Aberdeen School District – South Side Elementary School

Schematic Design Report

TCF Architecture
124 N. "I" Street Tacoma, WA 98403
tcfarchitecture.com

AUGUST 2026



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Introduction

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Introduction

The South Site Elementary School Schematic Design Report documents the outcomes of the schematic design phase for the Aberdeen School District's new educational facility in Aberdeen, Washington. This report serves as a comprehensive summary of design intent, guiding principles, technical strategies, and cost considerations that have shaped the project to date. It consolidates the work of the design team, Aberdeen School District leadership, and consultant partners, and establishes a clear baseline for advancing into design development.

The South Site Elementary School is envisioned as a forward-looking, flexible, and community-oriented campus that integrates multiple programs under one roof. Anchored by Aberdeen School District's commitment to preparing students for lifelong learning and civic engagement, the facility will accommodate South Site Elementary School.

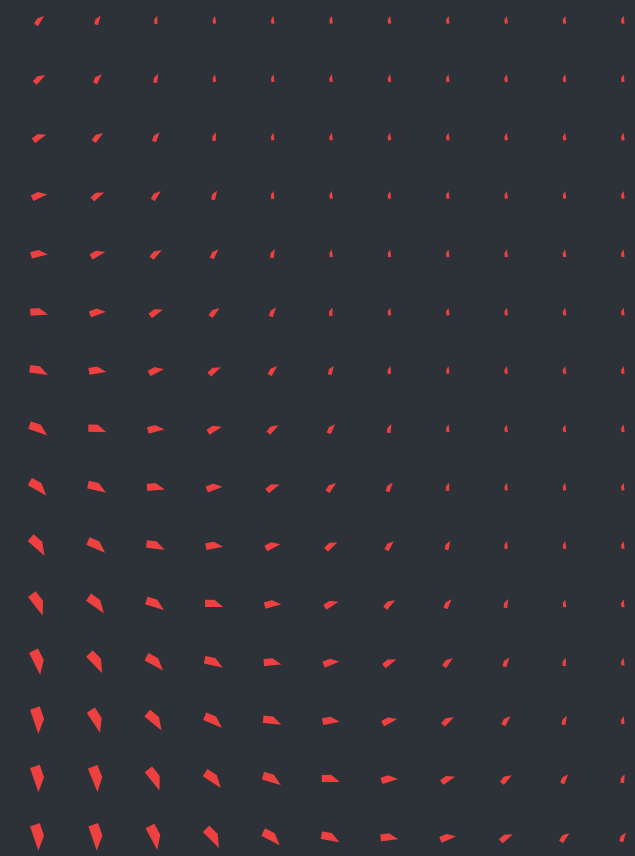
The project also holds a unique distinction as one of the **first school in Aberdeen School District to receive funding from the Washington State Office of Superintendent of Public Instruction's (OSPI) Seismic Grant Program**. This initiative reflects the state's commitment to improving the safety and resilience of educational facilities in seismically active regions. The South Site Elementary School will serve as a precedent-setting example for future district projects integrating seismic readiness with 21st-century educational design.

The schematic design process was guided by the District in close collaboration with the project management team from **ESD 112 | Construction Services Group,** who coordinated workshops, stakeholder engagement sessions, and design advisory meetings. These efforts ensured that educational needs, operational requirements, and long-term community goals were clearly represented in the design. While this introduction provides an overview, the **Design Methodology** section later in this report documents the process in greater detail.

- Key design priorities include flexible classrooms and incorporation of the Districts latest Special Program spaces, daylighting, acoustical performance, sustainability in alignment with the Washington Sustainable Schools Protocol (WSSP 2023), and compliance with the 2021 Washington State Energy Code (WSEC). The project reflects the District's dedication to creating an equitable, safe, and durable facility that will serve as a cornerstone of learning and community engagement in Aberdeen for decades to come.

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II. Executive Building Summary



Executive Building Summary II

The South Site Elementary School is planned as a two-story, 62,400 SF educational facility under the Office of Superintendent of Public Instruction's Seismic Grant Program (OSPI). The educational facility is located on a hillside site bordering Cosmopolis to the South. Designed under Type V-B wood-framed construction, the building integrates elementary-level education programs within a facility that locates the facility South of the river and out of the Tsunami inundation zone.

PROGRAMS SERVED

- South Side School: Kindergarten through fifth grade with TK programs, OTPT and Resource Classrooms for special education programs.

BUILDING SYSTEMS & MATERIALS

- Structure: Wood framing with wood shear walls, engineered wood roof joists and floor trusses with plywood sheathing and concrete topping at the second floor.
- Envelope: Durable, low-maintenance cladding (Ceraclad, masonry, and metal panel), aluminum entrance systems with fiberglass windows. Roofing is Asphalt shingles with small areas of EPDM membrane roofing.
- Interiors: Resilient flooring consistent with district standards (Forbo linoleum, Nora rubber tile, Armstrong VCT, Mondo gym flooring) selected for sustainability and lifecycle cost.
- Acoustics: Complies with WAC 246-366 (NC-35 classrooms) and ICC A117.1 enhanced acoustics (≤0.6–0.7 second reverberation times), supporting speech intelligibility and student focus.

SUSTAINABILITY & PERFORMANCE

- Washington Sustainable Schools Protocol (WSSP 2023): Preliminary scorecard shows 69 points, exceeding the Class I baseline.
- Washington State Energy Code (WSEC 2021): C406 compliance achieved with required credits met in both categories — 48 credits in energy efficiency measures (lighting + HVAC) and 23 credits in load management (HVAC).
- Health & Wellness: Daylighting strategies, low-emitting materials, ducted return air systems, and acoustical design promote student-centered environments.

Executive Building Summary

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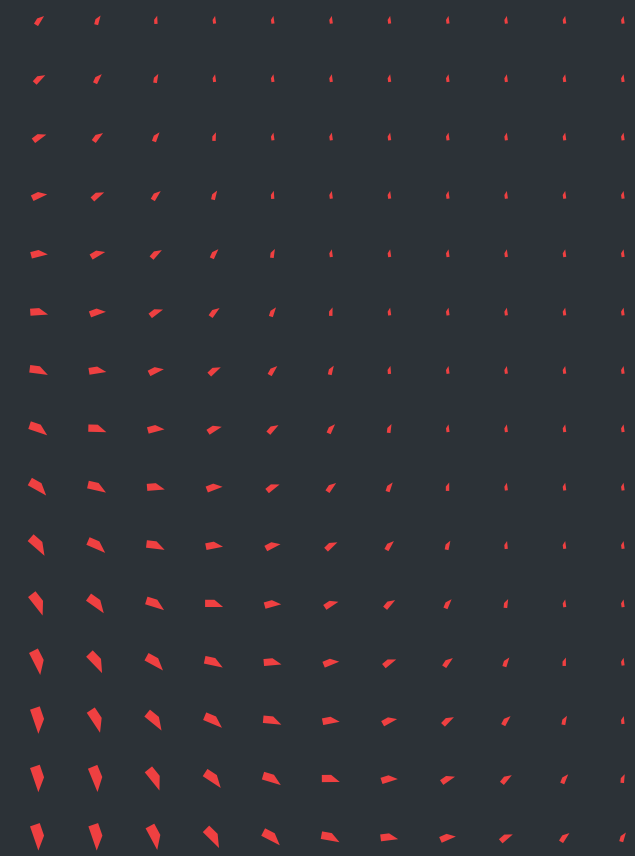
COST & SCHEDULE

- Target MACC: $52,089,241
- Schematic Design Estimate (July 2026): $58.5 million total project cost, including building, sitework, and off-site improvements.
  - Additive Alternates under consideration: Improved playfield drainage, rockery to save existing trees, metal vs asphalt shingle roofing, exterior sun shades, and Entry canopy size increase.
  - Delivery: Design–Bid–Build, with construction start anticipated in Septemer 2027 and substantial completion projected for Fall 2028.

The South Site Elementary School embodies Aberdeen School District's commitment to durability, operational efficiency, and seismic resilience, while delivering flexible, welcoming spaces that reflect the educational and social needs of its students and community.

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III. Design Methodology



Design Methodology

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DESIGN METHODOLOGY

The schematic design process for the South Site Elementary School was highly collaborative, guided by the Aberdeen School District and facilitated by the project management team from ESD 112 | Construction Services Group. This process engaged administrators, educators, students, and community representatives to ensure the resulting design reflects both programmatic needs and community values.

STAKEHOLDER ENGAGEMENT

Beginning in October 2025, the design team conducted a series of educational specifications (Ed Spec) workshops with faculty, staff, district representatives, and ESD 112 project managers. These workshops focused on refining requirements for administration/reception, Gym/Performance/Cafeteria/Kitchen Spaces, and classroom environments. The workshops established the foundation for the program and provided clarity on space standards and adjacencies.

SITE TOURS

To supplement workshop discussions, the District and project team organized site visits to comparable facilities in western Washington, including Littlerock, Peter G Schmidt, and Southworth Elementary Schools, which directly informed design strategies for the South Site Elementary School.

DESIGN ADVISORY COMMITTEE

A Design Advisory Committee—comprised of Aberdeen School District leaders, teachers, program staff, and ESD 112 representatives—was convened to guide decision-making and review schematic design progress at key milestones. This group met regularly, holding 9 meetings and a page-turn session, to ensure that educational goals, operational requirements, and community priorities were consistently integrated into the design process.

Design Methodology III

DESIGN GOALS:

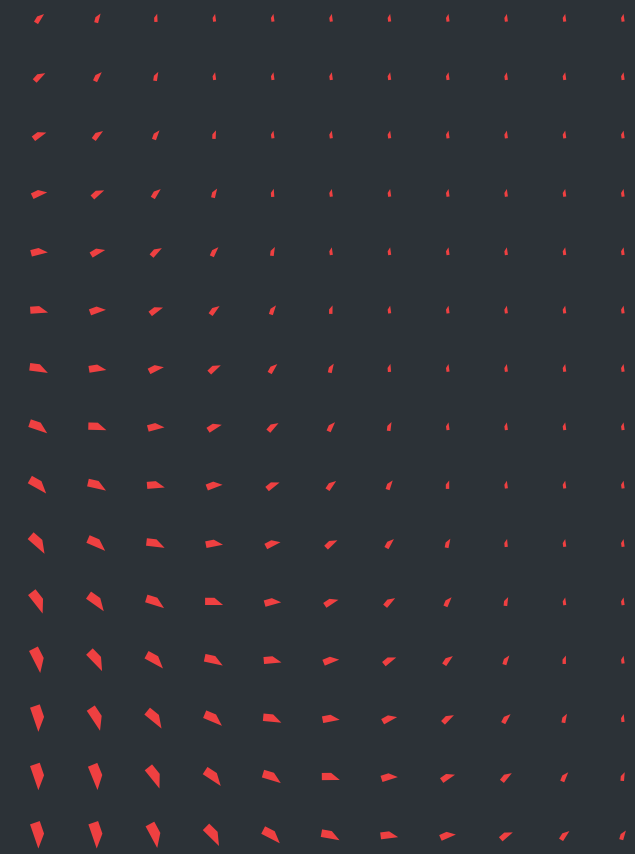
- Create flexible, learning environments that can respond to changing program needs.
- Prioritize supportive learning environment strategies that provide spaces for a variety of learning needs includes breakout areas that support informal interaction and semi-private conversations, and open commons designed for informal interaction, ensuring that students and staff can access environments suited to a range of activities and learning styles.
- Integrate daylighting and views to enhance learning environments.
- Achieve superior acoustical performance for speech intelligibility.
- Align with Aberdeen School District material standards for durability, lifecycle value, and a targeted 50–70 year facility lifespan.
- Ensure seismic resilience and long-term safety consistent with the OSPI Seismic Grant intent.
- Incorporate program needs and spatial adjacencies in a way that creates an efficient use of space and supports achieving the project's size and budget goals.
- Produce a cohesive architectural language that will set the tone for future seismic school replacements for Aberdeen School District, creating buildings that are clearly recognizable as Aberdeen schools. This goal also reinforces a sense of community pride and establishes a consistent architectural identity that can serve as a long-term brand for the District's facilities.

COLLABORATIVE PROCESS

- The design team leveraged a collaborative, iterative approach, balancing district standards, owner's project requirements (OPR), and cost estimating feedback. Design options were considered and evaluated for cost, durability, and program alignment before the preferred schematic design was advanced.
- The Design Team had the opportunity to solicit input from the Community before after a Stevens Elementary awards ceremony. Bilingual boards and surveys were displayed with playground equipment and mascot options and passerbys to and from the award ceremony were encouraged to vote and fill out the brief survey
- Through this collaborative methodology, the South Site Elementary School design reflects the shared vision of the District, ESD 112, and the community, providing a durable, flexible, and inspiring facility aligned with long-term educational goals. Detailed meeting minutes from this phase are included in the Appendix as a record of discussions and decision-making.

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IV. Sustainability



Sustainability IV

PROJECT SUSTAINABILITY, HEALTH, AND WELLNESS GOALS

The South Site Elementary School reflects the Aberdeen School District's commitment to sustainability, health, and resilience in both building performance and educational experience. The design aligns with the Washington Sustainable Schools Protocol (WSSP 2023) and the 2021 Washington State Energy Code (WSEC) Section C406, ensuring the facility meets or exceeds state requirements while fostering a safe, welcoming, and adaptable environment for students and community.

ENERGY AND ENVIRONMENTAL PERFORMANCE

The project incorporates high-efficiency HVAC, enhanced lighting controls, load management strategies, and a rooftop solar photovoltaic array. Together these exceed code baselines, reduce the building's energy use intensity (EUI), and prepare the facility for future renewable expansion. Native and drought-tolerant landscaping, irrigation sub-metering, and EV/bus charging readiness further reduce environmental impacts.

HEALTH AND WELLNESS

The design emphasizes variety and choice in spaces—from large public commons to quiet study areas. This school includes the most current Special Education approach featuring a large space to proactively de-escalate students with a variety of activities and quiet spaces depending on a student's needs. Daylighting, and providing territorial views to the North for all classrooms and central breakout nook, acoustical treatments, and thermal comfort controls are integrated to promote focus, comfort, and well-being.

The building floor plan is organized to be intuitive and easy to navigate, minimizing barriers to access and providing clear wayfinding throughout. Circulation paths are designed for visibility and simplicity, reducing stress for students and visitors. At the exterior, the facade and elevations express a welcoming and permanent presence, using durable materials and comfortable forms that reflect community identity.

DURABILITY AND ADAPTABILITY

Materials and systems are selected for lifecycle value and resilience in Aberdeen's coastal climate, targeting a ***50-70-year service life.*** The building is planned with flexibility for future program shifts, ensuring long-term relevance and alignment with evolving District and community needs.

OPERATIONS AND ENGAGEMENT

Systems are designed for transparency and ease of management, with submetering, load tracking, and staff training to optimize performance. Green cleaning, food waste reduction, and sustainable operational practices are embedded in long-term facility use.

SUMMARY

Through these strategies, the South Site Elementary School is positioned as a high-performance,healthy, and resilient educational facility. The design integrates sustainability with health and wellness priorities, ensuring the school is both an efficient building and an inviting, supportive environment that serves the Aberdeen community for generations.



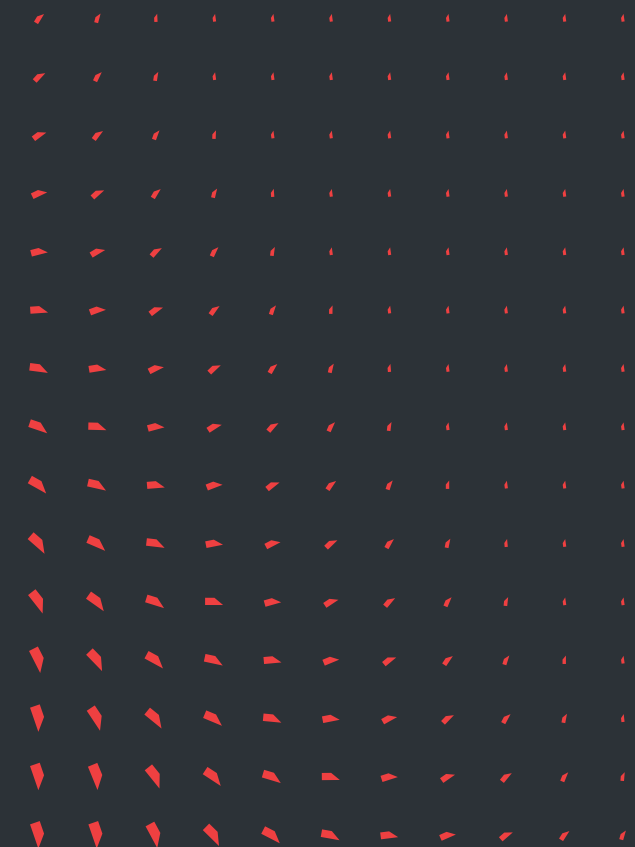
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Basis of Design

I. Civil
II. Landscape
III. Architectural
IV. Food Service
V. Structural
VI. Mechanical
VII. Electrical

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I. Civil



Civil

The civil design for the Aberdeen South Site Elementary School provides the framework for site development, utility connections, and compliance with local, state, and federal regulations. This section outlines the schematic-level basis of design for grading, stormwater, utilities, and access. The intent is to support the District's goals for safety, resilience, efficiency, and sustainability while addressing specific site conditions in south Aberdeen.

01 EXISTING SITE OVERVIEW

- The site will be located on a vacant lot at the southern end of City limits. Access is gained to the Site from Lomax Street via South Evans Street. The site is surrounded by residential to the south and northwest.
- The southern portion of the site allows for the building pad and parking lot. Existing slopes in this area are approximately 8%. The site slopes to the north and the hillside slopes are approximately 18%.
- Existing development includes a residential driveway at Lomax Street. Additionally, there are water and sanitary sewer mains on-site along with overhead power within Lomax Street that provide power to nearby residences.
- A geotechnical investigation report has not been provided at this time. However, it is assumed that infiltration is not suggested. Coordination with the Geotechnical engineer is required to confirm the proposed grading plan and approach to structural footing design.

02 PROPOSED GRADING & EARTHWORK

- In general the site slopes from south to north. The southern portion of the site will be in a cut situation and the northern portion of the site will be in a fill situation.
- Typical slope ratios will be 3H:1V for unretained slopes, unless otherwise engineered.
- Grading will establish level building pads and ADA-compliant circulation routes while maintaining positive drainage.
- During schematic design, it was decided to remove existing trees and not construct retaining walls to save them as a cost saving measures.
- Temporary erosion and sediment control (TESC) measures, such as silt fencing, construction entrances, and stabilized stockpile areas, will be implemented to protect adjacent properties and public rights-of-way during construction.
- Earthwork quantities include 7,900 CY of export and 6,300 CY of import, with structural fill imported to support foundations and paved surfaces.

03 SOIL CONDITIONS

- A geotechnical investigation report has not been provided at this time. This section will need to be updated once receiving the report.

04 STORAGE DRAINAGE

- Stormwater management follows the Department of Ecology's *Stormwater Management Manual for Western Washington (SWMMWW).*
- Stormwater runoff will be collected and conveyed to detention ponds at the northern end of the site and released to the existing storm drainage conveyance system. Runoff from pollution generating impervious surfaces will be treated prior to entering the detention system.
- Water quality treatment facility will likely be a mechanical filter system.
- Roof drainage will be collected separately from paved surface runoff and routed to the detention pond to bypass the treatment facility.
- A stormwater pollution prevention plan (SWPPP) will be implemented during construction.

Civil

05 UTILITIES

- Water: There is an existing 12" water main that bisects the site. Taps will be made to this main for fire hydrants, fire service, irrigation and potable water services. Backflow prevention for fire and potable water will be provided within the building. Potable and fire service lines will be coordinated with the mechanical engineer. Due to the amount of cut on the site, the water main will need to be lowered.
- Sanitary Sewer: There is an existing sanitary sewer main at the southwest corner of the proposed parking lot. Waste water from the proposed building will connect to the existing sanitary sewer manhole. A grease interceptor will serve the kitchen prior to discharge.
- Electrical & Telecommunications: Primary electrical service and communication pathways will be coordinated with local utility providers, routed underground, and sized for future capacity. Dedicated conduits for technology infrastructure will be included. Transformer and vault locations will be coordinated to maintain service reliability and clearances.
- Fire Protection: Separate fire service line with post-indicator valve (PIV) and backflow prevention will be provided. Hydrant locations will be reviewed with the City Fire Marshal to meet required coverage
- Other Dry Utilities: Provisions for cable, fiber optic, and other communication services will be included in the underground utility plan to ensure comprehensive service to the facility.

06 HARDSCAPE & LANDSCAPE COORDINATION

- The civil scope includes asphalt paving for parking lots and concrete paving for sidewalks and plazas.
- Pedestrian circulation routes will connect building entries to parking areas, playfields, and surrounding neighborhood sidewalks.
- Irrigation sleeves and utility coordination are provided for landscaped areas designed by the landscape architect.
- Playground surfacing and drainage systems are coordinated with site grading and stormwater collection.

07 ACCESS & CIRCULATION

- Primary site access will be from Lomax Street, with drive aisles designed to meet City of Aberdeen standards for sight distance and turning movements.
- Bus circulation, parent drop-off, and staff parking will be separated into distinct zones for safety and efficiency, with queuing capacity sized to reduce congestion on public streets.
- Service and emergency access will be provided via designated drive aisles with turning radii designed for fire truck access, consistent with the International Fire Code and Fire Marshal review.
- Pedestrian access will include new sidewalks, ADA-compliant curb ramps, and defined crosswalks connecting site entries with the surrounding neighborhood.
- Bicycle racks and pedestrian improvements will promote multimodal access, with routes coordinated to avoid conflicts with vehicular traffic.

08 STREET & OFF-SITE IMPROVEMENTS

- Improvements along South Evans Street and Lomax Street will include new asphalt paving, new curb and gutter, landscape strip, and a 12' wide concrete path for bicycles and pedestrians.
- The intersection of South Evans Street and Lomax Street will be improved to allow adequate turning movements for fire trucks, garbage trucks, etc.

09 VALUE ENGINEERING CONSIDERATIONS

- Installing a geo-grid with cement treated base will reduce the asphalt and aggregate base sections.

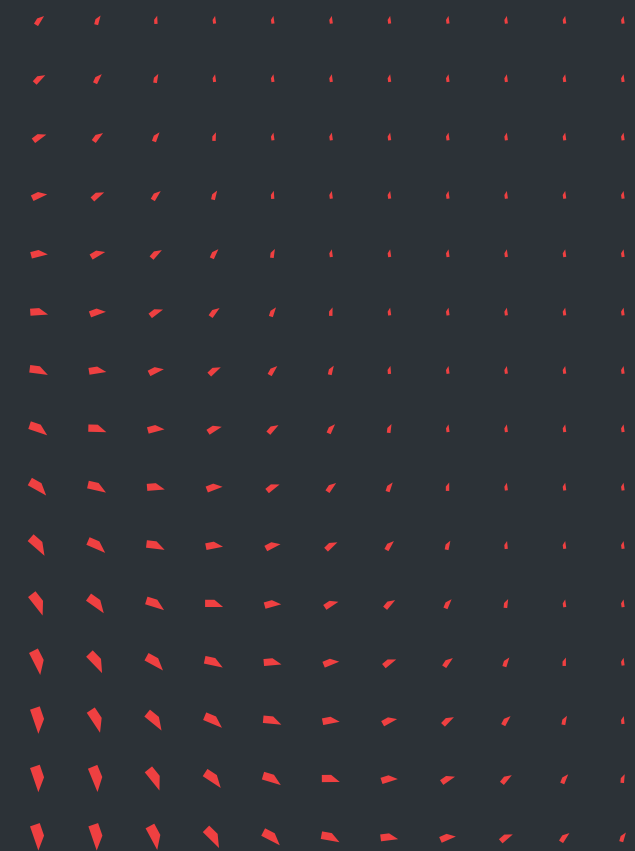
10 ENVIRONMENTAL REVIEW

- The project is subject to the State Environmental Policy Act (SEPA) review process. Documentation and analysis will be completed in coordination with the City of Aberdeen to ensure environmental impacts are properly evaluated and mitigated.

The civil basis of design for the South Site Elementary School addresses site challenges, steep grading, and stormwater management. By balancing earthwork volumes, separating site circulation, and integrating stormwater treatment with landscape elements, the design establishes a resilient and efficient foundation for the new facility. The approach supports Aberdeen School District's goals for a safe, sustainable, and cost-effective project with a targeted 50–70–year service life.

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II. Landscape



Landscape

II

The Schematic Design Phase Basis of Design (Design Criteria), as described herein, generally summarizes the design intent of materials and systems related to the landscape scope to be included in the Schematic Design cost estimate for the Aberdeen School South Site Elementary.

TREE RENTENTION

All trees outside the limits of excavation are to be protected with 6-foot tall temporary chain link fencing at the dripline of each tree. When the dripline extends over hardscape to remain the fencing shall be placed at the boundary between hardscape and softscape.

PAVING & FINISHING

- Type 1 Cast-in-place (CIP) Concrete Paving:
  - Medium broom finish, tooled joints, no shiners. Sidewalks and courtyards. See civil for horizontal and vertical controls.
- Type 2 CIP Concrete Paving:
  - Heavy Sandblast or Topcast Finish, sawcut joints at entry plaza. See civil for horizontal and vertical controls.

PLAY AREAS

- Preschool Play Area:
  - Play mound with synthetic turf slope, climbing orbs, and slide.
  - Synthetic turf with fall attenuation pad, infill, perimeter drainage with cleanout, and perimeter nailer board. Turf safety surfacing basis of design: Playground Grass (Ultra) by ForeverLawn.
  - Slide basis of design: Hill Slide 0.8 by Goric
  - Climbing orbs basis of design: Half Balls by Euroflex.
  - Nature exploration play opportunities including:
    - Willow Cave for enclosure and imagination.
    - Engineered wood fiber for tactile exploration.
    - Natural logs and rootwads for balancing and leaping.
  - Fence Portal: Added interactive feature into perimeter 3' Height). Ornamental Fence.
- Elementary Play Area:
  - Pedestrian asphalt surfacing (see civil) with painted lines for basketball, hopscotch, foursquare (16' x 16') , tetherball, a running track, and art.
  - Five basketball hoops. Basis of Design: Bison Ultimate HangTime Clear 6" Adjustable Systems
  - 5-12 year old Climbing structure with slide(s).
  - *Swing set (approx. 35' x 40') with belt swing, group swing, and accessible swing.*
  - Group spinner
  - Safety surfacing at swings, climber, and spinner. Synthetic turf with fall attenuation pad, infill, perimeter drainage with cleanout, and perimeter nailer board. Turf safety surfacing basis of design: Playground Grass (Ultra) by ForeverLawn.
- Hill Play Nature Exploration:
  - Boulders and natural logs scramble on hillside (NW corner of play field)
  - Outdoor classroom and garden. (20) 12" log rounds for seating arrayed on crushed rock surfacing with large flat boulder stage for outdoor learning.
  - (1) 3' wide log seat with crushed rock paving.
  - Nature exploration path. Crushed rock path with natural logs and boulders.
  - Stacked boulder seating against hill. Crushed rock paving
  - See Site Furnishings section below for benches, tables, and boulders.
  - See Planting and Soil Preparation section for lawn and planting.
- Play Field:
  - Lawn for informal sports play. See Planting and Soil Preparation section for lawn and planting.

- Asphalt loop path, 10’ width. See Paving and Finishing section for asphalt paving.
- CIP Concrete Paving (Type 1) on sloped portions of path.

- Entries and Courtyards:
  - Planted areas with natural logs, rootwads, boulders, and mulch for biophilic benefits.
  - 12" dia concrete “piles” ranging in height from 12” to 60” high.
  - Boulders located within planting areas and within CIP Concrete Paving (Type 2)
  - Staff outdoor lounge with (2) picnic tables (See Site Furnishings). Crushed rock surfacing.
  - Type 1 & Type 2 CIP concrete paving
  - Lawn. See Soil Preparation for lawn.

SITE FURNISHINGS

- Benches
  - Basis of Design: TimberForm Colossus
  - Quantity: Per plan
- Picnic Tables
  - Basis of Design: Transit Collection, by Tournesol with integral table and seats
  - Quantity: Per plan
- Boulders
  - 2’x2’x1.5’ Rounded Igneous Boulders
  - 3’x2’x2’ Rounded Igneous Boulders
  - 4’x3’x2’ Rounded Igneous Boulders
  - 5’x3’ x2’ Rounded Igneous Boulders
  - Quantity: Per plan
- Trash Receptacles
  - Basis of Design: Urban Accessories OT Litter Receptacle with door.
  - Quantity: Assume 3 total.
- Bicycle parking
  - Basis of Design: Sportworks ADA-compliant Tofino No-scratch Bike Rack
  - Quantity: Assume 5 will be required.
- Fences and Gates
  - 3’ Height Chain Link Fence: Black vinyl coated
  - 6’ Height Chain Link Fence: Black vinyl coated
  - 6’ Height Ornamental Fence: Basis of Design: Omega II Unik Pattern Ref. 22
  - o Assume 2 panels will be Omega II Unik Pattern Ref. 23 as Fence Portal
  - Gates to match the height of adjacent fence and coated with durable black paint to match the fence. Gates at play areas to include panic crash bars and hardware and child resistant locks as shown on the plans.
- Planting and Soil Preparation
  - All required planting areas including parking lot islands and perimeter landscaping shall meet the requirements of *Aberdeen Municipal Code 17.64.060*
- Shrub and Tree Planting Area (per plan)
  - Decompact native soil to 24” below finish grade.
  - Import 6” of bioretention soil as cap over existing soils, typical.
  - Each tree location shall be decompacted to 24” depth below finish grade, and the width of the root ball.
  - 1 gal. shrubs, 1 gal. and 4” groundcover and herbaceous
  - Deciduous / broadleaf trees to be 1.5” caliper. Conifers to be 6’-7’ tall.
  - 3” depth of med-fine bark mulch or coarse sand. See plans.

Landscape

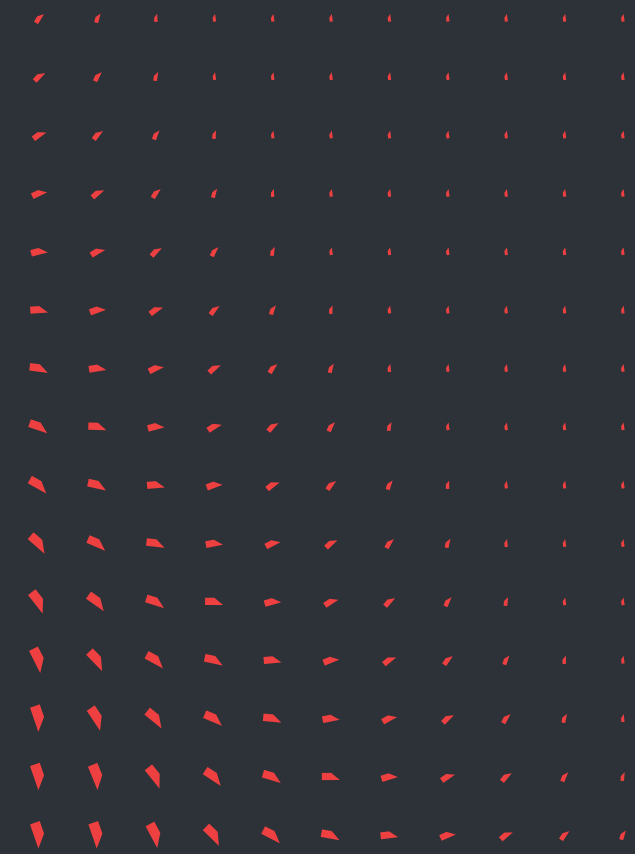
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PLAY AREAS SEEDED MEADOW AREA (PER PLAN)

- Seeded Meadow Area (per plan)
  - Decompact native soil to 24" below finish grade.
  - Import 6" of bioretention soil as cap over existing soils, typical.
  - Proof roll
  - Seeded grass mix
  - 1 gal shrubs and perennials
  - 3" depth of med-fine bark mulch or coarse sand. See plans.
- Detention Pond Planting Area (per plan)
  - Planting to meet stormwater code requirements
- Lawn (per plan)
  - Decompact native soil to 24" below finish grade.
  - 8" depth bioretention soil
  - Proof roll
  - Sod (or hydroseed, depending on timing of installation)
  - Basis of design: Premium Sod Seed Mixture by Country Green Turf Farms
  - Maintenance Edge: 12" width of Type 1 Concrete maintenance strip at perimeters of building where adjacent to the planting areas.
  - 1-year establishment period warranty for planting
- Mulch:
  - 3" depth of med-fine wood chips or coarse sand
- Irrigation:
  - Automatic permanent two-wire underground irrigation with rain sensor and flow meter. All new planting and lawn areas to receive permanent irrigation with pop-up
- Assumptions
  - Site lighting per electrical
  - Paving (except at play areas), curbs,site walls, and tactile warning per civil.
  - Flag pole per architectural.

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III. Architectural



Architectural

III

The South Site Elementary School is conceived as a durable, efficient, and flexible educational facility that will serve as a community anchor for Aberdeen and its surrounding region. Designed to Type V-B non-rated construction standards with a targeted 50–70–year life expectancy, the building reflects the Aberdeen School District's commitment to long-term resilience, low-maintenance systems, and high-performance learning environments.

The project integrates the priorities established in the Owner's Project Requirements (July 2026), ensuring alignment with the District's educational mission, sustainability goals, and operational needs. It also responds directly to the Educational Specifications (February 2026), which define the programmatic and spatial requirements for South Site Elementary School.

Design strategies are guided by compliance with the 2021 Washington State Energy Code (WSEC) and the Washington Sustainable Schools Protocol (WSSP 2023), targeting Class I baseline performance. They also reflect key health and safety standards, including WAC 246-366 for school environmental health, and the Tenor Engineering Acoustical Design Plan (July 2026), which establishes criteria for speech intelligibility and noise control.

Beyond compliance, the design emphasizes principles and community identity, drawing on Aberdeen's coastal setting and timber heritage. Flexible spaces, daylight-filled interiors, and biophilic finishes will support diverse learners while welcoming families and community members into a facility that is adaptable for multiple uses, both during and beyond the school day.

01 GENERAL BUILDING DESCRIPTION

- Building Size: Two-story facility, 60,352 SF gross floor area building and 1,500 SF covered Play. *Updated after value engineering (VE).*
- Programs Housed: South Site Elementary School K-5 and TK Classrooms with Special Education and OTPT Spaces.
- Structural System: Wood framed walls with plywood sheathing and TJI roof joists with plywood sheathing, concrete slab-on-grade, and Open web floor trusses, plywood sheathing with concrete topping.
- Construction Type: V-B non-rated per International Building Code (IBC).
- Seismic Design: Enhanced performance under the OSPI Seismic Grant Program.
- Maximum Allowable Construction Cost (MACC): $52,089,241
  - Schematic Design Estimate: $TBD (June, 2026).The current estimate exceeds the budgeted MACC. The team worked with Sazan and the District to determine savings to get the project in range of acceptable contingencies. Continued evaluation of the estimate will be ongoing to maintain the project budget.

02 BUILDING ENVELOPE

- Exterior Walls:
  - Cladding 1 Brick veneer at the base and main entries for durability, impact resistance, and compatibility with Aberdeen's civic architecture. This is consistent with District standards for masonry cladding at ground level.
  - Cladding 2 Vertically oriented metal wall panels (example: AEP Span lok), with high-performance fluoropolymer coating for salt-air corrosion resistance.
  - Cladding 3 Fiber Cement panel (example: Ceraclad) prefinished zen garden and wood-look panels accent areas.
  - Wall Assemblies: Loadbearing wood stud framing with batt insulation, plywood sheathing, continuous mineral wool insulation over a self-adhered WRB/ air barrier (e.g., VaproShield WrapShield SA or equal), and rainscreen cladding attachment (Knight Wall or Cascadia system).
  - Corrosion Resistance: All through-wall flashings and fasteners specified as stainless steel to meet ASD standards for coastal durability.

- Specialty Walls & Wall Accessories:
  - Service Yard Wall: Ground face CMU wall flashed with a sheet metal cap.
  - Lintels: Precast concrete lintels with embossed lettering will be incorporated above first-floor windows facing public access points to reinforce civic identity and provide durable detailing.
  - Below-Grade Concrete Walls: Concrete foundation walls provided with dampproofing or waterproofing at water-critical conditions. Extruded polystyrene insulation (XPS) with minimum R-10 will be installed on the exterior of below-grade walls for thermal performance and moisture resistance. Reference is made to the Civil Basis of Design for foundation drainage measures such as perimeter drains and gravel backfill.
- Roofs:
  - Primary Sloped Roofing: Asphalt shingle roofing (Malarkey Vista AR™ or equal), with 2 layers of underlayment.
  - Kitchen Low-Slope Roofing: Fully adhered single-ply EPDM membrane assemblies (Carlisle SynTec Systems, Sure-Seal® or equal) at low-slope roof areas, 60-mil thickness with mechanically fastened base layer and fully adhered cap sheet. Assemblies designed with tapered insulation for positive drainage and overflow scuppers sized for 100-year storm events.
  - Performance: Assemblies designed to meet or exceed WSEC 2021 prescriptive R-values (minimum R-38, target R-49) and achieve minimum SRI values for roof areas.
  - Warranty: Roofing systems detailed for a minimum 20-year warranty, with design intent for a 20-year service life. Manufacturer's weatherproofing warranties will be specified for both Asphalt Shingle and EPDM systems , with typical durations of 20–30 years for EPDM assemblies and 20–25 years for Asphalt Shingle roofing systems.
- Roof Accessories: Roof Hatches at each main roof area
  - Fall Protection: Permanent fall protection strap anchors mounted to the wood structure, integrated into the roof design for worker safety and compliance with OSHA standards. Guardian Fall Protection posts or similar systems will be specified.
  - PV Panel Attachments: Roof designed to accommodate solar PV installations using Ironridge Lynx clamps and L-Foot and horizontal rail systems, ensuring weatherproof integration without roof penetration failures.
  - Roof Access Walkways: Non-slip walk pads provided along service routes to mechanical equipment to protect membranes and improve maintenance safety. At standing seam roofing, walk pads will be aluminum grate systems mounted on S-5 clips to ensure secure attachment without compromising roof performance.
  - Roof Access Ladders: Fixed exterior and interior aluminum ladders with safety cages and lockable access points for controlled roof entry, specified in aluminum construction for enhanced corrosion resistance in the coastal environment.
  - Gutters: Prefinished sheet metal gutters from AEP Span with marine-grade finish, minimum width of 6 inches and minimum depth of 4 inches, installed with stainless steel fasteners for durability in the coastal environment.
  - Downspouts: PVC pipe downspouts, minimum 4-inch diameter, tightlined to storm drains. No downspout will daylight at grade. Stainless steel debris strainers will be provided at gutter and downspout inlets for durability and maintenance control.
- Exterior Windows & Glazing:
  - Primary Glazing: *Fiberglass windows* (Cascadia or similar) with insulated double-pane low-E glazing (Guardian or similar). Select classrooms include operable awning-style vents for natural ventilation. Performance criteria: maximum U-factor of 0.32, SHGC of 0.40 or lower, and STC ratings of 35–40 at high-noise exposures.

- Secondary Glazing: Thermally broken painted aluminum storefront frames (Kawneer or similar). Thermally broken painted aluminum storefront frames (Kawneer or similar), exterior-glazed with double-pane insulated glass using Guardian low-E coating or similar. Performance criteria per WSEC: maximum U-factor of 0.36 and SHGC of 0.40 or lower. Acoustic-rated glazing assemblies specified at street-facing facades to mitigate traffic noise. Laminated glazing will be provided at main entry vestibules at the Administration for enhanced safety and durability
- Window Coverings: Manually operated roller shades at exterior windows, electrically operated where roller shade elevation makes for difficult access. Draper as the basis of design.

- Exterior Doors:
  - Storefront Entrances: Aluminum storefront entries with thermally broken framing systems (similar to Kawneer Trifab® 451UT), meeting U-factor 0.45 or better, with panic hardware and automatic operators at primary entrances.
  - Hollow Metal Entrances: Curries Mercury thermally broken frames with Curries Q-Maxx insulated metal doors, coated with high-performance finishes to resist marine climate impacts.
- Insulation:
  - Interior Walls: Sound batt insulation at sound-rated walls for the full depth of the stud cavity, and 5/8" minimum thickness Type 'X' drywall is typical.
  - Exterior Walls: Continuous exterior insulation, minimum R-21 effective with target R-25, using mineral wool or rigid foam sheathing.
  - Roof: Rigid polyisocyanurate insulation at roof decks, minimum R-38 with target R-49.
  - Below-Grade: Foundation walls insulated to minimum R-10.
  - Moisture Resistance: Insulation types selected for improved thermal performance and resistance to moisture intrusion.
- Exterior Stairs:
  - Construction: Cast-in-place concrete with integral drainage design.
  - Treads & Nosings: Cast-in slip-resistant nosings for durability and safety in wet conditions.
  - Railings: Hot-dip galvanized steel railings, *ground-set into concrete* rather than surface-bolted, to enhance corrosion resistance and long-term stability.
  - Fasteners: Stainless steel fasteners specified where applicable to maximize durability in the coastal environment.
  - Integration: Stairs provide direct egress from upper-level corridors, coordinated with site circulation. Assemblies designed for heavy daily use and minimal maintenance.
- Air & Vapor Control:
  - System Type: Self-adhered WRB at exterior wall assemblies and self-adhered interim roofing membrane at roof assemblies serving as the primary air barrier layers.
  - System Type: Self-adhered WRB at exterior wall assemblies and self-adhered interim roofing membrane at roof assemblies serving as the primary air barrier layers.
  - Details: Fluid-applied membranes and flashing at penetrations, window frames, and control joints.
  - Performance: Designed to comply with WSEC 2021 requirements and enhance overall building envelope tightness, reducing infiltration and improving energy efficiency.

03 INTERIOR FINISHES

- Interior Doors:
  - Typical Doors: Wood veneer doors with hollow metal frames, stained and sealed to provide warmth and durability. VT Industries as design basis.
  - Service Doors: Doors at high-use service areas (mechanical rooms, electrical rooms, etc.) shall be hollow metal leaf with hollow metal frames for durability and security.

- Operable Wall at Gym & Commons: Electrically operated folding panel partition (Advanced Equipment Corporation Alpha Series as design basis) to provide flexibility for large assembly and multipurpose functions.
- Acoustic Doors: Door assemblies with STC ratings of 35 will be provided at spaces requiring enhanced sound isolation.
- Fire-Rated Doors: Fire-rated interior door assemblies will be limited to specialty areas such as the elevator equipment room, as required by code for Type V-B construction.
- Access Service Panels: Access service panels with trim collar (no mud-in), factory primed to be field painted. All doors below 8' elevation will r provided with keyed locks.
- Overhead Coiling Door: Electrically operated aluminum coiling door with stainless steel trims and covers, 8' in height. Overhead Door Model 620 or similar as basis of design. Coiling doors will be available at the Kitchen and Student Store areas.

Interior Glazing:

- Window Coverings: Manually operated roller shades at interior glazing locations, electrically operated where elevation makes access difficult. Draper as basis of design.
- Vision Panels & Sidelites: Interior vision panels and sidelites using safety-rated laminated or tempered glazing in hollow metal or aluminum frames. Acoustic laminated glazing used at spaces requiring enhanced sound isolation. No fire-rated glazing assemblies will be provided on this project, as none are required for this Type IIB building.
- Interior Storefront: Painted aluminum storefront full height at the Reception, Grays Harbor Academy, and security vestibules. Kawneer or similar as design basis. Glazing to be tempered, with laminated glazing provided at designated safety locations.

Interior Stairs:

- Floors: Steel pan with concrete tread and steel risers clad with resilient rubber treads and risers (Nora or equivalent District-approved product). Slip-resistant, integral nosings for durability and safety.
- Walls: Painted GWB or CMU, with ½" *painted MDF wainscot* at lower walls for impact resistance and durability.
- Ceilings: Painted GWB in enclosed stairwells; exposed painted structure where open to commons.
- Design Intent: Assemblies are designed for heavy daily use with long-term maintainability. Rubber finishes reduce impact noise and improve slip resistance. MDF wainscot protects walls in high-traffic student circulation zones. Enclosures comply with fire-rating requirements while open stairwells provide clear sightlines consistent design.

Handrails:

- Material: *Stainless steel,* continuous on both sides of stairs per IBC/ADA requirements.
- Mounting: Wall-mounted or guard-mounted as required.
- Detailing: Rounded gripping surface, slip-resistant finish, mounted 34–38 inches above stair nosing per ADA.
- Design Intent: Stainless steel handrails are selected for *durability, hygiene, and low maintenance* in a coastal, high-use educational setting. Continuous runs improve accessibility, safety, and user comfort.

Guardrails

- Material: Steel with high-performance coating finish at interior locations.
- Height/Spacing: *Minimum 55 inches high* (exceeding IBC 42-inch requirement) for enhanced safety in educational environments. Vertical pickets spaced ≤ 4 inches O.C. per IBC.
- Mounting: Anchored into stair structure or mezzanine framing for long-term stability.
- Design Intent: Guardrails exceed minimum height for *student safety* and are detailed for durability. Transparent infill (tempered glass or perforated metal) may be used in high-visibility areas to support

supervision and open sightlines.

- Restrooms:
  - Floors: Thinset ceramic tile with localized drain slopes.
  - Walls: Full-height ceramic tile for durability and moisture resistance. Full height framed walls forming individual toilet compartments.
  - Ceilings: Moisture-resistant gypsum board.
- Corridors:
  - Flooring: Nora rubber tile is preferred.
  - Walls: Painted gypsum board, with 4' minimum height, 1/2" thick painted MDF wainscoting or wood veneer wall panels at key locations.
  - Ceilings: Acoustical lay-in ceiling tiles for noise control and access at first floor. Painted gypsum board and hardwood veneer plank system at key locations. BOD System: Armstrong, Woodworks Channeled Plank or similar
  - Polycarbonate suspended canopies at 2nd floor corridor, BOD: 3Form Contact: Cindy Kim, cindy.kim@3-form.com
  - Supplemental acoustic suspended baffles or clouds in 2nd floor corridor, BOD: Impact Acoustics – Round Bubbles OR Modular Baffle Systems
  - Notes: High-traffic durability prioritized. Provide selected areas for gathering that promote biophilic concepts
- General Classrooms:
  - Resilient Flooring: Nora rubber tile is preferred
  - Carpet: Administration, library and office areas, for acoustical comfort and warmth.
  - Walls: Painted gypsum board with tackable and writable wall surfaces integrated. Sound-rated partitions designed to achieve minimum STC ratings per the Acoustical Report (STC 50 at classroom separations).
  - Ceilings: Acoustical lay-in ceiling tiles, Armstrong basis of design, with a minimum NRC rating of 0.70 for sound absorption and accessibility to utilities.
  - Casework: Typical classrooms will receive plastic laminate casework.
- Administration & Offices:
  - Floors: Carpet tile for acoustical comfort and professional appearance.
  - Walls: Painted gypsum board with accent hardwood veneer plank system at select locations. Offices to receive (1) wall of full height tackable surface.
  - Ceilings: Acoustical lay-in ceilings throughout, with accent hardwood ceilings.
  - Casework: Plastic laminate casework for workrooms and conference room. Main reception will receive a solid surface custom countertop with hardwood accents.
- Health / Wellness Room:
  - Floors: Sheet resilient with coved base for sanitation.
  - Walls: Painted GWB with washable finishes at bed height.
  - Ceilings: Acoustical lay-in ceilings NRC ≥ 0.70.
  - Casework/Fixtures: Plastic laminate counters with stainless steel sink; lockable storage for medical supplies.
  - Residential Fixtures: Includes a ***lockable undercounter refrigerator*** for secure storage of medications and supplies.
  - Additional Fixtures: (2) medical cots with divider curtains for student rest and isolation as needed.
  - Adjacent Health Toilet: Restroom with accessible shower, ceramic tile flooring, full-height ceramic tile walls, and moisture-resistant GWB ceiling.
  - Design Intent: Provides a *supportive, sanitary, and acoustically private environment* for student care. Divider curtains and cots allow for temporary student rest. The adjacent toilet with shower ensures hygiene and emergency use. Durable, washable finishes and secure refrigeration provide long-term maintainability.

Architectural

III

- Cafeteria:
  - Floors: Nora rubber tile is preferred
  - Walls: Painted GWB with ½" MDF impact-resistant wainscot to 8' minimum height in circulation/dining zones. Tackable display panels at select locations.
  - Ceilings: Combination of exposed structure with suspended acoustical ceiling clouds (BOD: Impact Acoustics Round Bubbles), plus hardwood ceiling accents for warmth and identity.
  - Casework/Fixtures: Plastic laminate casework with solid surface counters at serving/storage stations.
  - A/V: Built-in projection screen, A/V connections, and recessed speakers.
  - Operable Wall: Motor operated between Gym and Cafeteria.
  - Design Intent: A flexible hub for student dining, collaboration, and community events. Durable finishes support high daily traffic while acoustical treatments control reverberation for speech intelligibility.
- Food Service / Kitchen:
  - Flooring: Resilient sheet flooring with coved integral base for sanitation (District Standard approach).
  - Walls: FRP panels or stainless-steel wall protection in cooking zones for washability. Painted gypsum board in ancillary storage areas.
  - Ceilings: Moisture-resistant gypsum board with washable finish; acoustical ceilings in adjacent serving/dining areas.
  - Equipment Integration: All finishes coordinated with stainless-steel kitchen equipment for continuous washable surfaces.
  - surfaces.
  - Ceilings: Acoustical lay-in ceilings NRC ≥ 0.70.
  - Casework: Built-in instrument storage and associated cabinetry, drop in sink.
- Music Room:
  - Function: Music Classroom
  - Flooring: Rubber tile
  - Walls: Painted gypsum board with tackable display surfaces.
  - Ceilings: Acoustical lay-in ceilings NRC ≥ 0.70.
  - Casework: Built-in instrument storage and associated cabinetry, drop in sink.
  - Operable Wall: Motor operated between Music and Gym.
  - Design Intent: Can function as a classroom or open to become a stage.
- Support Spaces (Storage, Mechanical, Electrical):
  - Floors: Clear-sealed concrete.
  - Walls: Painted GWB in general storage; moisture-resistant surfaces in food storage.
  - Ceilings: Exposed or gypsum board as required.
  - Casework: None beyond utility storage shelving.
  - Notes: Service clearances maintained for maintenance.

04 ACCESSIBILITY & CODE COMPLIANCE

- General Compliance: The building is designed to fully comply with the *2021 International Building Code (IBC), 2021 Washington State Building Code, 2021 Washington State Energy Code (WSEC),* and all referenced standards. Accessibility requirements are provided per the *Americans with Disabilities Act (ADA 2010 Standards)* and the Washington State Building Code accessibility provisions.
- Accessible Routes: Continuous accessible paths of travel
- Vertical Access: An elevator is provided for access between levels, sized to meet stretcher and wheelchair requirements. Interior stairs are supplemented by accessible routes per IBC and ADA.
- Restrooms: All public and instructional restrooms include accessible toilet stalls, grab bars, clear floor spaces, and accessible lavatories with insulated piping. The Health Toilet includes an accessible shower.
- Assembly & Gathering Spaces: The Cafeteria and Gymnasium include accessible seating, companion seating, and assistive listening systems per ADA and IBC Chapter 11.
- Instructional Spaces: General Ed Classrooms and Specialty Classrooms include accessible casework (sink and counter heights) and adaptable furnishings.
- Signage: All required permanent room signage includes raised characters and Braille. Directional signage designed per ADA and WAC standards for legibility and consistency. Supergraphic at Main Exterior West Elevation
- Acoustics & Lighting: Accessibility is extended to sensory needs Sensory space and Classrooms have dimable lighting.
- Acoustics: Classrooms meet ANSI S12.60 and WAC 246-366 acoustical standards (STC 50+ partitions, NRC ≥ 0.70 ceilings).
- Lighting: Complies with ADA and WAC standards for visual comfort, glare reduction, and adequate illumination at all accessible routes.

05 SUSTAINABILITY & HEALTH

The South Site Elementary School is designed to meet the Washington Sustainable Schools Protocol (WSSP 2023) and the 2021 Washington State Energy Code (WSEC) C406 requirements. These frameworks guide strategies that improve building performance, reduce operational costs, and support student wellness.

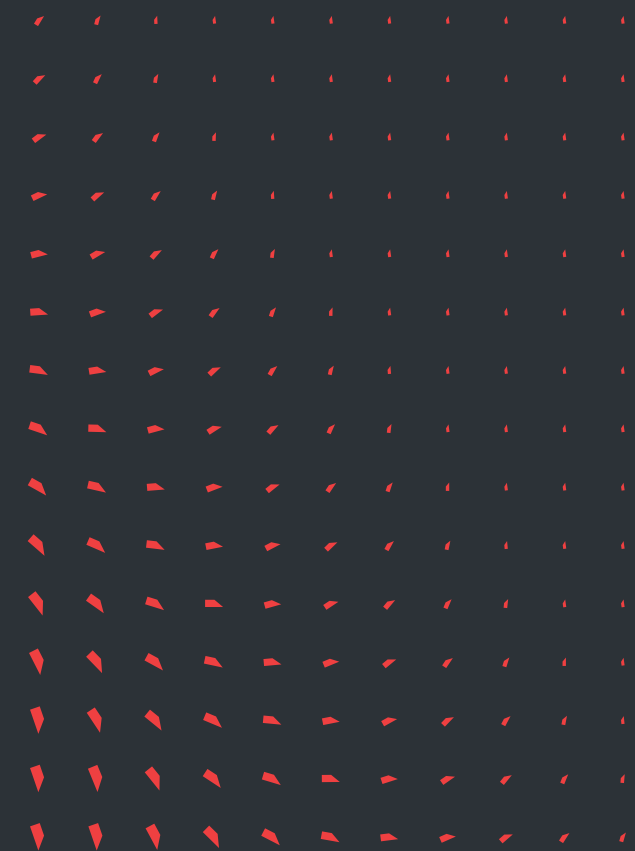
- WSSP 2023: The project achieves credits across site, water, materials, energy, indoor environmental quality, and operations, emphasizing daylighting, acoustics, indoor air quality, and durable, low-emitting materials.
- WSEC C406: The design exceeds the required energy efficiency credits through enhanced lighting, HVAC efficiency, and load management strategies, with flexibility to add renewable readiness or envelope enhancements if needed.
- Health & Wellness: Design strategies prioritize daylighting, acoustical control, thermal comfort, and air quality, aligning with special education program needs and equitable design principles. Natural finishes and community-focused spaces further support occupant wellbeing.

SUMMARY:

Together, WSSP and C406 strategies ensure that the South Site Elementary School is a high-performance, resilient, and healthy school environment, balancing sustainability, operational efficiency, and student success.

TCF

IV. Food Service



Food Service

IV

INTRODUCTION

- The Schematic Design Phase Basis of Design (Design Criteria), as described herein, generally summarizes the design intent of materials and systems to be included in Schematic Design cost estimate for the South Site Elementary School.

DESIGN INTENT

- The South Site Elementary School is to include approx. 1300 SF kitchen and serving area, serving breakfast and lunch in an open servery. For the purposes of establishing design and costs for a warming kitchen and future full cook kitchen, the following requirements are assumed to be a part of the project for the serving kitchen:

EQUIPMENT:

- Equipment is to be 100% new (not relocated/reused). Equipment selection is to be based on the number of students, frequency of product / goods deliveries and a few factors such as durability and maintainability; both of which are important in this application. The Equipment is to be commercial grade, and Energy Star rated in categories available and as energy efficient as possible where Energy Star categories are not available.

FLOORS:

- Commercial Welded Sheet Vinyl type or Quarry Tile finish floors.
  - Bases, integral with floor, are to have coved corners.
  - All floors to be pitched to area drains to ensure elimination of standing water and adequate drainage of floor.
  - Design kitchen for a minimum 100-lbs./sq. ft. (450 kg.cm2) live load capacity.

WALLS:

- Walls in food service areas shall be constructed using waterproof (green) gypboard or non-paper faced product covered full height, with FRP Paneling

CEILINGS:

- Ceiling surfaces must be smooth, easily cleanable and light in color.
  - Lay-in ceiling tile must be non-porous and non-fissured.

LIGHTING:

- General lighting fixtures complete with lamps, wiring and switches.
  - All exposed lamps MUST be plasticized shatterproof.
  - Illumination levels shall be in accordance with local codes or recommendations of the Illuminating Engineering Society (IES) with the following minimum foot candle levels measured 36" above floor line.
  - Dry and refrigerated storage areas: 25
  - Preparation areas: 50
  - Production areas: 70

REGULATIONS:

- All work and materials shall be in accordance with the latest rules and/or regulations of agencies/authorities having jurisdiction. All regulations, including building codes, and other codes applying to this jurisdiction should be followed. In addition, all equipment shall comply with the following:
  - Local Health Code.
  - National Fire Protection Association, Kitchen Ventilators (NFPA-96).

- National Electric Manufacturer's Association (N.E.M.A.).
- Underwriters Laboratories Inc., (U.L.), must bear label. National Electric Code, (N.E.C.).
- National Sanitation Foundation, (N.S.F.), including NSF-7, must bear label in jurisdictions requiring the same.
- American Society of Mechanical Engineers must carry the (A.S.M.E.) stamp.
- Occupational Safety and Health Act (O.S.H.A.) Standards.
- Hazard Analysis Critical Control Path (H.A.C.C.P.) Standards.
- American Disability Act (A.D.A.) Standards.

SUPPORT:

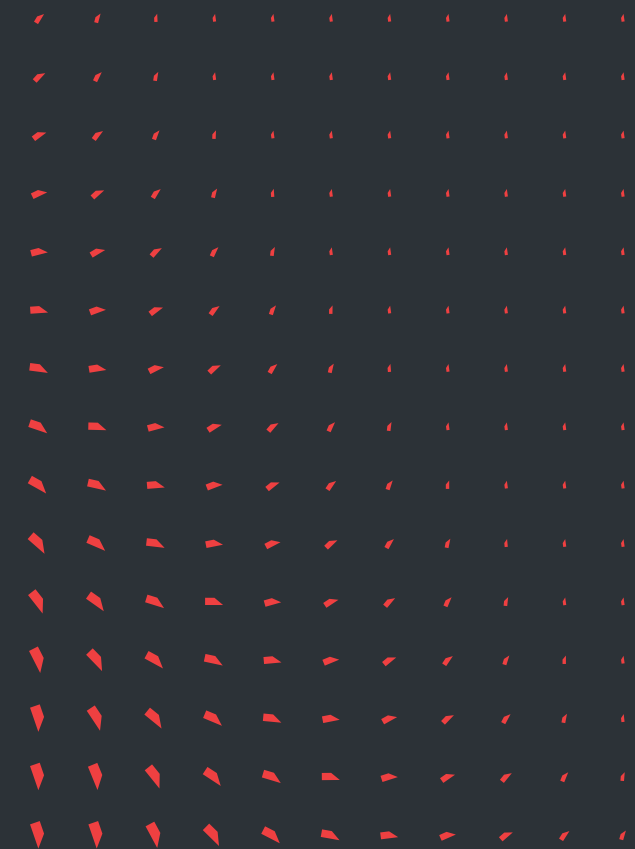
- A manager's desk will be located in the kitchen with provisions for phone and data lines. Trash dumpster will be provided in the loading dock area.

WARRANTY:

- All equipment, fixtures and materials furnished and installed shall be guaranteed against defect in workmanship and material. All repairs and replacements which may have become apparent and necessary by reasons of such defects, during the first year after final completion and acceptance of equipment installation, shall be made without cost and expense to the Owner. All such repairs and replacements shall be made at a time and during hours satisfactory to the Owner.

TCF

V. Structural



Structure V

INTRODUCTION

This narrative summarizes the schematic structural design for the Aberdeen South Elementary School. The Aberdeen school district plans to replace the existing Stevens Elementary with a new elementary school. The new school building will be approximately 62,000 square feet. The building includes a gymnasium, cafeteria, administrative wing, classroom wings, and an entry canopy. The building will have two seismic joints, one between the west and east wings of the main building and one between the main building and the entry canopy.

DESIGN CODE:

The new school will be designed under the 2024 International Building Code (IBC) which is projected to be adopted by the city of Aberdeen at the time of permitting. The school would represent a substantial hazard to human life in the event of failure due to its function as an elementary school campus. Therefore, the structure is classified as a Risk Category III building. This classification requires the use of a 1.25 seismic importance factor, which is in keeping with an "enhanced safety" structural performance level.

GRAVITY FRAMING:

The building will be wood-framed. Typical roof structure will consist of ½" plywood deck over wood I-joists or wood bar joists. The typical level 2 floor will use 1 1/2" of concrete over ½" plywood deck, supported by wood I joists and glulam beams. The gravity system over the roof of the gymnasium and cafeteria will use a different framing system given the large spans. Plywood roof will be supported by wood bar joists. It is anticipated that MEP equipment will be located on two mechanical mezzanines over the classroom wings. These mezzanines will be framed similar to typical floors.

LATERAL FRAMING:

The final geotechnical report has not been completed. In the interim, Degenkolb is using the information in "Report of Preliminary Geotechnical Engineering Findings" dated 2/26/2025 by Haley & Aldrich. The seismic design of the building will be based on the spectral response accelerations provided from ASCE 7-22. Based on the occupancy type and loading, the building is anticipated to be designed as Risk Category III. The soil is characterized as Site Class E, and with the spectral accelerations, the building will be assigned to Seismic Design Category E.

ASCE 7-22 will be used to determine design wind speeds for the structure. Degenkolb will use a basic wind speed of 102 miles per hour per ASCE 7-22 for a risk category III.

The proposed lateral system for this two-story building is buckling-restrained braced (BRB) frames. This system utilizes a restrained steel core which prevents buckling, allowing it to reach its full axial capacity in both tension and compression. Some benefits of BRBs over traditional braced frames include reduced residual drift after a major earthquake, flexible configuration, smaller beam and column sizes, and easier post-earthquake repair of damaged units.

The proposed lateral system for the main building Light Frame Wood Shear Walls. The proposed lateral system for the canopy is Ordinary Moment Frames (OMF). The equivalent lateral force procedure will be followed to design these elements.

Structure

V

As mentioned in the overview, seismic joints will be introduced in several locations throughout the structure to reduce the seismic effects of building irregularities. The seismic joints will pass through both structural and architectural elements and therefore will require flexible joint covers that maintain fire ratings at the building interior and weather-tightness at the building exterior. Any utilities that cross the joint will require flexible connections across the seismic joint.

FOUNDATIONS:

The foundation system is planned to be shallow reinforced concrete spread footings for the columns and strip footings for the walls. Footings will be designed in accordance with recommendations of the geotechnical engineer and soils report for the site. First floor will be a 4" thick concrete slab on grade.

Per the Geotech report, potentially liquefiable soils are present at the site. Ground improvement, which will likely take the form of deep soil mixing or stone columns, will be required to mitigate liquefaction. The site also has the potential to experience seismic-induced lateral spreading soil failures. Details of the mitigation required are expected to be provided in the final geo-technical report.

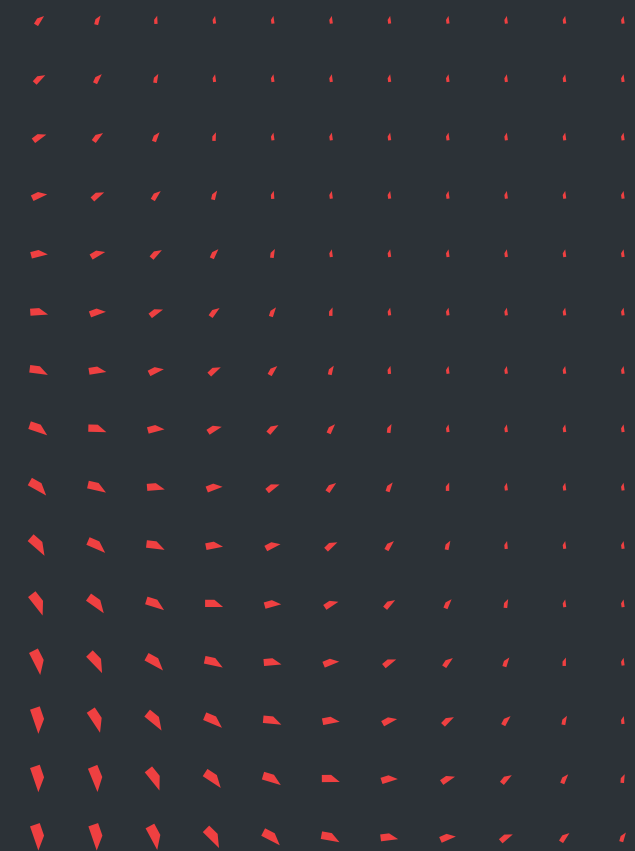
- Assumed Geotechnical Parameters
- SDS = 1.20
- Soil Site Class: E
- Allowale soil pressure (D+L): 4000psf (Assumes stone column improvment under footings)
- 1/3 Increase in bearing pressure when Earthquake or Wind loads are applied
- Passive pressure: 450pcf
- Coefficient of friction: 0.45

BUILDING STRUCTURAL MATERIALS

- Concrete:
  - Concrete: 4,000 psi, NW
  - Maximum aggregate size: 1" typical
  - Maximum water-to-cement ratio: 0.45
  - Base Plate Grout: 7,000 psi
- Concrete/ Masonry Reinforcement:
  - Concrete Reinforcement:
    - ASTM A615 (60 KSI) for #5 bars and smaller
    - ASTM A706 (60 KSI) for #6 bars and larger
  - Welded Bars: ASTM A706 Grade 60
  - Bar Splice Couplers: Type 2 per ACI-318
- Steel:
  - Wide Flange and Channels: ASTM A992 Grade 50
  - Angles and Plates: ASTM A572 Grade 50
  - Hollow Structural Steel (HSS)
    - Rectangular and Round: ASTM A500C
    - Pipe: ASTM A53 Grade B
    - Base Plates: ASTM A572 Grade 50
    - Composite Studs: ASTM A108
    - Connection Material/Plates: ASTM A572 Grade 50
    - High Strength Bolts: ASTM A325-N
    - Welding: E70XX electrodes
    - Anchor Rods: ASTM F1554 Grade 55 with weldable supplement S1
- Steel Deck:
  - Acoustical Bare Metal Roof Deck: ASTM A653 Grade 33 min, galvanized
  - Composite Deck: ASTM A653 Grade 33 min, galvanized and vented
  - Edge Closures: ASTM A653, 18 gage minimum, galvanized
- Wood:
  - Sawn Lumber: DF #1 or DF #2
  - Glue Laminated Timber: 24F-V4
  - Wood I joists: RedBuilt I Joists or Equivalent
  - Wood Bar Joists: RedBuilt Open Web Joists or Equivalent
- Specification Sections
  - 03 03 10 00 Concrete Forming and Accessories
  - 03 20 00 Concrete Reinforcing
  - 03 30 00 Cast-in-Place Concrete
  - 05 12 00 Structural Steel Framing
  - 05 31 00 Steel Decking
  - 05 40 00 Cold Form Metal Framing
  - 06 10 00 Rough Carpentry
  - 06 17 13 Engineered Wood Products
  - 06 18 00 Glue-Laminated Construction

TCF

VI. Mechanical



Mechanical VI

INTRODUCTION

- The mechanical system for the South Site Elementary School project is intended to be a balanced concept to meet project budget, published District Standards and expectations, and new 2021 WSEC requirements; while also adequately addressing and incorporating other equally important design, operational features and project goals including but not limited to programming and integration of spaces, operational and maintenance access needs and reduced system complexity, life cycle cost, occupant comfort, indoor air quality, reduction to ongoing District operational funds, acoustics, aesthetics, future system flexibility.

APPLICABLE CODES AND STANDARDS:

- The mechanical design shall meet, but not be limited to, the following codes:
  - *International Building Code (IBC)*
  - *International Mechanical Code (IMC)*
  - *International Fire Code (IFC)*
  - *Uniform Plumbing Code (UPC)*
  - *Washington State Energy Code (WSEC)*
  - *National Fire Protection Association (NFPA)*
- The mechanical design shall meet, but not be limited to, the following standards:
  - *ASHRAE Standard 52.1 – Gravimetric and Dust Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter*
  - *ASHRAE Standard 55 – Thermal Comfort*
  - *ASHRAE Standard 62.1 – Ventilation for Acceptable Indoor Air Quality*
  - *ASHRAE Standard 90.1 – Energy Standard for Buildings Except Low Rise Residential*
  - *SMACNA – Sheet Metal & Air Conditioning Contractors*
  - *WSSP – Washington State Sustainable School Protocol*

HVAC SYSTEM DESIGN CRITERIA:

- Table 1- Outdoor Design Temperatures

Design Season	Temperature
Outdoor Winter DB	25°F*
Outdoor Summer DB	83°F*

*values taken from 2021 WA State Energy Code for Aberdeen

Mechanical

VI

BUILDING ENVELOPE:

- *Building envelope* shall be in compliance with the minimum prescriptive values as defined by the 2021 Washington State Energy Code.

FIRE SPRINKLING SYSTEM:

- *The building* shall be completely sprinkled with wet system coverage in conformance with NFPA 13 and local AHJ requirements. The design shall include a wet pipe system to serve all interior occupied areas and combustible void spaces. Wet system piping shall be black steel with threaded or mechanical grooved joints. Where design coordination allows, non-combustible constructed building overhangs shall be protected with dry sidewall heads off of the wet system; and a dry system shall be provided at overhangs that are too large for dry sidewall head coverage if required by the AHJ.
- *The fire sprinkler service entrance* to the building shall be located within the building at the Central Plant Room. Fire system backflow prevention shall consist of a double detector check valve (DDCV) assembly. A fire department connection and post indicator valve shall be located on site downstream of the DDCV by Civil.

PLUMBING SYSTEMS:

- Utilities: The mechanical systems will be connected to site water, fire and sewer designed by the civil engineer. Connection will be at 5'-0" outside of the building.
- Water Service: The main building water service will be provided at the Central Plant Room. No boosters are assumed. The service riser will be located in this space and will separately serve the domestic cold water systems, domestic hot water systems, and hydronic heating/cooling systems. Backflow preventers will be located on site per utility district requirements. Water piping services throughout building shall be brazed type L copper for all mains 2-1/2" and larger in size and type L copper with soldered or press fittings for all sizes 2" and below, except where below grade at service entrance location piping shall be brazed type K copper. Piping services will be adequately isolated to provide ease of maintenance.
- Irrigation: The water service for landscape irrigation will not enter the building and is covered under the Landscape consultant's scope of work. The water service will be separately metered.
- Domestic Hot Water System: Air to water heat pumps serving storage tanks and backup electric tank-type water heaters will be located in the central plant room to serve fixtures. Hot water systems will be designed with hot water recirculation piping and pumps to keep hot water available at fixtures.
- Plumbing Fixtures: All plumbing fixtures will be selected for use in vandal resistant applications in conformance with Aberdeen SD Standards.
- Sanitary Waste & Vent System: A sanitary waste and vent system will be installed to serve all fixtures within the building. Piping shall be cast-iron with no hub fittings.
- Grease Waste & Vent System: A gravity type concrete vault style grease interceptor, located outside the building, will be provided for the Kitchen per the AHJ.
- Rain Leader Piping: Gutters and downspouts assumed by others scope of work with attachment to Civil storm system.
- Natural Gas System: No natural gas assumed on project.

HEATING, VENTILATING & AIR CONDITIONING (HVAC) SYSTEM:

- Ventilation: Ventilation systems serving each area of facility are as follows.
  - Classrooms, Library, Administration: Dedicated outdoor air systems shall serve zones via overhead supply grilles. Central variable volume air handling units (VTS proposed basis of design) will be supplied with air-to-air enthalpy type heat recovery wheels to temper ventilation air with building exhaust air. Air will be served to VAV boxes to modulate airflow demand and close ventilation air dampers when spaces are unoccupied.

- Gym & Commons: High efficiency VAV water to air heat pump units (ClimateMaster SB proposed basis of design) shall serve zones with overhead supply air diffusers. CO2 sensors will be provided for demand control ventilation of the Gym and Commons units and will also be supplied with airside economizer control capability to provide free air cooling to these spaces.
- Filters: MERV 13 final filters with MERV 8 pre-filters on both outside air and MERV 8 on return.
- Duct routing: Return-air will be fully ducted and ensure no mixing of air between spaces, not plenum type.

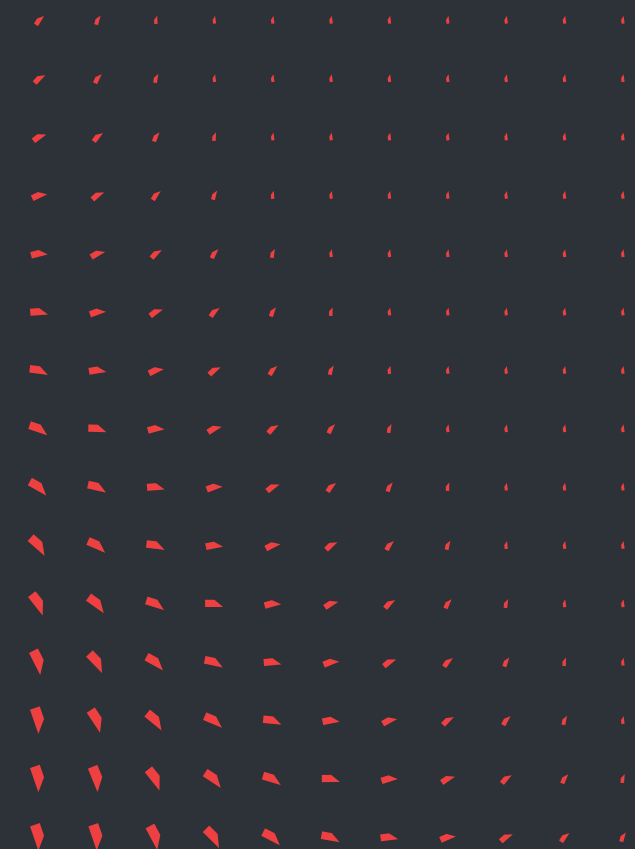
- Central Planet: The main source for heating and cooling dedicated zones are via a 2-pipe condenser water loop served by air-to-water heat pumps and back-up boiler.
- Heating and Cooling: Classrooms, Library and Administration spaces are served by water-to-air heat pump units (ClimateMaster SEV proposed basis of design). Gym and commons are served by single zone high-efficiency water-to-air heat pump units (ClimateMaster SB proposed basis of design). Attics, mechanical rooms and entry vestibules will be served by ceiling or wall-mountedelectric unit heaters providing space freeze protection
- Air-to-Water Heat Pump: Air-to-water heat pump(s) (Aermec proposed basis of design), located in the service yard, shall be provided to supply condenser water to facility. Heat pumps shall be de-coupled from main building condenser water loop and provided with their own in-line circulation pumps and buffer tank to ensure adequate flow and no nuisance tripping of equipment due to controlled valves.
- Boilers: An electric pony boiler (Precision proposed basis of design) shall be provided to supplement the air-to-water heat pumps at low temperature conditions.
- Building Hydronic System: Interior building hydronic system will be a four-pipe system providing heating and chilled water to facility. Each building hydronic system piping will be served by redundant vertical in-line variable speed split-coupled pumps. An air separator, expansion tank and chemical filter feeder is also provided on each system.
- Building Piping and Valves: Condenser system piping shall be welded or grooved black steel for all mains 2-1/2" and larger in size and type L soldered or press copper for all sizes 2" and below. Dielectric nipples shall be used at all connection points between dissimilar metals. All control valves located at equipment shall be 3-way or 2-way modulating type.
- Exhaust Systems: Dedicated exhaust will be provided for all areas of the facility where required (toilet rooms, custodial rooms, kitchen cooking hood, kitchen dishwasher, etc). Exhaust fans will also be provided to handle heat gain from electrical closets and heat pump plant room spaces where split system air conditioning is not required. Fans will be direct drive type with speed controller.
- Ductwork: Ductwork system shall be galvanized sheet metal throughout and installed per SMACNA standards based on specified pressure classification.
- IDF, MDF & Elevator Machine Rooms: Cooling will be provided by split system air conditioning units.

BUILDING AUTOMATION SYSTEM (BAS):

- *The mechanical systems* in the building will be controlled and monitored by a direct digital energy management control system with BACnet interface and web-based capability. In addition to controlling the mechanical systems, the controls will be capable of monitoring and controlling other systems in the building such as energy metering and lighting and receptacle controls. Basis of design vendor is ATS Automation with Alerton Controls.

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VII. Electrical



Electrical VII

INTRODUCTION

- The electrical system for the South Site Elementary School project is intended to be a balanced concept to meet project budget and the 2021 WSEC requirements; while also adequately addressing and incorporating other equally important design, operational features and project goals including but not limited to programming and integration of spaces, operational and maintenance access needs, reduced system complexity, and future system flexibility.

  New electrical systems shall include power, solar photovoltaics, EV chargers, emergency generator backup, lighting, fire alarm, distributed antenna, rescue assistance, data/communications, security/intrusion detection/ CCTV, access control/lock-down system, intercom clock/ speaker and classroom AV systems that meets all current codes including as noted below.

APPLICABLE CODES AND STANDARDS:

- The electrical design shall meet, but not be limited to, the following latest-adopted codes:
  - *International Building Code (IBC)*
  - *International Fire Code (IFC)*
  - *Washington State Energy Code (WSEC)*
  - *Washington State Administrative Code (WAC)*
  - *Washington Sustainable Schools Protocol (WSSP)*
  - *National Fire Protection Association (NFPA)*
  - *National Electrical Code (NEC)*

City of Aberdeen amendments to the above-listed codes

UTILITIES:

- *A new 480/277-volt, 3 phase service* will be provided by Grays Harbor Public Utility District to the building. The primary power is assumed to be extended from Lomax to the project site. The transformer is located in the service yard near the main electrical room. The pad/ vault, conduits, and secondary conductors will be by the contractor.

ELECTRICAL DISTRIBUTION:

- *Power for the building* is distributed via distribution/ branch panels at 480Y/277V, 3Ø and transformers will step-down power to 208Y/120V, 3Ø. This equipment is located in dedicated electrical equipment spaces. There will be multiple panelboards located through-out the building to minimize long branch circuit runs. Mechanical panels will be located in the mechanical spaces to serve the mechanical equipment.
- *Feeders will be copper.* Panelboards will be door-in-door style, with copper bussing.
- *Electrical power monitoring* will be installed on all new electrical equipment as required by the WSEC for buildings over 25,000 square feet. Power monitoring shall identify mechanical, EV charging, receptacle, lighting, and solar loads. Meters shall be capable of interfacing with the DDC system for monitoring.
- To protect the increasing quantities of sensitive electronic systems from power surges, *surge protective devices* will be provided at all of the panelboards and switchboards.

ELECTRICAL DEVICES:

- *Each classroom* will have (2) - (3) standard duplex receptacles located on each wall. There will be duplex computer receptacles located adjacent to each data outlet and one for the classroom projector. GFI duplex receptacle(s) will be provided at each sink or when placed within 6' of a water source.
- All other occupied rooms will have at least one receptacle on each wall. Desk and computer workstation locations will be provided with at least one duplex receptacle.
- *Fifty percent of all receptacles* installed in classrooms, offices, conference rooms, workrooms, break rooms and at individual workstations will be automatically switched off when not occupied in accordance with the Washington State Energy Code. In general, the switched receptacles will be controlled by an auxiliary relay in ceiling-mounted occupancy sensors in each space.
- *Duplex receptacles* will be provided at a maximum of

50' spacing in hallways, just outside of each public and student restroom, on the interior side at exterior doors, and will only be provided on the exterior of the building where required to be within 25' of mechanical equipment.

- *Power* will be provided to architectural, mechanical, and Owner equipment. Exact locations will be coordinated with each discipline as the design progresses.
- *Floor boxes* will only be provided where they are code required, there is no other option available or upon Owner request.
- *Power for receptacles* located in lab spaces at workstations will be routed through a relay panel and controlled via emergency shut off switch. The emergency shut off switch will be located near the teacher station adjacent to the gas shut off switch.

SOLAR PHOTOVOLTAIC SYSTEMS:

- *A code minimum solar photovoltaic system* will be located on the roof, sized ~39kW (AC) at 480V, 3-phase. The system will be mounted to the standing seam metal room. The PV inverter shall be located in the main electrical room with the disconnect located in the service yard adjacent to the utility meter.

EV CHARGING:

- *EV charging* shall be provided in conformance with WAC 51-50-0429 for Group E Occupancies, applicable only to designated staff parking stalls. Current staff parking stall count is ~30 spaces.
- Table 429.2
- Electric Vehicle Charging Infrastructure

Occupancy	Number of EV Charging Stations	Number of EV-Ready Parking Spaces	Number of EV-Capable Parking Spaces
Group E Occupancies	10% of total parking spaces	10% of total parking spaces	10% of total parking spaces

- EV charging stations and EV-Ready parking spaces: A minimum of 40-ampere dedicated 208/240-volt branch circuit shall be installed for each EV Ready parking space and each EV Charging Station. The branch circuits shall terminate at a receptacle outlet or EV charger in close proximity to the proposed location of the EV Ready parking space or the EV Charging Station.
- EV-Capable parking spaces: A listed raceway capable of accommodating a minimum of 40-ampere dedicated 208/240-volt branch circuit shall be installed for each EV-Capable parking space. The raceway shall terminate into a cabinet, box or other enclosure in close proximity to the proposed location of the EV-Capable parking space. Raceways and related components that are planned to be installed underground, and enclosed, inaccessible or concealed areas and spaces, shall be installed at the time of original construction.
- Electric vehicle charging infrastructure for accessible parking spaces: Ten percent of the accessible parking spaces, rounded to the next whole number, shall be EV Charging Stations. Additional 10 percent of the accessible parking spaces, rounded to the next whole number, shall be EV Ready. Not fewer than one for each type of EV charging system shall be accessible.

EMERGENCY POWER:

- *A diesel skid-mount emergency generator* will be provided with (2) automatic transfer switches. One automatic transfer switch (NEC 700) will serve emergency/egress lighting. The other transfer switch (NEC 702) will serve MDF/IDF rooms, EMCS equipment, administration area, and kitchen cooler & freezer. The generator fuel supply size will be rated at 48 hours run time at 100% capacity.

LIGHTING:

- *Light fixtures will utilize LED light sources* and will be located with long term maintenance in mind. Light fixtures will be controlled by occupancy sensors with manual local override switches as much as practical. Daylight sensors will be provided and control light fixtures in all daylight zones. All other lights will be controlled by a simple lighting relay panel to meet minimum code requirements.
- *Primary interior classroom lighting* will be recessed

in the T-Bar ceiling system. Particular attention will be paid to ease of access, comfortable lighting levels and glare control. Classroom lighting will be dimmable and controlled through a daylight harvesting system for dimming the lights in response to the quantity of incoming natural light.

- *The site lighting* will utilize LED fixtures on approximately 30' steel poles. The building perimeter lighting will be wall and ceiling or soffit mounted LED fixtures. All exterior lighting will be controlled by the lighting control system with a temporary (2 hour) manual override switch in the Main Office.
- *Exit signs* will use low maintenance LED sources and will be located in corridors and exit doorways.
- *Emergency interior and exterior egress lighting* will be provided by the use of remote mounted emergency transfer devices and be connected to the emergency generator. Emergency lighting will be provided for selected light fixtures in each classroom, rooms with occupant loads of 50 or more, corridors, exit passageways, mechanical and electrical rooms, accessible attic or mezzanine spaces and public restrooms. Lighting levels will be designed to a 1.0 foot-candle average with a 0.1 foot-candle minimum.
- *The lighting control system* will be IP addressable, UL 924 rated and will interface with the building management system for scheduling and control.

DATA/TELECOMMUNICATIONS:

- *The data networking system* will be based on data wire and outlets per the Aberdeen School Districts Standards. Multiple data locations will be provided in each classroom with Category 6 cables routed from the MDF to each outlet. Each outlet will contain two jacks, with desk locations (two possible locations in typical classrooms) containing three jacks. All other occupied rooms will receive at least two data outlets. Two Category 6A cables will be provided for each Wireless Access Point. Backbone cable will consist of 12-strand single-mode fiber optic cable and (1) 25-pair copper cable routed to the MDF. 2 data outlets per classroom will be located to charge carts.
- *Equipment racks in the MDF room* will have individual rack-mounted UPSs to provide uninterruptible power until the generator starts in the event of a power failure.

CLOCK/INTERCOM SYSTEM:

- *The communication system* shall be microprocessor based, of modular design, FCC approved and shall interface transparently with the School District telephone system. It shall utilize amplifiers, speakers and call buttons for overhead paging and two-way communication.
- *Power over Ethernet digital Clocks* shall be used throughout the facility.
- *Speakers* shall be located in the hallways and other areas shall be used to augment the communication system.
- *The IP telephone system and IP telephones* shall be provided by the School District.

RESCUE ASSISTANCE SYSTEM

- *The Rescue Assistance System* is IP based with cellular back up. The Base Station is to be located at a central control point on the first floor or as determined by local Authority having Jurisdiction. Call Boxes are to be located on all floors above and below the first floor, ideally next to a stairwell emergency exit or elevator landing on each floor.
- *The Base Station* must be capable of handling a minimum of 5 Call Boxes. Visual indicators on the Base Station allow rescue personnel to know which Call Box needs assistance. The Base Station must allow rescue personnel to speak to all Call Boxes or individual Call Boxes.
- *The emergency communication hardware* shall comply with the Americans with Disabilities Act (ADA). Call Boxes shall have the ability to be programmed with up to 5 emergency phone numbers. Upon activation of the emergency push button, a call will be automatically placed to the Base Station. If no one answers at the Base Station, the Call Box must dial a secondary location outside the building to activate two-way off-site person to person voice communications.

SECURITY SYSTEM

- *The security system* will be per district standards and will utilize addressable technology similar to that of the fire alarm system where the location of every door position switch and motion detector can be displayed on the LCD Keypad and reported to the monitoring agency. Door position switches will be located at each exterior door. Motion Sensors will be located in each classroom, in the Administration area, hallways, and the gymnasium. Intercom at the main entry for visitor check in. Panic button at reception desk.
- *All system equipment* shall be connected to continuous (emergency) power branch panels to operate while the generator is running.
- *The system* shall be designed to have a minimum of one hour of continuous operation using power supplies with battery backup. This shall accommodate any temporary power outage (from the time that the power is lost to the time that the generator is fully up and running).

CARD ACCESS SYSTEM/EMERGENCY LOCKDOWN SYSTEM

- *The Card Access System* will be per district standard. This system will grant access to the user when a valid card is read at the reader. Access can be restricted to each user group to certain times of day and days of the week, if desired. This system will allow operation of the existing cards that are currently being used throughout the district. Locations of card readers will be as determined by the district during the design development phase of the project.
- *This system* will also control all of the functions for the Emergency Lockdown System. In the event of an emergency, local Administrative Staff can push a button in the Admin office. This button will lock all of the electronically controlled exterior doors, to secure the perimeter of the building. Locations of the Emergency Lock Down System doors will be as determined by the district during the construction document phase of the project.

CLOSED CIRCUIT CAMERAS

- *The CCTV system* will consist of Power over Ethernet (PoE) IP Color Cameras. They will be located throughout the facility. The cameras will record locally on Video Servers. The exact type of cameras and system will be per district standards. Locations of cameras will be as determined by the district during the design development phase of the project. There will be one monitor located in the front office that will show live cameras, and another monitor in reception to show visitors they are being monitored.

SOUND REINFORCEMENT SYSTEMS:

- *The new sound system* in the Gymnasium will be a high quality, multi-channel wide frequency sound reinforcement and production system with microphone pick-up and pre-recorded program capabilities. The system will use solid-state dual-channel amplification with distribution to a full-range loudspeaker system.
- *The system* will provide for microphone pick-up, playback of pre-recorded material, mixing, signal processing, amplification and distribution to a full-range reference monitor loudspeaker system.

CLASSROOM AUDIO/VISUAL SYSTEMS:

- *The classrooms* will be equipped with a teacher voice enhancement system that includes ceiling mounted speakers and teacher microphone, a wall mounted TV, and AV cable connections from the front of the classrooms. A control panel for AV functions will be present by each tv/audio set up.

FIRE ALARM:

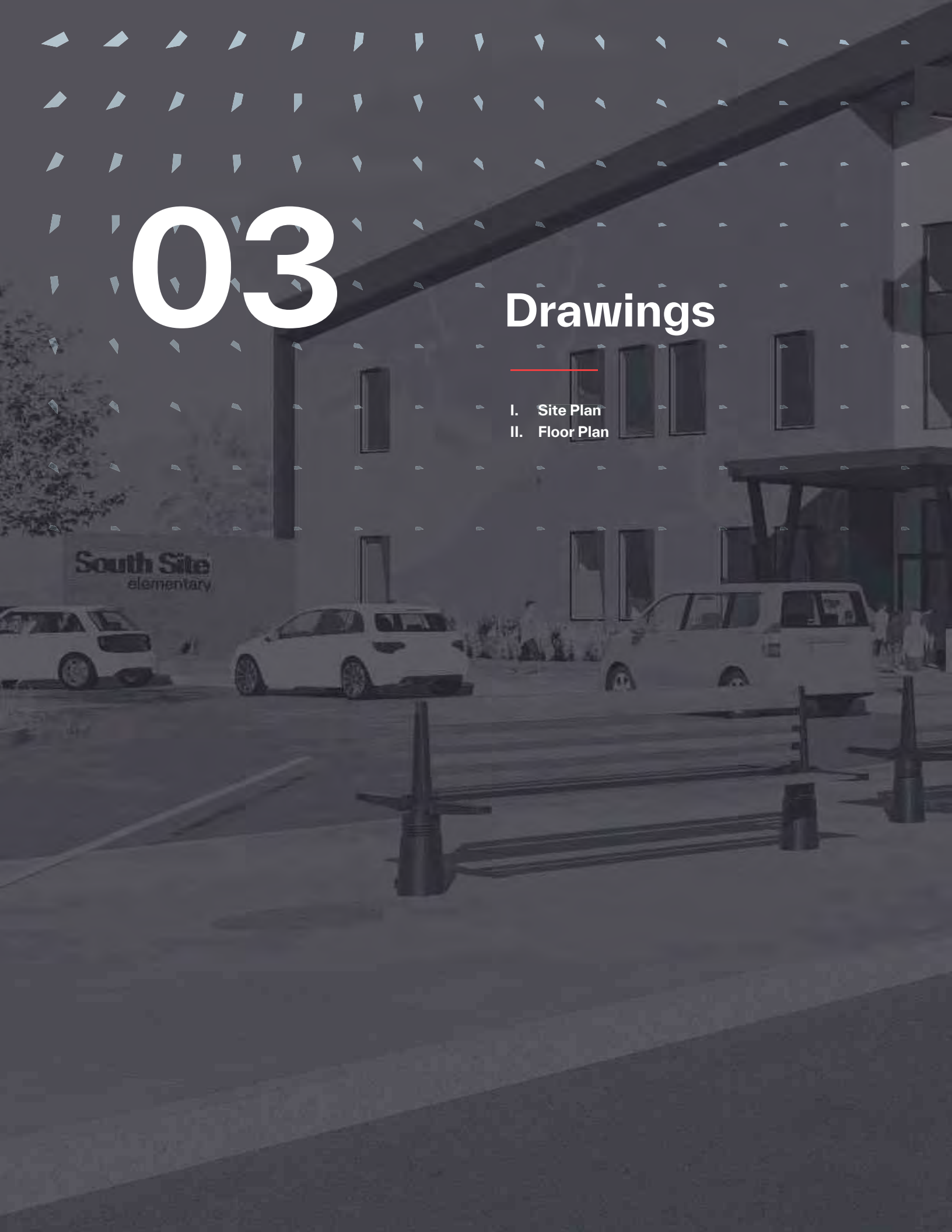
- General:
  - *A new fire alarm system* is to be provided, including fire alarm control panel, all connection points to the fire suppression system components including the sprinkler system alarm bell, dual fire pump installation flow, pressure and tamper switches, fire pump controller trouble, supervisory and alarm switches, and sprinkler riser(s) flow, pressure and tamper switches.

The fire alarm system contractor is to coordinate with the sprinkler system design/build contractor for exact quantities and locations of all sprinkler system monitoring contacts prior to bidding.

- *Connections are to be provided* to duct smoke detectors, fire/smoke dampers, and fire rated door hold opens in fire-rated walls where designated on the fire alarm floor plans. Provide connection to the EMCS for fan shutdown, to the network connection at the MDF/IDF, and primary and secondary Telco lines. The fire alarm/detection system is to meet all current codes and local jurisdictional requirements.
- *Penetration of fire rated walls, floors or ceilings* requires that the fire alarm system contractor utilize approved fire rated penetration seal methods.

Fire Alarm System:

- *The fire alarm system* will be a voice evacuation, audible addressable system. This system will be a digital microprocessor-based system that will monitor and report the alarm and operating status including individual component locations of all devices connected to the system. The system will monitor the automatic fire protection sprinkler system and report all information to the monitoring agent.
- *The Fire Alarm Control Panel* will be located in the sprinkler riser/fire alarm control room, with a remote annunciator at the main entrance, and is to be coordinated with the local fire authority having jurisdiction. A Graphical map showing fire alarm zones is required to be located adjacent to the Fire Alarm Control Panel, and the Remote Annunciator. It is to be large enough to support 1/8" text. The Fire Alarm Control Panel requires battery capacity sufficient for 24 hours standby time, and 15 minutes of voice message time.
- *Automatic smoke detectors* will be provided throughout all egress corridors, Gymnasium, Computer Room, above the fire alarm control panel, above all fire alarm system power extenders and on each side of doors with magnetic hold opens, in accordance with current national, state and local codes. Heat detectors are to be provided in locations where smoke detectors may be susceptible to false alarm. Manual pull stations will be provided at the main office and any other location not generally accessible to students.
- *The Automatic Fire Protection Sprinkler System* tamper switches are to be individually zoned. Electronic tamper switches are required on fire sprinkler system control valves, elevator sprinkler control valves, backflow preventers and post indicating valves.
- *Audio/visual devices* will be provided throughout the facility and shall conform to current ADA requirements. Refer to the contract documents for visual appliance placement, output basis, and notification circuit capacity per floor. Audible/Visual notification devices located in the attic area are to be coordinated with the installation locations of the mechanical equipment. Exterior horn-strobes are required along the path of the fire access lane and placed approximately 100'-0" apart. The fire sprinkler contractor is to verify whether any vocational/technical spaces require explosion-proof devices.
- *Provision for HVAC shutdown* via duct smoke detectors is to be per individual unit and shall be coordinated with the mechanical and electrical contractors. The fire alarm system contractor shall provide remote test switches and remote light emitting diodes (LED's) for each duct smoke detector.
- *Exposed fire alarm system* cabling is allowed in concealed spaces only. Fire Alarm conductors shall be permitted to be run open, not in conduit, in accessible ceiling voids or in attic spaces.
- *The fire alarm system contractor* shall perform audibility and intelligibility testing in each space of the building prior to acceptance testing to verify that common intelligibility scale (C.I.S.) values meet or exceed minimum requirements. In spaces that do not meet the minimum common intelligibility (C.I.S.) values, the fire alarm system contractor shall provide additional audible notification appliances (speakers) or adjust the location of audible notification appliances (speakers) until the minimum (C.I.S.) values are obtained.



03

Drawings

I. Site Plan
II. Floor Plan

TCF

I. Site Plan

PARKING CALCULATIONS

2024 ABERDEEN ZONING CODE

TABLE 17.65.040 OFF-STREET PARKING SPACES REQUIRED
MIN. (1) SPACE PER 300 SF

17.65.050 SIZE OF PARKING SPACES
C. COMPACT PARKING SPACES

1. UP TO 33-PERCENT OF REQUIRED NON-ACCESSIBLE PARKING SPACES MAY BE DESIGNATED AS COMPACT.

2. COMPACT PARKING SPACES HAVE A MINIMUM SPACE LENGTH OF 15-FEET AND A MINIMUM SPACE WIDTH OF EIGHT-FEET.

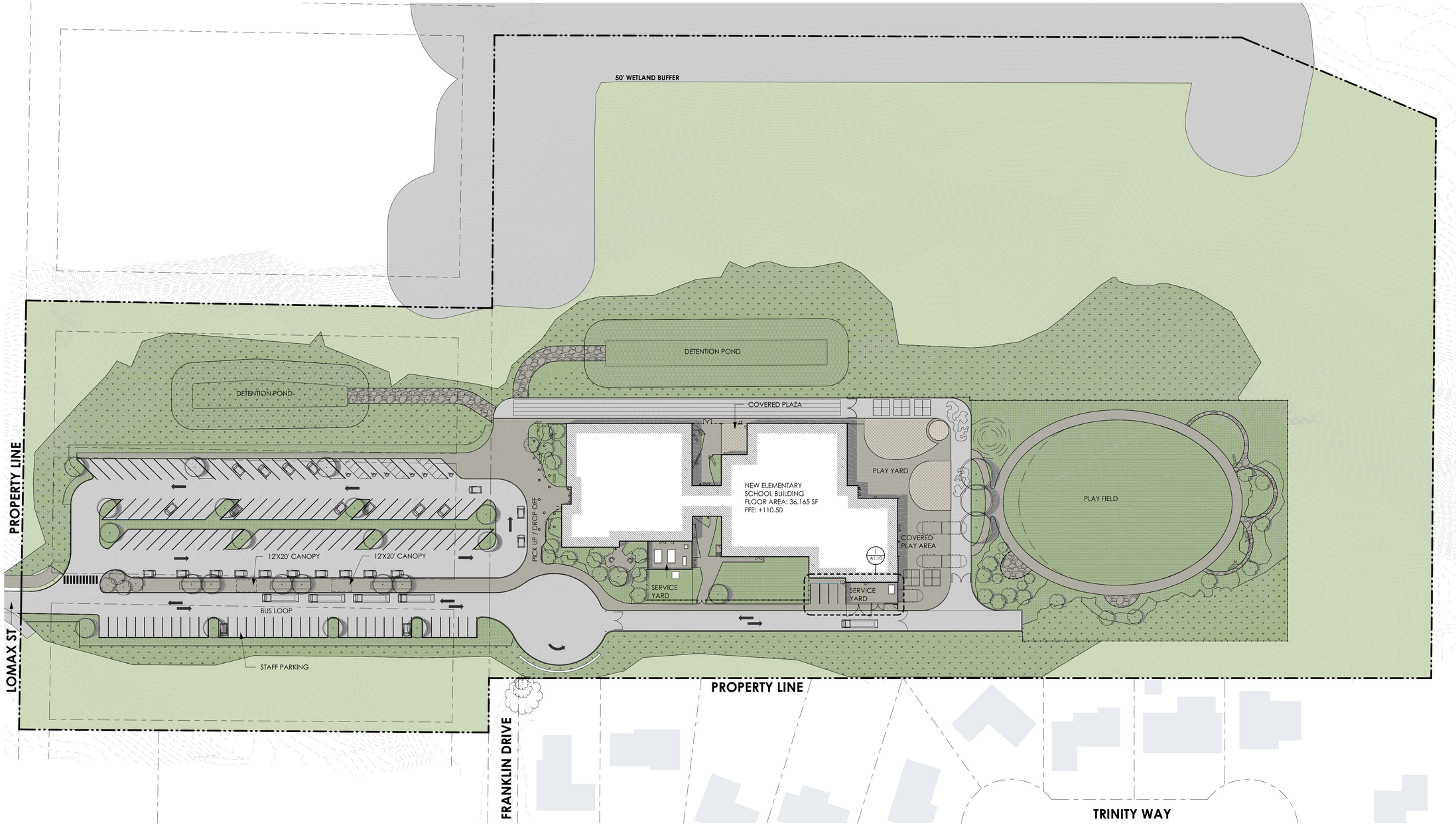
PARKING	PROVIDED
ADA - VAN ACCESSIBLE	6
STANDARD - 45 DEGREE	69
STANDARD - 90 DEGREE	41
TOTAL	**116**

SITE PLAN LEGEND

- PROPERTY LINE
- 8' - 0" HIGH FENCING
- BUILDING AREA
- PROPOSED LANDSCAPE AREA, SEE LANDSCAPE DRAWINGS
- GRAVEL, SEE CIVIL DRAWINGS
- EXISTING LANDSCAPE AREA - NO WORK, SEE LANDSCAPE DRAWINGS
- PROPOSED ASPHALT PAVING AREA, SEE CIVIL DRAWINGS
- PROPOSED CONCRETE PAVING AREA, SEE CIVIL DRAWINGS
- PLAYGROUND SURFACING, SEE LANDSCAPE DRAWINGS

GENERAL NOTES

1. SEE CIVIL DEMO PLANS AND SURFACING PLANS FOR CONTRACTOR'S SURFACING SCOPE OF WORK.
2. SURFACE PAVING SCOPE, SITE UTILITIES, SITE LIGHTING TYPE AND LOCATIONS, LANDSCAPE PLANTINGS SCHEMES ARE SHOWN ON THE ARCHITECTURAL SITE PLAN AND ENLARGED SITE PLANS FOR REFERENCE ONLY - SEE APPLICABLE DESIGN DISCIPLINE FOR EACH - CIVIL, ELECTRICAL AND LANDSCAPE SHEETS FOR THE ABOVE NAMED SCOPES OF WORK ON SITE.



1 SITE PLAN
1" = 50'-0"

TCF
124 North 'I' St. Tacoma, WA
www.tcfarchitecture.com
P.253.572.3993

Client
ABERDEEN SD #5

Project
SOUTH SITE ELEMENTARY SCHOOL
2025-004
SOUTH SITE ELEMENTARY SCHOOL
Aberdeen, WA

Issue & Revision Dates

27 APRIL 2026	65% SD
29 MAY 2026	95% SD
03 AUG 2026	100% SD

100% SCHEMATIC DESIGN
Not for Construction

NOTE: DRAWING MAY BE REDUCED
0 25' 50' 100'

Drawn By BB
Checked By AD

Sheet Title
SITE PLAN

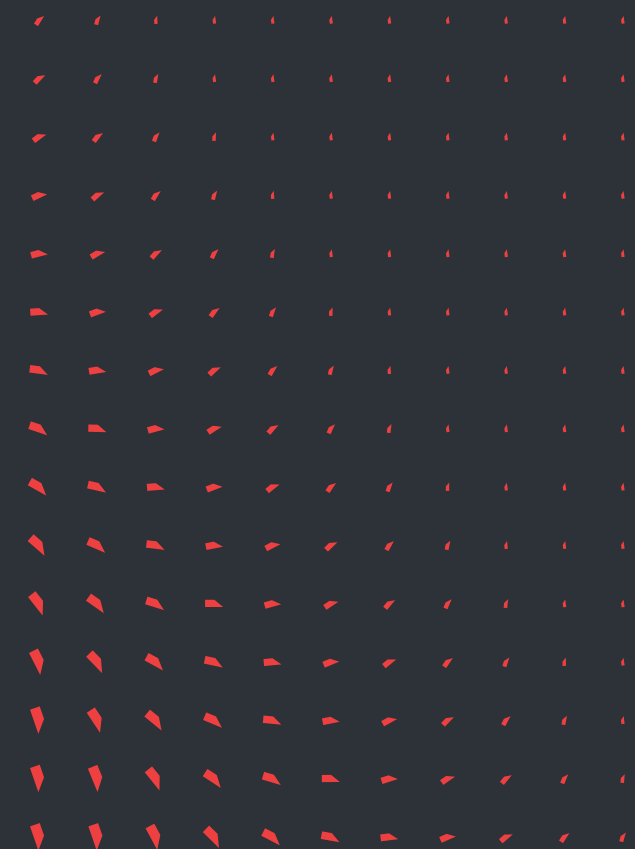
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II. Floor Plan



KEYNOTES

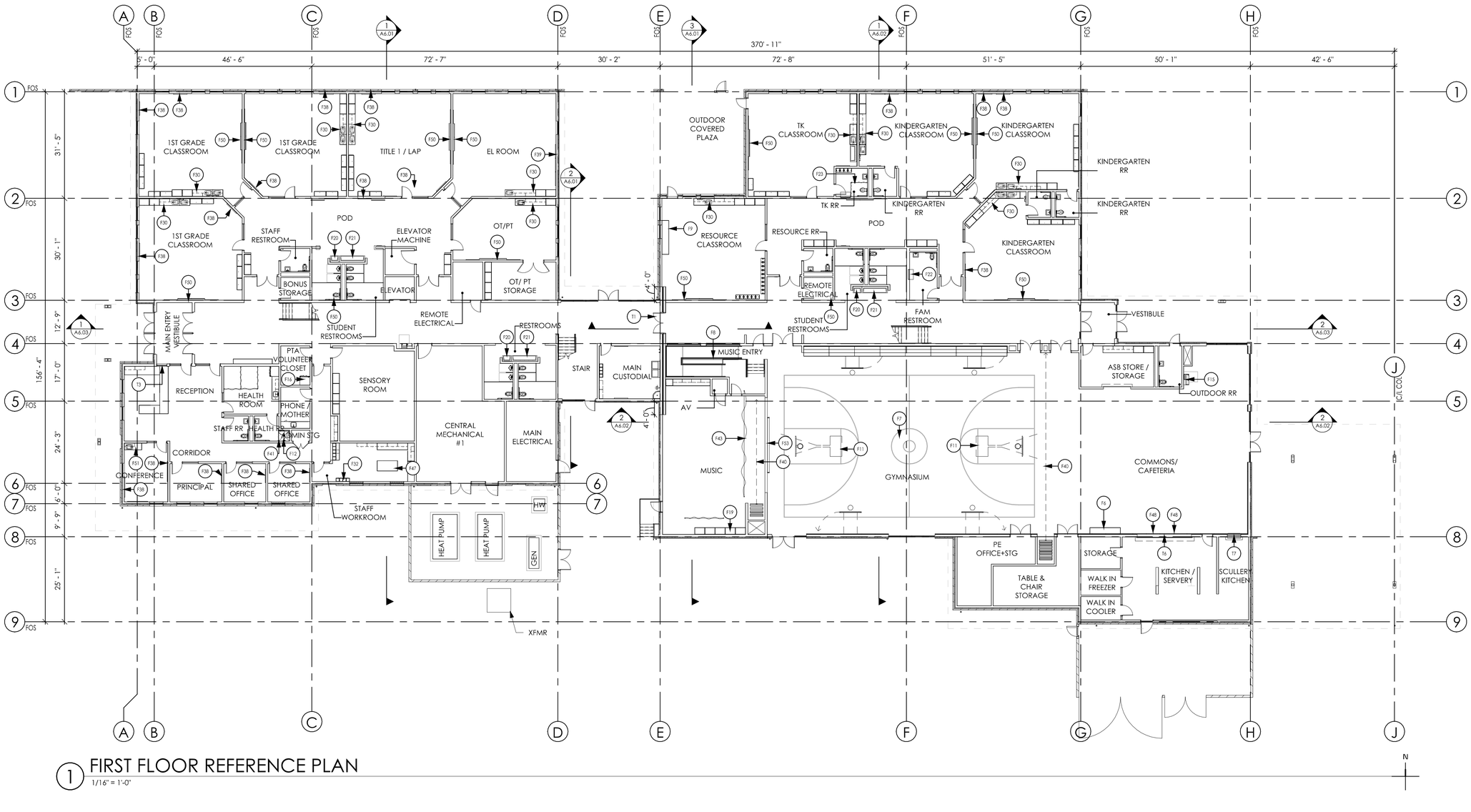
F6	QUARTZ COUNTERTOP WITH BASE CABINETRY FOR INTEGRATED TRASH RECEPTACLES
F7	BASKETBALL AND VOLLEYBALL GAME LINE STRIPING WITH CUSTOM CENTER-COURT LOGO
F8	55" GUARDRAIL
F9	BUILT-IN READING NOOK BENCH WITH PLASTIC LAMINATE FACE PANELS
F11	FRONT FOLD BASKETBALL HOOP W/HEIGHT ADJUSTER & BREAKAWAY RIM, 10'H WALL PADS
F12	ACCESSIBLE SHOWER & BENCH SEAT
F15	DRINKING FOUNTAIN
F16	REFRIGERATOR
F19	BUILT IN INSTRUMENT STORAGE
F20	CHILD HEIGHT TROUGH SINK
F21	3 FAUCET TROUGH SINK
F22	BABY CHANGING STATION
F23	TK BATHROOM: CHANGING STATION, TOILET PRIVACY CURTAIN, CUBBIES FOR 8
F30	TYP CLASSROOM CASEWORK: SEE A80.01 FOR CASEWORK LAYOUTS
F32	METAL LOCKERS
F38	MARKERBOARD
F39	TACKBOARD
F40	OPERABLE PARTITION WALL WITH CUSTOM LAMINATE AND ACOUSTIC FELT FINISH

KEYNOTES

F41	SHOWER CURTAIN
F43	STAGE CURTAIN AND TRACK
F47	STAFF WORK COUNTER: PLAM COUNTERTOP, LOWER BASE CABINETS WITH OPEN SHELVES
F48	MONITOR, OFCI
F50	TYPICAL CLASSROOM TEACHING WALL, SEE SHEET A80.01 FOR TYPICAL LAYOUT
F51	CONFERENCE COUNTERTOP: SOLID SURFACE COUNTERTOP WITH DROP-IN SINK, LOWER 5' BASE CABINETS
F53	PROJECTOR SCREEN
T1	2 HR FIRE RATED DOOR
T3	TRANSACTION WINDOW
T6	FULL HEIGHT OVERHEAD DOOR
T7	COUNTERTOP OVERHEAD DOOR

SHEET NOTES:

A. SEE SHEET A2.01 FOR FLOOR PLAN GENERAL NOTES, KEYNOTES AND LEGEND
B. SEE A30 SERIES SHEETS FOR EXTERIOR WALL TYPE DESCRIPTIONS AND GENERAL NOTES
C. SEE A31 SERIES SHEETS FOR INTERIOR WALL TYPE DESCRIPTIONS AND GENERAL NOTES



1 FIRST FLOOR REFERENCE PLAN
1/16" = 1'-0"

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Client
ABERDEEN SD #5

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NOTE: DRAWING MAY BE REDUCED
0 8' 16' 32'

Drawn By Author
Checked By Checker

Sheet Title
FIRST FLOOR REFERENCE PLAN

A2.02a

Sheet Number Of

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KEYNOTES

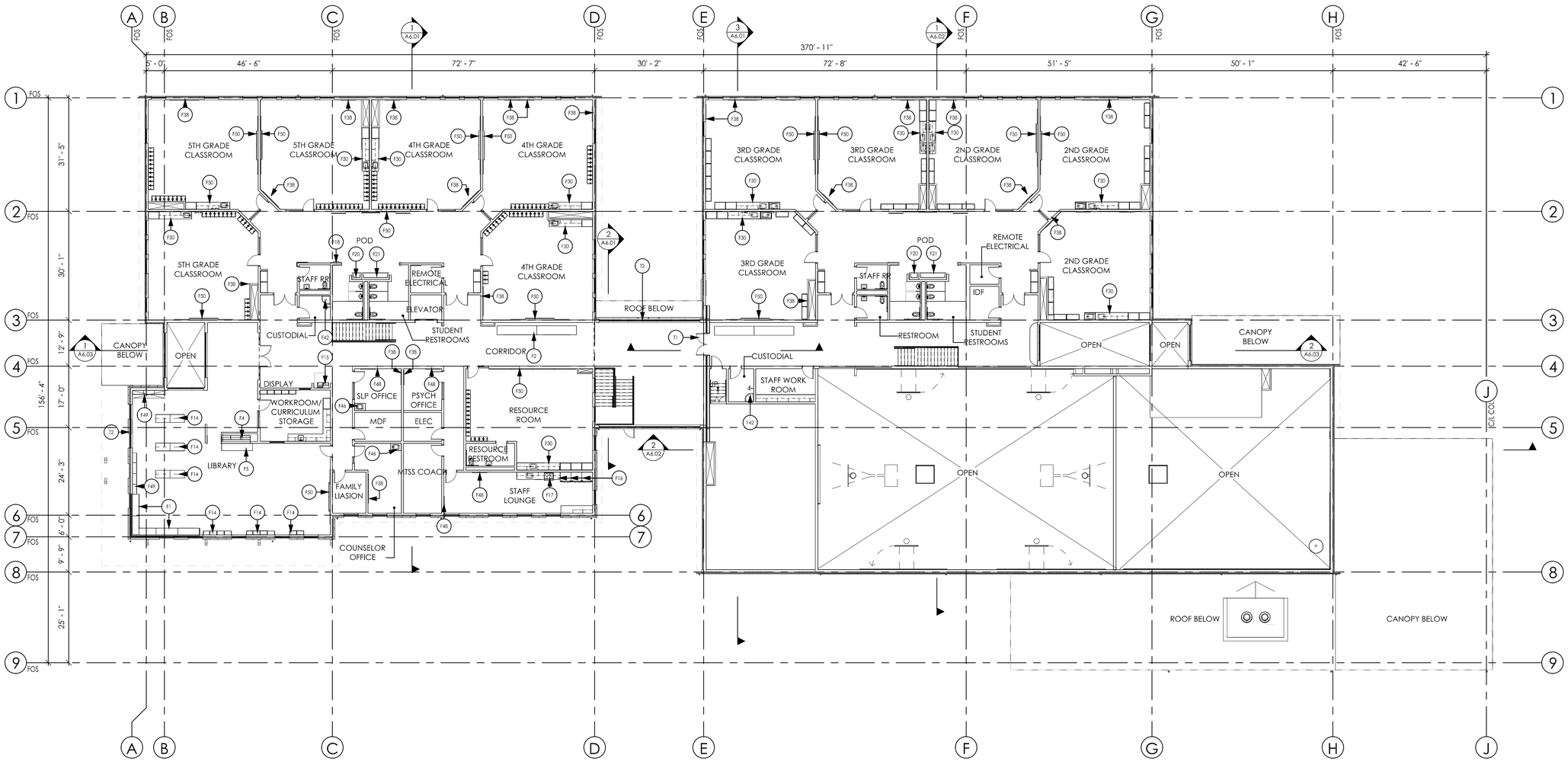
F1	BUILT-IN BENCH SEATING WITH OPEN BOOKSHELVES BELOW
F2	RAISED FLOOR OPENING, REFER TO DETAIL 1/ A21.01 (FIRST FLOOR, SIM)
F4	CUSTOM FEATURE BOOK DISPLAY, APPROXIMATELY 6'-0" HIGH, WITH TRACELESS PLASTIC LAMINATE FINISH
F5	QUARTZ COUNTERTOP
F14	3' TALL BOOKSHELVES FOR DISPLAY
F15	DRINKING FOUNTAIN
F16	REFRIGERATOR
F17	OVEN/RANGE W/RESIDENTIAL HOOD
F18	BOTTLE FILLER
F20	CHILD HEIGHT TROUGH SINK
F21	3 FAUCET TROUGH SINK

KEYNOTES

F30	TYP CLASSROOM CASEWORK; SEE A80.01 FOR CASEWORK LAYOUTS
F38	MARKERBOARD
F42	FLOOR SINK, MOP/BROOM HOLODER, CHEMICAL DISPENSER, EYEWASH STATION
F46	OFFICE COUNTERTOP: PLAM COUNTERTOP WITH DROP-IN SINK, LOWER 3' BASE CABINET, WALL MOUNTED MIRROR
F48	MONITOR, OFCI
F49	FULL HEIGHT BOOKSHELVES
F50	TYPICAL CLASSROOM TEACHING WALL, SEE SHEET A80.01 FOR TYPICAL LAYOUT
T1	2 HR FIRE RATED DOOR
T2	STOREFRONT

SHEET NOTES:

A. SEE SHEET A2.01 FOR FLOOR PLAN GENERAL NOTES, KEYNOTES AND LEGEND
B. SEE A30 SERIES SHEETS FOR EXTERIOR WALL TYPE DESCRIPTIONS AND GENERAL NOTES
C. SEE A31 SERIES SHEETS FOR INTERIOR WALL TYPE DESCRIPTIONS AND GENERAL NOTES



1 SECOND FLOOR REFERENCE PLAN

1/16" = 1'-0"

N

TCF
124 North 'I' St. Tacoma, WA
www.tcfarchitecture.com
P.253.572.3993

Client

ABERDEEN SD #5

Project

SOUTH SITE ELEMENTARY SCHOOL

2025-004

SOUTH SITE ELEMENTARY SCHOOL

Aberdeen, WA

Issue & Revision Dates

27 APRIL 2026	65% SD
29 MAY 2026	95% SD
03 AUG 2026	100% SD

100% SCHEMATIC DESIGN

Not for Construction

NOTE: DRAWING MAY BE REDUCED

0 8' 16' 32'

Drawn By Author
Checked By Checker

Sheet Title

SECOND FLOOR REFERENCE PLAN

A2.03a

Sheet Number Of

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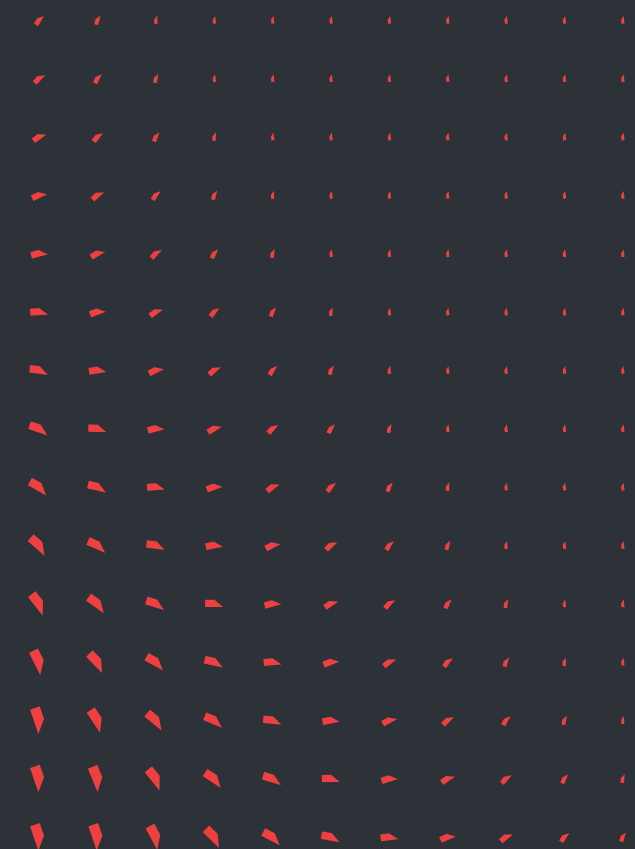
04

Budget Considerations

I. Cost Estimate
II. Value Engineering Options

TCF

I. Cost Estimate



Cost Estimate

This section introduces the Schematic Design (SD) cost estimate and the accepted value engineering (VE) items for the South Site Elementary School. The SD estimate exceeds the MACC by $6.4M, necessitating acceptance of targeted VE items to close the gap. The following pages summarize the estimate results and the VE strategies, with the full cost estimate and cost control strategy documents attached in the appendix for reference.

- Source: RC Cost Group — Schematic Design Estimate (Rev. 3), June 25, 2026
- Lead Estimator: Mark Richardson (RC Cost Group) — participated in SD estimate development and coordination with design and engineering disciplines.
- Project: South Side Elementary (60,783 GSF — $771/SF based on building cost only)

PROJECT: SOUTH SIDE ELEMENTARY (60,783 GSF)

- Total SD Estimate: $58,502,032
- Building: $46,870,649
- Sitework: $9,282,444
- Off-Site Improvements: $2,348,939
- Total Off-Site + Sitework: $11,631,33
- Target MACC: $52,089,241
- Variance: +$6,412,791 (over MACC)
- Key Cost Characteristics:
  - Sitework share: ~20% of total; principal driver was overcoming deep soil bearing with excavation and stone columns as well as the need to mitigate liquefaction via site drainage
  - Mechanical Systems: Changing from 4-pipe to water-source heat pump reduced cost
  - Construction Type: Changing to a wood bearing wall and framing construction from steel braced frame construction reduced cost

VALUE ENGINEERING - ACCEPTED ITEMS (SD PHASE)

- Acceptance Rule: Items shown are only those with a non-zero “Accepted Cost” value in the Cost Control Strategies log. The Item code (first column) is used as the unique identifier.

Cost Estimate

A. ACCEPTED COST REDUCTIONS

Design Team#	Sazan	Description	Accepted Cost ($)
C1b		Remove Hillside Slide	-39,495
C1d		Remove Music Concrete Outdoor Platform	-125,068
C1e		Reconfigure & Reduce Parking and Curb, Reduce Pavement	-375,795
	C-43	Remove stormwater treatment on the east side of the site	-68,000
	C-45	Remove trees to improve grading.	-46,000
	C-49	Reduce landscape budget by 30% (reduce/eliminate irrigation and plantings)	-112,000
A1d		Asphalt Shingle vs Metal Roofing	-548,638
A1g	P-142, S-166 A-6	Reduce Roof slope, simplify roof forms, reduce overhangs to 2' except at West and South side	-348,758
	A-5	Increased borrowed light from classrooms to pod area ILO clerestory windows and lightwells	-61,000
	A-8	Increased borrowed light from classrooms to pod area ILO clerestory windows and lightwells	-111,000
	S-168	Reduce foundation size according to less conservative assumptions	-269,000
	S-169	Change steel to wood framed construction	-2,410,000
	S-171	Consider vibratory aggregate piers in lieu of rammed aggregate piers.	-148,000
	S-173	Use 4" thick slab-on-grade ILO 5".	-98,000

Cost Estimate

A. ACCEPTED COST REDUCTIONS

Design Team#	Sazan #	Description	Accepted Cost ($)
M1c		Provide water source heat pumps vs the air-to-water heat pump ILO fan coil units. This would require a closet to house the water source heat pumps adjacent to the classroom.	-410,000
	M-130	Consider ABS (Acrylonitrile Butadiene Styrene) waste piping ILO cast iron piping	-39,495
	E-114	Allow MC (metal-clad) cabling.	-500,000
	E-115	Use direct-indirect troffer fixtures in classrooms ILO pendant lighting.	-167,000

B. ACCEPTED VALUE-ADDED ITEMS

Item	V/E Function No.	Description	Accepted Cost ($)
S-163		Widen Main Entry	+$0 (subtracted from A1g)

C. TOTALS (ACCEPTED ITEMS ONLY)

- Total Cost Reductions: –$5,877,997
- Total Value-Added Items: +$0
- Net Adjustment: –$5,877,997

Cost Estimate

The Schematic Design estimate identified a total project cost of ***$58,502,032***, which exceeded the District's MACC of ***$52,089,241 by $6,412,791.*** Through a package of targeted value engineering (VE) measures, including major savings from a change in building type from steel to wood, as well as changing mechanical systems from 4-pipe to watersource heatpumps, and numerous smaller changes, the project realized ***$5,877,997 in cost reductions.*** The remaining difference was covered through the application of project contingency, bringing the project into balance with the approved budget.

Result: The net adjustment, together with the contingency amount, aligns the project very closely with the District's MACC of $52,089,241. The project remains technically over budget by $534,794, which is well within the 7.5% contingency allowance of $3.6M. Core program requirements are preserved, and Entry spaces enhanced.

COST GROUP

ABERDEEN SCHOOL DISTRICT
SOUTH SITE ELEMENTARY SCHOOL
ABERDEEN, WA
SCHEMATIC DESIGN ESTIMATE

ESTIMATE ISSUE DATE: June 25, 2026
ESTIMATE REVISION: 3

Submitted To:

STEVE WACHTLER
TCF ARCHITECTURE
124 N I STREET
TACOMA, WA 98403

CLARIFICATIONS AND ASSUMPTIONS

RC Cost Group Estimating Team:

Lead Estimator: Mark Richardson
Architectural: Mark Richardson / Melia Blankenship
Structural: Mark Richardson
Plumbing: Hargis
HVAC: Hargis
Electrical: Hargis
Civil: Jacobson Consulting Engineers
Landscape: Fora
QA/QC: Andy Cluness

Exclusions from Construction Cost:

Design fees
Owners administration costs
Building and land acquisition fees
Legal and accounting fees
Removal of unforeseen underground obstructions
Owner's furniture, furnishings and equipment
Owners supplied materials
Moving owners equipment and furniture
Compression of schedule, premium or shift work
Assessments, finance, legal and development charges
Builder's risk, project wrap-up and other owner provided insurance program
Washington State Sales Tax
AV Equipment
Future proposed Portables

Assumption used in establishing the estimate:

The project will be procured utilizing the design, bid, build method
Construction Start Date: September 2027
Open and competitive bidding among all proportions of the work

Items that may affect the cost estimate:

Modifications to the scope of work included in this estimate.
Special phasing requirements other than mentioned above.
Restrictive technical specifications or excessive contract conditions.
Any non-competitive bid situations.
Bids delayed beyond the projected schedule.

ABERDEEN SCHOOL DISTRICT
SOUTH SITE ELEMENTARY SCHOOL
ABERDEEN, WA
SCHEMATIC DESIGN ESTIMATE

Date: **June 25, 2026**

COST GROUP

OVERALL SUMMARY CONSTRUCTION COST

	GFA	$/SF	$
Building	60,783 SF	771.11	46,870,649
Sitework			9,282,444
Off-Site Improvements			2,348,939
TOTAL COST OF WORK			**58,502,032**

MACC	52,089,241
Variance	12.31%

BUILDING DATA

Building Area:

Level 1	36,039 SF	
Level 2	24,744 SF	
Total Gross Floor Area		**60,783 SF**
Mechanical Attic	7,661 SF	
Total Unoccupied Space (Excluded from GFA)		**7,661 SF**

ABERDEEN SCHOOL DISTRICT
SOUTH SITE ELEMENTARY SCHOOL
ABERDEEN, WA
SCHEMATIC DESIGN ESTIMATE
BUILDING

GROSS FLOOR AREA: 60,783 SF
DATE: June 25, 2026

RC COST GROUP

No.	ELEMENT DESCRIPTION	ELEMENT TOTAL	GROUP TOTAL	COST PER SF
A10	FOUNDATIONS		$ 2,702,149	$ 44.46
A1010	Standard Foundation	$ 1,590,616		$ 26.17
A1020	Special Foundation	$ 520,000		$ 8.56
A1030	Slab on Grade	$ 591,533		$ 9.73
A20	BASEMENT WALL CONSTRUCTION		$ -	$ -
A2010	Basement Excavation	$ -		$ -
A2020	Basement Wall Construction	$ -		$ -
B10	SUPERSTRUCTURE		$ 4,866,252	$ 80.06
B1010	Floor & Roof Construction	$ 4,866,252		$ 80.06
B20	EXTERIOR ENCLOSURE		$ 3,977,972	$ 65.45
B2010	Exterior Walls	$ 3,166,998		$ 52.10
B2020	Exterior Windows	$ 660,184		$ 10.86
B2030	Exterior Doors	$ 150,790		$ 2.48
B30	ROOFING		$ 2,119,716	$ 34.87
B3010	Roofing	$ 2,119,716		$ 34.87
C10	INTERIOR CONSTRUCTION		$ 3,243,994	$ 53.37
C1010	Partitions	$ 2,197,790		$ 36.16
C1020	Interior Doors	$ 561,989		$ 9.25
C1030	Fittings and Specialties	$ 484,216		$ 7.97
C20	STAIRS		$ 276,652	$ 4.55
C2010	Stair Construction	$ 276,652		$ 4.55
C30	INTERIOR FINISHES		$ 2,095,924	$ 34.48
C3010	Wall Finishes	$ 861,445		$ 14.17
C3020	Floor Finishes	$ 640,980		$ 10.55
C3030	Ceiling Finishes	$ 593,499		$ 9.76
D10	CONVEYING		$ 165,000	$ 2.71
D1010	Elevators & Lifts	$ 165,000		$ 2.71
D20	PLUMBING		$ 1,686,144	$ 27.74
D2010	Plumbing	$ 1,686,144		$ 27.74
D30	HVAC		$ 4,899,019	$ 80.60
D3010	HVAC	$ 4,899,019		$ 80.60
D40	FIRE PROTECTION		$ 475,881	$ 7.83
D4010	Sprinkler System	$ 475,881		$ 7.83
D50	ELECTRICAL		$ 6,488,819	$ 106.75
D5000	Electrical	$ 6,488,819		$ 106.75
E10	EQUIPMENT		$ 658,143	$ 10.83
E1010	Equipment	$ 658,143		$ 10.83
E20	FIXED FURNISHINGS		$ 938,833	$ 15.45
E2010	Fixed Furnishings	$ 938,833		$ 15.45
F10	SPECIAL CONSTRUCTION		$ -	$ -
F1010	Special Structure	$ -		
F1020	Special Construction	$ -		
F20	SELECTIVE BUILDING DEMOLITION		$ -	$ -
F2010	Building Elements Demolition	$ -		
	Sub-Total Direct Cost		**$ 34,594,498**	**$ 569.15**
	General Conditions/General Requirements 11.75%		$ 4,064,854	$ 66.87
	Sub-Total		**$ 38,659,351**	**$ 636.02**
	Estimating / Design Contingency 7.50%		$ 2,899,451	$ 47.70
	Sub-Total		**$ 41,558,803**	**$ 683.72**
	Insurance & Bonds 1.50%		$ 623,382	$ 10.26
	General Contractor's Overhead and Profit 5.50%		$ 2,285,734	$ 37.60
	Sub-Total		**$ 44,467,919**	**$ 731.58**
	Escalation: July 2027 5.40%		$ 2,402,730	$ 39.53
	TOTAL CONSTRUCTION COST		**$ 46,870,649**	**$ 771.11**

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
A10	**FOUNDATIONS**				
A1010	**Standard Foundation**				
	A1011 Foundations				
	Reinforced concrete grade beams				
	Excavate for continuous footings	1,067	CY	48.00	51,216
	Backfill, assume imported fill	861	CY	58.00	49,938
	Disposal of excavated material off-site within 8 miles, assumed a 33% swell factor	1,419	CY	31.35	44,489
	Fine grade bottom of footing	3,051	SF	1.30	3,966
	Formwork to foundations - sides	5,082	SF	13.45	68,353
	Reinforcing steel in foundations	30,949	LB	1.76	54,470
	Concrete, 4,000 psi	206	CY	329.60	67,898
	Finish to top of footing	3,051	SF	1.40	4,271
	Reinforced concrete brace frame footings				
	Excavate for continuous footings	1,321	CY	48.00	63,408
	Backfill, assume imported fill	702	CY	58.00	40,716
	Disposal of excavated material off-site within 8 miles, assumed a 33% swell factor	1,757	CY	31.35	55,080
	Fine grade bottom of footing	4,290	SF	1.30	5,577
	Formwork to foundations - sides	6,064	SF	13.45	81,561
	Reinforcing steel in foundations	136,239	LB	1.76	239,781
	Concrete, 4,000 psi	619	CY	329.60	204,022
	Finish to top of footing	4,290	SF	1.40	6,006
	A1012 Column foundations				
	Reinforced concrete spread footings				
	Excavate for spread footings	879	CY	48.00	42,192
	Backfill, assume imported fill	593	CY	58.00	34,394
	Disposal of excavated material off-site within 8 miles, assumed a 33% swell factor	1,169	CY	31.35	36,650
	Fine grade bottom of footing	3,672	SF	1.30	4,774
	Formwork to foundations - sides	4,480	SF	13.45	60,256
	Reinforcing steel in foundations	35,700	LB	1.76	62,832
	Concrete, 4,000 psi	286	CY	329.60	94,266
	Finish to top of footing	3,672	SF	1.40	5,141
	A1013 Perimeter drainage and insulation				
	Perimeter drain pipe and rock	1,163	LF	29.45	34,250
	Perimeter insulation, rigid	3,101	SF	5.05	15,662
	Miscellaneous				
	Concrete stem wall	768	SF	88.00	67,547
	Dampproofing	3,101	SF	6.33	19,631
	Set anchor bolts and baseplates	1	LS	35,525.00	35,525
	Elevator pit including waterproofing	1	EA	26,744.00	26,744
	Add for step footings	1	LS	10,000.00	10,000
	Total For Standard Foundations				**1,590,616**
A1020	**Special Foundation**				
	A1020 Special Foundation				
	Stone aggregate piers, note pricing assumes 10'-0" deep @ 6-8' oc	1	LS	520,000.00	520,000
	Total For Special Foundations				**520,000**

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
A1030	**Slab on Grade**				
	A1031 Standard slab on grade				
	Reinforced concrete slab on grade, 5" including base	36,039	SF	15.72	566,533
	A1034 Trenches, pits and bases				
	Pads & Thickening allowance	1	LS	25,000.00	25,000
	Total For Slab on Grade				**591,533**
A20	**BASEMENT CONSTRUCTION**				
A2010	**Basement Excavation**				
	No work anticipated				N/A
	Total For Basement Excavation				
A2010	**Basement Walls**				
	No work anticipated				N/A
	Total For Basement Walls				
B1010	**Floor & Roof Construction**				
	B1012 Upper floors construction				
	Floor Structure				
	Structural steel at floor, 12.5lbs/sf	309,300	LBS	3.70	1,144,410
	Steel floor deck	24,744	SF	6.35	157,124
	Topping slab, incl mesh & nelson studs	24,744	SF	8.40	207,850
	Fireproofing at floors, none anticipated				
	Misc. structural steel/plates/connections	38,663	LB	3.70	143,051
	Seismic joint at floor structure	32	LF	275.00	8,800
	Brace frames				
	BRBs	54	EA	4,500.00	243,000
	Floor Structure at mezzanine				
	Steel floor structure at mezzanine, 12 psf	91,932	LB	3.70	340,148
	Steel floor deck	7,661	SF	6.35	48,647
	Topping slab, incl mesh & nelson studs	7,661	SF	8.40	64,352
	Misc. structural steel/plates/connections	11,492	LB	3.70	42,519
	B1020 Roof construction				
	Roof Structure				
	Structural steel at roof, 11lbs/sf	494,978	LBS	3.70	1,831,419
	Steel roof deck	34,070	SF	6.50	221,455
	Acoustical roof deck	10,928	SF	13.20	144,250
	Misc. structural steel/plates/connections	61,872	LB	3.70	228,927
	Fireproofing at floors, none anticipated				
	Seismic joint at roof structure	32	LF	275.00	8,800
	Seismic joint at canopy structure	60	LF	275.00	16,500
	Canopies				Incl above
	Misc				
	Elevator Steel	1	LS	15,000.00	15,000
	Total For Floor & Roof Construction				**4,866,252**

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
B20	**EXTERIOR CLOSURE**				
B2010	**Exterior Walls**				
	B2011 Exterior wall construction				
	Exterior wall finish material				
	Brick masonry veneer including masonry anchors	7,789	SF	49.85	388,282
	Fiber reinforced cement panels	21,833	SF	42.40	925,719
	Metal panel	3,294	SF	48.36	159,298
	Exterior wall substrate				
	S8.11 - 3" mineral wool insulation, 5/8" gypsum sheathing, WRB, 8" metal stud framing, batt insulation, vapor barrier, (1) layer of 5/8" gypsum at interior face	32,916	SF	35.38	1,164,568
	Masonry sealing, graffiti coatings	7,789	SF	4.00	31,156
	Sheet metal flashings at exterior walls	60,783	SF	2.75	167,153
	Blocking and backing at exterior walls	29,622	SF	2.45	72,574
	Framing at openings	7,843	SF	5.00	39,215
	Lintels/exterior wall steel	9,736	LBS	3.80	36,998
	B2013 Exterior louvers, screens and fencing				
	Louvers	1	LS	35,000.00	35,000
	B2014 Exterior sun control devices				N/A
	B2016 Exterior soffits				
	Canopy soffit finish, allow	4,201	SF	35.00	147,035
	Total For Exterior Walls				**3,166,998**
B2020	**Exterior Windows**				
	B2021 Windows				
	Fiberglass windows	2,444	SF	86.00	210,184
	B2023 Storefronts				
	Aluminum storefront (excludes door openings, interior storefront included in estimate section C1017 Interior Windows and Storefronts)	5,000	SF	90.00	450,000
	Total For Exterior Windows				**660,184**
B2030	**Exterior Doors**				
	B2031 Glazed doors and entrances				
	Aluminum glazed door, double	5	EA	12,480.00	62,400
	B2032 Solid exterior doors				
	HM doors, double, flush	1	EA	8,740.00	8,740
	HM doors, single, flush	7	EA	4,950.00	34,650
	Miscellaneous				
	Miscellaneous specialty hardware	1	LS	45,000.00	45,000
	Total For Exterior Doors				**150,790**
B30	**ROOFING**				
B3010	**Roof Covering**				
	B3011 Roof finishes				
	Metal roofing system	41,674	SF	36.50	1,521,101
	Metal roofing system, canopies	3,324	SF	32.50	108,030

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
B3012 Traffic toppings and paving membranes				
Walkway pads, allowance	1	LS	10,000.00	10,000
B3014 Flashings and trim				
Sheet metal flashings and trim at roof	41,674	SFA	3.50	145,859
B3016 Gutters and downspouts				
Downspouts	19	EA	550.00	10,450
Gutters	817	LF	27.50	22,468
B3021 Glazed roof openings				
Skylight	550	SF	275.00	151,250
B3022 Roof hatches				
Roof access hatch, curb, roofing accessories	4	EA	10,850.00	43,400
Roof access ladder	4	EA	2,250.00	9,000
Miscellaneous				
Rough carpentry	1	LS	39,508.95	39,509
Fall restraint anchors	51	EA	1,150.00	58,650
Total For Roofing				**2,119,716**
C10 INTERIOR CONSTRUCTION				
C1010 Partitions				
C1011 Fixed Partitions				
Metal stud				
6"	63,630	SF	11.90	757,197
8"	13,034	SF	16.40	213,758
GWB				
5/8", type 'X', taped & finished	146,146	SF	4.60	672,272
Allowance for soundproofing upgrades	1	ALLOW	25,000.00	25,000
Allowance for fireproofing upgrades	1	ALLOW	50,000.00	50,000
Batt Insulation	76,664	SF	1.35	103,496
Fire rated plywood	1,000	SF	5.58	5,580
Fire Caulking	1	LS	7,500.00	7,500
C1013 Retractable partitions				
Solid operable partition, gym	756	SF	165.00	124,740
Solid operable partition, platform	384	SF	165.00	63,360
C1016 Interior balustrades and screens				
Pipe guardrail, 55" high	68	LF	375.00	25,500
C1017 Interior windows and storefronts				
Storefront glazing	546	SF	95.00	51,870
HM relite	112	SF	80.00	8,960
Transaction window	1	EA	6,500.00	6,500
Miscellaneous				
Blocking and backing	60,783	GFA	0.25	15,196
Caulking, sealants, and firestopping	60,783	GFA	1.10	66,861
Total For Interior Partitions				**2,197,790**

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
C1020	**Interior Doors**				
	C1021 Interior doors				
	Interior doors, frames and hardware				
	Aluminum glazed door, double	2	EA	12,500.00	25,000
	Aluminum glazed door, single	2	EA	6,500.00	13,000
	Wood doors, double, flush	14	EA	8,150.00	114,100
	Wood doors, single, flush	76	EA	3,410.00	259,160
	Specialty hardware, rated doors, sound door premium	1	LS	60,000.00	60,000
	Specialty doors				
	Overhead coiling, 4'-4" x 5'-9" @ kitchen	25	SF	250.00	6,229
	Overhead coiling, 7'-0" x 7'-2" @ kitchen	100	SF	225.00	22,575
	Overhead coiling, 8'-0" x 7'-2" @ ASB	57	SF	225.00	12,900
	C1025 Interior door sidelights and transoms				
	Glazed HM sidelight at interior doors				
	Single pane				
	Full height, 2'-6" W or less	37	EA	1,325.00	49,025
	Total For Interior Doors				**561,989**
C1030	**Specialties**				
	C1032 Fabricated compartments and cubicles				
	ADA partitions	10	EA	2,680.00	26,800
	STD partitions	10	EA	2,440.00	24,400
	Urinal screen	5	EA	768.86	3,844
	C1033 Storage shelving and lockers				
	Janitors mop rack and shelf	3	EA	602.00	1,806
	Storage shelving	1	LS	20,000.00	20,000
	Lockers, 3-tier	1	ALLOW	10,000.00	10,000
	C1035 Identifying devices				
	Interior signage	60,783	SF	1.39	84,488
	Exterior building signage	1	LS	27,000.00	27,000
	C1037 General fittings and misc. metals				
	Miscellaneous metals, allow 0.3#/SF	18,235	LB	4.00	72,940
	Fire extinguisher cabinets	1	LS	14,400.00	14,400
	Cornerguards	1	LS	21,274.05	21,274
	Restroom accessories, CFIC				
	Grab bars, per set @ restrooms	24	EA	340.00	8,160
	Soap dispenser (OFCI)	24	EA	52.03	1,249
	Toilet paper dispenser (OFCI)	34	EA	52.03	1,769
	Toilet seat cover dispenser	34	EA	204.92	6,967
	Sanitary napkin receptacle	14	EA	216.05	3,025
	Paper towel dispenser (OFCI)	24	EA	78.04	1,873
	Mirrors	24	EA	272.00	6,528
	Mirrors, OT/PT 3'-6"x 5'-0"	1	EA	375.00	375
	Coat hooks	34	EA	45.00	1,530
	Baby changing station	1	EA	4,750.00	4,750
	Large changing station	1	EA	7,500.00	7,500
	Sink accessories at classrooms, offices and break room				
	Soap dispenser, classrooms (OFCI)	45	EA	52.03	2,341
	Paper towel dispenser, classrooms (OFCI)	45	EA	78.04	3,512
	Cubicle curtain and track at health room, allow	1	LS	4,000.00	4,000
	Elevator pit ladder	1	EA	1,374.60	1,375

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
	Overhead swing mount	2	EA	3,750.00	7,500
	Projector ceiling mounts, allow	1	LS	1,750.00	1,750
	Tackboard/markerboard display specialties				
	Tackboard, 4'-0" x 4'-0"	1	EA	410.00	410
	Markerboard, 4'-0" x 4'-0"	38	EA	425.00	16,150
	Sliding Markerboard, 6'-0" x 4'-0"	58	EA	1,250.00	72,500
	Metro shelving, allow	20.0	LF	200.00	4,000
	Display Cases	1	LS	20,000.00	20,000
	Total For Fittings and Specialty Items				**484,216**
C20	**STAIRS**				
C2010	**Stair Construction**				
	C 2010 Stair Construction including railings and finish				
	Architectural stairs, stair A	1	FLT	50,000.00	50,000
	Architectural stairs, stair B	1	FLT	75,000.00	75,000
	Architectural stairs, stair C	1	FLT	50,000.00	50,000
	Mechanical access stairs	2	FLT	25,700.00	51,400
	Stage Steps				
	Stage steps, CIP concrete	123	LFR	175.50	21,587
	Railings at stage ramp	91	LF	315.00	28,665
	Total For Stair Construction				**276,652**
C30	**INTERIOR FINISHES**				
C3010	**Wall Finishes**				
	C3012 Wall finishes to interior walls				
	Interior painting at walls	60,783	GFA	4.00	243,132
	Ceramic tile	5,466	SF	28.30	154,688
	Ceramic tile , backsplash	76	SF	35.00	2,660
	Vinyl wall covering	7,312	SF	6.65	48,625
	Acoustical wall panels	896	SF	28.00	25,088
	MDF Wainscot, wall paneling	5,246	SF	35.00	183,598
	Plywood wall protection	500	SF	5.00	2,500
	Hardwood veneer walll paneling	2,150	SF	45.00	96,749
	FRP	2,619	SF	15.00	39,285
	Vinyl wall paneling	432	SF	35.00	15,120
	Miscellaneous wall finishes allowance	1	LS	50,000.00	50,000
	Total For Wall Finishes				**861,445**
C3020	**Floor Finishes**				
	C3024 Flooring				
	Floor preparation	55,039	SF	0.88	48,434
	Sealed concrete	3,079	SF	2.28	7,020
	Porcelain floor tile	2,665	SF	25.00	66,625
	Carpet	4,252	SF	6.15	26,150
	Rubber athletic flooring	4,620	SF	16.75	77,385
	Resilient sheet flooring, kitchen	1,193	SF	12.00	14,316
	Rubber sheet flooring	226	SF	11.00	2,486
	Resilient tile flooring	44,509	SF	7.10	316,014
	Walk off mat	239	SF	16.50	3,944
	Gym striping and markings	1	LS	5,775.00	5,775

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
	C3026 Bases, curbs and trim				
	Rubber base	11,807	LF	4.14	48,881
	Ceramic Tile base	958	LF	25.00	23,950
	Total For Floor Finishes				**640,980**
C3030	**Ceiling Finishes**				
	C3031 Ceiling finishes				
	Suspended ACT and grid, 2'-0" x 4'-0"	32,591	SF	7.20	234,655
	Suspended acousticall panel ceiling, 2'-0"x 2'-0"	1,221	SF	7.65	9,341
	Suspended ACT and grid, 2'-0" x 4'-0", vinyl faced	1,176	SF	8.75	10,290
	Gypsum board over metal stud framing 5/8"	5,195	SF	10.50	54,548
	Suspended acoustic baffle system	3,967	SF	45.00	178,515
	Paint included in interior painting estimate				N/A
	Acoustic ceiling clouds	434	SF	31.50	13,671
	Acoustic treatments	1,440	SF	29.50	42,480
	Bulkheads	1	ALLOW	50,000.00	50,000
	Total For Ceiling Finishes				**593,499**
D10	**VERTICAL TRANSPORTATION**				
D1010	**Elevator & Lift**				
	D 1010 Elevators and Lifts				
	Hydraulic traction passenger elevator including cab finishes, 2 stops	1	EA	165,000.00	165,000
	Total For Elevator & Lifts				**165,000**
D20	**PLUMBING**				
D2010	**Plumbing**				
	Plumbing estimate provided by Metrix Engineers, dated 06/12/26				
	220719 PLUMBING INSULATION				
	Plumbing Insulation	60,784	SF	1.84	111,691
	221116 DOMESTIC WATER PIPING				
	Domestic Water Piping	60,784	SF	7.96	483,993
	221316 SANITARY WASTE AND VENT PIPING				
	Sanitary Waste and Vent Piping	60,784	SF	6.98	424,424
	Grease Interceptor, 1,500 Gallon, Below Grade Concrete Vault	1	LS	22,001.00	22,001
	222000 EARTHWORK FOR UNDERGROUND MECHANICAL SYSTEMS				
	Earthwork for Underground Mechanical Systems	60,784	SF	1.04	63,291
	223300 ELECTRIC HEAT PUMP WATER HEATER SYSTEM				
	Electric Heat Pump Water Heater and Storage Tank	1	LS	153,125.00	153,125
	80 Gallon, 36 KW, 147 GPH	2	EA	20,212.50	40,425

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
224200 COMMERCIAL PLUMBING FIXTURES				
Water Closets, Bowl, Flush Valve, Seat, 1.6 gpf, Wall Hung, RI	32	EA	2,588.43	82,830
Urinal, Wall Hung, Vitreous China, Hanger, Valve, 0.5 gpf, Water Saving, RI	10	EA	2,111.90	21,119
Lavatory, Wall Hung, Vitreous China, 18x15, RI, Self Closing Faucet	20	EA	1,958.78	39,176
Service Sinks, Wall, 22x20, Faucet, RI	3	EA	4,109.88	12,330
Commercial Wash Ftns, Multistation, RI	6	EA	7,423.50	44,541
Drinking Fountain, Wall Mounted, Non-Recessed, SS, Dual Level, RI	8	EA	2,715.83	21,727
Classroom Sinks, Countertop, Stainless, Faucet, Bubbler, Strainer, ADA, RI, 25x17	45	EA	2,638.65	118,739
Double Compartment Sinks, Countertop, Stainless, Faucet, Strainer, ADA, RI	1	EA	3,960.43	3,960
Fiberglass Shower Stall, ADA, Grab Bar, Seat, Mixing Valve, RI	1	EA	3,392.03	3,392
Emergency Eyewash, SS, Wall Mounted	2	EA	2,666.53	5,333
Interior Hose Bibb, Hot and Cold, RI	5	EA	1,418.55	7,093
Exterior Hose Bibb, Cold, RI	7	EA	753.38	5,274
Exterior Hose Bibb, Hot and Cold, RI	1	EA	1,326.68	1,327
Misc Fixtures (CW Service Box, Instahots, Dishwasher Connections, etc.)	12	EA	1,010.63	12,128
Electronic Trap Primer Panel	7	EA	1,175.39	8,228
Total For Plumbing				**1,686,144**
D30 HVAC				
D3010 HVAC				
HVAC estimate provided by Metrix Engineers, dated 06/12/26				
230548 VIBRATION AND SEISMIC CONTROL FOR HVAC				
Vibration and Seismic Control for HVAC	60,784	SF	0.55	33,507
230593 TESTING ADJUSTING AND BALANCING				
Testing, Adjusting and Balancing	60,784	SF	1.10	67,014
230700 MECHANICAL INSULATION				
Mechanical Insulation	60,784	SF	4.59	279,227
230800 COMMISSIONING SUPPORT				
Commissioning	60,784	SF	0.67	40,953
230900 INSTRUMENTATION AND CONTROL FOR HVAC				
Instrumentation and Control For HVAC	60,784	SF	12.25	744,604
232113 HYDRONIC PIPING				
Hydronic Piping	60,784	SF	14.70	893,525
232116 HYDRONIC PIPING SPECIALTIES				
Hydronic Piping Specialties	60,784	SF	3.55	215,935
232123 HYDRONIC PUMPS				
In-Line Centrifugal Hydronic Pumps	1	LS	47,775.00	47,775
232500 HVAC CHEMICAL TREATMENT				
HVAC Chemical Treatment	60,784	SF	0.55	33,507

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
	233113 METAL DUCTS				
	Metal Ducts	60,784	SF	15.31	930,755
	233300 AIR DUCT ACCESSORIES				
	Air Duct Accessories	60,784	SF	0.67	40,953
	233423 HVAC POWER VENTILATORS				
	Exhaust Fans	60,784	SF	0.55	33,507
	233600 AIR TERMINAL UNITS				
	Air Terminal Units	1	LS	29,890.00	29,890
	Fan Coils		EA		
	233713 DIFFUSERS, REGISTERS, AND GRILLES				
	Diffusers, Registers, and Grilles	60,784	SF	1.35	81,906
	235000 CENTRAL HEATING EQUIPMENT				
	Electric Boiler	1	EA	98,612.50	98,613
	236000 CENTRAL COOLING EQUIPMENT				
	Air to Water Heat Pump	2	EA	318,500.00	637,000
	237000 CENTRAL HVAC EQUIPMENT				
	Indoor Central-Station DOAS and Air Handling Units	1	LS	378,525.00	378,525
	Fan Coil Units	1	LS	259,700.00	259,700
	238000 DECENTRALIZED HVAC EQUIPMENT				
	238100 Decentralized Unitary HVAC Equipment	60,784	SF	0.86	52,122
	Total For HVAC				**4,899,019**
D40	**FIRE PROTECTION**				
D4010	**Fire Protection**				
	Fire Protection estimate provided by Metrix Engineers, dated 06/12/26				
	D4010 Fire Protection				
	Fire Protection systems, building	68,573	GFA	6.37	436,810
	Total For Fire Sprinkler System				**475,881**
D50	**ELECTRICAL**				
D5000	**Electrical**				
	Electrical estimate provided by Metrix Engineers, dated 06/09/26				
	WIRE AND CABLE				
	Wire and Cable	65,281	SF	9.88	644,976
	RACEWAYS				
	Raceways	65,281	SF	9.26	604,665
	SWITCHBOARDS				
	Switchboards, Meter, SPD	1	EA	156,462.15	156,462

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
PANELBOARDS				
Panelboards, Meters, SPDs	31	EA	14,820.00	459,420
TRANFORMERS				
Transformers	7	EA	10,003.50	70,025
GENERATOR				
Generator, ATS, MTS	1	EA	209,950.00	209,950
WIRING DEVICES				
Wiring Devices	65,281	SF	8.65	564,354
SOLAR PHOTOVOLTAICS				
Solar Photovoltaics	1	LS	172,900.00	172,900
LIGHTING				
Lighting	65,281	SF	17.29	1,128,708
COMMISSIONING				
Commissioning	65,281	SF	1.05	68,529
VOICE AND DATA COMMUNICATIONS				
Voice and Data Communications	65,281	SF	12.97	846,531
CLASSROOM AUDIO VISUAL SYSTEM				
Classroom AV System	24	EA	9,880.00	237,120
INTERCOM SYSTEM				
Clock, Intercom, Public Address System	65,281	SF	5.87	382,955
GYM/COMMONS AUDIO VISUAL SYSTEM				
AV System	1	LS	172,282.50	172,283
DISTRIBUTED ANTENNA SYSTEM				
DAS System	65,281	SF	3.71	241,866
ADDRESSABLE FIRE-ALARM SYSTEM				
Fire Alarm System	65,281	SF	5.00	326,519
SECURITY SYSTEM				
Access Control, Intrusion Detection, Video Surveillance	65,281	SF	2.28	149,151
RESCUE ASSISTANCE SYSTEM				
Rescue Assistance	65,281	SF	0.80	52,404
Total For Electrical				**6,488,819**
E10 EQUIPMENT				
E1010 Equipment				
E1023 Theater and stage equipment				
Stage drapery	1	EA	60,000.00	60,000
E1025 Audio-visual equipment				
Projection screen at gymnasium	1	EA	20,000.00	20,000
Projection screen at commons / stage	1	EA	35,000.00	35,000
Flat panel display, OFCI	12	EA	175.00	2,100

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
	E1029 Other institutional equipment				
	Wall mounted basketball backstops at gymnasium	4	EA	7,500.00	30,000
	Forward folding basketball backstop at gymnasium	2	EA	11,000.00	22,000
	Walk-draw gymnasium divider curtains	50	LF	375.00	18,563
	Volleyball standards and rack	1	EA	2,480.00	2,480
	Scoreboards, shotclocks	1	EA	30,000.00	30,000
	Telescopic gym seating, allowance	1	LS	35,000.00	35,000
	Miscellaneous gym equipment	1	LS	8,000.00	8,000
	E1093 Food service equipment				
	Food service equipment, kitchen allowance	1	LS	375,000.00	375,000
	E1094 Residential equipment				
	Residential appliances, allowance	1	LS	20,000.00	20,000
	Total For Equipment				**658,143**
E20	**FIXED FURNISHINGS**				
E2010	**Fixed Furnishing**				
	E2012 Fixed casework				
	Classrooms				
	Base cabinetry, sink cabinet only	374.0	LF	432.00	161,568
	Upper cabinet	312.0	LF	388.00	121,056
	Tall cabinetry, 7'-0" high	200.0	LF	880.00	176,000
	Countertop	374.0	LF	118.00	44,132
	Cubbies	378.0	LF	420.00	158,760
	Built-in bench, 18"D	35.0	LF	165.00	5,775
	Counter, Quartz	16.0	LF	152.00	2,432
	Trash Receptacle Casework	9.0	LF	475.00	4,275
	Mail slot cabinetry, 5 bays	5.0	LF	650.00	3,250
	Library				
	Built-in bench, w/ shelves underneath	28.0	LF	255.00	7,140
	Bookshelves	50.0	LF	765.00	38,250
	Custom Feature Display Bookshelves, 6' tall	8.0	LF	950.00	7,600
	Display Bookshelves, 3' tall	68.0	LF	550.00	37,400
	Reception				
	Reception Counter	27.0	LF	750.00	20,250
	Miscellaneous casework	60,783	GFA	0.40	24,313
	E2013 Blinds and other window treatments				
	Window treatments, manual	4,944	SF	15.50	76,632
	Premium for motorized window treatments	1	LS	50,000.00	50,000
	Total For Fixed Furnishings				**938,833**
F10	**SPECIAL STRUCTURES**				
F1020	**Special Construction**				
	No work anticipated				N/A
	Total For Special Construction				

ABERDEEN SCHOOL DISTRICT
SOUTH SITE ELEMENTARY SCHOOL
ABERDEEN, WA
SCHEMATIC DESIGN ESTIMATE
SITEWORK **ELEMENTAL ESTIMATE SUMMARY** **DATE:** **June 25, 2026**

RC COST GROUP

No.	ELEMENT DESCRIPTION		ELEMENT TOTAL	GROUP TOTAL
G10	SITE PREPARATION			$ 1,773,455
G1010	Site Clearing		$ -	
G1020	Site Demolition and Relocations		$ 376,770	
G1030	Site Earthwork		$ 1,396,685	
G1040	Hazardous Waste Remediation		$ -	
G20	SITE IMPROVEMENTS			$ 3,136,612
G2010	Roadways		$ -	
G2020	Parking Lots		$ 1,082,395	
G2030	Pedestrian Paving		$ 198,850	
G2040	Site Development		$ 1,095,103	
G2050	Landscaping		$ 760,264	
G30	SITE MECHANICAL UTILITIES			$ 1,141,950
G3010	Water Supply		$ 500,800	
G3020	Sanitary Sewer		$ 79,525	
G3030	Storm Sewer		$ 561,625	
G3040	Heating Distribution		$ -	
G3050	Cooling Distribution		$ -	
G3060	Fuel Distribution		$ -	
G3090	Other Site Mechanical Utilities		$ -	
G40	SITE ELECTRICAL UTILITIES			$ 793,932
G4010	Electrical Distribution		$ 532,112	
G4020	Site Lighting		$ 217,360	
G4030	Site Communications and Security		$ 44,460	
G4090	Other Site Electrical Utilities		$ -	
	Sub-Total Direct Cost			**$ 6,845,949**
	General Conditions/General Requirements	11.75%		$ 804,399
	Sub-Total			**$ 7,650,348**
	Estimating / Design Contingency	7.50%		$ 573,776
	Sub-Total			**$ 8,224,124**
	Insurance & Bonds	1.50%		$ 123,362
	General Contractor's Overhead and Profit	5.50%		$ 459,112
	Sub-Total			**$ 8,806,598**
	Escalation: July 2027	5.40%		$ 475,846
	TOTAL CONSTRUCTION COST			**$ 9,282,444**

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
G10	**SITE PREPARATION**				
G1010	**Site Clearing**				
	Included in Site Demolition				N/A
	Total For Site Clearing				
G1020	**Site Demolition and Relocations**				
	C1020 Site Demolition				
	Site Mobilization	1.00	LS	330,000.00	330,000
	Tree Removal	56	EA	750.00	42,000
	Water Line Removal	265	LF	18.00	4,770
	Total For Site Demolition and Relocations				**376,770**
G1030	**Site Earthwork**				
	G1030 Site Earthwork and Erosion Control				
	Site Grading & Earthwork				
	Site Earthwork Cut (incl. haul Off-Site)	7,850	CY	45.00	353,250
	Site Earthwork Import	6,300	CY	45.00	283,500
	G1033 Soil stabilization and treatment				
	Slope stabilization, horizontal drainage	1	LS	750,000.00	750,000
	G1037 Erosion control				
	Storm Drain Inlet Protection	13	EA	75.00	975
	Silt Fence	1,120	LF	8.00	8,960
	Total For Site Earthwork				**1,396,685**
G1040	**Hazardous Waste Remediation**				
	No work anticipated				N/A
	Total For Hazardous Waste Remediation				
G20	**SITE IMPROVEMENTS**				
G2010	**Roadways**				
	G2012 Paving and surfacing				
	Included in G2020				N/A
	Total For Roadways				
G2020	**Parking Lots**				
	G 2020 Parking Lots				
	Asphalt Paving	2,564.20	TON	150.00	384,630
	CTSC (Asphalt Paving)	9,762.81	TON	50.00	488,140
	Concrete Curb	2,700	LF	65.00	175,500
	Concrete Rolled Curb	55	LF	75.00	4,125
	Signage	1	LS	10,000.00	10,000
	Paint Striping	1	LS	20,000.00	20,000
	Total For Parking Lots				**1,082,395**

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
G2030	**Pedestrian Paving**				
	G2031 Paving and surfacing				
	Concrete Sidewalk	515.00	CY	300.00	154,500
	CSTC (Concrete Sidewalks)	720.00	TON	50.00	36,000
	Gravel (Pond Access Road)	95	TON	50.00	4,750
	CIP Concrete Stairs	80	SF	45.00	3,600
	Total For Pedestrian Paving				**198,850**
G2040	**Site Development**				
	G2041 Fences and gates				
	6' HT Ornamental Fence - OMEGA II UNIK	218	LF	120.00	26,160
	6' HT Black Coated Chainlink Fence	1,121	LF	85.00	95,285
	4' HT Black Coated Chainlink Fence	55	LF	65.00	3,575
	6' HT Ornamental Gate - OMEGA II UNIK, 8' wide double swing	2	EA	7,500.00	15,000
	6' HT Black Coated Chainlink Gate, 4' wide	2	EA	2,000.00	4,000
	6' HT Black Coated Chainlink Gate, 18' wide double swing	3	EA	15,000.00	45,000
	G2042 Retaining walls / Site Walls				
	Cast-in-place Wall	340	SF	120.00	40,800
	Rock Wall (Play Area)	120	SF	80.00	9,600
	CIP Concrete Seat Steps	79	CY	950.00	75,050
	CIP Concrete 'Piles'	29	EA	500.00	14,500
	G2044 Signage				N/A
	G2045 Site furnishings				
	Amphitheater Boulder Seating	19	EA	400.00	7,600
	Concrete at Play Areas	93	SF	20.00	1,860
	Log/rock scramble, crushed rock surf	284	SF	2.90	824
	Engineered Wood Fiber 6"	6	CY	15.00	90
	Drain Rock below EWF 6"	6	CY	80.00	480
	Crushed Rock Surfacing, 4" base course, 2" top course	2,555	SF	2.90	7,410
	Play Turf (including base prep)	5,135	SF	22.00	112,970
	1 Ton Igneous Boulders	2	TON	200.00	400
	2 Ton Igneous Boulders	9	TON	650.00	5,850
	3 Ton Igneous Boulders	2	TON	900.00	1,800
	Galvanized Steel Handrail	20	LF	150.00	3,000
	Recycling and Trash Receptacle	7	EA	1,200.00	8,400
	CIP Concrete stage plinth at classroom	1	EA	10,000.00	10,000
	Benches	6	EA	3,000.00	18,000
	Seat Logs 6' - 8'	7	EA	1,100.00	7,700
	Logs	7	EA	800.00	5,600
	Picnic Table	2	EA	5,000.00	10,000
	Bicycle Parking	3	EA	550.00	1,650
	Asphalt Play Area Striping	1	EA	15,000.00	15,000
	Hillside Play	1	ALLOW	1,500.00	1,500
	Slide @ hillside play	1	ALLOW	30,000.00	30,000
	Play Equipment (structure, spinners, swings)	1	ALLOW	350,000.00	350,000
	Play Equipment at Preschool Area	1	ALLOW	25,000.00	25,000

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
	G2049 Miscellaneous structures				
	Service Yard				
	Service yard wall	1,190	SF	75.00	89,250
	Service yard wall cap	140	LF	225.00	31,500
	Service yard wall footings	24	CY	750.00	18,000
	Service yard wall gate	1	EA	2,250.00	2,250
	Total For Site Development				**1,095,103**
G2050	**Landscaping**				
	G2053 Top soil and planting beds				
	Imported Topsoil Type A (6" at planting & lawn areas)	1,988	CY	60.00	119,280
	Mulch (3" depth)	543	CY	55.00	29,865
	G2054 Seeding and sodding				
	Seed - Meadow	15,408	SF	0.50	7,704
	Hydroseed - Lawn	33,337	SF	0.25	8,334
	G2055 Planting				
	Detention Pond Planting	30,164	SF	0.25	7,541
	Restoration Planting / Erosion Control	130,229	SF	0.75	97,672
	Perennial & Shrub Container Stock Planting	36,500	SF	7.00	255,500
	Trees	85	EA	550.00	46,750
	G2057 Irrigation system				
	Automatic Irrigation System - Shrubs+Perennial	36,500	SF	3.00	109,500
	Automatic Irrigation System - Lawn	48,745	SF	1.50	73,118
	Master valve, flow sensor, QCV, etc.	1	EA	2,500.00	2,500
	Controller	1	EA	2,500.00	2,500
	Total For Landscaping				**760,264**
G30	**SITE MECHANICAL UTILITIES**				
G3010	**Water Supply**				
	G3010 Water Utilities				
	12" Water Main	490	LF	300.00	147,000
	8" Water Main	770	LF	260.00	200,200
	6" Water Main	80	LF	250.00	20,000
	4" Fire Line	130	LF	220.00	28,600
	4" Water Service Line	100	LF	200.00	20,000
	3" Water Meter	1	EA	20,000.00	20,000
	RPBA	1	EA	4,000.00	4,000
	Fire Department Connection	1	EA	3,000.00	3,000
	Post Indicator Valve	1	EA	3,000.00	3,000
	Fire Hydrant	4	EA	10,000.00	40,000
	Connect to Existing Water Main	3	EA	5,000.00	15,000
	Total For Water Supply				**500,800**

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
G3020	**Sanitary Sewer**				
	G3020 Sanitary Sewer				
	8" Sanitary Sewer Pipe	935	LF	65.00	60,775
	Grease Interceptor	1	EA	10,000.00	10,000
	Sewer Cleanout	3	EA	1,250.00	3,750
	Connect to Existing Sewer Main	1	EA	5,000.00	5,000
	Total For Sanitary Sewer				**79,525**
G3030	**Storm Sewer**				
	G3030 Storm Sewer				
	12" PVC Storm Drain	1,750	LF	85.00	148,750
	6" Roof Drain	1,010	LF	50.00	50,500
	Basic Treatment System	2	EA	60,000.00	120,000
	Type 1 Catch Basin	17	EA	4,000.00	68,000
	Type 2 Flow Control Structure	2	EA	10,000.00	20,000
	Storm Drain Cleanout	20	EA	1,200.00	24,000
	6" Perf Pipe (Play Area)	1,400	LF	65.00	91,000
	Infiltration Trench (Play Area)	475	CY	45.00	21,375
	Strom Drain Cleanout (Play Area)	15	EA	1,200.00	18,000
	Total For Storm Sewer				**561,625**
G3040	**Heating Distribution**				
	No work anticipated				N/A
	Total For Heating Distribution				
G3050	**Cooling Distribution**				
	No work anticipated				N/A
	Total For Cooling Distribution				
G3060	**Fuel Distribution**				
	No work anticipated				N/A
	Total For Fuel Distribution				
G3090	**Other Site Mechanical Utilities**				
	No work anticipated				N/A
	Total For Other Site Mechanical Utilities				
G40	**SITE ELECTRICAL UTILITIES**				
G4010	**Electrical Distribution**				
	Site Electrical estimate provided by Metrix Engineers, dated 06/09/26				
	UTILITIES				
	Utilities, Conduits, Vaults, Trenching, Backfill	1	LS	308,750.00	308,750

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
	EV CHARGING				
	EV Chargers, Pathway	6	LS	10,003.50	60,021
	Trenching and Backfill	550	LF	18.53	10,189
	Underground Conduit	3,000	LF	5.03	15,079
	Ground Wire	3,000	LF	6.18	18,525
	Wire	6,000	LF	10.56	63,356
	Junction Boxes	10	EA	4,322.50	43,225
	Electrical Panel	1	EA	12,967.50	12,968
	Total For Electrical Distribution				**532,112**
G4020	**Site Lighting**				
	Site Electrical estimate provided by Metrix Engineers, dated 06/09/26				
	LIGHTING				
	New On-Site Lighting	22.0	EA	9,880.00	217,360
	Total For Site Lighting				**217,360**
G4030	**Site Communications and Security**				
	Site Electrical estimate provided by Metrix Engineers, dated 06/09/26				
	FIBER CONNECTION TO MAIN CAMPUS				
	Fiber Pathway, Trenching, Backfill	1	LS	44,460.00	44,460
	Total For Site Communications and Security				**44,460**
G4090	**Other Site Electrical Utilities**				
	G4092 Site emergency power generation				See Building Detail
	Total For Other Site Electrical Utilities				

ABERDEEN SCHOOL DISTRICT
SOUTH SITE ELEMENTARY SCHOOL
ABERDEEN, WA
SCHEMATIC DESIGN ESTIMATE
OFF-SITE IMPROVEMENTS **ELEMENTAL ESTIMATE SUMMARY** **DATE:** **June 25, 2026**

RC COST GROUP

No.	ELEMENT DESCRIPTION		ELEMENT TOTAL	GROUP TOTAL
G10	SITE PREPARATION			$ 472,170
G1010	Site Clearing		$ -	
G1020	Site Demolition and Relocations		$ 352,935	
G1030	Site Earthwork		$ 119,235	
G1040	Hazardous Waste Remediation		$ -	
G20	SITE IMPROVEMENTS			$ 498,450
G2010	Roadways		$ -	
G2020	Parking Lots		$ 347,500	
G2030	Pedestrian Paving		$ 46,550	
G2040	Site Development		$ 104,400	
G2050	Landscaping		$ -	
G30	SITE MECHANICAL UTILITIES			$ 112,150
G3010	Water Supply		$ -	
G3020	Sanitary Sewer		$ -	
G3030	Storm Sewer		$ 112,150	
G3040	Heating Distribution		$ -	
G3050	Cooling Distribution		$ -	
G3060	Fuel Distribution		$ -	
G3090	Other Site Mechanical Utilities		$ -	
G40	SITE ELECTRICAL UTILITIES			$ 649,610
G4010	Electrical Distribution		$ 432,250	
G4020	Site Lighting		$ 172,900	
G4030	Site Communications and Security		$ 44,460	
G4090	Other Site Electrical Utilities		$ -	
	Sub-Total Direct Cost			**$ 1,732,380**
	General Conditions/General Requirements	11.75%		$ 203,555
	Sub-Total			**$ 1,935,935**
	Estimating / Design Contingency	7.50%		$ 145,195
	Sub-Total			**$ 2,081,130**
	Insurance & Bonds	1.50%		$ 31,217
	General Contractor's Overhead and Profit	5.50%		$ 116,179
	Sub-Total			**$ 2,228,526**
	Escalation: July 2027	5.40%		$ 120,414
	TOTAL CONSTRUCTION COST			**$ 2,348,939**

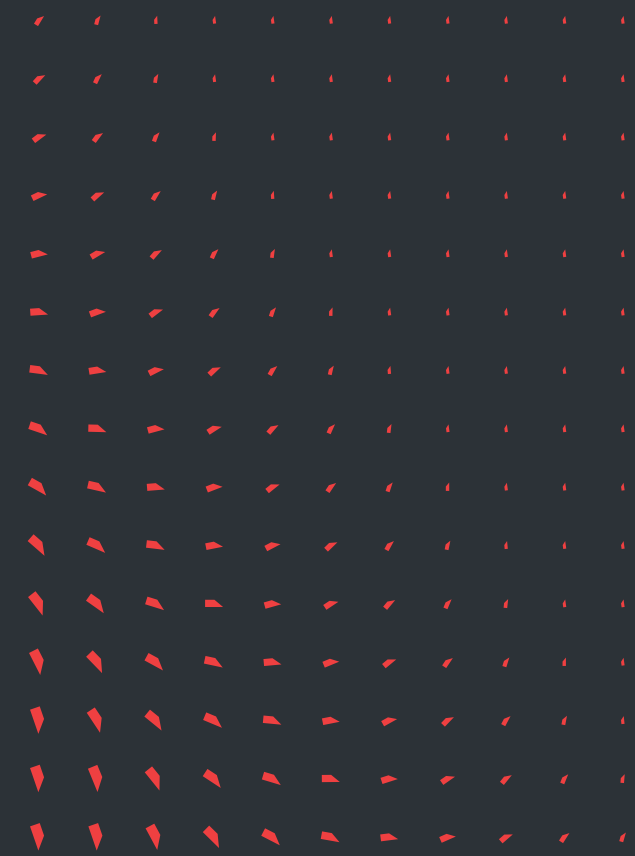
	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
G10	**SITE PREPARATION**				
G1010	**Site Clearing**				
	Included in Site Demolition				N/A
	Total For Site Clearing				
G1020	**Site Demolition and Relocations**				
	C1020 Site Demolition				
	Sawcut	90.00	LF	10.00	900
	Asphalt Removal (incl. haul off-site)	2,210.00	SY	150.00	331,500
	Gravel Removal	615.00	SY	5.00	3,075
	Tree Removal	10	EA	750.00	7,500
	Water Line Removal	220	LF	18.00	3,960
	Mail Box Relocation	1	LS	5,000.00	5,000
	Sign Relocation	2	EA	500.00	1,000
	Total For Site Demolition and Relocations				**352,935**
G1030	**Site Earthwork**				
	G1030 Site Earthwork and Erosion Control				
	Site Grading & Earthwork				
	Site Earthwork Cut (incl. haul Off-Site)	400	CY	45.00	18,000
	Site Earthwork Import	2,000	CY	45.00	90,000
	TESC				
	Storm Drain Inlet Protection	15	EA	75.00	1,125
	Silt Fence	1,120	LF	8.00	8,960
	Straw Wattles	230	LF	5.00	1,150
	Total For Site Earthwork				**119,235**
G1040	**Hazardous Waste Remediation**				
	No work anticipated				N/A
	Total For Hazardous Waste Remediation				
G20	**SITE IMPROVEMENTS**				
G2010	**Roadways**				
	G2012 Paving and surfacing				
	Included in G2020				N/A
	Total For Roadways				
G2020	**Parking Lots**				
	G 2020 Parking Lots				
	Asphalt Paving	850	TON	150.00	127,500
	CTSC (Asphalt Paving)	2,580	TON	50.00	129,000
	Traffic Curb	1,000	LF	65.00	65,000
	Driveway Entrance	6	EA	3,500.00	21,000
	Striping	1	LS	5,000.00	5,000
	Total For Parking Lots				**347,500**
G2030	**Pedestrian Paving**				

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
	G2031 Paving and surfacing				
	Concrete Sidewalk	135	CY	300.00	40,500
	CSTC (Concrete Sidewalks)	121	TON	50.00	6,050
	Total For Pedestrian Paving				**46,550**
G2040	**Site Development**				
	G2041 Fences and gates				N/A
	G2042 Retaining walls / Site Walls				
	Retaining Wall	870	SF	120.00	104,400
	G2044 Signage				N/A
	G2045 Site furnishings				N/A
	G2049 Miscellaneous structures				N/A
	Total For Site Development				**104,400**
G2050	**Landscaping**				
	G2053 Top soil and planting beds				N/A
	G2054 Seeding and sodding				N/A
	G2055 Planting				N/A
	G2057 Irrigation system				N/A
	Total For Landscaping				
G30	**SITE MECHANICAL UTILITIES**				
G3010	**Water Supply**				
	G3010 Water Utilities				N/A
	Total For Water Supply				
G3020	**Sanitary Sewer**				
	G3020 Sanitary Sewer				N/A
	Total For Sanitary Sewer				
G3030	**Storm Sewer**				
	G3030 Storm Sewer				
	12" PVC Storm Drain	990	LF	85.00	84,150
	Type 1 Catch Basin	7	EA	4,000.00	28,000
	Total For Storm Sewer				**112,150**
G3040	**Heating Distribution**				
	No work anticipated				N/A
	Total For Heating Distribution				
G3050	**Cooling Distribution**				
	No work anticipated				N/A

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
	Total For Cooling Distribution				
G3060	**Fuel Distribution**				
	No work anticipated				N/A
	Total For Fuel Distribution				
G3090	**Other Site Mechanical Utilities**				
	No work anticipated				N/A
	Total For Other Site Mechanical Utilities				
G40	**SITE ELECTRICAL UTILITIES**				
G4010	**Electrical Distribution**				
	Site Electrical estimate provided by Metrix Engineers, dated 06/09/26				
	UTILITIES				
	Utilities, Conduits, Vaults, Trenching, Backfill	1	LS	432,250.00	432,250
	Total For Electrical Distribution				**432,250**
G4020	**Site Lighting**				
	Site Electrical estimate provided by Metrix Engineers, dated 06/09/26				
	LIGHTING				
	Assumes (1) pole/100'	10.0	EA	17,290.00	172,900
	Total For Site Lighting				**172,900**
G4030	**Site Communications and Security**				
	Site Electrical estimate provided by Metrix Engineers, dated 06/09/26				
	FIBER CONNECTION TO MAIN CAMPUS				
	Fiber Pathway, Trenching, Backfill	1	LS	44,460.00	44,460
	Total For Site Communications and Security				**44,460**
G4090	**Other Site Electrical Utilities**				
	G4092 Site emergency power generation				See Building Detail
	Total For Other Site Electrical Utilities				

TCF

II. Value Engineering Options



ASD SESS Cost Control Strategies

TCF

	VE Item	SAZAN Item Number	Description	Priority	Design Team Cost Alternative	Cost w/ Markup	Rejected Cost	Recommended Cost Option 1 Wood Frame	Accepted Cost	Add Alt Bid	Notes/Remarks
1			yellow means still being studied		Markup =	1.3165					
2	**SITE**					-$804,357	$0	-$766,357	$0		
3	**C1 Site Layout**					-$804,357	$0	-$766,357	$0		
4	C1a		Reduce parking count if allowed by district	★★★★★		$0					See C1e
5	C1b		reduce paving section			$0					See C1e
6	C1c		Remove Hillside Slide			-$39,495		-$39,495			from landscape budget
7	C1d		Remove Music Conc outdoor stage			-$125,068		-$125,068			from landscape budget
8	C1e		Reconfigure parking and curb to eliminate drive and row of parking at bus drop off and reduce pavment section utilizing geogrid. Reduces stalls from 128 to 115			-$375,795		-$375,795			Needs final approval from District and City Variance
9	C1f		Horizontal Drain Estimate Correction								
10		C-37	Develop north courtyard as outdoor learning area ILO paved concrete walkway.			$44,000					
11		C-38	Use turf and underdrain system ILO sod at playfield.			$408,000					underdrain incl in estimate
12		C-39	Add a second site entrance to S Dewey St and separate parent and bus loops with no shared aisle.			-$38,000					Cost add, not reduction. Adds road and ROW improvements
13		C-40	Reduce public sidewalk width.			-$134,000					City requirement. ROW improvements have already been negotiated with city to a lower point than originally required
14		C-41	Add sidewalk to south of staff parking for bus drop off.			-$155,000					See modified Parking option C1f
15		C-42	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.			$104,000				$104,000	
16		C-43	Remove stormwater treatment on the east side of the site			-$68,000		-$68,000			Discuss with City
17		C-44	Hot Mix Asphalt (HMA) ILO concrete loop around playfield.			-$9,000					Contractors often request changing small widths of asphalt to conc due to equipment size for asphalt is typically cumbersome for small or narrow areas
18		C-45	Remove trees to improve grading.			-$46,000		-$46,000		$46,000	add alt to appease neighbors
19		C-46	Salvage on-site soil rather than import.			-$238,000					salvaging on-site soil will be a big problem because of the weed seedbank in the existing condition. The aggressive weeds will take over any new planting and prove a maintenance nightmare. It's possible to bury or export the ex. topsoil and use sub-soil as topsoil. However, doing this requires clarity in the specification about which soil layer to salvage and hawkish on-site CA management to oversee this atypical soil salvage process. We don't have CA budget to be out there all the time and are concerned about how this would be successfully pulled off.
20		C-47	Use PCC (Portland Cement Concrete) for roadway paving ILO ACP (Asphalt Concrete Pavement) for increased durability.			$20,000					
21		C-48	Use 5" over 17" for HD (heavy-duty) pavement.			$99,000					
22		C-49	Reduce landscape budget by 30% (reduce/eliminate irrigation and plantings).		-$112,000	-$251,000		-$112,000			$112K savings in switching some shrub planting areas in the field zone to meadow. Savings comes from both planting and irrigation. see also Slide and music platform reductions
23	**C2 Utilities**					$0	$0	$0	$0		
24	C2a					$0					
25	**C3 Stormwater Detention Options**					$0	$0	$0	$0		
26	C3a					$0					
27	**L1 Landscape**					$0	$0	$0	$0		
28	covered under Civil					$0	$0	0	$0		
29	**BUILDING**					-$11,700,622	-$6,290,622	-$5,111,639	$0		
30	**ARCHITECTURAL**					-$4,509,874	-$4,168,874	-$1,069,396	$0		

	VE Item	SAZAN Item Number	Description	Priority	Design Team Cost Alternative	Cost w/ Markup	Rejected Cost	Recommended Cost Option 1 Wood Frame	Accepted Cost	Add Alt Bid	Notes/Remarks
31	**A1 Building Exterior**					-$2,047,874	-$2,060,874	-$958,396	$0		
32											
33	A1a		Ground face CMU ILO Brick			-$41,017	-$41,017				allowed per opr
34	A1b		Hardi Panel ILO Ceraclad			-$130,998	-$130,998				allowed per opr
35	A1c		Vinyl vs FIberglass windows 132k?			-$55,552	-$55,552				allowed per opr
36	A1d		Asphalt Shingle vs Metal Roofing			-$548,638	-$548,638	-$548,638		$548,638	allowed per opr
37	A1g		Reduce Roof slope, simplify roof forms, reduce overhangs to 2' except at West and South sides			-$348,758	-$348,758	-$348,758			Design Team version of S166 and A6 ($272k)
38	A1h		EPDM roof vs Metal			-$438,911	-$438,911				
39		A-1	Reduce second floor TOS elevation.			-$147,000	-$147,000				
40		A-2	Exterior sun shades ILO blinds for administrative area's windows along south elevation.			$13,000				$13,000	
41		A-4	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).			-$128,000	-$128,000				
42		A-5	Increased borrowed light from classrooms to pod area ILO clerestory windows and lightwells			-$61,000	-$61,000	-$61,000			
43		A-6	Minimize Overhangs to 2'			-$161,000	-$161,000				See A1g
44		A-7	Use fiberglass ILO aluminum - VOID	★★★★★							No savings. Already covered in Cost Estimate
45	**A2 Flooring**					-$115,000	-$115,000	$0	$0		
46		A-10	Use carpet ILO rubber tile in classrooms			-$86,000	-$86,000				
47		A-11	Use linoleum ILO rubber tile in classrooms			-$29,000	-$29,000				
48						$0					
49	**A3 Walls**					$0	$0	$0	$0		
50	A3a					$0					
51	**A4 Ceilings**					-$280,000	-$169,000	-$111,000	$0		
52		A-8	Replace ceiling wood veneer finishes with acoustical clouds.			-$111,000		-$111,000			
53		A-9	Replace ceiling wood veneer finishes with exposed structure.			-$169,000	-$169,000				
54	**A5 Openings**					$0	$0	$0	$0		
55	A5a					$0					
56	**A6 Vertical Circulation**					$0	$0	$0	$0		
57	A6a					$0					
58	**A7 Casework**					$0	$0	$0	$0		
59	A7a					$0					
60	**A8 Signage**					$0	$0	$0	$0		
61	A8a					$0					
62	**A9 Equipment & Misc**					-$2,067,000	-$1,824,000	$0	$0		
63	A9a					$0					
64	**A10 Planning & Design**					-$2,067,000	-$1,824,000	$0	$0		
65		PL-142	Reduce corridor widths to 11'.			-$243,000					See A1g
66		PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).			-$534,000	-$534,000				
67		PL-144	Increase size of library.			$79,000	$79,000				
68		PL-145	Use FF&E (furniture, fixtures, and equipment) budget ILO MACC (maximum allowable construction cost) for: 1) Bleachers; 2) AV Devices; 3) CR Voice Augmentation; 4) Gym Electronics; 5) DAS Equipment (i.e., pathways under MACC).			-$891,000	-$891,000			-$891,000	Bleachers, DAS as deductive alternate
69		PL-149	Revise design to make the classroom wing 3-story ILO 2-story.			-$478,000	-$478,000				
70	**STRUCTURAL**					-$4,334,000	-$343,000	-$2,925,000	$0		
71	**S1 Structural**					-$4,334,000	-$343,000	-$2,925,000	$0		
72		S-160	Provide fan coils in classroom to reduce mechanical attics and ductwork.			-$579,000	-$579,000				relates to M-127 vrf, shrink mech attic, bldg columns replace decking. column size increases. Sim HLC

	VE Item	SAZAN Item Number	Description	Priority	Design Team Cost Alternative	Cost w/ Markup	Rejected Cost	Recommended Cost Option 1 Wood Frame	Accepted Cost	Add Alt Bid	Notes/Remarks
73		S-161	Increase covered play to 4000 sf.								added cost (# not provided by VE team) not accept
74		S-162	Modify main covered play roof slope and height (min 16', max 20').			-$22,000	-$22,000				will explore, small savings
75		S-163	Increase size and visibility of main entry canopy.			$421,000	$421,000			$421,000	will explore
76		S-164	Replace covered play area moment frame with braced frame or shear wall (north/south direction, east side).			-$52,000	-$52,000				small change
77		S-165	Use beam camber to reduce weight of steel.			-$261,000					If go to steel, will pursue
78		S-166	Lower roof and/or roof slope to reduce volume.			-$111,000	-$111,000				See A1g
79		S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.			-$687,000					may need deeper joists to avoid vibration, requires study of floor plate depth
80		S-168	Reduce foundation size according to less conservative assumptions.			-$269,000		-$269,000			Use stone column as assumption design basis
81		S-169	Channge steel to wood framed construction			-$2,530,000		-$2,410,000			Gym likely steel anyway , Topping offsets advantage. subtract 120$k for builders risk
82		S-170	Use standard composite metal deck (i.e., 3" over 2" non dovetail deck).			-$30,000					more conc, heavier floor on std. small deduct. can separate activity wing and corridor as dovetail
83		S-171	Consider vibratory aggregate piers in lieu of rammed aggregate piers.			-$148,000		-$148,000			review with geotech. consider bearing capacity of each
84		S-172	Consider DSM (Direct Soil Mixing) ILO rammed aggregate piers.			$27,000					review with geotech
85		S-173	Use 4" thick slab-on-grade ILO 5".			-$98,000		-$98,000			dk to review, 4" ok with tcf
86		S-174	Add additional window section to library west wall.			$5,000					
87	**MECHANICAL**					-$2,176,748	-$1,650,748	-$450,243	$0		
88	**M1 Mechanical**					-$1,793,748	-$1,611,748	-$410,748	$0		
89	M1a		combine admin zones			-$5,000	-$5,000				
90	M1b		ERVs above ceilings in leui of central DOAS unit in the mechanical attic. This along with FCUs located above the ceiling would reduce/elimate some of the mechanical attics. Saving would result from reduced ductwork and reducing/eliminating mechanical attics.								
91	M1c		Provide water source heat pumps vs the air-to-water heat pump system ILO of fan coil units. This would require a closet to house the water source heat pumps adjacent to the classroom.			-$410,748.00		-$410,748			Provides cooling
92	M1d					$0					
93	M1e					$0					
94	M1f					$0					
95		M-126	Use 2-pipe changeover ILO 4-pipe system.			-$182,000	-$410,748				Savings adjusted per Metrix
96		M-127	Consider air source heat pumps with condensing unit in service yard.			-$1,196,000	-$1,196,000				S-160 attic number duplicated here
97	**M2 Plumbing**					-$371,000	-$27,000	-$39,495	$0		
98	M2.a		eliminate kit mixing valve			-$3,000	$0		$0		
99		M-128	Consider routing west from east end of building though kitchen or all waste to a single point of connection.			-$2,000	-$2,000				tiny savings. may need to upsize mains to one point. deeper lines may offset cost savings
100		M-129	Consider PEX (cross-linked polyethylene) piping ILO copper for domestic water.			-$182,000	-$25,000				Savings amount adjusted by Metrix. not accepted by District
101		M-130	Consider ABS (Acrylonitrile Butadiene Styrene) waste piping ILO cast iron piping.			-$184,000		-$39,495			reccommend if District OK
102	**M3 Fire Protection**					-$12,000	-$12,000	$0	$0		
103	M3a		move canopy			-$12,000	-$12,000				
104	**ELECTRICAL**					-$680,000	-$128,000	-$667,000	$0		
105	**E1 Distribution**					$0	$0	$0	$0		
106	E1a		Loads estimated high so likely to come down			$0					
107	E1b		Less data ports, Less AV equipment			$0					discuss with District. depend on wifi more
108	**E2 Lighting**					-$680,000	-$128,000	-$667,000	$0		
109	E2a					$0					

	VE Item	SAZAN Item Number	Description	Priority	Design Team Cost Alternative	Cost w/ Markup	Rejected Cost	Recommended Cost Option 1 Wood Frame	Accepted Cost	Add Alt Bid	Notes/Remarks
110		E-109	Expand rooftop solar PV system beyond code-minimum array.			$394,000					not recommended
111		E-111	Control receptacles from user programmed on/off schedule ILO by occupancy sensors.			$16,000					Not recommended. avoids staff overriding. Number seems low, controller cost
112		E-112	Use fewer pendant lights in classrooms 3 ILO 4 rows.			-$87,000	-$87,000				recommend
113		E-113	As requested in the OPR, have a surge protective device only at Main Switchboard ILO all panels in the building.			-$41,000	-$41,000				not recommended. spr at work areas as well. 3-tiers. keep one at generator and main swithcboard and elevator at min.
114		E-114	Allow MC (metal-clad) cabling.			-$753,000		-$500,000			Feeder/HR hardpipe. Makes revisions/remodels more difficult. Easier to damage if GB cut. prob 500,000$
115		E-115	Use direct-indirect troffer fixtures in classrooms ILO pendant lighting.			-$167,000		-$167,000			Can pursue, not preferred
116		E-116	Allow aluminum feeders, bussing, and transformer windings (could not find prohibition in OPR).			-$42,000					Not recommended
117	**E3 Low Voltage**					$0	$0	$0	$0		
118	E3a					$0					
119	**FOOD SERVICE**					$0	$0	$0	$0		
120	**F1 Food Service**					$0	$0	$0	$0		
121	F1a					$0					
122	**PROJECT SCOPE**					$0	$0	$0	$0		
123	**BUILDING AREA REDUCTION**					$0	$0	$0	$0		
124	BA1					$0					
125	**TOTALS**				-$112,000	**-$12,504,979**	**-$6,290,622**	**-$5,877,997**	**$0**	$241,638	
126											
127	Current Estimate Building							$46,870,649			
128	Current Estimate Sitework							$9,282,444			
129	Current Estimate Off-Site Improvements							$2,348,939			
130	**Current Estimate Total**							**$58,502,032**	**$58,502,032**		
131											
132	New Total							$52,624,035	$58,502,032		
133	**amount over budget Cost Estimate -MACC**							**$6,412,791**			
134	MACC							$52,089,241	$52,089,241		
135	Difference							$534,794	$6,412,791		
136	**Percent variance**							**1.03%**	**12.31%**		
137	Savings amount							$5,877,997			
138	**SITE PERCENTAGES BEFORE VE REDUCTIONS**										
139	Site Cost							$9,282,444			
140	Off Site Cost							$2,348,939			
141	Total Site Costs							$11,631,383			
142	Percent On Site to Building Cost							16%			
143	Percent off Site to Building Cost							4%			
144	Percent total Site to Building Cost							20%			
145											
146	**SITE PERCENTAGES AFTER VE REDUCTIONS**										
147	Site Cost							$8,516,087			
148	Off Site Cost							$2,348,939			
149	Total Site Costs							$10,865,026			
150	Percent On Site to Building Cost							16%			

	VE Item	SAZAN Item Number	Description	Priority	Design Team Cost Alternative	Cost w/ Markup	Rejected Cost	Recommended Cost Option 1 Wood Frame	Accepted Cost	Add Alt Bid	Notes/Remarks
151	Percent off Site to Building Cost							4%			
152	Percent total Site to Building Cost							21%			
153											
154											
155											
156											
157											
158											
159	SD Phase Markups										
160	**Markup Calclulation**	**1.3165**									
161	GC's	11.75%									
162	Design Contingency	7.50%									
163	GC Profit	5.50%									
164	Escalation *	5.40%									
165	Insurance & Bonds	1.50%									
166		* Assumes construction in July 2027									

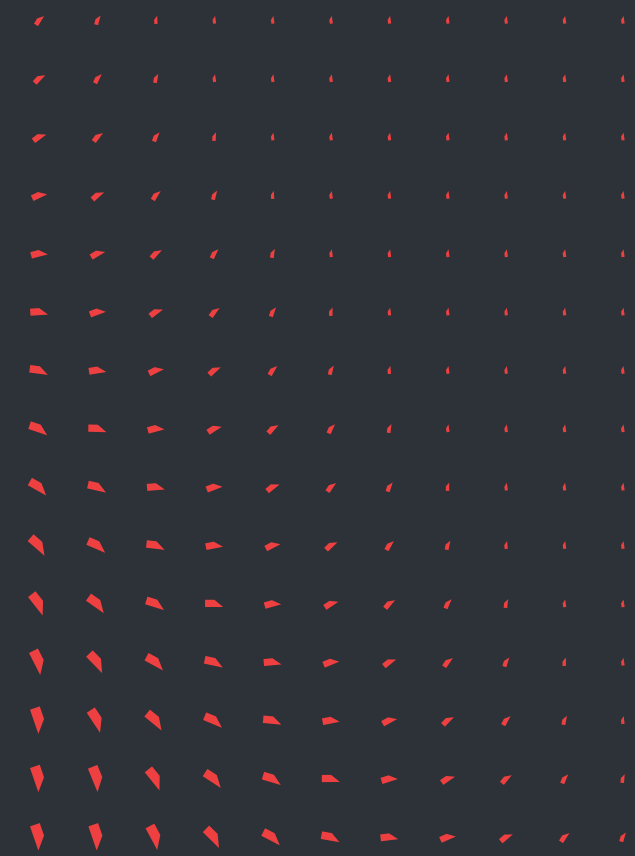
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Appendix

I. Project Schedule
II. Value Engineering Report
III. Systems Comparison
IV. Owner Project Requirements
V. WSSP Strategy and Scorecard
VI. C406 Strategy and Scorecard
VII. Preliminary Reports
VIII. Community Event
IX. Meeting Minutes

TCF

I. Project Schedule



ASD SSES - Phase Schedule

	Task Name	Duration	Predecessors	Start Date	End Date	Comments
1	SEE LEGEND AT END OF SCHEDULE					
2	**Replacement South Elementary School**	1522d		04/03/25	01/31/31	
3	Schedule Overview	1408d		09/10/25	01/31/31	
14	**PD Phase (Ed Specs / Programming)**	201d		04/03/25	01/09/26	
34	**SD**	156d		01/13/26	08/18/26	
102	**DD**	77d	34	08/18/26	12/03/26	
103						
104	Start of DD Documentation	0	100FS +1d	08/18/26	08/18/26	
105	TCF internal DD Kickoff Meeting	0	0	08/18/26	08/18/26	
106	City of Aberdeen Coordination Meeting	0	0	08/18/26	08/18/26	
107	Sustainability Checkpoint	1d		08/19/26	08/19/26	Time 11am-12pm
108	CLT Meeting	0	0	08/18/26	08/18/26	
109	Design Team Meeting #14 Interior Layout Coordination - Security and Access Control Focus	0	98FS +10d	08/18/26	08/18/26	
110	Envelope Kick Off Coordination	0	109FS +1d	08/19/26	08/19/26	
111	DAC Meeting #10 - VE changes & Interior Design	1d	110	08/20/26	08/20/26	
112	Room Layout Workshop Meetings - South Side Elem Staff: Admin, Kitchen, Transportation,	1d	110	08/20/26	08/20/26	
113	CLT Meeting	0	108FS +10d	09/01/26	09/01/26	
114	Design Team Meeting - Security & Access Control Focused	0	109FS +10d	09/01/26	09/01/26	
115	Bldg and Site Security & Access Control Meeting with ASD	0	114FS +1d	09/02/26	09/02/26	
116	Site Coordination Meeting with ASD - Facilities and Staff	0	115FS +1d	09/03/26	09/03/26	
117	OSPI Seismic Safety Comittee Update	0	115FS +1d	09/03/26	09/03/26	9/3/26 Teams 10am-12pm
118	Hardware Kick-Off Coordination with ASD	0	116FS +1d	09/04/26	09/04/26	
119	City of Aberdeen Coordination Meeting	0	106FS +10d	09/01/26	09/01/26	
120	Room Layout Workshop Meetings - South Side Elem Staff: Classroom Grade Levels, SPED, Student Services, Library, Gym,	3d	118FS +1d	09/08/26	09/10/26	
121	CLT Meeting	0	113FS +10d	09/15/26	09/15/26	
122	Design Team Meeting - M & O Systems Focused	0	114FS +10d	09/15/26	09/15/26	
123	M&O Systems Coordination with ASD	0	122FS +1d	09/16/26	09/16/26	

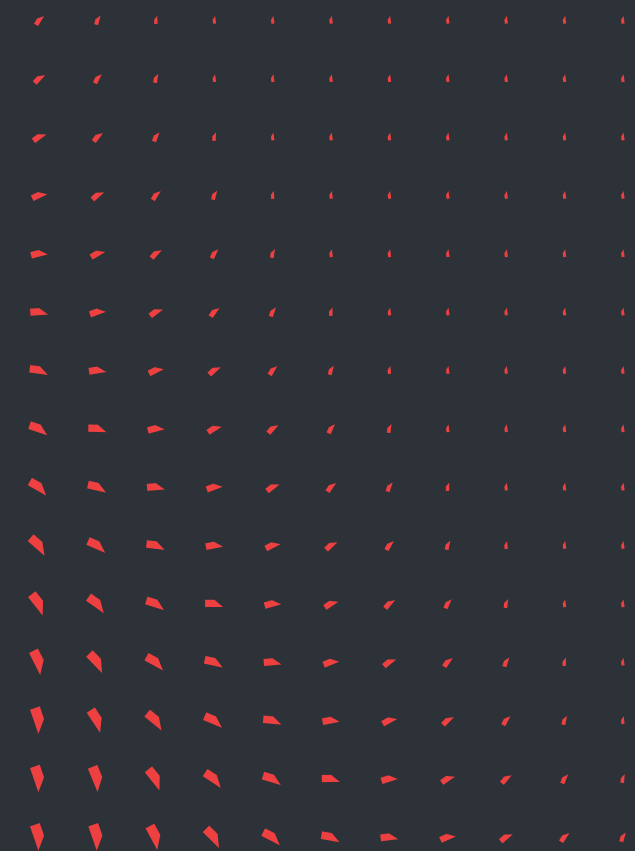
	Task Name	Duration	Predecessors	Start Date	End Date	Comments
124	WSSP & C406 Coordination Follow Up with ASD	0	123FS +1d	09/17/26	09/17/26	
125	City of Aberdeen Coordination Meeting	0	119FS +10d	09/15/26	09/15/26	
126	DAC Meeting #11 - Interior Design Update Meeting	0	111FS +25d	09/24/26	09/24/26	
127	Internal QC Milestone Set 65% DD- Consultant Backgrounds & PDF Drawings Due to TCF	1d	126	09/25/26	09/25/26	
128	CLT Meeting	0	121FS +10d	09/29/26	09/29/26	
129	Design Team Meeting - Interior Design Follow up	0	122FS +10d	09/29/26	09/29/26	
130	Envelope Review of 65% set	16d	127FS +1d	09/29/26	10/20/26	
131	DD Quality Control Review based on 65% set	16d	127FS +1d	09/29/26	10/20/26	
132	City of Aberdeen Coordination Meeting	0	125FS +10d	09/29/26	09/29/26	
133	City of Aberdeen Coordination Meeting	0	132FS +10d	10/13/26	10/13/26	
134	Quality Control & Envelope Markups due back from Consultants	0	131	10/20/26	10/20/26	
135	CLT Meeting	0	128FS +15d	10/20/26	10/20/26	
136	Design Team Meeting	0	129FS +15d	10/20/26	10/20/26	
137	DAC Meeting #12 - Color and Material Board Review	0	126FS +20d	10/22/26	10/22/26	
138	Page Turn Set to TCF - Pick up QC Comments	0	134FS +5d	10/27/26	10/27/26	
139	Page Turn Set to Owner: Drawings, Specs & Room Layout Booklet	1d	138	10/28/26	10/28/26	
140	Owner Page Turn Meeting	0	139FS +1d	10/29/26	10/29/26	
141	City of Aberdeen Coordination Meeting	0	133FS +10d	10/27/26	10/27/26	
142	Response to Owner Comments	9d	140	10/30/26	11/11/26	
143	CLT Meeting	0	135FS +10d	11/03/26	11/03/26	
144	Consultant 85% DD Drawings & Estimates to TCF	0	140FS +10d	11/12/26	11/12/26	
145	DAC Meeting #13 - Exterior & Interior Rendering Follow Up	1d	137FS +15d	11/13/26	11/13/26	
146	City of Aberdeen Coordination Meeting	0	141FS +10d	11/10/26	11/10/26	
147	Submit 85% DD Drawings to ASD & Cost Estimator	0	144FS +2d	11/16/26	11/16/26	
148	Design Team Meeting	0	136FS +20d	11/17/26	11/17/26	
149	Estimate Review Time	10d	147	11/17/26	11/30/26	Extra time for review due to holiday season.
150	CLT Meeting	1d	143FS +10d	11/18/26	11/18/26	
151	City of Aberdeen Coordination Meeting	0	146FS +10d	11/24/26	11/24/26	
152	Consultant Drawings & Report to TCF	0	149	11/30/26	11/30/26	
153	100% DD Drawing & Report to ASD	0	152FS +1d	12/01/26	12/01/26	

	Task Name	Duration	Predecessors	Start Date	End Date	Comments
154	OSPI Seismic Safety Comittee Update	1d	153FS +1d	12/03/26	12/03/26	12/3/26 Teams 10am-12pm

180	**LEGEND and ATTENDEES**					
181	Core Leadership Meeting (CLT) Meeting					Time: 8:30-10:00
182	Design Advisory Committee (DAC) Meetings					
183	Special Meeting or Workshop					
184	Design Team Meeting					Time: 10:00-11:30
185	TCF Document Delivery to ASD					
186	Consultant Document Delivery to TCF					
187	City Coordination Meeting					Time: 11:00-12:00
188	OSPI Seismic Safety Meeting Update					see above
189						

TCF

II. Value Engineering Report



Value Engineering Study Report



Stevens Elementary School

Aberdeen, WA

Prepared for
Aberdeen School District
Construction Services Group

July 2026

Prepared by
Säzän Group

600 Stewart Street, Suite 1600
Seattle, WA 98101
(206) 267-1700
www.sazan.com

July 28, 2026

Manuel Saldivar-Aguirre
Construction Project Manager
Construction Services Group | ESD 112
2500 NE 65th Avenue
Vancouver, WA 98661

Re: Stevens Elementary School
Value Engineering Study Final Report

Dear Manuel:

Transmitted herewith is an electronic copy of the final Value Engineering Study Report for the Stevens Elementary School project for your use and records. Please distribute to the project team for their review and comments.

Thank you for your assistance in supporting the VE effort. Should you have any questions please email me at jdavis@sazan.com.

Sincerely,

Säzän Group Inc.



Joel C. Davis, MA, MBA
Managing Principal

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Acknowledgements

The Säzän VE Team would like to acknowledge the special participation during the formal value engineering process and contributions that supported the success of this VE study.

Aberdeen School District
Michael Pauley
Traci Sandstrom
Courtney Sandstrom

Construction Services Group
Manuel Saldivar-Aguirre
Andrew Twyman
Drew Pearson
Dan Purefoy
Robert Musial

TCF Architecture
Albert deSantis
Brie Braukmann
Steve Wachtler

LDC Inc.
Ross Jarvis

CMTA Inc.
Ben Prehoda
Andrey Streltsov
Nate Shubert
Eric Nordlund

Degenkolb Engineers
Clare Cummins
Dan Sloat

Site Workshop
Maria Arevalo Martinez

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1.0 Introduction

Introduction

A Value Engineering (VE) workshop was conducted to review the 95% schematic design (SD) documents for the Stevens Elementary School (SES) project June 15 to 19, 2026. The owner is Aberdeen School District (ASD) and the owner's representative is Construction Services Group (CSG). TCF Architecture (TCF) is the prime architect/engineer (A/E) consultant. Säzän Group Inc. (Säzän) is the lead consultant and facilitator of the VE study. Representatives from ASD, CSG, TCF, and the Säzän VE team participated in the kick-off meeting for the workshop on June 15, 2026. The study was conducted in accordance with the SAVE International Value Methodology Eight-Step Job Plan and the Washington State WACs 392-343-080 and 392-344-065. A formal presentation of the workshop findings and recommendations was given to the ASD, CSG, and TCF project team on June 25, 2026.

Study Timing

The VE study was held following release of the May 29, 2026, 95% schematic design documents which show a total building area of 65,281 SF. The Schematic Design Estimate prepared by RC Cost Group (RCCG) dated June 12, 2026 was considered the baseline for the VE study. A comprehensive project schedule was not provided, though the project has an assumed construction duration of 21 months. The planned bid date for the project is July of 2027, with construction commencing in September of 2027.

Value Methodology

The formal Eight-Step VE process is an independent third-party review typically completed during the end of schematic design, or early design development in the project design process. The intent is to identify and document alternative solutions to project requirements which can improve performance relative to overall life cycle investment. The workshop follows the Value Methodology Eight-Step Job Plan beginning with pre-study preparations, followed by the information phase in a kick-off meeting with the client, design team, program manager and key stakeholders, progresses through function analysis, design and cost assessment, creative speculation, alternatives evaluation and development, and concludes with a presentation of study results to the project team and other key stakeholders, followed by an implementation phase including the incorporation of the VE ideas into the project design.

During ***1. Preparation***, the goal is to identify what is to be studied (the VM study subject) and when it is to be studied. The focus of the ***2. Information*** phase is to give the VE team an understanding of the program priorities, operations, budget, issues to be considered and goals for the study. The ***3. Function Analysis*** phase develops an understanding of the underlying functions the project must deliver to achieve the program objectives. The ***4. Creative Speculation*** phase identifies solutions to potential deficiencies and opportunities to enhance project value. ***5. Evaluation*** selects ideas with sufficient merit to warrant further analysis. In the ***6. Development*** phase, ideas selected for development into alternatives are analyzed and documented in workbooks for inclusion in the study report. Based on the analysis, the VE team makes a recommendation on the disposition of each alternative. At the conclusion of the workshop, the VE team makes a ***7. Presentation*** of findings and recommendations to the project team and other key stakeholders. During the final phase, ***8. Implementation***, sponsor and/or stakeholder acceptance of VM alternatives are incorporated into the subject

under study.

Workshop Scope and Objectives

The purpose of the VE review is to achieve optimum project performance relative to the investment. The overarching VE assessment objectives include confirming that the program functions are being met, improving project quality, performance and sustainability, and reducing project initial and life-cycle costs. Outcomes typically are more cost-effective designs, early identification of deficiencies and omissions, and resolution of mismatches between performance, cost and available funding.

The primary workshop scope for the Stevens Elementary School project was identified as an evaluation of the schematic design set, associated documents and supporting cost estimates. The primary study focus was to identify alternative measures for raising the school elevation, enhance the durability of the building considering the local climate, upgrade classroom features, and to consolidate mechanical and electrical systems for longevity and ease of maintenance. The RCCG Schematic Design Estimate reflects a total construction cost of $58.5 million, including estimating/design contingency. With a maximum allowable construction cost (MACC) budget of $52 million, this reflects a $6.5 million budget gap. This information added to the study a focus on strategies to reduce cost and improve bid responses. The VE team was additionally requested to provide an independent review of the cost estimate.

Specific objectives identified for the workshop include:

- Identify alternative measures for raising the school elevation.
- Enhance durability of the building considering year-round climate conditions in Greys Harbor County.
- Upgrade classroom features to provide educators with modern instruction technology.
- Consolidate mechanical and electrical systems for longevity and ease of maintenance.
- Provide better learning environment for students.
- Improve site circulation (parent and bus dropoff).

These objectives were considered when selecting potential VE alternatives to assess and in the evaluation of the alternatives.

Study Team

The VE team members were selected for technical expertise in their discipline, the ability to hold a broad perspective spanning the full project scope, knowledge of the project type and their creative ability to identify alternative solutions achieving the functional, performance and cost objectives of the project. The team members include:

Team lead and facilitator:	Joel Davis, Managing Principal, Säzän
Study assistant:	Natalia Winfield, VMA, Säzän
Cost Estimation:	John Langer, John Langer Consulting
Architectural:	Sam Wong, AIA, Säzän
Civil:	Peter Reich, PE, Apex Engineering

Structural:	Travis Michaud, PE, SE, Quantum Consulting Engineers LLC
Mechanical:	Chris Maroney, PE, Säzän
Electrical:	Robert Grzan, PE, Säzän
Construction Management:	Dan Purefoy, CSG

Contact information for each team member is listed in the Workshop Attendee List in Appendix F Workshop Information.

2.0 Study Results

Cost Summary

Total VE Team Recommended Cost Avoidance		**-$10,398,000**
VE Proposals	-$7,488,000	
Cost Only Proposals	-$2,910,000	
Total VE Team Recommended Cost Addition		**$1,583,000**
VE Proposals	$1,058,000	
Cost Only Proposals	$525,000	
Total VE Team Recommended Value		**$11,981,000**

Total Owner Accepted Cost Avoidance	-$5,877,997	
Total Owner Accepted Cost Addition	$0	
Total Owner Accepted Value		**$5,877,997**
Total Owner Potential Acceptance Cost Avoidance *	-$988,000	
Total Owner Potential Acceptance Cost Addition *	$0	
Total Owner Potential Acceptance Value *		**$988,000**

NOTE *: Above costs include mutually exclusive concepts and VE ideas that remain "Decision Pending" on the Owner Implementation matrix.

Discipline Summary

The following summary highlights the VE Team's recommendations and will be completed for the Final Report upon receipt of the CSG/ASD/TCF project team's Owner Implementation decisions:

PROPOSAL DISCIPLINE	# VE PROPOSALS	# VE COST ONLY PROPOSALS	# VE PROPOSALS ACCEPTED	#VE PROPOSALS PENDING ACCEPTANCE
Architectural	4	2	3	1
Civil	6	7	3	1
Structural	10	5	5	0

Mechanical	2	3	3	0
Electrical	4	3	2	0
Planning	4	1	2	1
TOTAL	**30**	**25**	**18**	3
RATE OF ACCEPTANCE			32.7%	0.5%

Implementation Summary

The typical return on investment (ROI) for Säzän VE Studies is 4,529%. In other words, for every dollar invested in Säzän's VE services, our client's benefit is $45.29 in value added (i.e., 1:45 ROI). ASD's ROI for the Stevens Elementary School VE study is calculated to be 7,324%.

Key Findings

The VE team evaluated the design relative to: project goals achieved; functions served; technical considerations, constraints and issues; performance; risk factors; budget and estimated cost; and project delivery. The results of the VE team's evaluation of the design are summarized below.

Overall, the team found that the design team has done a good job of achieving the project goals and program requirements given the challenging site conditions. The VE team identified the following key findings we wish to highlight:

1. General Conditions/Site Requirements at 11.75% are extremely high. Similar projects typically range between 7% and 8%.
2. There is a risk that the City may require additional off site, public street improvements.
3. Seriously consider developing site access to provide separate site access points and circulation pathways for bus and passenger vehicles.
4. East-side drive aisles may qualify as non-pollution-generating surfaces, potentially eliminating the need for a mechanical stormwater treatment system.
5. Retaining wall scope appears substantially larger than what the estimate currently carries and requires a quantity check.
6. Corrosive soils on site will impact iron piping and concrete mix design.
7. Spoils are too wet for conventional aeration-based reuse year-round; cement treatment is the most viable reuse strategy.
8. DSM buttress required downslope of the building is not included in the cost estimate.
9. Clear modulation of program elements (administration, learning pods, etc.).
10. Good organization of academic and public wings.
11. Effective separation between academic and community/public functions.
12. Building massing appears to include excess interior volume that may present opportunities for cost reduction.
13. Main entry is undersized, with a single set of double doors and a small canopy relative to the overall building massing.
14. Covered play area adjacency to the cafeteria and storefront glazing is not ideal for outdoor play

activities or exterior wall durability.
15. The east covered play area appears taller than necessary at the high side of the slope.
16. Structural steel unit weight for the floor structure is extremely high at $12.50/SF. Similar projects typically range from $7.50–8.00/SF.
17. Structural steel unit weight for the mezzanine is extremely high at $12.00/SF. Similar projects typically range around $7.00/SF.
18. Structural steel unit weight for the roof structure is extremely high at $11.00/SF. Similar projects typically range from $7.50–8.00/SF.
19. Buckling Restrained Frames (BRBs) are an efficient lateral-force-resisting system for a steel building.
20. Open-web steel joists are feasible and could reduce overall building weight.
21. Electrical construction costs, particularly the lighting component, are significantly higher than comparable school projects.

Additional detail on the findings is provided in Section 4.0 Project Evaluation and Appendix D.1 Cost Analysis.

Key Recommendations

The VE team recommends several key actions and alternatives that emerged in response to the workshop objectives, project goals, issues and shortcomings which were identified and opportunities to improve the project success.

1. In consideration of the current lack of funding to complete the project, consider evaluating alternative sites that may better support the project goals, budget, and schedule.
2. Ensure the design aligns with realistic declining student enrollment projections and the District's Long-Range Facilities Plan.
3. Reconfigure the building layout so the gymnasium has direct exterior access, reduce glazing in this area, and extend the brick façade to create a durable covered-play wall.
4. Increase the size of the covered play area to maximize funding opportunities and consider separating it from the main building to eliminate sprinkler requirements and reduce the potential for ball impacts on cafeteria glazing.
5. Widen the main entry by adding a second set of double doors and a larger entrance canopy to improve visibility and wayfinding.
6. Reorganize public-use spaces to improve adjacencies between the gymnasium, covered play area, stage, and cafeteria.
7. Reduce overall building volume where feasible.
8. Consider developing the academic wing as a three-story structure.
9. Ensure an adequate number of conference rooms and office spaces are provided for social services partners.
10. Evaluate the addition of a second site entrance from a North extension of S. Dewey Street to fully separate bus and parent vehicle circulation.
11. Reclassify gated maintenance and fire-access drive aisles as non-pollution-generating surfaces to eliminate stormwater treatment requirements and associated infrastructure.
12. Add a south-side French drain and dispersion trench to intercept hillside runoff before it reaches the playfield.
13. Consider cement treatment as the primary reuse strategy for deep soils mixing (DSM) spoils rather

than off-haul and import, as it is generally more cost-effective when double-handling costs are considered.
14. Consider rammed aggregate piers to achieve an allowable bearing capacity of approximately 4,000 psf in lieu of the currently assumed 2,500 psf.
15. Evaluate wood framing as the primary structural system.
16. Reduce roof heights and associated Level 2 interior volumes where feasible.
17. Revise the covered-play roof slope to increase clearance above the current 9-foot height at the south end.
18. Consider two-pipe hydronic changeover system to reduce system complexity and ease of maintenance.
19. Protect the Emergency ATS by locating it within a 2-hour fire-rated room and separating it from normal power distribution equipment in accordance with NFPA 110 (2019), Section 7.2.1.1.

Several of the key recommendations outlined above are discussed in Section 5.0 Value Improvement Alternatives. Section 5.0 presents several key alternatives the VE team recommends for acceptance or serious consideration.

3.0 Background

Project Description

The purpose of the Stevens Elementary School project is to replace the existing school and relocate it outside of the tsunami inundation zone. The new facility will be designed to meet ASD elementary school guiding principles and serve a school student population of approximately 417 enrolled in pre-K through 5th grade. The site for the replacement 65,281 SF two-story elementary school is located in the City of Aberdeen. The site is located in a residential area on top of a hill with steep slopes and wooded areas to all sides except for the southern edge of the school where the residential “Cosmopolis” neighborhood is located. One access point to the school will be provided from the west edge of the site via Lomax Street. Wetlands are present at the north edge of the site. Two service yards will be attached to the southern edge of the building to house electrical, mechanical, generator and the refuse dumpsters. Parking and bus/parent loops will be located on the western side of the site. The playfield occupies the entire eastern end of the site.

The architectural design for Stevens Elementary School is organized around a pod-based classroom arrangement, with six classrooms grouped around a central collaboration pod and adjacent service spaces. Due to the site configuration and desired views of Aberdeen, all classrooms will be located along the north side of the building to maximize daylight and provide visual connection to the surrounding area. A central spine will divide the building from north to south and provide circulation between the east and west portions of the facility. The exterior design incorporates a combination of thicker fiber cement panels in lieu of brick, composite panels, and fiber cement wood-look accent paneling. A large overhang along the south side of the building will provide solar protection for the library and administration areas. The building form consists of a series of shed roofs with clerestory windows to enhance natural daylighting throughout the facility. Exterior windows will primarily consist of fiberglass systems, with aluminum storefront systems at building entries.

The civil design accounts for the significant elevation change across the site, which slopes steeply from south to north. Retaining walls will be incorporated to support the site grades and accommodate the new building, circulation areas, and playfield. The main playfield will consist of a sod surface and occupy the eastern portion of the site. New water and sanitary sewer utilities will be installed and connected to existing utility services. The sanitary sewer system will be designed to maintain the shallowest feasible depth while incorporating elevation changes through strategically placed manholes.

The structural system will utilize shallow spread footings and tied conventional foundations appropriate for the site conditions. Buckling Restrained Braced Frames (BRBF) will provide lateral support and enhance seismic performance. Typical gravity columns will consist of HSS sections, with wide-flanged columns utilized at braced frame locations. The design will also incorporate select sloped columns to support the sloped roof forms and canopy overhangs. A concrete slab over dovetail metal deck will be used throughout the building, providing improved acoustic performance.

The HVAC system will utilize a four-pipe system served by outdoor air-to-water heat pumps located within the service yard. The central mechanical room will include a backup electrical boiler for additional system reliability. Domestic hot water will primarily be served by an outdoor heat pump water heater with supplemental heating capacity provided as needed. The electrical design includes a new utility transformer located within the service yard, with main electrical gear housed within dedicated electrical rooms.

Project Goals

Goals for the project outlined by the project team at the design presentation include:

- Replace the existing school and relocate it outside of the tsunami inundation zone.
- Accommodate surrounding residential community (Cosmopolis), such as retaining trees.
- Maintain connection to outdoors through natural light and ample fenestration.
- Separate instruction spaces from public spaces.

Constraints and Issues

At the introductory meeting for the study, the project team identified several constraints and issues that have defined and impacted the project. These include:

- Design completion contingent upon state funding and legislative results.
- Site has steep slopes on all sides requiring significant regrading.

Key Functions

Following the study informational meeting and a review of the project documentation, the VE team identified programmatic and facility functions the project must ultimately deliver to meet the program and project requirements and goals. The team analyzed the functional requirements and relationships between functions to better understand the project requirements. Key functions associated with the project performance and cost identified by the VE team include:

- Access Site
- Engage Parents
- Queue Vehicles

- Circulate Pedestrians
- Circulate Traffic
- Circulate Vehicles
- Condition Space
- Connect Outdoors
- Control Noise
- Control Pollutants
- Conserve Energy
- Convey Waste
- Convey Water
- Distribute Power
- Drain Site
- Enclose Equipment
- Enhance Durability
- Enhance Flexibility
- Fund Project
- Generate Energy
- Grade Site
- Illuminate Space
- Improve Acoustics
- Improve Technology
- Maintain Equity
- Manage Stormwater
- Park Vehicles
- Power Building
- Provide Pedestrian Access
- Reduce Cost
- Repel Moisture
- Resist Corrosion
- Resist Lateral Forces
- Resist Wind
- Separate Circulation
- Separate Space
- Stabilize Earth
- Support Grading
- Support Load
- Support Pavement
- Support Play
- Support Student Wellbeing
- Welcome Families

The functions listed above were used by the VE team to guide and organize the generation of creative ideas. A full list of identified functions is included in Appendix C Function Analysis. The VE team evaluated how well the project design is achieving the functional performance. The assessment informed development of several of the value improvement alternatives derived from the creative ideas generated by the VE team.

Additional background information on the project is included in Appendix E Background Documents.

4.0 Project Evaluation

The VE team reviewed the schematic design documents from the perspective of design professionals familiar with the design and construction of similar project types. The team utilized several analytical means to evaluate the project design and cost estimate. These included: peer review and site observation of project elements; function analysis of project requirements; design review; benchmarking of similar educational facilities; and construction estimate and project delivery evaluation.

Cost Analysis

Cost is a core factor in the analysis for all value studies. The value team completed an analysis of the estimated cost of the project and budget in comparison to recently reviewed projects of similar type and scope. This comparative data is useful for relative benchmarking of costs and helps focus the team's efforts on opportunities to improve value. The cost of comparison projects has been adjusted for escalation and location relative to the study project.

When comparing project costs, it is important to recognize that each project is developed according to the unique programming and design requirements of each client. Some owners place a higher priority on minimizing the initial cost of construction while others are more interested in minimizing their total cost of ownership, i.e., paying higher first costs to lower the overall life cycle costs of operations and maintenance.

The latter paradigm is typically reflected in the selection of higher quality and durability of materials and building systems with longer expected lifecycle performance. Additionally, each project site and context are highly variable, impacting the cost of the building. Therefore, in evaluating cost comparisons, it is important to recognize that cost estimates inherently reflect unique project constraints and client requirements.

A comparative analysis of the Uniformat building system cost categories was prepared evaluating the project cost estimate relative to the comparison average. Several cost categories stand out as differing from the average. Key areas of concern are:

- Escalation should be applied at start of construction for summer 2028 instead of summer 2027.
- Metal siding not included in cost estimate.
- Review Structural Steel unit pricing $/LB.
- Confirm use of metal panels (not in estimate).
- Review estimate for fiberglass windows ILO 100% storefront.
- Adjust estimate to reflect rubber tile $/SF in classroom ILO resilient tile flooring.
- Update offsite cost estimate to reflect landscaping for off-street improvements.
- Review Costs for Offsite Development.
- Review costs in estimate for G2045 Site Furnishings.

Further evaluation of these cost categories is warranted. Additional detail is provided in Appendix D.1 Cost Analysis.

Comparison of Building Cost Per Sq. Ft.

The Stevens Elementary School project estimate is based on a 62,749 SF replacement school with related demolition and site work; no renovations are included in the program. The project's estimated cost at $744 per sq. ft. is 6.8% above the comparison average.



Of the major building system costs, the sq. ft. costs for several systems are below the comparison average,

and a some above. Of these, the following stand out as differing significantly and warrant review.

Higher than average cost variances include:

- Electrical 33.9% or $26 per sq. ft.
- General Requirements 53.2% or $22 per sq. ft.
- O&P 22.3% or $8 per sq. ft.

Lower than average costs include:

- Foundations -17.9% or -$9 per sq. ft.
- Exterior Enclosure -19.6% or -$14 per sq. ft.
- Equipment -40.4% or -$7 per sq. ft.

Constructability Comments:

- Review opportunity to vacate the ROW to the west of the site and north of Lomax St.
- Consider extending culvert in Lomax St.
- Confirm the classification of public road improvements with the City and verify whether Aberdeen Municipal Code 17.52 requires full street standards.
- Identify retaining wall segments exceeding 2.5 ft of exposed height that will require fall protection
- Determine if the RPBA needs power to heat the enclosure.
- Determine if water meter vault can have a gravity storm outlet or if it needs a sump pump.
- The proposed retaining wall on Lomax Street is located at or near the right-of-way line. Construction of the wall and associated backfill will require temporary work easements from adjacent property owners.

The detailed cost analysis, estimate review, project delivery and risk analysis comments can be found in Appendix D Project Evaluation.

5.0 Value Improvement Alternatives

Following the VE team's review of background information, developing an understanding of the required functions and evaluation of the project design and cost, the team generated a list of 189 ideas addressing project issues and opportunities to improve project value. The team used the list of functions identified during function analysis to guide and organize the generation of ideas. This initial list of ideas was scored by the team using the project goals and study objectives as guidelines. Thirty ideas were identified as having sufficient merit to warrant further assessment and selected for analysis and documentation as project alternatives. Twenty-five self-explanatory ideas were priced but do not include full write-ups. The remaining ideas were either incorporated into the documented alternatives, presented as design considerations to be considered later by the project team, or deemed as not warranting further attention.

Key Recommended Alternatives

The VE team recommends the following alternatives which respond to the workshop objectives, project goals, issues and opportunities to improve the project success are accepted or given serious consideration.

Architectural
A-1: Reduce second floor TOS elevation (cost avoidance of -$147,000).
A-6: Minimize to 2' roof overhang on all elevations (cost avoidance of -$161,000).

Civil
C-41: Add sidewalk to south of staff parking for bus drop off (cost avoidance of -$155,000).
C-46: Salvage on-site soil rather than import (cost avoidance of -$238,000).
C-49: Reduce landscape budget by 30% (cost avoidance of -$251,000).

Electrical
E-114: Allow MC (metal-clad) cabling (cost avoidance of -$753,000).
E-115: Use direct-indirect troffer fixtures in classrooms ILO pendant lighting (cost avoidance of -$167,000).

Mechanical
M-126: Use 2-pipe changeover ILO 4-pipe system (cost avoidance of -$182,000).
M-127: Consider air source heat pumps with condensing unit in service yard (cost avoidance of -$1,196,000).

Planning
PL-142: Reduce corridor widths to 11' (cost avoidance of -$243,000).
PL-143: Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (cost avoidance of -$534,000).
PL-145: Use FF&E (furniture, fixtures, and equipment) budget ILO MACC (maximum allowable construction cost) for: 1) Bleachers; 2) AV Devices; 3) CR Voice Augmentation; 4) Gym Electronics; 5) DAS Equipment (cost avoidance of-$891,000).

Structural
S-160: Provide fan coils in classroom to reduce mechanical attics and ductwork (cost avoidance of -$579,000).
S-165: Use beam camber to reduce weight of steel (cost avoidance of -$261,000).
S-167: Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof (cost avoidance of -$687,000).
S-168: Reduce foundation size according to less conservative assumptions (cost avoidance of -$269,000).
S-169: Change the construction from steel to wood (cost avoidance of -$2,530,000).

All documented alternatives are listed on the Value Improvement Matrix, including the estimated cost and the VE team's recommended action for each alternative. The complete list of ideas generated by the VE team is included on the Creative Idea List. It is recommended that the project team review the full list of ideas generated to determine if other ideas warrant further investigation. Additionally, the VE team priced multiple alternatives that include the back-up estimates but do not include full write-ups. The lists, estimates, and detailed workbooks documenting each alternative are included in Appendix B Value Improvement Alternatives. The project team's formal response to the VE team findings and recommendations will be

included in Appendix A Owner Implementation of the final report.

Appendix A
Owner Implementation

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SÄZÄN GROUP

Value Engineering Study
Stevens Elementary School
Aberdeen School District

Owner Implementation Matrix

July 2026

Function - Idea No.	Creative Idea	First-Cost Potential	VE Team Recommendation	Owner Implementation	Design Team Recommendation	Design Team Accepted Amount	Owner Accepted Amount	Comments
Architectural								
A-1	Reduce second floor TOS elevation.	-$147,000	Accept		Reject			
A-2	Exterior sun shades ILO blinds for administrative area's windows along south elevation.	$13,000	Accept		Reject			
A-4	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).	-$128,000	Accept		Reject			
A-5	Increase borrowed light from classrooms to pod area ILO clerestory windows and lightwells.	-$61,000	Accept		Accept	-$61,000		
A-6	Minimize to 2' roof overhang on all elevations.	-$161,000	Accept		Modify	-$348,758		Modification: Design team combined reduce some overhangs, reduce roof slope and simplify roof forms
A-7	Use fiberglass windows ILO aluminum.	-$115,000	Accept		Reject			VOID as already incorporated
A-8	Replace ceiling wood veneer finishes with acoustical clouds.	-$111,000	Partially Accept		Accept	-$111,000		
A-9	Replace ceiling wood veneer finishes with exposed structure.	-$169,000	Partially Accept		Reject			
A-10	Use carpet ILO rubber tile in classrooms.	-$86,000	Partially Accept		Reject			Rejected by District
A-11	Use linoleum/marmoleum ILO of rubber tile in classrooms.	-$29,000	Partially Accept		Decision Pending			
A1d	Change from Metal to Asphalt shingle roofing					-$548,638		Design Team option
Civil								
C-37	Develop north courtyard as outdoor learning area ILO paved concrete walkway.	$44,000	Accept		Reject			
C-38	Use turf and underdrain system ILO sod at playfield.	$408,000	Accept		Reject			Design will carry this as an Additive Alternate
C-39	Add a second site entrance to S Dewey St and separate parent and bus loops with no shared aisle.	-$38,000	Accept		Reject			This will be a high cost for Road and ROW improvements
C-40	Reduce public sidewalk width.	-$134,000	Accept		Reject			
C-41	Add sidewalk to south of staff parking for bus drop off.	-$155,000	Accept		Modify	-$375,795		Combines reduce paving section, reduction in parking and
C-42	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.	$104,000	Accept		Reject			
C-43	Remove stormwater treatment on the east side of the site.	-$68,000	Accept		Decision Pending	-$68,000		Need to review with City for acceptance
C-44	Hot Mix Asphalt (HMA) ILO concrete loop around playfield.	-$9,000	Accept		Reject			
C-45	Remove trees to improve grading.	-$46,000	Accept		Accept	-$46,000		
C-46	Salvage on-site soil rather than import.	-$238,000	Accept		Reject			
C-47	Use PCC (Portland Cement Concrete) for roadway paving ILO ACP (Asphalt Concrete Pavement) for increased durability.	$20,000	Consider		Reject			
C-48	Use 5" over 17" for HD (heavy-duty) pavement.	$99,000	Accept		Reject			
C-49	Reduce landscape budget by 30% (reduce/eliminate irrigation and plantings).	-$251,000	Accept		Modify	-$276,563		Reduct landscape $112,000, elim outdoor music platform $125,068 , elim play hillside slide $39,495
Electrical								
E-109	Expand rooftop solar PV system beyond code-minimum array.	$394,000	Accept		Reject			
E-111	Control receptacles from user programmed on/off schedule ILO by occupancy sensors.	$16,000	Accept		Reject			Not recommended. avoids staff overriding. Number seems low, controller cost
E-112	Use fewer pendant lights in classrooms 3 ILO 4 rows.	-$87,000	Consider		Reject			took e115 instead
E-113	As requested in the OPR, have a surge protective device only at Main Switchboard ILO all panels in the building.	-$41,000	Accept		Reject			not recommended. spr at work areas as well. 3-tiers. keep one at generator and main swithcboard and elevator at min.
E-114	Allow MC (metal-clad) cabling.	-$753,000	Accept		Modify	-$500,000		Feeder/HR hardpipe.
E-115	Use direct-indirect troffer fixtures in classrooms ILO pendant lighting.	-$167,000	Accept		Accept	-$167,000		
E-116	Allow aluminum feeders, bussing, and transformer windings (could not find prohibition in OPR).	-$42,000	Accept		Reject			
Mechanical								
M-126	Use 2-pipe changeover ILO 4-pipe system.	-$182,000	Accept		Accept			Value revised higher per Metrix to $-410,748

Owner Implementation Matrix

July 2026

Function - Idea No.	Creative Idea	First-Cost Potential	VE Team Recommendation	Owner Implementation	Design Team Recommendation	Design Team Accepted Amount	Owner Accepted Amount	Comments
M-127	Consider air source heat pumps with condensing unit in service yard.	-$1,196,000	Accept		Reject			
M-128	Consider routing west from east end of building though kitchen or all waste to a single point of connection.	-$2,000	Accept		Reject			
M-129	Consider PEX (cross-linked polyethylene) piping ILO copper for domestic water.	-$182,000	Accept		Reject			Rejected by District. Values revised lower per Metrix. -$26,330
M-130	Consider ABS (Acrylonitrile Butadiene Styrene) waste piping ILO cast iron piping.	-$184,000	Accept		Modify	-$39,495		values revised lower per Metrix.. Mains are cast iron and where makes sense for acoustics
M-1c	Water source Heat pump with condensing units outside	-$410,748			Accept	-$410,748		Accepted by District
Planning								
PL-142	Reduce corridor widths to 11'.	-$243,000	Accept		Modify			see A6. modified to 12'
PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).	-$534,000	Accept		Reject			Not preferred program layout
PL-144	Increase size of library.	$79,000	Accept		Modify			see A6
PL-145	Use FF&E (furniture, fixtures, and equipment) budget ILO MACC (maximum allowable construction cost) for: 1) Bleachers; 2) AV Devices; 3) CR Voice Augmentation; 4) Gym Electronics; 5) DAS Equipment (i.e., pathways under MACC).	-$891,000	Accept		Decision Pending			
PL-189	Revise design to make the classroom wing 3-story ILO 2-story.	-$478,000	Consider		Reject			
Structural								
S-160	Provide fan coils in classroom to reduce mechanical attics and ductwork.	-$579,000	Accept		Reject			
S-161	Increase covered play to 4000 sf.		Accept		Reject			
S-162	Modify main covered play roof slope and height (min 16', max 20').	-$22,000	Accept		Reject			
S-163	Increase size and visibility of main entry canopy.	$421,000	Accept		Reject			
S-164	Replace covered play area moment frame with braced frame or shear wall (north/south direction, east side).	-$52,000	Accept		Reject			Take Wood Frame option vs steel
S-165	Use beam camber to reduce weight of steel.	-$261,000	Accept		Reject			Take Wood Frame option vs steel
S-166	Lower roof and/or roof slope to reduce volume.	-$111,000	Consider		Modify			see A6 modified
S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.	-$687,000	Accept		Reject			Take Wood Frame option vs steel
S-168	Reduce foundation size according to less conservative assumptions.	-$269,000	Accept		Accept	-$269,000		
S-169	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.	-$2,530,000	Accept		Accept	-$2,410,000		Gym likely steel anyway , Topping offsets advantage. subtract 120$k for builders risk
S-170	Use standard composite metal deck (i.e., 3" over 2" non dovetail deck).	-$30,000	Accept		Reject			Take Wood Frame option vs steel
S-171	Consider vibratory aggregate piers in lieu of rammed aggregate piers.	-$148,000	Consider		Accept	-$148,000		
S-172	Consider DSM (Direct Soil Mixing) ILO rammed aggregate piers.	$27,000	Consider		Reject			
S-173	Use 4" thick slab-on-grade ILO 5".	-$98,000	Consider		Accept	-$98,000		
S-174	Add additional window section to library west wall.	$5,000	Accept		Reject			

Total VE Team Recommended Cost Avoidance	**-$12,125,748**	**-$5,877,997**		**Total Owner Accepted Cost Avoidance**
Total VE Team Recommended Cost Addition	**$1,630,000**	**$0**		**Total Owner Accepted Cost Addition**
Total VE Team Recommended Value	**$13,755,748**	**$5,877,997**		**Total Owner Accepted Value**

*NOTE: COSTS AND COUNTS ABOVE INCLUDE MUTUALLY EXCLUSIVE CONCEPTS

Owner Implementation Matrix

July 2026

Function - Idea No.	Creative Idea	First-Cost Potential	VE Team Recommendation	Owner Implementation	Design Team Recommendation	Design Team Accepted Amount	Owner Accepted Amount	Comments

NOTES

Pricing Key

Score	Meaning
Cost Neutral	Difference between baseline and alternative costs is negligible.
Not Priced	Cost analysis not prepared.
Project Sugg.	Narrative prepared without a cost analysis.
Priced-Only	Estimate prepared without a full analysis and workbook documentation.

Appendix B
Value Improvement Alternatives

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Value Improvement Matrix

July 2026

Function - Idea No.	Creative Idea	Program	Aesthetics	Durability	TCO	Sustainability	Schedule	Constructability	Comfort, Safety, Performance	First-Cost Potential	VE Team Recommendation
Architectural											
A-1	Reduce second floor TOS elevation.	=	=	=	+	=	+	=	=	-$147,000	Accept
A-4	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).	=	=	=	+	=	+	+	=	-$128,000	Accept
A-5	Increase borrowed light from classrooms to pod area ILO clerestory windows and lightwells.	+	+	=	=	=	=	=	+	-$61,000	Accept
A-6	Minimize to 2' roof overhang on all elevations.	=	-	+	+	=	=	+	=	-$161,000	Accept
Civil											
C-37	Develop north courtyard as outdoor learning area ILO paved concrete walkway.	+	+	-	-	+	=	=	+	$44,000	Accept
C-39	Add a second site entrance to S Dewey St and separate parent and bus loops with no shared aisle.	+	=	=	+	=	=	=	+	-$38,000	Accept
C-40	Reduce public sidewalk width.	-	=	=	+	=	+	+	-	-$134,000	Accept
C-41	Add sidewalk to south of staff parking for bus drop off.	+	=	=	-	=	=	=		-$155,000	Accept
C-42	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.	+	=	+	-	=	-	=	+	$104,000	Accept
C-43	Remove stormwater treatment on the east side of the site.	=	=	+	+	=	+	+	=	-$68,000	Accept
Electrical											
E-109	Expand rooftop solar PV system beyond code-minimum array.	+	=	+	+	+	=	=	=	$394,000	Accept
E-111	Control receptacles from user programmed on/off schedule ILO by occupancy sensors.	=	=	=	-	=	=	=	+	$16,000	Accept
E-112	Use fewer pendant lights in classrooms 3 ILO 4 rows.	=	+	+	+	+	+	+	=	-$87,000	Consider
E-113	As requested in the OPR, have a surge protective device only at Main Switchboard ILO all panels in the building.	=	=	-	+	+	+	+	-	-$41,000	Accept
Mechanical											
M-126	Use 2-pipe changeover ILO 4-pipe system.	=	=	=	+	+	=	+	=	-$182,000	Accept
M-127	Consider air source heat pumps with condensing unit in service yard.	=	-	-	-	-	+	=	=	-$1,196,000	Accept
Planning											
PL-142	Reduce corridor widths to 11'.	=	-	=	+	+	=	=	=	-$243,000	Accept
PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).	+	=	+	=	=	=	+	=	-$534,000	Accept

Value Improvement Matrix

July 2026

Function - Idea No.	Creative Idea	Program	Aesthetics	Durability	TCO	Sustainability	Schedule	Constructability	Comfort, Safety, Performance	First-Cost Potential	VE Team Recommendation
PL-144	Increase size of library.	+	=	=	=	=	=	=	+	$79,000	Accept
PL-189	Revise design to make the classroom wing 3-story ILO 2-story.	=	=	=	=	=	+	+	=	-$478,000	Consider
Structural											
S-160	Provide fan coils in classroom to reduce mechanical attics and ductwork.	=	=	=	+	+	+	+	=	-$579,000	Accept
S-161	Increase covered play to 4000 sf.	=	=	=	+	=	+	+	=	Project Sugg.	Accept
S-162	Modify main covered play roof slope and height (min 16', max 20').	=	+	=	-	=	=	=	+	-$22,000	Accept
S-163	Increase size and visibility of main entry canopy.	+	+	=	+	=	=	=	+	$421,000	Accept
S-164	Replace covered play area moment frame with braced frame or shear wall (north/south direction, east side).	=	-	=	-	=	=	+	=	-$52,000	Accept
S-165	Use beam camber to reduce weight of steel.	=	=	=	+	+	-	-	=	-$261,000	Accept
S-166	Lower roof and/or roof slope to reduce volume.	=	-	+	+	+	+	+	+	-$111,000	Consider
S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.	=	=	=	+	+	-	=	=	-$687,000	Accept
S-168	Reduce foundation size according to less conservative assumptions.	=	=	+	+	+	+	+	=	-$269,000	Accept
S-169	Change the construction from steel to wood.	=	=	=	+	+	+	+	=	-$2,530,000	Accept

Total Gross Cost Reduction	**-$8,164,000**
Total Gross Cost Addition	**$1,058,000**
Count of Avoidance	**23**
Count of Addition	**6**

Total VE Team Recommended Cost Avoidance	**-$7,488,000**
Total VE Team Recommended Cost Addition	**$1,058,000**

*NOTE: COSTS AND COUNTS ABOVE INCLUDE MUTUALLY EXCLUSIVE CONCEPTS

Value Improvement Matrix

July 2026

Function - Idea No.	Creative Idea	Program	Aesthetics	Durability	TCO	Sustainability	Schedule	Constructability	Comfort, Safety, Performance	First-Cost Potential	VE Team Recommendation

NOTES

Pricing Key

Score	Meaning
Cost Neutral	Difference between baseline and alternative costs is negligible.
Not Priced	Cost analysis not prepared.
Project Sugg.	Narrative prepared without a cost analysis.
Priced-Only	Estimate prepared without a full analysis and workbook documentation.

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Priced-Only Matrix July 2026

Function - Idea No.	Creative Idea	First-Cost Potential	VE Team Recommendation
Architectural			
A-2	Exterior sun shades ILO blinds for administrative area's windows along south elevation.	$13,000	Accept
A-7	Use aluminum windows ILO fiberglass.	-$115,000	Accept
A-8	Replace ceiling wood veneer finishes with acoustical clouds.	-$174,000	Partially Accept
A-9	Replace ceiling wood veneer finishes with exposed structure.	-$169,000	Partially Accept
A-10	Use carpet ILO rubber tile in classrooms.	-$86,000	Partially Accept
A-11	Use linoleum/marmoleum ILO of rubber tile in classrooms.	-$29,000	Partially Accept
Civil			
C-38	Use turf and underdrain system ILO sod at playfield.	$408,000	Accept
C-44	Hot Mix Asphalt (HMA) ILO concrete loop around playfield.	-$9,000	Accept
C-45	Remove trees to improve grading.	-$46,000	Accept
C-46	Salvage on-site soil rather than import.	-$238,000	Accept
C-47	Use PCC (Portland Cement Concrete) for roadway paving ILO ACP (Asphalt Concrete Pavement) for increased durability.	$20,000	Consider
C-48	Use 5" over 17" for HD (heavy-duty) pavement.	$99,000	Accept
C-49	Reduce landscape budget by 30% (reduce/eliminate irrigation and plantings).	-$251,000	Accept
Electrical			
E-114	Allow MC (metal-clad) cabling.	-$753,000	Accept
E-115	Use direct-indirect troffer fixtures in classrooms ILO pendant lighting.	-$167,000	Accept
E-116	Allow aluminum feeders, bussing, and transformer windings (could not find prohibition in OPR).	-$42,000	Accept
Mechanical			
M-128	Consider routing west from east end of building though kitchen or all waste to a single point of connection.	-$2,000	Accept
M-129	Consider PEX (cross-linked polyethylene) piping ILO copper for domestic water.	-$182,000	Accept
M-130	Consider ABS (Acrylonitrile Butadiene Styrene) waste piping ILO cast iron piping.	-$184,000	Accept
Planning			
PL-145	Use FF&E (furniture, fixtures, and equipment) budget ILO MACC (maximum allowable construction cost) for: 1) Bleachers; 2) AV Devices; 3) CR Voice Augmentation; 4) Gym Electronics; 5) DAS Equipment (i.e., pathways under MACC).	-$891,000	Accept
Structural			
S-170	Use standard composite metal deck (i.e., 3" over 2" non dovetail deck).	-$30,000	Accept
S-171	Consider vibratory aggregate piers in lieu of rammed aggregate piers.	-$148,000	Consider

Priced-Only Matrix July 2026

Function - Idea No.	Creative Idea	First-Cost Potential	VE Team Recommendation
S-172	Consider DSM (Direct Soil Mixing) ILO rammed aggregate piers.	$27,000	Consider
S-173	Use 4" thick slab-on-grade ILO 5".	-$98,000	Consider
S-174	Add additional window section to library west wall.	$5,000	Accept

Total Gross Cost Avoidance	**-$3,614,000**
Total Gross Cost Addition	**$572,000**
Count of Avoidance	**19**
Count of Addition	**6**

Total VE Team Recommended Cost Avoidance	**-$2,910,000**
Total VE Team Recommended Cost Addition	**$525,000**

*NOTE: COSTS AND COUNTS ABOVE INCLUDE MUTUALLY EXCLUSIVE CONCEPTS

NOTES

Pricing Key

Score	Meaning
Cost Neutral	Difference between baseline and alternative costs is negligible.
Not Priced	Cost analysis not prepared.
Project Sugg.	Narrative prepared without a cost analysis.
Priced-Only	Estimate prepared without a full analysis and workbook documentation.

Creative Idea List July 2026

Function - Idea No.	Score	Resp.	Creative Idea
Architectural			
A-1	A	DP	Reduce second floor TOS elevation.
A-2	B	JL	Exterior sun shades ILO blinds for administrative area's windows along south elevation.
A-3	D		Centralize reception to improve visibility and supervision.
A-4	A	SW	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).
A-5	A	SW	Increase borrowed light from classrooms to pod area ILO clerestory windows and lightwells.
A-6	A	SW	Minimize to 2' roof overhang on all elevations.
A-7	B	JL	Use aluminum windows ILO fiberglass.
A-8	B	JL	Replace ceiling wood veneer finishes with acoustical clouds.
A-9	B	JL	Replace ceiling wood veneer finishes with exposed structure.
A-10	B	JL	Use carpet ILO rubber tile in classrooms.
A-11	B	JL	Use linoleum/marmoleum ILO of rubber tile in classrooms.
A-12	C		Retain building enclosure subject matter expert during design development/construction documents to detail isometrics.
A-13	C		Add two (2) operable window units in classrooms.
A-14	C		Modify exterior platform stair adjacent to stage room for ADA compliance.
A-15	C		Eliminate suspended polycarbonate canopies.
A-16	D		Reduce resource room in favor of additional family liaison/social service areas.
A-17	D		Reduce mechanical room by ~25%.
A-18	D		Reconfigure reception/SW conference room access to allow for wider entry way - welcome families, reduce pinch-point, maintain double wide corridor past stair.
A-19	D		Brick ILO of glass at covered play exterior wall.
A-20	D		More color varied FCP (fiber cement panels) and less brick.
A-21	D		Eliminate metal panels at ground level.
A-22	D		Overhang roof on north side and replace the wrap down metal siding with FCP (fiber cement panels).

Creative Idea List July 2026

Idea No.	Score	Resp.	Creative Idea
Function -			
A-23	D		Add two (2) double doors at main entry.
A-24	D		Swap gym and cafeteria.
A-25	E		Use wood frame vs. metal stud at fixed partitions.
A-26	E		Reducing exterior materials from 6 to 4 different types.
A-27	E		Skylights for daylight harvesting ILO clerestory.
A-28	E		Consider more brick and metal and less FCP (fiber cement panels).
A-29	E		Consider flat roof for knuckle and add roof top units.
A-30	E		Use 3-tab asphalt shingles ILO metal roofing.
A-31	E		Aberdeen shake shingles ILO metal roofing.
A-32	E		Sarnafil ILO metal roofing.
A-33	E		EPDM (Ethylene Propylene Diene Monomer) ILO metal roofing.
A-34	F		Move covered outdoor play over north drive lane.
A-35	G		Reconfigure entry stairs and admin to avoid pinch point.
A-36	G		Incorporate PV array.
Civil			
C-37	A	DP	Develop north courtyard as outdoor learning area ILO paved concrete walkway.
C-38	B	JL	Use turf and underdrain system ILO sod at playfield.
C-39	A	PR	Add a second site entrance to S Dewey St and separate parent and bus loops with no shared aisle.
C-40	A	PR	Reduce public sidewalk width.
C-41	A	PR	Add sidewalk to south of staff parking for bus drop off.
C-42	A	PR	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.
C-43	A	PR	Remove stormwater treatment on the east side of the site.
C-44	B	JL	Hot Mix Asphalt (HMA) ILO concrete loop around playfield.
C-45	B	JL	Remove trees to improve grading.
C-46	B	JL	Salvage on-site soil rather than import.
C-47	B	JL	Use PCC (Portland Cement Concrete) for roadway paving ILO ACP (Asphalt Concrete Pavement) for increased durability.
C-48	B	JL	Use 5" over 17" for HD (heavy-duty) pavement.

Creative Idea List July 2026

Function - Idea No.	Score	Resp.	Creative Idea
C-49	B	JL	Reduce landscape budget by 30% (reduce/eliminate irrigation and plantings).
C-50	C		Step the building down the site.
C-51	C		Request permission from AHJ to vacate ROW (right-of-way) between lots for continuous site development.
C-52	C		Develop different site.
C-53	C		Compact stalls for portion of parking.
C-54	C		Covered walkways from parking to building.
C-55	C		Add off-site parking and overflow parent waiting area.
C-56	C		Reduce size of service yard for deliveries.
C-57	C		Revert sidewalks at building approach back to 20'.
C-58	C		Flip building and parking areas. Take advantage of the lower grade for the building.
C-59	C		MSE (Mechanically Stabilized Earth) ILO CIP (cast-in-place) concrete retaining wall on Lomax.
C-60	C		Two (2) shorter walls ILO single higher retaining wall on Lomax.
C-61	C		Gabion ILO CIP concrete retaining wall on Lomax.
C-62	C		Use HDPE (High-Density Polyethylene) piping ILO DI (Ductile Iron) for waterline.
C-63	C		Request permission from AHJ (authority having jurisdiction) to move water meter closer to property line.
C-64	C		Use PVC (polyvinyl chloride) piping ILO DI (ductile iron) for waterline.
C-65	C		Encapsulate DI (ductile iron) piping with plastic sleeve.
C-66	C		Add cathodic protection on DI (ductile iron) piping for waterline.
C-67	C		Use plastic catch basins instead of concrete.
C-68	C		Review if landscape is meeting code minimum.
C-69	D		Relocate sidewalk further south to reduce extent of retaining walls on Lomax.
C-70	D		Reduce N-S building width to reduce soil amendment.
C-71	D		Create bus loop that doubles up on the approach.
C-72	D		Reduce height of retaining wall on Lomax St.
C-73	D		Provide underground drainage at playfield to improve year-round play surface.
C-74	E		Extend on-site queue length.

Creative Idea List July 2026

Function - Idea No.	Score	Resp.	Creative Idea
C-75	E		Use Redi-Rock or similar to reduce earthwork at northeast corner.
C-76	E		Consider soldier pile wall to stabilize slope instead of 30' wide ground improvement.
C-77	E		Leverage grade changes to separate vehicular-pedestrian circulation zones.
C-78	E		On-site cut for reuse as structural fill.
C-79	E		Use tangent pile cutoff walls to stabilize site slopes.
C-80	E		Bicycle parking emphasis with secure shelter.
C-81	E		Carpool incentive space allocation.
C-82	E		Widen drop-off lanes to allow two-abreast queueing.
C-83	E		Use hard surface play area for event overflow parking.
C-84	E		Use playfield as overflow parking.
C-85	E		Propose light duty asphalt at the fire access loop around the building.
C-86	E		Porous concrete to reduce stormwater treatment.
C-87	E		Gravel ILO pavement for fireloop.
C-88	E		Grasscrete ILO pavement for fireloop.
C-89	E		Route bikes on a parallel path to pedestrians.
C-90	E		Use bid alternate for pavement around playfield.
C-91	E		Reduce sports field size (currently 200'x300').
C-92	E		Rock walls ILO CIP concrete retaining wall on Lomax.
C-93	E		Pre-cast panels ILO concrete retaining wall on Lomax.
C-94	E		Make sports field a bid alternate.
C-95	F		Shift building to west to begin development over current "overflow parking area".
C-96	F		Relocate playfield to reduce grading.
C-97	F		Add a second site entrance from Franklin St.
C-98	F		Add a second site entrance from W Holman St.
C-99	F		Hammerhead turnaround ILO fire loop around the buildings.
C-100	F		Overflow parallel parking on bus loop.
C-101	F		Eliminate running track section of fireloop.
C-102	F		Reduce length of bus loop to be adequately sized for bus count.
C-103	F		Ecology block concrete retaining wall on Lomax.

Creative Idea List July 2026

Function - Idea No.	Score	Resp.	Creative Idea
C-104	F		Incorporate bioswales into parking islands for stormwater treatment.
C-105	F		Single pond ILO multiple stormwater detention ponds.
C-106	G		Conduct traffic study for BOD (basis of design) of parking & queuing.
C-107	G		Review stormwater treatment for offsite improvements.
C-108	G		Evaluate if a smaller water meter in lieu of RPBA (reduced pressure backflow assembly) can be used, reducing SDC (service department connection) charges and ongoing backflow testing costs.
Construction Management			
CM-140	G		Issue an early sitework package for spring / summer of 2027 and define SCAP (School Construction Assistance Program) budget.
CM-141	G		Coordinate installation of the new 12" waterline to minimize shutdown of the existing waterline and require contractor submittal.
Electrical			
E-109	A	JN	Expand rooftop solar PV system beyond code-minimum array.
E-110	E		Pursue EV Bus grant opportunities.
E-111	A	RG	Control receptacles from user programmed on/off schedule ILO by occupancy sensors.
E-112	A	RG	Use fewer pendant lights in classrooms 3 ILO 4 rows.
E-113	A	RG	As requested in the OPR, have a surge protective device only at Main Switchboard ILO all panels in the building.
E-114	B	JL	Allow MC (metal-clad) cabling.
E-115	B	JL	Use direct-indirect troffer fixtures in classrooms ILO pendant lighting.
E-116	B	RG	Allow aluminum feeders, bussing, and transformer windings (could not find prohibition in OPR).
E-117	C		Consider additional C406.2 energy efficiency measures (e.g., fault detection and diagnostics, heat pump water heating, building envelope consultant, etc.).
E-118	C		Consider reducing high volume spaces to reduce C406.2 additional energy efficiency measure requirements.

Creative Idea List July 2026

Function - Idea No.	Score	Resp.	Creative Idea
E-119	C		Review loads and right size power service down from 34W/sf.
E-120	C		Reduce quantity of receptacles, for example in sensory room.
E-121	C		Optimize data/communication distribution with fiber (CAT VI) wireless systems.
E-122	C		Use touchscreen displays in classrooms ILO short-throw overhead projector.
E-123	C		Use plenum rated cable with J-hooks for fire alarm, CCTV, access control and data.
E-124	E		Consider wind turbines.
E-125	G		Verify code required rough-in for future PV (photovoltaic) installations.

Mechanical

M-126	A	CM	Use 2-pipe changeover ILO 4-pipe system.
M-127	A	CM	Consider air source heat pumps with condensing unit in service yard.
M-128	B	JL	Consider routing west from east end of building though kitchen or all waste to a single point of connection.
M-129	B	JL	Consider PEX (cross-linked polyethylene) piping ILO copper for domestic water.
M-130	B	JL	Consider ABS (Acrylonitrile Butadiene Styrene) waste piping ILO cast iron piping.
M-131	C		Since copper is an OPR, consider ProPress for domestic water piping and only soldered joints where specifically required by the engineer or manufacturer.
M-132	C		Eliminate kitchen mixing valve.
M-133	C		Utilize hard wired touchless lavatory faucets.
M-134	C		Provide single-occupancy restrooms for all grade levels.
M-135	C		Evaluate LCCA (life-cycle cost analysis) of air to water hydronic system vs air source heat pumps.
M-136	C		Consider VAV (variable air volume) air handlers for classrooms.
M-137	C		Provide a single hydronic riser group to attic.
M-138	D		Consider vertical fan coils in classrooms to reduce ductwork and shrink mechanical attics.

Creative Idea List July 2026

Function - Idea No.	Score	Resp.	Creative Idea
M-139	G		Reduce size of the primary electric water heater to rely on the secondary electric water heater for full capacity.

Planning

PL-142	A	TM	Reduce corridor widths to 11'.
PL-143	A	SW	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
PL-144	A	SW	Increase size of library.
PL-145	B	JL	Use FF&E (furniture, fixtures, and equipment) budget ILO MACC (maximum allowable construction cost) for: 1) Bleachers; 2) AV Devices; 3) CR Voice Augmentation; 4) Gym Electronics; 5) DAS Equipment (i.e., pathways under MACC).
PL-146	C		Replace circulation space program space to increase SCAP (School Construction Assistance Program) funding potential.
PL-147	C		Consolidate/right-size building for 310 students.
PL-148	C		Consider a stepped/stacked building floor plan to reduce grading.
PL-149	C		Provide classroom for art/STEM/maker space.
PL-150	C		Consider self-contained restrooms for grade 1-2 classrooms.
PL-151	D		Create outdoor learning area(s).
PL-152	E		Reconfigure pods to eliminate single-loaded corridor effect to increase efficiency in circulation.
PL-153	E		Accommodate growth from out of district (Cosmopolis SD).
PL-154	E		Create knuckle as main entry.
PL-155	E		Three (3) story building to consolidate footprint.
PL-156	E		Consider developing the site in two, linear parallels for building and vehicle circulation to avoid the building straddling the grade change.
PL-157	F		Rotate both buildings to expose new entry at knuckle.
PL-158	G		Review assumptions and definitions of tier 1-2 seismic classification.
PL-159	G		Add one (1) single occupant restroom for each pod.

Creative Idea List July 2026

Function - Idea No.	Score	Resp.	Creative Idea
PL-189	A	JL	Revise design to make the classroom wing 3-story ILO 2-story.

Structural

S-160	A	CM	Provide fan coils in classroom to reduce mechanical attics and ductwork.
S-161	A	DP	Increase covered play to 4000 sf.
S-162	A	TM	Modify main covered play roof slope and height (min 16', max 20').
S-163	A	SW	Increase size and visibility of main entry canopy.
S-164	A	TM	Replace covered play area moment frame with braced frame or shear wall (north/south direction, east side).
S-165	A	TM	Use beam camber to reduce weight of steel.
S-166	A	TM	Lower roof and/or roof slope to reduce volume.
S-167	A	TM	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.
S-168	A	TM	Reduce foundation size according to less conservative assumptions.
S-169	A	TM	Change the construction from steel to wood.
S-170	B	JL	Use standard composite metal deck (i.e., 3" over 2" non dovetail deck).
S-171	B	JL	Consider vibratory aggregate piers in lieu of rammed aggregate piers.
S-172	B	JL	Consider DSM (Direct Soil Mixing) ILO rammed aggregate piers.
S-173	B	JL	Use 4" thick slab-on-grade ILO 5".
S-174	B	JL	Add additional window section to library west wall.
S-175	C		Consider anchoring roof over covered play area to the main building to eliminate seismic joint.
S-176	C		Lower second floor corridor roof to make seismic joint construction easier.
S-177	C		Remove the diagonal roof overhang kickers on south side of building.

Creative Idea List July 2026

Idea No.	Function - Score	Resp.	Creative Idea
S-178	C		Consider kicker braces in roof to reduce height of backup framing at tall walls.
S-179	C		Break up massing of exterior walls with more wall modulation.
S-180	D		Reduce height and footprint of mechanical attics.
S-181	D		More selective use of overhangs for shading to reduce overall extent of overhangs.
S-182	E		Use auger cast piles ILO rammed aggregate piers.
S-183	E		Use monoslope/gable roof.
S-184	E		Use conventional brace frames ILO BRBFs (Buckling-Restrained Braced Frames).
S-185	F		Consider roof top units and eliminate mechanical attics.
S-186	G		Structural to verify that the roof framing includes supplemental framing for future PV (photovoltaic) arrays.
S-187	G		Reduce roof slopes.
S-188	G		Remove butterfly roof.

NOTES

VE Team

Abbrev.	Meaning
CM	Chris Maroney
DP	Dan Purefoy
JL	John Langer
JN	Jack Newman
PR	Peter Reich
RG	Robert Grzan
SW	Sam Wong
TM	Travis Michaud

Creative Idea List July 2026

Idea No.	Function - Score	Resp.	Creative Idea

Scoring

Score	Meaning
A	Selected for evaluation by VE team
B	Selected for pricing-only by VE team
C	Project suggestion for evaluation by design team
D	Incorporated into a developed alternative
E	Not recommended
F	Fatal flaw/highly unlikely to be accepted
G	In the baseline design

Workbook ID: A-1	Reduce second floor TOS elevation.
Function(s): Reduce Costs; Reduce Scale	**Includes Idea(s)**:

Baseline Concept:

The baseline concept specifies a second-floor top of slab elevation of 14.'

Alternative Concept:

The alternative concept reduces the second-floor top of slab elevation down to 13.'

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**=**
Aesthetics	**=**	Schedule	**+**
Durability & Reliability	**=**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 5,138,000	$ NA	$ NA
Alternative Concept	$ 4,991,000	$ NA	$ NA
Cost Difference	**$ -147,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: A-1	Reduce second floor TOS elevation.
Function(s): Reduce Costs; Reduce Scale	**Includes Idea(s)**:

Recommendation:

Accept the alternative to reduce the second floor slab elevation from 14’ down to 13.’

Alternative Concept

Advantages	Disadvantages
• Reduced exterior wall area and associated materials	• Reasonable constriction of MEP rough ins
• Reduced metal stud framing, sheathing, insulation, air barrier, and exterior cladding quantities	•
• Reduced stair and elevator travel	•
• Reduced overall building volume, potentially lowering heating and cooling loads	•
• Reduction in structural steel	•
•	•

Analysis and Justification:

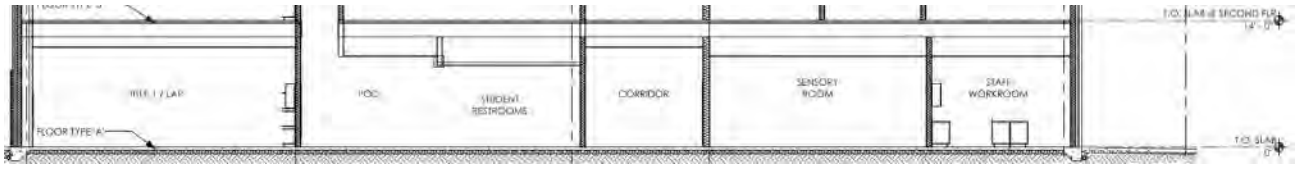
The current design utilizes a 14'-0" top of slab second floor elevation. Preliminary review suggests that this height may provide more plenum and interstitial space than is necessary to accommodate the building's structural, mechanical, electrical, plumbing, fire protection, and technology systems. Elementary schools are commonly designed with floor-to-floor heights ranging from approximately 13'-0" to 13'-6" while still maintaining finished classroom ceiling heights of 9'-0" to 9'-6", which are generally considered appropriate for elementary educational environments.

Reducing the 2nd floor height by 12 inches offers an opportunity to improve overall building efficiency and long-term operating costs without reducing program area or educational functionality. This approach reduces the total building volume and exterior enclosure area, generating cost savings across multiple building systems simultaneously rather than relying on a single material substitution.

This recommendation maintains the full educational program and usable square footage while improving the efficiency of the building form.

Workbook ID: A-1	Reduce second floor TOS elevation.
Function(s): Reduce Costs; Reduce Scale	**Includes Idea(s)**:

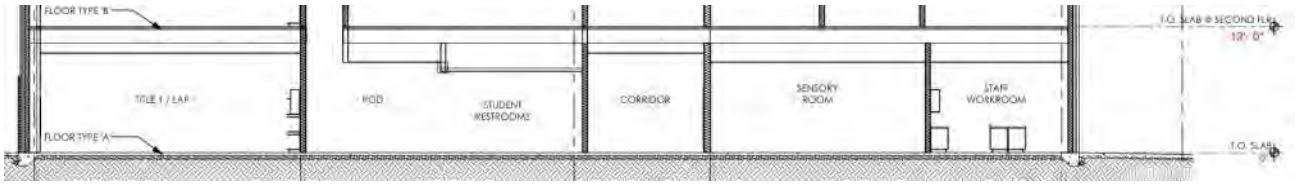
Baseline Concept Illustration



Baseline Section Depicting Top of Slab Distance on First Floor]

Workbook ID: A-1	Reduce second floor TOS elevation.
Function(s): Reduce Costs; Reduce Scale	**Includes Idea(s)**:

Alternative Concept Illustration



Alternative Building Section Demonstrating a Reduction to the TOS Distance

Workbook ID: A-1	Reduce second floor TOS elevation.							
Function(s): Support Load						**Includes Idea(s):**		
	Markup	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Fiber reinforced cement panels	35.48%	SF	21,833	42.40	1,254,164	21,062	42.40	1,209,875
Brick masonry veneer including masonry anchors	35.48%	SF	7,789	49.85	526,044	7,589	49.85	512,537
SB-11 - 3" mineral wool insulation, 5/8" gypsum sheathing, WRB,8" metal stud framing, bat insulation, vapor barrier, (1) layer of 5/8" gypsum at interior face	35.48%	SF	29,622	35.38	1,419,866	28,651	35.38	1,373,323
Metal Stud 6"	35.48%	SF	63,680	11.90	1,026,657	61,500	11.90	991,510
GWB 5/8", type "X", taped and finished	35.48%	SF	146,146	4.60	910,794	144,966	4.60	903,440
TOTAL COSTS*					**5,138,000**			**4,991,000**
							TOTAL (PROPOSED less BASELINE)	**-147,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: A-4	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).
Function(s): Reduce Cost; Repel Moisture	**Includes Idea(s)**: 20,21

Baseline Concept:

In the baseline concept, double height brick walls and metal panel siding are shown on the north and south elevations.

Alternative Concept:

In the alternative concept, limit brick to existing Level 1 heights and replace with FCP at Level 2; retain double height brick façade at the SW corner (housing Admin and Library). Replace all metal panel siding with fiber cement panels (FCP).

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**=**
Aesthetics	**=**	Schedule	**+**
Durability & Reliability	**=**	Constructability	**+**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 1,902,000	$ NA	$ NA
Alternative Concept	$ 1,774,000	$ NA	$ NA
Cost Difference	**$ - 128,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: A-4	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).
Function(s): Reduce Cost; Repel Moisture	**Includes Idea(s)**: 20,21

Recommendation:

Recommend accepting the alternative to limit the brick veneer to the L1, except at the SW corner, and replace with FCP. Additionally, replace metal siding with FCP.

Alternative Concept

Advantages	Disadvantages
• Reduce material cost	• Reduces variation in material
• Improves constructability	• Changes aesthetic concept
• Emphasizes interior program	•
•	•
•	•
•	•

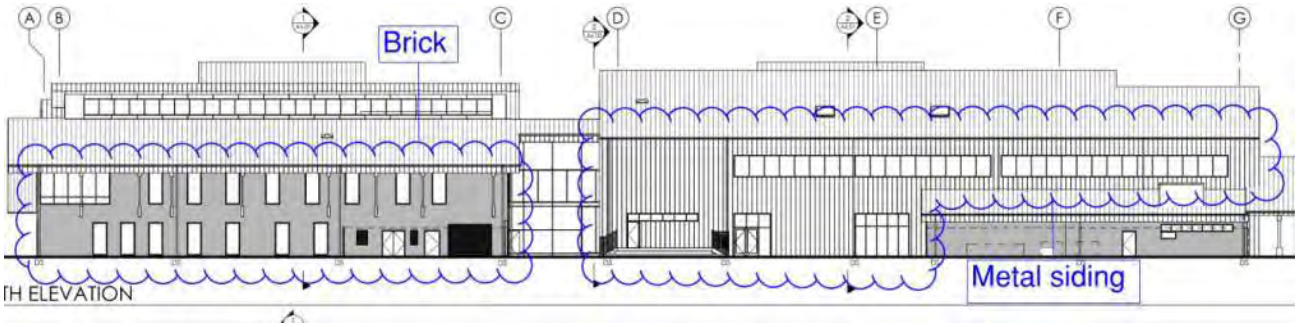
Analysis and Justification:

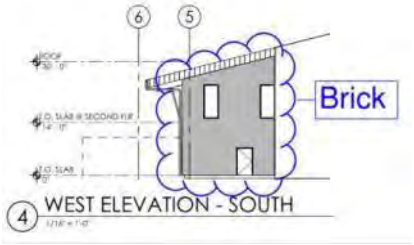
The Alternative Concept reduces the amount of brick veneer and limits it to priority program and function areas, such as the Entry corner, Library, Administration area, Level 1 classrooms, and the southeast service area adjacent to the cafeteria. This reduction still provides variation and modulation while reducing the cost of brick veneer.

Additionally, though we recognize the aesthetic concept of a wrap-around metal roof to grade, this expression would be minimally appreciated given the orientation and sightlines of the approach from drive/parking area. Replacing the metal panel siding with FCP would not only reduce costs but potentially mitigate an enclosure detail issue at the bent connection between roof and exterior wall.

Workbook ID: A-4	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).
Function(s): Reduce Cost; Repel Moisture	**Includes Idea(s)**: 20,21

Baseline Concept Illustration

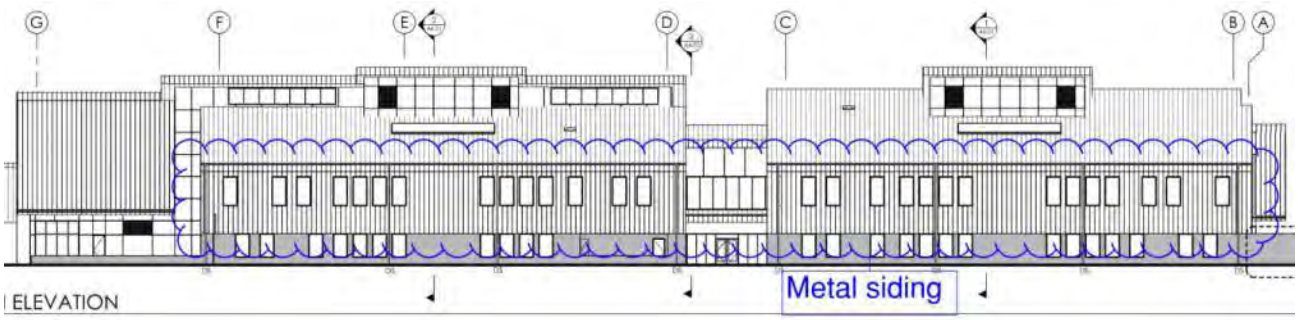




Baseline South Elevation Brick and Metal Siding Locations

Workbook ID: A-4	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).
Function(s): Reduce Cost; Repel Moisture	**Includes Idea(s)**: 20,21

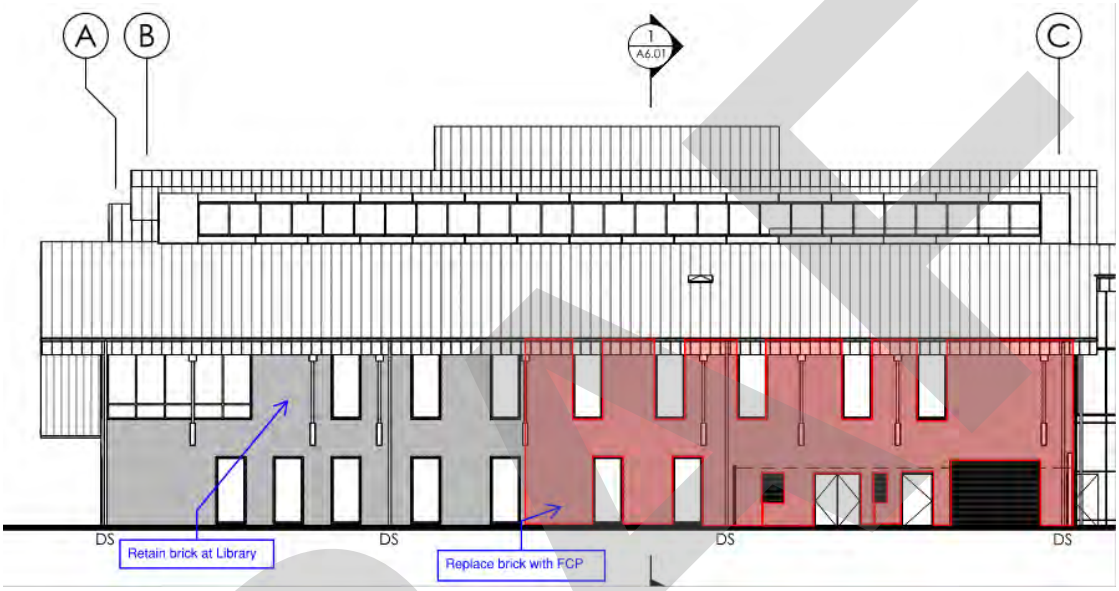
Baseline Concept Illustration

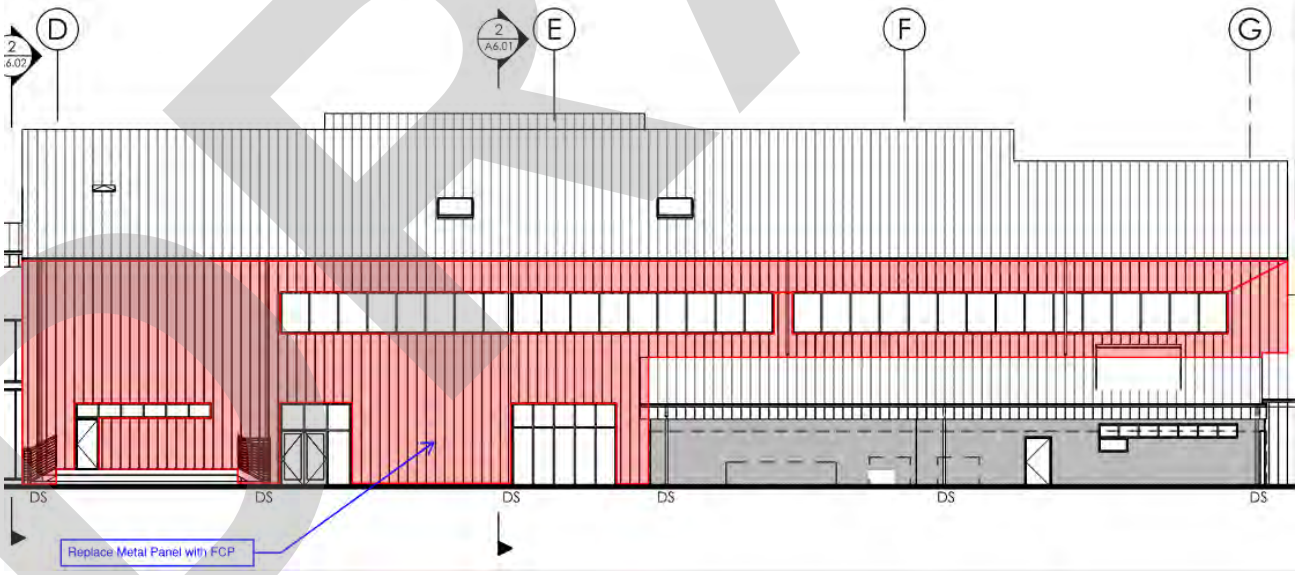


Baseline North Elevation Metal Siding Locations

Workbook ID: A-4	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).
Function(s): Reduce Cost; Repel Moisture	**Includes Idea(s)**: 20,21

Alternative Concept Illustration



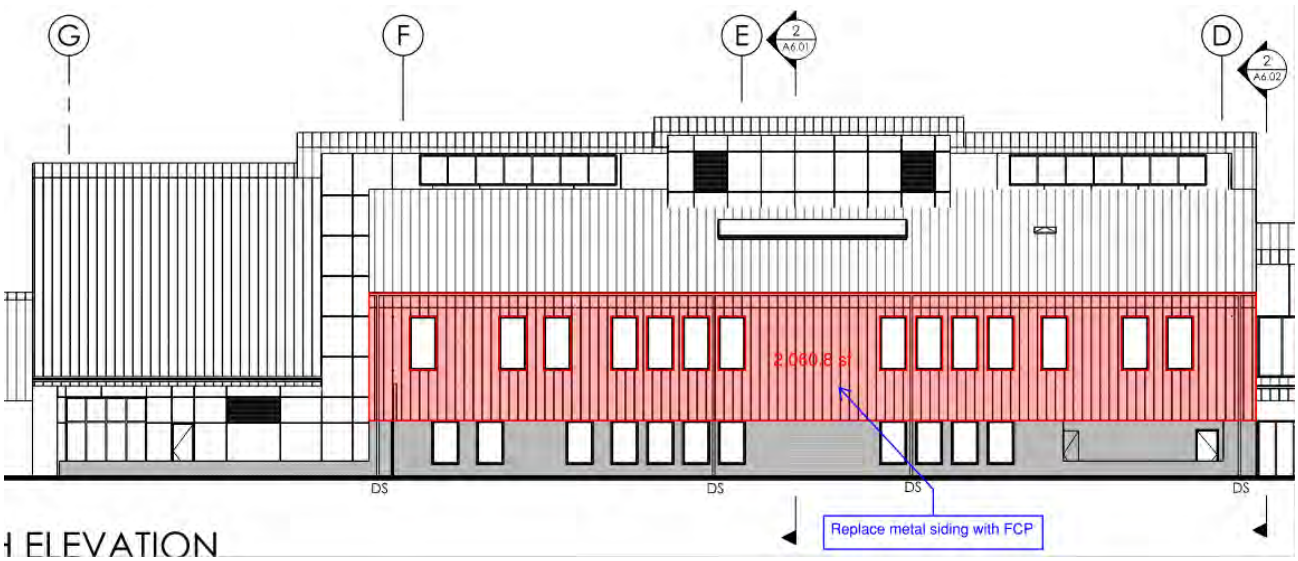


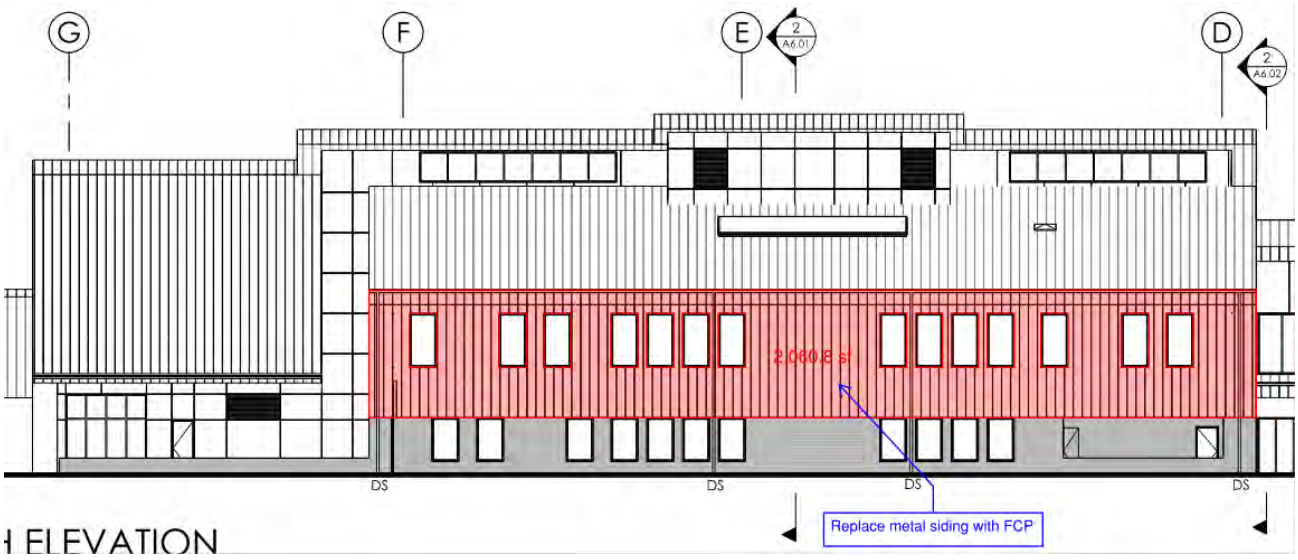
South Elevation Brick and Metal Panel to FCP

DRAFT

Workbook ID: A-4	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).
Function(s): Reduce Cost; Repel Moisture	**Includes Idea(s)**: 20,21

Alternative Concept Illustration

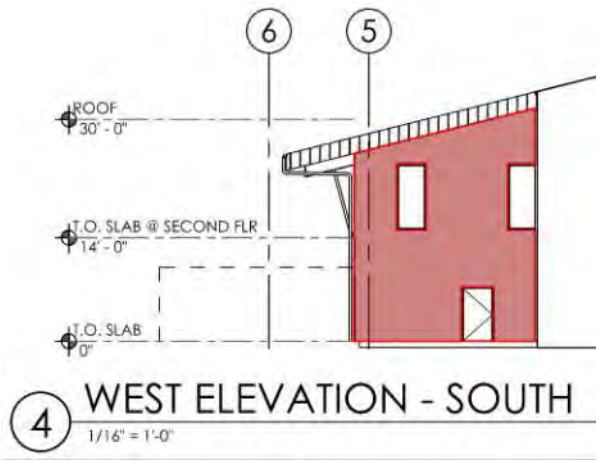




North Elevation Metal Panel to FCP

Workbook ID: A-4	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).
Function(s): Reduce Cost; Repel Moisture	**Includes Idea(s)**: 20,21

Alternative Concept Illustration



West Elevation – South Replace Brick with FCP

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Workbook ID: A-4	Limit brick to Level 1 elevations and replace with FCP (fiber cement panels).							
Function(s): Reduce Cost; Repel Moisture						**Includes Idea(s):**	20,21	
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Note: SD Cost Estimate is carrying only FRCP and Brick Veneer in the pricing	35.48%							
Brick masonry veneer including masonry anchors	35.48%	SF	7,789	49.85	526,044	7,189	49.85	485,522
Fiber reinforced cement panels	35.48%	SF	21,833	42.40	1,254,164	22,433	42.40	1,288,630
Estimate adjustment: Cost differential between FRCP and scope of Metal Wall Panel	35.48%	SF	8,920	10.10	122,057			
TOTAL COSTS*					**1,902,000**			**1,774,000**
							TOTAL (PROPOSED less BASELINE)	**-128,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

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Workbook ID: A-5	Increase borrowed light from classrooms to pod area ILO clerestory windows and lightwells.
Function(s): Daylight Space; Enhance Flexibility	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept (Roof Redesign), there are clerestories with lightwells along the north side, east, and west pods.

Alternative Concept:

In the alternative concept, remove clerestories/skylights and lightwells, and provide lighting through increased interior glazing at classrooms.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**+**	Environmental Sustainability	**=**
Aesthetics	**+**	Schedule	**=**
Durability & Reliability	**=**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**=**	Occupant Comfort, Safety, Performance	**+**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 7,930,000	$ NA	$ NA
Alternative Concept	$ 7,869,000	$ NA	$ NA
Cost Difference	**$ -61,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: A-5	Increase borrowed light from classrooms to pod area ILO clerestory windows and lightwells.
Function(s): Daylight Space; Enhance Flexibility	**Includes Idea(s)**:

Recommendation:

Recommend to accept the alternative and remove clerestories and light well, increase L2 Pod floor space, install transom windows at walls between classroom and Pods.

Alternative Concept

Advantages	Disadvantages
• Eliminates cost for clerestories/skylights	• Reduces natural ambient day lighting
• Increase Pod space on L2 (north side)	• Increases cost for ceiling finish at L2 and L1
• Reduces cost of light wells	• Increases interior glazing for transom windows at classrooms
• More flexibility for L2 ceiling volumes/roof redesign	•
•	•
•	•

Analysis and Justification:

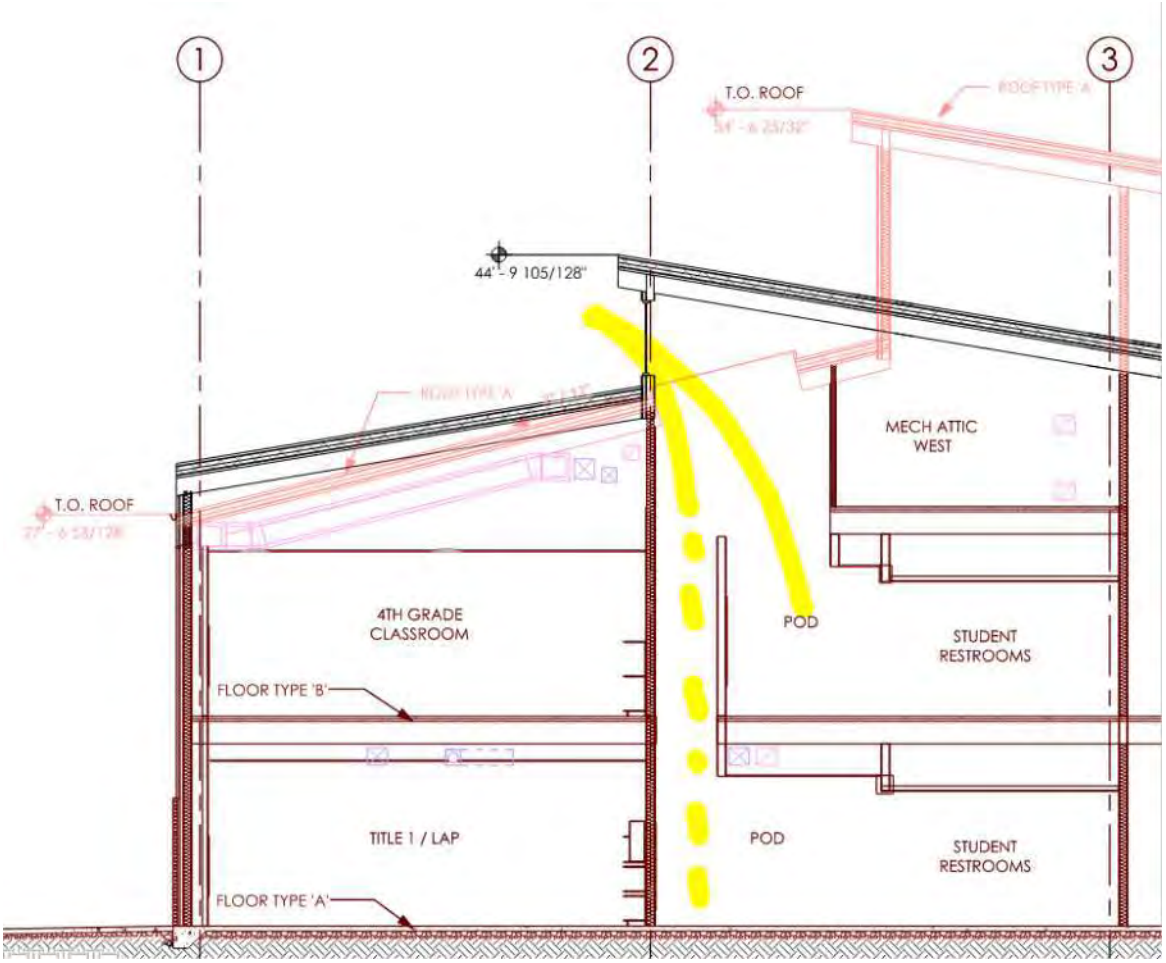
Much of the spatial function, especially at L2 appeared to center around providing a lightwell from north-facing clerestories. Ambient lighting through clerestories may not provide as much daylight to L1 as intended. The lightwells also interrupt the L2 floorplate, minimizing extremely value Pod program space that should be allocated to shared learning areas.

By removing the north-facing clerestories, cost of glazing at the exterior reduces, as well as the interior construction for the lightwell. With the assumed design intent to bring natural daylight into the Pod areas, the alternate concept instead increases the interior glazing (elevated transom windows) at the wall between Pod and classrooms to provide ambient lighting. It is assumed that with north-facing clerestories, the type of daylighting whether from above or from adjacent classrooms would provide similar functionality.

Additionally, with the removed clerestories, design team can continue evaluating reducing overall volume of roof.

Workbook ID: A-5	Increase borrowed light from classrooms to pod area ILO clerestory windows and lightwells.
Function(s): Daylight Space; Enhance Flexibility	**Includes Idea(s)**:

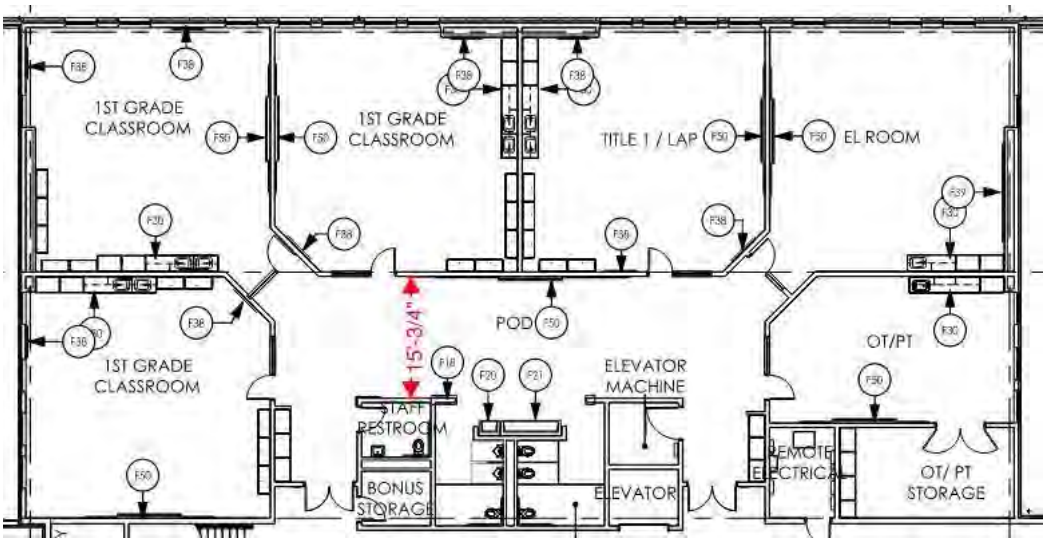
Baseline Concept Illustration



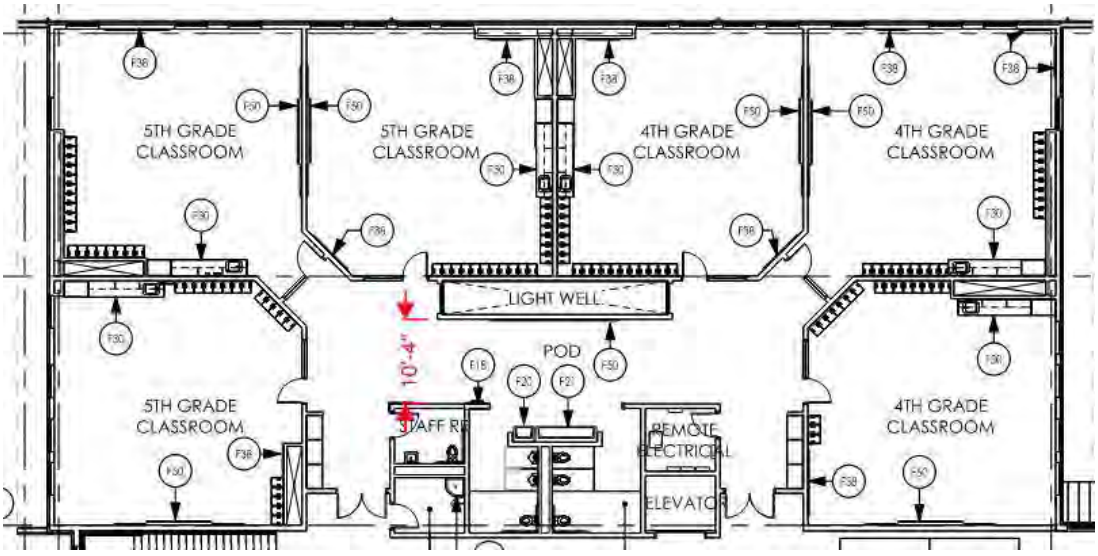
Baseline Section of Skylights to Pods

Workbook ID: A-5	Increase borrowed light from classrooms to pod area ILO clerestory windows and lightwells.
Function(s): Daylight Space; Enhance Flexibility	**Includes Idea(s)**:

Baseline Concept Illustration



Level 1

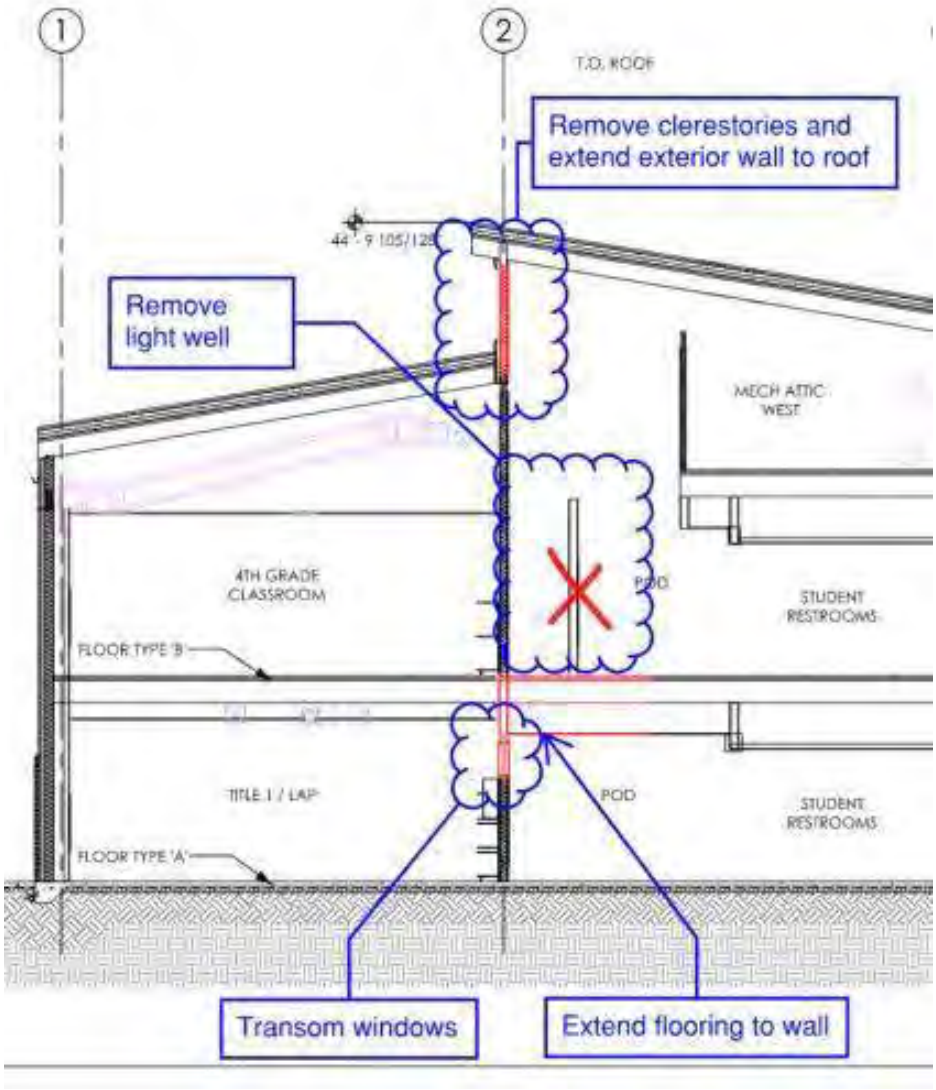


Level 2

Baseline Pod Area compared to Light Well (L1 and L2)

Workbook ID: A-5	Increase borrowed light from classrooms to pod area ILO clerestory windows and lightwells.
Function(s): Daylight Space; Enhance Flexibility	**Includes Idea(s)**:

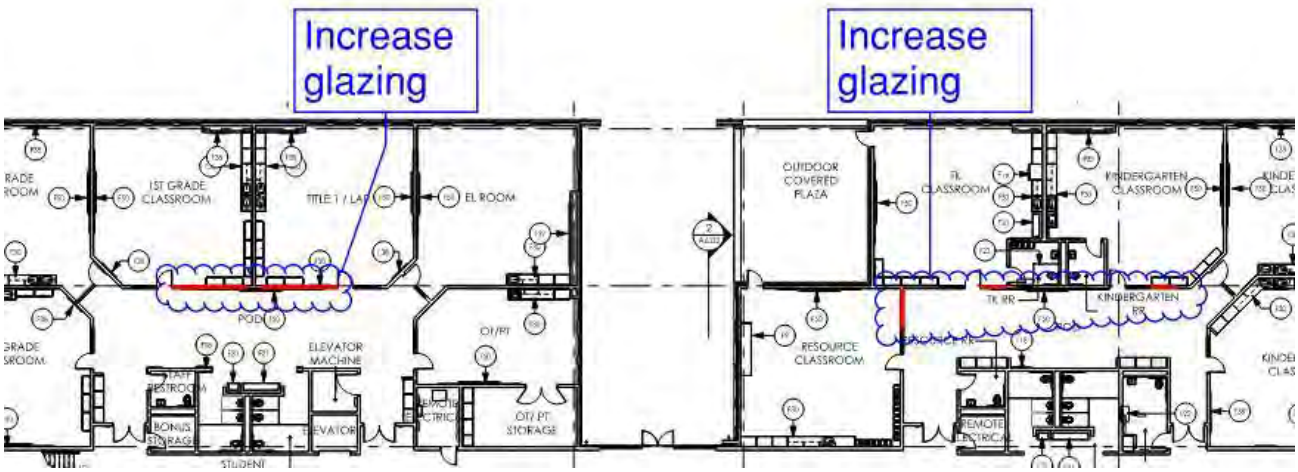
Alternative Concept Illustration



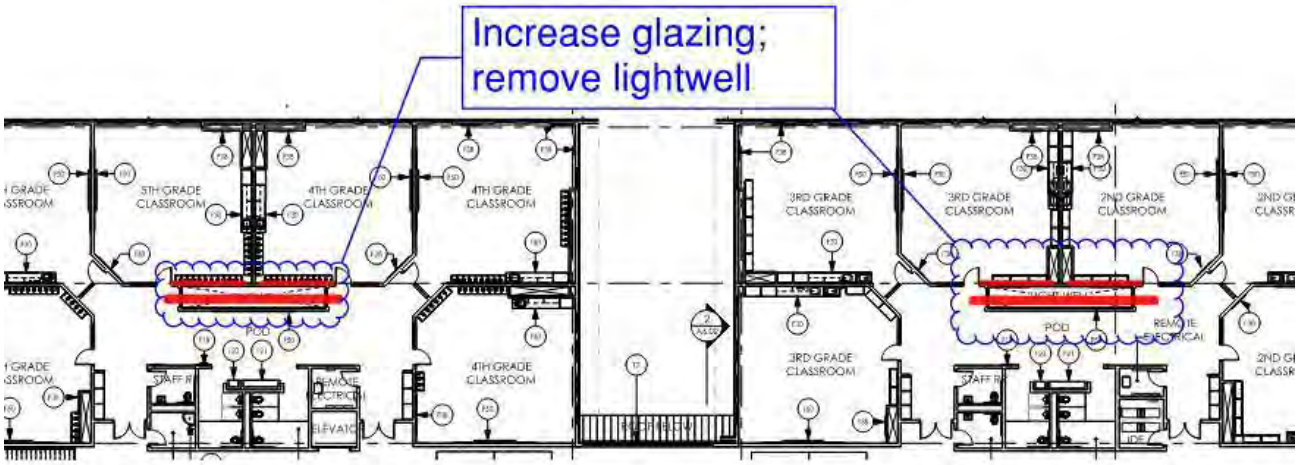
Alternate Concept with Removed Clerestories

Workbook ID: A-5	Increase borrowed light from classrooms to pod area ILO clerestory windows and lightwells.
Function(s): Daylight Space; Enhance Flexibility	**Includes Idea(s)**:

Alternative Concept Illustration



Level 1



Level 2

Alternate Concept Floorplans

Workbook ID: A-5	Increase borrowed light from classrooms to pod area ILO clerestory windows and lightwells.							
Function(s): Daylight Space; Enhance Flexibility						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Skylight	35.48%	SF	629	275.00	234,347			
6" Metal stud	35.48%	SF	63,630	11.90	1,025,850	66,420	11.90	1,070,831
GWB 5/8", type "X", taped & finished	35.48%	SF	146,146	4.60	910,794	148,936	4.60	928,181
Transom windows (2' H)	35.48%	SF				124	65.00	10,920
Structural steel at floor, 12.5 lbs/sf	35.48%	SF	325,675	3.70	1,632,531	329,162	3.70	1,650,010
Steel floor deck	35.48%	LBS	26,054	6.35	224,142	26,333	6.35	226,542
Topping slab incl mesh & nelson studs	35.48%	SF	26,054	8.40	296,503	26,333	8.40	299,678
Strucutral steel at roof, 11 lbs/sf	35.48%	LBS	91,932	3.70	460,833	98,851	3.70	495,516
Steel roof deck	35.48%	SF	34,070	6.50	300,027	34,699	6.50	305,566
Metal roofing system	35.48%	SF	41,674	36.50	2,060,788	42,303	36.50	2,091,892
Resilient tile flooring	35.48%	SF	46,475	7.10	447,047	46,754	7.10	449,730
Suspended ACT and grid, 2'-0" x4'-0"	35.48%	SF	34,557	7.20	337,088	34,836	7.20	339,810
Note: No apparent cost impacts to the MEP								
TOTAL COSTS*					**7,930,000**			**7,869,000**
							TOTAL (PROPOSED less BASELINE)	**-61,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

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Workbook ID: A-6	Minimize to 2' roof overhang on all elevations.
Function(s): Reduce Cost; Manage Stormwater; Maintain Operations; Repel Moisture	**Includes Idea(s)**: 22

Baseline Concept:

In the baseline concept, roof overhangs are generally between 3’-4” and 9’-7.

Alternative Concept:

In the alternative concept, reduce all roof overhangs to 2’.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	=	Environmental Sustainability	=
Aesthetics	--	Schedule	=
Durability & Reliability	+	Constructability	+
Total Cost of Ownership / Lifecycle Cost	+	Occupant Comfort, Safety, Performance	=

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 5,084,000	$ NA	$ NA
Alternative Concept	$ 4,923,000	$ NA	$ NA
Cost Difference	**$ -161,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

DRAFT

Workbook ID: A-6	Minimize to 2' roof overhang on all elevations
Function(s): Reduce Cost; Manage Stormwater; Maintain Operations; Repel Moisture	**Includes Idea(s)**: 22

Recommendation:

Consider the alternative to reduce all roof overhangs to 2’ and provide a 2’ overhang at the north elevation in conjunction with A-4, replacing metal siding with FCP.

Alternative Concept

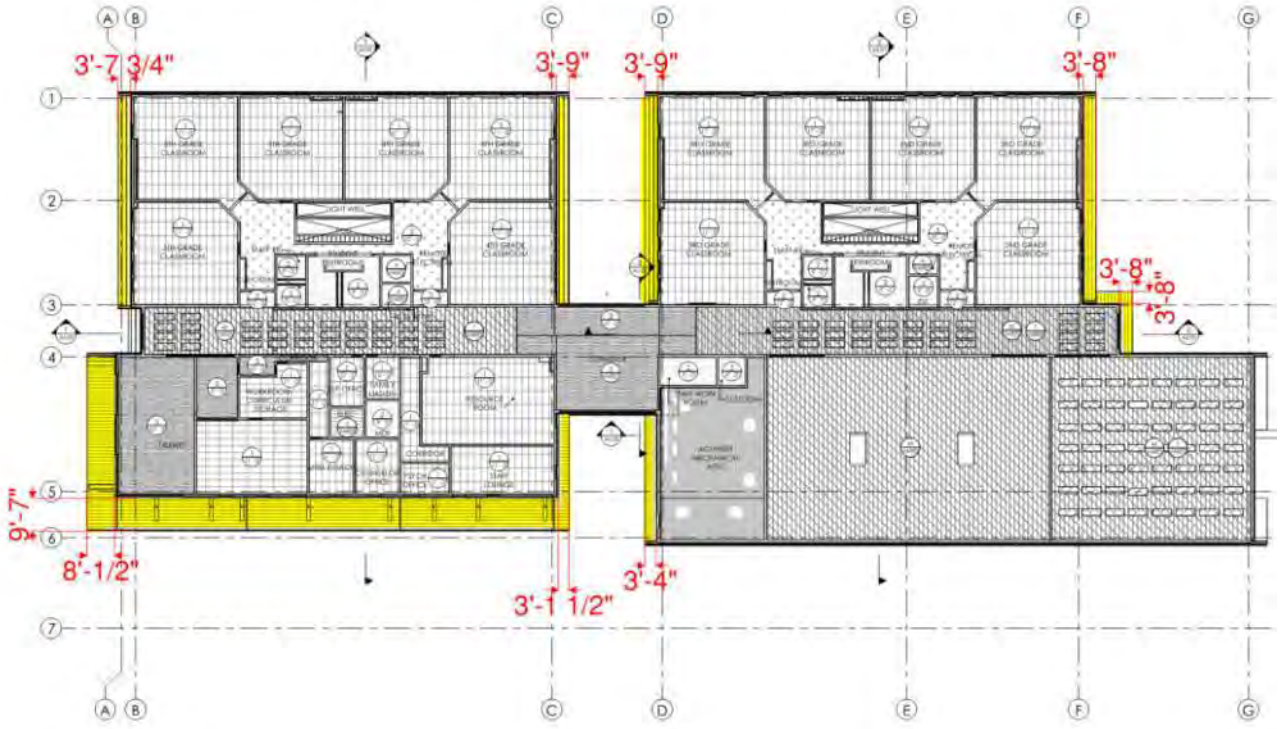
Advantages	Disadvantages
• Reduces cost of roof structure and material	• Increase roofing at the north elevation
• Provides rainwater mitigation at north elevation	• Conceptually changes the massing of the north facade
• Allows for ease of building maintenance	• Less solar protection at the south façade
•	•
•	•
•	•

Analysis and Justification:

The most immediate benefit in this proposal is the reduction of the overall structure and material of the roof overhang on the southwest elevation, as well as all overhangs exceeding 2 feet. The additional extension of the roof on the north façade mitigates the need for detailing the transitions from metal roofing to metal siding. This also provides a direct stormwater sheet flow to downspouts and gutters, and redirects runoff down the metal panel siding, assisting with management of debris maintenance and reducing potential water intrusion weak points. Consider this alternative concept in conjunction with A-4, replacing metal siding with FCP.

Workbook ID: A-6	Minimize to 2' roof overhang on all elevations
Function(s): Reduce Cost; Manage Stormwater; Maintain Operations; Repel Moisture	**Includes Idea(s)**: 22

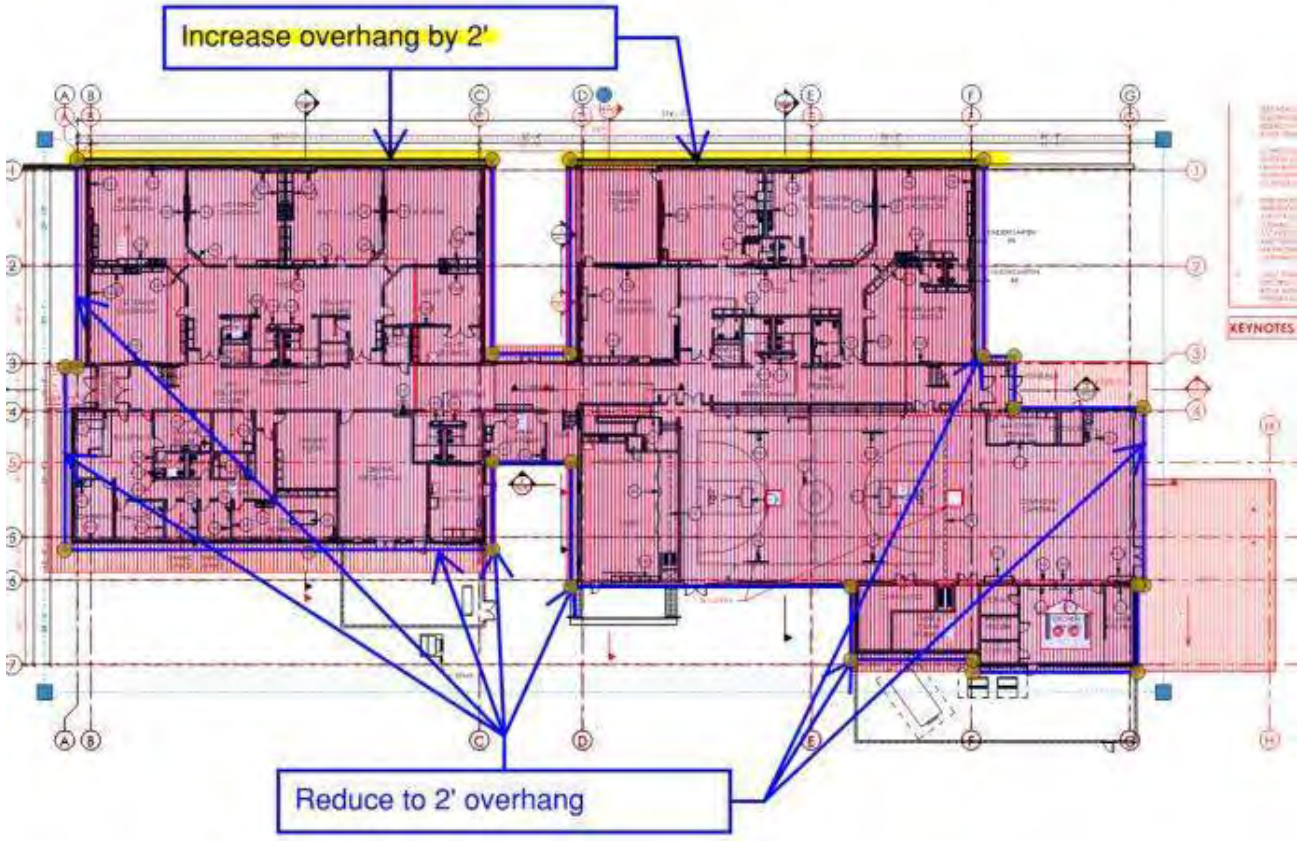
Baseline Concept Illustration



Baseline Roof Overhang Dimensions

Workbook ID: A-6	Minimize to 2' roof overhang on all elevations
Function(s): Reduce Cost; Manage Stormwater; Maintain Operations; Repel Moisture	**Includes Idea(s)**: 22

Alternative Concept Illustration



Alternate Roof Plan

Workbook ID: A-6	Minimize to 2' roof overhang on all elevations.							
Function(s):	Reduce Cost; Manage Stormwater; Maintain Operations; Repel Moisture					**Includes Idea(s):**	22	
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Structural steel at roof, 11lbs/sf	35.48%	LBS	494,978	3.70	2,481,206	478,643	3.70	2,399,322
Steel roof deck	35.48%	SF	34,070	6.50	300,027	32,585	6.50	286,950
Metal Roof system	35.48%	SF	41,674	36.50	2,060,788	40,189	36.50	1,987,354
Sheet metal flashings and trim at roof	35.48%	SF	41,674	3.50	197,610	40,189	3.50	190,568
Downspouts	35.48%	EA	19	550.00	14,158	25	550.00	18,629
Gutters	35.48%	LF	817	27.50	30,439	1,081	27.50	40,275
TOTAL COSTS*					**5,084,000**			**4,923,000**
							TOTAL (PROPOSED less BASELINE)	**-161,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: C-37	Develop north courtyard as outdoor learning area ILO paved concrete walkway.
Function(s): Educate Students; Connect Outdoors	**Includes Idea(s)**: 151

Baseline Concept:

The north exterior courtyard area consists of an exposed aggregate concrete paved area, landscape groundcover and logs.

Alternative Concept:

Convert the proposed concrete courtyard area into a landscaped outdoor learning area consisting of natural surface materials, seating elements, educational features, and native plantings in lieu of a paved hardscape.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**+**	Environmental Sustainability	**+**
Aesthetics	**+**	Schedule	**=**
Durability & Reliability	**--**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**--**	Occupant Comfort, Safety, Performance	**+**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 722,000	$ NA	$ NA
Alternative Concept	$ 766,000	$ NA	$ NA
Cost Difference	**$ 44,000**	$ NA	$ NA
Cost Addition	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: C-37	Develop north courtyard as outdoor learning area ILO paved concrete walkway.
Function(s): Educate Students; Connect Outdoors	**Includes Idea(s)**: 151

Recommendation:

Consider accepting the alternative.

Alternative Concept

Advantages	Disadvantages
• Reduction in concrete paving quantities and associated construction costs	• More maintenance requirements
• Reduction in stormwater runoff and impervious surface area	• Accessibility challenges
• Increased educational and curriculum-based use of outdoor space	• Weather dependency
• Enhanced student engagement and outdoor learning opportunities	•
• Improved site aesthetics and integration with the natural environment	•
• Potential reduction in heat island effects compared to large paved areas	•

Analysis and Justification:

The current design includes a substantial concrete-paved area intended for outdoor gathering and circulation. While durable and low maintenance, large expanses of concrete provide limited educational value and can contribute to increased construction costs, stormwater runoff, heat gain, and long-term maintenance requirements.

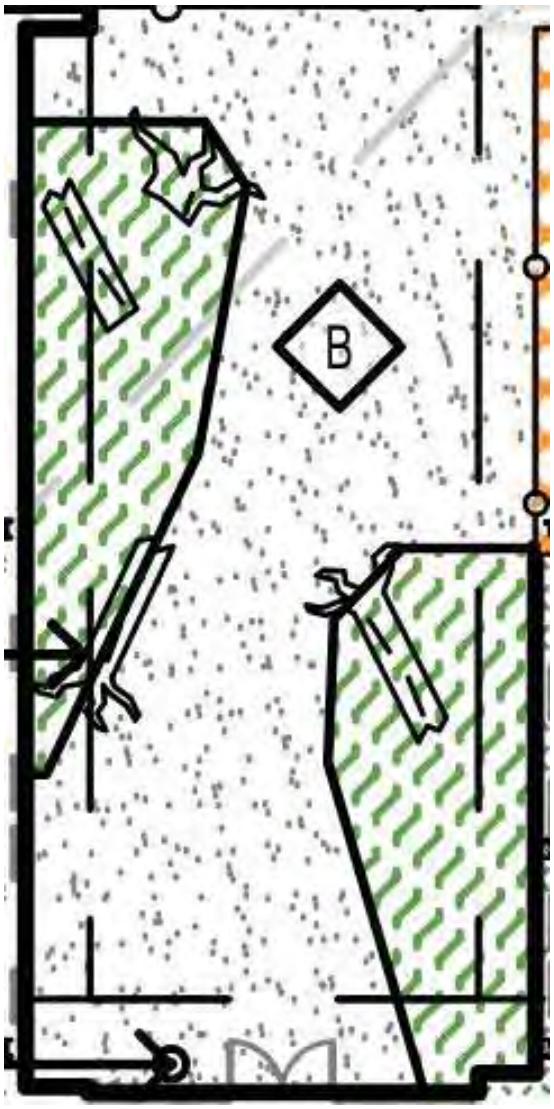
An outdoor learning area can provide equivalent functional space while enhancing educational opportunities and reducing the quantity of concrete paving required. The area could incorporate outdoor classrooms, learning circles, interpretive landscaping, flexible seating, natural play elements, and curriculum-supporting features that align with the educational mission of the school.

Reducing hardscape quantities decreases excavation, aggregate base, concrete placement, reinforcement, and associated site infrastructure costs.

This approach maintains the usability of the space while creating a more engaging and educational environment for students. Outdoor learning environments have become increasingly common in modern elementary school design and can support science, reading, art, small group instruction, and social-emotional learning activities.

Workbook ID: C-37	Develop north courtyard as outdoor learning area ILO paved concrete walkway.
Function(s): Educate Students; Connect Outdoors	**Includes Idea(s)**: 151

Baseline Concept Illustration



Baseline Concept of North Courtyard

Workbook ID: C-37	Develop north courtyard as outdoor learning area ILO paved concrete walkway.
Function(s): Educate Students; Connect Outdoors	**Includes Idea(s)**: 151

Alternative Concept Illustration



Alternative Concept Showing Outdoor Learning Spaces

Workbook ID: C-37	Develop north courtyard as outdoor learning area ILO paved concrete walkway.							
Function(s): Educate Students; Connect Outdoors						**Includes Idea(s):** 151		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Concrete sidewalk	35.48%	CY	475	300.00	193,059	461	300.00	187,369
Imported Topsoil Type A (6" at planting areas and lawn)	35.48%	CY	1,988	60.00	161,601	1,977	60.00	160,706
Hydroseed Lawn	35.48%	SF	33,337	0.25	11,291	32,737	0.25	11,088
Perennial & Shrub Container Stock Planting	35.48%	SF	36,500	7.00	346,151	37,100	7.00	351,842
Crushed Rock Surfacing, 4" Base Course, 2" Top Course	35.48%	SF	2,555	2.90	10,038	3,685	2.90	14,478
Outdoor Learning Area	35.48%	ALW				1	30,000.00	40,644
TOTAL COSTS*					**722,000**			**766,000**
							TOTAL (PROPOSED less BASELINE)	**44,000**

Note: Total Costs are rounded to nearest thousand dollars

COST

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Workbook ID: C-39	Add a second site entrance to S Dewey St and separate parent and bus loops with no shared aisle.
Function(s): Circulate Traffic; Separate Modes	**Includes Idea(s)**: 71

Baseline Concept:

In the baseline concept, the site is accessed from a single entrance with buses, staff, and parent vehicles sharing drive aisles within the parking area. The bus loop and parent drop-off overlap in circulation, and the parking lot provides approximately 125 stalls served by 20-foot two-way aisles with angled parking.

Alternative Concept:

In the alternative concept, a second site entrance is added on S Dewey Street to the north, dedicated to bus and staff traffic. Buses and staff enter from Dewey and circulate through the northern loop, which provides 76 perpendicular parking stalls served by one-way aisles. Parents enter from the southern Lomax Street entrance and circulate through an independent loop with 83 angled parking stalls and a dedicated drop-off zone. No drive aisles are shared between the two user groups. Total stall count increases to 159. The alternative layout and stall count are based on the updated SD plans from the design team, not the original SD set provided to the VE team.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**+**	Environmental Sustainability	**=**
Aesthetics	**=**	Schedule	**=**
Durability & Reliability	**=**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**+**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 988,000	$ NA	$ NA
Alternative Concept	$ 927,000	$ NA	$ NA
Cost Difference	**$ -61,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: C-39	Add a second site entrance to S Dewey St and separate parent and bus loops with no shared aisle.
Function(s): Circulate Traffic; Separate Modes	**Includes Idea(s)**: 71

Recommendation:

Recommend accepting this alternative. Separating bus and parent circulation eliminates the highest-risk conflict point in the site layout and resolves the shared-aisle condition that contributed to queuing and safety concerns at the existing school.

Alternative Concept

Advantages	Disadvantages
• Eliminates bus-parent vehicle conflicts by providing fully independent circulation loops with no shared aisles	• Adds cost for the new Dewey Street entrance, including curb cuts, driveway apron, and any required off-site frontage improvements
• Increases parking capacity from approximately 125 to 159 stalls	• Increases total impervious area, which may increase stormwater detention and treatment requirements
• Distributes site traffic across two access points, reducing congestion at either entrance	• Requires coordination with the City on the new Dewey Street access for sight distance, spacing, and permitting
• Provides a dedicated parent drop-off zone isolated from bus movements, improving pedestrian safety at the point of student transfer	•

Analysis and Justification:

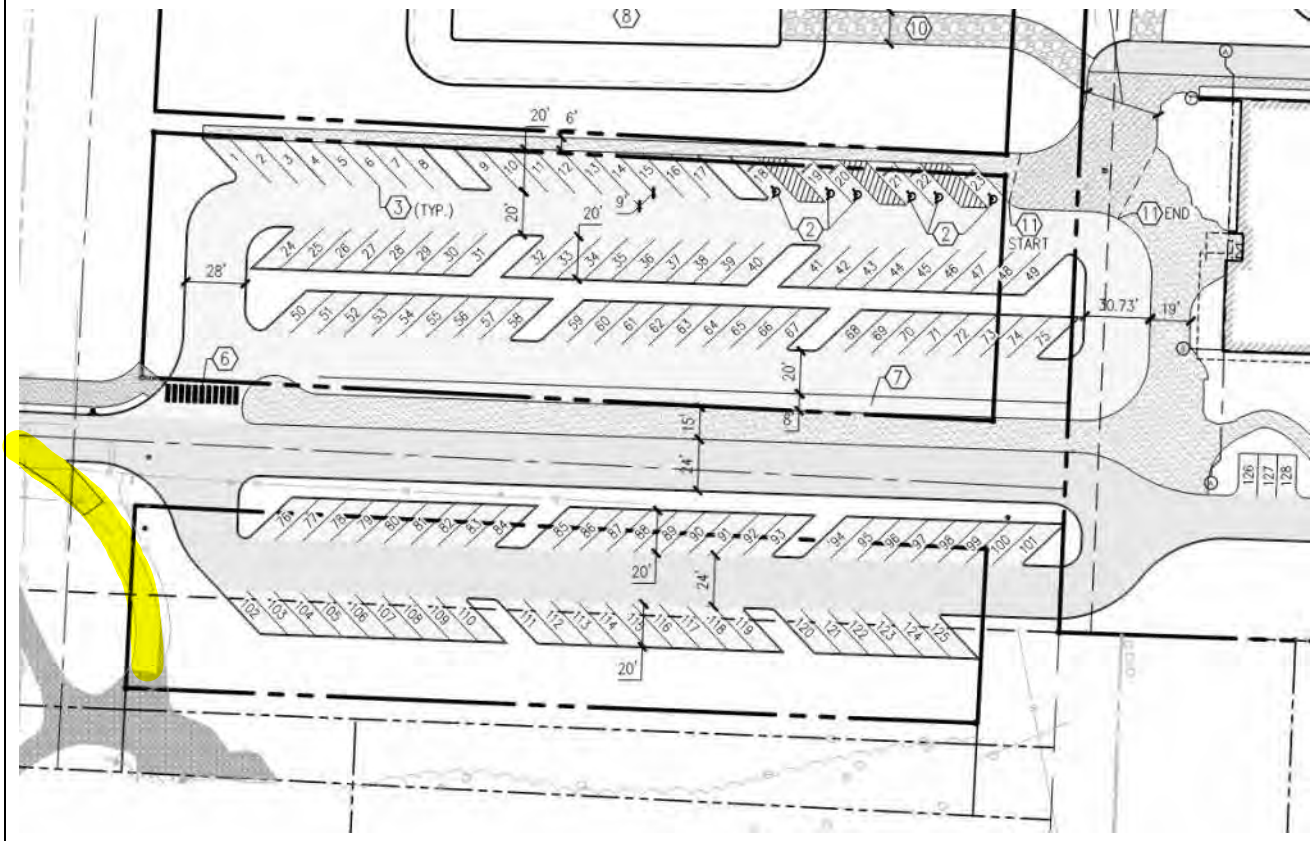
The baseline layout routes buses, staff, and parents through a shared parking area with overlapping drive aisles. This configuration replicates the type of circulation conflicts documented at the existing school, where queuing and mixed vehicle types create congestion and pedestrian safety concerns during arrival and dismissal periods.

The alternative adds a second entrance on S Dewey Street and assigns it exclusively to bus and staff traffic, while parents use the Lomax Street entrance to the south. The two loops operate independently with no shared aisle, eliminating the primary conflict point. The northern bus/staff loop uses perpendicular stalls on one-way aisles, and the southern parent loop uses angled stalls with a dedicated drop-off zone. Total stall count increases to 159 based on the updated SD plans from the design team. This count reflects the more recent design layout and should not be compared directly to the original SD set, which had a different configuration.

The added Dewey Street entrance will require coordination with the City for access permitting. Additionally, the increased impervious area should be evaluated against stormwater requirements.

Workbook ID: C-39	Add a second site entrance to S Dewey St and separate parent and bus loops with no shared aisle.
Function(s): Circulate Traffic; Separate Modes	**Includes Idea(s)**: 71

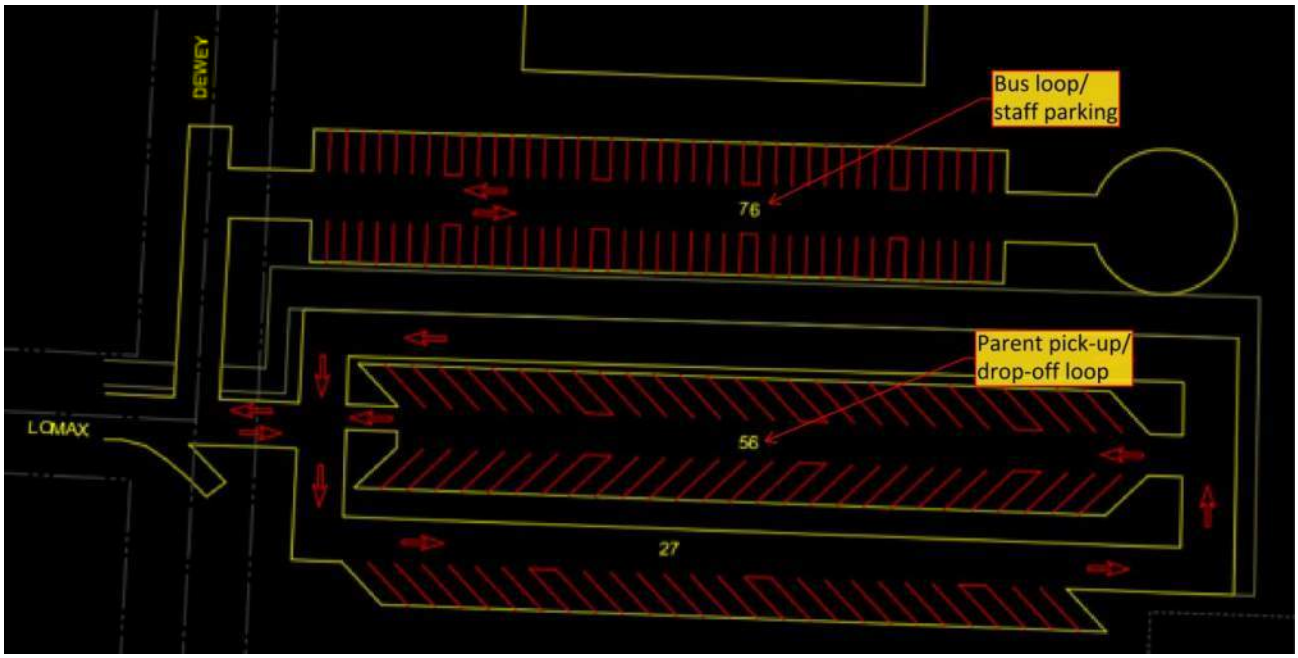
Baseline Concept Illustration



Existing Parking Lot Layout

Workbook ID: C-39	Add a second site entrance to S Dewey St and separate parent and bus loops with no shared aisle.
Function(s): Circulate Traffic; Separate Modes	**Includes Idea(s)**: 71

Alternative Concept Illustration



Alternative Parking Lot Layout

Workbook ID: C-39	Add a second site entrance to S Dewey St and separate parent and bus loops with no shared aisle.							
Function(s): Circulate Traffic; Separate Modes						**Includes Idea(s):** 71		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Heavy Duty Asphalt	35.48%	Ton				1,539	150.00	312,756
Light Duty Asphalt	35.48%	Ton				605	150.00	122,948
Heavy Duty Asphalt	35.48%	Ton	1,835	150.00	372,909			
Light Duty Asphalt	35.48%	Ton	600	150.00	121,932			
CSTC (Asphalt Paving)	35.48%	Ton	3,325	50.00	225,236	2,930	50.00	198,478
Concrete Sidewalk	35.48%	CY				520	300.00	211,349
CSTS (Concrete Sidewalk)	35.48%	Ton				550	50.00	37,257
Concrete Sidewalk	35.48%	CY	475	300.00	193,059			
CSTS (Concrete Sidewalk)	35.48%	Ton	500	50.00	33,870			
Signage	35.48%	LS	1	10,000.00	13,548	1	11,000.00	14,903
Paint Striping	35.48%	LS	1	20,000.00	27,096	1	21,500.00	29,128
TOTAL COSTS*					**988,000**			**927,000**
							TOTAL (PROPOSED less BASELINE)	**-61,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

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Workbook ID: C-40	Reduce public sidewalk width.
Function(s): Circulate Pedestrians	**Includes Idea(s)**: 72

Baseline Concept:

In the baseline concept, the FR-01 frontage improvement plan shows a 12-foot-wide concrete sidewalk along the Lomax and Evans Street frontage with a landscape buffer between the curb and sidewalk that varies from approximately 4 feet to 13 feet. The wide sidewalk pushes the back of walk closer to the right-of-way, requiring retaining walls to hold the grade transition within the right-of-way. The baseline carries approximately 495 LF of retaining wall and 12,240 SF of sidewalk. Any wall segment exceeding 2.5 feet of exposed height will require fall protection, adding cost and long-term maintenance.

Alternative Concept:

In the alternative concept, the sidewalk width is reduced to 5 feet and is re-aligned with a 5-foot landscape strip, consistent with the city's minimum guidance for frontage improvements. The narrower sidewalk creates additional space between the back of walk and the maximum permanent slope of 2:1 identified in the geotechnical report, allowing wall heights to be reduced and eliminating approximately 115 LF of wall. The grading extents remain unchanged. Total sidewalk area is reduced from 12,240 SF to approximately 5,100 SF. This alternative assumes the roadway can be constructed as currently shown and does not trigger full street standards per AMC 17.52.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	--	Environmental Sustainability	=
Aesthetics	=	Schedule	+
Durability & Reliability	=	Constructability	+
Total Cost of Ownership / Lifecycle Cost	+	Occupant Comfort, Safety, Performance	--

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 311,000	$ NA	$ NA
Alternative Concept	$ 177,000	$ NA	$ NA
Cost Difference	**$ -134,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: C-40	Reduce public sidewalk width.
Function(s): Circulate Pedestrians	**Includes Idea(s)**: 72

Recommendation:

Accept the alternative. The 12-foot sidewalk exceeds the city's minimum standard and drives unnecessary retaining wall height and length. A 5-foot sidewalk with a 5-foot landscape buffer is consistent with the surrounding neighborhood context and the city's own guidance for these improvements.

Alternative Concept

Advantages	Disadvantages
• Reduces sidewalk area by approximately 7,140 SF and eliminates approximately 115 LF of retaining wall	• Narrower sidewalk does not accommodate side-by-side walking as comfortably
• Lowers wall heights on the remaining segments by using the recovered space to lay back the grade	•
• Reduces the extent of wall segments exceeding 2.5 feet of exposed height, reducing the fall protection requirement	•
•	•
•	•
•	•

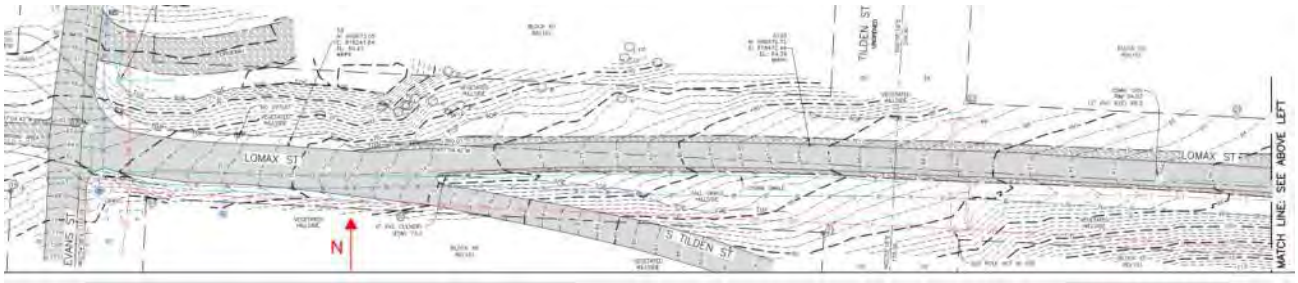
Analysis and Justification:

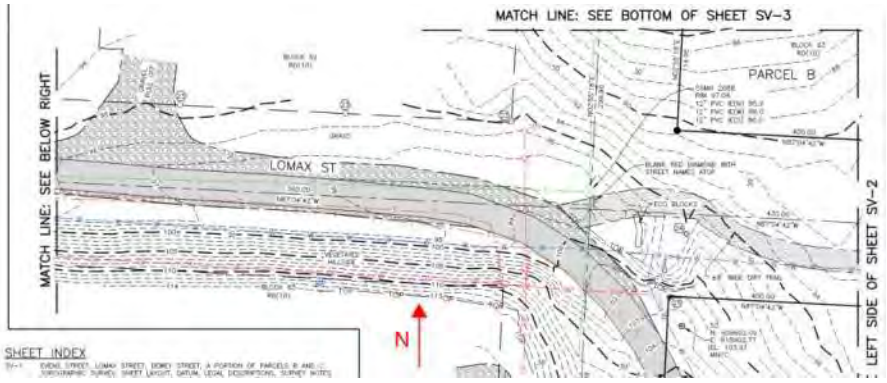
The baseline sidewalk width of 12 feet is wider than what the city's frontage improvement guidance calls for and wider than any comparable sidewalk in the surrounding neighborhood. The oversized width consumes space between the back of walk and the natural slope that could otherwise be used to reduce retaining wall heights. By narrowing to a 5-foot sidewalk with a 5-foot landscape strip, the additional space allows the grade transition behind the walk to be held within the geotechnical report's 2:1 maximum permanent slope, reducing wall heights and eliminating 115 LF of the wall entirely. The cost savings come from three sources: the reduction in concrete sidewalk area from 12,240 SF to 5,100 SF, the reduced retaining wall quantity, and the reduction in fall protection scope where walls currently exceed 2.5 feet of exposed height. A 5-foot sidewalk is the standard pedestrian facility width for residential frontages and is adequate for an elementary school where the primary pedestrian demand is at the building entrances, not along the public street frontage.

Workbook ID: C-40	Reduce public sidewalk width.
Function(s): Circulate Pedestrians	**Includes Idea(s)**: 72

Baseline Concept Illustration



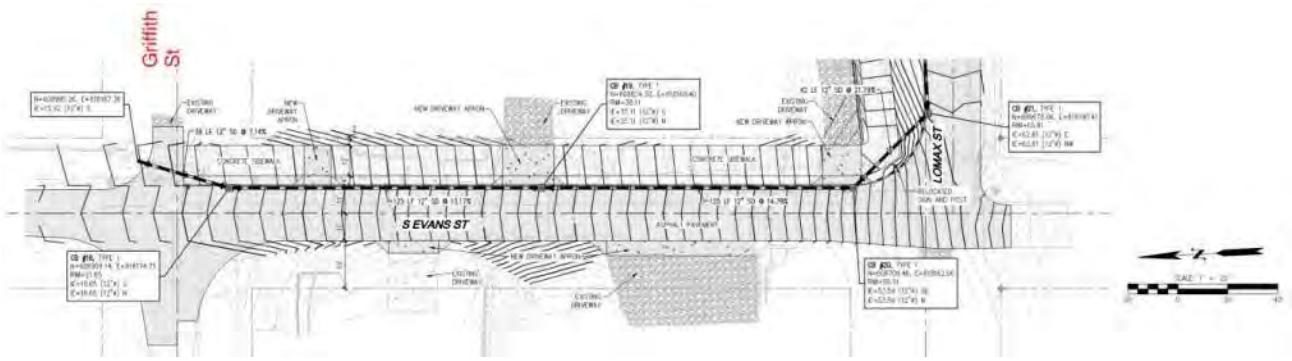


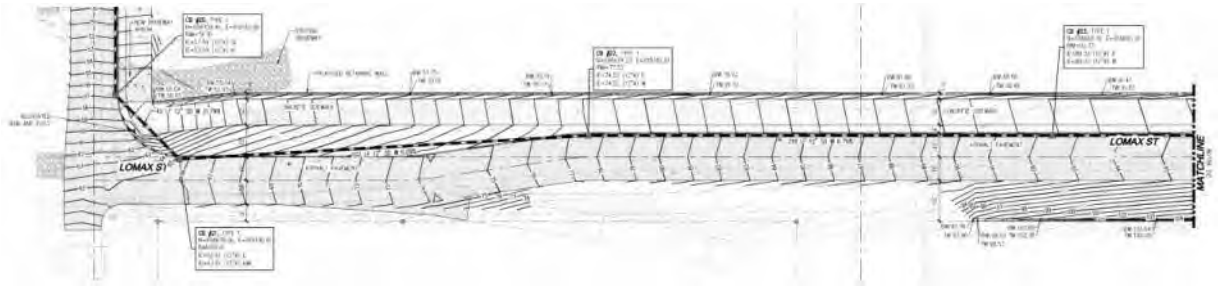


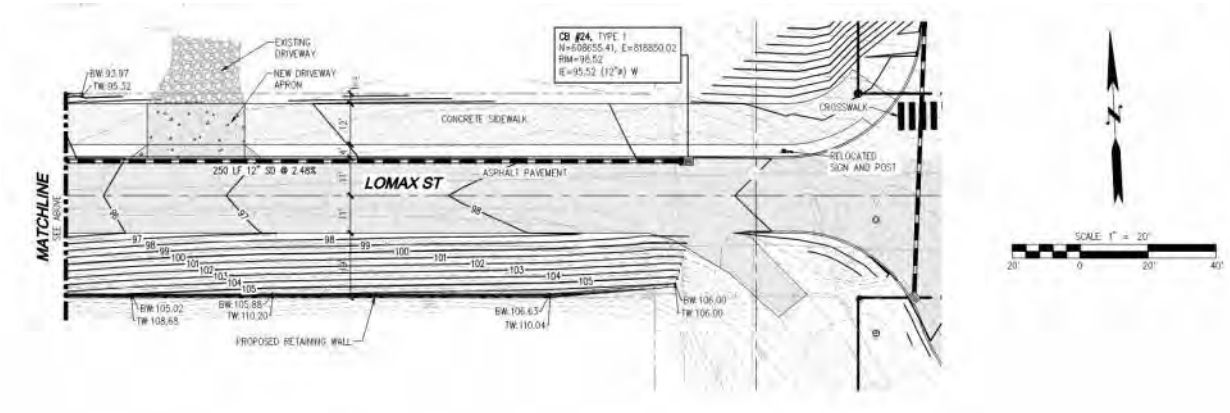
Existing Conditions from Topographic Survey

Workbook ID: C-40	Reduce public sidewalk width.
Function(s): Circulate Pedestrians	**Includes Idea(s)**: 72

Baseline Concept Illustration



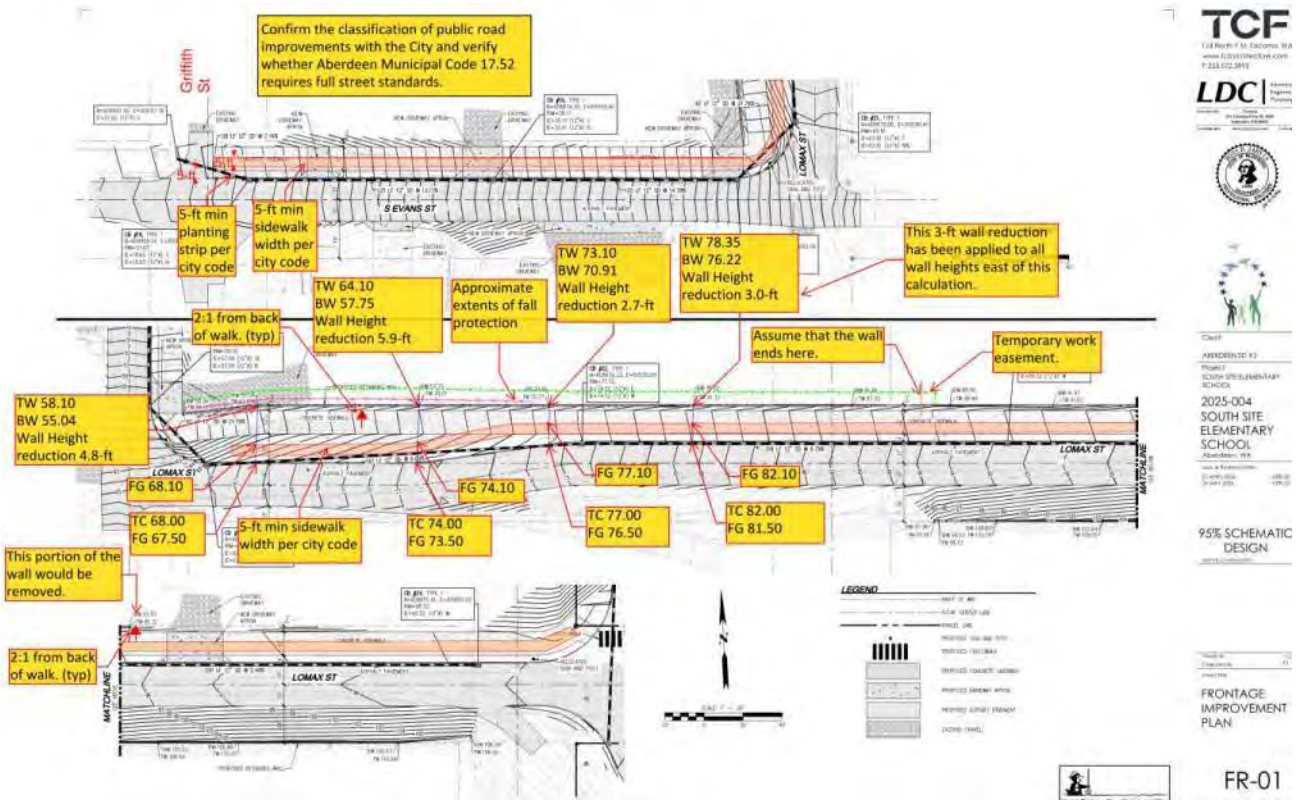




Baseline Proposed Public Improvements

Workbook ID: C-40	Reduce public sidewalk width.
Function(s): Circulate Pedestrians	**Includes Idea(s)**: 72

Alternative Concept Illustration



Alternative Proposed Public Improvements

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Workbook ID: C-40	Reduce public sidewalk width.							
Function(s): Circulate Pedestrians						**Includes Idea(s):** 72		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Concrete Sidewalk	35.48%	SF	135	300.00	54,869	57	300.00	23,167
CSTC (Concrete Sidewalk)	35.48%	Ton	121	50.00	8,197	50	50.00	3,387
Wall Length (Estimate Adjustment)	35.48%	LF	495	200.00	134,125	380	200.00	102,965
3-Rail Metal Guardrail with 4" Toe Kick (Estimate Adjustment)	35.48%	LF	375	195.00	99,070	180	195.00	47,553
Assumed Earthwork (None Shown in Cost Estimate)	35.48%	CY	192	55.00	14,307			
TOTAL COSTS*					**311,000**			**177,000**
							TOTAL (PROPOSED less BASELINE)	**-134,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

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Workbook ID: C-41	Add sidewalk to south of staff parking for bus drop off.
Function(s): Circulate Traffic	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, buses, staff, and parent vehicles share drive aisles within the parking area. Bus loading occurs within the same circulation zone as parent drop-off, with no dedicated bus staging area or separated pedestrian path for bus riders.

Alternative Concept:

In the alternative concept, a dedicated bus drop-off area and new sidewalk are added along the south side of the staff parking lot. Buses circulate to the south with a turnaround loop and stage at designated bays adjacent to the new sidewalk. Parent drop-off is assigned to the middle zone. Both bus and parent students are received at the center sidewalk area. Staff parking remains in the upper rows. Buses and parents share the site entrance but follow separated drive aisles to their respective staging areas. The layout provides 119 parking stalls based on the updated SD plans.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**+**	Environmental Sustainability	**=**
Aesthetics	**=**	Schedule	**=**
Durability & Reliability	**=**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**--**	Occupant Comfort, Safety, Performance	**+**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 909,000	$ NA	$ NA
Alternative Concept	$ 754,000	$ NA	$ NA
Cost Difference	**$ -155,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: C-41	Add sidewalk to south of staff parking for bus drop off.
Function(s): Circulate Traffic	**Includes Idea(s)**:

Recommendation:

Accept this alternative to separate bus and parent vehicle circulation so that the two modes do not share drive aisles, eliminating vehicle-to-vehicle conflicts without requiring a second site entrance.

Alternative Concept

Advantages	Disadvantages
• Separates bus and parent vehicle circulation into independent paths, eliminating drive-aisle conflicts between the two modes	• Reduces parking capacity from approximately 125 to 119 stalls to accommodate the dedicated bus staging area
• Adds a dedicated bus staging area with a new sidewalk connection to the center student receiving area	• Buses and parents still share the site entrance and a portion of the internal drive aisle before splitting to their respective zones
• Retains the existing single-entrance configuration while improving internal circulation separation	•
•	•
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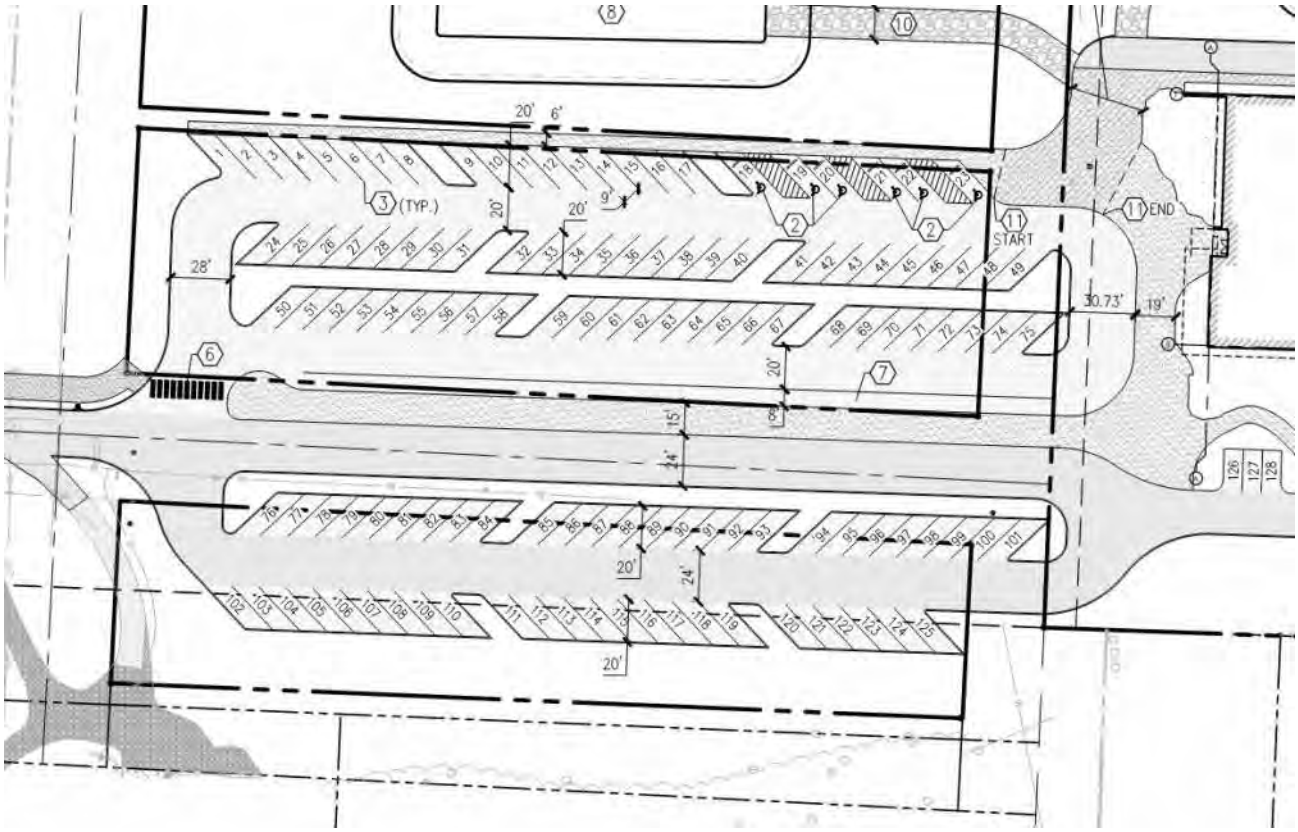
Analysis and Justification:

The current design assumes a parent drop off to the North of the Pedestrian Peninsula and Bus drop off to the same Pedestrian Peninsula. This combines and congests student pedestrians arriving simultaneously from both modes of transportation.

The alternative seeks to develop two separate drop-off areas, with a secondary sidewalk for the bus drop along the south edge of the bus circulation route. Buses circulate to the south and stage at designated bays, with a more efficient circulation pattern that also eliminates a long section of heavy-duty pavement.

Workbook ID: C-41	Add sidewalk to south of staff parking for bus drop off.
Function(s): Circulate Traffic	**Includes Idea(s)**:

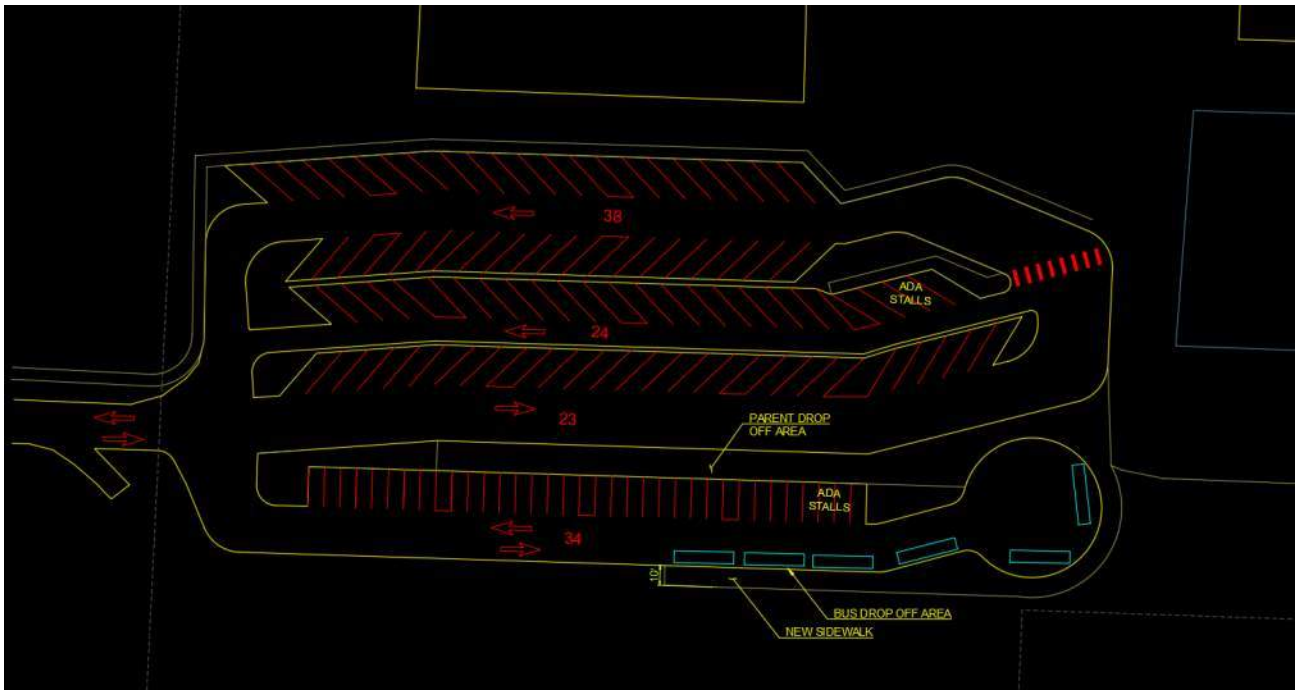
Baseline Concept Illustration



Existing Parking Lot Configuration

Workbook ID: C-41	Add sidewalk to south of staff parking for bus drop off.
Function(s): Circulate Traffic	**Includes Idea(s)**:

Alternative Concept Illustration



Alternative Parking Lot Configuration

Workbook ID: C-41	Add sidewalk to south of staff parking for bus drop off.							
Function(s): Circulate Traffic						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Asphalt Paving	35.48%	Ton	2,250	150.00	457,245	1,565	150.00	318,039
CSTC (Asphalt Paving)	35.48%	Ton	3,325	50.00	225,236	2,315	50.00	156,818
Ped Concrete	35.48%	CY	475	300.00	193,059	579	300.00	235,329
CSTC (Concrete Sidewalks)	35.48%	CY	500	50.00	33,870	640	50.00	43,354
TOTAL COSTS*					**909,000**			**754,000**
							TOTAL (PROPOSED less BASELINE)	**-155,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: C-42	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.
Function(s): Manage Stormwater, Drain Site, Support Play	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, the oval playfield is graded on native soil with no subsurface drainage system. Stormwater from the south hillside sheet flows directly onto the play surface. Field runoff sheet flows off the northern edge and down the hill.

Alternative Concept:

In the alternative concept, a French drain is installed along the south side of the playfield to intercept hillside runoff before it reaches the play surface. The drain system outlets to a dispersion trench on the downhill (north) side of the field, providing a gravity-fed positive discharge down the natural slope. A sand/topsoil root zone mix over the drain tiles improves surface drainage within the interceptor zone.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**+**	Environmental Sustainability	**=**
Aesthetics	**=**	Schedule	**--**
Durability & Reliability	**+**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**+**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 0	$ NA	$ NA
Alternative Concept	$ 104,000	$ NA	$ NA
Cost Difference	**$ 104,000**	$ NA	$ NA
Cost Addition	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: C-42	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.
Function(s): Manage Stormwater, Drain Site, Support Play	**Includes Idea(s)**:

Recommendation:

Recommend accepting this alternative. The playfield sits at the base of a significant slope with poor-draining native soils. Without subsurface drainage, the field will likely be seasonally unusable in Aberdeen's wet climate.

Alternative Concept

Advantages	Disadvantages
• Intercepts hillside runoff before it saturates the play surface, addressing the primary source of wet-field conditions	• Adds construction cost for French drain, drain tile, granular backfill, sand/topsoil mix, and dispersion trench
• Provides a gravity-fed outlet via dispersion trench, requiring no connection to the storm system	• Drain invert elevations must be verified against seasonal groundwater levels from the geotechnical data to confirm system effectiveness
• Extends the usable season of the playfield, a core program element for an elementary school	•
• Improves turf durability and reduces long-term turf repair and re-establishment costs	•
•	•
•	•

Analysis and Justification:

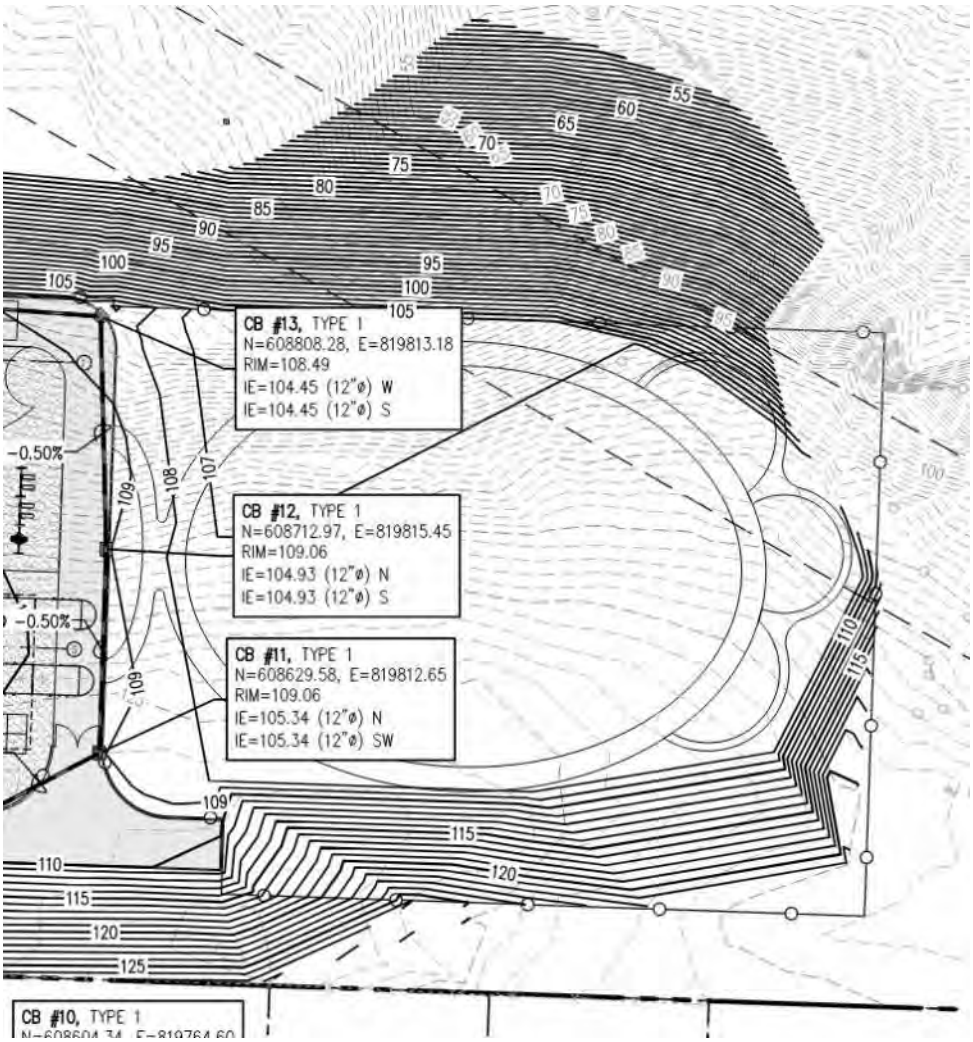
The playfield is sited at the base of a south-facing hillside. Without interception, the play surface is likely to be saturated and unusable for extended periods in Aberdeen's climate.

The alternative installs a perimeter French drain system to intercept hillside flow before it reaches the field and to collect water from within the field root zone. The system discharges to a dispersion trench on the north (downhill) side. A sand/topsoil root zone layer over the drain tiles promotes rapid surface drainage consistent with standard athletic field subdrainage practice.

The design team should verify that proposed drain invert elevations are above the seasonal high groundwater elevation at the field location using the nearest geotechnical borings. Adequate vertical separation between the drains and the water table is necessary for the system to function as intended.

Workbook ID: C-42	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.
Function(s): Manage Stormwater, Drain Site, Support Play	**Includes Idea(s)**:

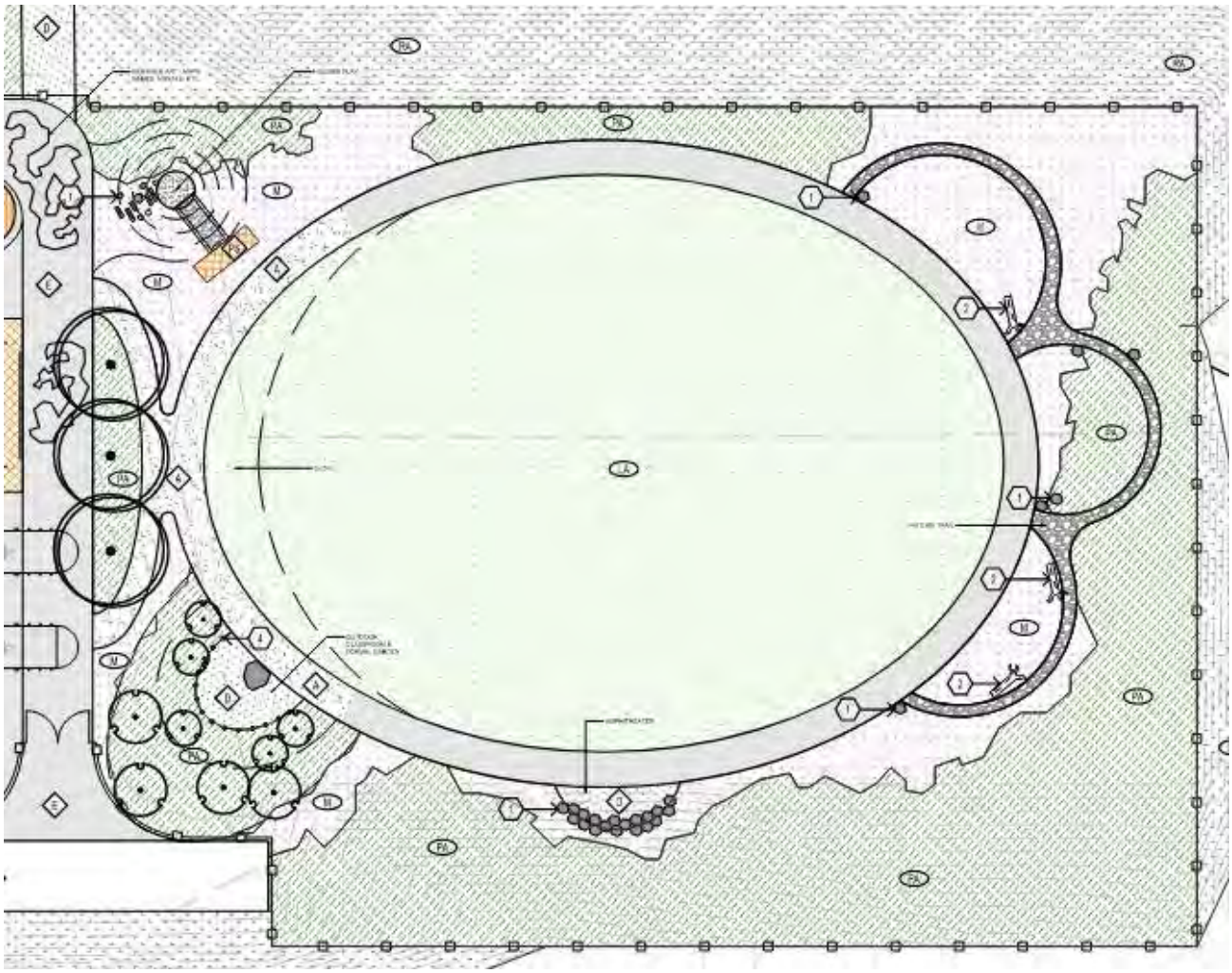
Baseline Concept Illustration



Existing Field Grading a Storm Sewer Plan

Workbook ID: C-42	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.
Function(s): Manage Stormwater, Drain Site, Support Play	**Includes Idea(s)**:

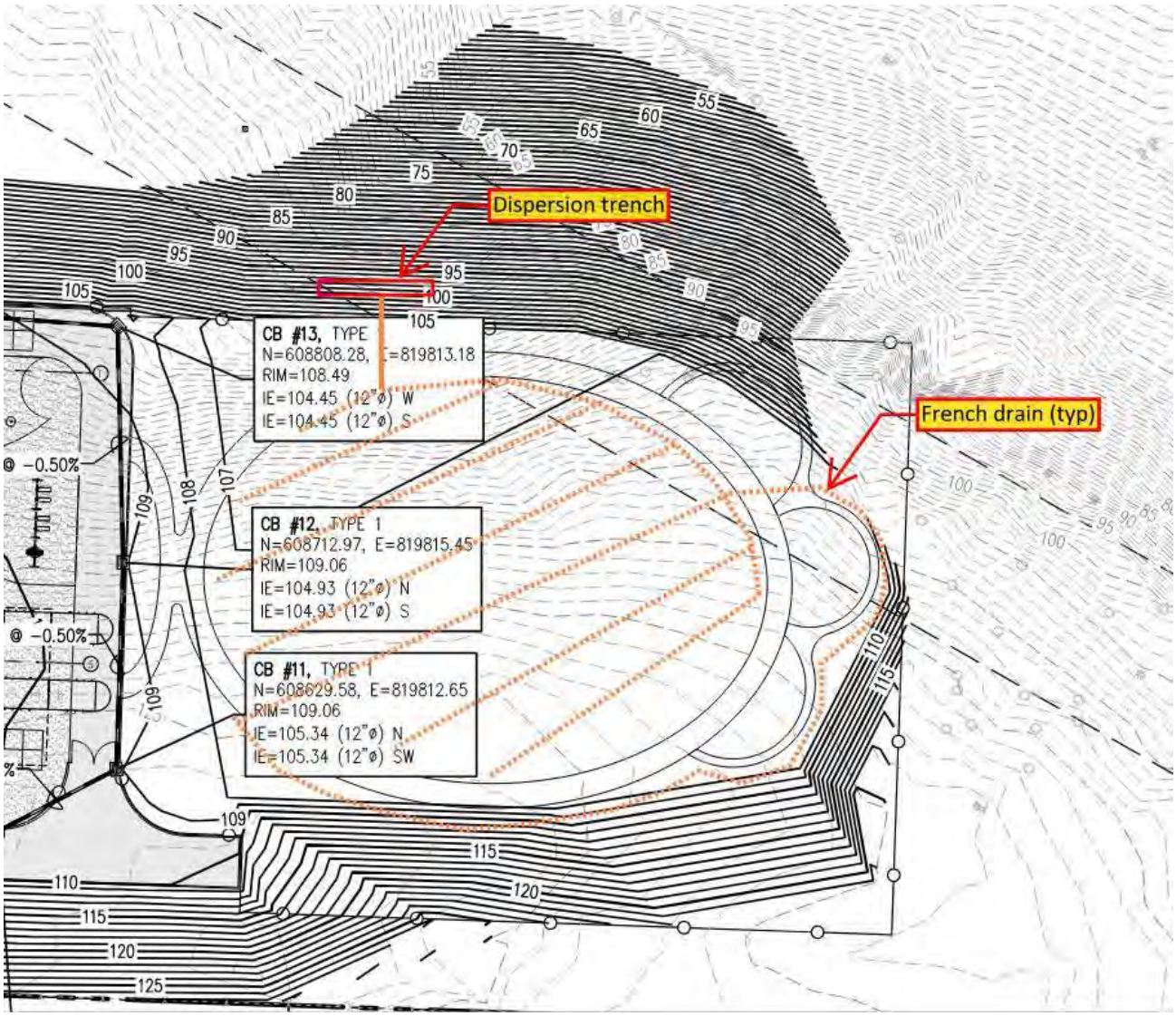
Baseline Concept Illustration



Existing Field Landscape Plan

Workbook ID: C-42	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.
Function(s): Manage Stormwater, Drain Site, Support Play	**Includes Idea(s)**:

Alternative Concept Illustration



Alternative French Drain / Underdrain System

Workbook ID: C-42	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.
Function(s): Manage Stormwater, Drain Site, Support Play	**Includes Idea(s)**:

Alternative Concept Illustration

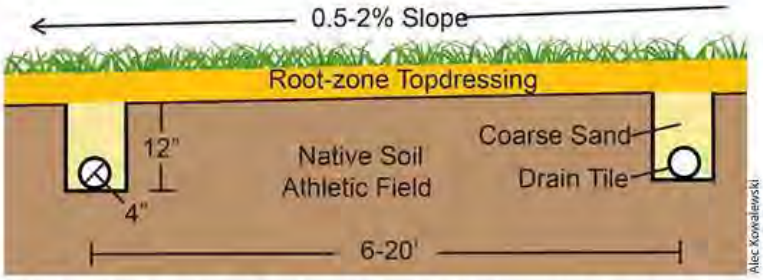


Figure 11. The sand cap build-up method utilizes drain tile installation and then sequential top-dressing applications to develop a sand-based system over time.

little or no permeability, install drainage lines to intercept and carry away excessive water. These lines should be installed by methods already described. In later years the option is open to reconstruct the field utilizing the shallow sand profile.

In order to accommodate regulation play, it is important to practice the highest quality maintenance program. This would include aerification, overseeding to maintain dense populations of grass, and careful watering programs to avoid soil saturation, especially at or near time of play. Good nutritional programs will ensure adequate growth and recovery from wear. This alternative is the cheapest option of the three described, and to be successful it requires careful maintenance combined with carefully regulated use.

4. **Sand cap build-up system:** The fourth renovation option is the sand cap build-up system, which can be done in two simple steps:
   1. Install intercept drain tiles into existing fields, and then
   2. Build up a sand layer over the native soil using sequential sand top-dressing applications (Figure 11). The general idea is to cut drains into the existing field running lengthwise on 6- to 20-foot centers, depending on the surface grade and slope; put drain tile in the lines; and backfill with coarse sand or fine gravel. After the drain lines have been backfilled to field level, begin a 2-year, top-dressing program with the goal of developing a 2-inch, sand-based profile over time.

References

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Moreland, J.W. 1986. "Sports Turf Drainage: A Battle of Two Forces." *SportsTurf*. 18, 20, and 21.

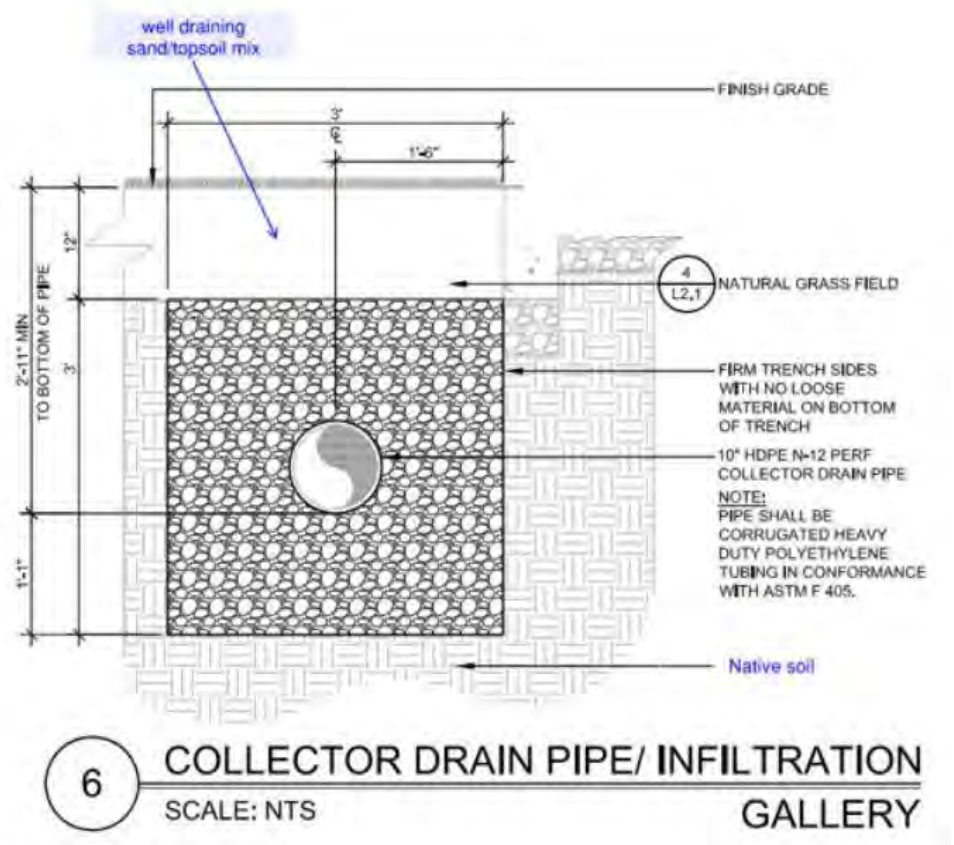
Robey, M. J. 1979. "SportsTurf all-weather fields: Natural grass at its best!" 34th Annual Texas Turfgrass Conference Proceedings. Texas A & M University, College Station, TX. 31–35.

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12

Excerpt from Best Management Practices for Construction of Sand-based Natural Grass Athletic Fields

Workbook ID: C-42	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.
Function(s): Manage Stormwater, Drain Site, Support Play	**Includes Idea(s)**:



Typical French Drain Detail

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Workbook ID: C-42	Add perimeter French drain and dispersion trench around playfield to improve year-round play surface.							
Function(s): Manage Stormwater, Drain Site, Support Play						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
6" Storm Pipe, incl trenching and backfill	35.48%	LF				38	65.00	3,346
6" Perf Pipe	35.48%	LF				1,660	21.00	47,228
Drain Rock	35.48%	CY				555	45.00	33,836
Geotextile	35.48%	SF				21,700	0.45	13,230
Dispersion Trench, per detail	35.48%	LF				50	100.00	6,774
TOTAL COSTS*								**104,000**
							TOTAL (PROPOSED less BASELINE)	**104,000**

Note: Total Costs are rounded to nearest thousand dollars COST

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Workbook ID: C-43	Remove stormwater treatment on the east side of the site.
Function(s): Manage Stormwater, Control Pollutants	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, stormwater runoff from the east-side maintenance and fire access drive aisles is collected by a series of catch basins (CB #8, #15, #16, #17) and conveyed through 12-inch storm drain piping to a mechanical treatment system (TS #2) before discharging to the detention pond and dispersion tees. This configuration treats the gated drive aisles as pollution-generating surfaces requiring water quality treatment.

Alternative Concept:

In the alternative concept, the east-side drive aisles are classified as non-pollution-generating surfaces based on their gated, restricted-access condition, limited to occasional maintenance vehicles and emergency apparatus. The mechanical treatment system (TS #2), associated catch basins, and connecting storm drain piping are removed. Stormwater from the drive aisles is directed to the detention pond via sheet flow or simplified conveyance without quality treatment. Flow control and detention functions are retained.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**=**
Aesthetics	**=**	Schedule	**+**
Durability & Reliability	**+**	Constructability	**+**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 310,000	$ NA	$ NA
Alternative Concept	$ 242,000	$ NA	$ NA
Cost Difference	**$ -68,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: C-43	Remove stormwater treatment on the east side of the site.
Function(s): Manage Stormwater, Control Pollutants	**Includes Idea(s)**:

Recommendation:

Recommend accepting the alternative. Reclassify the gated east-side drive aisles as non-pollution-generating surfaces and remove the associated stormwater quality treatment system to reduce cost, maintenance burden, and construction complexity.

Alternative Concept

Advantages	Disadvantages
• Eliminates the capital cost of one mechanical treatment system (TS #2) and associated catch basins, piping, and structures	• Requires jurisdictional confirmation that gated, restricted-access drive aisles qualify as non-pollution-generating surfaces under the Western Washington Stormwater Manual and local standards
• Reduces long-term maintenance obligations, mechanical treatment systems require periodic inspection, media replacement, and sediment removal	•
• Simplifies the east-side stormwater conveyance system, reducing the number of underground structures subject to corrosive soil conditions	•
•	•

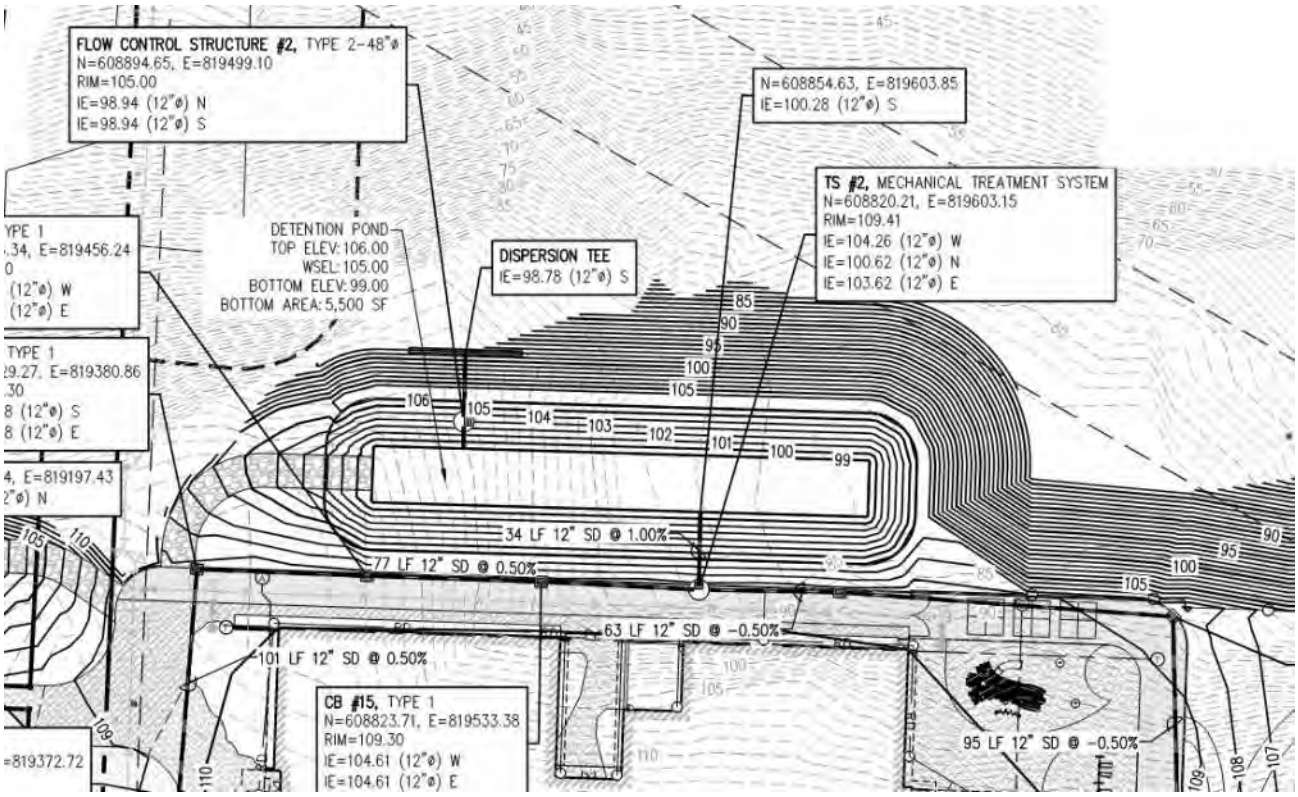
Analysis and Justification:

The east side of the site is enclosed by a gated perimeter that restricts vehicular access to maintenance staff and fire apparatus. These drive aisles do not serve daily parent, bus, or staff traffic and are not exposed to routine pollutant-generating activity such as high-frequency turning movements, fueling, or parking. Under the Western Washington Stormwater Manual, pollution-generating impervious surfaces are generally defined by their exposure to vehicular use, industrial activity, or other pollutant sources. A gated fire access lane with infrequent, low-speed vehicle use does not meet the typical threshold for classification as a pollution-generating surface.

The key implementation step is confirming with the City of Aberdeen and the permitting authority that the gated classification supports reclassification. If confirmed, the design team can remove TS #2, the associated catch basins, and the connecting piping, and revise grading to direct east-side runoff to the detention pond via sheet flow. A new outfall pipe would convey pond discharge directly, bypassing the removed treatment infrastructure.

Workbook ID: C-43	Remove stormwater treatment on the east side of the site.
Function(s): Manage Stormwater, Control Pollutants	**Includes Idea(s)**:

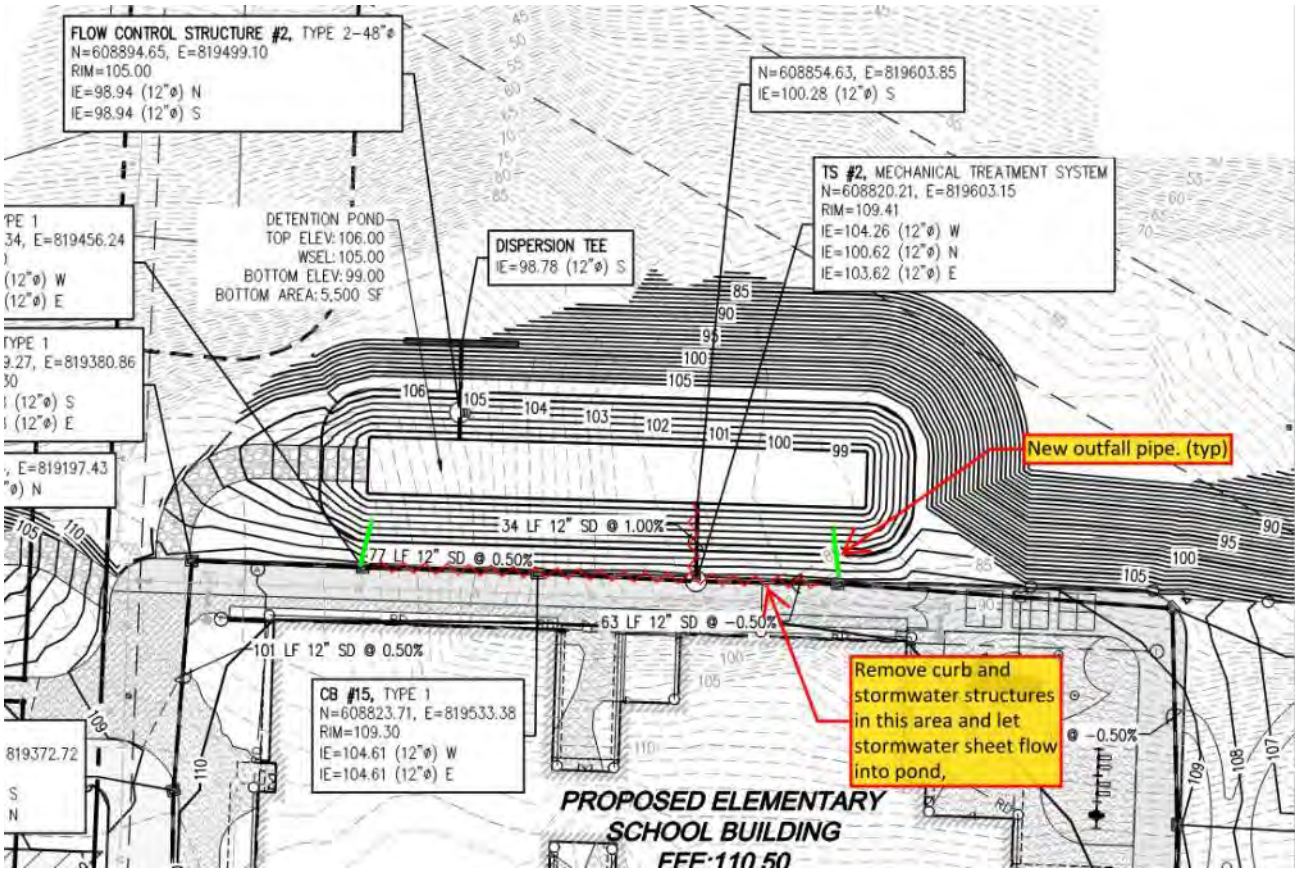
Baseline Concept Illustration



Existing Treatment System on the East Side of the Site

Workbook ID: C-43	Remove stormwater treatment on the east side of the site.
Function(s): Manage Stormwater, Control Pollutants	**Includes Idea(s)**:

Alternative Concept Illustration



Removing Treatment Infrastructure on the East Side of the Site

Workbook ID: C-43	Remove stormwater treatment on the east side of the site.							
Function(s): Manage Stormwater, Control Pollutants						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
12" PVC Storm Pipe	35.48%	LF	243	85.00	27,983	201	85.00	23,147
Concrete curb	35.48%	LF	2,700	65.00	237,767	2,490	65.00	219,274
Type 1 Catch Basin	35.48%	EA	2	4,000.00	10,838			
Mechanical Treatment Vault (Estimate adjustment, not currently shown)	35.48%	EA	1	25,000.00	33,870			
TOTAL COSTS*					**310,000**			**242,000**
							TOTAL (PROPOSED less BASELINE)	**-68,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: E-109	Expand rooftop solar PV system beyond code-minimum array.
Function(s): Generate Energy	**Includes Idea(s)**:

Baseline Concept:

The current schematic design includes a code-compliance rooftop photovoltaic system consisting of 68 solar panels at 580 W each, for a total array size of approximately 39.44 kW-DC. The design also identifies solar readiness zones on the roof for future expansion.

Alternative Concept:

Expand the rooftop photovoltaic system within the available solar readiness area to approximately 136 kW DC / 100 kW AC, based on HelioScope solar modeling. The expanded system includes approximately 252 Silfab 540 W modules and is modeled to produce approximately 149.1 MWh annually.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**+**	Environmental Sustainability	**+**
Aesthetics	**=**	Schedule	**=**
Durability & Reliability	**+**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 159,000	$ NA	$ NA
Alternative Concept	$ 553,000	$ NA	$ NA
Cost Difference	**$ 394,000**	$ NA	$ NA
Cost Addition	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: E-109	Expand rooftop solar PV system beyond code-minimum array.
Function(s): Generate Energy	**Includes Idea(s)**:

Recommendation:

Recommend accepting the alternative to increase onsite renewable energy generation, reduce purchased utility electricity, and better utilize the solar readiness area already identified in the schematic design.

Alternative Concept

Advantages	Disadvantages
• Increases onsite renewable energy production	• Increases initial construction cost – but assumed offset by Commerce grant
• Produces approximately 149 MWh electricity annually	• Requires additional PV modules, racking, and electrical equipment
• Reduces purchased utility electricity	• Requires coordination with roof design and structural loading
• Reduces greenhouse gas emissions	•
• Improves long-term energy cost performance	•
• Lower total cost of ownership and higher ROI provided Dept. of Commerce grant funding	•

Analysis and Justification:

The current schematic design includes a code-minimum rooftop PV system. The alternative expands the system to better utilize available roof area and increase onsite renewable energy generation.

HelioScope solar modeling indicates that a 136.08 kW DC / 100 kW AC rooftop PV system will produce approximately 149.1 MWh annually with an 85.2% performance ratio. The system uses 252 Silfab 540 W modules and a SolarEdge 100 kW inverter.

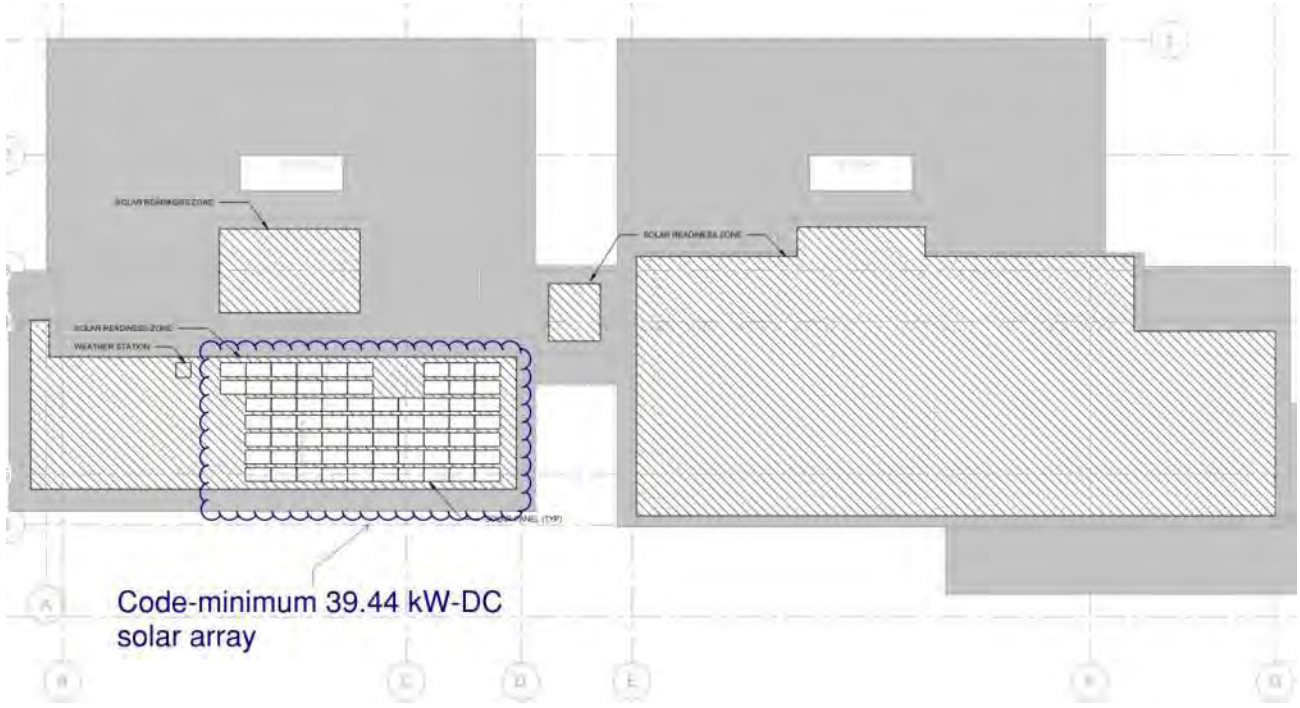
Expanding the PV system during design is more cost-effective than a future retrofit and allows the electrical and structural systems to be coordinated before construction. The alternative increases initial cost but improves long-term operating cost performance and environmental sustainability.

For improved resiliency, rural communities moving to higher ground to avoid tsunami inundation zones are likely to receive priority consideration under Department of Commerce grant application reviews.

Due to utility cost increases lifecycle cost savings should be expected to benefit the District with lower total cost of operations. It is assumed that an LCCA would be included in any grant application.

Workbook ID: E-109	Expand rooftop solar PV system beyond code-minimum array.
Function(s): Generate Energy	**Includes Idea(s)**:

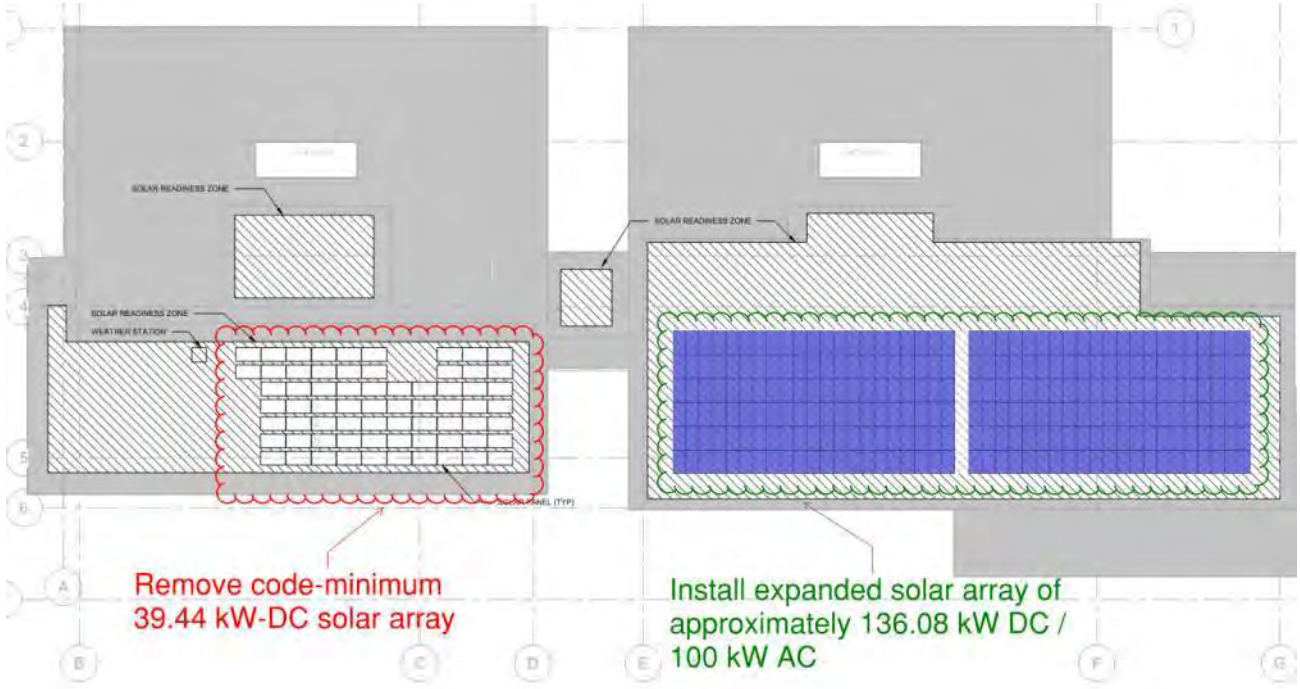
Baseline Concept Illustration



Baseline PV Array Concept (E6.01)

Workbook ID: E-109	Expand rooftop solar PV system beyond code-minimum array.
Function(s): Generate Energy	**Includes Idea(s)**:

Alternative Concept Illustration



Alternative PV Array Concept

Workbook ID: E-109	Expand rooftop solar PV system beyond code-minimum array.							
Function(s): Generate Energy						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
136 kW-DC solar array	35.48%	kW	39	3,000.00	158,512	136	3,000.00	552,758
TOTAL COSTS*					**159,000**			**553,000**
							TOTAL (PROPOSED less BASELINE)	**394,000**

Note: Total Costs are rounded to nearest thousand dollars COST

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Workbook ID: E-110	Pursue EV Bus grant opportunities.
Function(s): Generate Energy	**Includes Idea(s)**:

Baseline Concept:

The baseline schematic design includes passenger electric vehicle charging, EV-ready stalls, and EV-capable stalls to support future expansion. These provisions are intended for passenger vehicle charging and do not specifically accommodate future electric school bus charging or bi-directional vehicle-to-building (V2B) applications.

Alternative Concept:

The alternative concept includes applying for grant funding to provide electrical infrastructure within the Service Yard to support future installation of two 30 kW DC fast chargers serving Aberdeen School District's school bus fleet. The proposed work includes a dedicated 100A, 480/277V distribution panel, appropriately sized conduit pathways, and reserved equipment space to accommodate future fleet electrification. Installing this infrastructure during initial construction minimizes future trenching and electrical modifications while preserving flexibility for phased implementation as funding becomes available. The enhancement positions the District to pursue future transportation electrification grants and supports future bidirectional vehicle-to-building (V2B) capability serving the facility.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**+**	Environmental Sustainability	**+**
Aesthetics	**=**	Schedule	**=**
Durability & Reliability	**+**	Constructability	**+**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**+**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 0	$ NA	$ NA
Alternative Concept	$ 95,000	$ NA	$ NA
Cost Difference	**$ 95,000**	$ NA	$ NA
Cost Addition	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: E-110	Pursue EV Bus grant opportunities.
Function(s): Generate Energy	**Includes Idea(s)**:

Recommendation:

Recommend accepting the alternative to apply for grant funding to provide future fleet electrification capability and resiliency benefits at a modest initial cost increase.

Alternative Concept

Advantages	Disadvantages
• Positions the district for future school bus electrification with grant funding	• Adds modest first cost
• Minimizes future demolition and pavement restoration	• Defers charger procurement
• Supports phased implementation as grant funding becomes available	• Final charging locations depend on district fleet operations
• Enables future bidirectional charging (V2B/V2G) capability	• Bidirectional charging will require future utility coordination and controls
• Enables demand charge management	• Grant funding is competitive and subject to award
• Aligns with Washington transportation initiatives	•

Analysis and Justification:

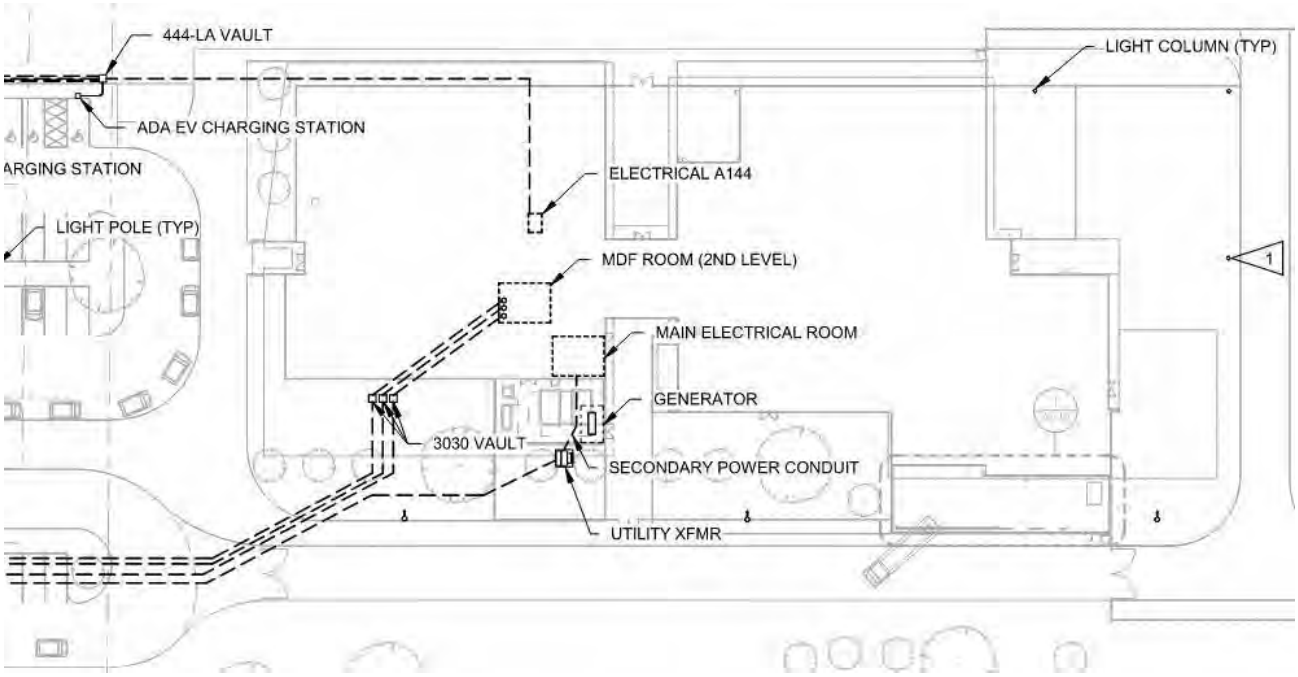
The current schematic design does not include electrical infrastructure supporting future electric school bus charging. Providing dedicated electrical capacity within the Service Yard aligns with existing fleet operations while avoiding future disruption to completed site improvements is feasible with grant funding. EPA grants, as well as Washington State Department of Commerce EV grants are viable options for this addition.

OSPI fleet inventory indicates Aberdeen School District operates four Type A school buses, presenting an opportunity for a phased electrification pilot. Installing the enhanced electrical infrastructure during initial construction leverages planned trenching and electrical distribution, minimizing future retrofit costs.

The proposed enhancement preserves flexibility for future implementation and improves eligibility for transportation electrification grant funding. The infrastructure also positions the District to support future bi-directional vehicle-to-building (V2B) applications serving facilities within the District Service Yard, providing opportunities for demand reduction, resiliency, and operational flexibility as fleet electrification matures.

Workbook ID: E-110	Pursue EV Bus grant opportunities.
Function(s): Generate Energy	**Includes Idea(s)**:

Baseline Concept Illustration



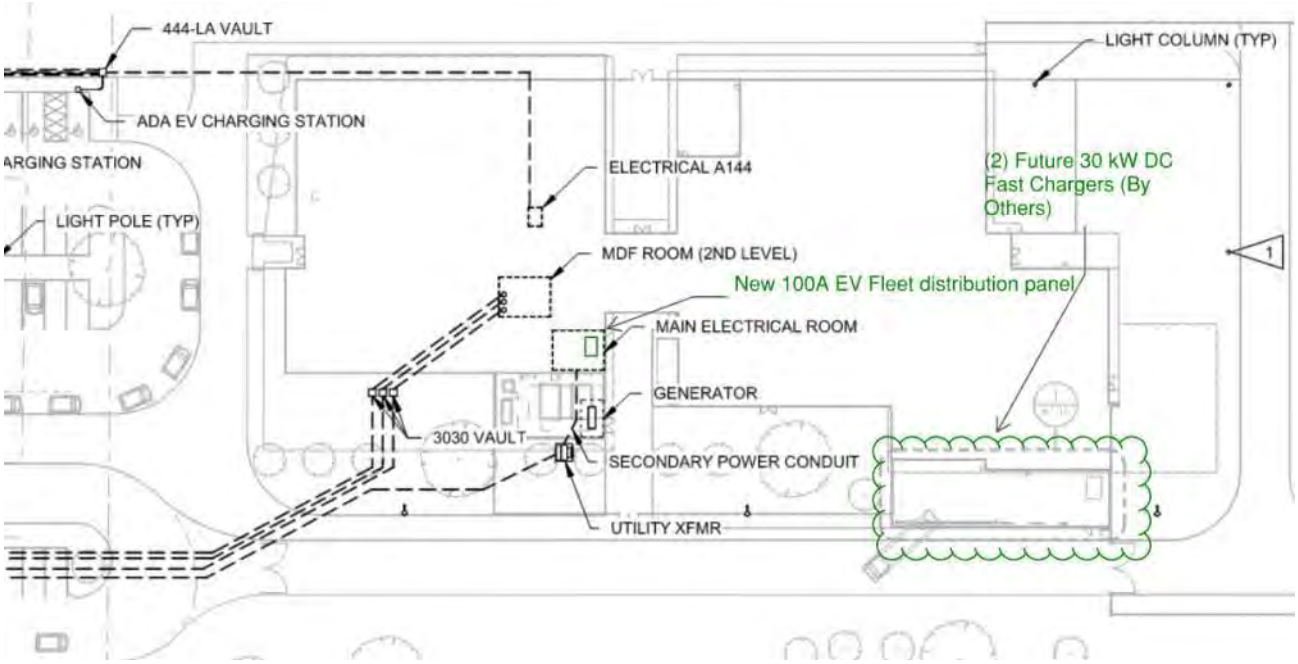
Baseline Concept – No Fleet Charging Infrastructure

Workbook ID: E-110	Pursue EV Bus grant opportunities.
Function(s): Generate Energy	**Includes Idea(s)**:

Alternative Concept Illustration

Pursue grant funding to finalize design and implement additional EV charging infrastructure, including battery electric bus grants and EV charging station installation grants:

- https://electricschoolbusinitiative.org/all-about-clean-school-bus-programhttps://ecology.wa.gov/blog/may-2026/hop-aboard-ecology-s-latest-electric-bus-grant



Alternative Concept – Future Fleet Charging Infrastructure

Workbook ID: E-110	Pursue EV Bus grant opportunities.							
Function(s): Generate Energy						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Convert EV-ready stalls to fleet charging stalls (already included)	35.48%							
225A, 480V EV distribution panel	35.48%					1	18,000.00	24,386
Panel feeder and installation	35.48%					1	22,000.00	29,806
Additional conduit to (4) fleet charging stalls	35.48%					1	15,000.00	20,322
Design/coordination allowance	35.48%					1	15,000.00	20,322
TOTAL COSTS*								**95,000**
							TOTAL (PROPOSED less BASELINE)	**95,000**

Note: Total Costs are rounded to nearest thousand dollars COST

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Workbook ID: E-111	Control receptacles from user programmed on/off schedule ILO by occupancy sensors.
Function(s): Conserve Energy	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, energy code compliant receptacles are controlled by room occupancy sensors and will be turned off within minutes from when occupants leave a room.

Alternative Concept:

In the alternative concept, controlled receptacles can be programmed to remain on during normal business hours and/or other pre-defined schedules.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	=	Environmental Sustainability	=
Aesthetics	=	Schedule	=
Durability & Reliability	=	Constructability	=
Total Cost of Ownership / Lifecycle Cost	--	Occupant Comfort, Safety, Performance	+

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 11,000	$ NA	$ NA
Alternative Concept	$ 27,000	$ NA	$ NA
Cost Difference	**$ 16,000**	$ NA	$ NA
Cost Addition	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: E-111	Control receptacles from user programmed on/off schedule ILO by occupancy sensors.
Function(s): Conserve Energy	**Includes Idea(s)**:

Recommendation:

Recommend accepting this alternative to prevent the unintended interruption of power to equipment.

Alternative Concept

Advantages	Disadvantages
• Users decide when controlled receptacles are allowed to be turned off	• Requires additional hardware and network cabling
• Energy saving (controlled) receptacles are more likely to be used if they can be trusted to not shutdown computers during break periods	• Increase construction cost
• Facility can monitor status of receptacles	•
•	•
•	•
•	•

Analysis and Justification:

The baseline design addresses the energy code requirement of having half of all receptacles in certain spaces automatically turned off when that space is vacant by utilizing occupancy sensors and relay devices. These are the same occupancy sensors that turn on/off the lights as one enters and leaves a space.
The sensors can only be set to turn off power within a range of 10 to 20 minutes of a space becoming vacant. Therefore, this design carries the risk of unintentional loss of power to an appliance, computer, or other device if the occupants merely step out for a break.
For that reason, staff are often instructed to recognize the specially labeled receptacles and make sure devices that need to stay on are plugged into non-controlled receptacles.
The Code offers an alternative which uses a time-of-day operated control device that turns receptacle power off at specific programmed times. While additional hardware is necessary, it is preferred by users because they can decide when receptacles are allowed to turn off, that is, when the space will be vacant for an extended period.
The VE alternative applies this Code option to the project. The receptacle controls can be integrated with the lighting control system. The same user interface would then allow lights and receptacles to be programmed based on a schedule as well as allow for centralized monitoring of status.

Workbook ID: E-111	Control receptacles from user programmed on/off schedule ILO by occupancy sensors.
Function(s): Conserve Energy	**Includes Idea(s)**:

The alternative concept illustrations are based on a wired Lutron system that has proven to be reliable in use. Other brands have similar products and configurations.

For reference, the applicable Code is:

2021 Washington State Energy Code - WAC 51-11C

C405.10.1 Automatic receptacle control function. Automatic receptacle controls shall comply with the following:

1. Either split controlled receptacles shall be provided with the top receptacle controlled, or a controlled receptacle shall be located within 12 inches of each uncontrolled receptacle. CE-152 2021 Washington State Energy Code

2. One of the following methods shall be used to provide control:

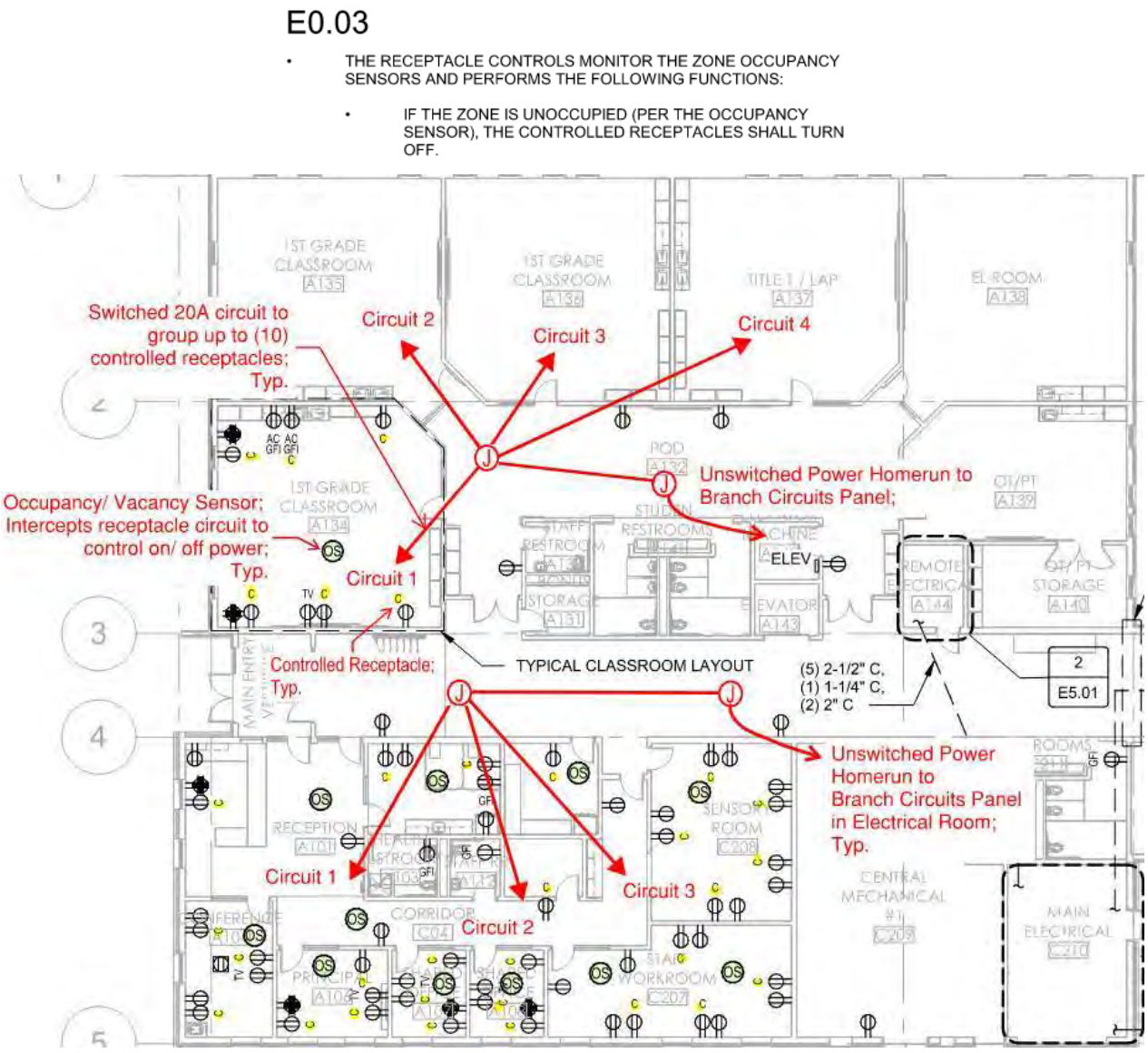
Alternate Concept → 2.1. A scheduled basis using a time-of-day operated control device that turns receptacle power off at specific programmed times and can be programmed separately for each day of the week. The control device shall be configured to provide an independent schedule for each portion of the building of not more than 5,000 square feet and not more than one floor. The occupant shall be able to manually override an area for not more than 2 hours. Any individual override switch shall control the receptacles of not more than 5,000 feet.

Baseline Design → 2.2. An occupant sensor control that shall turn off receptacles within 20 minutes of all occupants leaving a space.

2.3. An automated signal from another control or alarm system that shall turn off receptacles within 20 minutes after determining that the local area is unoccupied.

Workbook ID: E-111	Control receptacles from user programmed on/off schedule ILO by occupancy sensors.
Function(s): Conserve Energy	**Includes Idea(s)**:

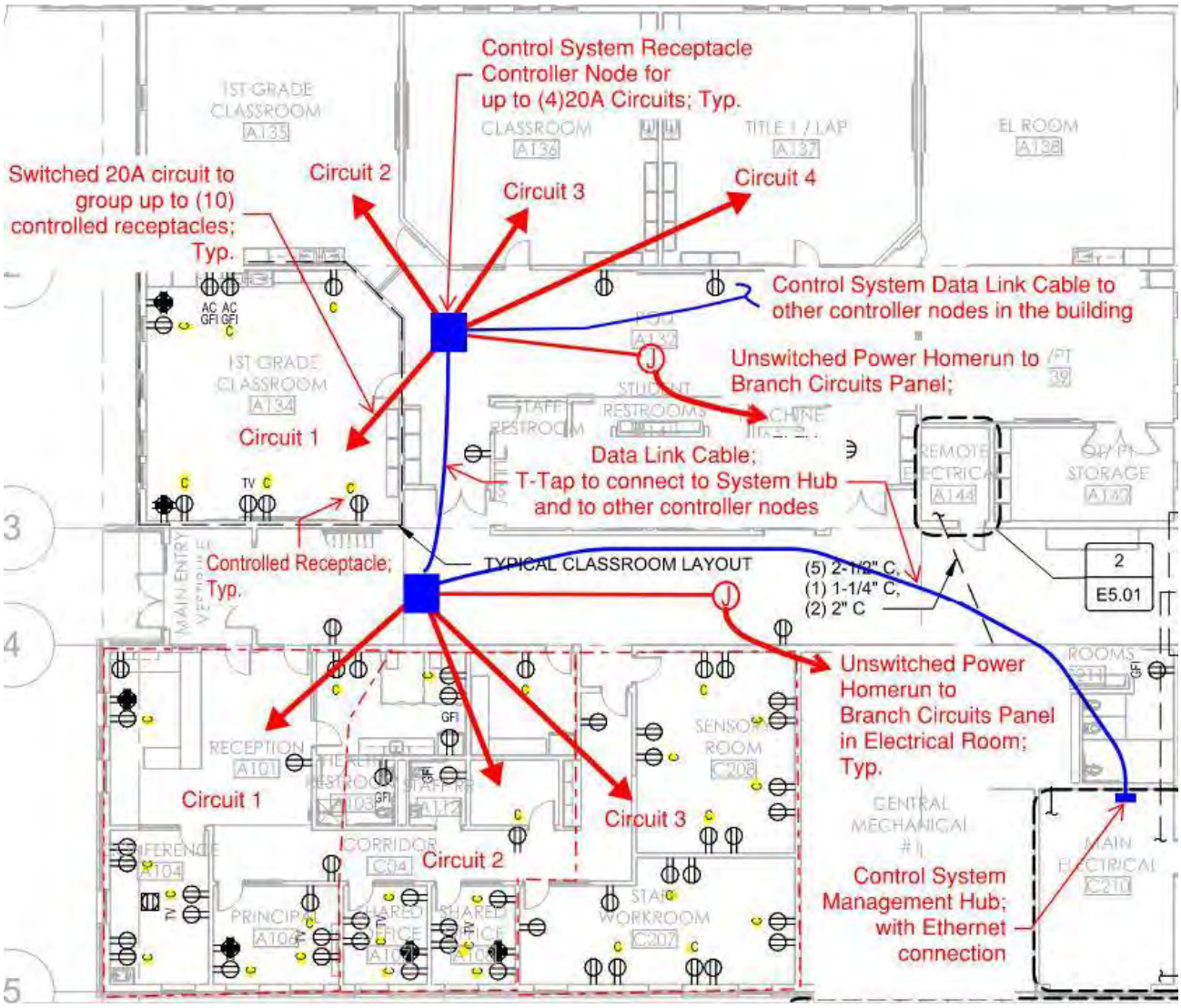
Baseline Concept Illustration



Power Plan – Receptacles and Occupancy Sensor Controls

Workbook ID: E-111	Control receptacles from user programmed on/off schedule ILO by occupancy sensors.
Function(s): Conserve Energy	**Includes Idea(s)**:

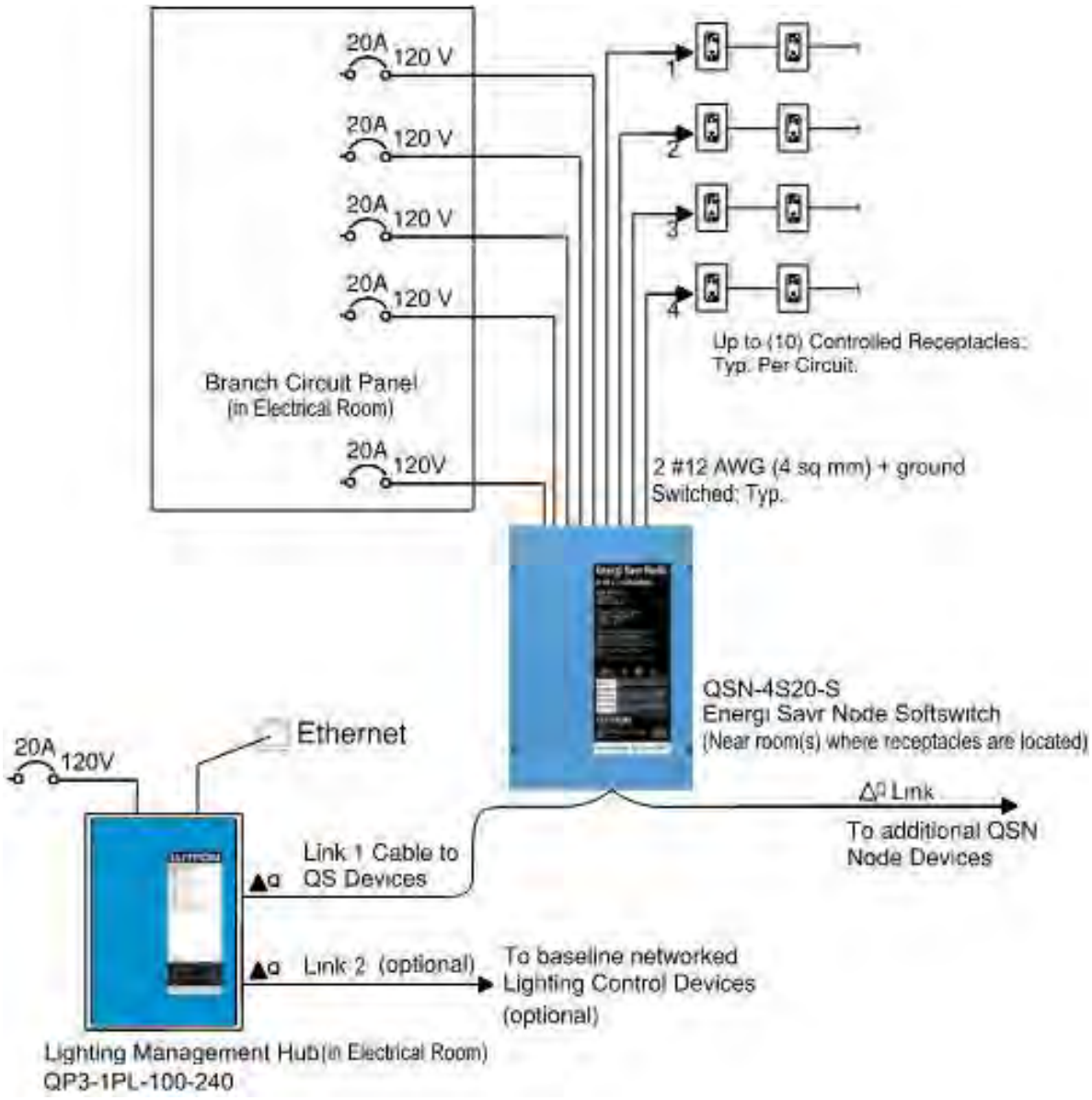
Alternative Concept Illustration



Power Plan with Receptacle Control System Interface

Workbook ID: E-111	Control receptacles from user programmed on/off schedule ILO by occupancy sensors.
Function(s): Conserve Energy	**Includes Idea(s)**:

Alternative Concept Illustration



Programmable Receptacle Control System (Lutron Example Shown)

Workbook ID: E-111	Control receptacles from user programmed on/off schedule ILO by occupancy sensors.							
Function(s): Conserve Energy						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
20A Relay Switchpack for wireless control of receptacle circuit from Occupancy Sensor	35.48%	EA	40	200.00	10,838			
4-Circuit Controller; Lutron QSN-4S20-S Energy Saver Node 20A 120VAC to intercept power circuits and derive switching at or near the rooms with controlled receptacles	35.48%	EA				10	1,150.00	15,580
Load Management Hub; Lutron QP3-1PL	35.48%	EA				1	1,250.00	1,694
Control Signal cabling; Lutron Q Link cable suspended from J-Hooks	35.48%	LF				800	8.75	9,484
TOTAL COSTS*					**11,000**			**27,000**
							TOTAL (PROPOSED less BASELINE)	**16,000**

Note: Total Costs are rounded to nearest thousand dollars COST

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Workbook ID: E-112	Use fewer pendant lights in classrooms, 3 ILO 4 rows.
Function(s): Illuminate Space	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, each classroom is illuminated with four rows of indirect/direct lighting pendants.

Alternative Concept:

In the alternative concept, each classroom is illuminated with three rows of indirect/direct lighting.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**+**
Aesthetics	**+**	Schedule	**+**
Durability & Reliability	**+**	Constructability	**+**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 346,000	$ NA	$ NA
Alternative Concept	$ 259,000	$ NA	$ NA
Cost Difference	**$ -87,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: E-112	Use fewer pendant lights in classrooms, 3 ILO 4 rows.
Function(s): Illuminate Space	**Includes Idea(s)**:

Recommendation:

Accept this alternative for the benefits described.

Alternative Concept

Advantages	Disadvantages
• Lower initial cost	• Slightly more uneven lighting due to wider spacing
• 25% less installation time	• Requires minimum of 18” pendant length for best results
• Fewer lights to maintain	•
• Less sources of glare	•
• Achieves acceptable minimum light levels using fewer watts per square feet of input power	•
•	•

Analysis and Justification:

The baseline design for typical classrooms shows four rows of 24ft long linear pendant hung lights that are spaced 8ft on center. The specific manufacturer and model are still to be determined but it would comply with the district’s preference of LED indirect/direct type lighting.

The alternative proposes using a high-performance luminaire that comes with a wide throw indirect reflector, to allow for greater on center spacing and thereby reducing the quantity of pendants needed in the room.

While this proposed luminaire can effectively be used as close as 12" from the ceiling, a distance of 18” is typically recommended to minimize the difference between the brightest and darkest parts of the ceiling.

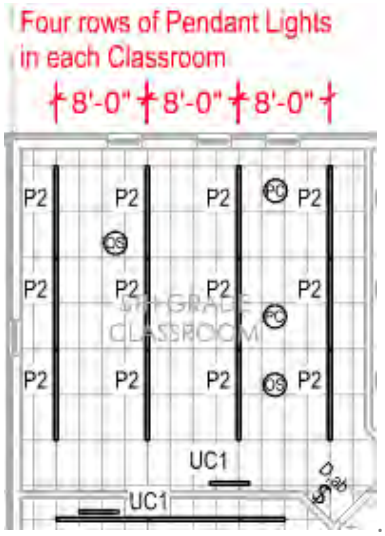
The VE alternative would also comply with the 2021 Energy Code maximum power allowance per classroom of 0.71 W/sf + 4.5w/lf of whiteboard.

The alternative concept has fewer lights to install and to maintain over the life of the building.

While a suspended fixture does have the potential for dust accumulation, the proposed solution uses a rounded top, log shape, in a subtle recognition of the lumber industry of Aberdeen.

Workbook ID: E-112	Use fewer pendant lights in classrooms, 3 ILO 4 rows.
Function(s): Illuminate Space	**Includes Idea(s)**:

Baseline Concept Illustration



Owner's Project Requirements—South Site ES

4.4 Lighting and Visual Quality

4.4.1 What is the general level and description of the visual quality desired and for each use or occupancy type in the facility?

Low glare, good quality LED lights w/ occupancy and dimming.

4.5 Lighting Levels

4.5.1 Required average maintained light levels for this project are listed below. For spaces not listed, the current IESNA light level recommendations shall be followed.

General Classrooms: 30FC.

4.6 Light Fixtures and Lamps

4.6.1 What level of energy efficiency is desired in the lighting equipment for each occupancy type (standard, above standard, exceptional)?

Exceptional - LED.

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTALS
LIGHTING				
Lighting	65,281	SF	17.29	1,128,708

Partial Plan - Classroom Lighting, OPR Requirements, and Cost Estimate

Workbook ID: E-112	Use fewer pendant lights in classrooms, 3 ILO 4 rows.
Function(s): Illuminate Space	**Includes Idea(s)**:

Alternative Concept Illustration

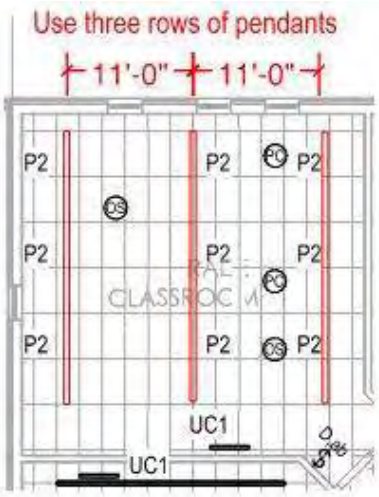




Photo courtesy of NW Lighting Design Lab

Partial Plan - Classroom Lighting, With Wide (11- 12ft) Spacing

Workbook ID: E-112	Use fewer pendant lights in classrooms, 3 ILO 4 rows.
Function(s): Illuminate Space	**Includes Idea(s)**:

Alternative Concept Illustration



Proposed High Performance Up/Downlight

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Workbook ID: E-112	Use fewer pendant lights in classrooms 3 ILO 4 rows.							
Function(s): Illuminate Space						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Four rows per classroom of 24ft linear pendant LED with high performance direct/indirect optics	35.48%	Ea	88	2,900.00	345,745			
Three rows per classroom of 24ft linear pendant LED with high performance direct/indirect optics	35.48%	Ea				66	2,900.00	259,309
TOTAL COSTS*					**346,000**			**259,000**
							TOTAL (PROPOSED less BASELINE)	**-87,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: E-113	As requested in the OPR, have a surge protective device only at Main Switchboard ILO all panels in the building.
Function(s): Distribute Power	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, surge protection devices are installed in all panelboards and the main switchboard.

Alternative Concept:

In the alternative concept, the main switchboard, the emergency panel, and the photovoltaic (PV) panel would each have a surge protection device (SPD). The elevator machinery would also have an integral SPD.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**+**
Aesthetics	**=**	Schedule	**+**
Durability & Reliability	**--**	Constructability	**+**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**--**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 48,000	$ NA	$ NA
Alternative Concept	$ 7,000	$ NA	$ NA
Cost Difference	**$ -41,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: E-113	As requested in the OPR, have a surge protective device only at Main Switchboard ILO all panels in the building.
Function(s): Distribute Power	**Includes Idea(s)**:

Recommendation:

Accept this alternative for construction cost savings and reduction in maintenance

Alternative Concept

Advantages	Disadvantages
• Lower initial cost	• Little to no protection from power surges that may originate within the building.
• Fewer devices to maintain and replace	• Potentially less protection from external power surges or lightning if main switchboard SPD fails
•	•
•	•
•	•
•	•

Analysis and Justification:

Surge-Protective Devices (SPD), also known as Transient Voltage Surge Suppressors (TVSS), are used in power distribution equipment to limit sudden and dangerously high voltage spikes caused by lightning and/or utility substation switching. Surges can also occur because of switching certain types of equipment on and off within a building.

There are four types of protection defined in the Code:

- Type 1: Permanently connected SPDs intended for installation between the service transformer and the line side of the main service disconnect.
- Type 2: Permanently connected SPDs intended for installation on the load side of the main service disconnect, including SPDs located at branch panels.
- Type 3: Point of utilization SPDs (e.g. at receptacles).
- Type 4: Component SPDs, including discrete components, as well as assemblies.

While not required, in certain situations, a multi-layered approach utilizing each of the above types of protection provides the broadest building safety.

The base design appears to show Type 2 SPDs are to be installed at most of the electrical panelboards.

The 2023 National Electrical Code, (NEC) currently in effect, requires one at the main service entrance of residential units, hotels and motels, and areas of nursing homes and limited-care patient sleeping rooms.

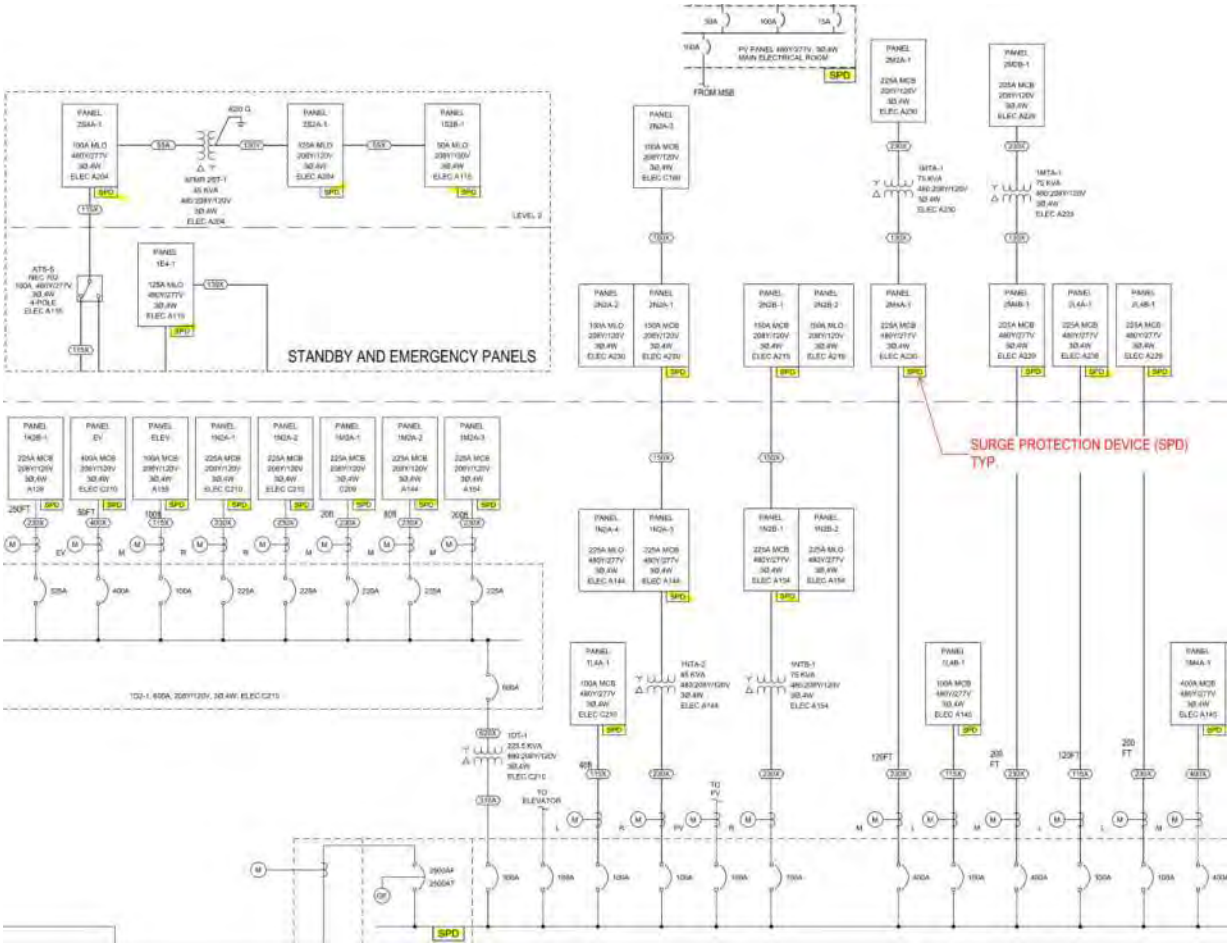
Workbook ID: E-113	As requested in the OPR, have a surge protective device only at Main Switchboard ILO all panels in the building.
Function(s): Distribute Power	**Includes Idea(s)**:

They are required at fire pump controllers, Critical Operations facilities, and some types of industrial process control panels and in hazardous locations. Schools are not listed.
However, the Code states that all Emergency (NEC Article 700) system panels must have an SPD. There is one panelboard on this project that is designated as Emergency.
Elevators that are not on an emergency power system, are exempt but when the 2026 Code is adopted, they will also be required to have an integral SPD or installed adjacent to the elevator disconnecting means.
Washington State plans to adopt the 2026 National Electrical Code on December 31, 2026.
The Owner's Project Requirements, (OPR) indicates that there is a desire to have some surge protection, at main equipment, but not all panels.
The VE alternative is to have SPDs at the Main Switchboard "MSB," to protect against utility surges and lightning strikes, the Emergency panelboard "1E4-1," as required by the electrical code, and one at the Photovoltaic "PV panel," supplies a large amount of power from a single point and is more susceptible to lightning damage. The *NFPA 780 Standard for the Installation of Lightning Protection System* recommends SPDs for rooftop arrays, but this is not an adopted Code in Washington State.
While not required for schools, it is wise to include a high-performance surge suppression system at the incoming service connection to stop any transient voltage spikes from entering. Utility power surges are a threat to the sensitive equipment inside the building.
Note also that frequent utility substation transformer switching can cause degradation of the suppression electronics over time. Even though their indicator lights may show the SPD is still considered operable, the metal oxide semiconductor (MOS) materials used within them gradually lose their ability to absorb excess voltage after each surge, reducing their effectiveness. And environmental conditions have the potential to shorten the useful life of an SPD to as little as 10- 15 years of service.
Therefore, in addition to the LED indicator, we recommend that the SPD, the main one at least, has the ability to track surge events with an internal counter so the facility can monitor and replace them as needed.
Due to the Washington State Energy Code, facilities now predominantly use variable frequency drives (VFD) and electronically controlled motors. These manage the load's behavior to reduce electrical and mechanical stress and limit surges and sags. While VFDs themselves are a source of dirty power, they can come with their own filters. We recommend that the Division 23 specifications require the VFD vendor to perform a power study that will allow them to determine the right amount of line reactive filters to smooth out power fluctuations as well as provide their own packaged (Type 4) SPDs.
If the permit package is planned to be submitted after adoption of the 2026 Electrical Code, then we recommend that the elevator machinery is ordered with an integral SPD rather than having one adjacent to the electrical panel/ disconnect. This not only saves wall space, but results in improved protection of the elevator equipment.

Workbook ID: E-113	As requested in the OPR, have a surge protective device only at Main Switchboard ILO all panels in the building.
Function(s): Distribute Power	**Includes Idea(s)**:

Baseline Concept Illustration

D5000	**Electrical**		
	SWITCHBOARDS		
	Switchboards, Meter, SPD	1	EA
	PANELBOARDS		
	Panelboards, Meters, SPDs	31	EA



Partial Power One-Line Diagram with SPDs highlighted

Workbook ID: E-113	As requested in the OPR, have a surge protective device only at Main Switchboard ILO all panels in the building.
Function(s): Distribute Power	**Includes Idea(s)**:

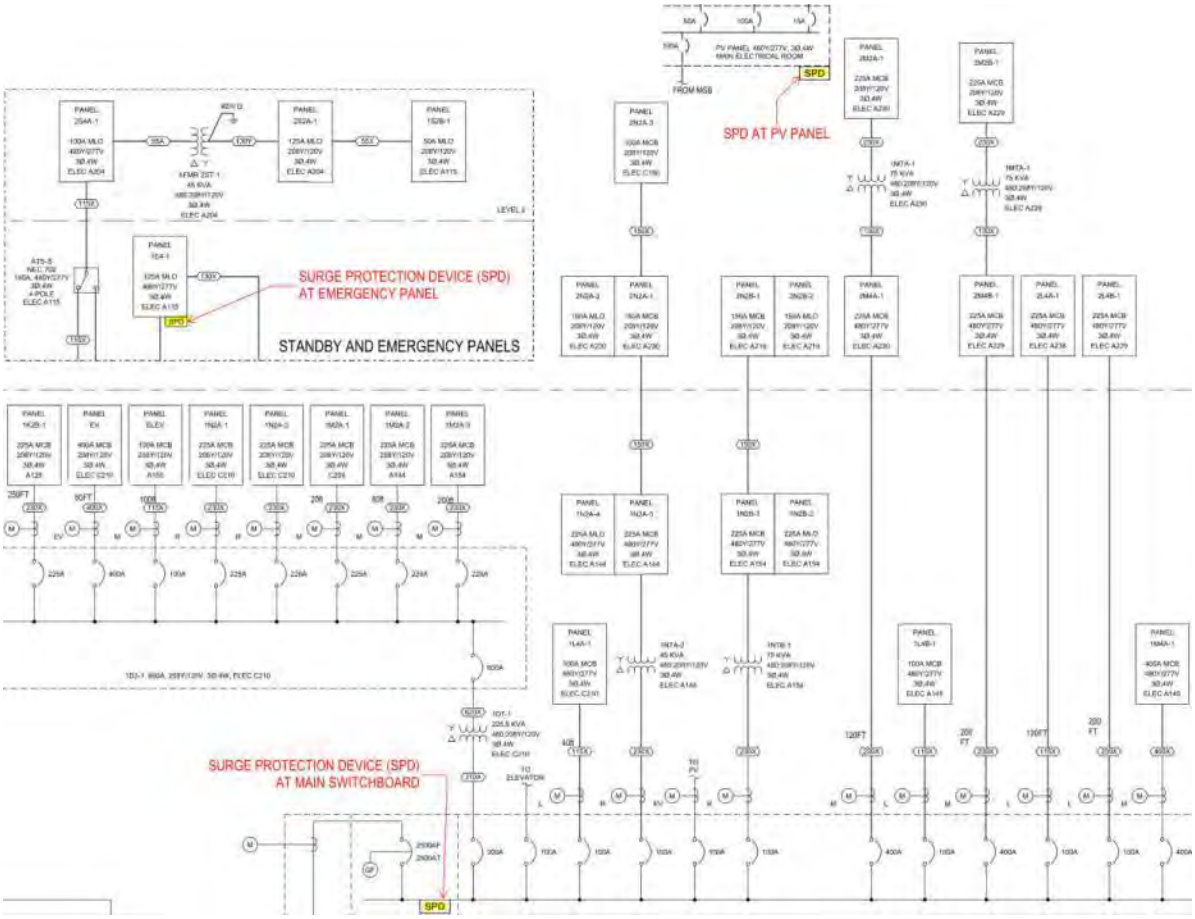
Alternative Concept Illustration

Owner's Project Requirements—South Site ES

4.3 Power Quality

4.3.3 What level of safeguard is required to monitor and maintain the integrity (such as voltage or phase imbalance) of the incoming power (e.g. - protection of sensitive lab equipment)? What equipment or devices are included in the design to meet this requirement?

Have some surge protectors on main equipment. Can provide on main switchgear, not needed at every panel.



Partial Power One-Line Diagram with SPD

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Workbook ID: E-113	As requested in the OPR, have a surge protective device only at Main Switchboard ILO all panels in the building.							
Function(s): Distribute Power						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Surge Protection Device, Type II, 3Phase at Main Switchboard w/counter	35.48%	EA	1	2,050.00	2,777			
Surge Protection Device, Type II, 3Phase Panelboard Mounted	35.48%	EA	31	1,080.00	45,359			
Surge Protection Device, Type II, 3Phase at Main Switchboard w/counter	35.48%	EA				1	2,050.00	2,777
Surge Protection Device, Type II, 3Phase Panelboard Mounted	35.48%	EA				2	1,080.00	2,926
Surge Protection Device, Type II or IV, Integral with Elevator Machinery	35.48%	EA				1	750.00	1,016
TOTAL COSTS*					**48,000**			**7,000**
							TOTAL (PROPOSED less BASELINE)	**-41,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

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Workbook ID: M-126	Use 2-pipe changeover ILO 4-pipe system.
Function(s): Condition Space	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, two air to water heat pumps are provided to generate chilled water, heating hot water or both simultaneously though a four-pipe system to hydronic fan coils and hydronic vav air handlers. Hydronic distribution is a variable primary/secondary system with six pumps and a series of eight control valves at the heat pumps to allow the usage of either heat pump for heating or cooling at any time. Chilled and heated hot water are piped individually to two control valves at the fan coil or air handler.

Alternative Concept:

In the alternative concept, the currently designed air to water heat pumps will remain but a single, two pipe hydronic loop will be provided to a single coil at each fan coil or air handler. Primary secondary piping will be reduced to a variable primary loop with two pumps.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**+**
Aesthetics	**=**	Schedule	**=**
Durability & Reliability	**=**	Constructability	**+**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 359,000	$ NA	$ NA
Alternative Concept	$ 177,000	$ NA	$ NA
Cost Difference	**$ -182,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: M-126	Use 2-pipe changeover ILO 4-pipe system.
Function(s): Condition Space	**Includes Idea(s)**:

Recommendation:

Recommend accepting this alternative which includes a design revision from four-pipe with simultaneous heating and cooling to a two-pipe changeover system.

Alternative Concept

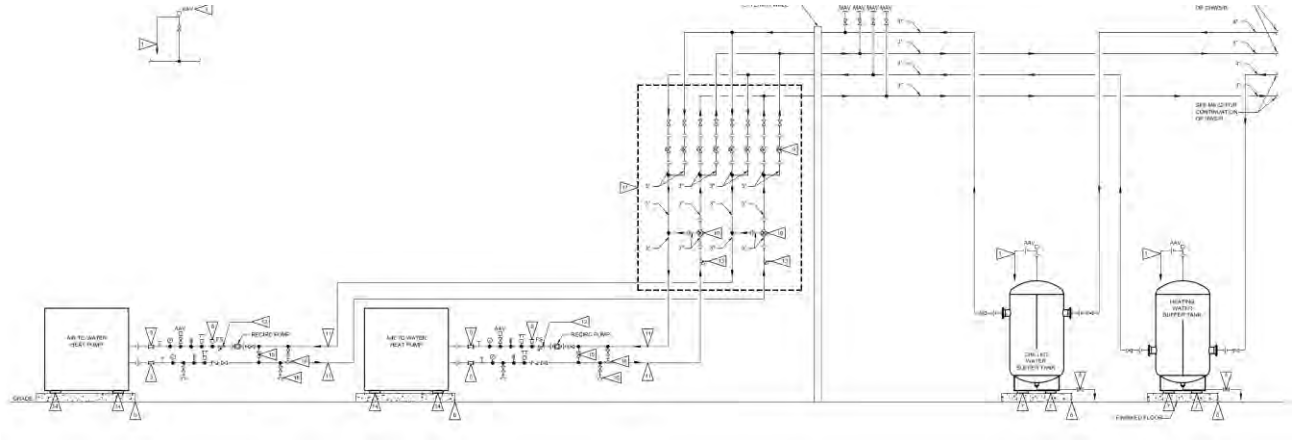
Advantages	Disadvantages
• Reduced piping	• No simultaneous heating and cooling
• Reduced quantity of pumps	•
• Reduced complexity of system	•
• Reduced quantity of hydronic coils and control valves	•
•	•
•	•

Analysis and Justification:

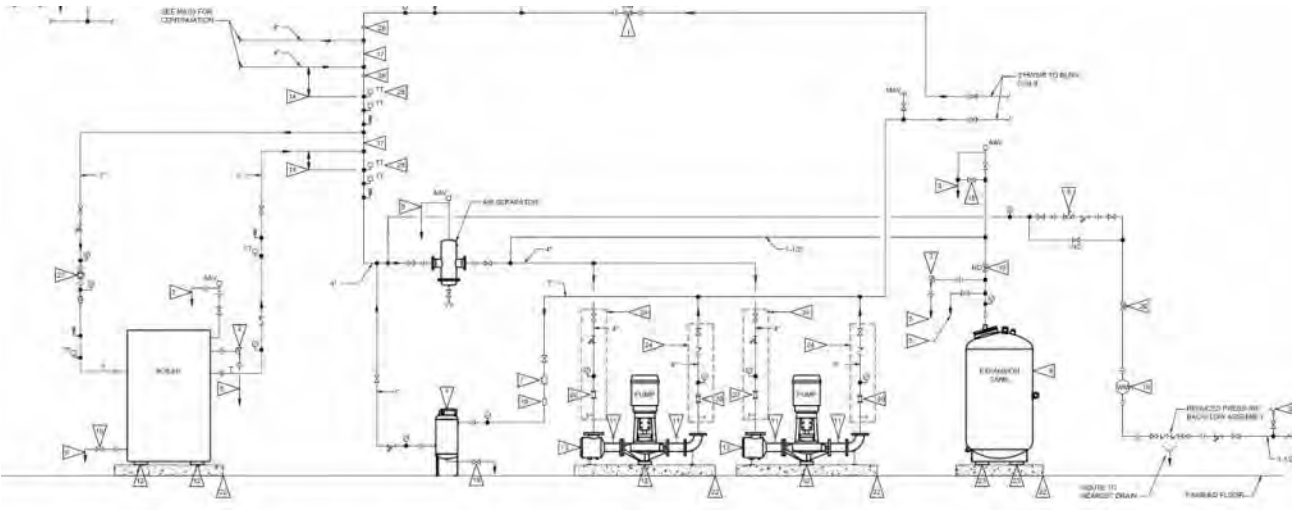
The current four-pipe system allows simultaneous heating and cooling in the case that spaces have different requirements at a single point in time. The low daily temperature change, temperate marine environment, and low cooling load of the project site drastically reduces times that simultaneous heating and cooling may be called for. The Washington State Energy Code requires cooling when ambient temperatures are above 82 degrees. In 2025, there were five occurrences above that temperature including on July 15th, August 10th, 11th, 22nd and 23rd. The two-pipe design will still provide cooling for days when it is required and those are days that it is extremely unlikely that there is also a heating demand. By switching to a two-pipe changeover system, space temperature requirements can be met throughout the majority of the school year and school day while removing the additional cost and additional operational complexity of a four-pipe system.

Workbook ID: M-126	Use 2-pipe changeover ILO 4-pipe system.
Function(s): Condition Space	**Includes Idea(s)**:

Baseline Concept Illustration



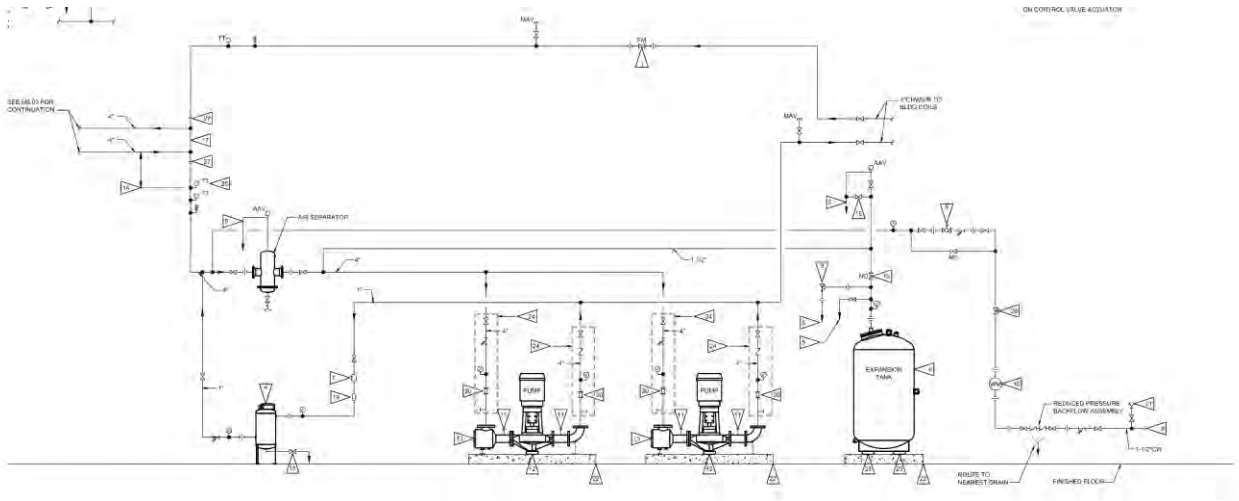
4 Pipe Air To Water Heat Pumps



Heating Hot Water Distribution

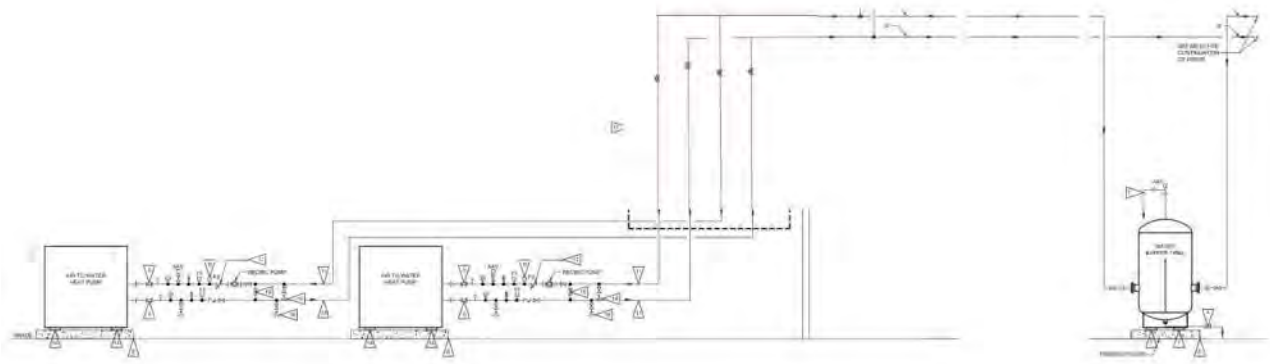
Workbook ID: M-126	Use 2-pipe changeover ILO 4-pipe system.
Function(s): Condition Space	**Includes Idea(s)**:

Baseline Concept Illustration



Chilled Water Distribution

Workbook ID: M-126	Use 2-pipe changeover ILO 4-pipe system.
Function(s): Condition Space	**Includes Idea(s)**:



1 AIR-TO-WATER HEAT PUMP HEATING / CHILLED WATER PIPING DIAGRAM

2 Pipe Chilled Water System

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Workbook ID: M-126	Use 2-pipe changeover ILO 4-pipe system.							
Function(s): Condition Space						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
3" 3 way control valve	35.48%	EA	2	1,875.00	5,081			
3" 2 way control valve	35.48%	EA	8	1,450.00	15,716	4	1,450.00	7,858
1/2" 2 way control valve	35.48%	EA	54	325.00	23,777	27	325.00	11,888
15 hp pump	35.48%	EA	4	13,500.00	73,159	2	13,500.00	36,580
6" air separator	35.48%	EA	2	6,259.00	16,959	1	6,259.00	8,480
700 gal buffer tank	35.48%	EA	2	17,500.00	47,418	1	17,500.00	23,709
3" copper piping	35.48%	Ft	800	72.50	78,578	400	72.50	39,289
Hydronic coils	35.48%	EA	54	1,350.00	98,765	27	1,350.00	49,382
TOTAL COSTS*					**359,000**			**177,000**
							TOTAL (PROPOSED less BASELINE)	**-182,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: M-127	Consider air source heat pumps with condensing unit in service yard.
Function(s): Condition Space	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, two air to water heat pumps are provided to generate chilled water, heating hot water or both simultaneously though a four-pipe system to hydronic fan coils and hydronic VAV air handlers. Hydronic distribution is a variable primary/secondary system with six pumps and a series of eight control valves at the heat pumps to allow the usage of either heat pump for heating or cooling at any time. Chilled and heated hot water are piped individually to two control valves at the fan coil or air handler.

Alternative Concept:

In the alternative concept, heating and cooling will be provided by 34 DX split systems and three (3) DW VAV air handlers. Fan coils will be located in the classroom, air handler will be located in the mechanical attics, and condensing units will be located in the current space with an added mechanical equipment yard.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**--**
Aesthetics	**--**	Schedule	**+**
Durability & Reliability	**--**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**--**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 3,794,000	$ NA	$ NA
Alternative Concept	$ 2,598,000	$ NA	$ NA
Cost Difference	**$ -1,196,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: M-127	Consider air source heat pumps with condensing unit in service yard.
Function(s): Condition Space	**Includes Idea(s)**:

Recommendation:

We recommend considering the alternative of using DX heat pump split systems in lieu of air to water heat pumps and hydronic distribution.

Alternative Concept

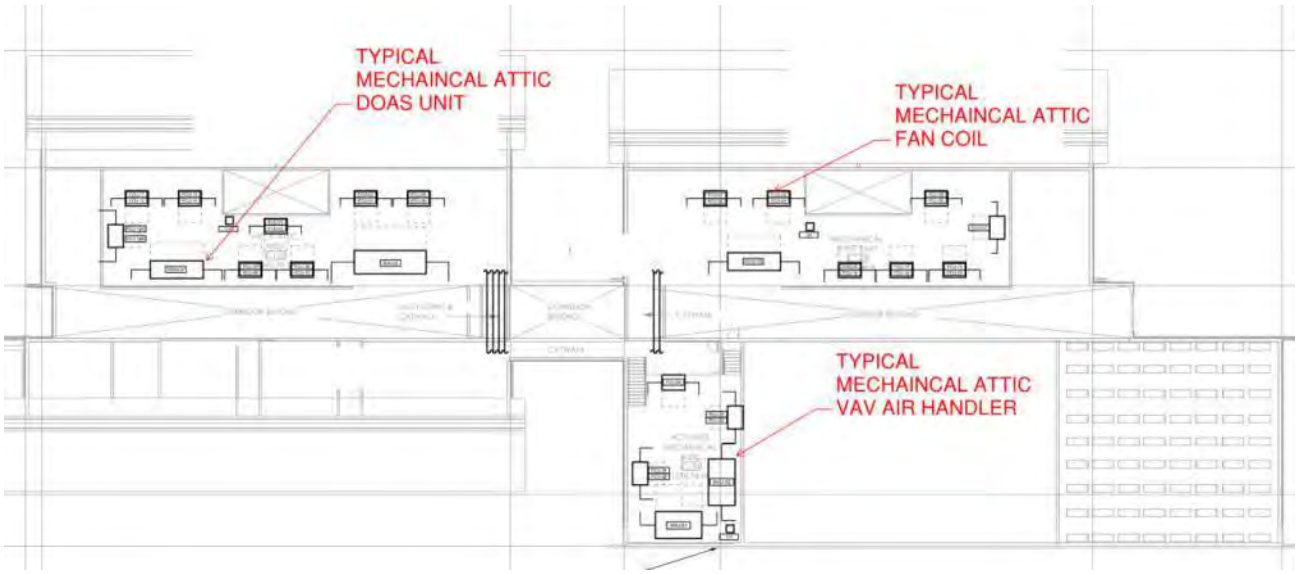
Advantages	Disadvantages
• Simplified operation and maintenance	• Lower efficiency
• Lower first cost	•
•	•
•	•
•	•
•	•

Analysis and Justification:

The district has noted in the OPR and VE kick off meeting that their maintenance department is short-handed and that finding qualified technical HVAC support is problematic. Additionally, the OPR notes that the District is unfamiliar with air to water heat pumps. To simplify system operation and maintenance we propose the use of DX split heat pumps which are readily serviceable by most mechanical contractors.

Workbook ID: M-127	Consider air source heat pumps with condensing unit in service yard.
Function(s): Condition Space	**Includes Idea(s)**:

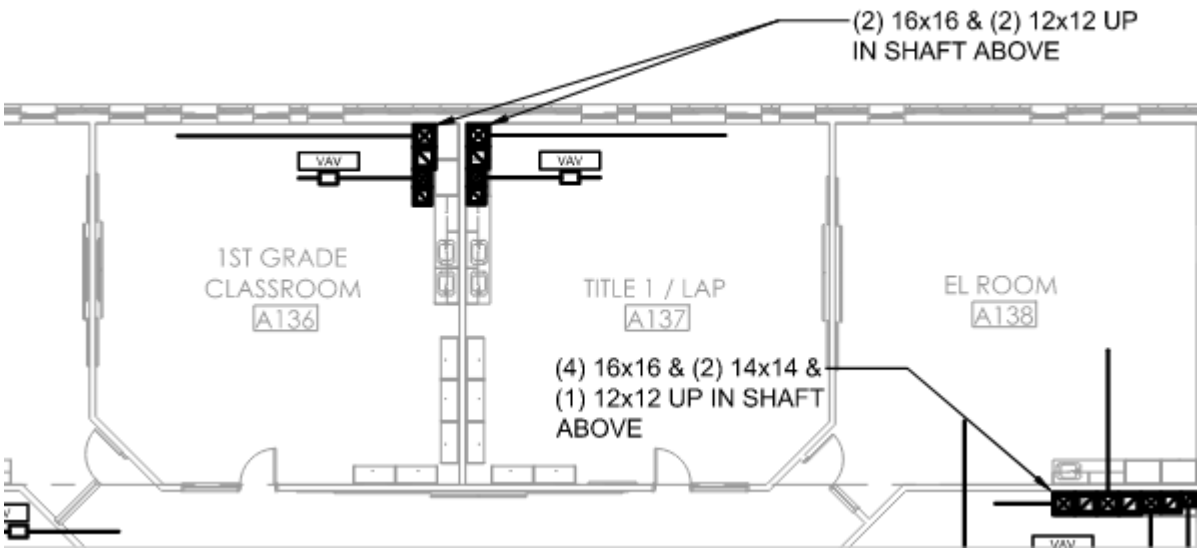
Baseline Concept Illustration



Mechanical Attics

Workbook ID: M-127	Consider air source heat pumps with condensing unit in service yard.
Function(s): Condition Space	**Includes Idea(s)**:

Baseline Concept Illustration



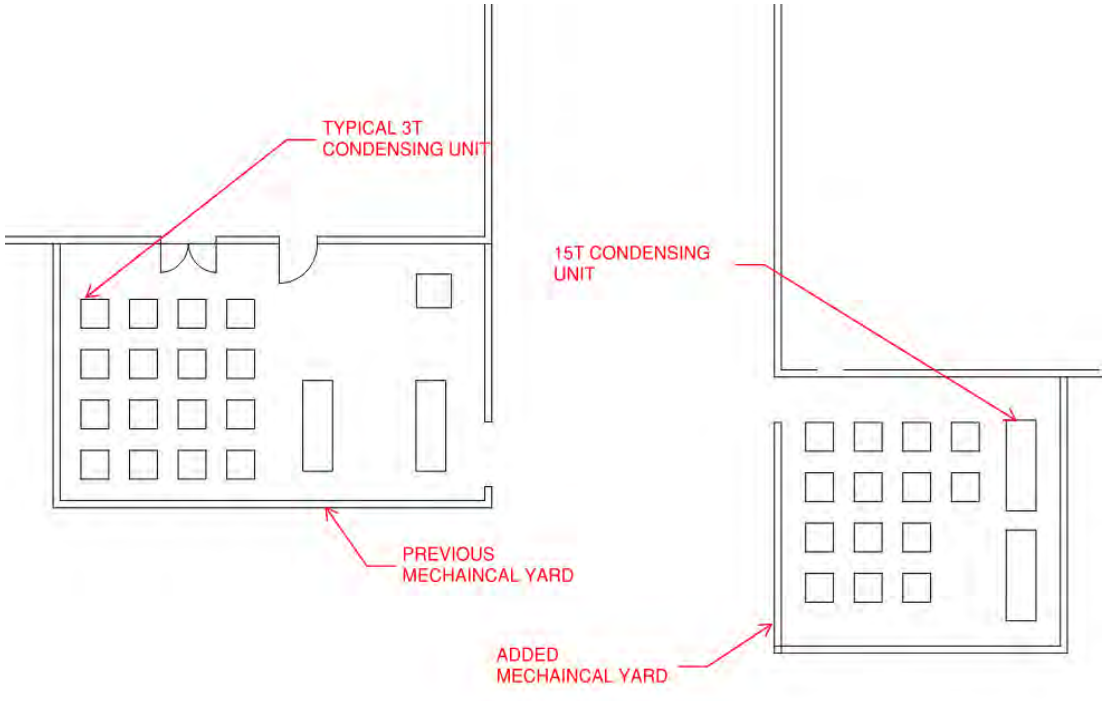
Typical Classrooms

Workbook ID: M-127	Consider air source heat pumps with condensing unit in service yard.
Function(s): Condition Space	**Includes Idea(s)**:

Alternative Concept Illustration



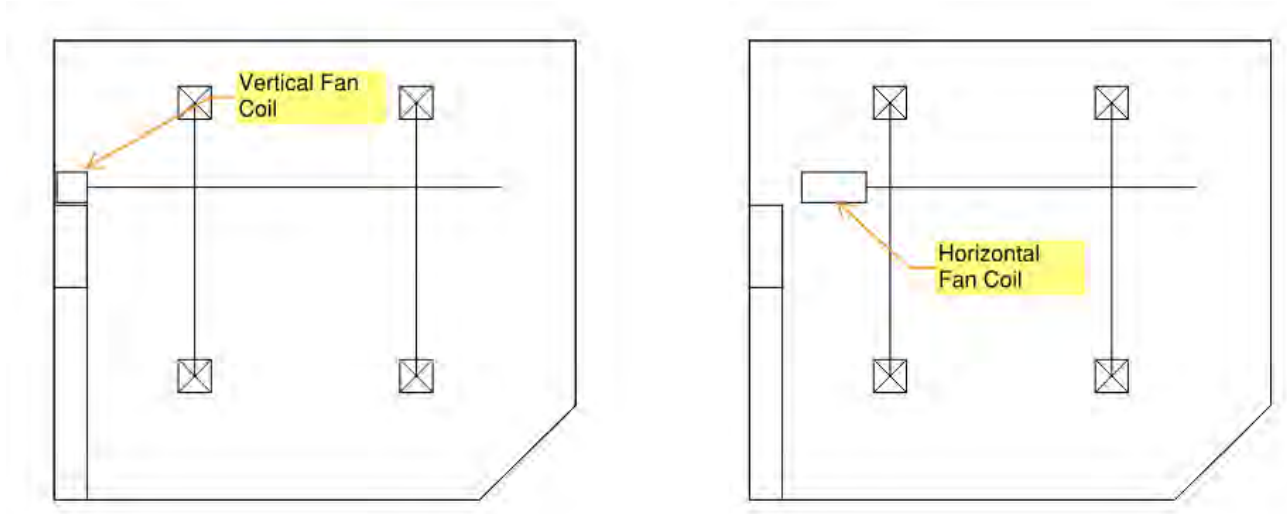
Reduced Mechanical Attic Space



Condensing Unit in Service Yard

Workbook ID: M-127	Consider air source heat pumps with condensing unit in service yard.
Function(s): Condition Space	**Includes Idea(s)**:

Alternative Concept Illustration



Typical Classroom

Workbook ID: M-127	Consider air source heat pumps with condensing unit in service yard.							
Function(s): Condition Space						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
3" 3 way control valve	35.48%	EA	2	1,875.00	5,081			
3" 2 way control valve	35.48%	EA	8	1,450.00	15,716	4	1,450.00	7,858
1/2" 2 way control valve	35.48%	EA	54	325.00	23,777			
15 hp pump	35.48%	EA	4	13,500.00	73,159			
6" air separator	35.48%	EA	2	6,259.00	16,959			
700 gal buffer tank	35.48%	EA	2	17,500.00	47,418			
3" copper piping incl, fittings, specialties, supports & insulation	35.48%	Ft	800	72.50	78,578			
Hydronic coils	35.48%	EA	54	1,350.00	98,765	27	1,350.00	49,382
Mechanical attic (costs from S-160)	35.48%							
Steel floor structure at mezzanine, 12psf	35.48%	LBS	91,932	3.70	460,833	44,400	3.70	222,567
Steel floor deck	35.48%	SF	7,661	6.35	65,907	3,700	6.35	31,831
Topping slab, incl mesh & nelson studs	35.48%	SF	7,661	8.40	87,185	3,700	8.40	42,107
Misc. structural steel/plates connections	35.48%	LBS	11,492	3.70	57,607	5,550	3.70	27,821
6" CFMS Studs	35.48%	SF	63,360	11.90	1,021,498	60,360	11.90	973,131
GWB 5/8",type "X" fire taped	35.48%	SF	146,146	4.60	910,794	143,146	4.60	892,097
Batt Insulation	35.48%	SF	76,664	1.35	140,217	73,664	1.35	134,730
Fan Coil Ductwork from attic to classroom	35.48%	LBS	12,000	9.75	158,512			
88 ton air to water heat pump	35.48%	EA	2	75,000.00	203,220			
3 ton DX Split Heat Pump	35.48%	EA				34	3,500.00	161,221
200KW electric boiler	35.48%	EA	1	23,000.00	31,160			

Workbook ID: M-127	Consider air source heat pumps with condensing unit in service yard.							
Function(s): Condition Space						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
6000 cfm VAV Air Hander	35.48%	EA	3	31,500.00	128,029			
15 ton DX Split System	35.48%	EA				3	13,500.00	54,869
3000 cfm hydronic fan coil	35.48%	EA	34	3,675.00	169,282			
TOTAL COSTS*					**3,794,000**			**2,598,000**
							TOTAL (PROPOSED less BASELINE)	**-1,196,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

=Workbook ID: PL-142	Reduce corridor widths to 11'.
Function(s): Support Student Wellbeing; Improve Acoustics	**Includes Idea(s)**: 70

Baseline Concept:

In the baseline concept, the main first floor corridor is 13 feet wide at the west wing. The second-floor main corridor is 13 feet wide for the entire length.

Alternative Concept:

In the alternative concept, the main first floor corridor is reduced to 11 feet wide at the west wing. The second-floor main corridor is reduced to 11 feet wide for the entire length.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**+**
Aesthetics	**--**	Schedule	**=**
Durability & Reliability	**=**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 19,832,000	$ NA	$ NA
Alternative Concept	$ 19,589,000	$ NA	$ NA
Cost Difference	**$ -243,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

=Workbook ID: PL-142	Reduce corridor widths to 11'.
Function(s): Support Student Wellbeing; Improve Acoustics	**Includes Idea(s)**: 70

Recommendation:

Recommend accepting this alternative.

Alternative Concept

Advantages	Disadvantages
• Increases student comfort by providing better scaling	• Reduces extra space in hallway
• Reduces construction cost	•
• Reduces mechanical system demand	•
•	•
•	•
•	•

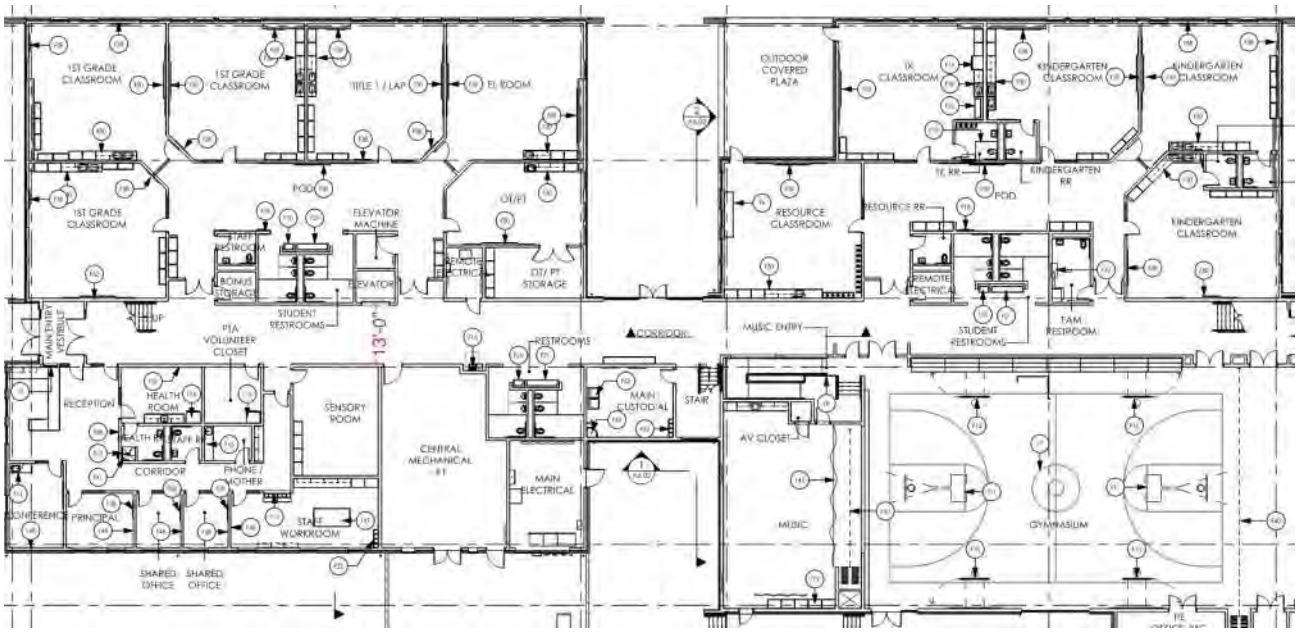
Analysis and Justification:

The proposed reduction of the main corridor width from 13 feet to 11 feet is an improvement in the experience for the building's primary occupants. Elementary age students are smaller than adults; corridors sized for adult proportions could feel disorienting to young children. An 11 feet corridor still comfortably accommodates two-way student traffic, side-by-side adult supervision, and full egress compliance under IBC, while creating a more appropriately scaled environment that may feel safer and less institutional to the children using it daily.

Wider corridors also encourage running, noise, and possible loss of supervision site lines. An 11 feet clear corridor exceeds the required egress width for the anticipated occupant loads in this building and maintains comfortable clearance for lockers, drinking fountains, and classroom door swings without congestion. The 2'-0" reduction per corridor run also translates directly into recoverable square footage that can be redistributed to instructional spaces or reduce the overall building footprint, delivering cost savings in structure, mechanical, and envelope without sacrificing programmatic space.

=Workbook ID: PL-142	Reduce corridor widths to 11'.
Function(s): Support Student Wellbeing; Improve Acoustics	**Includes Idea(s)**: 70

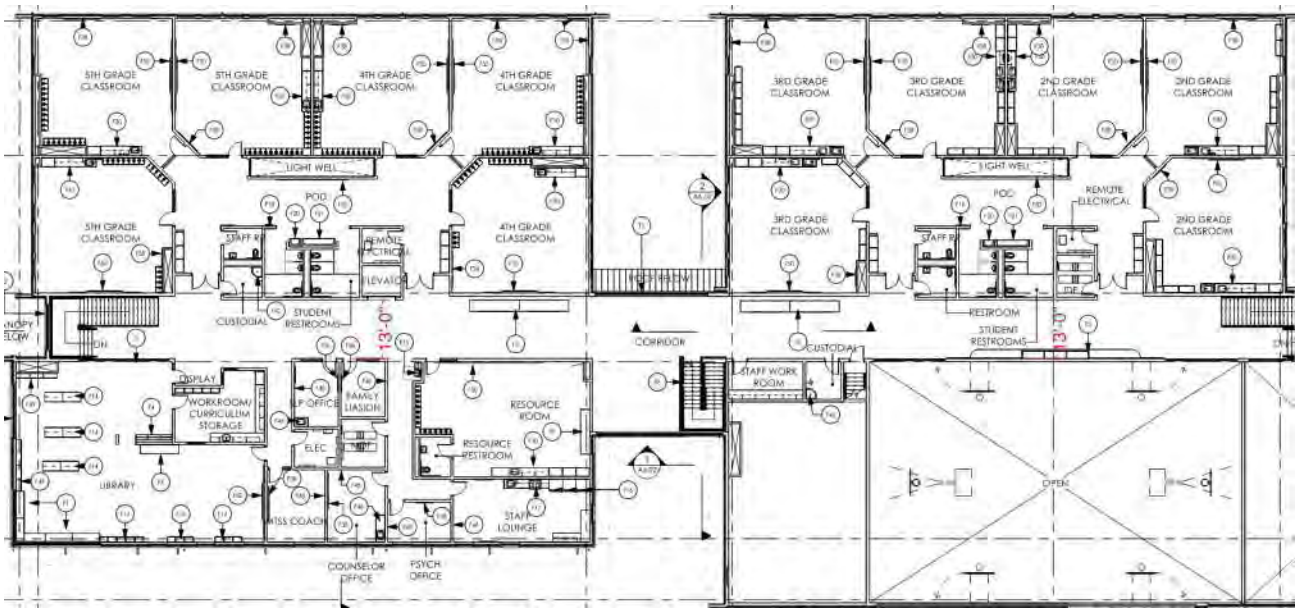
Baseline Concept Illustration



First Floor Plan

=Workbook ID: PL-142	Reduce corridor widths to 11'.
Function(s): Support Student Wellbeing; Improve Acoustics	**Includes Idea(s)**: 70

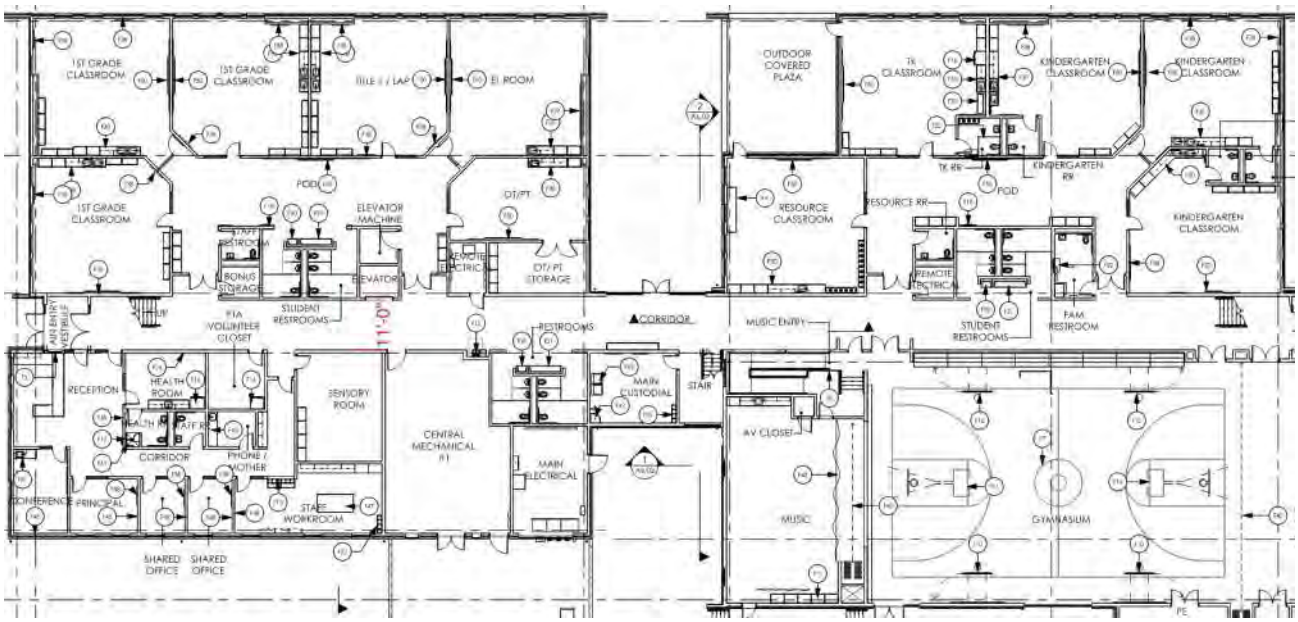
Baseline Concept Illustration



Second Floor Plan

=Workbook ID: PL-142	Reduce corridor widths to 11'.
Function(s): Support Student Wellbeing; Improve Acoustics	**Includes Idea(s)**: 70

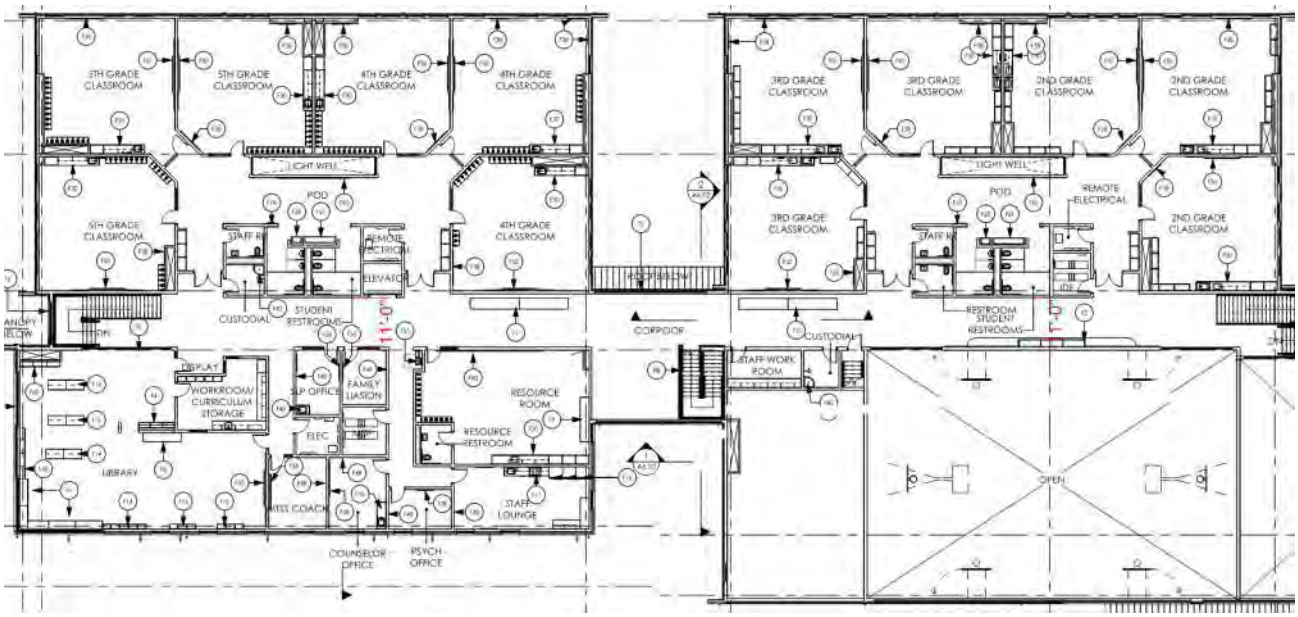
Alternative Concept Illustration



First Floor Plan

=Workbook ID: PL-142	Reduce corridor widths to 11'.
Function(s): Support Student Wellbeing; Improve Acoustics	**Includes Idea(s)**: 70

Alternative Concept Illustration



Second Floor Plan

Workbook ID: PL-142	Reduce corridor widths to 11'.							
Function(s): Support Student Wellbeing; Improve Acoustics						**Includes Idea(s):** 70		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Slab On Grade	35.48%	SF	36,695	15.72	781,510	36,395	15.72	775,121
Structural steel at floor, 12.5 lbs / SF	35.48%	lbs	325,675	3.70	1,632,531	319,050	3.70	1,599,321
Steel Floor Deck	35.48%	SF	26,054	6.35	224,142	25,524	6.35	219,582
Topping Slab, incl mesh & nelson studs	35.48%	SF	26,054	8.40	296,503	25,524	8.40	290,471
Structural steel at roof, 11 lbs / SF	35.48%	lbs	494,978	3.70	2,481,206	491,648	3.70	2,464,513
Steel roof deck	35.48%	SF	34,070	6.50	300,027	33,770	6.50	297,385
Metal roof system	35.48%	SF	41,674	36.50	2,060,788	41,374	36.50	2,045,953
Floor preparation	35.48%	SF	57,005	0.88	67,963	56,175	0.88	66,973
Resilient tile flooring	35.48%	SF	46,475	7.10	447,047	45,645	7.10	439,063
Ceiling Finishes	35.48%	SF	34,557	7.20	337,088	33,727	7.20	328,992
Composite HVAC pricing excluding equipment	35.48%	SF	60,784	56.15	4,623,962	59,984	56.15	4,563,104
Fire Protection	35.48%	SF	68,573	6.37	591,790	67,773	6.37	584,886
Composite Electrical pricing excluding equipment	35.48%	SF	65,218	67.76	5,987,094	64,418	67.76	5,913,653
TOTAL COSTS*					**19,832,000**			**19,589,000**
							TOTAL (PROPOSED less BASELINE)	**-243,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
Function(s): Connect Outdoors, Control Noise	**Includes Idea(s)**: 24

Baseline Concept:

In the baseline concept, the Music room is adjacent to the Gym, which is adjacent to the Cafeteria, which provides direct access to the Covered Play on the West elevation.

Alternative Concept:

In the alternative concept, the Music room is adjacent to the Cafeteria, which is adjacent to the Gym, which provides direct access to the Covered Play.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**+**	Environmental Sustainability	**=**
Aesthetics	**=**	Schedule	**=**
Durability & Reliability	**+**	Constructability	**+**
Total Cost of Ownership / Lifecycle Cost	**=**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 24,006,000	$ NA	$ NA
Alternative Concept	$ 23,472,000	$ NA	$ NA
Cost Difference	**$ -534,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
Function(s): Connect Outdoors, Control Noise	**Includes Idea(s)**: 24

Recommendation:

Recommend accepting this alternative for improved adjacencies.

Alternative Concept

Advantages	Disadvantages
• Enhances fluidity and efficiency of program spaces	• Requires structural grid re-evaluation
• Decrease square footage at the southwest corner	• Additional glazing at the gym
• Reduces group noise from gym and outdoor play	•
• Increases daylighting to gym	•
• Reduces costs	•

Analysis and Justification:

In the baseline concept, the program sequence from the Music/Stage, Gymnasium, Cafeteria to the Covered Play places the high-activity, noise-generating gymnasium between two spaces that benefit from being connected. This forces activity and noise from the gym back out to the corridor, past the cafeteria, and then out to the Covered Play.

The alternative concept sequences the relationship between programs to benefit the flow from Music to performance and gathering, followed by assembling activity and sound from the gym / PE classes to one side of the building, which also has direct access to the Covered Play and flexibility of PE / outdoor programs. In this way, the adjusted direction of the Gym allows for a reduced building size in the east-west direction. This increases outdoor space for additional area or grouping future portable locations on the east end of the building.

By adjusting the Gymnasium to the east end of the building, the exterior enclosure treatment can be modified from storefront glazing (when a cafeteria) to brick, and double as a wall for play under and adjacent to the Covered Play. The increased square footage towards the south appears be approximately equal to the decreased square footage from the east.

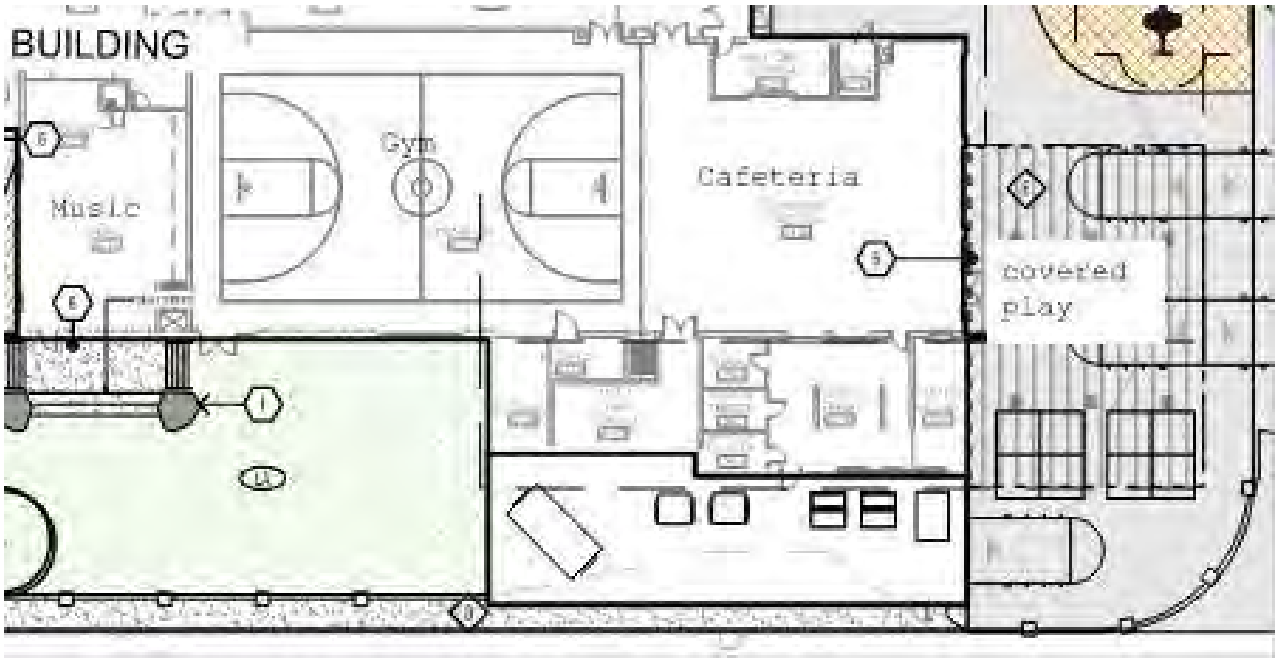
Placing the Music Room and Cafeteria together encourages a more central and accessible location relative to

Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
Function(s): Connect Outdoors, Control Noise	**Includes Idea(s)**: 24

the main entry and administration block, improving natural wayfinding particularly for first-time visitors, families, and after-hour gatherings or activity.

Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
Function(s): Connect Outdoors, Control Noise	**Includes Idea(s)**: 24

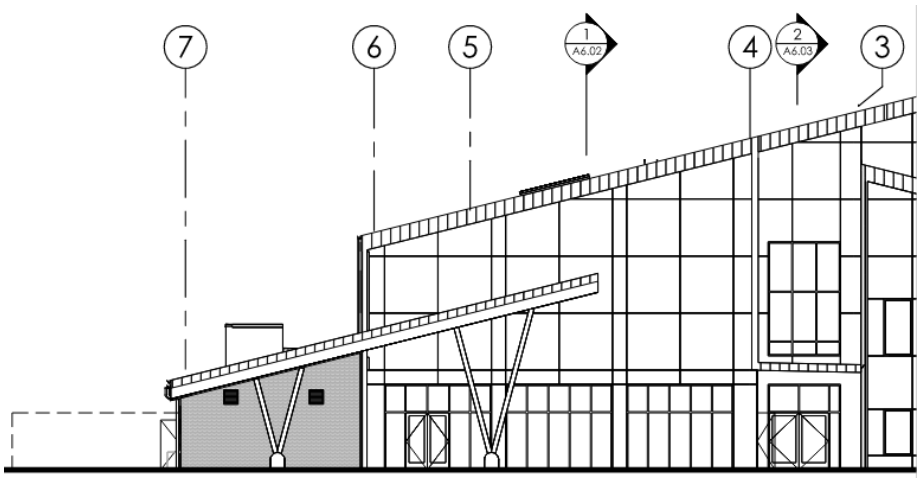
Baseline Concept Illustration



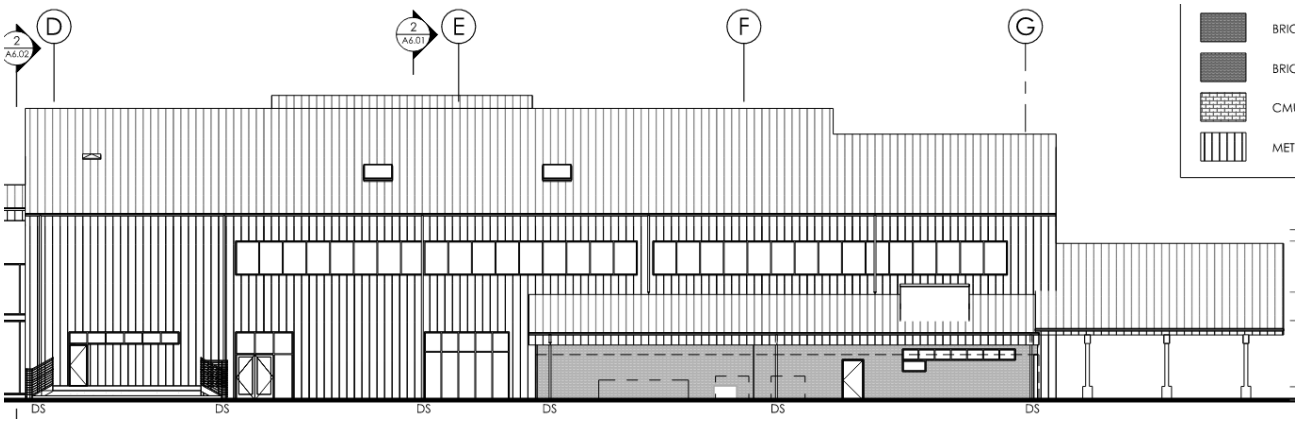
Baseline Program Layout

Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
Function(s): Connect Outdoors, Control Noise	**Includes Idea(s)**: 24

Baseline Concept Illustration



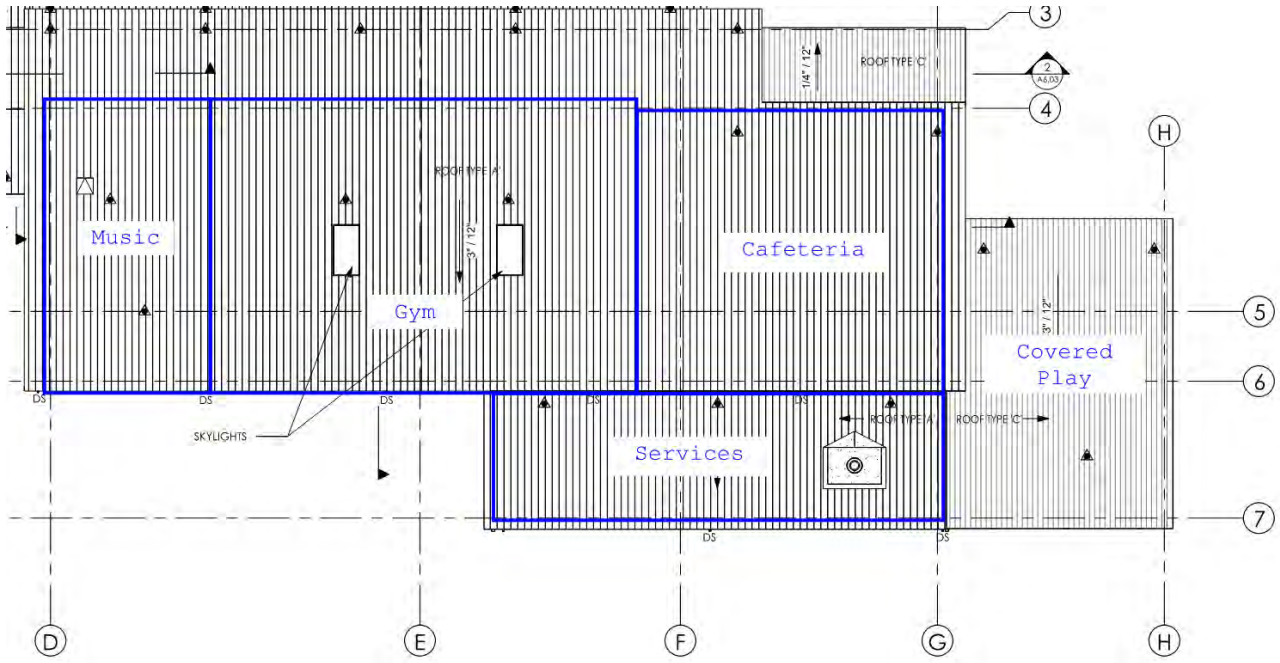
Baseline East Elevation of Covered Play and Egress from Cafeteria



Baseline South Elevation

Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
Function(s): Connect Outdoors, Control Noise	**Includes Idea(s)**: 24

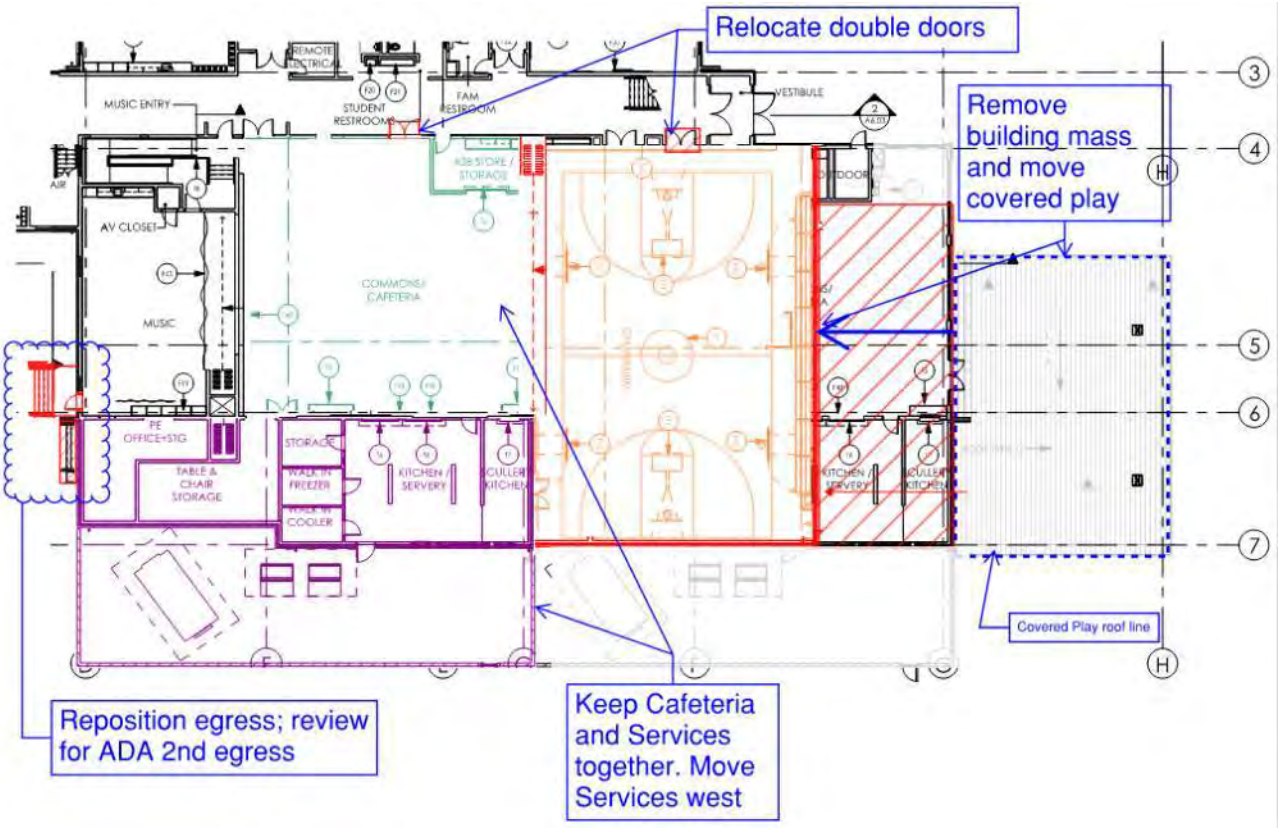
Baseline Concept Illustration



Baseline Roof Plan over Program Areas

Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
Function(s): Connect Outdoors, Control Noise	**Includes Idea(s)**: 24

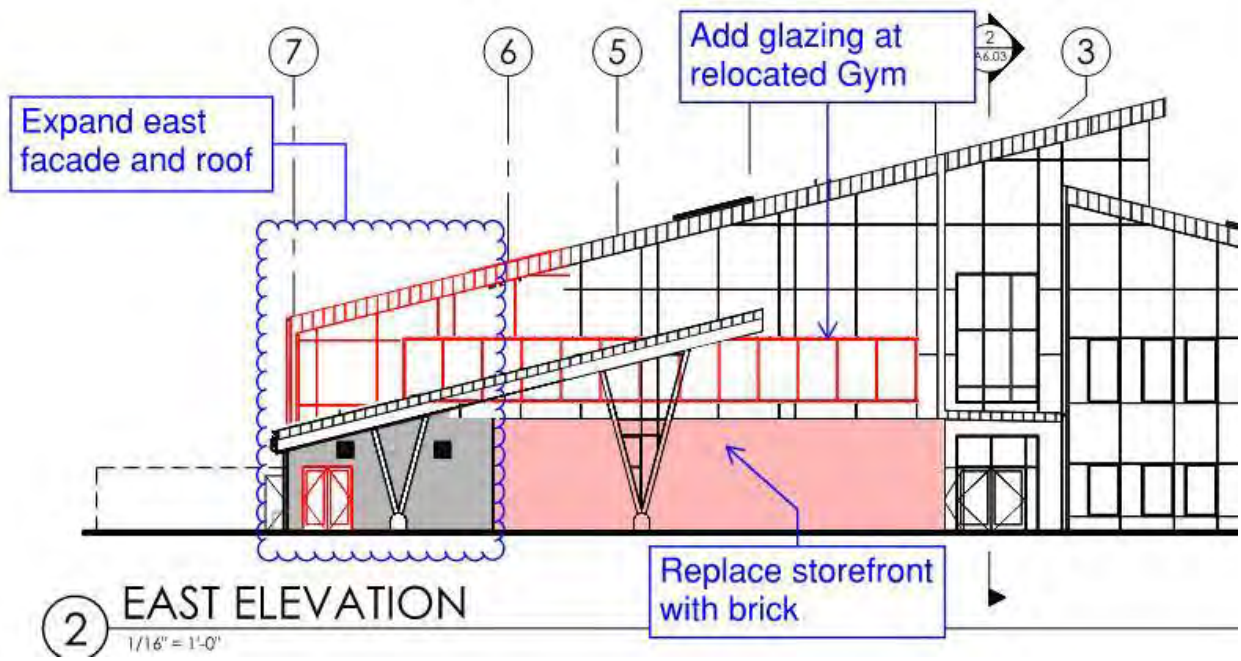
Alternative Concept Illustration



Alternate Concept Program Layout

Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
Function(s): Connect Outdoors, Control Noise	**Includes Idea(s)**: 24

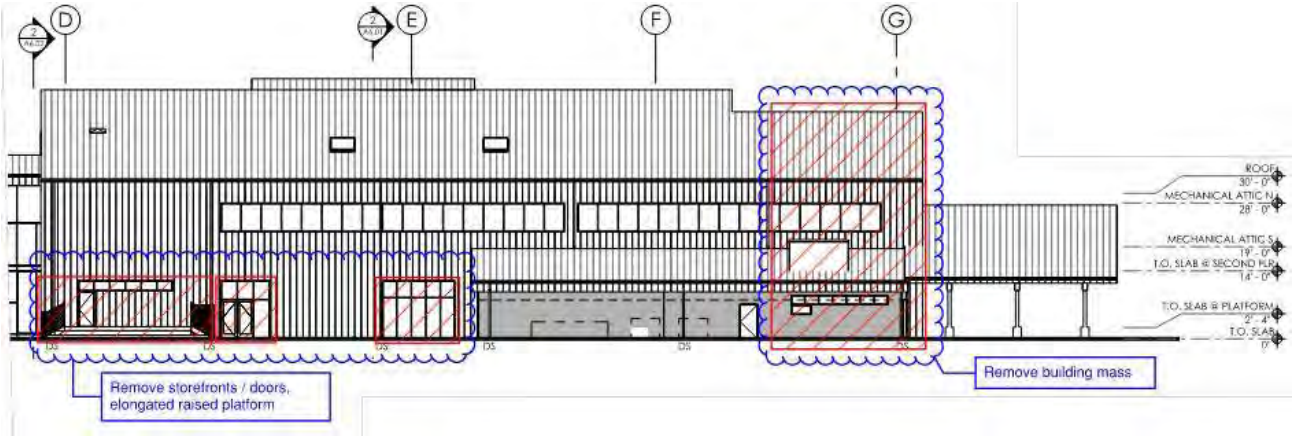
Alternative Concept Illustration



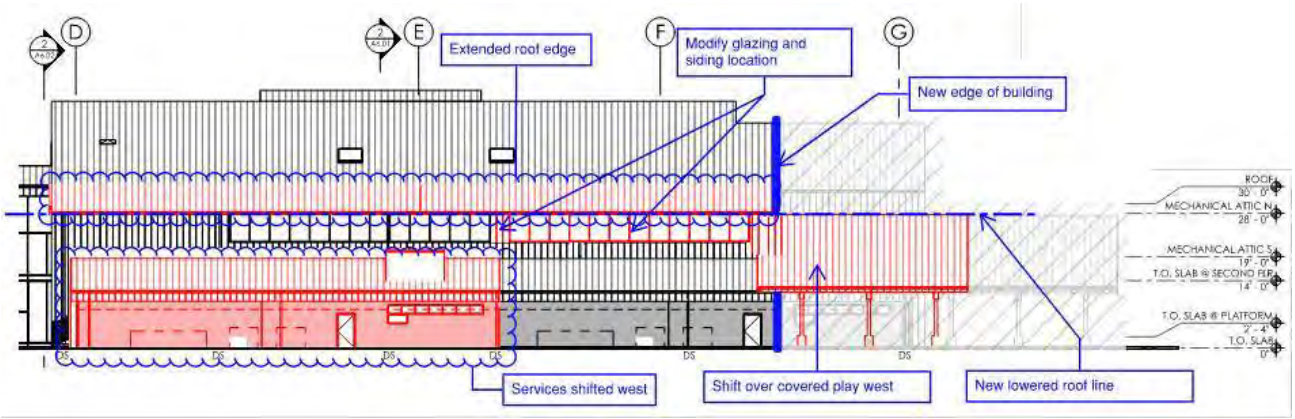
Alternate Concept East Façade – Shifted Program

Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
Function(s): Connect Outdoors, Control Noise	**Includes Idea(s)**: 24

Alternative Concept Illustration



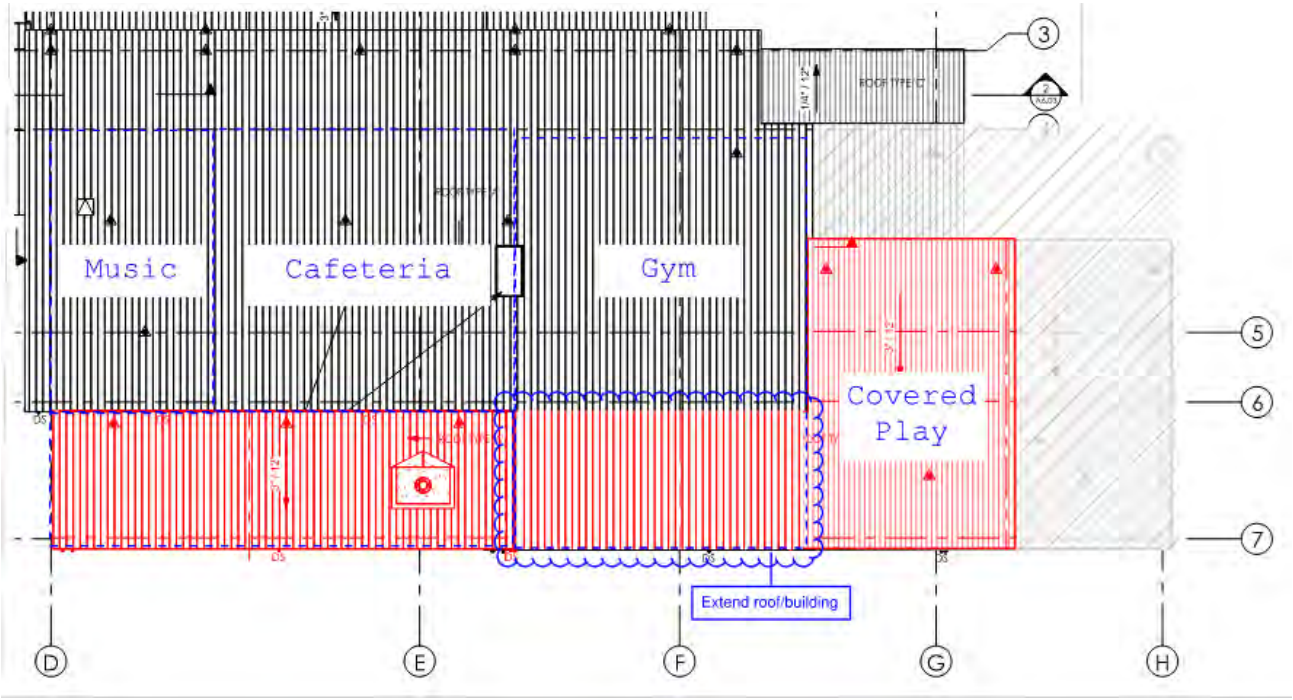
Alternate Concept South Façade - Demo Concept



Alternate Concept South Façade – Shifted Program

Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
Function(s): Connect Outdoors, Control Noise	**Includes Idea(s)**: 24

Alternative Concept Illustration



Alternate Concept Roof Plan – Shifted Program

Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).
Function(s): Connect Outdoors, Control Noise	**Includes Idea(s):** 24

CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Excavate for continuous footings	35.48%	CY	529	48.00	34,401	476	48.00	30,954
Backfill, assume imported fill	35.48%	CY	416	58.00	32,689	374	58.00	29,388
Disposal of excavated material off-site within 8 miles, assumed a 33% swell factor	35.48%	CY	704	31.35	29,901	634	31.35	26,928
Fine grade bottom of footing	35.48%	SF	1,458	1.30	2,568	1,312	1.30	2,311
Formwork to foundations - sides	35.48%	SF	1,932	13.45	35,205	1,739	13.45	31,688
Reinforcing steel to foundations	35.48%	LB	17,010	1.76	40,559	15,309	1.76	36,504
Concrete, 4,000 psi	35.48%	CY	113	329.60	50,459	102	329.60	45,547
Finish top of footing	35.48%	SF	1,458	1.40	2,765	1,312	1.40	2,488
Perimeter drain pipe and rock	35.48%	LF	1,163	29.45	46,402	1,048	29.45	41,814
Perimeter insulation, rigid	35.48%	SF	3,672	5.05	25,123	2,791	5.05	19,095
Stone aggregate piers, note pricing assumes 30'-0" deep	35.48%	LS	1	546,000	739,721	1	491,400	665,749
Pads & Thickening allowance	35.48%	LS	1	25,000	33,870	1	20,000	27,096
Reinforced concrete slab on grade, 5" including base	35.48%	SF	36,695	15.72	781,510	34,895	15.72	743,175
Strucutral steel at floor, 12.5lbs/sf	35.48%	LBS	325,675	3.70	1,632,531	303,175	3.70	1,519,744
Structural steel at roof, 11lbs/sf	35.48%	LBS	494,978	3.70	2,481,206	499,861	3.70	2,505,683
Brick masonry veneer including masonry anchors	35.48%	SF	7,789	49.85	526,044	8,499	49.85	573,995
Fiber reinforced cement panels	35.48%	SF	21,833	42.40	1,254,164	22,075	42.40	1,268,066

Workbook ID: PL-143	Reconfigure Program to align Music/Stage-Cafeteria-Gym-Covered Play (i.e., provide Gym-CP adjacency).							
Function(s): Connect Outdoors, Control Noise						**Includes Idea(s):** 24		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
SB-11 - 3" mineral wool insulation, 5/8" gypsum sheathing, WRB, metal stud framing, batt insulation, vapor barrier, (1) layer 5/8" gypsum at interior face	35.48%	SF	29,622	35.38	1,419,866	29,864	35.38	1,431,466
Blocking and backing at exterior walls	35.48%	SF	29,622	2.45	98,323	29,864	2.45	99,126
Aluminum storefront (excludesdoor openings, interior storefront included in estimate section C1017 Interior Windows and Storefronts)	35.48%	SF	7,444	90.00	907,662	6,257	90.00	762,929
Aluminum glazed door, double	35.48%	EA	5	12,480	84,540	4	12,480	67,632
Metal roofing system	35.48%	SF	41,674	36.50	2,060,788	43,926	36.50	2,172,149
Gutter	35.48%	LF	817	27.50	30,439	878	27.50	32,712
Resilient tile flooring	35.48%	SF	46,475	7.10	447,047	44,675	7.10	429,732
Composite HVAC pricing excluding equipment	35.48%	SF	60,784	56.15	4,623,962	59,074	56.15	4,493,879
Composite Electrical pricing excluding equipment	35.48%	SF	65,281	67.76	5,992,877	63,481	67.76	5,827,635
Fire Protection systems, building	35.48%	SF	68,573	6.37	591,790	67,773	6.37	584,886
TOTAL COSTS*					**24,006,000**			**23,472,000**
							TOTAL (PROPOSED less BASELINE)	**-534,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

Workbook ID: PL-144	Increase size of library.
Function(s): Enhance Flexibility, Improve Technology, Separate Space	**Includes Idea(s)**: 16

Baseline Concept:

In the baseline concept, the library is approximately 1,850 SF of open floor area. The open space adjacent to the south/central stair appears un-programed.

Alternative Concept:

In the alternative concept, increase library square footage and shift some program towards the open area adjacent to the south/central stair.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**+**	Environmental Sustainability	**=**
Aesthetics	**=**	Schedule	**=**
Durability & Reliability	**=**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**=**	Occupant Comfort, Safety, Performance	**+**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 2,704,000	$ NA	$ NA
Alternative Concept	$ 2,783,000	$ NA	$ NA
Cost Difference	**$ 79,000**	$ NA	$ NA
Cost Addition	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: PL-144	Increase size of library.
Function(s): Enhance Flexibility, Improve Technology, Separate Space	**Includes Idea(s)**: 16

Recommendation:

Recommend accepting this alternative increasing Library space by moving current Resource Room towards the South/Central Stair.

Alternative Concept

Advantages	Disadvantages
• Increases size of library for addition use capability	• Adds additional corridor space around offices
• Develops U-shape corridor in lieu of dead-ends	• Moderately reduces SF of Resource Room
• Increases size of Psych Office	•
• Improves alignment of MEP for constructability	•
•	•
•	•

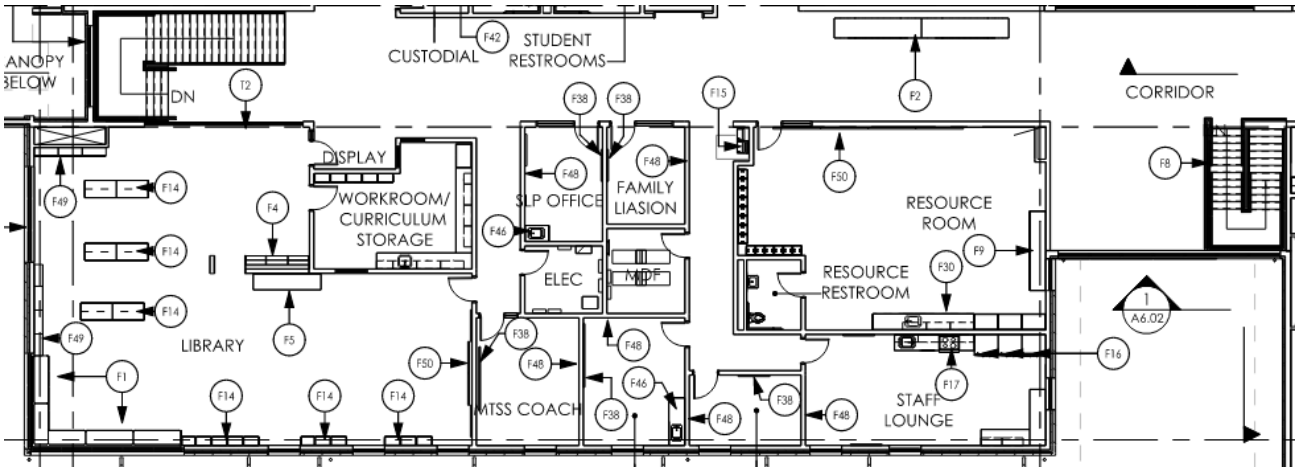
Analysis and Justification:

The primary benefit of shifting the Resource Room and office/electrical/MDF block of rooms, is increasing the library space which could allow for greater group collaboration, additional technology areas, and other additional programs. In shifting the program, the restroom (located within the Resource Room), now stacks above the restrooms below, aligning a plumbing chase for increased constructability and potentially reducing some costs associated with piping. Additionally, the electrical room and MDF room are relocated closer to the Main Electrical and Mechanical rooms below.

The circulation in and around the Workroom and offices does increase. However, by connecting the two dead-end corridors, we now have a U-shaped continuous path of travel.

Workbook ID: PL-144	Increase size of library.
Function(s): Enhance Flexibility, Improve Technology, Separate Space	**Includes Idea(s)**: 16

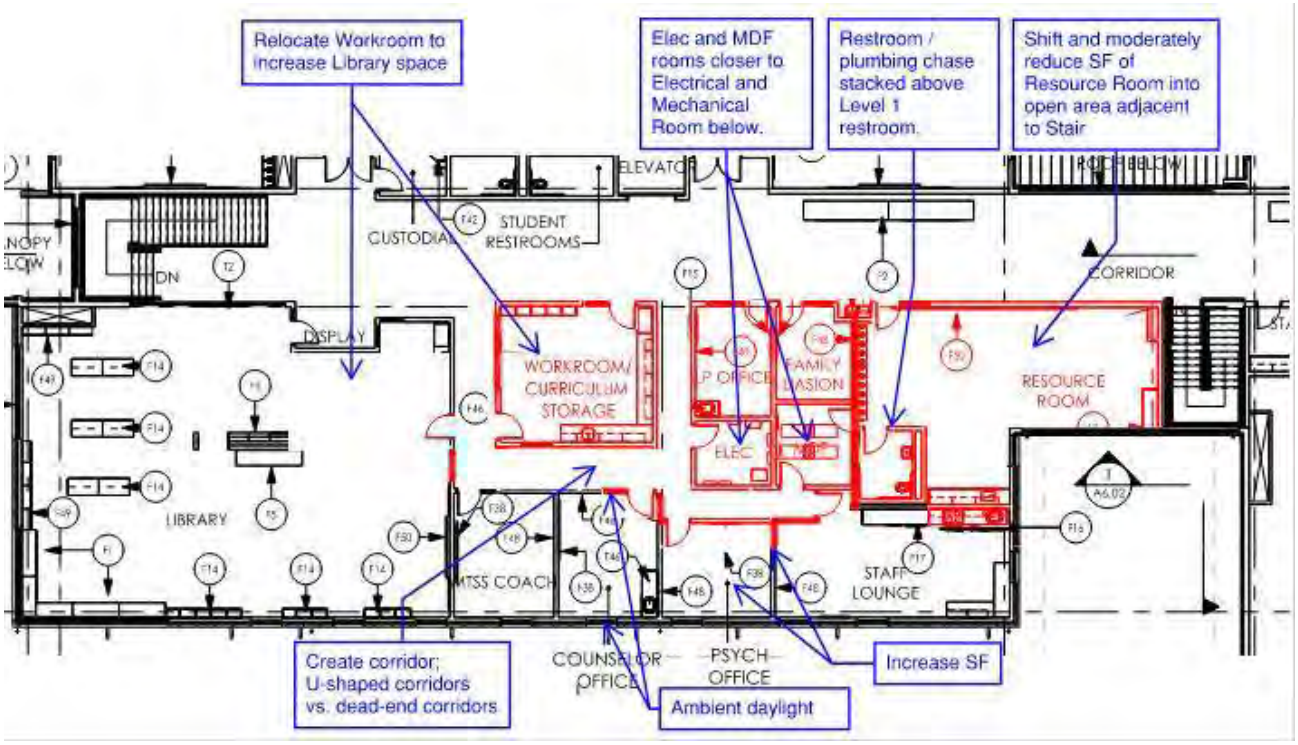
Baseline Concept Illustration



Baseline Level 2 Library Area

Workbook ID: PL-144	Increase size of library.
Function(s): Enhance Flexibility, Improve Technology, Separate Space	**Includes Idea(s)**: 16

Alternative Concept Illustration



Alternate Concept Layout

Workbook ID: PL-144	Increase size of library.							
Function(s): Enhance Flexibility, Improve Technology, Separate Space						**Includes Idea(s):** 16		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Metal stud 6"	35.48%	SF	63,630	11.90	1,025,850	67,230	11.90	1,083,890
GWB 5/8", type "X", taped and finished	35.48%	SF	146,146	4.60	910,794	147,346	4.60	918,272
HM relite	35.48%	SF	112	80.00	12,139	136	80.00	14,740
Wood doors, single flush	35.48%	EA	76	3,410.00	351,110	77	3,410.00	355,730
Interior paint to walls	35.48%	GFA	74,610	4.00	404,327	75,765	4.00	410,586
Minimal changes to Ceiling, Flooring, HVAC and Electrical								
TOTAL COSTS*					**2,704,000**			**2,783,000**
							TOTAL (PROPOSED less BASELINE)	**79,000**

Note: Total Costs are rounded to nearest thousand dollars

COST

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Workbook ID: PL-189	Revise design to make the classroom wing 3-story ILO 2-story.
Function(s): Layout Building; Consolidate Building; Reduce Earthwork	**Includes Idea(s)**:

Baseline Concept:

In the baseline design, the academic wing is configured as a two-story structure with a footprint of approximately 36,695 SF (i.e., based upon slab on grade takeoff).

Alternative Concept:

In the alternative concept, the academic wing would be configured as a three-story structure to reduce the building footprint to approximately 30,035 SF and associated earthwork.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	=	Environmental Sustainability	=
Aesthetics	=	Schedule	+
Durability & Reliability	=	Constructability	+
Total Cost of Ownership / Lifecycle Cost	=	Occupant Comfort, Safety, Performance	=

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 11,136,000	$ NA	$ NA
Alternative Concept	$ 10,658,000	$ NA	$ NA
Cost Difference	**$ -478,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: PL-189	Revise design to make the classroom wing 3-story ILO 2-story.
Function(s): Layout Building; Consolidate Building; Reduce Earthwork	**Includes Idea(s)**:

Recommendation:

Take advantage of the extended design schedule to redesign the classroom wing as a three-story structure.

Alternative Concept

Advantages	Disadvantages
• Reduced earthwork	• None apparent
• Improved constructability	•
• Lower first cost	•
• Lower risk due to reduced earthwork	•
•	•
•	•

Analysis and Justification:

Three story elementary schools are becoming more common due to the improved efficiencies during construction and long-term building operations. The proposed site that has been selected for the new Stevens Elementary presents one of the most challenging ever reviewed by the VE Team and the earthwork necessary to place the building on this site requires extensive excavation, soil treatment for stabilization and grading. Consequently the VE team explored options to address these concerns, including stepping the two-story academic wing into the site, or a three-story configuration. The VE team suggests both be explored further by the design team, but to initiate this suggestion we developed a rough order of magnitude cost for the District and design team to evaluate the concept and potential cost avoidance of nearly $500k.
No graphics were developed for this concept.

Workbook ID: PL-189	Revise design to make the classroom wing 3-story ILO 2-story.							
Function(s): Educate Students						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Reduce footprint by adding a third floor to the classroom wing. Relocate classrooms along grid lines 1 &2/D+ &F (reduces footprint by 3,660 SF +/- at 1st floor and roof)								
Standard Foundation, assume 6% reduction	35.48%	LS	1	1,414,696	1,916,630	1	1,329,814	1,801,632
Special Foundation, assume 6% reduciton	35.48%	LS	1	546,000	739,721	1	513,240	695,338
Slab on Grade	35.48%	SF	36,695	15.72	781,510	30,035	14.78	601,289
Strucutral steel at floor, 1.25lbs/sf	35.48%	LBS	325,675	3.70	1,632,531	371,425	3.70	1,861,864
Steel floor deck	35.48%	SF	26,054	6.35	224,142	29,714	6.35	255,629
Topping slab, incl mesh and nelson studs	35.48%	SF	26,054	8.40	296,503	29,714	8.40	338,155
Strcutural steel at roof, 11#/sf	35.48%	LBS	494,978	3.70	2,481,206	454,718	3.70	2,279,392
Steel roof desk	35.48%	SF	34,070	6.50	300,027	30,410	6.50	267,797
Metal roofing system	35.48%	SF	41,674	36.50	2,060,788	38,014	36.50	1,879,800
Sheet metal flashings and trin at roof	35.48%	SF	41,674	3.50	197,610	38,014	3.50	180,255
Downspouts	35.48%	EA	19	550.00	14,158	15	750.00	15,242
Gutters	35.48%	LF	817	27.50	30,439	756	27.50	28,166
Elevator, revise rfom 2-stop to 3-stop	35.48%	EA	1	165,000	223,542	1	210,000	284,508
Architectural stairs, revise from 3 to 2 w/2 flt	35.48%	LS	1	175,000	237,090	1	125,000	169,350
Note: Minimal cost impacts to the interior construction and MEP								
TOTAL COSTS*					**11,136,000**			**10,658,000**
							TOTAL (PROPOSED less BASELINE)	**-478,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: S-160	Provide fan coils in classroom to reduce mechanical attics and ductwork.
Function(s):Condition Space	**Includes Idea(s)**: 17,30,180

Baseline Concept:

In the baseline concept, 4 pipe hydronic fan coils are provided in the three mechanical attic spaces and ducted to each classroom.

Alternative Concept:

In the alternative concept, the 4 pipe fan coils, either vertical or horizonal, would be installed in the classroom space.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**+**
Aesthetics	**=**	Schedule	**+**
Durability & Reliability	**=**	Constructability	**+**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 2,903,000	$ NA	$ NA
Alternative Concept	$ 2,324,000	$ NA	$ NA
Cost Difference	**$ -579,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: S-160	Provide fan coils in classroom to reduce mechanical attics and ductwork.
Function(s):Condition Space	**Includes Idea(s)**: 17,30,180

Recommendation:

We recommend accepting the alternate to reduce ductwork and mechanical attic space.

Alternative Concept

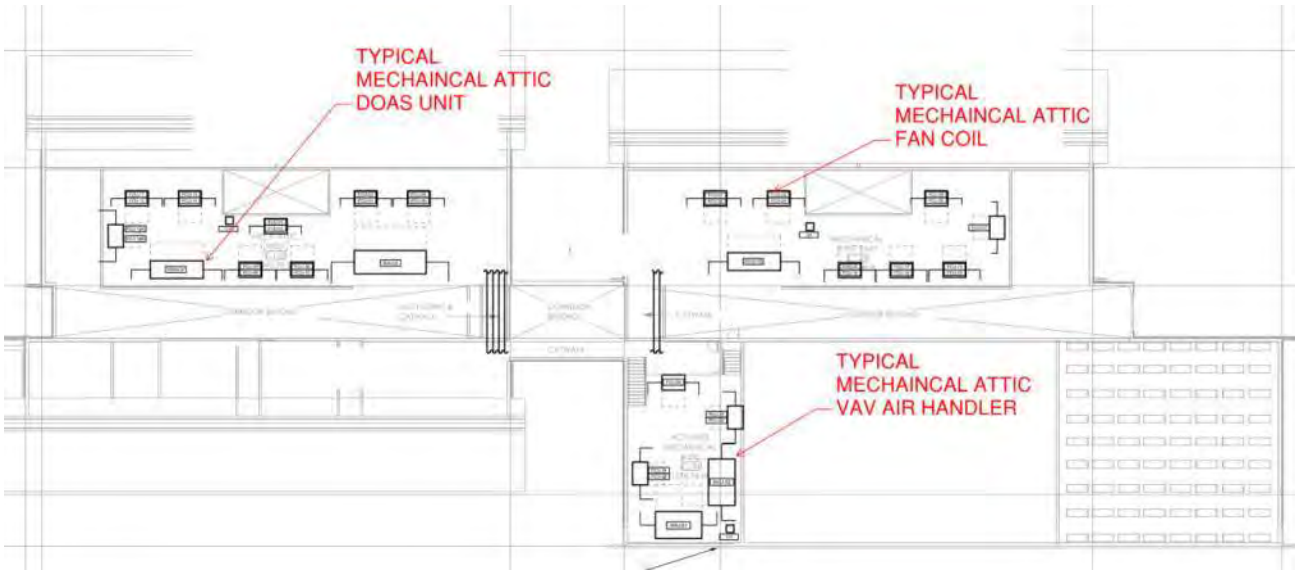
Advantages	Disadvantages
• Reduces size of mechanical attics	• Decentralized equipment maintenance
• Reduces quantity of ductwork	•
• Reduces fan power	•
•	•
•	•
•	•

Analysis and Justification:

The baseline design provides heating and cooling to classrooms from hydronic fan coils in mechanical attics. The design requires long duct runs from each fan coil to the classroom served. Longer duct runs require additional material as well as added fan power to overcome static pressure loss in the ductwork. To reduce the length of ductwork we propose installing four pipe fan coils in the classroom. These can either be horizonal fan coils above the ceiling or vertical fan coils in place of the currently designed duct shafts though the classrooms.

Workbook ID: S-160	Provide fan coils in classroom to reduce mechanical attics and ductwork.
Function(s):Condition Space	**Includes Idea(s)**: 17,30,180

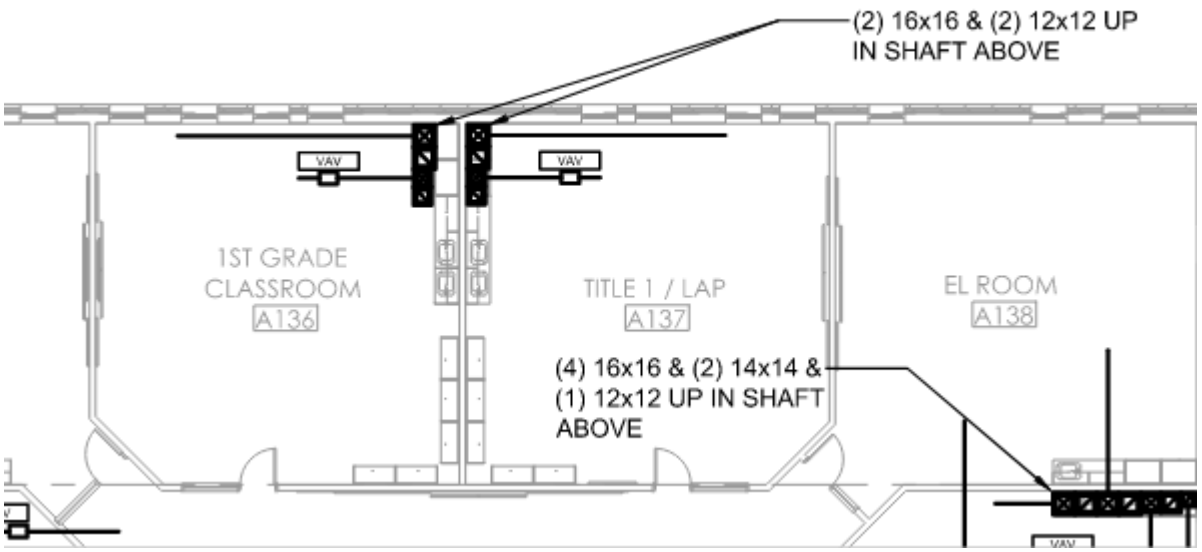
Baseline Concept Illustration



MECHAINCAL ATTICS

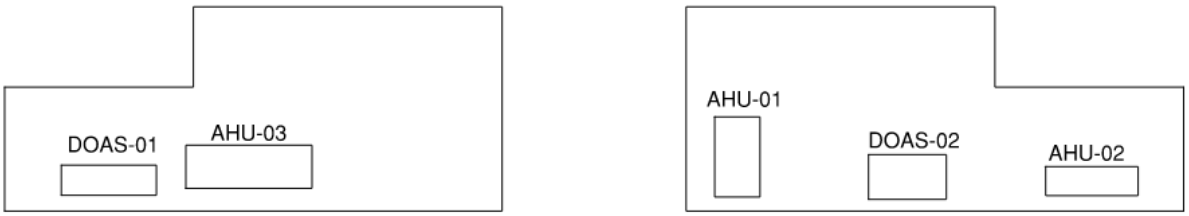
Workbook ID: S-160	Provide fan coils in classroom to reduce mechanical attics and ductwork.
Function(s):Condition Space	**Includes Idea(s)**: 17,30,180

Baseline Concept Illustration



TYPICAL CLASSROOMS

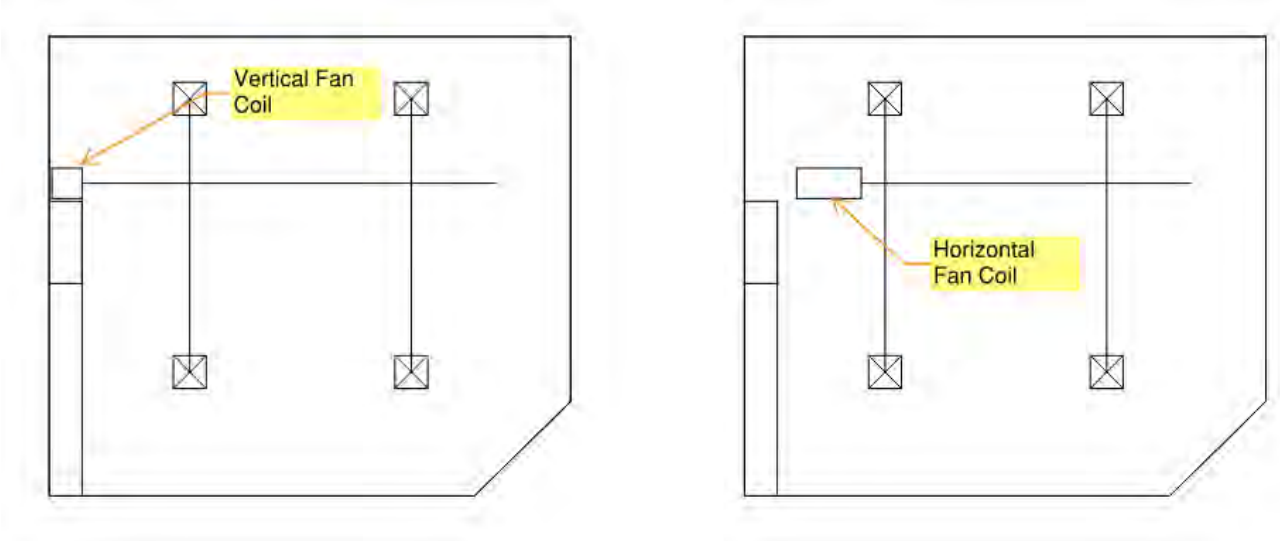
Workbook ID: S-160	Provide fan coils in classroom to reduce mechanical attics and ductwork.
Function(s):Condition Space	**Includes Idea(s)**: 17,30,180



Reduced mechanical attic space

Workbook ID: S-160	Provide fan coils in classroom to reduce mechanical attics and ductwork.
Function(s):Condition Space	**Includes Idea(s)**: 17,30,180

Alternative Concept Illustration



Typical Classroom

Workbook ID: S-160	Provide fan coils in classroom to reduce mechanical attics and ductwork.							
Function(s): Condition Space						**Includes Idea(s):** 17,30,180		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Steel floor structure at mezzanine, 12psf	35.48%	LBS	91,932	3.70	460,833	44,400	3.70	222,567
Steel floor deck	35.48%	SF	7,661	6.35	65,907	3,700	6.35	31,831
Topping slab, incl mesh & nelson studs	35.48%	SF	7,661	8.40	87,185	3,700	8.40	42,107
Misc. structural steel/plates connections	35.48%	LBS	11,492	3.70	57,607	5,550	3.70	27,821
6" CFMS Studs	35.48%	SF	63,360	11.90	1,021,498	60,360	11.90	973,131
GWB 5/8",type "X" fire taped	35.48%	SF	146,146	4.60	910,794	143,146	4.60	892,097
Batt Insulation	35.48%	SF	76,664	1.35	140,217	73,664	1.35	134,730
Fan Coil Ductwork from attic to classroom	35.48%	LBS	12,000	9.75	158,512			
TOTAL COSTS*					**2,903,000**			**2,324,000**
							TOTAL (PROPOSED less BASELINE)	**-579,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

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Workbook ID: S-161	Increase covered play to 4,000 sf.
Function(s): Encourage Play	**Includes Idea(s)**:

Baseline Concept:

The current design includes 2,636 SF of covered play area.

Alternative Concept:

The proposed concept would reduce the overall building area by 682 SF and increase the covered play area to 4,000 SF.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	=	Environmental Sustainability	=
Aesthetics	=	Schedule	+
Durability & Reliability	=	Constructability	+
Total Cost of Ownership / Lifecycle Cost	+	Occupant Comfort, Safety, Performance	=

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ NA	$ NA	$ NA
Alternative Concept	$ NA	$ NA	$ NA
Cost Difference	**$ NA**	$ NA	$ NA

Project Suggestion

Life cycle cost analysis uses a NA% discount rate and NA-year economic life.

DRAFT

Workbook ID: S-161	Increase covered play to 4,000 sf.
Function(s): Encourage Play	**Includes Idea(s)**:

Recommendation:

Accept this alternative to reduce the overall building area by 682 SF and increase the covered play area to 4,000 SF.

Alternative Concept

Advantages	Disadvantages
• Reduces overall construction costs	• Results in a reduction of enclosed building area
• Provides additional all-weather outdoor space for P.E., recess etc.	• Covered canopy space does not provide the same functionality as enclosed conditioned space during severe weather events
• Improves overall project value without reducing educational functionality	•
• Reduces long-term operating costs	•
• Takes full advantage of the OSPI funding model	•
•	•

Analysis and Justification:

The proposed building square footage appears to exceed the space requirements associated with both current enrollment and projected student population trends, which indicates continued enrollment decline. Opportunities exist to improve building efficiency through reductions in corridor widths, circulation areas, and other non-programmatic spaces without negatively impacting the educational program.

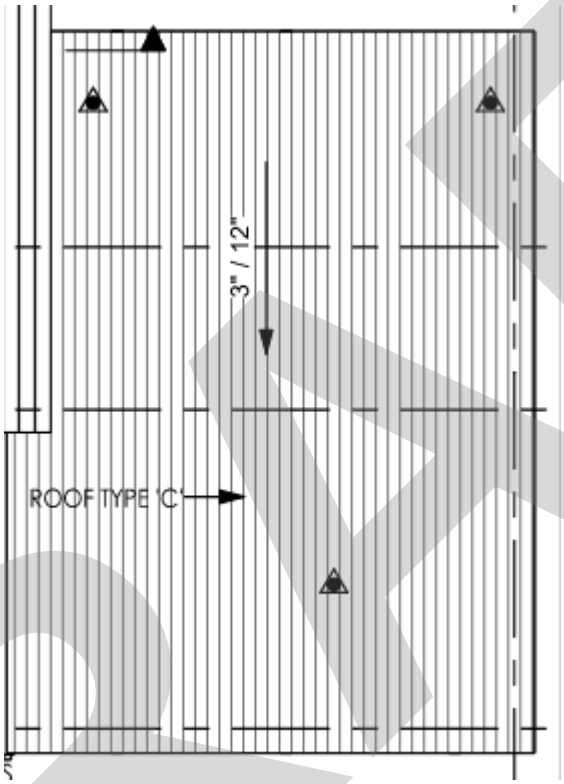
Although Covered Play areas cost development is significantly lower than costs to develop fully conditioned and finished buildings, under OSPI's current SCAP funding model, districts may receive state assistance for 50% of covered play area at the same cost SF as the full building development. Utilizing this funding mechanism by increasing the covered canopy area by approximately 1,364 SF, results in additional funding of 682 SF x $399.38 July 2026 Area Cost Allowance, or $272,377. Actual increased costs for the larger Covered Play would be $136,400, for a net savings of $135,977.

This strategy provides a significant value advantage. In addition to the funding strategy, given Aberdeen's climate and annual rainfall, increasing covered area provides meaningful educational and operational benefits by expanding all-weather outdoor learning, play, gathering, and circulation spaces.

DRAFT

Workbook ID: S-161	Increase covered play to 4,000 sf.
Function(s): Encourage Play	**Includes Idea(s)**:

Baseline Concept Illustration

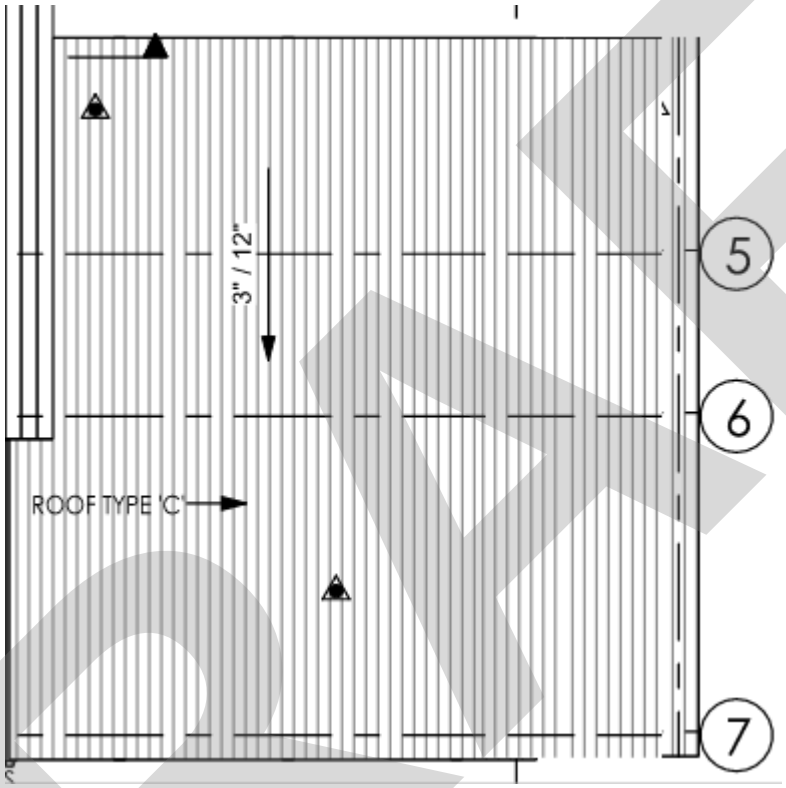


Baseline Covered Play Area

DRAFT

Workbook ID: S-161	Increase covered play to 4,000 sf.
Function(s): Encourage Play	**Includes Idea(s)**:

Alternative Concept Illustration



Alternative Covered Play Area

DRAFT

Workbook ID: S-162	Modify main covered play roof slope and height (min 16', max 20').
Function(s): Support Load, Connect Outdoors	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, the covered play roof has a low eave clear height of 9'-6" and a high eave clear height of 24'-6".

Alternative Concept:

In the alternative concept, the covered play roof has a low eave clear height of 16'-0" and a high eave clear height of 20'-0".

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**=**
Aesthetics	**+**	Schedule	**=**
Durability & Reliability	**=**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**--**	Occupant Comfort, Safety, Performance	**+**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 22,000	$ NA	$ NA
Alternative Concept	$ 0	$ NA	$ NA
Cost Difference	**$ -22,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: S-162	Modify main covered play roof slope and height (min 16', max 20').
Function(s): Support Load, Connect Outdoors	**Includes Idea(s)**:

Recommendation:

Consider accepting this alternative.

Alternative Concept

Advantages	Disadvantages
• Provides a more functional covered play space	• Changes design intent alignment of covered play roof slope with current building roof slope
• Inhibits rain blowing into the play space	•
•	•

Analysis and Justification:

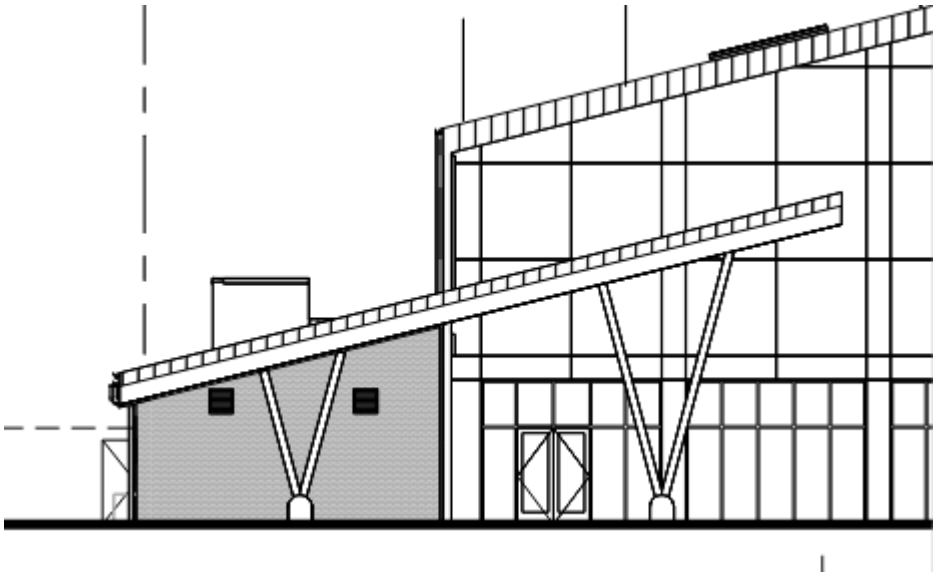
Raising the low eave clear height from 9'-6" to 14'-0" and lowering the high eave from 24'-6" to 20'-0" results in a more functional and better-proportioned structure for elementary-age students. The existing design creates an extreme pitch differential across the slope dimension. While this works well for the canopy's primary purpose of protecting the play area from the elements, given prevailing winds from the West and SW in Aberdeen, and considering protection from the building to the West and the low eave to the South, raising the low South eave and lowering the high eave to 20'-0", the canopy presents a reduced profile to wind, limiting the pressure differential that draws weather into the covered space and improving usable dry area during the rain and wind events that are common during the school year.

Raising the low eave from 9'-6" to 16'-0" addresses a functional concern for an active elementary covered play area. The concern is the marginal clearance that too low and constricts ball play. At 16'-0", the raised low eave provides generous, unobstructed clearance and daylighting that is more appropriate for active play, equipment access, and supervision sightlines across the full canopy footprint. The net result of this modification is a shallower, more uniform roof slope that encloses a more child-appropriate and functional space below and reduces the structural demands on the canopy framing.

The roof will need to be decoupled from the main building to allow for the taller eave and gentler slope which allows for other architectural adjustments such as sloping the canopy away from or toward the gym wall in lieu of parallel to the gym wall. If the roof is decoupled, then the seismic joint between the buildings can also be removed resulting in project cost savings and better long-term performance of the roof coverings.

Workbook ID: S-162	Modify main covered play roof slope and height (min 16', max 20').
Function(s): Support Load, Connect Outdoors	**Includes Idea(s)**:

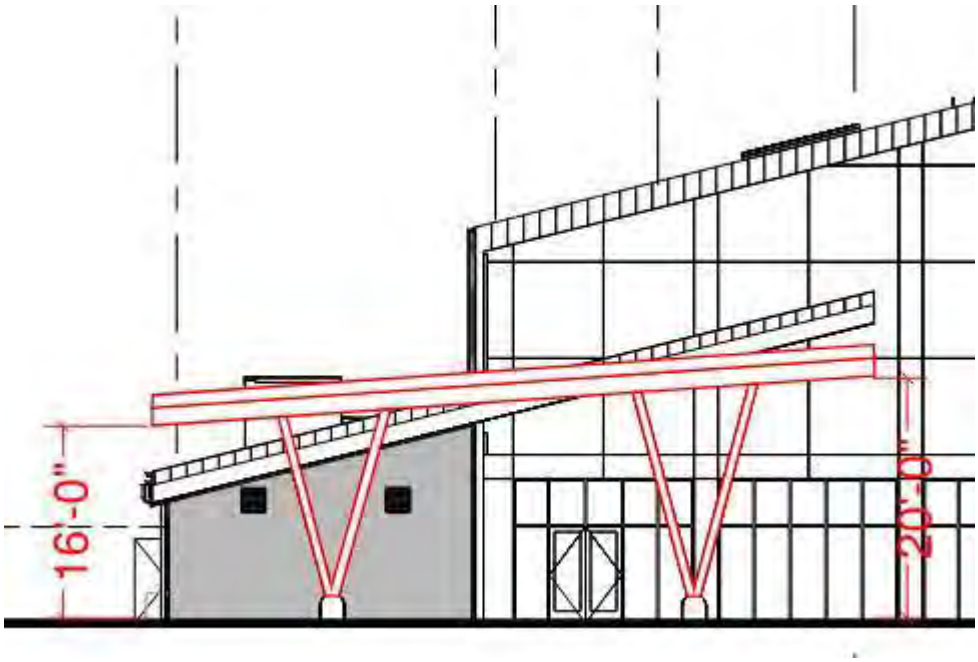
Baseline Concept Illustration



Existing Roof Profile

Workbook ID: S-162	Modify main covered play roof slope and height (min 16', max 20').
Function(s): Support Load, Connect Outdoors	**Includes Idea(s)**:

Alternative Concept Illustration



Alternate Roof Profile

Workbook ID: S-162	Modify main covered play roof slope and height (min 16', max 20').							
Function(s): Support Load, Connect Outdoors						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Seismic joint at canopy structure	35.48%	LF	60	275.00	22,354			
TOTAL COSTS*					**22,000**			
							TOTAL (PROPOSED less BASELINE)	**-22,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: S-163	Increase size and visibility of main entry canopy.
Function(s): Enclose Space, Improve Security, Circulate Students	**Includes Idea(s)**: 3, 18, 23

Baseline Concept:

In the baseline concept, the Reception area and desk are located immediately adjacent to the Main Entry Vestibule.

Alternative Concept:

The alternative concept reorients the Reception area and desk, widens the Main Entrance by shifting modular admin area south approximately 8', and increases the entry circulation around west stair.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**+**	Environmental Sustainability	**=**
Aesthetics	**+**	Schedule	**=**
Durability & Reliability	**=**	Constructability	**=**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**+**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 20,000,000	$ NA	$ NA
Alternative Concept	$ 20,421,000	$ NA	$ NA
Cost Difference	**$ 421,000**	$ NA	$ NA
Cost Addition	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: S-163	Increase size and visibility of main entry canopy.
Function(s): Enclose Space, Improve Security, Circulate Students	**Includes Idea(s)**: 3, 18, 23

Recommendation:

Recommend accepting this alternative to increase the Main Entrance and rearrange the Administration/Reception areas.

Alternative Concept

Advantages	Disadvantages
• Increases sight lines from Reception to entry and corridor	• Increases material and cost at storefront and exterior glazing
• Allows additional circulation to enter the building	• Increases building square footage
• Promotes natural wayfinding at the widened and grander entrance	•
• Increases lobby space	•
• Mitigates the pinch-point at back of West stairs, where the current circulation is directed	•
• Additional exterior covered space under Main Entrance canopy for students needing to wait outside	•

Analysis and Justification:

The alternative concept relocates the reception desk away from its immediate adjacency to the main entry vestibule. The most immediate benefit of this proposal is improved sightlines and supervision where staff can increase their line of sight from the reception desk to both the entry doors and the main corridor, rather than the presumed direction inward towards the administrative area.

In considering the rearrangement of the administrative area, it was also reviewed that the main entrance's north door leaf leads pedestrian traffic towards a constrained area under the West Stairs; between the path of egress, stair circulation and corridor circulation, a natural point of congestion develops. Widening the main entry with a second set of double doors and increasing the corridor circulation adjacent to the Administration area allows for more capacity into/out-of the building, bypassing the chokepoint at the stairs, while creating a more spacious and open entry sequence (inside and out) into a more generous arrival space.

The widened entry improves natural wayfinding that clearly welcomes families to the primary point of arrival. Widening the canopy of the entrance also creates additional covered space for students to take

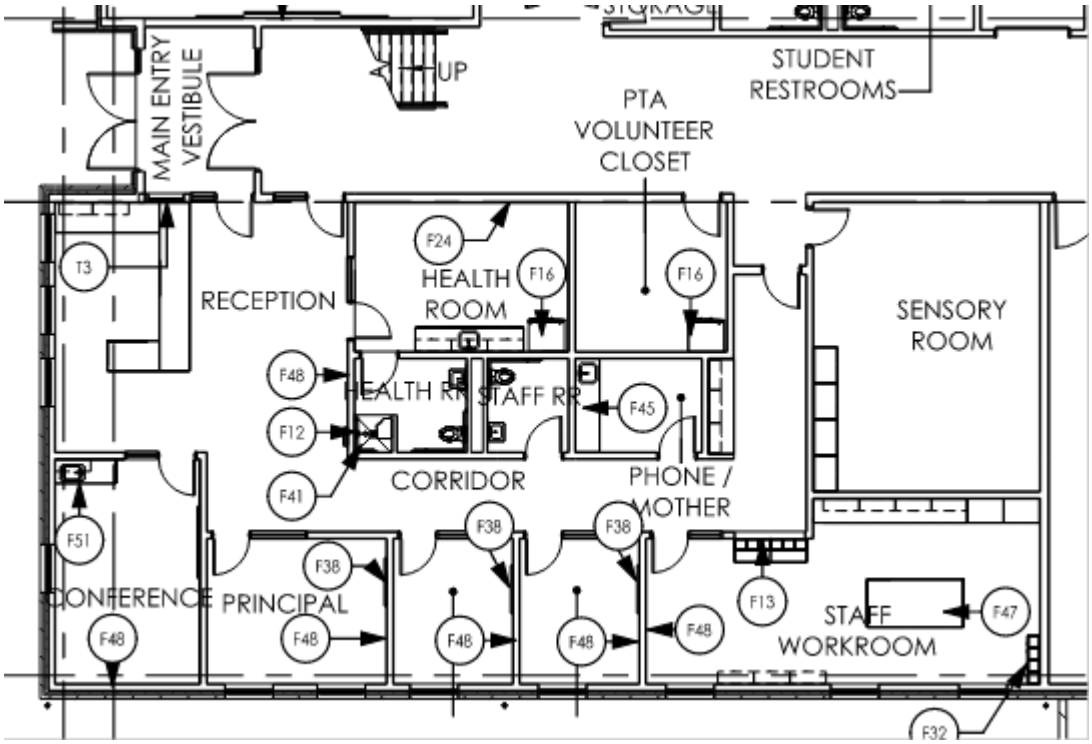
Workbook ID: S-163	Increase size and visibility of main entry canopy.
Function(s): Enclose Space, Improve Security, Circulate Students	**Includes Idea(s)**: 3, 18, 23

shelter from Aberdeen's typical weather conditions, while they wait outside for parent pickup, bus loading, or supervised transitions.

This alternative concept proposes modifying the reception orientation while maintaining the administrative block, and widening the main entry and relative corridor. Conceptually, this moves the administrative block approximately 8' south. This will increase the overall building gross square feet and incorporate additional storefront and glazing. However, you gain an improved entry sequence and potentially room for additional conference rooms or shared offices. There is also opportunity to reduce the adjacent mechanical room and increase the administrative function.

Workbook ID: S-163	Increase size and visibility of main entry canopy.
Function(s): Enclose Space, Improve Security, Circulate Students	**Includes Idea(s)**: 3, 18, 23

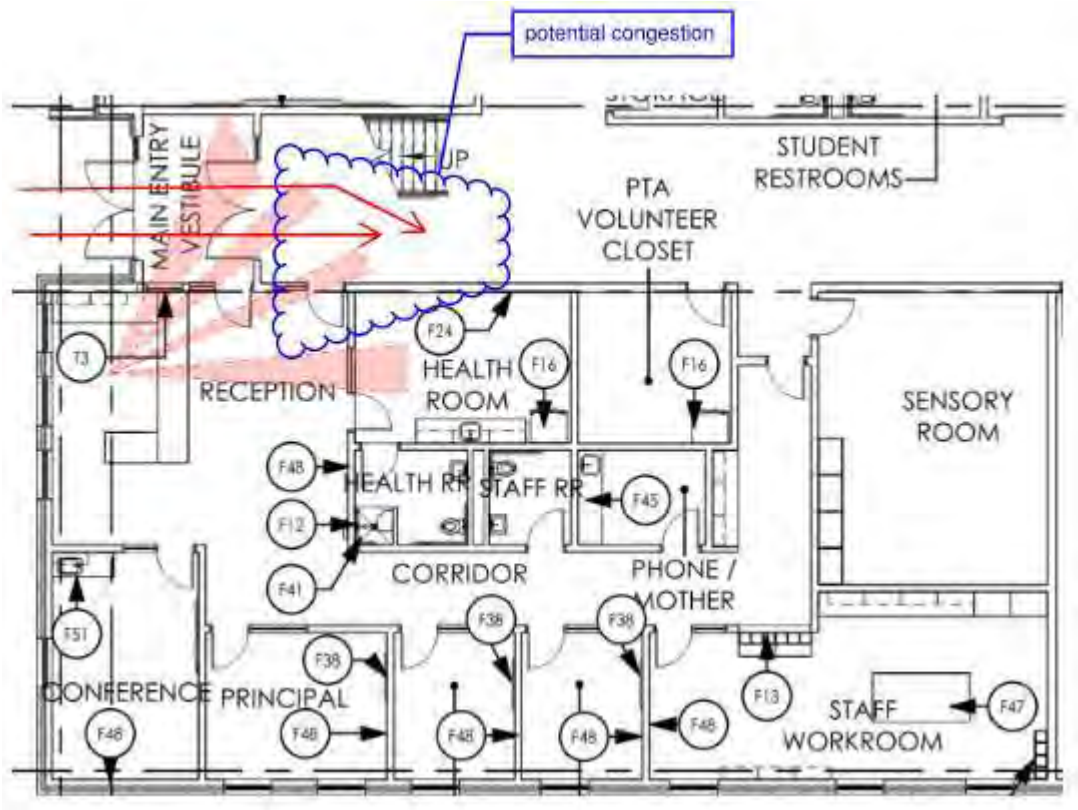
Baseline Concept Illustration



Baseline Reception and Administration Area

Workbook ID: S-163	Increase size and visibility of main entry canopy.
Function(s): Enclose Space, Improve Security, Circulate Students	**Includes Idea(s)**: 3, 18, 23

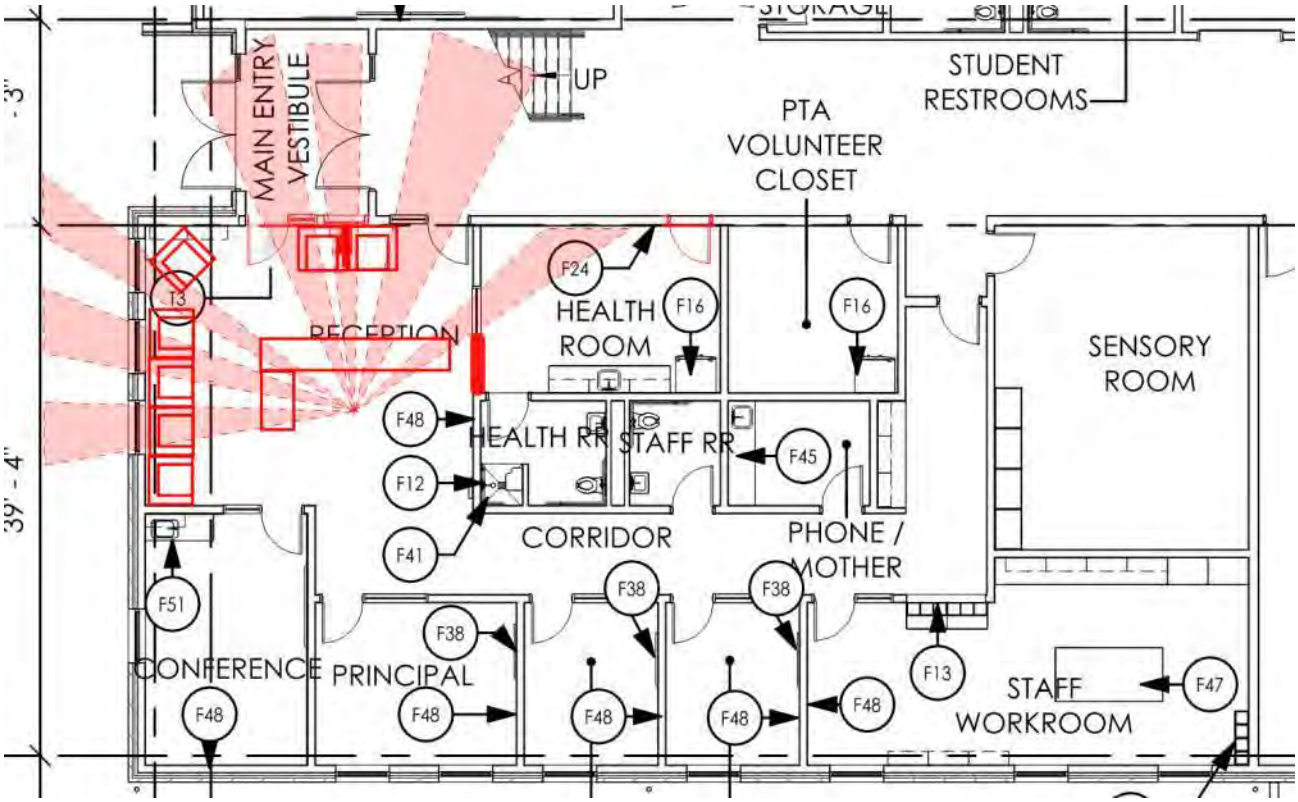
Baseline Concept Illustration



Baseline Concept with Sight Lines

Workbook ID: S-163	Increase size and visibility of main entry canopy.
Function(s): Enclose Space, Improve Security, Circulate Students	**Includes Idea(s)**: 3, 18, 23

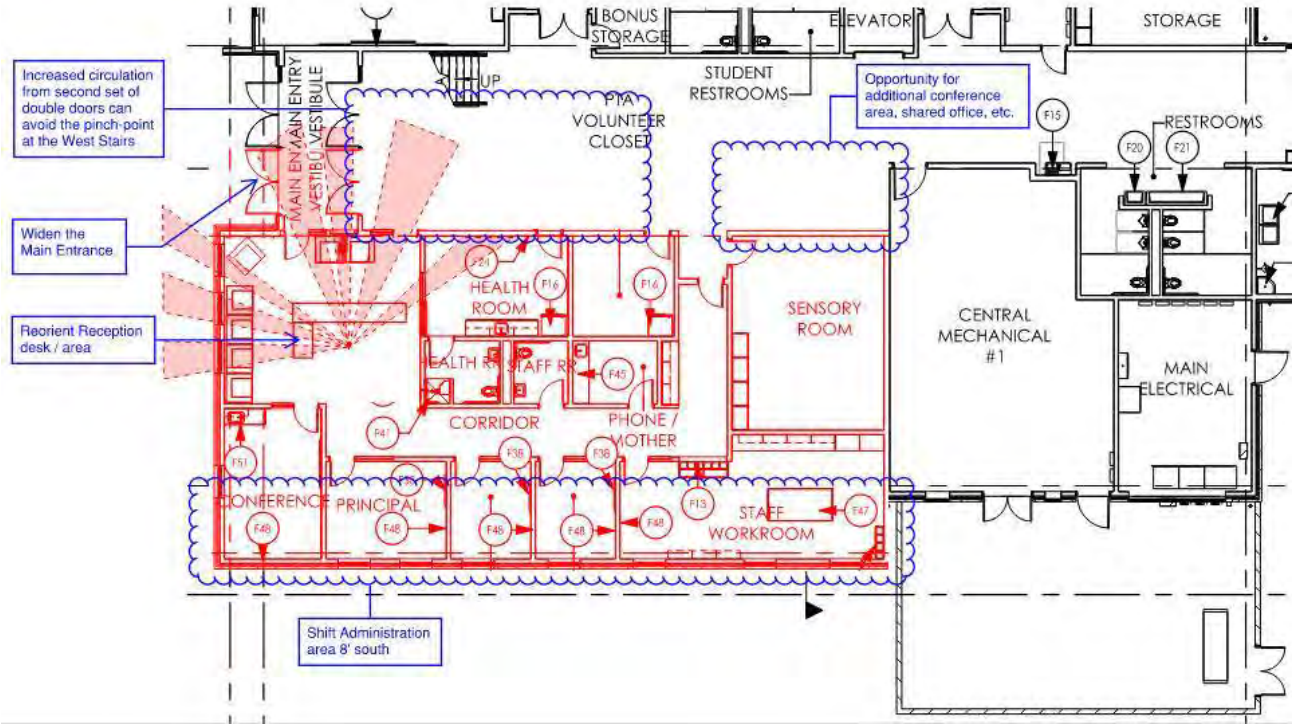
Alternative Concept Illustration



Alternative Reception Area/Desk Sight Line Concept

Workbook ID: S-163	Increase size and visibility of main entry canopy.
Function(s): Enclose Space, Improve Security, Circulate Students	**Includes Idea(s)**: 3, 18, 23

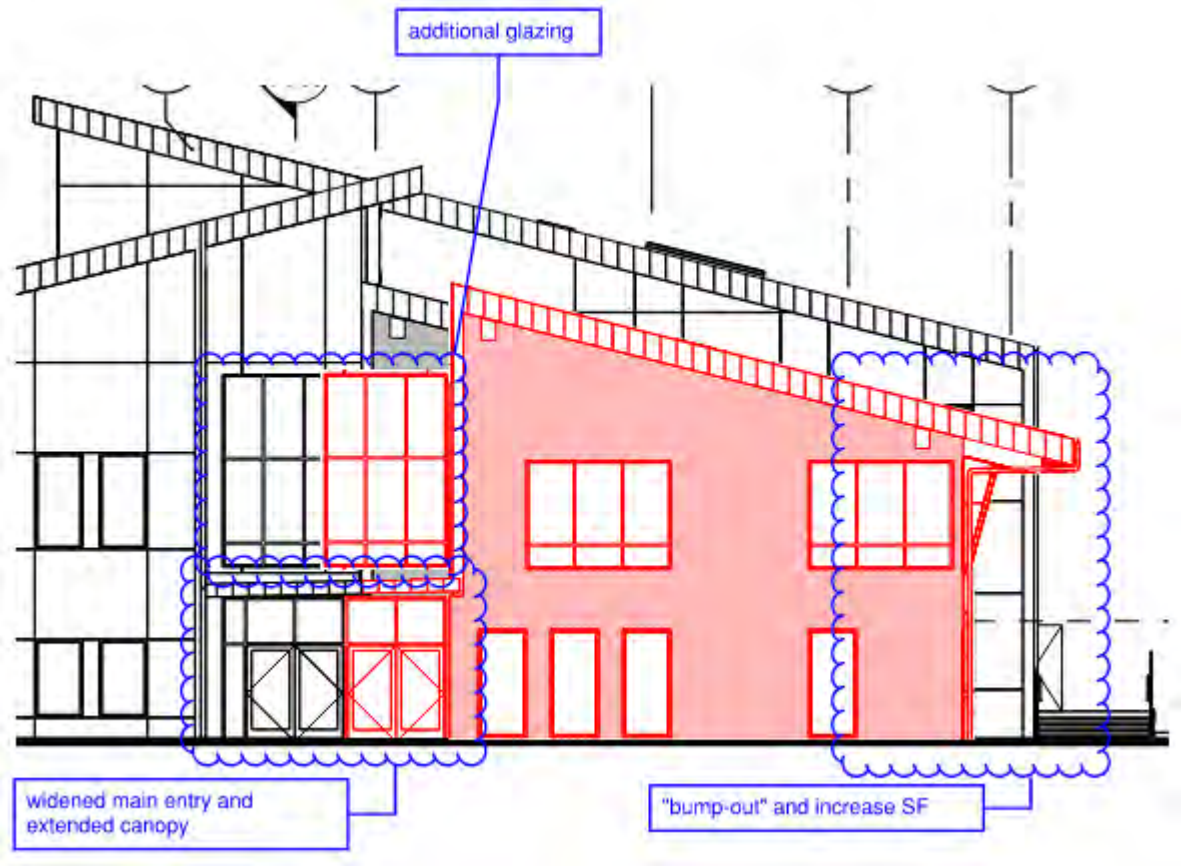
Alternative Concept Illustration



Alternative Reception Area/Desk with Widened Main Entry, Increased Corridor, and Shifted Administration Area

Workbook ID: S-163	Increase size and visibility of main entry canopy.
Function(s): Enclose Space, Improve Security, Circulate Students	**Includes Idea(s)**: 3, 18, 23

Alternative Concept Illustration



Widened Main Entry and Canopy, Increased Glazing, and Shifted Administration Area

Workbook ID: S-163	Increase size and visibility of main entry canopy.							
Function(s): Enclose Space, Improve Security, Circulate Students						**Includes Idea(s):** 3, 18, 23		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Excavate for continuous footings	35.48%	CY	529	48.00	34,401	531	48.00	34,531
Backfill, assume imported fill	35.48%	CY	426	58.00	33,474	427	58.00	33,553
Fine grade bottom of footing	35.48%	SF	1,458	1.30	2,568	1,470	1.30	2,589
Formwork to foundations - sides	35.48%	SF	1,932	13.45	35,205	1,956	13.45	35,642
Reinforcing steel in foundations	35.48%	LB	17,010	1.76	40,559	17,100	1.76	40,774
Concrete, 4,000 PSI	35.48%	CY	113	329.60	50,459	114	329.60	50,906
Finish to top of footing	35.48%	SF	1,458	1.40	2,765	1,470	1.40	2,788
Stone aggregate piers, note pricing assumes 30'-0" deep	35.48%	LS	1	546,000.00	739,721	1	557,000.00	754,624
Reinforced concrete slab on grade, 5" including base	35.48%	SF	36,695	15.72	781,510	37,255	15.72	793,437
Floor structure at floor, 12.5 lbs/sf	35.48%	LBS	325,675	3.70	1,632,531	339,675	3.70	1,702,709
Steel floor deck	35.48%	SF	26,054	6.35	224,142	26,614	6.35	228,960
Topping slab, incl. mesh & nelson studs	35.48%	SF	26,054	8.40	296,503	26,614	8.40	302,876
Structural steel at roof, 12psf	35.48%	SF	494,978	3.70	2,481,206	501,138	3.70	2,512,085
Steel roof deck	35.48%	SF	34,070	6.50	300,027	40,790	6.50	359,205
Brick masonry veneer including masonry anchors	35.48%	SF	7,789	49.85	526,044	7,855	49.85	530,501
SB-11 - 3" mineral wool insulation, 5/8" gypsum	35.48%	SF	26,992	35.38	1,293,803	27,058	35.38	1,296,966
Aluminum storefront (excludes door openings,	35.48%	SF	7,444	90.00	907,662	7,604	90.00	927,171
Aluminum glazed door, double	35.48%	EA	5	12,480.00	84,540	6	12,480.00	101,447
Metal roofing system	35.48%	SF	41,674	36.50	2,060,788	42,234	36.50	2,088,480
Resilient tile flooring	35.48%	SF	46,475	7.10	447,047	47,035	7.10	452,433
Suspended acoustical panel ceiling,2'-0"x2'-0"	35.48%	SF	1,221	7.65	12,655	1,781	7.65	18,459

Workbook ID: S-163	Increase size and visibility of main entry canopy.							
Function(s): Enclose Space, Improve Security, Circulate Students						**Includes Idea(s):**	3, 18, 23	
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Metal Ducts	35.48%	SF	60,784	15.31	1,260,781	61,904	15.31	1,284,012
Air Duct Accessories	35.48%	SF	60,784	0.67	55,175	61,904	0.67	56,191
Wire and Cable	35.48%	SF	65,281	9.88	873,814	66,401	9.88	888,806
Raceways	35.48%	SF	65,281	9.26	818,979	66,401	9.26	833,030
Wiring Devices	35.48%	SF	65,281	8.65	765,029	66,401	8.65	778,155
Lighting	35.48%	SF	65,281	17.29	1,529,174	66,401	17.29	1,555,410
Voice and Data Communications	35.48%	SF	65,281	12.97	1,147,102	66,401	12.97	1,166,782
Clock, Intercom, Public Address System	35.48%	SF	65,281	5.87	519,159	66,401	5.87	528,066
DAS system	35.48%	SF	65,281	3.71	328,122	66,401	3.71	333,752
Fire Alarm System	35.48%	SF	65,281	5.00	442,213	66,401	5.00	449,800
Access Control, Intrusion Detection, Video	35.48%	SF	65,281	2.28	201,649	66,401	2.28	205,109
Rescue Assistance	35.48%	SF	65,281	0.80	70,754	66,401	0.80	71,968
TOTAL COSTS*					**20,000,000**			**20,421,000**
							TOTAL (PROPOSED less BASELINE)	**421,000**

Note: Total Costs are rounded to nearest thousand dollars

COST

Workbook ID: S-164	Replace covered play area moment frame with braced frame or shear wall (north/south direction, east side).
Function(s): Resist Lateral Forces	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, the covered play area is braced by ordinary moment frames in the north/south direction.

Alternative Concept:

In the alternative concept, the covered play area is braced by ordinary braced frames in the north/south direction.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	=	Environmental Sustainability	=
Aesthetics	--	Schedule	=
Durability & Reliability	=	Constructability	+
Total Cost of Ownership / Lifecycle Cost	--	Occupant Comfort, Safety, Performance	=

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 105,000	$ NA	$ NA
Alternative Concept	$ 53,000	$ NA	$ NA
Cost Difference	**$ -52,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: S-164	Replace covered play area moment frame with braced frame or shear wall (north/south direction, east side).
Function(s): Resist Lateral Forces	**Includes Idea(s)**:

Recommendation:

Consider the alternative if covered play is attached to building in the east/west direction (seismic joint removed) or braced frame is architecturally preferred.

Alternative Concept

Advantages	Disadvantages
• Simplifies construction with more tolerance at braces	• Grade beam footings are required at braced frame locations
• Eliminate expensive moment connections	•
•	•

Analysis and Justification:

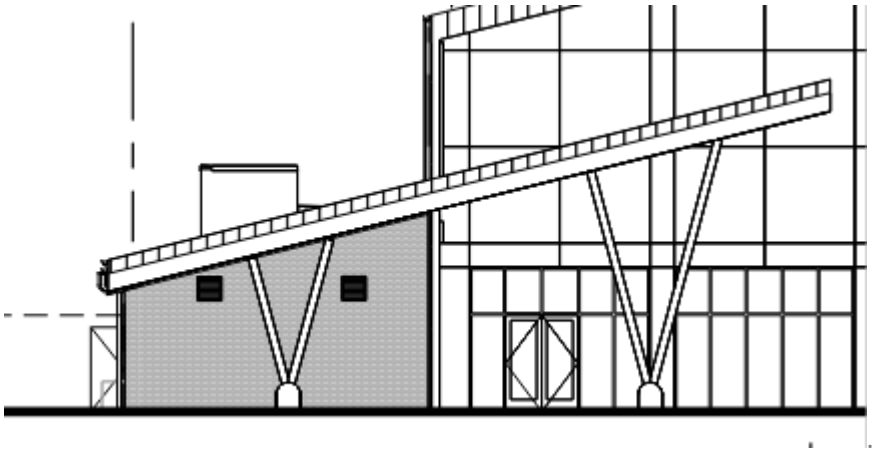
The V configuration of the sloping columns currently shown lend themselves nicely to be converted to braces within a braced frame. Braced frames are dramatically stiffer than moment frames for equivalent steel weight. Controlling drift in a high-seismic zone is often the governing design condition. Moment frames require large beam and column sections and rigid connections to achieve drift compliance rather than strength. Braced frames achieve the required stiffness inherently through axial action in the brace members, which is structurally efficient.

Moment frame connections are expensive. A fully-restrained welded moment connection requires CJP welds, continuity plates, doubler plates, and special inspection. All these factors add fabrication time, cost, and QC burden. Braced frame connections are primarily field welded shear connections at beams and columns, with the brace itself handling the lateral load. The connection cost differential is significant on a project with multiple frames.

A light gauge shear wall sheathed with plywood sheathing could also be used, infilling between the columns marked up the alternate concept illustration. A shear wall would perform similarly to braced frames and would be more cost effective. Both options (braced frame or shear wall) become more viable if the moment frame in east/west direction is eliminated by tying the roof into the main building. Significant material savings could be realized if lateral systems were not required in both directions.

Workbook ID: S-164	Replace covered play area moment frame with braced frame or shear wall (north/south direction, east side).
Function(s): Resist Lateral Forces	**Includes Idea(s)**:

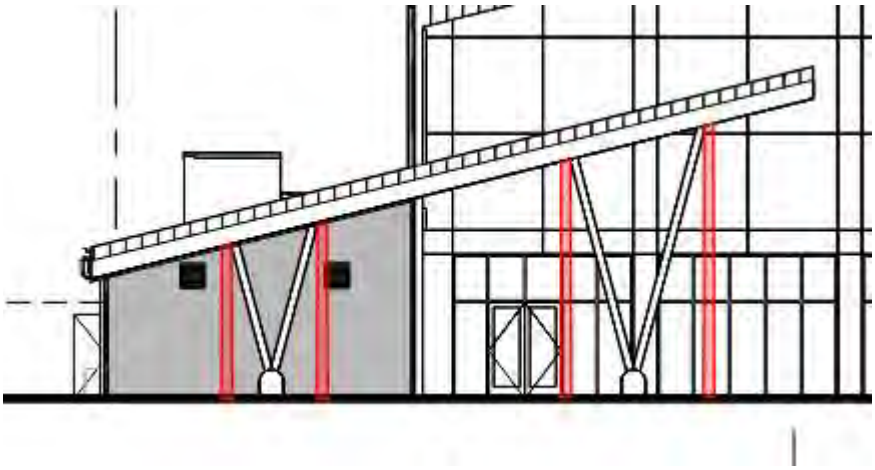
Baseline Concept Illustration



Covered Play East Elevation

Workbook ID: S-164	Replace covered play area moment frame with braced frame or shear wall (north/south direction, east side).
Function(s): Resist Lateral Forces	**Includes Idea(s)**:

Alternative Concept Illustration



Braced Frame Columns Added

Workbook ID: S-164	Replace covered play area moment frame with braced frame or shear wall (north/south direction, east side).							
Function(s): Resist Lateral Forces						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Concrete, 4000 psi	35.48%	CY	44	329.60	19,648	24	329.60	10,717
Frame Structural Steel	35.48%	LB	16,928	3.70	84,856	8,522	3.70	42,719
TOTAL COSTS*					**105,000**			**53,000**
							TOTAL (PROPOSED less BASELINE)	**-52,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

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Workbook ID: S-165	Use beam camber to reduce weight of steel.
Function(s): Support Load	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, floor steel beams and girders are shown without beam camber.

Alternative Concept:

In the alternative concept, floor steel beams and girders will be composite beams with camber for improved structural performance and efficiency.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**+**
Aesthetics	**=**	Schedule	**--**
Durability & Reliability	**=**	Constructability	**--**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 2,093,000	$ NA	$ NA
Alternative Concept	$ 1,832,000	$ NA	$ NA
Cost Difference	**$ -261,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: S-165	Use beam camber to reduce weight of steel.
Function(s): Support Load	**Includes Idea(s)**:

Recommendation:

Accept the alternative at longer (+/- 30') beams.

Alternative Concept

Advantages	Disadvantages
• Reduces weight of steel framing which reduces cost and makes beams easier to handle on site	• Increases lead time as cambering beams is an additional task within the manufacturing process
• Reduces seismic mass which results in lower seismic loads imparted to the frames, therefore frame and foundation can be smaller	•
• Reduces deflection as beam pre-composite deflection is cambered out	•
•	•
•	•
•	•

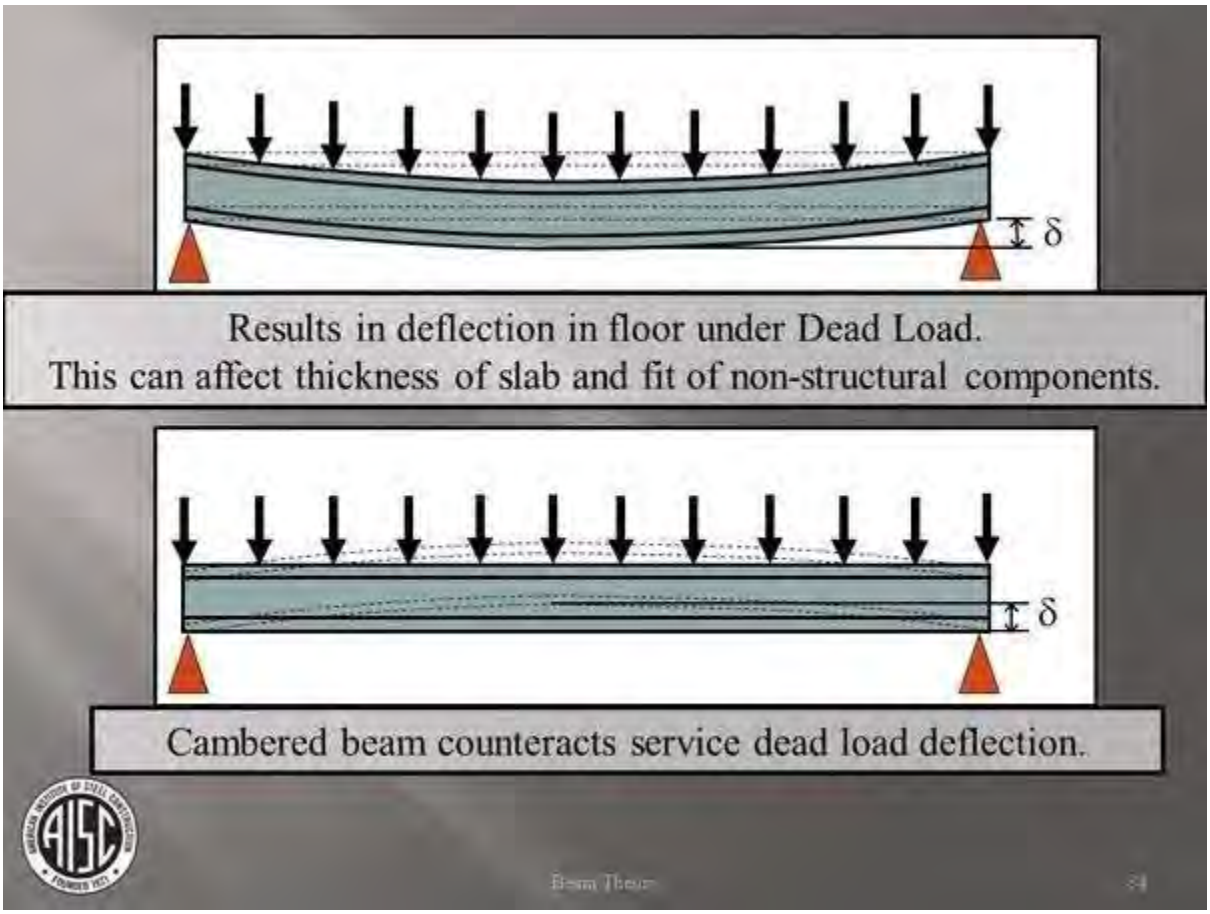
Analysis and Justification:

Cambering is done during fabrication typically by cold-pressing the beam before it ships. The cost is modest, typically a few dollars per linear foot, and is almost always recovered in reduced beam weight alone on a composite slab. Cambering beams can result in lower final deflections as the pre-composite dead load deflection is accounted for in the camber.

Cambering would be appropriate for the longer (+/- 30 feet) span beams and beam girders. Typically, shorter spans are not cambered because these shorter spans deflect significantly less. About half of the floor and mechanical attic beams would benefit from beam camber.

Workbook ID: S-165	Use beam camber to reduce weight of steel.
Function(s): Support Load	**Includes Idea(s)**:

Alternative Concept Illustration



Beam Camber System Example

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Workbook ID: S-165	Use beam camber to reduce weight of steel.							
Function(s): Support Load						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Structural steel at floor, 12.5 lbs/SF	35.48%	lbs	325,675	3.70	1,632,531	284,966	3.70	1,428,464
Steel floor structure at mezzanine, 12 psf	35.48%	lbs	91,932	3.70	460,833	80,441	3.70	403,229
TOTAL COSTS*					**2,093,000**			**1,832,000**
							TOTAL (PROPOSED less BASELINE)	**-261,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

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Workbook ID: S-166	Lower roof and/or roof slope to reduce volume.
Function(s): Condition Space; Fund Project; Support Student Wellbeing	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, large volumes exist throughout the project. The main corridor has an average floor to ceiling height of 22 feet at some portions. The gymnasium is also very tall with an average floor to ceiling height of 30 feet.

Alternative Concept:

In the alternative concept, the roof slope and/or the roof elevation could be further modified to reduce excess building volume.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	=	Environmental Sustainability	+
Aesthetics	+	Schedule	+
Durability & Reliability	+	Constructability	+
Total Cost of Ownership / Lifecycle Cost	+	Occupant Comfort, Safety, Performance	+

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 2,226,000	$ NA	$ NA
Alternative Concept	$ 2,115,000	$ NA	$ NA
Cost Difference	**$ -111,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: S-166	Lower roof and/or roof slope to reduce volume.
Function(s): Condition Space; Fund Project; Support Student Wellbeing	**Includes Idea(s)**:

Recommendation:

Recommend considering this alternative.

Alternative Concept

Advantages	Disadvantages
• Reduces material costs	• Reduces building prominence on site
• Reduces HVAC demands	•
• Improve aspect ratio for lateral resisting elements	•
• Improved scale for elementary students	•
•	•
•	•

Analysis and Justification:

In response to reducing total cost of ownership for the long-term operational costs of the building, it is suggested that additional building volume reduction can be achieved through several means, including reducing the roof slope, lowering the overall roof elevation, or eliminating the clearstory and using a simple gable roof profile. The baseline design produces corridor heights averaging 22 feet and a gymnasium height averaging 30 feet both more than what is functionally required for an elementary school program. Reducing these volumes directly reduces the quantity of structural framing, exterior cladding, insulation, and finished interior surface required to construct and close the building envelope.

Mechanical system savings are a primary driver of lifecycle cost improvement. Conditioned volume is the dominant sizing parameter for HVAC equipment, and reducing it allows smaller units, shorter duct runs, and simpler distribution systems. This reduces both initial mechanical construction costs and ongoing energy consumption. Elimination or reduction of the clerestory also removes a thermally complex envelope condition that is difficult to detail.

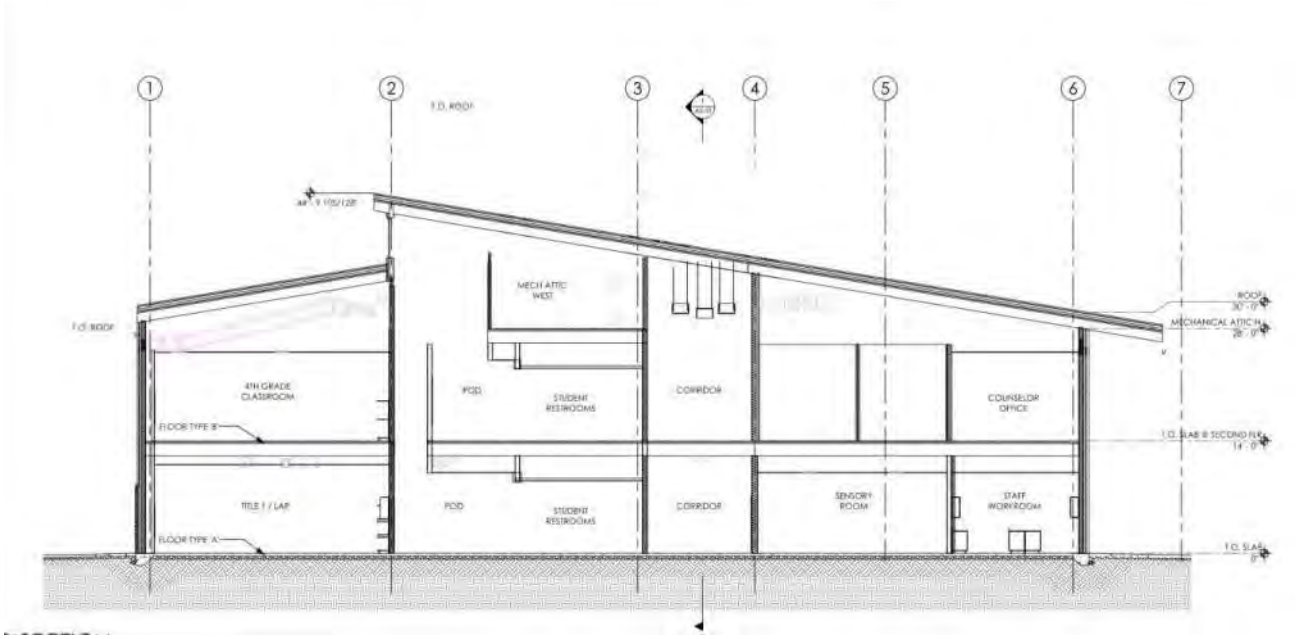
The structural benefits are compounded by the site's high seismic hazard. Reducing roof height lowers the center of mass of the building, reducing seismic base shear and overturning demands on the lateral force-resisting system.

Workbook ID: S-166	Lower roof and/or roof slope to reduce volume.
Function(s): Condition Space; Fund Project; Support Student Wellbeing	**Includes Idea(s)**:

The primary disadvantage is the potential reduction in daylighting if clerestory glazing is eliminated, which should be offset through skylights. Gymnasium height reduction should be coordinated with the district to confirm the proposed clear height meets program requirements. The aesthetic impact of a lower roofline is acknowledged, though a well-proportioned low-slope or gable roof can remain appropriate to the institutional character of an elementary school.

Workbook ID: S-166	Lower roof and/or roof slope to reduce volume.
Function(s): Condition Space; Fund Project; Support Student Wellbeing	**Includes Idea(s)**:

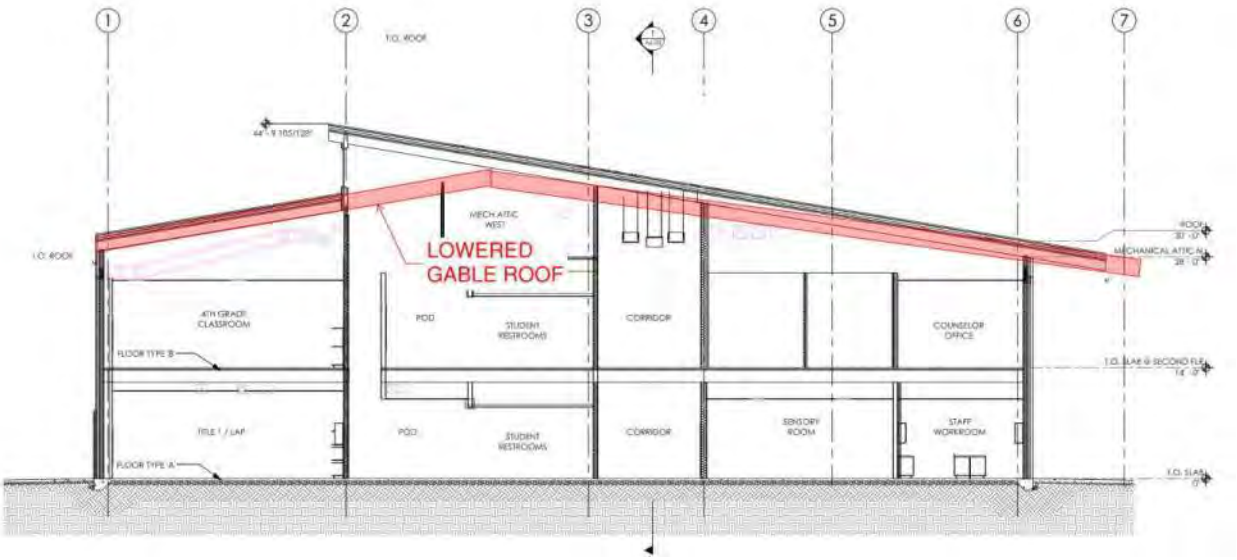
Baseline Concept Illustration



Existing Clearstory Roof

Workbook ID: S-166	Lower roof and/or roof slope to reduce volume.
Function(s): Condition Space; Fund Project; Support Student Wellbeing	**Includes Idea(s)**:

Alternative Concept Illustration



Lower Gable Roof

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Workbook ID: S-166	Lower roof and/or roof slope to reduce volume.							
Function(s): Condition Space; Fund Project; Support Student Wellbeing						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Metal stud 6" partitions	35.48%	SF	63,630	11.90	1,025,850	60,449	11.90	974,558
Metal stud 8" partitions	35.48%	SF	13,034	16.40	289,599	12,382	16.40	275,119
5/8", type "X", taped and finished'	35.48%	SF	146,146	4.60	910,794	138,839	4.60	865,254
TOTAL COSTS*					**2,226,000**			**2,115,000**
							TOTAL (PROPOSED less BASELINE)	**-111,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.
Function(s): Support Load	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, the building is framed with steel. The floor and mechanical attic framing consists of concrete over metal deck supported by steel beams. The roof framing consists of metal deck over steel beams.

Alternative Concept:

In the alternative concept, the floor and mechanical attic framing consists of concrete over metal deck supported by composite open web steel joists. The roof framing consists of metal deck supported by standard (non-composite) roof joists.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	=	Environmental Sustainability	+
Aesthetics	=	Schedule	--
Durability & Reliability	=	Constructability	=
Total Cost of Ownership / Lifecycle Cost	+	Occupant Comfort, Safety, Performance	=

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 4,575,000	$ NA	$ NA
Alternative Concept	$ 3,888,000	$ NA	$ NA
Cost Difference	**$ -687,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.
Function(s): Support Load	**Includes Idea(s)**:

Recommendation:

Consider accepting this alternative.

Alternative Concept

Advantages	Disadvantages
• Lowers weight of building, reducing seismic demand, braced frame sizes, and foundation sizes	• Potential difficulty running utilities through shallow joists
• Reduces cost of structural steel package	• Increases labor required to install shear studs
• Reduces depth for floor profile	•
•	•
•	•
•	•

Analysis and Justification:

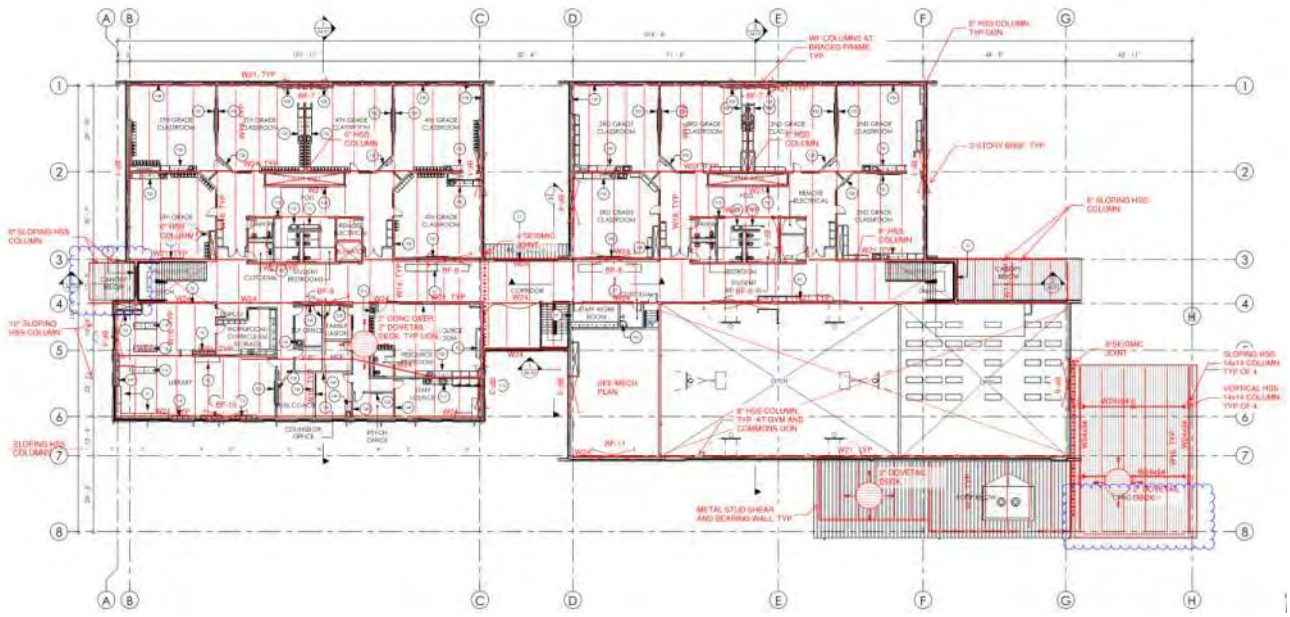
The alternate floor assembly would consist of 2" of concrete over a 2" metal concrete filled deck above composite joists which are supported at the girder lines in the baseline design.

Compared to the baseline steel beam framing (concrete over metal deck on steel beams), composite joists are generally less expensive than wide-flange beam framing at equivalent spans; approximately a 15% savings in the cost of the steel package. The SJI catalog system eliminates custom fabrication and shop drawing complexity. Material cost per square foot is typically lower due to the optimized chord geometry versus a rolled wide-flange section carrying significant dead web weight.

Wide-flange beams are connected to columns or girders with standard shear tab angle connections which require careful placement and alignment during construction. Composite joists bear on a top chord seat connection, which still requires precise align but is simpler to construct. Composite joists are more cost effective with no meaningful performance penalty for this repetitive and rectilinear plan.

Workbook ID: S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.
Function(s): Support Load	**Includes Idea(s)**:

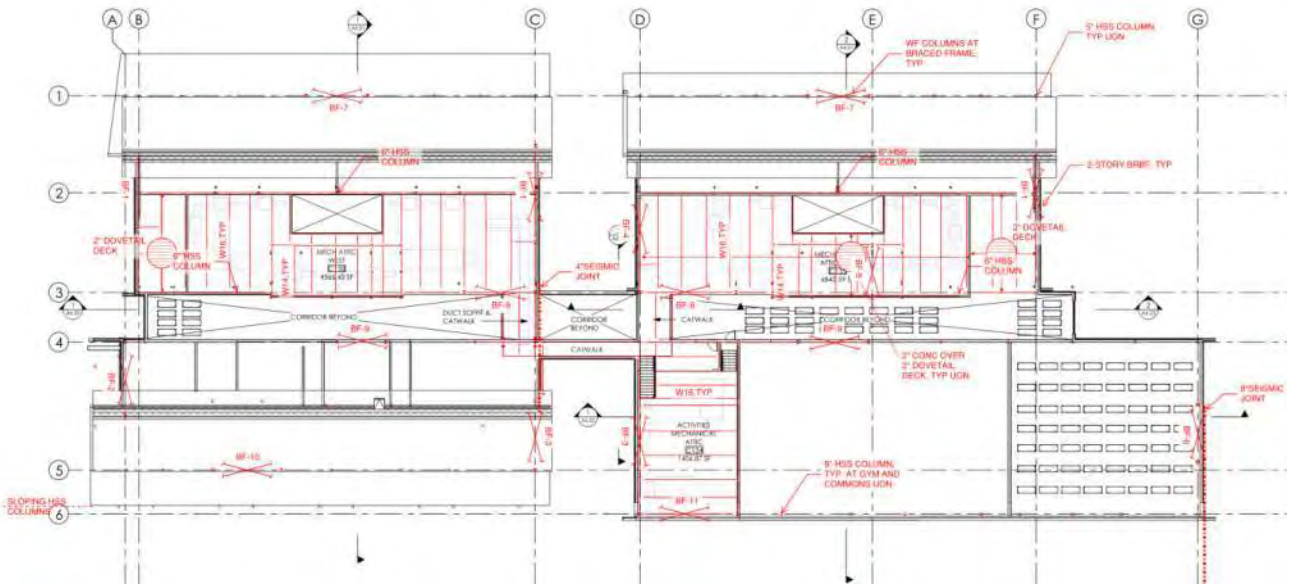
Baseline Concept Illustration



Second Floor Framing Plan

Workbook ID: S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.
Function(s): Support Load	**Includes Idea(s)**:

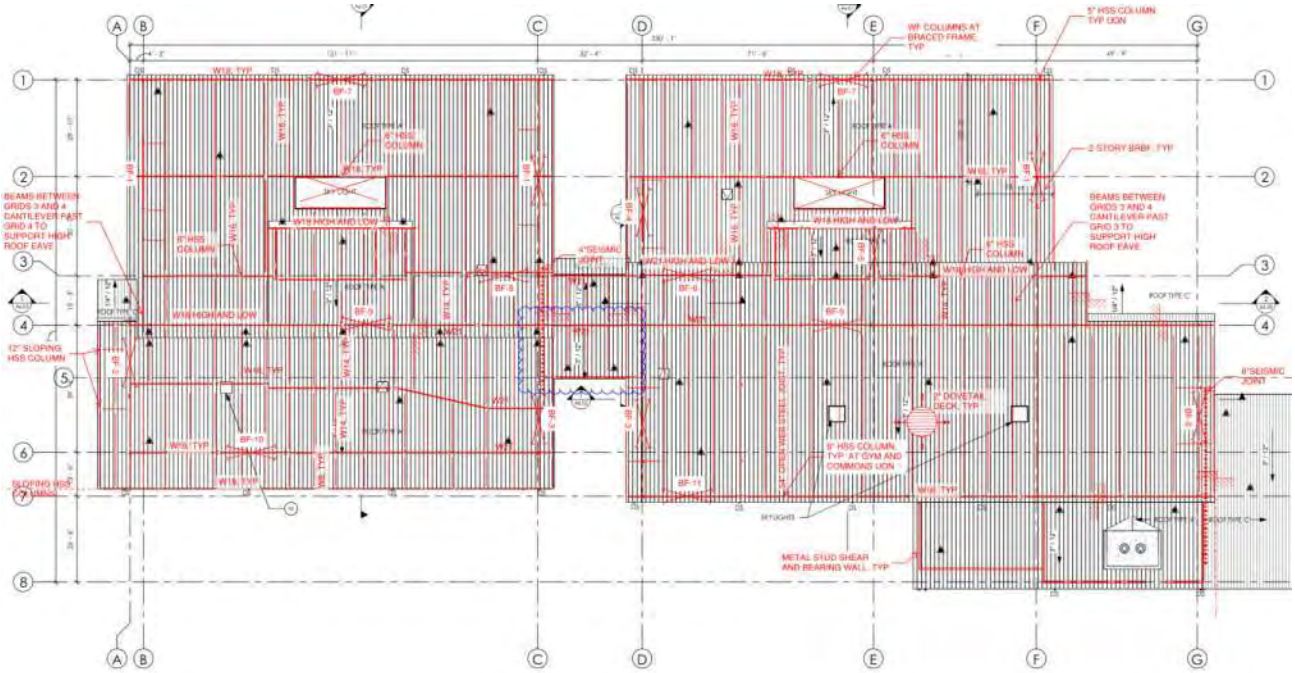
Baseline Concept Illustration



Mechanical Attic Framing Plan

Workbook ID: S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.
Function(s): Support Load	**Includes Idea(s)**:

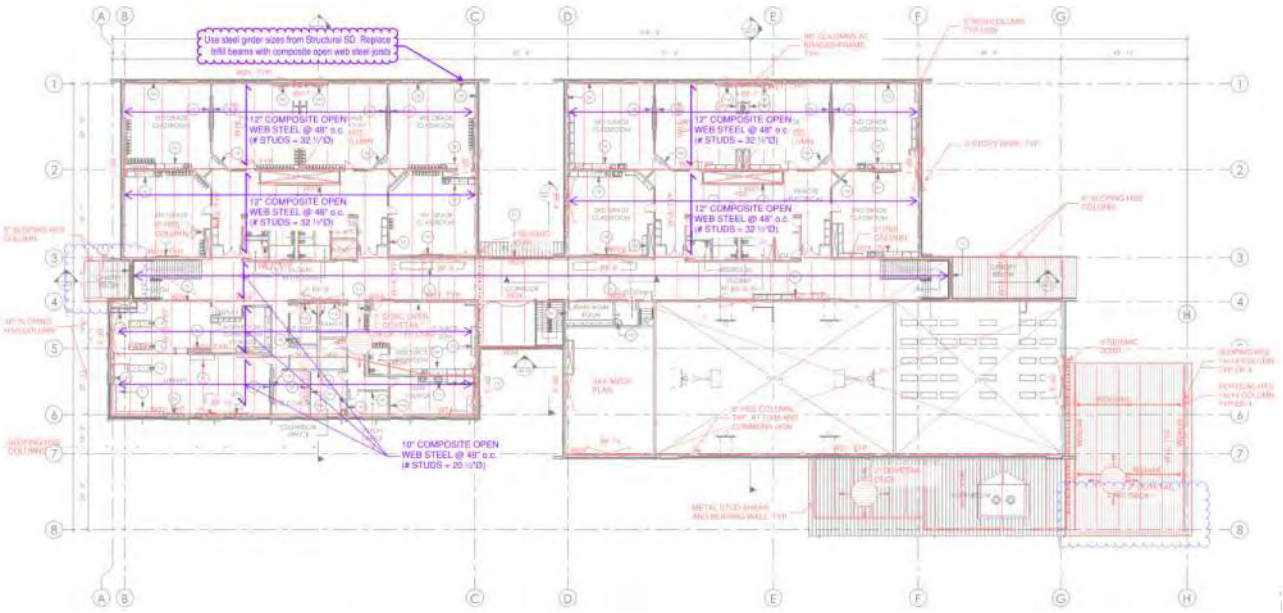
Baseline Concept Illustration



Roof Framing Plan

Workbook ID: S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.
Function(s): Support Load	**Includes Idea(s)**:

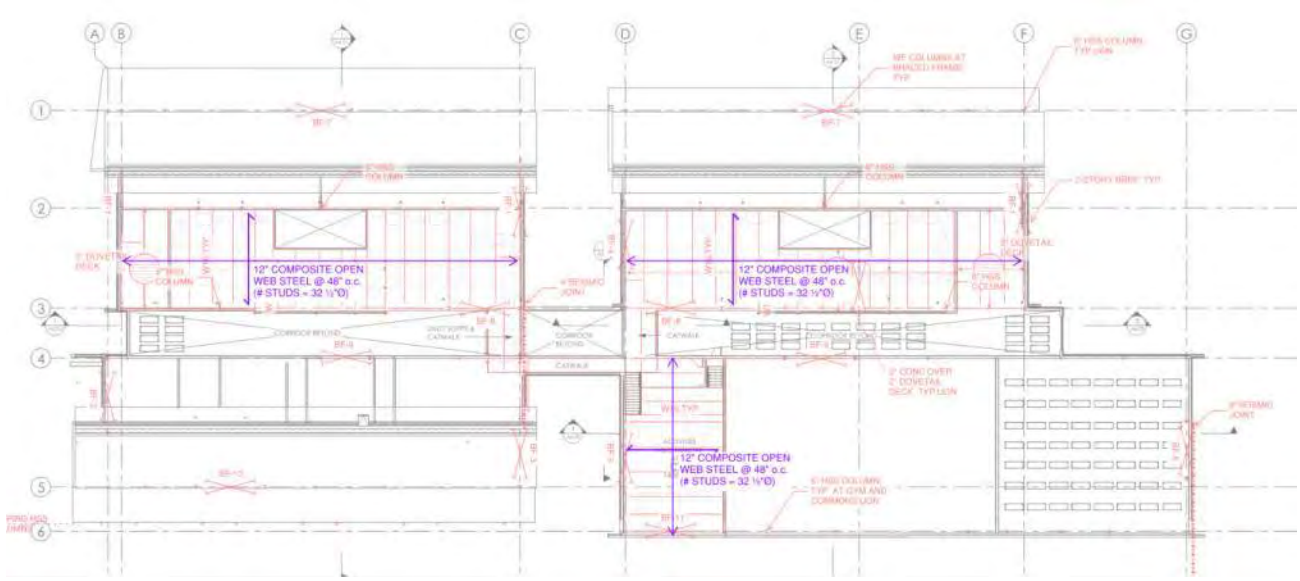
Alternative Concept Illustration



Second Floor Framing

Workbook ID: S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.
Function(s): Support Load	**Includes Idea(s)**:

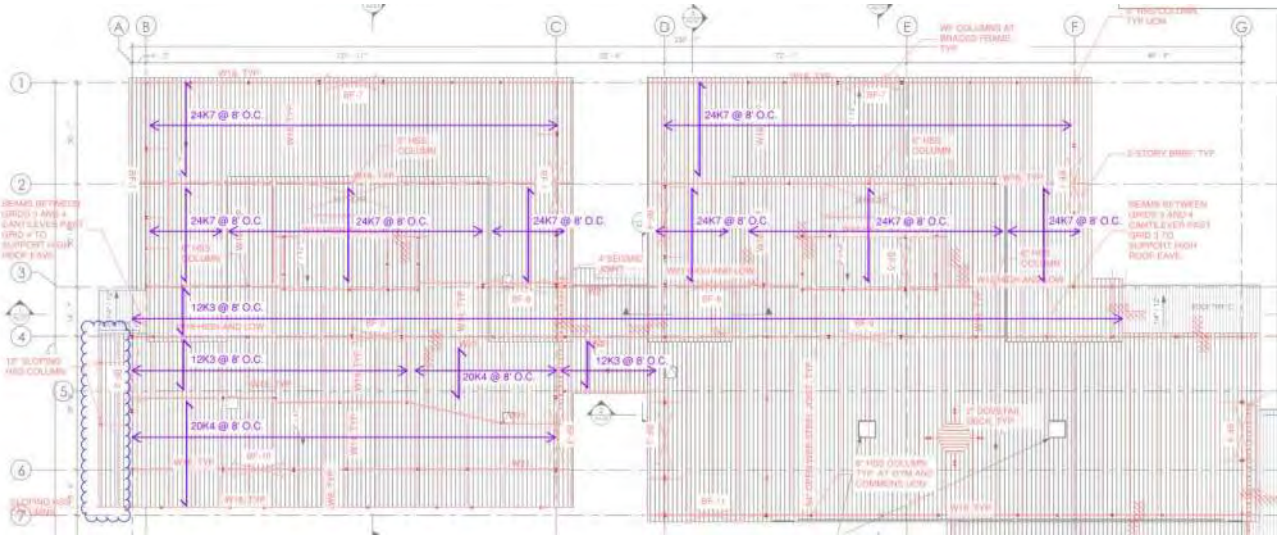
Alternative Concept Illustration



Mechanical Attic Framing

Workbook ID: S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.
Function(s): Support Load	**Includes Idea(s)**:

Alternative Concept Illustration



Roof Framing

Workbook ID: S-167	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.							
Function(s): Support Load						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Structural steel at floor, 12.5 lbs/SF	35.48%	lbs	325,675	3.70	1,632,531	276,824	3.70	1,387,651
Steel floor structure at mezzanine, 12 psf	35.48%	lbs	91,932	3.70	460,833	78,142	3.70	391,708
Structural steel at roof	35.48%	lbs	494,978	3.70	2,481,206	420,731	3.70	2,109,025
TOTAL COSTS*					**4,575,000**			**3,888,000**
							TOTAL (PROPOSED less BASELINE)	**-687,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

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Workbook ID: S-168	Reduce the foundation size according to less conservative assumptions.
Function(s): Support Load	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, the foundation was designed using an allowable bearing pressure of 2,500 pounds per square foot which corresponds to bearing strata composed of reinforced structural fill or cement-amened subgrade. The project bid documents assumed ram aggregate pier foundations which have an allowable bearing pressure of 4,000 pounds per square foot.

Alternative Concept:

In the alternative concept, the foundation will be designed using assuming ram aggregate pier foundations with an allowable bearing pressure of 4,000 pounds per square foot.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**+**
Aesthetics	**=**	Schedule	**+**
Durability & Reliability	**+**	Constructability	**+**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 1,091,000	$ NA	$ NA
Alternative Concept	$ 822,000	$ NA	$ NA
Cost Difference	**$ -269,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: S-168	Reduce the foundation size according to less conservative assumptions.
Function(s): Support Load	**Includes Idea(s)**:

Recommendation:

Accept this alternative.

Alternative Concept

Advantages	Disadvantages
• Reduces foundation size reduces cost	• Requires use of a proprietary bidder-design system
• Increases available laydown area during construction	•
•	•
•	•
•	•
•	•

Analysis and Justification:

Using rammed aggregate piers for the foundation results in a higher allowable design bearing pressure. Smaller foundations may be used because less bearing area is required to spread the load resulting in construction cost savings.

The advantage of rammed aggregate piers over other soil improvements is that they are installed in place with limited off-site soil disposal. Replacing the soils with reinforced structural fill requires exporting much of the existing soils and importing new suitable structural fill. Using cement amended soils requires excavating the existing soil, stockpiling, amending the soil, and then placing the soil back to be used as the foundation subgrade. Both fill alternatives are more labor intensive and require more laydown space on site. This site is hilly and initial site work may be difficult, limiting the amount of soil moved will reduce the cost of construction.

Workbook ID: S-168	Reduce foundation size according to less conservative assumptions.							
Function(s): Support Load						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Foundation Concrete, 4000 psi	35.48%	CY	113	329.60	50,459	85	329.60	37,956
Finish top of footing	35.48%	SF	1,458	1.40	2,765	1,093	1.40	2,073
Fine grade bottom of footing	35.48%	SF	1,458	1.30	2,568	1,093	1.30	1,925
Reinforcing steel in foundations	35.48%	LB	17,010	1.76	40,559	14,459	1.76	34,477
Grade Beam Concrete, 4000 psi	35.48%	CY	619	329.60	276,410	464	329.60	207,196
Finish top of footing	35.48%	SF	4,290	1.40	8,137	3,218	1.40	6,104
Fine grade bottom of footing	35.48%	SF	4,290	1.30	7,556	3,218	1.30	5,668
Reinforcing steel in foundations	35.48%	LB	136,239	1.76	324,855	102,179	1.76	243,641
Column Concrete, 4000 psi	35.48%	CY	619	329.60	276,410	464	329.60	207,196
Finish top of footing	35.48%	SF	4,290	1.40	8,137	3,218	1.40	6,104
Fine grade bottom of footing	35.48%	SF	4,290	1.30	7,556	3,218	1.30	5,668
Reinforcing steel in foundations	35.48%	LB	35,700	1.76	85,125	26,775	1.76	63,844
TOTAL COSTS*					**1,091,000**			**822,000**
							TOTAL (PROPOSED less BASELINE)	**-269,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: S-169	Change the construction from steel to wood.
Function(s): Support Load; Resist Lateral Forces; Reduce Cost	**Includes Idea(s)**:

Baseline Concept:

In the baseline concept, the building is framed with steel beams. The floor and mechanical attic framing consists of concrete over metal deck supported by steel beams. The roof framing consists of metal deck over steel beams. Buckling restrained braces frames are used to resist lateral forces.

Alternative Concept:

In the alternative concept, the building floors and roof would be framed with open web wood trusses supported on wood framed bearing walls. Lateral forces would be resisted by wood plywood sheathed shear walls.

Performance Summary (relative to Baseline Concept: **+** improvement; **--** detriment; **=** equal)

Program	**=**	Environmental Sustainability	**+**
Aesthetics	**=**	Schedule	**+**
Durability & Reliability	**=**	Constructability	**+**
Total Cost of Ownership / Lifecycle Cost	**+**	Occupant Comfort, Safety, Performance	**=**

Cost Summary	Initial Cost	Future Cost	Life Cycle Cost
Baseline Concept	$ 9,449,000	$ NA	$ NA
Alternative Concept	$ 6,919,000	$ NA	$ NA
Cost Difference	**$ -2,530,000**	$ NA	$ NA
Cost Avoidance	Life cycle cost analysis uses a NA% discount rate and NA-year economic life.		

Workbook ID: S-169	Change the construction from steel to wood.
Function(s): Support Load; Resist Lateral Forces; Reduce Cost	**Includes Idea(s)**:

Recommendation:

Recommend the team accept this alternative.

Alternative Concept

Advantages	Disadvantages
• Reduces construction cost	• Requires interior and exterior walls to be structural
• Provides better thermal envelope	• Limits designers' flexibility to move walls during construction
• Eliminate 10" square and 12" square buckling restrained braces and need for thicker walls to conceal frames	• Requires more stacking of interior walls from floor to floor
• Improves constructability, allowing more construction tolerance in the field	•
• Improves functionality of concrete tie beams	•
• Eliminates grade beams and spread footings	•

Analysis and Justification:

The stacking building configuration and the relatively short spans lends itself to a more economical wood framing and a plywood shear wall system. Using plywood shear walls as the lateral resisting elements eliminates the need for the large expensive braced frames. Using the interior partition walls as bearing walls also eliminates the heavy steel girders. The proposed floor assembly would be composed of 2-1/2" of concrete (either normal wt. or light-weight) over 1-1/8" of plywood sheathing over wood open web trusses spaced at 24" o.c.

The wood framing significantly reduces the weight of the building, thus reducing foundation sizes. The geotechnical report requires all foundations to be interconnected with concrete ties. These concrete ties could be used as strip footing below wood structural walls, eliminating the large independent spread footings and grade beams in the baseline design.

The inherent properties of the wood provide a better thermal envelope. It also allows for subtle changes late in the design without having to recreate complex structural and steel shop drawings. The buildings partition walls will exist whether the walls are structural. Using the walls as structural elements increased

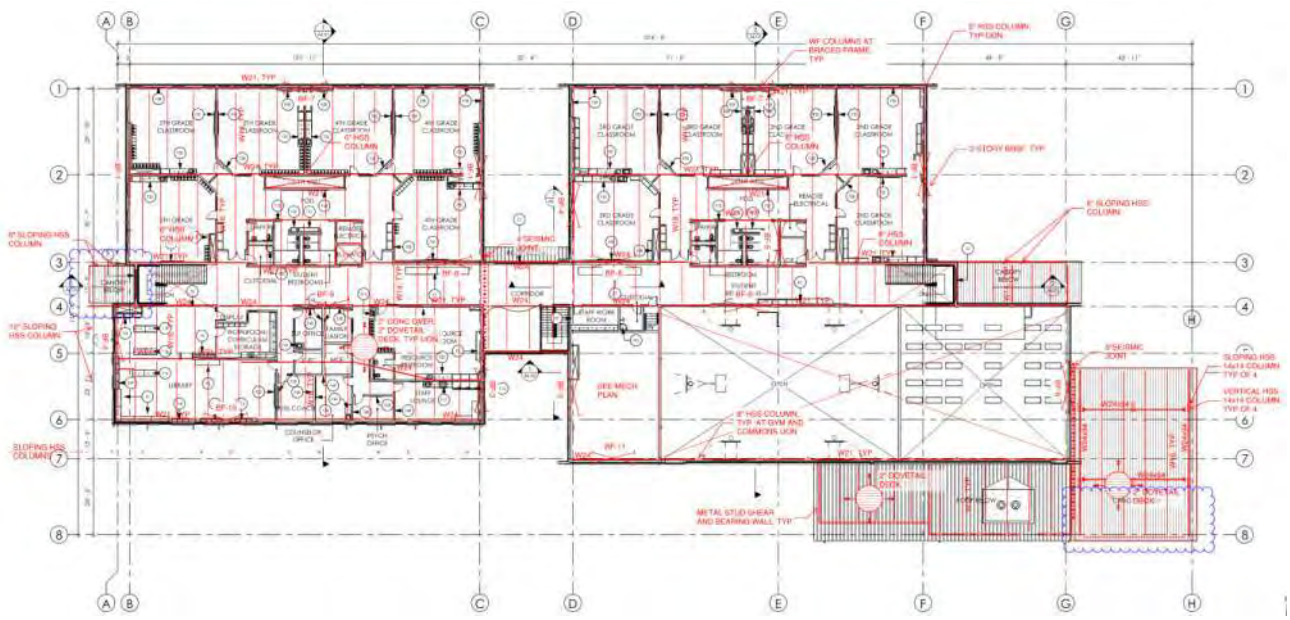
Workbook ID: S-169	Change the construction from steel to wood.
Function(s): Support Load; Resist Lateral Forces; Reduce Cost	**Includes Idea(s)**:

the functionality of the space. Planning to ensure structural walls are located at the correct locations architecturally will be required.

Aberdeen is known as the "Lumber Capital of the World." Using timber in a community building not only saves costs but provides economic benefit to the community, reduces the inherent embodied carbon associated with composite steel and concrete structures, and enhances the respect of the City's timber heritage and embraces it's lumber roots.

Workbook ID: S-169	Change the construction from steel to wood.
Function(s): Support Load; Resist Lateral Forces; Reduce Cost	**Includes Idea(s)**:

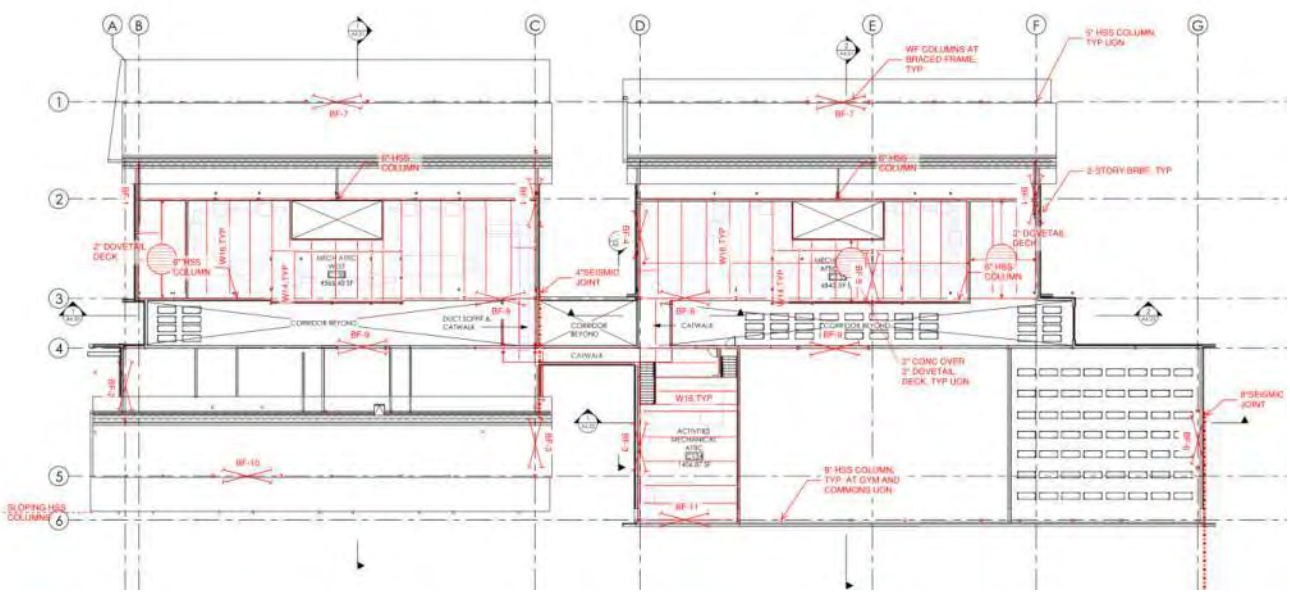
Baseline Concept Illustration



Second Floor Framing Plan

Workbook ID: S-169	Change the construction from steel to wood.
Function(s): Support Load; Resist Lateral Forces; Reduce Cost	**Includes Idea(s)**:

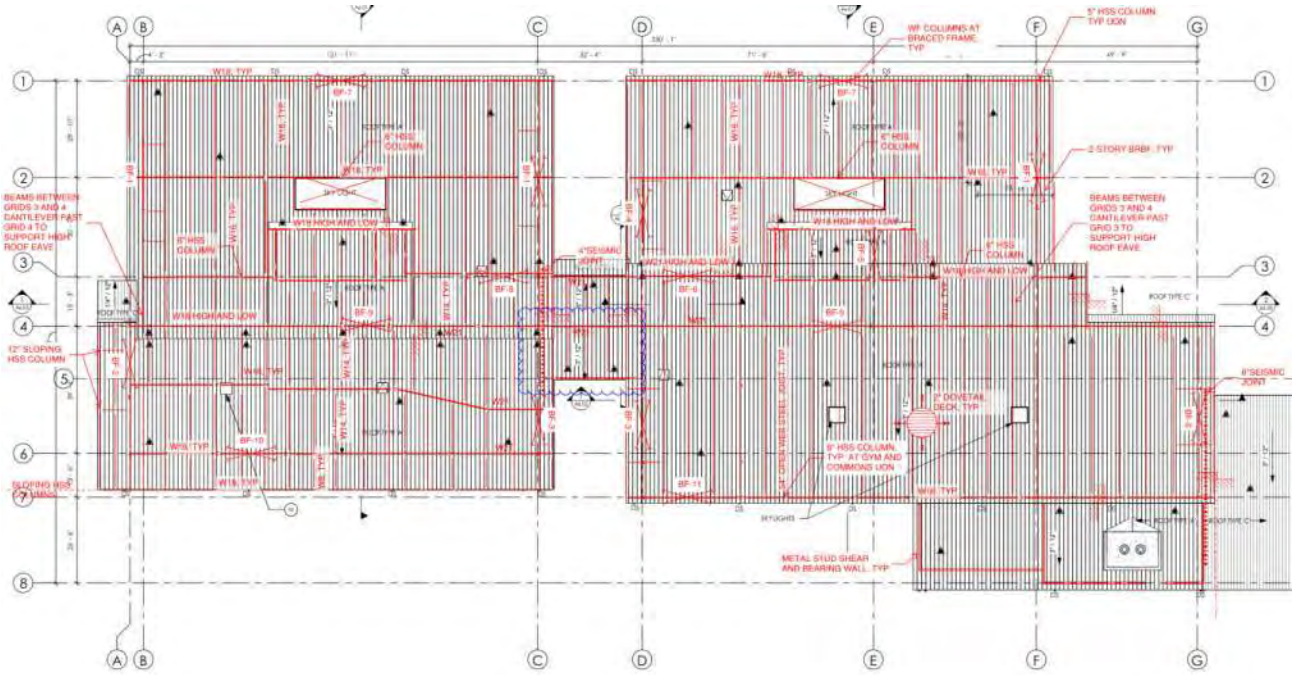
Baseline Concept Illustration



Mechanical Attic Framing Plan

Workbook ID: S-169	Change the construction from steel to wood.
Function(s): Support Load; Resist Lateral Forces; Reduce Cost	**Includes Idea(s)**:

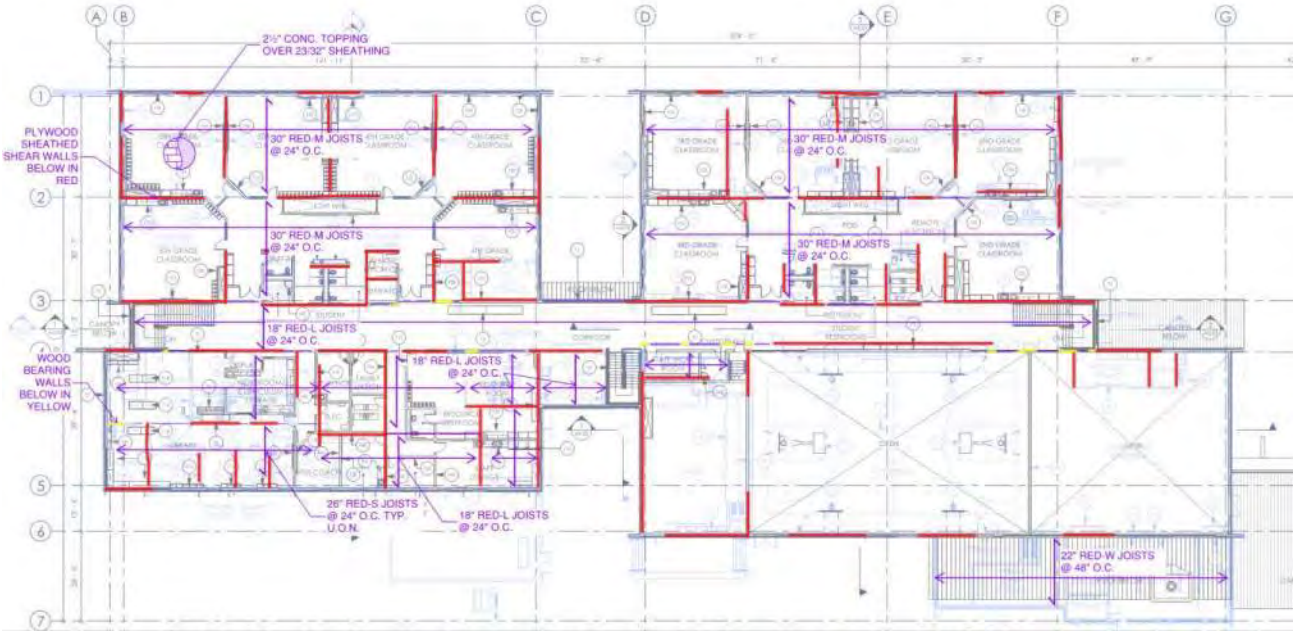
Baseline Concept Illustration



Roof Framing Plan

Workbook ID: S-169	Change the construction from steel to wood.
Function(s): Support Load; Resist Lateral Forces; Reduce Cost	**Includes Idea(s)**:

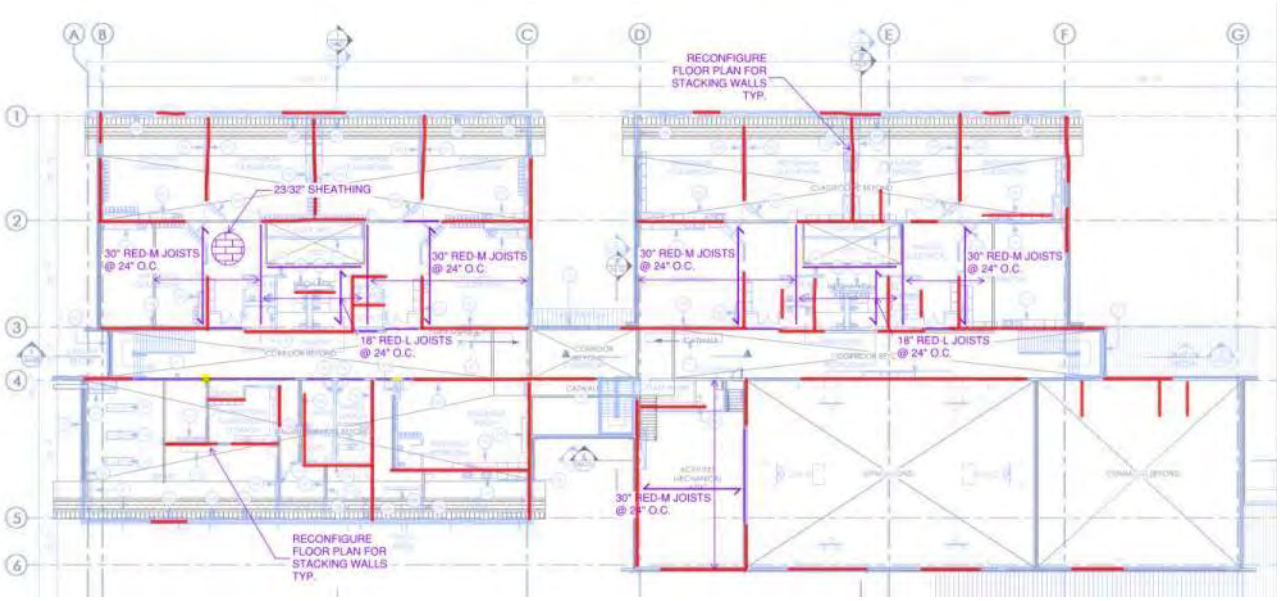
Alternative Concept Illustration



Second Floor Framing

Workbook ID: S-169	Change the construction from steel to wood.
Function(s): Support Load; Resist Lateral Forces; Reduce Cost	**Includes Idea(s)**:

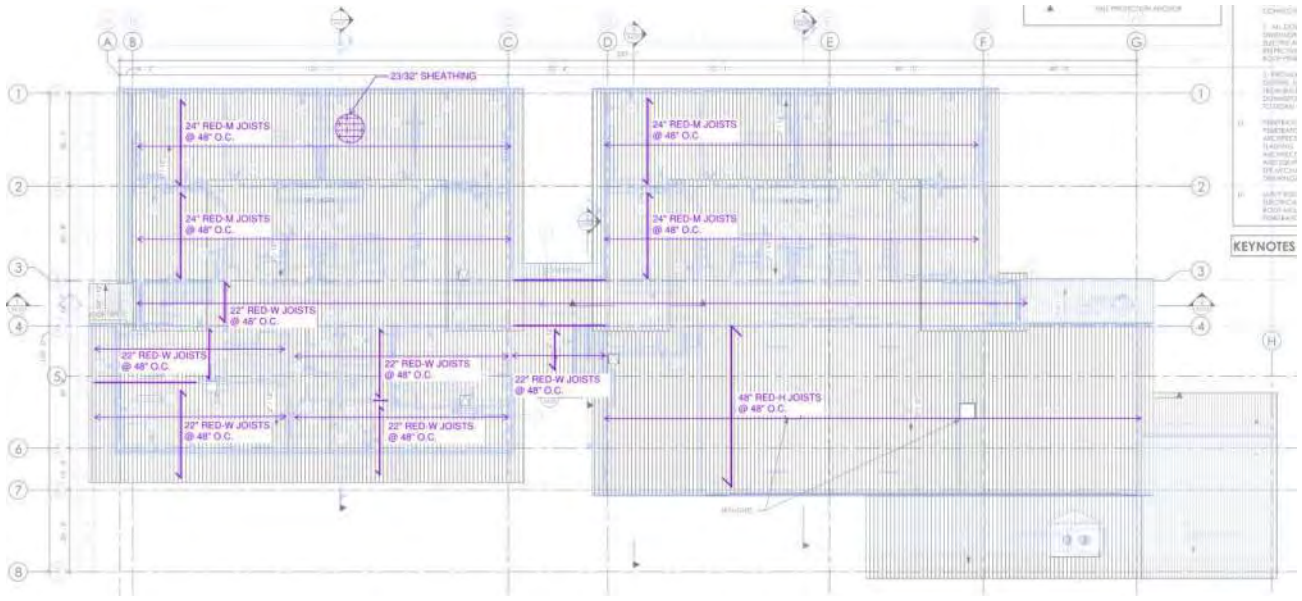
Alternative Concept Illustration



Mechanical Attic Framing Plan

Workbook ID: S-169	Change the construction from steel to wood.
Function(s): Support Load; Resist Lateral Forces; Reduce Cost	**Includes Idea(s)**:

Alternative Concept Illustration



Roof Framing Plan

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Workbook ID: S-169	Use composite open web steel joists at floor and mechanical attics and standard open web steel joists at roof.							
Function(s): Support Load; Reduce Cost						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Floor and Roof Construction	35.48%	Ea.	1	4,953,736.00	6,711,322			
Wood Framed Roof w/ open web roof joists	35.48%	SF				43,660	29.75	1,759,729
3/4" plywood roof decking	35.48%	SF				43,660	3.50	207,027
Wood Framed mech attic w/ open web roof joists	35.48%	SF				8,812	24.50	292,493
Wood Framed second floor w/ open web roof joists	35.48%	SF				27,523	26.00	969,492
Plywood decking 1-1/8" thick	35.48%	SF				36,473	5.25	259,422
2½" Conc Topping	35.48%	CY				280	329.60	125,194
Exterior wall substrate	35.48%	SF	29,662	35.38	1,421,783	29,662	32.50	1,306,048
Interior partitions 6" metal stud	35.48%	SF	63,630	11.90	1,025,850			
Interior partition 8" metal stud	35.48%	SF	13,034	16.40	289,599			
Interior partitions 2x6 w/ plywood sheathing	35.48%					76,664	19.25	1,999,389
TOTAL COSTS*					**9,449,000**			**6,919,000**
							TOTAL (PROPOSED less BASELINE)	**-2,530,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: A-2	Exterior sun shades ILO blinds for administrative area's windows along south elevation.							
Function(s): Daylight Space						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Window treatments, manual	35.48%	SF	7,444	15.50	156,320	7,220	15.50	151,616
Exterior sunshades, 2'-0" wide	35.48%	LF				65	200.00	17,612
TOTAL COSTS*					**156,000**			**169,000**
							TOTAL (PROPOSED less BASELINE)	**13,000**

Note: Total Costs are rounded to nearest thousand dollars

COST

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Workbook ID: A-7	Use aluminum windows ILO fiberglass.							
Function(s): Enclose Space						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Aluminum storefront (excludes door openings, interior storefront included in estimate section C1017, interior Windows and Storefronts)	35.48%	SF	7,444	90.00	907,662	3,226	90.00	393,353
Estimate adjustment for storefront	35.48%	SF	7,444	25.00	252,128	3,226	25.00	109,265
Estimate adjustment for aluminum windows	35.48%	SF	4,218	-10.00	-57,145			
Fiberglass windows	35.48%	SF				4,218	85.00	485,736
Note: Fiberglass widows are more energy efficient and have a longer useful life span								
TOTAL COSTS*					**1,103,000**			**988,000**
							TOTAL (PROPOSED less BASELINE)	**-115,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: A-8	Replace ceiling wood veneer finishes with acoustical clouds.							
Function(s): Finish Space						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Acoustical Linear Planks Hardwood Ceiling System, Estimate Adjustment as none is shown in cost estimate	35.48%	SF	4,100	35.00	194,414			
Suspended ACT and grid, 2'-0"x4'-0", Estimate Adjustment to reflect Acoustical Linear Planks	35.48%	SF	34,557	7.20	337,088	30,457	7.20	297,095
Acoustical Ceiling Clouds	35.48%	SF	434	31.50	18,521			
Acoustical Ceiling Clouds, assume 40% of ceiling area ILO Acoustical Linear Planks	35.48%	SF				1,640	31.50	69,989
Paint to structure above	35.48%	SF				1,640	4.00	8,887
TOTAL COSTS*					**550,000**			**376,000**
						TOTAL (PROPOSED less BASELINE)		**-174,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: A-9	Replace ceiling wood veneer finishes with exposed structure.							
Function(s): Finish Space						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Acoustical Linear Planks Hardwood Ceiling System, Estimate Adjustment as none is shown in cost estimate	35.48%	SF	4,100	35.00	194,414			
Suspended ACT and grid, 2'-0"x4'-0", Estimate Adjustment to reflect Acoustical Linear Planks	35.48%	SF	30,457	7.20	297,095	30,457	7.20	297,095
Paint to structure above	35.48%	SF				4,100	4.75	26,385
TOTAL COSTS*					**492,000**			**323,000**
							TOTAL (PROPOSED less BASELINE)	**-169,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: A-10	Use carpet ILO rubber tile in classrooms.							
Function(s): Improve Acoustics						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Resilient tile flooring	35.48%	SF	46,475	7.10	447,047	25,120	7.10	241,631
Estimate Adjustment to reflect Rubber Tile	35.48%	SF	46,475	2.40	151,114	25,120	2.40	81,678
Carpet tile 24"x24"	35.48%	SF				19,795	6.50	174,319
Sheet vinyl at wet areas	35.48%	SF				1,560	6.75	14,266
TOTAL COSTS*					**598,000**			**512,000**
							TOTAL (PROPOSED less BASELINE)	**-86,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: A-11	Use linoleum/marmoleum ILO of rubber tile in classrooms.							
Function(s): Improve Durability						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Resilient tile flooring	35.48%	SF	46,475	7.10	447,047	25,120	7.10	241,631
Estimate Adjustment to reflect Rubber Tile	35.48%	SF	46,475	2.40	151,114	25,120	2.40	81,678
Sheet Marmoleum	35.48%	SF				22,915	7.90	245,257
TOTAL COSTS*					**598,000**			**569,000**
							TOTAL (PROPOSED less BASELINE)	**-29,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: C-38	Use turf and underdrain system ILO sod at playfield.							
Function(s): Manage Stormwater						**Includes Idea(s):** 73		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Imported topsoil Type A (6" at planting and lawn areas)	35.48%	CY	1,988	60.00	161,601	1,060	60.00	86,165
Hydroseed - Lawn	35.48%	SF	33,327	0.25	11,288	7,327	0.25	2,482
Automatic Irrigation System - Lawn	35.48%	SF	48,745	1.50	99,060	22,745	1.50	46,222
Artificial Turf	35.48%	SF				26,000	12.50	440,310
6" Storm Pipe, incl trenching and backfill	35.48%	LF				38	65.00	3,346
6" Perf Pipe	35.48%	LF				1,660	21.00	47,228
Drain Rock	35.48%	CY				555	45.00	33,836
Geotextile	35.48%	SF				21,700	0.45	13,230
Dispersion Trench, per detail	35.48%	LF				50	100.00	6,774
TOTAL COSTS*					**272,000**			**680,000**
							TOTAL (PROPOSED less BASELINE)	**408,000**

Note: Total Costs are rounded to nearest thousand dollars

COST

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Workbook ID: C-44	Hot Mix Asphalt (HMA) ILO concrete loop around playfield.							
Function(s): Stabilize Earth						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Concrete loop at playfield (estimate adjustment, none shown)	35.48%	Ton	61	300.00	24,793			
CSTC (Concrete Pathway)	35.48%	Ton	500	50.00	33,870	535	50.00	36,241
Hot Mix Asphalt (HMA) Paving	35.48%	SF	1,800	5.50	13,413	3,620	5.50	26,974
Note: New pavement section assumes 3" HMA o/7" CSTC								
TOTAL COSTS*					**72,000**			**63,000**
							TOTAL (PROPOSED less BASELINE)	**-9,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: C-45	Remove trees to improve grading.							
Function(s): Stabilize Earth						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Tree Removal	35.48%	EA	56	750.00	56,902	60	750.00	60,966
Gabion Wall 8.5' Ave Height (Estimate adjustment, not included)	35.48%	SF	935	50.00	63,337			
Site Earthwork Cut (incl. haul off-site)	35.48%	CY	7,850	45.00	478,583	8,020	45.00	488,947
Footing drain 4" PVC w/rock and geotextile wrap	35.48%	LF				115	20.50	3,194
TOTAL COSTS*					**599,000**			**553,000**
							TOTAL (PROPOSED less BASELINE)	**-46,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: C-46	Salvage on-site soil rather than import.							
Function(s): Eliminate Waste						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Imported Topsoil Type "A" (6" at planting and lawn area)	35.48%	CY	1,988	60.00	161,601			
Assume 6" native material on site (amend and use as Topsoil)	35.48%	CY				1,988	16.50	44,440
Site Earthwork Cut (incl. haul off-site)	35.48%	CY	7,850	45.00	478,583	5,862	45.00	357,383
TOTAL COSTS*					**640,000**			**402,000**
							TOTAL (PROPOSED less BASELINE)	**-238,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: C-47	Use PCC (Portland Cement Concrete) for roadway paving ILO ACP (Asphalt Concrete Pavement) for increased durability.							
Function(s): Support Load						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Asphalt Paving (assumed 60% of weight HD paving)	35.48%	Ton	1,350	150.00	274,347			
CSTC (Asphalt Paving)	35.48%	Ton	2,160	50.00	146,318			
Concrete Paving (PCC) 8" depth	35.48%	CY				730	350.00	346,151
CSTC (Concrete Paving)	35.48%	Ton				1,400	50.00	94,836
TOTAL COSTS*					**421,000**			**441,000**
							TOTAL (PROPOSED less BASELINE)	**20,000**

Note: Total Costs are rounded to nearest thousand dollars

COST

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Workbook ID: C-48	Use 5" over 17" for HD (heavy-duty) pavement.							
Function(s): Support Load						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Asphalt Paving (assumed 60% of weight HD paving)	35.48%	Ton	1,350	150.00	274,347			
CSTC (Asphalt Paving)	35.48%	Ton	2,160	50.00	146,318			
Heavy Duty (HD) Asphalt Concrete Pavement 5" Depth	35.48%	Ton				1,340	150.00	272,315
CSTC (HD asphalt)	35.48%	Ton				3,655	50.00	247,590
TOTAL COSTS*					**421,000**			**520,000**
							TOTAL (PROPOSED less BASELINE)	**99,000**

Note: Total Costs are rounded to nearest thousand dollars

COST

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Workbook ID: C-49	Reduce landscape budget by 30% (reduce/eliminate irrigation and plantings).							
Function(s): Enhance Site						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Imported Topsoil Type A (6" at planting and lawn areas)	35.48%	CY	1,988	60.00	161,601	1,392	60.00	113,153
Mulch (3" Depth)	35.48%	CY	543	55.00	40,461	380	55.00	28,315
Hydroseed lawn	35.48%	SF	33,337	0.25	11,291	23,336	0.25	7,904
Perennial & shrub container stock planting	35.48%	SF	36,500	7.00	346,151	25,550	7.00	242,306
Trees	35.48%	EA	85	550.00	63,337	60	550.00	44,708
Automatic irrigation system - shrubs + perennials	35.48%	SF	36,500	3.00	148,351	25,550	3.00	103,845
Automatic irrigation system - lawn excluded seed-meadow)	35.48%	SF	33,337	1.50	67,747	23,336	1.50	47,423
TOTAL COSTS*					**839,000**			**588,000**
							TOTAL (PROPOSED less BASELINE)	**-251,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: E-114	Allow MC (metal-clad) cabling.							
Function(s): Distribute Power						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Wire and Cable	35.48%	SF	65,281	9.88	873,814	26,112	9.88	349,520
Raceways	35.48%	SF	65,281	9.26	818,979	26,112	9.26	327,587
MC Cable (assume 60%)	35.48%	SF				39,168	4.95	262,671
TOTAL COSTS*					**1,693,000**			**940,000**
							TOTAL (PROPOSED less BASELINE)	**-753,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: E-115	Use direct-indirect troffer fixtures in classrooms ILO pendant lighting.							
Function(s): Illuminate Space						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Four rows per classroom of 24 ft linear pendant LED with high performance direct/indirect optics	35.48%	EA	88	2,900.00	345,745			
Direct-indirect troffer light fixtures (4' length)	35.48%	EA				528	250.00	178,834
TOTAL COSTS*					**346,000**			**179,000**
							TOTAL (PROPOSED less BASELINE)	**-167,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

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Workbook ID: E-116	Allow aluminum feeders, bussing, and transformer windings (could not find prohibition in OPR).							
Function(s): Distribute Power						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Cu Feeder ID #115X 1-1/4"EMT, 4#2, 1#6G	35.48%	LF	570	34.00	26,256			
Cu Feeder ID #150X 2"EMT, 4#1/0, 1#6G	35.48%	LF	100	40.00	5,419			
Cu Feeder ID #230X 2-1/2"EMT, 4#4/0, 1#4G	35.48%	LF	1,400	65.00	123,287			
Cu Feeder ID #400X (2)2"EMT, 4#3/0, 1#2G (Ea)	35.48%	LF	100	120.00	16,258			
Cu Transformer 45kVA 480:208Y/120	35.48%	Ea	2	5,200.00	14,090			
Cu Transformer 75kVA 480:208Y/120	35.48%	Ea	3	7,100.00	28,857			
Cu Transformer 225kVA 480:208Y/120	35.48%	Ea	1	14,000.00	18,967			
Al Feeder ID #115X 1-1/4"EMT, 4#2, 1#6G	35.48%	LF				570	28.90	22,318
Al Feeder ID #150X 2"EMT, 4#1/0, 1#6G	35.48%	LF				100	33.75	4,572
Al Feeder ID #230X 2-1/2"EMT, 4#4/0, 1#4G	35.48%	LF				1,400	52.50	99,578
Al Feeder ID #400X (2)2"EMT, 4#3/0, 1#2G (Ea)	35.48%	LF				100	98.50	13,345
Al Transformer 45kVA 480:208Y/120	35.48%	Ea				2	4,650.00	12,600
Al Transformer 75kVA 480:208Y/120	35.48%	Ea				3	5,680.00	23,086
Al Transformer 225kVA 480:208Y/120	35.48%	Ea				1	11,200.00	15,174
TOTAL COSTS*					**233,000**			**191,000**
							TOTAL (PROPOSED less BASELINE)	**-42,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: M-128	Consider routing west from east end of building though kitchen or all waste to a single point of connection.							
Function(s): Convey Waste						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Relocate western point of connection to east at kitchen	35.48%	EA	3	1,500.00	6,097	2	1,500.00	4,064
TOTAL COSTS*					**6,000**			**4,000**
							TOTAL (PROPOSED less BASELINE)	**-2,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: M-129	Consider PEX (cross-linked polyethylene) piping ILO copper for domestic water.							
Function(s): Convey Water						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Copper Domestic Water Piping	35.48%	SF	60,784	7.96	655,507			
PEX Domestic Water Piping	35.48%	SF				60,784	5.75	473,513
TOTAL COSTS*					**656,000**			**474,000**
							TOTAL (PROPOSED less BASELINE)	**-182,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: M-130	Consider ABS (Acrylonitrile Butadiene Styrene) waste piping ILO cast iron piping.							
Function(s): Convey Waste						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Current cost assumes CISP No-Hub	35.48%	SF	60,784	6.98	574,804			
ABS waste piping	35.48%	SF				60,784	4.75	391,163
TOTAL COSTS*					**575,000**			**391,000**
							TOTAL (PROPOSED less BASELINE)	**-184,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: PL-145	Use FF&E (furniture, fixtures, and equipment) budget ILO MACC (maximum allowable construction cost) for: 1) Bleachers; 2) AV Devices; 3) CR Voice Augmentation; 4) Gym Electronics; 5) DAS Equipment (i.e., pathways under MACC).

Function(s): Fund Project						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Voice and Communications	35.48%	SF	65,281	12.97	1,147,102	65,281	9.97	881,774
Classroom AV System	35.48%	SF	24	9,880.00	321,250	24	6,916.00	224,875
Clock, Intercom, Public Address System	35.48%	SF	65,281	5.87	519,159	65,281	3.55	313,972
AV System	35.48%	LS	1	172,282.50	233,408	1	103,200.00	139,815
DAS System	35.48%	SF	65,281	3.71	328,122	65,281	2.30	203,418
Projection Screen at gymnasium	35.48%	EA	1	20,000.00	27,096	1	2,400.00	3,252
Projection Screen at commons / stage	35.48%	EA	1	35,000.00	47,418	1	10,500.00	14,225
Scoreboards. Shot clocks	35.48%	EA	1	30,000.00	40,644	1	12,000.00	16,258
Telescopic gym seating, allowance	35.48%	LS	1	35,000.00	47,418	1	17,500.00	23,709
Note: Assumed 30-40% of total cost to labor								
TOTAL COSTS*					**2,712,000**			**1,821,000**
							TOTAL (PROPOSED less BASELINE)	**-891,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: S-170	Use standard composite metal deck (i.e., 3" over 2" non dovetail deck).							
Function(s): Support Load						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Steel floor deck, floors and mezzanine	35.48%	SF	33,715	6.35	290,049			
Standard 2" steel floor deck, 20GA	35.48%	SF				33,715	4.75	216,966
Topping slab, incl mesh & nelson studs	35.48%	SF	33,715	8.40	383,687			
3" Topping slab, incl mesh & nelson studs	35.48%	SF				33,715	9.35	427,081
TOTAL COSTS*					**674,000**			**644,000**
							TOTAL (PROPOSED less BASELINE)	**-30,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: S-171	Consider vibratory aggregate piers in lieu of rammed aggregate piers.							
Function(s): Support Load, Minimize Displacement						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Stone aggregate piers, note pricing assumes 30'-0" depth	35.48%	LS	1	546,000	739,721			
Vibratory aggregate piers	35.48%	LS				1	436,800	591,777
Cost based on top-down vibro aggregate placement								
TOTAL COSTS*					**740,000**			**592,000**
							TOTAL (PROPOSED less BASELINE)	**-148,000**

Note: Total Costs are rounded to nearest thousand dollars

SAVINGS

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Workbook ID: S-172	Consider DSM (Direct Soil Mixing) ILO rammed aggregate piers.							
Function(s): Support Load						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Stone aggregate piers, note pricing assumes 30'-0"deep	35.48%	LS	1	546,000	739,721			
Note: 325'x30'x40' DSM per soils report								
Direct Soil Mixing	35.48%	CY				14,445	35.00	684,953
10% spoils removal including haul within 8 miles, assume 33% swell factor	35.48%	CY				1,922	31.35	81,633
TOTAL COSTS*					**740,000**			**767,000**
							TOTAL (PROPOSED less BASELINE)	**27,000**

Note: Total Costs are rounded to nearest thousand dollars

COST

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Workbook ID: S-173	Use 4" thick slab-on-grade ILO 5".							
Function(s): Support Load						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Reinforced concrete slab on grade, 5" including subbase	35.48%	SF	36,695	15.72	781,510			
Reinforced concrete slab on grade, 4" including subbase	35.48%	SF				36,695	13.75	683,573
TOTAL COSTS*					**782,000**			**684,000**
							TOTAL (PROPOSED less BASELINE)	**-98,000**

Note: Total Costs are rounded to nearest thousand dollars SAVINGS

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Workbook ID: S-174	Add additional window section to library west wall.							
Function(s): Illuminate Space						**Includes Idea(s):**		
CONSTRUCTION ELEMENT	**Markup**	**BASELINE DESIGN ASSUMPTION**				**PROPOSED ALTERNATIVE**		
Description	%	Unit	Qty	Unit Cost $	TOTAL $	Qty	Unit Cost $	TOTAL $
Aluminum storefront (excludes door openings, interior storefront included in estimate section C1017 interior Windows and Storefront)	35.48%	SF	7,444	90.00	907,662	7,540	90.00	919,367
Estimate adjustment to unit cost of storefront	35.48%	SF	7,444	25.00	252,128	7,540	25.00	255,380
Fiber reinforced cement panels	35.48%	SF	21,833	42.40	1,254,164	21,737	42.40	1,248,650
Exterior wall substrate SB-11 -3" mineral wool insulation, 5/8" gypsum sheathing, WRB, 8" metal stud framing, batt insulation, vapor barrier, (1) layer of 5/8"gypsum at interior face	35.48%	SF	29,662	35.38	1,421,783	29,566	35.38	1,417,182
TOTAL COSTS*					**3,836,000**			**3,841,000**
							TOTAL (PROPOSED less BASELINE)	**5,000**

Note: Total Costs are rounded to nearest thousand dollars COST

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Appendix C
Function Analysis

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C.1 Functions

Random Function Determination

The VE team identified project functions required for the project to deliver the services required and accomplish the project goals. Identification and analysis of the underlying functions helped the VE team form a deeper understanding of the project alternatives and consider alternatives to improve the design. The function or functions categorized as Basic are defined as the principal reasons for the project. Higher Order functions are why the Basic functions are being implemented. Required Secondary and Secondary functions are the means by which the Basic function is carried out and supported. Additionally, several functions fall into the category of All-the-Time functions or define performance criteria for the project.

Function	Function Type
Modernize Teaching	Project Objectives
Maintain Equity	Project Objectives
Enhance Resilience	Project Objectives
Engage Community	Project Objectives
Welcome Families	Project Objectives
Increase Collaboration	Project Objectives
Express Identity	Project Objectives
Calm Students	Higher Order
Deliver Project	Higher Order
Exercise Students	Higher Order
Facilitate Learning	Higher Order
Exercise Students	Higher Order
Promote Play	Higher Order
Encourage Play	Higher Order
Socialize Students	Higher Order
Educate Students	**Basic**
Access Site	Required Secondary
Adapt Space	Required Secondary
Circulate Pedestrians	Required Secondary
Circulate Students	Required Secondary
Circulate Vehicles	Required Secondary
Condition Space	Required Secondary
Control Access	Required Secondary

Function	Function Type
Control Noise	Required Secondary
Control Pollutants	Required Secondary
Convey Waste	Required Secondary
Convey Water	Required Secondary
Create Volume	Required Secondary
Daylight Space	Required Secondary
Distribute Data	Required Secondary
Distribute Power	Required Secondary
Drain Site	Required Secondary
Enclose Space	Required Secondary
Finish Space	Required Secondary
Grade Site	Required Secondary
Illuminate Space	Required Secondary
Improve Acoustics	Required Secondary
Improve Technology	Required Secondary
Light Site	Required Secondary
Maintain Operations	Required Secondary
Manage Stormwater	Required Secondary
Monitor Occupants	Required Secondary
Park Vehicles	Required Secondary
Power Building	Required Secondary
Protect Children	Required Secondary
Queue Vehicles	Required Secondary
Repel Moisture	Required Secondary
Resist Earthquake	Required Secondary
Resist Fire	Required Secondary
Resist Lateral Forces	Required Secondary
Resist Weather	Required Secondary
Retain Earth	Required Secondary
Secure Building	Required Secondary
Stabilize Earth	Required Secondary

Function	Function Type
Support Load	Required Secondary
Ventilate Space	Required Secondary
Avoid Tsunami	Secondary
Charge Vehicles	Secondary
Connect Outdoors	Secondary
Conserve Energy	Secondary
Contain Stormwater	Secondary
Create Aesthetics	Secondary
Display Media	Secondary
Distribute Food	Secondary
Enclose Equipment	Secondary
Enhance Durability	Secondary
Enhance Flexibility	Secondary
Facilitate Communications	Secondary
Generate Energy	Secondary
Maintain Equipment	Secondary
Prepare Food	Secondary
Protect Systems	Secondary
Protect Wetlands	Secondary
Reduce Heat	Secondary
Reduce Weight	Secondary
Resist Corrosion	Secondary
Retain Trees	Secondary
Serve Food	Secondary
Supply Basic Needs	Secondary

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Appendix D
Project Evaluation

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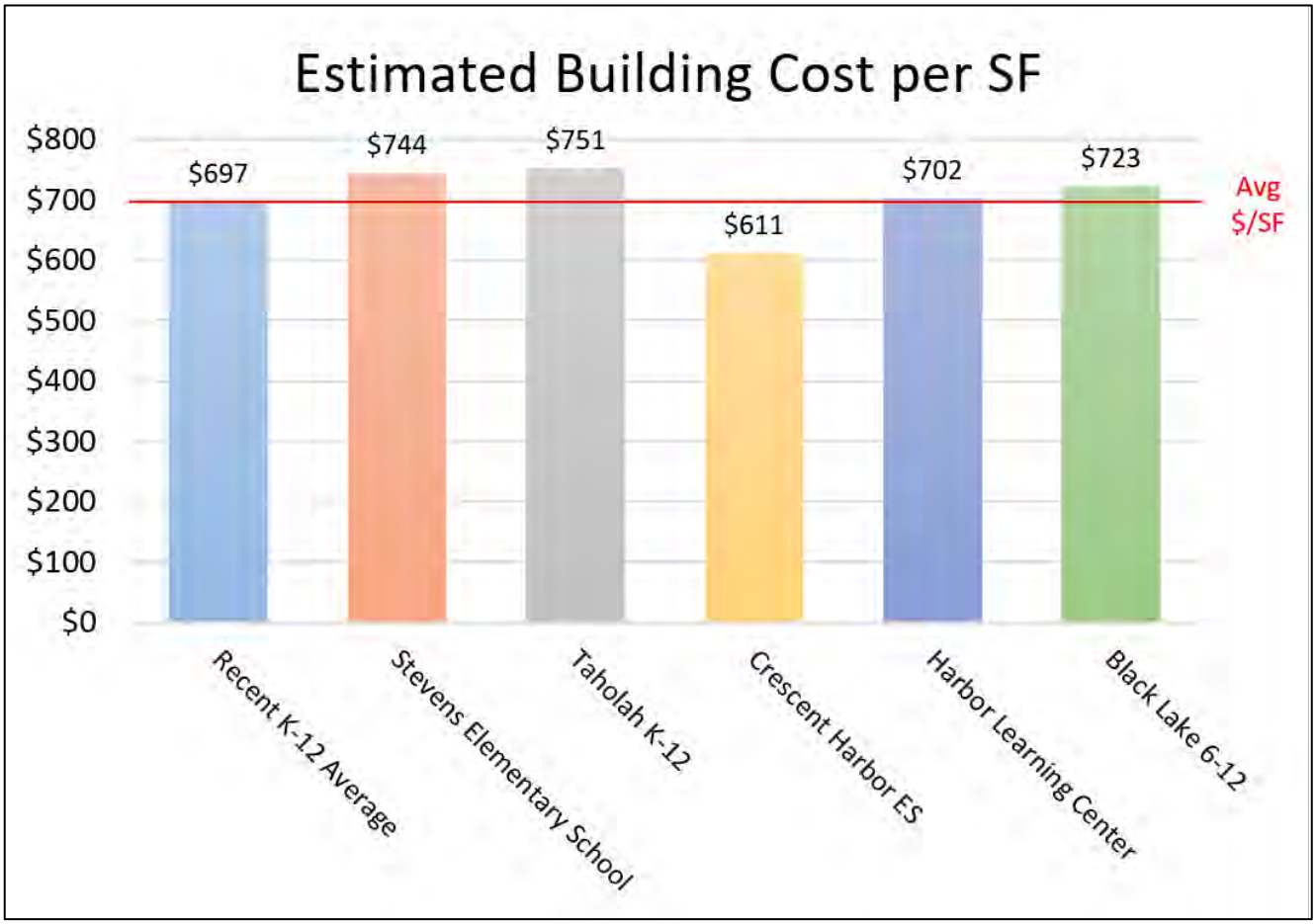
D.1 Cost Analysis

Cost Analysis
The value team completed an analysis of the estimated cost of the project in comparison to recently reviewed projects of similar type and scope. Cost information for these comparison projects was drawn from project estimates prepared by cost consultants, engineers and general contractors providing preconstruction estimating services. It is important to note that the cost information is not actual bid prices. While consultant estimates generally reflect market bid prices, they will vary depending on how closely each tracks the market place. These comparable projects are relatively similar in purpose, population served, size, building type, new or renovation/modernization, and overall scope. The estimate summaries from the comparison projects are escalated to the time period of the current project. The historical escalation is based on the Turner Building Cost Index and the escalation looking forward is based on that used in the project estimate. A geographic location adjustment based on RS Means' location factors has also been applied. The comparison projects provide a general benchmark when reviewed in aggregate to help identify differences of the subject project in overall cost, building cost per sq. ft., Uniformat cost divisions, and individual unit cost pricing, from the average. With this information, the value and project teams can access the differences and either validate the difference or identify the need for any changes.

Comparison of Building Cost Per Sq. Ft.
The value team compared the overall cost per sq. ft. of the project relative to recently reviewed comparables and the average of these projects. This comparative data is useful for relative benchmarking of costs and helps focus the team's efforts on opportunities to improve value. When comparing project costs, it is important to recognize that each project is developed according to the unique programming and design requirements of each client. Some owners place a higher priority on minimizing the initial cost of construction while others are more interested in minimizing their total cost of ownership, i.e., paying higher first costs to lower the overall life cycle costs of operations and maintenance. The latter paradigm is typically reflected in the selection of higher quality and durability of materials and building systems with longer expected lifecycle performance. Additionally, each project site and context are highly variable, impacting the cost of the building. Therefore, in evaluating cost comparisons, it is important to recognize that cost estimates inherently reflect unique project constraints and client requirements.

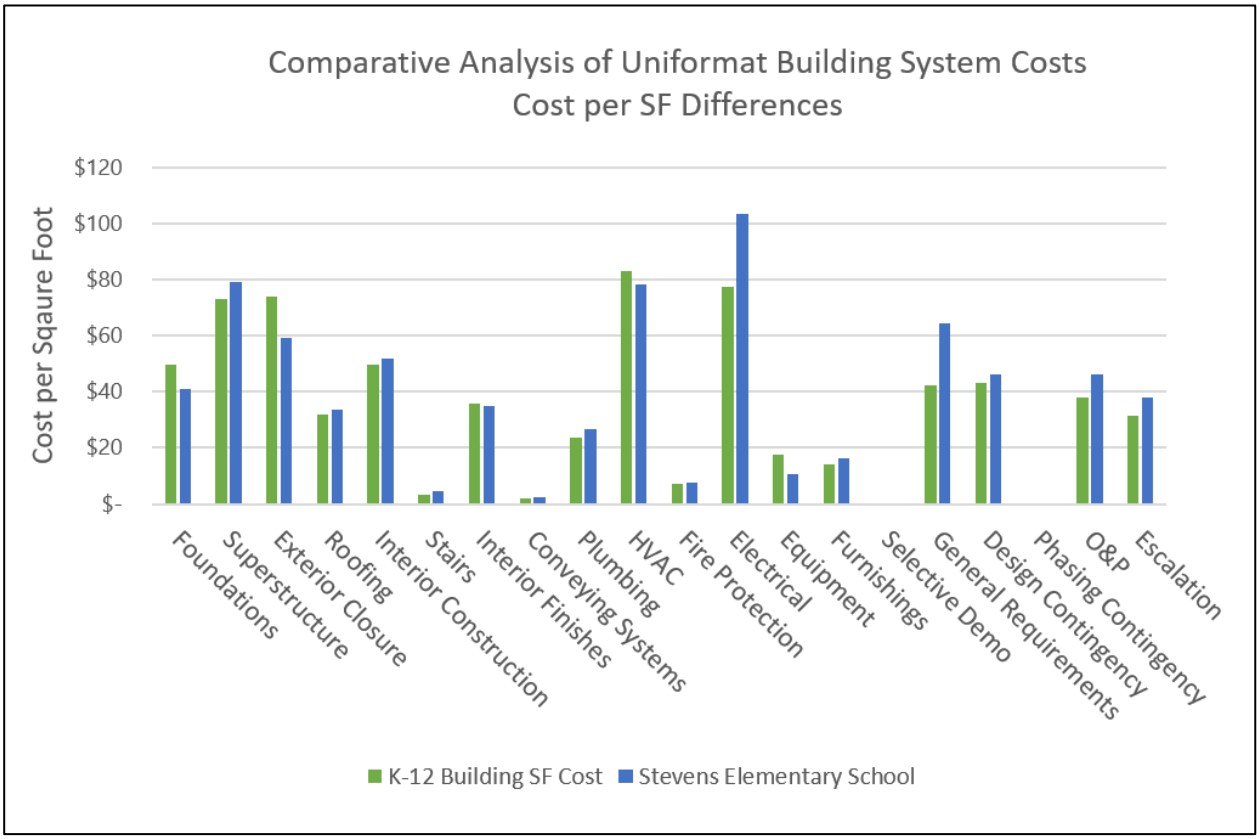
Our comparison of similar K-12 estimates for four projects representing four school districts from the Pacific Northwest, including Aberdeen School District shows an average estimated cost per sq. ft. of $697 (for the building only, not including site development cost). This average is for estimated costs escalated to the same period of time as the subject project. The $697 per sq. ft. average is representative of the range of cost for a larger pool of school project estimates reviewed over the last 24 months.

The Stevens Elementary School project estimate is based on a 62,749 SF replacement school with related demolition and site work; no renovations are included in the program. The project's estimated cost at $744 per sq. ft. is 6.8% above the comparison average.



Comparative Analysis of Uniformat System Costs

A comparative analysis of the Uniformat building system cost categories was prepared evaluating the project cost estimate relative to the comparison average. The cost differences between the project and the comparison average were analyzed on a cost per sq. ft. basis and as a percentage of the overall building costs. The building cost per sq. ft. comparison is represented below.



The patterns reflected in the comparison of Uniformat costs for the project reveal variations from the averages of recently reviewed projects. The more significant cost variances per sq. ft. are outlined below.

Higher than average cost variances include:

- Electrical 33.9% or $26 per sq. ft.
- General Requirements 53.2% or $22 per sq. ft.
- O&P 22.3% or $8 per sq. ft.

Lower than average costs include:

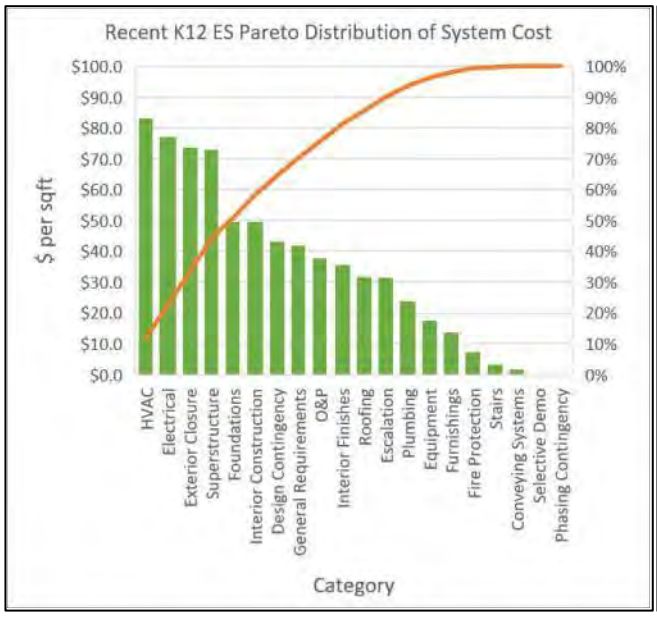
- Foundations -17.9% or -$9 per sq. ft.
- Exterior Enclosure -19.6% or -$14 per sq. ft.
- Equipment -40.4% or -$7 per sq. ft.

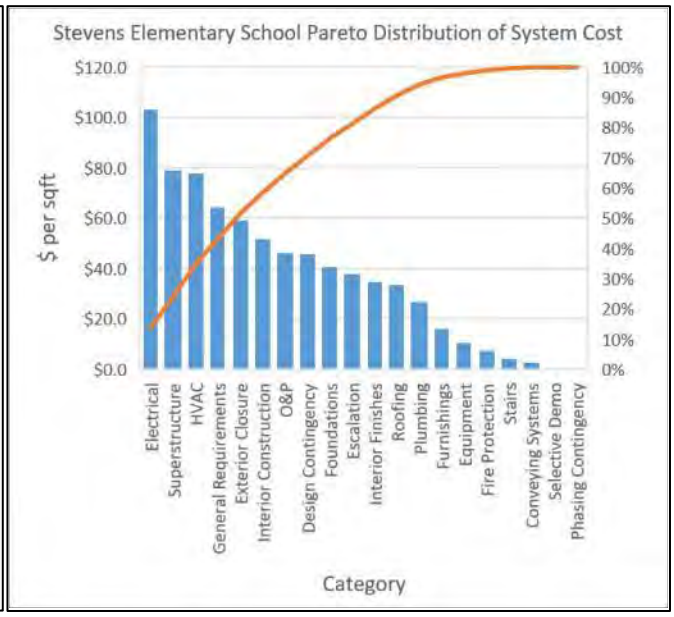
The degree of variation for these cost categories may reflect program differences, special conditions and design features, or possibly misunderstanding of the scope by the estimator. The degree of differences and potential impacts to the project cost warrant validation of the scope and estimated cost by the design team and estimator. Detailed comments about the Uniformat costs are provided in the D.2 Estimate Review.

Pareto Cost Distribution

The value team prepared a Pareto, or 80/20 ratio analysis comparing Uniformat construction cost categories,

i.e., the superstructure, exterior enclosure, interior finishes, etc., of the project relative to the Pareto distribution average of the comparison projects. The Pareto distribution of Uniformat cost categories represents 80% of cost below and 20% of cost above the distribution curve. The Pareto analysis is founded on the Pareto Principal (or observation) that roughly 80% of the effects of a system are generated by about 20% of the system variables. The analysis is useful for quickly understanding which building systems are driving project cost and risk, and potentially offer the greatest opportunities for managing these two factors.





The project Pareto 80/20 distribution curve reveals the project varies from the average; typically, the top four categories do not include General Requirements. Otherwise, the typical categories of Superstructure, HVAC and Electrical systems are falling within the top cost categories. The K-12 Average Pareto Distribution is composed of the comparison projects.

The cost categories which fall above the curve offer the greatest opportunity for design alternatives to influence the overall building cost.

D.2 Estimate Review

Estimate

The value team reviewed cost estimates developed for the Stevens Elementary School (SES) project which form the basis of the following comments. Estimates were prepared by the following consultants:

- Schematic Design Summary Estimate prepared by RC Cost Group, dated 6/12/2026.
- Landscape: Fora.
- Civil: Jacobson Consulting Engineers.
- Plumbing: Metrix Engineers, dated 6/12/2026.
- HVAC: Metrix Engineers, dated 6/12/2026.
- Fire Protection: Metrix Engineers, dated 6/12/2026.
- Electrical: Metrix Engineers, dated 6/12/2026.

Note that the cost estimate indicates Hargis Engineers as the Plumbing, HVAC, Fire Protection and Electrical as the engineer.

This review is formatted in the same sequence as the cost estimate. Discrete quantities were spot checked with the focus of the review on the unit prices. In developing recommended costs for unit prices in question, the VE team compared them with cost estimates on file from previous similar projects within the Pacific Northwest region prepared by a variety of cost consultants, engineers, and general contractors.

The SES project estimate is based on a 62,749 SF replacement school on an existing site with related demolition and site and off-site work, no renovations are included in the program. The new facility is designed as a two-story, steel-framed structure with a mixture of FRCP, Brick Venner and Metal Wall with standing seam metal roof. Soil stabilization with rammed aggregate piers is planned due to underlying soils subject to liquefaction and differential settlement in a seismic event. The site area is located on a hillside and both excavation and imported structural backfill will be required to develop a level working pad. Adequate construction access is available to all sides of the building.

Mechanical and Electrical estimates appear to be based on historical data adjusted to current market conditions, and the drawings at schematic design do not have sufficient data to develop most quantities at this stage of design. Specific comments are below. However, the calculations are based on square footage (SF) that varies with the building footprint. Additionally, verify that the unit cost applied includes the mechanical attics. It is assumed that minimal HVAC, electrical power and lighting and fire alarm will be required.

Areas of Observation and Concern

Overall Estimate – The cost estimate does not include the changes in the building systems that are indicated on the 95% Schematic Design (SD) drawings. However, some of the unit pricing is in line with other project estimates of similar scope. Specific observations are outlined below. Quantities were spot checked and any significant exceptions found are noted below.

Estimate Exclusions – Qualifications and exclusions are consistent with a project at this level of design.

Schedule Duration – The cost estimate anticipates NTP of September 2027, with a completion date not indicated. Based on scope of the project, as designed, it is anticipated that the construction schedule should be 18 months. In reviewing the site related work, the anticipated NTP should be NLT than May 2027, if funding is available.

General Conditions/General Requirements (GC/CR) at 11.75% are extremely high for this project. Typically, the CG/CR range is 7.5-8% for a new replacement grade school and associated site work.

Estimating/Design Contingency of 7.50% appropriate at this level of design.

Escalation Adjustment – Anticipated project escalation calculated at 5.40% applied to the construction cost is calculated to July 2027 rather than through the mid-point of construction, assumed to be January 2028. Recently, we have seen escalation computed based on an annual rate between 5% to 6%, with 5% being more common. Material cost indices are moving up, particularly for steel which has escalated at 25%, and associated materials and equipment. While computing to the mid-point of construction is the preferred method for computing escalation in accordance with the Association for the Advancement of Cost Engineering (AASCEI) Guideline RP 58R-10. Some consulting firms prefer amortizing the rate only to the start of construction, however the contracting community and most cost consultants follow the AASCEI Guideline.

Market Conditions – Escalation is defined as rising costs of materials, rentals, wages, etc. and does not account for more immediate market conditions. Market conditions are defined as contractor, subcontractor, and worker availability at time of bid and how desirable a project is based on constructability, location, and risk factors. Factors affecting these perceived conditions are location, client, worker availability, simplicity of the project, competition for this project, and timing of the project.

It is recommended that an allowance for potential tariffs of 1.00% be included in the project costs.

Insurance & Bonds at 1.50% is appropriate for a project of this size and complexity.

General Contractor's Overhead & Profit at 5.50% are appropriate for a project of this size and complexity.

Uniformat Cost Review

A10 Substructure:
SES cost at $40.84/sf islower than the historical average of the comparison projects at $49.76/sf.

A1011 Standard Foundations

Formwork to foundations – sides at $13.45/Sf appears low, recommend that the unit cost be increased to $15.00/sf.

Reinforcing steel to foundations at $1.76/Sf appears low, recommend that the unit cost be increased to $1.95/SF.

Concrete, 3,000 psi at $329.60/cy appears low, recommend that the unit cost be increased to $370.00/cy.

These recommended changes apply to continuous wall footings/grade beams and braced frame footings.
Perimeter drain pipe and rock at $29.45/lt appears low, recommend that the unit cost be increased to $30.75/lf.
All other costs appear fair and reasonable.

A1020 Special Foundation

A1020 Special Foundation
Stone aggregate piers pricing assumes 30'-0" deep, the unit cost appears fair and reasonable at this level of design.

A1030 Slab on Grade

The unit costs appear fair and reasonable.

B10 Superstructure:

SES cost at $78.95/sf is higher than the historical average of the comparison projects at $73.17/sf. The difference in costs is directly related to the calculation of the weight in lbs. per sf.
Structural steel at floor at 12.5lbs/sf is extremely high, typically, the calculation is based on 8lbs/SF.
Floor structure at mezzanine at 12psf is extremely high, typically, the calculation is based on 6lbs/SF.
Structural steel at roof at 11lbs/sf is extremely high, typically, the calculation is based on7lbs/SF.
All other costs appear fair and reasonable.

B20 Exterior Closure:

SES cost at $59.24/sf is lower than the historical average of the comparison projects at $73.70/sf.

B2010 Exterior Walls

The unit cost for the masonry veneer including masonry anchors at $49.85/sf appears low, recommend that the unit cost be reduced to $53.00/sf based on the small quantity in the project.
The cost estimate has not captured the metal wall panel shown on the drawings. When calculated, I recommend that a unit cost of $62.50/sf be used.
All other costs appear fair and reasonable.

B2020 Exterior Windows

Exterior storefront/curtainwall (excludes door openings) at $90.20/sf appears low. Based on discussions with the local Kawneer representative, storefront unit cost installed is $115.00/sf.
Storefront windows have not been captured separately and when calculated, recommend that the unit cost be increased to $105.00/sf.

B2030 Exterior Doors

The unit costs appear fair and reasonable for this project.

B30 Roofing:

SES cost at $33.72/sf is comparable to the historical range of the comparison projects at $31.81/sf.

B3021 Glazed roof openings

Skylight, unit cost of $275.00/sf appears high, recommend that the unit cost be reduced to $225.00/sf.
All other unit costs appear fair and reasonable for this project.

Interior Construction:
SES cost at $51.89/sf is comparable to the historical range of the comparison projects at $49.59/sf.
C1010 Partitions
C1017 Interior windows and storefronts
Recommend that the unit cost for storefront glazing increase from $95.00/sf to $115.00/sf.
All other unit costs appear fair and reasonable.
C1020 Interior Doors
The unit costs appear fair and reasonable.
C1025 Interior door sidelights and transoms
The unit costs appear fair and reasonable.
C1030 Specialties
The unit costs appear fair and reasonable.

C20 Stairways:
SES cost at $4.41/sf is higher than the historical range of the comparison projects at $3.30/sf.
C2010 Stair Construction
C2010 Stair Construction including railings and finish
The unit costs appear fair and reasonable based on the number of stairways included in the project.

C30 Interior Finishes:
SES cost at $34.76/sf is comparable to the historical range of the comparison projects at $35.76/sf.
C3012 Wall Finishes
The unit costs appear fair and reasonable.
C3024 Floor Finishes
The unit costs appear fair and reasonable.
C3030 Ceiling Finishes
Suspended acoustical baffle system, unit cost of $45.00/sf appears low, recommend that the unit costs be increased to $47.50/sf.
All other unit costs appear fair and reasonable.

D10 Conveying:
SES cost at $2.63/sf is comparable to the historical range of the comparison projects at $1.82/sf.
C1010 Elevators and Lifts
The unit cost of $165,000.00/ea appears fair and reasonable.

D20 Plumbing:
SES cost at $26.87/sf is higher than the historical range of the comparison projects at $23.88/sf.
The plumbing costs reflect the SF takeoffs completed by Metrix Engineers and are not reflective of the

gross floor area of 62,479 sf versus 60,784 sf used by Metrix Engineers.

D30 HVAC:

SES cost at $78.07/sf is lower than the historical range of the comparison projects at $83.17/sf.

The HVAC costs reflect the SF takeoffs completed by Metrix Engineers and are not reflective of the gross floor area of 62,479 sf versus 60,784 sf used by Metrix Engineers.

D40 Fire Protection:

SES cost at $7.58/sf is comparable to the historical range of the comparison projects at $7.39/sf.

D50 Electrical:

SES cost at $103.41/sf is higher than the historical range of the comparison projects at $77.23/sf.

The Electrical costs reflect the SF takeoffs completed by Metrix Engineers and are not reflective of the gross floor area of 62,479 sf versus 60,784 sf used by Metrix Engineers.

E10 Equipment:

SES cost at $10.49/sf is lower than the historical range of the comparison projects at $17.61/sf.

E20 Furnishings:

SES cost at $16.36/sf is higher than the historical range of the comparison projects at $13.96/sf.

G10 Site Work:

On-site Sitework

G1010 Site Clearing

The unit costs appear fair and reasonable.

G1020 Site Demolition and Relocations

Clarify that the unit cost of $230,000.00 is carried as a line item. Typically, the subcontractors GC's are included in the unit cost of the element of work.

All unit costs appear fair and reasonable for the small amount of site demolition.

G1030 Site Earthwork

An allowance should be included for soil amendments, recommend a unit cost of $25,000.

All other unit costs appear fair and reasonable.

G20 Site Improvements

G2020 Parking Lots

Asphalt Paving, unit cost of $150.00/Ton appears reasonable: however, the quantities should be calculated based on the type of pavement, Heavy Duty v. Light Duty.

CSTC (Asphalt Paving), the unit cost of $50.00/Ton appears reasonable: however, the quantities should be calculated based on the type of pavement, Heavy Duty v. Light Duty.

Concrete Curb

The unit cost appears fair and reasonable.

Concrete Rolled Curb

The unit cost appears fair and reasonable.
Markings & Signage
The unit costs appear fair and reasonable.

G2030 Pedestrian Paving
G2031 Paving and surfacing
The unit costs appear fair and reasonable.

G2040 Site Development
G2041 Fences and gates
The unit costs appear fair and reasonable.
G2042 Retaining walls
There is no quantity and unit cost for footing drain behind the retaining walls.
There is no quantity or unit cost for rock retaining wall at south side of site.
All other unit costs appear fair and reasonable.
G2044 Signage
The unit costs appear fair and reasonable.
G2045 Site Furnishings
The unit costs appear fair and reasonable.
G2048 Flagpoles
Verify that a flagpole is required, if so, include an allowance of $7,500.

G2050 Landscaping
G2053 Topsoil and planting beds
The unit costs appear fair and reasonable.
G2054 Seeding and sodding
Seed – Meadow, the unit cost of $.50/sf appears fair and reasonable.
Hydroseed – Lawn, the unit cost of $.25/sf appears fair and reasonable.
G2055 Planting
The unit costs appear fair and reasonable.
G2057 Irrigation
The unit costs appear fair and reasonable.

G30 Mechanical Utilities
G3010 Water Utilities
12” Water Main, the unit cost of $300.00/lf appears extremely high. Based on the profile and average depth of bury, recommend that the unit cost be reduced to $150/.00/lf.
8” Water Main, the unit cost of $260.00/lf appears extremely high. Based on the profile and average depth of bury, recommend that the unit cost be reduced to $120.00/lf.
6” Water Main, the unit cost of $250.00/lf appears extremely high. Based on the profile and average depth of bury, recommend that the unit cost be reduced to $100.00/lf.
4” Water Main, the unit cost of $200.00/lf appears extremely high. Based on the profile and average depth of

bury, recommend that the unit cost be reduced to $85.00/lf
All other costs appear fair and reasonable.
G3020 Sanitary Sewer
8” Sanitary Sewer Pipe, PVC (incl. trenching, bedding and backfill), the unit cost of $65.00/lf appears adequate if the average depth of bury is 8’ or less.
All other unit costs appear fair and reasonable.
G3030 Storm Sewer
Basic Treatment System, unit cost of $60,000.00 appears to be low, additional costs of liner, dispersion trenches need to be included.
All other unit costs appear fair and reasonable.

G40 Site Electrical Utilities
G4010 Electrical Distribution
The unit cost is shown as a lump sum item of $308,750.00. Clarify what is included in the lump sum costs as shown on drawing E1.01.
EV Charging, the unit costs appear fair and reasonable.
G2040 Site Lighting
New On-Site Lighting, the unit cost of $9,880.00/ea appears fair and reasonable.
G4030 Site Communications and Safety
The unit cost is shown as a lump sum item of $44,460.00. Clarify what is included in the lump sum costs as shown on drawing E1.01.

Off-Site Improvements
G10 Site Preparation
G1030 Site Earthwork
Missing quantities and unit prices of earthwork; excavation and backfill for the Lomax Street alignment.

G20 Site Improvements
G2020 Parking Lots
Asphalt Paving, unit cost of $150.00/Ton appears reasonable: however, the quantities should be calculated based on the type of pavement, Heavy Duty v. Light Duty.
CSTC (Asphalt Paving), the unit cost of $50.00/Ton appears reasonable: however, the quantities should be calculated based on the type of pavement, Heavy Duty v. Light Duty.
Concrete Curb
The unit cost appears fair and reasonable.
Concrete Rolled Curb
The unit cost appears fair and reasonable.
Markings & Signage
There is no quantity and unit cost for pavement markings and signage.
G2030 Pedestrian Paving
G2031 Paving and surfacing
The unit costs appear fair and reasonable.

G2042 Retaining Walls
There is no quantity and unit cost for the retaining wall on the north side of Lomax Street.
There is no quantity and unit cost for footing drain behind the retaining wall.

G2050 Landscaping
There is no quantity and unit cost for required landscaping on Lomax Street.
There is no quantity and unit cost for irrigation, if required, along Lomax Street.

G30 Site Mechanical Utilities
G3030 Storm Sewer
Verify that an oil-water separator is required for the storm drain system at Lomax Street.
All other unit costs appear fair and reasonable.

G40 Electrical Distribution
G4010 Electrical Distribution
Utilities, the unit cost is shown as a lump sum item of $432,250.00. Clarify what is included in the lump sum costs as no distribution is shown plans for Lomax Street.
G4020 Site Lighting
The unit costs appear fair and reasonable.
G4030 Site Communications and Security
Fiber Pathway, Trenching, Backfill, the unit cost is shown as a lump sum item of $44,460.00. Clarify what is included in the lump sum costs as no communication or security is shown plans for Lomax Street.

Constructability and Project Delivery:
SES is a simple, easy to construct project with ample access for deliveries and equipment. Access to the site will not be difficult, however caution will be needed when navigating from residential streets onto the site, however there should not be issues with accessing the building site.

This project is projected to be a design-bid-build.

Comments and observations contained within this report represent the value team's observations and are intended for verification by the project team.

D.3 VE Team Observations and Comments

The following initial observations and comments were noted by the VE team following the design presentation and site visit.

Cost

- The design appears to be very functional.
- The building is inviting and draws the users is.
- Facility appears to support community engagement.
- Indirect costs appear excessive.
- Escalation is not calculated correctly.
- Design/estimating contingency is reasonable for the level of design (95% SD).

Architectural

- OPR: EPDM and Standing Seam Metal. BOD roof mostly all Standing Seam.
- FCP driving exterior material costs.
- Motorized partitions and priorities of flexible spaces.
- Music/gym/cafeteria/outdoor play, somewhat unconventional to music/cafe/gym/outdoor play.

Civil

- Multiple retaining wall runs.
- Two detention ponds at the top of steep slopes.
- Two service yards.
- Driveway misaligns with drive aisle.
- Awkward turn into north drop-off.
- Single site access combines bus/passenger vehicles.

Structural

- Steel moment frames used at roof over play area (tall).
- Steel beams used in roof framing.
- Steel BRB braced frames.
- The estimate notes rammed aggregate piers will be used.
- Dovetail deck is used everywhere.
- Big volumes.
- Consider a Gravel Raft in lieu of the aggregate piers.
- Consider vibratory columns in lieu of rammed aggregate depending on what the design is around.

Mechanical

- Use of air source system and ability to meet 30% energy savings.
- Multiple waste connection points.
- HP WH plus primary electric and secondary electric.
- There is a lot of ductwork.
- Mixing valve for kitchen when design is 120.
- There are two hydronic risers next to each other.
- Hydronic system design is flexible but complicated.

- No controls design.
- Since Copper is an OPR, consider ProPress for domestic water piping and only soldered joints where specifically required by the engineer or manufacturer.

Electrical

- E5.01 Emergency ATS is not in a fire protected electrical room.
- PV Array based on half of GSF Code minimum 39.44kW, 40% of Roof Area used for solar readiness.
- Centrally located electrical rooms but mostly not stacked.
- May have double the necessary receptacles in classrooms.
- BOD conflicts with plans: switched receptacles will be controlled by ceiling-mounted occupancy sensors vs scheduled.
- Site light poles have been coordinated with landscape trees.
- Two-story facility, 60,784 SF gross floor area.
- BOD states 50–70 year life expectancy.
- OPR states it must comply with the 2021 Washington State Energy Code (WSEC) and achieve Washington Sustainable Schools Protocol (WSSP 2023) Class I baseline.
- No natural gas provided on project.
- A new 2500A, 480/277-volt, 3 phase service will be provided by Grays Harbor Public Utility District
- Kitchen and serving area of 1300 SF.
- 100kW 480V Generator, with fuel supply rated at 48 hours run time at 100% capacity.
- Copper only.
- No MC Cabling (General Notes E3.01, Use of MC cable is not permitted).

D.4 Risk Analysis

	PROB	COST IMPACT	SCHEDULE IMPACT
HIGH (5)	90-100%	>1m	>2 mos.
MEDIUM-HIGH (4)	66-89%	500k-1m	1.5-2 mos.
MEDIUM (3)	45-65%	2-500k	1-1.5 mos.
MEDIUM-LOW (2)	30-44%	1-200k	.5-1 mo.
LOW (1)	<29%	<100k	<.5 mo.

Table 1: Risk Scoring Legend

RISK FACTORS	PROB	COST IMPACT	SCHEDULE IMPACT	SCORE
Funding contingent upon future legislation.	MH	H	H	20
Site development uncertainties leading to change orders.	MH	H	MH	18
Single entry point constraining general site and emergency vehicle access.	MH	H	M	16
There is a risk that the City of Aberdeen will require full public street improvements as a condition of the new school development. If triggered, this would add significant scope including curb, gutter, and sidewalk on both sides, potential roadway widening, and associated grading, drainage, and utility adjustments.	MH	MH	MH	16
Wet soil construction costs (ESU 1a silts sensitive to disturbance year-round; cement treatment, stabilization rock, geotextile, and haul roads required regardless of season).	MH	MH	M	14
On-site soil reuse limited; silts too wet to compact as structural fill without cement treatment or prolonged dry-weather farming; fills up to 25 ft may require significant import or treatment cost.	MH	MH	M	14
Future movement due to unstable soils.	M	MH	MH	12
Northern detention basin must be lined per Geotech (no infiltration allowed due to slope stability); affects stormwater design and basin construction cost.	MH	M	M	12
Electrical service availability and high PUD costs.	H	ML	ML	10
Escalation increase due to global economic environment may add cost to project.	MH	MH	L	10
DSM spoils handling; high-pH material requires Ecology BMP C151/C252 compliance; if on-site reuse isn't feasible, hauling and disposal adds unbudgeted cost.	MH	M	ML	10

RISK FACTORS	PROB	COST IMPACT	SCHEDULE IMPACT	SCORE
Corrosive soils confirmed requiring protection on all buried iron, steel, mortar-coated steel, and reinforced concrete.	MH	M	ML	10
Coastal environment impacting/driving premium specifications.	M	MH	ML	9
Continued declining enrollment levels.	M	M	M	9
Construction-phase dewatering for ponds more extensive than anticipated.	M	M	M	9
Water intrusion given extent of building envelope.	MH	M	L	8
Relatively remote site may limit contractor availability.	M	ML	ML	6
Soil corrosion accelerating deterioration of certain types of pipe.	MH	ML	L	6
Lower detention pond bottom (El. 90.41) within 0.6 ft of regional groundwater table (El. 91); seasonal fluctuation could affect detention volume and liner performance.	ML	M	M	6
Keeping neighbors old growth trees causing damage to building in the event of tree-fall.	M	ML	L	4.5
Challenges with replacing and adding water lines.	L	L	ML	1.5
Large electrical gear with long lead times delaying project.	L	L	L	1

Table 2: Risk Factors and Scores

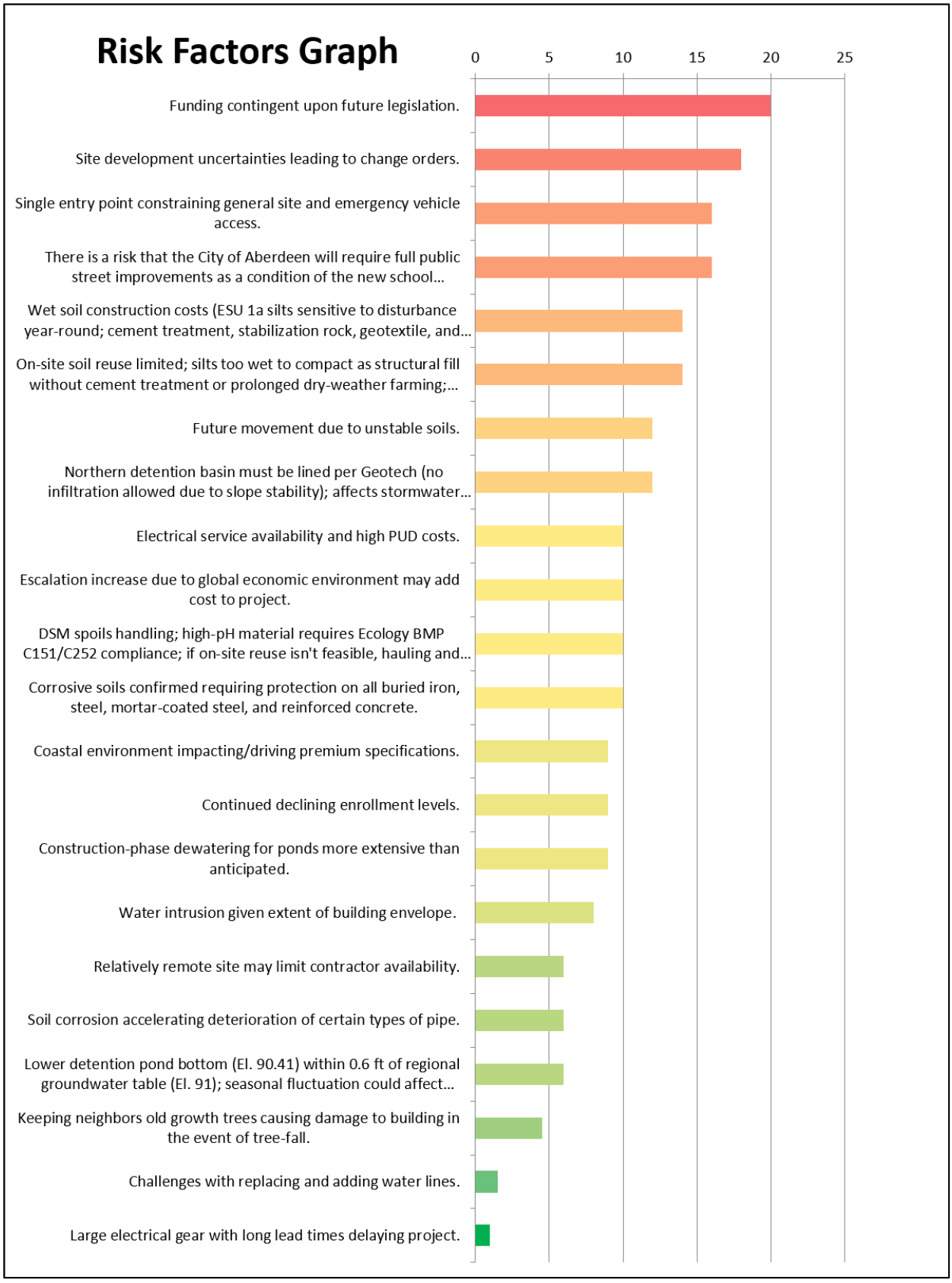


Figure 1: Risk Factors Graph Ranked by Criticality

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Appendix E
Background Documents

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E.1 Background Documents

The documents listed below were provided to the VET for reference in reviewing and analyzing the project design.

- Stevens Elementary School – 95% Schematic Design Set by NAC Architecture, May 29, 2026.
- Stevens Elementary School – 95% Schematic Design Structural Drawings (R2 – Foundations) by TCF, June 23, 2026.
- Stevens Elementary School – Structural Design Criteria by Degenkolb, June 15, 2026.
- Stevens Elementary School – South Site Civil Schematic Design Plans by LDC, June 10, 2026.
- Stevens Elementary School – Geotechnical Report by HAI Geotechnical, June 15, 2026.
- Stevens Elementary School – Schematic Design Estimate (Rev. 3) by RC Cost Group, June 23, 2026.
- Stevens Elementary School – Educational Specifications by Aberdeen School District, February 11, 2026.
- Stevens Elementary School – Roof Redesign by NAC Architecture, June 17, 2026.
- Stevens Elementary School – Stair Redesign (SF Reduction) by NAC Architecture, June 16, 2026.
- Stevens Elementary School – Updated Second Floor Reflected Ceiling Plan by NAC Architecture, May 29, 2026.
- Stevens Elementary School – Future Addition & Portables by NAC Architecture, June 17, 2026.
- Stevens Elementary School – Site Topographic Survey by MTN 2 Coast, March 2, 2026.
- Stevens Elementary School – Environmental Noise Site Study by Tenor, May 1, 2026.

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E.2 Design Drawings

Stevens Elementary School Conceptual Renderings



Back View

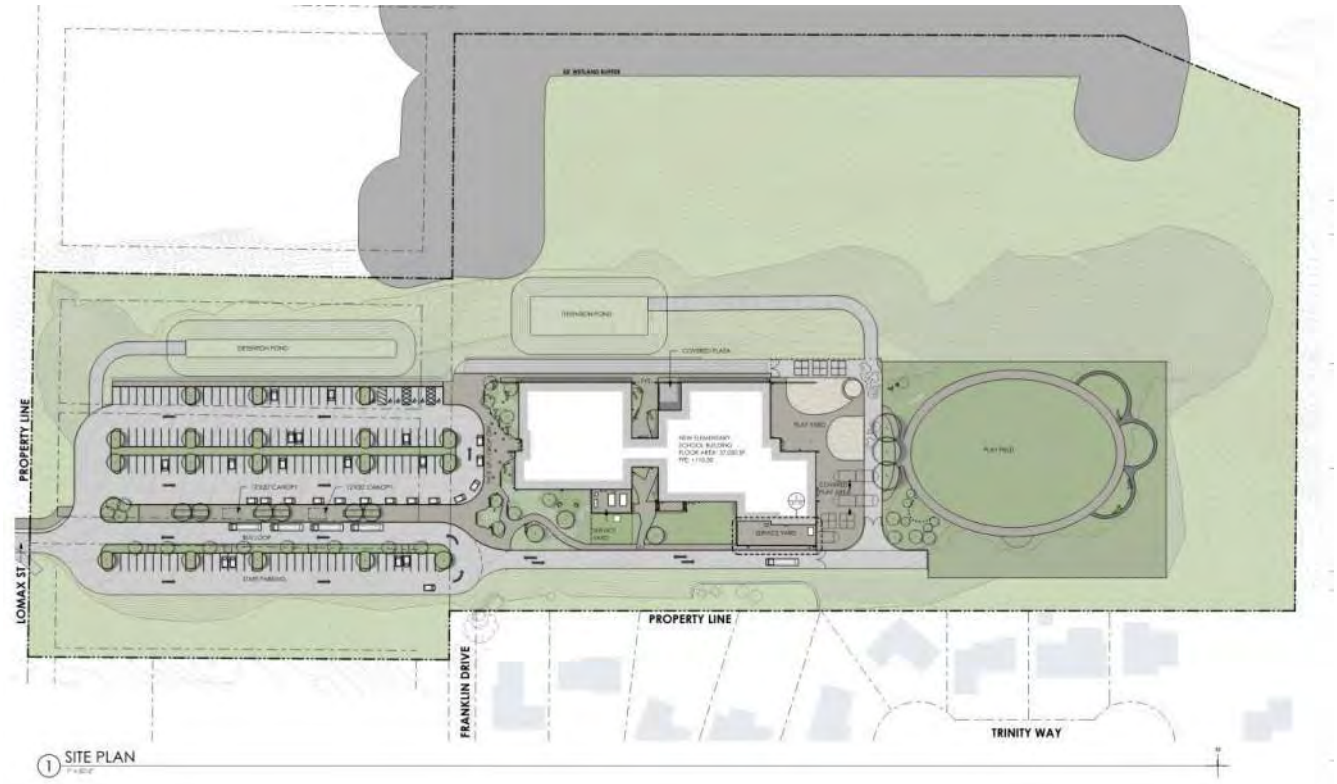


Main View

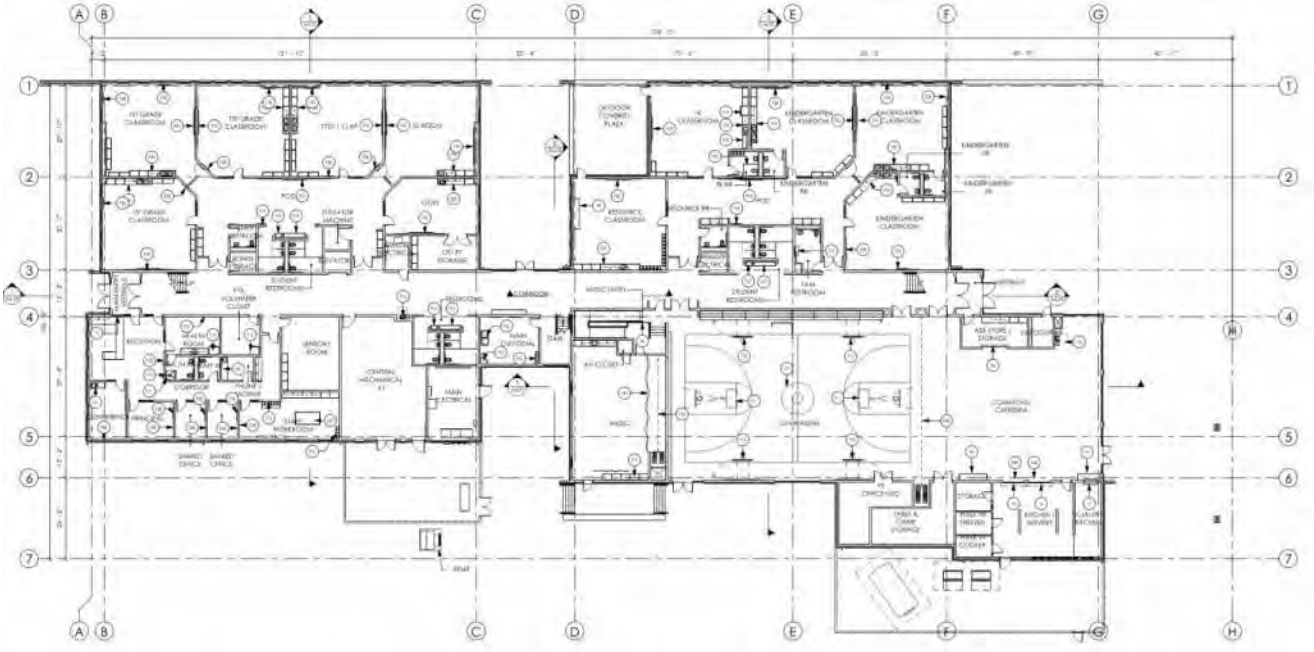


Side View

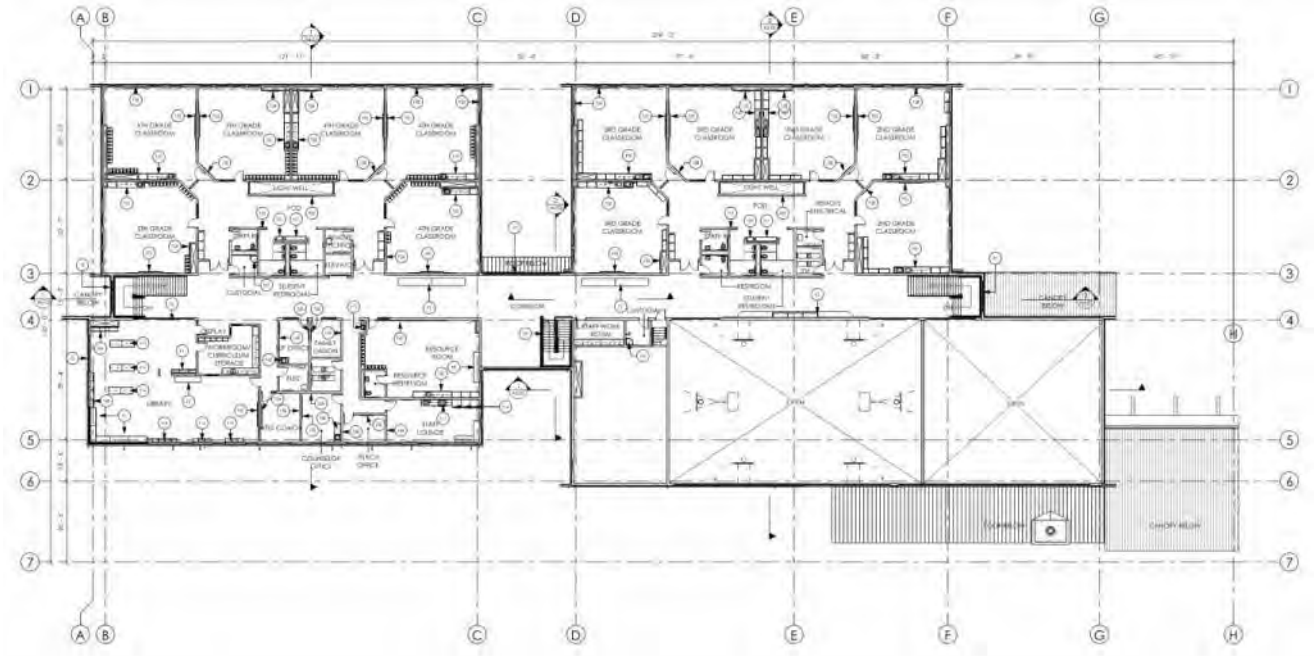
SITE PLAN


PROPERTY LINE
LOMAX ST
PROPERTY LINE
FRANKLIN DRIVE
TRINITY WAY
1 SITE PLAN

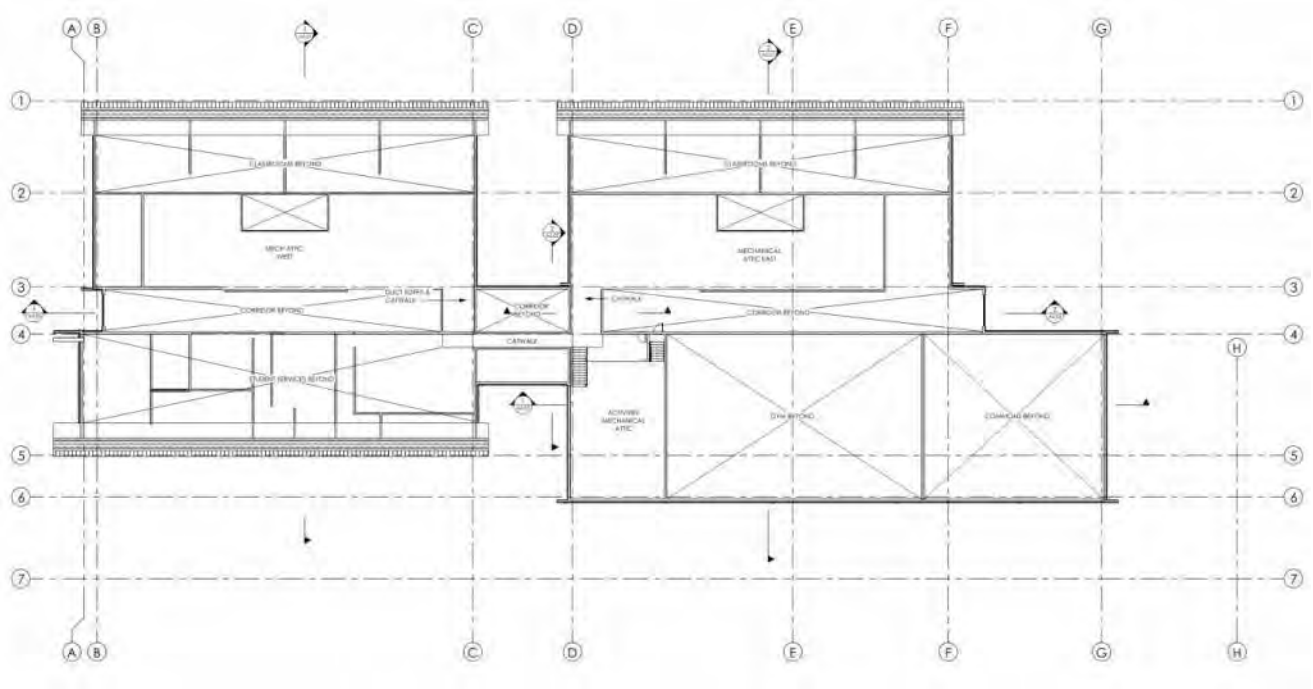
FLOOR PLANS



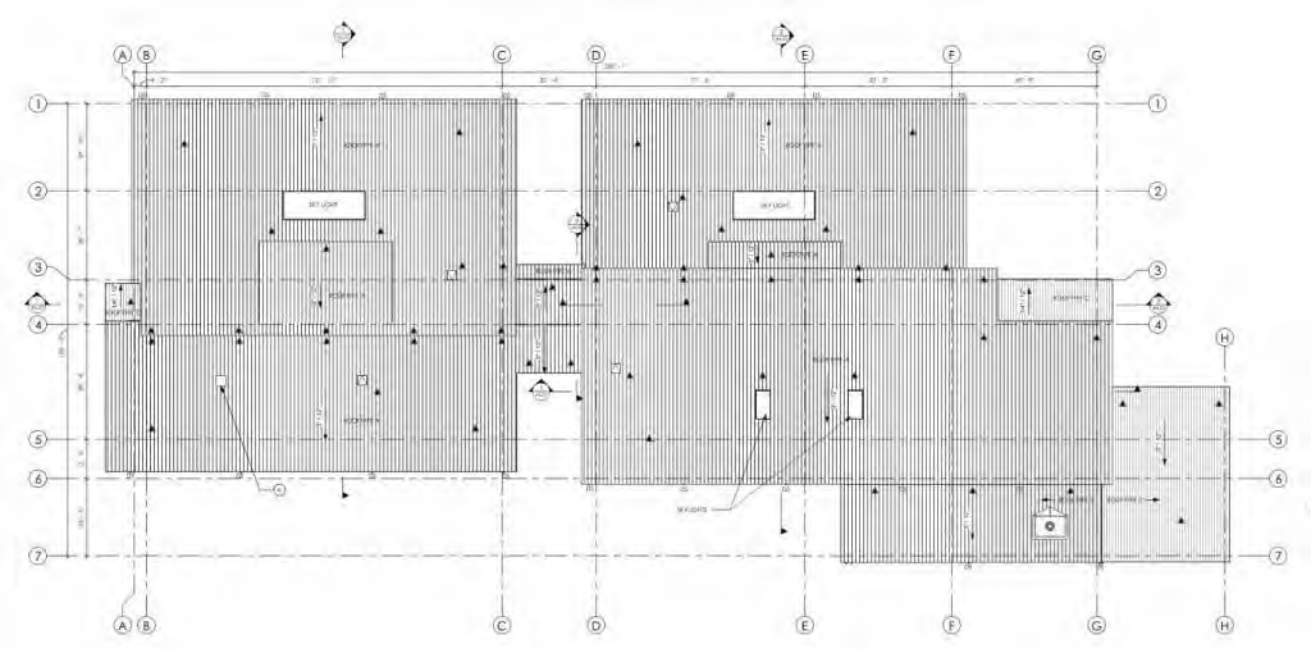
Ground Floor



Second Floor

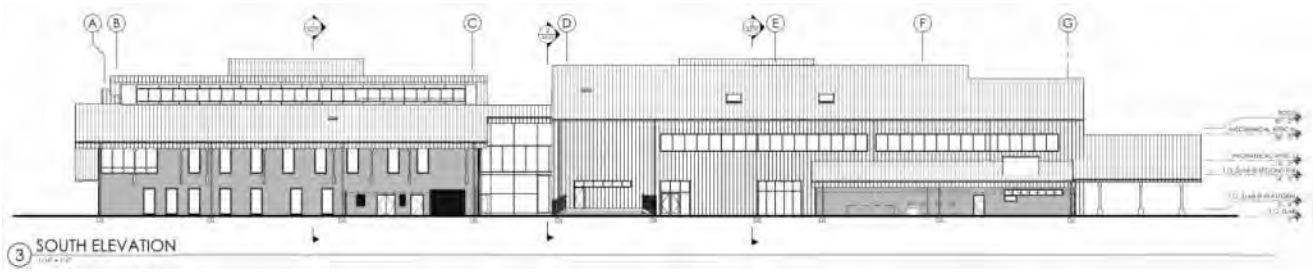


Mechanical Attic

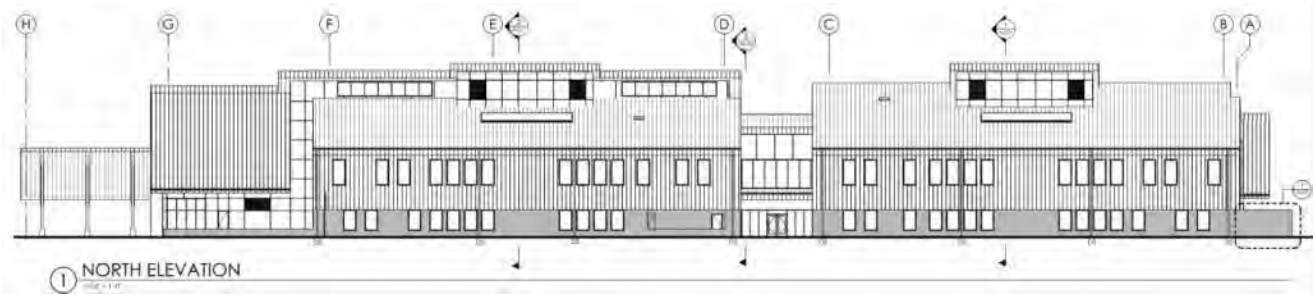


Roof Plan

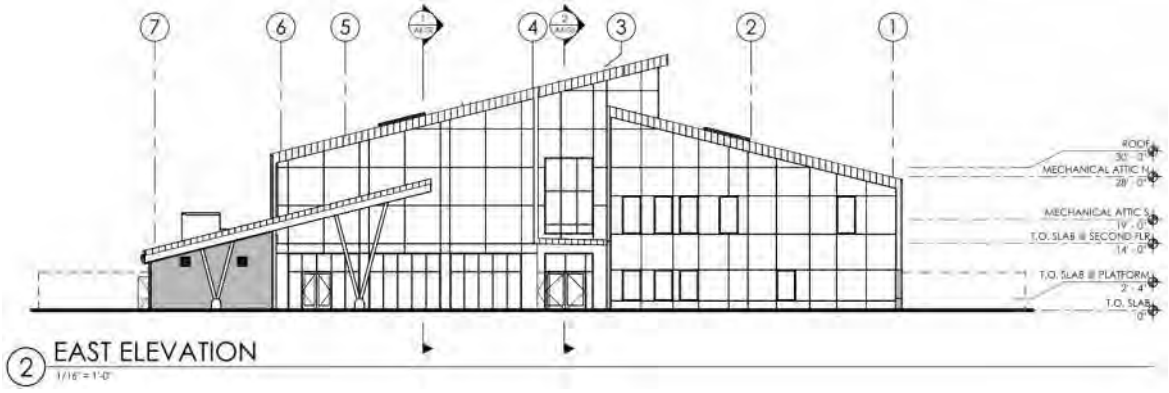
Exterior



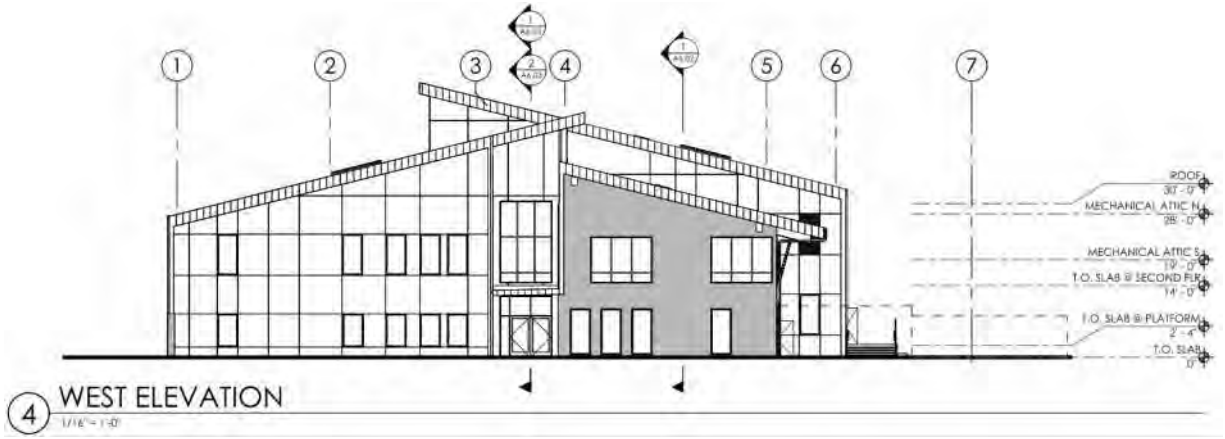
South Elevation



North Elevation



East Elevation



West Elevation

Appendix F
Workshop Information

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VE Study Agenda

Monday, June 15th, 2026 – hosted via Teams.

		Participants
8:45	**Set Up** Join the teleconference to enable a prompt meeting kickoff at 9:00	ASD Reps CSG Team TCF Team VE Team
9:00	**Introduction and Background** Introductions Review VE agenda and methodology - Säzän	
9:15	**Information** Project overview, program and goals – ASD, TCF Design presentation – TCF Review of project issues and constraints – TCF Overview of project budget and current working estimate – ASD, TCF	
11:15	**Study Goals and Objectives** Review workshop goals and objectives – Säzän Review alternatives evaluation criteria – Säzän	
12:00	**Break for Lunch**	

Workshop resumes via Teams.

1:00	**Observations** Document observations on concerns, issues and how and how well baseline design achieves program and project goals	VE Team
2:00	**Risk Review** Develop risk register and rate project risks	
3:00	**Function Analysis** Examine major systems, elements and functions Identify unique or specialized functions required to meet project objectives and performance requirements	
4:00	**Creative Speculation** Identify functions for consideration Speculate on alternative solutions	
5:00	**Adjourn** Review agenda for next day	

Tuesday, June 16th, 2026 – hosted via Teams.

8:30	**Continue Creative Speculation**	VE Team
10:30	**Break**	
10:45	**Continue Creative Speculation**	
12:00	**Break for Lunch**	
1:00	**Evaluation** Review alternatives evaluation criteria Score ideas and select alternatives for development Assign person responsible for follow-up; distribute workbooks	

3:30 **Break**

4:30 **Adjourn**
Review agenda for next day

Wednesday, June 17th, 2026 – hosted via Teams.

8:30 **Development** VE Team
Follow up on issues and questions
Prepare analysis of alternatives
Document technical, risk and cost analysis with supporting calculations, sketches, research and estimates

12:00 **Break for Lunch**

1:00 **Development**
Continue development

4:30 **Adjourn**
Review agenda for next day

Thursday, June 18th, 2026 – hosted via Teams.

8:30 **Development** VE Team
Continue development

12:00 **Break for Lunch**

1:00 **Presentation Prep**
Identify key findings and recommendations
Prep for presentation

4:30 **Adjourn**
Review agenda for next day

Friday, June 19th, 2026 – hosted via Teams.

8:30 **Development** VE Team
Continue development

12:00 **Break for Lunch**

1:00 **Workbooks Due to Estimator**

4:30 **All Workbooks & Estimates Due EOD**

POST WORKSHOP

Thursday, June 25th, 2026 – hosted via Teams.

2:00-	**Results Presentation**	ASD Reps
4:00	Presentation of study key findings and recommendations	CSG Team
	Presentation of study results	TCF Team
	Next step actions	VE Team

***Draft Report delivery by EOD Friday, July 3rd**

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F.2 Attendance Sheet

June							NAME	DISCIPLINE/ REPRESENTING	PHONE	EMAIL
Kickoff: 15th	Workshop Day 1: 15th	Workshop Day 2: 16th	Workshop Day 3: 17th	Workshop Day 4: 18th	Workshop Day 5: 19th	Results Presentation: 25th				
X	X	X	X	X	X	X	Joel Davis	Facilitator, Säzän	206-267-1700	spaget@sazan.com
X	X	X	X	X	X	X	Natalia Winfield	Study Assistant, Säzän	760-707-8336	nwinfield@sazan.com
X	X	X	X	X	X	X	Cassidy Davenport	Study Assistant, Säzän	206-576-7174	cdavenport@sazan.com
X	X	X	X	X	X	X	John Langer	VE Cost Estimator, John Langer Consulting	425-422-6986	johnl_cc@hotmail.com
X	X	X	X	X	X	X	Sam Wong	VE Architectural, Säzän	206-605-7328	swong@sazan.com
X	X	X	X	X	X	X	Peter Reich	VE Civil, Apex Engineering	360-869-1283	peter.reich@apexcos.com
X	X	X	X	X	X	X	Travis Michaud	VE Structural, Quantum Consulting Engineers LLC	206-957-3917	tmichaud@quantumce.com
X	X	X	X	X	X	X	Chris Maroney	VE Mechanical, Säzän	480-530-9102	cmaroney@sazan.com
X	X	X	X	X	X	X	Robert Grzan	VE Electrical, Säzän	234-802-4265	rgrzan@sazan.com
X	X	X	X	X	X	X	Dan Purefoy	VE Construction Management, CSG	509-368-0853	dan.purefoy@esd112.org
X							Michael Pauley	Aberdeen School District		
						X	Traci Sandstrom	Aberdeen School District		
						X	Courtney Sandstrom	Aberdeen School District		

June							NAME	DISCIPLINE/ REPRESENTING	PHONE	EMAIL
Kickoff: 15th	Workshop Day 1: 15th	Workshop Day 2: 16th	Workshop Day 3: 17th	Workshop Day 4: 18th	Workshop Day 5: 19th	Results Presentation: 25th				
X						X	Manuel Saldivar-Aguirre	Construction Services Group		manuel.saldivar-aguirre@esd112.org
X						X	Andrew Twyman	Construction Services Group		andrew.twyman@esd112.org
X							Drew Pearson	Construction Services Group		drew.pearson@esd112.org
X						X	Robert Musial	Construction Services Group		robert.musial@esd112.org
X						X	Albert deSantis	TCF Architecture		albert@tcfarchitecture.com
X						X	Brie Braukmann	TCF Architecture		brie@tcfarchitecture.com
						X	Steve Wachtler	TCF Architecture		stevew@tcfarchitecture.com
X						X	Ross Jarvis	LDC Inc.		rjarvis@LDCcorp.com
X						X	Ben Prehoda	CMTA Inc.		Ben.Prehoda@cmta.com
X							Andrey Streltsov	CMTA Inc.		Andrey.Streltsov@cmta.com
X						X	Nate Shubert	CMTA Inc.		Nate.Shubert@cmta.com
						X	Eric Nordlund	CMTA Inc.		Eric.Nordlund@cmta.com
X							Clare Cummins	Degenkolb Engineers		ccummins@degenkolb.com
						X	Dan Sloat	Degenkolb Engineers		dsloat@degenkolb.com

June							NAME	DISCIPLINE/ REPRESENTING	PHONE	EMAIL
Kickoff: 15th	Workshop Day 1: 15th	Workshop Day 2: 16th	Workshop Day 3: 17th	Workshop Day 4: 18th	Workshop Day 5: 19th	Results Presentation: 25th				
						X	Maria Arevalo Martinez	Site Workshop		manuel.saldivar-aguirre@esd112.org

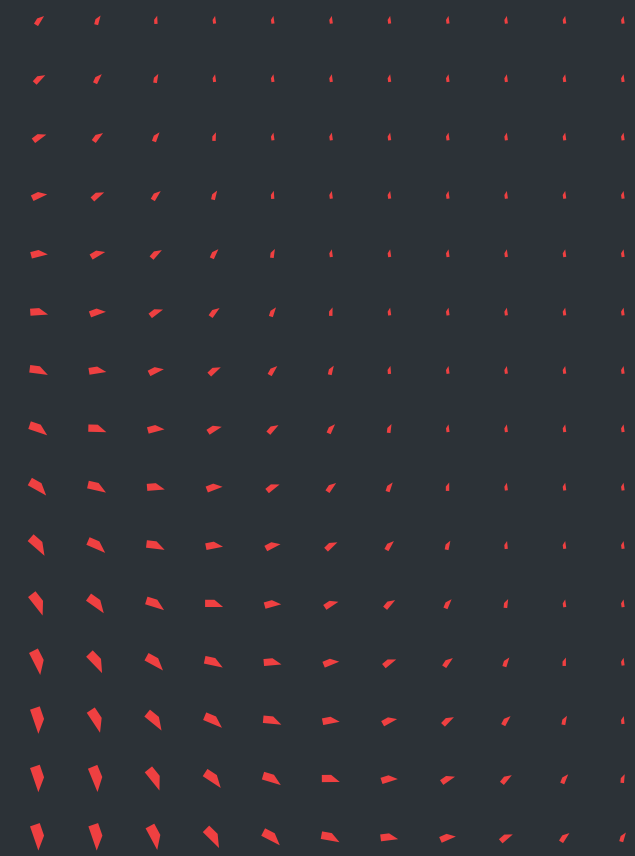


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III. Systems Comparison



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South Site Elementary School
5.3 Building Construction Type Comparison.

Introduction:
This comparison outlines key differences between **Type II-B (non-combustible steel/concrete)** and **Type V-B (combustible wood-framed)** construction for a 2-story, 62,400 SF school facility such as the South Site Elementary School. It evaluates how each construction type performs relative to fire code, acoustics, durability, cost, and constructability, with specific attention to the geographic and regulatory context of Aberdeen, WA. While other construction types (such as Type I or III) were considered, they were not explored in depth due to limited cost efficiency, higher construction complexity, or reduced suitability for the project's size and site constraints. The goal is to support informed early-phase design decisions by clearly presenting the trade-offs between these two viable structural systems.

Category	Type II-B (Steel/Concrete)	Type V-B (Wood-Framed)	System of Advantage
Max Allowable Area (2-story Group E w/ full increases)	123,375 SF	49,875 SF For this school a 2hr wall is needed to achieve the allowable area	**Type II-B**
Typical First Floor Max (w/o fire walls)	Up to ~61,000 SF	~33,250 SF (2hr wall required to exceed this SF)	**Type II-B**
Structural Fire Resistance	None required (non-combustible)	None required per code (2hr separation compensates for combustible framing)	No Advantage
Exterior Wall Fire Rating (if <10')	1-hr w/in 10' of lot line, easy w/ metal stud	1-hr if <10' from lot line; complex with GWB over wood	No Advantage (No adjacent lot lines)
Draft Stopping (Floors & Attics)	Not required	Required in floors/attics every 3,000 SF	No Advantage as cost is not impactful
Fire Blocking in Concealed Spaces	Minimal	**Extensive:** wall, ceiling, chases	**Type II-B**

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Corridor Fire-Rating Likelihood	Not required in sprinklered school buildings	Not required in sprinklered school buildings	**Type II-B**
Shaft Enclosure (Stairs/Elevators)	1-hr required for elevator shaft	1-hr required for elevator shaft	No Advantage
MEP Shaft Penetration Strategy	Straightforward	Straightforward	No Advantage
Sprinkler Layout Complexity	**Straightforward**; not required at non combustible canopies Still required often at exit canopies	**Straightforward**; but required at combustible canopies	**Type II-B**
Acoustic Performance (STC/IIC)	**High baseline performance**; less treatment needed	**Weaker without upgrades**; may need additional Wallboard or other treatment	**Type II-B**
Weather & Moisture Resilience (Aberdeen)	**Resilient to moisture, mold, and rot**	**Higher risk** of warping, mold	**Type II-B**
Cladding Material Flexibility	Supports all cladding types easily	Supports all cladding types easily	No Advantage
Construction Sequencing & Flexibility	High; framing independent. Walls separate system. Need precise alignment and fabrication. Longer lead time due to shop drawing and fabrication times	**Walls can be panelized and erected quickly. Vs framing waiting for steel structure shop drawings and installation. Less precision required**	**Type V-B**
Site Utilization for Area Increases	**High** more tolerant of tighter site or setbacks	**Highly dependent on open space**; frontage increases often required	No Advantage on this site (Full frontage available on all 4-sides)

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Exit Discharge & Egress Path Layout	**Flexible**; more forgiving in layout and discharge routing	Flexible but has 2 hour wall adding complexity to exiting	**Type II-B**
Framing & Draft Stop Impact on HVAC/Lighting	**Minimal**; open web steel joists simplify coordination	Framing often conflicts with systems soffits and furring common	**Type II-B**
Deflection	Requires deflection at the tops of all walls and finishes	**Not required on loadbearing wood walls**	**Type V-B**
Span Capability for Large Spaces (Gym, Commons)	**Excellent**; long clear spans, good for gym/commons	**Limited;** without engineered lumber; harder to span gym/commons	**Type II-B**
Insurance & Code Oversight	**Standard**; lower scrutiny due to materials	Higher scrutiny for fire blocking, concealed spaces. Additional builders risk required for wood construction Cost of construction insurance premiums higher.	**Type II-B**
Upfront Cost Efficiency	**Moderate** upfront cost	**Lower** upfront cost (materials/labor)	**Type V-B**
Lifecycle Durability & Maintenance	**Longer lasting**; lower maintenance	**Higher maintenance**; lower long-term durability	**Type II-B**
Local Contractor Availability (Aberdeen)	May require importing steel-qualified crews	**Good** pool of wood-framing contractors	**Type V-B**
Seismic Resilience for Risk Category III (SDC D)	**High** steel braced frames and rigid diaphragms perform well; easier detailing and deflection control	**Moderate** engineered shear walls required; more detailing, anchorage, and diaphragm stiffness challenges	No Advantage ultimately as the performance of both result in a building of the same seismic category

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Footing Sizes	**Heavier** footings to receive lateral frames.	**Lighter Weight** for wood brace frame assemblies	**Type V-B**
Window Placement	More **open** due to brace frames freeing up wall area. Braced frames often cross in front of some windows. This can be a nuisance or aesthetically interesting.	May be **limited** in some locations to allow for enough shear wall area.	**Type II-B**
Space utilization	Braced frames require chases if can't be left exposed. Where exposed they prevent wall use or access to windows. Needs furring at locations where not exposed and occupys useable floor area. Columns also need furring.	**No need for furring out columns and braced frames**	**Type V-B**
Insulation	Steel construction requires continuous exterior insulation	Wood construction can be designed without exterior insulation potentially as wood conducts heat less than steel	**Type V-B**
Future Flexibility	Steel spans and fewer lateral bracing locations allow for great flexibility	As most walls will be shear walls with plywood, future penetrations may require additional structural requirements.	**Type II-B**
Sustainability	Carbon is used to create steel during fabrication and smelting	Wood **encapsulates** more carbon during its growth then is used for its fabrication and delivery.	**Type V-B**

Summary:
Type V-B offers significantly lower upfront costs and aligns with local contractor availability and community heritage. However, it introduces challenges related to area limitations, fire protection detailing, and long-term durability.
Type II-B provides greater flexibility in layout, fewer code-driven fire separations, and improved acoustic and moisture performance. However, it requires more complexity in detailing deflection, and structural elements occupy significant floor area, at a significantly higher initial cost.
Selection of the appropriate system will depend on how site constraints, cost targets, and program layout priorities balance with long-term performance and code compliance considerations.

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South Site Elementary School
5.4 Roofing Type Comparison

Introduction:
This comparison outlines key differences between **Metal Roofing and Asphalt Shingle Roofing** for an Elementary School. It evaluates how each roofing type performs relative to first cost, longevity, maintenance, and Value considerations for Aberdeen School District Climate and Maintenance Capacity. Membrane roofing was not examined although it is listed as an accepted roofing type in the OPR. The goal is to support informed early-phase design decisions by clearly presenting the trade-offs between these two viable structural systems.

Category	Asphalt Shingle Roofing	Metal Roofing	System of Advantage
Context - Aesthetic	Fits into adjacent neighborhood containing houses with asphalt shingle roofs	**Looks more Civic (like a school vs an oversized house)**	**Metal Roofing –** although debatable depending on aesthetic goals
Context - Environmental	Holds moisture and debris due to textured surface. Non glaring.	**Smooth hard surface easy to clean and does not hold debris as easily. Fire resistant.**	**Metal Roofing**
Warranty	Non-prorated warranty for shingles: 20 years Warranty for layers of underlayment: 12 years	Corrosion warranty: 25 years Color warranty: 40 years	**Metal Roofing**
Expected Life	Shingles: ~20 years Low-slope underlayment: ~12-15 years	~40-60 years	Metal Roofing, otherwise similar if Asphalt Shingles are maintained
First Cost	Significantly lower first cost	Higher first cost	**Asphalt Shingle**
Maintenance	More frequently to prevent moss and debris build up	**Should be washed regularly but more forgiving due to its smooth surface**	**Metal Roofing**
Suitability for Wood vs Steel Construction	Requires venting to maintain warranty regardless of framing type	**Does not need ventilation to maintain warranty**	**Metal Roofing**
Roof Slope	Greater than 2:12 preferred for warranty	**Warrantable down to ¼":Foot**	**Metal Roofing**
Installation	Less skill needed for installation. Easy to replace		
Demolition	Not particularly challenging	can be removed easily	No Advantage

Recycling	recyclable	recyclable	No Advantage
Maintenance	Suggested inspection 1-2 times a year. Should be cleaned of debris 1-2 times a year. Cleaning of moss and mildew to be done by a professional.	Suggested inspection once a year. Should be cleaned of debris once a year, though removal of mildew and debris can be done without professional service.	**Metal Roofing**

Summary:
Asphalt Shingle Roofing offers significantly lower upfront costs and fits into the adjacent single family homes surrounding the site. However, it requires ventilation to maintain its warranty and in an area with abundant trees, would require more frequent cleaning.
Metal Roofing provides greater longevity and lower maintenance. However has more complicated detailing and a significantly higher initial cost.
Selection of the appropriate system will depend on cost targets balanced with long-term performance considerations. Roofing is often the first system to be replaced with the exception of painted surfaces.

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South Site Elementary School
5.5 Mechanical System Type Comparison

Introduction:
This comparison outlines key differences between **2 pipe changeover system and Watersource HP system** for South Site Elementary School. It evaluates how each System type performs relative to first cost, longevity, maintenance, and Value considerations for Aberdeen School District and their Maintenance Capacity. The goal is to support informed early-phase design decisions by clearly presenting the trade-offs between these two viable structural systems.

Category	Watersource HP	2 Pipe Changeover	4pipe
First Cost	Similar to 2 pipe, lower than 4 pipe.	Lower first cost. Sazan's VE study estimates $182,000 in savings vs the 4-pipe system. Metrix estimates savings closer to $300k.	Higher first cost.
Expected life	Heat pumps typically have a service life of 15–20 years. Central loop infrastructure may last considerably longer.	Fan coil units typically have a service life of 20–25 years. Central piping infrastructure may last considerably longer.	Same as 2-pipe.
Frequency and Cost of repair	Higher maintenance requirements due to compressors, refrigerant circuits, condensate systems, and distributed equipment.	Lower maintenance requirements. Fan coils contain fewer moving parts and no refrigeration system within each unit.	Same as 2-pipe.
Parts Availability	Readily available through multiple manufacturers. Some specialized components may have longer lead times.	Readily available through multiple manufacturers and suppliers.	Same as 2-pipe.
Training	Additional training would be required to maintain for more sophisticated equipment.	Minimal additional training is typically required given the district's familiarity with the equipment.	Same as 2-pipe.
A/C Capable	Simultaneous heating and cooling can occur	Building must operate in either heating mode	Full A/C provided.

	throughout the building.	or cooling mode. Changeover decisions can create comfort complaints during spring and fall weather conditions.	
Other considerations	Additional cost savings available by locating heat pumps in closets and reducing/removing mechanical attics.	Would require adding economizer to Fan Coil Units. Additional cost savings available by locating fan coil unit above ceilings and reducing/removing mechanical attics.	Additional cost savings available by locating fan coil unit above ceilings and reducing/removing mechanical attics.

Summary:

2-Pipe Changeover Fan Coil Systems offers a lower first cost, and is a system District maintenance is familiar with. The system has fewer components requiring specialized service and typically operates more quietly than water source heat pumps. However, because the building must operate in either heating or cooling mode, occupant comfort will be reduced during spring and fall shoulder seasons when different areas of the building require different conditioning modes, or zones require heating early in the am and cooling in the mid-day or afternoon. Changeover can occur automatically via controls system, but Metrix recommends the District makes the change via seasonal changeover to not waste energy going back and forth between heating and cooling.

Water Source Heat Pump Systems provides superior zone-level comfort and operational flexibility compared to a 2-pipe FCU system. Individual spaces can heat or cool independently, allowing the building to respond to varying occupancy patterns, solar exposures, and seasonal conditions. These systems can also improve energy performance through heat recovery between zones. However, they require additional maintenance requirements due to the distributed compressors, refrigerant circuits, and controls located throughout the building.

TCF

South Site Elementary School
5.6 Domestic Piping System Type Comparison

Introduction:
This comparison outlines key differences between **PEX domestic water piping and Copper domestic water piping** for South Site Elementary School. It evaluates how each System type performs relative to first cost, longevity, maintenance, and Value considerations for Aberdeen School District and their Maintenance Capacity. The goal is to support informed early-phase design decisions by clearly presenting the trade-offs between these two viable structural systems.

Category	PEX	Copper	
First Cost	Lower first cost. Sazan's VE study estimates $182,000 in savings. This seems high and Metrix would assume closer to $20k savings.	Higher first cost due to material pricing.	
Expected life	Expected service life of 40–50+ years.	Expected service life of 50–70+ years.	
Maintenance and Repair	Repairs can typically be completed quickly with mechanical fittings. Maintenance would need PEX tooling.	Repairs require cutting, cleaning, and soldering/brazing, often resulting in longer repair times and greater labor effort.	
Parts Availability	Readily available through multiple manufacturers and suppliers.	Readily available through multiple manufacturers and suppliers.	
Damage	More susceptible to damage from physical puncture.	Highly resistant to physical damage.	
Leaching of toxins/ Microplastics	Regarding your question about PEX piping and microplastics, the PEX piping we specify is NSF certified for use in domestic water applications: https://www.nsf.org/knowledge-library/what-is-nsf-certification NSF has some information regarding studies on PEX pipe leeching: https://www.nsf.org/knowledge-library/water-plumbing-systems-study-results https://www.nsf.org/knowledge-library/nsf-reviews-2021-study-pex		

	That said, if ASD is concerned about leeching we can stick with copper, but based on the current available data, we don't have a reason to recommend against using PEX. Let me know if there are any follow up questions or concerns.		

Summary:
PEX domestic water piping offers a significantly lower upfront cost and can reduce overall installation labor costs. It is a widely used and accepted piping material in K-12 with a proven track record of reliable performance. PEX also has minimal theft risk during construction and can provide substantial project cost savings compared to copper. However, because PEX is a flexible plastic material, it is more susceptible to puncture or physical damage than copper. Care must be taken during construction activities, particularly during the installation of drywall, cabinetry, backing, and other wall-mounted components where screws or fasteners could inadvertently penetrate concealed piping.
Copper domestic water piping provides a longer-established track record in institutional facilities and is often viewed as the premium piping option. It offers excellent physical durability, UV resistance, and high recyclability. However, it comes with a significantly higher initial cost and may be more susceptible to theft during construction.

TCF

South Site Elementary School
5.7 Domestic Piping System Type Comparison

Introduction:
This comparison outlines key differences between **Cast Iron waste piping and ABS or PVC waste piping** for South Site Elementary School. It evaluates how each System type performs relative to first cost, longevity, maintenance, and Value considerations for Aberdeen School District and their Maintenance Capacity. The goal is to support informed early-phase design decisions by clearly presenting the trade-offs between these two viable plumbing waste piping systems.

Category	ABS/PVC	Cast Iron	
First Cost	Lower first cost. Sazan's VE study estimates $184,000 savings. This seems high and Metrix would assume closer to $30k savings.	Higher first cost due to material pricing and labor.	
Expected life	Longevity expected to be 50+ years.	Longevity expected to be 70-100+ years.	
Maintenance and Repair	Repairs are generally straightforward and can be completed quickly using solvent-welded fittings.	Repairs typically require more labor and specialized tools, resulting in longer repair times.	
Parts Availability	Readily available through multiple manufacturers and suppliers.	Readily available through multiple manufacturers and suppliers.	
Damage	More susceptible to physical damage.	Highly resistant to physical damage.	
Acoustics	May require enhanced acoustics	Superior acoustic performance.	
Other considerations	An approach we typically see is allowing ABS on above waste piping, but requiring cast iron on below grade piping. We could also require		

	cast iron on main waste risers serving stacked toilets. There are multiple middle ground approaches that can be considered, if desired.		

Summary:

ABS/PVC wasting piping offers a lower initial cost and reduced installation labor compared to cast iron. It is a widely used and accepted piping material in K-12 construction and provides reliable long-term performance when properly installed. ABS is lightweight, corrosion-resistant, and allows for faster construction schedules. However, it provides less sound attenuation than cast iron and may require additional acoustic treatments in noise-sensitive areas. It is also more susceptible to physical damage during construction and future renovation activities.

Cast iron waste piping provides superior acoustic performance and exceptional durability, making it a common choice in K-12 construction. Cast iron is highly resistant to physical damage and offers a long service life, but it comes with a significantly higher initial cost and more labor-intensive installation requirements.

TCF

South Site Elementary School
Schematic Design Report

6.1 Building Construction Type Comparison.

Introduction:
This comparison outlines key differences between **Type II-B (non-combustible steel/concrete)** and **Type V-B (combustible wood-framed)** construction for a 2-story, 62,400 SF school facility such as the South Site Elementary School. It evaluates how each construction type performs relative to fire code, acoustics, durability, cost, and constructability, with specific attention to the geographic and regulatory context of Aberdeen, WA. While other construction types (such as Type I or III) were considered, they were not explored in depth due to limited cost efficiency, higher construction complexity, or reduced suitability for the project's size and site constraints. The goal is to support informed early-phase design decisions by clearly presenting the trade-offs between these two viable structural systems.

Category	Type II-B (Steel/Concrete)	Type V-B (Wood-Framed)	System of Advantage
Max Allowable Area (2-story Group E w/ full increases)	123,375 SF	49,875 SF For this school a 2hr wall is needed to achieve the allowable area	**Type II-B**
Typical First Floor Max (w/o fire walls)	Up to ~61,000 SF	~33,250 SF (2hr wall required to exceed this SF)	**Type II-B**
Structural Fire Resistance	None required (non-combustible)	None required per code (2hr separation compensates for combustible framing)	No Advantage
Exterior Wall Fire Rating (if <10')	1-hr w/in 10' of lot line, easy w/ metal stud	1-hr if <10' from lot line; complex with GWB over wood	No Advantage (No adjacent lot lines)
Draft Stopping (Floors & Attics)	Not required	Required in floors/attics every 3,000 SF	No Advantage as cost is not impactful
Fire Blocking in Concealed Spaces	Minimal	**Extensive:** wall, ceiling, chases	**Type II-B**
Corridor Fire-Rating Likelihood	Not required in sprinklered school buildings	Not required in sprinklered school buildings	**Type II-B**
Shaft Enclosure (Stairs/Elevators)	1-hr required for elevator shaft	1-hr required for elevator shaft	No Advantage
MEP Shaft Penetration Strategy	Straightforward	Straightforward	No Advantage
Sprinkler Layout Complexity	**Straightforward**; not required at non combustible canopies	**Straightforward**; but required at combustible canopies	**Type II-B**

	Still required often at exit canopies		
Acoustic Performance (STC/IIC)	**High baseline performance**; less treatment needed	**Weaker without upgrades**; may need additional Wallboard or other treatment	**Type II-B**
Weather & Moisture Resilience (Aberdeen)	**Resilient to moisture, mold, and rot**	**Higher risk** of warping, mold	**Type II-B**
Cladding Material Flexibility	Supports all cladding types easily	Supports all cladding types easily	No Advantage
Construction Sequencing & Flexibility	High; framing independent. Walls separate system. Need precise alignment and fabrication. Longer lead time due to shop drawing and fabrication times	**Walls can be panelized and erected quickly. Vs framing waiting for steel structure shop drawings and installation. Less precision required**	**Type V-B**
Site Utilization for Area Increases	**High** more tolerant of tighter site or setbacks	**Highly dependent on open space**; frontage increases often required	No Advantage on this site (Full frontage available on all 4-sides)
Exit Discharge & Egress Path Layout	**Flexible**; more forgiving in layout and discharge routing	Flexible but has 2 hour wall adding complexity to exiting	**Type II-B**
Framing & Draft Stop Impact on HVAC/Lighting	**Minimal**; open web steel joists simplify coordination	Framing often conflicts with systems soffits and furring common	**Type II-B**
Deflection	Requires deflection at the tops of all walls and finishes	**Not required on loadbearing wood walls**	**Type V-B**
Span Capability for Large Spaces (Gym, Commons)	**Excellent**; long clear spans, good for gym/commons	**Limited;** without engineered lumber; harder to span gym/commons	**Type II-B**
Insurance & Code Oversight	**Standard**; lower scrutiny due to materials	Higher scrutiny for fire blocking, concealed spaces. Additional builders risk required for wood construction Cost of construction insurance premiums higher.	**Type II-B**
Upfront Cost Efficiency	**Moderate** upfront cost	**Lower** upfront cost (materials/labor)	**Type V-B**

Lifecycle Durability & Maintenance	**Longer lasting**; lower maintenance	**Higher maintenance**; lower long-term durability	**Type II-B**
Local Contractor Availability (Aberdeen)	May require importing steel-qualified crews	**Good** pool of wood-framing contractors	**Type V-B**
Seismic Resilience for Risk Category III (SDC D)	**High** steel braced frames and rigid diaphragms perform well; easier detailing and deflection control	**Moderate** engineered shear walls required; more detailing, anchorage, and diaphragm stiffness challenges	No Advantage ultimately as the performance of both result in a building of the same seismic category
Footing Sizes	**Heavier** footings to receive lateral frames.	**Lighter Weight** for wood brace frame assemblies	**Type V-B**
Window Placement	More **open** due to brace frames freeing up wall area. Braced frames often cross in front of some windows. This can be a nuisance or aesthetically interesting.	May be **limited** in some locations to allow for enough shear wall area.	**Type II-B**
Space utilization	Braced frames require chases if can't be left exposed. Where exposed they prevent wall use or access to windows. Needs furring at locations where not exposed and occupys useable floor area. Columns also need furring.	**No need for furring out columns and braced frames**	**Type V-B**
Insulation	Steel construction requires continuous exterior insulation	Wood construction can be designed without exterior insulation potentially as wood conducts heat less than steel	**Type V-B**
Future Flexibility	Steel spans and fewer lateral bracing locations allow for great flexibility	As most walls will be shear walls with plywood, future penetrations may require additional structural requirements.	**Type II-B**
Sustainability	Carbon is used to create steel during fabrication and smelting	Wood **encapsulates** more carbon during its growth then is used for its fabrication and delivery.	**Type V-B**

Summary:

Type V-B offers significantly lower upfront costs and aligns with local contractor availability and community heritage. However, it introduces challenges related to area limitations, fire protection detailing, and long-term durability.

Type II-B provides greater flexibility in layout, fewer code-driven fire separations, and improved acoustic and moisture performance. However, it requires more complexity in detailing deflection, and structural elements occupy significant floor area, at a significantly higher initial cost.

Selection of the appropriate system will depend on how site constraints, cost targets, and program layout priorities balance with long-term performance and code compliance considerations.

TCF

South Site Elementary School
Schematic Design Report

6.2 Domestic Piping System Type Comparison

Introduction:
This comparison outlines key differences between **Cast Iron waste piping and ABS or PVC waste piping** for South Site Elementary School. It evaluates how each System type performs relative to first cost, longevity, maintenance, and Value considerations for Aberdeen School District and their Maintenance Capacity. The goal is to support informed early-phase design decisions by clearly presenting the trade-offs between these two viable plumbing waste piping systems.

Category	ABS/PVC	Cast Iron	
First Cost	Lower first cost. Sazan's VE study estimates $184,000 savings. This seems high and Metrix would assume closer to $30k savings.	Higher first cost due to material pricing and labor.	
Expected life	Longevity expected to be 50+ years.	Longevity expected to be 70-100+ years.	
Maintenance and Repair	Repairs are generally straightforward and can be completed quickly using solvent-welded fittings.	Repairs typically require more labor and specialized tools, resulting in longer repair times.	
Parts Availability	Readily available through multiple manufacturers and suppliers.	Readily available through multiple manufacturers and suppliers.	
Damage	More susceptible to physical damage.	Highly resistant to physical damage.	
Acoustics	May require enhanced acoustics	Superior acoustic performance.	
Other considerations	An approach we typically see is allowing ABS on above waste piping, but requiring cast iron on below grade		

	piping. We could also require cast iron on main waste risers serving stacked toilets. There are multiple middle ground approaches that can be considered, if desired.		

Summary:
ABS/PVC wasting piping offers a lower initial cost and reduced installation labor compared to cast iron. It is a widely used and accepted piping material in K-12 construction and provides reliable long-term performance when properly installed. ABS is lightweight, corrosion-resistant, and allows for faster construction schedules. However, it provides less sound attenuation than cast iron and may require additional acoustic treatments in noise-sensitive areas. It is also more susceptible to physical damage during construction and future renovation activities.
Cast iron waste piping provides superior acoustic performance and exceptional durability, making it a common choice in K-12 construction. Cast iron is highly resistant to physical damage and offers a long service life, but it comes with a significantly higher initial cost and more labor-intensive installation requirements.

South Site Elementary School
Schematic Design Report

6.3 Domestic Piping System Type Comparison

Introduction:
This comparison outlines key differences between **PEX domestic water piping and Copper domestic water piping** for South Site Elementary School. It evaluates how each System type performs relative to first cost, longevity, maintenance, and Value considerations for Aberdeen School District and their Maintenance Capacity. The goal is to support informed early-phase design decisions by clearly presenting the trade-offs between these two viable structural systems.

Category	PEX	Copper	
First Cost	Lower first cost. Sazan's VE study estimates $182,000 in savings. This seems high and Metrix would assume closer to $20k savings.	Higher first cost due to material pricing.	
Expected life	Expected service life of 40–50+ years.	Expected service life of 50–70+ years.	
Maintenance and Repair	Repairs can typically be completed quickly with mechanical fittings. Maintenance would need PEX tooling.	Repairs require cutting, cleaning, and soldering/brazing, often resulting in longer repair times and greater labor effort.	
Parts Availability	Readily available through multiple manufacturers and suppliers.	Readily available through multiple manufacturers and suppliers.	
Damage	More susceptible to damage from physical puncture.	Highly resistant to physical damage.	
Leaching of toxins/ Microplastics	Regarding your question about PEX piping and microplastics, the PEX piping we specify is NSF certified for use in domestic water applications: https://www.nsf.org/knowledge-library/what-is-nsf-certification NSF has some information regarding studies on PEX pipe leeching: https://www.nsf.org/knowledge-library/water-plumbing-systems-study-results		

	https://www.nsf.org/knowledge-library/nsf-reviews-2021-study-pex That said, if ASD is concerned about leeching we can stick with copper, but based on the current available data, we don't have a reason to recommend against using PEX. Let me know if there are any follow up questions or concerns.		

Summary:
PEX domestic water piping offers a significantly lower upfront cost and can reduce overall installation labor costs. It is a widely used and accepted piping material in K-12 with a proven track record of reliable performance. PEX also has minimal theft risk during construction and can provide substantial project cost savings compared to copper. However, because PEX is a flexible plastic material, it is more susceptible to puncture or physical damage than copper. Care must be taken during construction activities, particularly during the installation of drywall, cabinetry, backing, and other wall-mounted components where screws or fasteners could inadvertently penetrate concealed piping.
Copper domestic water piping provides a longer-established track record in institutional facilities and is often viewed as the premium piping option. It offers excellent physical durability, UV resistance, and high recyclability. However, it comes with a significantly higher initial cost and may be more susceptible to theft during construction.

TCF

South Site Elementary School
Schematic Design Report

6.4 Mechanical System Type Comparison

Introduction:
This comparison outlines key differences between **2 pipe changeover system and Watersource HP system** for South Site Elementary School. It evaluates how each System type performs relative to first cost, longevity, maintenance, and Value considerations for Aberdeen School District and their Maintenance Capacity. The goal is to support informed early-phase design decisions by clearly presenting the trade-offs between these two viable structural systems.

Category	Watersource HP	2 Pipe Changeover	4pipe
First Cost	Similar to 2 pipe, lower than 4 pipe.	Lower first cost. Sazan's VE study estimates $182,000 in savings vs the 4-pipe system. Metrix estimates savings closer to $300k.	Higher first cost.
Expected life	Heat pumps typically have a service life of 15–20 years. Central loop infrastructure may last considerably longer.	Fan coil units typically have a service life of 20–25 years. Central piping infrastructure may last considerably longer.	Same as 2-pipe.
Frequency and Cost of repair	Higher maintenance requirements due to compressors, refrigerant circuits, condensate systems, and distributed equipment.	Lower maintenance requirements. Fan coils contain fewer moving parts and no refrigeration system within each unit.	Same as 2-pipe.
Parts Availability	Readily available through multiple manufacturers. Some specialized components may have longer lead times.	Readily available through multiple manufacturers and suppliers.	Same as 2-pipe.
Training	Additional training would be required to maintain for more sophisticated equipment.	Minimal additional training is typically required given the district's familiarity with the equipment.	Same as 2-pipe.

A/C Capable	Simultaneous heating and cooling can occur throughout the building.	Building must operate in either heating mode or cooling mode. Changeover decisions can create comfort complaints during spring and fall weather conditions.	Full A/C provided.
Other considerations	Additional cost savings available by locating heat pumps in closets and reducing/removing mechanical attics.	Would require adding economizer to Fan Coil Units. Additional cost savings available by locating fan coil unit above ceilings and reducing/removing mechanical attics.	Additional cost savings available by locating fan coil unit above ceilings and reducing/removing mechanical attics.

Summary:

2-Pipe Changeover Fan Coil Systems offers a lower first cost, and is a system District maintenance is familiar with. The system has fewer components requiring specialized service and typically operates more quietly than water source heat pumps. However, because the building must operate in either heating or cooling mode, occupant comfort will be reduced during spring and fall shoulder seasons when different areas of the building require different conditioning modes, or zones require heating early in the am and cooling in the mid-day or afternoon. Changeover can occur automatically via controls system, but Metrix recommends the District makes the change via seasonal changeover to not waste energy going back and forth between heating and cooling.

Water Source Heat Pump Systems provides superior zone-level comfort and operational flexibility compared to a 2-pipe FCU system. Individual spaces can heat or cool independently, allowing the building to respond to varying occupancy patterns, solar exposures, and seasonal conditions. These systems can also improve energy performance through heat recovery between zones. However, they require additional maintenance requirements due to the distributed compressors, refrigerant circuits, and controls located throughout the building.

TCF

South Site Elementary School
Schematic Design Report

6.5 Roofing Type Comparison

Introduction:
This comparison outlines key differences between **Metal Roofing and Asphalt Shingle Roofing** for an Elementary School. It evaluates how each roofing type performs relative to first cost, longevity, maintenance, and Value considerations for Aberdeen School District Climate and Maintenance Capacity. Membrane roofing was not examined although it is listed as an accepted roofing type in the OPR. The goal is to support informed early-phase design decisions by clearly presenting the trade-offs between these two viable structural systems.

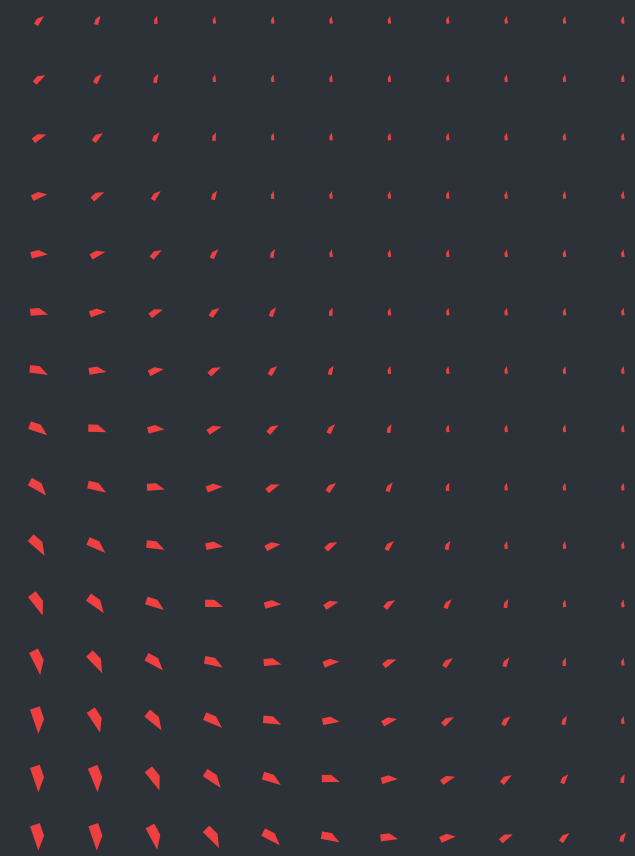
Category	Asphalt Shingle Roofing	Metal Roofing	System of Advantage
Context - Aesthetic	Fits into adjacent neighborhood containing houses with asphalt shingle roofs	**Looks more Civic (like a school vs an oversized house)**	**Metal Roofing –** although debatable depending on aesthetic goals
Context - Environmental	Holds moisture and debris due to textured surface. Non glaring.	**Smooth hard surface easy to clean and does not hold debris as easily. Fire resistant.**	**Metal Roofing**
Warranty	Non-prorated warranty for shingles: 20 years Warranty for layers of underlayment: 12 years	Corrosion warranty: 25 years Color warranty: 40 years	**Metal Roofing**
Expected Life	Shingles: ~20 years Low-slope underlayment: ~12-15 years	~40-60 years	Metal Roofing, otherwise similar if Asphalt Shingles are maintained
First Cost	Significantly lower first cost	Higher first cost	**Asphalt Shingle**
Maintenance	More frequently to prevent moss and debris build up	**Should be washed regularly but more forgiving due to its smooth surface**	**Metal Roofing**
Suitability for Wood vs Steel Construction	Requires venting to maintain warranty regardless of framing type	**Does not need ventilation to maintain warranty**	**Metal Roofing**
Roof Slope	Greater than 2:12 preferred for warranty	**Warrantable down to ¼":Foot**	**Metal Roofing**
Installation	Less skill needed for installation. Easy to replace		

Demolition	Not particularly challenging	can be removed easily	No Advantage
Recycling	recyclable	recyclable	No Advantage
Maintenance	Suggested inspection 1-2 times a year. Should be cleaned of debris 1-2 times a year. Cleaning of moss and mildew to be done by a professional.	Suggested inspection once a year. Should be cleaned of debris once a year, though removal of mildew and debris can be done without professional service.	**Metal Roofing**

Summary:
Asphalt Shingle Roofing offers significantly lower upfront costs and fits into the adjacent single family homes surrounding the site. However, it requires ventilation to maintain its warranty and in an area with abundant trees, would require more frequent cleaning.
Metal Roofing provides greater longevity and lower maintenance. However has more complicated detailing and a significantly higher initial cost.
Selection of the appropriate system will depend on cost targets balanced with long-term performance considerations. Roofing is often the first system to be replaced with the exception of painted surfaces.

TCF

IV. Owner Project Requirements



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SOUTH SITE ELEMENTARY
5.2 OWNER'S PROJECT REQUIREMENTS (OPR)

The Owner's Project Requirements (OPR) for South Side Elementary establishes the District's overarching goals and technical standards, serving as a framework to guide design, construction, and long-term operations. This document ensures alignment between the educational mission, sustainability commitments, and operational needs of the Aberdeen School District while allowing for flexibility as the design develops.

Educational Mission & Program Alignment

- Supports the replacement of the Stevens Elementary school.
- Provide up to date building meeting current codes and curriculum requirements outside of the Tsunami inundation zone.

Performance & Sustainability

- Must comply with the 2021 Washington State Energy Code (WSEC) and achieve Washington Sustainable Schools Protocol (WSSP 2023) Class I baseline.
- Prioritizes durability, energy efficiency, acoustical quality, indoor air quality, and daylighting.
- Requires commissioning, energy metering, and long-term performance monitoring.

Materials & Standards

- Reinforces Aberdeen School District's material standards for durability, lifecycle value, and sustainability:
    - Forbo linoleum, Nora rubber flooring, Armstrong VCT, Mondo gym flooring.
    - Masonry cladding, aluminum/fiberglass windows, wood/HM doors.
    - EPDM roofing membranes and Standing Seam Metal Roofing.
- Other materials that balance maintainability, cost, and sustainability.

Health, Safety & Acoustics

- Complies with WAC 246-366 Indoor Air Quality standards.
- Integrates the Acoustical Design Plan for speech intelligibility, noise control, and learning effectiveness.
- Includes daylighting and glare control to support student comfort and performance.

Building Systems & Operations

- Requires fundamental commissioning.
- Incorporates controls, metering, and energy storage readiness.
- Prioritizes maintainability, durability, and district staff training.

Governance of Material and System Selection

The OPR establishes four levels of guidance for decision-making:

- **Required** – Must be incorporated into the design (e.g., compliance with WSEC 2021, WSSP Class I, commissioning, district-standard resilient flooring).
- **Prohibited** – Must not be used due to performance, maintenance, or health concerns.
- **Allowed Upon Approval** – May be incorporated if justified and reviewed with District approval (e.g., alternative materials or systems with proven lifecycle performance).
- **Discouraged** – Not preferred due to maintenance complexity, cost inefficiency, or past performance issues, but may be considered only with strong justification.

Summary

The Aberdeen School District OPR provides a comprehensive roadmap balancing the District's educational vision, sustainability goals, durability standards, and community use priorities. It outlines clear requirements, identifies prohibited and discouraged practices, and allows conditional flexibility through approval-based decisions. This structured framework will guide the project team through design and construction while safeguarding the long-term performance and adaptability of the facility.

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
Division 2 – Existing Conditions				
General	00000	N/A		• Confirm temporary utilities and coordination of utility switchovers. • Confirm documents clearly state that contractor is to perform all tasks necessary to disconnect existing utilities and connect new utilities. • Remaining foundation at parking area. May have removed more at grass area at South Side Elementary. May have documents.
Structure & Utility Demolition	024116	N/A	REVIEWED	• When possible, review demolition scope with GC's and Subcontractor's prior to submitting bid documents. • Removal of existing utilities is ***preferred*** versus abandoning them in place. Confirm approach on a project-by-project basis. • Hazardous material removal is ***preferred*** over encapsulation.
Division 3 – Concrete				
Cast-in-Place Concrete	033000	Read-Mix	REVIEWED	• Fly Ash ***prohibited***. • Exposed concrete at stair landings and stair treads may be ***allowed upon approval***. • *Clear sealed floors are* ***preferred*** at mechanical, electrical, MDF & IDF, storage and similar interior rooms. Exact locations to be finalized. • Use of lightweight concrete or gypcrete on second floor slabs is ***discouraged***.
Ramps	033000	Read-Mix	REVIEWED	• Ramps shall be designed with a tolerance greater than ADA requirement: Minimum slope to be 1" per every 12.5" in length ***required***.
Concrete Elevator Pits	033000	Read-Mix	TO BE FURTHER REVIEWED	• All elevator pits including walls, slab, and sump shall be waterproofed with bentonite waterproofing ***required***. See DIV 07 standards. • Coordinate sump pump and discharge requirements with district and local jurisdictions. Review with state L & I sump pump is typically required and is required to outlet to a grease separator.
Stair Nosing	033000	Read-Mix	REVIEWED	• Stair nosing as ***required*** by code. Further discussion will be ***required*** on a project-by-project basis.
Skateboard Deterrents	033000	Read-Mix	REVIEWED	• Cast-in-place notches as a skateboard deterrent are ***preferred*** versus use other types of deterrents at concrete site walls.
Vapor Retarder	033000	Steggo Systems / Steggo wrap	REVIEWED	• Class A vapor retarder ***required***. • 15 Mil minimum thickness ***required***. • Tape seal at all vapor barrier edges and penetrations ***required***.
Polished Concrete Floors	033543	PROHIBITED	REVIEWED	• Polished concrete floors are ***prohibited***.
Architectural Precast Concrete	034500	Northwest Precast	REVIEWED	• Precast concrete is ***allowed upon approval***. Generally, project budget will drive approval.
Division 4 – Masonry				
General - Masonry	040000	N/A	REVIEWED	• See 071900 water repellants for masonry protection and coatings. • *A* masonry wainscot around building perimeter at a minimum height of the windowsill height is ***preferred*** for durability and ease of maintenance. o Adequate vertical and horizontal control joints per code and structural engineer's review are ***required***. o Mortar net and weep at base of wall and at window headers ***required***. o Stainless steel flashing is ***preferred*** in lieu of flexible through-wall flashings. Hem all exposed edges. o Through wall flashings 4"-6" above grade ***preferred***. o The base course of veneer is ***preferred*** to be one course below finish floor minimum. Smooth face block is ***preferred*** in these locations.
Reinforced Unit Masonry (CMU)	042200	Mutual Materials / Basalite	REVIEWED	• The use of CMU is ***allowed upon approval*** at service yard wall.

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
Brick Veneer	042113	Mutual Materials / Interstate Brick	REVIEWED	• Brick Veneer: o The use of brick veneer is ***allowed.*** o Also see general above.
CMU Veneer	042213	Mutual Materials / Basalite	REVIEWED	• CMU Veneer: o The use of CMU veneer at the building façade is ***allowed***. o The use split face block is generally ***discouraged*** but is ***prohibited*** at openings due to conflicts with opening flashing. o Also see general above.
Division 5 – Steel				
General – Steel	050000	As Specified	REVIEWED	• See Division 9 for Paints and Coatings. • Size floor joists and beams to minimize deflection. • Architectural exposed steel (AESS) ***allowed upon approval*** • Avoid exterior conditions or features that allow bird roosting. • For large projects steel from AISC or approved certified mill is ***preferred.***
Metal Fabrications	055000		REVIEWED	• Lintels: Lintels (and related steel supports) shall be galvanized steel. • Steel Downspouts: The use of steel downspouts is ***discouraged*** except stainless steel. PVC downspouts are ***preferred***. • Bollards: Bollards ***preferred*** to be fabricated from galvanized pipe and painted. • Access Ladders: o Full stairs to mechanical attics ***preferred***. (Also see 055113 Metal Pan Stairs below). o Ships ladders ***allowed upon approval***. o Pull-down attic access ladders ***allowed upon approval***. o Roof access ladders ***allowed***. Roof mounted access ladders ***required*** to be aluminum or stainless steel only. o Alternating tread devices ***allowed upon approval***.
Steel Decking	053100		REVIEWED	• The use of perforated metal deck where exposed in occupied spaces is ***allowed***. • Dovetail metal decking ***allowed upon approval*** for acoustical quality.
Cold Formed Metal Framing	054000		REVIEWED	• Review blocking and backing strategy with owner, e.g., wood versus steel strapping. Magnetic markerboards are heavy. Both are ***allowed*** based on price point. • Deflection track at top of non-bearing walls ***required*** where roof or floor deflection may occur. • Cold formed metal framing and treated wood ***prohibited*** to be in contact.
Structural Steel Framing	051200		REVIEWED	• All structural steel ***required*** to be primed per division 9. • Immediately after fabrication, steel ***required*** to be protected with *galvanizing or epoxy primer.*
Metal Pan Stairs	055113		REVIEWED	• Metal pan stair treads ***preferred*** for general stair construction. Perforated risers ***prohibited*** for privacy reasons. Use of precast stair treads at feature stairs ***preferred.*** • Mechanical attic and access stairs: Wood framed attic stairs ***preferred*** to be wood framed to economize on cost if building type allows .
Pipe and Tube Railings	055213		REVIEWED	• Interior & Exterior Handrails: Stainless steel handrails ***preferred***. Handrails to mechanical attics can be primed steel. Galvanized steel ***allowed upon approval*** at exterior where budget doesn't permit for stainless steel. Painted rails are ***discouraged.*** • Guardrails*:* Steel guardrails with high performance coating ***preferred***. Galvanized steel handrails ***allowed upon approval***. Horizontal rod or cable infills that can be used for climbing ***prohibited***. Guardrails ***required*** to be **55"** high minimum, aesthetically pleasing, discourage climbing.
Division 6 – Wood, Plastics, & Composites				

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
General – Wood, Plastics, & Composites	060000		REVIEWED	• Use of salvaged wood ***allowed*** on project-by-project basis. Verify salvaged items with owner.
Rough Carpentry	061000		REVIEWED	• Provide continuous backing for whiteboards, projection screens, dispensers, custodial shelves, etc. 12" steel strapping 18 gauge minimum is acceptable centered at +3'-0" & +7'-0". Also see 055400 Section regarding backing. • Either 18 ga metal strapping or wood backing is ***allowed.***
Wood Roof Decking	061516		REVIEWED	• Conventional wood decking ***allowed upon approval***. Exposed exterior wood should be finished with a semi-translucent stain ***allowed upon approval***. • Use of CLT ***allowed upon approval.***
Sheathing	061600		REVIEWED	• Orientated Strand Board (OSB) ***prohibited*** at roof, floors, exterior walls, and sills. Interior use shall be weather protected during construction.
Glued-Laminated Construction	061800		REVIEWED	• Architectural grade ***preferred*** where exposed to view. ***Allowed upon approval*** at exterior locations. Architectural concealed brackets at attachment points where glu-lam is exposed.
Exterior Finish Carpentry	062013	PROHIBITED FOR SIDING	REVIEWED	• *The use of exterior wood stripping for wall cladding is* ***prohibited.***
Interior Finish Carpentry	062023	Compact Plastic Laminate Wainscot: Wilsonart, Compact Laminate, Classic Grade	REVIEWED	Wainscots: mechanical attachment only. Need corner guards. Apple ply veneer is an ***allowed upon approval***. • Corner Guards: ***Required*** at outside corner locations at corridors, classrooms, and common areas. Stainless steel corner guards ***required*** at kitchen areas. • Wainscot Fasteners: Architect to provide fastener types to Owner for review during design. • Height: Minimum 8'-0" high wainscot ***preferred*** at all hallways, corridors, and stairs. • Compact plastic laminate (CPL): Compact plastic laminate wainscot is ***preferred.*** Panels to be minimum 1/8" thick. • Stainless Steel: SS wainscot ***preferred*** at mop sinks. Verify if required at combustible areas (range top, cook top, oven etc.). • Fiberglass Reinforced Wainscot (FRP): Smooth FRP wainscot ***preferred*** at kitchens. School store, eyewash, and shower. • MDF: MDF wainscot ***allowed upon approval***. Clear sealed is ***discouraged***, painted is ***preferred***. • Fiber Reinforced Laminate (FRL): ***Allowed upon approval.*** Example: Specialty CTE areas. • Hardwood Veneer Paneling: ***Allowed upon approval*** for select areas.
Division 7 – Thermal & Moisture Protection				
General – Thermal & Moisture Protection	070000		REVIEWED	• All products in this section shall be reviewed with the Design Team's envelope consultant. • The use of sloped roofs is ***preferred.*** The use of low slope roofs are ***allowed upon approval***. • Designs that permit easy access to roof from fences and walls ***discouraged.*** • Use of internal roof drains ***discouraged.*** • 20-Year minimum warranty ***required*** on Low Slope Roofs and 30-50-Year minimum warranty ***required*** material warranty on Sloped Roofs. 5-year installer warranty ***required***. • Roof and envelope specific system warranties to be discussed with and approved by owner. • Provide snow guards above entries at metal roofs. • Fall protection supported by the roof structure ***required.*** • 3'-11" Overhangs ***preferred.*** • Roof types – Slopes greater then 3:12 are ***preferred***. • Full coverage of self-adhered "ice and water shield" is ***required*** at sloped roofs. • Interim roof/vapor retarder ***required*** at all low-slope roofs. • Walkway pads ***required*** at all low-slope roofs at equipment requiring maintenance. • Roof top equipment ***preferred*** to have all maintenance access to be 10' or greater from roof edge. Provide guard rails where distance is less than 10'.

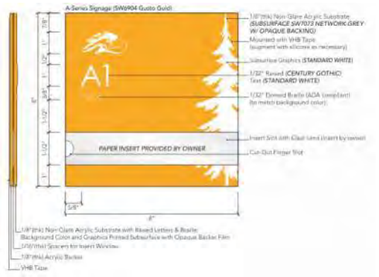
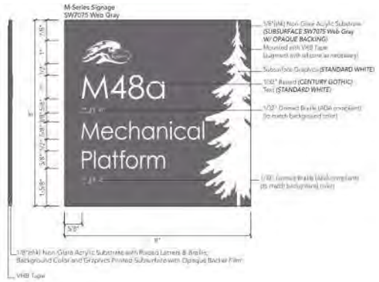
Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
				• ½" cover board is ***preferred*** under roofing membrane and above insulation at low-slope roofs.
Bituminous Dampproofing	071113	BASF; MasterSeal	REVIEWED	• Use on exterior face of footings and stem walls and as directed by envelope consultant. • Damp-proofing ***required*** at the back concealed side of retaining walls.
Bentonite Waterproofing	071700	Carlisle; MiraCLAY	REVIEWED	• All elevator pits including walls, slab, and sump ***preferred*** to be *waterproofed with bentonite waterproofing*. Consult with envelope consultant involving use under slab and other locations when driven by high water table. • Waterproofing ***required*** at below grade walls to occupied spaces.
Water Repellents	071900	Prosoco / Evonik	REVIEWED	• Masonry veneer ***preferred*** to be water repellent. • Provide Anti-graffiti coating to approximate 10 feet above grade and at other locations subject to graffiti. Review product options with Owner. Non-water-based coating ***preferred***. Confirm existing coatings at wall for compatibility at remodel or renovations.
Thermal Insulation	072100	Atlas / Carlisle	REVIEWED	• Rigid insulation over deck is ***preferred*** over batt insulation between joists at roofs. Premanufactured sandwich panels for plywood and rigid insulation assembly are ***preferred.*** • Continuous insulation: Semi-rigid mineral wool. • Cavity insulation: fiberglass or mineral wool insulation unfaced. • Below grade insulation: Polystyrene (XPS).
Foamed-In-Place insulation	072119		REVIEWED	• Use of closed-cell spray foam at wall to roof transitions in air barrier is ***allowed.*** • Use of closed-cell spray foam wall cavities is ***allowed upon approval.***
Weather Barriers	072500	VaproShield Inc., WrapShield SA (self-adhered) VaproShield Inc., Liqui-Flash	REVIEWED	• Weather-Resistive / Air Barrier: A self-adhered WRB is ***preferred***. All envelope details should reflect manufacturers recommendations for installation of WRB membrane and components. • Liquid Applied Weather Barrier as WRB ***allowed upon approval*** *f*rom Owner and Envelope consultant. Typically, it is only used as field WRB at CMU applications. • Fluid Applied Waterproofing (FAWP) over the WRB pre-strip at openings is ***preferred.***
Asphalt Shingle Roofing	073113	Malarkey Roofing; Laminated Shingle	REVIEWED	• Laminated asphalt shingle roofing is ***allowed.*** • (add minimum warrantee (see Alaskan product from Malarkey 30-50 year laminate).
Standing Seam Metal Panels	074113	AEP Span and Metal Sales	REVIEWED	• Metal roofs are ***preferred.*** • Metal roof finishes and fastening shall be rated for marine environment. (aluminum or 3-coat steel).
Metal siding	074213	AEP Span and Metal Sales	REVIEWED	• The use of metal panel siding is ***preferred***. • 22 gauge minimum thickness. • Exposed fasteners are discouraged • Metal wall finishes and fastening shall be rated for marine environment. (aluminum or 3-coat steel) • Provide neoprene closure gasket formed to sliding profile except at rainscreen to have insect screening to maintain drainage and ventilation. • Provide insect screens and pest resistant strategies at corners and edges.
Polyvinyl-Chloride (PVC) Roofing	074419	Carlisle / Sika	REVIEWED	• PVC roofing ***allowed****;* 60 mil thickness minimum. • Fully adhered membrane.
Fiber-Cement Siding	074646	James Hardie / Others with approval	REVIEWED	• Fiber Cement Siding: James Hardie Fiber Cement panel and lap siding is ***allowed.*** 5/16" panels are ***allowed***. The use of 7/16" panels is ***preferred*** if budget allows or areas exposed to high traffic or abuse. Fasteners marine-grade ***preferred***. • High Density Fiber Cement Siding: If budget allows high density fiber cement siding products like Nichiha and Cereclad are ***allowed upon approval.*** • Backer plates ***preferred*** at butt joints.

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
Styrene-Butadiene-Styrene (SBS) modified bituminous roofing	075216		REVIEWED	• 3-ply min SBS modified bituminous roofing ***preferred*** for low slope roofing system. • SBS Modified bitumen systems ***preferred*** with torch or cold applied adhesive system. • Fluid applied flashing ***preferred*** at select roof penetrations.
Thermoplastic-Polyolefin (TPO) Roofing	075419		REVIEWED	• Thermoplastic-Polyolefin (TPO) roofing is ***discouraged.***
EPDM Roofing	075323		REVIEWED	• EPDM roofing ***allowed****;* 80 mil thickness minimum. • Fully adhered membrane.
Roof Accessories	077200		REVIEWED	• Fall Protection: Single point system over cable system is ***preferred.*** • D-ring fall restraints are ***allowed*** at asphalt shingle roofs. • See metal fabrications for access ladders. • Roof access hatch ***preferred*** to be thermally sealing and have safety post and integral guardrail with gate. • Pedestals/pavers system for occupiable roofs is ***allowed upon approval.***
Division 8 – Openings				
General - Openings	080000		REVIEWED	• Standard door leaf size to be 3’-0” x 7’-0”; Provide greater size at special use spaces or where more access is needed. • Provide double leaf doors where movement of equipment, furniture and other large items ***required***. • Allow for 180 degree door swing ***encouraged.*** • Encroachment of door swings into major circulation areas through recessed doors ***discouraged.*** • Louvers away from sources of fumes and smell ***preferred.*** • Removable keyed mullions at double leaf doors ***preferred.*** • Hold-open cush arm ***preferred***. • Also see 122113 Horizontal Louver Blinds and 122413 Roller Window shades.
Hollow Metal Door Frames	081113	Curries, Republic and Steelcraft	REVIEWED	• Knock down frames ***prohibited.*** • Frames ***required*** to be fully welded. • Exterior frames ***required*** to meet energy code. • Exterior frames ***required*** to be galvanized and painted. • Insulation for exterior frames and acoustically sensitive interior frames with mineral wool ***preferred***. • Interior frames ***preferred*** to be 16 gauge, exterior 14 gauge. • If horizontal mullion is provided, size to allow for roller shades to continue to sill or provide translucent glazing in lower pane.
Hollow Metal Doors	081113	Curries, Republic and Steelcraft	REVIEWED	• Provide HM doors at exterior secondary access locations. • HM doors in the interior are ***allowed upon approval***, except as noted below. • Provide at mechanical rooms, kitchen, electrical rooms, etc. • Insulate per energy code. • Face metal to be 16 gauge. • Preferred manufacturers are the same as Metal Door Frames.
Aluminum Doors	084113	EFCO and Kawneer	REVIEWED	• ***Allowed upon approval*** at main entry and other entries where integrated with storefront frame.

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
Wood Doors	081416	VT Industries / Vancouver Door	REVIEWED	• Stained wood veneer solid core doors are ***preferred*** at all interior locations except for mechanical rooms, electrical rooms, etc. where HM doors are ***preferred***. • Painted wood doors are ***discouraged.***
Access Doors & Frames	083113	KARP	REVIEWED	• All access doors mounted 8’ or lower shall have keyed entry. • Doors shall be factory primed to be field painted, except stainless steel when located in wainscot ***preferred.***
Coiling Doors	083323	Overhead Door Company	REVIEWED	• Provide coiling doors at kitchen, open grille ***allowed upon approval*** if required for ventilation. • Stainless steel finish or Powder coated steel finishes are ***allowed***. • Power operated coiling doors are ***preferred.*** Review with Owner.
Overhead Sectional Doors	083613	Clopay	REVIEWED	• Sectional doors to connect program spaces ***allowed upon approval.*** • Insulated and weatherproofed at exterior to comply with energy code.
Entrance & Storefronts	084113	EFCO and Kawneer	REVIEWED	• Aluminum storefront is ***allowed upon approval.*** • System thermally broken and internally draining ***required.*** • Factory applied fluoropolymer finish or anodized are ***allowed.***
Curtain Wall Systems	084413		REVIEWED	• Curtain wall is ***allowed upon approval.*** Limit use of curtain wall systems to where storefront height limits are exceeded.
Windows	085113 085413 085313	EFCO, Kawneer, Cascadia, Kolbe, Anderson	REVIEWED	• Fiberglass Windows*:* ***Preferred.*** • Aluminum Windows: ***Allowed.*** • Vinyl Windows: ***Allowed.*** • Operable windows: The use of operable windows is ***allowed upon approval.***
Skylights	086200	Kingspan	REVIEWED	• Skylights are ***discouraged*** and only allowed upon approval or where required by code.
Louvers	089119	Ruskin	REVIEWED	• Louvers with drainable blades and be resistant to wind-driven rain ***required.***
Glazing	088000		REVIEWED	• Front office visibility to main entry is ***preferred.*** • Individual panes of glass shall not exceed 4 feet x 8 feet. • Exterior glazing shall be insulated. • Provide Low-E coating where ***required*** to comply with code. • Provide translucent ¼ lite glazing at all classroom doors. • Provide ½ lite clear glass at offices with roller shades. • Wire glass ***prohibited.*** • Fire-rated ceramic glazing ***allowed*** where required by code for fire rating. • Glass at entry vestibule ***required*** to be laminated. Glazing for any windows adjacent to main entry ***preferred*** to be laminated. • Tempered or laminated glass ***required*** for glazing at gymnasium, cafeteria, and where high impact likely to occur.
Hardware	087100			• Review of specific requirements on this section with hardware consultant and District Locksmith is ***required***. • A door hardware consultant shall be engaged to coordinate selection of operational features of hardware. • Exit devices where required by code. • Continuous hinges **required** at main entry doors. • Corridor and building zoning doors ***required*** to be on hold opens and able to be placed in lock-down mode. • Provide ADA push buttons and automatic door operators at major building entries where required by code but a minimum at:

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
				o Main entry o Access from parent drop-off (if different location than main entry) o *Access from bus drop-off* o *Access from playground* • Temporary construction cores/cylinders ***required*** to be keyed to the district's standard construction keying. • Final cores/cylinders ***required*** to be provided by supplier directly to Owner. • Final keying requirements by hardware consultant. • Final installation by contractor.
Division 9 – Finishes				
Gypsum Wallboard	092900		REVIEWED	• Provide abuse resistant gypsum wallboard in areas subject to abuse e.g., gyms. • Provide gypsum wallboard behind all wainscot locations. • Provide moisture resistant gypsum wallboard in areas subject to moisture. • Wall board on exterior walls shall be resistant to moisture. • Provide cementitious or special gypsum backer board behind wall tile. • Gypsum wallboard finish: o Level 5 ***prohibited***, unless approved in high light areas. o Level 4 ***preferred*** unless noted otherwise. o Level 3 Not used. o Level 2 Fire resistive construction above ceiling, Finish behind cabinets and other items ***required*** to match adjacent finish. Fire Tape at Mechanical and Electrical room ***required***.
Perforated Gypsum Ceiling & Walls System	092900		REVIEWED	• Perforated gypsum board is ***allowed upon approval*** on ceilings. • Perforated gypsum board is ***prohibited*** on walls.
Suspended Ceiling Systems	095113		REVIEWED	• 2 x 4 suspended ceilings is ***preferred.*** • 2 x 2 suspended ceiling ***allowed upon approval.*** • A Tegular ceiling tile profile is ***preferred***. • Scrubbable tile ***required*** at kitchen • Raised ceiling height in MDF and IDF rooms for ease of cable routing ***preferred.***
Wood Ceiling Systems	095426		REVIEWED	• Wood ceiling systems are ***allowed upon approval*** at key focal areas.
Flooring		Preferred Carpet Manufacturers? Tandus, Shaw, Millikan, others	REVIEWED	• Locate floor types as follows: o Classroom, library, administration: Carpet or resilient per Ed Specs. o Classroom "Wet Areas": resilient ***required.*** o Commons: Linoleum or Rubber ***preferred.*** o Corridors (at Ground Floor): Linoleum or Rubber ***preferred.*** o Corridors (at 2nd Floor): Linoleum or Rubber ***preferred.*** o Entry Vestibules: Walk-off Mats ***required,*** three-component walk-off system ***allowed upon approval*** to comply with enhanced WSSP. o Gym: Wood at Middle and High Schools. Resilient athletic flooring at Elementary and Specialty School ***required.***

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
				○ Stairs: Pre-cast concrete ***preferred*** at main stair & cast-in-place concrete ***preferred*** at secondary stairs. Rubber stair treads & risers. ○ Kitchen: Quarry tile ***preferred.*** Fluid-applied ***allowed upon approval.*** ○ Student restrooms: Ceramic Tile ○ Staff restrooms: Ceramic Tile ○ Health room: Sheet Vinyl ○ OTPT Room: Rubber Tile ○ Storage rooms: sealed concrete ***preferred.*** ○ Boiler & Electrical Rooms: Sealed Concrete • Carpet tile ***preferred*** over sheet products. • Coved base is ***required*** in restrooms, health room, and kitchen. • 4" Rubber floor base ***preferred.***
Ceramic Tile	090130		REVIEWED	• Large format ceramic floor tiles is ***preferred.*** • Large format ceramic wall tiles is ***preferred.*** • Epoxy grout ***required*** at all tile. • *Waterproof membrane below tile* ***required.*** • Floor slope at restrooms: At restrooms provide a localized 3'x3' +/- sump to floor drain at -3/4" ***preferred.*** • Thin set tile over waterproofing/uncoupling membrane ***preferred.***
Paint	099000		REVIEWED	Paint Sheen: • Walls – Satin Finish ***required.*** • Ceilings – Satin Finish ***required.*** • Corridors (Walls and Ceilings) – Satin Finish ***required.*** • HM Doors and Frames – Semi Gloss ***required.*** • Exposed steel – Semi Gloss ***required.*** • Exposed ductwork and equipment to match adjacent walls/ceilings. • Fire rated paint for MDF & IDF.
Division 10 – Specialties				
Door and Wall Protection	102600	InPro Corporation (IPC); Model G2-160R	REVIEWED	Corner Guards: • 7' High +/- corner guards are ***required*** at all outside corners in hallways, corridors and other select locations. • Surface-Mounted, Plastic-Cover Corner Guards ***preferred.*** • Stainless Steel Corner guards ***required*** at kitchen and ***allowed*** in special locations.
Classroom Marker Boards	101100		REVIEWED	• Dray Eraser Type, low sheen. • (2) 8 linear feet by 4 feet tall (At typical classrooms). • (2) 8 linear feet by 5 feet tall (At KG & 1st Grade Classrooms). • Aluminum trim, cork tack strip and clips along top, and eraser trays. • Magnetic boards ***allowed.***
Other Markerboards	101100			• Reviewed on a project-by-project basis.

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
				• Eraser trays shall be omitted from MB's in gyms.
Tackboards / Tack Strips	101100		REVIEWED	• (2) 8 linear feet by 4 feet tall (At typical classrooms). • 16 linear feet tack strip as alternative.
Signage	101400		REVIEWED	• Building Address Signage: Address numbers highly visible for fire department ***required.*** • Classroom signage: Classroom Signage shall have raised characters for the room number with matching Braille underneath. A ***required*** slot shall be provided for a removable paper insert for the grade and teacher's name. Thumb recess for removal of the paper insert ***required***. See example at right from Tumwater Hill Elementary School.  • Support spaces, where no insert for a teacher's name is required should have raised characters with the room number, name (where appropriate) and matching Braille.  • All door frames shall have the architectural room number at the top of the door frame.
Toilet Compartments	102113.17	Scranton Products; Hiny Hiders	REVIEWED	• Solid-Plastic (HDPE) Toilet Compartments are ***preferred.*** • Floor support and headrail braced with tamper-proof fasteners. • Hardware and support devices shall be stainless steel. • Pivot hinges and continuous wall brackets ***required***.
Toilet Accessories	102800	Bobrick		The following toilet Accessories are ***preferred*** to be OFCI: • Toilet Paper Dispensers. • Hand Soap Dispensers. • Toilet Seat Cover Dispensers. • Paper Towel Dispensers . • Sanitary Napkin Disposal Unit (SND). • Sanitary Napkin/Tampon Dispenser. The following toilet Accessories are ***preferred*** to be CFCI: • Grab Bars. • Purse Shelfs. • Mirrors. • Robe Hooks. • Diaper Changing Stations.

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
				In Elementary Schools: Sanitary napkin dispensers, receptacles, and toilet seat cover dispensers in adult and health restrooms only.
Cubical Curtains	102123	C/S, InPro	REVIEWED	• Track 6062. • Washable.
Defibrillators	104313		REVIEWED	• Confirm if OFOI at both Main Office and Gym.
Fire Extinguishers & Cabinets	104416		REVIEWED	• Semi-recessed ***preferred.*** • Fully recessed ***allowed.*** • Stainless steel. • Fire Extinguishers CFCI in new projects. • Type K in Kitchen ***required***. • Certify for use with tags. • Use plexiglass in lieu of glass on doors. • Mount on brackets in mechanical & back-of-house spaces.
Flag Poles	107516		REVIEWED	• One flagpole is ***preferred*** over multiple flag poles. USA flag &WA flag. • Review lighting approach to flag poles with owner. Solar down light ***allowed.*** • Tilting flagpole base ***preferred***.
Storage Cabinets	109900		REVIEWED	• 1 flammable storage cabinet in custodial area and/or Service Yard ***required.*** • 1 flammable and 1 corrosive cabinet in Science Prep room at secondary school (unvented) ***required.***
Operable Walls	102239	Advanced Equipment	REVIEWED	• Motorized operation at Gymnasium/Commons and stage ***preferred.*** • STC 54 or greater. • Durable laminate finish ***required.***
Accordion Walls	102233		REVIEWED	• Use of accordion walls is ***prohibited.***
Electric Hand Dryers			REVIEWED	• Use of Electric Hand Dryers is ***allowed upon approval*** .
Safe	109900		REVIEWED	• Safe ***required*** to be in Main Office area inside of base cabinet.
Knox Box	10 99 00			• OFCI flush mount at wall locations is ***preferred.***
Division 11– Equipment				
Residential Appliances	113013		REVIEWED	Staff Lounge: (Also see Ed Specs for requirements at each school). • 2 microwaves minimum (CFCI). • 2 refrigerators (CFCI). • 1 dishwasher (CFCI). • 1 Range (CFCI) – with venting to exterior. • 1 Vending Machine (OFOI). Health Room: • 1 Ice Maker (CFCI). • Lockable Undercounter Refrigerator (CFCI).

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
				Life skill: • Per Ed Specs. Student Store/Business & Marketing: • Per Ed Specs. Custodial Room: • 1 washer and 1 dryer (side by side ***preferred***).
Gymnasium Equipment	116623	Porter	REVIEWED	(6) basketball hoops: • (2) at main court and (2) at each side court. • Main court hoops motorized forward fold or side fold where in front of proscenium. Maintain 23'-9" clear above volleyball court. • Side court hoops to be side-fold or up-fold. Blocking spectator view in up position ***prohibited.*** Glass ***allowed upon approval.*** • Electric height adjusters of main court hoops are ***preferred.*** • Manual height adjusters on side hoops ***preferred.*** Wall Pads: • Entire Assembly ASTM E-84 tested for Class "A" Fire Rating. • Wall pads glued and screwed into place ***preferred.*** • 'Z' Clip (French Cleat) Approach ***prohibited.*** • Minimum 16' behind each basketball goal ***required***. Volleyball: • Recess volleyball inserts/sleeves are preferred. Quantity to be determined project-by-project. Gym Striping: • Gym striping to be on a project-by-project basis.
Scoreboard			REVIEWED	• Provide at Middle School and above. No scoreboards at Elementary Schools.
Emergency Evacuation Chairs			REVIEWED	• Locate one on each floor. OFCI
Food Service Equipment	114000		REVIEWED	• Review with District Food Service Supervisor for ASD standard installations. Tailored for each school.
Division 12 – Furnishings				
Window Treatments	122413		REVIEWED	• Roller shades at all interior relites ***required.*** • Mini Blinds allowed at exterior openings, but roller shades ***preferred.*** • Provide motorized rollers hades at high windows.
Platform Curtain			REVIEWED	• No Preferences.
Walk-Off Mats	124813		REVIEWED	• 7' minimum length in direction of travel. • Three-component walk-off system ***allowed upon approval*** to comply with enhanced WSSP.
Manufactured Plastic-Laminate Faced Casework	123216		REVIEWED	• All casework shall comply with the latest version of the AWI Standards or WI's North American Woodwork Standards. • Plastic laminate countertops ***preferred.*** Use of other countertop material ***allowed upon approval*** by Owner. • Post Formed or PVC Edging ***allowed***. PLAM Edging ***prohibited***.

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
				• Backsplash at location with sinks should extend to casework above otherwise 4" high backsplash shall ***required***. • Standard base cabinets to top of countertop to be 33-1/2" tall, except at under cabinet refrigerators. • Recessed stainless steel Drawer and Door Pulls ***preferred.*** • Lock teacher wardrobe cabinet and base cabinet below sink. Verify other locking locations with Owner. All front office cabinets and Health Room cabinets to be locked. Coordinate Special Ed cabinet locking at each school. • Cabinet manufacturers ***required*** to provide standard locks and keyed the same, except Health Room key separately. • Vents in the wardrobe cabinet ***required***. • The use of mobile book storage in central area of Library is ***preferred.*** Verify if they are furniture or custom casework on a project basis upon approval.
Quartz Countertops or other Solid Surfacing Countertops	12366.19		REVIEWED	• Quartz and solid surface countertops are ***allowed upon approval*** at main entry and library reception desks. They are also ***allowed upon approval*** at gang restroom counters.
Division 14 – Conveying Equipment				
Elevator	142400		REVIEWED	• Holeless Hydraulic Elevators are ***preferred.*** • Size elevator per local jurisdictional requirements. 3000-pound capacity ***preferred*** to accommodate gurney. • Card Access control is ***required***.
Division 21 – Fire Protection – See separate Mechanical OPR document				
Division 22 – Plumbing – See separate Mechanical OPR document				
Division 23 – HVAC – See separate Mechanical OPR document				
Division 26 – Electrical, Lighting, and Fire Alarm Systems – See separate Electrical OPR document				
Division 27 – Performance Audio Visual, Sound, Intercom Clock, Telephone & I. S. System Guidelines –– See separate Electrical OPR document				
Division 31 – Earthwork				
Site Clearing	311000		REVIEWED	• Bid documents shall clearly state which sub-contractor shall perform landscaping demolition and soil removal.
Selective Tree Removal	311313		REVIEWED	• Remove stumps to a minimum of 3-feet blow rough grade. • Backfill material to be specified.
Soil Stripping and Stockpiling	311400		REVIEWED	• Specifications shall state that track out is ***prohibited***. If track out occurs, the contractor shall clean immediately. • Specification shall state that the contractor will be the NPDES permitting and shall cover costs associated with reporting.

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
				• Provide geotechnical engineering report and Stormwater Pollution Prevention Plan as a supplemental document. Contractor's acknowledgment understanding of the report ***required***.
Earth Moving	312000		REVIEWED	• Specifications shall include dewatering plan. Language shall indicate that de-watering shall be provided at the contractor's expense. A project specific de-watering plan shall be provided by the contractor, reviewed and approved by the owner prior to mobilization. • Recycled glass is ***prohibited*** to be specified in fill under any circumstances.
Grading	312200		REVIEWED	• Finish grades are ***prohibited*** to expose the foundation. If exposed, adjust grades accordingly or provide curbing or retaining wall(s). • Grades are ***prohibited*** to exceed maximum ADA allow slopes. • Grade ***preferred*** to slope away from perimeter of building.
Excavation & Fill	312300		REVIEWED	• Excavated materials for use as fill: Onsite soils may be acceptable for reuse as structural fill in landscaped areas and if approved by the geotechnical engineer. Native soils shall not be used for backfill in structural areas such as under the building, in paved areas and under sidewalks. The suitability of excavated site soils for compacted backfill will depend on gradation and moisture content of soil when placed. • Coordinate fill requirements at crawl spaces or basements that need to be filled following demolition.
Division 32 – Exterior Improvements				
Concrete Paving	321313		REVIEWED	• 1'-0" wide concrete mow strip or sidewalk next to building to keep landscape and pests away unless prohibited by City requirements ***required***. • Concrete sidewalks of 6' minimum wide ***preferred*** at primary pathways. Secondary pathways less than 6' width are ***allowed upon approval***. • At select plaza and main entry areas a higher level of finish such as top cast concrete is ***preferred***.
Aggregate Surfacing	321500		REVIEWED	• Pervious paving is ***discouraged***. Pervious concrete or asphalt may be allowed on a case-by-case basis depending on location and use.
Curbs and Gutters	321600		REVIEWED	• Cast-in-place concrete curbs are ***preferred*** compared to extruded curbs. • 6" curb face ***preferred.***
Athletic & Recreational Surfacing	321800		REVIEWED	• At turf play fields grass seeded fields are ***preferred***, also see Topsoil Placement & Grading. • At "Natural" or "Low-Intensity" play areas, wood fiber chips are ***preferred***. • At "High-Intensity" play areas, field turf at accessible areas, and wood fiber chips are ***preferred***. • At play areas provide a cast-in-place concrete curb or enclosure wall at all sides of play area. • At general paved play areas asphalt paving is ***preferred***. • At competition level exterior paved play surfaces concrete is ***preferred***.
Chain Link Fences and Gates	323100		REVIEWED	• A low fence along the curb side of the sidewalks, along bus driveways and parent pick-up & drop-off areas ***preferred***. 4' wide gaps ***preferred.*** • Passage gates with a 48" minimum clear width ***required***. Nothing narrower is allowed. • Galvanized 6- high standard fences unless approved otherwise by owner. Black vinyl coated fencing is ***preferred***. • 3" O.D. corner and end posts with a specified weight of 5.790 lbs. per lineal foot ***required***. Provide 4" O.D. Gate Posts with a specified weight of 9.11 lbs. Per lineal foot. • Folded top ***required*** if lower than 6'. • Concrete mow strips under fencing are ***preferred*** if budget allows. • Decorative fencing and gates ***preferred*** versus chain link at locations requiring access control.
Decorative Metal Fences and Gates	323119	Ameristar Fence Products	REVIEWED	• Ameristar, Montage II, Majestic fencing is ***preferred*** BOD. • Decorative gates designed with panic hardware and closures shall be a minimum of 7' high. • Provide 1/8" steel plate for mounting panic hardware. Gate plate kits ***prohibited.*** • Gates shall have perforated metal panels installed above and below panic hardware full height on fencing adjacent to gate. • Kickplates to be provided on all gates with panic hardware.

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
				• Gate hinges to be reviewed by hardware consultant, gate hinges shall be self closing at access controled areas.
Retaining Walls	323200		REVIEWED	• Rockeries (2 to 3 man rock) are ***discouraged.*** • If exposed, trowel finished concrete ***preferred.***
Site Furnishings	323300	Per project.	REVIEWED	• Site furnishings to be selected on a project by project basis. Consider the following options with site furnishings: Bench seating, picnic table seating, group seating areas, exterior classroom areas, and accessible access and options at all conditions. • Skateboard deterrent shall be provided where appropriate. Deterrents type to be approved by owner.
Irrigation	328400		REVIEWED	• Irrigation is ***required*** at play fields and code required areas. The contractor shall maintain it for the first year and document the start/end date. 2-wire irrigation with weather sensing capabilities and spray heads for uniform and efficient coverage is ***preferred***. • Drip irrigation is ***discouraged***. Irrigation at other locations ***allowed upon approval.*** • Bioretention soil is ***preferred*** for all planting areas. • Coarse sand ***preferred*** at lawn areas. • Trees to be on separate irrigation zones. • ASD to provide guidance on irrigation standards and preferences.
Topsoil Placement & Grading	329119		REVIEWED	• Topsoil from approved list of suppliers ***required.*** • Some minimal sloping at playfields to allow for longevity is ***preferred***. • Avoid loam soils for maintenance and weed propagation. 6” cap is ***preferred***. • Existing soils ***required*** to be decompacted to 18” below finish grade. • A sand based infield at elementary schools is ***preferred.***
Turf and Grasses	329200		REVIEWED	• ASD to provide seed mix to include in these standards. • Playfields shall use sand base (where applicable). • The use of playfield underdrainage systems is ***discouraged.***
Exterior Plants	329300		REVIEWED	• Landscaping ***allowed upon approval.*** • Keep trees away from the building. • ASD to provide guidance of landscaping standards.
Misc.			REVIEWED	• Monument & Reader Board Signs: Buildings shall have both a reader board and monument sign. They can be combined pending permitting jurisdiction. Reader boards preferred on street, but allowed on building on case by case basis. • Baseball Backstops: backstop and basic benches at baseball fields ***preferred.*** • Drainage Galleries: Drainage galleries under play fields ***discouraged***. If done, rock ***discouraged***. • Mailboxes: Designer to coordination location and mailbox type with District and postmaster on project-by-project basis. • Vehicle Gates: Vehicle gates shall be constructed from 2” diameter steel tubing or smallest dia. required for gate span similar to a cattle gate for ease of user operation. All gate foundations need to be designed by a structural engineer. Gates shall be designed with a vertical return at end to prevent a dangerous hazard. Gates shall be HPC painted black to match fencing with applicable reflective safety reflectors. • Play Equipment (Big Toy): CFCI ***preferred***. Playground surfacing on case-by-case basis. Review required depth with current health department requirements. • Walking Path Around Play Fields: Walking paths shall be designed around playfields. Where accessibility is required paved walking paths are ***preferred***, ¼” minus crushed rock contained with concrete curbs is ***allowed upon approval***. • Future Bldg. Expansion: All schools shall be designed with a layout and configuration that is conducive to adding a future building addition off a classroom wing or other planned out location. • Future Portables: New school design shall plan for locations for (4) double portables at elementary schools and (3) double portables and Middle Schools. Utilities shall be roughed into future portable location.

Product / System	Spec Section	Preferred Product / Mfr	Owner Reviewed	System Notes
				• Outdoor Covered Areas: Design Teams to study on a project-by-project basis, covered outdoor areas adjacent to cafeteria / MP Rooms for outdoor dining. • Site Circulation: Parent and bus pick-up and drop-off shall have separate access points to the site.
Division 33 – Utilities				
General			REVIEWED	• Review with the Owner the need for sleeving (power, low voltage, and irrigation) for future use underneath paved surfaces. • Coordinate isolation valve locations with Owner. • Ladder up assembly on all vaults (water meter, irrigation, power, etc.) ***required.***
Water Utility Distribution	331100		REVIEWED	• Coordinate isolation valve quantity and location with owner. • Drains at all vaults, tight-lined to the storm sewer system ***required***.
Water Supply Backflow Preventer	332313		REVIEWED	• At new schools, should a backflow prevention device be above the finish grade and exposed to the elements inside a Hot Box. Electrical power is required for heat trace or other electrical heating devices to keep the backflow device from freezing. Located inside building ***preferred.*** • Stainless steel enclosures are ***preferred***. • Contractor shall coordinate water shutdown with the school district three days prior to shutdown.
Sanitary Utility Sewerage Piping	333100		REVIEWED	• 6” minimum size of all lines and fittings ***preferred.*** • Verify that lengthy sewer lines are equipped with access covers every 100’ minimum. • Cleanouts at all bends greater than 45 degrees ***required***. • All cleanouts to be equipped with concrete collars.
Sanitary Utility Sewerage Structures	333900		REVIEWED	• Locate grease interceptors outside building (no grease traps inside building). • Plastic or fiberglass grease interceptors are ***preferred***. • Gravity drain or sump pump to eliminate water within all vaults ***allowed upon approval.***
Utility Septic Tank	333600		REVIEWED	• Connect to generator to operate sewage pumps in times of power outage. Coordinate with Section 26 30 00 Emergency Generator.
Sanitary Utility Sewerage Manholes, Frames and Covers	333900		REVIEWED	• Locking lids on all utility lids ***required***. • Manhole and clean-out covers ***required*** to be labeled “Sanitary Sewer”. • Verify the top of vaults are above the surrounding finish grade.
Storm Drainage Structures	334900		REVIEWED	• Installation of storm drainage structure under playfields is ***discouraged.***
Gas Metering	335133		REVIEWED	• Seismic valve on gas meters ***required***. Locate gas meters inside service yards. Meter each building individually (after PSE gas meter) to isolate the building.

Owner's Project Requirements

South Site Elementary School

Aberdeen, WA

Date of this version: _____

This version approved by: _____

Aberdeen School District 5

South Site Elementary School

Aberdeen, WA

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1. Overview and Scope

Overview and Definition

The Owner's Project Requirements (OPR) provide an explanation of the ideas, concepts and criteria that are considered to be very important to the owner, coming out of the programming and conceptual design phases and which are desired to be tracked throughout design and construction. The OPR is developed by the owner, not the design team. The OPR provides the direction for the design team. The OPR document sets the functional goals that the design is judged against and establishes the basis of the criteria used during construction to verify actual performance. The OPR does not list items that are already required by code. The OPR is generally not a description of what specifically will be included in the project design, but is the more general feature and categorical performance criteria to be met by the design. Where practical and known, the OPR includes measurable indicators used to verify that the performance requirements were met.

The OPR will be followed by the basis of design or design narrative written by the design team and included with design package submissions. The basis of design documents the primary thought processes and assumptions behind the design decisions and describes the design elements being incorporated to meet the OPR.

1.1 Scope

This document includes requirements for the systems that are more likely to be included under the formal commissioning umbrella or be impacted by their interactions. For reference, systems not included in this project and OPR that are typically commissioned and should have an OPR developed for them include: process mechanical and plumbing, paging, automatic doors and gates, presentation screens, and other moving mechanical devices.

This document is not a comprehensive project OPR, and does not include all project requirements and directives to the design team which could include: other disciplines such as fire protection, structural, landscaping, civil, geotechnical and other earth work, utilities, specification division 1 requirements, demolition, all the materials, furnishings and special construction disciplines, drawing, specification and calculation requirements, codes and references, etc.

This document focuses on the mechanical, energy and comfort related systems and on the sustainability requirements of the project. Other areas impacted by commissioning or commissioned systems are covered more broadly. The design areas included in this document are:

Covered More Thoroughly

- Heating, ventilating & air conditioning (HVAC)
- Electrical
- Sustainability
- Commissioning

Covered Peripherally

- General requirements
- Design process
- Fire alarm
- Plumbing
- Data and communications
- Security and access

1.2 Format

Under each area or building system is a list of pertinent questions and data needed to be answered. Blue, indented italicized text indicates the answers to the questions and specific information about the project requirements for this project.

2. General Requirements

Describe this project, including the general overall objectives?

2.1.1 In general, what type of activities/functions will occur in this facility? (Provide a general overview. The space planning and detailed functional uses of the building are listed or referred to later in this document).

Elementary school facility w/ Preschool classrooms.

2.1.2 What is the proposed facility's life expectancy?

50 year target.

2.1.3 What future flexibility in function/activities must this facility accommodate?

Trying to design in a modular format so spaces can be moved around as needed.

2.1.4 Are spaces anticipated to be converted from one use or occupancy type to another?

Possible.

2.1.5 Will the Owner operate and maintain the building?

Yes.

2.1.6 What are the overall energy efficiency goals and objectives? (ASHRAE 90.1, State Code, Energy Star, other indices, this building's past performance, etc.)

Would like to be better than code minimum.

2.1.7 What other environmental goals and requirements are there?

Not at this time.

2.1.8 What are the objectives relative to the local neighborhood?

None.

2.1.9 What are the challenges relative to the local neighborhood and adjacent buildings?

Fire access to site. Being a good neighbor, not encroaching, privacy, etc.

3. Design Process

3.1 Design Reviews

3.1.1 Describe the expected design reviews and the expectations of the design team regarding responding to comments.

There will be owner review page turns at each major milestone (SD, DD, CD), as well as third party commissioning review for commissioned systems for each design submission.

4. Heating, Ventilating & Air Conditioning

4.1 Occupancy, Climatic, Temperature and Sizing Requirements

4.1.1 **Time of day schedules.** List tenant types with their time of day and days of week they occupy.

Possible for future summer school, minimal program.

4.1.2 List and describe any spaces that will require night time operation. Indicate how often and how long this after hours occupancy is likely to be.

Gym and common areas. Minimal night operation.

4.1.3 **Temperature and humidity.** List the interior temperature and relative humidity conditions that must be maintained for each tenant or occupancy type. List any special conditions or spaces.

Will use Washington State Energy Code setpoints. 68F heating, 75F cooling

4.1.4 **Tolerances.** List the space temperature and humidity tolerances that each space type must stay within during occupied hours.

+/- 3F per WSEC.

4.1.5 **Air Drafts.** How tolerant are the occupants expected to be of noticeable HVAC air movement—none, little, some, moderate.

None at this time.

4.1.6 **Diversity.** Is it OK to plan for reasonable diversity—typically around 85%—that is, the assumption and likelihood that not all spaces will experience worst case load conditions at the same time?

Ok to assume some diversity, especially with Gym.

Will be an emergency evacuation point.

4.1.7 **Redundancy.** What redundancies are desired for specific HVAC services (chilled water, hot water, space air temperature, humidity, air quality) and why?

Would like redundancy on the chilled water system (more want than need).

4.2 Air Quality and Ventilation

4.2.1 What are the goals and requirements for indoor air quality--standard, above average, exceptional? List any special requirements.

Have been meeting requirements. Used MERV 13 during COVID, but back to MERV 8 now. Can design around 2" MERV 13 and that gives the District flexibility to use MERV 13 or 8.

4.2.2 Will there be rooms that store bulk quantities of flammable, combustible materials?

No.

4.2.3 Where are operable windows acceptable? Where are operable windows desired?

Operable windows are desired. Will have limited openings.

No fire egress windows.

4.3 General HVAC Systems Data

4.3.1 Is full air conditioning/comfort cooling a requirement?

Cooling is not a must but would like it if it fits in the budget.

May make sense to follow approach at the high school (cooling at activities/admin but not at classrooms). HS, some rooms can get real cool and some rooms can get real hot.

Changeover system may make sense for this facility with the current budget and site constraints.

4.3.2 What system types and brands are not desired or are not acceptable? (2 or 4-pipe fan coil unit, central high-efficiency VAV, water source heat pump)

No rooftop units. No unit ventilators. Not familiar with VRF or water-to-air heat pumps.

Water-to-air heat pumps may be considered as a VE item (subject to owner approval).

4.3.3 What system types or brands are mandatory?

No specific manufacture preferences.

4.3.4 Is larger central equipment desired over smaller more numerous distributed equipment? (Central equipment typically is easier to maintain, but requires vendor support, lasts longer, is more energy efficient, but may cost more.)

Depends on system type. Prefer central hydronic plant systems. Fan coil units are acceptable. No preference between larger central or smaller individual DOAS units. Convectors can be considered on a heating only system.

Liked the idea of central air-to-water heat pump serving a four-pipe fan coil unit system with DOAS.

4.3.5 Can central air-to-water heat pumps be considered?

Yes.

4.3.6 Is it acceptable to locate any equipment above ceilings of zones served or corridors? And if so, what types of equipment? (VAV boxes, Fan Coil Units, Exhaust Fans)

Yes, but they need to be accessible and maintainable.

4.4 Energy Efficiency and Demand Reduction

4.4.1 The goals and targets of *overall building* energy efficiency are given in the Sustainability section under Energy Efficiency.

Meet the Clean Building Standards. Keep refrigeration units under 50 lbs of gas.

4.4.2 List any specific HVAC energy efficiency features or equipment desired or required for this project.

None specifically.

4.4.3 What level of HVAC *equipment* energy efficiency are desired (standard, above standard, exceptional)?

Code minimum is acceptable.

4.4.4 Are power demand reduction features important? These include, listed from moderate to rigorous: staggering of equipment startup, active automatic load limiting, thermal energy storage, etc. List those required or of interest.

Would like to implement demand response on Day 1. Will have several stages.

Ok implementing mechanical demand response for WSEC C406.

4.5 Renewable Energy

4.5.1 Describe any renewable energy goals.

Will have a small PV array to meet code. No plans for a larger system.

4.6 New Concepts and Systems

4.6.1 Would incorporating new or relatively untried systems and equipment be seriously considered (no, possibly, likely)?

No.

4.7 HVAC Flexibility

4.7.1 What are the requirements for flexibility in the HVAC systems to accommodate changing floor layouts and occupancy needs (normal, above average flexibility, very flexible. List the areas that apply or any special needs)?

There should be some flexibility for the system to adapt to potential floor plan changes.

4.8 Maintainability

4.8.1 What are the maintainability objectives for the HVAC equipment (standard level, above standard, exceptionally easy to maintain)?

Standard for a school.

Workability with a 10' step ladder.

Don't route piping in front of access panels.

4.8.2 Is it expected that there will be normal, above normal or exceptional accommodation for replacement of chillers, cooling towers, boilers and air handlers?

Normal.

4.8.3 How much desire is there for top of the line equipment features that simplify and make maintenance easier? (e.g., hinged access doors, filter pressure monitoring, direct expansion equipment with refrigerant hose access plugs and taps, hose bibs on roof, lights in cabinets, service outlets in units or nearby, etc.). Little, some, significant.

Starting with standard equipment, good handles and hinges. Accessible filters.

4.9 Reliability and Durability

4.9.1 What are the reliability and durability objectives for the HVAC equipment (standard level, above standard, exceptionally reliable)? Would this include smaller components like dampers, actuators, valves, sensors, etc. and not just the larger equipment?

Provide equipment with at least 1 year warranty. Heat pumps- 7 year compressor.

Standard reliability and durability of major and smaller components are desired.

No preference between EC fan/motors and motors with VFDs.

4.10 Operations and Maintenance Documentation

4.10.1 Are electronic O&M manuals desired?

Yes.

4.11 Training

4.11.1 Who will be operating the building HVAC and electrical systems? (in-house staff, outsourced staff)

In-house staff.

4.11.2 How much equipment will be maintained by equipment vendors vs. in-house staff?

All in-house staff.

4.11.3 What level of training is desired for the in-house staff for operating and maintaining the systems and assemblies of the building?

All staff will be new to this building. A comprehensive level of training is desired.

4.11.4 How much of the training is desired to be video recorded? (All, most, some.)

All mechanical systems will have their trainings recorded.

4.12 Building Automation System (BAS) and Controls

4.12.1 Are there special owner control system standards that need to be followed?

Look at a recent project for templates, naming conventions.

4.12.2 What sophistication is desired in the control system (standard, above standard, exceptional)?

Above standard

4.12.3 What control systems are not acceptable?

None at this time.

4.12.4 What control systems are mandatory or highly desirable?

Currently use ATS in all buildings. Recently replaced a JCI system with ATS.

4.12.5 List any control element type or brand that is not to be used.

None at this time.

4.12.6 Is a web-based accessible system desired?

Yes.

4.12.7 Will the control system need to tie into another existing building automation control system from another building? Explain.

ATS has a district central server.

4.12.8 Describe interlocks to the HVAC system from the Fire Alarm System.

Fire alarm system is separate, except general alarms are passed to the BAS.

4.12.9 Describe interlocks to the HVAC system from the Lighting Control System.

Have control of exterior lighting through BAS at HS. BAS doesn't control interior lights at the HS. Provide some interior light scheduling through BAS (common spaces and corridors) to push to lighting control system via BACnet interface. Start off matching this approach for SSES.

4.12.10 For the chiller, boiler and pumps are there any of these that will not require automatic changeover to the backup / lag piece without operator action should one piece of equipment fail?

No.

4.12.11 How fast should the refresh rate be on the operator's work station? (standard, above average, exceptional)

Standard.

4.12.12 What fraction of the BAS set points should be able to be adjusted from the OWS graphics screens? (none, few, some, most, all)

Most.

4.12.13 For non-measurement and verification (M&V) purposes, like energy optimization and troubleshooting, how many system monitoring points are desired, above that required to execute the sequences of control (none, some, many)?

None.

4.12.14 Is there going to be a measurement and verification (M&V)--rigorous energy tracking, or significant ongoing commissioning program after occupancy, requiring numerous additional power and HVAC monitoring points? Mention it's part of LEED, if applicable.

Nothing beyond typical.

4.12.15 How much expansion capacity is desired for adding control point inputs and outputs in each field control panel and primary controller? (none, 5%, 10%, 20%, etc.)

~10%

4.12.16 Are there areas of the building that require essentially uninterrupted delivery of the HVAC (which would affect how the controls were designed)? List.

None.

4.12.17 Are there any critical areas that need their controllers to have redundancy in their power supplies?

No.

4.12.18 Upon a control system network failure should all equipment not being controlled by local controllers control to the last known value?

Yes.

4.12.19 Upon restoration of power after an outage, which equipment is allowed to require an operator to go to the equipment and reset it before it will start? Or require operator action at the workstation?

None to either.

4.12.20 Upon a general alarm that shuts down the equipment, upon the condition correcting itself, what equipment is allowed to or should require an operator to reset the unit at the equipment? Or require action at the workstation?

None to either.

4.12.21 What other desires for the control system are there?

Text notifications for certain critical alarms.

System shutdown button at Admin.

4.13 Occupant HVAC Control

4.13.1 What level of control is desired for the occupants to have over the temperature and ventilation in their space—list for each occupancy type (temperature adjustable by occupants at a zone thermostat, ventilation control adjustable by occupants for their specific area, temperature control adjustable only by facility staff, ventilation control adjustable only by facility staff)? Describe what areas will have after-hours override capabilities accessible to the tenants or occupants.

Occupants can have limited controllability of thermostats (+/- 2F).

4.14 HVAC Acoustics --See Acoustics in the Sustainability section.

5. Electrical Systems

5.1 General

5.1.1 List general requirements for the electrical system.

All electrical equipment will bear the UL label and no rebuilt, refurbished or remanufactured or used equipment or material shall be specified or installed. Complete raceway routing from panels to the field devices shall be indicated on the drawings for power, fire alarm, security, PA, intercom and CCTV.

Complete 1-line power diagram(s) are required.

5.1.2 List any requirements for coordination studies (short circuit study, protective relays/breakers, voltage drop / transient study for large motors, etc.).

Short circuit study is required.

Arc flash study is required.

Selective coordination study is required for emergency systems.

Protective device setting/Ground fault protection study is required.

5.1.3 List requirements for connected and operating electrical load estimate, including future project loads, if applicable, lighting level calculations.

Both load calcs and lighting level calcs are required. *Grays Harbor County Health Department- refer to them for light level standards.*

5.1.4 List any specific equipment brand or components that are to be included or not included in this project.

Main switchgear- no preference. HS is GE, no issues.

5.2 Power Capacity and Redundancy

5.2.1 Are there any requirements for redundant transformers or power feeds from the utility?

None.

5.3 Power Quality

5.3.1 What level of power quality are desired (standard, above standard, exceptional)?

Standard.

5.3.2 Are there any spaces that require special power quality requirements?

None identified.

5.3.3 What level of safeguard is required to monitor and maintain the integrity (such as voltage or phase imbalance) of the incoming power (e.g. - protection of sensitive lab equipment)? What equipment or devices are included in the design to meet this requirement?

Have some surge protectors on main equipment. Can provide on main switchgear, not needed at every panel.

5.3.4 Are there special grounding and EMF mitigation requirements for these lab environments and equipment? What measures will be taken to mitigate?

None.

5.4 Lighting and Visual Quality

5.4.1 What is the general level and description of the visual quality desired and for each use or occupancy type in the facility?

Low glare, good quality LED lights w/ occupancy and dimming.

5.5 Lighting Levels

5.5.1 Required average maintained light levels for this project are listed below. For spaces not listed, the current IESNA light level recommendations shall be followed.

Offices: 45 FC with occupancy sensor daylight sensors where applicable.

Lobbies: 20 FC

Corridors and means of egress: 15 FC.

Conference rooms: 30 FC to 50 FC with dimming controls as required.

Restrooms: 20 FC

Equipment rooms: 30 FC

General Classrooms: 30FC.

Gymnasiums/Common Spaces: minimum 20FC.

Kitchens: 50-70FC.

Exterior lighting at building entrances, walkways, streets, and parking lots: Not more than 2 FC.

5.5.2 Would task lighting be an acceptable design feature required to achieve desired light levels in office areas?

Task lighting at workstations will be plug-in at discretion of the end-user. Where casework allows for integrated approach, undercounter lighting will be added.

5.6 Light Fixtures and Lamps

5.6.1 What level of energy efficiency is desired in the lighting equipment for each occupancy type (standard, above standard, exceptional)?

Exceptional - LED.

5.7 Lighting Control

5.7.1 What control of lighting is required in the various types of spaces (open office, closed offices, common areas, conference rooms, retail spaces, condominiums, exterior, parking garage, etc.)? Examples are manual switches to on, occupancy sensors to turn on or off, scheduled lighting controls and lighting sweeps and daylight dimming.

Don’t have a specific lighting control system- current systems obsolete. Could look into ATS lighting control system. Current system is outdated and no longer supported. Currently designing around Lutron, Current, Levitron. Hybrid wireless system.

Open office: manual switch on, occupancy sensor off.

Closed office, storage and copy rooms: manual switch on, occupancy sensor off.

Corridors and other service spaces: time clock schedule.

Perimeter office (open and closed), lobbies and corridors: same as above, but also include daylight dimming.

Classrooms: manual switch on, occupancy sensor off.

Conference rooms: manual switch on, occupancy sensor off.

Exterior: photocell and time clock.

5.7.2 Do any spaces have special glare requirements?

None.

5.8 Emergency Generator and UPS

5.8.1 In general, what equipment is desired to be on generator power?

Planning on providing generator.

Life/safety equipment (emergency lighting, fire alarm, smoke detectors, datacenter).

Kitchen equipment, freezer/cooler.

Heat trace for heat pump, no other mechanical.

5.8.2 How much extra capacity is desired in the generator (for potential special needs by tenants, etc.)?

Provide additional capacity to allow enlarging and powering the MDF load by 50%.

5.8.3 How many hours of full load operation are desired in sizing the fuel tank?

Meet minimum code requirement.

5.8.4 What equipment will require uninterruptible power supplied?

UPS, including the MDF & IDF, rack-mounted.

5.9 Power Monitoring

5.9.1 Is submetering of utility power desired? (list for gas, steam, electricity, water) What is the purpose of the monitoring of each? (resource efficiency tracking, measurement and verification (M&V), occupant billing, demand reduction, etc.)

Submetering of electricity is required per code.

5.9.2 What is the intended level of metering and sub-metering? (Main switchgear only, or including metering of energy consuming sub-systems, such as HVAC central plant, AHUs, lighting panels, etc.)

Code minimum.

5.9.3 How will the metered information be presented and reported for the occupants and staff? (Integrated with BAS, separate monitoring station, touch screen displays in lobby/common areas, etc.)

Integrated with BAS. Can look into energy dashboard.

5.9.4 Are peak demand reduction strategies desired?

Possibly, can be at BAS.

6. Sustainability

What are the general sustainability goals for this project?

The project is required to comply with the Washington Sustainable Schools Protocol.

The specific sustainability goals for the project are listed in the categories below.

6.1.1 State where any sustainability certifications or achievements will make the project eligible for Federal, state or local tax credits or incentives.

6.2 Certifications

6.2.1 Describe any LEED or other certification goals and objectives.

6.3 Water Efficiency and Conservation

6.3.1 Describe the water efficiency goals of the project.

Standard water savings features.

6.3.2 Is grey water recovery a consideration for this project?

No.

6.3.3 Is rainwater harvesting and use a consideration for this project?

No.

6.3.4 What level of low-water use landscaping is desired or would be considered?

Yes, is desired.

6.3.5 To what level of sophistication will the irrigation controls be, beyond simple typical time clock functions and above ground sprinklers, to reduce water consumption?

Normal system controller.

Provide additional BAS water meter to measure irrigation usage.

6.4 Energy Efficiency

6.4.1 What level of *overall building* energy efficiency is required above code? (none, 10%, 20%, 30%, etc.).

Note stated energy savings goals. Want the building to be as efficient as possible while staying within project budget and constraints.

6.4.2 Specifics of HVAC energy efficiency are found in the HVAC section, lighting efficiency under Electrical and water heating under Plumbing.

6.5 Indoor Environmental Quality

6.5.1 HVAC related IEQ goals and requirements are listed in the HVAC section.

6.5.2 Interaction with building operations personnel. Describe the interface that occupants will have with operations and maintenance personnel to voice concerns over IEQ and related issues (e.g., direct to facility manager's office, front receptionist, internal company supervisor, etc).

Occupant complaints come via work order system.

6.5.3 Lighting and visual quality requirements.

These are listed under the Electrical section.

7. Plumbing Systems

Water Efficiency

7.1.1 Refer to the Water Efficiency section under Sustainability for details of the water efficiency objectives of this project.

7.2 Fixture Controls

7.2.1 Are auto-flushing and on/off controls desired on urinals, lavatories, toilets?

Prefer manual flush valves. Auto flush are expensive and have seen some failures.

7.2.2 Are waterless urinals a consideration? Where?

No.

7.3 Energy Efficiency

7.3.1 The water heating system energy design is desired to be: standard code, somewhat more efficient that code, much more efficient than code? Note standard code now requires heat pump water heaters.

Standard code.

7.3.2 Are there specific system types that shall be incorporated or that are not to be considered (e.g., point of use heaters, electric heaters, etc.)?

No.

8. Fire Protection and Alarm

List the specific brand and/or model of fire alarm system required, if any.

No specific type required.

8.1.1 List any special features desired or required of the fire alarm system.

Fully addressable system required. Code compliant minimum system with additional features mentioned below. Full detection coverage along with fully sprinklered. Integration into AV systems, intercom systems. Supervisory on duct detectors. One pull station at admin area, and one pull station at fire alarm panel/elevator room.

8.1.2 Describe where the fire alarm signal is to be sent to off site.

Alerts or troubles will remain in the fire alarm panel. Alarms will be sent to the BAS as a general alarm and to the municipal fire department. Alarms will be sent to a monitoring company – Guardian Security.

8.1.3 Is the FA system to have addressable and monitored fire smoke dampers (ones that can be commanded open or closed from the fire alarm panel)?

Yes.

8.1.4 Are the fire smoke dampers to have end switches that positively confirm closed and open positions or is the commanded position notification acceptable?

Commanded position notification is acceptable.

9. Data and Communications Systems

Describe the data requirements in the building.

Single mode- no multimode, minimum of 10 gigs. Plan is to bring fiber from ISP, land at MDF on rack. Spread fiber out to IDF as required.

OS2 Single mode, yellow, with LC-UPC terminations between MDF and IDF.

Provide CAT6 cabling to data drops, Cat 6A to wireless access points located for full coverage. Specialty systems integrated w/ AV systems.

2-drops per each wireless access point location.

IP based system for elevator recall.

Need network drops for IP based phones. Drops for camera systems and expansions.

ISP- Greys harbor PUD, Comcast and Lumen.

Walkie Talkie repeater- ask Mike Pauley.

Network Drops by Room Type (excludes any needed for communication systems, security, wireless, etc.)

- Classrooms
  - Min x2 to x4 data ports single box, 1 box per wall wherever feasible (we've found that over time classroom configurations will change a lot from their originally designed state. If the room is limited to data ports in a single location this can add complication and lack of flexibility to the potential future use.) It would not be assumed that all of these ports would need to be "live" at all times, only as needed.

        - Min x2 ports on ceiling, one anticipated for Wireless Access Point, additional for future use
        - Other ports as needed depending on use case, i.e. "lab" should have designed port drops for anticipated setup in addition to ports above
    - Office Space, Small Meeting Space
        - Min x2 drops for small one occupancy office size space
        - Min x4 drops for medium sized rooms
    - Hallways
        - Min 2 ports/1 panel approx every 80 ft. This is in addition to any other ports already planned for supporting wifi infrastructure, etc. These ports support future expansion of network based equipment, i.e. Cameras, sensors, etc.
        - Preferred to be up above drop tile ceiling, non-visible but easily accessed for future installation needs, etc., example usage, cameras and/or additional TV display for digital signage that needs network, or uses additional box for connection "vivi" etc.
- Wireless Access Point Locations
    - General thought/recommendation for placement:
    - Assume 1 Wireless Access Point in each classroom/student room
    - Assume multiple Wireless Access Points for large areas, based upon occupancy, 1 AP per 30 people
    - Additional External consideration, where instruction might take place outside the building

9.1.1 Describe the needs for future expansions.

Will have space built into patch panels. ~20% spare. Will try to have adequate space in racks for future equipment.

9.1.2 Will special backbone, conduit and cabling be required for future flexibility?

Conduit and pathway sizing for future flexibility. ~20% spare capacity.

9.1.3 Describe the wireless internet systems desired for the building.

Complete wireless coverage throughout. May be some target exterior areas (covered play).

9.1.4 Describe the communication systems desired for the building.

IP Phone Systems (OFOI).

District Radio (OFOI). Infrastructure for radio system to be CFCI.

- Silke Communications

Fire and security panels are cellular dialers. Separate from AES Radios.

Rescue Assistance to be IP system. (Metrix to coordinate this with the state)

POTS requirements to be coordinated with local fire marshal- will provide if required, but don't think it will be required.

9.1.5 Is CATV desired?

Could be brought into a demark location. HS is using coax for morning announcements, etc.

Will have head end brought into MDF room if desired by district. Not planning on providing coax jacks throughout.

9.1.6 Describe any tie-in between the data and communication systems and the security system or building automation system.

Sometimes, see security tie-in. Will provide drops for BAS. Nothing else required.

10. Security and Access

What are the securities concerns for this facility?

Goal is for a less complex and easy security system to maintain. Security basis-of-design is Bosch (used to be Radionics). Multiple exterior doors will have card reader access (main entries, receiving area, etc.). Has remote access to all systems.

The current video surveillance standard is Vivotek cameras on Exacqvision servers and can be access remotely. No monthly or yearly operating costs to 3rd party service providers.

Additional security cameras (like license plate readers), will be roughed-in at select exterior light pole locations.

If cellular connections are desired, then cellular dialer system would be added for remote montoring/alerting by Guardian Security.

Lockdown buttons located in the reception area can be triggered over the phone or hardwired.

Duress buttons will be located in the reception area. Messages can be sent via Navigate app.

10.1.1 List the specific brand and/or model of security system required, if any.

Security- familiar with Bosch, open to others.

Cameras- prefer to stay with Vivotek.

10.1.2 What access control must this facility accommodate?

Will coordinate with District security.

10.1.3 What areas of the facility will require controlled access?

Will coordinate with District security.

10.1.4 Describe the desired security system features (e.g., card reader, fingerprint, retina scanner types, length of image storage capacity, remote access capabilities and backup features, user programmability, reporting functions, battery backup duration, etc.).

Security system, card readers, video intercom systems, cameras.

10.1.5 Describe any required interlocks between the security system and the building automation system and HVAC.

Standard connections from BAS to security panel.

10.1.6 Describe any required security interfaces, recommendations, visual indicators, mass notification.

Designated office station with room for workstation as well as live monitoring station that displays camera feeds of building entrance/exits (depending size, multiple stations may need to have space for this scenario, i.e. AHS)

Main entry space with live 2 way audio-video/vestibule or other means to communicate with visitors without allowing access to the building

Remote unlock for opening/unlocking primary entrance doors for authorized visitors (front doors, vestibule doors, etc.)

Close camera coverage at all entrances and exits

Interior camera coverage at maximum no further than 100' between cameras when facing opposed to each other, independent coverage range no further than 50'

Avoid alcoves where possible which may create blind spots (int/ext)

Alerting system with both Audio and Visual Alerts, able to handle following scenarios

- Lockdown
  - Solid lights, visual reader boards and audio message to indicate a threat to the building.
    - May include a message with directions on what to do, barricade, law enforcement is on the way, etc, do not open your doors, administration or law enforcement will release you, etc.
- Hold
  - TBD, visual reader boards and audio message
    - Message indicating to close and secure all doors, clear the halls, continue to work as normal
- Secure
  - TBD, visual reader boards and audio message
    - Message indicating to close and secure all doors, continue to work as normal
- Evacuation
  - TBD, visual reader boards and audio message
    - Evacuate the building to the designated location in safest route possible
- Shelter
  - TBD, visual reader boards and audio message
    - Message indicating to shelter etc.
- Fire
  - Building alarm systems/strobes, etc.

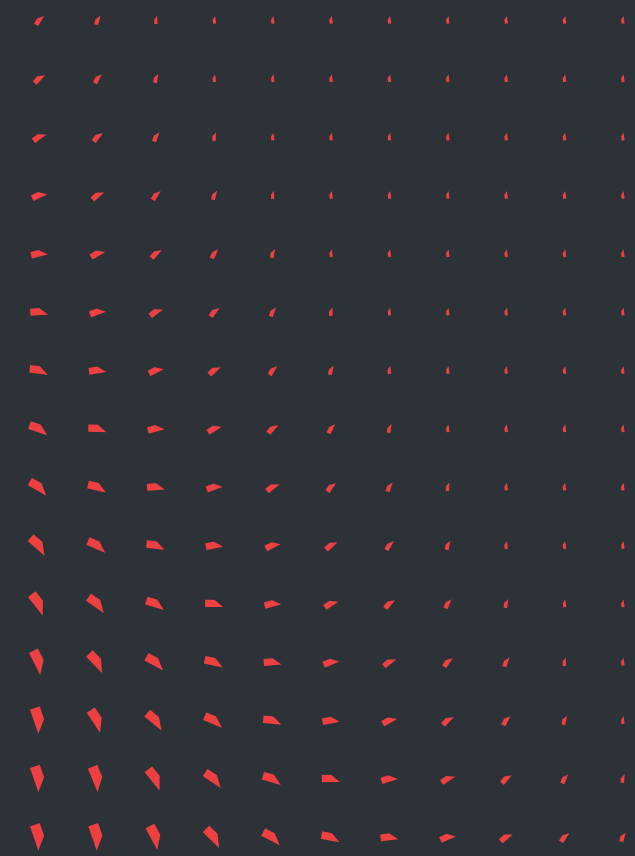
Visual alert systems need to be seen from all public locations, easily visible from locations which do not have such systems, i.e. placement directly outside of bathrooms

Visual alert systems located in every room, min light and audio, larger rooms, reader boards, etc. excludes small rooms off of classrooms or spaces that they must exit through

---END of OPR---

TCF

V. WSSP Strategy and Scorecard



504 SSES - WSSP 2023 Scorecard

TCF

	Category	Credit Number	Credit Name	Available Points	Highest Possible Points	Yes	No	Maybe	Credit Summary	Responsible Party	Contractor Action	Action Verification	Notes
1			2025-004 ASD - SSES										
2	**Category**	**Credit Number**	**Credit Name**	**Available Points**	**Possible Points**	**Yes**	**No**	**Maybe**					
3	2023 WSSP COMPILED LISTING OF REQUIRED CREDITS - SEE ATTACHED		2023 WSSP COMPILED LISTING OF REQUIRED CREDITS - SEE ATTACHED						2023 WSSP COMPILED LISTING OF REQUIRED CREDITS - SEE ATTACHED				
4	**Site**												
5	1) Selection & Use												
6		S1.0	Code Compliance	R	0	REQUIRED			Comply with all siting and environmental impact study requirements of the most current edition of the School Facilities Manual, issued by the Washington State Office of the Superintendent of Public Instruction.	ALL	No submittals or action required of the Contractor for this credit.		
7		S1.1	Sensitive Areas	1	1	1			Avoid environmentally sensitive or important areas. See criteria in 2023 WSSP - Credit attached for team review	x	No submittals or action required of the Contractor for this credit.		
8		S1.2	Greenfields	1	1		1		Do not build on greenfield	x	No submittals or action required of the Contractor for this credit.		
9		S1.3	Central Location	1	1	1	1		Locate sites where at least 50% of students live within the following distances from the school: ES - 1 mile MS/JrH - 2 miles HS - 4 miles To earn this point, calculations must be based on the planned number of students indicated on the D5 submittal.	OWNER	No submittals or action required of the Contractor for this credit.		6/24/26 Cannot be confirmed until after D5 submittal, percent is close enough to keep an eye on it. TCF / CSG to follow up after D5.
10		S1.4	Joint Use of On-Site Facilities	1-2	2	1	1	1	Joint Use On-Site: Make portion(s) of the school building or grounds available for either shared or dedicated use by community and other appropriate organizations. One point if the space is "shared" use. An additional point (total of two points) if the space is dedicated for use by the community and other appropriate organizations	OWNER	No submittals or action required of the Contractor for this credit.		6/24/26 There will be no dedicated space for a community partner on the site or building.
11		S1.5	Joint Use of Off Site Facilities	1	1	0	1		Share park or recreation space with local park boards or other organizations (off-site).	OWNER	No submittals or action required of the Contractor for this credit.		6/24/26 District will be locking the fence to the public to minimize risk and liability
12		S1.6	Protect Open Space	2	2			2	Design a building footprint that does not exceed 60% of the total building square footage, a Floor Area Ratio (FAR) equal to or greater than 1:4.	ARCHITECT	No submittals or action required of the Contractor for this credit.		
13		S1.7	Tree Canopy	1	1			1	Increase tree canopy by 10% over existing tree cover. Survey available by Monday 2/23	LANDSCAPE	No submittal or action required of the Contractor for this credit.		NEW Credit
14		S1.8	School Carbon Sequestration Data	1	1	1			Use the I-Tree Planting Calculator to assess the amount of CO2 sequestered (in lbs/sq.ft. or kg/sq.m.) by vegetation such as all trees and shrubs on the baseline site compared to the proposed site.	LANDSCAPE	No submittal or action required of the Contractor for this credit.		NEW Credit
15	2) Transportation												
16		S2.1	Public Transportation	1	1	1			In urban areas, locate the school within ½ mile of a commuter rail or light rail station or within ¼ mile of one or more bus lines. In rural and suburban areas, with limited or non-existent rail/bus service, provide busing to the school.	ARCHITECT - TCF	No submittals or action required of the Contractor for this credit.		
17		S2.2	Bike & Walk to School	1	1			1	Provide bike lanes or sidewalks that extend to the end of the property. And provide suitable means for securing bicycles for at least 5% of students above grade 3 and staff (at peak periods) in an elementary or middle school, and 3% of building staff and students (at peak periods) in a high school. And either Integrate the Engineering and infrastructure component of the Washington Safe Routes to School in the planning and design process. The education and enforcement components can be implemented for credit under PEO3.3 Transportation Options OR complete a School Walk Route Map or Plan in accordance with WAC 392-151-025 and/or WAC 392-141-340.	ARCHITECT	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents		
18		S2.3	Electric Buses or District Vehicles	1-2	2		2		1 point - Develop and implement a plan for acquiring at least 1 electric bus. 2 points - Develop and implement a plan for 50% of all other (non-bus) vehicles owned or leased to serve the school to be electric vehicles.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents		
19		S2.4	Minimize Parking	1	1			1	Provide preferred parking totaling 5% of staff and student spaces for carpools or vanpools and alternative fuel vehicles, AND Size parking capacity not to exceed 2.25 spaces per classroom plus parking for 20% of students at High Schools, or three spaces per classroom for Elementary and Junior/Middle Schools. OR Provide preferred parking totaling 5% of staff and student spaces for carpools, vanpools, and alternative fuel vehicles, and size parking capacity not to exceed local codes. OR Add no new parking for modernization projects and provide preferred parking totaling 5% of staff and student spaces for carpools, vanpools, and alternative fuel vehicles.	ARCHITECT	No submittals or action required of the Contractor for this credit.		
20	3) Stormwater Management												
21		S3.0	Construction Stormwater Pollution Prevention	R		REQUIRED			Implement a site stormwater pollution prevention plan (SWPPP) that follows the best management practices outlined by the Washington State Department of Ecology's Stormwater Management Manuals (for Western Washington: Volume II, Construction Stormwater Pollution Prevention, and for Eastern Washington, Chapter 7: Construction Stormwater Pollution Prevention), and the local ordinance requirements.	CIVIL	implement and maintain site sediment and erosion control plan, and provide photographic documentation of the implememntation of the plan.		
22		**S3.1**	**On-site Stormwater Management and Flow Control**	**R-1**	**1**	**R**	**1**		**Required: Meet state and local requirements for on-site management and flow control of stormwater on the developed site. Projects exempted by state or local jurisdictions are exempt from this requirement.** **1 point - Apply Low Impact Development (LID) performance standards for either Eastern or Western Washington to enhance stormwater management and flow control.**	**CONTRACTOR**	**Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents**		
23		S3.2	Stormwater Treatment	R-1	1	R	1		Install treatment systems designed to meet site-specific requirements outlined in Washington State Department of Ecology's Stormwater Management Manual for either Western or Eastern Washington and the local jurisdiction requirements. Projects exempted by state or local jurisdictions are exempt from this requirement. Apply Low Impact Development (LID) performance standards for either Eastern or Western Washington to enhance stormwater treatment.	CIVIL	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents		
24		S3.3	Soil Management	1	1	1			Implement the Department of Ecology's BMP T5.13 "Post-Construction Soil Quality and Depth" that provides guidelines for amending soils with compost post-construction, or local government guidelines and procedures similar to those recommended in Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13.	CIVIL	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents		
25	4) Outdoor Surfaces												
26		S4.1	Outdoor Learning Spaces	2	2			2	Provide an outdoor classroom or lab for students to experience their learning beyond the walls of a school building.	ARCHITECT - TCF	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents		

	Category	Credit Number	Credit Name	Available Points	Highest Possible Points	Yes	No	Maybe	Credit Summary	Responsible Party	Contractor Action	Action Verification	Notes
27		S4.2	School Gardens	1-2	2	1		1	1 point - Provide dedicated space and infrastructure for a future school garden 2 points - Provide a complete installation of a school garden	LANDSCAPE	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
28		S4.3	Reduce Heat Island - Site	1-2	2	1	1		1 POINT: Provide shade (at plant maturity) on at least 30% of non-roof, impervious surfaces on the site, including parking lots, walkways, plazas, etc., OR Use light-colored materials with a solar reflectance of at least 0.30 for 50% of the site's non-roof, impervious surfaces, OR Use an open-grid pavement system (net impervious area of less than 50%) for a minimum of 30% of the parking lot area. A combination of shading and high solar reflectance may be used to meet the credit. 2 POINTS: Use an open-grid pavement system (net impervious area of less than 50%) for a minimum of 50% of the parking lot area.		No submittals or action required of the Contractor for this credit.	☐	
29		S4.4	Reduce Heat Island - Roof Design	1	1			1	Install an ENERGY STAR® labeled Cool Roof for a minimum of 75% of the roof surface, with a minimum initial solar reflectance of 0.65, and after 3 years 0.50 on low-sloped roofs 2:12 or lower and an initial 0.25, and >= 0.15 after 3 years, on steep-sloped roof > 2:12, OR install a vegetated roof for at least 50% of roof area, OR install high-albedo & vegetated roof surface that in combination, meet the following criteria: Area Roof Meeting Minimum SRI + Area of Vegetated Roof ≥ Total Roof Area		No submittals or action required of the Contractor for this credit.	☐	
30	5) Outdoor Lighting											☐	
31		S5.1	Light Pollution Reduction	1	1	1			Do not exceed Illuminating Engineering Society of North America (IESNA) foot-candle level requirements as stated in the IESNA RP-33 Recommended Practice for Exterior Environmental Lighting or applicable sections of the IESNA Lighting Handbook, Current Edition; AND Design interior and exterior lighting (excluding sports fields) such that zero direct-beam illumination leaves the building site.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
32	**Site**		**Total possible**		**26**	**9**	**8**	**10**				☐	
33													
34	**Water - 6 Points**											☐	
35	1) Outdoor Systems											☐	
36		W1.0	Landscape Water Use Budget	R		REQUIRED			Develop a landscape water budget that conforms to the requirements set forth in the Irrigation Association Best Management Practices, Appendix B. Develop a landscape plan and Estimated Water Use for the site specific landscaping.	LANDSCAPE	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
37		W1.1	Irrigation Water Reduction (50%, 100%)	1-2	2	1	1		1 point - Reduce water consumption of water supplied for irrigation by a water district or utility, after plant establishment period, by 50% of Maximum Applied Water Allowance as determined in credit W1.0. 2 points - For an additional point, eliminate water consumption for irrigation use of water supplied by water district or utility, after plant establishment period.	LANDSCAPE	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
38		W1.2	Control Irrigation Water Use	R-1	1	1			REQUIRED: Develop an irrigation schedule, by zone, based on historic rates of evapotranspiration, plant water requirements, soil type, and system efficiency. AND input into controller after plant establishment, OR Any irrigation systems used for playfields must have weather-based irrigation controllers (WBIC) that meet or exceed Smart Water Application Technology (SWAT) protocols to manage operation of irrigation systems when there is adequate ambient moisture. 1 POINT: Irrigation systems used for campus landscape, gardens, and recreational areas must have weather-based irrigation controllers (WBIC) that meet or exceed SWAT protocols.	LANDSCAPE	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
39		W1.3	Irrigation System Testing and Training	1-2	2	2		0	1 POINT: Create an irrigation commissioning plan to verify the irrigation system and controls are operating as intended and that effective training for system upkeep and maintenance has been provided. 1 POINT: The Landscape Architect will provide a baseline irrigation run time schedule for post establishment irrigation for all zones, including sports fields, that shall be input by the contractor into the irrigation controller prior to final hand-off of the irrigation system to the owner. The irrigation audit shall include coverage test and confirmation that the entire system has been installed per design.	OWNER	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	6/24/26 TCF (L.ARCH) to provide commissioning plan.
40		W1.4	Flow Switches & Irrigation Water Meters	R-1	1	1			REQUIRED: Install a flow switch or flow sensor to monitor the flow rate and pressure of water. 1 POINT: Install an irrigation water meter, deduct meter, or submeter for measuring irrigation used in outdoor activities. District-owned meters must be connected to the building automation system.	LANDSCAPE		☐	NEW CREDIT
41	2) Indoor Systems											☐	
42		**W2.0**	**Lead-Free Potable Water System NOTE: W2.1 & W2.2 FROM THE 2018 MANUAL ARE NO LONGER AVAILABLE IN THIS 2023 MANUAl**	**R**		**R**			**All products that are part of the potable water system (pipes, pipe fittings, plumbing fittings and plumbing fixtures) are certified as meeting the lead free requirement of the 2014 Safe Drinking Water Act (SDWA).**	**Mechanical during design / Contractor during CA**	**Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents**	☐	**NEWLY REQUIRED CREDIT**
43	**Water**		**Total possible**		**6**	**5**	**1**	**0**				☐	
44													
45	**Materials and Waste - 29 Points**											☐	
46	1) Efficient Material Use & Waste Management											☐	

	Category	Credit Number	Credit Name	Available Points	Highest Possible Points	Yes	No	Maybe	Credit Summary	Responsible Party	Contractor Action	Action Verification	Notes
47		MW1.0	Storage and Collection of Recyclables and Compostables	R-2	2	**REQUIRED**			REQUIRED: Space shall be provided for the storage of recycled materials, compost and solid waste for all new buildings. AND Provide dedicated, easily accessible areas, within the building/facility, for the separation, collection, and storage of materials for recycling and composting. Also provide at least one centralized collection point for all materials to be staged for removal from the site (e.g. loading dock), or for transport to composting location. The staging area shall be designed to meet the needs of the occupancy, efficiency for pickup, and shall be available to haulers. AND Regularly inform all building occupants about what materials can and cannot be recycled and composted, and educate building occupants about the environmental and economic benefits. AND Provide means for recycling in each teaching and learning space. Administration areas must have one central recycling station set up per 20 employees, if not one at each desk. AND When local waste service providers have ability to divert food waste, provide means for collection of organic waste in food preparation and dining areas. 1 POINT: Provide means for recycling and composting at sports fields. 1 POINT: Provide means for collection of compostable paper products in dining areas and restrooms.	ARCHITECT - TCF	No submittals or action required of the Contractor for this credit.	☐	Locate recycling throughout building and provide space for collection in/near service yard
48		**MW1.1**	**Construction Site Waste Management (50%, 75%, 90%)**	**R-3**	**3**	**2**		**1**	**REQUIRED: Develop and implement a construction site waste management plan and provide documentation of waste disposal at the conclusion of the project. 1-3 POINTS: Document the percent (by weight) of construction and demolition waste diverted from the landfill, excluding hazardous or dangerous materials and land clearing debris. 50%=1 POINT 75%=2 POINTS 90%=3 POINTS**	**CONTRACTOR**	**Comply with all requirements of Waste Management Specification. Submit monthly waste management reports and final report for inclusion in WSSP final documentation.**	☐	**NEWLY REQUIRED CREDIT. Have achieved 90% on previous projects.**
49		MW1.2	Building Reuse - Structure/Shell (50%, 75%, 95%)	1-3	3		3		Maintain a minimum of 50%, (or 75% or 95%) of existing building structure and shell (exterior skin and framing, excluding window assemblies). Hazardous and unsound materials or systems that are remediated as part of the project scope are to be excluded from the calculation of the percent maintained (ex. asbestos removal).	ARCHITECT - TCF	Maintain and Re-use materials as directed in the contract documents	☐	
50		MW1.3	Building Reuse - Interior Non-Structural Elements (50%)	1	1		1		Maintain and reuse at least 50% of interior non-structural (walls, interior partitions, doors, relites, floor coverings, and ceiling systems) materials.	ARCHITECT - TCF	No submittals or action required of the Contractor for this credit.	☐	
51		MW1.4	Materials Reuse (5%, 10%)	1-2	2		2		1 POINT: Install salvaged or refurbished materials using either a percentage approach or prescriptive approach for one or two points. Calculate using material costs. (PERFORMANCE OR PRESCRIPTIVE AS NOTED BELOW) Performance Approach (#1): Install salvaged or refurbished materials for 5%, based on cost, of the total value of building materials. OR Prescriptive Approach (#1): Specify salvaged or refurbished materials for 25% of one of the following major interior finish materials: [Flooring;; Casework; Acoustical Ceiling Tile; Wall Coverings; Tile.] 2 POINTS: Above requirements doubled.		No submittals or action required of the Contractor for this credit.	☐	
52		MW1.5	PCB/T12 Lighting Removal	R-1	1		1		REQUIRED: Remove and replace all T-12 lighting fixtures and ballasts manufactured in or before 1979. 1 POINT: Replace removed fixtures with Energy Star certified LED lighting.			☐	NEW CREDIT
53	2) Sustainable Materials											☐	
54		**MW2.1**	**Recycled Content (10%/4 mtls, 20%/8 mtls)**	**1-2**	**2**	**1**		**1**	**Performance Approach: Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer recycled content constitutes at least 10% (or 20%) of the total cost of the materials in the project. See manual for Prescriptive approach Note: If attempting MW2.5, the product(s) used for that credit must still be listed on the product matrix for this credit, but their recycled content may not be used and should be listed as 0%.**	**Architect during Design / Contractor during CA**	**No submittals or action required of the Contractor for this credit.**	☐	
55		MW2.2	Rapidly Renewable Materials	1	1		1		Install rapidly renewable building materials for 2.5% of the total value of all building materials, excluding mechanical and electrical. OR Prescriptive Approach: Specify rapidly renewable materials for 50% of one of the following major interior finish or structural materials: Flooring, casework, acoustical ceiling tile, wall covering, tile, exterior walls, and roof. A product must contain 25% rapidly renewable raw materials based on weight to qualify under the prescriptive approach.		No submittals or action required of the Contractor for this credit.	☐	Difficult to achieve 5% of building materials.
56		**MW2.3**	**Certified Wood (50%, Chain of Custody)**	**1-2**	**2**	**1**	**1**		**At least 50% of the cost of wood and wood-based materials and products are from a sustainable forest certified by a third party. This includes, but is not limited to, framing, flooring, finishes, and built-in cabinetry. One additional point is available if all of the certified wood also has chain-of-custody tracking.**	**Architect during Design / Contractor during CA**	**No submittals or action required of the Contractor for this credit.**	☐	
57		MW2.4	Regional/Local Materials	1-2	2	**1**		1	For one point: 20% (by cost) of the building materials are manufactured, extracted, harvested, or recovered from within a 500-mile radius of the site. OR 2 points - 20% (by cost) of the building materials are manufactured, extracted, harvested, or recovered from within Washington State	ARCHITECT	Architect has specified regional materials. Contractor shall submit completed WSSP submittal cover sheet with submittals for each product containing regional materials. WSSP Product Matrix shall include all Project products and their costs (except MEP, Irrigation & Elevator) and regional materials shall also be included in the regional materials column of the matrix.	☐	
58		MW2.5	Environmentally Preferrable Products - Multiple Attribute	1-2	2			2	Earn one point for each major building product that meets the Environmentally Preferable Products (EPP) established criteria, and is certified for at least 2 of the attributes under a nationally recognized certification program. If claiming points under this credit you may not claim points for the same materials under M1.4, M2.1 or M2.2.		No submittals or action required of the Contractor for this credit.	☐	
59		MW2.6	Environmental Product Declaration	2-7	7			7	2 POINTS: Select 10 products or materials (that are each at least 2% of the total value of all building materials and products based on costs) that contain a third-party certified Environmental Product Declaration (EPD) (cradle to cradle) conforming to the requirements of ISO 14025 on Type III environmental declarations and/or ISO 21930 on environmental declarations of building products. 1-5 POINTS: An additional 1 point for each product declaration that demonstrates a 10% or higher reduction (in comparison to the industry baseline) in one half of the impact categories (global warming potential category is required). Talk to Kristin		No submittals or action required of the Contractor for this credit.	☐	

	Category	Credit Number	Credit Name	Available Points	Highest Possible Points	Yes	No	Maybe	Credit Summary	Responsible Party	Contractor Action	Action Verification	Notes
60		MW2.7	Building Materials Health Product Disclosure		1		1		Provide a published Health Product Declaration (HPD) with a disclosure level of 1000ppm for at least 20 permanently installed products from at least five different manufacturers in accordance with the Health Product Declaration Standard Version 1.0, 2.0, or 2.1.		No submittals or action required of the Contractor for this credit.	☐	
61	**Material and Waste**		**Total possible**		**29**	**5**	**10**	**12**				☐	
62													
63	**Energy - 108 Points**											☐	
64	1) Efficiency											☐	
65		E1.0	Minimum Energy Performance								Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
66		E1.0.1	Energy Code Minimum	R		**REQUIRED**			The school design and construction must be Washington State Energy Code (WSEC) Commercial Provisions compliant.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
67		E1.0.2	Energy Star Certified Equipment	R		**REQUIRED**			All major appliances, commercial food service equipment, electronics and office equipment must be ENERGY STAR Certified if certification is available for the product type, and required features and functionality are not sacrificed.	MEP & ARCHITECT	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
68		E1.1	Superior Energy Performance - Prescriptive Component Design	1-14	14		14		Comply with more than the minimum required credits in WSEC Section C406 to achieve points.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
69		E1.2	Superior Energy Performance - Whole Buidling Design	1-20	20	**10**	6	4	Reduce the predicted energy use intensity (pEUI) of the proposed design to be better than the energy use intensity target (EUIt) as defined by the Clean Buildings Performance Standard (CBPS). The EUIt shall be adjusted by both the operating shift normalization and new construction factors as defined in the tables below. Select either Table 1 or 2 based on the average weekly operating hours that the majority of the building is open to serve the public. The pEUI shall be gross EUI before the application of any onsite or offsite renewables.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
70		E1.3	Zero Net Energy	35	35		35		Design and construct the building to be zero net energy	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
71	3) Alternative Energy											☐	
72		E3.1	**On-Site Renewable Energy**						SEE ATTACHED 3.1.1 THROUGH 3.1.3			☐	
73		E3.1.1	On-Site Renewable Energy	2-12	12	**2**	7	3	Use on-site renewable energy for a portion of a school's energy use. Point levels correspond to the percentage of energy use supplied by this method. See WSSP manual for point breakdown		No submittals or action required of the Contractor for this credit.	☐	
74		E3.1.2	Solar Ready	3	3	3			Design a structurally-sound building to allow for a solar array that maximizes the available roof area.		Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
75		E3.1.3	Service Water Heating	2-8	8		8		Use site-solar or site-recovered energy for at least 25% of the annual service water-heating energy used. Energy production used to earn this credit may not be used to earn points for percentage of energy supplied by renewables (E3.1.1).		Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
76	4) Commissioning											☐	
77		E4.0	Fundamental Commissioning	R		**R**			Comply with requirements outlined in WSEC and WAC 392-343-080 regarding: • Cx Plan • Commissioned Systems • Supporting Documents (system documentation, record documents, and training) • Cx Report • Systems Balancing (TAB) • Functional Testing (FT) • Systems Operation Training WAC 392-343-080 requires on-site physical inspection remote monitoring-based Cx is not sufficient. The CxP must be an independent third party regardless of project delivery method (design-build or GC/CM). AND The Owner will develop the Owner's Project Requirements (OPR) and the Design Team will develop the Basis of Design (BOD) documents. AND Conduct a controls summit to clarify sequences of operation for networked control systems, when applicable (see Building Automation System). The controls summit must occur prior to final shop drawing. AND Review test, adjust, and balance (TAB) report, including duct pressure testing when applicable. AND Verify functional and maintenance training of O&M Staff, and document training is completed in the Final Commissioning Report. AND Assure, through contractual arrangements, involvement by the CxP in reviewing building operation after one academic year of building use with O&M staff and occupants. AND Verify warranty documentation from equipment suppliers and sub-contractors; including extended warranty requirements, if any.	CxA	no submittals or action required of the Contractor for this credit.	☐	
78		E4.1	**Enhanced Commissioning**							CxA		☐	
79			Commissioning Review; Verification and Assurances	3	3		3		Independent CxA required by E4.0 and State regulations as referenced in E4.0 will: • Conduct a commissioning design review of the Owner's Project Requirements (OPR), Basis of Design (BOD), and design documents prior to mid-construction documents phase. • Review contractor submittals applicable to systems being commissioned for compliance with OPR and BOD. • Ensure commissioning milestones are included in the project schedule. CxA will: * participate in OPR development * Witness air barrier leakage testing * Review building IAQ flushout if applicable * Verify training for optimal operation of commissioned systems they interface with has been completed. * Conduct O&M staff training to optimize building performance over time, such as through trend-log analysis. * Conduct seasonal testing and review performance quarterly during the first year of operation		No submittals or action required of the Contractor for this credit.	☐	

	Category	Credit Number	Credit Name	Available Points	Highest Possible Points	Yes	No	Maybe	Credit Summary	Responsible Party	Contractor Action	Action Verification	Notes
80		E4.1.1	Energy Measurement & Verification	1	1		1		commissioning provider will assist the building owner in setting up first-year Energy Star Portfolio Manager reporting and compare actual energy use with modeled energy use and resolve differences.		No submittals or action required of the Contractor for this credit.	☐	
81	5) Metering & Management											☐	
82		E5.0	Minimum Energy Metering	R		R			Install an energy use metering system to measure, monitor, record and display each energy source and end-use per WSEC. Required for new buildings and additions with more than 50,000 sq. ft. gross conditioned floor area, for all energy sources (with exceptions), and sub-metered for HVAC and domestic hot water. Additionally, a data acquisition and display system is required. See WSEC for provisions that apply to existing building upgrades (modernizations and additions).	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
83		E5.1	**Energy Metering - Other**									☐	
84		E5.1.1	Energy Metering System - Not Code Required	4	4		4		Install an energy use metering system that meets the code required (above) on a project that does not meet the square foot threshold.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
85		E5.1.2	Energy Use Metering Display	4	4	4			For each building subject to Section C409.2 and C409.3, either a single visible display in a location with ready access, or a single web page or other electronic document available for access to building operation and management personnel or to a third-party energy data analysis service shall be provided in the building; for metering data acquisition systems and energy displays monitored by a third-party energy data analysis service, building operation and management personnel shall retain access to the metering data acquisition system and energy dis-play. See WSSP 2023 for added information.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
86		E5.2	Energy Storage	2	2		2		Implement a new technology, strategy, or technique that produces actual and measurable results for on-site electric power storage that: * Reduces peak demand from grid * Provides a reliable source of electric power * Provides storage for renewable energy generated (beyond what is used on the site)	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
87		E6.0	Building Enclosure Commissioning	2	2	**2**			Employ the services of a professional consultant to commission the Building Enclosure including: * Weather barrier *Air barrier *Thermal * Roof Assembly and its vapor retarder/barrier * BECx activities must include and be overseen by a qualified BEX envelope consultant * Define enclosure performance requirements in the OPR. * Review design details for constructability and performance * Prepare building enclosure details, specifications, and test plans * Review product test data. * Observe construction beginning with mock-ups and testing of mock-ups * Witness testing of enclosure barriers and envelope * Prepare BECx review, site-visit, field reports * Review enclosure O&M Manual * Ensure Owner O&M staff are trained on enclosure maintenance. See 2023 WSSP manual for added requirements	BECx		☐	NEWLY REQUIRED CREDIT.
88	**Energy**		**Total possible**		**108**	**19**	**80**	**7**				☐	
89													
90	**Indoor Environmental Quality - 24 Points**											☐	
91	1) Daylighting											☐	
92		IEQ1.0	Permanent Shading	R-1	1	R			Comply with the minimum exterior sun control requirements in WAC 246-366-050 (9), if applicable. OR FOR 1 POINT, Eliminate direct sun from day lit spaces (other than instructional areas, assembly rooms and meeting rooms covered by the WAC) from March 21st until September 21st through the use of permanent or automated shading devices.	ARCHITECT - TCF	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
93		IEQ1.1	Outdoor View Windows	R-1	1	R			Comply with the minimum outdoor view window requirements in WAC 246-366-050 (8). For 1 point, Provide a direct line of sight to vision glazing from 90% of critical task areas and office spaces, not including copy rooms, storage areas, mechanical, laundry and other low occupancy support areas. To qualify, a space will have view glazing equal to or greater than 7% of the floor area. View glazing will be transparent, but not translucent, and only include window area above 2.5 ft. or below 7.5 ft. from the floor.	ARCHITECT - TCF		☐	
94		IEQ1.2	Daylighting Classrooms	1-4	4	**3**		1	1 Point 25% all classroom area day lit 2 Point 50% all classroom area day lit 3 Point 75% all classroom area day lit 4 Point 90% all classroom area day lit	ARCHITECT - TCF		☐	Confirm if a daylight study will be done on the building.
95	2) Electric Lighting Quality											☐	
96		IEQ2.0	**Electric Lighting Quality**									☐	
97		IEQ2.0.1	Electric Lighting Quality	R		R			Comply with all requirements in WAC 246-366-120. School spaces will be designed so end of lamp life conditions meet the minimum average illumination levels as identified in WAC 246-366-120. See WSSP Manual for additional info	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
98		IEQ2.0.2	Electric Lighting Dimming	1	1	1			After meeting all requirements for IEQ2.0.1 above, dim all luminaires in the classrooms, excluding whiteboard luminaires. Provide switches that allow for manual dimming below the levels set by the photocells based on natural lighting entering the space.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
99		IEQ2.0.3	Electric Lighting Luminaire Color	1	1		1		After meeting all requirements above, provide a lighting system designed to change the color of the luminaires (approximately 3,000 K – 5,000 K) based on the respective color of sunlight throughout the day. System may have the ability to have a temporary override (up to 60 minutes) for “calm” (3,000 K) and/ or “test” (5,000 K) settings.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
100	3) Indoor Air Quality											☐	
101		IEQ3.0	**Min Requirements Ventilation, Filtration, & Moisture Control**									☐	

	Category	Credit Number	Credit Name	Available Points	Highest Possible Points	Yes	No	Maybe	Credit Summary	Responsible Party	Contractor Action	Action Verification	Notes
102		IEQ3.0.1	Permanent Ventilation	R		R			Comply with ventilation requirements for primary and secondary schools in WAC 246-366-080. Meet International Mech Code with WA amendments for performance reqs. AND: * Filtration during construction: Temporary filters: If permanent air handlers must be used during construction, install filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 at each return air grille as determined by ASHRAE 52.2. Replace all filtration media immediately prior to occupancy. AND: *Moisture Control: All surface grades, drainage systems, and HVAC condensate must be designed to prevent the accumulation of water under, in, or near buildings, including portables. Irrigation systems must not spray on buildings. Building materials, especially wood, porous insulation, paper, fabric, and other porous materials must be kept dry before, during, and after installation to prevent the growth of mold and bacteria. Before installation, store all materials in a manner that assures they stay dry. If stored outside, cover building materials with plastic to protect from the rain and other sources of moisture, and keep off of the ground. Immediately discard all water-damaged materials and replace with new, undamaged materials. If building envelope components (foundation, framing and/or sheathing) are significantly impacted by moisture during the framing process, mitigation measures to reduce the moisture content to acceptable levels must be implemented prior to installation of insulation, wall cover, and other interior finishes.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
103		IEQ3.0.2	Increased Ventilation	1	1		1		In all general classrooms set the ventilation to be 21 cfm/person or greater. Ventilation rate must be maintained during all occupied hours. Increase HVAC heat recovery system efficiency beyond code to assure this approach is energy natural. Do not take additional energy efficiency credit for this modification.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
104		**IEQ3.1**	**Outdoor Moisture Management**	**R**		**R**			**Design surface grades to slope away from the building and the building foundation to drain away rainwater, snowmelt, and HVAC condensate to prevent ponding, pooling, or otherwise saturating the building envelope or foundation. Rain leaders, or downspouts, must be directed to infiltration structures, on site storage, rain gardens or daylight provided that surface drainage moves water well away from the building and does not result in unintended ponding or pooling. Lawn irrigation systems are also required to be designed to prevent spray on building walls. And HVAC systems that use evaporation drip pans for condensate removal are prohibited.**	**ARCHITECT - TCF**		☐	**NEWLY REVISED & REQUIRED CREDIT.**
105		**IEQ3.2**	**Low-Emitting Interior Finishes**	**R-1**	**1**	**R**			**Use products that have been independently tested and certified for VOC emissions by a qualified third party. Testing for VOC emissions will be in accordance with the following: * Interior carpet, hard surface flooring, building insulation, acoustical ceilings, wall panels, adhesives and sealants shall be tested and determined complaint for emissions of VOCs in accordance with California Department of Public Health (CDPH) Standard Method v1.2, using the applicable exposure scenario (school classroom). * For wet-applied products, the VOC material content must be disclosed in the third-party certificate or in the manufacturer's product documentation, and must meet the applicable VOC content standard rule listed below; • Interior adhesives and sealants must meet South Coast Air Quality Management District Rule 1168; • Interior Paints and Coatings must meet South Coast Air Quality Management District Rule 1113 or CARB 2019 Suggested Control Measure for Architectural Coatings; • Concrete sealers must meet South Coast Air Quality Management District Rule 1113. For 1 Point: All interior composite wood products must contain no added urea formaldehyde. Formaldehyde content must be disclosed in a third-party certification or the manufacturer's product documentation.**	**Architect during Design / Contractor during CA**	**Contractor shall maintain a list of all products in the 6 chosen options. Submit documentation under WSSP cover sheet showing that each product within each option is compliant with the requirements as noted to the left and further expanded in the WSSP manual.**	☐	**NEWLY REVISED & REQUIRED CREDIT.**
106		IEQ3.3	Low-Emitting Furniture	1	1		1	0	100% of the new or newly refurbished/remanufactured student and administrative workstations (desk/table and chair or a desk/chair combination, and individual pieces) are low-VOC-emitting.	OWNER		☐	NEWLY REVISED CREDIT. 6/24/26 Confirmed NO
107		**IEQ3.4**	**Source Control**	**3**	**3**	**3**			**Design to minimize and control sources of indoor air pollutants per WSSP Manual 2023**	**Architect during Design / Contractor during CA**	**Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents**	☐	**See attached EPA IEQ document for entry mat system**
108		**IEQ3.5**	**Ducted HVAC Returns**	**1**	**1**	**1**			**Install all ducted HVAC returns.**	**Mechanical during design / Contractor during CA**	**Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents**	☐	**NEWLY REVISED CREDIT.**
109		IEQ3.6	**Construction IAQ Management**									☐	
110		**IEQ3.6.1**	**During Construction**	**1**	**1**	**1**			**Temporary construction ventilation: Continuously ventilate with temporary equipment (not the permanent HVAC system) affected spaces during installation of materials that emit volatile organic compounds (VOC) and for at least 72 hours after installation. Ventilate longer than 72 hours if necessary to remove odors. Exhaust the air directly to the outside; do not re-circulate to other enclosed spaces. AND Duct protection: Turn the permanent mechanical system off and protect HVAC supply and return openings from debris generated during dust-producing activities such as drywall installation and finishing. Provide temporary ventilation as needed. Additionally, specify that ductwork be sealed when transported to the construction site and store ductwork in clean, dry conditions and keep sealed during storage. Wipe down internal surfaces of ductwork immediately prior to installation to remove dust. AND Preconditioning: Allow products with odors and significant VOC content to off-gas, off-site in a dry, well-ventilated area for at least two weeks prior to delivery to the construction site. Remove products from their containers and packaging to maximize off-gassing of VOCs. AND Sequencing: Install any necessary odorous and/or VOC-emitting products and allow to off-gas prior to installation of porous and fibrous materials. AND HEPA vacuuming (carpets and upholstery): After installation, vacuum carpeted and soft surfaces with a high-efficiency particulate arrestor (HEPA) vacuum as needed and just prior to occupancy. AND HEPA duct cleaning: Prior to installation, inspect ducts for dust and debris. Remove any dust, dirt, and residual oil. Prior to substantial completion and prior to using the permanent mechanical system, inspect the ducts again for dust and other debris that may have collected during construction. Immediately remove any dust using a HEPA vacuum. Bid specifications must require that new ducts be pre-cleaned and sealed prior to shipping to the job site.**	**CONTRACTOR**	**See WSSP manual "Construction IAQ Management" credit and comply with all requirements therein.**	☐	
111		**IEQ3.6.2**	**After Construction**	**1**	**1**	**1**			**After construction either use Option 1 Building Flush out before Occupancy or Option 2 Building Flush out after occupancy. All interior finishes, such as millwork, doors, paint, carpet, acoustic tiles, and furniture must be installed, and major VOC punch list items must be finished prior to either flushout. NOTE THE TESTING REQUIREMENTS THAT MUST BE ACCOMPLISHED PRIOR TO OPTION #2 - SEE PAGE 2 OF ATTACHED**	**CONTRACTOR**	**Perform flush-out per WSSP 2023 manual.**	☐	
112	4) Acoustics											☐	

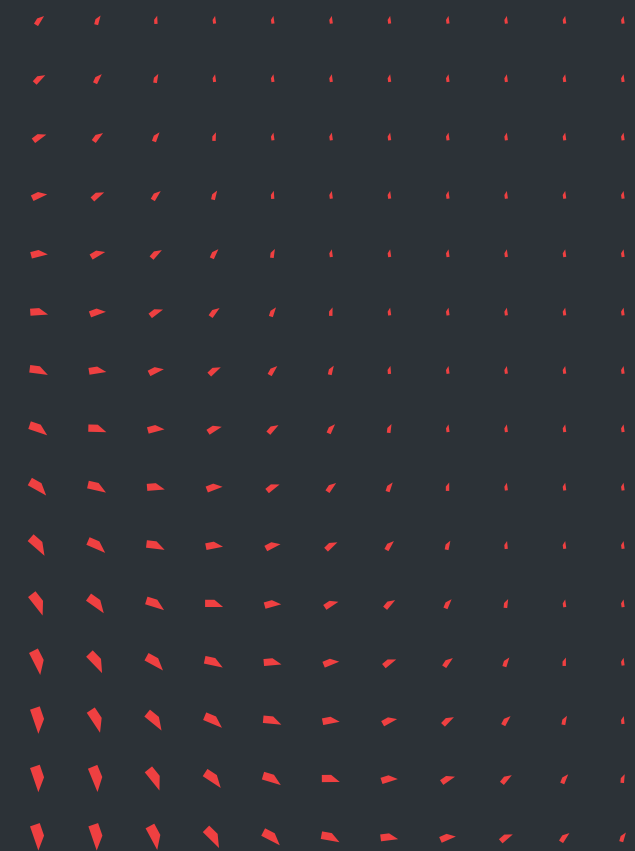
	Category	Credit Number	Credit Name	Available Points	Highest Possible Points	Yes	No	Maybe	Credit Summary	Responsible Party	Contractor Action	Action Verification	Notes
113		IEQ4.0	Acoustic Performance	R		R			Comply with sound control requirements in WAC 246-366-110.	ACOUSTICS	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents. Compliance with this prerequisite must be determined with the classroom ventilation system and noise generating components, such as compressors and fans, in normal operation during conditions representing reasonable worst-case equipment loads. Contractor shall coordinate with Acoustical Testing Agency to schedule these tests.	☐	
114	(note that previous credits 4.1.1 through 4.1.4 are now included in this one-point credit)	IEQ4.1	Improved Acoustical Performance	1	1			1	See the tables in IEQ4.0 attached above. The requirements in Credit IEQ 4.1 column of each of the following tables must be achieved to attain this one credit: *NC/dBA - Table 1 - Background Noise *STC - Table 2 - Sound Transmission & Impact Insulation Criteria *IIC [included in Table 2] *RT Table 3 - Room Reverberation Criteria		Contractor shall coordinate testing/inspections	☐	
115		IEQ4.2	Sound Amplification	1	1	1			Provide accommodations for a sound amplification system and an assistive listening system in all classroom spaces. * A sound amplification system to amplify the teacher's voice, via wired or wireless microphones, and to amplify audio visual presentations. * A dedicated or portable assistive listening device (system) to amplify the teacher's voice, via wired or wireless microphones, and to amplify audio visual presentations.	ACOUSTICS/TELECOM	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	NEWLY REVISED CREDIT.
116		IEQ4.3	Acoustical Consultant	1	1	1			Retain the services of an experienced acoustical consultant (with a minimum of ten years experience in Educational Facilities). Prior to the conclusion of Schematic Design, the consultant must be involved in the design process and provide integrated team review, outline specifications and acoustic performance requirements, code sheet requirements, and general acoustic performance input. By Design Development, provide review and recommendations of architectural and mechanical systems, specifications, and basic system details or edits. By the Bid Period, have provided Contract document coordination, review, and input. During construction and prior to occupancy, provide submittal review for acoustic related items, and site observations of installed acoustic components and systems.			☐	NEW CREDIT.
117	5) Thermal Comfort											☐	
118		IEQ5.0	Thermal Code Compliance	R		R			Comply with ASHRAE Standard 55 - Thermal Comfort Conditions for Human Occupancy, for thermal comfort standards within established ranges per climate zone. For buildings designed with occupant-controlled naturally conditioned spaces ensure an adaptive comfort standard has been established.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
119		IEQ5.1	Radiant Heated Floors - K–5	2	2		2		Provide radiant heated floors in all general classrooms that serve elementary students grade K through 5	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
120	6) User Controls											☐	
121		IEQ6.1	User Control - Windows	1	1		1		Provide a minimum of two operable window in each standard classroom.	ARCHITECT - TCF	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
122		IEQ6.2	User Control - Temperature	1	1	1			Provide a temperature control, adjustable by the occupants during occupied hours, in each classroom.	MEP	Contractor shall provide all product and material submittals as required and install all systems as required in the Contract Documents	☐	
123	**Indoor Environmental Quality**		**Total possible**		**24**	**13**	**8**	**2**				☐	
124													
125	**Integration, Education and Operations - 45 points**											☐	
126	1) Integration											☐	
127		IEO1.1	Integrated Design Workshop	1	1	1			Conduct a workshop no later than mid-schematic design phase. Include project stakeholders to collaboratively develop a range of sustainable building strategies for all five categories of the WSSP, document the project's sustainable building goals, and incorporate them as an ongoing part of programming and design decision-making.	ARCHITECT - TCF	No submittals or action required of the Contractor for this credit.	☐	
128		IEO1.2	Enhanced Integrated Design	1-2	2			2	1 POINT: Advanced Design Modeling - Utilize an advanced BIM decision-making tool for integrated sustainable design; whole building life cycle assessment (WBLCA); or environmental impact modeling tool such as Tally, Athena, One Click, or Skanska's Embodied Carbon in Construction Calculator (EC3); or others that facilitate calculation of embodied and/or operating carbon emissions. 1 POINT: Cross-Category Workshops - During the integrated design workshop, set aside time to specifically discuss design opportunities to improve multiple high performance outcomes by identifying criteria across categories (Site, Water, Materials and Waste, Energy, Indoor Environmental Quality) that contribute to the achievement of other category credits and/or design strategies that also promote human health, nutrition, or wellness.			☐	NEWLY REVISED CREDIT.
129		IEO 1.3	Durability	1	1	1			Implementation of Durability, Efficiency and Maintainability Features Provide Architect's certification that major components of the facility are designed to exceed the 50 year useful service life envisioned by the state of Washington. A criterion for this certification is the design professional's evaluation of the building systems design life. The architect's certification should outline the specific features and indicate how they will improve service life, given reasonable use and maintenance.		No submittals or action required of the Contractor for this credit.	☐	NEWLY REVISED CREDIT.
130		IEO1.4	Faculty and Staff Changing and Shower Facilities	1	1	1			Provide a minimum of one onsite changing room and shower facility for faculty and staff, separate from any facility designated for students (toilet rooms, locker rooms). If only one is provided design for unisex use. If 2, then one for each gender, or as determined best suitable to serve the non-student population.			☐	NEWLY REVISED CREDIT.
131	Note that strategies or technologies not tried in school buildings and/or masterplans that incorporate high-performance elements may also be considered for innovation points.	IEO1.5	Innovation	1-2	2			2	Implement a new technology, strategy, or technique that produces actual and measurable results, is not used to comply with a point in another WSSP credit, and that strives for at least one of the following goals: * Improves the health and performance of students and staff. * Improves the performance and efficiency of the school facility, or operation of the facility. * Restores the natural environment. * Achieves Living Building status as defined by the Living Future Institute. * Demonstrate exceptional performance in an existing criterion area through submission of a narrative explaining how the intent was exceeded by a significant amount.			☐	NEWLY REVISED CREDIT.

	Category	Credit Number	Credit Name	Available Points	Highest Possible Points	Yes	No	Maybe	Credit Summary	Responsible Party	Contractor Action	Action Verification	Notes
132		IEO1.6	Biophilic Design	1-3	3			3	1 POINT: BIOPHILIC DESIGN - Document and implement a holistic Biophilic Plan to strengthen connections between building users and natural ecosystems. The plan must incorporate a minimum of six biophilic features, with at least two elements in each of the three categories: Nature in the Space (physically experiencing nature), Nature of the Space (spatial configurations), and Natural Analogues (nature-inspired elements). Biophilic Plan will likely include multiple strategies working together to create an overall experience for all users that is grounded in place and nature. 1 POINT: RESPONSIVE DESIGN - Provide a minimum of two interior or exterior features that create safe and calming spaces, provide sensory input, or contribute to a sense of community. Features may include the sites' cultural, spiritual, archeological, or architectural history. 1 POINT: EDUCATIONAL MATERIALS - Provide educational materials for students and teachers that document the successful biophilic design strategies.			☐	NEWLY REVISED CREDIT.
133		IEO1.7	Pursue Additional Funding Sources	2	2			2	Pursue private and public funding in support of initiatives/features that provide long-term environmental benefits to the building and site.			☐	NEWLY REVISED CREDIT.
134	**note that the 2nd paragraph in the credit summary adds a new requirement to attain these two points. The requirement for a CPTED professional may make this difficult to achieve. The 2-points for this credit do not appear to be separable - both portions of the credit must be achieved.**	IEO1.8	Safer Schools by Design	2	2		2		Design safer schools by including at least 4 of the elements of safe school design in new building, addition and modernization projects. Conduct a Crime Prevention Through Environmental Design (CPTED) workshop with key project stakeholders and a CPTED professional at the outset of, or before, schematic design to identify site, building, and interior issues, and define strategies aligned with CPTED principles. The design team must incorporate these strategies in the project design. To earn the NICP's CPTED Professional Designation credential, a participant must successfully complete sixty-four hours of instruction offered through the NICP within two consecutive years. Course curriculum includes forty-hours of training in Basic CPTED and twenty-four hours of training in Advanced CPTED training. CPTED training from another training provider cannot be used as credit for the NICP's CPTED Professional Designation.			☐	NEWLY REVISED CREDIT.
135	2) Education											☐	
136		IEO2.1	Green Building Learning	1-2	2	**2**			1 point - Develop student-learning opportunities by using the building structure and site, through demonstration areas, exposed systems, lesson plans, teaching aids, interpretive graphics and signage. Note: 1 or more of the options listed above (for the first point) will satisfy this credit. for example, graphics and signage will be enough to earn this point.. 1 point - Provide students, teachers, and staff with knowledge of each aspect of the high-performance design and their responsibility for use and preservation.	ARCHITECT - TCF & Owner if the 2nd point is attempted. Contractor during CA	Provide signage as required in the Contract Documents	☐	6/24/26 TCF to provide sustainability signage.
137	3) Operations											☐	
138		IEO 3.0	Operational Performance Monitoring	R		**R**			The project energy and water use will be tracked in EPA's ENERGY STAR Portfolio Manager for a period of 5 years following either building occupancy or board acceptance.	OWNER		☐	
139		IEO 3.1	Post Occupancy Evaluation (POE)									☐	
140		IEO3.1.1	POE Occupant Survey	R		**R**			Conduct a Post Occupancy Evaluation (POE) at least one year after the building is occupied, but no longer than two years after. A written plan for a POE must be in place at the time of the final (D11) high-performance submittal. The POE evaluation will include at a minimum: Surveys of occupants regarding comfort, including thermal comfort, air quality, lighting, building furnishings, spatial layout and acoustical comfort. *	OWNER		☐	A written plan for a POE must be in place at the time of the final (D11) high-performance submittal. The POE evaluation will include at a minimum: • Surveys of occupants regarding comfort, including thermal comfort, air quality, lighting, building furnishings, spatial layout and acoustical comfort. • ARCHITECT'S STANDARD 1-YEAR WARRANTY REVIEW DOES NOT COVER REQUIREMENTS OF THIS PREREQUISITE
141		IEO3.1.2	Comprehensive POE	2	2		2		In addition to the required elements listed above the POE includes additional topics such as security, accessibility, transportation, and green building features, as well as an analysis of the actual resource use (energy and water). & The POE investigates connections between the facility and health, user satisfaction, academic achievement, and other fundamental goals of facility construction.		No submittals or action required of the Contractor for this credit.	☐	
142		IEO3.2	**ELCCA/LCCA**									☐	
143		IEO3.2.1	ELCCA Required Facilities	R		**R**			As part of the early design process, perform an Energy Life Cycle Cost Analysis (ELCCA) to meet chapter 39.35 RCW – Energy Conservation in Design of Public Facilities requirements. For major facilities that are (1) new buildings having twenty-five thousand gross square feet or more of usable floor space, (2) renovation, modernization, addition, alteration or repair of a facility having greater than twenty-five thousand square feet, work completed within a 12-month period, the project cost is more than 50 percent of the assessed value of the existing facility and the project affects energy-using systems.	MEP	No submittals or action required of the Contractor for this credit.	☐	
144		IEO3.2.2	ELCCA Other Facilities	1	1		1		Perform an ELCCA for all other facilities (1) new building projects larger than five thousand gross square feet, but less than twenty-five thousand gross square feet of usable floor space, (2) renovation, modernization, addition, alteration, or repair of a facility where the cost is less than 50 percent of the assessed value of the existing facility.		No submittals or action required of the Contractor for this credit.	☐	
145		IEO3.2.3	ELCCA Update	1	1			1	Update the ELCCA energy model based on final construction drawings. This is a valuable tool that can be used to compare designed performance with actual performance. 2026-1-29:NOT CURRENTLY IN SCOPE OF WORK		No submittals or action required of the Contractor for this credit.	☐	
146		IEO3.2.4	LCCA	1	1				Perform a Life Cycle Cost Analysis (LCCA) showing 50-year net present value.		No submittals or action required of the Contractor for this credit.	☐	
147		IEO3.3	Monitoring-Based Commissioning	4	4		4		Develop an ongoing commissioning program.			☐	6/24/26 Confirmed with District NO
148		IEO3.4	**Project or District Long Term Operations**						**Choose all of the operations activities below that apply to this school. Plans and programs may be developed for the individual school or for the entire district. This section includes 21 possible points for operations and maintenance activities that often generate strong returns on the investment.**			☐	
149		IEO3.4.0	Asset Preservation Program (APP)-New Buildings	R		**R**			Newly constructed state-assisted school buildings, board accepted after December 31, 1993, must participate in the Asset Preservation Program (APP) in order to be eligible for future state assistance. A district Asset Preservation System (maintenance plan) is required as part of the APP. The building maintenance plan must include maintenance and operational issues related to high-performance features.	OWNER		☐	
150		IEO3.4.1	Operations and Maintenance Staff Involvement	R		**R**			Involve at least 3 key Operations & Maintenance staff, including resource conservation managers, custodians, electricians, mechanical and control system staff, grounds and building services staff in every phase of the project, from pre-planning through close-out. Staff selection to participate is at the discretion of the school district or project team.	OWNER		☐	
151		IEO3.4.2	Asset Preservation System (APS) on Modernizations	1	1		1		A state-assisted school building modernization project is not required to participate in the Asset Preservation Program (APP), therefore no asset preservation system (maintenance plan) for OSPI purposes is required. To earn the point, the district will provide an asset preservation plan that meets the requirements in the APP program, and include maintenance and operational issues related to high-performance features.	OWNER		☐	

	Category	Credit Number	Credit Name	Available Points	Highest Possible Points	Yes	No	Maybe	Credit Summary	Responsible Party	Contractor Action	Action Verification	Notes
152		IEO3.4.3	Green Power and Carbon Offsets	1-2	2		2		Enter into a contract for a minimum of five years to provide at least 50% (1 point) or 100% (2 points) of the project's energy from green power, carbon offsets or renewable energy certificates (RECs). Any combination of the three.	OWNER		☐	6/24/26 Confirmed with District NO
153		IEO3.4.4	Resouce Conservation and GHG Reduction Plan	1	1		2		Develop and implement a Resource Conservation Plan including energy, water, and materials conservation. & Develop a Greenhouse Gas Reduction plan. Include plans for reduction of water, energy, and vehicle miles traveled. Include goals with target dates.	OWNER		☐	6/24/26 Confirmed with District NO
154		IEO3.4.5	IAQ Management Plan	2	2			2	Use EPA's Design Tools for Schools as a design reference and resource. Implement the EPA's Tools for Schools Program or an alternative, equivalent in scope and effectiveness. A school-specific IAQ management plan must be implemented.	OWNER		☐	6/24/26 District aspire to have IAQ Management Plan and hopes to have it in place by the time the new school is in use
155		IEO3.4.6	Integrated Pest Management Program	1-2	2	2			1 POINT: Develop and implement a formal IPM Program that follows the model IPM program for schools in Washington State developed by Urban Pesticide Education Strategy Team (UPEST). To get this point, an IPM plan must be developed and implemented at the school. A district-wide IPM that includes the new school can be used to satisfy this credit. 1 POINT: DESIGN FOR IPM - ncorporate pest prevention through design principles that will prevent pest entry or harborage. This includes: * Using ¼" hardware cloth on all ventilation openings * Caulk all cracks * Keep landscape plantings at least two feet from all buildings * Facades should be designed to discourage birds from roosting or excavating * Select pest-proof dumpsters that seal tightly and are easy for people to open and close. Garbage areas need to be easily cleanable and not located where fresh air intakes will entrain odors * Use door sweeps on all exterior doors * Make all kitchen surfaces easy to degrease	OWNER		☐	6/24/26 confirmed with District no
156		IEO3.4.7	Transportation Options Program	1	1		1		Develop and implement a Transportation Options Program, with input from the local community and other stakeholders. The goal of the plan is to improve the school's connection to the community by offering students and staff more transportation choices such as public buses, rail, biking, and walking. Implement the education and enforcement components of the Safe Routes to School program.	OWNER		☐	6/24/26 Street improvements will qualify as Safe Routes to Schools
157		IEO3.4.8	Operations and Maintenance Personnel Training	1-2	2	1		1	Facilities and maintenance staff will receive operations and maintenance training on all systems included in the commissioning scope of work, as well as systems related to high-performance – lighting, shading controls, all floor and wall finishes, audio systems, etc. depending on the scope of the project. Training will be a combination of Operations & Maintenance document review and field observations. For 1 point: BOC Level 1, maintained for 2 years, for at least 2 staff that have responsibility to maintain the new building systems included in the commissioning. For 2 points: BOC Level 2, maintained for 2 years, for at least 2 staff that have responsibility to maintain the new building systems included in the commissioning or BOC Level 1 for all O & M staff that have primary responsibility for maintaining the new facility, including electrical, mechanical, custodial, building services, grounds, controls, resource conservation managers.	OWNER		☐	6/24/26 District is halfway there to achieving 1 point, lets track it for now.
158		IEO3.4.9	Food Related Waste Management	1-2	2	1	0	1	1 point - Develop and implement a plan for food waste management at this school 1 point - Food Services at this school uses only re-usable trays	OWNER		☐	6/24/26 Team to confirm with Food Service reusable trays are exclusively used at Stevens for second point
159		IEO3.4.10	Wasted Food Reduction Program	1, 2-3	3	1	0	1	1 POINT: Initiate a reducing wasted food awareness campaign 2 POINTS: 15% LESSS EDIBLE FOOD WASTE GOES TO COMPOST OR LANDFILL. Implement a Wasted Food Reduction Program to reduce the amount of food fit for consumption that is being wasted 3 POINTS: 25% LESS EDIBLE FOOD WASTE GOES TO COMPOST OR LANDFILL. Reference the EPA's Food Recovery Hierarchy for preferred reduction strategies.	OWNER		☐	6/24/26 District to confirm with Food service if the 2 additional points are attainable.
160		IEO3.4.11	Fuel Efficient Buses and Maintenance Vehicles		1	1			At least 20% of the district-owned buses and 20% of the district-owned maintenance vehicles that are diesel (only those that travel on the roads and highways) serving this school are built in or after 2007 when the latest standards we updated. If district bus service is provided under contract from a third party, then 20% of the buses used to service this school must meet the requirement. The same is true if the school is served by public bus service.	OWNER		☐	6/24/26 District already abides to this
161		IEO3.4.12	Environmentally Preferrable Supplies Purchasing		1		0	1	Develop and implement an environmentally preferable purchasing policy at the school or district level. The plan must include the environmental performance indicators that are to be used to judge purchasing decisions. The plan should include typical products and materials and weighting of the indicators. Typical products and materials generally include office supplies and classroom supplies. The plan should ensure the protection of the students, staff, and workers.	OWNER		☐	6/24/26 District to confirm whether this is already in place.
162		IEO3.4.13	Green Cleaning Policy and Program		1	0		1	Develop and implement a Green Cleaning Policy and Program at the school or district level. See WSSP 2023 manual for requirements	OWNER		☐	6/24/26 District needs to formalize it as a District Standard
163		IEO3.4.14	Green School Program		1		1		Register and participate in one or more Green School Programs that meet the requirements include Washington Green Schools, King County Green Schools, EPA's Cool Schools Challenges, plus others.	OWNER		☐	6/24/26 confirmed with district no
164	**Integration, Education and Operations**		**Total Possible**		**45**	**11**	**16**	**17**				☐	
165													
166			GRAND TOTAL Possible Points (Most points possible, not a total of all points listed above)		**238**	**62**	**122**	**48**				☐	
167			Minimum required for Washington Sustainable School Two-tier system:									☐	
168			**New Facility and new Building on Existing Facility**		**66**							☐	
169			For Class I Districts: Minimum 66 points									☐	
170			For Class II Districts: Minimum 58 points									☐	
171			**Modernization**		**43 or 49**							☐	
172			For Class I Districts: Minimum 66 points									☐	
173	*Published June 2018*		For Class II Districts: Minimum 58 points									☐	
174													
175													
176													
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TCF

VI. C406 Strategy and Scorecard



ASD-SSES C406 Scorecard

TCF

Credit Section	Section Title	Credits	Possible Credit	Accepted Credits	Maybe	Yes	No	Responsibility	Added Cost of Credit	Credit Description	Notes
C406 Credit Strategy	South Side Elementary				☐	☐	☐				
Legend:					☐	☐	☐				
	Credit is Accepted in Design				☐	☐	☐				
	Credit is Currently Possible in Design				☐	☐	☐				
TABLE C406.2(1) EFFICIENCY MEASURE CREDIT	TITLE	AVAIL. CREDITS	POSSIBLE CREDITS	ACCEPTED CREDITS	☐	☐	☐			CREDIT DESCRIPTION	NOTES
~~C406.2.2~~	~~1. Dwelling unit HVAC control~~	~~NA~~	~~0~~	~~0~~	☐	☐	☑			~~HVAC systems serving dwelling units or sleeping units shall be controlled with a programmable thermostat that is configured to automatically activate a setback condition of at least 5°F (3°C) for both heating and cooling. The programmable thermostat shall be configured to provide setback during occupied sleep periods. The unoccupied setback mode shall be configured to operate in conjunction with one of the following:~~	~~7/2 - Metrix - Doesn't apply.~~
~~C406.2.2.1~~	~~2. Improved HVAC TSPR~~	~~17~~	~~0~~	~~0~~	☐	☐	☑			~~For systems required to comply with Section C403.1.1, the HVAC TSPR shall exceed the minimum requirement by five percent. If improvement is greater, the credits in Table C406.2(1) are permitted to be prorated up to a 20 percent improvement.~~ ~~TSPR = Total System Performance Ratio~~	~~7/2 - Metrix - TSPR not required for systems with heat pumps.~~
C406.2.2.2	3. Improve cooling and fan efficency	4	0	4	☐	☑	☐	Mechanical		No less than 90 percent of the total HVAC capacity serving the total conditioned floor area of the entire building, building addition or tenant space in accordance with Section C406.1.1 shall comply with Sections C406.2.2.2.1 through C406.2.2.2.3. Where individual equipment efficiencies vary, weigh them based on capacity.	7/27 - Confirm if efficiencies can be met 1. Elec resistance heating limited - OK - Moving into yes category
C406.2.2.3	4. Improve heating efficienty	10	10	0	☑	☐	☐	Mechanical		No less than 90 percent of the total HVAC capacity serving the total conditioned floor area of the entire building, building addition or tenant space in accordance with Section C406.1.1 shall comply with Sections C406.2.2.3.1 through C406.2.2.3.2.	7/27 - Efficiency equations need to be completed in order to confirm
~~C406.2.2.4~~	~~5. Improved Low-carbon district energy system (10% better)~~	~~11~~	~~0~~	~~0~~	☐	☐	☑			~~Not less than 90 percent of the annual service hot water and space heating load, or not less than 90 percent of the annual service hot water, space heating, and space cooling load shall meet the criteria of Section C406.2.2.4.1 or C406.2.2.4.2.~~	~~6/26 - TCF (Dan)don't have a district energy system~~
~~C406.2.2.5~~	~~6. Improved low-carbon district energy system (20% better)~~	~~33~~	~~0~~	~~0~~	☐	☐	☑			~~Not less than 90 percent of the annual service hot water and space heating load, or not less than 90 percent of the annual service hot water, space heating, and space cooling load shall meet the criteria of Section C406.2.2.5.1 or C406.2.2.5.2.~~	~~6/26 - TCF (Dan)Projects using C406.2.2.5 shall not use C406.2.2.4.~~ ~~Doesn't apply.~~
C406.2.2.6	7. High performance DOAS	39	39	0	☑	☐	☐	Mechanical	$200,000.00	No less than 90 percent of the total conditioned floor area of the whole project, excluding floor area of unoccupied spaces that do not require ventilation as specified by the International Mechanical Code, shall be served by DOAS installed in accordance with Section C403.3.5 with the following adjustments: 1. Minimum heat recovery sensible effectiveness of 80 percent, calculated in accordance with Section C403.3.5.1 2. Where design outdoor airflow is greater than 500 cfm (250 L/s), the DOAS shall be equipped with an economizer bypass, damper control, or wheel speed control that is active between 55°F (13°C) and 75°F (24°C) outdoor air temperature and minimizes energy recovery or maintains an appropriate DOAS leaving air temperature when the building is generally in cooling, based either on outdoor air temperature or a DDC zone-based cooling system reset. 3. DOAS total combined fan power shall be less than either: 3.1. 0.769 W/cfm (1.55 W/L/s) when calculated in accordance with Section C403.3.5.2. 3.2 Eighty percent of fan power allowance for a constant volume system when calculated in accordance with Section C406.8.1. This option is not available to areas served by systems utilizing Section C403.2.2.1 exception 5.	7/2 - Metrix (Eric) Would require much larger DOAS equipment and ductwork. And would need to add DOAS to big box spaces (currently planned to be high-eff VAV). Can get this but the mechanical attic sizes will need to get larger. taller and wider DOAS unites (by feet). Would need to start space planning for this now. 7/27 - TCF (JR) This seems like a lot of cost and complexity. Added space and structure will add to the 200K cost. Lets assign this as a low-priority point item and see about getting points elsewhere
C406.2.2.7	8. Fault detection & diagnostics (FDD)	6	0	6	☐	☑	☐	Mechanical	$20,000.00	A project not required to comply with Section C403.2.3 or C403.6.10(16) shall achieve energy credits for installing a fault detection and diagnostics system to monitor the HVAC system's performance and automatically identify faults. The installed system shall comply with items 1 through 6 in Section C403.2.3.	7/2 - TCF (Dan) Could pay for these points by adding software to the DDC 7/27 - TCF (JR) - This seems like a low cost item and a possible good cost/benefit. Moving into the yes column to establish a point basis.
C406.2.3.1	9. 10% reduced lighting power	16	0	16	☐	☑	☐	Electrical	$0.00	The total connected interior lighting power calculated in accordance with Section C405.4.1 shall be 90 percent or less of the lighting power values specified in Table C405.4.2(1) times the floor area for the building types, or 90 percent or less of the total interior lighting power allowance calculated in accordance with Section C405.4.2.	we'll know closer to 60% design if we can hit 20%. 7/27 - TCF (JR) Seems likely we can hit this target. Am moving into the Yes column for scoring. Ben can you confirm the logic on the likelyhood of hitting this target?
C406.2.3.2	10. 20% reduced lighting power	32	32	0	☑	☐	☐	Electrical	$0.00	The total connected interior lighting power calculated in accordance with Section C405.4.1 shall be 80 percent or less of the lighting power values specified in Table C405.4.2(1) times the floor area of the building types, or 80 percent or less of the total interior lighting power allowance calculated in accordance with Section C405.4.2.	6/26 - TCF (Dan) Projects using C406.2.3.2 shall not use C406.2.3.1. This will likely be attainable on an elementary school but should be carried as a maybe. 7/27 - TCF (JR) Ben, has there been any progress on the feasibility of this credit? If we take this credit then we will exceed our 48 point target.
~~C406.2.3.3~~	~~11. Lamp efficacy improvement~~	~~NA~~	~~0~~	~~0~~	☐	☐	☑			~~No less than 95 percent of the permanently installed light fixtures in dwelling units and sleeping units shall be provided by lamps with a minimum efficacy of 90 lumens per watt.~~	

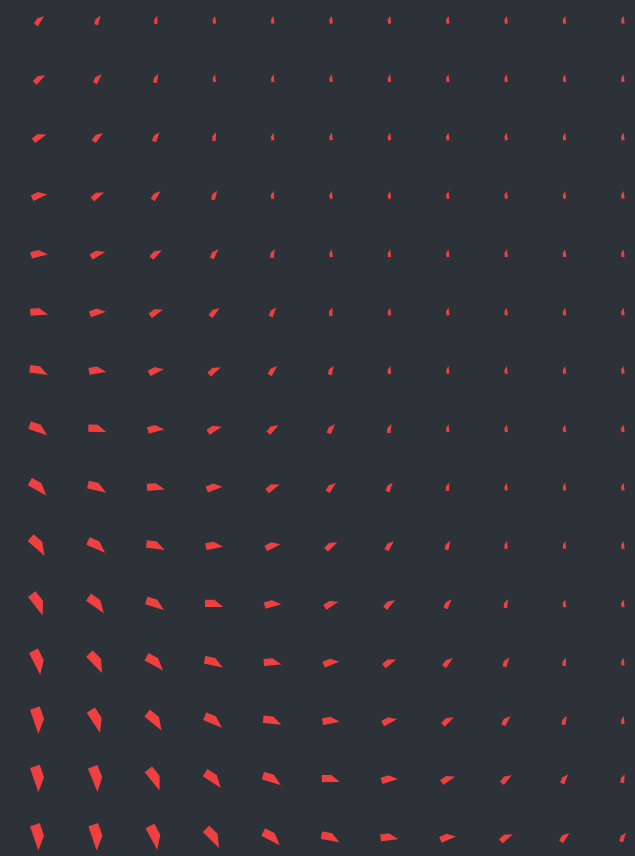
Credit Section	Section Title	Credits	Possible Credit	Accepted Credits	Maybe	Yes	No	Responsibility	Added Cost of Credit	Credit Description	Notes
~~C406.2.4.1~~	~~12. Residential lighting control~~	~~NA~~	~~0~~	~~0~~	☐	☐	☑			~~In buildings with nontransient dwelling units and sleeping units, lighting controls shall be configured to meet the following:~~ ~~1. Each dwelling unit or sleeping unit shall have a main control by the main entrance that turns off all the lights and switched receptacles in the unit. The main control shall be permitted to have two controls, one for permanently wired lighting and one for switched receptacles. The main controls shall be clearly identified as "lights master off" and "switched outlets master off."~~ ~~2. Switched receptacles shall be clearly identified and all switched receptacles shall be located within 12 inches of an unswitched receptacle. Each room shall have a minimum of two switched receptacles except bathrooms, kitchens, and closets.~~	
C406.2.4.2	**13. Enhanced lighting control**	**6**	**0**	**6**	☐	☑	☐	**Electrical**		**Measure credits shall be achieved where no less than 50 percent of the gross floor area within the project has luminaires and lighting controls that include high end trim in compliance with Section C405.2.8.3 and either luminaire-level lighting controls in compliance with Section C405.2.8.1 or networked lighting controls in accordance with Section C405.2.8.2. Where general lighting in more than 50 percent of the gross floor area complies, the base credits from Table C406.2(1) shall be prorated as follows:** **[Floor area with high end trim, %] x [Base energy credits for C406.2.4.2] / 50%**	**7/2 - Metrix - Given district's inexperience with digital controls this may not be recommended.** **Metrix: Most lighting control systems are digital/low voltage now. It isn't a big leap to go from stand-alone systems to a networked system with luminaire-level lighting control. It may be worth visiting other districts with different control systems (for example Bethel SD uses wireless nLight Air with sensors in each fixture and they are happy with it. Wireless also cuts down on labor/material cost).** **7/27 - TCF (JR) With the new controls systems being chosen this week can this credit be "firmed up". Can this feature be demoed by the lighting rep this week?**
C406.2.5	**14. Renewable energy**	**24**	**24**	**0**	☑	☐	☐	**Electrical**	**$36,000.00**	**Projects installing on-site or off-site renewable energy systems with a capacity of at least 0.1 watts per gross square foot (1.08 W/m2) of building area in addition to the renewable energy capacity required elsewhere in this code shall achieve energy credits for this measure. Renewable energy systems achieving energy credits shall not be used to satisfy other requirements of this code. Off-site renewable energy systems shall comply with Sections C411.2.2 and C411.2.3. Credits shall be prorated from the table value in accordance with Equation 4-17.**	**7/27 - TCF (JR) - Lets keep this credit in reserve if another fails through. I assume adding additional PV panels doesn't effect backbone/switchgear type infrastructure much? If not then adding additional PV panels at the last minute if we need credits may be a viable low-cost option.** **8/1 Metrix - We can size the inverter to have additional capacity built in in case we need to go this route. Does not affect backbone/switchgear sizes, just inverter and PV panel size.** **8/8 - Metrix - Additional 12 kW beyond energy code.** **Metrix: Further discussion is needed on this one, as the current scope is only going for code minimum.**
~~C406.2.6.1~~	~~15. Shower drain heat recovery~~	~~3~~	~~0~~	~~0~~	☐	☐	☑			~~Shower drain heat recovery units shall comply with Section C404.10 and preheat cold water supply to the showers. Potable waterside pressure loss shall be less than 10 psi (69 kPa) at maximum design flow. The efficiency of drain water heat recovery units shall be 54 percent in accordance with CSA B55.1. Full credits are applicable to the following building use types: Multi-family, hotel, motel, dormitory, and schools with locker room showers. Where not all showers in the project have drain heat recovery, the credit is adjusted based on the following:~~ ~~[Section C406.2.6.1 table credits] x [Showers with drain recovery] / [Total number of showers]~~	~~7/2 - Metrix -Not applicable.~~
~~C406.2.6.2~~	~~16. Service water heat revovery~~	~~14~~	~~0~~	~~0~~	☐	☐	☑			~~Not less than 30 percent of the annual service hot water heating energy use, or not less than 70 percent of the annual service hot water heating energy use in buildings with condenser water systems subject to the requirements of Section C403.9.2.1 or qualifying for one of its exceptions, shall be provided by one or more of the following:~~ ~~1. Waste heat recovery from service hot water, heat recovery chillers, building equipment, process equipment, or other approved system. Qualifying heat recovery must be above and beyond heat recovery required by other sections of this code.~~ ~~2. On-site renewable energy water-heating systems where not used to meet other requirements or to obtain other energy credits.~~	~~6/26 - TCF(Dan) Would be expensive for little return.~~
~~C406.2.6.3~~	~~17. Heat pump water heating~~	~~13~~	~~0~~	~~0~~	☐	☐	☑			~~Credit shall be achieved where the primary heat pump service water heating system is sized to deliver no less than 100 percent of the net calculated demand for service water production during the peak demand period with entering dry bulb or wet bulb outdoor air temperature at 40°F (4°C) for air-source heat pumps, or 44°F (7°C) ground temperature for ground-source heat pumps, as calculated using the equipment manufacturer's selection criteria or another approved methodology. For this credit, the net calculated demand shall be the gross building demand less any portion of the demand complying with the exceptions to Section C404.2.1. Supplemental heating is permitted in accordance with Section C404.2.1, but cannot use fossil fuels. Heat pump water heaters shall comply with one of the following:~~ ~~1. The COP rating shall be a minimum COP of 3.0 reported at the design leaving heat pump water temperature with an entering air temperature of 60°F (16°C) or lower. For water-source equipment, the COP rating will be reported at the design leaving load water temperature with an entering load water temperature of 74°F (23°C) or lower.~~ ~~2.The uniform energy factor (UEF) shall be a minimum of 3.40 rated based on U.S. Department of Energy requirements.~~	~~6/26 - TCF(Dan) These points may be expensive because this is increasing the domestic hot water heat pump capacity by ~2x code baseline, however there are only a limited number of heat pump sizes on the market so we'll have to analyze the actual cost. This is low on the list to consider doing.~~ ~~7/2 - Metrix -putting down as a no as there are better options listed as maybe above~~
~~C406.2.6.4~~	~~18. High efficiency service water heating, gas-fired~~	~~NA~~	~~0~~	~~0~~	☐	☐	☑			~~The credit achieved shall be from Table C406.2(2) where hot water is supplied by gas-fired equipment with minimum efficiency of 0.91 UEF.~~	
~~C406.2.7.1~~	~~19. Heat trace system~~	~~1~~	~~0~~	~~0~~	☐	☐	☑			~~The credit achieved shall be from Table C406.2(1). This system shall include self-regulating electric heat cables, connection kits and electronic controls. The cable shall be installed directly on the hot water supply pipes underneath the insulation to replace standby losses.~~	~~7/2 - Metrix -Would not recommend this point~~
~~C406.2.7.2~~	~~20. Point of use water heater~~	~~5~~	~~0~~	~~0~~	☐	☐	☑			~~The credit achieved shall be from Table C406.2(1) where any fixtures requiring hot water shall be supplied from a localized electric source of hot water with no recirculation or heat trace and limited to 2 kW and 6 gallons of storage. The supply pipe length from the point of use water heater to the termination of the fixture supply pipe shall be no more than 20 feet.~~	~~7/2 - Metrix - Not practical for a school~~
~~C406.2.8~~	~~21. Service hot water distribution right sizing~~	~~NA~~	~~0~~	~~0~~	☐	☐	☑			~~To achieve this credit, where Group R-1 and R-2 occupancies are served by a central service hot water system, the distribution system serving dwelling units, sleeping units and guestrooms shall be sized using Appendix M of the Uniform Plumbing Code.~~	

Credit Section	Section Title	Credits	Possible Credit	Accepted Credits	Maybe	Yes	No	Responsibility	Added Cost of Credit	Credit Description	Notes
C406.2.9	22. High performance service hot water temperature maintenance system	1	1	0	☑	☐	☐	Mechanical		Systems with multiple riser service hot water circulation systems shall use only heat pump technology for temperature maintenance. The heat pump technology shall have a minimum COP of 3.0 or UEF of 3.4. For air-source equipment, the COP rating will be reported at the design leaving heat pump water temperature with an entering dry bulb air temperature of 60°F (16°C) or lower and a relative humidity of 50 percent or lower. For water-source equipment, the COP rating will be reported at the design leaving load side water temperature with an entering source side water temperature of 74°F (23°C) or lower. The system shall comply with the requirements of Section C404.7.1.	7/27 - TCF(JR) With only 1 point available: lets make this a low priority item. With one of the lighting controls items above we could make this point obsolete.
C406.2.10	23. High efficiency service hot water circulation system	1	1	0	☑	☐	☐	Mechanical		Multiple riser service hot water circulation systems shall use a variable volume circulation pump controlled to vary the pump speed based on system demand and shall include self-actuated thermostatic balancing valves to control the system flow at each riser.	7/27 - TCF(JR) With only 1 point available: lets make this a low priority item. With one of the lighting controls items above we could make this point obsolete.
~~C406.2.11~~	~~24. Low flow residential showerheads~~	~~NA~~	~~0~~	~~0~~	☐	☐	☑			~~All showerheads installed in Group R-1 and R-2 dwelling units or sleeping units shall have a maximum listed flowrate of 1.25 gallons per minute or less at 80 psi operating pressure for fixed showerheads and a maximum listed flowrate of 1.50 gallons per minute or less at 80 psi operating pressure for handheld showerheads. When a shower is served by more than one showerhead, including handheld showerheads, the combined flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.25 gallons per minute or less for fixed or 1.5 gallons per minute or less for handheld, or the shower shall be designed to allow only one shower outlet to be in operation at a time.~~	
C406.2.12	25. Enhanced envelope performance	5	5	0	☑	☐	☐	Architecture		The Proposed Total UA of the thermal envelope of the project shall be 15 percent lower than the Allowable Total UA determined in accordance with Section C402.1.5 and Equation 4-2.	6/26 - TCF(Dan) Buildings or building areas that are exempt from the thermal envelope requirements in accordance with Sections C402.1.1 and C402.1.2, do not qualify for this package. 7/27 - TCF(JR) Our gameplan was to use prescriptive method for thermal envelope insulation. However if we "need" points then we can shift to a whole UA value. We can increase 15% by adding 1/2" of Poly Iso (7" in lieu of 6.5") and adding batt cavity insulation at walls.
~~C406.2.13.2~~	~~26. Base reduced air leakage~~	~~3~~	~~0~~	~~0~~	☐	☐	☑			~~Measured air leakage shall not exceed 68 percent of the maximum leakage allowed by Section C402.5.1.2.~~	~~6/26 - TCF - Buildings or building areas that are exempt from the thermal envelope requirements in accordance with Sections C402.1.1 and C402.1.2, do not qualify for this package.~~
~~C406.2.13.3~~	~~27. Enhanced reduced air leakage~~	~~5~~	~~0~~	~~0~~	☐	☐	☑			~~Measured air leakage shall not exceed 33 percent of the maximum leakage allowed by Section C402.5.1.2.~~	~~6/26 - TCF - Buildings or building areas that are exempt from the thermal envelope requirements in accordance with Sections C402.1.1 and C402.1.2, do not qualify for this package.~~
C406.2.14	28. Enhanced commerical kitchen equipment	30	0	30	☐	☑	☐			For buildings or areas designated as Group A-2, or facilities whose primary business type involves the use of a commercial kitchen with at least one gas or electric fryer, all fryers, dishwashers, steam cookers and ovens shall comply with all of the following: 1. Achieve the ENERGY STAR label in accordance with the specifications current as of January 1, 2022. 2. Be installed prior to the issuance of the certificate of occupancy. 3. Have the ENERGY STAR qualified model number listed on the construction documents submitted for permitting. Energy efficiency credits for efficient commercial kitchen equipment shall be determined based on Equation 4-19, rounded to the nearest whole number.	6/26 - TCF - Additional energy efficiency credits, up to the maximum shown in Table C406.2(2), shall be calculated according to Section C406.2.14.
~~C406.2.15~~	~~29. Enhanced residnetial kitchen equipment~~	~~NA~~	~~0~~	~~0~~	☐	☐	☑			~~For projects with Group R-1 and R-2 occupancies, energy credits shall be achieved where not less than 90 percent of dishwashers, refrigerators, and freezers comply with all of the following: 1. Achieve the ENERGY STAR Most Efficient label in accordance with the 2021 specifications. 2. Be installed prior to the issuance of the certificate of occupancy. For Group R-1 where only some guestrooms are equipped with both refrigerators and dishwashers, the table credits shall be prorated as follows: [Section C406.2.15 table credits] x [Floor area of guestrooms with kitchens] / [Total guestroom floor area]~~	
C406.2.16	30. Enhanced residential laundry equipment	NA	0	NA	☐	☑	☐			For projects with Group R-2 occupancies, energy credits shall be achieved where not less than 90 percent of clothes washers and dryers in the project meet the following requirements: 1. Each dwelling unit contains in-unit washing washer and dryer equipment that meets the following requirements: 1.1 Achieve the ENERGY STAR Most Efficient label in accordance with the 2021 specifications. 1.2 Be installed prior to the issuance of the certificate of occupancy. 2. Where only some dwelling units are equipped with both washers and dryers, the table credits shall be prorated as follows: [Section C406.2.16 table credits] x [Floor area of dwelling units with laundry] / [Total dwelling unit floor area]	
~~C406.2.17~~	~~31. Heat pump clothes dryers~~	~~NA~~	~~0~~	~~0~~	☐	☐	☑			~~Not less than 90 percent of domestic clothes dryers located in Group R-1 and R-2 of the whole project are ENERGY STAR rated heat pump dryers. Credit applies only to buildings where laundry facilities are provided either within each residential dwelling or sleeping units or grouped together in central multifamily use laundry rooms, or a mix of the two. To claim this credit, the building permit drawings shall specify the appliance type and provide documentation of ENERGY STAR compliance. At the time of inspection, all appliances shall be installed and connected to utilities.~~	
C406.2.18	32. Efficient elevator equipment	5	5	0	☑	☐	☐			Qualifying elevators in the building shall be Energy Efficient Class A in accordance with ISO 25745-2, Table 7. Only buildings three or more floors above grade shall be permitted to use this credit. Credits shall be prorated based on Equation 4-18, rounded to the nearest whole credit. Projects with a compliance ratio (CRe in Equation 4-18) below 0.5 do not qualify for this credit.	
	TOTAL CREDITS & COST		117	62	☐	☐	☐		$256,000.00		

Credit Section	Section Title	Credits	Possible Credit	Accepted Credits	Maybe	Yes	No	Responsibility	Added Cost of Credit	Credit Description	Notes
TABLE C406.3 LOAD MANAGEMENT MEASURE CREDITS	**TITLE**	**AVAIL. CREDITS**	**POSSIBLE CREDITS**	**ACCEPTED CREDITS**	☐	☐	☐			**CREDIT DESCRIPTION**	
~~C406.3.1~~	~~1. Lighting load management~~	~~15~~	~~0~~	~~0~~	☐	☐	☑			~~Automatic controls shall be capable of gradually reducing general lighting power with continuous dimming in 75 percent of the building area by at least 20 percent during peak demand periods. Where less than 75 percent, but at least 50 percent, of the building area lighting is controlled, the credits from Table C406.3 shall be prorated as follows:~~ ~~[Area of building with lighting load management, %] × [Table credits for C406.3.1] 75%~~ ~~EXCEPTION: Warehouse or retail storage building areas shall be permitted to achieve this credit by switching off at least 25 percent of lighting power in 75 percent of the building area without dimming.~~	~~7/2 - Metrix: Electrical has not implemented this yet, but possible and should be discussed if load management is a desire of the Owner.~~ ~~7/27 - TCF(JR) Lets keep this as our secondary option if the HVAC load management option falls through. If this is just pure management of software options perhaps we consider this option as well.~~
C406.3.2	**2. HVAC load management**	**23**	**0**	**23**	☐	☑	☐			**Automatic controls shall:** **1. Where electric cooling is used, be configured to gradually increase, over a minimum of three hours, the cooling setpoint by at least 3°F during the summer peak periods.** **2. Where electric heating is used, be configured to gradually reduce, over a minimum of three hours, the heating setpoint by at least 3°F during winter peak periods.**	**7/2 - Metrix (Eric) Would be fairly simple to implement mechanically.** **7/27 - TCF(JR) - If this is a simple one then lets use this as our primary strategy. Meeting this single item will meet the requirements for load management.** **Note- am moving to yes column**
~~C406.3.3~~	~~3. Automated shading~~	~~16~~	~~0~~	~~0~~	☐	☐	☑			~~Where fenestration on south and west exposures exceeds 20 percent of the wall area, automatic controls shall be configured to operate movable exterior shading devices or dynamic glazing to reduce solar gain through sunlit fenestration on southern and western exposures by at least 50 percent during summer peak periods.~~ ~~Informative Note:~~ ~~This credit can be met by exterior roller, movable blind or movable shutter shading devices; however, fixed overhang, screen or shutter shading will not meet the requirement. Roller shades that reject solar gain but still allow a view are allowed as long as they provide an effective 50 percent reduction in net solar gain (e.g., have a shading coefficient of less than 0.5 for the shading material itself). Interior shading devices will not meet the requirement. Electrochromic windows that achieve 50 percent of SHGC would qualify.~~	
~~C406.3.4~~	~~4. Electric energy storage~~	~~72~~	~~0~~	~~0~~	☐	☐	☑			~~Automatic controls shall store electricity in electric storage devices during nonpeak periods and use stored energy during peak periods. Electric storage devices shall have a minimum capacity of 5 Wh/ft2 (58 Wh/m2) of gross building area. For greater storage capacity up to 15 Wh/ft2 (160 Wh/m2), credits shall be prorated as follows:~~ ~~[Installed electric storage capacity, Wh/ft2] × [C406.3.4 credits from Table C406.3]~~	~~7/2 - Metrix - Metrix: These are very expensive and would most likely be cost prohibitive to the project. Lead times are also an issue.~~
~~C406.3.5~~	~~5. Cooling energy storage~~	~~19~~	~~0~~	~~0~~	☐	☐	☑			~~Automatic controls shall be capable of activating ice or chilled water storage to reduce peak period electric demand. Credits shown in Table C406.3 are based on storage capacity of 2 ton-hours per design day ton of cooling load (2 kWh per design day kW) with a 1.15 sizing factor. Credits shall be prorated for installed storage systems sized between 0.5 and 3.5 ton-hours per design day ton (kWh per design day kW) of cooling load rounded to the nearest whole credit. The storage tank shall have no more than 1.5 percent of storage capacity standby loss per day.~~	
~~C406.3.6~~	~~6. Service hot water energy storage~~	~~8~~	~~0~~	~~0~~	☐	☐	☑			~~To achieve this credit, where service hot water is heated by electricity, automatic controls shall preheat stored service hot water before the peak period and suspend electric water heating during the peak period. Storage capacity shall be provided by either:~~ ~~1. Preheating water above 140°F (60°C) delivery temperature with at least 1.34 kWh of energy storage per kW of water heating capacity. Tempering valves shall be provided at the water heater delivery location.~~ ~~2. Providing additional heated water tank storage capacity above peak service hot water demand with equivalent peak storage capacity to item 1.~~	
~~C406.3.6~~	~~7. Building thermal mass~~	~~95~~	~~0~~	~~0~~	☐	☐	☑			~~To achieve this credit, the building shall have both additional passive interior mass and a night-flush control of the HVAC system.~~ ~~1. Interior to the building thermal envelope insulation, provide 15 pounds of passive thermal mass per square foot of building floor area. Mass construction shall be in the building interior and the indoor facing portion of the exterior wall, and interior floor construction. Mass construction shall have mass surfaces in direct contact with the air in conditioned spaces with directly attached wall board or hard surface flooring allowed. Mass with carpet or furred wallboard shall not be counted toward the building mass required. For integral insulated concrete block walls complying with ASTM C90, only the mass of the interior face shall be counted toward the building mass required.~~ ~~2. When summer mode is active and indoor average temperature is 5°F (3°C) or more above outdoor temperature and between 10:00 p.m. and 6:00 a.m., automatic night flush controls shall operate outdoor air economizers at low fan speed less than 66 percent during the unoccupied period until the average indoor air temperature falls to the occupied heating setpoint. Summer mode shall be activated when outdoor air exceeds 70°F (21°C) and continues until deactivated when outdoor air falls below 45°F (7°C). Another night flush strategy shall be permitted where demonstrated to be effective, avoids added morning heating and is approved by the code official.~~ ~~Informative Note:~~ ~~The simplified night flush sequence described will operate in "summer mode" below the 70°F outdoor air trigger temperature down until outdoor air of 45°F is hit when the "summer mode" is deactivated until the outdoor air temperature rises above 70°F again. Other strategies may be implemented that cool the space below the heating setpoint and adjust the morning heating setpoint to avoid morning reheating.~~	
	TOTAL CREDITS & COST	**248**	**0**	**23**	☐	☐	☐		**$0.00**		
			Possible Credits	**Accepted Credits**	☐	☐	☐		Total Cost Implications	**Credit Requirements**	
	Total Credits for Table 406.2 Efficiency		**117**	**62**	☐	☐	☐		$256,000.00	48 Credits Minimum Required	
	Total Credits for Table 406.3 Management Measurement		**0**	**23**	☐	☐	☐		$0.00	15 Credits Minimum Required	

TCF

VII. Preliminary Reports



HALEY ALDRICH

www.haleyaldrich.com

GEOTECHNICAL ENGINEERING REPORT
NEW ABERDEEN SOUTH ELEMENTARY SCHOOL
ABERDEEN, WASHINGTON

by
Haley & Aldrich, Inc.
Vancouver, Washington

for
Aberdeen School District No. 5
Aberdeen, Washington

DRAFT

File No. 0211414-003
June 2026

HALEY & ALDRICH, INC.
300 West 15th Street
Vancouver, WA 98660
360.448.4189

June 15, 2026
File No. 0211414-003

Aberdeen School District No. 5
216 North G Street
Aberdeen, Washington 98520

Attention: Lynn Green, Superintendent

Subject: Geotechnical Engineering Report
New Aberdeen South Elementary School
North of Franklin Drive at Glencoe Way
Aberdeen, Washington

Dear Lynn Green:

Haley & Aldrich, Inc. (Haley & Aldrich) is pleased to submit this report to Aberdeen School District No. 5 (District) summarizing our design-level geotechnical engineering services for design of the new South Elementary School (site) in Aberdeen, Washington. Our services were completed in general accordance with our agreement dated November 19, 2025 and executed December 19, 2025.

We understand the District is planning to construct a new elementary school campus located North of Franklin Drive at Glencoe Way in Aberdeen. The proposed two-story school structure will occupy the elevated southern portion of the site and will house classrooms, a gymnasium, and administrative spaces. The planned structure will have a ground-level finish floor elevation (El.) of 110.5 feet. A sports field is planned to the east of the school structure, and parking lots are planned to the west. A stormwater detention basin is planned to the north of the school. The main site entrance will be from Franklin Drive to the south, with a secondary entry on Lomax Street to the west.

Primary geotechnical conditions affecting the design and construction of the planned facilities include seismic hazards such as: very strong seismic shaking, liquefaction, and seismic-induced slope instability; shallow perched groundwater conditions in some portions of the site; and the presence of shallow, native fine-grained soils with high expansion potential within the proposed zones of excavation and underlying the proposed structure. These conditions may be mitigated or accommodated by utilizing various methods of ground improvement. We recommend that the proposed structure be supported on spread footings bearing on new structural fill or on aggregate piers extending to dense sands and gravels, typically located approximately 10 to 20 feet below the proposed finish floor elevation. Mitigation of liquefaction and lateral spread may be achieved via construction of a deep soil mix buttress to resist seismic-induced lateral movements. Our recommendations regarding foundations, ground improvement, site grading, pavements, and other geotechnical aspects of this project are presented in this report.

DRAFT

Thank you for the opportunity to perform these services for you. Please do not hesitate to contact us if you have any questions or comments.

Sincerely yours,
HALEY & ALDRICH, INC.

Kayla Ahrens, P.E.
Project Geotechnical Engineer

Micah D. Hintz, P.E.
Senior Project Manager

Daniel J. Trisler, P.E.
Principal Geotechnical Engineer

Enclosures

https://haleyaldrich.sharepoint.com/sites/AberdeenSchoolDistrictNo.5/Shared Documents/0211414.Aberdeen SD School Relocations/-003 South Elementary/Deliverables In-Basket/Geotech Report/2026_0615_HAI_AberdeenSElem_GeotechRprt_D.docx

DRAFT

HALEY & ALDRICH, INC.
300 WEST 15TH STREET
VANCOUVER, WA 98660
360.448.4189

SIGNATURE PAGE FOR

GEOTECHNICAL ENGINEERING REPORT
NEW ABERDEEN SOUTH ELEMENTARY SCHOOL
ABERDEEN, WASHINGTON

PREPARED FOR
ABERDEEN SCHOOL DISTRICT NO. 5
ABERDEEN, WASHINGTON

PREPARED BY:

Kayla Ahrens, P.E.
Project Geotechnical Engineer
Haley & Aldrich, Inc.

REVIEWED AND APPROVED BY:

Micah D. Hintz, P.E.
Senior Project Manager
Haley & Aldrich, Inc.

Daniel J. Trisler, P.E.
Principal Geotechnical Engineer
Haley & Aldrich, Inc.

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1. Introduction

Haley & Aldrich, Inc. (Haley & Aldrich) is pleased to present this report to Aberdeen School District No. 5 (District) summarizing the results of our geotechnical field explorations, testing, and engineering analyses completed for the design of a new Aberdeen South Elementary School (site) in Aberdeen, Washington.

The site is located north of Franklin Drive near Glencoe Way in southern Aberdeen, as shown on Figure 1. The proposed school site is undeveloped forested land. The site is bounded by housing developments to the west and south, and by undeveloped land to the north and east.

Our understanding of the new school and campus layout is primarily based on our conversations with TCF Architects (project architect) and LDC Corp (project civil engineer). The proposed two-story school structure will occupy the elevated southern portion of the site and will house classrooms, a gymnasium, and administrative spaces. The planned structure will have a ground-level finish floor at elevation (El.) 110.5 feet. A sports field is planned to the east of the school structure, and parking lots are planned to the west. A stormwater detention basin is planned to the north of the school. The main site entrance will be from Franklin Drive to the south, with secondary drive access via Lomax Street to the west.

We understand the project will be designed according to the provisions of the Washington State Building Code 2024 and the associated technical guidance of the American Society of Civil Engineering (ASCE) 7-22.

Haley & Aldrich previously investigated site subsurface conditions and provided preliminary recommendations for site development in a Preliminary Geotechnical Report dated February 26, 2025 (Haley & Aldrich, 2025). In the Preliminary Geotechnical Report, we concluded that site soils subjected to strong seismic shaking will be vulnerable to liquefaction-induced settlement, loss of soil strength and bearing capacity, and global slope instability. Supplemental geotechnical studies were recommended to further characterize site conditions and provide design-level recommendations for the new school campus.

This report contains the findings and results from our prior and supplemental geotechnical explorations and analyses, and provides recommendations for design and construction of the proposed school campus. This report supersedes all discussions and recommendations in the Preliminary Geotechnical Report. The report is divided into several sections. The first section provides an overview of the project information discussed in the text and the main body of the report presents our geotechnical engineering findings and recommendations in detail. The report is organized as follows:

- Introduction;
- Scope of Services;
- Site Conditions;
- Geologic and Seismic Hazards;
- Conclusions;
- Geotechnical Design Recommendations;
- Drainage Design Recommendations;

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- Pavement Design and Considerations;
- Earthwork Recommendations;
- Limitations; and
- References.

Following the main text are eleven figures and five appendices. Figure 1 shows the location of the site. Figures 2 and 3 show the general site topography and features with the locations of explorations, with Figure 2 showing existing conditions and Figure 3 showing an overlay of proposed improvements. Figure 4 is a soil map and Figure 5 shows the regional geology. Figures 6 through 11 show interpretations of subsurface conditions across five cross sections drawn through the proposed school site. Supporting information is provided in the appendices. Appendix A contains site subsurface exploration logs, and Appendix B contains the results of laboratory testing completed for our analyses. Appendix C presents the report of geophysical testing performed to support the classification of shear wave velocity. Appendix D includes groundwater monitoring data from two monitoring wells installed onsite. Appendix E presents slope stability analysis results.

All elevations shown on the figures and this report text are in North American Vertical Datum of 1988 (NAVD 88) unless otherwise noted.

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2. Scope of Services

The purpose of our geotechnical services was to evaluate the site's subsurface soil and groundwater conditions to aid in planning and design of the proposed school campus. The scope of services for this project were outlined in our agreement dated November 19, 2025 and executed December 19, 2025, which included the following tasks:

- Conducted a field exploration program that included:
  - drilling eight mud rotary borings to collect soil samples and log conditions to depths ranging from approximately 16.5 to 50 feet below ground surface (bgs);
  - installing two groundwater monitoring wells in select borings to maximum screened depths of 15 and 43 feet deep;
  - conducting four dynamic cone penetrometer (DCP) tests to support design of new asphalt concrete pavements along the southern portion of the site and the proposed parking area to the west;
  - drilling four hand-auger borings, each adjacent to a DCP location, to log near-surface soil conditions in the proposed parking and driveway areas; and
  - conducting geophysical surface wave testing to develop a deep shear wave velocity profile and determine the seismic site class in conformance with ASCE 7-22.
- Installed a pressure transducer with an integrated data logger into each monitoring well to monitor long-term groundwater levels.
- Completed a program of geotechnical laboratory testing on select soil samples to evaluate engineering properties of the soils.
- Conducted engineering analyses to update geotechnical design recommendations for seismic design criteria, foundations, earthwork, and construction considerations included in our Preliminary Geotechnical Report.
- Prepared this report outlining our findings and recommendations, including information related to:
  - seismic hazards, including liquefaction and seismic settlement potential;
  - earthquake ground motions;
  - vertical and lateral foundation design parameters;
  - ground improvement recommendations;
  - pavement sections for on-site parking lots and drive aisles;
  - temporary shoring; and
  - earthwork and foundation construction guidelines.
- Provided project management and support services, including coordinating staff and subcontractors and conducting telephone consultations and email communications with you and the design team.

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3. Site Conditions

3.1 SURFACE CONDITIONS

The site is currently undeveloped and is occupied by grasses and low brush in its western portion, and tree cover in its central and eastern portions. Historical photos indicate that nearly the entire site had heavy tree coverage as recently as 2018, before performance of timber harvesting. Site topography is defined by a northern lowland area that increases in elevation to the south. The northern lowlands (where no improvements are currently planned) have a low elevation at about El. 14 feet. Elevations increase to the south at inclinations as steep as approximately 3 horizontal to 1 vertical (3H:1V) before reaching the site's highest elevations on a southern plateau at El. 115 to 125 feet. A second, relatively smaller plateau is located just north of the southernmost plateau at an average elevation of El. 80 feet.

The Chehalis River is located about 0.7 miles north of the site. The bay of Grays Harbor begins approximately 2.8 miles west of the site, at the mouth of the Chehalis River. The Pacific Ocean is about 18.5 miles to the west of the site, beyond the northern peninsula of Grays Harbor.

3.2 GEOLOGIC AND SOIL MAPPING

The site is mapped in Logan (1987) as Quaternary alluvium (Qal) described as "silt, sand, and gravel deposited in streambeds and fans," the surface of which is "relatively undissected". In mapping that starts at the northern portion of the site, Rau (1986) describes Quaternary deposits (Qd) at the floor of river valleys as undifferentiated "alluvium and glacial drift," the latter of which is described as "outwash and gravel deposits". Logan (1987) maps Quaternary terraced sediments, undifferentiated (Qtr), approximately 0.5 miles southeast of the site that are described as "iron-stained pebble gravel to laminated fine sand and clay with cross-bedded gravel and local peat layers". The terraced sediments represent older alluvium and "uplifted coastal marine and estuarine deposits" with the best-preserved surfaces found between El. 80 and 120 feet (Logan, 1987); more deeply dissected terraces are between El. 220 to 240 feet, and between El. 520 to 560 feet (site elevations range from El. 17 to 125 feet). Geologic mapping is shown on Figure 5. Our explorations in the southern "upland" portion of the site encountered materials more similar in appearance to the terraced deposits rather than alluvium as mapped by Logan (1987).

The mapping also indicates that the alluvium and terraced deposits are likely underlain by marine sedimentary rocks assigned to the Miocene Montesano Formation. This formation is described as predominantly silty coarse- to fine-grained sandstone with "local to widespread conglomerate, siltstone, and mudstone" that is generally blue-gray where fresh and orange-brown where weathered (Logan, 1987). Several of our explorations encountered dense, rock-like materials between approximately 35 to 70 feet bgs, which are likely part of this sedimentary rock formation.

Near-surface site soils are mapped by the U.S. Department of Agriculture (USDA) in the *Soil Survey of Grays Harbor County Area, Pacific County, and Wahkiakum County* (Pringle, 1986), as compiled in the Web Soil Survey (USDA, 2025) as Calawah silt loam, Mopang silt loam, and Ocosta silty clay loam from least to most extensive, respectively. Distribution of site soils appears to be correlated with elevation and slope, with Calawah soils mapped at the southern end of the site on the upper elevation terrace, Ocosta soils in the low-elevation and level northern half of the site, and Mopang soils mapped along the

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steep north-facing slope located between the upper and lower portions of the site, as shown on Figure 4. The physical properties of each soil type are summarized below.

- Calawah silt loam, 1 to 8 percent slopes, is described as a very deep, well-drained soil found on high terraces and derived from "glaciofluvial sediments and valley fill of mixed origin" (Pringle, 1986). The typical soil profile generally comprises 16 inches of medial silt loam (United Soil Classification System [USCS]: MH, OL, ML, OH) overlying silt loam (USCS: MH, ML) to 60 inches. Depth to water in this soil type is typically greater than 80 inches and the soil is assigned to hydrologic soil group B, which are soils that generally have moderate infiltration and water transmission rates. The estimated saturated hydraulic conductivity values range from 0.6 to 2 inches per hour. The risk of corrosion is rated as "high" for uncoated steel and "moderate" for concrete with typical effective cation-exchange capacity ranging from 45 to 70 milliequivalents per 100 grams of soil (meq/100g).
- Mopang silt loam, 5 to 30 percent slopes and 30 to 65 percent slopes, is a deep, well-drained soil found on the "ground moraines of uplands" and formed in old alluvium deposited over glacial drift (Pringle, 1986). The typical soil profile generally comprises 6 inches of silt loam (USCS: OH, ML, OL, MH) overlying silty clay loam (USCS: MH, ML) to 43 to 46 inches, very gravelly silt loam (USCS: GM) to 51 to 54 inches, and cemented extremely gravelly silt loam (USCS: GM) to 60 inches. Depth to water in this soil type is typically greater than 80 inches with a cemented horizon at 40 to 60 inches. The hydraulic conductivity of this limiting layer is very low to moderately low, with a saturated hydraulic conductivity less than 0.06 inches per hour. However, the soil is assigned to hydrologic soil group B, which are soils that generally have moderate infiltration and water transmission rates. The risk of corrosion is rated as "high" for both uncoated steel and concrete with typical effective cation-exchange capacity ranging from 10 to 60 meq/100g.
- Ocosta silty clay loam soils are very deep, poorly drained soils formed in clayey alluvium deposited in coastal bays and found on level plains and deltas protected from tidal overflow (Pringle, 1986). The typical soil profile generally comprises 12 inches of silty clay loam (USCS: CL) overlying silty clay (USCS: MH, CH) to 20 inches, and clay (USCS: CH) to 60 inches. Depth to water in this soil type is about 12 to 35 inches. The hydraulic conductivity of this soil is very low with a saturated hydraulic conductivity of 0.0 inches per hour. Subsequently, the soil is assigned to hydrologic soil group D, which are soils that generally have very slow infiltration and water transmission rates and high runoff potential. The risk of corrosion is rated as "high" for both uncoated steel and concrete with typical effective cation-exchange capacity ranging from 25 to 40 meq/100g.

Based on our explorations, the soils identified as "native" soils in our exploration logs are generally similar to those described in the geologic and soil mapping.

3.3 SUBSURFACE CONDITIONS

3.3.1 General

Conclusions and recommendations in this report are based on subsurface conditions interpreted from explorations completed for our current study and previous geotechnical study. We also considered soil properties inferred from field and laboratory test results from each study. The locations and depths of our explorations were selected considering the site features, under the constraints of surface access, time, and budget.

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Our preliminary geotechnical study included an exploration program consisting of drilling three borings in the southern portion of the site. These explorations (designated B-1 through B-3) were performed between December 18 to 19, 2024 using mud rotary drilling techniques, with borings reaching final depths of approximately 50 to 70 feet bgs.

The current exploration program performed to support design-level efforts was primarily focused on gathering additional subsurface data in the areas within and surrounding the proposed school building footprint and in the previously unexplored areas north of the topographic bench in the middle of the site. Haley & Aldrich executed this design-level exploration program between January 12 and 16, 2026 by drilling borings, installing groundwater monitoring wells, performing geophysical testing, and conducting DCP testing, including the following tasks:

- Eight borings were drilled (designated B-4 through B-11) to depths ranging from approximately 16.5 to 51.5 feet bgs using mud rotary techniques.
- Two monitoring wells were constructed within borings B-10 and B-11 to monitor groundwater levels. Monitoring well MW-1 was constructed within B-10 and was screened between depths of 23 and 43 feet bgs. Monitoring well MW-2 was constructed within B-11 and was screened between depths of 5 and 15 feet bgs. Each monitoring well was fitted with a pressure transducer and data logger to collect water level readings over time.
- Non-invasive multichannel analysis of surface waves (MASW) and refraction microtremor (ReMi) geophysical testing was performed along one test transect within the proposed school footprint. The primary purpose of this testing was to develop shear wave velocity data to support site class designation and provide seismic design values in conformance with ASCE 7-22.
- DCP tests and hand auger borings were performed to investigate shallow subsurface conditions in the southern and westernmost portions of the site. These explorations (designated DCP-1 through DCP-4 and HA-1 through HA-4) were performed to depths of approximately 1 to 6 feet bgs in unpaved areas coinciding with proposed pavement improvements.

Our field exploration procedures and exploration logs from the current study and the 2024 preliminary study are in Appendix A. Laboratory soil testing procedures and results are in Appendix B.

3.3.2 Soil Conditions

The materials encountered in the majority of explorations generally consist of fine-grained terraced deposits which are composed of very loose to loose silty sand and soft silt and elastic silt with varying amounts of sand, underlain by coarse-grained terraced deposits that generally consist of medium dense to very dense silty sand with gravel and medium dense to very dense gravel with silt and sand underlain at depth by sandstone of the Montesano Formation. In several borings, a layer of very loose to medium dense silty sand was encountered interbedded in the coarse-grained terraced deposits. The surficial topsoil in the southern portion of the site typically consists of organic-rich topsoil and forest duff consisting of silt and silty sand with rootlets to depths of approximately 12 to 24 inches.

Based primarily on boring B-8, near-surface soil conditions in the lower-elevation areas at the northern portion of the site consist of approximately 3 inches of organic-rich forest duff underlain by several feet of silty gravel fill. Native materials underlying the fill consist of approximately 15 feet of soft to medium stiff alluvial deposits composed of elastic silt and organic silt before grading to approximately 10 feet of coarse-grained alluvium above the contact with sandstone of the Montesano Formation at approximately 35 feet bgs.

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For the purpose of engineering analyses, we grouped subsurface materials into seven Engineering Soil Units (ESUs). Soil and rock encountered our explorations were categorized based on consistency, soil classification, SPT $N_{1(60)}$ blow counts, and interpreted friction angles. The breakdown of the ESUs is described below.

- ESU 1a: Silt and Elastic Silt;
- ESU 1b: Upper Silty Sand;
- ESU 2a: Sand Terraced Deposits;
- ESU 2b: Gravel Terraced Deposits;
- ESU 3: Lower Silty Sand;
- ESU 4: Alluvium; and
- ESU 5: Montesano Formation.

These ESUs are discussed in detail in the following sections.

3.3.2.1 ESU 1a – Silt and Elastic Silt

This ESU generally consists of soft to stiff silt and elastic silt with varying amounts of sand and trace gravel. This unit was encountered at variable depths across the site but was generally limited to the upper 20 to 25 feet bgs at each exploration location. In the area of the proposed school structure in the southern portion of the site, the thickness of this unit decreases from east to west. The SPT "blow count" for samples of this material ranged from 0 (weight of hammer) to 15 blows per foot (bpf), with an average of 5 bpf. This unit is occasionally interbedded with ESU 1b. This ESU is considered to be weak, compressible, and susceptible to earthquake-induced cyclic softening where saturated.

Laboratory testing performed on select samples indicated in situ moisture contents typically range between 43 and 92 percent. Grain size analyses were performed on select samples, with reported fines contents ranging between approximately 72 and 89 percent. Plasticity indexes of this material ranged from 6 to 31.

3.3.2.2 ESU 1b – Upper Silty Sand

This unit is characterized by very loose to medium dense silty sand with varying amounts of gravel. This unit was encountered at variable depths and thickness across the site and is in instances interbedded with ESU 1a. The depth ranges where this ESU was encountered at each exploration are summarized in Table 1. SPT blow counts in this ESU ranged from 3 to 17 bpf, with an average of 6. This ESU is considered to be weak and susceptible to earthquake-induced liquefaction where saturated.

Laboratory testing performed on select samples indicated in situ moisture contents generally ranged between 16 and 74 percent. Grain size analyses were performed on select samples and indicated the gravel content ranged between approximately 0 and 17 percent and the fines content ranged between approximately 17 and 49 percent.

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3.3.2.3 ESU 2a – Sand Terraced Deposits

This ESU generally consists of medium dense to very dense silty sand with varying amounts of gravel. This unit was encountered at variable depths across the site and is interbedded with ESU 2b. These depths are summarized in Table 1. SPT blow counts in this ESU ranged from 15 to 50 blows per 3-inches, with an average of 56 bpf. This ESU has low compressibility and is not considered to be susceptible to earthquake-induced liquefaction.

Laboratory testing performed on select samples indicated in situ moisture content generally ranged between 13 and 43 percent. Grain size analyses were performed on select samples and indicated the gravel content ranged between approximately 0 and 37 percent and the fines content ranged between approximately 10 and 32 percent.

3.3.2.4 ESU 2b – Gravel Terraced Deposits

This unit is charactered by medium to very dense silty gravel with varying amounts of sand. This unit was encountered at variable depths across the site and is interbedded with ESU 2a. These depths are summarized in Table 1. SPT blow counts in this ESU ranged from 11 to 99 blows per 11-inches, with an average of 66 bpf. This ESU has low compressibility and is not considered to be susceptible to earthquake-induced liquefaction.

Laboratory testing performed on select samples indicated in situ moisture content generally ranged between 17 and 24 percent. Grain size analyses were performed on select samples and indicated the gravel content ranged between approximately 30 and 49 percent and the fines content ranged between approximately 10 and 32 percent.

3.3.2.5 ESU 3 – Lower Silty Sand

This ESU generally consists of very loose to medium dense silty sand. This unit was encountered at variable depths across the site and is typically interbedded with ESUs 2a and 2b. These depths are summarized in Table 1. SPT blow counts in this ESU ranged from 2 to 14 bpf, with an average of 10 bpf. This ESU is considered to be weak and susceptible to earthquake-induced liquefaction where saturated.

Laboratory testing performed on select samples indicated in situ moisture content generally ranged between 27 and 43 percent. Grain size analyses were performed on select samples and indicated the fines content ranged between approximately 20 and 35 percent.

3.3.2.6 ESU 4 – Alluvium

This ESU generally consists of soft to stiff elastic silt and organic silt. This unit is present in the low-lying areas in central and northern portions of the site and was only encountered in boring B-8 between depths of 4 and 20 feet bgs. SPT blow counts in this ESU ranged from 2 to 10 bpf, with an average of 6 bpf. This ESU is considered to be weak, compressible, and susceptible to earthquake-induced cyclic softening where saturated.

Laboratory testing performed one sample from our explorations indicated in situ moisture content within a sample of organic soil from this unit was in excess of approximately 500 percent.

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3.3.2.7 ESU 5 – Montesano Formation

This unit is characterized as fresh, blue-gray sandstone with a rock strength designation of R0 (weak rock). This unit was encountered in three of our borings at depths ranging from 29 to 68 feet bgs. This ESU is considered to be strong, generally incompressible, and not susceptible to earthquake-induced liquefaction.

3.3.2.8 ESU Summary

The depths at which each unit was encountered are summarized in Table 1.

Table 1. Depth Ranges of ESUs Encountered in Each Exploration

Exploration	Depth Range Encountered (feet, bgs)						
	ESU 1a	ESU 1b	ESU 2a	ESU 2b	ESU 3	ESU 4	ESU 5
B-1	15 to 25	1.3 to 15	35 to 51.5	28.5 to 35	25 to 28.5	--[1]	--[1]
B-2	1 to 20	20 to 23.5	29 to 65	23.5 to 29 65 to 68	--[1]	--[1]	68 to 70.5
B-3	0 to 3 8 to 13	3 to 8	13 to 25	25 to 28.5 45 to 50.5	28.5 to 45	--[1]	--[1]
B-4	0.7 to 13	--[1]	13 to 21.5	--[1]	--[1]	--[1]	--[1]
B-5	1 to 10.5	--[1]	10.5 to 25 35 to 37	30 to 35 37 to 47	25 to 30	--[1]	--[1]
B-6	0.7 to 10	10 to 15	15 to 20 25 to 30 45 to 50	20 to 25 30 to 35 50 to 50.4	35 to 45	--[1]	--[1]
B-7	--[1]	0 to 3	10 to 15 25 to 35	3 to 10 15 to 25	--[1]	--[1]	35 to 40.4
B-8	--[1]	--[1]	25 to 35	--[1]	20 to 25	4 to 20	29 to 49.4
B-9	0.4 to 25.5	--[1]	30 to 30.5	25.5 to 30 30.5 to 31	--[1]	--[1]	--[1]
B-10	1 to 11	--[1]	12.5 to 16.5	11 to 12.5	--[1]	--[1]	--[1]
B-11	0.8 to 7.5	7.5 to 10.5	15 to 25 30 to 35	10.5 to 15 25 to 30 44 to 51.5	35 to 44	--[1]	--[1]

Notes:

1. *ESU not identified in exploration.*
2. *Forest duff and organics not included in ESU depth ranges.*

3.3.3 Groundwater

Groundwater was identified at depths of approximately 4 to 4.5 feet bgs in borings B-10 and B-11, respectively, at the time of drilling; this is equivalent to approximately El. 121 and 116 feet, respectively.

Two monitoring wells were installed as part of our January 2026 exploration program. Well MW-1 was installed within boring B-10, with a screened interval ranging from 5 to 15 feet bgs, or approximately El. 120 to 110 feet. The second well, designated MW-2, was installed within boring B-11, with a screened interval ranging from 23 to 43 feet bgs, or approximately El. 98 to 78 feet. These wells were installed to determine the depth of the groundwater table and provide substantiating data regarding the presence of a perched water layer above ESU 1a materials.

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Wells MW-1 and MW-2 were each fitted with a pressure transducer and data logger immediately following well installation, to continuously collect groundwater level information in each well over time. Based on data collected between January 16 and March 25, 2026, the depth to groundwater at MW-1 ranged from approximately 3 to 7 feet bgs, with an average of 5 feet bgs, or roughly El. 120 feet. At MW-2, the reported depth to groundwater over the two-month monitoring period was initially approximately 5 feet bgs. However, approximately two weeks after monitoring began, the depth to water dropped to approximately 34 feet bgs, rebounding to about 29 feet bgs by mid-February. Post-construction well development was not performed at MW-2 and we speculate that the high initial water elevation at MW-2 may have been caused by temporary clogging of the well screen with fines. Over a period of several weeks, a conduit was formed through the fines and hydraulic head rapidly normalized to the groundwater table elevation at greater depths. Therefore, we conclude a perched water layer is present within ESU 1A materials and the local groundwater table underlying the proposed structure and adjacent improvements is deeper at approximately El. 91 feet. Plots depicting groundwater level readings at MW-1 and MW-2 are presented in Appendix D.

For our seismic hazard analyses, we assumed groundwater to be present at El. 91 feet within the limits and nearby vicinity of the proposed school structure. Perched water conditions at higher elevations are considered to be present in localized areas; we assume this perched layer is present for engineering analyses and recommendations pertaining to design aspects including site retaining walls and earthwork.

3.3.4 Soil Corrosivity

We performed three suites of corrosivity tests on samples of site soils collected from borings B-2, B-9, and B-10 at depths ranging from 5 to 15 feet bgs. The samples had reported pH levels of 5.31, 5.4, and 7.0, indicating slightly acidic to neutral pH conditions. Minimum electrical resistivity measurements ranged from 5,130 to 29,436 ohm-centimeters. Low chloride and sulfate levels were detected, with peak concentrations of 6 and 39 parts per million (ppm), respectively. These soils are considered corrosive to buried iron, steel, mortar-coated steel, and reinforced concrete structures. Refer to the corrosivity analysis letter prepared by Cerco Analytical in Appendix B for more information.

3.4 INFILTRATION

Haley & Aldrich conducted laboratory grain-size distribution testing on representative soil samples collected from our borings, as presented in Appendix B. We used the results of the testing to develop a first-order estimate of the saturated hydraulic conductivity (K_{sat}) of site soils using empirical relationships with grain size, as described in the 2024 Washington State Department of Ecology (Ecology) Stormwater Management Manual for Western Washington, which uses methods described by Massmann (2008).

The estimated saturated hydraulic conductivities of 13 samples distributed across the site are presented in Table 2. Where proposed infiltration features are specified for design, we recommended that additional infiltration analyses be conducted, preferably including field infiltration tests.

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Table 2. Initial Hydraulic Conductivity Estimates					
Boring/ Sample	**Depth (feet bgs)**	**ESU**	**USCS Classification**	**Percent Fines**	**Estimated, Unfactored K_{sat} (in/hr)**
B-5/S-3	15	2a	Well Graded Sand with Silt and Gravel (SW-SM)	12	70.4
B-5/S-5	25	3	Silty Sand (SM)	31	<0.1
B-5/S-6	30	2b	Poorly Graded Gravel with Silt and Sand (GP-GM)	15	63.7
B-5/S-8	40	2b	Well Graded Gravel with Silt and Sand (GW-GM)	11	73.0
B-6/S-3	15	2a	Poorly Graded Sand with Silt and Gravel (SP-SM)	12	68.6
B-6/S-8	40	3	Silty Sand (SM)	23	65.7
B-7/S-2	10	2a	Silty Sand with Gravel (SM)	18	3.2
B-7/S-4	20	2b	Well Graded Gravel with Silt and Sand (GW-GM)	12	69.6
B-7/S-6	30	2a	Silty Sand (SM)	32	1.9
B-8/S-7	30	2a	Silty Sand (SM)	32	2.1
B-10/S-5	12.5	2a	Poorly Graded Gravel with Silt and Sand (GP-GM)	14	66.9
B-11/S-6	20	2a	Poorly Graded Sand with Silt and Gravel (SP-SM)	11	72.8
B-11/S-9	35	3	Silty Sand (SM)	25	1.5

Notes:

1. The values in this table are initial and should not be used as design infiltration rates.

in/hr = inches per hour

3.5 SHEAR WAVE VELOCITY CONDITIONS

Shear wave velocity testing of subsurface soils was performed along one test transect by means of geophysical MASW and ReMi testing. Reported shear wave velocity readings in the upper 100 feet bgs ranged from 441 to 2,196 feet per second (ft/s), and the corresponding weighted-average shear wave velocity over the upper 100 feet (V_{s100}) is 1,053 ft/s. The location of the geophysical test transect is presented in Figure 2. The geophysical report is included as Appendix C.

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4. Geologic and Seismic Hazards

The site is in a seismically active area. In this section, we describe the seismic setting, identify the seismic basis of design, provide code-based design values, and discuss the seismic hazards at the site. Geologic hazards mapped near the site are all related to seismicity and include tsunami inundation, very strong earthquake shaking, and a moderate to high liquefaction hazard (Washington State Department of Natural Resources [DNR], 2025).

4.1 SITE SEISMICITY

Western Washington sits at the contact between two large crustal tectonic plates. The Juan de Fuca Plate forms the floor of the Pacific Ocean off the coast of the northwestern United States and moves northeastward from its spreading ridge boundary with the Pacific Plate at an average rate of approximately 1.5 inches per year. As it converges with the continental North American Plate, the Juan de Fuca Plate dips below (or "subducts") beneath the North American Plate forming a shallow, eastward-dipping contact interface. This boundary is known as the Cascadia Subduction Zone (CSZ) and is responsible for the seismicity in the western Washington regions, producing earthquakes associated with three types of source zones: subduction interface, subduction intraslab, and crustal. The CSZ is located offshore approximately 105 miles west of the site.

Subduction Interface Sources. The displacement caused by the subduction of the Juan de Fuca Plate below the North American Plate does not generally manifest as slip between the two plates; rather, it is absorbed by compression of the North American Plate at the interface at relatively shallow depths. This compression, based on geologic and historical evidence, is released every 300 to 600 years, on average, in the form of magnitude 8 to 9 or larger earthquakes, the last such event occurring in 1700. Characteristics of this type of earthquake may include very large ground accelerations, shaking durations in excess of two minutes, and particularly strong long-period ground motions that may affect tall or long-period structures.

Subduction Intraslab Sources. A deeper zone of seismicity is associated with a steeper bending of the Juan de Fuca Plate and the breaking of the plate under its own weight below the Pacific Northwest region. This region, termed the Benioff Zone, produces intraslab earthquakes at depths of 40 to 70 kilometers. Such past events in western Washington include the 1949 Puget Sound, 1965 Olympia, and 2001 Nisqually earthquakes. Deep, intraslab earthquakes tend to be felt over larger areas than shallower crustal events, and generally lack significant aftershocks.

Crustal Sources. Shallow crustal faults are caused by cracking of the continental crust, resulting from the stress that builds as the subduction zone plates remain locked together. Many small crustal faults are mapped near the site that are a part of the greater Cascadia Fold and Thrust Belt (U.S. Geologic Survey [USGS], 2025a). However, due to the size of these faults, their contribution to the site seismic hazard is relatively small.

4.2 SEISMIC HAZARD LEVEL AND MAGNITUDE OF SHAKING

Haley & Aldrich evaluated potential seismic shaking in accordance with the 2024 International Building Code (IBC) (International Code Council, Inc., 2024) combined with ASCE 7-22 Minimum Design Loads for Buildings and Other Structures (ASCE/SEI, 2022). The seismic hazard considers the maximum considered

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earthquake (MCE) to be seismic shaking having a 2-percent probability of exceedance in 50 years (approximately 2,475-year return period). Refer to *Section 4.5 - Seismic Site Class* for a discussion of ground motion amplification. Based on the disaggregation of the site seismic hazard, the modal magnitude (Mw) and source distance at the 2,475-year hazard level are M9.06 and 31 kilometers (hypocentral distance), respectively.

4.3 FAULT SURFACE RUPTURE

We used the USGS U.S. Quaternary faults web application (USGS, 2025a) to identify earthquake-producing faults near the site. No mapped earthquake-producing crustal faults are present at the site. The closest mapped fault is a strand of the Cascadia Fold and Fault Belt located more than 12 miles to the west of the site. The USGS has mapped the "Cascadia Megathrust" portion of the CSZ approximately 105 miles west of the site.

Based on known fault locations, we consider the potential for fault rupture to occur at the site to be low unless occurring on an unmapped or otherwise unknown fault.

4.4 TSUNAMI HAZARD

The tsunami hazard at the site is mapped in the *Tsunami Hazard Maps of Southwest Washington - Model Results from a ~2,500-Year Cascadia Subduction Zone Earthquake Scenario* by the DNR (Eungard et al., 2018). Based on this reference, the site is not within a tsunami-inundation zone.

The ASCE Tsunami Hazard Tool (https://asce7tsunami.online/) maps probabilistic inundation hazards for all potential tsunami sources, not just a CSZ-related event. The site is not within a tsunami-inundation zone according to this source (ASCE, 2022).

Based on mapping by DNR and ASCE, we consider the potential for tsunami inundation to affect proposed structures, driveways, and parking lots at the site to be very low.

4.5 SEISMIC SITE CLASS

Thick sequences of unconsolidated, soft sediments typically amplify the shaking of long-period ground motions, such as those associated with subduction zone earthquakes; whereas areas underlain by shallow soil profiles are not likely to amplify seismic waves.

The Seismic Site Class is a designation used by the ASCE 7 to quantify ground motion amplification. The classification is based on the stiffness in the upper 100 feet of site soil and bedrock. The upper 100 feet of site subsurface stratigraphy predominantly consists of soft to stiff clay and silt with and without organics, and bedrock.

As discussed in *Section 3.5 - Shear Wave Velocity Conditions*, the MASW testing resulted in a Vs_{100} of 1,053 ft/s, which falls within range of Site Class CD conditions as defined in ASCE 7-22. However, ESUs 1b and 3 may experience liquefaction under design-level seismic shaking, which requires evaluation of the site as Site Class F. Per ASCE 7, a Site Class F designation requires a site-specific analysis including a seismic hazard analysis and a site response analysis; however, buildings with structural periods of less than 0.5 seconds (as proposed for this project) may be designed using seismic design parameters developed considering Site Class CD conditions.

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4.6 SEISMIC DESIGN VALUES

Recommended code-based seismic design parameters and acceleration response spectrum values for the design of the proposed structures in conformance with ASCE 7-22 are presented in Tables 3 and 4, respectively.

Table 3. Seismic Design Parameters	
Parameter	**Value**
Site Class	CD
MCE_R[1] Ground Motion (Period = 0.2 seconds), S_s	1.86g
MCE_R Ground Motion (Period = 1.0 second), S_1	0.70g
Site-Modified Peak Ground Acceleration, PGA_M	0.98g
Site-Modified Spectral Acceleration Value at 0.2 seconds, S_{MS}	2.10g
Site-Modified Spectral Acceleration Value at 1.0 second, S_{M1}	1.15g
Design Spectral Acceleration at 0.2 seconds, S_{DS}	1.40g
Design Spectral Acceleration at 1.0 seconds, S_{D1}	0.77g

Notes:

1. *MCE_R = Risk-targeted maximum considered earthquake*
2. *g = acceleration of gravity*
3. *Design values presented above are based on a site located at Latitude / Longitude = 46.955822/ –123.787834.*

Table 4. Design Response Spectrum	
Period, T (seconds)	**Spectral Acceleration, S_a (g)**
0.00	0.68
0.01	0.68
0.02	0.71
0.03	0.74
0.05	0.83
0.075	1.02
0.10	1.26
0.15	1.48
0.20	1.55
0.25	1.51
0.30	1.47
0.40	1.32
0.50	1.17
0.75	0.95
1.00	0.77
1.50	0.55
2.00	0.42
3.00	0.26
4.00	0.18
5.00	0.13
7.50	0.082
10.00	0.066

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4.7 LIQUEFACTION

4.7.1 General

When cyclic loading occurs during an earthquake, the shaking can increase the pore pressure in loose to medium dense saturated sand and cause liquefaction. The rapid increase in pore water pressure reduces the effective normal stress between soil particles, resulting in the sudden loss of shear strength in the soil. Granular soils, which rely on interparticle friction for strength, are susceptible to liquefaction until the excess pore pressures can dissipate. Sand boils and flows observed at the ground surface after an earthquake are the result of excess pore pressures dissipating upward, carrying soil particles with the draining water. In general, loose, saturated sand soils with low silt and clay contents are the most susceptible to liquefaction. Silty soils with low plasticity are moderately susceptible to liquefaction under relatively higher levels of ground shaking. For any soil type, the soil must be saturated for liquefaction to occur.

We performed liquefaction potential analyses on site soils using the procedures outlined in Idriss and Boulanger (2008), and updated magnitude scaling factor as outlined in Boulanger and Idriss (2014).

The term liquefaction is defined very specifically by the simplified method that we used to evaluate the liquefaction hazard. Liquefaction is defined as when a soil under repeated cyclic loading exhibits the generation of increasing excess pore pressures until the pore pressure equals the total overburden stress. When this condition is reached, the normal stress acting between adjacent soil particles is effectively lost, and the soil, which derives its shear strength from interparticle friction, can lose much of its available shear strength. However, it is well documented that not all soils exhibit the same behavior after the initiation of liquefaction.

Loose sandy soils that achieve the condition of liquefaction during earthquake shaking can subsequently collapse and exhibit large shear strains under continued cyclic or static loading. This type of behavior is a well-documented result of numerous earthquakes, where structures underlain by shallow, liquefiable hydraulically placed fills have been observed to experience bearing capacity failures and collapse. Conversely, medium dense to dense sandy soils that achieve the condition of liquefaction will typically not collapse and can exhibit strain hardening behavior due to dilation effects. Therefore, despite the soil achieving the condition of liquefaction, there is little to no shear strength loss and only moderate shear strains under continued cyclic and static loading. This condition is termed “cyclic mobility”.

4.7.2 Analysis

Haley & Aldrich performed liquefaction potential analyses on soils logged in the southern portion of the site per Boulanger and Idriss (2014), which provides a simplified liquefaction evaluation procedure that compares the earthquake-induced cyclic stress ratio to a cyclic resistance ratio derived from in situ tests. The method incorporates updated stress-reduction factors, magnitude scaling factors, and overburden and static shear stress corrections to estimate a factor of safety against liquefaction triggering at each depth in the soil profile.

For analyses in the southern half of the site, we used the site class adjusted acceleration coefficient PGA_M of 0.98 g for Site Class CD, in combination with a design magnitude of 9.06. Our analyses indicate liquefaction is generally limited to saturated zones of silty sands belonging to ESUs 1b and 3.

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Estimated liquefaction-induced settlements in the vicinity of the proposed school footprint range from 0 to 3 inches. Estimated liquefaction-induced settlements at the proposed parking lots, soccer field, and detention basin are generally less than 2 inches.

Based on these findings, we conclude that potential for liquefaction (and secondary effects including seismic-induced settlement) to occur at the site is high. Due to the presence of the sloping grade changes, the likelihood of seismic-induced slope failures along liquefied strata and lateral spreading occurring in this area is also considered high, as described below.

4.7.3 Surface Effects

Haley & Aldrich evaluated the potential for liquefaction-related surface manifestations (i.e., sand boils) to occur using the procedures presented by Ishihara (1985). The Ishihara procedure compares the thickness of a given liquefiable soil layer to the thickness of the overlying non-liquefiable soil mantle, to determine if surface manifestations are possible at a given PGA. This approach has several limitations and may overestimate potential for surface manifestations to occur in silty sands and sandy silts, as the relatively low permeability of these materials has potential to prevent pore water from flowing quickly enough to produce sand boils (Kramer, 1996).

Based on this analysis, we conclude that the potential for surface effects to occur at the site is very low.

4.7.4 Seismic Strength Loss

Some strength loss due to cyclic shear stresses has the potential to occur in the silty soils present in the southern half of the site, in locations where these soils are saturated. Under existing conditions, ESU 1a materials are frequently saturated due to the presence of perched groundwater conditions above the unit. Proposed grading is expected to reduce or eliminate perched groundwater conditions underneath the proposed structure, reducing the potential for seismic strength loss to occur within these materials. Therefore, based on currently available information regarding proposed grading and development plans, we conclude that the potential for cyclic softening to impact the proposed structure is low.

4.8 GLOBAL STABILITY EVALUATION

4.8.1 General

Haley & Aldrich performed global stability evaluations on three cross sections drawn perpendicular to the slope, designated Cross Sections A-A', B-B', C-C', and F-F'. The locations of these cross sections are shown on Figures 2 and 3. Our global stability evaluations addressed both existing topography and proposed grading and site improvement, plus any recommended permanent stabilization methods for both static and seismic loading conditions.

Global stability analyses for this study were performed using the commercial code Slide2 by RocScience. The Slide program performs two-dimensional limit equilibrium analysis to analyze slope stability and to determine a factor of safety (FS) against global failure. The FS against failure can be generalized as the ratio of the forces resisting slope movement (soil strength, soil mass) and the forces driving slope movement (gravity, earth pressure, and earthquake shaking). A FS value equal to or less than 1 indicates a condition when the shear stresses required to maintain equilibrium in the slope reach or exceed the available shear resistance.

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Our stability analyses of pre- and post-development topography or site layout were evaluated for two loading cases based on static and seismic conditions, as follows:

- Case 1: Static (non-seismic) loading conditions with "full" soil strength properties; and
- Case 2: Seismic (pseudo-static) loading conditions with the horizontal seismic coefficient, $k_h = 1/2\ A_S$, and residual (liquefied) soil strength properties.

4.8.2 Material Properties

Material properties used in our slope stability analyses were developed based on empirical correlations with data collected during the field explorations (e.g., standard penetration test [SPT] blow counts), laboratory testing, and our experience with similar earth materials. The material properties used for our stability analyses are provided in Table 5 and are shown on the stability analyses output presented in Appendix E.

Table 5. Material Properties for Stability Analyses

ESU	Unit Weight (pcf)	Strength Type	Friction Angle (degrees)	Cohesion (psf)
1a – Silt and Elastic Silt	124	Mohr-Coulomb	29	0
1b – Upper Silty Sand	130	Mohr-Coulomb	30	
2a – Dense Sand	135	Mohr-Coulomb	36	
2b – Dense Gravel	135	Mohr-Coulomb	42	
3 – Lower Silty Sand	133	Mohr-Coulomb	31	
3 – Lower Silty Sand (Liquefied)	133	Mohr-Coulomb		750[1]
4 – Alluvium	127	Mohr-Coulomb	30	
5 – Montesano Formation	135	Mohr-Coulomb	35	6,000
New Structural Fill	125	Mohr-Coulomb	36	50
Cement-Soil Mix	135	Mohr-Coulomb		10,000

Notes:

1. *Residual strength per Seed and Harder (1990)*

pcf = pounds per cubic foot

psf = pounds per square foot

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As discussed in *Section 3.3.3 - Groundwater*, our interpretations of monitoring well data lead us to the conclusion that the ESU 1a and 1b materials contain perched groundwater, whereas the local groundwater table is at approximately El. 91 feet. For our analyses, we neglected the presence of perched groundwater and modeled the groundwater table at El. 91 feet at the southern end of the site, decreasing gradually towards the slope face to the north.

4.8.3 Evaluation of Existing Condition

We performed slope stability analyses on Cross Sections A-A', B-B', C-C', and F-F' to evaluate the stability of existing site slopes under static and pseudostatic (seismic) conditions. Static analyses of Cross Sections A-A', B-B', and C-C' produced factors of safety in excess of 1.5, indicating acceptable global stability of the site in its current condition. The static factor of safety at Section F-F' under existing conditions is 1.2, which indicates the slope is stable but does not meet the typical minimum safety factor

threshold of 1.5. Analyses of the slopes under seismic conditions resulted in pseudostatic factors of safety ranging from 0.32 to 0.74, signifying potential for slope failure in the event of a design-level earthquake. Potential failure surfaces with factors of safety of less than 1.0 appear to extend beyond the southern site limits into adjacent residential properties. Results of these analyses are presented on Figures E1 through E12 in Appendix E.

4.8.4 Evaluation of Proposed Condition

The proposed site plans include grading modifications involving lowering of site grades near the site's southern boundary and throughout most of the planned school footprint, and placement of fill in the northern end of the proposed school footprint, bus lane and driveway, and lined northern detention basin. We evaluated the site's stability under these proposed conditions by analyzing Cross Sections A-A', B-B', C-C', and F-F' under static and pseudostatic conditions.

Evaluations of proposed slopes under static conditions generally result in minimum factors of safety between about 1.6 and 1.9, indicating stability in the absence of seismicity. However, as discussed in Section 4.8.3, the static factor of safety at Section F-F' for the critical failure surface is just 1.2 under existing conditions. This critical factor of safety applies to the proposed condition at Section F-F' as well; however, failure surfaces with factors of safety of less than 1.5 are limited to areas downslope from limits of proposed grading and improvements and do not extend onto the properties to the south.

Stability analyses performed on these sections under pseudostatic conditions resulted in critical factors of safety ranging from approximately 0.4 to 0.9, indicating a high probability of slope instability due to design-level seismic shaking. Numerous potential failure surfaces extending through the proposed school footprint and into the neighboring southern residential properties were identified as having pseudostatic factors of safety less than 1.1. Results of these analyses are presented on Figures E13 through E24 in Appendix E.

In response to this finding, we estimated the degree of ground displacement associated with seismic slope instability using the limit-equilibrium analysis approach described by Macedo et al. (2023). The Macedo et al. (2023) analysis is performed by determining the critical seismic yield coefficient (ky) using limit-equilibrium software, followed by determining earthquake characteristics (magnitude and spectral acceleration at a given period), slope geometry (height and shape), and shear wave velocity profile. These values are entered into an equation that provides probabilistic levels of ground surface displacement.

Estimated seismic-induced slope displacements under proposed conditions without modifications (i.e., no ground improvement or similar improvements) were found to range from 0.5 to 4.0 feet, considering a 50-percent probability of exceedance (see Table 6). At the 84-percent confidence level, estimated displacements are not expected to exceed 1 to 6 feet. Typically, lateral displacements in excess of 12 to 18 inches cannot be accommodated by a shallow foundation system. Parking lot areas (as modeled by Cross Section F-F') can be permitted to displace to a greater degree (as these displacements are not considered to pose a life-safety hazard), though significant regrading and reconstruction of features in these areas may be required following a design-level earthquake. We evaluated methods to stabilize the slopes supporting the proposed school structure, as discussed in the next section.

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Table 6. Mean Seismic Slope Displacements Per Macedo et al. (2023)	
Cross Section	**No Improvement**
A-A’	48
B-B’	34
C-C’	6
F-F’	16

4.8.5 Evaluation of Proposed Condition with Stabilization Measures

We considered several mitigation measures for achieving improved seismic slope stability and reduced seismic slope displacement at the proposed school structure (Cross Sections A-A’, B-B’, and C-C’), including construction of a cement-soil mix buttress to resist lateral forces and installation of horizontal drains to dewater the liquefiable lower silty sand (ESU 3) layer. Preliminary analyses evaluating horizontal drains showed insufficient increases in seismic factors of safety, and this approach was thus disregarded. Installation of a soil-cement buttress appears to be the most feasible approach for limiting seismic-induced slope displacements.

A detailed discussion of soil-cement buttress design and associated recommendations is presented in *Section 6.2 - Ground Improvement*. For the purpose of slope stability evaluation, we analyzed a 30-foot-wide soil-cement buttress installed north of the proposed school building, spanning the building’s east-west extents. The modeled buttress extends to a base at El. 50 feet, coincident with the Montesano Formation contact. Results of these analyses are presented on Figures E25 through E29 in Appendix E.

A summary of the minimum pseudostatic factor of safety and seismic yield coefficient for each section transecting the school under proposed conditions, with and without soil-cement ground improvement, is presented in Table 7.

Table 7. Pseudostatic Factors of Safety (and Yield Coefficients) for Proposed Site Slopes		
Section	**No Improvement**	**DSM Buttress**
A-A’	0.37 (0.15)	0.94 (0.48)
B-B’	0.38 (0.17)	0.99 (0.50)
C-C’	0.85 (0.42)	--

As shown in Table 6, even with implementation of a ground improvement buttress, the factors of safety determined from pseudostatic analyses are less than 1.0, signifying potential for seismic-induced slope failure. However, use of a soil-cement buttress results in estimated lateral displacements per Macedo et al. (2023) of less than 6 inches at mean probability of exceedance (whereas displacements of up to about 3 feet are predicted if no mitigation is performed). This reduced level of displacement makes support of planned structures using shallow foundations permissible per ASCE 7-22 *Section 12.13.9 Requirements for Foundations Subject to Seismically Induced Soil Displacement or Strength Loss*. Estimated mean seismic-induced lateral displacement values are presented in Table 8.

Table 8. Mean Seismic Slope Displacements Per Macedo et al. (2023)		
Section	**No Improvement**	**DSM Buttress**
A-A’	48	6
B-B’	34	6
C-C’	6	--

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We estimate that the western parking lot (evaluated by analyzing Cross Section F-F') will displace approximately 1.5 feet as a result of the design-level seismic event. Lower levels of estimated displacement in this area could be achieved by installing a soil-cement buttress in this area as well. However, this condition was not evaluated as slope movement in this area will not impact planned structures, nor will proposed grading in this area reduce the factor of safety of potential failure surfaces that extend to residential areas off the site. If desired by the District, the deep soil mix buttress could conceptually be extended westward to significantly reduce displacements in the parking lot area (the degree of improvement can be evaluated at the District's request).

4.9 CONSOLIDATION

A one-dimensional consolidation test was conducted to determine consolidation properties of a single intact sample of ESU 1a materials obtained from boring B-6 at a depth of about 6 feet bgs. The test was performed in general accordance with ASTM International (ASTM) 4186M. The relatively intact, fine-grained sample was carefully trimmed and fit into a rigid ring with porous stones placed on the top and bottom of the sample to allow drainage. Vertical loads were then applied to the sample such that the sample could consolidate under a given load condition. Measurements were recorded of the compression of the sample (with time) under a given load. Rebound was measured during unloading sequences. In general, the tests were performed until approximately 100 percent of primary consolidation was achieved. The test results plotted in terms of axial strain versus load are presented in Appendix B.

Results of testing on the sample from boring B-6 report an overconsolidation ratio (OCR) of over 10, indicating that ESU 1a materials may be highly overconsolidated (i.e., resistant to compression under load application). The tested sample has a compression ratio of 0.25, indicating high compressibility when stressed beyond its preconsolidation pressure. These results denote low potential for soils underneath the proposed building foundations to undergo long-term static settlement, as long as care is taken to prevent disturbance of these soils during grading activities.

4.10 EXPANSION POTENTIAL

Six samples of silt and elastic silt (ESU 1A) materials present to depths of 10 to 20 feet bgs throughout the southern portion of the site were subjected to Atterberg limits testing. Test results are presented in Table 9.

Table 9. Atterberg Limits for ESU 1A Materials

Boring and Sample ID	Sample Depth Range (feet)	USCS	Liquid Limit	Plastic Limit	Plasticity Index
B-1 S-5	15 to 16.5	Elastic Silt (MH)	83	52	31
B-1 S-6	20 to 21.5	Elastic Silt (MH)	51	39	12
B-2 S-3	7 to 8.5	Elastic Silt (MH)	74	66	8
B-2 S-6	13.5 to 15	Elastic Silt (MH)	63	40	23
B-3 S-5B	10.5 to 11.5	Elastic Silt (MH)	61	38	23
B-10 S-2	5 to 6.5	Silt (ML)	NP	NP	NP

Note:
NP = Non Plastic

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Based on these test results, the site's elastic silt layers have a moderate to high expansion potential. Subgrade improvements will be required beneath foundations to mitigate this potential hazard (as discussed in *Section 6.1.4 - Foundation Subgrade Preparation*). Additionally, spread footings along the structure perimeter will require deepened embedment below adjacent exterior grade to reduce potential for moisture fluctuations to induce seasonal expansion-contraction cycles.

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5. Conclusions

Based on our explorations, testing, and analyses, we have developed recommendations for use in the design and construction of the school building and appurtenant improvements. We offer the following general summary.

- Subsurface conditions in the southern portion of the site (within the limits of the proposed school building) generally consist of up to 20 feet of silt and elastic silt interbedded with silty sand, underlain by layers of dense sand and gravel with an interbedded layer of liquefiable silty sand. Montesano Formation sandstone is typically present at approximately 70 feet below existing surface grade (near El. 50 feet).
  - Silt and elastic silt within the upper 20 feet bgs (typically between El. 120 and 100 feet) is typically soft to medium stiff, moist to wet, and occasionally contains organic-laden strata. Consolidation testing shows this soil may be overconsolidated, meaning it is unlikely to undergo significant settlement under proposed building loads; however, this material will be very susceptible to disturbance during grading. Atterberg limits testing indicates the elastic silts may have high expansion potential.
  - Dense sand and gravel layers are present underlying the elastic silt and upper silty sands, generally beginning near El. 100 to 105 feet near the proposed school building footprint.
  - Medium dense silty sand is present within an approximately 5- to 10-foot-thick layer, typically between El. 90 and 75 feet. This layer is largely saturated and susceptible to liquefaction under present conditions.
- Groundwater level readings from MW-1 indicate a perched water table is present within the silt and elastic silt and upper silty sands typically found within the upper 20 feet bgs in the southern portion of the site. Groundwater level readings from MW-2 indicate that a deeper, likely regional, groundwater table is found at about El. 91 feet. The groundwater levels are both expected to descend towards the north with proximity to the slope face.
- The potential for seismic hazards, including liquefaction and seismic-induced lateral slope displacement, is high within the upper silty sand (ESU 1B) and lower silty sand (ESU 3) units.
  - Plans for site grading generally include removal of the upper silty sand (ESU 1B) materials; however, the liquefaction-susceptible lower silty sand (ESU 3) materials will generally remain in place.
  - Under current conditions, design-level seismic shaking may induce liquefaction within the ESU 3 layer, leading to up to 3 inches of total vertical settlement and a mean probability of occurrence for over 5 feet of lateral slope displacement.
  - A soil-cement buttress is recommended north of the proposed building to reduce the seismic slope displacement.
- The potential for site tsunami inundation is expected to be very low.
- Due to the potential for soil liquefaction, the relatively weak nature of the site soils, and the potential for seismically induced slope deformation, the proposed structure may be supported by shallow foundations but only if ground improvement measures are incorporated into the foundation design. Additionally, a soil-cement buttress is required north of the proposed building.

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  - Footings should be designed to bear on a zone of geosynthetic-reinforced structural fill, cement-amended subgrade, or aggregate piers.
  - Footings should be tied together per ASCE 7-22 Section 12.13.9.
  - A soil-cement buttress is recommended north of the proposed building to mitigate seismic slope displacement.
- Site soils are considered corrosive. A corrosion engineer should be consulted to provide recommendations for protecting buried site improvements against corrosion.

The following sections present our recommendations for geotechnical design elements of the project.

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6. Geotechnical Design Recommendations

6.1 SHALLOW FOUNDATIONS

6.1.1 General

We recommend new structures be supported on interconnected spread footing foundation system that is supported by shallow ground improvement measures. The foundation system shall be designed following the criteria outlined in Section 12.13.9 Requirements for Foundations Subject to Seismically Induced Soil Displacement or Strength Loss of ASCE 7-22.

Recommendations in this section are based on the assumption that maximum structural loads will be up to 100 kips for column footings and 5 kips per linear foot for continuous wall footings. If structural loads are greater, then we should be contacted to verify that our recommendations are appropriate.

6.1.2 Bearing Resistance and Dimensions

The foundation system should consist of a series of interlocked perimeter and interior strip footings; no isolated footings should be used. Enlarged footings tied to nearby footings with grade beams are allowed. Continuous strip footings and enlarged footings supporting isolated loads should be at least 18 and 24 inches wide, respectively. The bottoms of exterior footings should be at least 24 inches below the adjacent finished exterior grade. Interior footings should be embedded at least 12 inches below the adjacent interior grade (e.g., base of slab). Where footings are located on or near sloping grades, the footings should be embedded to provide at least 15 feet of "horizontal coverage" from the toe of the footing to the face of the slope.

Footings should be designed to bear on a zone of geosynthetic-reinforced structural fill, cement-amended subgrade, or aggregate piers as described in *Section 6.1.4 - Foundation Subgrade Preparation*. Footings bearing on reinforced structural fill or cement-amended subgrade may be designed for a maximum allowable bearing capacity of 2,500 psf, while foundations bearing on aggregate piers may be designed for a maximum allowable bearing capacity of 4,000 psf. These bearing capacities contain a factor of safety of at least 2 and may be increased by one-third for total loads, including wind or seismic forces. Refer to for additional information regarding the ground improvement requirements below the footings.

As noted above, foundations should be designed in accordance with Section 12.13.9 of ASCE 7-22. For the design matrices, the structural engineer should assume there will be up to 3 inches of seismic-induced settlement and on the order of 6 inches of seismic-induced lateral deformation.

We estimate new structural foundations may experience total static settlements up to approximately 1 inch using these design values, with static differential settlements amounting to approximately 1/2 inch over a lateral span of 50 feet.

6.1.3 Lateral Resistance

Lateral loads on footings can be resisted by passive earth pressures on the sides of footings and by friction on the bearing surface. We recommend that passive earth pressures be calculated using an

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equivalent fluid density of 250 pounds per cubic foot. We recommend using an allowable friction coefficient of 0.35 for foundations bearing on cement-amended subgrade and 0.45 for foundations placed on an aggregate base subgrade. The passive earth pressure and friction components may be combined provided that the passive component does not exceed two-thirds of the total. The lateral resistance values include a reduction factor of 1.5.

6.1.4 Foundation Subgrade Preparation

We recommend that new shallow foundations be underlain by improved subgrade constructed by means of one of the following approaches:

- **Cement-Amended Fill:** Perform cement-treatment on native or fills soils present beneath planned foundation elements. Cement treatment should be performed to a depth of at least 3 feet below the base of the footing and should extend 3 feet laterally beyond the footing edge. Supplemental recommendations for cement treatment are presented in *Section 9.6.7 - Cement-Amended Subgrade*. A minimum strength of 200 pounds per square inch (psi) is recommended for cement-amended fill.
- **Geosynthetic-Reinforced Aggregate Base:** Excavate the area beneath each footing plus 3 feet laterally beyond the footing edge to a depth of 3 feet. Line the base of the excavation with a geosynthetic and then backfill with engineered fill. The engineered fill shall consist of imported crushed aggregate. The geosynthetic shall consist of a biaxial geogrid with a minimum tensile strength at 2-percent strain of 410 pounds per foot (Tensar BX1200 or approved equivalent) or woven geotextile with a minimum tensile strength at 2-percent strain of 480 pounds per foot (e.g., Mirafi HP270 or approved equivalent).
- **Aggregate Piers:** Install discrete aggregate pier elements beneath all footings, as designed by a specialty contractor for increased bearing capacity. For planning purposes, we anticipate 24-inch-diameter by 15-foot-deep piers to be installed at approximately 6 to 8 feet on-center at strip footings and in groups of three or more for enlarged footings. An in-depth discussion of this alternative is presented in *Section 6.2.1 - Aggregate Piers*.

Any on-site soils that are reused for engineered fill or incorporated into the cement-treated fill section shall be processed to remove deleterious materials, such as organics, construction debris, and other materials identified by Haley & Aldrich. All engineered fill (import or on-site processed) should be placed and compacted as discussed in *Section 9 - Earthworks Recommendations*.

Prior to the placement of fill or reinforcing steel in the footing excavations, all loose or disturbed soils should be removed. If water infiltrates and pools in the excavation, the water, along with any disturbed soil, should be removed before placing the reinforcing steel.

6.2 GROUND IMPROVEMENT

6.2.1 General

Ground improvement measures are required to improve the bearing capacity of foundation subgrade, as outlined in *Section 6.1.4 - Foundation Subgrade Preparation.* Two options generally involve earthwork measures, while the third includes the use of aggregate piers. This option is described in more detail in *Section 6.2.2*. Additionally, separate ground improvement measures are required to improve seismic

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slope stability. We recommend the use of a “deep soil mixed buttress” to achieve this, as described in *Section 6.2.3*.

6.2.2 Aggregate Piers

Ground improvement through the use of rammed aggregate piers or similar systems may be considered for to provide increased bearing capacities beneath structure foundations.

6.2.2.1 General Criteria

The design of ground improvement systems is typically completed by a specialty design-build contractor that installs them. We have provided some performance guidelines and general recommendations for use by the contractor in their design.

Rammed aggregate piers can be constructed by augering an open hole or pushing a displacement mandrel into the ground. The resulting hole is backfilled with crushed aggregate that is placed and compacted in 2- to 3-foot-thick lifts. For the augered systems, the pier hole is drilled and then rock is dumped in the hole from the top and then the rock is compacted with a tamper or similar measure. For the displacement systems, the pier hole is created by vibrating a large mandrel into the ground to the bottom of the improvement zone, and free-draining rock is passed through the mandrel and into the column cavity. The mandrel is withdrawn and reinserted in intervals (typically 2 feet) to provide vibratory or pneumatic compactive effort. These processes create columns of compacted aggregate that are typically 2 to 3 feet in diameter.

The goal of installing aggregate piers is typically to strengthen the soft/loose soils via: 1) bulk soil mass strength increases due to replacement; 2) densification; 3) stress redistribution; and/or to a lesser degree 4) drainage effects. Because site soils at the planned structure footing elevations are expected to include silt and elastic silt with moderate to high plasticity, the densification of the soils is expected to be somewhat reduced compared to that which can be achieved with clean, loose sand. Furthermore, vibrations generated during aggregate pier construction can cause temporary deterioration and softening of soft fine-grained soils. Therefore, the contractor should consider this softening potential in their selection of equipment and methods for installation of the piers.

Aggregate piers will be concentrated along footing lines and beneath structural columns. While not required for purposes of life-safety, aggregate piers may also be installed beneath floor slabs to help reduce seismically induced settlement and to accommodate possible future building reconfigurations.

If using aggregate piers, we anticipate piers will be on the order of 10 feet deep and spaced approximately 6 to 8 feet on-center along strip footings and placed in groups of three or more piers for enlarged footings at isolated loads. A target allowable bearing capacity up to 4,000 psf is expected to be feasible with the installation of aggregate piers. However, the layout of piers can be refined to meet the actual load-carrying requirements of individual footings. The actual number, configuration, and capacity of aggregate piers will be determined by the specialty contractor's design.

The general contractor should coordinate earthwork and subgrade stabilization with the ground improvement subcontractor to provide a stable working base for their equipment, while also protecting the site subgrade. See *Section 9.3 - Wet Soil Construction* for further recommendations on the topic of construction traffic subgrade preparation.

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6.2.2.2 Performance Criteria

We recommend the ground improvement system be designed to target the following performance criteria.

- Minimum allowable foundation bearing capacity of 4,000 psf for static and seismic conditions, or as required by the structural loads.
- Bottom of pier elevation within ESU 2A/2B materials at approximately El. 100 feet in the western half of the school, deepening to approximately El. 90 feet in the eastern half.
- Minimum frictional coefficient of 0.35 for sliding resistance along the bases of footings in contact with a mixture of native soil and aggregate pier elements. However, if a minimum 12-inch layer of crushed rock is placed between the base of the footing and the underlying soil and aggregate piers, then a frictional coefficient of 0.45 may be used.
- Minimum allowable slab loading of 175 psf, where slabs are underlain by aggregate piers.
- Static foundation and slab settlement:
  - less than 1 inch of total settlement and less than 1/2 inch of differential settlement over a 50-foot span or between adjacent columns, whichever is a greater distance.
- Seismic foundation settlement:
  - less than 3 inches of total settlement and less than 1.5 inches of differential settlement over a 50-foot span or between adjacent columns, whichever is a greater distance.

6.2.2.3 Design Considerations and Quality Control

Based on the design criteria described above and the site soil conditions, we recommend the following considerations for the design of the aggregate piers.

- The design and construction techniques should address the potential presence of shallow, perched groundwater (estimated to be within the upper 5 feet below finish grade) and the potential for temporary deterioration and softening of fine-grained soils due to installation-induced vibrations.
- The ground improvement contractor should submit plans and calculations (stamped by a professional engineer licensed in the State of Washington) with the final aggregate pier layout and depths (i.e., pier depths, diameter, spacing, and pattern).
- If ground improvement via densification and stress redistribution is proposed, the pier design should incorporate the methodologies of Barksdale and Bachus (1983) to evaluate the stress redistribution and densification effects, respectively, for piers constructed at the site.
- We recommend that Haley & Aldrich be retained to review the final aggregate pier design.

6.2.3 Deep Soil Mixing

We recommend that soil-cement mixing (by means of deep soil mixing, or DSM) be performed to improve seismic slope stability performance at the proposed school structure.

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DSM is a ground improvement method that involves mechanically mixing cementitious binder into in situ soils to create a higher-strength, stiffer soil body for improved structural support and liquefaction mitigation. Soil mixing can be performed by constructing individual soil-crete columns or rows of overlapping columns, resulting in up to 100 percent mass stabilization.

In many cases where liquefaction mitigation is the primary purpose of ground improvement, the percent mass stabilization (or area replacement ratio [ARR]) of DSM ranges from 30 to 40 percent. By constructing intersecting rows of DSM elements, subsurface "shear grid walls" can act to mitigate liquefaction through the confinement of the liquefiable soil between the grid elements. Shear strains imposed on the soil during seismic events are reduced, in turn decreasing the generation of excess pore pressures. Should the ground motion produce excess pore pressures to the point of inducing liquefaction, the grid walls will act to retain the liquefied soil and minimize any lateral and vertical deformations. Additionally, the higher-strength structural properties of the soil-cement mixed walls provide reinforcement within the soil body to sustain pseudo-static loading during periods of strong shaking.

The general contractor should coordinate earthwork and subgrade stabilization with the ground improvement subcontractor to provide a stable working base for their equipment, while also protecting the site subgrade. For budgeting purposes, we recommend the installation of a minimum 12- to 18-inch-thick working platform of heavy rock (e.g., 2- to 4-inch angular rock) over the work area.

Where feasible, spoils generated by the DSM work may be integrated into the site grading, though their placement needs to consider their effects on landscaping and other improvements due to the high pH from their cement content. Excess spoils to be hauled off the site will also require special handling and disposal due to their high pH and cement content.

6.2.3.1 Design Details and Performance Criteria

We recommend that the zone of DSM improvement span the east-west extents of the proposed school building, be at least 30 feet in width, and be performed to contact with Montesano Formation rock at approximately El. 50 feet. The extents of the recommended DSM limits in plan view are shown on Figure 3, and the limits in the vertical dimension are shown on select slope stability figures in Appendix E. In areas receiving fill, the DSM is not required to extend above the existing ground surface (i.e., DSM is not required to be performed in fill). DSM should achieve an ARR of at least 45 percent in this area. All DSM should be designed and constructed with a cement mix sufficient for achieving a minimum 28-day unconfined compressive strength of 300 psi.

6.2.3.2 Design and Construction Considerations

Based on the design criteria described above and the site soil conditions, we recommend the following considerations for the design of the deep soil mix area.

- The design and construction techniques should address the potential presence of shallow groundwater if construction occurs during the wet season.
- The ground improvement contractor should submit plans with the final DSM layout, element identification, and dimensions (i.e., pier depths, diameter, spacing, and pattern).
- The contractor's ground improvement design should include appropriate field verification testing to evaluate the effectiveness of the ground improvement and to verify that the specified

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performance criteria have been met. The final verification test results should be submitted to the District's design team for review and approval.

- We recommend that Haley & Aldrich be retained to review the contractor's submittal package.
- We recommend that Haley & Aldrich be retained to provide field observation of the ground improvement installation to verify and document proper installation methods.

6.2.3.3 Miscellaneous Construction Considerations

The contractor should be responsible for handling, control, and disposal of spoils generated by the ground improvement activities. All spoils and runoff from treated areas or spoils ponds/stockpiles should be contained by berms to prevent runoff. Handling of the cement, cement slurry, concrete, grout, and associated materials shall be completed per Ecology Best Management Practice (BMP) C151 – Concrete Handling. Any process water or runoff from ground improvement work or containment areas should be handled per Ecology BMP C252 – Treating and Disposing of High pH Water.

The reuse of spoils from the DSM ground improvement process may be considered if:

- The material reuse is allowed by Ecology. (The contractor is responsible for verifying that their intended approach and methodologies are acceptable to Ecology.)
- The spoils have dried or cured sufficiently to be considered a cement-stabilized soil (e.g., wet or sloppy slurry mud cannot be used). The dried spoils should be processed and broken down prior to reuse.
- The material complies with the project and Washington State Department of Transportation (WSDOT) fill or backfill requirements for the proposed placement location.
- The material can be compacted to a dense and non-yielding condition that does not pump or deflect under proof loading with a loaded dump truck.
- The material is placed at least 2 feet below finished grade.
- The proposed use of the material is reviewed and approved by the project engineer.

6.3 FLOOR SLABS

Satisfactory subgrade support for concrete floor slabs-on-grade under static conditions can be obtained from new structural fill or native subgrade prepared in accordance with *Section 9 - Earthwork Recommendations*. A minimum 6-inch-thick layer of aggregate base should be placed over the prepared subgrade to assist as a capillary break. Aggregate base material placed directly below the slab should be 0.75- to 1-inch maximum size. Flooring manufacturers often require vapor barriers to protect flooring and flooring adhesives. Many flooring manufacturers will warrant their product only if a vapor barrier is installed according to their recommendations. Selection and design of an appropriate vapor barrier, if needed, should be based on discussions among members of the design team.

Slabs should be reinforced according to their proposed use and per the structural engineer's recommendations.

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6.4 RETAINING WALLS

Based on our evaluation of the planned school footprint and floor grades relative to existing site grades, we anticipate that retaining walls on the order of 10 feet or less in height may be required to achieve site design grades. If taller walls are required, we should be contacted to evaluate them for global stability. We expect that concrete cast-in-place (CIP) walls and modular block walls will be the most economical wall types at this site. Recommendations for design of these walls are presented in the following sections.

6.4.1 CIP Walls

We recommend that, where possible, CIP retaining walls be **backfilled with non-expansive fill** within a sloped 1H:1V zone that extends laterally away from the base of the wall footing and up toward the retained ground surface. For CIP walls satisfying this condition, we recommend use of the following earth pressures.

- For walls that are free to rotate at the top, we recommend designing the walls to resist an active lateral earth pressure with an equivalent fluid weight of 35 pcf for walls with backslopes flatter than 10H:1V. For walls with backslopes of 2H:1V, an active lateral earth pressure with an equivalent fluid weight of 45 pcf shall be used. For intermediate slopes, linearly interpolate between these values.
- For walls that are restrained from movement, we recommend the walls be designed to resist an at-rest lateral earth pressure with an equivalent fluid weight of 55 pcf.

While not anticipated based on our understanding of proposed site grading, proposed walls may in some instances have insufficient lateral clearance to construct a 1H:1V non-expansive backfill zone. In this situation, earth pressures acting on walls will be higher than those imparted on walls backfilled with non-expansive select fill. We recommend use of the following earth pressures for walls in this area.

- For walls that are free to rotate at the top, we recommend a design active lateral earth pressure of 55 pcf, assuming a backslope flatter than 10H:1V; walls with backslopes of 2H:1V may be designed using an active lateral earth pressure with an equivalent fluid weight of 65 pcf. For intermediate slopes, linearly interpolate between these values.
- For walls restrained against movement at the top, an at-rest lateral earth pressure of 65 pcf may be used, assuming a backslope flatter than 10H:1V; walls with backslopes of 2H:1V may be designed using an active lateral earth pressure with an equivalent fluid weight of 80 pcf. For intermediate slopes, linearly interpolate between these values.

We recommend that all walls designed for seismic forces include an additional seismic lateral earth pressure of 25 pcf for cantilever walls with backslopes flatter than 10H:1V. The additional seismic lateral earth pressure shall increase to 35 pcf for walls restrained against movement and for cantilever walls with a backslope of 2H:1V.

Walls subject to transient surcharge loading from vehicles (within 4 feet from the retaining walls) should be designed to withstand a uniform horizontal lateral traffic surcharge pressure of 100 psf (rectangular distribution).

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Foundations for CIP walls shall be designed in accordance with *Section 6.1 - Shallow Foundations,* and should bear on subgrade improved in conformance with recommendations in *Section 6.1.4 - Foundation Subgrade Preparation*. For lateral resistance, the upper 1 foot of soil should be ignored for passive resistance unless covered by slabs or pavements.

6.4.2 Modular Block Walls

6.4.2.1 Design Parameters

Modular block walls can consist of geogrid-reinforced mechanically stabilized earth (MSE) walls or gravity block walls. Modular block wall design should be based on the soil parameters presented in Table 10.

Table 10. Modular Block Wall Design Parameters

Material	Unit Weight, γ (pcf)	Friction Angle, ϕ (degrees)	Cohesion, c (psf)
Reinforced Zone Fill	130	36	0
Retained Soil	120	30	0
Foundation Soil	120	30	0

The "reinforced zone fill" used for backfill within the geogrid zone behind the MSE blocks should meet the specifications provided in the 2026 WSDOT Standard Specifications (WSS) 9-03.14(4) - Gravel Borrow for Structural Earth Wall. "Foundation Soil" and "Retained Soil" are new fills prepared in accordance with *Section 9.6 - Structural Fill and Backfill*.

For the seismic evaluation of modular block retaining walls, the designer may assume an allowable internal displacement of 4 inches during seismic shaking, *unless tighter tolerances are required adjacent to site improvements*. The determination of a horizontal seismic coefficient, k_h, should be based on the PGA_M from Table 3. The vertical acceleration coefficient, k_v, may be assumed to be 0.

Modular block walls should be constructed in general accordance with the specifications provided in WSS 6-13 - Structural Earth Walls.

6.4.2.2 Modular Block Wall Foundations

The design of modular block wall foundations should be based on the soil parameters presented in Table 9, above. We recommend that bases of modular block walls be embedded at least 1 foot below adjacent grade for walls less than 5 feet tall and at least 1.5 feet below grade for walls taller than 5 feet. The base layer of block should be underlain by a gravel layer as follows.

- Wall height less than 5 feet tall - utilize a 1-foot-thick gravel layer.
- Wall height between 5 and less than 10 feet tall - utilize an 18-inch-thick gravel layer.
- Wall height 10 feet or greater - contact Haley & Aldrich for additional information.

Where walls are founded in new structural fill, they should be underlain by a minimum 6-inch-thick layer of compacted gravel. The compacted gravel base should be placed above native subgrade or a zone of engineered fill overlying native materials (i.e., the wall face may not be supported over aggregate piers or uncontrolled fill materials).

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All gravel layers should extend at least 6 inches in front and behind the lowest layer of blocks. For 2-foot-thick gravel layers, the layer should extend at least 12 inches in front and behind the lowest layer of blocks.

6.4.3 Wall Drainage and Backfill

The above design parameters have been provided assuming that back-of-wall drains will be installed to prevent hydrostatic pressures against the backs of walls.

A conventional gravel backdrain system shall consist of a minimum 12-inch-wide zone of drain rock placed against the back of the walls and extending from the base of the wall to within 6 inches of finished grade. Perforated collector pipes should be embedded at the base of the drain rock. The drain rock should meet the requirements provided in *Section 9 - Earthwork Recommendations*. The perforated collector pipes should discharge at an appropriate location away from the base of the wall. The discharge pipe(s) should not be tied directly into stormwater drain systems, unless measures are taken to prevent backflow into the wall's drainage system.

A prefabricated drainage panel against the backside of the wall is an acceptable method for backdraining the walls. The drainage panels should extend down to a suitable collector pipe that discharges into a storm drain.

The wall backfill should be compacted to a minimum of 95 percent of the maximum dry density, as determined by ASTM D1557. However, backfill located within a horizontal distance of 3 feet from retaining walls should only be compacted to approximately 90 percent of the maximum dry density, as determined by ASTM D1557. Backfill placed within 3 feet of the wall should be compacted in lifts less than 6 inches thick using hand-operated tamping equipment (e.g., jumping jack or vibratory plate compactors). If flat work (e.g., sidewalks or pavements) will be placed atop the wall backfill, we recommend that the upper 2 feet of material be compacted to at least 95 percent of the maximum dry density, as determined by ASTM D1557.

Settlements of up to 1 percent of the wall height commonly occur immediately adjacent to the wall as the wall rotates and develops active lateral earth pressures. Consequently, we recommend that construction of buildings directly above retaining walls be postponed at least four weeks after backfilling of the wall, unless survey data indicates that settlement is complete prior to that time.

6.5 CORROSIVITY

Based on corrosivity test results obtained from three samples of silty soils within the upper 15 feet bgs, the site soils are classified as corrosive to buried iron, steel, mortar-coated steel, and reinforced concrete structures. We recommend that the design team consult with a corrosivity engineer to evaluate results presented in Appendix B and develop recommendations for corrosion protection for proposed improvements.

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7. Drainage Design Recommendations

7.1 TEMPORARY DRAINAGE

During site mass grading, the contractor should be made responsible for temporary drainage of surface water as necessary to prevent standing water and/or erosion at the working surface. During rough and finished grading of the building site, the contractor should keep all footing excavations and building pads free of water. Excavations for removal of pre-existing fill and debris and for installation of new underground structures and utilities may encounter groundwater seepage that will need to be collected and removed from temporary excavations prior to backfilling.

7.2 SURFACE DRAINAGE

The finished ground surface around buildings should be sloped away from their foundations at a minimum 2-percent gradient for a distance of at least 5 feet. Downspouts or roof scuppers should discharge into a storm drain system that carries the collected water to an appropriate stormwater system. These elements should not be attached to wall or footing drains. Trapped planter areas should not be created adjacent to buildings without providing means for positive drainage (i.e., swales or catch basins).

7.3 INFILTRATION SYSTEMS

Current site plans include a large stormwater detention basin north of the planned school structure. We recommend the northern basin be designed as a lined, impervious feature (i.e., not designed for infiltration) to prevent the potentially destabilizing influence of infiltrating stormwater on slope stability in this area.

We understand smaller infiltration or detention basins may be considered, potentially located to the west of the school building. Due to the presence of fine-grained soils (ESU 1a) and perched groundwater in ESU 1b, we anticipate the use of infiltration system will be difficult. We should be contacted for further discussion if such systems are proposed.

7.4 SUBSURFACE DRAINAGE

Based on our findings, it does not appear that subsurface drainage (e.g., subslab or footing drains) will be required around building perimeters, provided that finished floor elevations are no nearer than 4 feet from the estimated design groundwater at El. 91 feet. However, if trapped planters or adverse grades are created adjacent to buildings, then the use of footing drains should be considered. The need for perimeter footing drains should be evaluated once the grading plan has been further developed.

Perched water conditions are expected to be present upslope (to the south) of the site. If utility connections enter the site from the upper, southern side of the property, installation of utility trench water cut offs should be considered (see *Section 9.4.4 - Utility Trench Dams*) to reduce the potential for upslope groundwater seepage to chase the utility trench backfill.

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8. Pavement Design and Considerations

8.1 GENERAL

Planned site pavement is assumed to consist of conventional flexible asphalt concrete (AC) for parking areas and driveways. Some rigid Portland cement concrete (PCC) pavements may be required at bus drop off zones, crosswalks, trash enclosures, and other localized areas.

Conceptual traffic loading data for this site is not available. For current design purposes, we conservatively assume that the heaviest traffic at the site (e.g., in main drive aisles and bus lanes) will include daily traffic of up to approximately 1,000 passenger vehicles, 10 buses, 10 delivery or box trucks, several weekly visits by both recycling and garbage trucks, and a monthly visit for a fire engine or equivalently loaded vehicle. For areas receiving lighter traffic loading (e.g., typical interior drive aisles, parking stalls), we assume daily loading from several hundred passenger vehicles and infrequent loading from bus or box truck traffic.

Based on these assumptions, we calculate a design traffic loading of 200,000 equivalent single axle loads (ESALs) for new AC pavements for on-site bus lanes and main drive aisles (i.e., those receiving high through-traffic from site entrance to exit). For other drive aisles and parking stalls that will not be used by heavy trucks, a 20,000-ESAL value was used. These ESAL values are based on an assumed 20-year design life for new AC pavement sections, and no traffic growth is expected over time (due to usage as a parking lot). If these estimated traffic counts or assumptions are inaccurate, please contact us to develop updated recommendations.

Due to soft native soils, special care will be required for preparation of pavement subgrades as discussed in *Section 9 - Earthwork Recommendations*.

8.2 PAVEMENT SECTIONS

8.2.1 Flexible AC

The AC pavement sections in Table 11 are minimum recommended material thicknesses and assume the subgrade has been prepared in accordance with *Section 8.3.4 - Soil Subgrade*. We provide recommendations for pavement sections consisting of asphalt concrete over either: a) a thickened section of aggregate base; or b) a thinner section of aggregate base underlain by cement-treated subbase derived from existing on-site soils. Where aggregate base is placed without a cement-treated subbase layer, the base should be underlain by a geotextile separation fabric as discussed in *Section 8.3.5 - Geotextile Fabric*.

Table 11. AC Pavement Sections

Pavement Usage	Pavement (inches)	Aggregate Base (inches)	Cement-Treated Subbase (inches)
Heavy Loading:	5.0	17.0	--
Bus Lanes and Main Drive Aisles	4.0	6.0	12.0
Light Loading:	3.0	14.0	--
Parking Aisles and Stalls	3.0	4.0	12.0

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If staging areas or haul roads are proposed that coincide with the areas receiving new pavements, the design thickness of the pavement sections in Table 11 should not be relied upon, and additional thicknesses of base rock or cement-treated subbase should be placed.

8.2.2 Rigid PCC

Rigid pavement used in non-bus traffic areas (e.g., driveway aprons) should consist of a minimum of 5 inches of PCC pavement over a minimum of 8 inches of aggregate base on a compacted soil subgrade or 4 inches of aggregate base on 12 inches of cement amended subgrade.

Rigid pavement used at bus drop off or parking area should consist of a minimum of 8 inches of PCC pavement over a minimum of 12 inches of aggregate base on a compacted soil subgrade or 4 inches of aggregate base on 12 inches of cement amended subgrade.

The PCC should be constructed with a maximum joint spacing of 15 feet. The slabs should be interlocked at contraction joints (e.g., continuous slab with no dowels). However, dowels should be used at construction and expansion joints. Where used, dowels should be smooth, round, 1-inch-diameter bars that are greased on one end. The dowels should be placed at 12-inches on-center and should be at least 18 inches long.

8.3 PAVEMENT MATERIALS

8.3.1 Flexible AC

Flexible AC should be 1/2-inch hot mix asphalt in conformance with the specifications provided in WSS 5 04 - Hot Mix Asphalt and WSS 9 03.8 - Aggregates for Hot Mix Asphalt. The asphalt cement binder should be PG 64-22 Performance Graded Asphalt Cement according to WSS 9-02.1(4) - Performance Graded Asphalt Binder. A higher viscosity binder should be considered for use at the bus pads to reduce potential for rutting under repeated bus loads. The AC should be placed with a minimum lift thickness of 1.5 inches and maximum thickness of 3 inches and be compacted to at least 91 percent of Rice Density of the mix, as determined in accordance with ASTM D2041.

8.3.2 Rigid PCC

Rigid PCC pavement should meet the specifications provided in WSS 5 05 - Cement Concrete Pavement. The PCC should have a minimum compressive strength of 4,000 psi and nominal maximum aggregate size of 1.5 inches.

8.3.3 Aggregate Base

Imported granular material used as base aggregate (base rock) for conventional pavements should meet the criteria specified in *Section 9.6 - Structural Fill and Backfill* of this report. The base aggregate should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557, and should be well drained.

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8.3.4 Soil Subgrade

The pavement design assumes the soil subgrade consists of either cement-treated subgrade or compacted native soil subgrade that has been prepared as discussed in *Section 9 - Earthwork Recommendations*.

8.3.5 Geotextile Fabric

Subgrade separation geotextile used for pavement sections should, at minimum, meet the specifications provided in WSS 9-33.2(1) Table 3 - Geotextile for Separation or Soil Stabilization. The geotextile should be installed in conformance with the specifications provided in WSS 2-12 - Construction Geosynthetic.

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9. Earthwork Recommendations

9.1 GENERAL

Site earthwork should be completed in conformance with the WSS (WSDOT, 2026) and the project specifications. Based on available information, we anticipate that earthwork will generally consist of significant mass grading including cuts on the order of 10 feet and fills up to approximately 25 feet, cuts and fills associated with new retaining walls, and excavation and backfilling for utilities, foundations, and improved subgrade.

Existing site soils are moist to wet and typically consist of silt and elastic silt (ESU 1A) within the upper 20 feet (from approximately El. 120 to 100 feet) throughout much of the area planned for development with the new school building, driveways, and parking lots. Perched groundwater may be present within these upper fine-grained materials. Silt and elastic silt within the zones of excavation will be sensitive to disturbance when altered by mechanical means. As such, there is a high probability that typical construction activities will cause pumping, rutting, and general degradation of the soil subgrade. Special care should be taken by the contractor to protect the exposed site soils from disturbance at all times of the year, particularly during wet weather.

9.2 SITE PREPARATION

9.2.1 Clearing and Grubbing

Initial site preparation and earthwork operations generally include clearing and grubbing, stripping, and grading to establish subgrade elevation for improvements. We recommend removing soils containing more than 5 percent of organics. Stripping depths should be based on field observations at the time of construction. Stripped material should be transported off of the site for disposal or stockpiled for use in landscaped areas.

Should tree removal be required for construction of the proposed improvements, trees and their root balls should be grubbed out to the depth of significant roots, which could exceed 3 to 5 feet bgs for tall trees. Depending on the methods used to remove the root balls, considerable disturbance and loosening of the subgrade could occur during site grubbing.

We recommend that soil disturbed during clearing and grubbing operations be removed to expose firm, undisturbed subgrade. The resulting excavations should be backfilled with compacted structural fill.

9.2.2 Demolition

We understand the site is currently and historically undeveloped, with the exception of a buried domestic water pipeline. Therefore, demolition activities required for site development are expected to be minor.

Demolition should include complete removal of existing site improvements within areas to receive new pavements, buildings, or engineered fill. Underground utility lines or vaults encountered in areas of new improvements should be completely removed or grouted full if left in place.

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Materials generated during demolition of existing improvements should be transported off the site for disposal or stockpiled in areas designated by the owner.

9.2.3 Existing Fill

Following demolition and stripping, if any undocumented fill materials are encountered in locations of proposed structural improvements (e.g., buildings, slabs, foundations) or pavements, this material should be re-worked and/or removed and replaced. Scarification and compaction of this fill is an option for granular fill materials; otherwise, removal and replacement with granular structural fill or cement-treated fill is generally a viable option throughout the site.

9.2.4 Subgrade Preparation and Evaluation

Subgrade soils are expected to be vulnerable to disturbance due to construction equipment loading regardless of season. The contractor shall employ wet soil construction techniques, as described in the next section, regardless of the time of year that earthwork is taking place.

Following stripping, demolition, site preparation, and rough grading, the suitability of the subgrade should be evaluated by Haley & Aldrich to identify any soft, loose, or unsuitable areas.

A typical method for evaluating subgrade preparation is via proof rolling with a fully loaded dump truck or similar heavy rubber-tired construction equipment. However, proof rolling may not be feasible if the subgrade has not already been stabilized. Therefore, initial subgrade evaluations may need to be by observing earthwork activity and probing with a steel foundation probe. Observations and probing should be performed by Haley & Aldrich.

If soft or loose zones are identified during proof rolling or probing, these areas should be excavated to the extent indicated by Haley & Aldrich and replaced with structural fill.

Where site preparation activities cause excessive subgrade disturbance, replacement with imported structural fill or stabilization via cement amendment may be necessary.

9.3 WET SOIL CONSTRUCTION

Near-surface site soils generally consist of soft to stiff silts and clays. Additionally, shallow perched groundwater may be exposed by the proposed site grading. ***These site soils to exposed by site earthwork will be highly susceptible to becoming disturbed when trafficked by conventional construction traffic and equipment. If not carefully executed, site preparation, utility trench work, earthwork, and pavement construction can create extensive soft areas, and significant repair costs can result. Earthwork planning should include considerations for minimizing subgrade disturbance.***

The following sections describe subgrade stabilization methods which will likely be required to be employed during site development activities.

9.3.1 Aeration and Re-Compaction

The ESU 1A silts that will be encountered throughout the majority of the planned grading areas are likely to be above the soil's optimum moisture content at any time of the year and will require drying to reuse as structural fill. Drying is expected to require prolonged farming (e.g., spreading, tilling, and aerating)

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and consistent dry weather to allow sufficient time to farm the soils. If earthwork is completed during rainy weather or during periods of high moisture content in the soil, the subgrade may be too wet to dry by conventional aeration. In that case, the subgrade may need to be stabilized by removal and replacement with geotextile stabilization fabric and granular fill, or cement amendment of the soil, as discussed in the next subsections.

9.3.2 Removal and Replacement

Soft or wet soils can be removed and replaced with imported granular fill. Stabilization rock and possibly select granular fill can be used as the initial lift of structural fill over a softer subgrade. The native soil subgrade would be covered by a stabilization geotextile fabric and then covered with 12 to 18 inches of stabilization rock or select granular fill, depending upon the subgrade condition, finished grades, and the contractor's means and methods. This may require partial removal and replacement to meet design grades.

9.3.3 Soil Amendment with Cement

As an alternative to the use of imported granular material for structural fill, the on-site fine-grained soils can be amended with PCC to obtain suitable support properties. PCC-amended soils are hard and have low permeability. They should not be used if runoff during construction cannot be properly controlled.

Treatment depths for subgrades, haul roads, and staging areas are typically on the order of 12, 16, and 12 inches, respectively. To protect the cement-treated surfaces from abrasion or damage, the finished surface is typically covered with 4 to 6 inches of imported granular material.

The actual thickness of the amended material, percentage of added cement, and thickness of imported granular material will depend on the anticipated subgrade usage, as well as the contractor's means and methods, and accordingly, should be the contractor's responsibility.

If the subgrade is amended with cement, refer to *Section 9.6.7 Cement-Amended Subgrade* for additional discussion.

9.3.4 Haul Roads and Stabilized Work Areas

One method for minimizing subgrade disturbance during construction is using temporary haul roads and stabilized work areas. Based on our experience, between 12 and 18 inches of imported granular material is generally required to construct work areas and haul roads that will support typical construction traffic. However, the actual thickness will depend on the contractor's means and methods, and accordingly, should be the contractor's responsibility. Additionally, a geotextile fabric may be placed as a barrier between the subgrade and imported granular material in areas of repeated construction traffic to provide separation between the imported rock and native soils. The imported granular material and geotextile fabric should meet the specifications in *Section 9.6 - Structural Fill and Backfill* of this report.

9.4 EXCAVATION

9.4.1 General Excavations

Site soils are generally expected to consist of soft to medium stiff silt and elastic silt within expected excavation depths. It is our opinion that conventional earthmoving equipment in proper working

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condition should be capable of making necessary general excavations for utilities, footings, and other earthwork. The earthwork contractor should be responsible for providing equipment and following procedures as needed to excavate the site soils as described in this report.

Permanent slope excavations should have a maximum gradient of 2H:1V.

9.4.2 Temporary Excavation Stability

While the near-surface soils are mostly composed of silt and clay (Occupational Safety and Health Administration [OSHA] Soil Type B) there is still the potential for sloughing, raveling, or caving, even for shallow excavations, particularly for excavations that extend below perched groundwater zones or below the groundwater table. Therefore, we recommend considering these materials to be OSHA Soil Type C for planning purposes.

Open-excavation techniques may be used for temporary excavations above the groundwater table. For planning purposes only, we expect that temporary cut slopes may be excavated at an angle of 1.5H:1V or flatter. However, because of the variables involved, actual slope angles required for stability in temporary cut areas can only be estimated before construction. We recommend that stability of the temporary slopes used for construction be the responsibility of the contractor, since the contractor is in control of the construction operation and is continuously at the site to observe the nature and condition of the subsurface.

All temporary soil cuts associated with site excavations greater than 4 feet in depth should be adequately sloped back to prevent sloughing and collapse in accordance with OSHA guidelines.

The stability and safety of cut slopes depend on a number of factors, including:

- type and density of the soil;
- presence and amount of any seepage;
- depth of the cut;
- proximity and magnitude of the cut to any surcharge loads, such as stockpiled material, traffic loads, or structures;
- duration of the open excavation; and
- care and methods used by the contractor.

It is the responsibility of the contractor to ensure that the excavation is properly sloped or braced for worker protection, in accordance with OSHA guidelines. To assist with this effort, for planning purposes only, we make the following recommendations regarding temporary excavation slopes.

- Protect the slope from erosion with plastic sheeting for the duration of the excavation to minimize surface erosion and raveling.
- Limit the maximum duration of open excavation to the shortest time period practicable.
- Place no surcharge loads (equipment and materials) within 10 feet of the top of any excavation or slope.

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More restrictive requirements may apply, depending on specific site conditions, which should be continuously assessed by the contractor.

If temporary sloping is not feasible due to site spatial constraints, excavations could be supported by internally braced shoring systems, such as a trench box or other temporary shoring. There are a variety of options available. We recommend that the contractor be responsible for selecting the type of shoring system to use. Box shoring is a safety feature used to protect workers and does not prevent caving. If the excavations are left open for extended periods of time, then caving of the sidewalls may occur. The presence of caved material will limit the ability to properly backfill and compact the trenches. The voids between the box shoring and the sidewalls of the trenches should be properly filled with sand or gravel before caving occurs.

9.4.3 Dewatering

Perched groundwater is expected to be present throughout the near-surface (upper 5 feet below existing ground surface), within and above the ESU 1A silts blanketing much of the southern portion of the site. The groundwater will saturate the shallow site soils, making them susceptible to construction-related disturbance as discussed in *Section 9.3 - Wet Soil Construction.* Control of groundwater and surface water flows will be an important part of earthwork, utility, and foundation construction at the site.

The ESU 1A soils present throughout much of the area of planned earthwork activities have low permeability characteristics. As such, we anticipate sump pumps can be used to collect seepage into excavations but will require shoring systems that provide active restraint to the excavation sidewalls. Also, sump pumps will not reduce the potential for soft, unstable excavation bases which may develop when active seepage is allowed.

The use of external dewatering systems (e.g., wells or well points) can be considered for deeper excavations or where better control over seepage is desired; however, the efficacy of such systems will be poor and drawdown times will be long due to the fine-grained nature of the ESU 1A site soils.

Because selection of an appropriate temporary dewatering system will depend on the water quantity, season, weather conditions, construction sequence, and contractor's methods, final decisions about dewatering systems are best made in the field at the time of construction.

9.4.4 Utility Trench Dams

Due to silty soils near the surface and shallow perched water conditions, granular soils used as utility trench backfill may act as a conduit to carry water towards buildings. As such, we recommend that seepage cut offs be installed in utility trenches penetrating the building and in other areas where trenches may direct unwanted seepage, such as down slopes to the north of the buildings. This can be achieved by trench plugging techniques such as using low strength concrete, controlled density fill, or a low permeability clay in the trench backfill. The cut offs should extend at least 18 inches beyond the sides and bases of the trenches and extend to within 1 foot of finished grade. At buildings, we recommend trenches be plugged from the face of the building and extend outward at least 3 feet.

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9.5 PERMANENT SLOPES

Permanent cut or fill slopes should be completed in accordance with the specifications provided in WSS 2-03 - Roadway Excavation and Embankment and City of Aberdeen standards.
Permanent cut slopes up to approximately 10 feet tall and fill slopes on the order of 25 feet tall are anticipated to be required for the project.

Permanent slopes should not exceed a gradient of 2H:1V. Where soft surficial soils are encountered in the exposed face of cut slopes, they may need to be excavated and replaced with structural fill, as described in *Section 9.2 - Site Preparation*. Also, where seepage is encountered at the face of cut slopes, it will be necessary to install a subdrain to collect the water, as discussed in *Section 7.0 - Drainage Design Recommendations*. This condition should be evaluated during design and possibly presented as a construction contingency.

Hardscape improvements (e.g., curbs) should be located at least 3 feet from the crest of slopes. The setback for the toe of building and wall foundations should be no less than 10 feet from the crest of slopes, unless the foundation design and construction takes into consideration soil creep and slope stability. Depending upon the slope gradient and structure setback from the crest of the slope, this requirement will affect the foundation embedment.

Slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face of the slope.

9.5.1 Keyways and Benches

Where fill 4 feet or more in thickness is to be placed on hillside slopes steeper than 5H:1V, keyways and benches should be cut into the exposed ground surface to provide support for the fill. The keyways should be constructed along the toe of fill slopes. Horizontal benches should be excavated into the native materials or competent fill as the fill progresses up the slope to develop good bond between the foundation material and the fill. The keyways should extend a minimum of 4 feet into native natural soil, rock, or competent fill below weak soils. Typically, keyways should be a minimum of 5 feet in depth and 10 feet in width. A subdrain should be added to all keyways. Subdrains may also be required at benches, depending on the final design of graded slopes.

9.5.2 Cut Slope Subdrains

We anticipate localized zones of perched seepage may be encountered in proposed cut slopes, such as those along the southern property boundary. Where seepage is observed during construction, subdrains should be installed. In general, subdrains should consist of minimum 2-foot-wide by 4-foot-deep, drain rock-filled trenches installed in and at least 5 feet beyond the area of seepage. The drain rock should be completely wrapped with a geotextile drainage fabric. A perforated pipe should be installed at the base of the gravel to collect water seepage. The collector pipe should “daylight” at an appropriate location away from the slope.

9.6 STRUCTURAL FILL AND BACKFILL

Structural fill should be considered to include subgrade soils beneath buildings, foundations, slabs, and pavements and in other areas intended to support structures or within the influence zone of structures.

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Fill should only be placed over a subgrade that has been prepared in conformance with the prior sections of this report. A variety of materials may be used as site structural fill. However, all material used as structural fill should be free of organic matter or other unsuitable materials and should meet specifications provided in the WSS for structural fill (WSDOT, 2026). A brief characterization of some of the acceptable materials and our recommendations for their use as structural fill are provided below. All materials should be placed and compacted in lifts with maximum uncompacted thicknesses and relative densities as recommended in the tables that follow.

9.6.1 On-Site Soils

Near-surface site soils that might be used for fill generally consist of silt. In general, we expect these excavated fine-grained soils to be near saturation and will be very difficult to moisture-condition (i.e., dry out) to a state suitable for placement as structural fill as discussed in *Section 9.3 - Wet Soil Construction*. Therefore, cement-treatment of these materials is likely to be required before they can be used as fill (see *Section 9.6.7 - Cement-Amended Subgrade*).

Near-surface soils may exhibit potential to be expansive; therefore, if used as fill without treatment, they should be placed at around 2 percent over optimum moisture content in order to mitigate the effect of contact with water after placement.

On-site soils used as structural fill should be free of particles over 6 inches in diameter and meet the specifications provided in WSS 9 03.14(3) – Common Borrow. Topsoil materials are not suitable for structural fill.

9.6.2 Imported Select Structural Fill

Imported granular material used as structural fill should be pit or quarry run rock, crushed rock, or crushed gravel and sand and should meet the specifications provided in WSS 9 03.9(1) - Ballast, WSS 9 03.14(1) - Gravel Borrow, or WSS 9 03.14(2) - Select Borrow. However, the imported granular material should also have a maximum size of 2 inches, be angular and fairly well-graded between coarse and fine material, have less than 5 percent by dry weight passing the U.S. Standard No. 200 mesh sieve, and have at least two mechanically fractured faces.

If the imported granular fill is placed atop the native silt and clay, a separation fabric should be placed atop the subgrade prior to the placement of the imported granular material. The geotextile should meet the specifications in WSS 9-33.2(1) Table 3 - Geotextile for Separation or Soil Stabilization. The geotextile should be installed in conformance with the specifications provided in WSS 2-12 - Construction Geosynthetic.

9.6.3 Aggregate Base

Imported granular material used as aggregate base (base rock) beneath pavements, the building, or footings should be clean, crushed rock or crushed gravel and sand that is fairly well-graded between coarse and fine. The base aggregate should meet the specifications provided in WSS 9 03.9 - Aggregates for Ballast and Crushed Surfacing, depending upon application. For use beneath general building slabs, the base rock should also meet the gradation of WSS 9 03.9(3) - Crushed Surfacing for “Base Course,” though should have less than 5 percent by dry weight passing a U.S. Standard No. 200 mesh sieve. This material should also have at least two mechanically fractured faces.

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For use beneath pavements or footings, the aggregate base should have a maximum particle size of 1 inch or 1.5 inches, while for use beneath the building or sidewalk slabs should have a maximum particle size of 0.75 or 1 inch.

If the aggregate base is placed atop the native silt, a separation fabric should be considered based on construction conditions observed by Haley & Aldrich. If implemented, it should be placed atop the subgrade prior to the placement of the imported granular material. The geotextile should meet the specifications in WSS 9-33.2(1) Table 3 - Geotextile for Separation or Soil Stabilization. The geotextile should be installed in conformance with the specifications provided in WSS 2-12 - Construction Geosynthetic.

9.6.4 Trench Backfill

Trench backfill placed beneath, adjacent to, and for at least 12 inches above utility lines (i.e., the pipe zone) should consist of well-graded granular material with a maximum particle size of 1 inch and should meet the specifications provided in WSS 9 03.12(3) - Gravel Backfill for Pipe Zone Bedding and the pipe manufacturer.

Within pavement and slab subgrades, the remainder of the trench backfill up to the subgrade elevation can consist of the above 1-inch material or of granular material with a maximum particle size of 2.5 inches, less than 10 percent by dry weight passing the U.S. Standard No. 200 mesh sieve, and meeting the specifications provided in WSS 9 03.19 - Bank Run Gravel for Trench Backfill.

As noted in Section 9.3.4, seepage cut offs should be installed in utility trenches to reduce the potential for the trench backfill to act as a conduit for water flow towards undesirable locations.

9.6.5 Stabilization Material

Imported material that is placed as a stabilization layer for haul roads, staging areas, or the bases of trenches that are soft should consist of a clean, angular, crushed rock, such as ballast or quarry spalls. The material should have a maximum particle size of 4 inches, a nominal size between 2 and 4 inches, less than 5 percent by dry weight passing the U.S. Standard No. 4 mesh sieve, and at least two mechanically fractured faces.

Material meeting the gradations of WSS 9-03.9(1) - Ballast, WSS 9-13.1(3) - Light Loose Riprap, WSS 9-03.12(5) - Gravel Backfill for Drywells, or WSS 9-13.1(5) - Quarry Spalls is generally acceptable for this use. Stabilization material should be placed in lifts between 12 and 18 inches thick and be compacted to a well keyed condition with a smooth drum roller without using vibratory action.

Stabilization material should be separated from the base of soft or fine-grained subgrades with a layer of subgrade geotextile that meets the specifications provided in WSS 9-33.2(1) Table 3 - Geotextile for Separation or Soil Stabilization. The geotextile should be installed in conformance with the specifications provided in WSS 2-12 - Construction Geosynthetic.

9.6.6 Drain Rock

Drain rock used for subsurface drains should meet the specifications provided in WSS 9 03.12(4) - Gravel Backfill for Drains. The drain rock should be wrapped in a geotextile fabric that meets the specifications

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provided in WSS 9 33.2 for drainage geotextiles. The geotextile should be installed in conformance with the specifications provided in WSS 2 12 - Construction Geosynthetic.

9.6.7 Cement-Amended Subgrade

As an alternative to the use of imported granular material for structural fill or stabilization of the in situ site subgrade soils, an experienced contractor may be able to amend the on-site soils with PCC to obtain suitable support properties. Successful use of soil amendment depends on the use of correct mixing techniques, soil moisture content, and amendment quantities. Specific recommendations for soil amending, based on exposed site conditions, can be provided if necessary.

PCC-amended soils are hard and have low permeability. These soils do not drain well nor are they suitable for planting. Future planted areas should not be cement amended, if practical, or accommodations should be made for drainage and planting. Moreover, cement amending soil within building areas must be done carefully to avoid trapping water under floor slabs. We should be contacted if this approach is considered. Cement amendment should not be used if runoff during construction cannot be directed away from off-site drainage facilities.

Treatment depths for subgrades, haul roads, and staging areas are typically on the order of 12 to 18 inches. We recommended a seven-day unconfined compressive strength of at least 80 psi. To protect the cement-treated surfaces from abrasion or damage, the finished surface should be covered with 4 to 6 inches of imported granular material. The crushed rock typically becomes contaminated with soil during construction. Contaminated base rock should be removed and replaced with clean rock in pavement areas.

A site-specific study for determining the actual percent cement to be used was not performed. We recommend that this study be performed prior to construction to determine the optimum percent cement to be used. For preliminary planning purposes, we estimate that 5-percent cement (by dry weight) will be required for amending of on-site soils for use as general structural fill. However, where amended soils will be used in the upper 12 to 18 inches of roadway subgrades, haul roads, or staging areas, we estimate the cement may need to be increased to 6 percent. Actual percentages of cement will need to be based on in situ soil moisture contents and other field conditions at the time of amendment. The contractor should assume an in situ soil unit weight of 110 pcf when estimating cement volumes.

The actual thickness of the amended material and imported granular material will depend on the anticipated traffic, as well as the contractor's means and methods, and accordingly, should be the contractor's responsibility.

It is not possible to amend soils during heavy or continuous rainfall. Work should be completed during suitable conditions. To prevent strength loss during curing, cement-amended soil should be allowed to cure for a minimum of four days prior to access by construction traffic.

In order to use wet on-site soils that would not otherwise be suitable for structural fill, they may be amended and placed as fill over a stabilized subgrade. Consecutive lifts of fill may be treated immediately after the previous lift has been amended and compacted (e.g., the four-day wait period does not apply). However, where the final lift of fill is a building or roadway subgrade, then the four-day wait period is in effect.

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Where excavations for utility lines penetrate the cement-treated layer, the utility should be located below the cement-treated soil and the resulting excavation should be backfilled to the top of the adjacent cement-treated soil with compacted Class 2 Aggregate Base, lean concrete, or controlled density fill. The remainder of the excavation above the top of the cement treatment, such as the capillary break or aggregate base section, should be placed as discussed in the applicable sections of these recommendations.

9.7 FILL PLACEMENT AND COMPACTION

Structural fill should be placed and compacted in accordance with the following guidelines.

- Place fill and backfill on a prepared subgrade that consists of firm, inorganic native soils or approved structural fill.
- Place fill or backfill in uniform horizontal lifts with a thickness appropriate for the material type and compaction equipment. Table 12, below, provides general guidance for lift thicknesses.

Table 12. Guidelines for Uncompacted Lift Thickness

Compaction Equipment	Guidelines for Uncompacted Lift Thickness (inches)		
	On-site Soil	Granular and Crushed Rock Maximum Particle Size ≤ 1½ inch	Crushed Rock Maximum Particle Size > 1½ inch
Plate Compactors and Jumping Jacks	4 – 6	4 – 8	Not Recommended
Rubber-Tire Equipment	6 – 8	10 – 12	6 – 8
Light Roller	8 – 10	10 – 12	8 – 10
Heavy Roller	10 – 12	12 – 18	12 – 16
Hoe Pack Equipment	12 – 16	18 – 24	12 – 16

Note:
The above table is based on our experience and is intended to serve as a guideline. The information provided in this table should not be included in the project specifications.

- Use appropriate operating procedures to attain uniform coverage of the area being compacted.
- Place fill at a moisture content within approximately 3 percent of optimum as determined in accordance with ASTM D1557. Moisture condition fill soil to achieve uniform moisture content within the specified range before compacting. Compact fill to the percent of maximum dry densities as noted in Table 13, below.
- Do not place, spread, or compact fill soils during freezing or unfavorable weather conditions. Frozen or disturbed lifts should be removed or properly recompacted prior to placement of subsequent lifts of fill soils.

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Table 13. Fill Compaction Criteria			
Fill Type	**Percent of Maximum Dry Density Determined in Accordance with ASTM D1557**		
	0 – 2 Feet Below Subgrade	**>2 Feet Below Subgrade**	**Pipe Bedding and Pipe Zone**
Mass Fill: fine-grained soils	92	92	-----
Mass Fill: granular materials	95	95	-----
Aggregate Base	95	95	-----
Trench Backfill	95	95	90
Nonstructural Trench Backfill	90	88	-----
Nonstructural Zones	90	88	90
Note: *"Nonstructural" areas are only located in landscaping zones, where the potential for localized trench settlement is acceptable to the owner.*			

During structural fill placement and compaction, a sufficient number of in-place density tests should be completed by Haley & Aldrich to verify that the specified degree of compaction is being achieved. For structural fill with more than 30 percent retained on the 3/4-inch sieve, Haley & Aldrich should visually verify proper compaction with a proof roll or other methods.

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10. Limitations

Haley & Aldrich has prepared this report for the exclusive use of Aberdeen School District No. 5 and their authorized agents for the proposed Aberdeen South Elementary project in Aberdeen, Washington. Our work was completed in general accordance with the signed agreement between Haley & Aldrich and Aberdeen School District dated November 19, 2025 and executed on December 19, 2025. Our report is intended to provide our opinion of geotechnical parameters for design and construction of the proposed project based on exploration locations that are believed to be representative of site conditions. However, conditions can vary significantly between exploration locations and our conclusions should not be construed as a warranty or guarantee of subsurface conditions or future site performance.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty, express or implied, should be understood.

Any electronic form, facsimile, or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by Haley & Aldrich and will serve as the official document of record.

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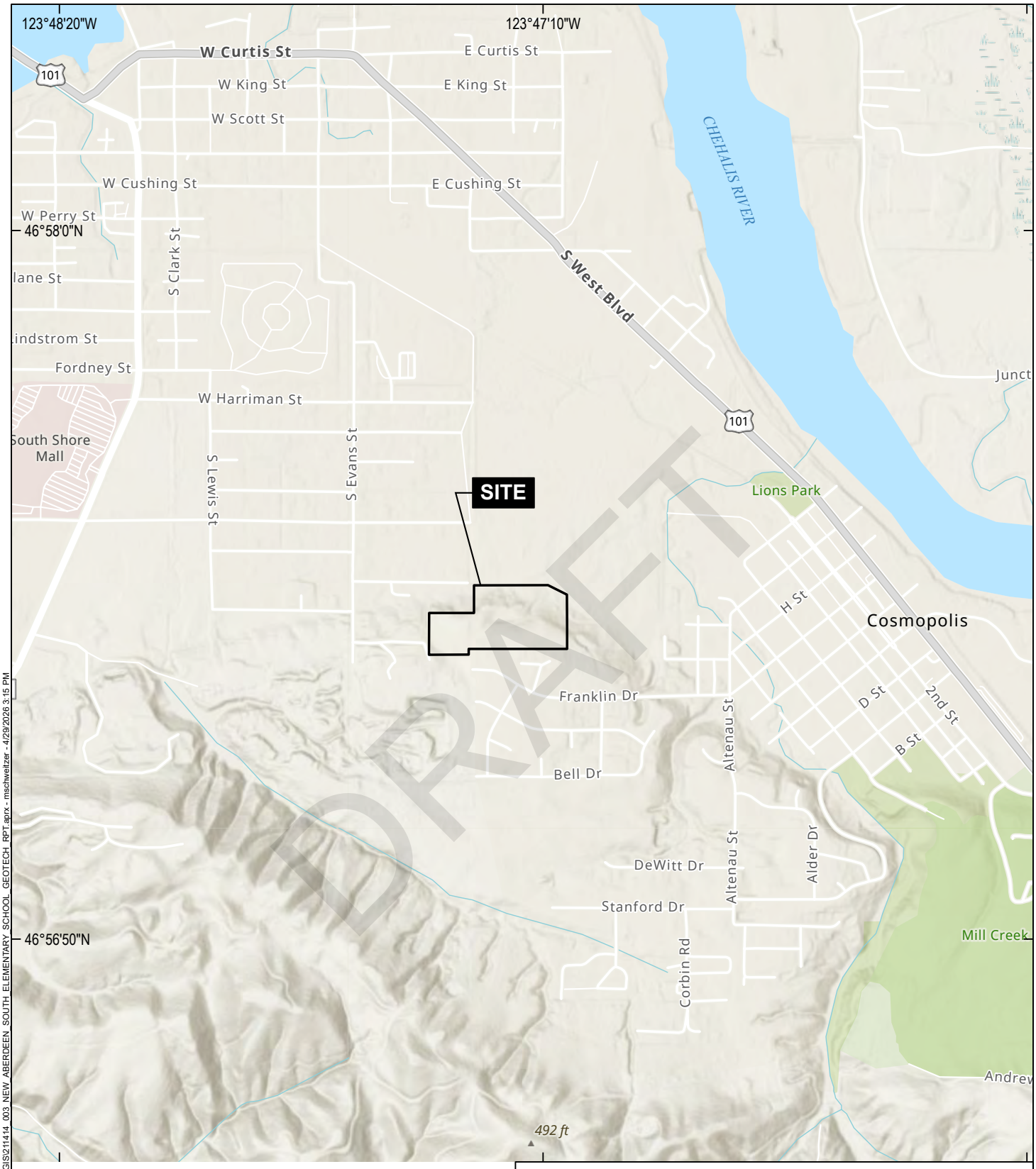
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FIGURES

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MAP SOURCE: ESRI
SITE COORDINATES: 46°57'25"N, 123°47'13"W

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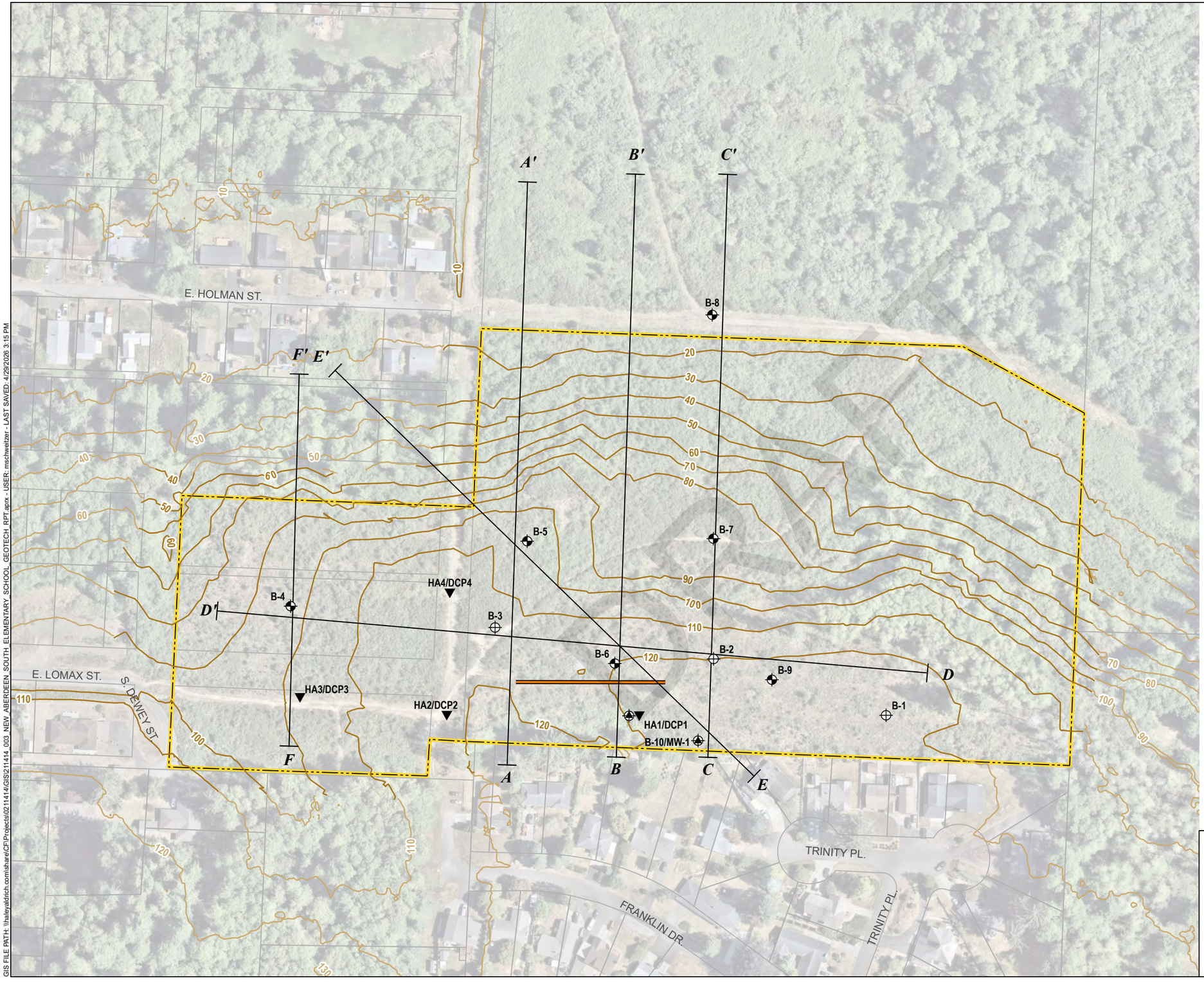
ABERDEEN SCHOOL DISTRICT
NEW ABERDEEN SOUTH ELEMENTARY SCHOOL
ABERDEEN, WASHINGTON

VICINITY MAP

APPROXIMATE SCALE: 1 IN = 4000 FT
JUNE 2026

FIGURE 1

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LEGEND

- BORING (JANUARY 2026)
- BORING WITH MONITORING WELL (JANUARY 2026)
- HAND AUGER WITH DYNAMIC CONE PENETROMETER TEST (DCP) (JANUARY 2026)
- BORING (DECEMBER 2024)
- CROSS SECTION
- GEOPHYSICAL SURVEY LINE
- SURVEYED TOPOGRAPHIC ELEVATION CONTOUR, 10-FT INTERVAL (NAVD 88)
- WADNR TOPOGRAPHIC ELEVATION CONTOUR, 10-FT INTERVAL (NAVD 88)
- SUBJECT PROPERTY
- PARCEL BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. SURVEYED TOPOGRAPHIC ELEVATION CONTOUR SOURCE: MTN2COAST LLC. PROFESSIONAL LAND SURVEYORS, MARCH 2, 2026

3. WADNR TOPOGRAPHIC ELEVATION CONTOUR SOURCE: WASHINGTON STATE DEPARMENT OF NATURAL RESOURCES (WADNR), WASHINGTON LIDAR PORTAL, 2019

4. AERIAL IMAGERY SOURCE: NEARMAP, JULY 15, 2025

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SCALE IN FEET

HALEY ALDRICH

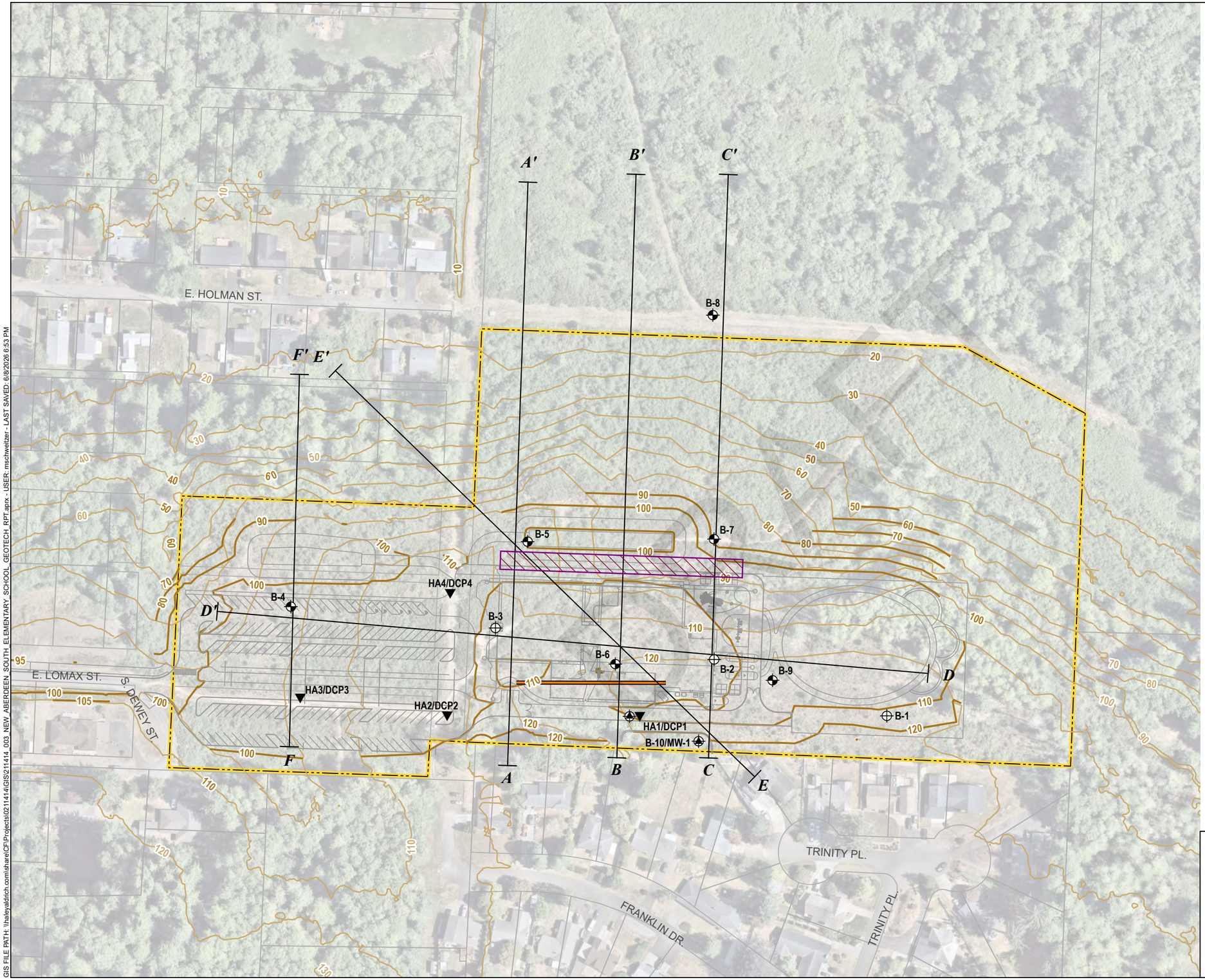
ABERDEEN SCHOOL DISTRICT
NEW ABERDEEN SOUTH ELEMENTARY SCHOOL
ABERDEEN, WASHINGTON

SITE PLAN - EXISTING

JUNE 2026

FIGURE 2

GIS FILE PATH: \\haleyaldrich.com\share\CPI\Projects\0211414\GIS\211414_003_NEW_ABERDEEN_SOUTH_ELEMENTARY_SCHOOL_GEOTECH_RPT.aprx - USER: mschweitzer - LAST SAVED: 4/29/2026 3:15 PM



LEGEND

- BORING (JANUARY 2026)
- BORING WITH MONITORING WELL (JANUARY 2026)
- HAND AUGER WITH DYNAMIC CONE PENETROMETER TEST (DCP) (JANUARY 2026)
- BORING (DECEMBER 2024)
- CROSS SECTION
- GEOPHYSICAL SURVEY LINE
- PROPOSED TOPOGRAPHIC ELEVATION CONTOUR, 10-FT INTERVAL (NAVD 88)
- SURVEYED AND WADNR TOPOGRAPHIC ELEVATION CONTOUR, 10-FT INTERVAL (NAVD 88)
- SUBJECT PROPERTY
- PARCEL BOUNDARY
- PROPOSED DEEP SOIL MIX AREA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. PROPOSED SITE FEATURE SOURCE: CAD FILE, "_C26-102 X-PBASE 1.DWG," RECIEVED JUNE 8, 2026

3. SURVEYED TOPOGRAPHIC ELEVATION CONTOUR SOURCE: MTN2COAST LLC. PROFESSIONAL LAND SURVEYORS, MARCH 2, 2026

4. WADNR TOPOGRAPHIC ELEVATION CONTOUR SOURCE: WASHINGTON STATE DEPARMENT OF NATURAL RESOURCES (WADNR), WASHINGTON LIDAR PORTAL, 2019

5. AERIAL IMAGERY SOURCE: NEARMAP, JULY 15, 2025

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SCALE IN FEET

HALEY ALDRICH

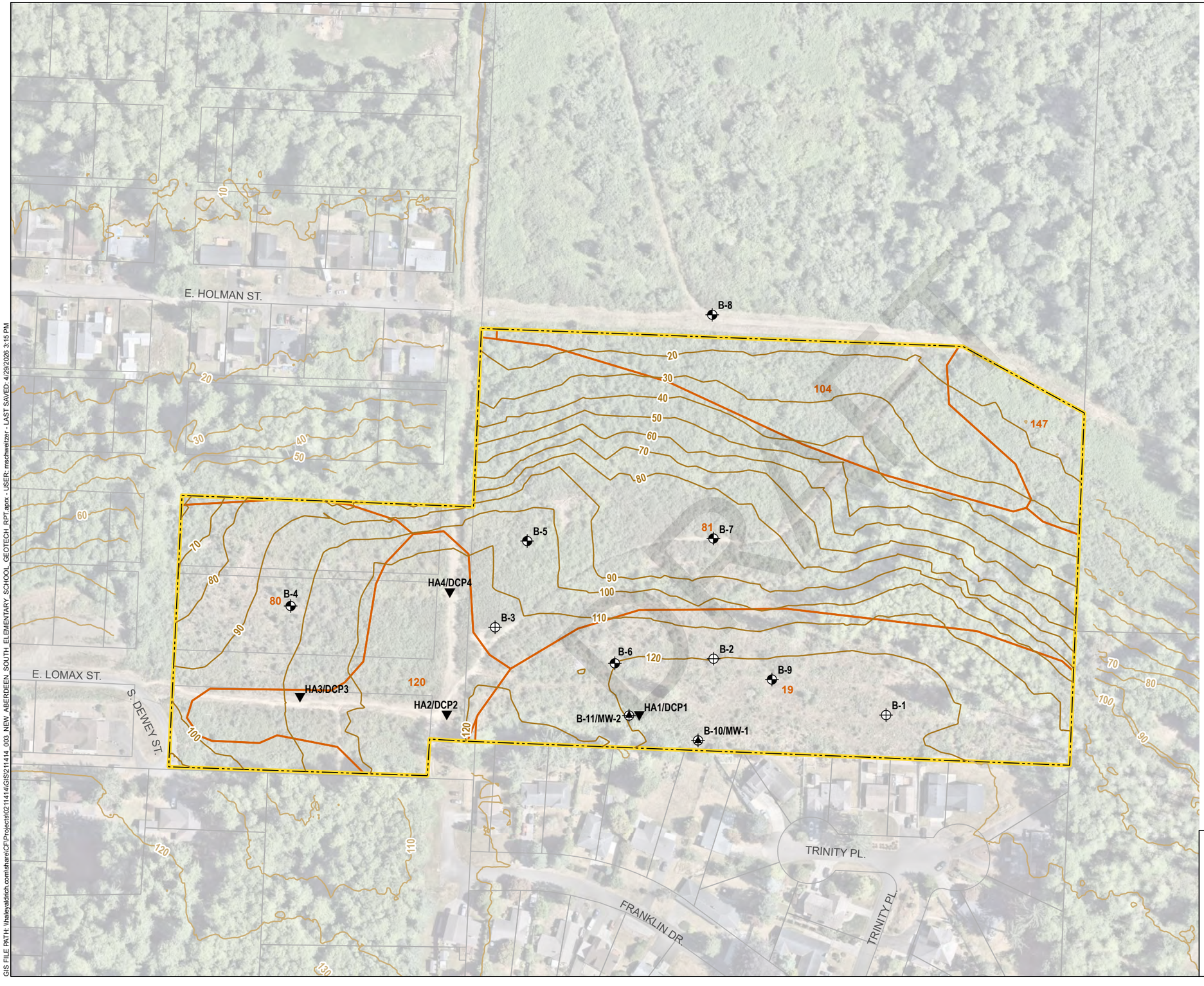
ABERDEEN SCHOOL DISTRICT
NEW ABERDEEN SOUTH ELEMENTARY SCHOOL
ABERDEEN, WASHINGTON

SITE PLAN - PROPOSED

JUNE 2026

FIGURE 3

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LEGEND

- BORING (JANUARY 2026)
- BORING WITH MONITORING WELL (JANUARY 2026)
- HAND AUGER WITH DYNAMIC CONE PENETROMETER TEST (DCP) (JANUARY 2026)
- BORING (DECEMBER 2024)
- SURVEYED TOPOGRAPHIC ELEVATION CONTOUR, 10-FT INTERVAL (NAVD 88)
- WADNR TOPOGRAPHIC ELEVATION CONTOUR, 10-FT INTERVAL (NAVD 88)
- SOIL MAP UNIT
- SITE BOUNDARY

SOIL MAP UNIT	DESCRIPTION
19	Calawah silt loam 1 to 8 percent slopes
80	Mopang silt loam 5 to 30 percent slopes
81	Mopang silt loam 30 to 65 percent slopes
104	Ocosta silty clay loam
120	Pits gravel
147	Udorthents level

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. SURVEYED TOPOGRAPHIC ELEVATION CONTOUR SOURCE: MTN2COAST LLC. PROFESSIONAL LAND SURVEYORS, MARCH 2, 2026

3. WADNR TOPOGRAPHIC ELEVATION CONTOUR SOURCE: WASHINGTON STATE DEPARMENT OF NATURAL RESOURCES (WADNR), WASHINGTON LIDAR PORTAL, 2019

4. SOIL MAP UNIT SOURCE: UNITED STATES DEPARTMENT OF AGRICULTURE WEB SOIL SURVEY

5. AERIAL IMAGERY SOURCE: NEARMAP, JULY 15, 2025

N

0 150 300
SCALE IN FEET

HALEY ALDRICH

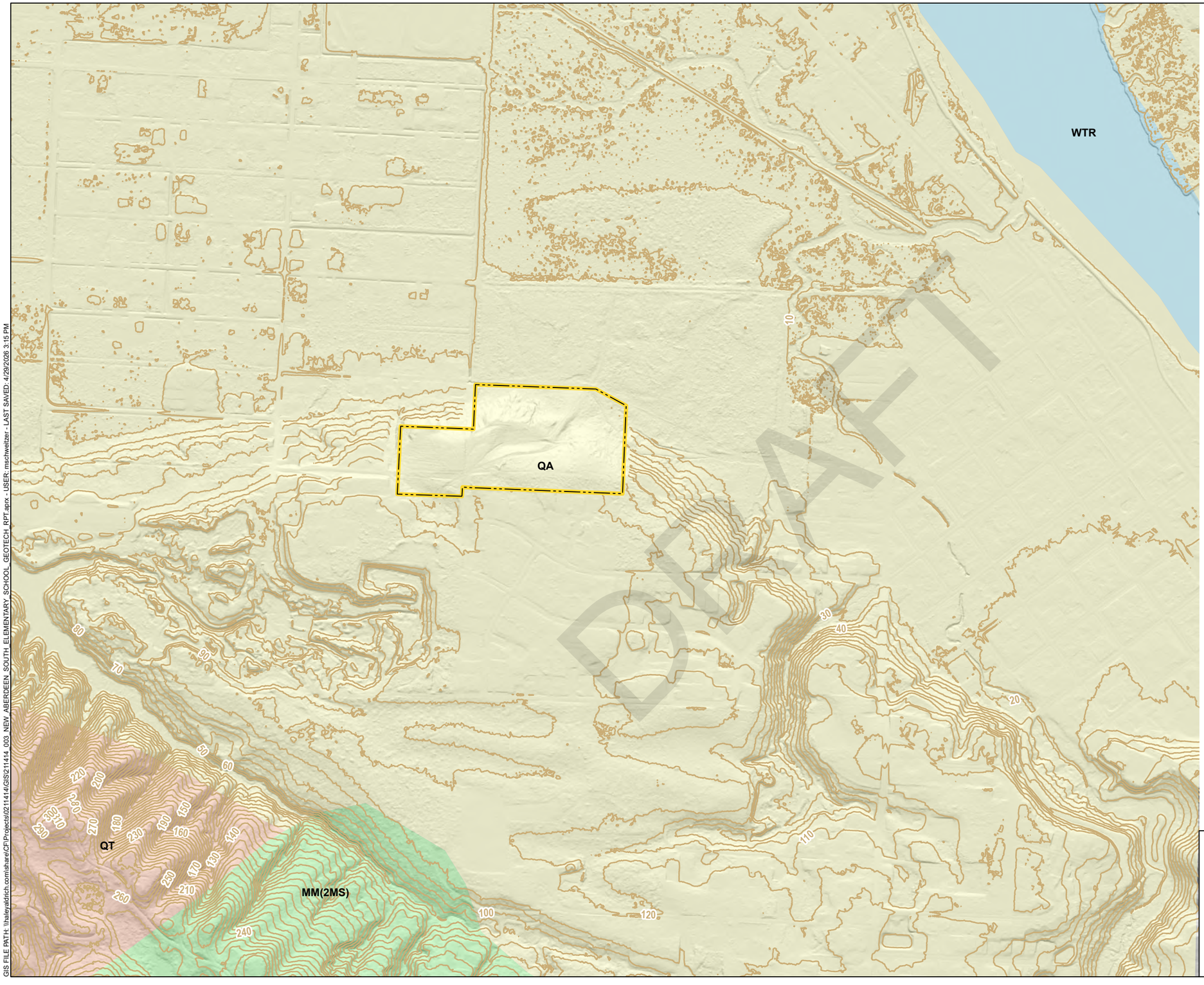
ABERDEEN SCHOOL DISTRICT
NEW ABERDEEN SOUTH ELEMENTARY SCHOOL
ABERDEEN, WASHINGTON

SOIL MAP

JUNE 2026

FIGURE 4

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LEGEND

- WADNR TOPOGRAPHIC ELEVATION CONTOUR, 10-FT INTERVAL (NAVD 88)
- SITE BOUNDARY

GEOLOGIC UNIT

- MM(2MS) TERTIARY SEDIMENTARY ROCKS AND DEPOSITS
- QA QUATERNARY ALLUVIUM
- QT TERRACED DEPOSITS
- WTR WATER

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. TOPOGRAPHIC ELEVATION CONTOUR AND LIDAR HILLSHADE SOURCE: WASHINGTON STATE DEPARMENT OF NATURAL RESOURCES (WADNR), WASHINGTON LIDAR PORTAL, 2019.

3. GEOLOGIC UNIT SOURCE: WADNR 100K SURFACE GEOLOGY

N

0 600 1,200

SCALE IN FEET

HALEY ALDRICH

ABERDEEN SCHOOL DISTRICT
NEW ABERDEEN SOUTH ELEMENTARY SCHOOL
ABERDEEN, WASHINGTON

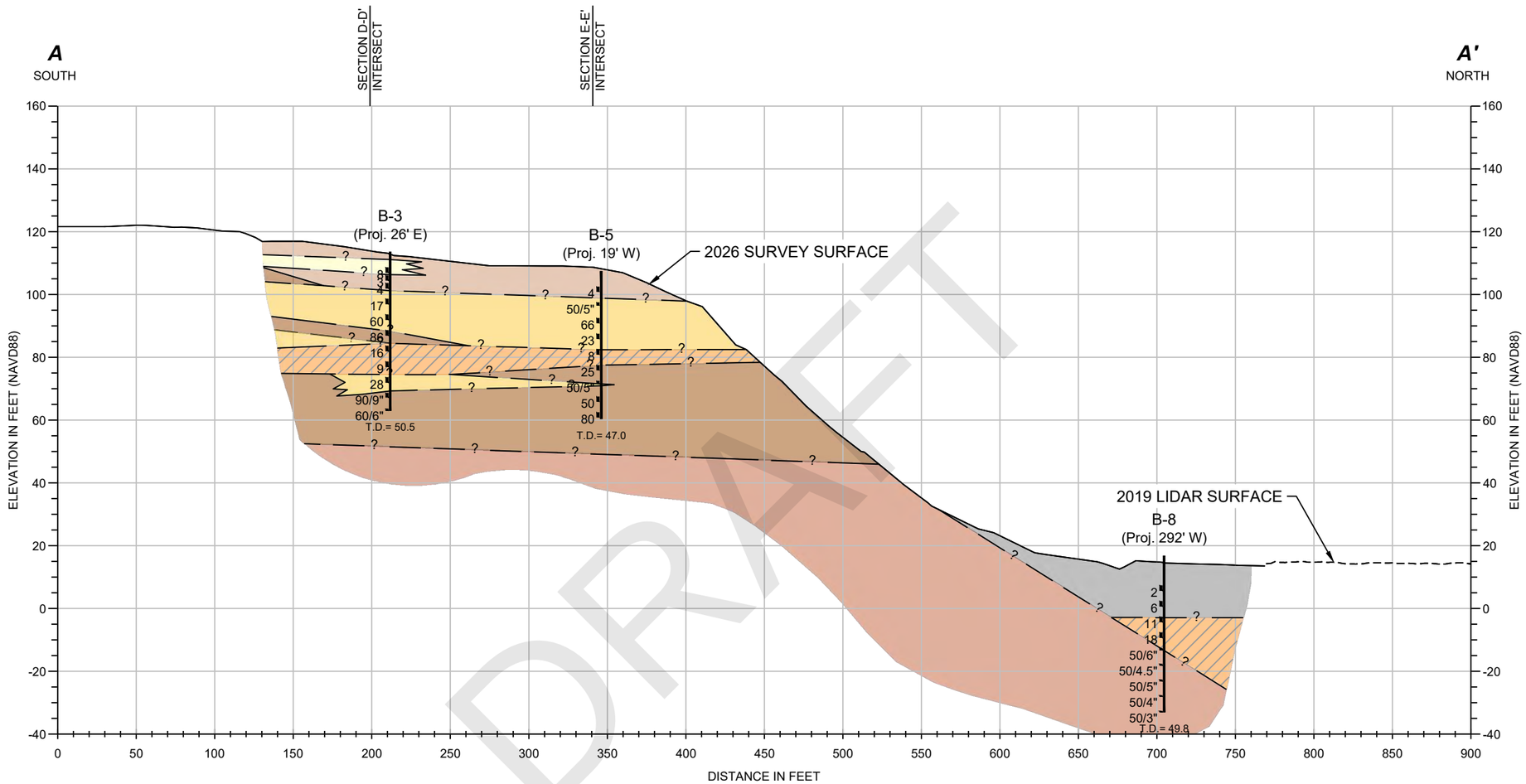
GEOLOGIC MAP

JUNE 2026

FIGURE 5

DRAFT

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DRAFT

BORING NAME WITH OFFSET — B-1 (Proj. 92' S)

BORING LOCATION

N-VALUE — 22 — WATER LEVEL

SCREEN INTERVAL

T.D. = 51.5 — TOTAL DEPTH

LEGEND

- ESU 1A - SILT & ELASTIC SILT
- ESU 1B - UPPER SILTY SAND
- ESU 2A - DENSE SAND
- ESU 2B - DENSE GRAVEL
- ESU 3 - LOWER SILTY SAND
- ESU 4 - ORGANIC SILT (YOUNG) ALLUVIUM
- ESU 5 - BEDROCK (MONTESANO FM)
- LIQUEFIABLE SOILS

NOTE

THIS SUBSURFACE PROFILE IS GENERALIZED FROM MATERIALS OBSERVED IN SOIL BORINGS. VARIATIONS MAY EXIST BETWEEN PROFILE AND ACTUAL CONDITIONS.

HORIZ. 0 80 160
VERT. 0 40 80
SCALE IN FEET

HALEY ALDRICH

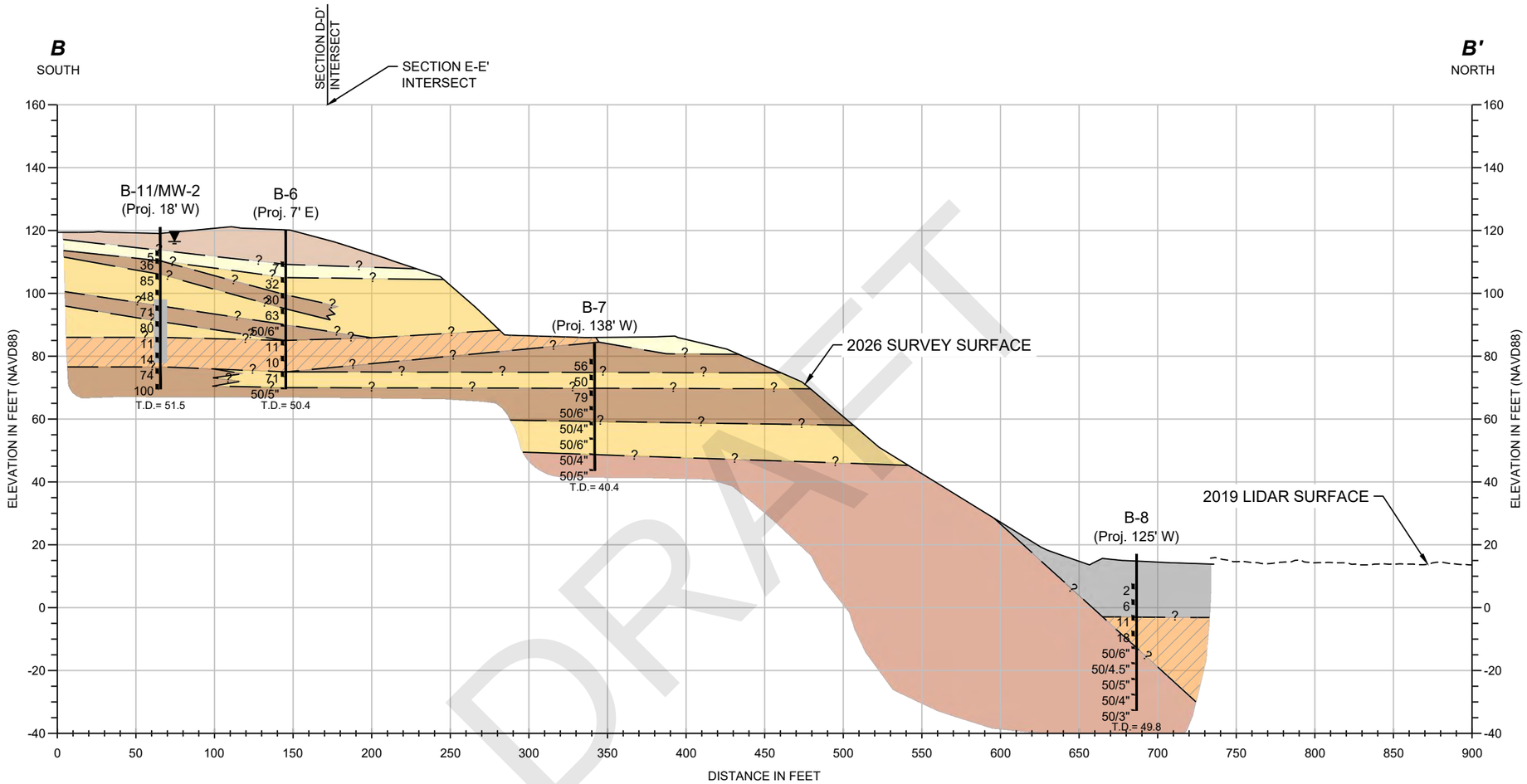
ABERDEEN SCHOOL DISTRICT
NEW ABERDEEN SOUTH ELEMENTARY SCHOOL
ABERDEEN, WASHINGTON

CROSS-SECTION A-A'

JUNE 2026

FIGURE 6

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BORING NAME WITH OFFSET — B-1 (Proj. 92' S)
BORING LOCATION
N-VALUE — 22
WATER LEVEL
SCREEN INTERVAL
T.D. = 51.5 — TOTAL DEPTH

LEGEND

- ESU 1A - SILT & ELASTIC SILT
- ESU 1B - UPPER SILTY SAND
- ESU 2A - DENSE SAND
- ESU 2B - DENSE GRAVEL
- ESU 3 - LOWER SILTY SAND
- ESU 4 - ORGANIC SILT (YOUNG) ALLUVIUM
- ESU 5 - BEDROCK (MONTESANO FM)
- LIQUEFIABLE SOILS

NOTE

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HORIZ. 0 80 160
VERT. 0 40 80
SCALE IN FEET

HALEY ALDRICH

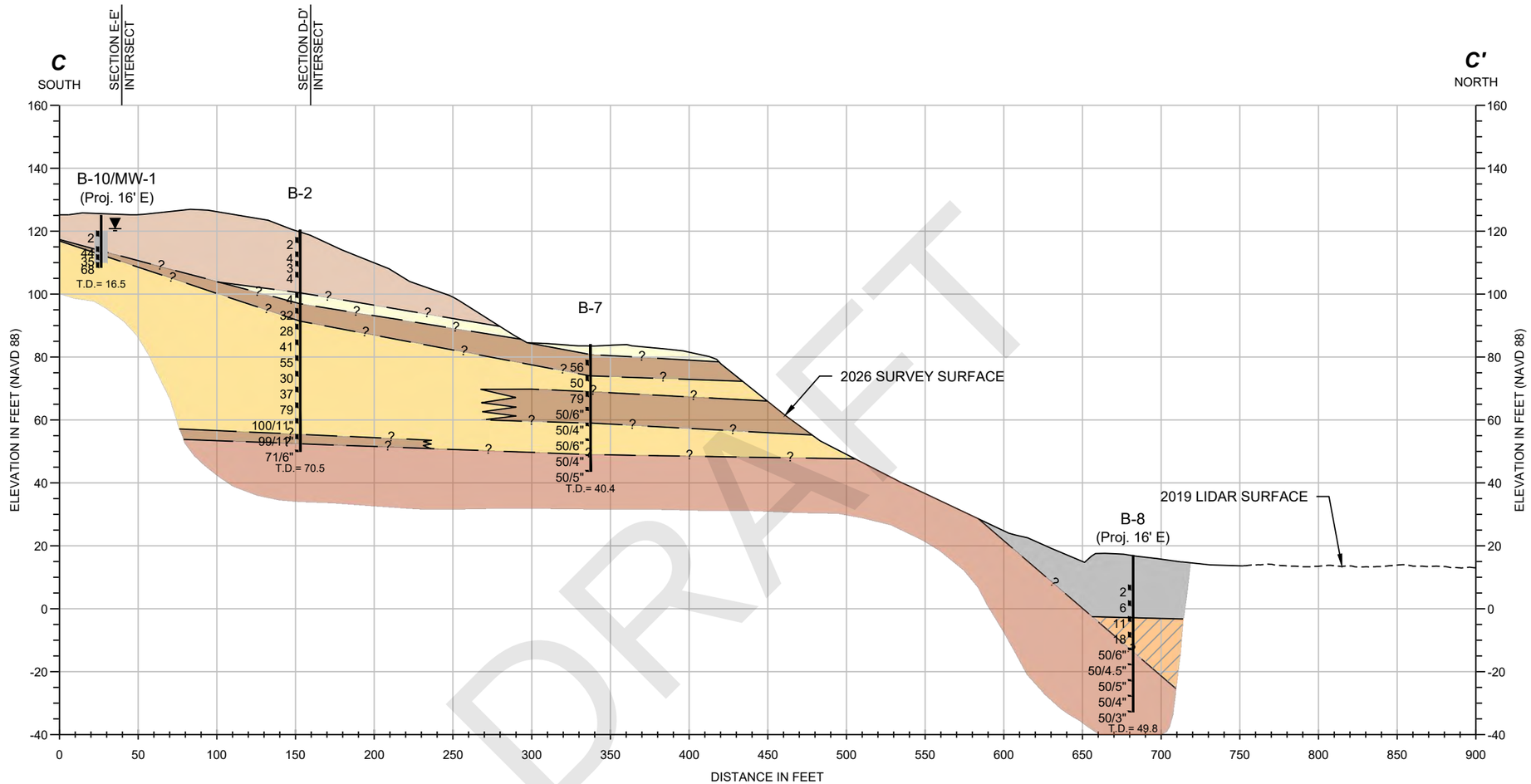
ABERDEEN SCHOOL DISTRICT
NEW ABERDEEN SOUTH ELEMENTARY SCHOOL
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CROSS-SECTION B-B'

JUNE 2026

FIGURE 7

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\\HALEYALDRICH.COM\SHARE\CF\PROJECTS\0211414\CAD\FIGURES\211414_000_CROSS_SECTION.DWG



DRAFT

BORING NAME WITH OFFSET — B-1 (Proj. 92' S)
BORING LOCATION
N-VALUE — 22
WATER LEVEL
SCREEN INTERVAL
T.D. = 51.5 — TOTAL DEPTH

LEGEND

- ESU 1A - SILT & ELASTIC SILT
- ESU 1B - UPPER SILTY SAND
- ESU 2A - DENSE SAND
- ESU 2B - DENSE GRAVEL
- ESU 3 - LOWER SILTY SAND
- ESU 4 - ORGANIC SILT (YOUNG) ALLUVIUM
- ESU 5 - BEDROCK (MONTESANO FM)
- LIQUEFIABLE SOILS

NOTE

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HORIZ. 0 80 160
VERT. 0 40 80
SCALE IN FEET

HALEY ALDRICH

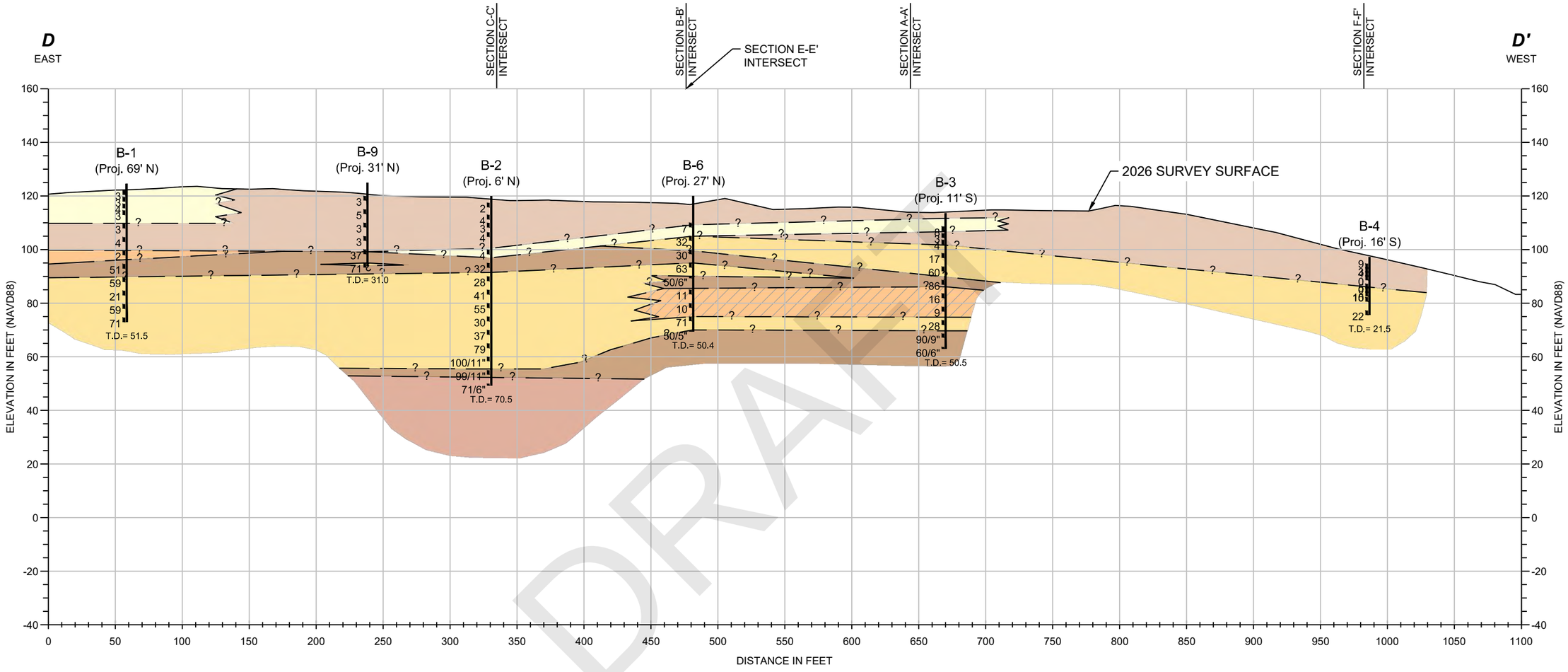
ABERDEEN SCHOOL DISTRICT
NEW ABERDEEN SOUTH ELEMENTARY SCHOOL
ABERDEEN, WASHINGTON

CROSS-SECTION C-C'

JUNE 2026

FIGURE 8

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\\HALEYALDRICH.COM\SHARE\CP\PROJECTS\0211414\CAD\FIGURES\211414_000_CROSS_SECTION.DWG



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BORING NAME WITH OFFSET — B-1 (Proj. 92' S)

BORING LOCATION

N-VALUE — 22 — WATER LEVEL

SCREEN INTERVAL

T.D. = 51.5 — TOTAL DEPTH

LEGEND

- ESU 1A - SILT & ELASTIC SILT
- ESU 1B - UPPER SILTY SAND
- ESU 2A - DENSE SAND
- ESU 2B - DENSE GRAVEL
- ESU 3 - LOWER SILTY SAND
- ESU 4 - ORGANIC SILT (YOUNG) ALLUVIUM
- ESU 5 - BEDROCK (MONTESANO FM)
- LIQUEFIABLE SOILS

NOTE

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HORIZ. 0 80 160
VERT. 0 40 80
SCALE IN FEET

HALEY ALDRICH

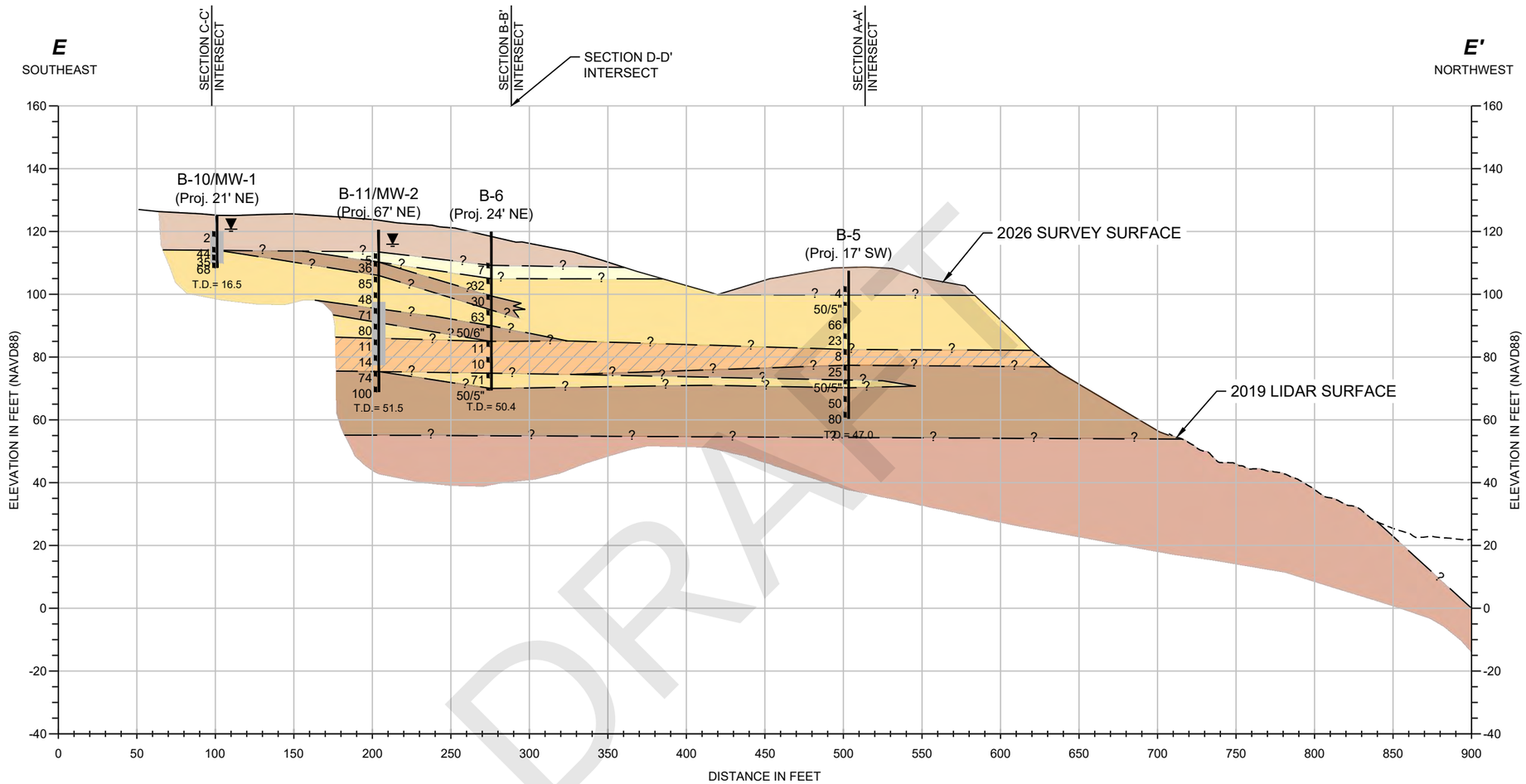
ABERDEEN SCHOOL DISTRICT
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CROSS-SECTION D-D'

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FIGURE 9

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DRAFT

BORING NAME WITH OFFSET — B-1 (Proj. 92' S)

BORING LOCATION

N-VALUE — 22 — WATER LEVEL

SCREEN INTERVAL

T.D. = 51.5 — TOTAL DEPTH

LEGEND

- ESU 1A - SILT & ELASTIC SILT
- ESU 1B - UPPER SILTY SAND
- ESU 2A - DENSE SAND
- ESU 2B - DENSE GRAVEL
- ESU 3 - LOWER SILTY SAND
- ESU 4 - ORGANIC SILT (YOUNG) ALLUVIUM
- ESU 5 - BEDROCK (MONTESANO FM)
- LIQUEFIABLE SOILS

NOTE

THIS SUBSURFACE PROFILE IS GENERALIZED FROM MATERIALS OBSERVED IN SOIL BORINGS. VARIATIONS MAY EXIST BETWEEN PROFILE AND ACTUAL CONDITIONS.

HORIZ. 0 80 160
VERT. 0 40 80
SCALE IN FEET

HALEY ALDRICH

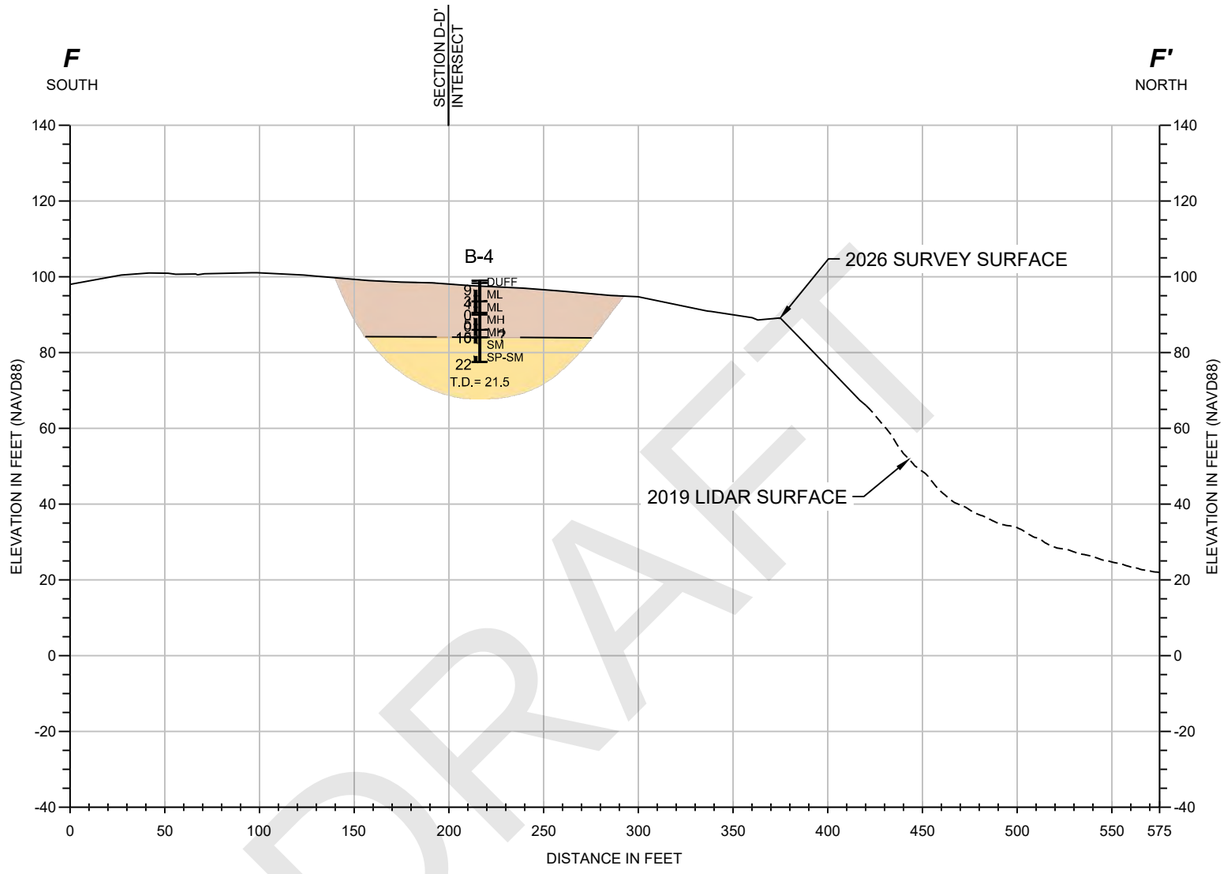
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CROSS-SECTION E-E'

JUNE 2026

FIGURE 10

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DRAFT

BORING NAME WITH OFFSET — B-1 (Proj. 92' S)

BORING LOCATION

N-VALUE — 22 — WATER LEVEL

SCREEN INTERVAL

T.D. = 51.5 — TOTAL DEPTH

LEGEND

- ESU 1A - SILT & ELASTIC SILT
- ESU 1B - UPPER SILTY SAND
- ESU 2A - DENSE SAND
- ESU 2B - DENSE GRAVEL
- ESU 3 - LOWER SILTY SAND
- ESU 4 - ORGANIC SILT (YOUNG) ALLUVIUM
- ESU 5 - BEDROCK (MONTESANO FM)
- LIQUEFIABLE SOILS

NOTE

THIS SUBSURFACE PROFILE IS GENERALIZED FROM MATERIALS OBSERVED IN SOIL BORINGS. VARIATIONS MAY EXIST BETWEEN PROFILE AND ACTUAL CONDITIONS.

HORIZ. 0 80 160
VERT. 0 40 80
SCALE IN FEET

HALEY ALDRICH

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CROSS-SECTION F-F'

JUNE 2026

FIGURE 11

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\\HALEYALDRICH.COM\SHARE\CP\PROJECTS\0211414\CAD\FIGURES\211414_000_CROSS_SECTION.DWG

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APPENDIX A
Exploration Logs

APPENDIX A

Field Explorations

Haley & Aldrich, Inc. (Haley & Aldrich) evaluated subsurface conditions at the site from 18 to 19 December 2024, by advancing three mud rotary borings. Borings were completed using an ATV-mounted CME-55 drill rig operated by Western States Soil Conservation, Inc. of Hubbard, Oregon. The field explorations were coordinated and overseen by geotechnical staff from Haley & Aldrich, who classified the various soil units encountered, obtained representative soil samples for geotechnical testing, recorded groundwater conditions, and maintained a detailed log of each exploration. Logs of the borings are included in this appendix. Results of the laboratory testing are indicated on the exploration logs and are included in Appendix B.

Materials encountered in the explorations were classified in the field in general accordance with ASTM International (ASTM) Standard Practice D 2488 "Standard Practice for the Classification of Soils (Visual-Manual Procedure)". Disturbed ("grab") samples were collected from the core samples in the push probe boring. Sampling intervals are shown on the exploration logs included in this appendix.

The exploration logs in this appendix show our interpretation of the exploration, sampling, and testing data. The logs indicate the depth where the soils change. Note that the change may be gradual. In the field, we classified the samples taken from the explorations according to the methods presented on the *Figure A-1 - Key to Exploration Logs*. This figure also provides a legend explaining the symbols and abbreviations used in the logs.

The approximate locations of the explorations are shown in Figure 2 of the report.

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Sample Description

Identification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. ASTM D 2488 visual-manual identification methods were used as a guide. Where laboratory testing confirmed visual-manual identifications, then ASTM D 2487 was used to classify the soils.

Relative Density/Consistency

Soil density/consistency in borings is related primarily to the standard penetration resistance (N). Soil density/consistency in test pits and probes is estimated based on visual observation and is presented parenthetically on the logs.

SAND or GRAVEL Relative Density	N (Blows/Foot)	SILT or CLAY Consistency	N (Blows/Foot)
Very loose	0 to 4	Very soft	0 to 1
Loose	5 to 10	Soft	2 to 4
Medium dense	11 to 30	Medium stiff	5 to 8
Dense	31 to 50	Stiff	9 to 15
Very dense	>50	Very stiff	16 to 30
		Hard	>30

Moisture

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

USCS Soil Classification Chart (ASTM D 2487)

Major Divisions			Symbols: Graph	Symbols: USCS	Typical Descriptions
Coarse Grained Soils — More than 50% of Material Retained on No. 200 Sieve	Gravel and Gravelly Soils — More than 50% of Coarse Fraction Retained on No. 4 Sieve	Clean Gravels (<5% fines)		GW	Well-Graded Gravel; Well-Graded Gravel with Sand
				GP	Poorly Graded Gravel; Poorly Graded Gravel with Sand
		Gravels (5-12% fines)		GW-GM	Well-Graded Gravel with Silt; Well-Graded Gravel with Silt and Sand
				GW-GC	Well-Graded Gravel with Clay; Well-Graded Gravel with Clay and Sand
				GP-GM	Poorly Graded Gravel with Silt; Poorly Graded Gravel with Silt and Sand
				GP-GC	Poorly Graded Gravel with Clay; Poorly Graded Gravel with Clay and Sand
		Gravels with Fines (>12% fines)		GM	Silty Gravel; Silty Gravel with Sand
				GC	Clayey Gravel; Clayey Gravel with Sand
	Sand and Sandy Soils — More than 50% of Coarse Fraction Passing No. 4 Sieve	Sands with few Fines (<5% fines)		SW	Well-Graded Sand; Well-Graded Sand with Gravel
				SP	Poorly Graded Sand; Poorly Graded Sand with Gravel
		Sands (5-12% fines)		SW-SM	Well-Graded Sand with Silt Well-Graded Sand with Silt and Gravel
				SW-SC	Well-Graded Sand with Clay; Well-Graded Sand with Clay and Gravel
				SP-SM	Poorly Graded Sand with Silt; Poorly Graded Sand with Silt and Gravel
				SP-SC	Poorly Graded Sand with Clay; Poorly Graded Sand with Clay and Gravel
		Sands with Fines (>12% fines)		SM	Silty Sand; Silty Sand with Gravel
				SC	Clayey Sand; Clayey Sand with Gravel
Fine Grained Soils — More than 50% of Material Passing No. 200 Sieve	Silts			ML	Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
				MH	Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly Elastic Silt
	Silty Clay (based on Atterberg Limits)			CL-ML	Silty Clay; Silty Clay with Sand or Gravel; Gravelly or Sandy Silty Clay
	Clays			CL	Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly Lean Clay
				CH	Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly Fat Clay
	Organics			OL/OH	Organic Soil; Organic Soil with Sand or Gravel; Sandy or Gravelly Organic Soil
Highly Organic (>50% organic material)				PT	Peat - Decomposing Vegetation - Fibrous to Amorphous Texture

Minor Constituents

	Estimated Percentage
Sand, Gravel	
Trace	<5
Few	5 - 15
Cobbles, Boulders	
Trace	<5
Few	5 - 10
Little	15 - 25
Some	30 - 45

Soil Test Symbols

%F	Percent Passing No. 200 Sieve
AL	Atterberg Limits (%) — Liquid Limit (LL), Water Content (WC), Plastic Limit (PL)
CA	Chemical Analysis
CAUC	Consolidated Anisotropic Undrained Compression
CAUE	Consolidated Anisotropic Undrained Extension
CBR	California Bearing Ratio
CIDC	Consolidated Drained Isotropic Triaxial Compression
CIUC	Consolidated Isotropic Undrained Compression
CK0DC	Consolidated Drained k0 Triaxial Compression
CK0DSS	Consolidated k0 Undrained Direct Simple Shear
CK0UC	Consolidated k0 Undrained Compression
CK0UE	Consolidated k0 Undrained Extension
CRSCN	Constant Rate of Strain Consolidation
DS	Direct Shear
DSS	Direct Simple Shear
DT	In Situ Density
GS	Grain Size Classification
HYD	Hydrometer
ILCN	Incremental Load Consolidation
K0CN	k0 Consolidation
kc	Constant Head Permeability
kf	Falling Head Permeability
MD	Moisture Density Relationship
OC	Organic Content
OT	Tests by Others
P	Pressuremeter
PID	Photoionization Detector Reading
PP	Pocket Penetrometer
SG	Specific Gravity
TRS	Torsional Ring Shear
TV	Torvane
UC	Unconfined Compression
UUC	Unconsolidated Undrained Triaxial Compression
VS	Vane Shear
WC	Water Content (%)

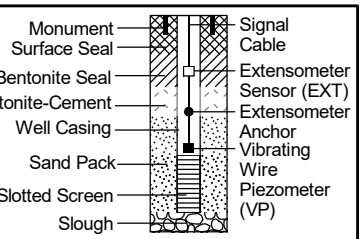
Groundwater Indicators

- Groundwater Level on Date or At Time of Drilling (ATD)
- Groundwater Level on Date Measured in Piezometer
- Groundwater Seepage (Test Pits)

Sample Symbols

- 1.5" I.D. Split Spoon
- 3.0" I.D. Split Spoon
- Modified California Sampler
- Rock Core Run
- Sonic Core
- Thin-walled Sampler
- Grab
- Cuttings
- Push Probe

Well Symbols



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HALEY ALDRICH

Project: SOUTH ELEMENTARY RELOCATION
Location: Aberdeen, Washington
Project No.: 0211414-000

Key to Exploration Logs

Figure A-1
Sheet 1 of 3

HALEY TO EXP LOGS (SOIL ROCK 1) - C:\USERS\DKAMP\ONEDRIVE - HALEY ALDRICH\DESKTOP\HC_LIBRARY (GLB - 2/6/25 22:14 - \\HALEYALDRICH.COM\SHARE\CPROJECTS\0211414\PERMANENT GINT FILE\0211414-000_ABERDEEN SD RELOCATION SITE 4_GINT.GPJ - dkamp

Weathered State of Rock

Term	Description	Grade
Fresh	No visible signs of rock material weathering; perhaps slight discoloration in major discontinuity surfaces.	I
Slightly Weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering, and may be somwhat weaker externally than in its fresh condition	II
Moderately Weathered	Less than half of the rock material is decomposed and/or disintegrated to soil. Fresh or discolored rock is present either as a continuous framework or as corestones.	III
Highly Weathered	More than half of the rock material is decomposed and/or disintegrated to soil. Fresh or discolored rock is present either as discontinuous framework or as corestone.	IV
Completely Weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.	V
Residual Soil	All rock material is converted to soil. The mass structure and material fabric is destroyed. There is a large change in volume, but the soil has not been significantly transported.	VI

Relative Rock Strength

Grade	Description	Field Identification	Uniaxial Compressive Strength
R0	Extremely Weak	Indented by thumbnail.	0.04 to 0.15 ksi
R1	Very Weak	Specimen crumbles under sharp blow with point of geological hammer, and can be cut with a pocket knife.	0.15 to 3.6 ksi
R2	Moderately Weak	Shallow cuts or scrapes can be made in a specimen with a pocket knife. Geological hammer point indents deeply with firm blow.	3.6 to 7.3 ksi
R3	Moderately Strong	Specimen cannot be scraped or cut with a pocket knife, shallow indentation can be made under firm blows from a hammer point.	7.3 to 15 ksi
R4	Strong	Specimen breaks with one firm blow from the hammer end of a geological hammer.	15 to 29 ksi
R5	Very Strong	Specimen requires many blows of a geological hammer to break intact sample.	Greater than 29 ksi

Discontinuities

Discontinuity Spacing		Discontinuity Condition	
Description	**Spacing**	**Condition**	**Description**
Very Widely Spaced	Greater than 10 feet	Excellent Condition	Very rough surfaces, no separation, hard discontinuity wall.
Widely Spaced	3 to 10 feet	Good Condition	Slightly rough surfaces, separation less than 0.05 inches, hard discontinuity wall.
Moderately Spaced	1 to 3 feet	Fair Condition	Slightly rough surface, separation greater than 0.05 inches, soft discontinuity wall.
Closely Spaced	2 to 12 inches	Poor Condition	Slickensided surfaces, or soft gouge less than 0.2 inches thick, or open discontinuities 0.05 to 0.2 inches.
Very Closely Spaced	Less than 2 inches	Very Poor Condition	Soft gouge greater than 0.2 inches, or open discontinuities greater than 0.2 inches.

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HA KEY TO EXP LOGS (SOIL/ROCK) WSDOT 2 - C:\USERS\DNAPPO\DESKTOP\HC_LIBRARY GLB - 2/6/26 22:17 - \\HALEYALDRICH.COM\SHARE\CP\PROJECTS\0211414\PERMANENT GINT FILE\0211414-000_ABERDEEN SD RELOCATION SITE 4_GINT.GPJ - dnapp

Grain Size

Grain Size	Description	Criteria
Less than 0.04 inches	Fine grained	Few crystal boundaries/grains distinguishable in the field or with a hand lens.
0.04 to 0.2 inches	Medium grained	Most crystal boundaries/ grains distinguishable with the aid of a hand lens.
Greater than 0.2 inches	Coarse grained	Most crystal boundaries/ grains distinguishable with the naked eye.

Igneous Rock Textures

Texture	Grain Size
Pegmatitic	Very large; diameters greater than 0.8 in.
Phaneritic	Can be seen with the naked eye
Porphyritic	Grained of two widely different sizes
Aphanitic	Cannot be seen with the naked eye
Glassy	No grains present

Pyroclastic Rocks

Rock Name	Characteristics
Pyroclastic Breccia	Pyroclastic rock whose average pyroclast size exceeds 2.5 inches and in which angular pyroclasts predominate.
Agglomerate	Pyroclastic rock whose average pyroclast size exceeds 2.5 inches and in which rounded pyroclasts predominate.
Lapilli Tuff	Pyroclastic rock whose average pyroclast size is 0.08 to 2.5 inches.
Ash Tuff	Pyroclastic rock whose average pyroclast size is less than 0.08 inches.

Degree of Vesicularity

Designation	Percentage of Cavities (by volume) of Total Sample
Slightly Vesicular	5 to 10 Percent
Moderately Vesicular	10 to 25 Percent
Highly Vesicular	25 to 50 Percent
Scoriaceous	Greater than 50 Percent

Other Terms:

Core Recover (CR) = the ratio of core recovered to the core run length expressed as a percentage.

Rock Quality Designation (RQD) = the percentage of rock core recovered in intact pieces of 4 inches or more in length in the length of a core run. Does not include mechanical breaks caused by drilling.

Fracture Frequency (FF) = the number of natural fractures per foot in the length of core recovered.

Reference:

Washington State Department of Transportation (WSDOT), 2014. *Geotechnical Design Manual*, Publication M 46-03.10, August, 2014.

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HALEY TO EXP LOGS (SOIL/ROCK) WSDOT.3 - C:\USERS\DNAPPO\DESKTOP\HC_LIBRARY GLB - 2/6/26 22:14 - \\HALEYALDRICH.COM\SHARED\PROJECTS\0211414\PERMANENT GINT FILES\0211414-000_ABERDEEN SD RELOCATION SITE 4_GINT.GPJ - dnappo

Date Started: 12/18/2024	Date Completed: 12/18/2024	Drilling Contractor/Crew: Western States Soil Conservation, Inc. / James, Jonathan, Jose	
Logged by: D. Knapp	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955370 Long: -123.786290 (WGS 84)		Rig Model/Type: CME-55 / ATV-mounted Drill	
Ground Surface Elevation: 124.77 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 86.8	
		Hole Diameter: 4 inches	Well Casing Diameter: NA
		Total Depth: 51.5 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	PL WC (%) LL; ✖ Fines Content (%); ▲ SPT N Value (10 20 30 40)	Depth (feet)
120	0							Organic debris and forest duff (16-inches thick)		0
		1 2 1		16in.	18	S-1 GS, PP, TV, WC		SILTY SAND (SM), very loose, moist, yellow-brown, fine sand, trace medium to coarse subangular sand, trace rootlets and organic debris, fine mica. [INTERBEDDED ELASTIC SILT AND SILTY SAND] (PP = 1.25 tsf, TV = 0.1 tsf)	▲ 3; ✖ ● 20	
	5	1 2 1		18in.	18	S-2 PP, TV		grades to no coarse sand, decrease in organic debris (PP = 2.75 tsf, TV = 0.45 tsf)	▲ 3	5
		1 2 2		18in.	18	S-3 GS, PP, TV, WC		layered with varying sand content, fine to medium sand, relict root casts (PP = 3.0 tsf, TV = 0.5 tsf)	▲ 4; ● 49 71.5	
115	10	1 2 1		18in.	18	S-4 GS, WC		stratified with alternating layers of silty sand and sandy silt, fine to medium subrounded to subangular sand, trace coarse subrounded sand, varicolored lithics	▲ 3; ✖ 19; ● 75.3	10
110	15	1 2 1		18in.	18	S-5 AL, PP, TV, WC		ELASTIC SILT (MH), trace fine sand, soft, moist, tan with orange staining, layered, extensive horizontal iron oxide staining, occasional layers with black organics debris (less than 1/8-inch diameter). (PP = 0.5 tsf, TV = 0.2 tsf)	▲ 3; ● 60.4	15
105	20	2 2 2		18in.	18	S-6 AL, PP, TV		SANDY ELASTIC SILT (MH), soft, moist to wet, tan with red and orange layering, fine to medium sand, stratified with frequent seams to layers of silty sand and sandy silt, silt layers are laminated, medium to rapid dilation in sandy layers, layer of gray silty sand at 20.8 ft (2-inches thick), trace black organic debris. (PP = 2.5 tsf, TV = 0.25 tsf)	▲ 4	20
100	25	3 1 1		18in.	18	S-7		SILTY SAND (SM), very loose, moist to wet, red-brown, fine sand, trace subangular medium sand, highly stratified with frequent seams to layers of silt, silty sand, and sandy silt, extensive iron oxide staining. (gravelly drill action at 28.5 ft bgs)	▲ 2	25
95	30	10 23 28		18in.	18	S-8 GS, WC		SILTY GRAVEL WITH SAND (GM), very dense, moist, red with orange mottling, fine to coarse subrounded to rounded sand, fine to coarse subrounded to rounded gravel, well-graded, stratified with frequent layers, weakly cemented, extensive iron oxide staining, weathering rinds on gravel. [COARSE-GRAINED TERRACED DEPOSITS]	✖ ● 13; ▲ 51	30
90	35	28 28 31		14in.	18	S-9		SILTY SAND WITH GRAVEL (SM), very dense, moist, red with orange mottling, fine to coarse subrounded to rounded sand, fine to coarse subrounded to rounded gravel, well-graded, faint layering, extensive iron oxide staining.	▲ 59	35
85										

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General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: Aberdeen, Washington Project No.: 0211414-000	Boring Log **B-1**	Figure **A** Sheet **1 of 2**

HA BORING LOG - \\HALEYALDRICH.COM\SHARE\SEA_DATA\GINT\HC_LIBRARY.GLB - 2024\5\5 15:22 - \\HALEYALDRICH.COM\SHARE\CORPROJECTS\0211414\PERMANENT\ GINT FILE\0211414-000_ABERDEEN SD RELOCATION SITE 4 .GINT .GPJ - kbabel

Date Started: 12/18/2024	Date Completed: 12/18/2024	Drilling Contractor/Crew: Western States Soil Conservation, Inc. / James, Jonathan, Jose	
Logged by: D. Knapp	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955370 Long: -123.786290 (WGS 84)		Rig Model/Type: CME-55 / ATV-mounted Drill	
Ground Surface Elevation: 124.77 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 86.8	
		Hole Diameter: 4 inches	Well Casing Diameter: NA
		Total Depth: 51.5 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	PL WC (%) LL; Fines Content (%); SPT N Value	Depth (feet)
80	40	3 10 11		10in.	18	S-10 GS, WC		SILTY SAND (SM), medium dense, moist, dark red, fine to medium sand, stratified with frequent layers and seams of silty sand, poorly graded.	19, 21	40
								(light drill chatter at 45 ft)		
75	45	23 29 30		18in.	18	S-11		SILTY SAND WITH GRAVEL (SM), very dense, moist, tan to yellow-brown with red and orange mottling, fine to coarse subrounded to rounded sand, fine to coarse subrounded to rounded gravel, stratified with frequent layers of silty sand, well-graded, weak cementation, extensive iron oxide staining, iron oxide staining on gravel.	59	45
	50	22 32 39		18in.	18	S-12			71	50
								Bottom of Borehole at 51.5 feet.		
70	55									55
65	60									60
60	65									65
55	70									70
50	75									75
45										

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General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
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4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: Aberdeen, Washington Project No.: 0211414-000	Boring Log **B-1**	Figure **A** Sheet **2 of 2**

HA BORING LOG - \\HALEYALDRICH.COM\SHARE\SEA_DATA\GINT\HC_LIBRARY.GLB - 2024\25 15:22 - \\HALEYALDRICH.COM\SHARE\CORPROJECTS\0211414\PERMANENT\ GINT FILE\0211414-000_ABERDEEN SD RELOCATION SITE 4 .GINT .GPJ - kbabel

Date Started: 12/18/2024	Date Completed: 12/19/2024	Drilling Contractor/Crew: Western States Soil Conservation, Inc. / James, Jonathan, Jose	
Logged by: D. Knapp	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955570 Long: -123.787370 (WGS 84)		Rig Model/Type: CME-55 / ATV-mounted Drill	
Ground Surface Elevation: 120.44 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 86.8	
		Hole Diameter: 4 inches	Well Casing Diameter: NA
		Total Depth: 70.5 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description
120	0							Topsoil and forest duff (12-inches thick).
		1 1 1		18in.	18	S-1 PP, TV		ELASTIC SILT (MH), soft, moist, red-brown, homogeneous, trace rootlets and organic debris. [INTERBEDDED ELASTIC SILT AND SILTY SAND] (PP = 2.0 tsf, TV = 0.4 tsf)
115	5			24in.	24	U-2 WC		
		1 2 2		18in.	18	S-3 AL, PP, TV		ELASTIC SILT WITH SAND (MH), trace fine to coarse subangular gravel, soft, moist, red-brown, fine sand, occasional layers of sandy silt with gravel (2-inch thick), trace rootlets. (PP = 3.0 tsf, TV = 0.55 tsf)
110	10	1 1 2		18in.	18	S-4 PP, TV, WC		SANDY ELASTIC SILT (MH), soft, moist to wet, red-brown, fine to medium sand, stratified with frequent partings to layers, occasional layers of silty sand. (PP = 2.5 tsf, TV = 0.4 tsf)
				24in.	24	U-5		
105	15	1 2 2		18in.	18	S-6 AL, PP, TV, WC		ELASTIC SILT (MH), trace fine to coarse sand, soft, moist, light brown to red-brown, occasional layers of silty sand. (PP = 0.75 tsf, TV = 0.25 tsf)
				12in.	24	U-7		
100	20	1 2 2		18in.	18	S-8A S-8B GS, PP, TV, WC		SILTY SAND (SM), very loose, moist to wet, light brown to red-brown, fine to medium sand, stratified with frequent seams and layer of sandy silt and silty sand (3- to 4-inches thick). (PP = 1.75 tsf, TV = 0.15 tsf) (gravelly drill action starting at 23.5 ft)
95	25	16 16 16		14in.	18	S-9		SILTY GRAVEL WITH SAND (GM), dense, moist, dark gray with red-orange mottling, fine to coarse subrounded to subangular sand, fine to coarse subrounded to subangular gravel, homogeneous, well-graded. [COARSE-GRAINED TERRACED DEPOSITS] (smooth drilling, minor chatter from 28 to 29 ft)
90	30	13 17 11		18in.	18	S-10 GS, WC		WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM), medium dense, moist, dark gray, fine to medium sand, few coarse rounded sand, fine rounded to subrounded gravel, stratified, gravel occurs in occasional 2-inch thick layers, black and red lithics. (gravelly drill action starting at 32.5 ft)
85	35	20 22 19		18in.	18	S-11		SILTY SAND WITH GRAVEL (SM), dense, moist, red-brown with orange and yellow mottling, fine to coarse subrounded to subangular sand, fine to coarse subrounded to subangular gravel, well-graded, weak cementation, socketed gravel, gravel has iron oxide weathering rinds.

PL WC (%) LL
✖ Fines Content (%)
▲ SPT N Value
10 20 30 40

▲ 2 — 91.6 ✖
▲ 4
▲ 3 — 69.2 ✖
▲ 4 — 60.0 ✖
▲ 4 — 48 ✖
32
10 ✖ ● 28
41

Depth (feet): 0, 5, 10, 15, 20, 25, 30, 35

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General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: Aberdeen, Washington Project No.: 0211414-000	Boring Log **B-2**	Figure **A** Sheet **1 of 2**

HA BORING LOG - \\HALEYALDRICH.COM\SHARE\SEA_DATA\GINT\HC_LIBRARY.GLB - 2024\25 15:23 - \\HALEYALDRICH.COM\SHARE\CORP\PROJECTS\0211414\PERMANENT GINT FILE\0211414-000_ABERDEEN SD RELOCATION SITE 4_GINT.GPJ - kbobel

Date Started: 12/18/2024	Date Completed: 12/19/2024	Drilling Contractor/Crew: Western States Soil Conservation, Inc. / James, Jonathan, Jose	
Logged by: D. Knapp	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955570 Long: -123.787370 (WGS 84)		Rig Model/Type: CME-55 / ATV-mounted Drill	
Ground Surface Elevation: 120.44 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 86.8	
		Hole Diameter: 4 inches	Well Casing Diameter: NA
		Total Depth: 70.5 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	Depth (feet)
80	40	16 33 22		18in.	18	S-12		SILTY SAND WITH GRAVEL (SM), dense, moist, red-brown with orange and yellow mottling, fine to coarse subrounded to subangular sand, fine to coarse subrounded to subangular gravel, well-graded, weak cementation, socketed gravel, gravel has iron oxide weathering rinds. *(continued)* grades to very dense, quartz coarse sand and fine gravel (smooth drilling with sand in cuttings from 43 to 45 ft)	40
75	45	17 14 16		18in.	18	S-13 GS, WC		grades to medium dense, decrease in gravel and silt content (chattery drill action from 45 to 50 ft)	45
70	50	19 17 20		18in.	18	S-14		grades to dense, increase in gravel and silt content (chattery with intervals of heavier drill action from 50 to 55 ft)	50
65	55	25 44 35		18in.	18	S-15		grades to very dense, stratified with pockets of silty sand	55
60	60	28 50 50		17in.	17	S-16		(chattery with intervals of heavier drill action from 55 to 65 ft)	60
55	65	30 49 50		17in.	17	S-17		SILTY GRAVEL WITH SAND (GM), very dense, moist, red-brown to orange-brown, fine to coarse subrounded to rounded sand, fine to coarse subrounded to rounded gravel, well-graded, homogeneous, weak to moderate cementation, extensive iron oxide staining. SANDSTONE, R0, fresh, blue-gray, fine to medium grained, laminated to stratified, silty, micaceous, friable [MONTESANO FORMATION]	65
50	70	71		6in.	6	S-18		Bottom of Borehole at 70.5 feet.	70
45	75								75

PL WC (%) LL
✖ Fines Content (%)
▲ SPT N Value
10 20 30 40

55
13 30
37
79
100/11"
99/11"
71/6"

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General Notes:
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4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: Aberdeen, Washington Project No.: 0211414-000	Boring Log **B-2**	Figure **A** Sheet **2 of 2**

HA BORING LOG - \\HALEYALDRICH.COM\SHARE\SEA_DATA\GINT\HC_LIBRARY.GLB - 2024\25 15:23 - \\HALEYALDRICH.COM\SHARE\CORPROJECTS\0211414\PERMANENT GINT FILE\0211414-000_ABERDEEN SD RELOCATION SITE 4_GINT.GPJ - kbobel

Date Started: 12/19/2024	Date Completed: 12/19/2024	Drilling Contractor/Crew: Western States Soil Conservation, Inc. / James, Jonathan, Jose	
Logged by: D. Knapp	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955670 Long: -123.789720 (WGS 84)		Rig Model/Type: CME-55 / ATV-mounted Drill	
Ground Surface Elevation: 114.64 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 86.8	
		Hole Diameter: 4 inches	Well Casing Diameter: NA
		Total Depth: 50.5 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	PL WC (%) LL; ✖ Fines Content (%); ▲ SPT N Value (10 20 30 40)	Depth (feet)
115	0							ELASTIC SILT (MH), trace fine sand, medium stiff, moist to wet, orange-brown. [INTERBEDDED ELASTIC SILT AND SILTY SAND]		0
						G-1 / WC		grades to (very soft)	64.3	
								SILTY SAND (SM), loose, moist, light gray, fine sand, stratified.		
110	5					G-2				5
		2 4 4		18in.	18	S-3 / GS, WC			8 ▲ / 36 ✖	
									60.2	
		3 1 2		18in.	18	S-4A / S-4B / WC		SANDY ELASTIC SILT (MH), soft, moist to wet, gray-brown, fine sand, stratified with alternating silt and sand seams and layers, minor iron oxide staining in sandy layers.	3 ▲	
									58.6	
105	10	3 2 2		18in.	18	S-5A / S-5B / AL, WC		ELASTIC SILT WITH SAND (MH), soft, moist, light brown with orange staining, fine sand, stratified with frequent seams of sandy silt, iron oxide staining in sandy layers. (chattery drilling at 13 ft with sand in cuttings)	4 ▲	10
									57.5	
								SILTY SAND WITH GRAVEL (SM), medium dense, moist, red to red-brown, fine to coarse subrounded to rounded sand, fine rounded gravel, well-graded, extensive iron oxide staining. [COARSE-GRAINED TERRACED DEPOSITS]		
100	15	8 7 10		18in.	18	S-6 / GS, WC			17 ✖ / 17 ●	15
								(chattery drill action starting at 19.5 ft)		
95	20	20 30 30		18in.	18	S-7 / WC		grades to very dense, red to red-brown with orange and yellow-mottling, few coarse rounded gravel	●	20
									60 ▲	
90	25	33 36 50		18in.	18	S-8		SILTY GRAVEL WITH SAND (GM), very dense, moist, red to red-brown with orange mottling, fine to coarse subrounded to rounded sand, fine to coarse subrounded to rounded gravel, well-graded, extensive iron oxide staining. (smooth drilling below 28.5 ft)		25
									86 ▲	
85	30	3 9 7		18in.	18	S-9 / WC		SILTY SAND (SM), medium dense, moist to wet, light brown to red, fine sand, trace medium subrounded to subangular sand, stratified with frequent seams with varying silt content, poorly graded, weak cementation where iron oxide staining is strongest and dark red, iron oxide staining in coarse grained seams, quartz medium sand.	● / 16 ▲	30
80	35	3 4 5		18in.	18	S-10		grades to loose, light brown to gray-brown, decrease in iron oxide staining	9 ▲	35
75										

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4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: Aberdeen, Washington Project No.: 0211414-000	Boring Log **B-3**	Figure **A** Sheet **1 of 2**

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Date Started: 12/19/2024	Date Completed: 12/19/2024	Drilling Contractor/Crew: Western States Soil Conservation, Inc. / James, Jonathan, Jose	
Logged by: D. Knapp	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955670 Long: -123.789720 (WGS 84)		Rig Model/Type: CME-55 / ATV-mounted Drill	
Ground Surface Elevation: 114.64 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 86.8	
		Hole Diameter: 4 inches	Well Casing Diameter: NA
		Total Depth: 50.5 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	PL WC (%) LL; Fines Content (%); SPT N Value	Depth (feet)
110	40	10 15 13		18in.	18	S-11 GS, WC		SILTY SAND WITH GRAVEL (SM), medium dense, moist, red to red-brown, fine to coarse subrounded to rounded sand, stratified with frequent layers of gravel, weak cementation, extensive iron oxide staining.	15 28	40
70	45	19 40 50		15in.	15	S-12		SILTY GRAVEL WITH SAND (GM), very dense, moist, red to red-brown, fine to coarse subrounded to subangular sand and gravel, well-graded, moderate cementation. (slow, hard, very chattery drilling from 48 to 49 ft) broken gravel in sampler shoe indicates coarse gravel to cobbles	90/9"	45
65	50	60		4in.	6	S-13		Bottom of Borehole at 50.5 feet.	60/6"	50
60	55									55
55	60									60
50	65									65
45	70									70
40	75									75
35										

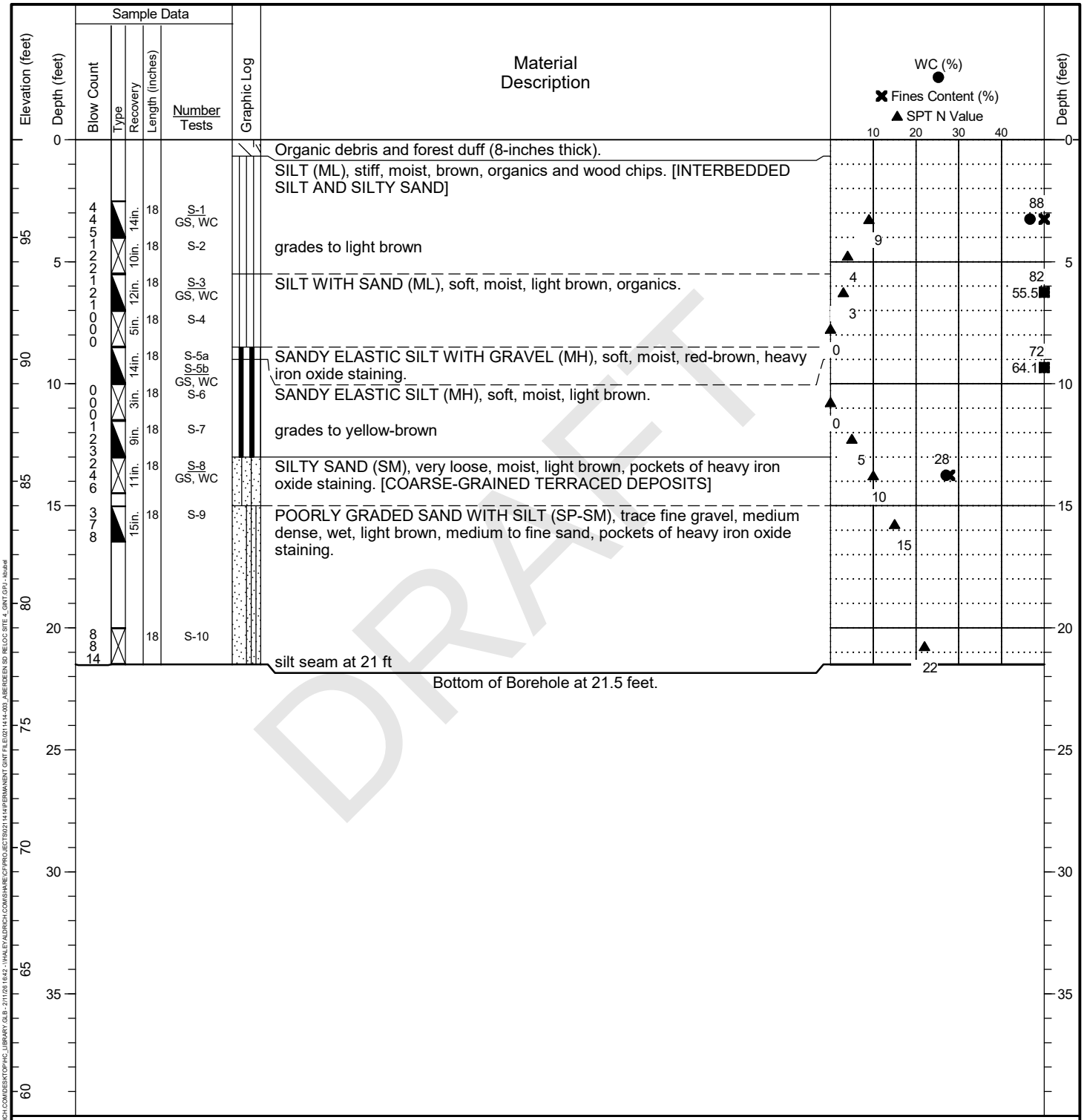
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General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
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3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: Aberdeen, Washington Project No.: 0211414-000	Boring Log **B-3**	Figure **A** Sheet **2 of 2**

HA BORING LOG - \\HALEYALDRICH.COM\SHARE\SEA_DATA\GINT\HC_LIBRARY.GLB - 2024\25 15:23 - \\HALEYALDRICH.COM\SHARE\CORPROJECTS\0211414\PERMANENT GINT FILE\0211414-000_ABERDEEN SD RELOCATION SITE 4 .GINT .GPJ - kbobel

Date Started: 01/14/2026	Date Completed: 01/14/2026	Drilling Contractor/Crew: Holt Services, Inc. / A. Causland	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955722 Long: -123.789989 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 99.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments: Blow counts for >1.5" split spoon adjusted to approximate SPT N-values (see report text).		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 91	
		Hole Diameter: 10 inches	Well Casing Diameter: NA
		Total Depth: 21.5 feet	Depth to Groundwater: Not Identified



General Notes:
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2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: ABERDEEN, WASHINGTON Project No.: 0211414-003	Boring Log **B-4**	Figure **A** Sheet **1 of 1**

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - \\HALEYALDRICH.COM\SHARE\CPROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started: 01/15/2026	Date Completed: 01/15/2026	Drilling Contractor/Crew: Holt Services, Inc. / A. Causland	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.956037 Long: -123.788548 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 107.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 91	
		Hole Diameter: 6 inches	Well Casing Diameter: NA
		Total Depth: 47.0 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	PL WC (%) LL; ✖ Fines Content (%); ▲ SPT N Value (10 20 30 40)	Depth (feet)
	0							Organic debris and forest duff (12-inches thick).		0
105								SANDY SILT (ML), soft, moist, yellow-brown, occasional layers of fine sand. [FINE-GRAINED TERRACED DEPOSITS]		
	5	1 2 2		18in.	18	S-1 AL, WC			▲ 4	5
100										
	10	15 50		12in.	11	S-2a AL, WC S-2b		ELASTIC SILT WITH SAND (MH), hard, moist, yellow-brown, mostly fine sand, stratified with iron oxide staining.	▲ 50/5"	10
95								WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM), very dense, moist, red-brown, fine subrounded gravel, strong cementation, heavy iron oxide staining. [COARSE-GRAINED TERRACED DEPOSITS]		
	15	15 33 33		13in.	18	S-3 GS			✖ 12 ▲ 66	15
90										
	20	22 19 4		15in.	18	S-4a S-4b		grades to medium dense, red-brown, fine to coarse subrounded gravel, pocket of fine gravel near top of sample, no iron oxide staining	▲ 23	20
85								SILTY SAND (SM), medium dense, moist, tan to yellow-brown, mostly fine sand.		
	25	2 4 4		18in.	18	S-5 GS		grades to loose, wet, iron oxide staining near top that grades out with depth	✖ 31 ▲ 8	25
80										
	30	19 13 12		12in.	18	S-6 GS		POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), medium dense, moist, red-brown clasts in olive matrix, medium sand, coarse subangular to rounded gravel, weak cementation.	✖ 15 ▲ 25	30
75								(heavy drill chatter at 33 ft)		
	35	15 50		13in.	11	S-7a S-7b		SILTY SAND (SM), trace fine subrounded gravel, medium dense, wet, yellow-brown, coarse to fine sand.	▲ 50/5"	35
70								POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), very dense, moist, gray, fine rounded gravel, weak cementation, 1.5-in. layer of mudstone. (very heavy drill chatter at 37 ft)		

DRAFT

General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: ABERDEEN, WASHINGTON Project No.: 0211414-003	Boring Log **B-5**	Figure **A-6** Sheet **1 of 2**

HA BORING LOG - C:\USERS\DNAPPI\ONEDRIVE - HALEYALDRICH.COM\NON-PROJECT FOLDERS\DESKTOP HC_LIBRARY GLB - 61\ 26 14-27 - I:\HALEYALDRICH.COM\SHARE\CP\PROJECTS\021141\PERMANENT GINT FILE\021141-003_ABERDEEN SD REL OC SITE 4_GINT.GPJ - dmerp

Date Started: 01/15/2026	Date Completed: 01/15/2026	Drilling Contractor/Crew: Holt Services, Inc. / A. Causland	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.956037 Long: -123.788548 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 107.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 91	
		Hole Diameter: 6 inches	Well Casing Diameter: NA
		Total Depth: 47.0 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	PL WC (%) LL; ✖ Fines Content (%); ▲ SPT N Value (10 20 30 40)	Depth (feet)
65	40	26 19 31		12in.	18	S-8 GS		WELL-GRADED GRAVEL WITH SILT AND SAND (GW-GM), very dense, moist, red-brown, fine rounded gravel, weak to moderate cementation.	✖ 11 ▲ 50	40
								(heavy drill chatter at 44 ft)		
60	45	27 33 47		10in.	18	S-9		POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), very dense, wet, light brown and gray, fine rounded gravel. (slow hard drilling at 47 ft)	▲ 80	45
								Bottom of Borehole at 47.0 feet.		
55	50									50
50	55									55
45	60									60
40	65									65
35	70									70
30	75									75

DRAFT

General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: ABERDEEN, WASHINGTON Project No.: 0211414-003	Boring Log **B-5**	Figure **A-6** Sheet **2 of 2**

HA BORING LOG - C:\USERS\DHANPY\ONEDRIVE - HALEYALDRICH.COM\NON-PROJECT FOLDERS\DESKTOP HC_LIBRARY GLB _6Y 6/26 14:27 - \\HALEYALDRICH.COM\SHARE\CF\PROJECTS\021141\REMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ I...dmerp

Date Started: 01/14/2026	Date Completed: 01/14/2026	Drilling Contractor/Crew: Holt Services, Inc. / A. Causland	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955538 Long: -123.787977 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 120.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments: Blow counts for >1.5" split spoon adjusted to approximate SPT N-values (see report text).		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 91	
		Hole Diameter: 6 inches	Well Casing Diameter: NA
		Total Depth: 50.4 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description
	0							Hand augered to 5 ft bgs.
								Organic debris and forest duff (8-inches thick).
115								ELASTIC SILT (MH), stiff, moist, yellow-brown to tan. [INTERBEDDED SILT AND SILTY SAND]
	5			27in.	27	U-1 PP, TV		(PP = 1.75 tsf, TV = 0.5 tsf)
110	10	1 2 5		18in.	18	S-2a AL, WC S-2b GS, WC		grades to stratified with silty sand layers SILTY SAND (SM), trace fine gravel, loose, moist, gray-brown, mostly fine to medium sand.
105	15	9 13 19		12in.	18	S-3 GS		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), medium dense, wet, brown and red-brown, coarse to medium sand, fine gravel. [COARSE-GRAINED TERRACED DEPOSITS]
100	20	11 13 17		13in.	18	S-4a GS, WC S-4b		grades to gray POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), medium dense, moist, red, angular to subangular gravel, iron oxide staining.
95	25	12 30 33		14in.	18	S-5		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), very dense, wet, red-brown, coarse to medium sand, fine to coarse subrounded gravel, stratified with gray silty sand layers.
90	30	50		6in.	6	S-6		POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), very dense, wet, red-brown, coarse subangular gravel.
85	35	2 5 6		16in.	18	S-7a S-7b GS, WC		SILTY SAND (SM), medium dense, wet, tan and red-brown, fine sand, pocket of sandy silt, stratified with iron oxide layers. grades to moist, red-brown, medium to fine sand

PL WC (%) LL
✖ Fines Content (%)
▲ SPT N Value
10 20 30 40

7 (▲) 41 (✖) 58.5 (●)
12 (✖) 32 (▲)
12 (✖) 30 (▲)
63 (▲)
50/6" (▲)
11 (▲) 20 (✖)

DRAFT

General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH

Project: SOUTH ELEMENTARY RELOCATION
Location: ABERDEEN, WASHINGTON
Project No.: 0211414-003

Boring Log
B-6

Figure **A**
Sheet **1 of 2**

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - J:\HALEY\ALDRICH.COM\SHARE\CPROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started: 01/14/2026	Date Completed: 01/14/2026	Drilling Contractor/Crew: Holt Services, Inc. / A. Causland	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955538 Long: -123.787977 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 120.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments: Blow counts for >1.5" split spoon adjusted to approximate SPT N-values (see report text).		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 91	
		Hole Diameter: 6 inches	Well Casing Diameter: NA
		Total Depth: 50.4 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	PL WC (%) LL; Fines Content (%); SPT N Value	Depth (feet)
80	40	3 5 5		19in.	18	S-8 GS		SILTY SAND (SM), medium dense, wet, tan and red-brown, fine sand, pocket of sandy silt, stratified with iron oxide layers. *(continued)* grades to loose, wet, light brown, medium to fine sand	10	40
75	45	23 30 41		19in.	18	S-9		POORLY GRADED SAND WITH GRAVEL (SP), very dense, wet, red-brown to light gray, coarse to medium sand, fine grounded gravel, weak to moderate cementation, iron oxide staining.	23 71	45
70	50	50		5in.	5	S-10		POORLY GRADED GRAVEL WITH SAND (GP), very dense, wet, dark brown to dark red and black, coarse subrounded to subangular gravel, iron oxide staining.	50/5"	50
								Bottom of Borehole at 50.4 feet.		
65	55									55
60	60									60
55	65									65
50	70									70
45	75									75

DRAFT

General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - J:\HALEY\ALDRICH.COM\SHARES\CF\PROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started: 01/16/2026	Date Completed: 01/16/2026	Drilling Contractor/Crew: Holt Services, Inc. / S. Lefrancois	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.956080 Long: -123.787402 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 84.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 84.9	
		Hole Diameter: 6 inches	Well Casing Diameter: NA
		Total Depth: 40.4 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	WC (%) ● / Fines Content (%) ✖ / SPT N Value ▲ (10 20 30 40)	Depth (feet)
								Hand augered to 3.2 ft bgs.		
84	0							Organic debris and forest duff (6-inches thick).		0
								POORLY GRADED SAND WITH SILT (SP-SM), loose to medium dense, moist, yellow-brown. [INTERBEDDED ELASTIC SILT AND SILTY SAND]		
80	5	18 29 27		8in.	18	S-1 WC		POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), very dense, wet, red to red-brown and olive, coarse rounded sand. [COARSE-GRAINED TERRACE DEPOSITS]	● ▲56	5
75	10	17 18 32		14in.	18	S-2 GS		(drill chatter decreases at 8.5 ft) SILTY SAND WITH GRAVEL (SM), dense, wet, red to red-brown, coarse to medium sand, fine subrounded gravel, weak cementation.	✖18 ▲50	10
70	15	32 45 34		11in.	18	S-3		POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), very dense, moist, red-brown, coarse to medium sand, coarse to fine subrounded gravel, weak cementation, iron oxide staining.	▲79	15
65	20	43 50		10in.	12	S-4 GS		(smooth drilling at 23 ft)	✖12 ▲50/6"	20
60	25	32 50		9in.	10	S-5		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), very dense, moist, yellow-brown to red, fine sand, fine subrounded gravel, moderately cemented sand in shoe, iron oxide staining.	▲50/4"	25
55	30	50		7in.	6	S-6 GS		SILTY SAND (SM), very dense, moist, yellow-brown, medium to fine sand, moderate cementation.	✖32 ▲50/6"	30
50	35	50		7in.	4	S-7		POORLY GRADED SAND (SP), very dense, moist, gray, fine to medium sand, weak cementation. [MONTESANO FORMATION] *presents as R0 to R1 completely weathered SANDSTONE in situ*	▲50/4"	35
45										

DRAFT

General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
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4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH

Project: SOUTH ELEMENTARY RELOCATION
Location: ABERDEEN, WASHINGTON
Project No.: 0211414-003

Boring Log
B-7

Figure **A**
Sheet **1 of 2**

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - J:\HALEYALDRICH.COM\SHARE\CPROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started: 01/16/2026	Date Completed: 01/16/2026	Drilling Contractor/Crew: Holt Services, Inc. / S. Lefrancois	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.956080 Long: -123.787402 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 84.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 84.9	
		Hole Diameter: 6 inches	Well Casing Diameter: NA
		Total Depth: 40.4 feet	Depth to Groundwater: Not Identified

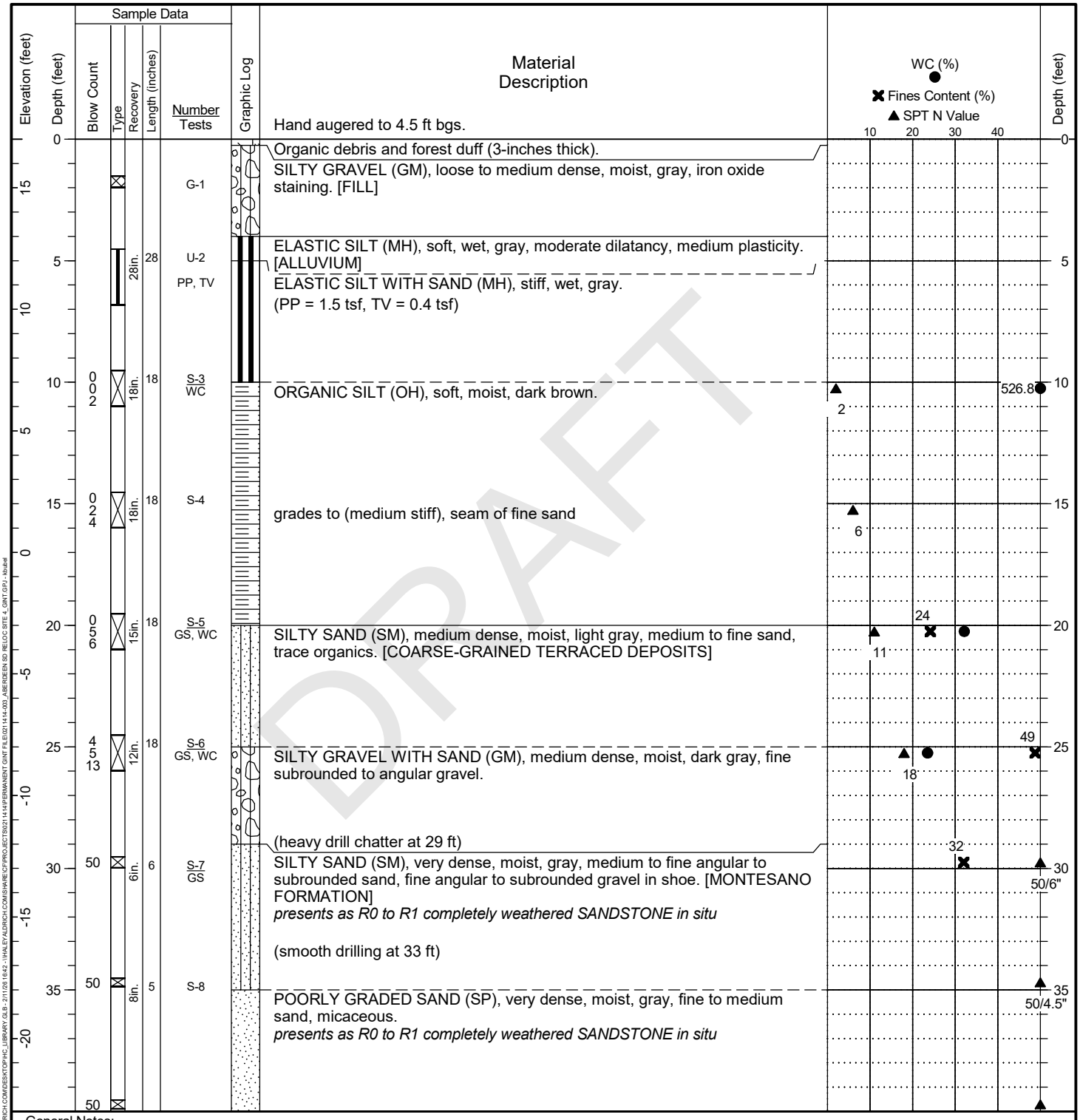
Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	WC (%) ● / Fines Content (%) ✖ / SPT N Value ▲ (10 20 30 40)	Depth (feet)
40	0	50	⊠	5in.	5	S-8		grades to moderate cementation at 40 ft	▲ 50/5"	40
								Bottom of Borehole at 40.4 feet.		
40	45									45
35	50									50
30	55									55
25	60									60
20	65									65
15	70									70
10	75									75
5										

DRAFT

General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - \\HALEYALDRICH.COM\SHARE\CF\PROJECT\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started: 01/16/2026	Date Completed: 01/16/2026	Drilling Contractor/Crew: Holt Services, Inc. / A. Causland	
Logged by: B. Arvesen	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.957025 Long: -123.787467 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 17.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments: Blow counts for >1.5" split spoon adjusted to approximate SPT N-values (see report text).		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 91	
		Hole Diameter: 6 inches	Well Casing Diameter: NA
		Total Depth: 49.8 feet	Depth to Groundwater: Not Identified



DRAFT

General Notes:

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: ABERDEEN, WASHINGTON Project No.: 0211414-003	Boring Log **B-8**	Figure **A** Sheet **1 of 2**

HA BORING LOG - C:\USERS\KBUBELO\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - J:\HALEY\ALDRICH.COM\SHARED\PROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started: 01/16/2026	Date Completed: 01/16/2026	Drilling Contractor/Crew: Holt Services, Inc. / A. Causland	
Logged by: B. Arvesen	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.957025 Long: -123.787467 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 17.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments: Blow counts for >1.5" split spoon adjusted to approximate SPT N-values (see report text).		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 91	
		Hole Diameter: 6 inches	Well Casing Diameter: NA
		Total Depth: 49.8 feet	Depth to Groundwater: Not Identified

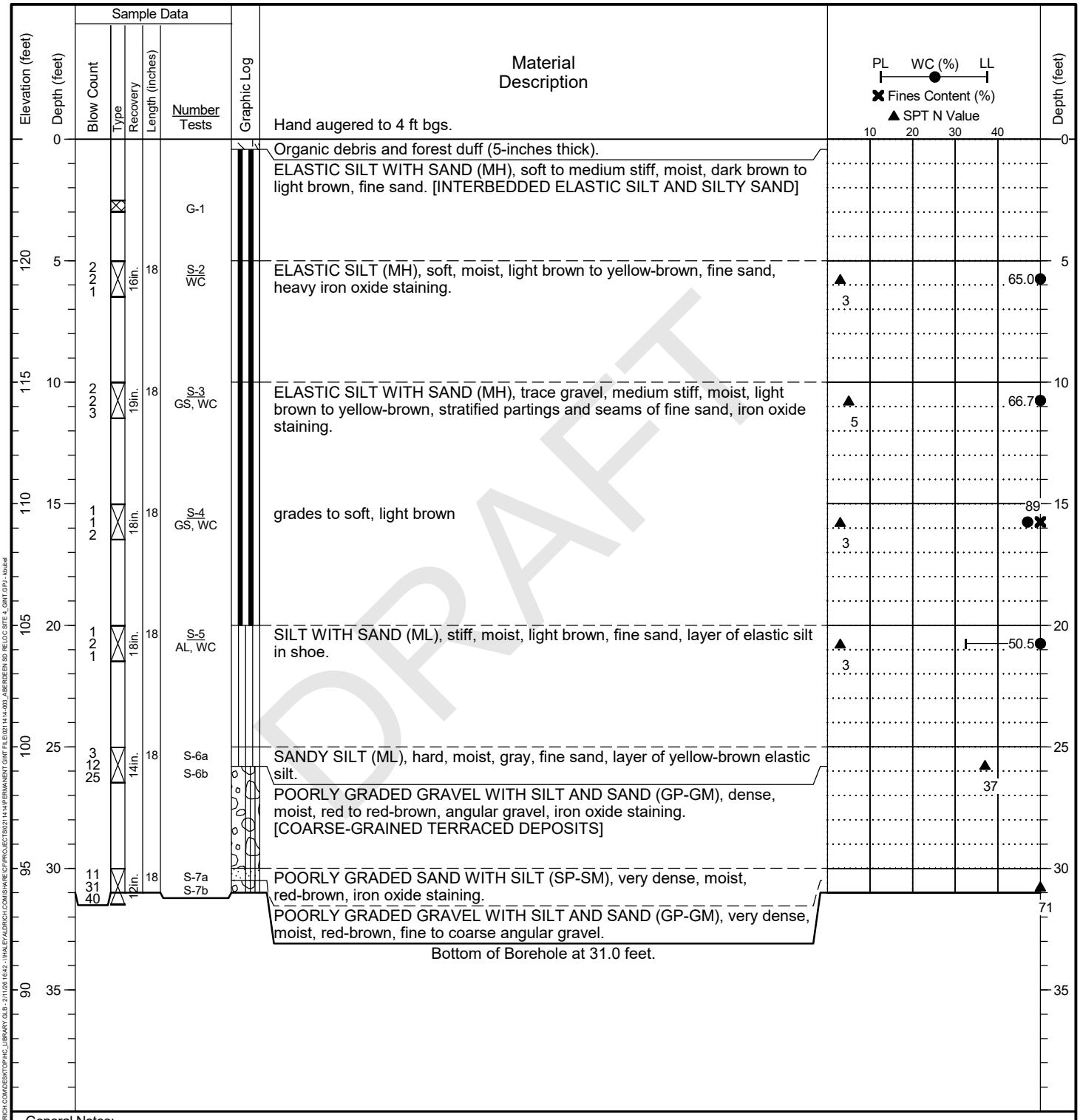
Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	WC (%) ● / Fines Content (%) ✖ / SPT N Value ▲ (10 20 30 40)	Depth (feet)
-25	40			7.5in.	5	S-9		POORLY GRADED SAND (SP), very dense, moist, gray, fine to medium sand, micaceous. *(continued)*		40
-30	45	50		6in.	4	S-10			50/4" ▲	45
-35	50	50		3in.	3	S-11		Bottom of Borehole at 49.8 feet.	50/3" ▲	50
-40	55									55
-45	60									60
-50	65									65
-55	70									70
-60	75									75

DRAFT

General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - J:\HALEY ALDRICH.COM\SHARE\CF\PROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started: 01/13/2026	Date Completed: 01/14/2026	Drilling Contractor/Crew: Holt Services, Inc. / A. Causland	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955496 Long: -123.787005 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 125.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments:		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 91	
		Hole Diameter: 6 inches	Well Casing Diameter: NA
		Total Depth: 31.0 feet	Depth to Groundwater: Not Identified



General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: ABERDEEN, WASHINGTON Project No.: 0211414-003	Boring Log **B-9**	Figure **A** Sheet **1 of 1**

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - J:\HALEY\ALDRICH.COM\SHARED\PROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started: 01/13/2026	Date Completed: 01/13/2026	Drilling Contractor/Crew: Holt Services, Inc. / A. Causland	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955227 Long: -123.787445 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 125.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments: Well Tag ID: BRJ330		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 91	
		Hole Diameter: 10 inches	Well Casing Diameter: ID: 2 inches
		Total Depth: 16.5 feet	Depth to Groundwater: 4.2 feet

Elevation (feet)	Depth (feet)	Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	Water Level	Well Construction	PL WC (%) LL; Fines Content (%); SPT N Value	Depth (feet)
125	0							Organic debris and forest duff (12-inches thick).				0
						G-1		ELASTIC SILT WITH SAND (MH), medium stiff, moist, light brown, fine sand. [INTERBEDDED ELASTIC SILT AND SILTY SAND]	ATD			
120	5	1 1 1		15in.	18	S-2 AL		SILT (ML), soft, wet, light brown, iron oxide staining.			2	5
				29in.	30	U-3 PP, TV		grades to trace organics (PP = 3.25 tsf, TV = 0.4 tsf)				
115	10	4 12 32		19in.	18	S-4a WC S-4b		SANDY ELASTIC SILT WITH GRAVEL (MH), hard, moist, tan to yellow-brown, fine sand, coarse rounded to subrounded gravel, organics.			44	10
		8 18 17		14in.	18	S-5 GS		POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), very dense, moist, dark brown to gray, fine to coarse subrounded gravel. [COARSE-GRAINED TERRACED DEPOSITS]			14 35	
110	15	30 25 43		10in.	18	S-6		SILTY SAND WITH GRAVEL (SM), dense, wet, gray to black, fine to medium sand, fine to coarse gravel. grades to very dense, medium to coarse sand, pocket of silty sand, occasional layers of fine gravel			68	15
								Bottom of Borehole at 16.5 feet.				
105	20											20
100	25											25
95	30											30
90	35											35

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General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: ABERDEEN, WASHINGTON Project No.: 0211414-003	Boring and Monitoring Well Log **B-10/MW-1**	Figure **A** Sheet **1 of 1**

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - J:\HALEY\ALDRICH.COM\SHARED\PROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started: 01/12/2026	Date Completed: 01/12/2026	Drilling Contractor/Crew: Holt Services, Inc. / A. Causland	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955320 Long: -123.787876 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 121.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments: Well Tag ID: BRJ331		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 91	
		Hole Diameter: 6 inches	Well Casing Diameter: ID: 2 inches
		Total Depth: 51.5 feet	Depth to Groundwater: 4.55 feet

Elevation (feet)	Depth (feet)	Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	Water Level	Well Construction	WC (%) / Fines Content (%) / SPT N Value	Depth (feet)
								Hand augered to 4 ft bgs.				
120	0							Organic debris and forest duff (10-inches thick).				0
								SILT WITH SAND (ML), soft to medium stiff, moist, brown, organics. [INTERBEDDED ELASTIC SILT AND SILTY SAND]				
						G-1						
								ELASTIC SILT (MH), soft, moist, light brown to yellow-brown.	ATD			
115	5			28in.	24	U-2 PP, TV		grades to wet, trace coarse gravel (PP = > 4.5 tsf, TV = 0.425 tsf)				5
		2 3 2		15in.	18	S-3 GS, WC		SILTY SAND (SM), loose, moist, brown, mostly fine sand, occasional to frequent pockets to layers of silt, iron oxide staining.			5 49 50.7	
110	10	5 13 23		13in.	18	S-4a WC S-4b		POORLY GRADED SAND WITH SILT (SP-SM), dense, wet, brown, fine sand.			36	10
								POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), dense, wet, brown, fine to coarse subrounded gravel, iron oxide staining. [COARSE-GRAINED TERRACED DEPOSITS] (heavy drill action at 12 ft)				
105	15	15 39 46		10in.	18	S-5 WC		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), very dense, wet, gray and brown, medium to coarse sand, fine to coarse subrounded to subangular gravel.			85	15
100	20	15 25 23		8in.	18	S-6 GS		grades to dense			11 48	20
95	25	21 27 44		9in.	18	S-7		POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), very dense, wet, brown, fine to coarse subrounded to subangular gravel, lithified, moderate to strong cementation, iron oxide staining.			71	25
90	30	10 32 48		9in.	18	S-8		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), very dense, wet, red-brown, fine to coarse subrounded to rounded gravel, weak cementation, iron oxide staining.			80	30
85	35	5 6 5		18in.	18	S-9 GS		SILTY SAND (SM), loose, wet, brown, seam of tan clay, iron oxide staining.			11 25	35

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General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: ABERDEEN, WASHINGTON Project No.: 0211414-003	Boring and Monitoring Well Log **B-11/MW-2**	Figure **A** Sheet **1 of 2**

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEY\ALDRICH.COM\SHARED\PROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started: 01/12/2026	Date Completed: 01/12/2026	Drilling Contractor/Crew: Holt Services, Inc. / A. Causland	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Mud Rotary	
Location: Lat: 46.955320 Long: -123.787876 (WGS 84)		Rig Model/Type: Mobile B-57 / ATV-mounted Drill	
Ground Surface Elevation: 121.00 feet (NAVD 88)		Hammer Type: Auto-hammer	
Comments: Well Tag ID: BRJ331		Hammer Weight (pounds): 140	Hammer Drop Height (inches): 30
		Measured Hammer Efficiency (%): 91	
		Hole Diameter: 6 inches	Well Casing Diameter: ID: 2 inches
		Total Depth: 51.5 feet	Depth to Groundwater: 4.55 feet

Elevation (feet)	Depth (feet)	Sample Data: Blow Count	Type	Recovery	Length (inches)	Number / Tests	Graphic Log	Material Description	Water Level	Well Construction	WC (%) ● / Fines Content (%) ✖ / SPT N Value ▲ (10 20 30 40)	Depth (feet)
80	40	7 6 8		4in.	18	S-10 GS, WC		SILTY SAND (SM), loose, wet, brown, seam of tan clay, iron oxide staining. *(continued)*			▲ 14 ✖ 35 ●	40
								(hard and smooth drilling at 44 ft)				
75	45	9 22 52		13in.	18	S-11a S-11b		grades to alternating gray and brown, trace gravel, iron oxide staining			▲ 74	45
								POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), very dense, moist, brown, fine to coarse subrounded gravel, strong cementation.				
70	50	15 47 53		15in.	18	S-12		grades to heavy cementation			▲ 100	50
								Bottom of Borehole at 51.5 feet.				
65	55											55
60	60											60
55	65											65
50	70											70
45	75											75

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General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH

Project: SOUTH ELEMENTARY RELOCATION
Location: ABERDEEN, WASHINGTON
Project No.: 0211414-003

Boring and Monitoring Well Log
B-11/MW-2

Figure **A**
Sheet **2 of 2**

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - J:\HALEY\ALDRICH.COM\SHARED\PROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started: 01/15/2026	Date Completed: 01/15/2026	Drilling Contractor/Crew: Haley & Aldrich, Inc. / T. Merlin	
Logged by: T. Merlin	Checked by: K. Ahrens	Drilling Method: Hand Auger	
Location: Lat: 46.955320 Long: -123.787813 (WGS 84)		Rig Model/Type:	
Ground Surface Elevation: 122.00 feet (NAVD 88)		Hammer Type:	
Comments:		Hammer Weight (pounds):	Hammer Drop Height (inches):
		Measured Hammer Efficiency (%): Not Available	
		Hole Diameter: 6 inches	Well Casing Diameter: NA
		Total Depth: 5.5 feet	Depth to Groundwater: Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Type	Sample Data: Length (inches)	Sample Data: Number / Tests	Graphic Log	Material Description	Depth (feet)
122	0					Tuff/organics (10-inches thick).	0
120				G-1		SILT (ML), (loose), moist, dark brown, organics, roots.	
				G-2		ELASTIC SILT (MH), trace fine sand, (stiff), moist, tan to yellow-brown, organics.	
117	5			G-3		ELASTIC SILT WITH SAND (MH), (stiff), moist, tan to yellow-brown, fine sand.	5
						Bottom of Borehole at 5.5 feet.	
115	10						10
110	15						15
105	20						20
100	25						25
95	30						30
90	35						35
85							

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General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: ABERDEEN, WASHINGTON Project No.: 0211414-003	Hand-Auger Log **HA-1/DCP1**	Figure **A** Sheet **1 of 1**

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEY\ALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2\11\26 16:42 - J:\HALEY\ALDRICH.COM\SHARE\CF\PROJECTS\0211414\PERMANENT\GINT FILE\0211414-003_ABERDEEN ISD RELOC SITE 4_GINT.GPJ - kbubel

Date Started:		Date Completed:	
Logged by:	B. Arvesen	Checked by:	
Location:	(WGS 84)		
Ground Surface Elevation:	(NAVD 88)		
Comments:			

Drilling Contractor/Crew:	Haley & Aldrich, Inc.
Drilling Method:	Hand Auger
Rig Model/Type:	
Hammer Type:	
Hammer Weight (pounds):	Hammer Drop Height (inches):
Measured Hammer Efficiency (%):	Not Available
Hole Diameter:	6 inches
Well Casing Diameter:	NA
Total Depth:	5.0 feet
Depth to Groundwater:	Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Type	Sample Data: Length (inches)	Sample Data: Number / Tests	Graphic Log	Material Description
	0			G-1		Topsoil/forest duff (2-inches thick).
				G-2		ELASTIC SILT (MH), moist, yellow to light brown, low to medium plasticity, no dilatancy, scattered organics. grades to occasional organics, none to slow dilatancy, occasional iron oxide staining
				G-3		FAT CLAY (CH), moist, yellow to light brown, high plasticity (lump forms without cracks after passing plastic limit), no dilatancy, feels very greasy when wet.
				G-4		FAT CLAY WITH SAND (CH), moist to wet, yellow to light brown, coarse sand, no dilatancy, medium to high plasticity, feels greasy and slimy when wet, tacky when moist.
	5			G-5		FAT CLAY (CH), moist to wet, color?, no dilatancy, medium to high plasticity, greasy when wet, some iron oxide staining.
						Bottom of Borehole at 5.0 feet.
	10					
	15					
	20					
	25					
	30					
	35					

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General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: ABERDEEN, WASHINGTON Project No.: 0211414-003	Hand-Auger Log **HA-2**	Figure **A** Sheet **1 of 1**

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - J:\HALEYALDRICH.COM\SHARE\CPROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started:		Date Completed:	
Logged by:	B. Arvesen	Checked by:	
Location:	(WGS 84)		
Ground Surface Elevation:			
Comments:			

Drilling Contractor/Crew:	Haley & Aldrich, Inc.
Drilling Method:	Hand Auger
Rig Model/Type:	
Hammer Type:	
Hammer Weight (pounds):	Hammer Drop Height (inches):
Measured Hammer Efficiency (%):	Not Available
Hole Diameter:	6 inches
Well Casing Diameter:	NA
Total Depth:	5.0 feet
Depth to Groundwater:	Not Identified

Elevation (feet)	Depth (feet)	Sample Data: Type	Sample Data: Length (inches)	Sample Data: Number / Tests	Graphic Log	Material Description	Depth (feet)
	0			G-1		Topsoil/forest duff (2-inches thick).	0
				G-2		SILTY SAND (SM), trace fine subangular to subrounded gravel, moist, brown, low plasticity, numerous organics (~20%).	
				G-3		grades to dark brown, less fines, trace organics, fine to medium subangular sand	
				G-4		SANDY SILT (ML), moist, yellow-brown, rapid dilatancy, low plasticity, trace organics (roots).	
				G-5		POORLY GRADED SAND WITH SILT (SP-SM), wet, gray-brown, fine to medium subangular to subrounded sand.	
	5			G-5		POORLY GRADED SAND (SP), moist, brown, fine to coarse angular to subrounded sand, grading to mostly medium from above.	5
						fines and fine sand mostly grade out from above	
						Bottom of Borehole at 5.0 feet.	
	10						10
	15						15
	20						20
	25						25
	30						30
	35						35

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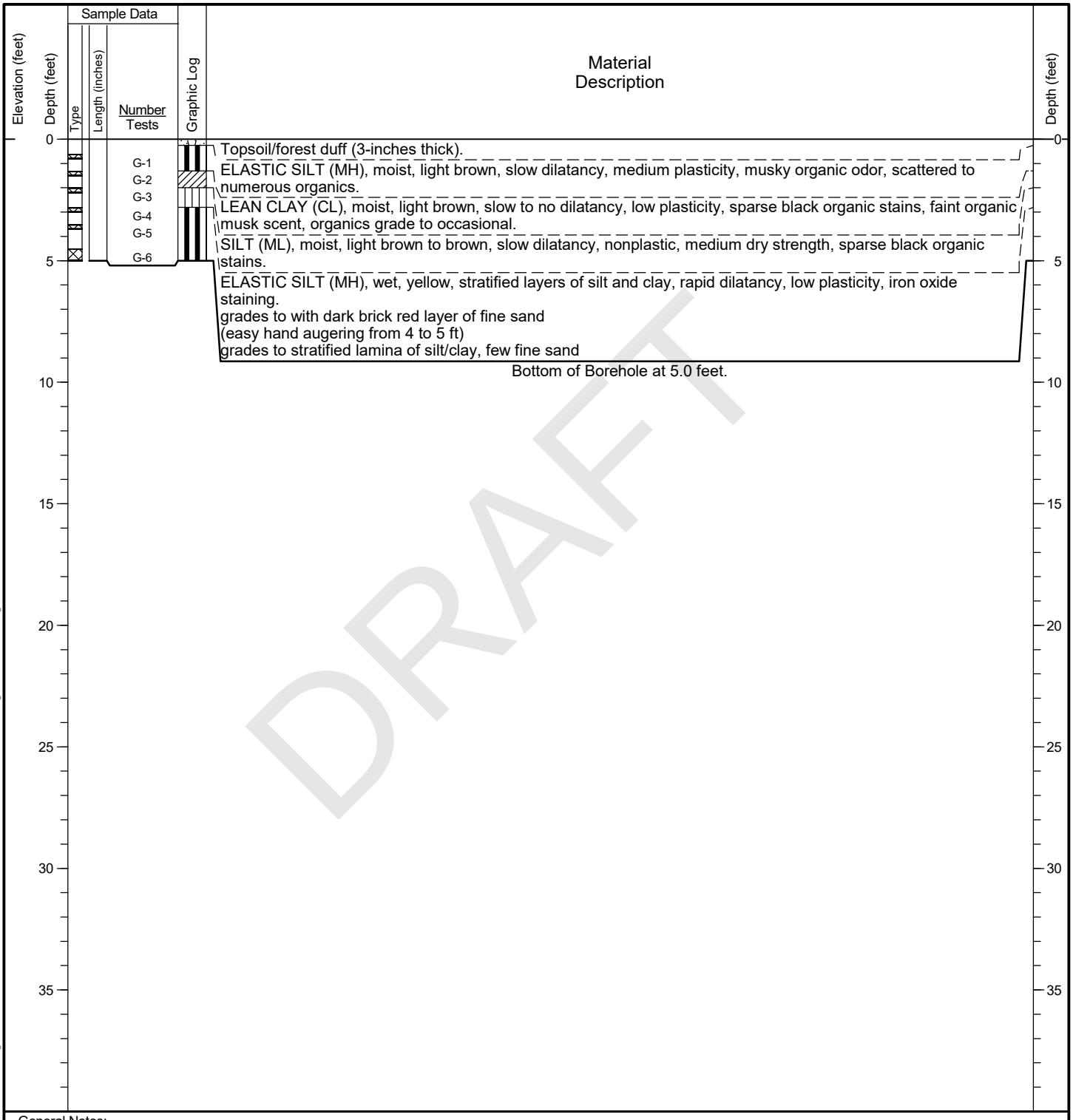
General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: ABERDEEN, WASHINGTON Project No.: 0211414-003	Hand-Auger Log **HA-3**	Figure **A** Sheet **1 of 1**

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - J:\HALEYALDRICH.COM\SHARE\CPROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

Date Started:		Date Completed:	
Logged by:	B. Arvesen	Checked by:	
Location:	(WGS 84)		
Ground Surface Elevation:			
Comments:			

Drilling Contractor/Crew:	Haley & Aldrich, Inc.
Drilling Method:	Hand Auger
Rig Model/Type:	
Hammer Type:	
Hammer Weight (pounds):	Hammer Drop Height (inches):
Measured Hammer Efficiency (%):	Not Available
Hole Diameter:	6 inches
Well Casing Diameter:	NA
Total Depth:	5.0 feet
Depth to Groundwater:	Not Identified



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General Notes:
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Material stratum lines are interpretive and actual changes may be gradual. Solid lines indicate distinct contacts and dashed lines indicate gradual or approximate contacts.
3. USCS designations are based on visual-manual identification (ASTM D 2488), unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling/excavation (ATD) or for date specified. Level may vary with time.
5. Location and ground surface elevations are approximate.

HALEY ALDRICH	Project: SOUTH ELEMENTARY RELOCATION Location: ABERDEEN, WASHINGTON Project No.: 0211414-003	Hand-Auger Log **HA-4**	Figure **A** Sheet **1 of 1**

HA BORING LOG - C:\USERS\KBUBEL\ONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2/11/26 16:42 - \\HALEYALDRICH.COM\SHARE\CPROJECTS\0211414\PERMANENT GINT FILE\0211414-003_ABERDEEN SD RELOC SITE 4_GINT.GPJ - kbubel

APPENDIX B
Laboratory Test Results

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APPENDIX B

Laboratory Testing

General

Soil samples obtained from the explorations were transported to Haley & Aldrich, Inc.'s laboratory and evaluated to confirm or modify field classifications, as well as to assess engineering properties of the soils encountered. Representative samples were selected for laboratory testing. The tests were performed in general accordance with the test methods of ASTM International (ASTM) or other applicable procedures. A summary of the test results is included as Figure B-1.

Visual Classifications

Soil samples obtained from the explorations were visually classified in the field and in our geotechnical laboratory based on the Unified Soil Classification System and ASTM classification methods. ASTM Test Method D 2488 was used to classify soils using visual and manual methods. ASTM Test Method D 2487 was used to classify soils based on laboratory test results.

Laboratory Test Results

MOISTURE CONTENT

The moisture content of samples was obtained in general accordance with ASTM Test Method D 2216. The results of the moisture-content tests completed on samples from the explorations are presented on the exploration logs included in Appendix A and on Figure B-1 in this appendix.

ATTERBERG LIMITS TESTING

Atterberg limits (liquid limit, plastic limit, and plasticity index) were obtained in general accordance with ASTM Test Method D 4318. The plastic limit is defined as the moisture content where the soil becomes brittle. The liquid limit is defined as the moisture content where the soil begins to act similar to a liquid. The plasticity index is the difference between the liquid and plastic limits. The results of the Atterberg limits analysis and plasticity characteristics are plotted on Figure B-2, summarized on Figure B-1, and shown graphically on the appropriate exploration logs in Appendix A.

PARTICLE SIZE DISTRIBUTION

Sieve analysis tests were performed in general accordance with ASTM Test Method D 6913 to determine the quantitative distribution of particle sizes in select samples. Additionally, several tests were performed to determine the percent of fine soil particle sizes in each sample. The tests were performed in general accordance with ASTM Test Method D 1140. Soils retained on the U.S. Standard No. 200 mesh sieve were also tested to determine the percent of sand-size and gravel-size particles. The "percent fines" portions of the test results are indicated on the appropriate exploration logs included in Appendix A. The percentage of fines, sands, and gravels are presented on Figure B-1 in this appendix. Full results of sieve analyses are presented on Figure B-3 in this appendix.

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CORROSIVITY TESTING

A corrosivity test suite was performed on one sample collected from boring B-2. The test suite included testing for in situ moisture content, pH, chloride, sulfide, sulfate, and electrical resistivity. The results of the test are presented on the final sheets of this appendix.

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Exploration	Sample ID	Depth	Gravel (%)	Sand (%)	Fines (%)	Liquid Limit	Plastic Limit	Water Content (%)	USCS Group Symbol	Soil Description
B-1	S-1	2.5	0.0	79.9	20.1			15.8	SM	SILTY SAND
B-1	S-2	5.0								
B-1	S-3	7.5	1.0	50.4	48.5			71.5	SM	SILTY SAND
B-1	S-4	10.0	2.2	78.9	19.0			75.3	SM	SILTY SAND
B-1	S-5	15.0				83	52	60.4	MH	ELASTIC SILT
B-1	S-6	20.0				51	39		MH	ELASTIC SILT
B-1	S-7	25.0								
B-1	S-8	30.0	46.2	40.7	13.0			16.9	GM	SILTY GRAVEL WITH SAND
B-1	S-9	35.0								
B-1	S-10	40.0	0.0	81.1	18.9			36.8	SM	SILTY SAND
B-1	S-11	45.0								
B-1	S-12	50.0								
B-2	S-1	2.5								
B-2	U-2	5.0						91.6		
B-2	S-3	7.0				74	66		MH	ELASTIC SILT
B-2	S-4	10.0						69.2		
B-2	U-5	11.5								
B-2	S-6	13.5				63	40	60.0	MH	ELASTIC SILT
B-2	U-7	18.0								
B-2	S-8A	20.0								
B-2	S-8B	20.3	0.0	51.8	48.2			29.8	SM	SILTY SAND
B-2	S-9	25.0								
B-2	S-10	30.0	27.3	62.7	10.0			17.6	SW-SM	WELL-GRADED SAND WITH SILT AND GRAVEL
B-2	S-11	35.0								
B-2	S-12	40.0								
B-2	S-13	45.0	24.1	62.6	13.2			24.9	SM	SILTY SAND WITH GRAVEL
B-2	S-14	50.0								
B-2	S-15	55.0								
B-2	S-16	60.0								
B-2	S-17	65.0								
B-2	S-18	70.0								
B-3	G-1	2.0						64.3		
B-3	G-2	4.0								
B-3	S-3	5.0	0.0	64.4	35.6			60.2	SM	SILTY SAND
B-3	S-4A	7.5								
B-3	S-4B	8.0						58.6		
B-3	S-5A	10.0								
B-3	S-5B	10.5				61	38	57.5	MH	ELASTIC SILT
B-3	S-6	15.0	16.6	66.1	17.3			29.0	SM	SILTY SAND WITH GRAVEL
B-3	S-7	20.0						15.5		
B-3	S-8	25.0								
B-3	S-9	30.0						32.3		
B-3	S-10	35.0								
B-3	S-11	40.0	20.9	64.6	14.5			29.6	SM	SILTY SAND WITH GRAVEL
B-3	S-12	45.0								
B-3	S-13	50.0								

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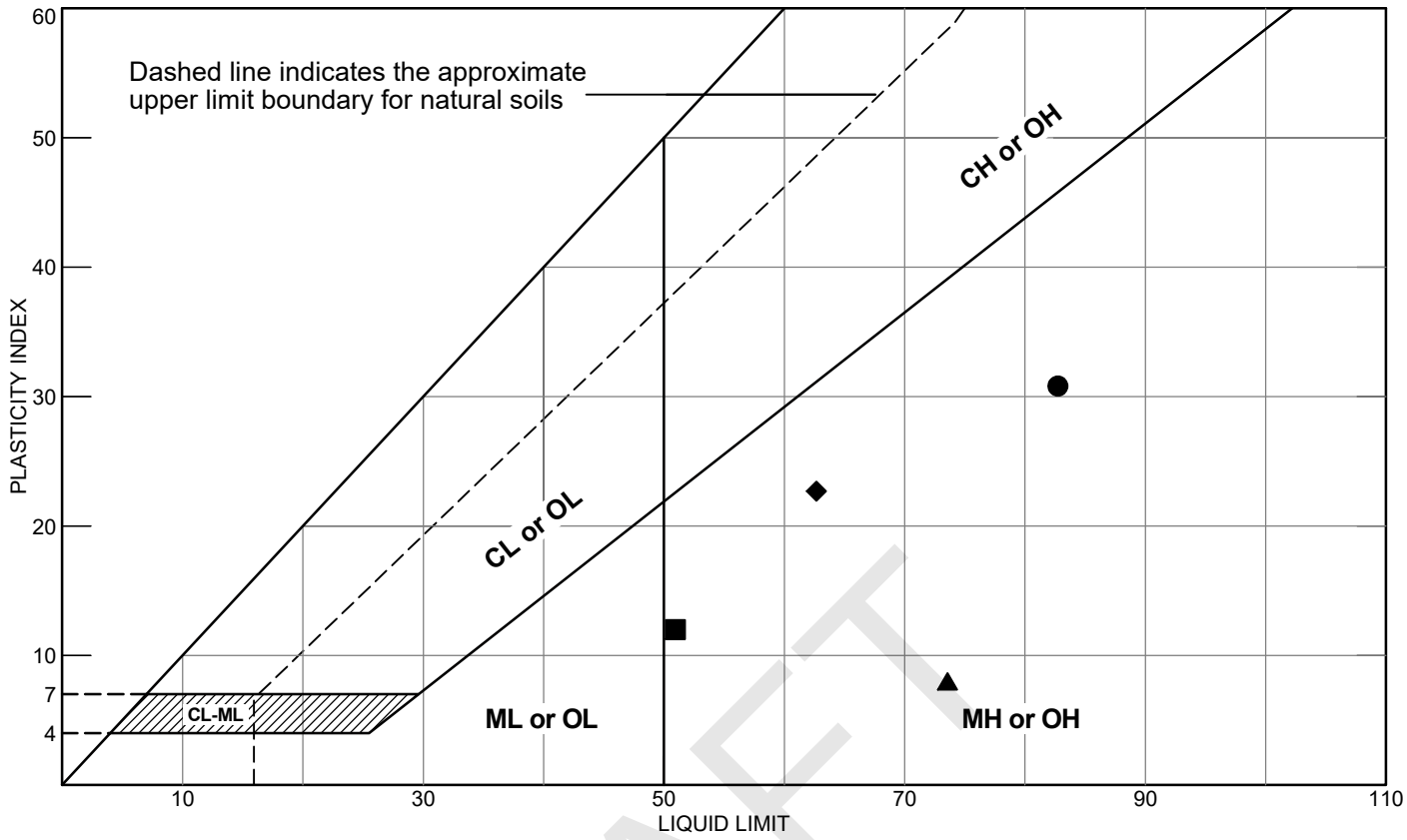
HALEY ALDRICH

Project: New Aberdeen School District Campus - Site 4
Location: Aberdeen, Washington
Project No.: 0211414-000

Summary of Laboratory Results

Figure **B-1**
Sheet **1 of 1**

SEATTLE - HA LAB SUMMARY (FOR REPORTS) - C:\USERS\TSLOTH\OWERONEDRIVE - HALEYALDRICH.COM\DESKTOP\HC_LIBRARY GLB - 2017\05\08 11:; \\HALEYALDRICH.COM\SHARE\CF\PROJECTS\0211414\PERMANENT\GINT FILE\0211414-000_ABERDEEN SD RELOCATION SITE 4_GINT GPJ - tslofmyer



Location and Description	LL	PL	PI	-#200	MC%	USCS
● **Source:** B-1 **Sample No.:** S-5 **Depth:** 15.0 to 16.5 ELASTIC SILT	83	52	31	NT	60	MH
■ **Source:** B-1 **Sample No.:** S-6 **Depth:** 20.0 to 21.5 ELASTIC SILT	51	39	12	NT	NT	MH
▲ **Source:** B-2 **Sample No.:** S-3 **Depth:** 7.0 to 8.5 ELASTIC SILT	74	66	8	NT	NT	MH
◆ **Source:** B-2 **Sample No.:** S-6 **Depth:** 13.5 to 15.0 ELASTIC SILT	63	40	23	NT	60	MH

Remarks:

● ■ ▲ ◆

DRAFT

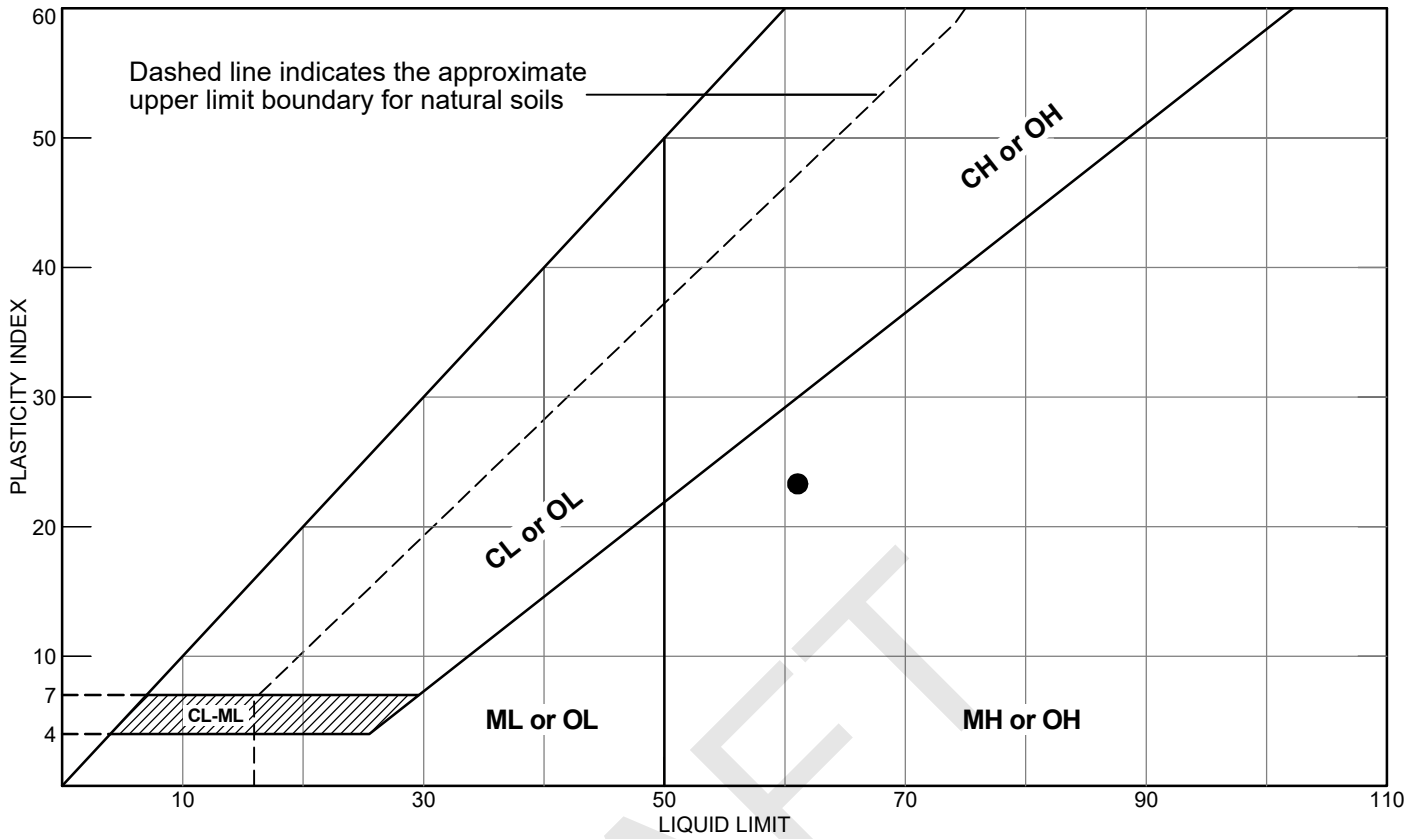
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HALEY ALDRICH

Project: New Aberdeen School District Campus - Site 4
Location: Aberdeen, Washington
Project No.: 0211414-000

Liquid Limit, Plastic Limit, and Plasticity Index

Figure **B-2**
Sheet **1 of 2**



Location and Description	LL	PL	PI	-#200	MC%	USCS
● **Source:** B-3 **Sample No.:** S-5B **Depth:** 10.5 to 11.5 ELASTIC SILT	61	38	23	NT	57	MH

Remarks:

●

DRAFT

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HALEY ALDRICH

Project: New Aberdeen School District Campus - Site 4
Location: Aberdeen, Washington
Project No.: 0211414-000

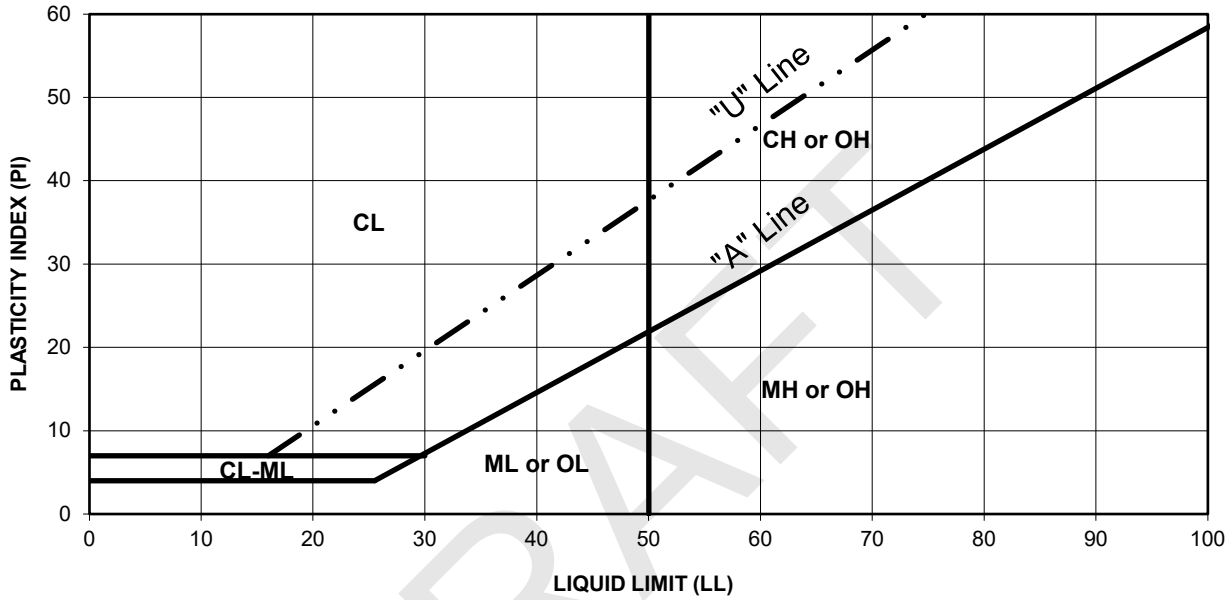
Liquid Limit, Plastic Limit, and Plasticity Index

Figure **B-2**
Sheet **2 of 2**

AP Engineering and Testing, Inc.
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2607 Pomona Boulevard | Pomona, CA 91768
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ATTERBERG LIMITS
ASTM D 4318

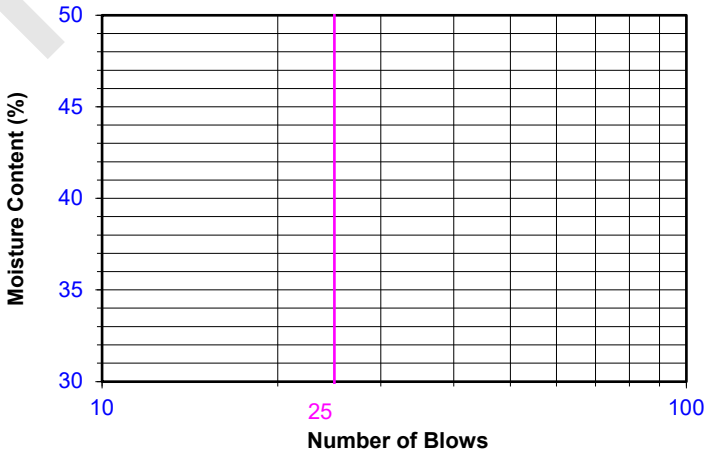
Client Name:	Haley & Aldrich Inc.	Tested By:	LS	Date:	02/04/26
Project Name:	Aberdeen S. Elementary	Computed By:	JG	Date:	02/05/26
Project No.:	0211414-003	Checked By:	AP	Date:	02/06/26



DRAFT

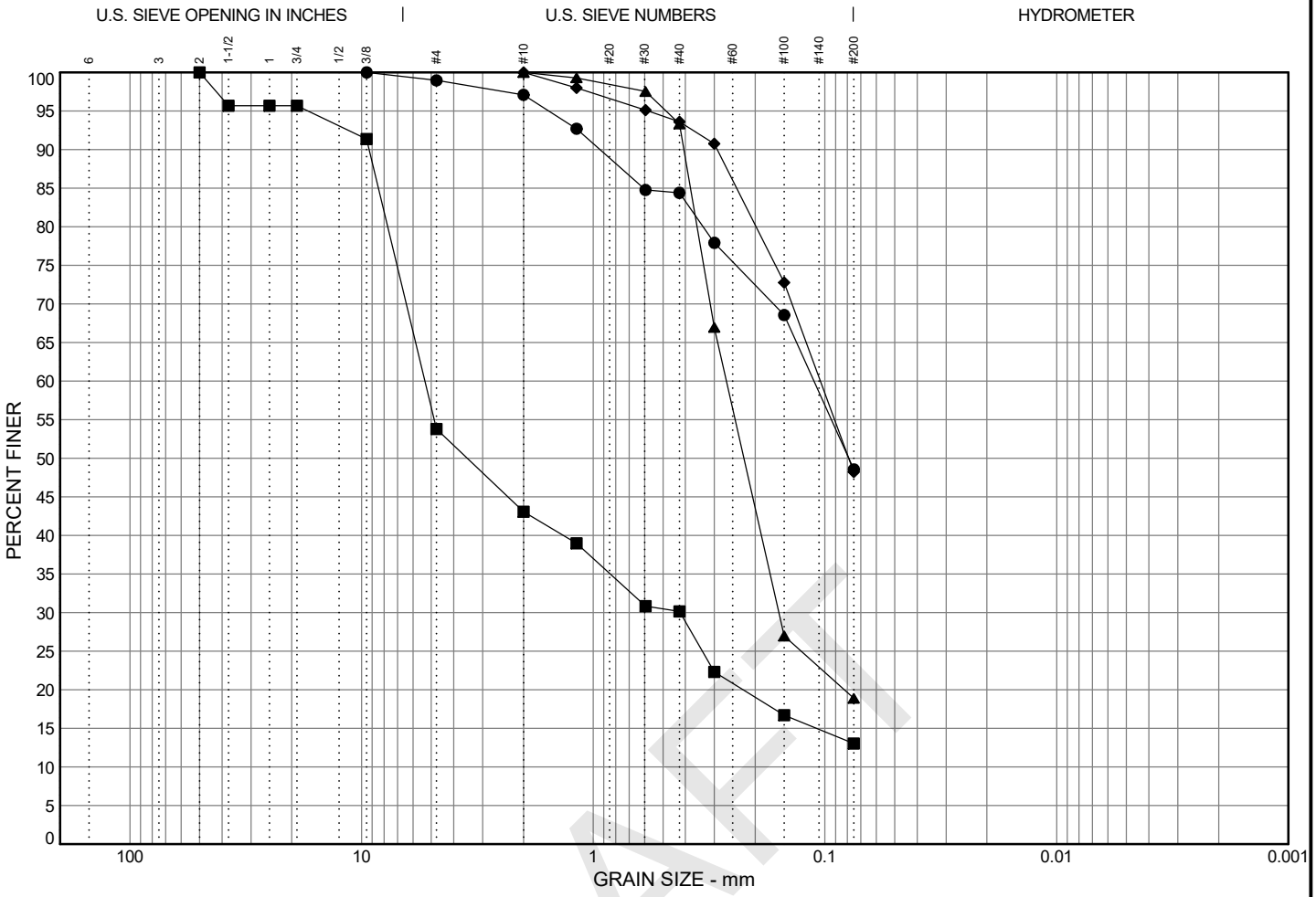
PROCEDURE USED

- ☐ Wet Preparation
- ☒ Dry Preparation
- ☒ Procedure A Multipoint Test
- ☐ Procedure B One-point Test



Symbol	Boring Number	Sample Number	Depth (feet)	LL	PL	PI	Plasticity Chart Symbol
	B-10	S-2	5	NP	NP	NP	

* NP denotes "non-plastic"



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Location and Description	% Cobbles	% Gravel	% Sand	% Silt	% Clay	MC%	USCS
● **Source:** B-1 **Sample No.:** S-3 **Depth:** 7.5 to 9.0 SILTY SAND	0.0	1.0	50.4	48.5		72	SM
■ **Source:** B-1 **Sample No.:** S-8 **Depth:** 30.0 to 31.5 SILTY GRAVEL WITH SAND	0.0	46.2	40.7	13.0		17	GM
▲ **Source:** B-1 **Sample No.:** S-10 **Depth:** 40.0 to 41.5 SILTY SAND	0.0	0.0	81.1	18.9		37	SM
◆ **Source:** B-2 **Sample No.:** S-8B **Depth:** 20.3 to 21.5 SILTY SAND	0.0	0.0	51.8	48.2		30	SM

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.607	0.112	0.079					
■			8.448	5.327	3.500	0.422	0.109			
▲			0.381	0.266	0.224	0.158				
◆			0.240	0.105	0.079					

Remarks:

● ■ ▲ ◆

DRAFT

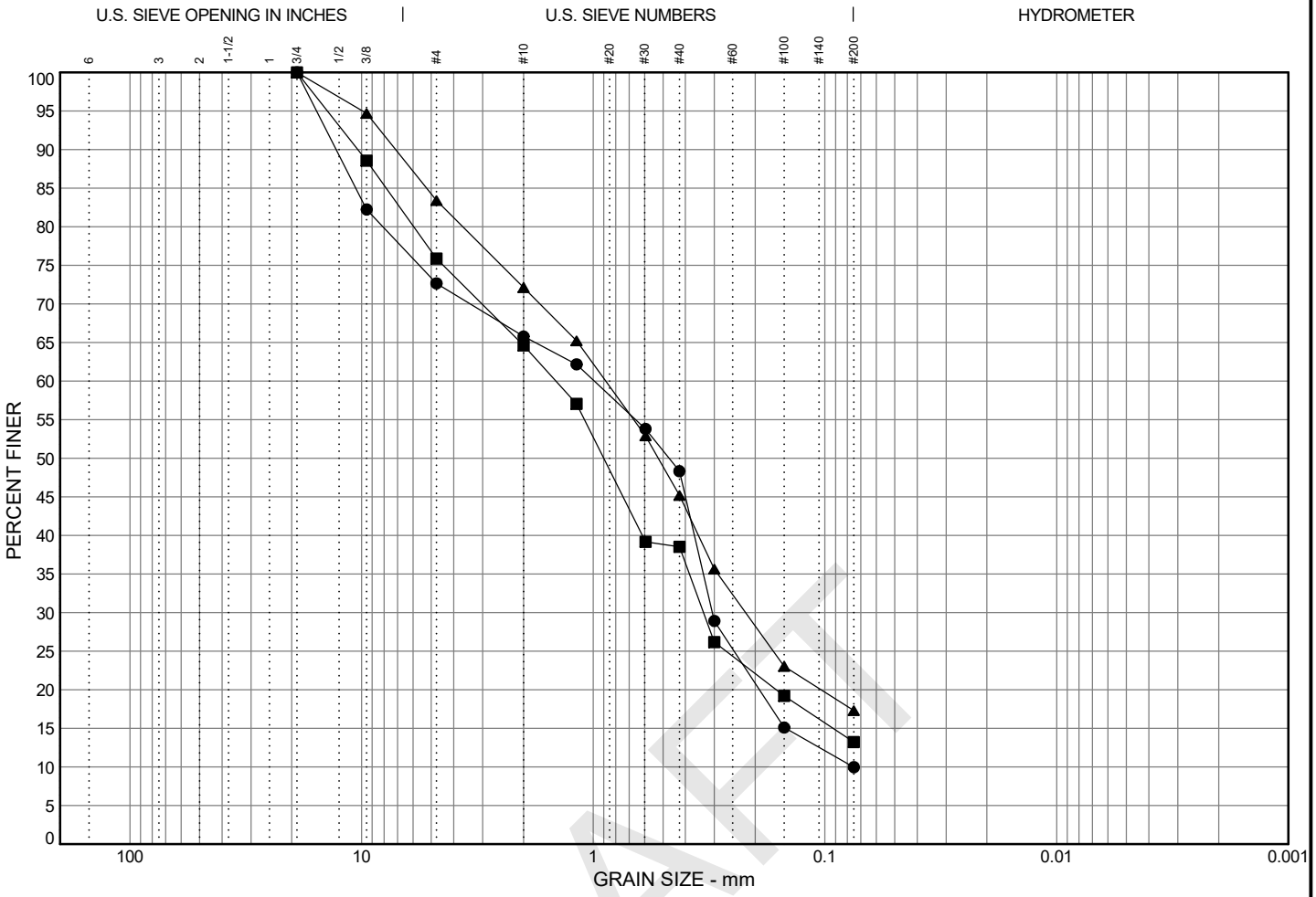
HALEY ALDRICH

Project: New Aberdeen School District Campus - Site 4
Location: Aberdeen, Washington
Project No.: 0211414-000

Particle-Size Analysis

Figure **B-3**
Sheet **1 of 2**

HA GRAIN SIZE - C:\USERS\TSLOTHOWER\ONEDRIVE - HALEY ALDRICH\DOCUMENTS\DESKTOP\HC_LIBRARY (GLB - 2.17.23 8:08:09) - \\HALEY ALDRICH.COM\SHARE\CF\PROJECTS\0211414\PERMANENT GINT FILE\0211414-000_ABERDEEN SD RELOCATION SITE 4_GINT.GPJ - tslothower



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Location and Description	% Cobbles	% Gravel	% Sand	% Silt	% Clay	MC%	USCS
●	**Source:** B-2 **Sample No.:** S-10 **Depth:** 30.0 to 31.5 WELL-GRADED SAND WITH SILT AND GRAVEL	0.0	27.3	62.7	10.0		18	SW-SM
■	**Source:** B-2 **Sample No.:** S-13 **Depth:** 45.0 to 46.5 SILTY SAND WITH GRAVEL	0.0	24.1	62.6	13.2		25	SM
▲	**Source:** B-3 **Sample No.:** S-6 **Depth:** 15.0 to 16.5 SILTY SAND WITH GRAVEL	0.0	16.6	66.1	17.3		29	SM

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			10.580	0.988	0.471	0.306	0.148	0.075	1.26	13.11
■			7.819	1.450	0.901	0.334	0.092			
▲			5.243	0.883	0.525	0.220				

Remarks:

●

■

▲

DRAFT

HALEY ALDRICH

Project: New Aberdeen School District Campus - Site 4
Location: Aberdeen, Washington
Project No.: 0211414-000

Particle-Size Analysis

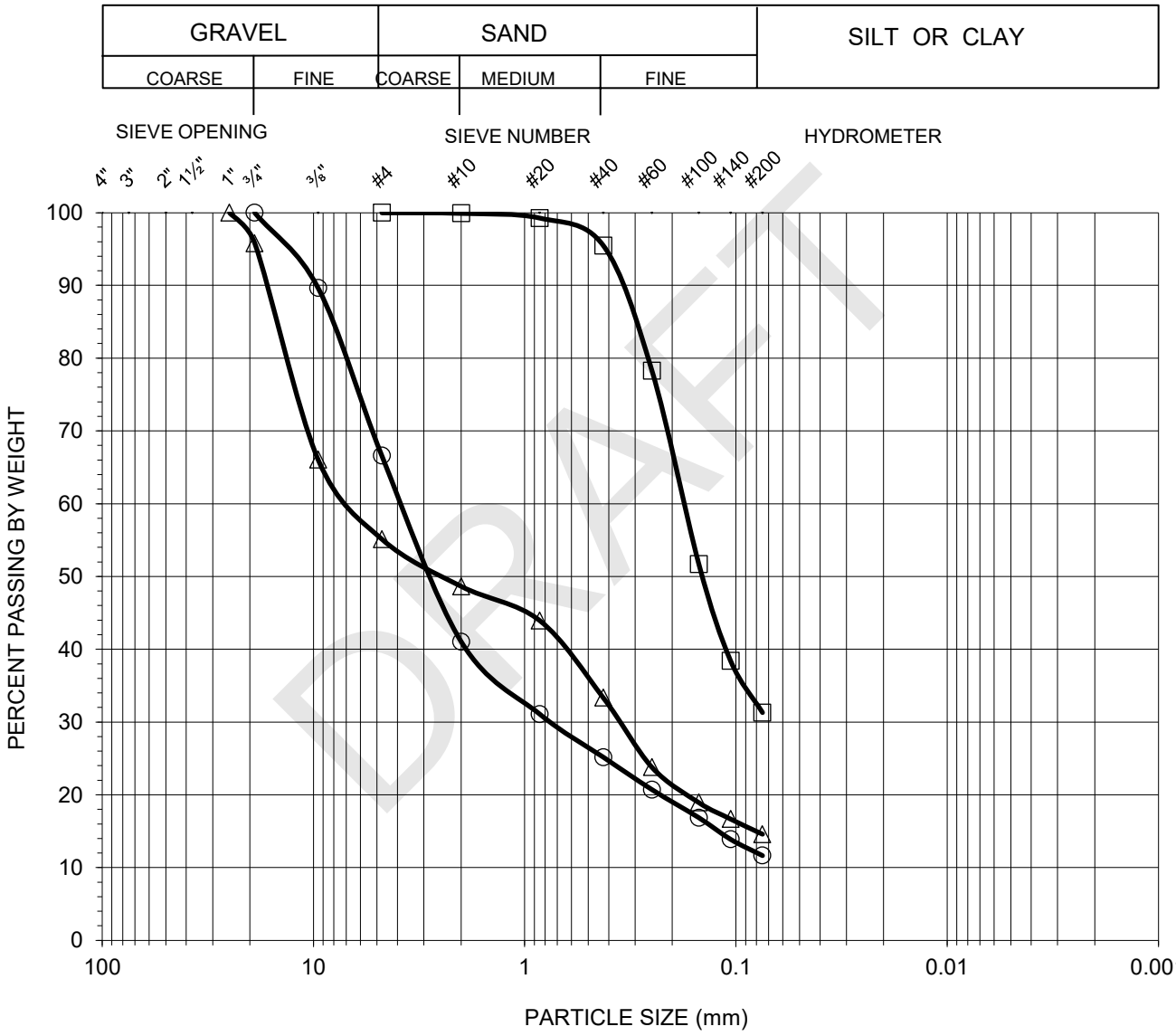
Figure **B-3**
Sheet **2 of 2**

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GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name: Haley & Aldrich Inc. Tested by: LS Date: 02/06/26
Project Name: Aberdeen S. Elementary Computed by: JG Date: 02/06/26
Project No.: 0211414-003 Checked by: AP Date: 02/09/26

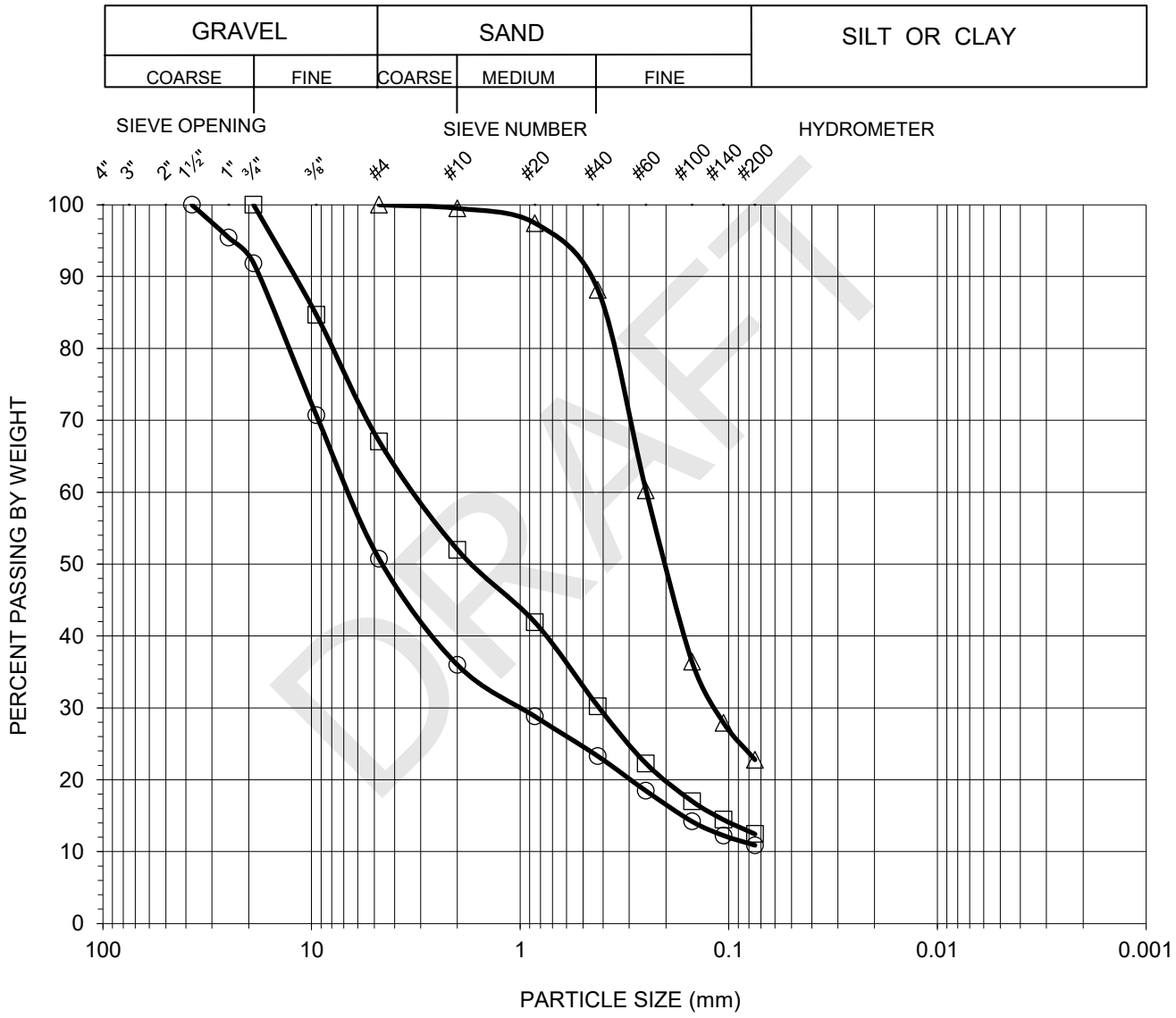


Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	B-5	S-3	15	33	55	12	N/A	SW-SM
□	B-5	S-5	25	0	69	31	N/A	SM
△	B-5	S-6	30	45	40	15	N/A	SM

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Client Name: Haley & Aldrich Inc. Tested by: LS Date: 02/06/26
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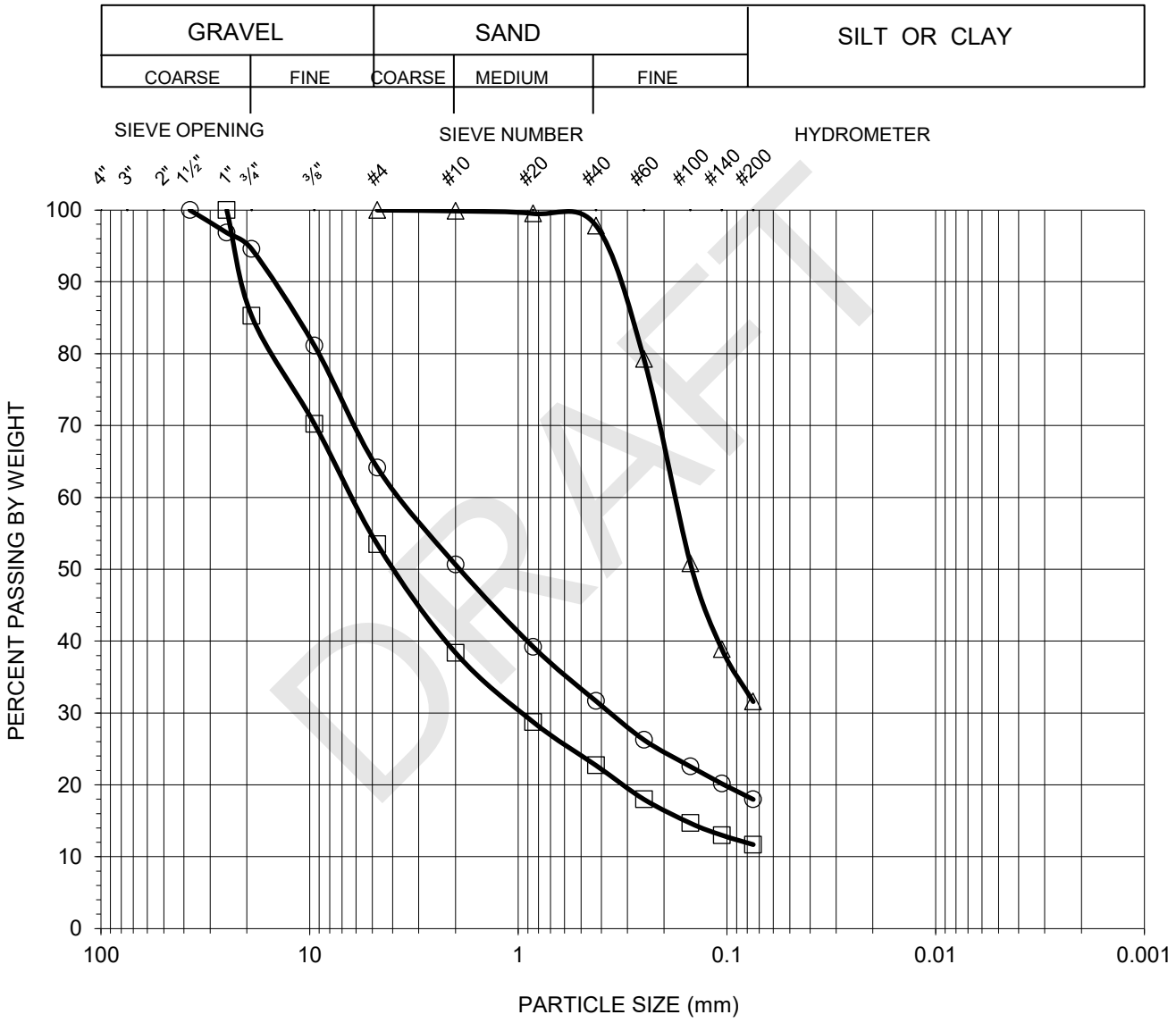
DRAFT

Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	B-5	S-8	40	49	40	11	N/A	GW-GM
□	B-6	S-3	15	33	55	12	N/A	SP-SM
△	B-6	S-8	40	0	77	23	N/A	SM

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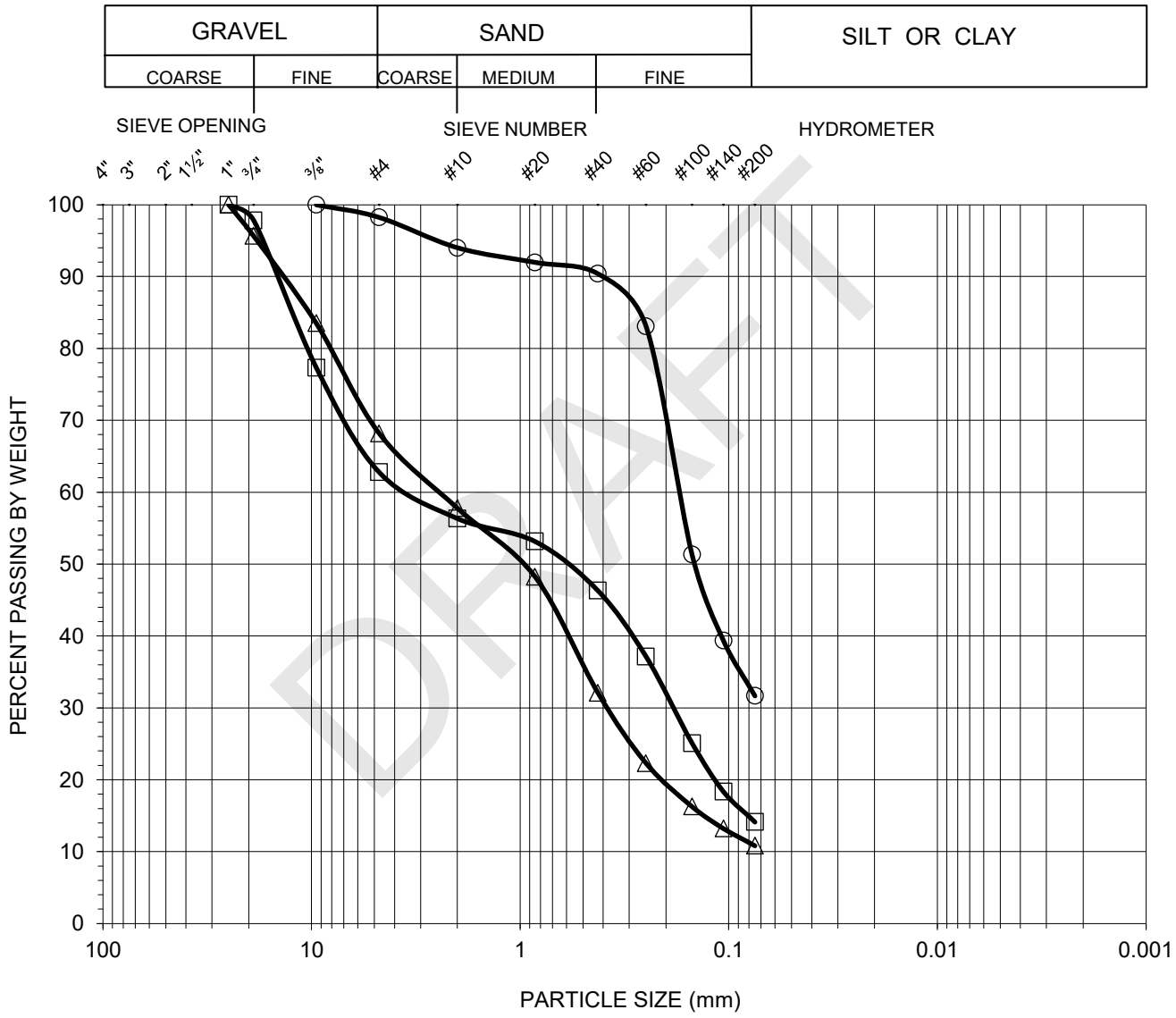


Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	B-7	S-2	10	36	46	18	N/A	SM
□	B-7	S-4	20	47	41	12	N/A	GW-GM
△	B-7	S-6	30	0	68	32	N/A	SM

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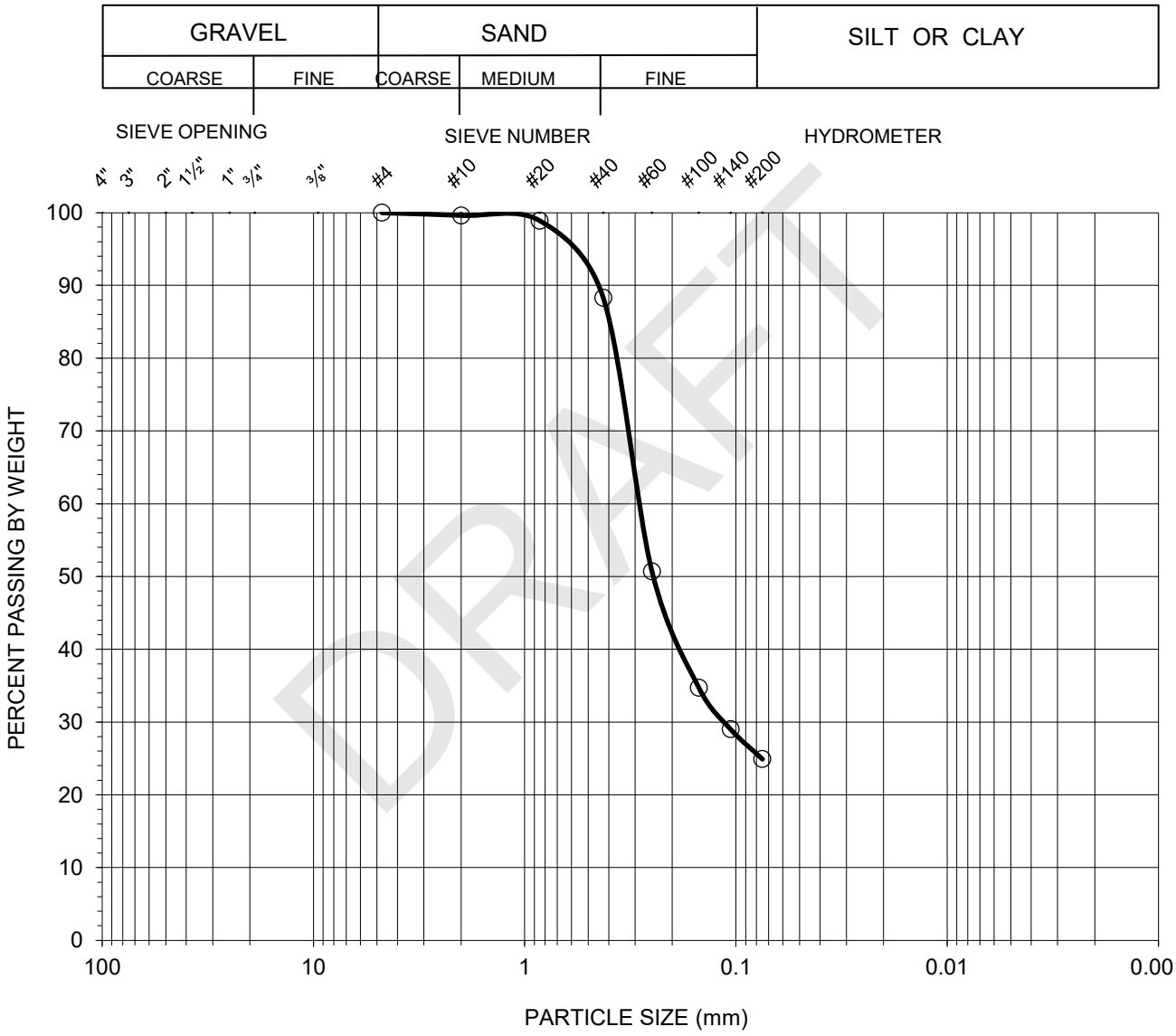
DRAFT

Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	B-8	S-7	30	2	66	32	N/A	SM
□	B-10	S-5	12.5	37	49	14	N/A	SM
△	B-11	S-6	20	32	57	11	N/A	SP-SM

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GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name: Haley & Aldrich Inc. Tested by: LS Date: 02/06/26
Project Name: Aberdeen S. Elementary Computed by: JG Date: 02/06/26
Project No.: 0211414-003 Checked by: AP Date: 02/09/26



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	B-11	S-9	35	0	75	25	N/A	SM

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

8 January, 2025

Job No. 2412063
Cust. No. 13349

Mr. Micah Hintz
Haley & Aldrich
6420 S. Macadam Avenue, Suite 100
Portland, OR 97239

Subject: Project No.: 0211414
Project Name: Aberdeen SD Sites 3 and 4
Corrosivity Analysis –ASTM Test Methods

Dear Mr. Hintz:

Pursuant to your request, CERCO Analytical has analyzed the soil samples submitted on December 30, 2024. Based on the analytical results, this brief corrosivity evaluation is enclosed for your consideration.

Based upon the resistivity measurements, both samples are classified as "mildly corrosive". All buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric coated steel or iron should be properly protected against corrosion depending upon the critical nature of the structure. All buried metallic pressure piping such as ductile iron firewater pipelines should be protected against corrosion.

The chloride ion concentrations reflect none detected with a reporting limit of 15 mg/kg.

The sulfate ion concentrations are none detected and 39 mg/kg and are determined to be insufficient to damage reinforced concrete structures and cement mortar-coated steel at these locations.

The pH of the soil is 5.03 and 5.31, which are considered to be corrosive to buried iron, steel, mortar-coated steel and reinforced concrete structures. Therefore, corrosion prevention measures need to be considered for structures to be placed in this acidic soil.

The redox potentials are 290-mV and 300-mV. Both samples are indicative of potentially "slightly corrosive" soils resulting from anaerobic soil conditions.

This corrosivity evaluation is based on general corrosion engineering standards and is non-specific in nature. For specific long-term corrosion control design recommendations or consultation, please call *JDH Corrosion Consultants, Inc. at (925) 927-6630.*

We appreciate the opportunity of working with you on this project. If you have any questions, or if you require further information, please do not hesitate to contact us.

Very truly yours,
CERCO ANALYTICAL, INC.

J. Darby Howard, Jr., P.E.
President

JDH/jdl
Enclosure

DRAFT

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

Client: Haley & Aldrich, Inc.
Client's Project No.: 0211414
Client's Project Name: Aberdeen SD Sites 3 and 4
Date Sampled: 9-Dec-24 -- 13-Dec-24
Date Received: 30-Dec-24
Matrix: Soil
Authorization: Signed Chain of Custody

Date of Report: 7-Jan-2025

Job/Sample No.	Sample I.D.	Redox (mV)	pH	Conductivity (umhos/cm)*	Resistivity (100% Saturation) (ohms-cm)	Sulfide (mg/kg)*	Chloride (mg/kg)*	Sulfate (mg/kg)*
2412063-001	Site 4 B-1/S-2 @ 5'	290	5.31	-	17,000	-	N.D.	39
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

DRAFT

Method:	ASTM D1498	ASTM D4972	ASTM D1125M	ASTM G57	ASTM D4658M	ASTM D4327	ASTM D4327
Reporting Limit:	-	-	10	-	50	15	15
Date Analyzed:	2-Jan-2025	2-Jan-2025		3-Jan-2025		2-Jan-2025	2-Jan-2025

Julia Clauson
Chemist

* Results Reported on "As Received" Basis
N.D. - None Detected

Quality Control Summary - All laboratory quality control parameters were found to be within established limits

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CORROSION TEST RESULTS

Client Name: Haley & Aldrich Inc.
Project Name: Aberdeen S. Elementary
Project No.: 0211414-003

AP Job No.: 26-0153
Date: 02/04/26

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
B-9	S-4	15	Sandy Silt	5,130	7.0	19	4
B-10	S-2	5	Sandy Silt	29,436	5.4	5	6

DRAFT

NOTES: Resistivity Test and pH: California Test Method 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

Maseeh College of Engineering and Computer Science
Department of Civil and Environmental Engineering

Post Office Box 751
Portland, Oregon 97207-0751

503-725-4282 tel
503-725-5950 fax

Portland State UNIVERSITY

February 9, 2026

REPORT

To: Micah Hintz, Haley & Aldrich Inc.

From: Monir Hossain, Arash Khosravifar, Diane Moug; Portland State University

Subject: Data Report – Consolidation Testing for Aberdeen SD HLC Relocation

---

Dear Micah,

This Data Report presents the results of laboratory tests conducted on soil samples for the Aberdeen SD HLC Relocation project. It includes results of tests carried out on specimens prepared from the Shelby Tube B-4 U-1. The testing program was comprised of two (2) consolidation tests. The testing period lasted from December 12, 2025, to January 28, 2026, and the tests were conducted at the Geotechnical Laboratory of Portland State University. Table 1 list the specimen and test parameters. Appendix A includes detailed consolidation tests results. Appendix B includes the locations of the specimens along the Shelby tubes and photos taken during sample preparation and post-test disassembly. Appendix C includes electronic data files.

If you have any questions, please do not hesitate to contact me at dmoug@pdx.edu 503-725-4283.

Sincerely,

Diane Moug, Ph.D.
Associate Professor
Civil and Environmental Engineering
Portland State University
Phone: 503-725-4283; Email: dmoug@pdx.edu

DRAFT

Table 1. Specimen Parameters

				Specimen Depth (ft)		Specimen Height (in)		Total Wet Mass of Specimen (g)[a]		Water Content (%)		Maximum Vertical Consolidation Stress (psf)
Test ID	Boring	Sample	Test Type	From	To	Initial Height	Final Height	Before Test[b]	After Test[b]	Before Test[c]	After Test[b]	
Consol_01	B-4	U-1	1D Consolidation	1.5	4	1.00	0.79	145.4	124.0	42.4	26.7	32,000
Consol_02	B-4	U-1	1D Consolidation	1.5	4	1.00	0.78	141.8	131.4	38.2	30.0	32,000

a Initial specimen height was 1 in, and the specimen diameter was 2.5 in
b Measured from the specimen
c Measured on the trimmings

DRAFT

ASTM Standards Used

Designation: D2435/D2435M – 11 “One-Dimensional Consolidation Properties of Soils Using Incremental Loading”

DRAFT

APPENDIX A:

Test Results

DRAFT

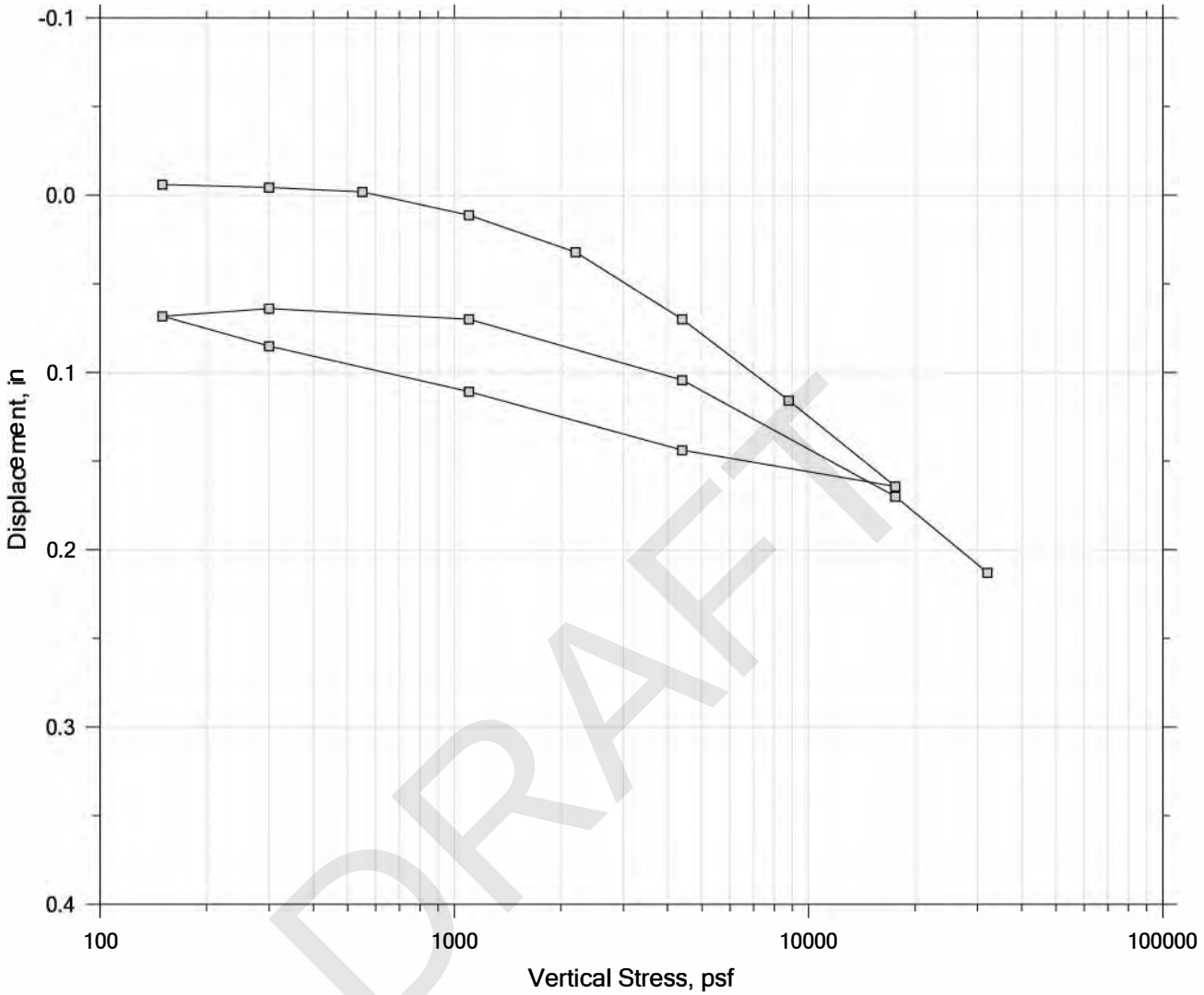
Consol_01

B-4 U-1

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Consolidation Test

Summary Report

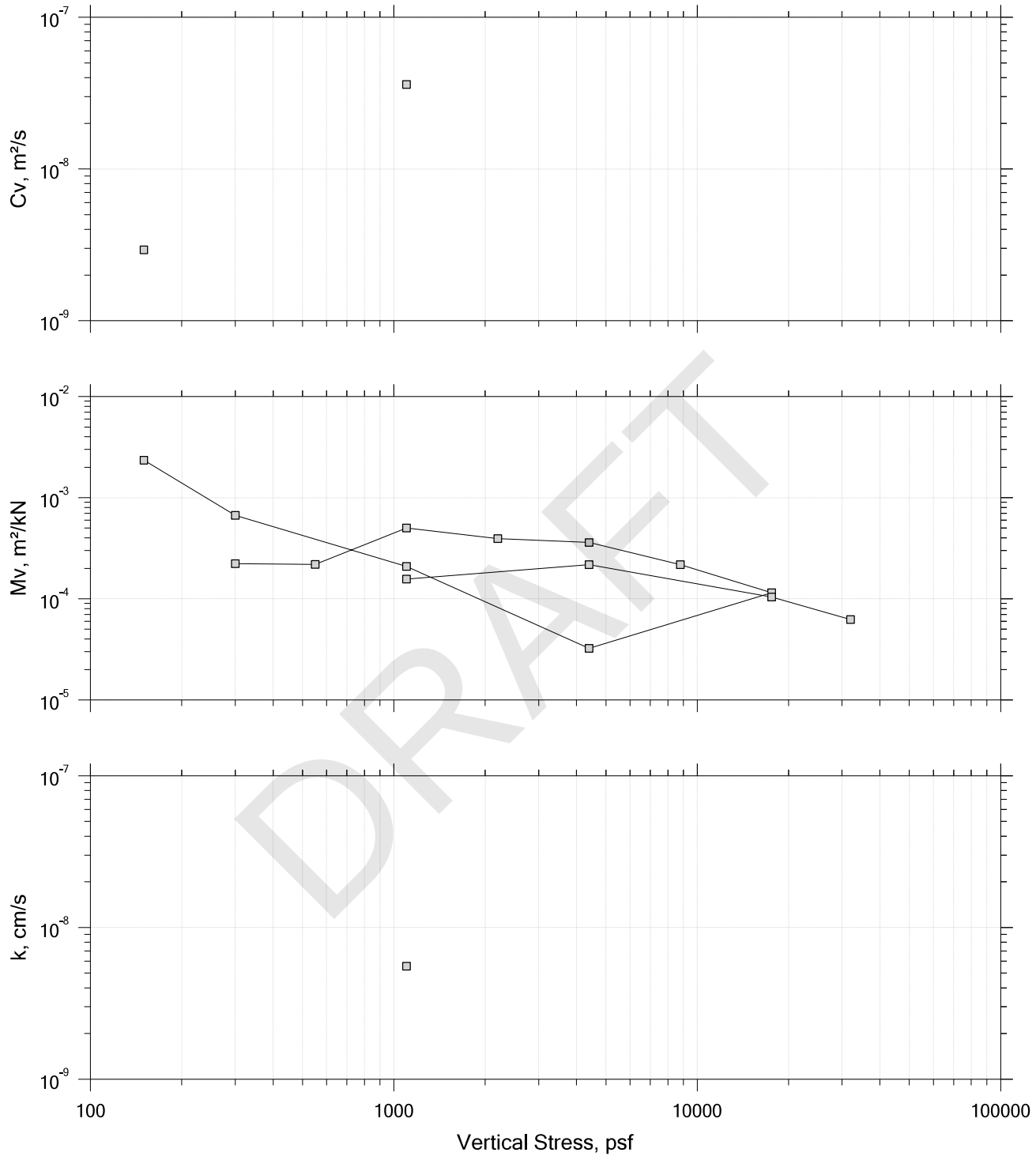


DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		
	Displacement at End of Increment		

Consolidation Test

Log of Time Coefficients

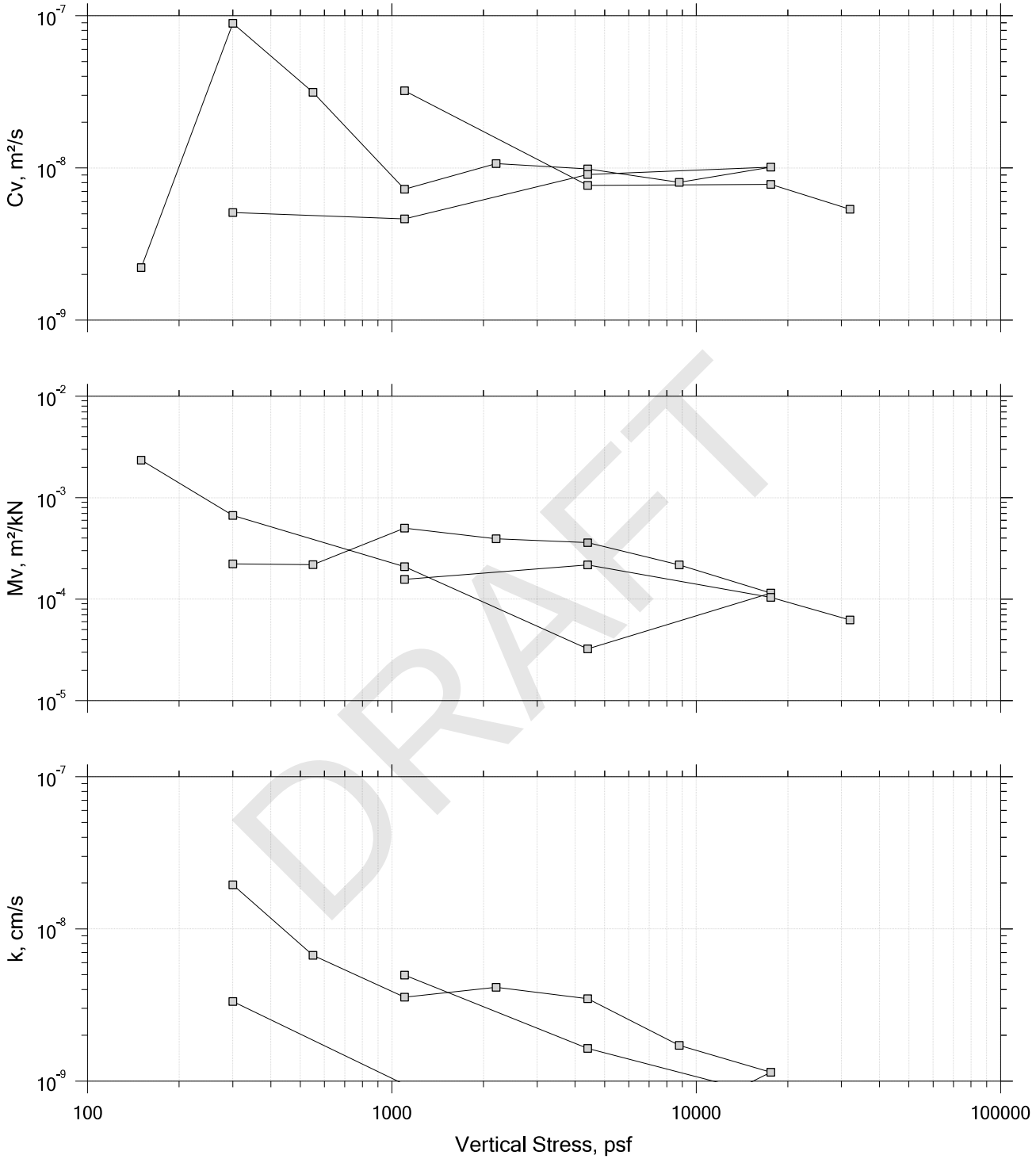


DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Square Root of Time Coefficients

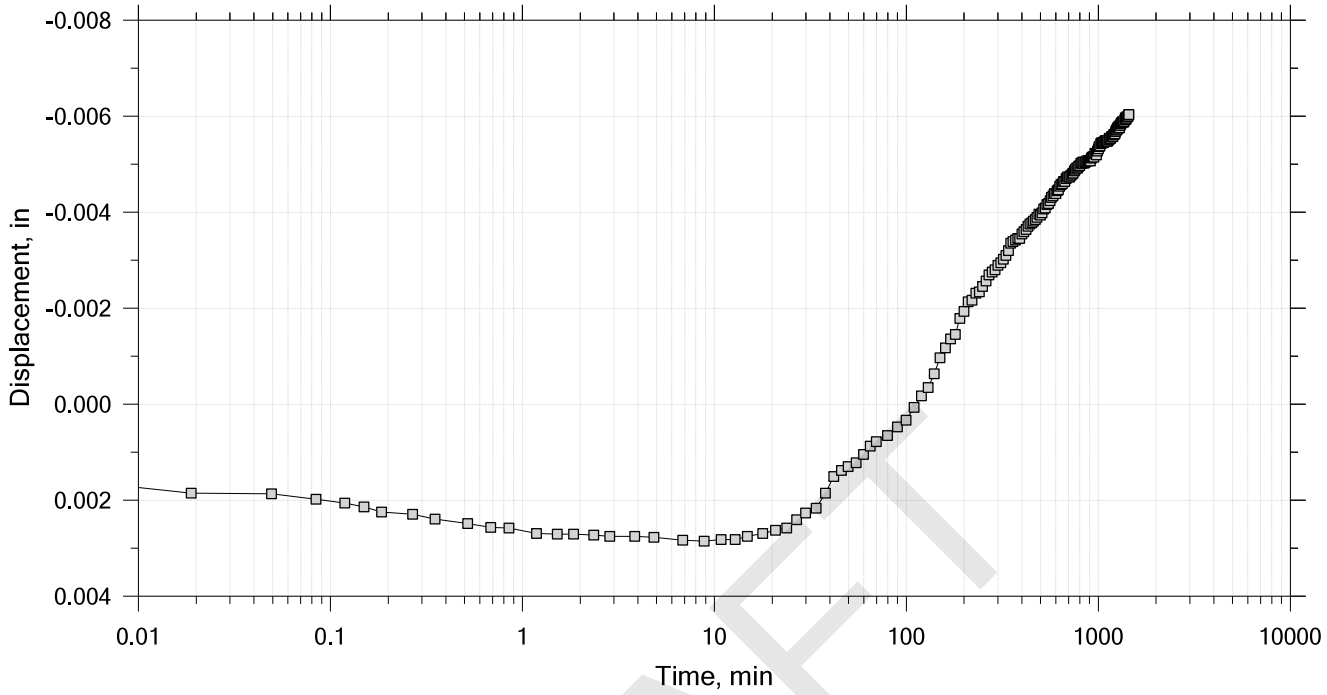


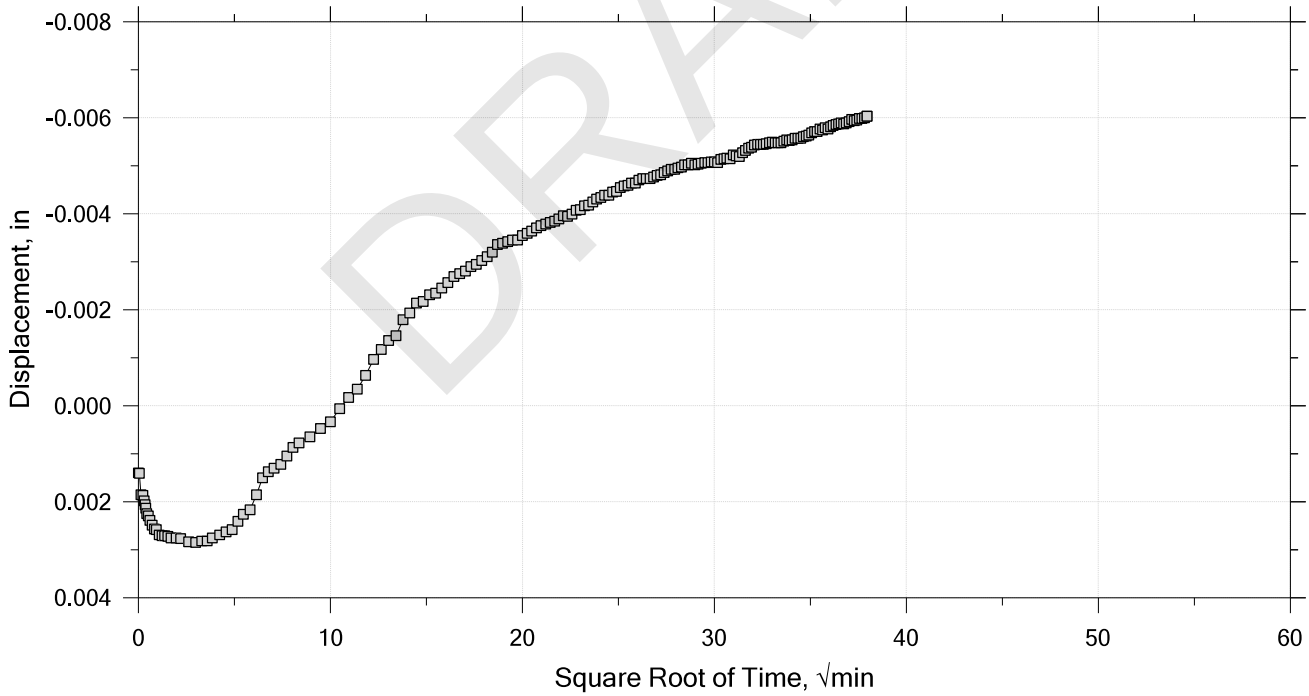
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 1 of 17
Constant Load Step
Stress: 150 psf



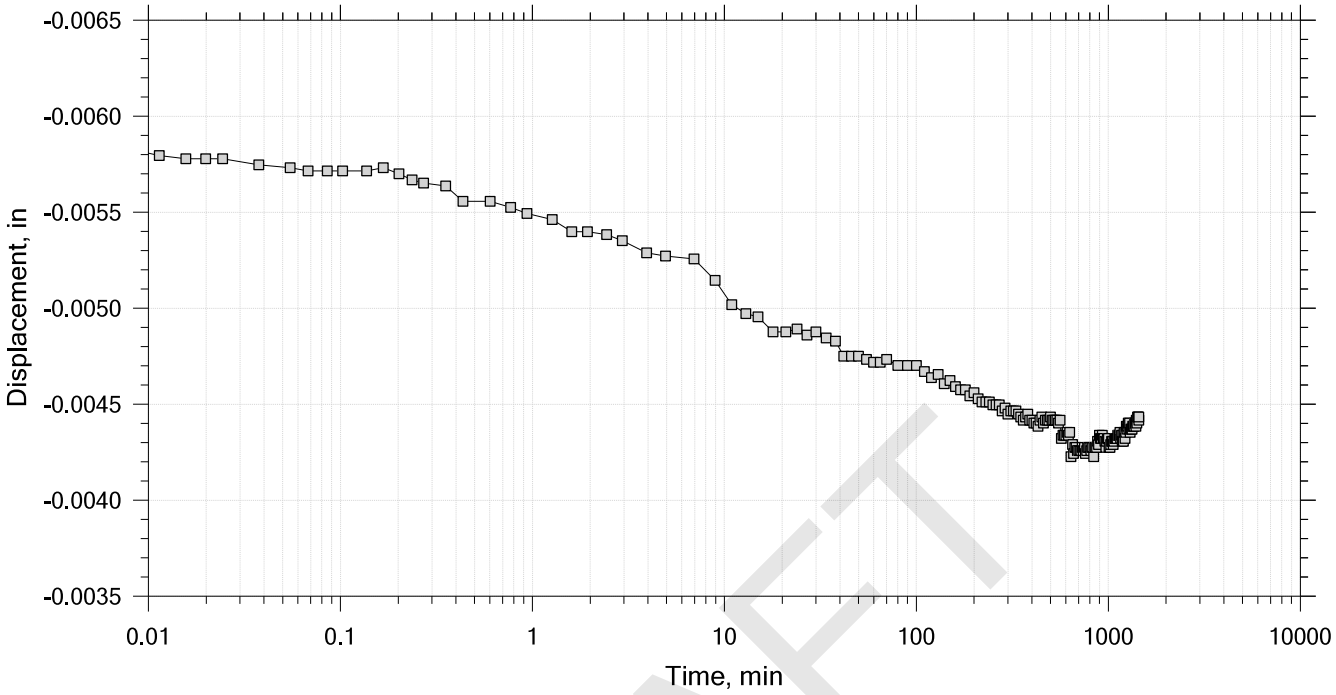


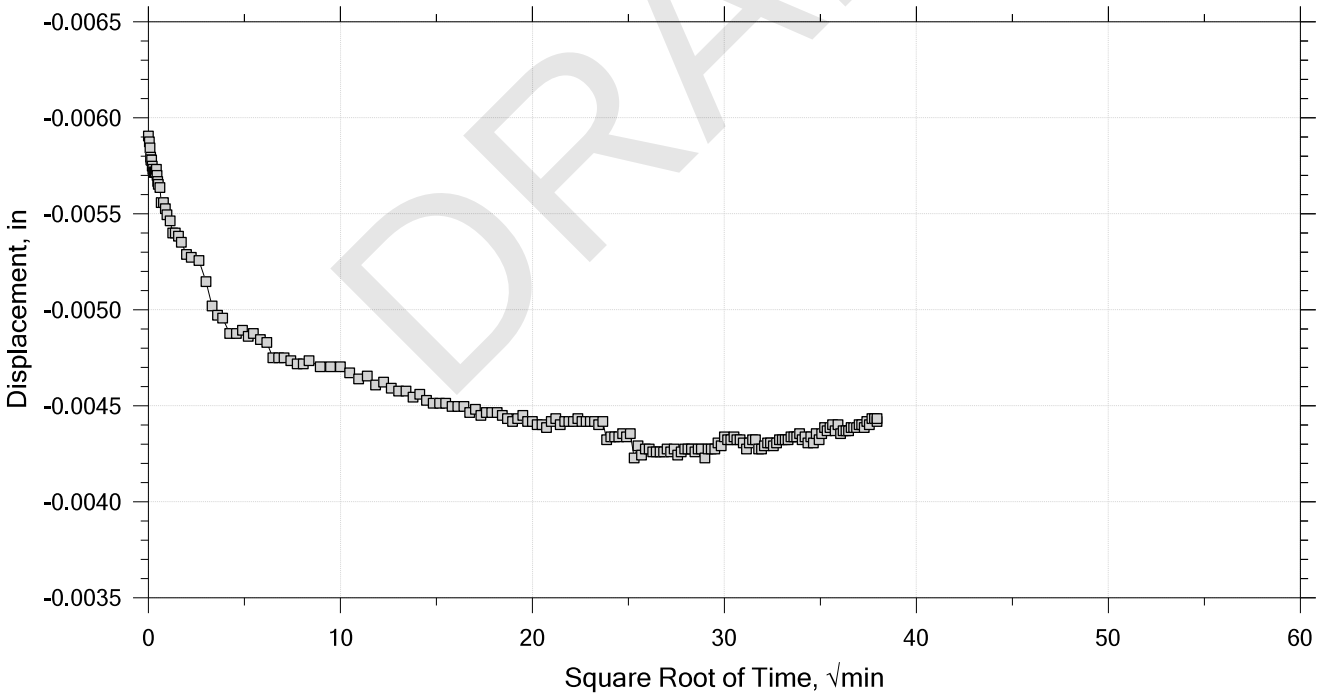
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 2 of 17
Constant Load Step
Stress: 300 psf



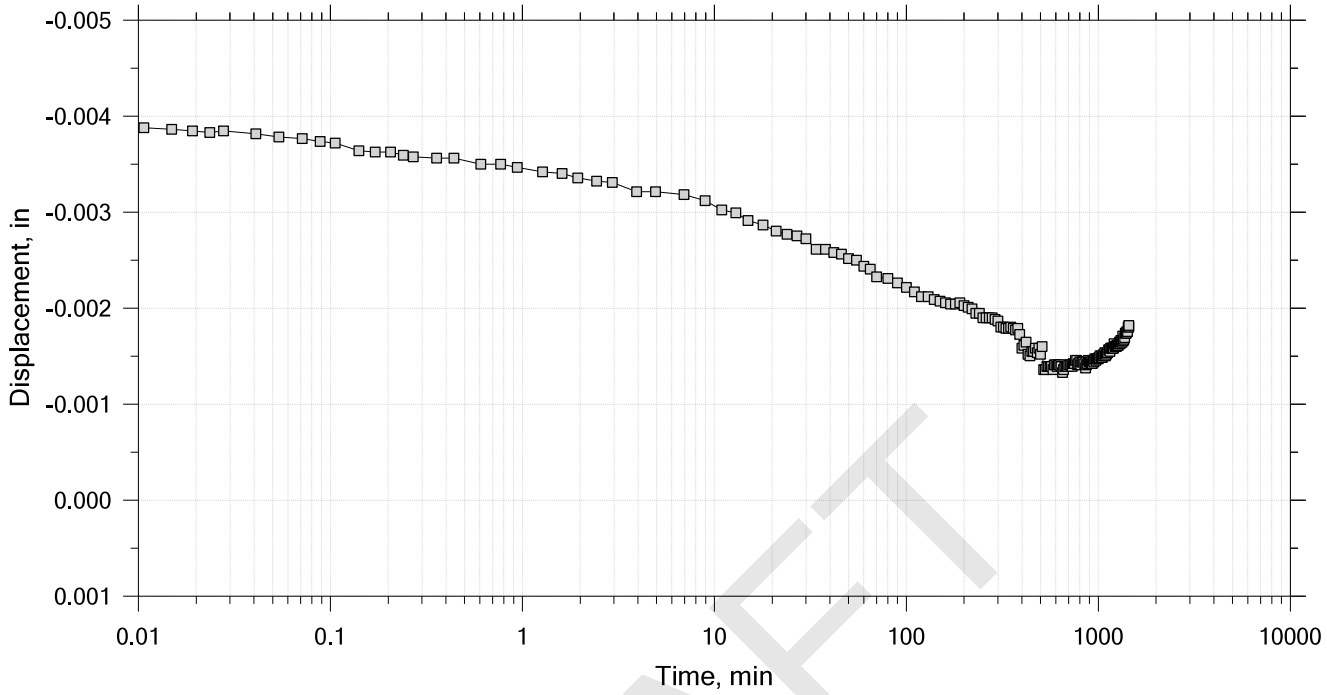


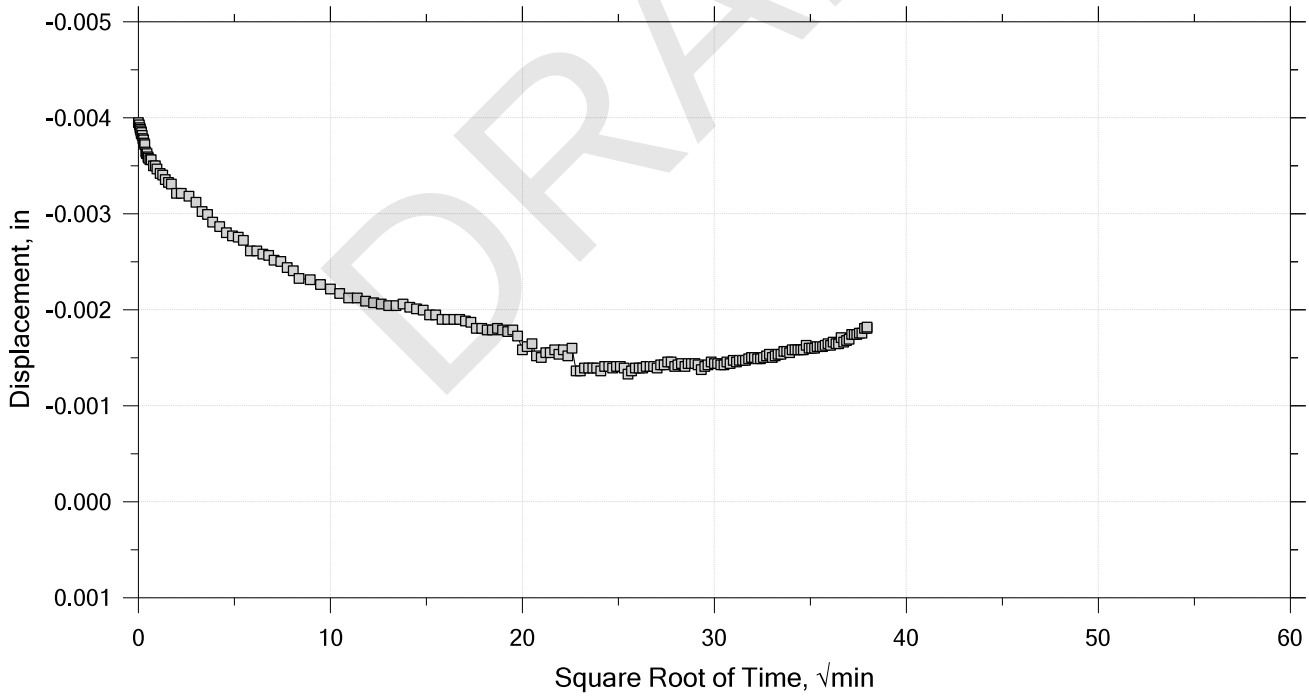
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 3 of 17
Constant Load Step
Stress: 550 psf



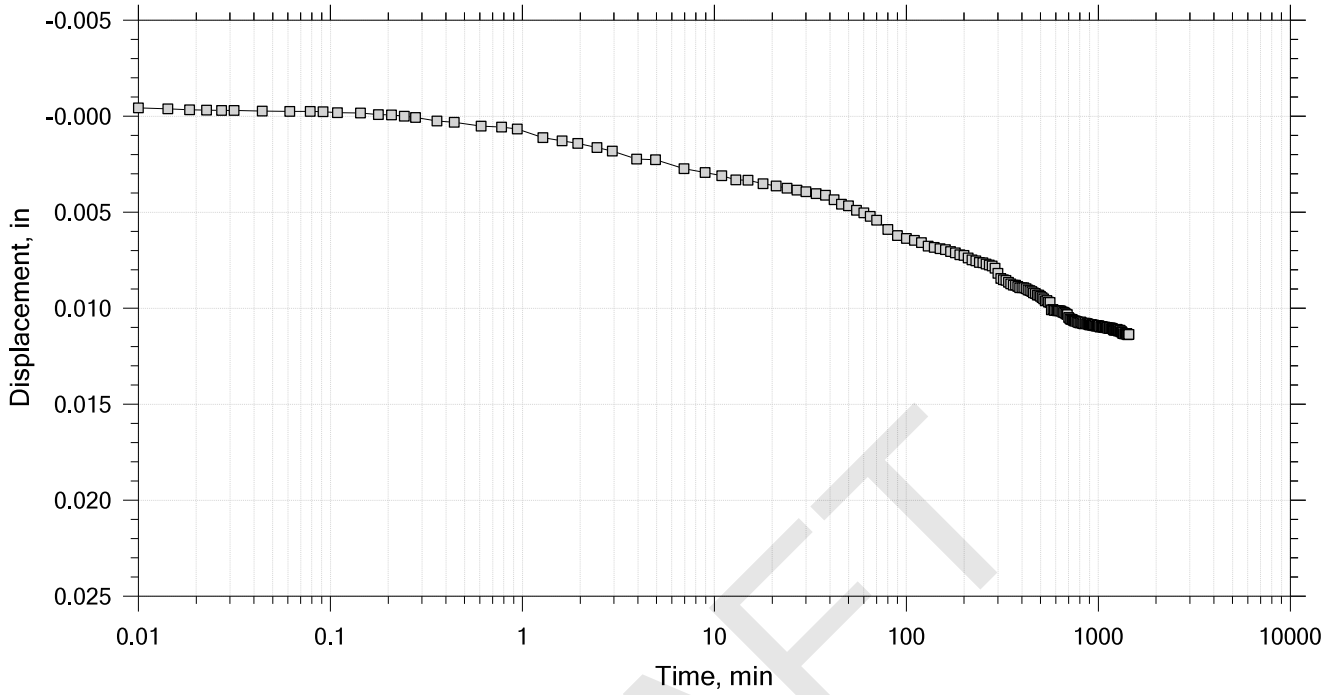


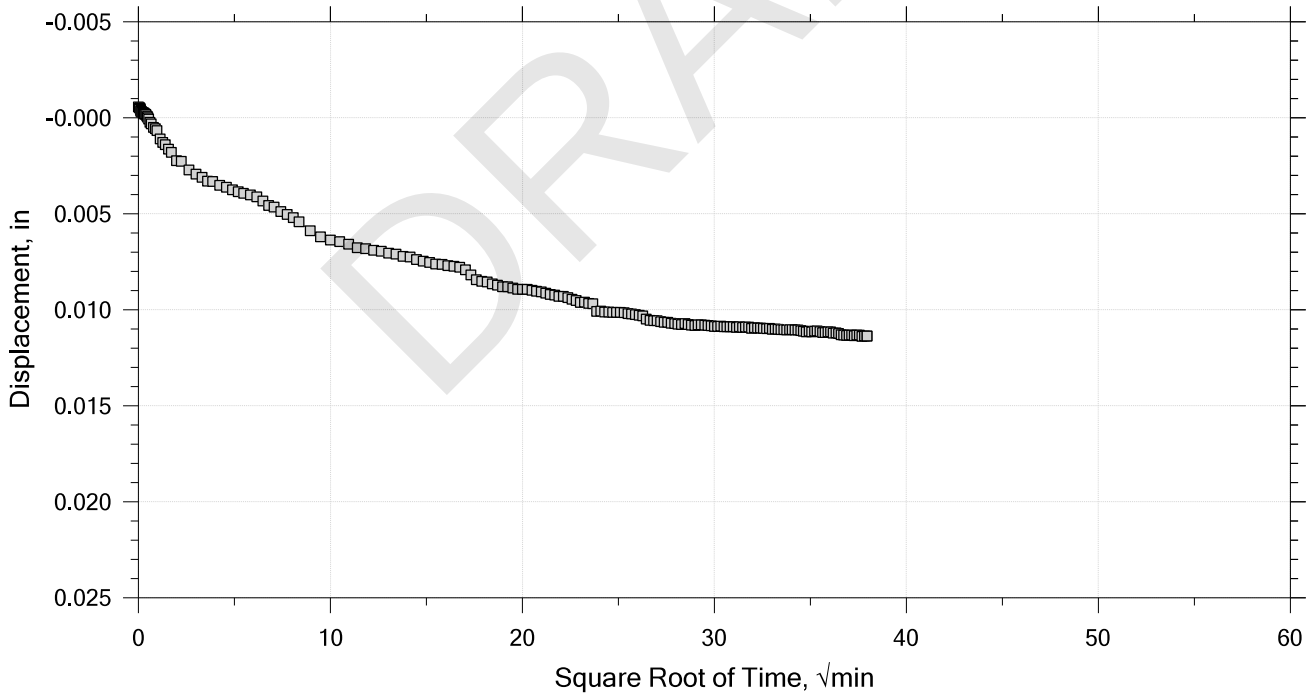
DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: KS
Sample No.: U-1	Test Date: 12/12/2025	Depth:
Test No.: Consol_01	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
Remarks:		

Consolidation Test

Time Curve 4 of 17
Constant Load Step
Stress: 1.1e+03 psf



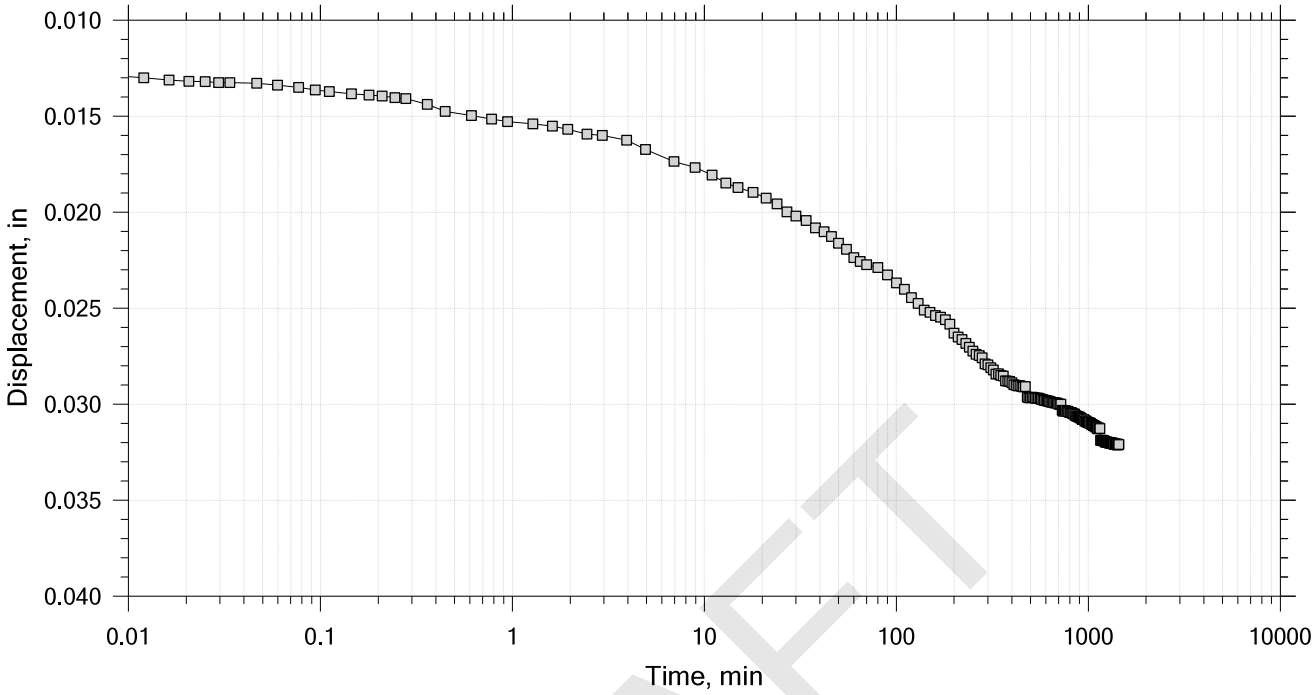


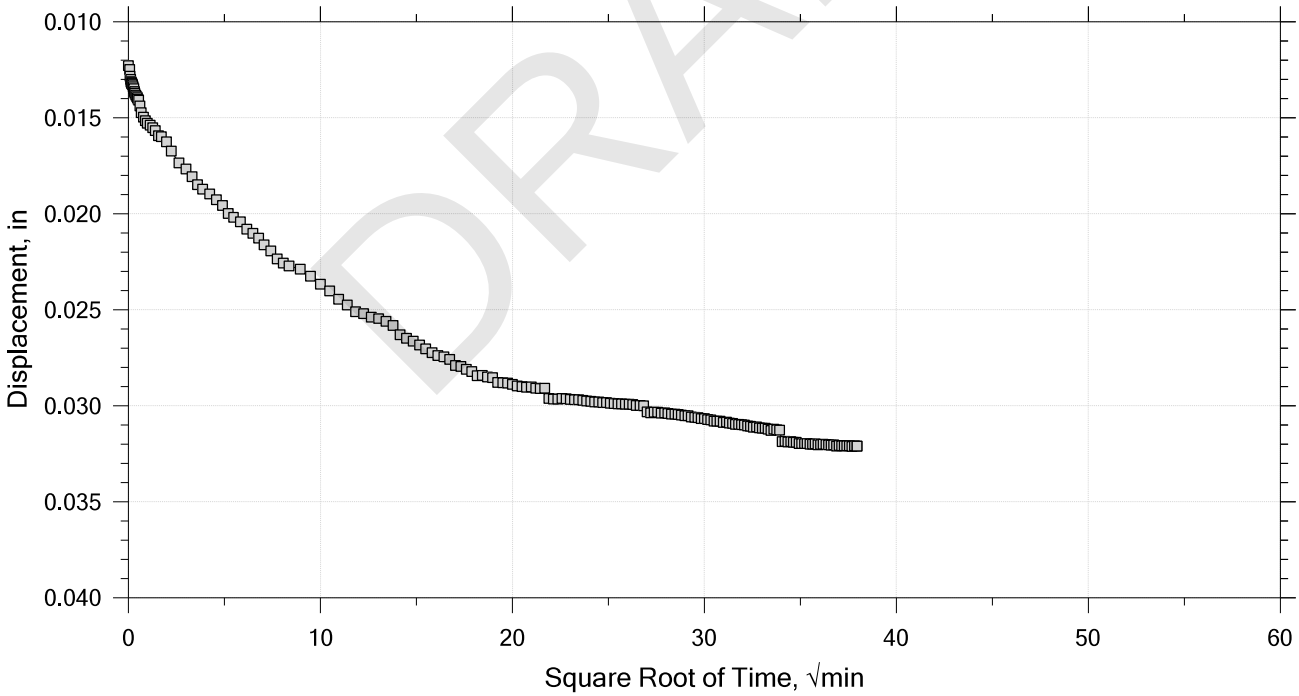
DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: KS
Sample No.: U-1	Test Date: 12/12/2025	Depth:
Test No.: Consol_01	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
Remarks:		

Consolidation Test

Time Curve 5 of 17
Constant Load Step
Stress: 2.2e+03 psf



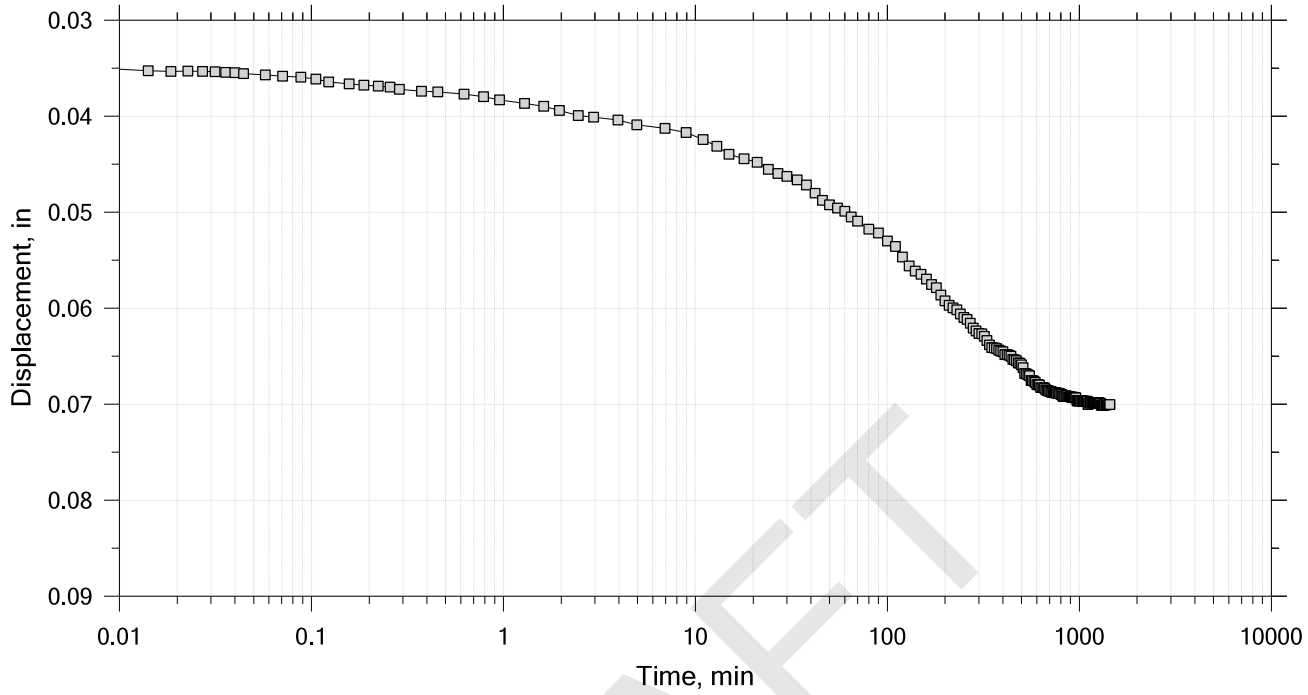


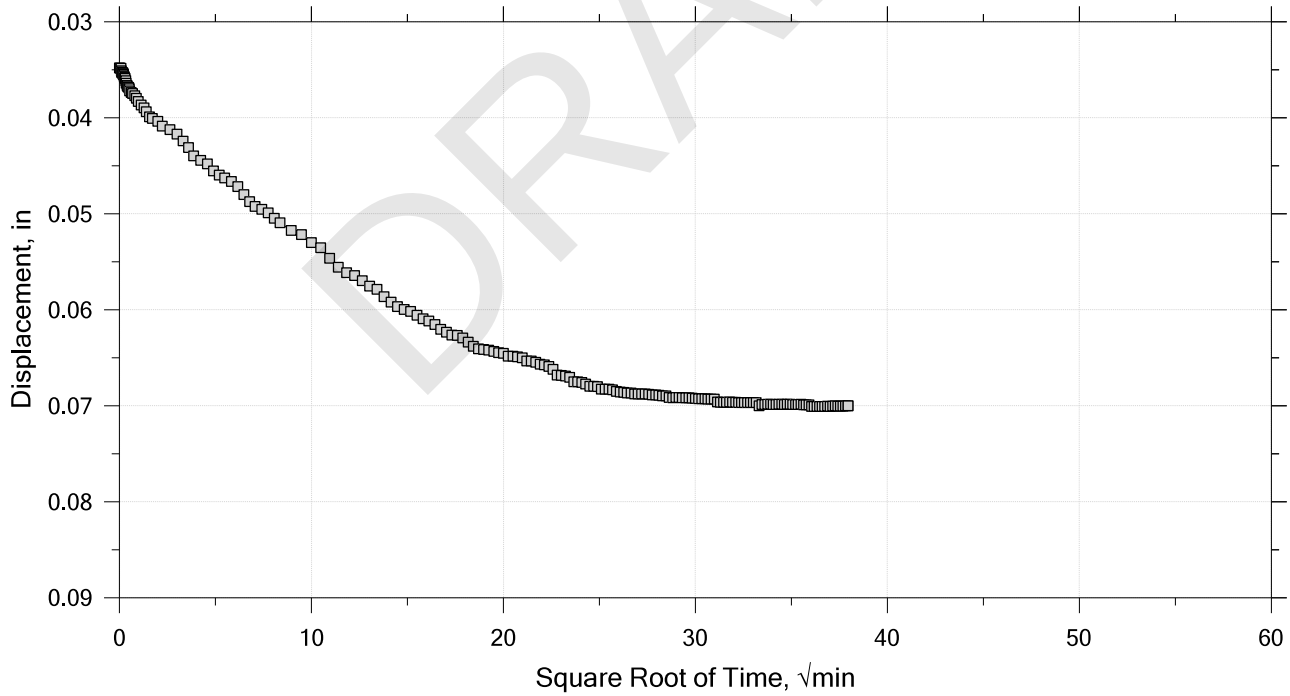
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 6 of 17
Constant Load Step
Stress: 4.4e+03 psf



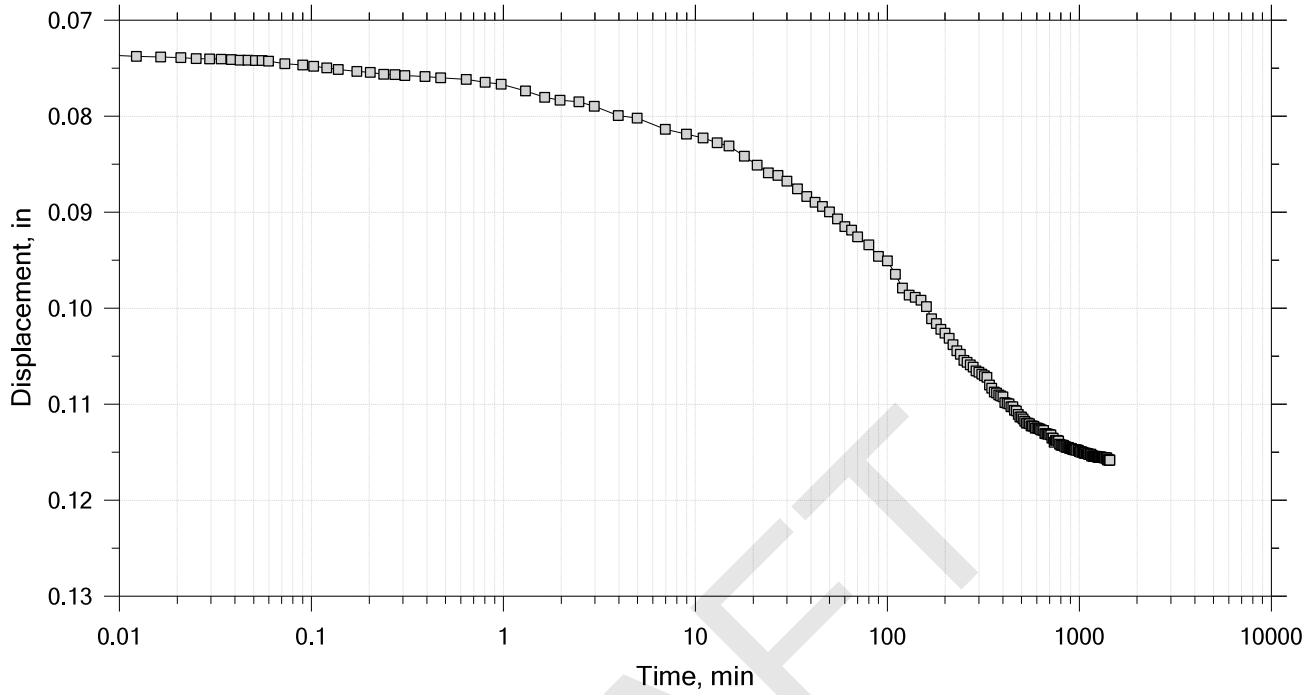


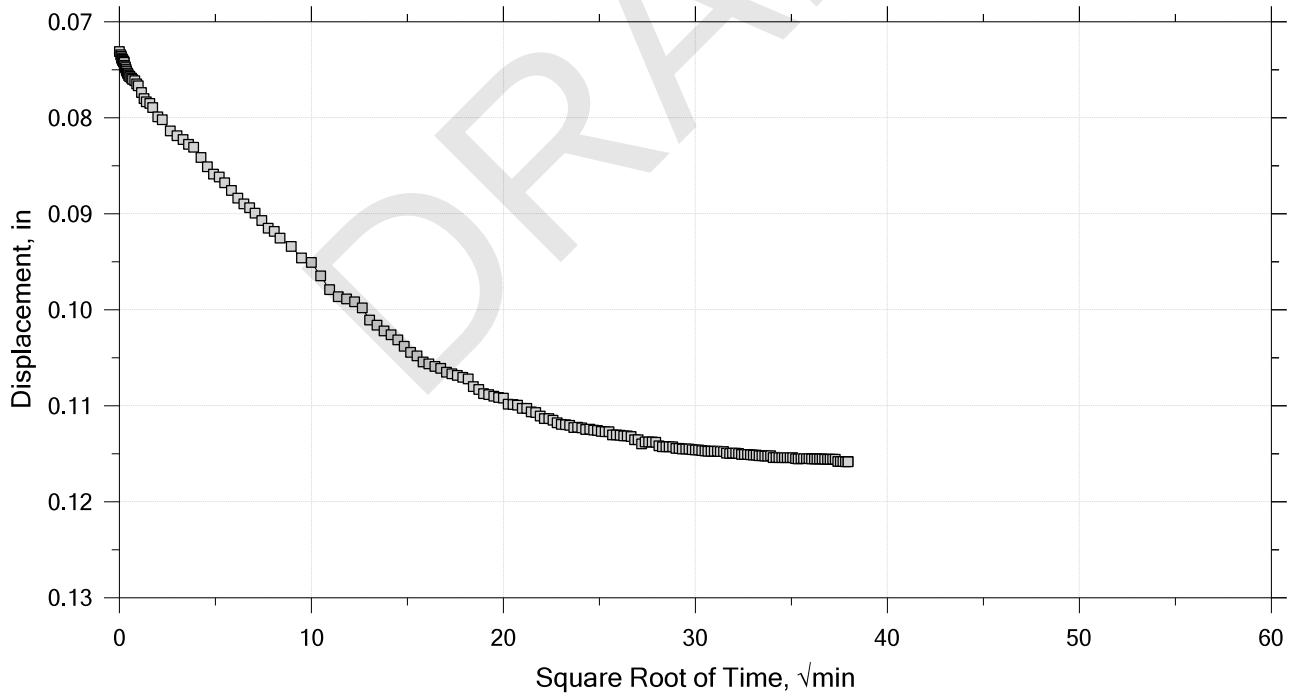
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 7 of 17
Constant Load Step
Stress: 8.8e+03 psf



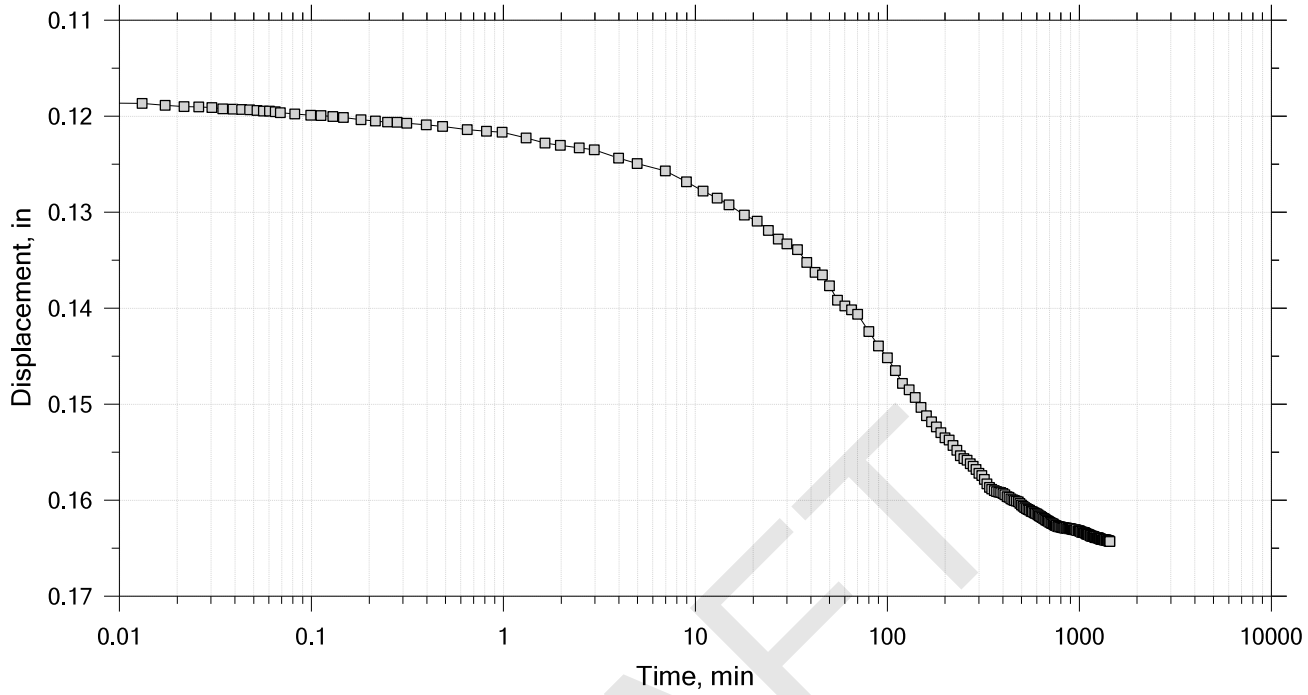


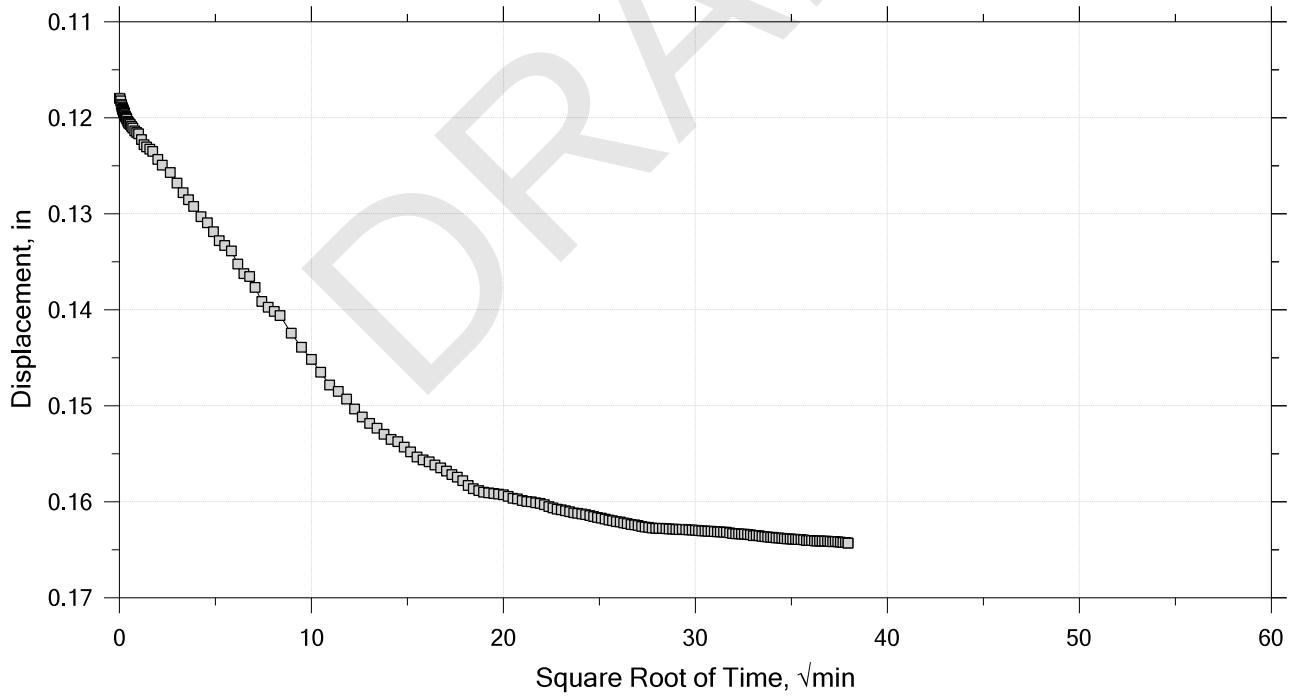
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 8 of 17
Constant Load Step
Stress: 1.76e+04 psf



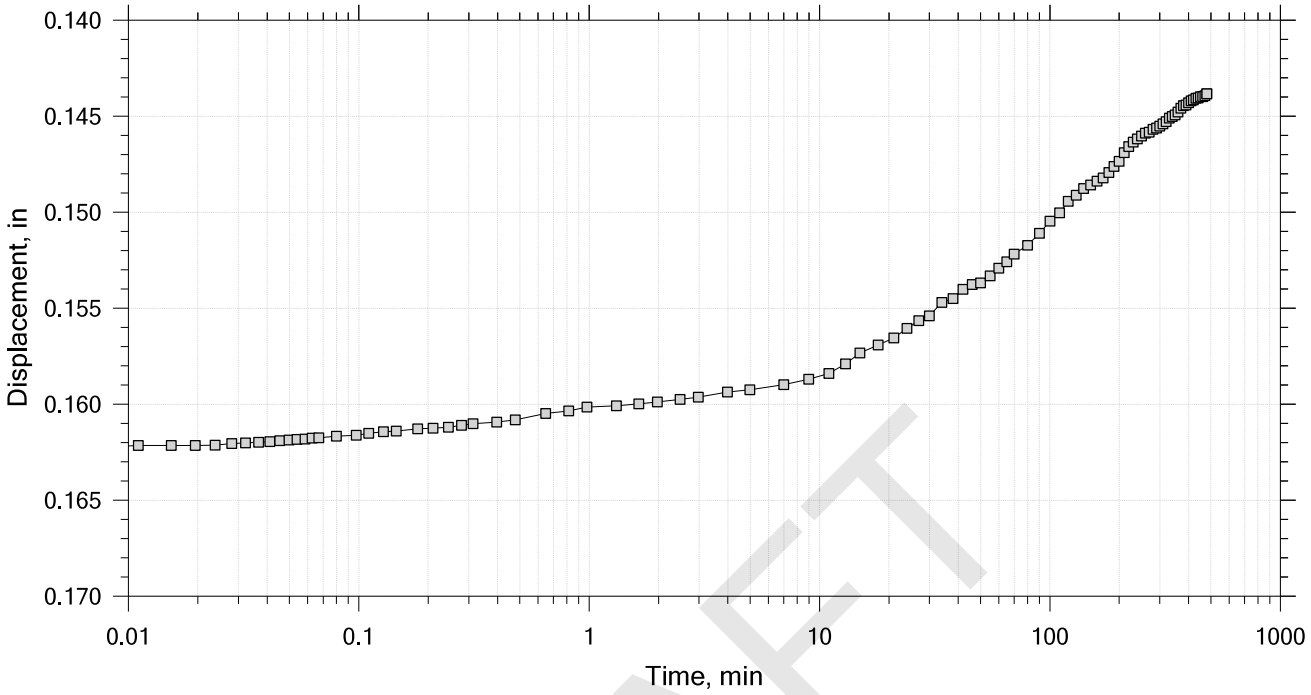


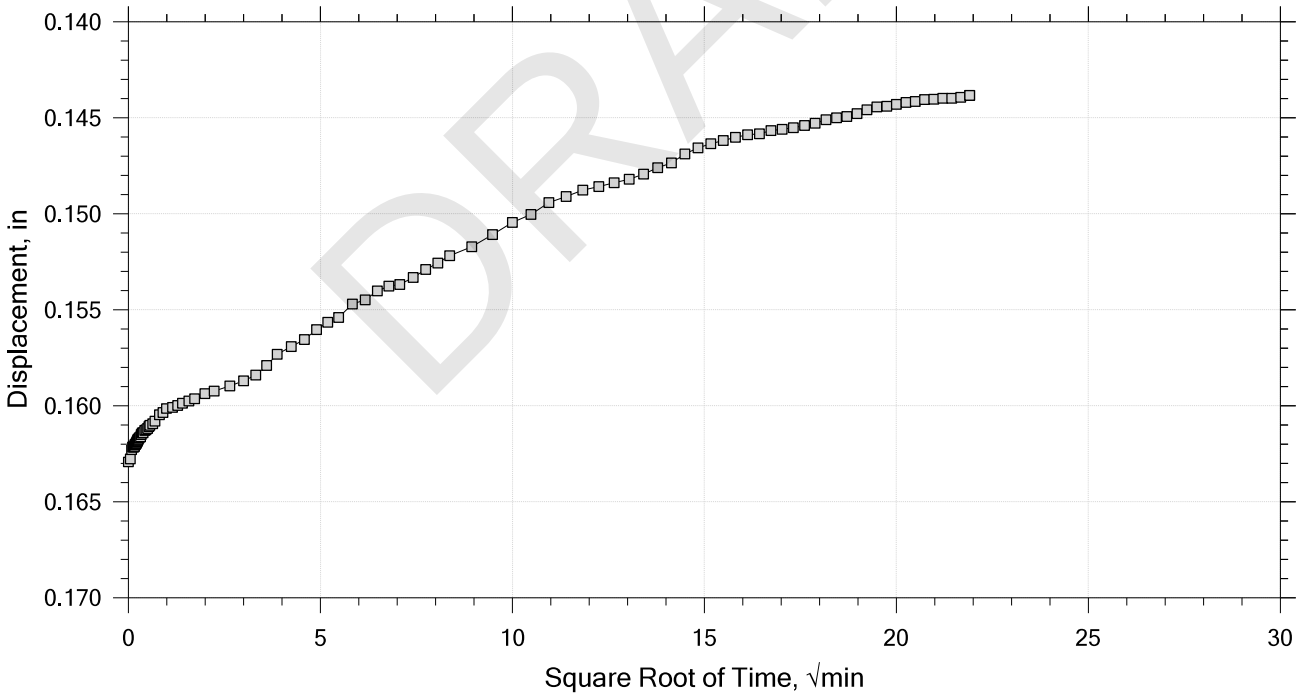
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 9 of 17
Constant Load Step
Stress: 4.4e+03 psf



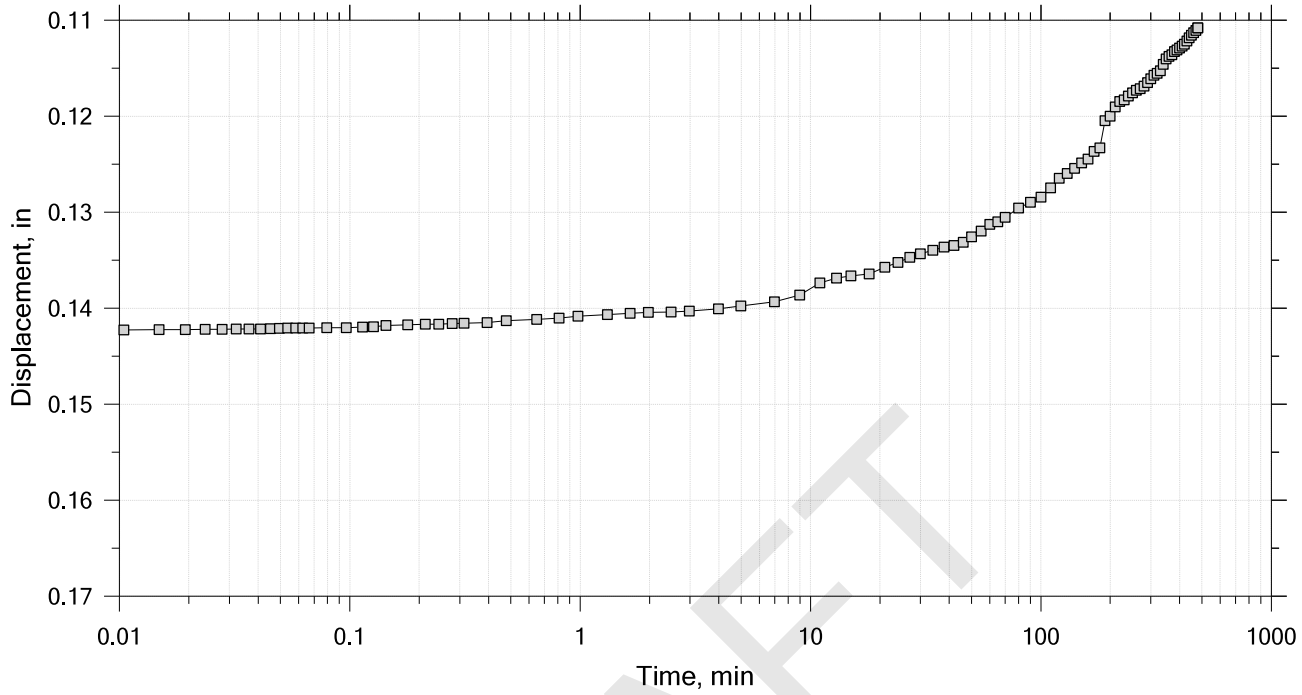


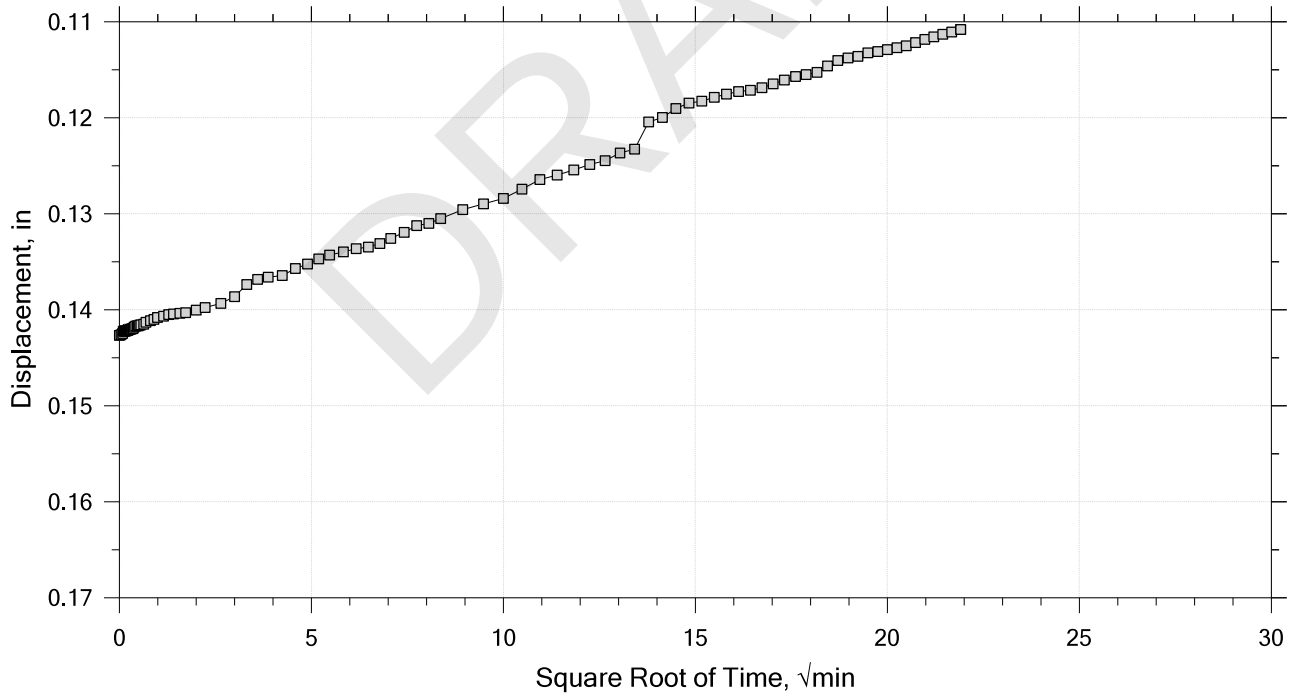
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 10 of 17
Constant Load Step
Stress: 1.1e+03 psf



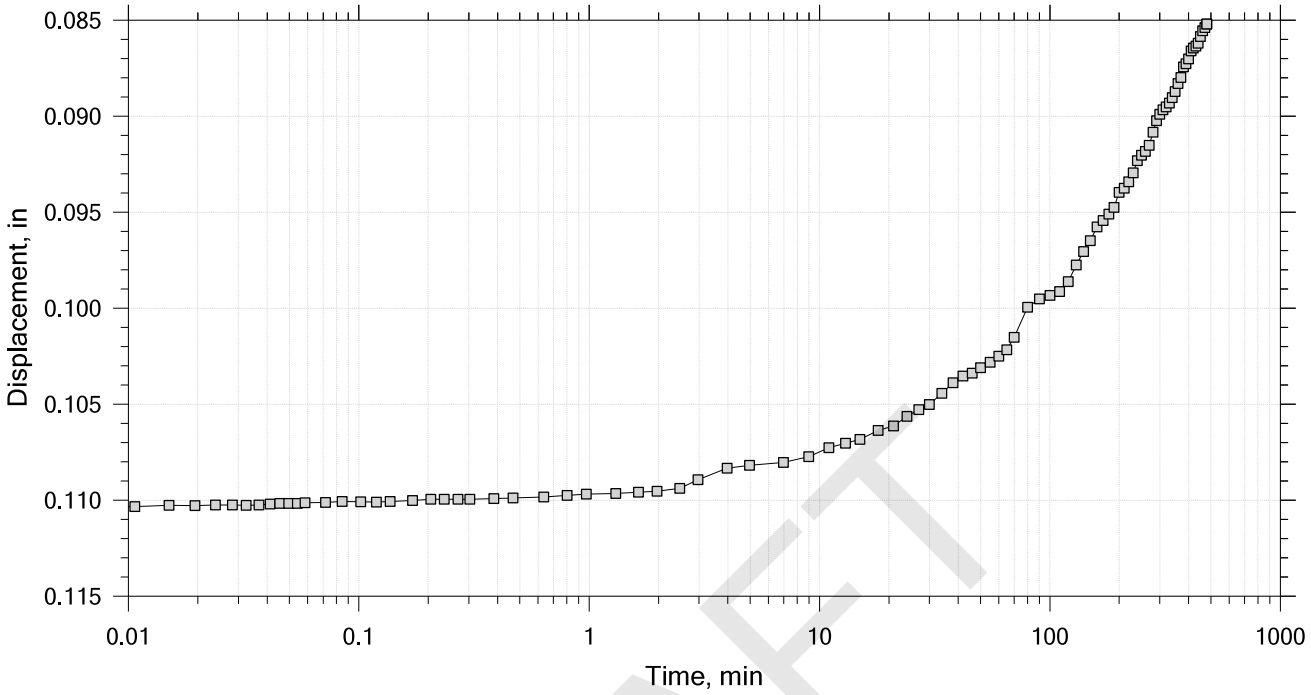


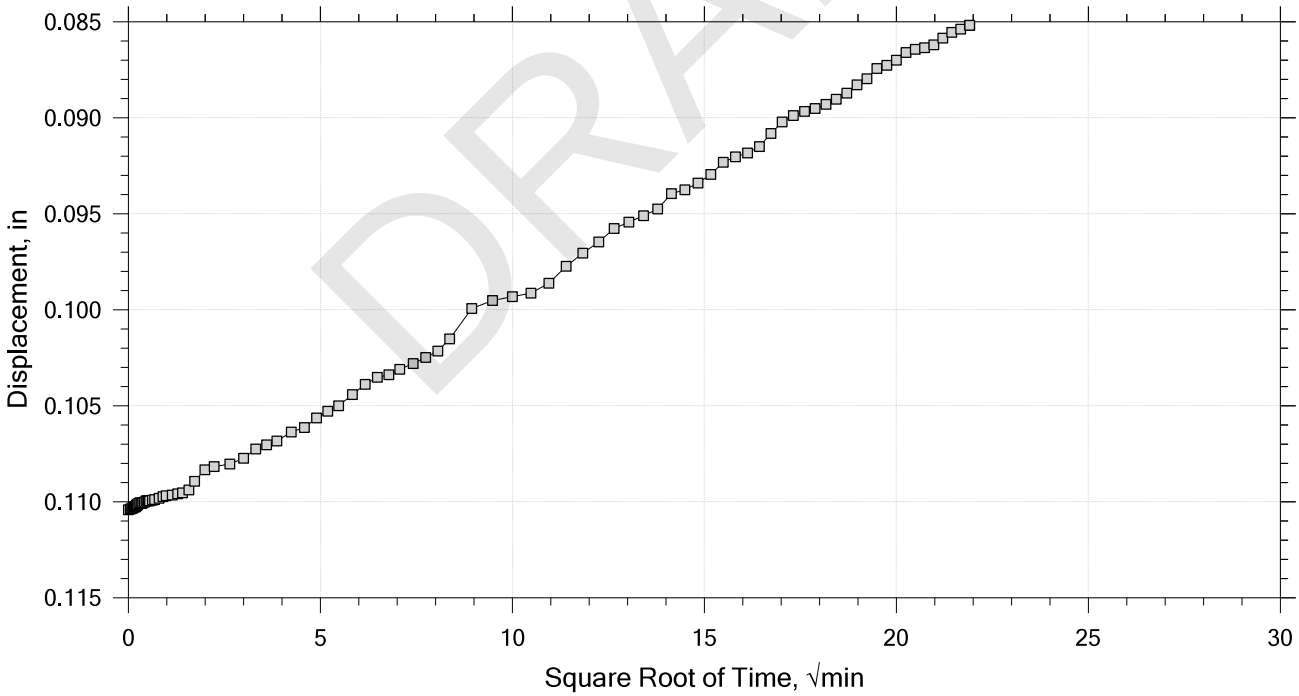
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 11 of 17
Constant Load Step
Stress: 300 psf



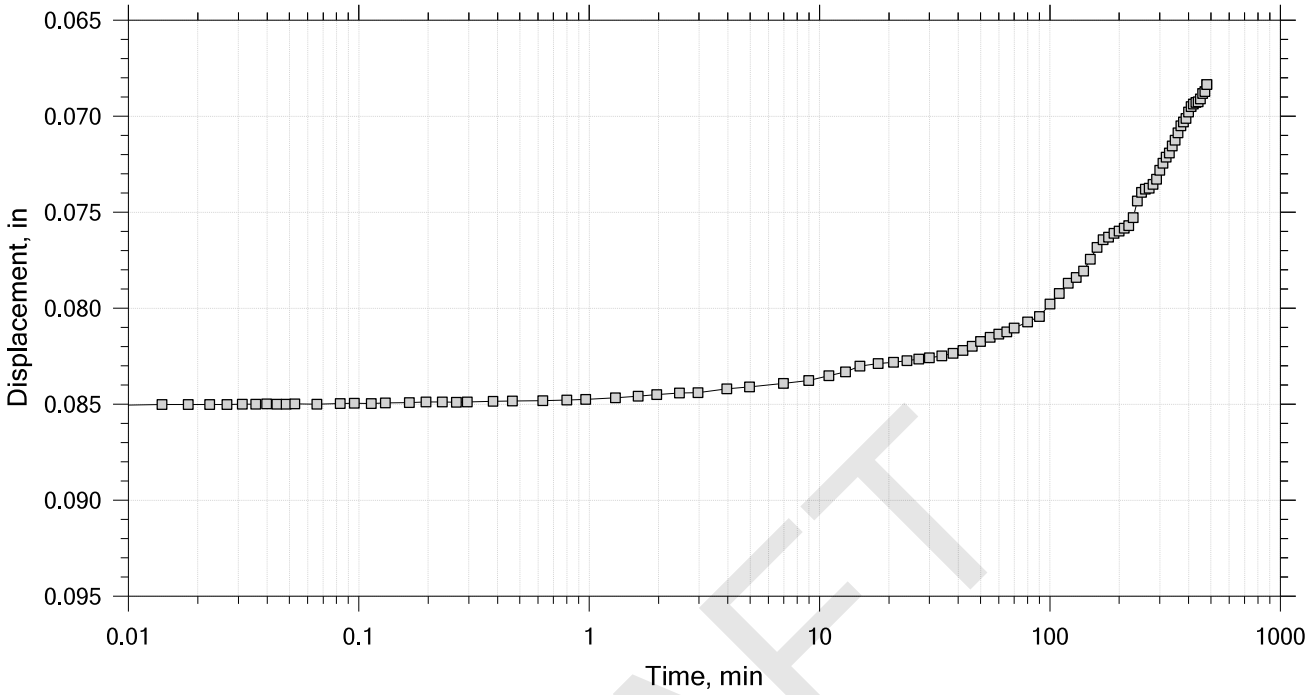


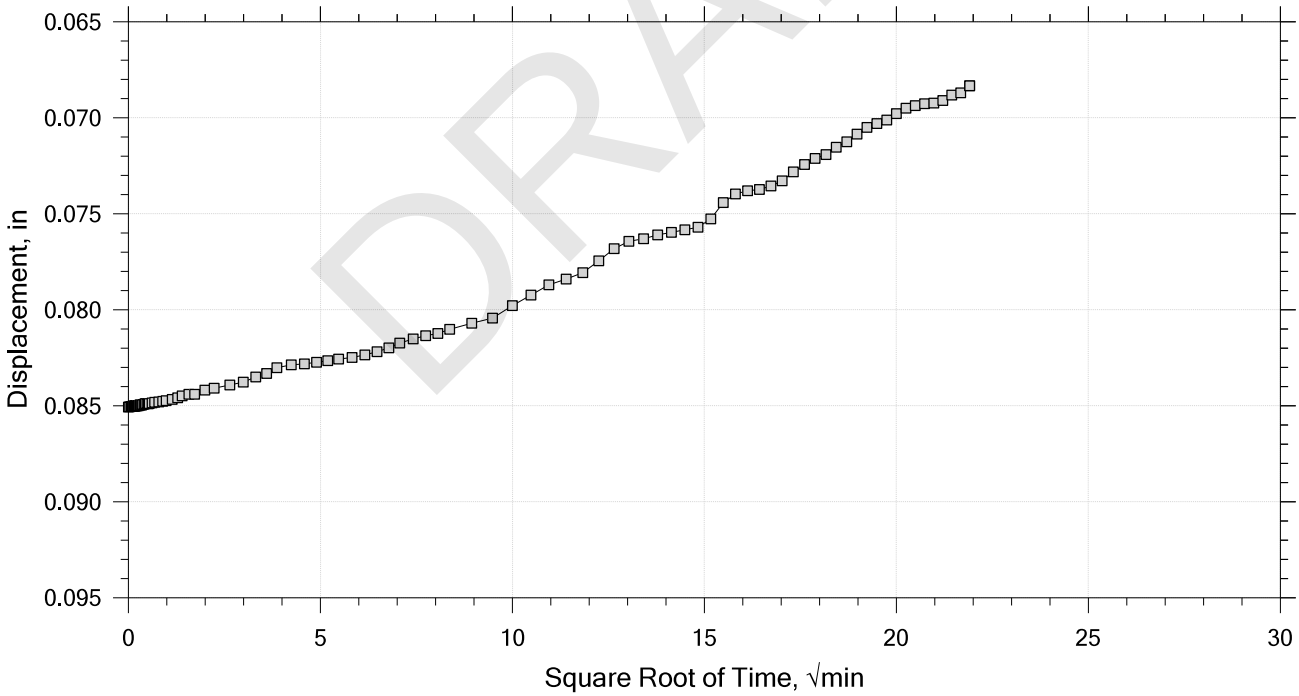
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 12 of 17
Constant Load Step
Stress: 150 psf



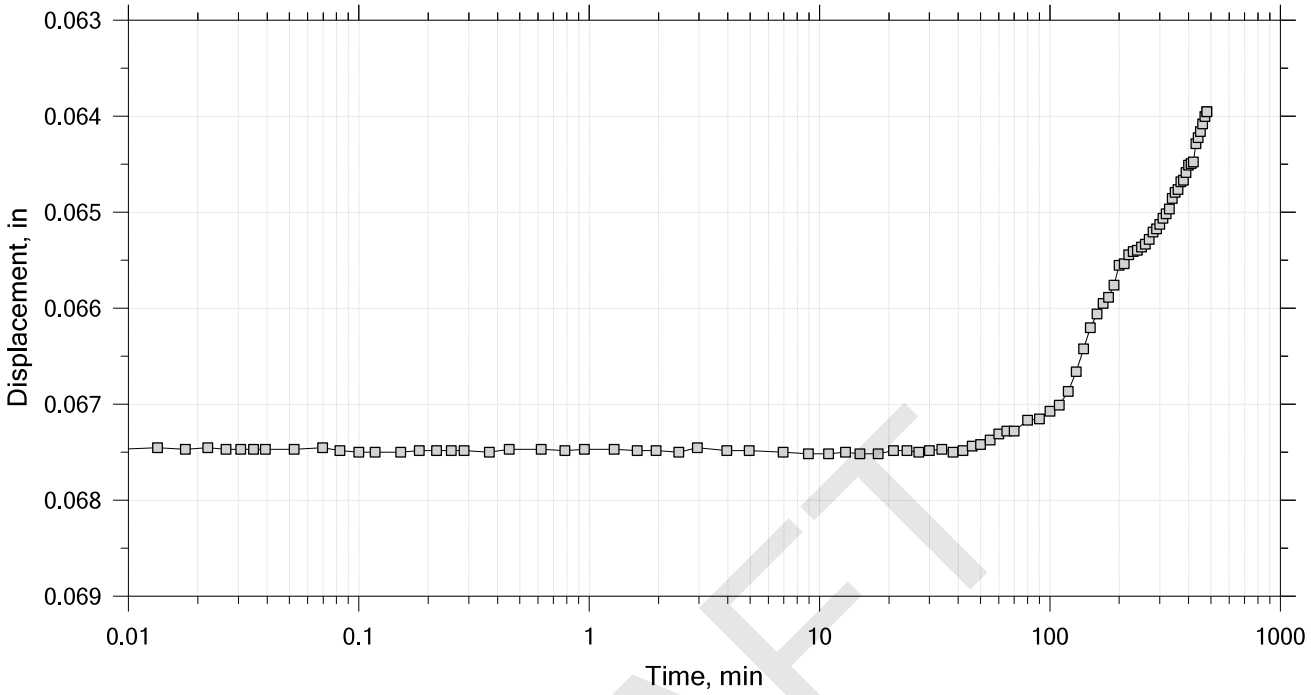


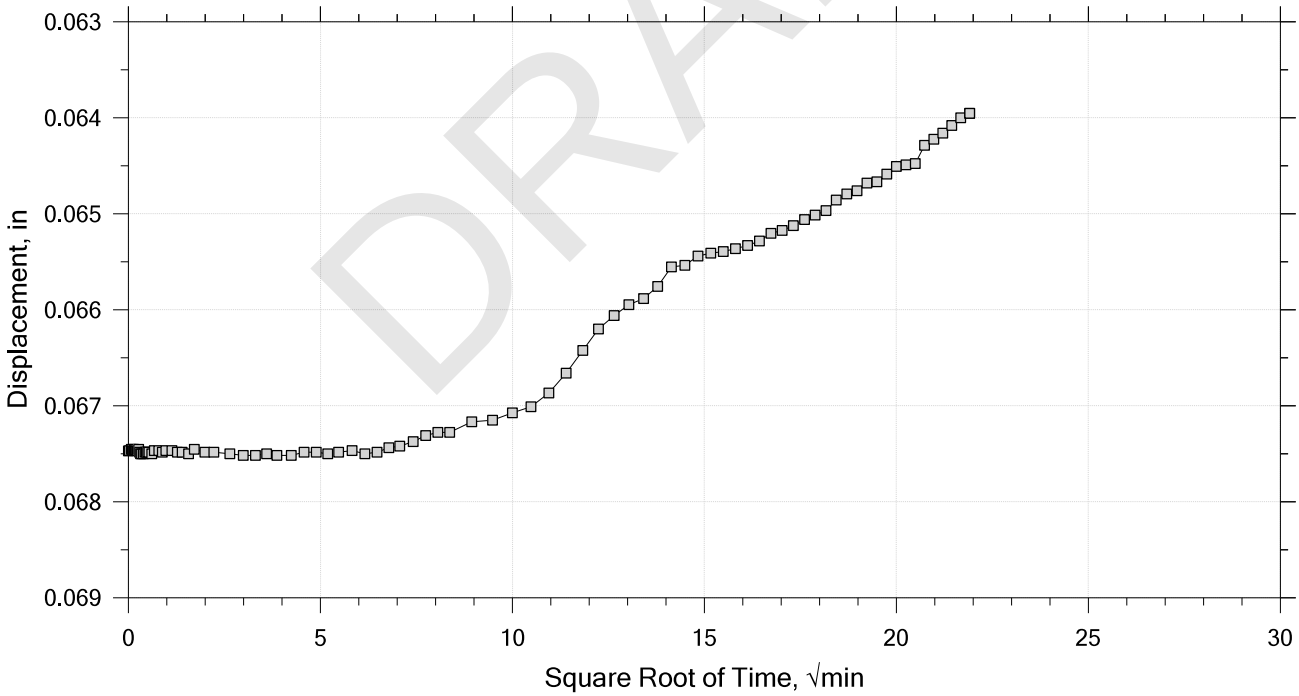
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 13 of 17
Constant Load Step
Stress: 300 psf



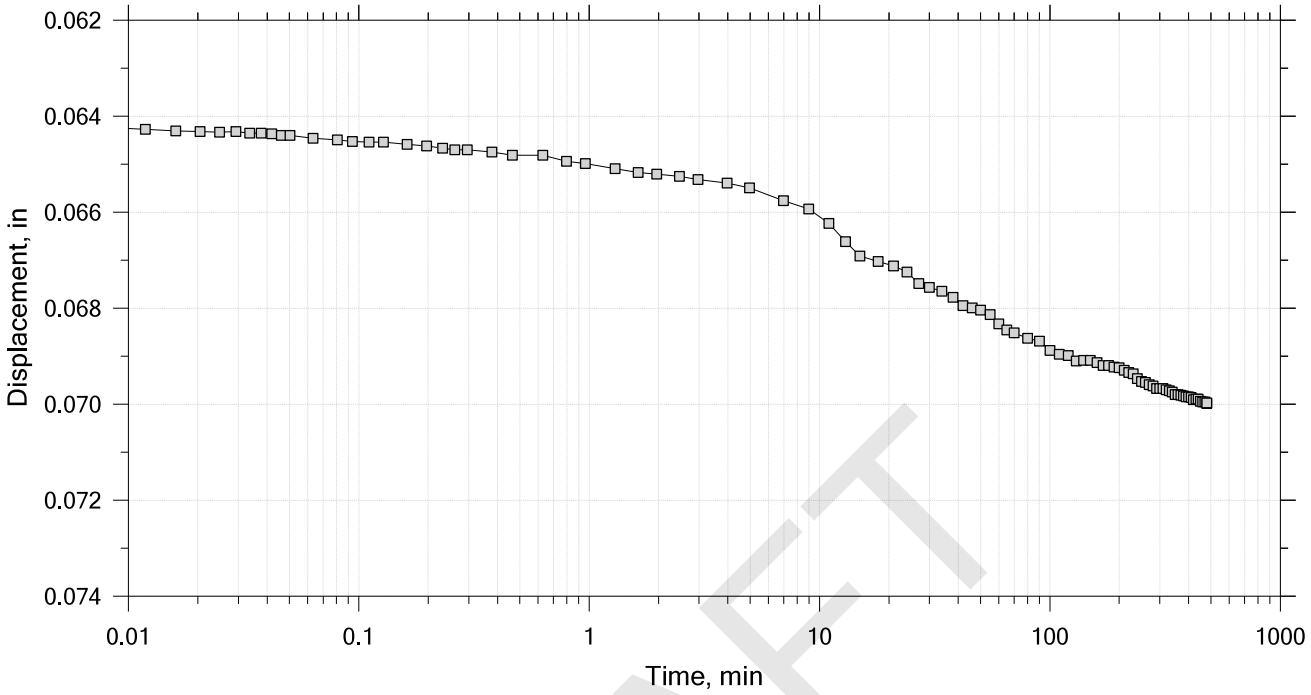


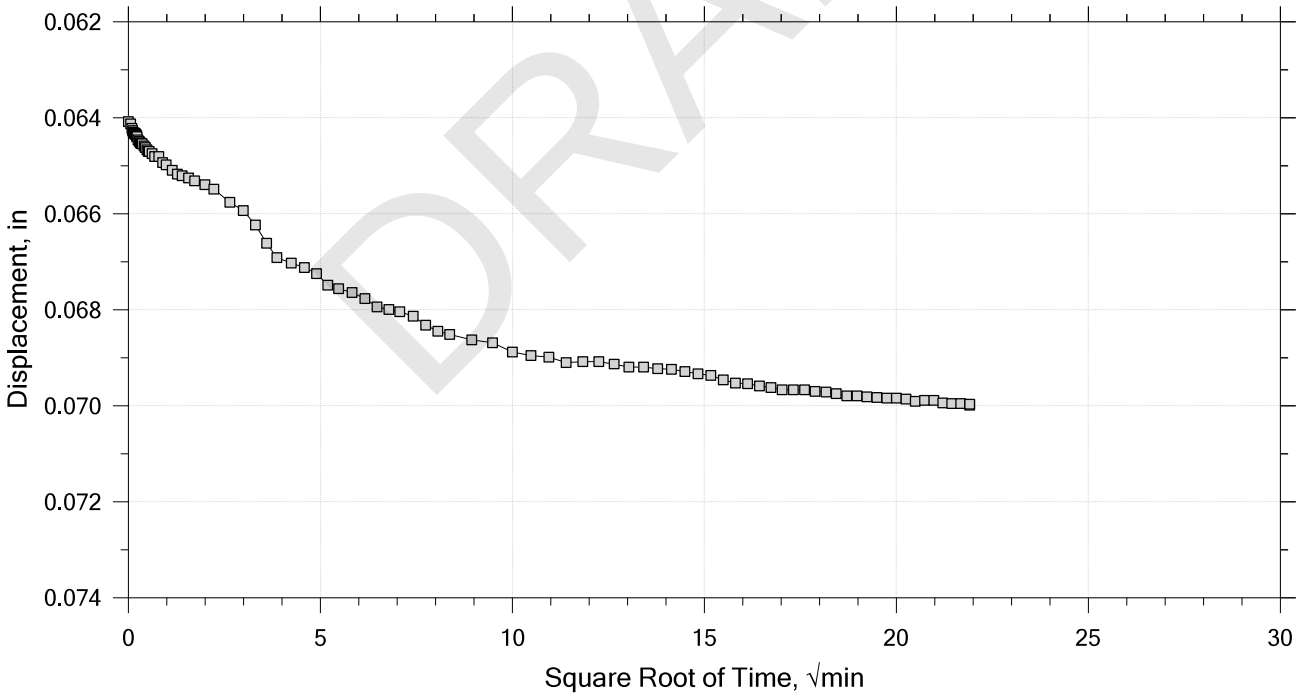
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 14 of 17
Constant Load Step
Stress: 1.1e+03 psf



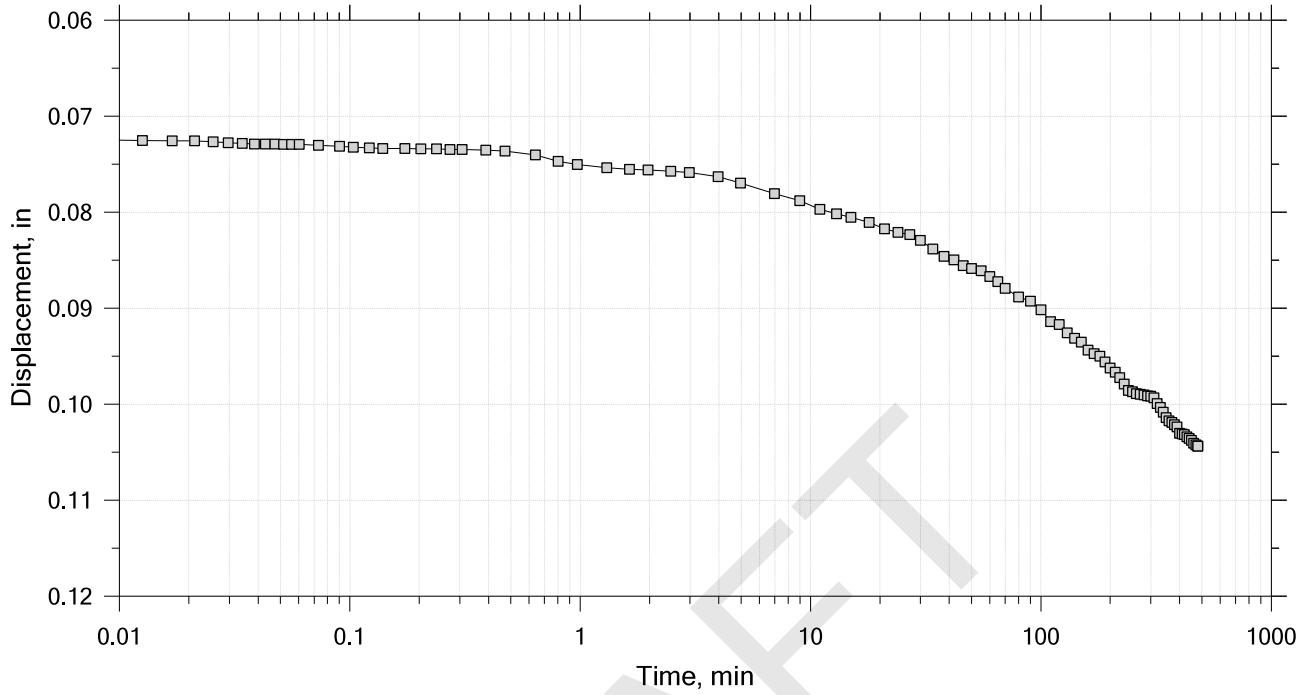


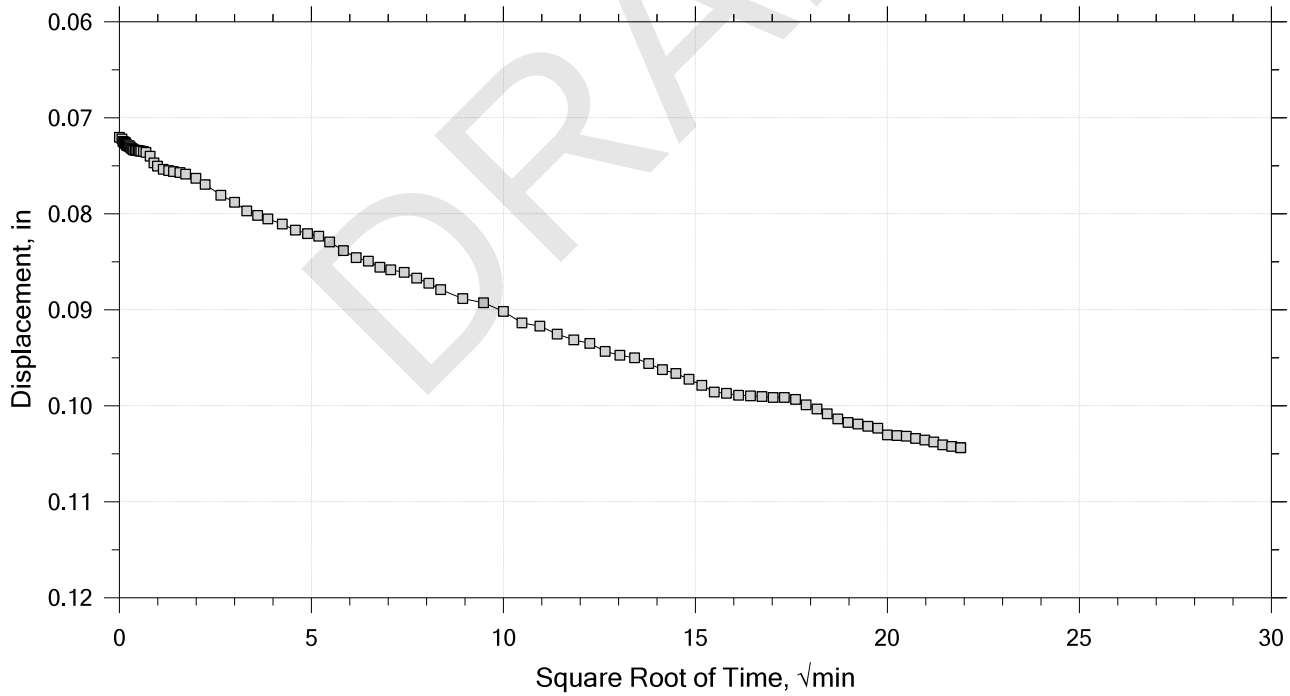
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 15 of 17
Constant Load Step
Stress: 4.4e+03 psf



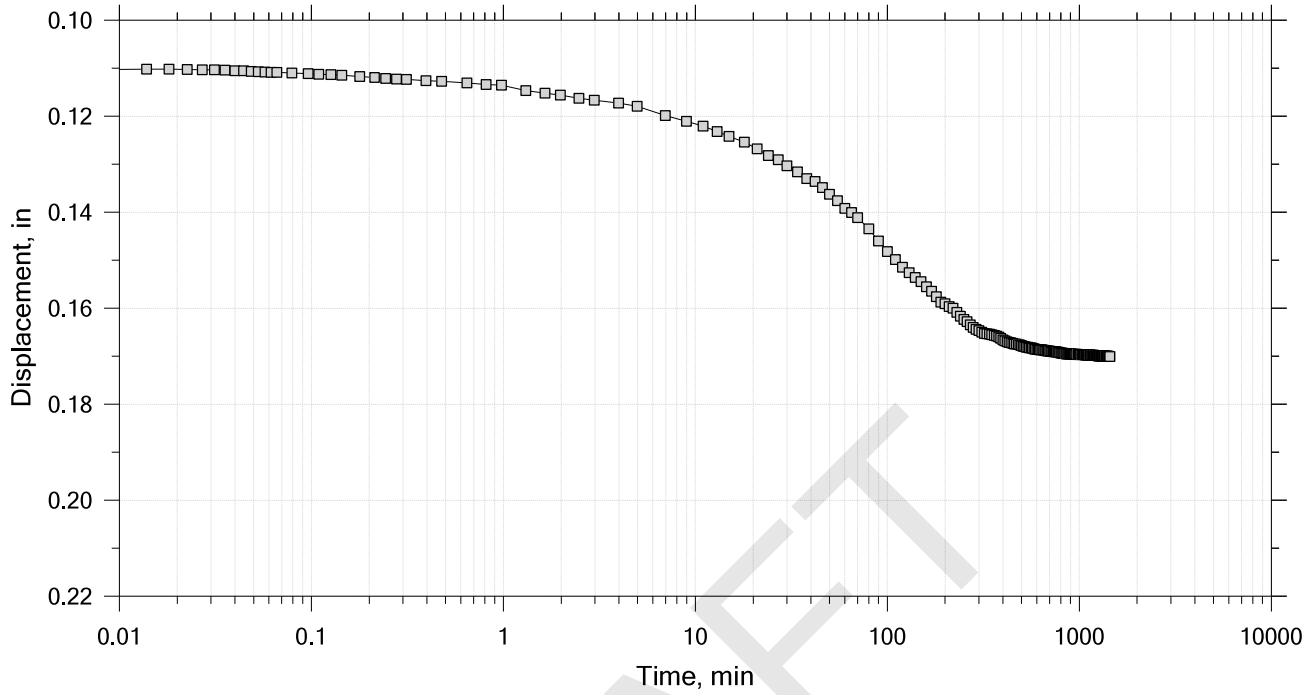


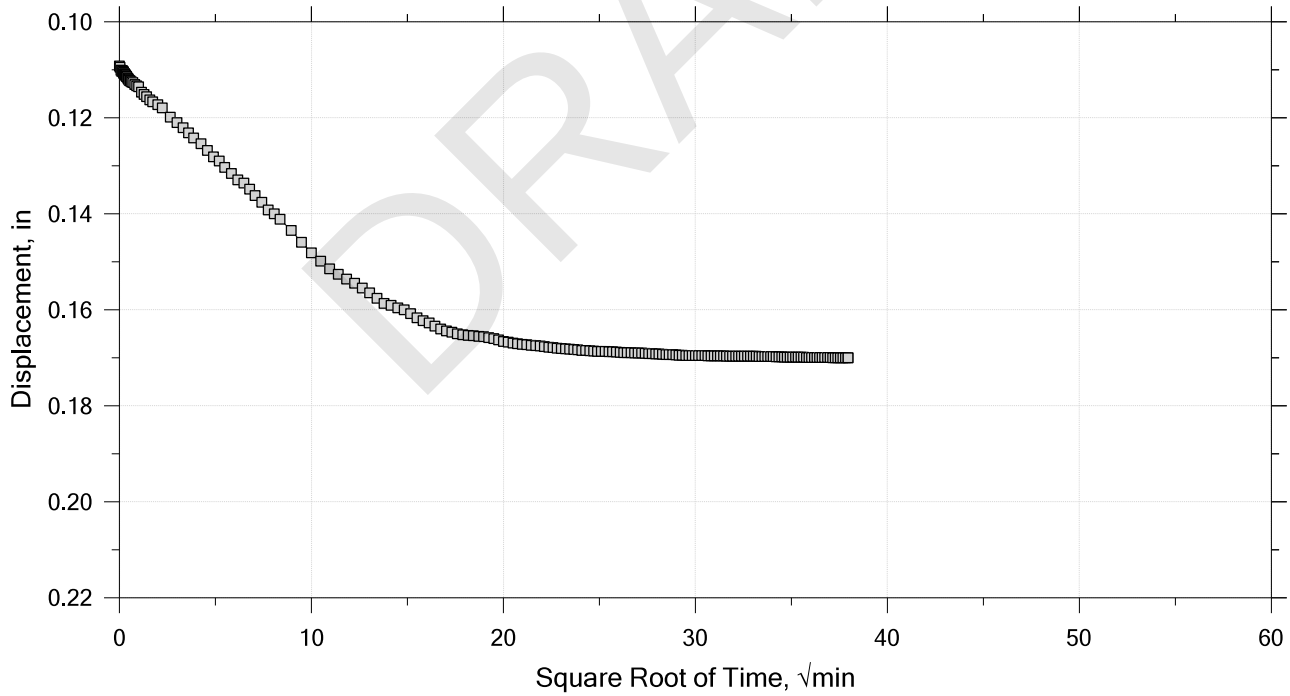
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 16 of 17
Constant Load Step
Stress: 1.76e+04 psf



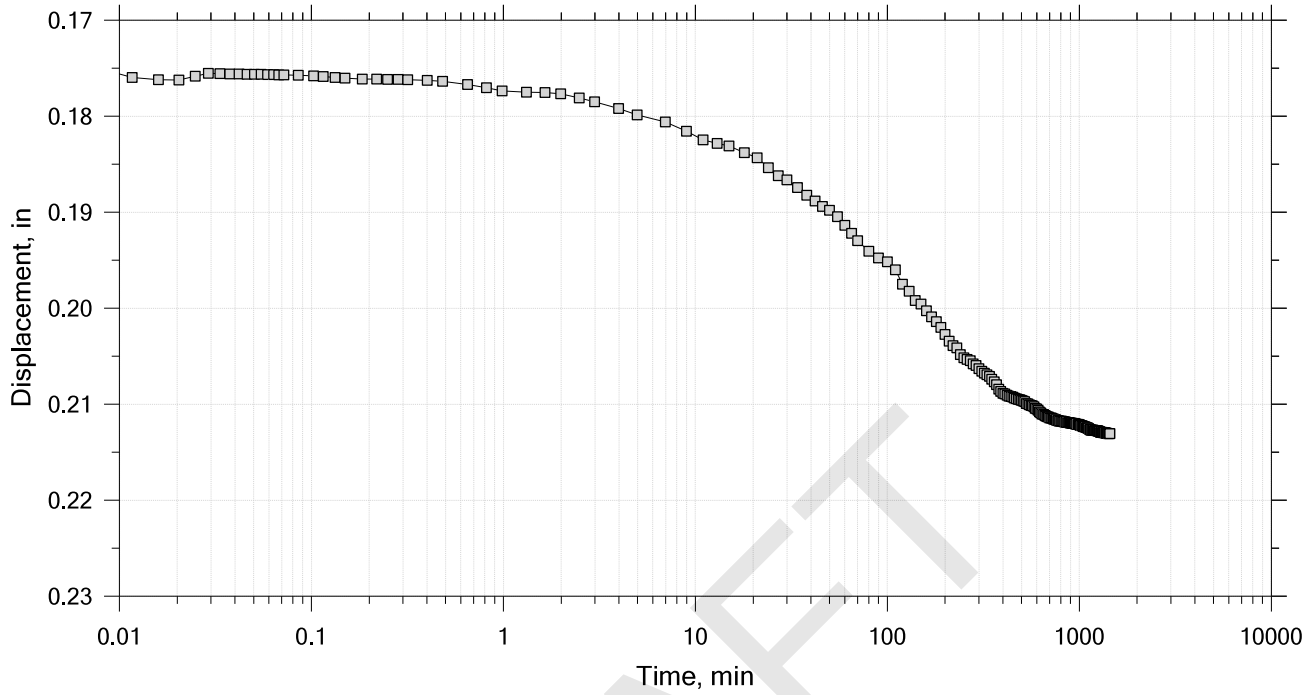


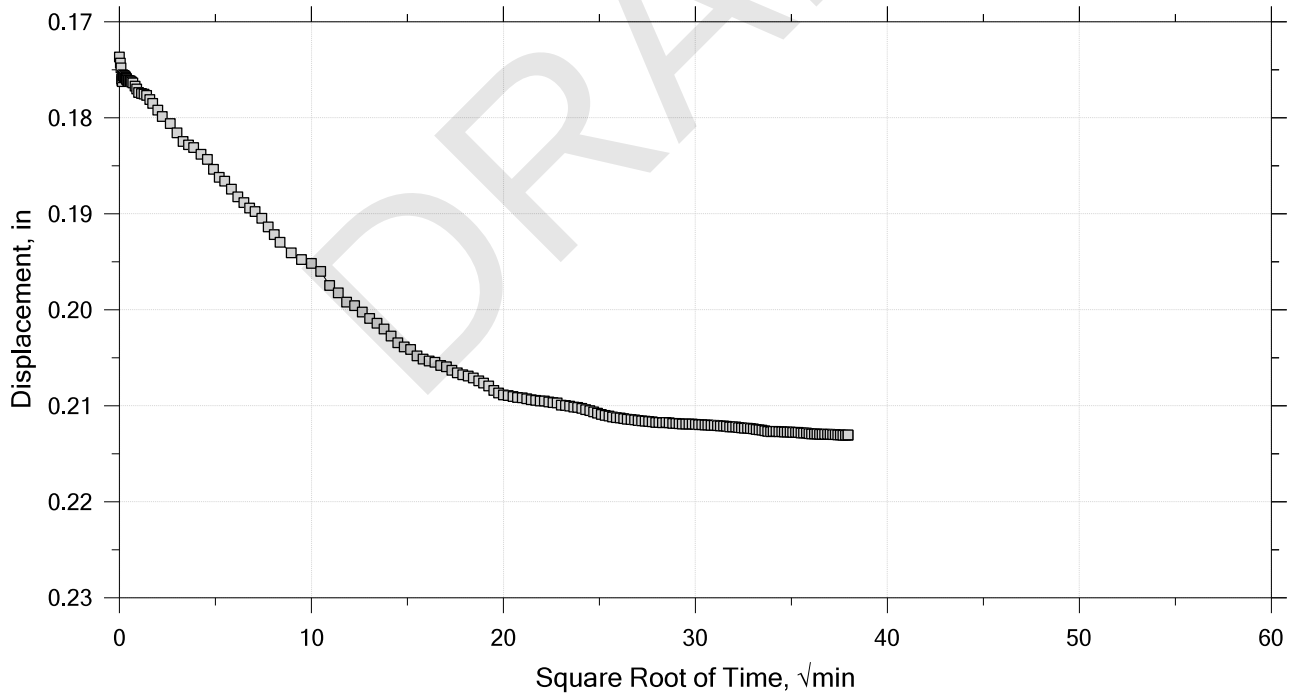
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: KS
	Sample No.: U-1	Test Date: 12/12/2025	Depth:
	Test No.: Consol_01	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
	Remarks:		

Consolidation Test

Time Curve 17 of 17
Constant Load Step
Stress: 3.2e+04 psf





DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: KS
Sample No.: U-1	Test Date: 12/12/2025	Depth:
Test No.: Consol_01	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp.		
Remarks:		

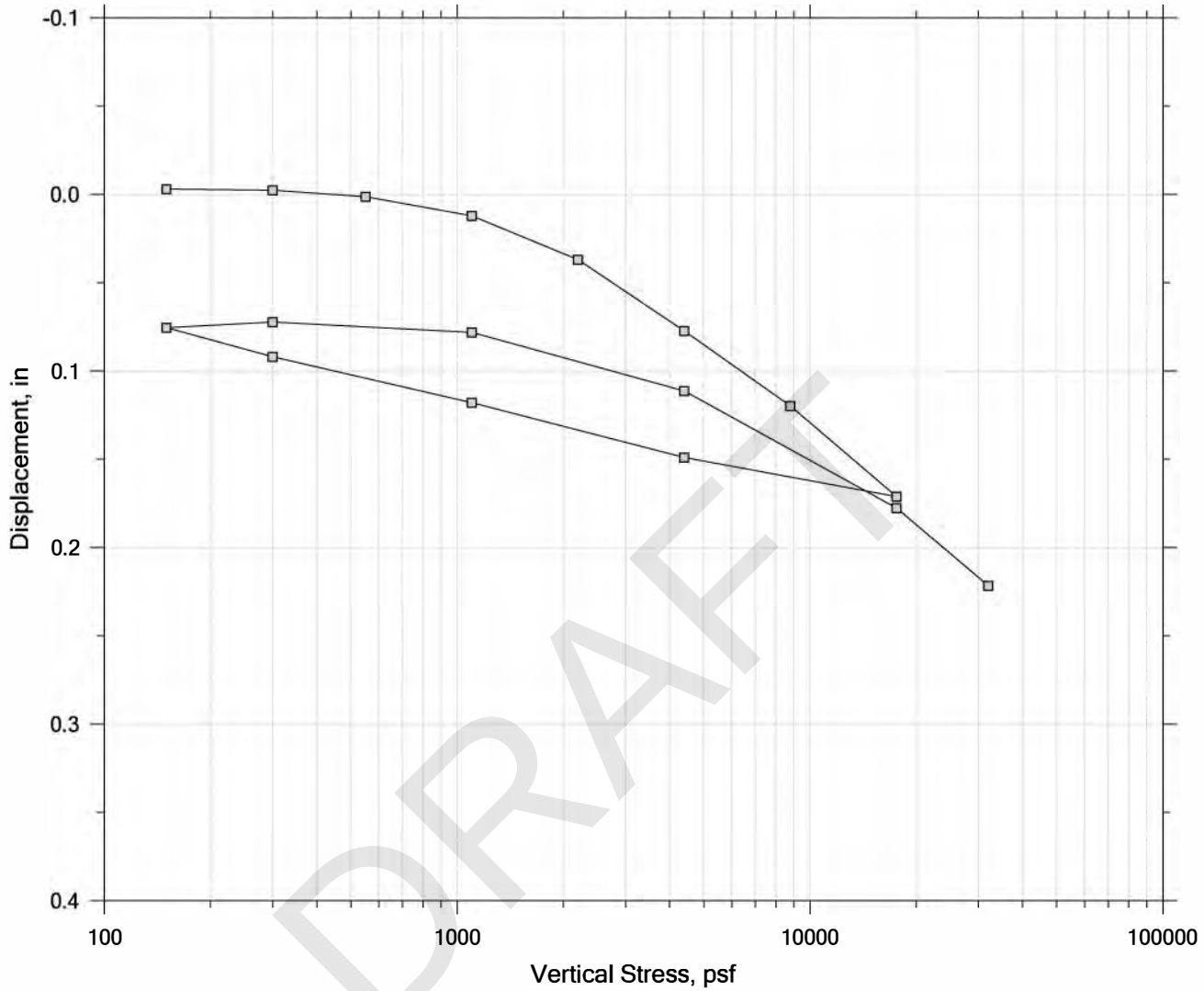
Consol_02

B-4 U1

DRAFT

Consolidation Test

Summary Report

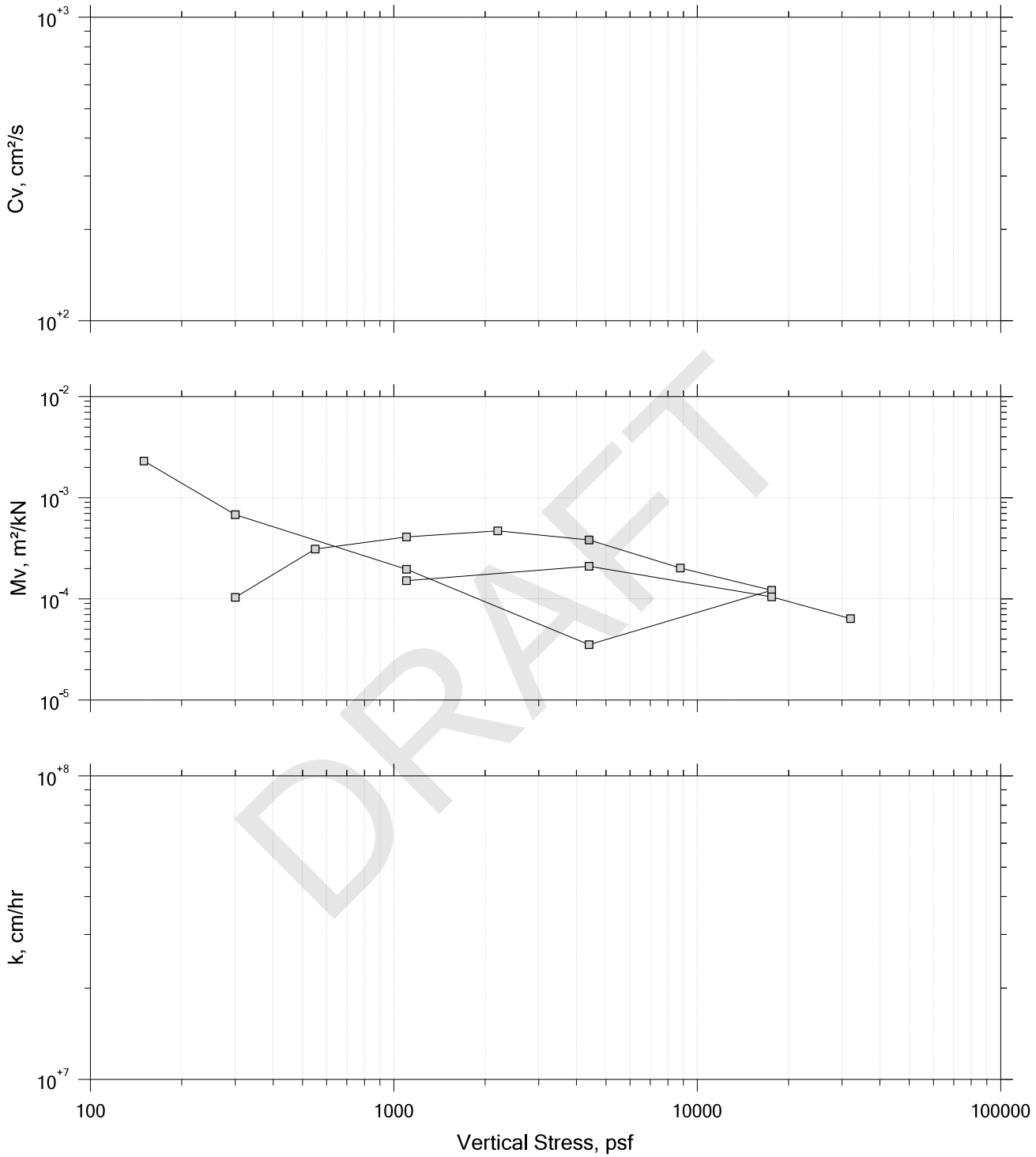


DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: DM
	Sample No.: U-1	Test Date: 01/12/2026	Depth:
	Test No.: Consol_02	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
	Remarks:		
	Displacement at End of Increment		

Consolidation Test

Log of Time Coefficients

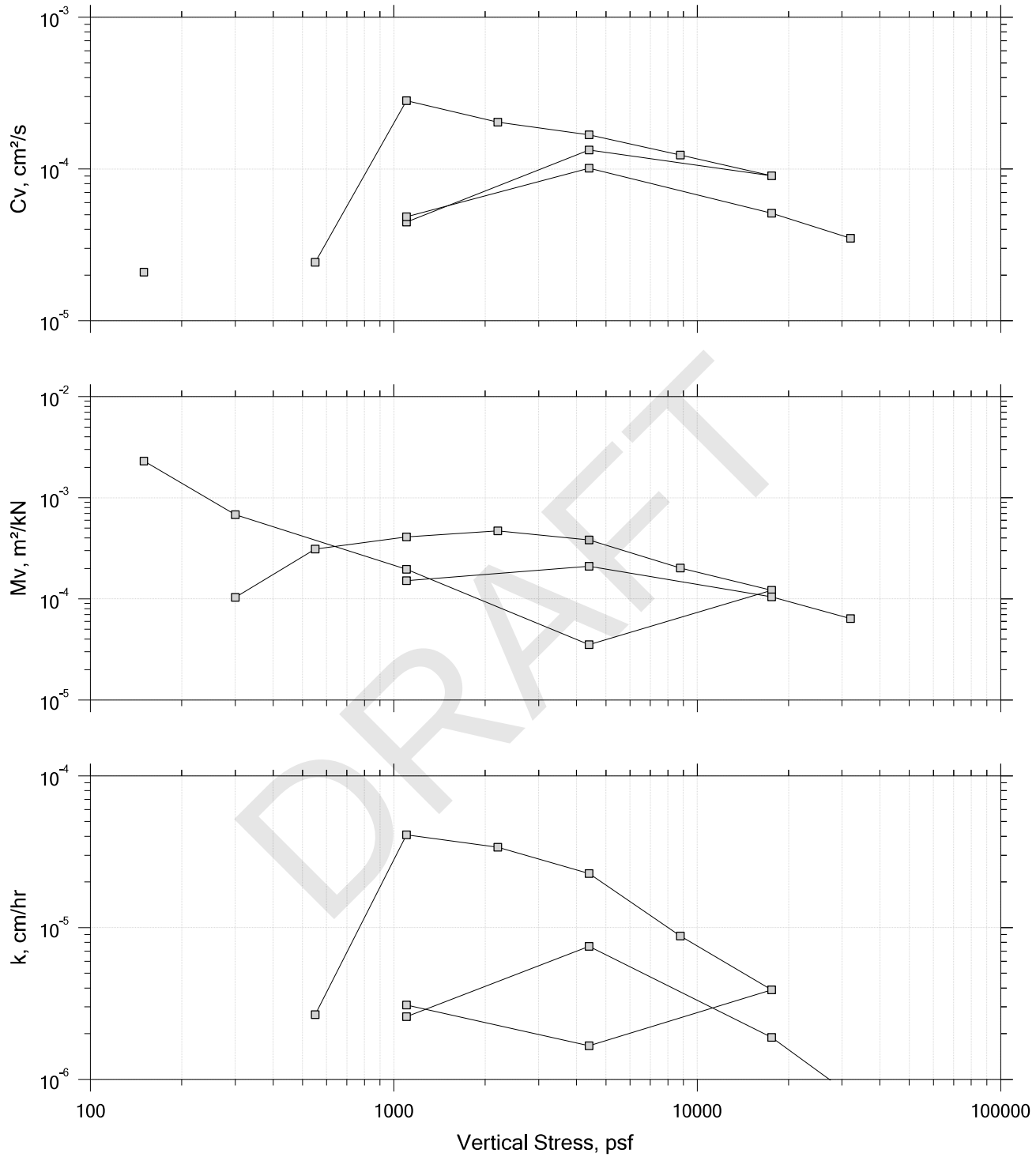


DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: DM
	Sample No.: U-1	Test Date: 01/12/2026	Depth:
	Test No.: Consol_02	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
	Remarks:		

Consolidation Test

Square Root of Time Coefficients

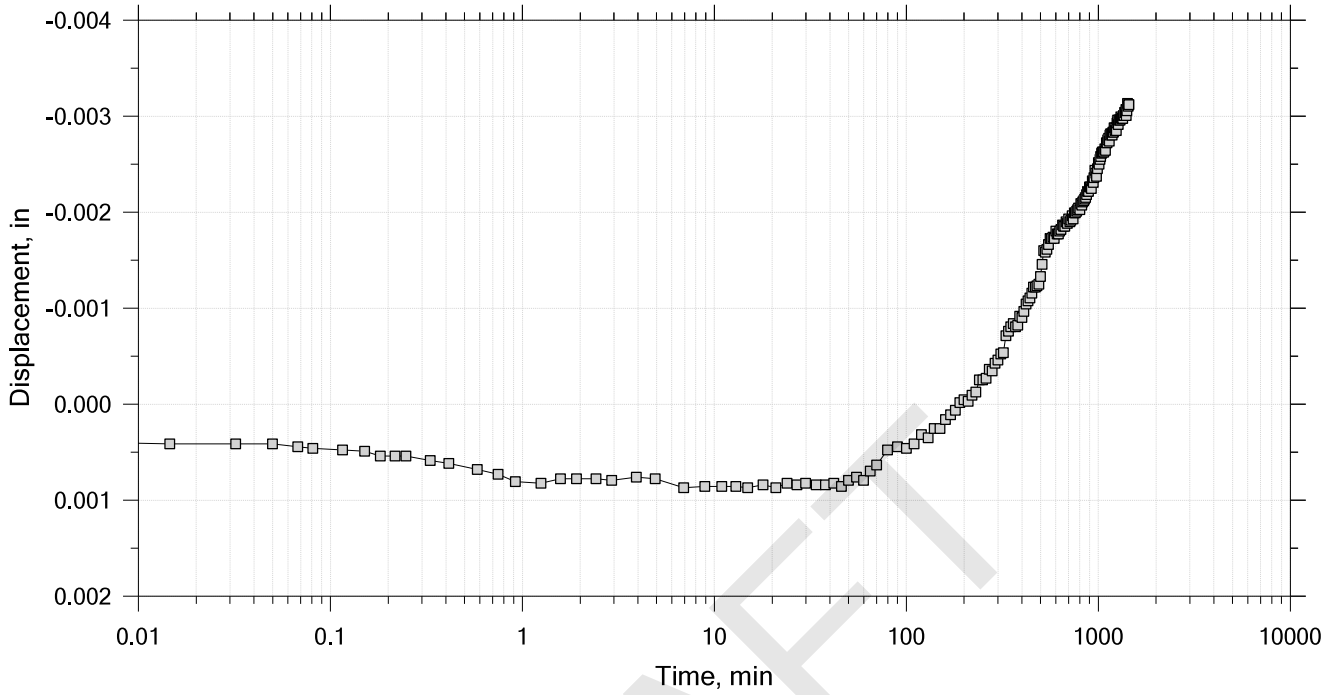


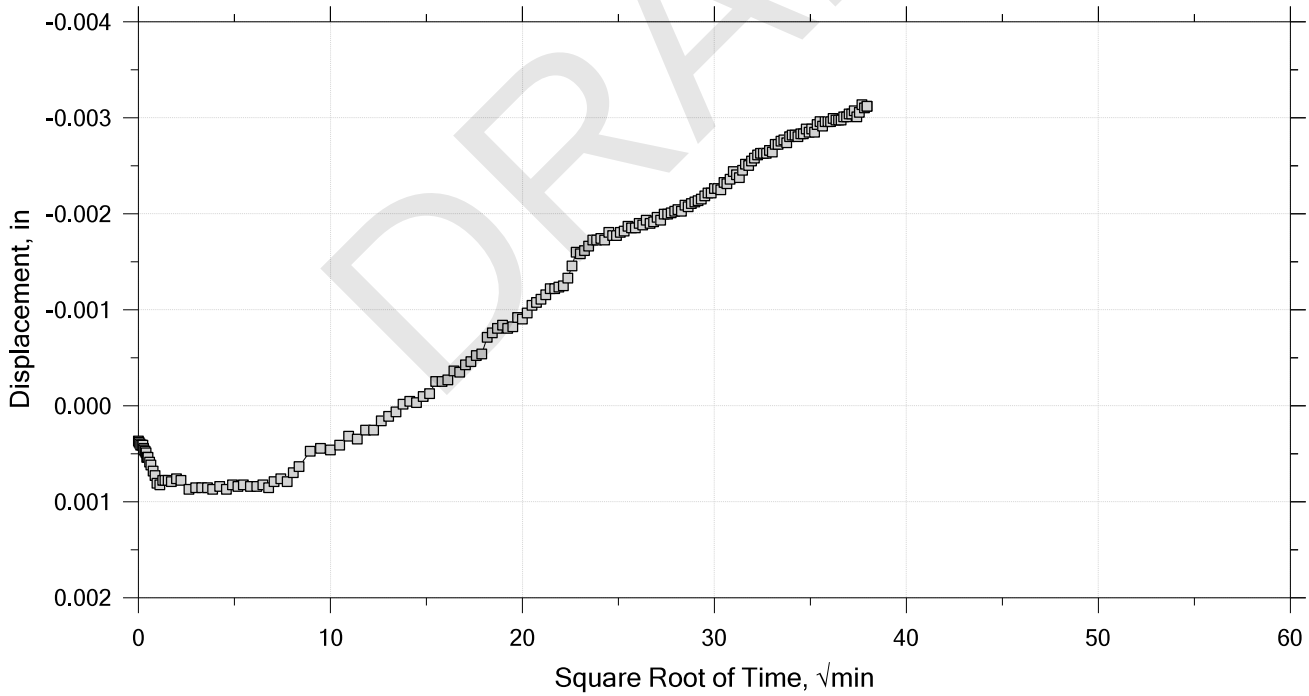
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: DM
	Sample No.: U-1	Test Date: 01/12/2026	Depth:
	Test No.: Consol_02	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
	Remarks:		

Consolidation Test

Time Curve 1 of 17
Constant Load Step
Stress: 150 psf



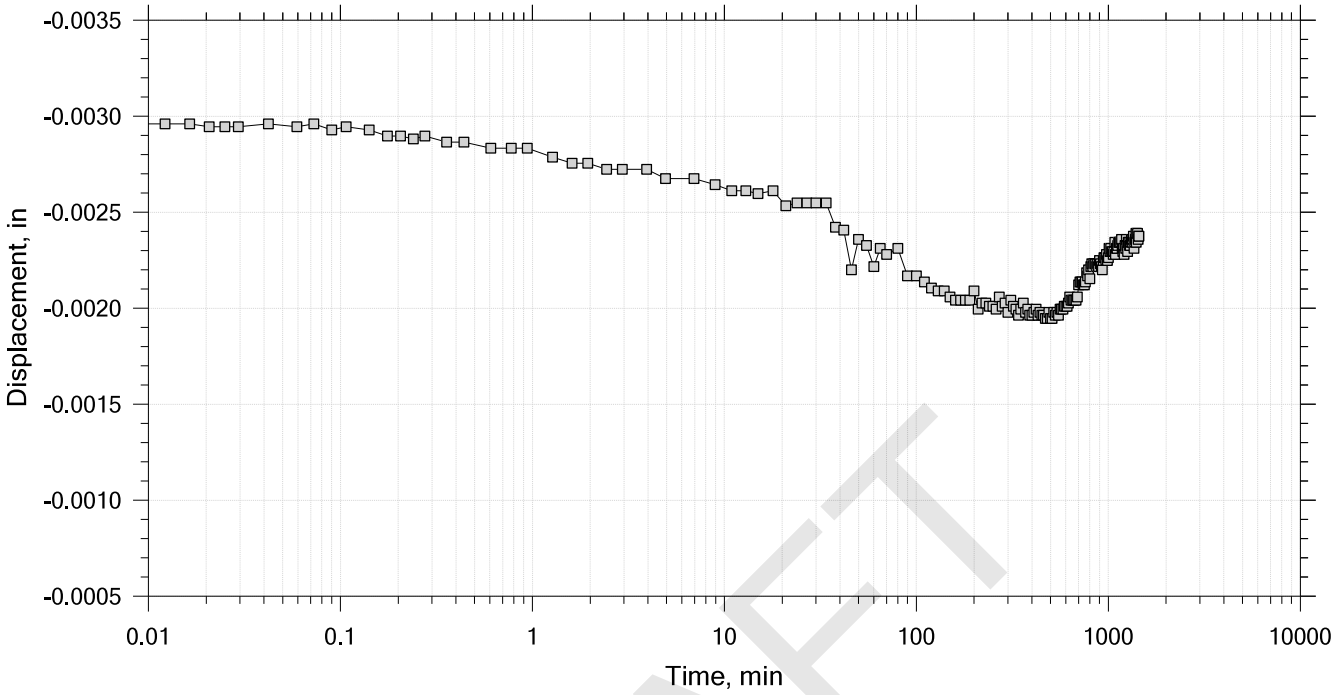


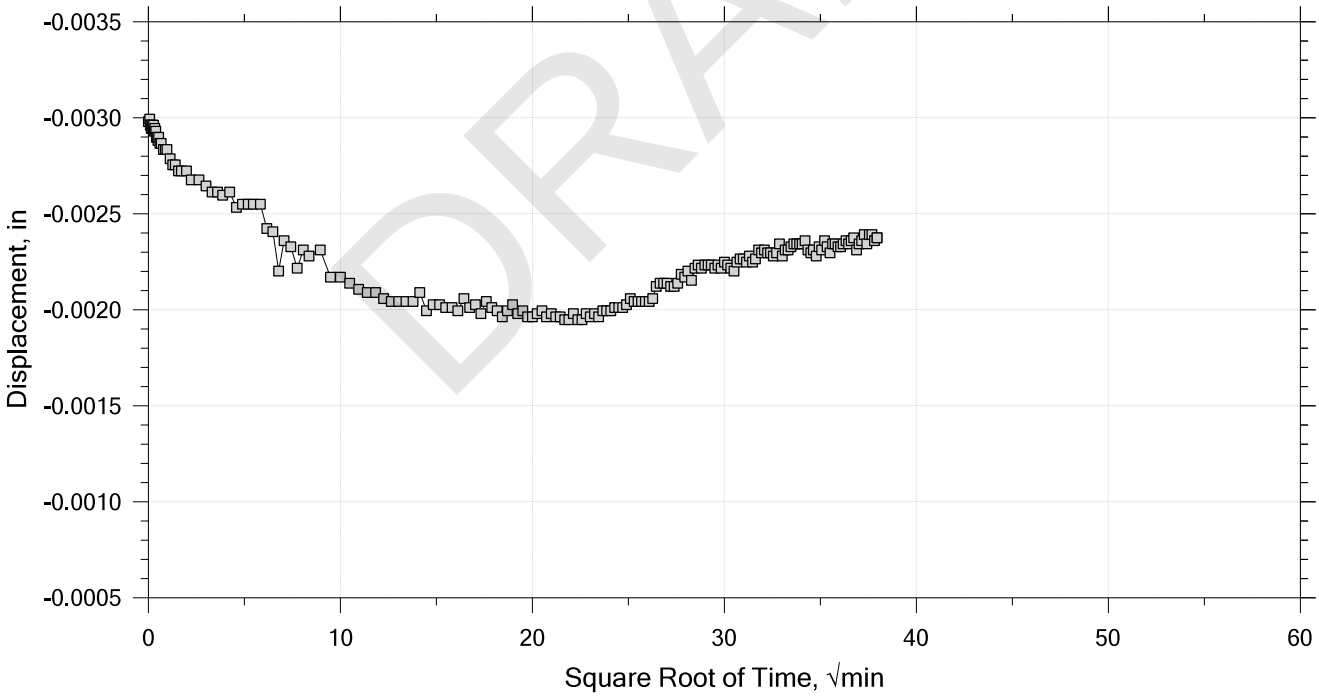
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: DM
	Sample No.: U-1	Test Date: 01/12/2026	Depth:
	Test No.: Consol_02	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
	Remarks:		

Consolidation Test

Time Curve 2 of 17
Constant Load Step
Stress: 300 psf



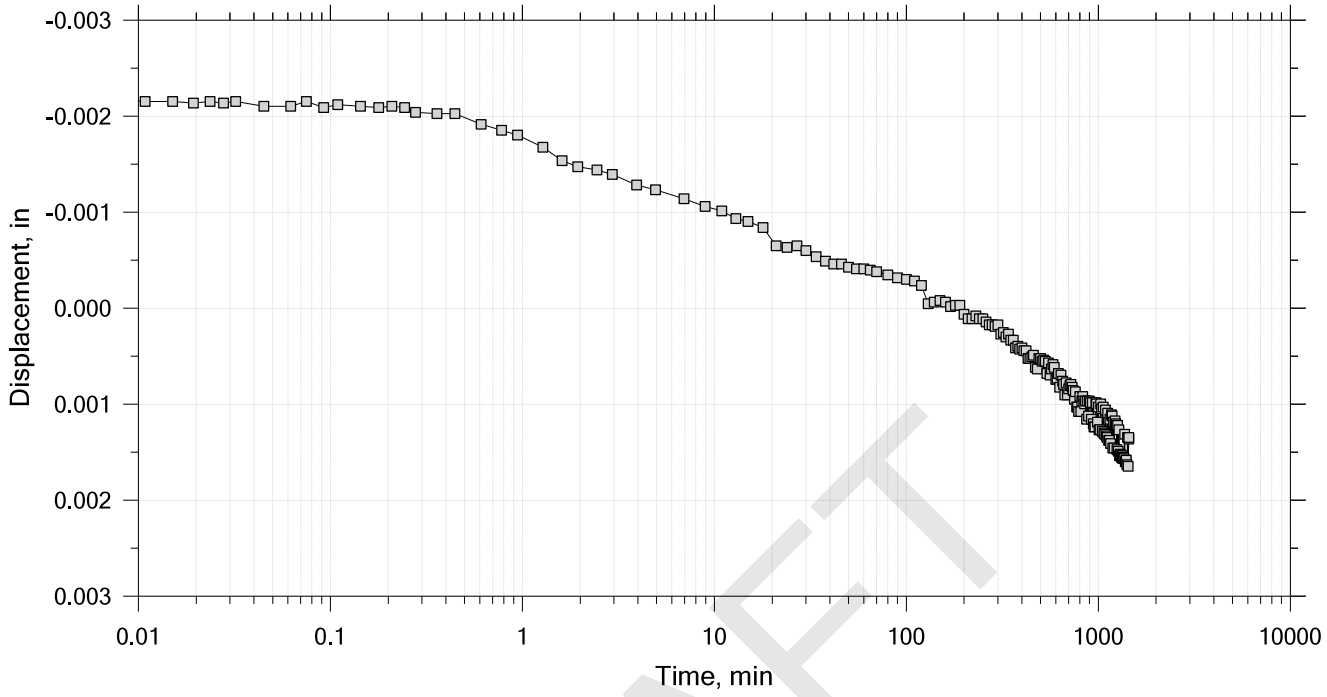


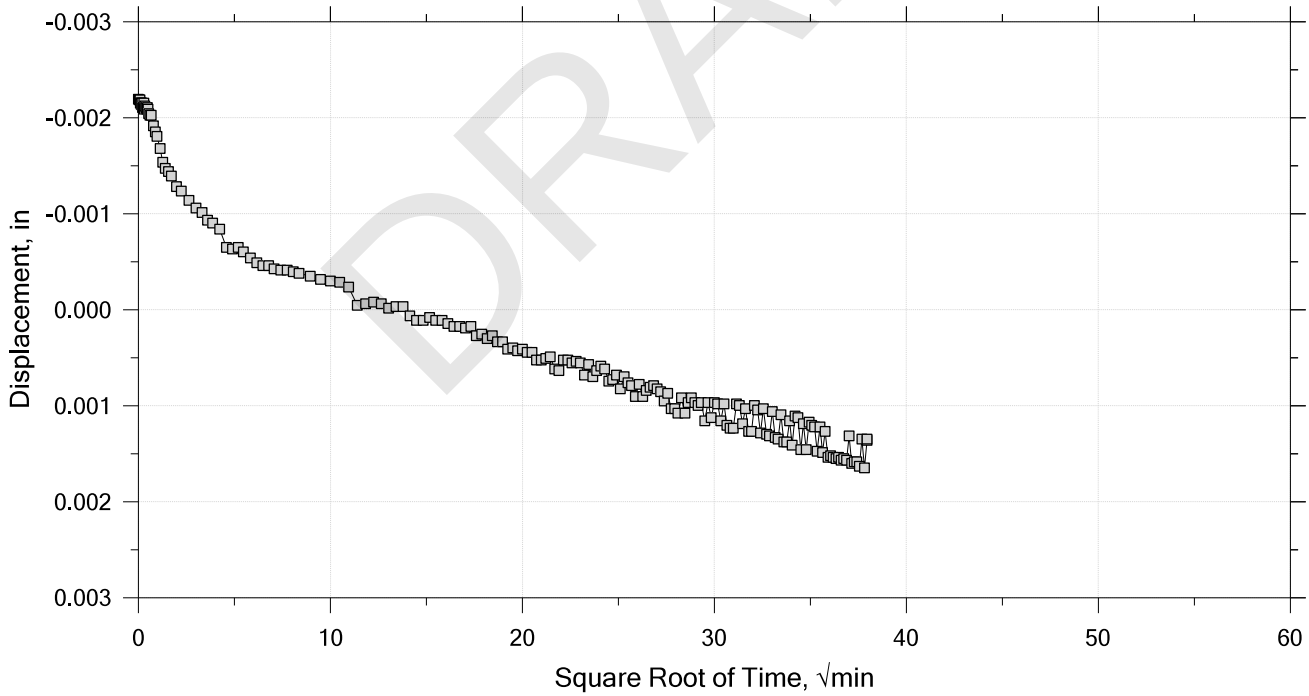
DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: DM
Sample No.: U-1	Test Date: 01/12/2026	Depth:
Test No.: Consol_02	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
Remarks:		

Consolidation Test

Time Curve 3 of 17
Constant Load Step
Stress: 550 psf



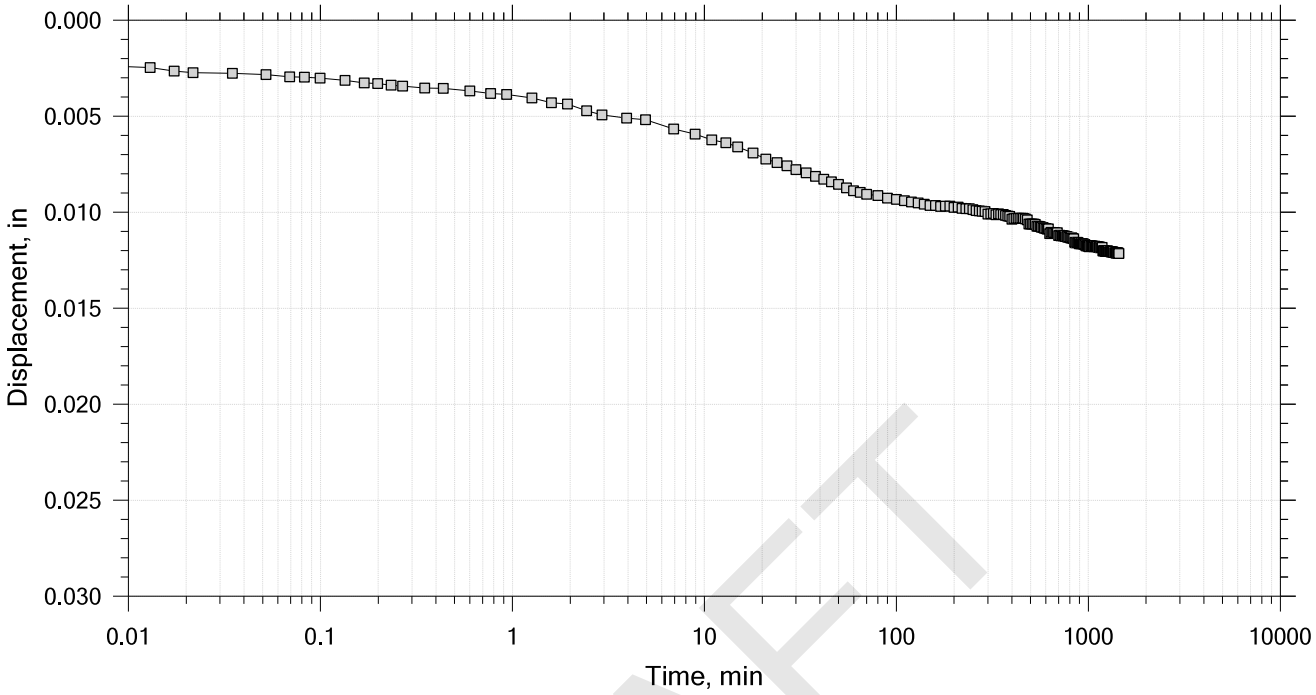


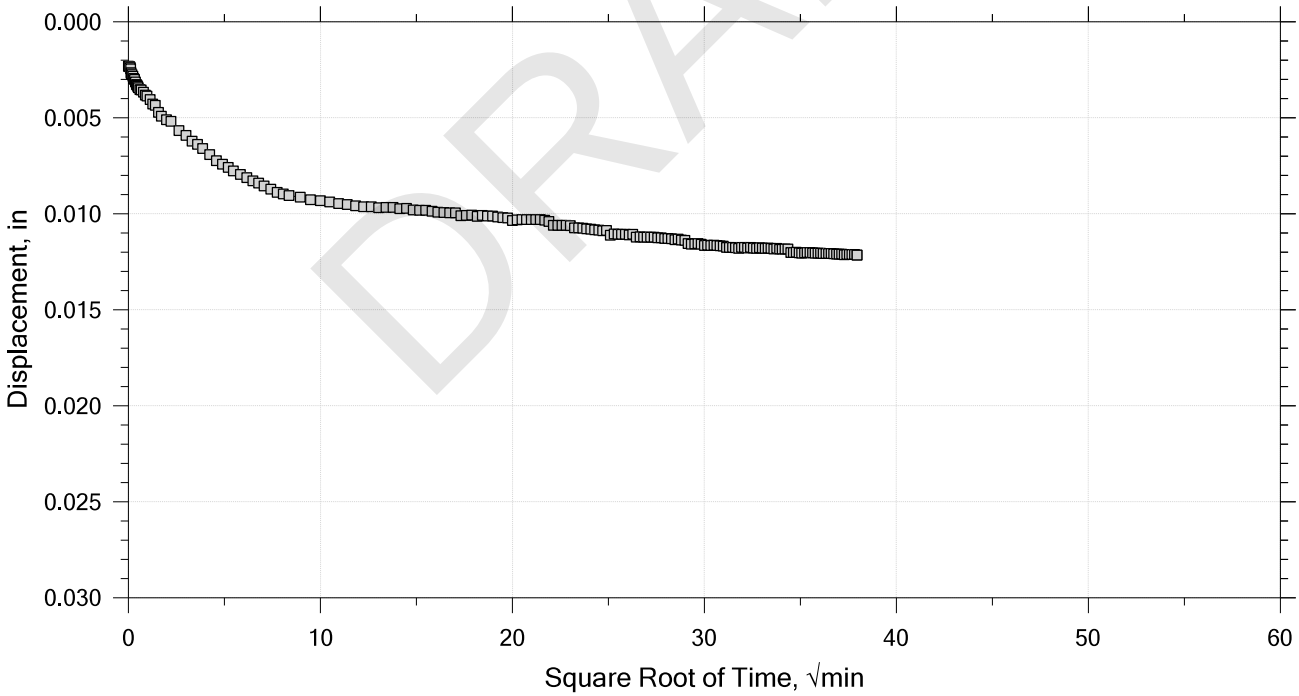
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: DM
	Sample No.: U-1	Test Date: 01/12/2026	Depth:
	Test No.: Consol_02	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
	Remarks:		

Consolidation Test

Time Curve 4 of 17
Constant Load Step
Stress: 1.1e+03 psf



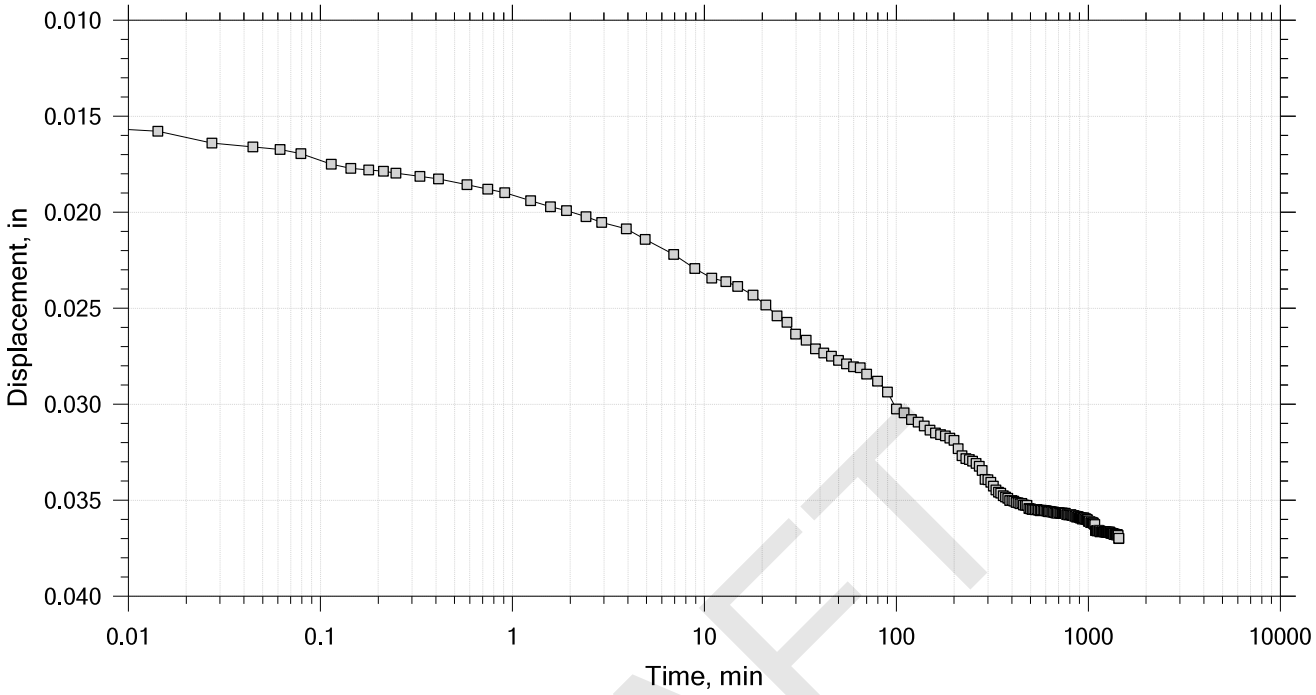


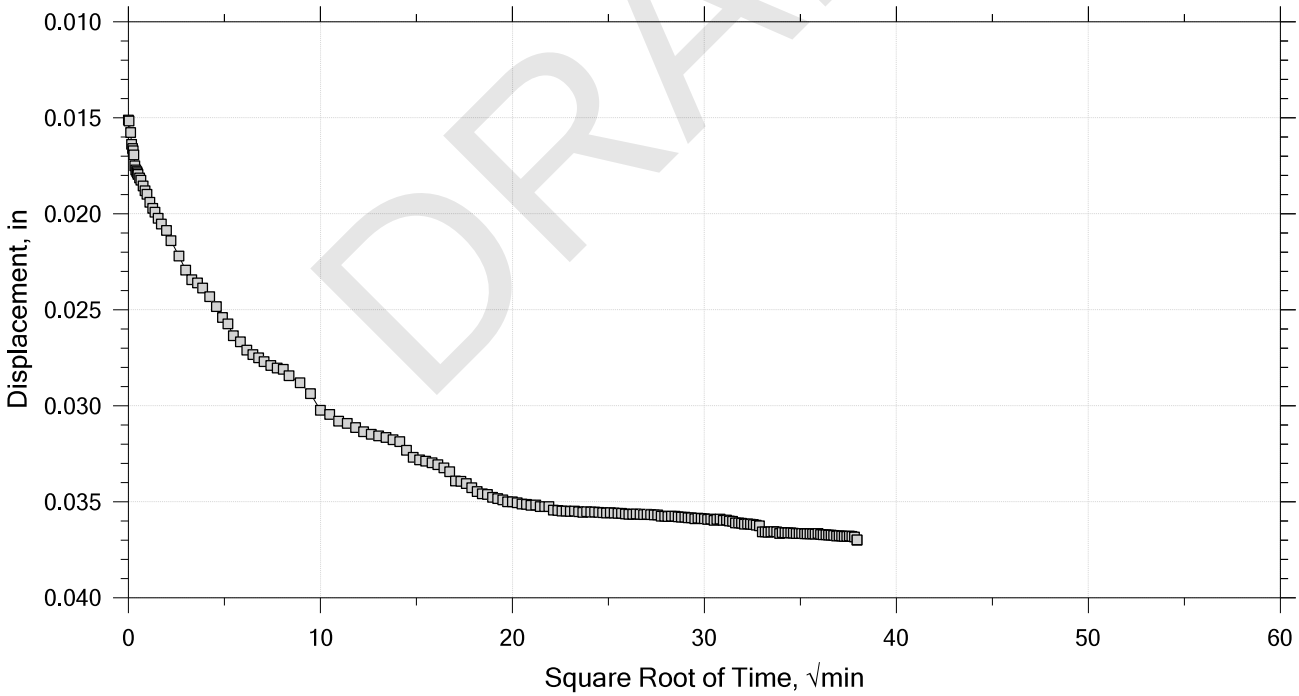
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: DM
	Sample No.: U-1	Test Date: 01/12/2026	Depth:
	Test No.: Consol_02	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
	Remarks:		

Consolidation Test

Time Curve 5 of 17
Constant Load Step
Stress: 2.2e+03 psf



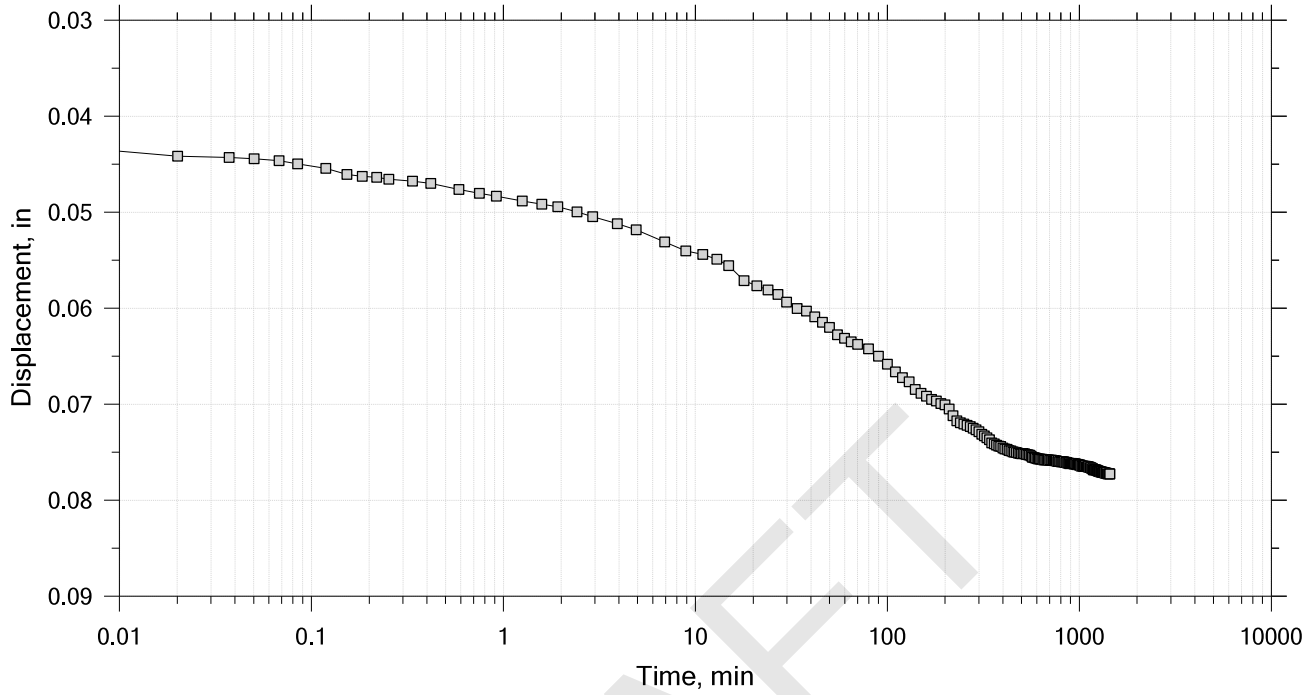


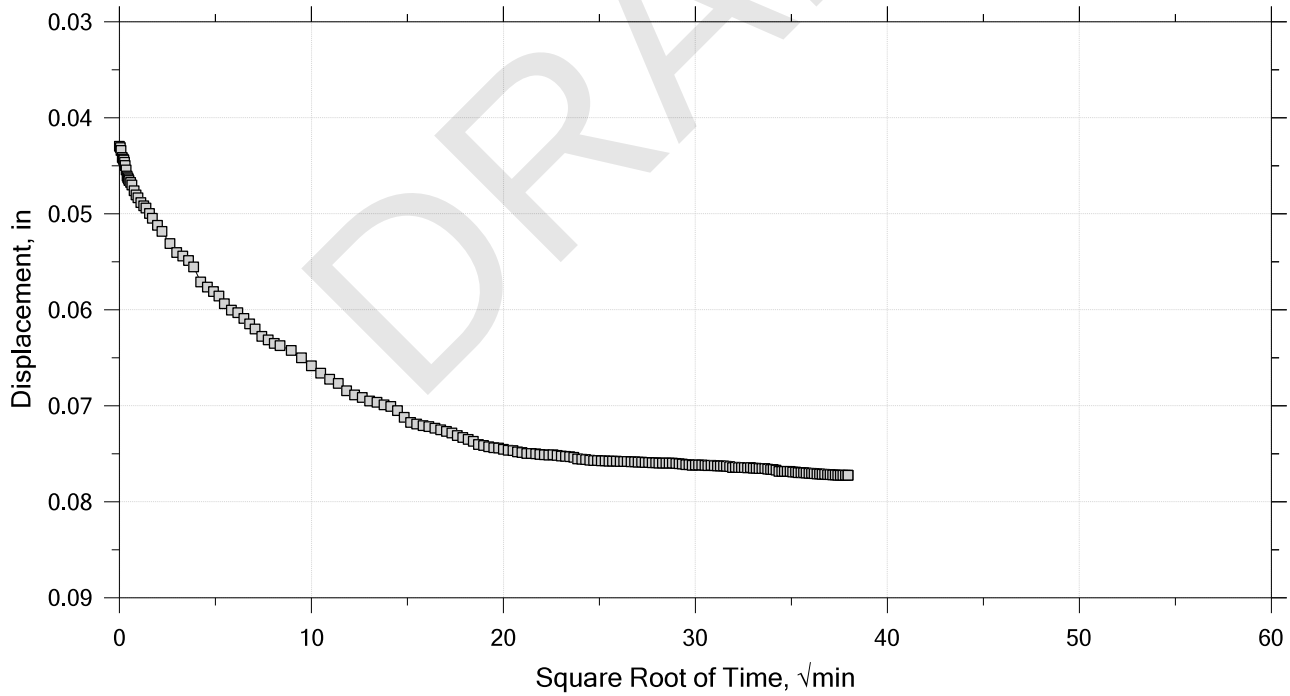
DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: DM
Sample No.: U-1	Test Date: 01/12/2026	Depth:
Test No.: Consol_02	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
Remarks:		

Consolidation Test

Time Curve 6 of 17
Constant Load Step
Stress: 4.4e+03 psf



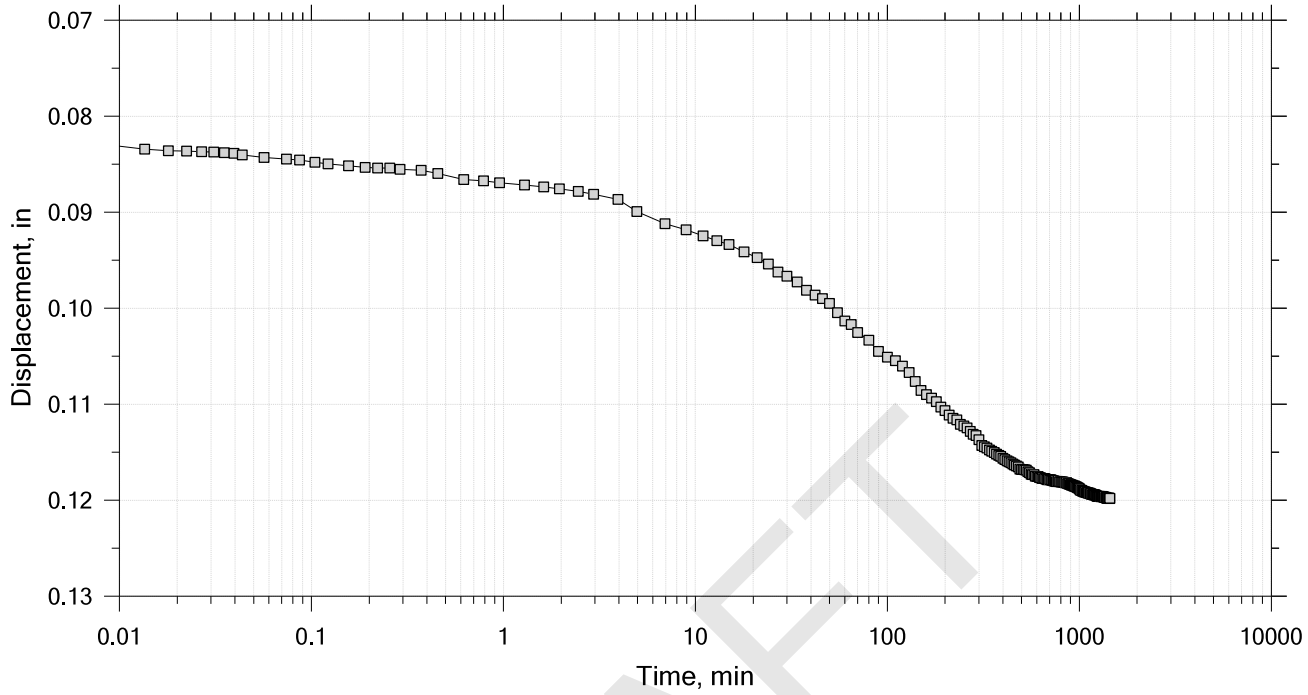


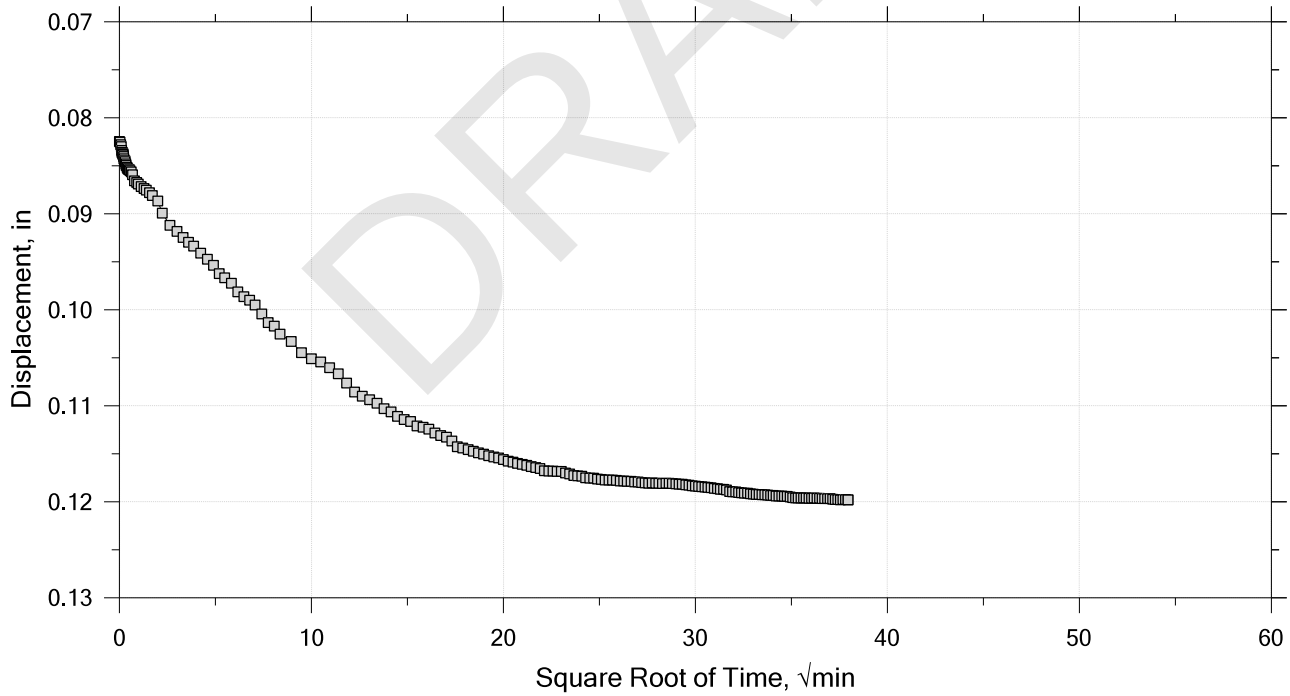
DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: DM
Sample No.: U-1	Test Date: 01/12/2026	Depth:
Test No.: Consol_02	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
Remarks:		

Consolidation Test

Time Curve 7 of 17
Constant Load Step
Stress: 8.8e+03 psf



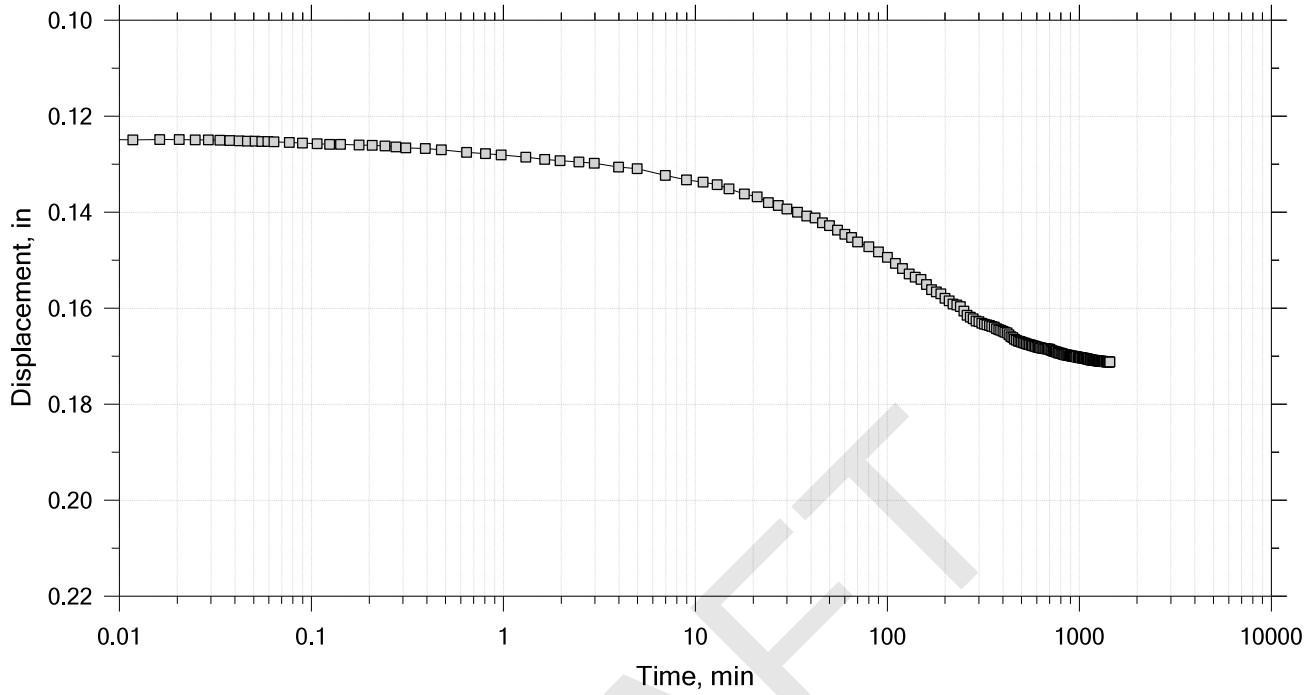


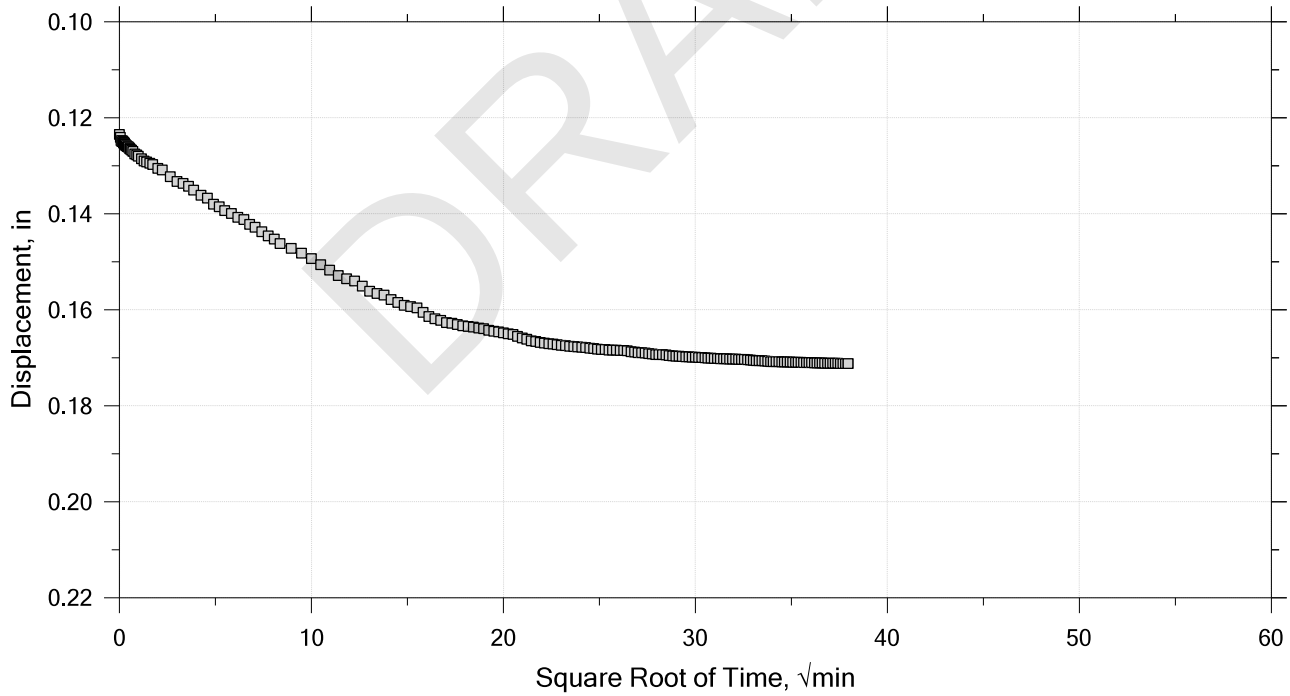
DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: DM
Sample No.: U-1	Test Date: 01/12/2026	Depth:
Test No.: Consol_02	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
Remarks:		

Consolidation Test

Time Curve 8 of 17
Constant Load Step
Stress: 1.76e+04 psf



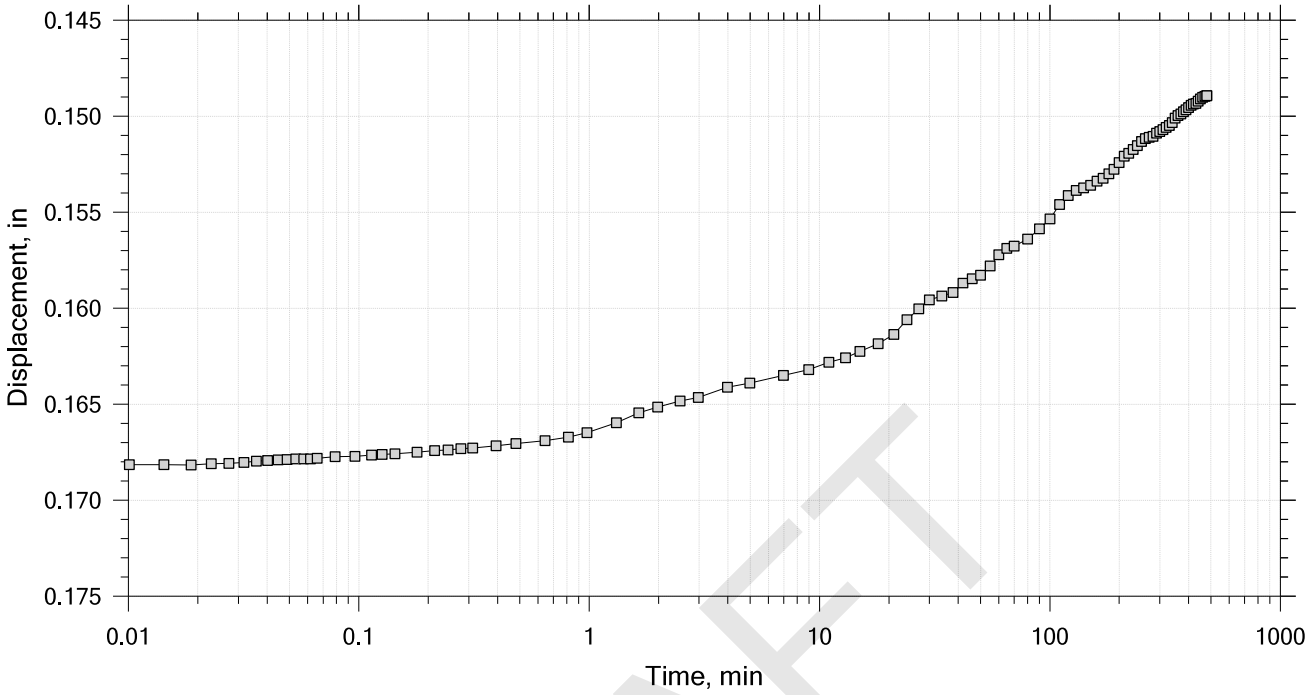


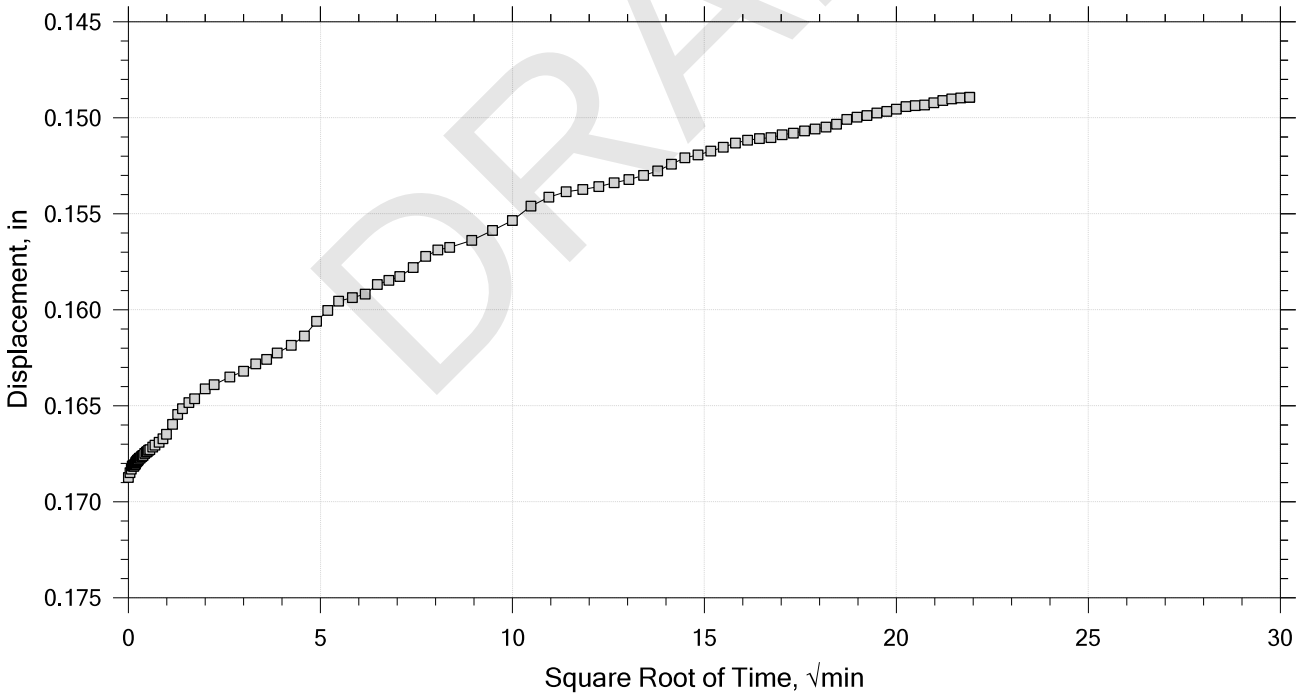
DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: DM
Sample No.: U-1	Test Date: 01/12/2026	Depth:
Test No.: Consol_02	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
Remarks:		

Consolidation Test

Time Curve 9 of 17
Constant Load Step
Stress: 4.4e+03 psf



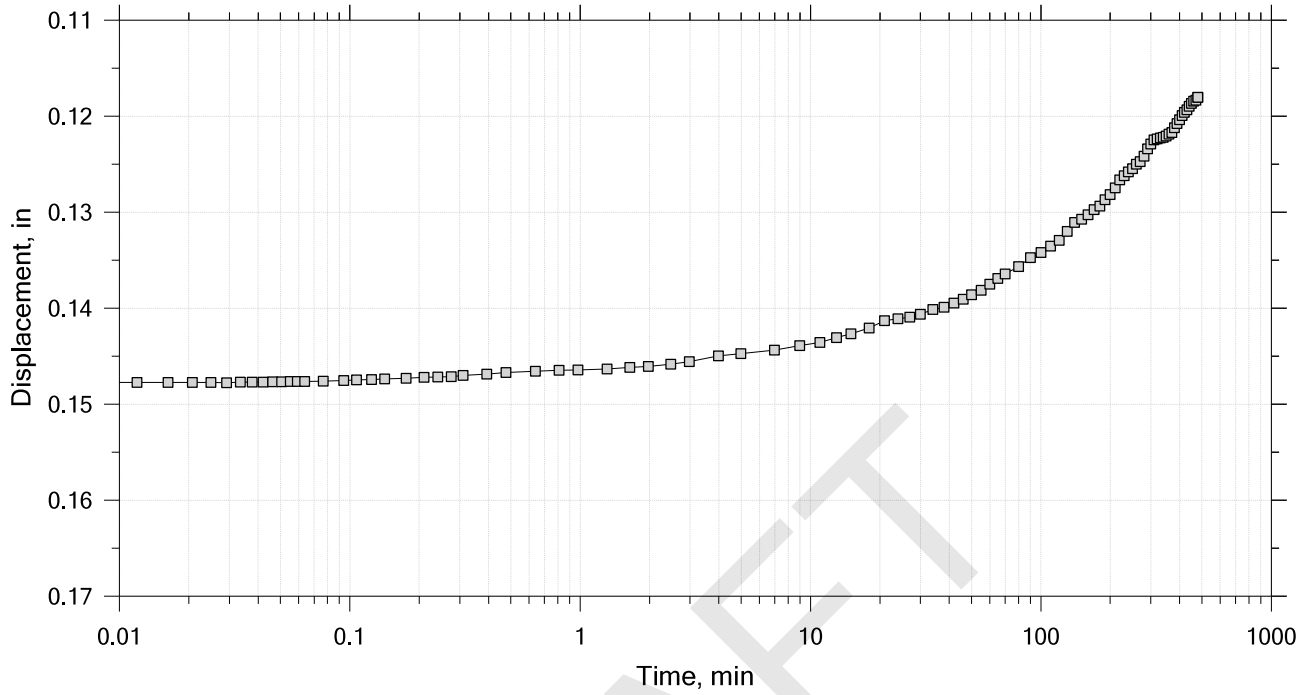


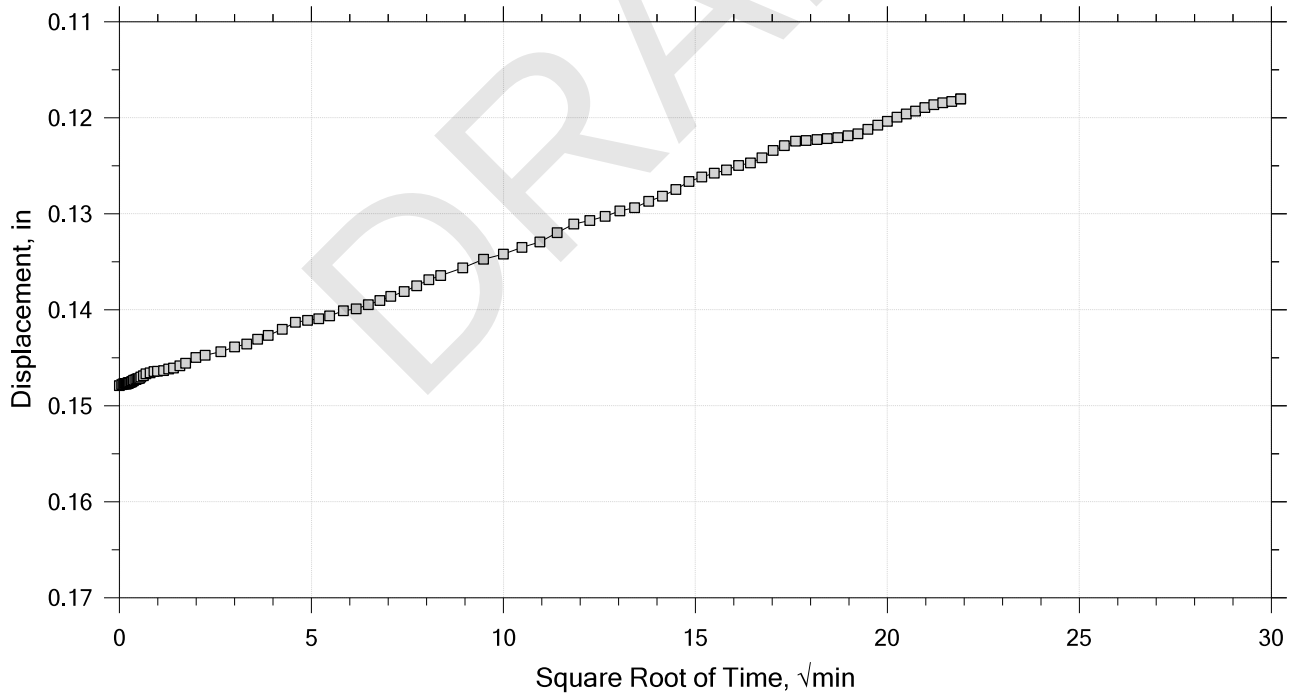
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: DM
	Sample No.: U-1	Test Date: 01/12/2026	Depth:
	Test No.: Consol_02	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
	Remarks:		

Consolidation Test

Time Curve 10 of 17
Constant Load Step
Stress: 1.1e+03 psf



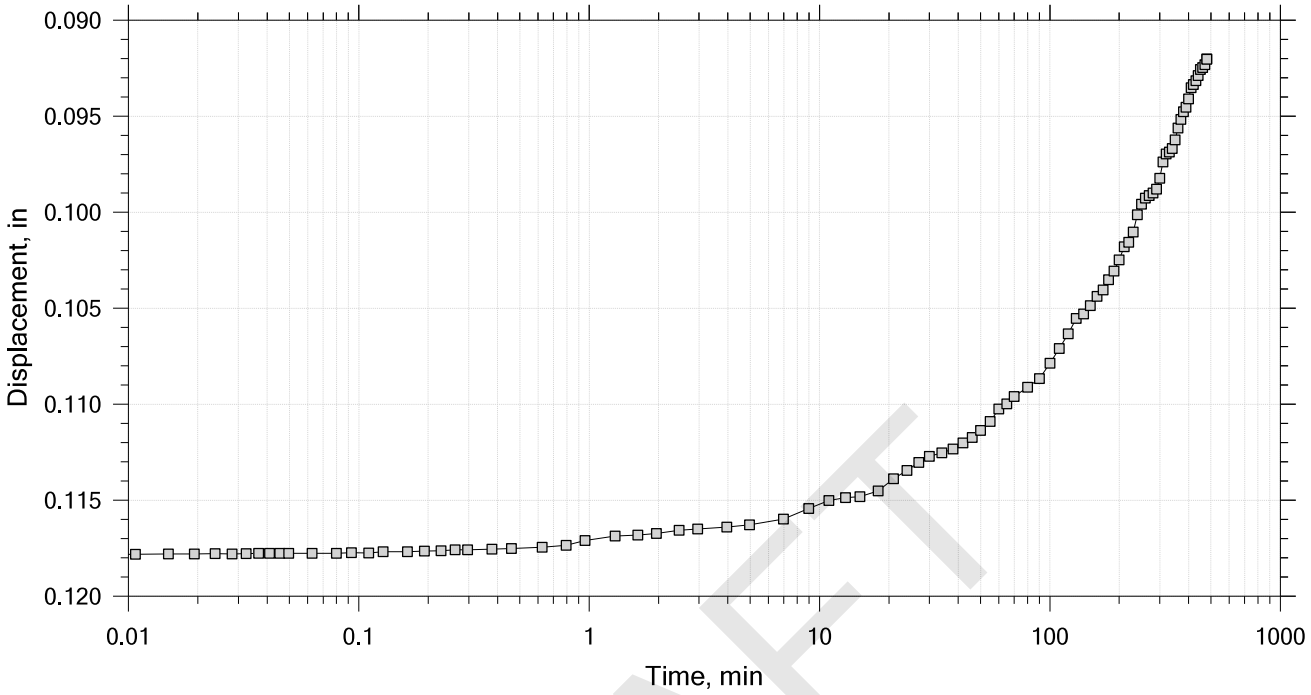


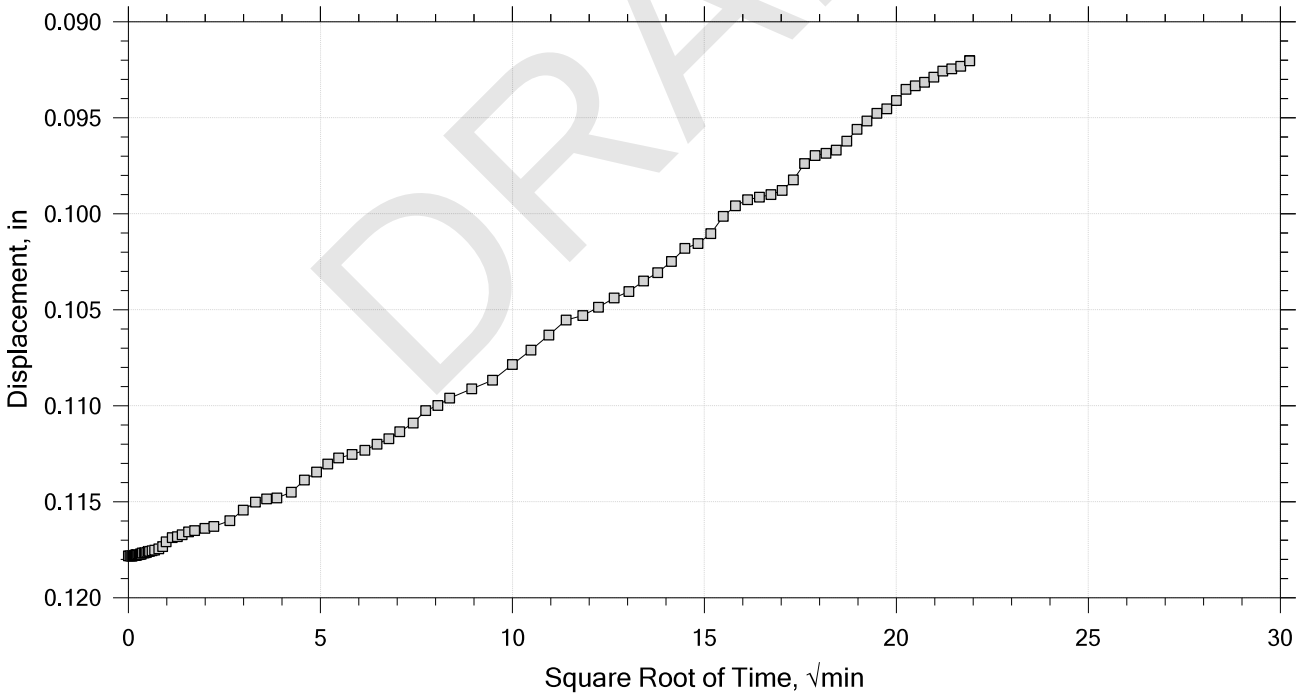
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: DM
	Sample No.: U-1	Test Date: 01/12/2026	Depth:
	Test No.: Consol_02	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
	Remarks:		

Consolidation Test

Time Curve 11 of 17
Constant Load Step
Stress: 300 psf



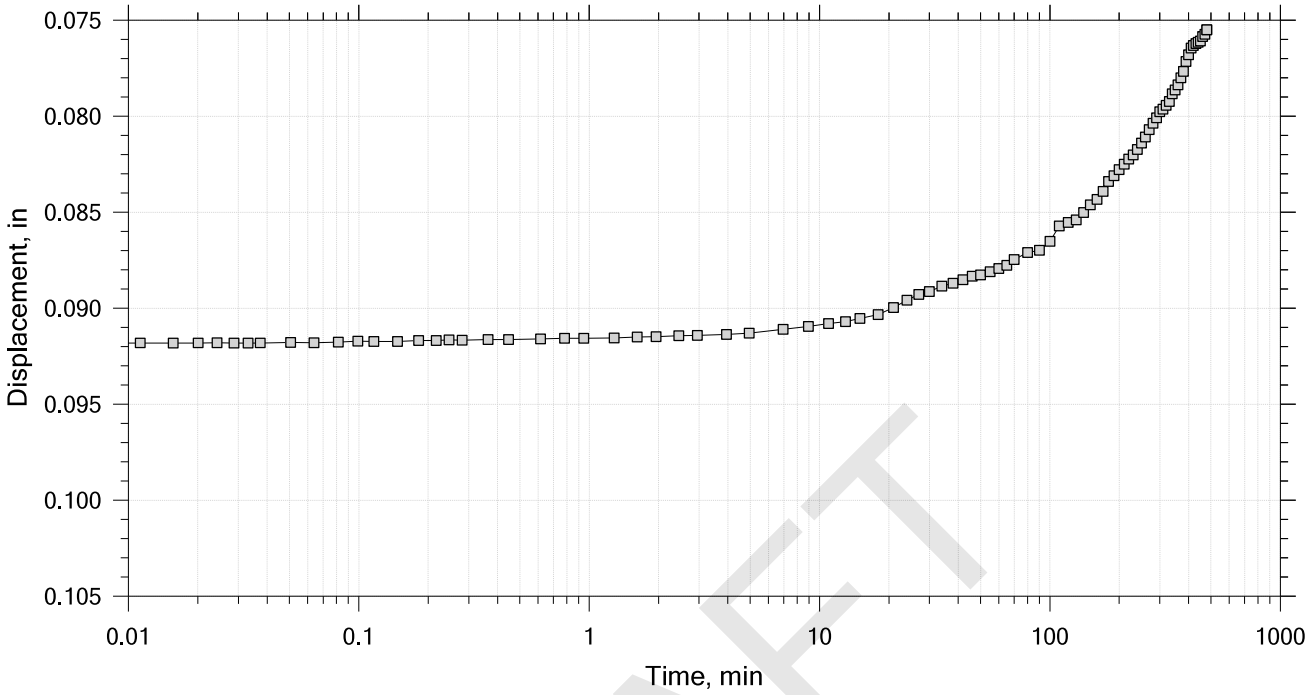


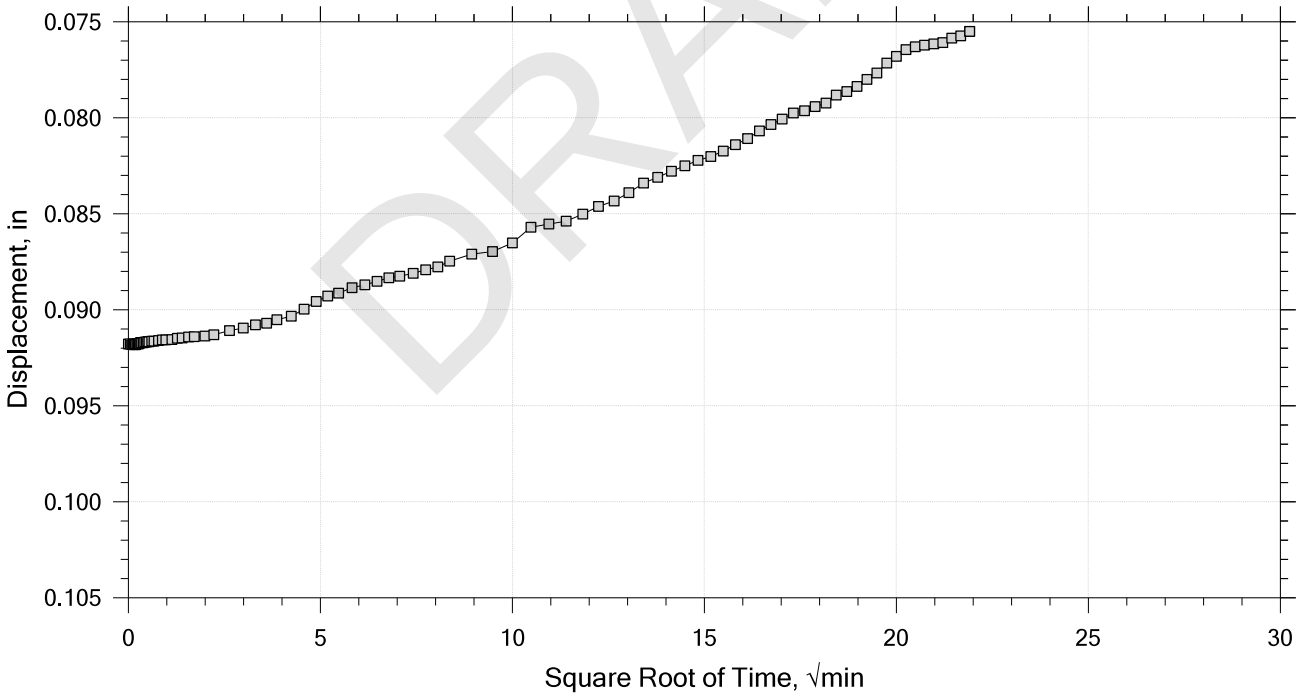
DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: DM
Sample No.: U-1	Test Date: 01/12/2026	Depth:
Test No.: Consol_02	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
Remarks:		

Consolidation Test

Time Curve 12 of 17
Constant Load Step
Stress: 150 psf



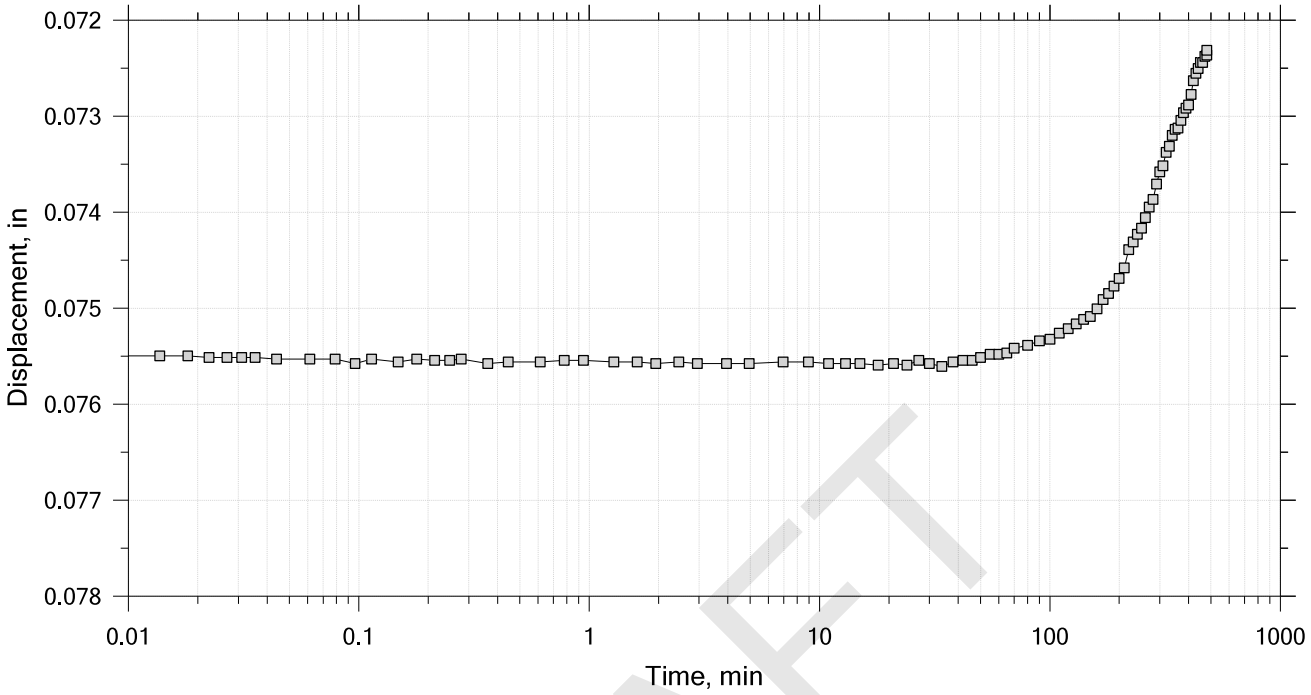


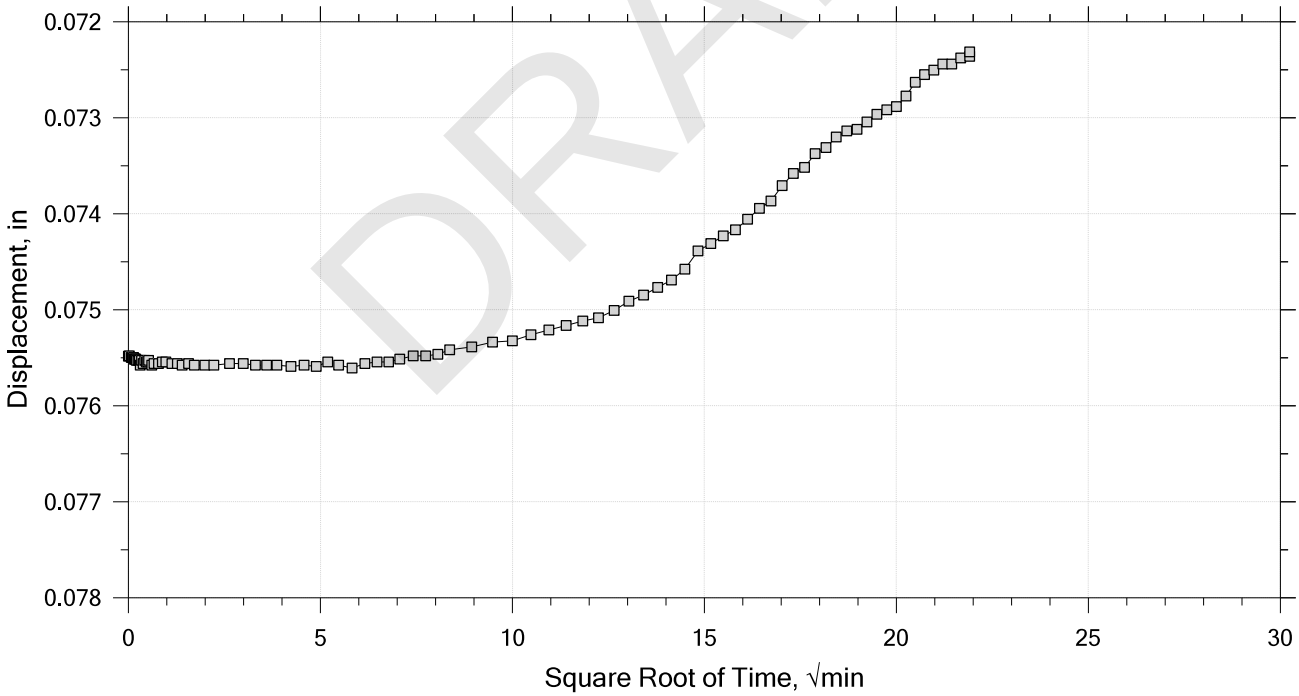
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: DM
	Sample No.: U-1	Test Date: 01/12/2026	Depth:
	Test No.: Consol_02	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
	Remarks:		

Consolidation Test

Time Curve 13 of 17
Constant Load Step
Stress: 300 psf



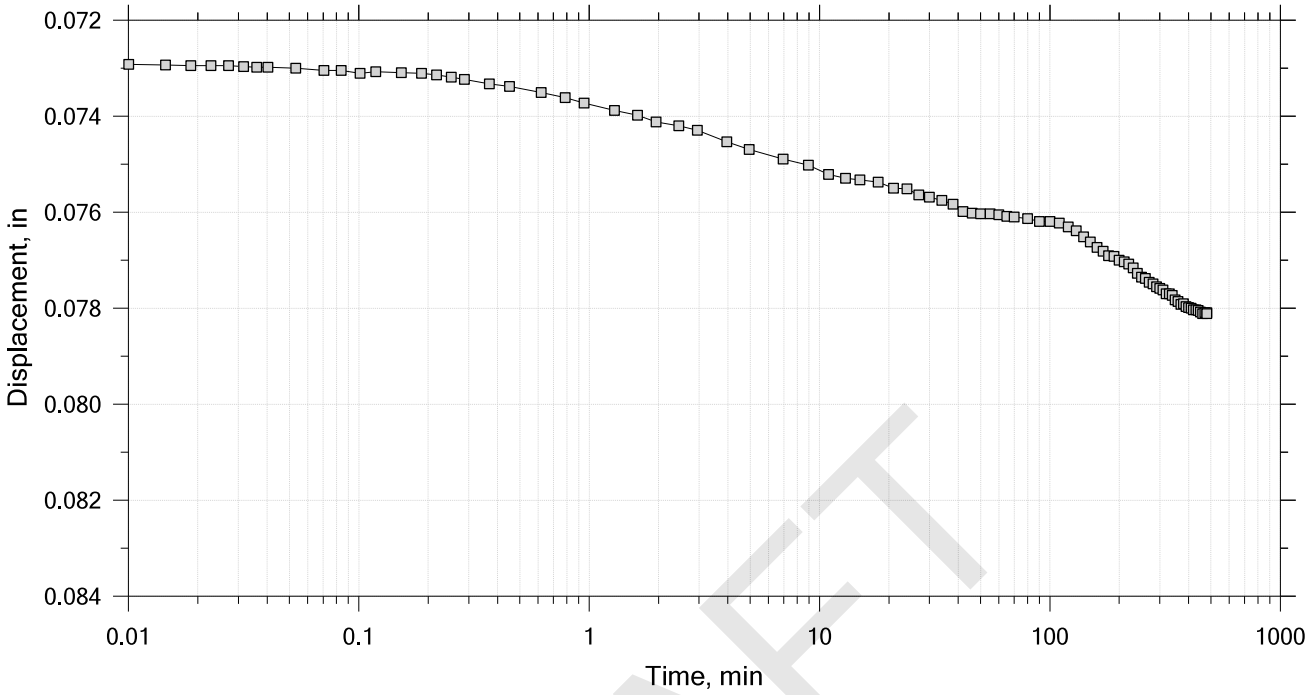


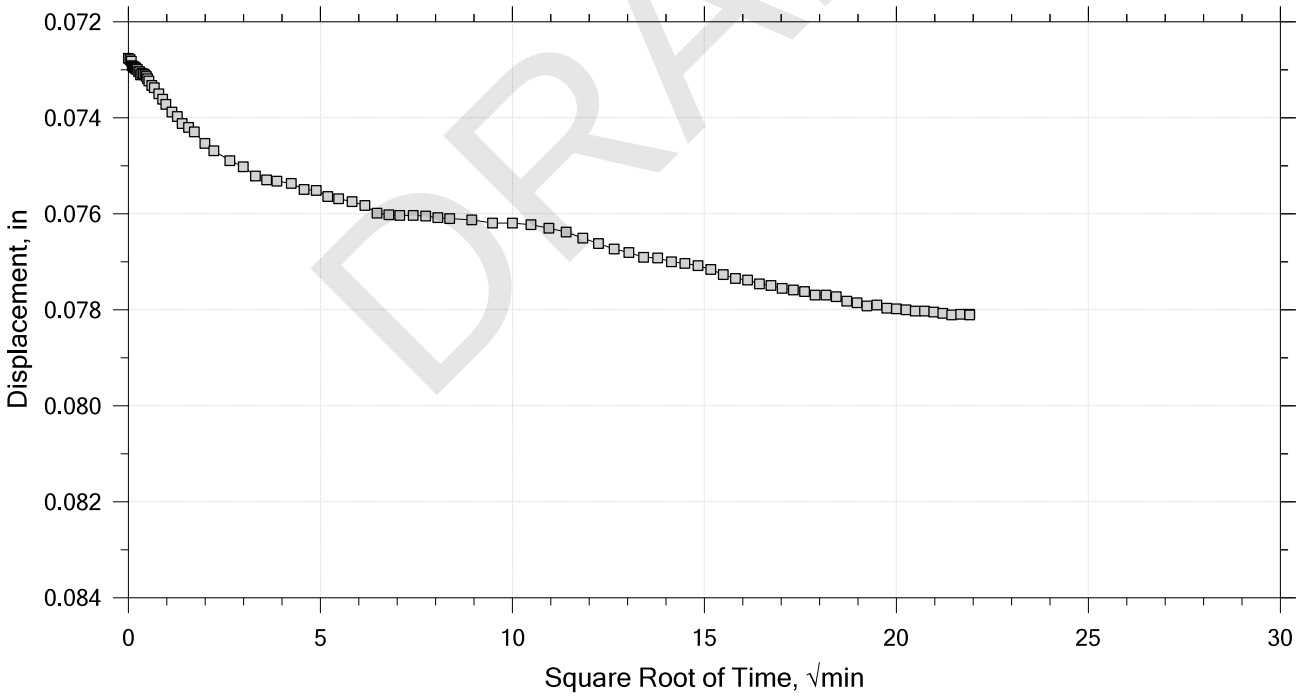
DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: DM
Sample No.: U-1	Test Date: 01/12/2026	Depth:
Test No.: Consol_02	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
Remarks:		

Consolidation Test

Time Curve 14 of 17
Constant Load Step
Stress: 1.1e+03 psf



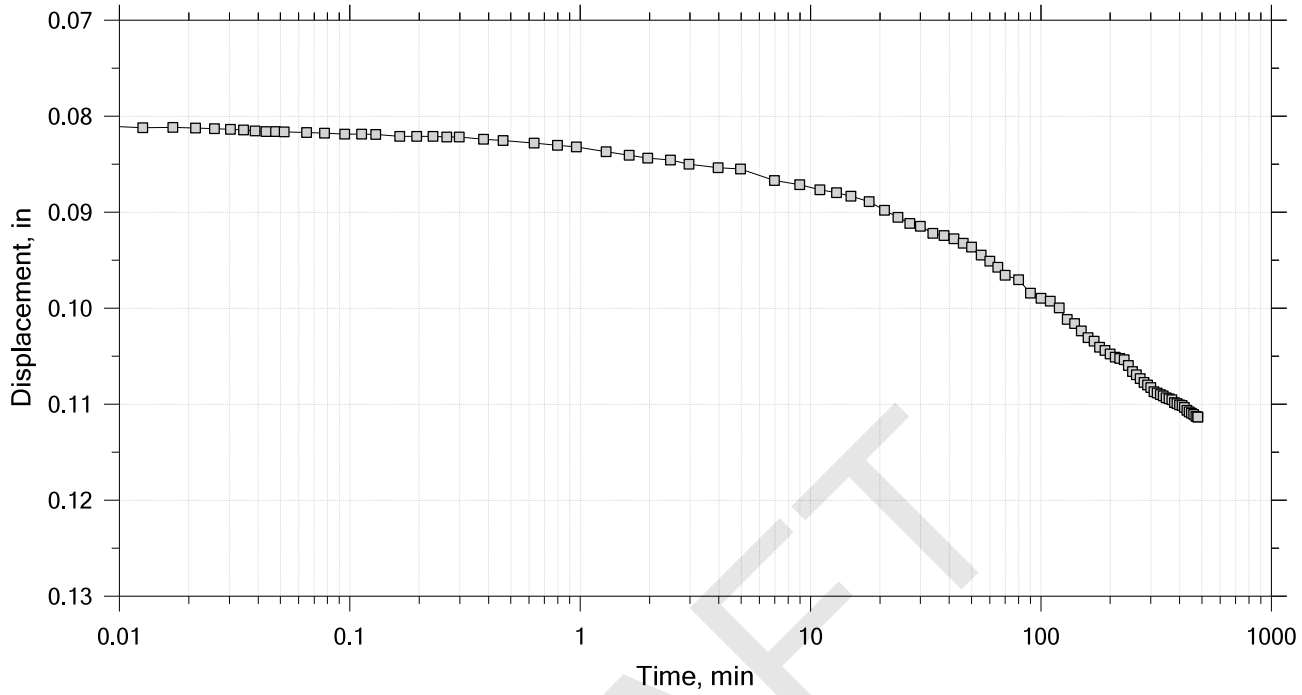


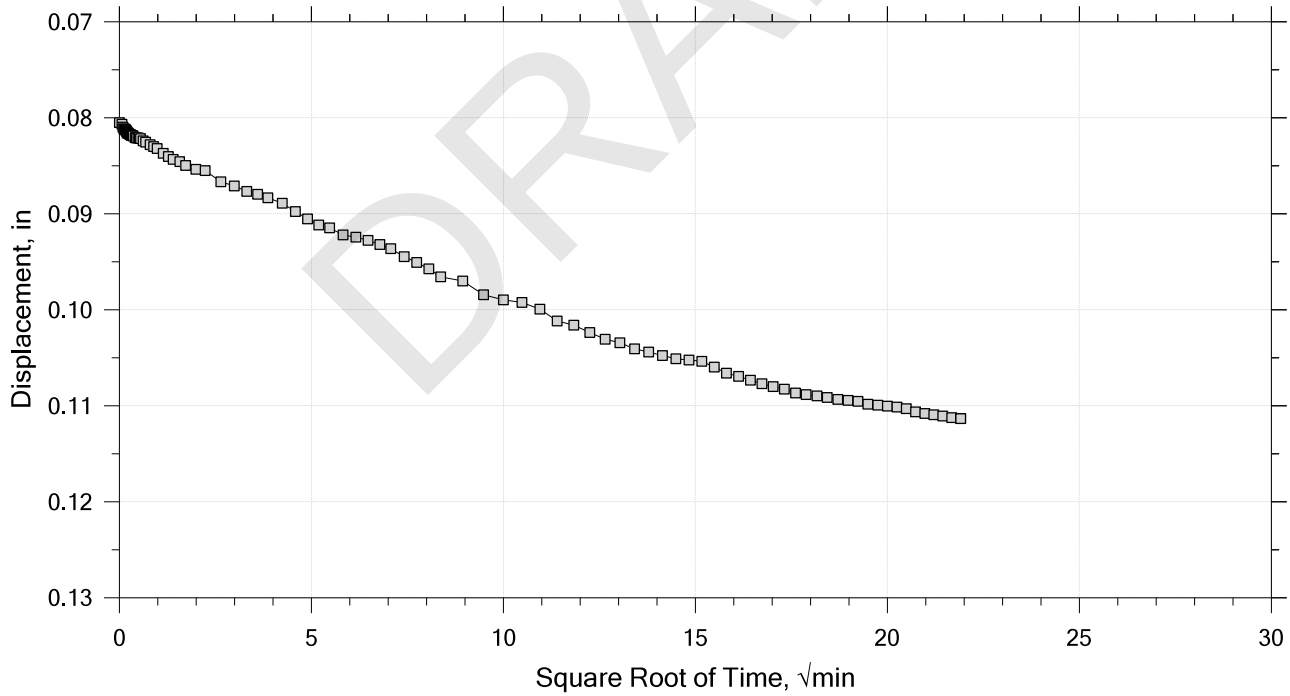
DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: DM
Sample No.: U-1	Test Date: 01/12/2026	Depth:
Test No.: Consol_02	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
Remarks:		

Consolidation Test

Time Curve 15 of 17
Constant Load Step
Stress: 4.4e+03 psf



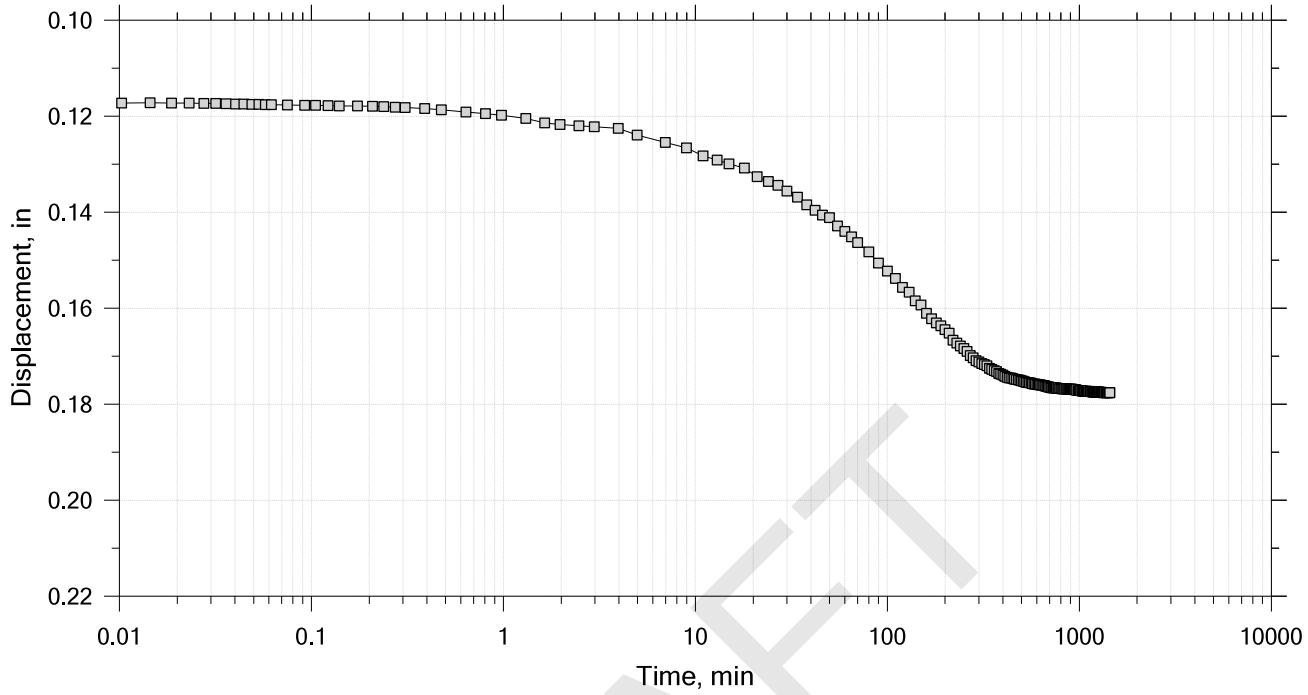


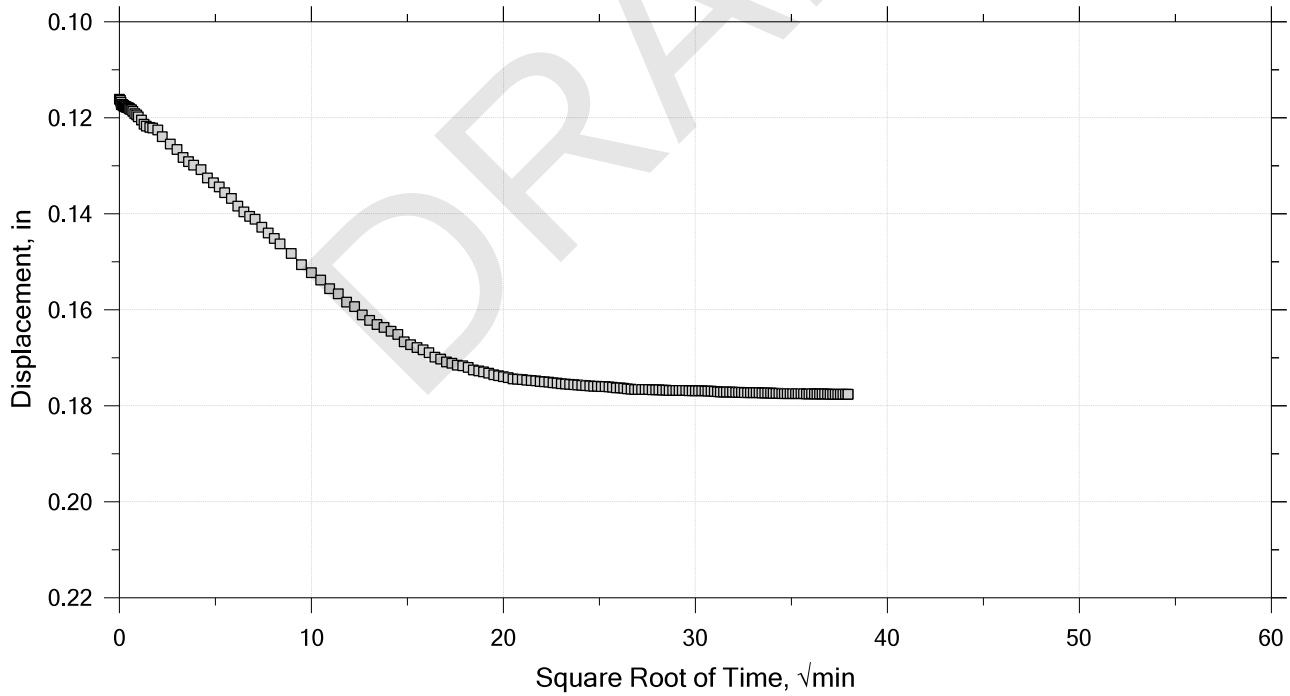
DRAFT

Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: DM
Sample No.: U-1	Test Date: 01/12/2026	Depth:
Test No.: Consol_02	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
Remarks:		

Consolidation Test

Time Curve 16 of 17
Constant Load Step
Stress: 1.76e+04 psf



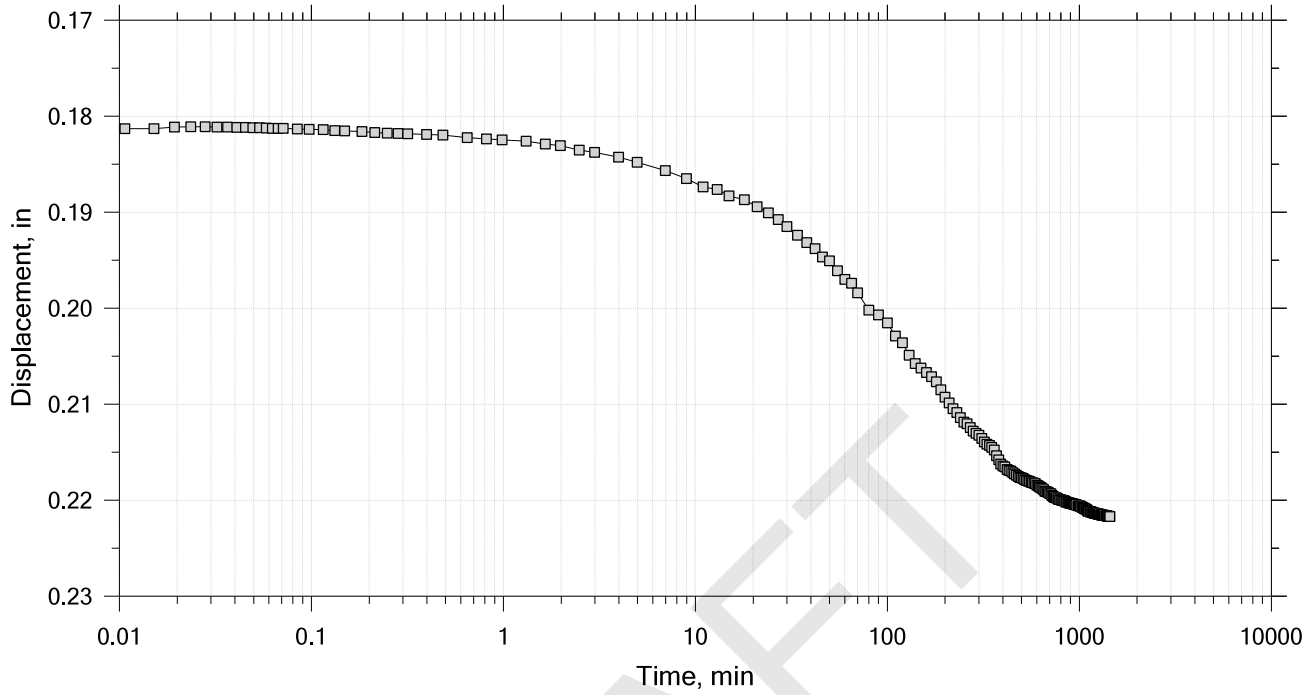


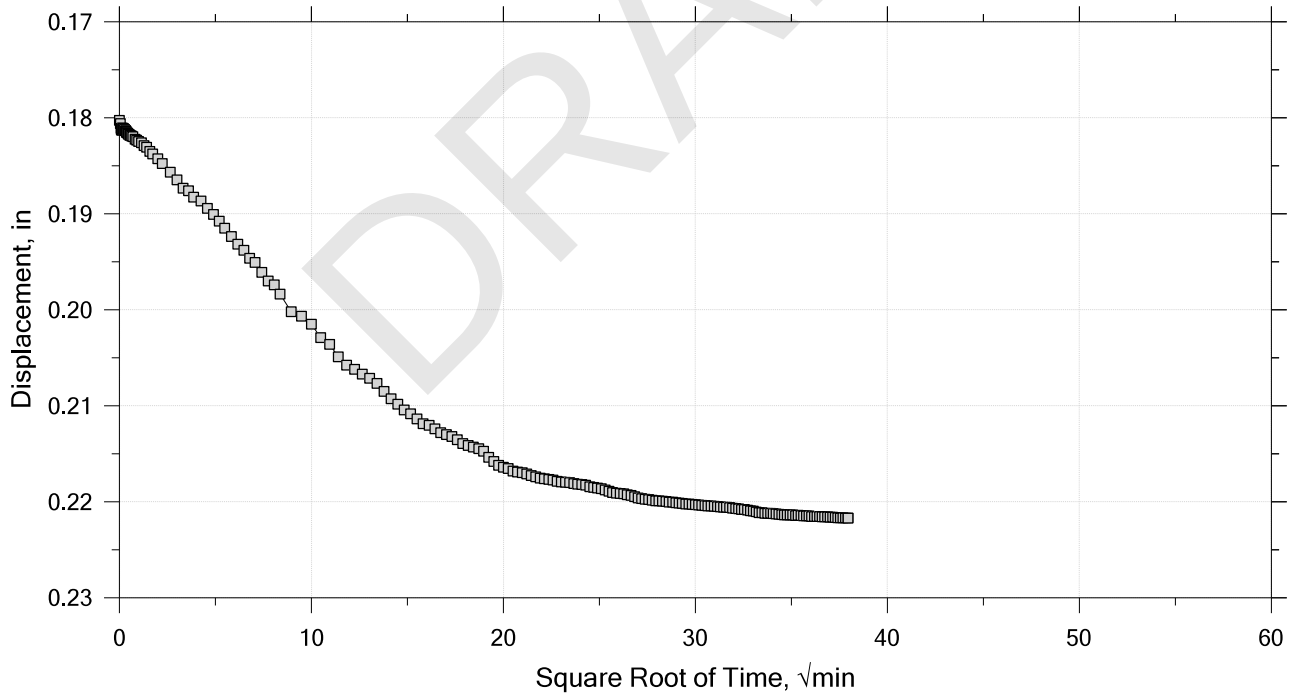
DRAFT

	Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
	Boring No.: B-4	Tested By: MH	Checked By: DM
	Sample No.: U-1	Test Date: 01/12/2026	Depth:
	Test No.: Consol_02	Sample Type:	Elevation:
	Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
	Remarks:		

Consolidation Test

Time Curve 17 of 17
Constant Load Step
Stress: 3.2e+04 psf





DRAFT

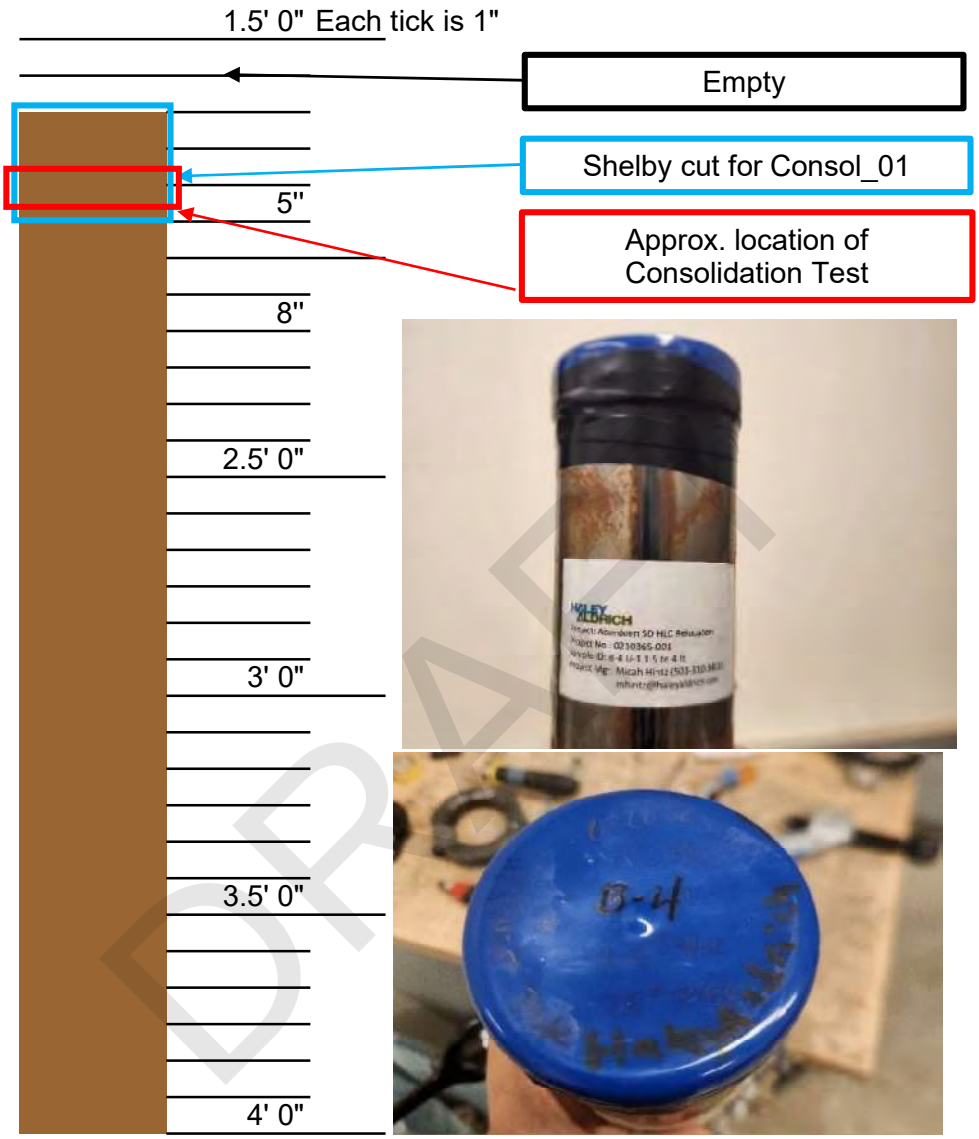
Project: Aberdeen SD HLC Relcation	Location:	Project No.: 0210365-001
Boring No.: B-4	Tested By: MH	Checked By: DM
Sample No.: U-1	Test Date: 01/12/2026	Depth:
Test No.: Consol_02	Sample Type:	Elevation:
Description: The is whitish-brown in color and has a stiff, sticky texture. It is damp with mini stone.		
Remarks:		

APPENDIX B:

Shelby Tube Schematics and Specimen Photos

DRAFT

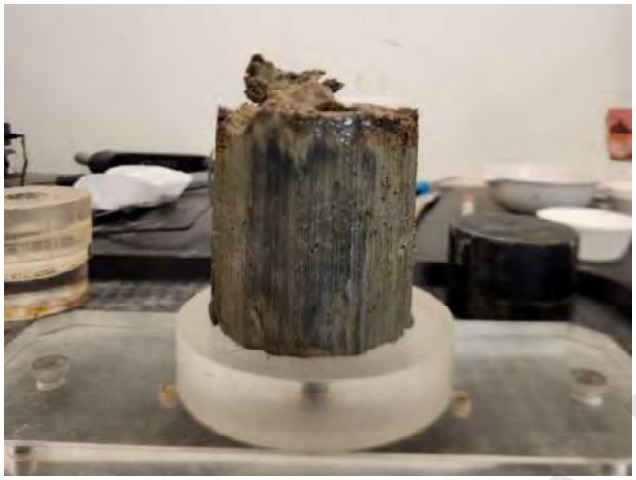
Boring:	B-4
Sample ID:	U-1
Test:	Consol_01



DRAFT

Boring: B-4
Sample ID: U-1
Test: Consol_01

The soil sample was extruded with medium pressure. The specimen is whitish-brown in color and fine-grained soil. It exhibits a stiff consistency with noticeable stickiness. Minor voids were filled using trimmed soil.



The extruded soil from the Shelby tube



The bottom of the cut Shelby tube.

Top

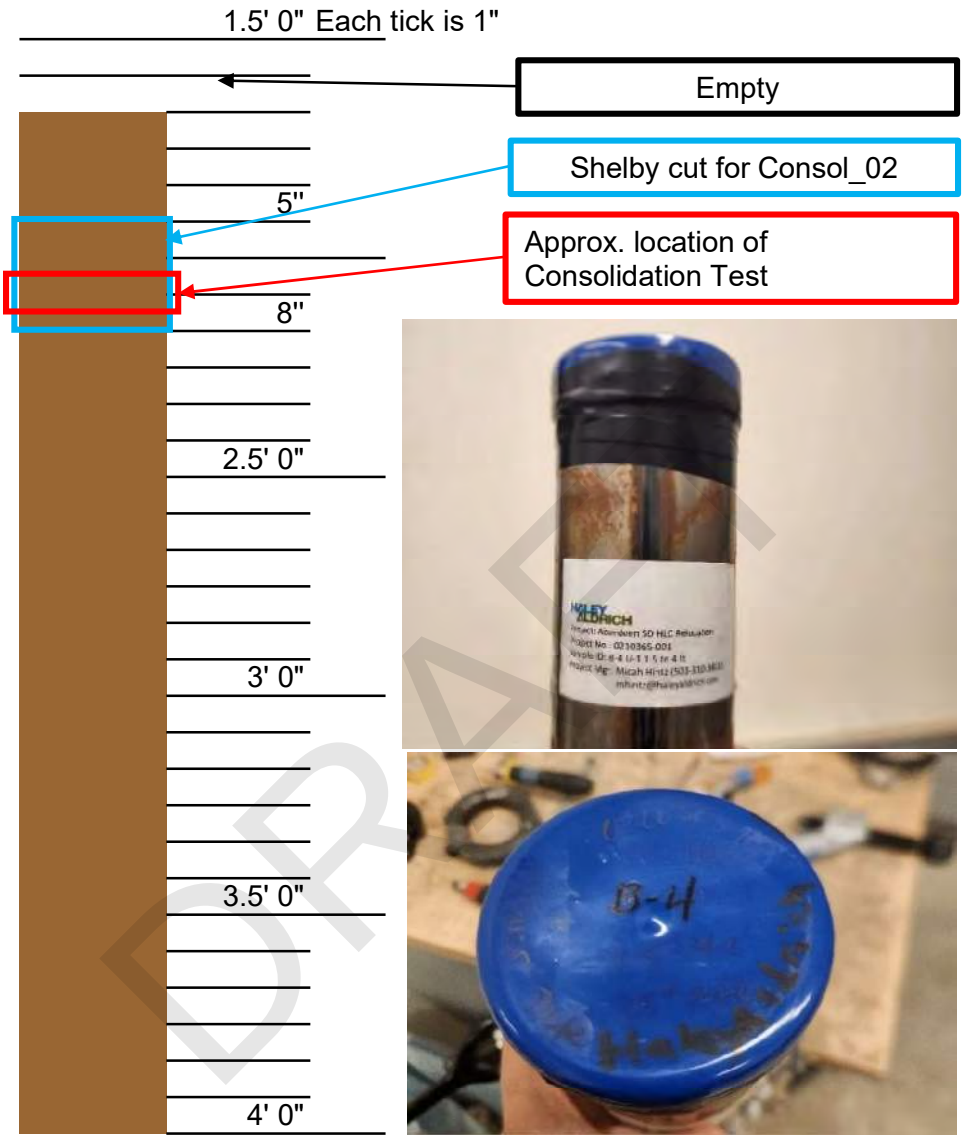


Bottom: after void filled with trimmings



DRAFT

Boring:	B-4
Sample ID:	U-1
Test:	Consol_02



DRAFT

Boring: B-4
Sample ID: U-1
Test: Consol_02

The soil sample was extruded with medium pressure. The specimen is whitish-brown in color and fine-grained soil. It exhibits a stiff consistency with noticeable stickiness. Minor voids were filled using trimmed soil.



The extruded soil from the Shelby tube



The bottom of the cut Shelby tube.

The test specimen contained stones on both the top and bottom sides (as marked in the photos). These stones were removed, and the resulting areas were filled with nearby trimming soil. Minor voids were filled with trimmed soil.

Bottom: Before with void circled in red. After (right) with void filled with trimmings



DRAFT

Boring: B-4
Sample ID: U-1
Test: Consol_02



Top: Before with void circled in red, and After (right) with void filled with trimmings

DRAFT

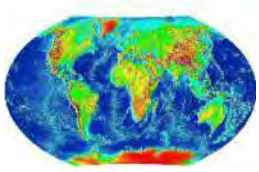
APPENDIX C:

Digital Data Files

DRAFT

DRAFT

APPENDIX C
Geophysics Report



Global Geophysics
P.O. Box 2229
Redmond, WA 98073-2229
Tel: 425-890-4321
Fax: 206-582-0838

Haley & Aldrich, Inc.
4386 S. Macadam Ave | Suite 101
Portland, OR 97239

Attention: Kayla Ahrens, PE

RE: REPORT ON THE GEOPHYSICAL SURVEY AT 1432 FRANKLIN DRIVE, COSMOPOLIS, WA

Dear Kayla:

Global Geophysics conducted 1 MASW and ReMi (refraction microtremor) survey on January 22, 2026 near 1432 Franklin Drive, Cosmopolis, WA. The objective is to obtain Vs100.

GEOPHYSICAL METHODS AND FIELD PROCEDURES

MASW and ReMi

The MASW and ReMi methods determines variations in surface wave velocities with increasing distances and wavelengths. The data from these measurements are used to model the shear wave velocities of the subsurface. This information can then be used to infer rock/soil types, stratigraphy and soil conditions.

The MASW uses active source while ReMi survey uses passive sources. They require a seismic source, to generate surface-waves, and at least 24 geophones, to measure the ground response at increasing distances from the source. Surface waves are a special type of seismic wave whose propagation is confined to the near surface medium. The depth of subsurface penetration of a surface-wave is directly proportional to its wavelength. In a non-homogeneous medium, surface-waves are dispersive, i.e. each wavelength has a characteristic velocity stemming from subsurface heterogeneities. The relationship between surface-wave velocity and wavelength is used to calculate the shear-wave velocity of the medium with increasing depth.

The seismic source can be either active or passive, depending on the application and location of the survey. Examples of active sources include explosives, weight-drops, and vibrating pads. Examples of passive sources are drill rigs, road traffic, micro-tremors, and water-wave action (in near-shore environments). Geophone measures the arrival time of the various components of the surface wave-train traveling from the seismic source.

The surface-wave velocity with respect to frequency (called the 'dispersion curve') is determined by measuring the delay time in wave propagation between the geophones. The dispersion curve is then matched to a theoretical dispersion curve using an iterative forward-modeling procedure. The result is a profile of shear-wave velocity versus depth. This shear wave profile can be with used other parameters such as density, to estimate the dynamic shear modulus of the medium as a function of depth.

The ReMi survey was conducted using 24 4.5-Hz vertical geophones placed at 10 ft spacing and the seismic energy source was from ambient vibrations.

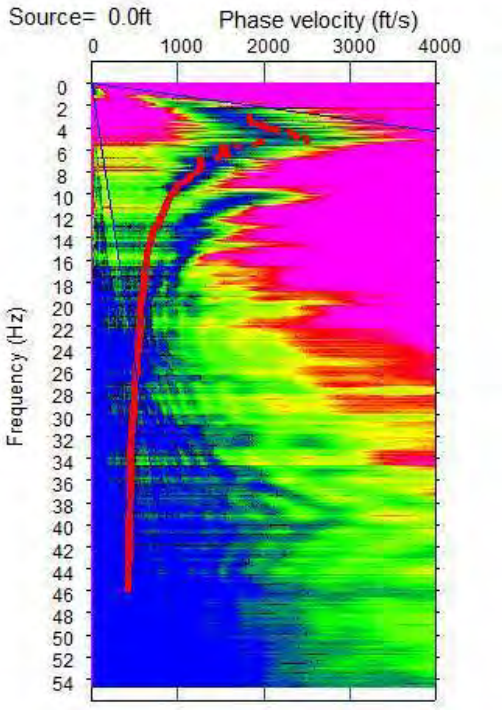
RESULTS

The data were collected at 1 locations. The line layout is shown with the data below.

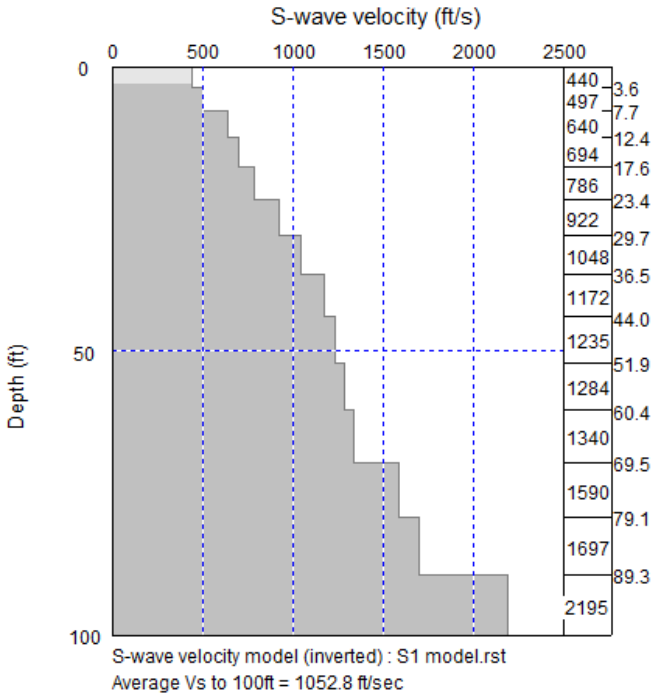


ReMi Test Results:

Sounding S-1 Dispersion Curve:



S-1 model graph:



Vs100 =1052.8 ft/s

Table 1: S-1 S-wave velocity model

Depth(ft)	S-wave velocity(ft/s)
0	441
4	498
8	641
12	694
18	787
23	923
30	1049
37	1173
44	1236
52	1284
60	1341
70	1591
79	1698
89	2196
100	2196

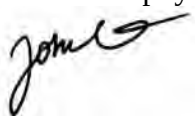
CLOSURE

Global Geophysics services will be conducted in a manner consistent with the level of care and skill ordinarily exercised by other members of the geophysical community currently practicing under similar conditions subject to the time limits and financial and physical constraints applicable to the services.

We appreciate the opportunity to work with you on this project, and we hope that you find the results of the geophysical survey useful to your investigation. If you have any questions regarding this report, please call the undersigned at 425-890-4321. We look forward to providing you with additional geophysical services in the future.

Sincerely,

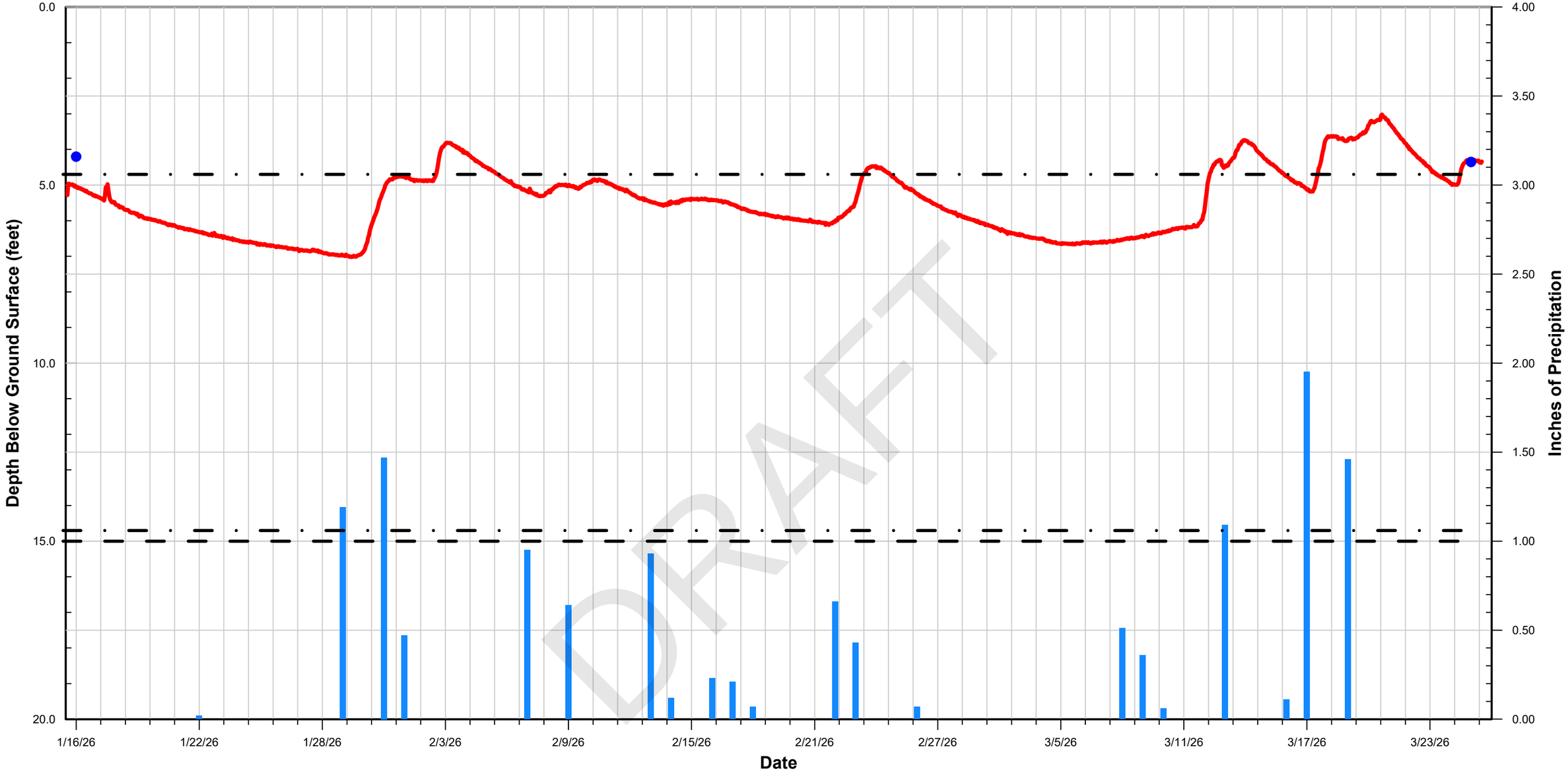
Global Geophysics.



John Liu, Ph.D., R.G.
Principal Geophysicist

APPENDIX D
Groundwater Figures

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LEGEND

TOP OF WELL SCREEN
BOTTOM OF WELL
PRECIPITATION
BOTTOM OF WELL SCREEN
DEPTH OF WATER
MANUAL READING

NOTES:
1) GROUND SURFACE ELEVATION = 125.0 FEET (NAVD 88).
2) RAINFALL REPORTED AT STATION ABERDEEN 2.1 SE, WA US, LOCATED APPROXIMATELY 0.4 MILES W OF PROJECT SITE.

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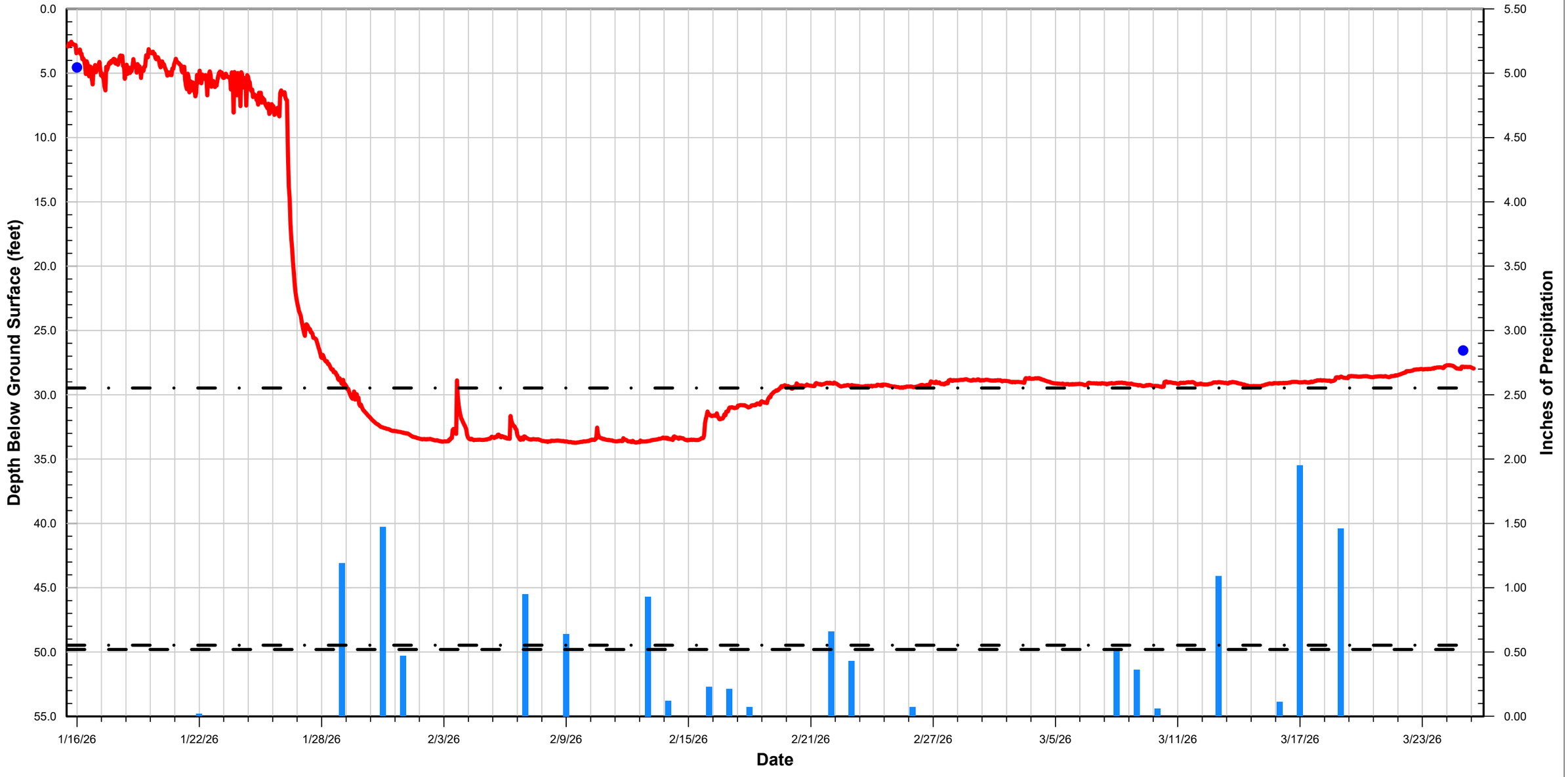
SOUTH ELEMENTARY SCHOOL RELOCATION
ABERDEEN, WASHINGTON

MW-1 GROUNDWATER DEPTH AND PRECIPITATION PLOT

APRIL 2026

FIGURE C-1

\\haleyaldrich.com\share\CF\Projects\0211414\Geotech\-003 South Elementary\Calc 8_Groundwater\MW-1 & MW-2 GW Data.gpj



LEGEND

TOP OF WELL SCREEN
BOTTOM OF WELL
PRECIPITATION
BOTTOM OF WELL SCREEN
DEPTH OF WATER
MANUAL READING

NOTES:
1) GROUND SURFACE ELEVATION = 121.0 FEET (NAVD 88).
2) RAINFALL REPORTED AT STATION ABERDEEN 2.1 SE, WA US, LOCATED APPROXIMATELY 0.4 MILES W OF PROJECT SITE.
3) SEE REPORT TEXT FOR DISCUSSION OF INITIAL HIGH GROUNDWATER READINGS AND SUBSEQUENT DROP

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SOUTH ELEMENTARY SCHOOL RELOCATION
ABERDEEN, WASHINGTON

MW-2 GROUNDWATER DEPTH AND PRECIPITATION PLOT

APRIL 2026

FIGURE C-2

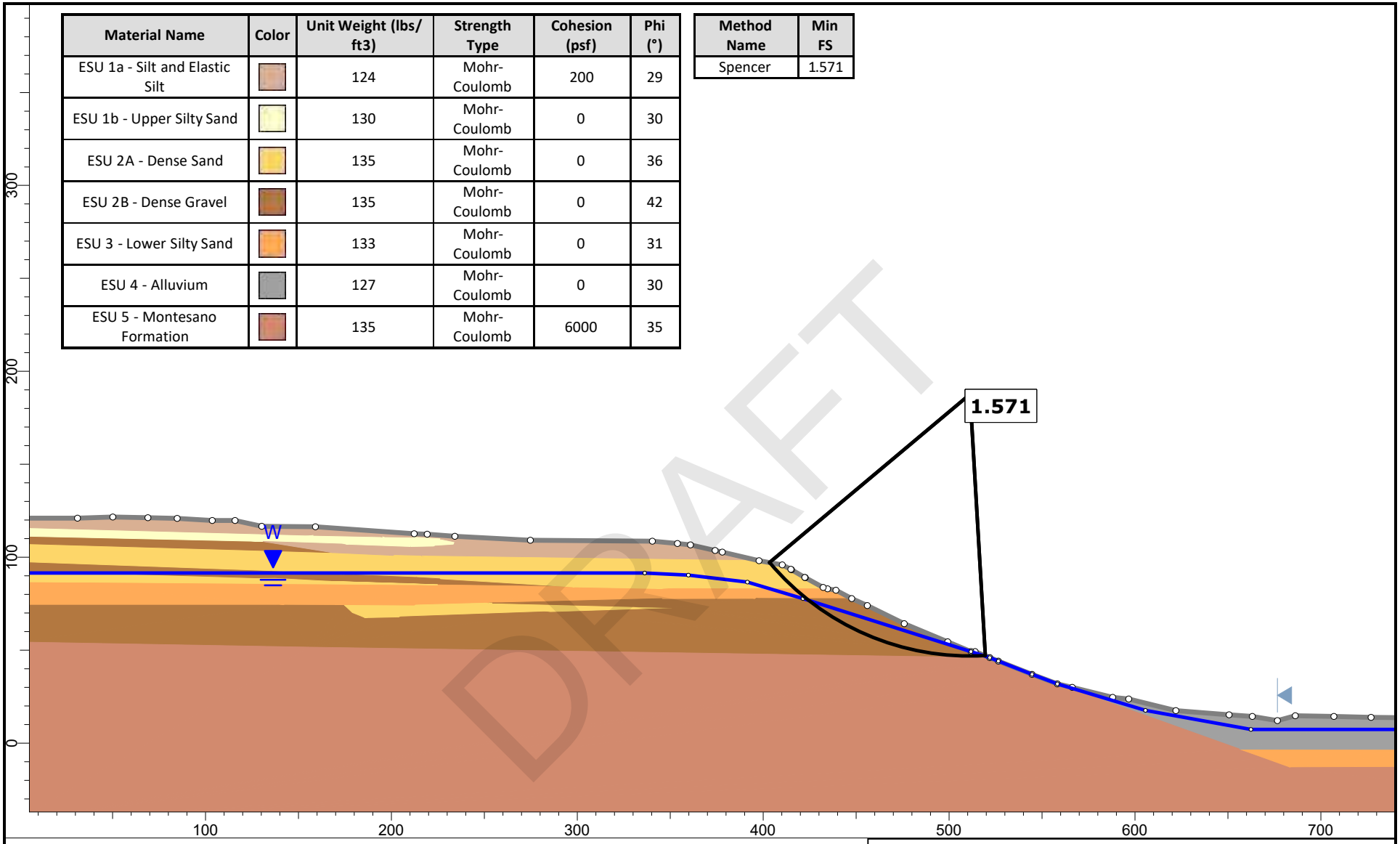
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APPENDIX E
Slope Stability

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35

Method Name	Min FS
Spencer	1.571



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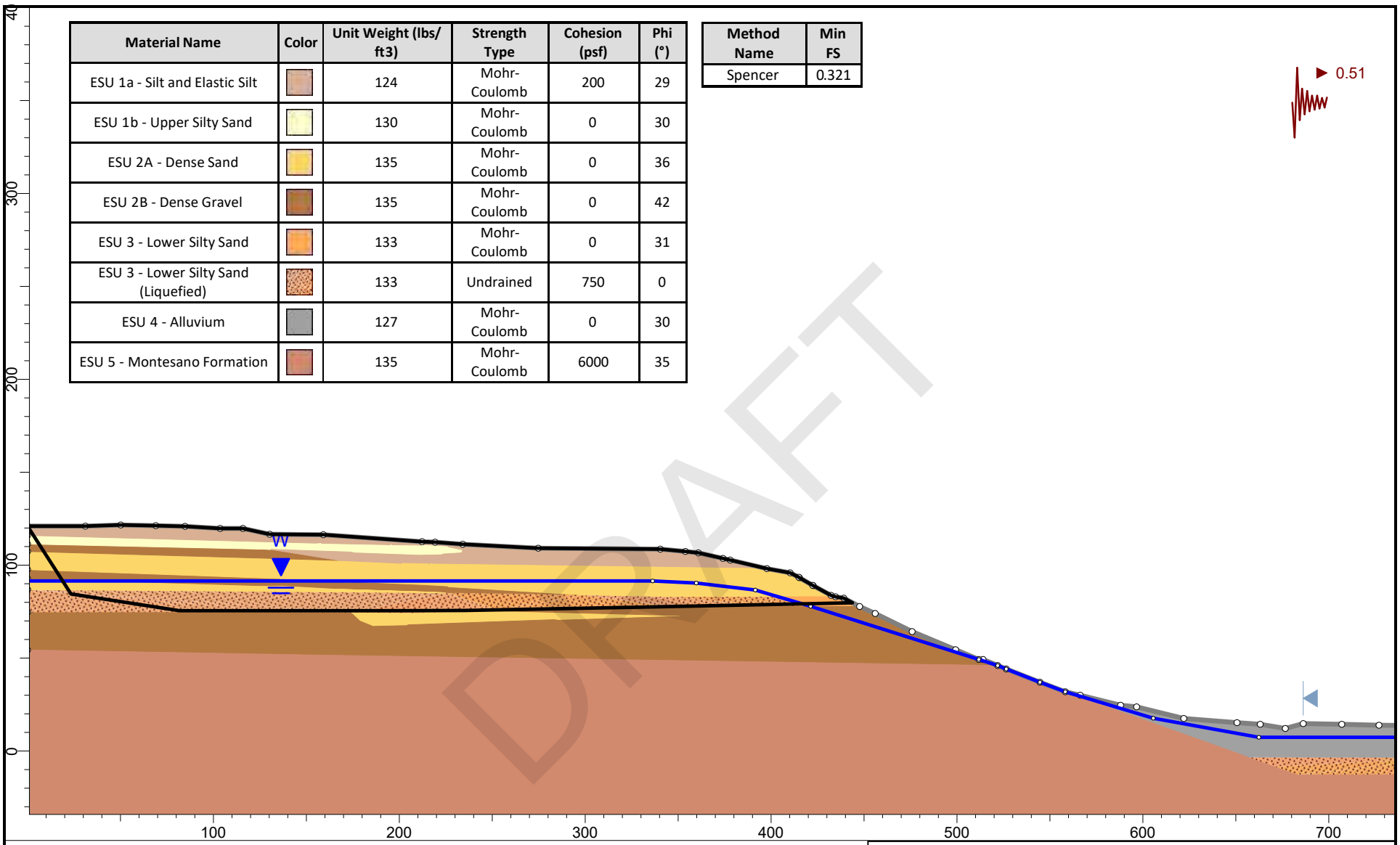
CROSS-SECTION A-A'
EXISTING CONDITION
STATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E1

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35

Method Name	Min FS
Spencer	0.321



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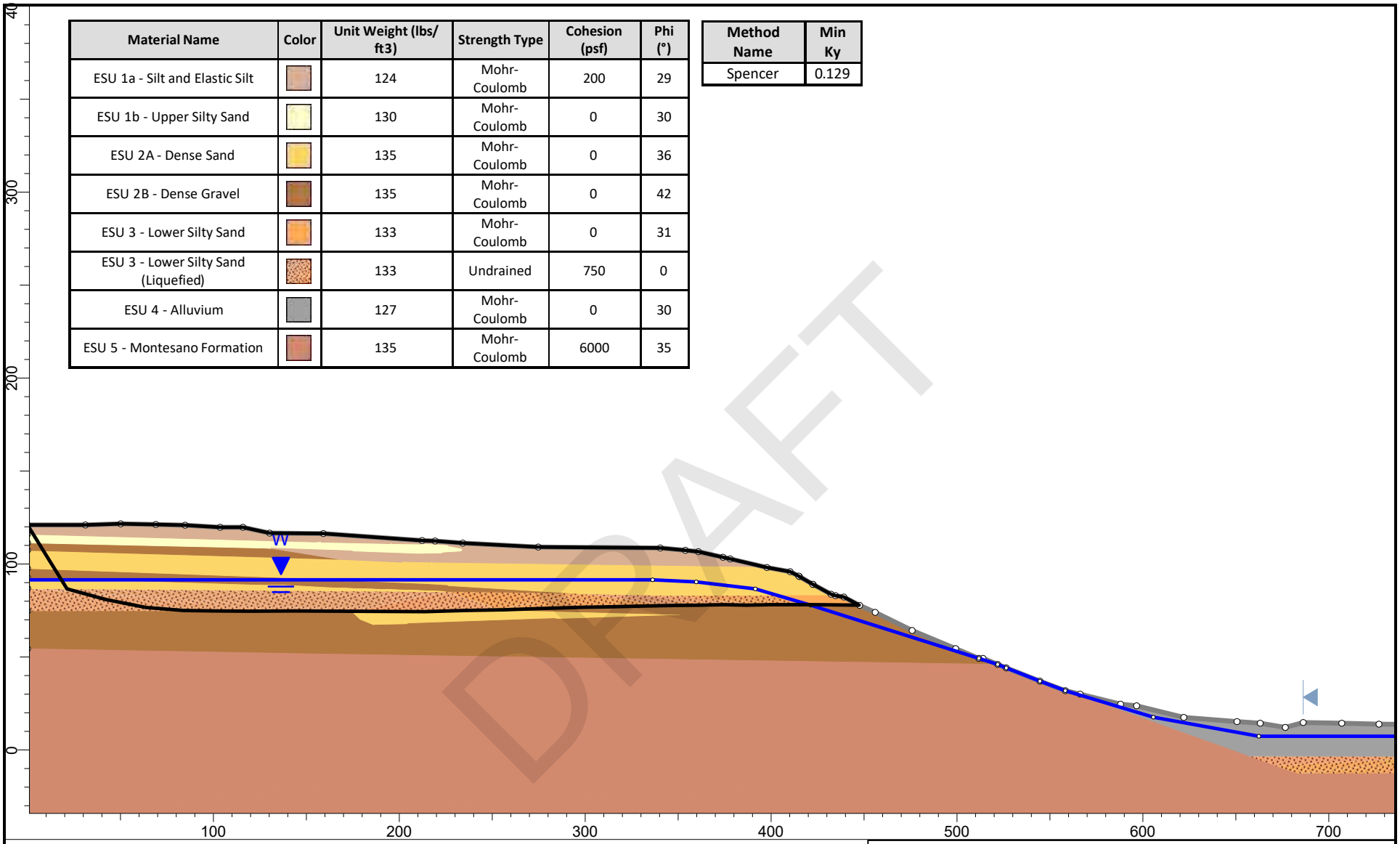
CROSS-SECTION A-A'
EXISTING CONDITION
PSEUDOSTATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E2

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35

Method Name	Min Ky
Spencer	0.129



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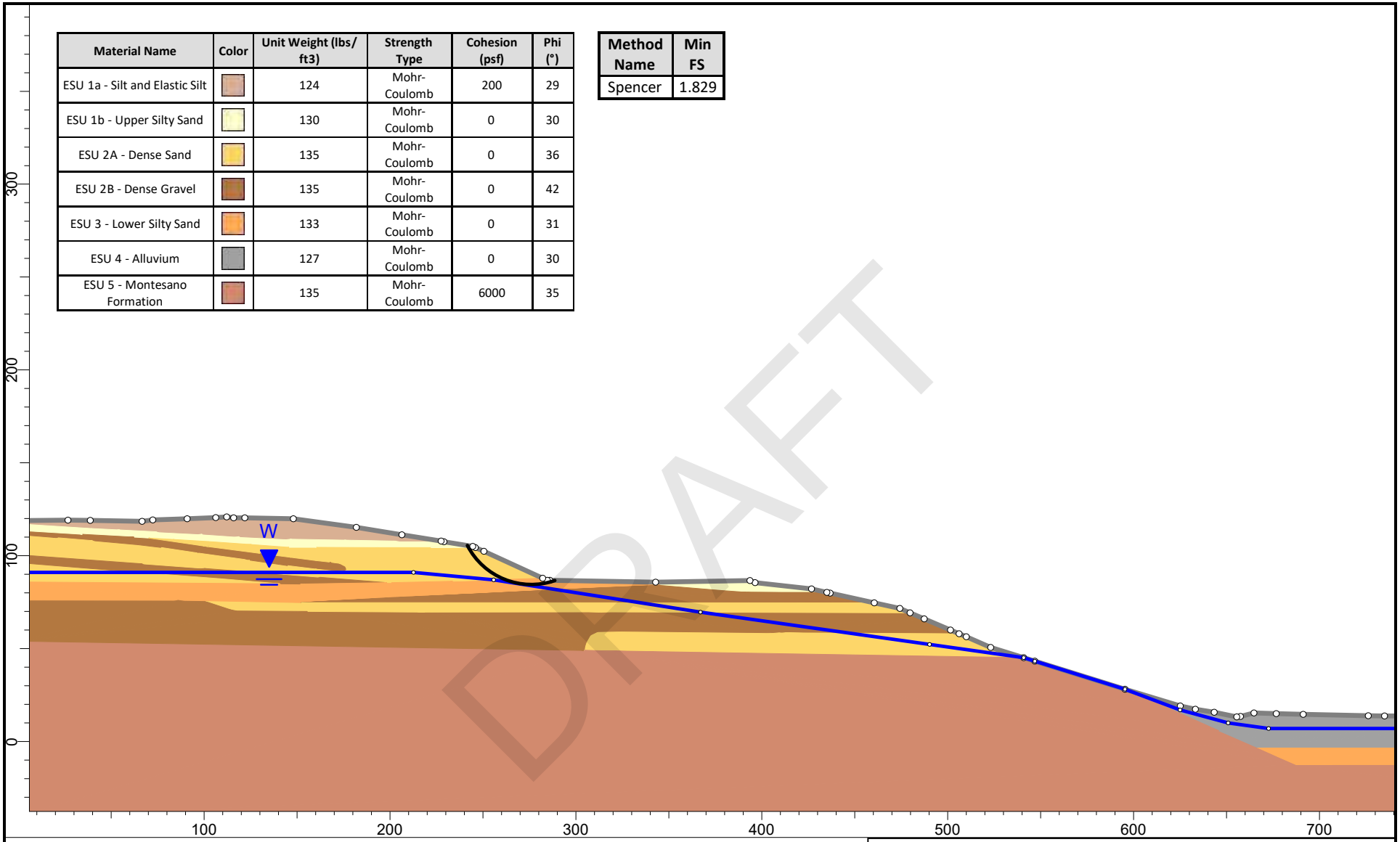
CROSS-SECTION A-A'
EXISTING CONDITION
SEISMIC YIELD ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E3

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35

Method Name	Min FS
Spencer	1.829



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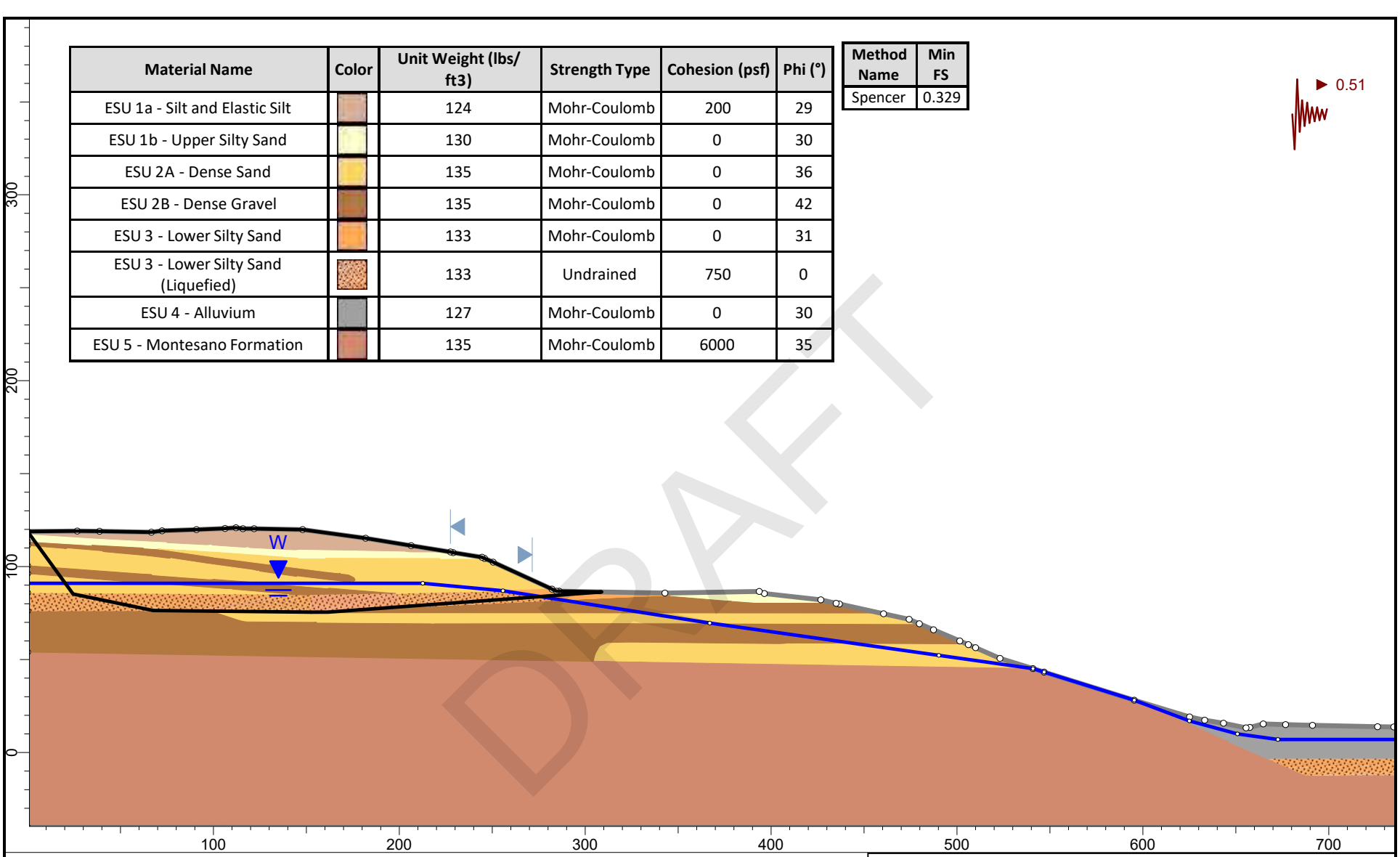
CROSS-SECTION B-B'
EXISTING CONDITION
STATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E4

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35

Method Name	Min FS
Spencer	0.329



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CROSS-SECTION B-B'
EXISTING CONDITION
PSEUDOSTATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

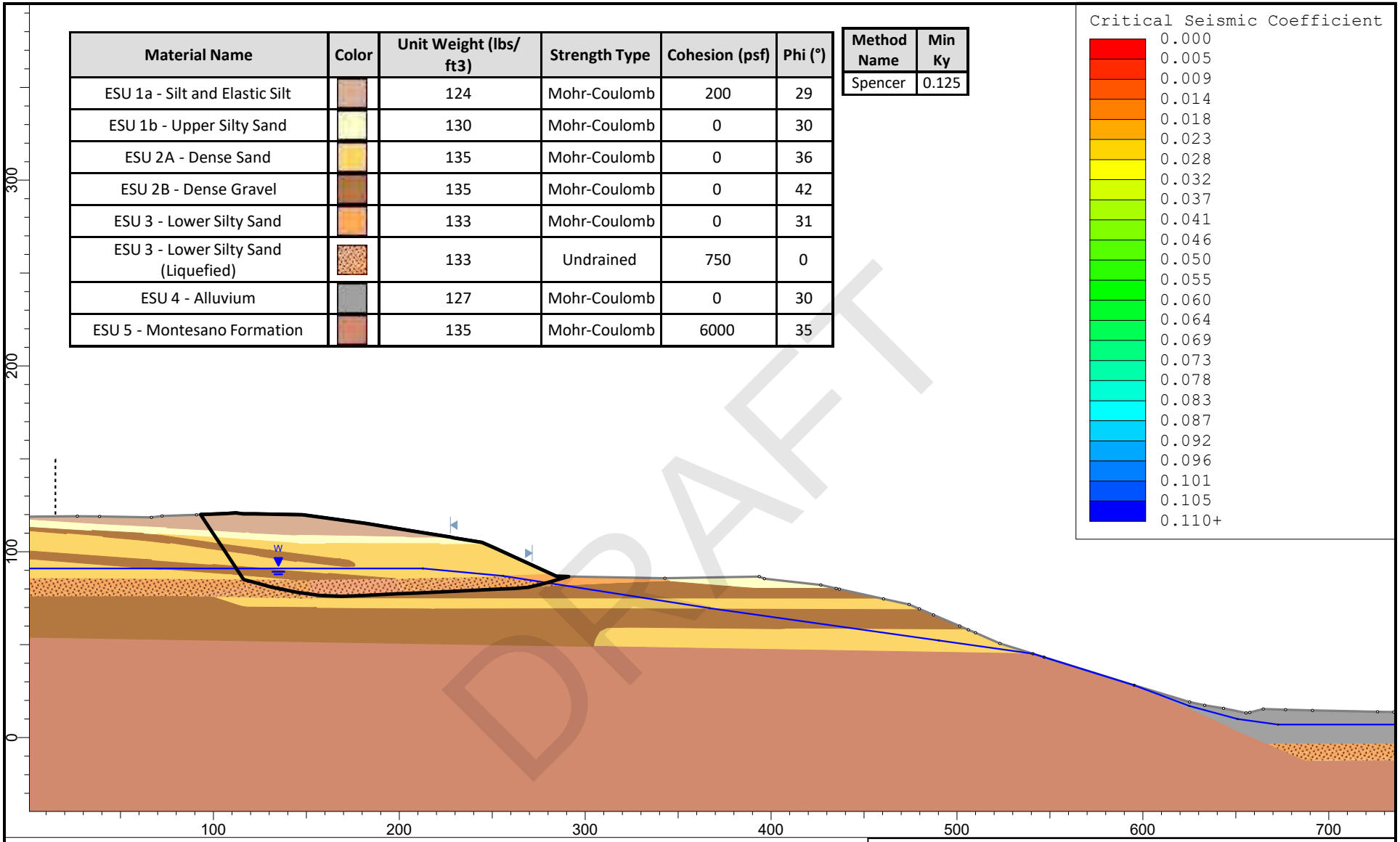
FIGURE E5

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35

Method Name	Min Ky
Spencer	0.125

Critical Seismic Coefficient

0.000
0.005
0.009
0.014
0.018
0.023
0.028
0.032
0.037
0.041
0.046
0.050
0.055
0.060
0.064
0.069
0.073
0.078
0.083
0.087
0.092
0.096
0.101
0.105
0.110+



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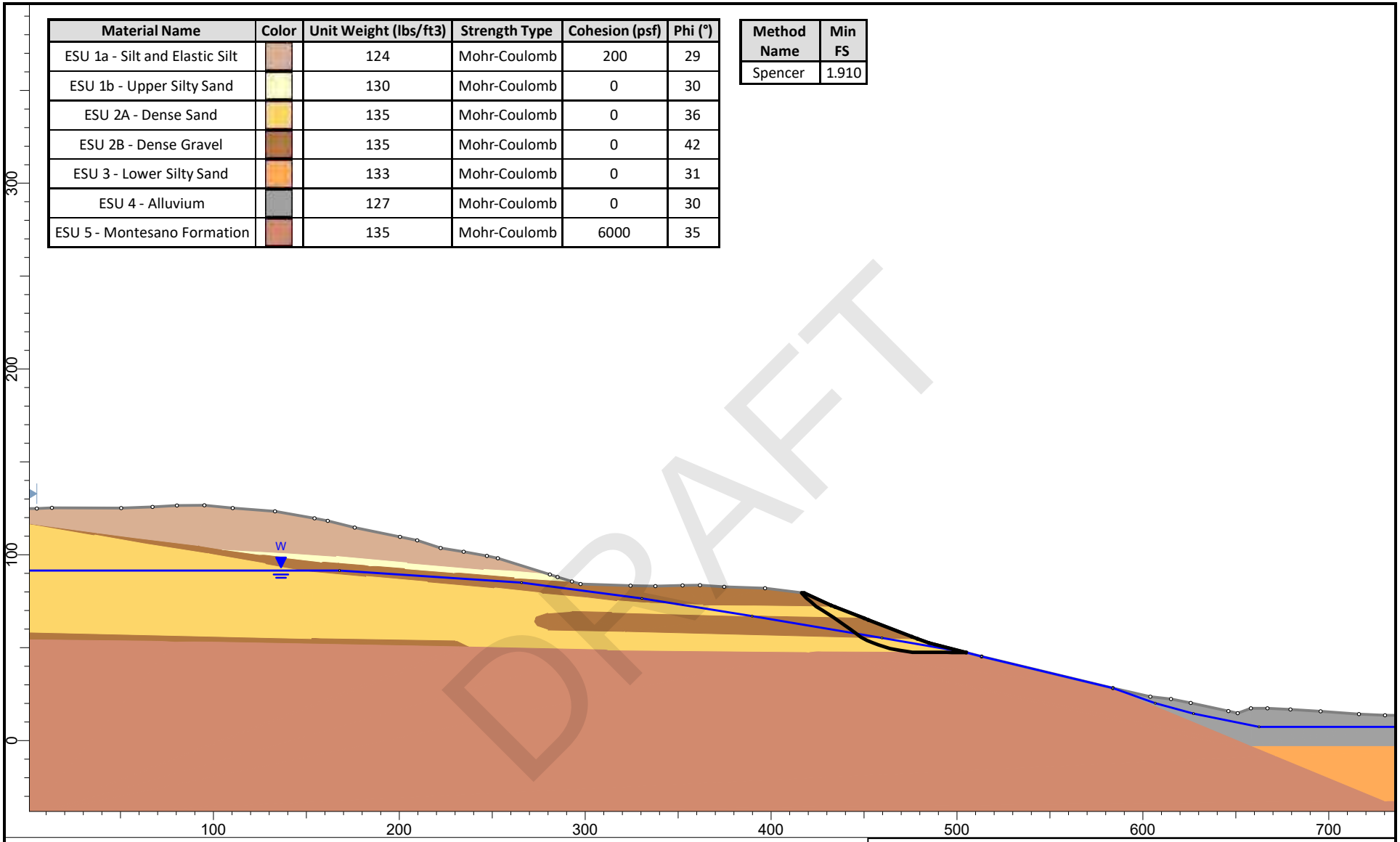
CROSS-SECTION B-B'
EXISTING CONDITION
SEISMIC YIELD ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E6

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35

Method Name	Min FS
Spencer	1.910



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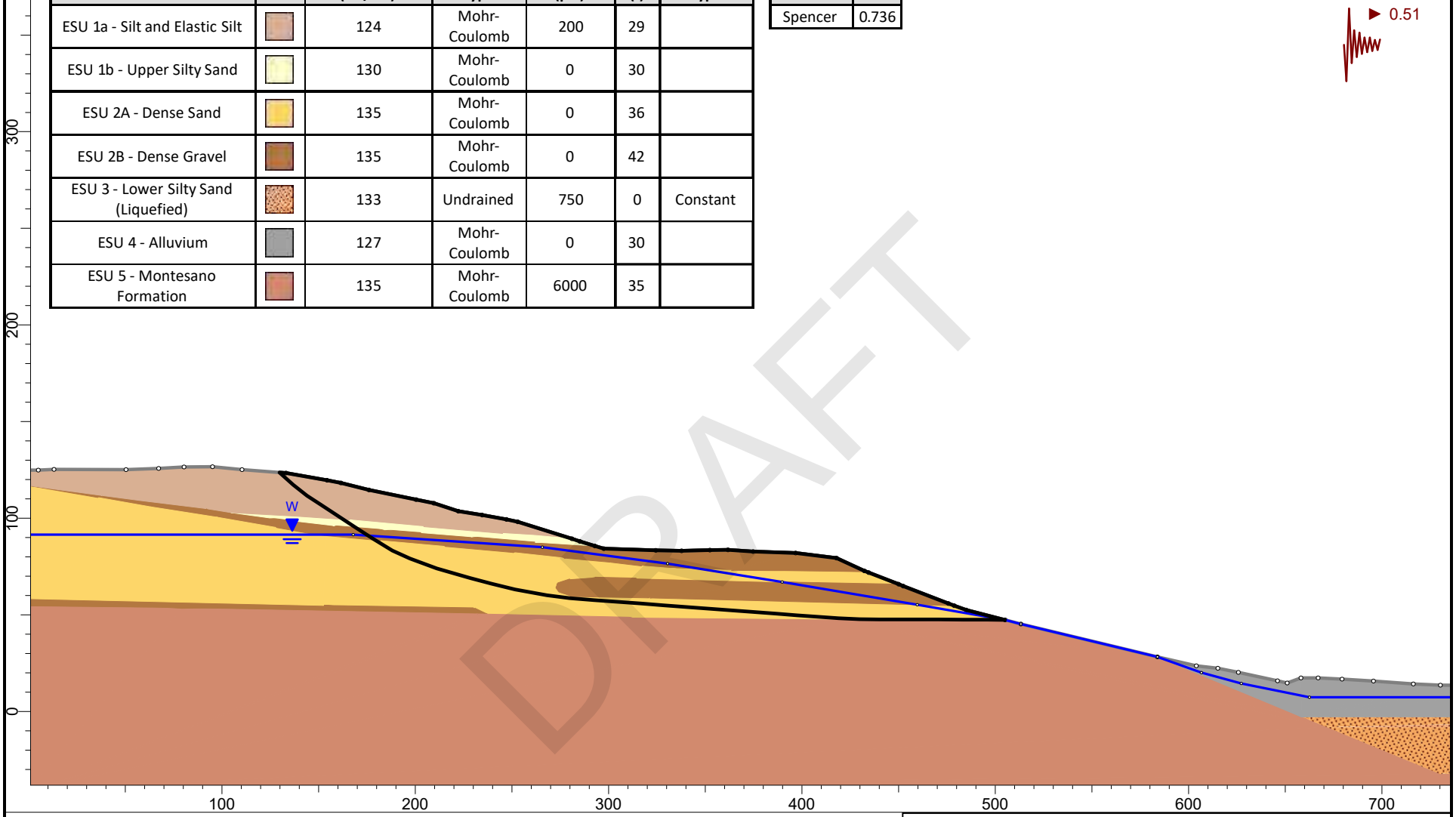
CROSS-SECTION C-C'
EXISTING CONDITION
STATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E7

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)	Cohesion Type
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29	
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30	
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36	
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42	
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0	Constant
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30	
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35	

Method Name	Min FS
Spencer	0.736



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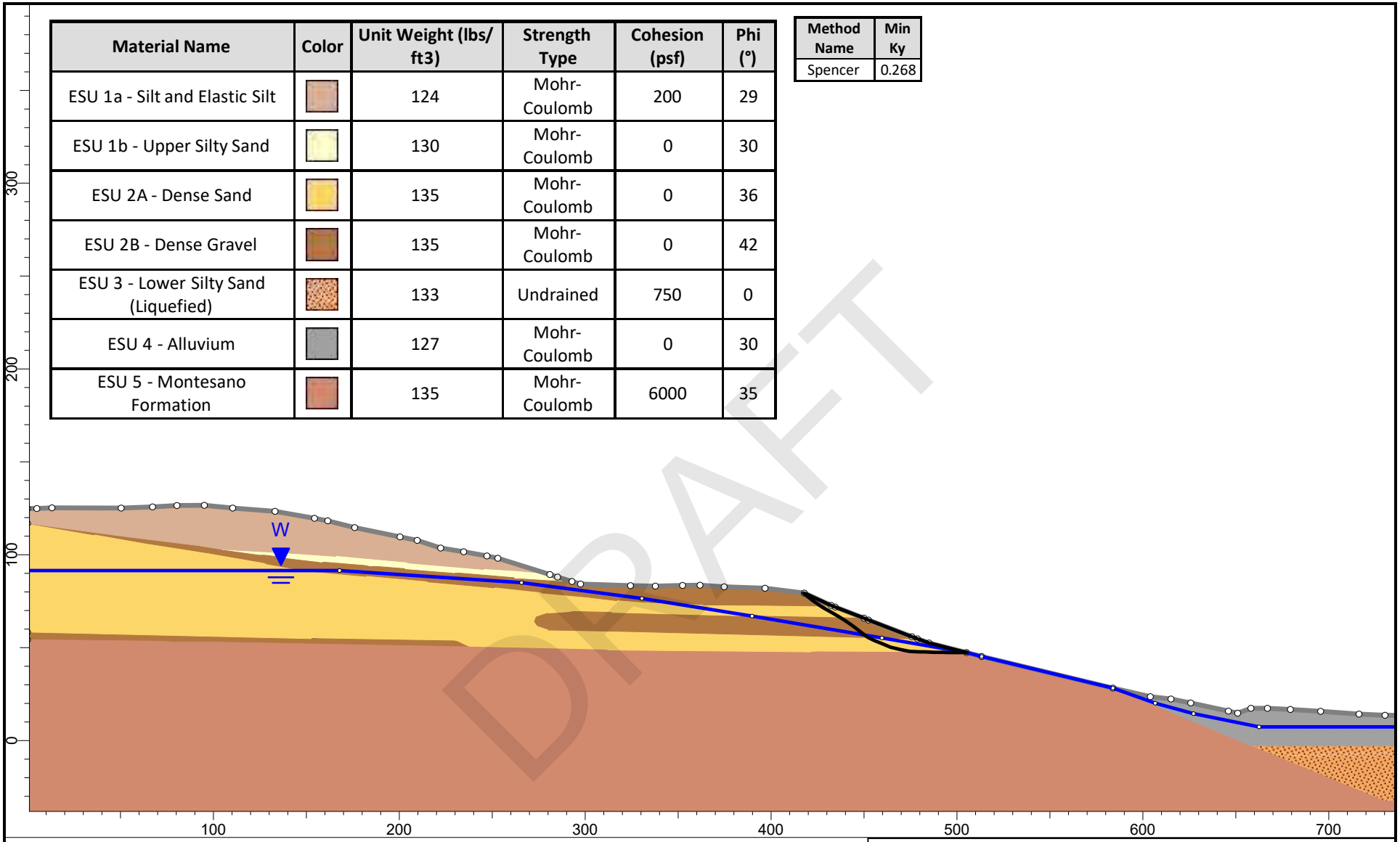
CROSS-SECTION C-C'
EXISTING CONDITION
PSEUDOSTATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E8

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35

Method Name	Min Ky
Spencer	0.268



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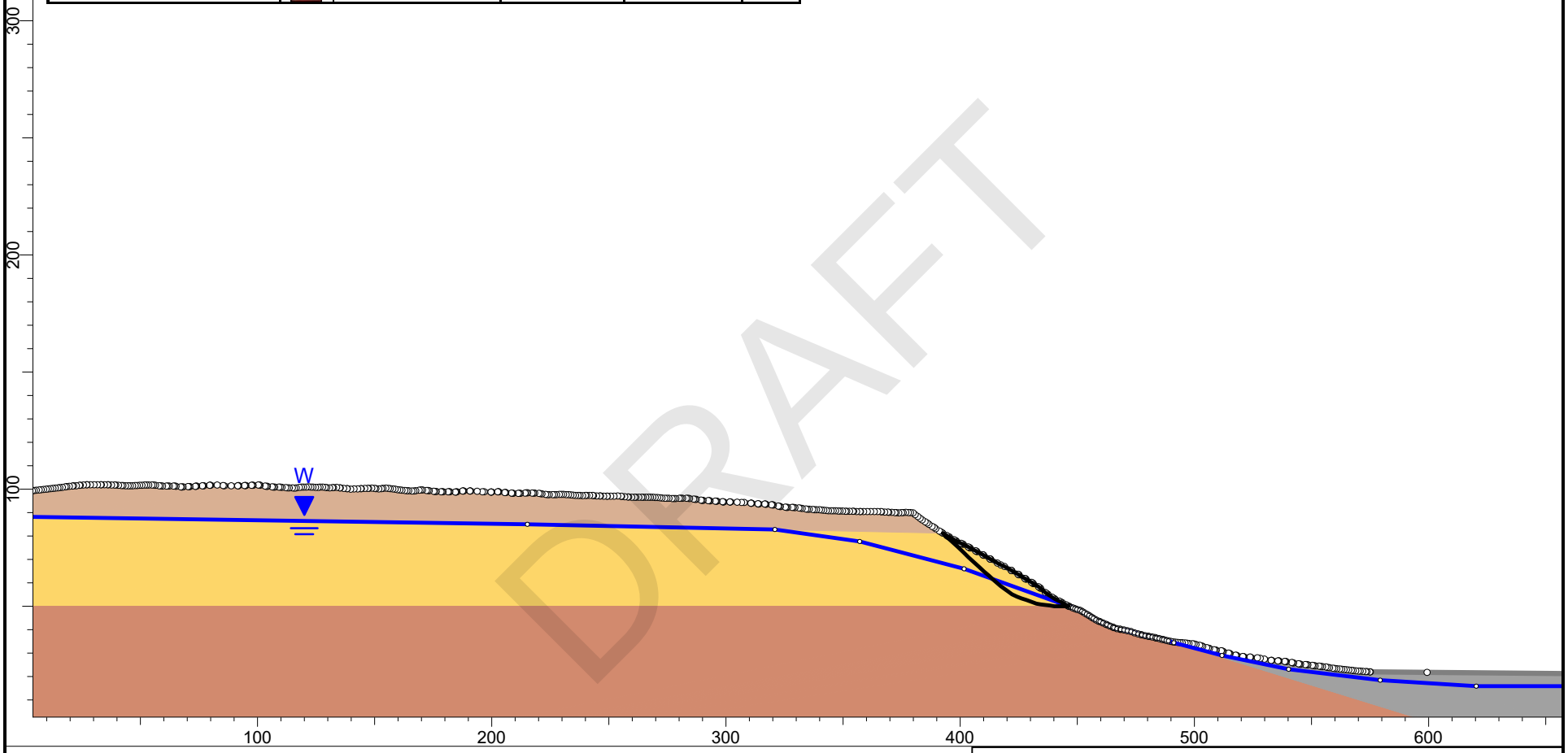
CROSS-SECTION C-C'
EXISTING CONDITION
SEISMIC YIELD ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E9

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35

Method Name	Min FS
Spencer	1.198



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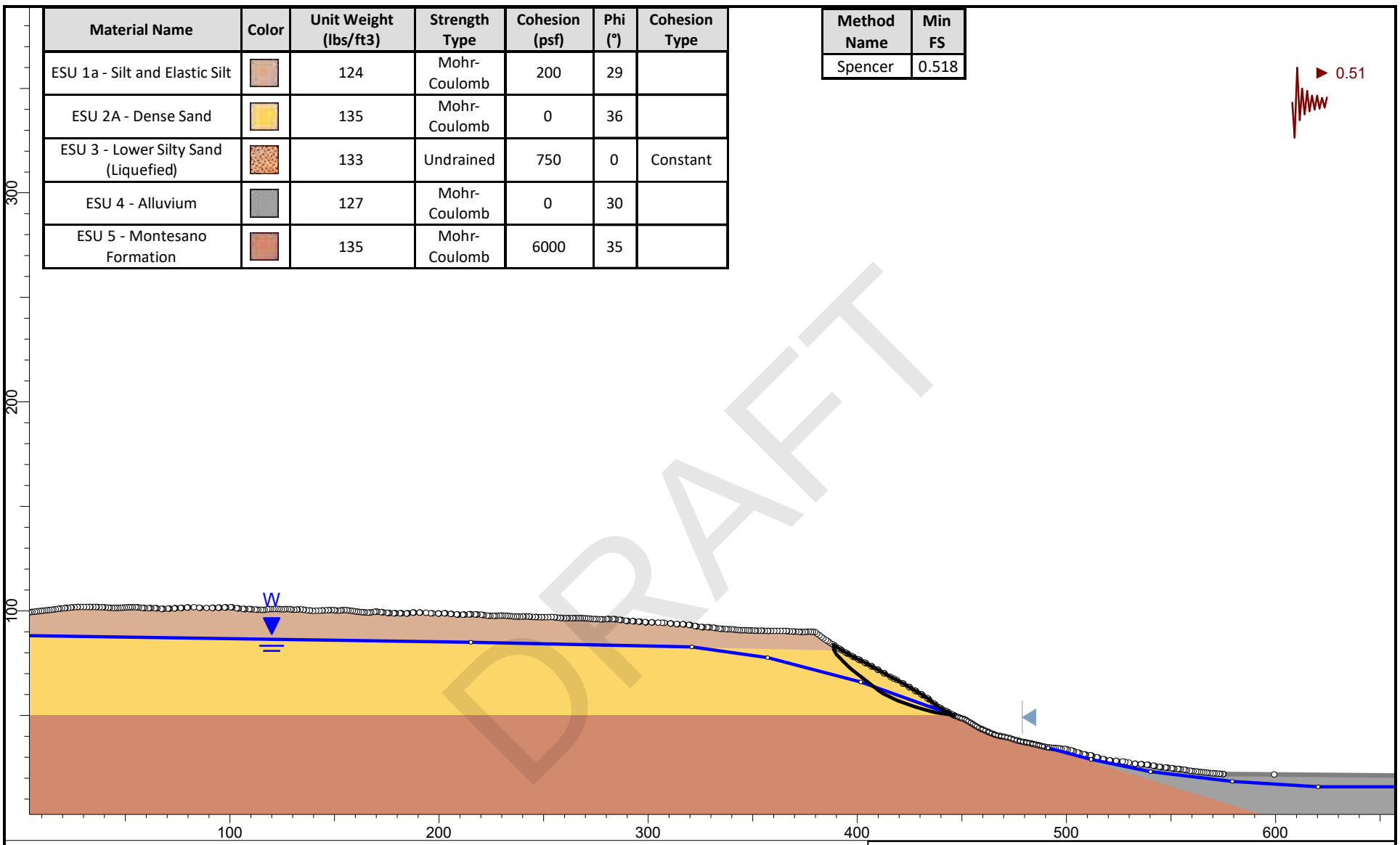
CROSS-SECTION F-F'
EXISTING CONDITION
STATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E10

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)	Cohesion Type
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29	
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36	
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0	Constant
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30	
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35	

Method Name	Min FS
Spencer	0.518



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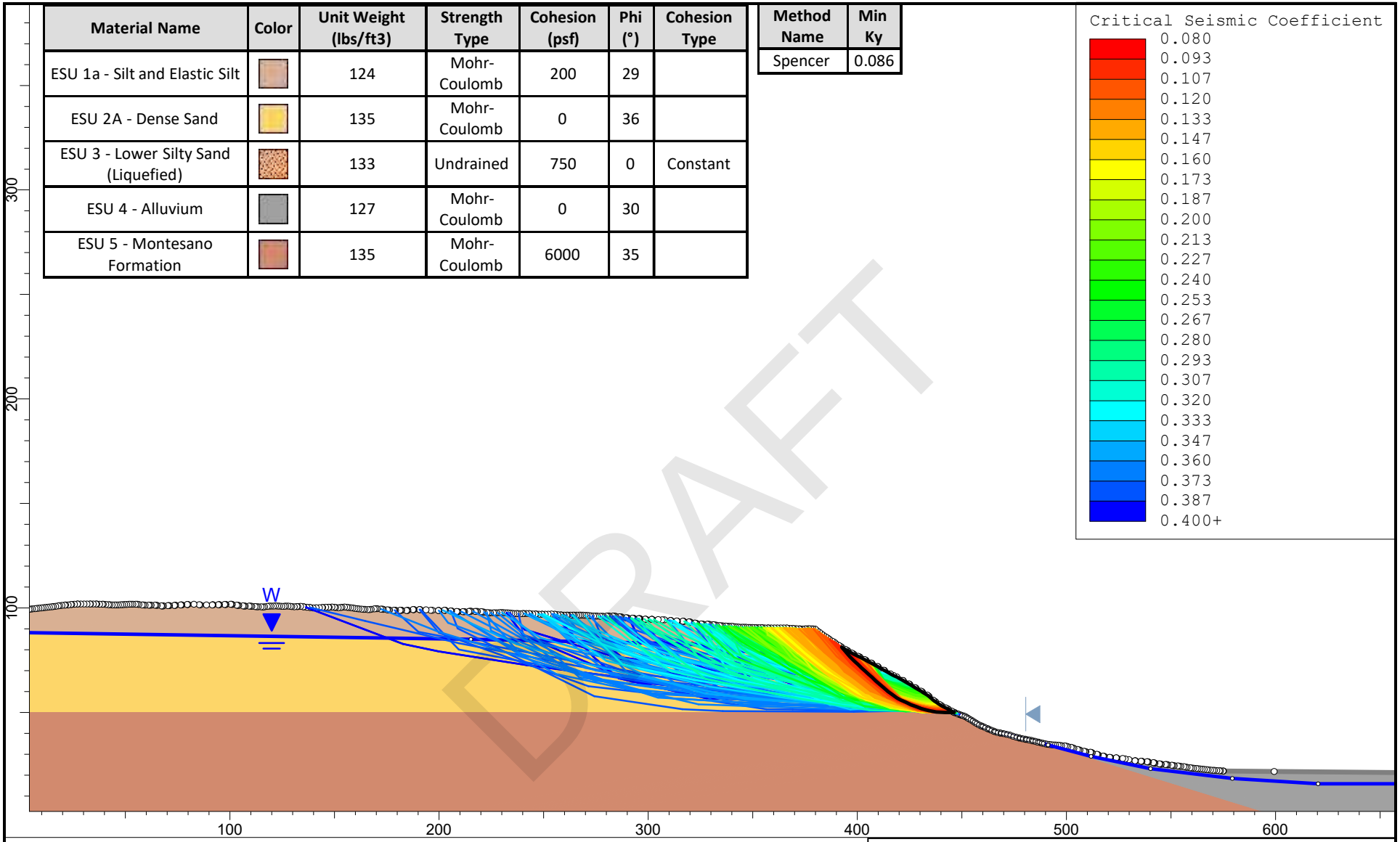
CROSS-SECTION F-F'
EXISTING CONDITION
PSEUDOSTATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E11

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)	Cohesion Type
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29	
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36	
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0	Constant
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30	
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35	

Method Name	Min Ky
Spencer	0.086



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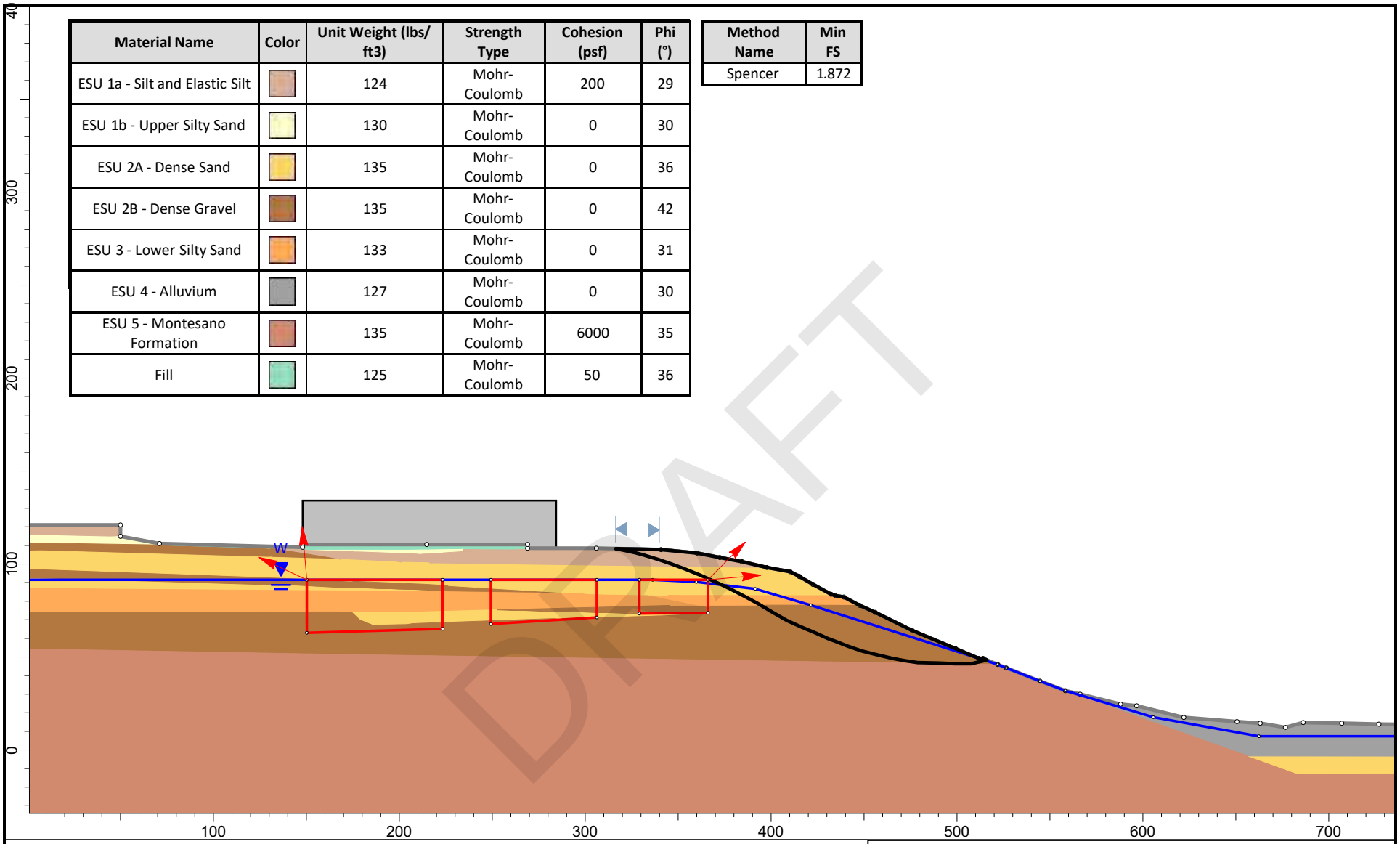
CROSS-SECTION F-F'
EXISTING CONDITION
SEISMIC YIELD ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E12

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36

Method Name	Min FS
Spencer	1.872



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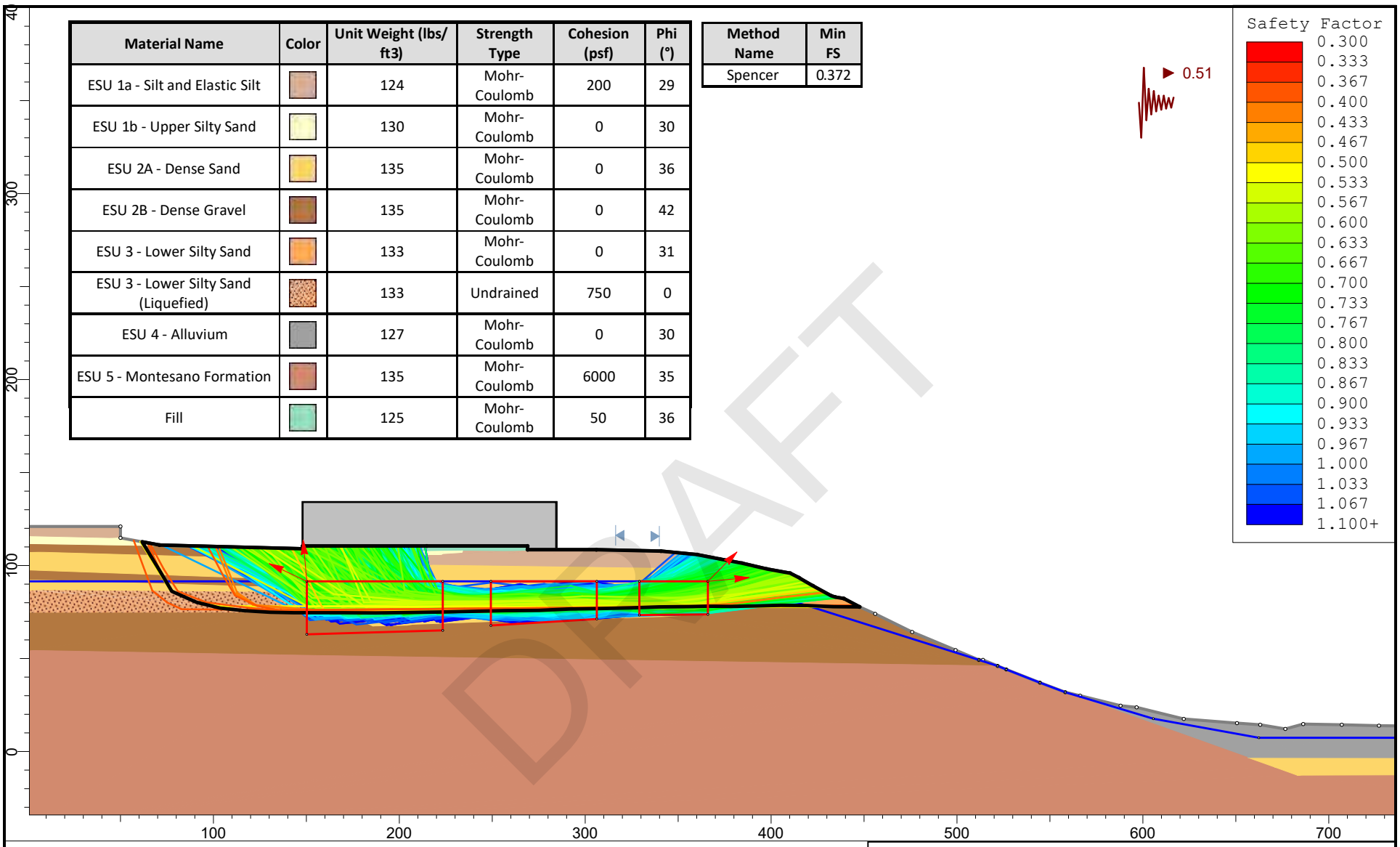
CROSS-SECTION A-A'
PROPOSED CONDITION
STATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E13

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36

Method Name	Min FS
Spencer	0.372



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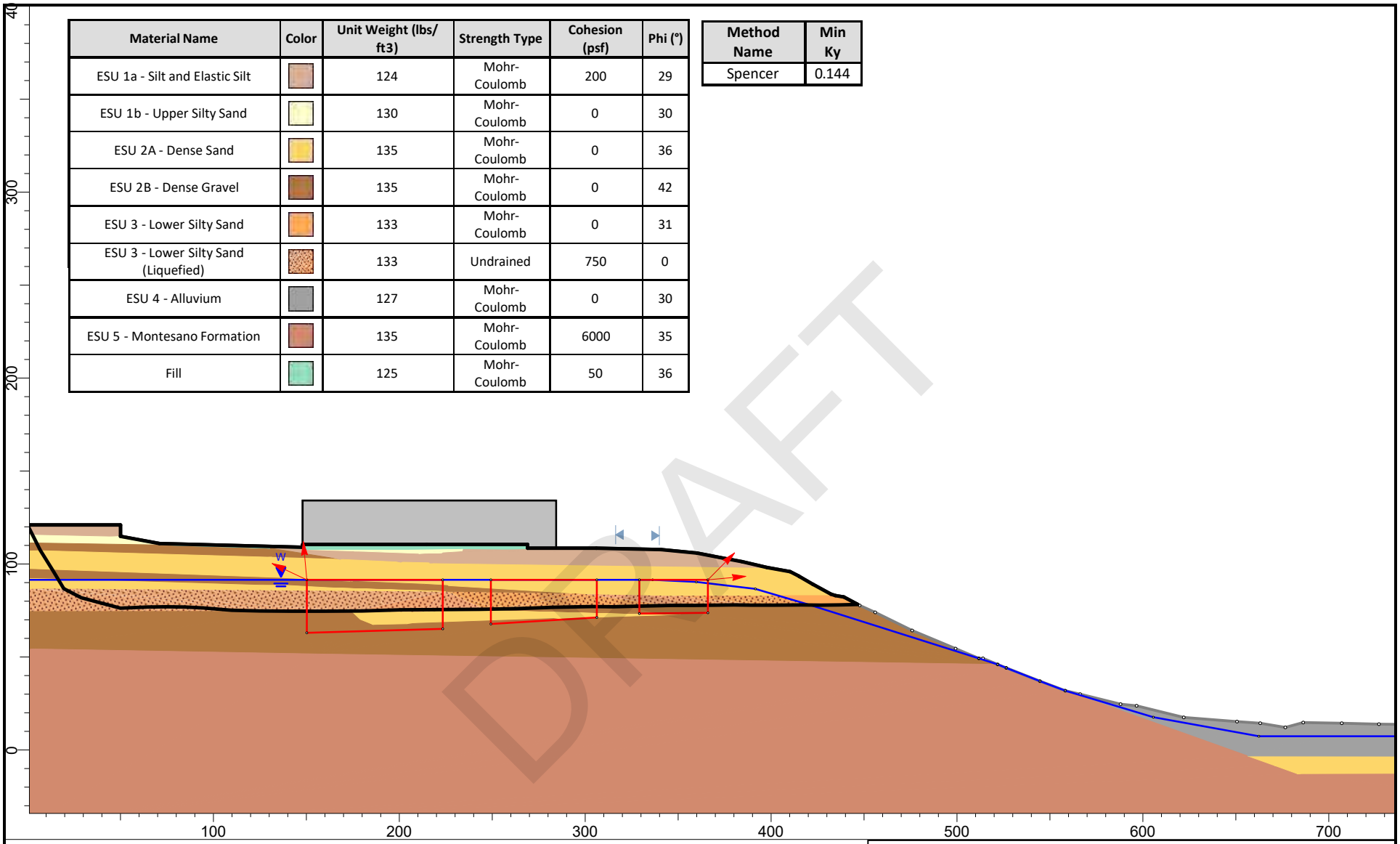
CROSS-SECTION A-A'
PROPOSED CONDITION
PSEUDOSTATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E14

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36

Method Name	Min Ky
Spencer	0.144



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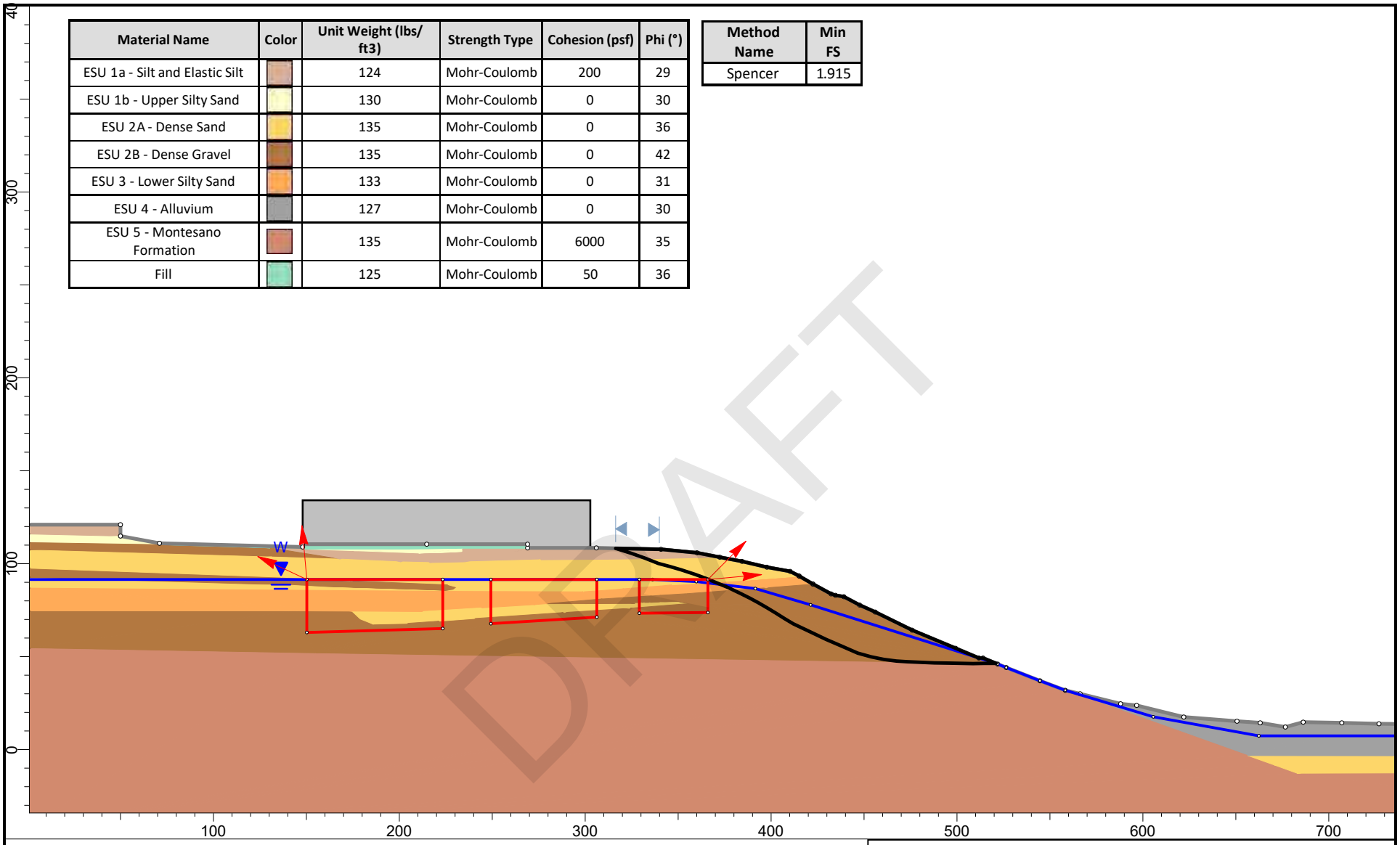
CROSS-SECTION A-A'
PROPOSED CONDITION
SEISMIC YIELD ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E15

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36

Method Name	Min FS
Spencer	1.915



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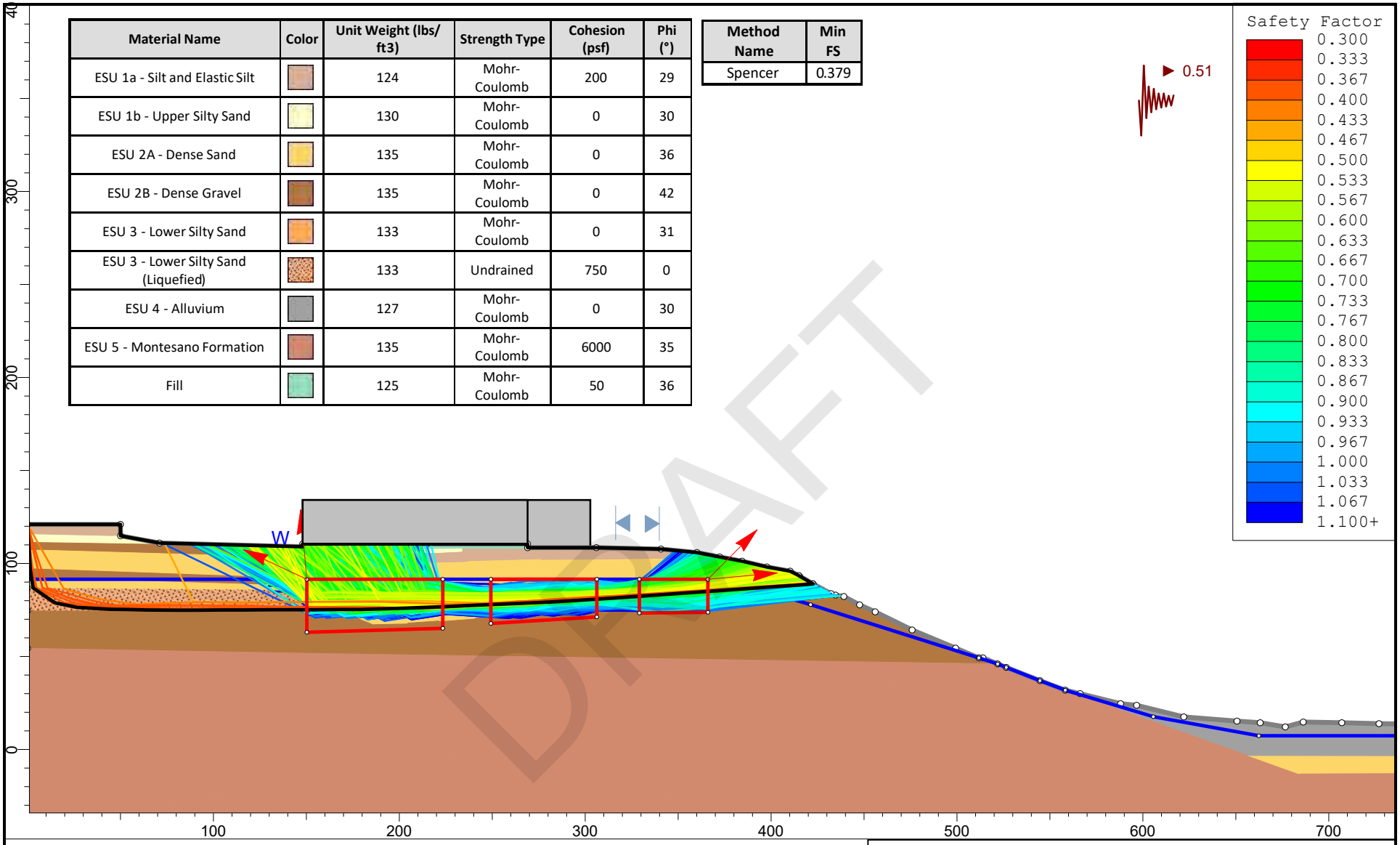
CROSS-SECTION B-B'
PROPOSED CONDITION
STATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E16

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36

Method Name	Min FS
Spencer	0.379



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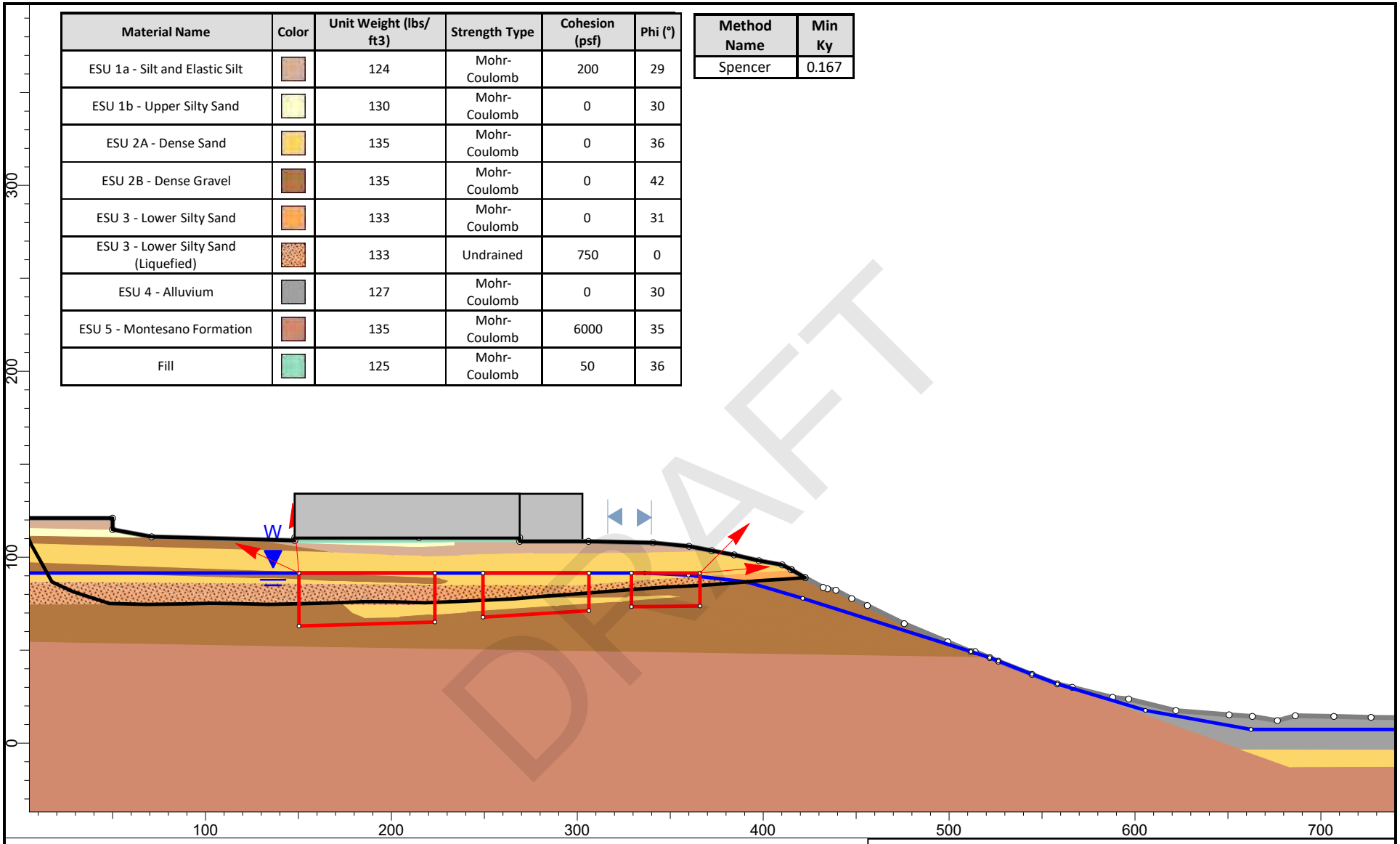
CROSS-SECTION B-B'
PROPOSED CONDITION
PSEUDOSTATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E17

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36

Method Name	Min Ky
Spencer	0.167



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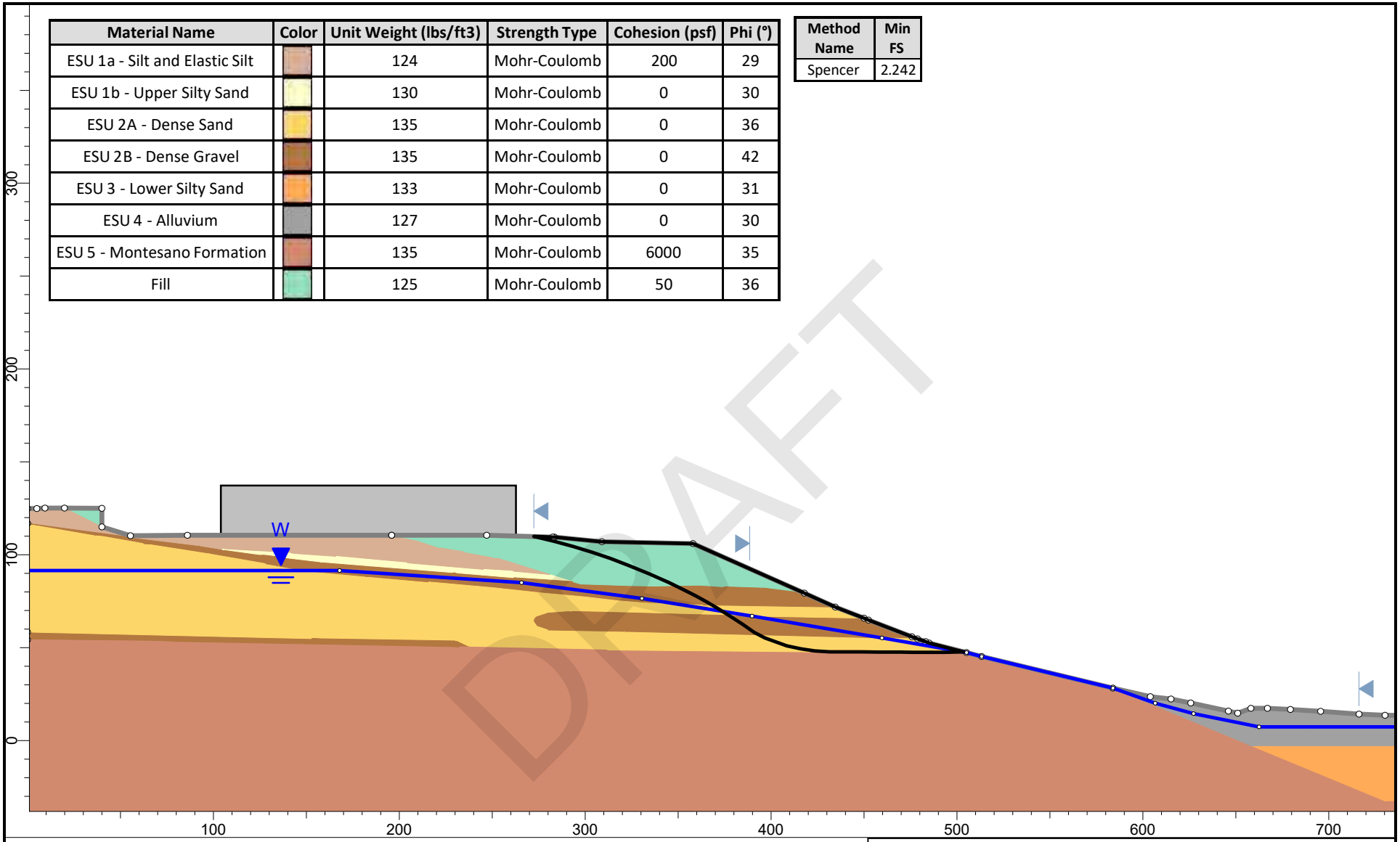
CROSS-SECTION B-B'
PROPOSED CONDITION
SEISMIC YIELD ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E18

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36

Method Name	Min FS
Spencer	2.242



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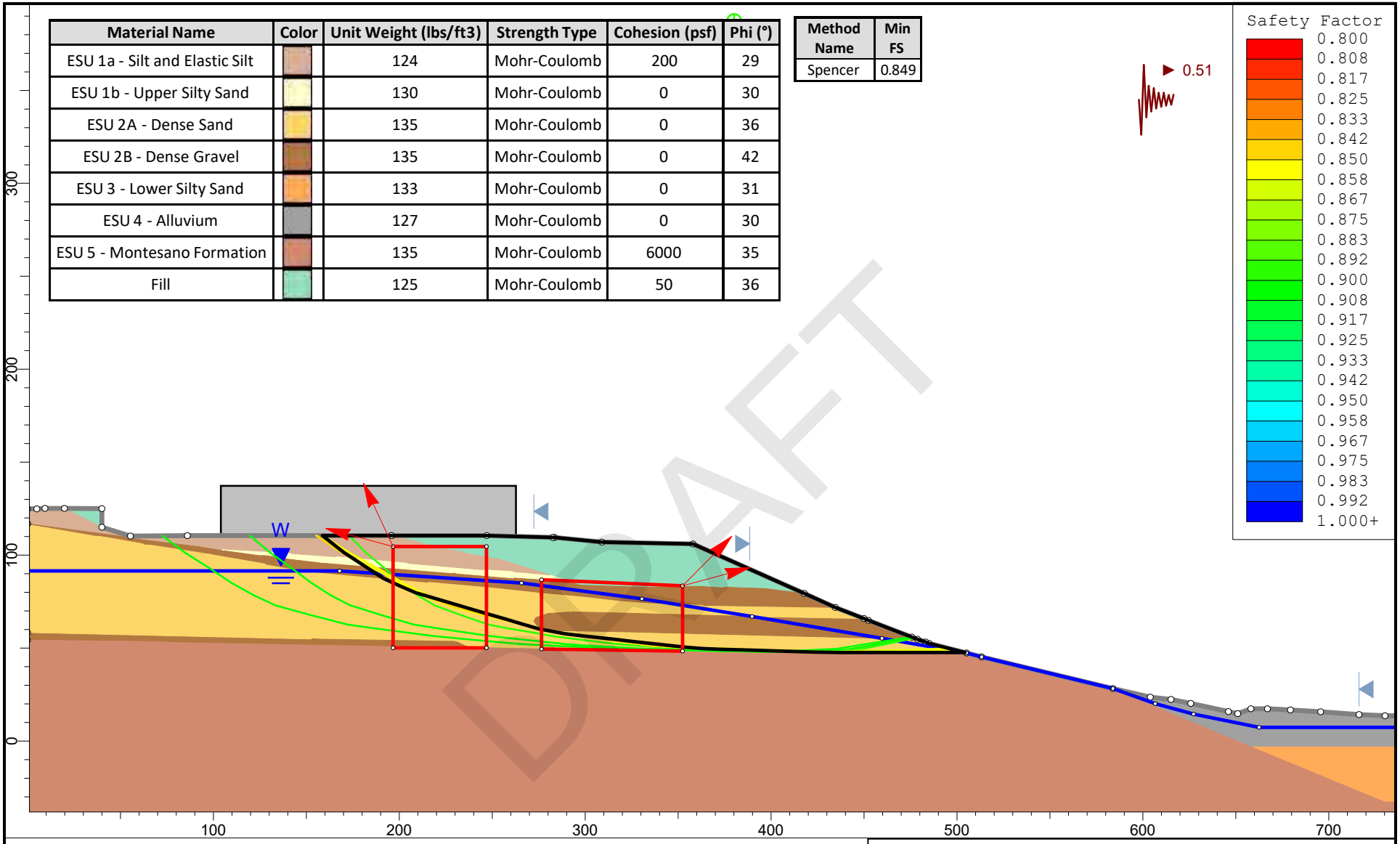
CROSS-SECTION C-C'
PROPOSED CONDITION
STATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E19

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36

Method Name	Min FS
Spencer	0.849



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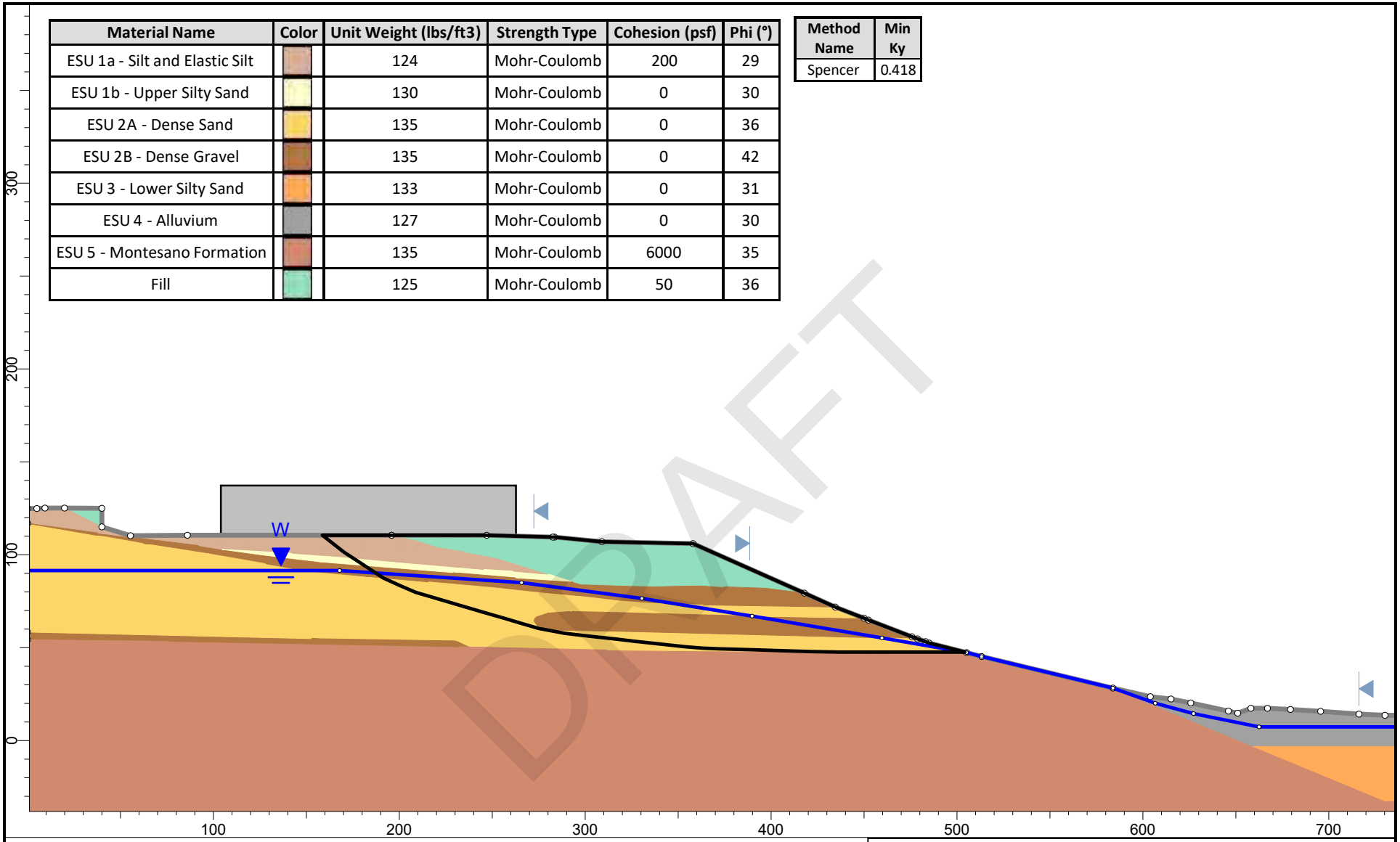
CROSS-SECTION C-C'
PROPOSED CONDITION
PSEUDOSTATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E20

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36

Method Name	Min Ky
Spencer	0.418



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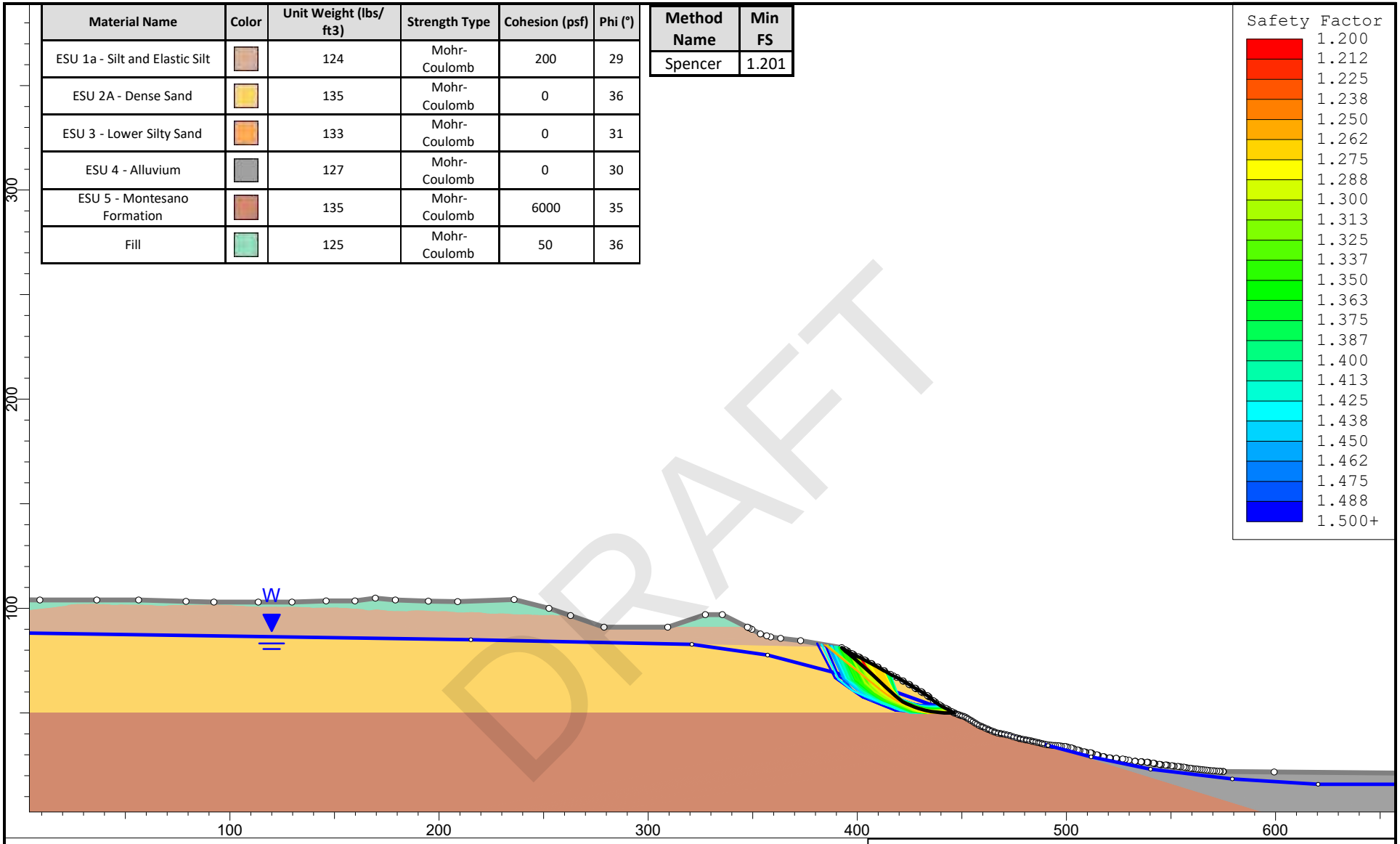
CROSS-SECTION C-C'
PROPOSED CONDITION
SEISMIC YIELD ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E21

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36

Method Name	Min FS
Spencer	1.201



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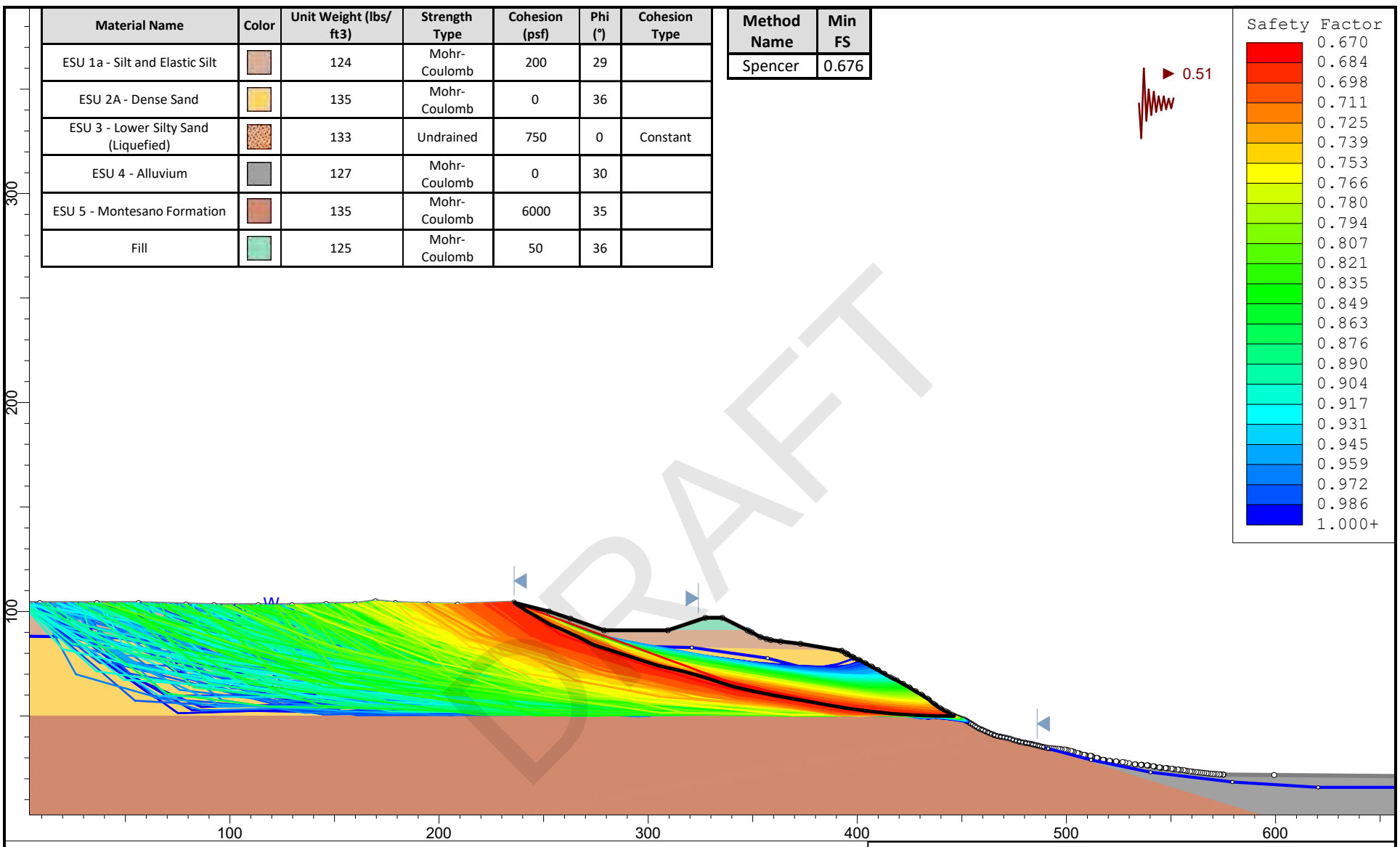
CROSS-SECTION F-F'
PROPOSED CONDITION
STATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E22

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Cohesion Type
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29	
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36	
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0	Constant
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30	
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35	
Fill		125	Mohr-Coulomb	50	36	

Method Name	Min FS
Spencer	0.676



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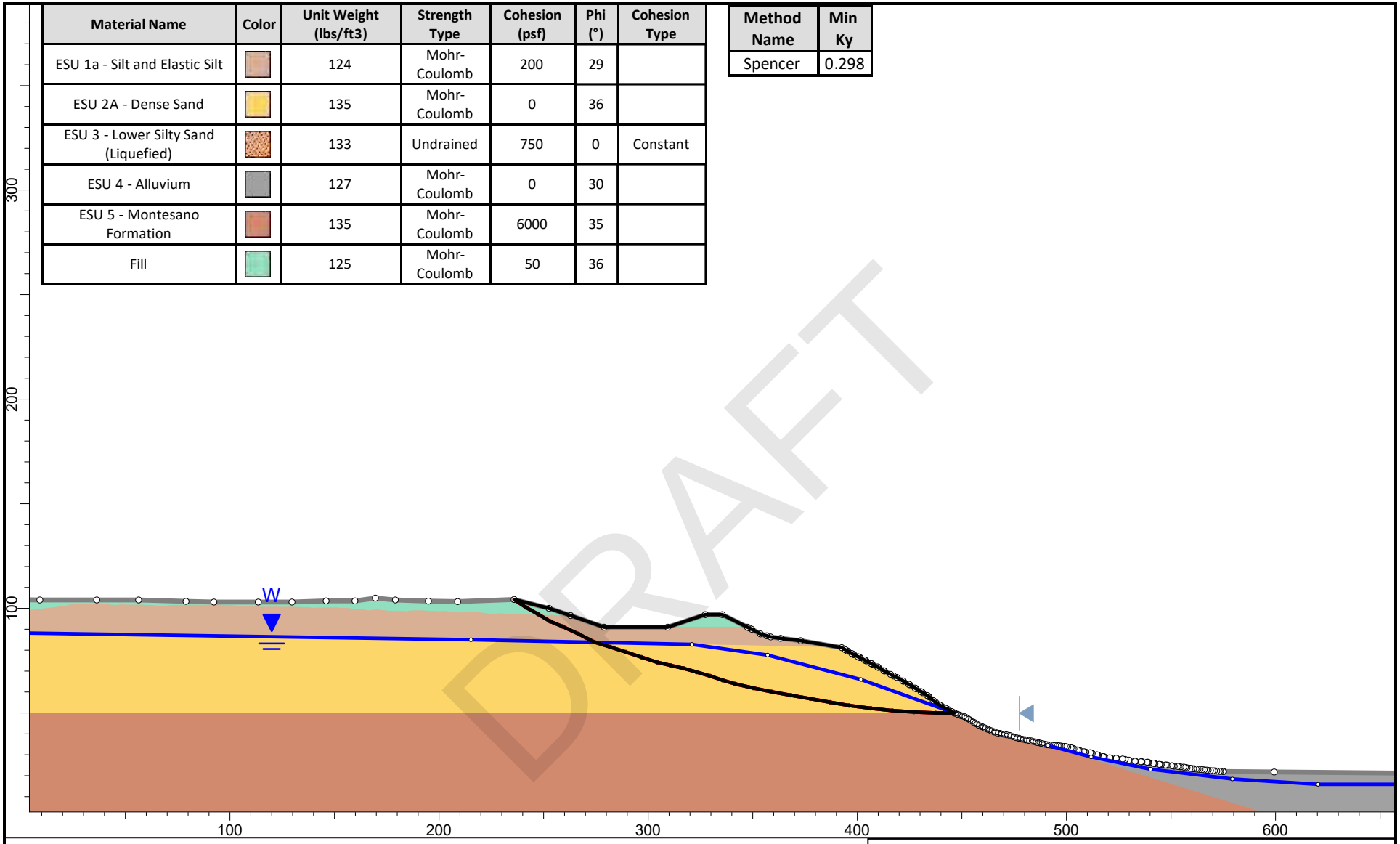
CROSS-SECTION F-F'
PROPOSED CONDITION
PSEUDOSTATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E23

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)	Cohesion Type
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29	
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36	
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0	Constant
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30	
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35	
Fill		125	Mohr-Coulomb	50	36	

Method Name	Min Ky
Spencer	0.298



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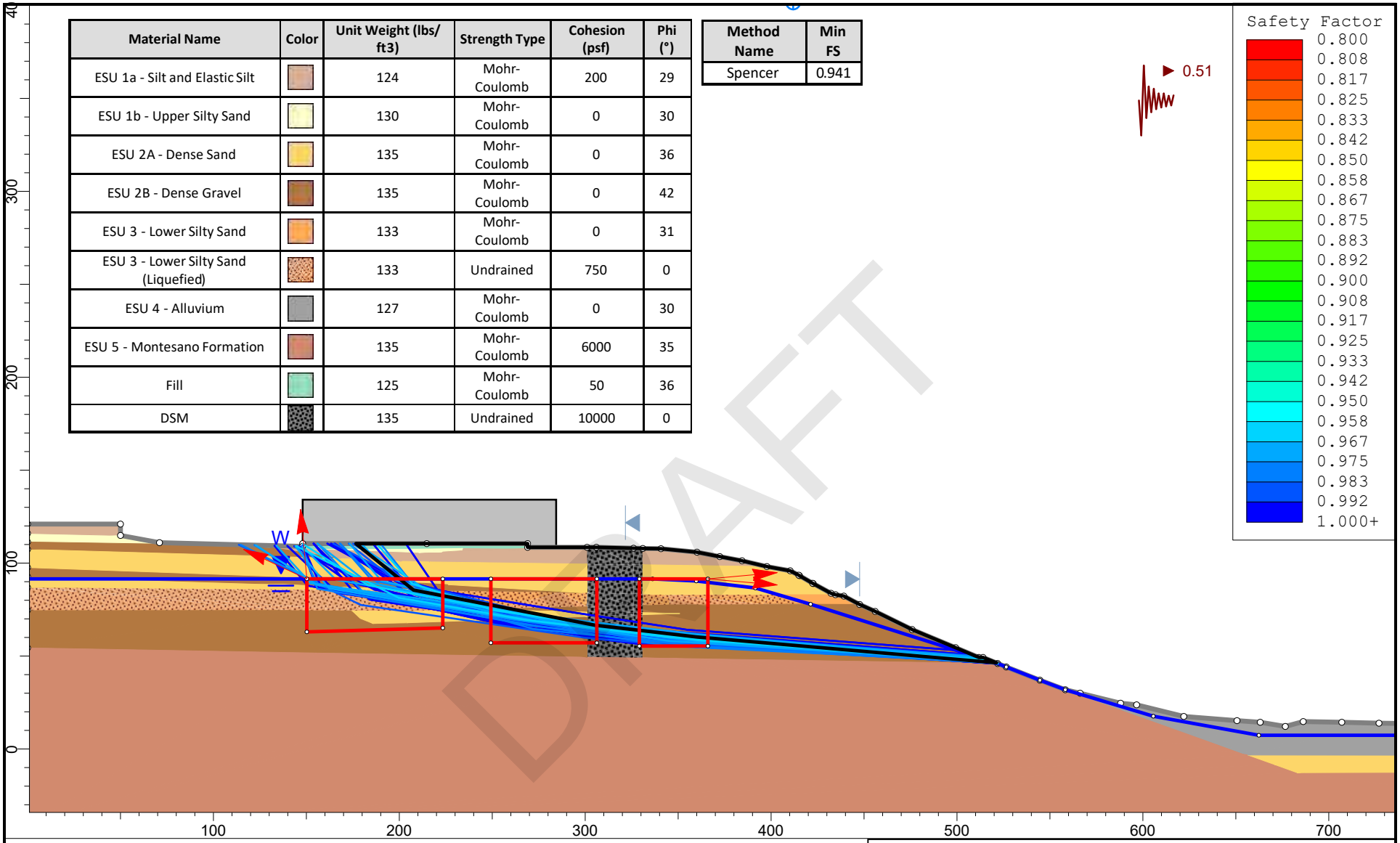
CROSS-SECTION F-F'
PROPOSED CONDITION
SEISMIC YIELD ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E24

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36
DSM		135	Undrained	10000	0

Method Name	Min FS
Spencer	0.941



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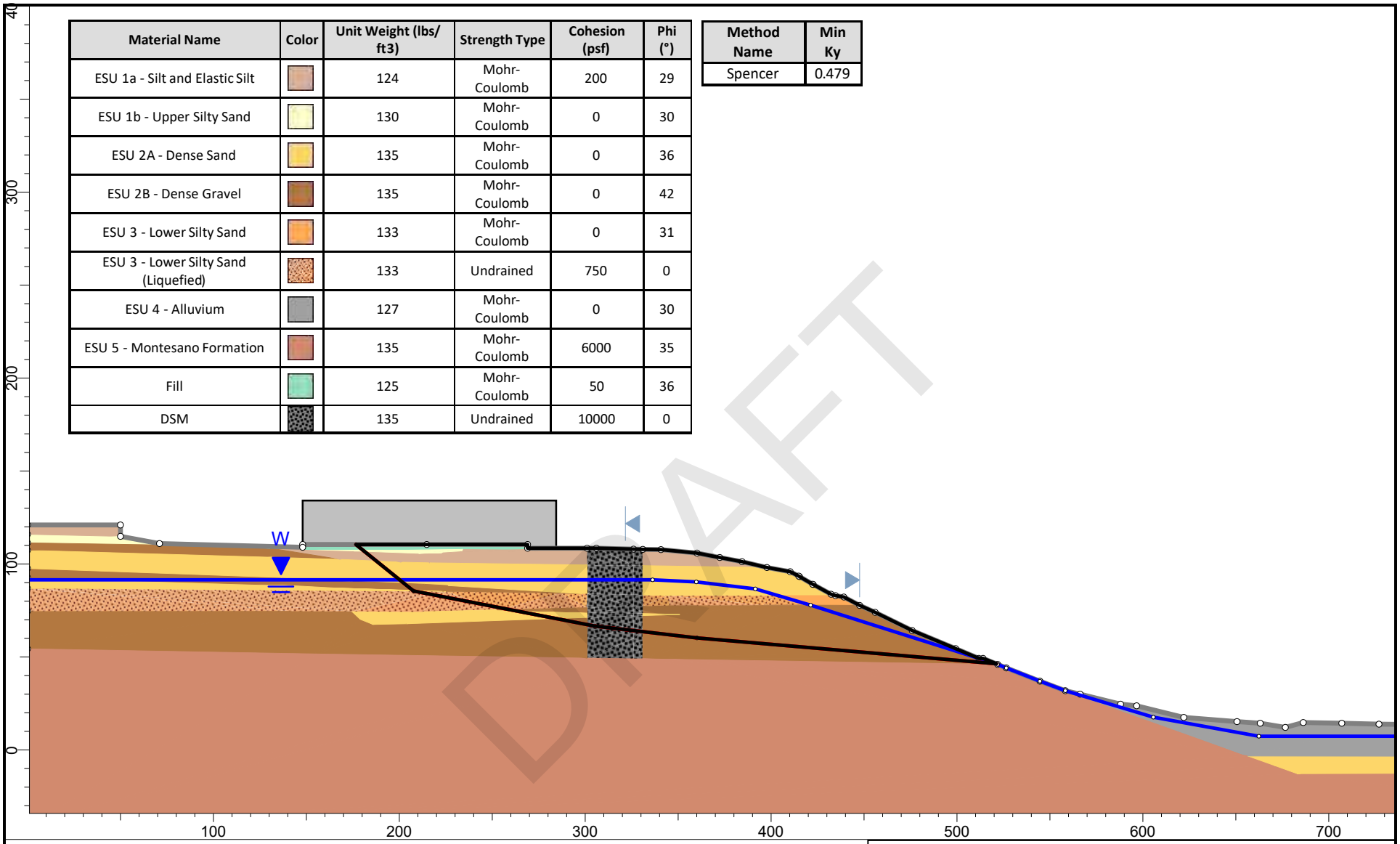
CROSS-SECTION A-A'
PROPOSED CONDITION WITH DSM
PSEUDOSTATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E25

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36
DSM		135	Undrained	10000	0

Method Name	Min Ky
Spencer	0.479



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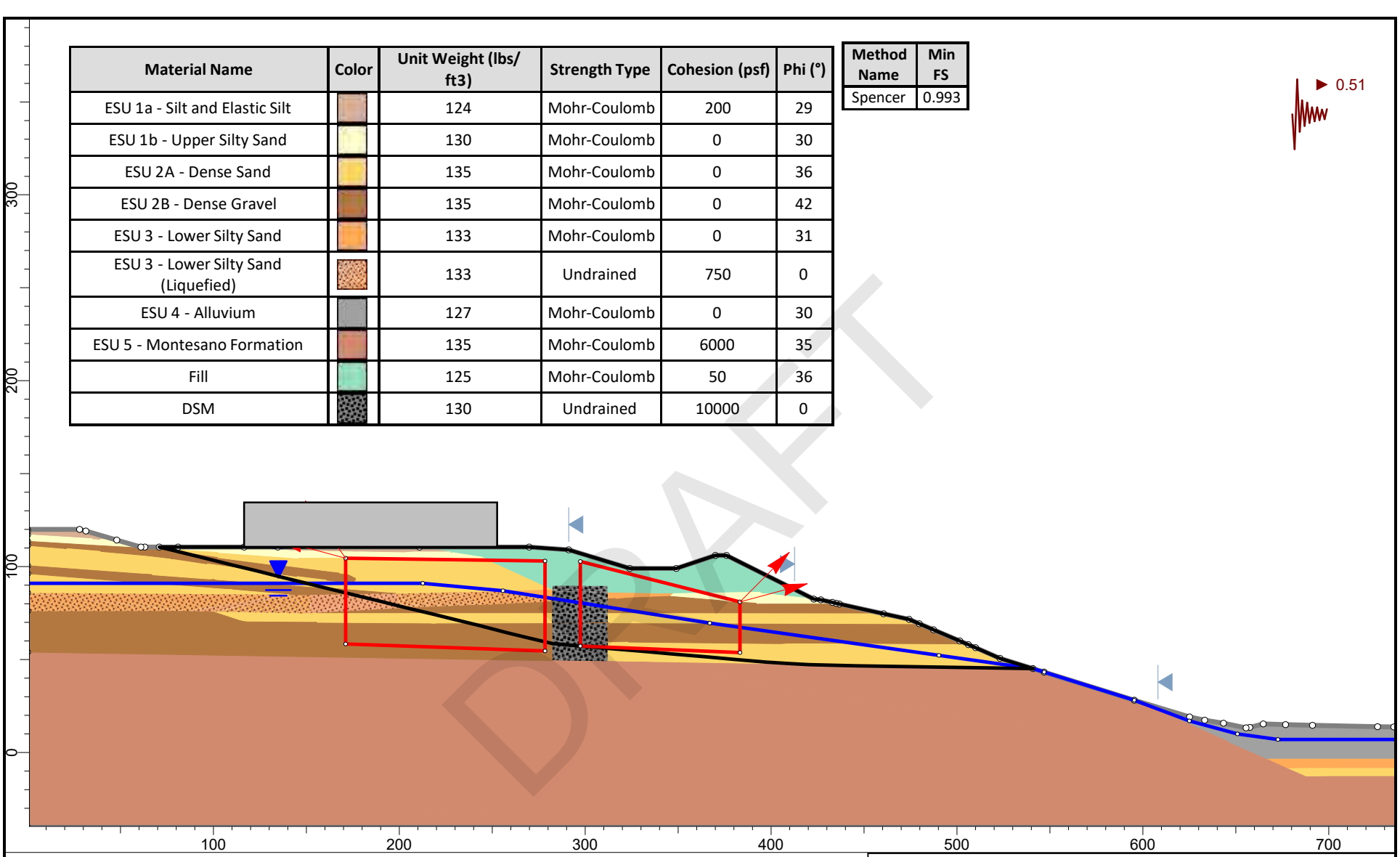
CROSS-SECTION A-A'
PROPOSED CONDITION WITH DSM
SEISMIC YIELD ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E26

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36
DSM		130	Undrained	10000	0

Method Name	Min FS
Spencer	0.993



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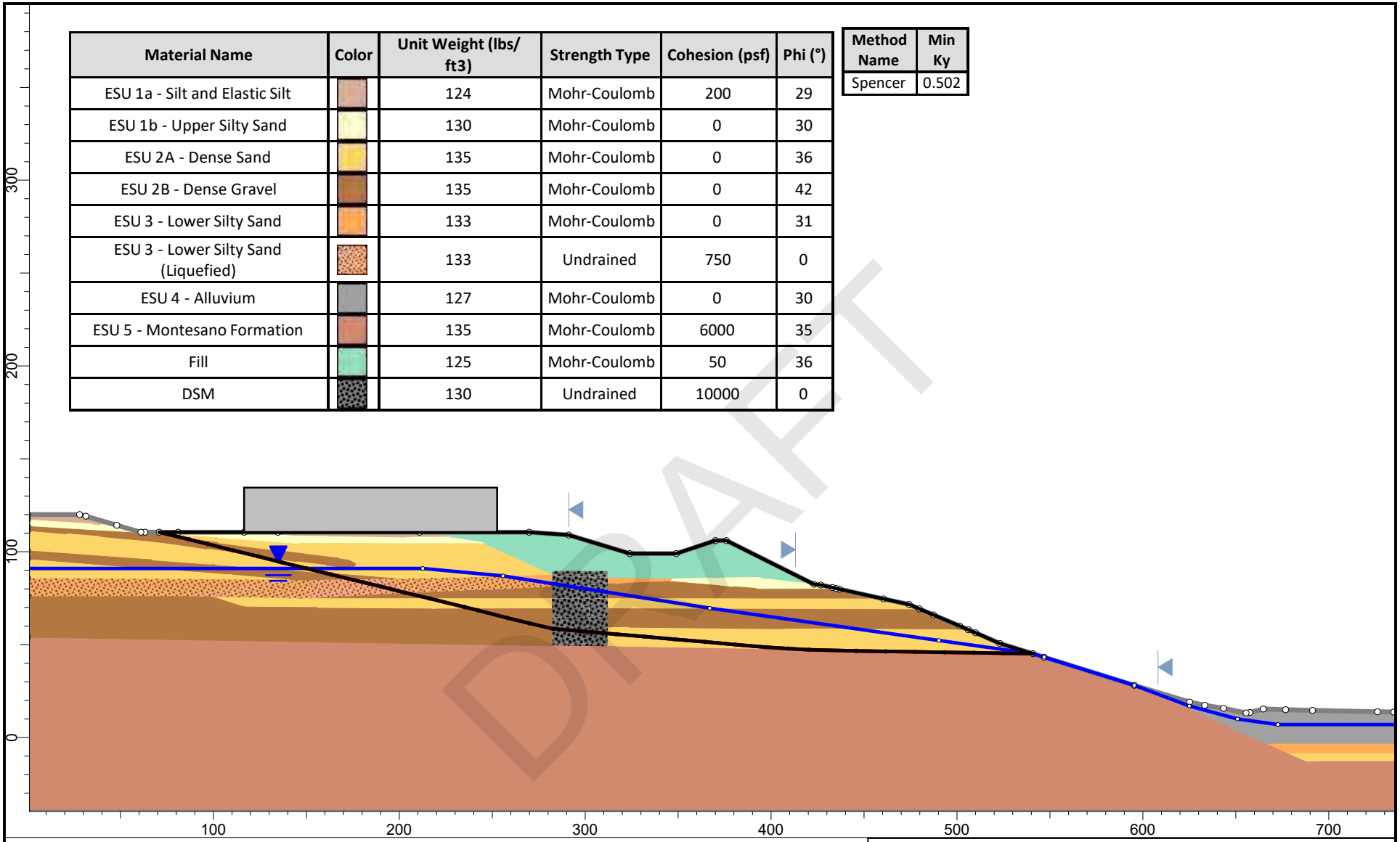
CROSS-SECTION B-B'
PROPOSED CONDITION WITH DSM
PSEUDOSTATIC ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E27

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
ESU 1a - Silt and Elastic Silt		124	Mohr-Coulomb	200	29
ESU 1b - Upper Silty Sand		130	Mohr-Coulomb	0	30
ESU 2A - Dense Sand		135	Mohr-Coulomb	0	36
ESU 2B - Dense Gravel		135	Mohr-Coulomb	0	42
ESU 3 - Lower Silty Sand		133	Mohr-Coulomb	0	31
ESU 3 - Lower Silty Sand (Liquefied)		133	Undrained	750	0
ESU 4 - Alluvium		127	Mohr-Coulomb	0	30
ESU 5 - Montesano Formation		135	Mohr-Coulomb	6000	35
Fill		125	Mohr-Coulomb	50	36
DSM		130	Undrained	10000	0

Method Name	Min Ky
Spencer	0.502



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CROSS-SECTION B-B'
PROPOSED CONDITION WITH DSM
SEISMIC YIELD ANALYSIS

SCALE: AS SHOWN
JUNE 2026

FIGURE E28

Elevating acoustical design.

SOUTH SITE ELEMENTARY SCHOOL

Acoustical Design Plan

100% Schematic Design Progress Set (UPDATED 7/22/2026)

Submitted to:

TCF Architecture
124 North 'I' St.
Tacoma, WA 98403

Prepared by:

Tenor Engineering Group
811 1st Ave, Suite 466
Seattle, WA 98104

July 27, 2026

Tel 206.899.5450 / www.tenor-eng.com

Space Type	Adjacent Space Type	Acoustic Criteria for Airborne Sound Isolation (STC) IEQ4.0 (Minimum Req.)	IEQ4.1 (1 point)
Classrooms and Core Learning Space	Classrooms and Core Learning Space	STC 45	STC 50
	Corridor, Hallway, or Common Area*	STC 40	STC 45
	Gymnasium, Band/Music Room, Cafetena, or Mechanical Room	STC 55	STC 60
	Bathroom	STC 50	STC 55

KEYNOTES

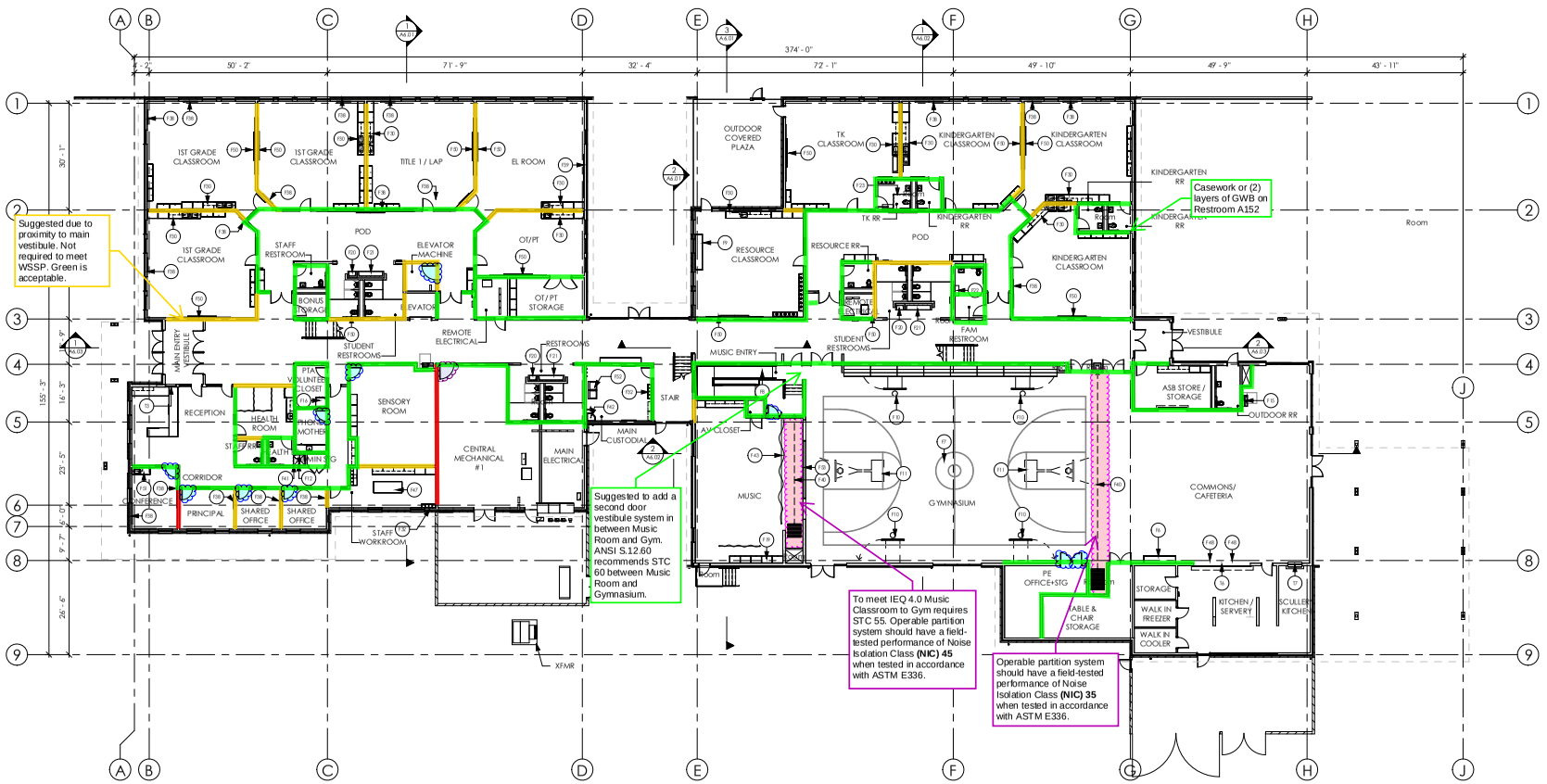
F6	QUARTZ COUNTERTOP WITH BASE CABINETRY FOR INTEGRATED TRASH RECEPTACLES
F7	BASKETBALL AND VOLLEYBALL GAME LINE STRIPING WITH CUSTOM CENTER-COURT LOGO
F8	5.5' GUARDRAIL
F9	BUILT-IN READING NOOK BENCH WITH PLASTIC LAMINATE FACE PANELS
F10	SIDE FOLD BASKETBALL HOOP W/HEIGHT ADJUSTER & BREAKAWAY RIM, 10'H WALL PADS
F11	FRONT FOLD BASKETBALL HOOP W/HEIGHT ADJUSTER & BREAKAWAY RIM, 10'H WALL PADS
F12	ACCESSIBLE SHOWER & BENCH SEAT
F15	DRINKING FOUNTAIN
F16	REFRIGERATOR
F19	BUILT IN INSTRUMENT STORAGE
F20	CHILD HEIGHT TROUGH SINK
F21	3 FAUCET TROUGH SINK
F22	BABY CHANGING STATION
F23	TK BATHROOM: CHANGING STATION, TOILET PRIVACY CURTAIN, CUBBIES FOR 8
F30	TYP CLASSROOM CASEWORK; SEE A80.01 FOR CASEWORK LAYOUTS
F32	METAL LOCKERS
F38	MARKERBOARD
F39	TACKBOARD

KEYNOTES

F40	OPERABLE PARTITION WALL WITH CUSTOM LAMINATE AND ACOUSTIC FELT FINISH
F41	SHOWER CURTAIN
F42	FLOOR SINK, MOP/BROOM HOLDER, CHEMICAL DISPENSER, EYEWASH STATION
F43	STAGE CURTAIN AND TRACK
F47	STAFF WORK COUNTER: PLAM COUNTERTOP, LOWER BASE CABINETS WITH OPEN SHELVES
F48	MONITOR, OFCI
F50	TYPICAL CLASSROOM TEACHING WALL, SEE SHEET A80.01 FOR TYPICAL LAYOUT
F51	CONFERENCE COUNTERTOP: SOLID SURFACE COUNTERTOP WITH DROP-IN SINK, LOWER 5' BASE CABINETS
F52	LIGHT COMMERCIAL WASHER AND DRYER
F53	PROJECTOR SCREEN
T3	TRANSACTION WINDOW
T6	FULL HEIGHT OVERHEAD DOOR
T7	COUNTERTOP OVERHEAD DOOR

SHEET NOTES:

A. SEE SHEET A2.01 FOR FLOOR PLAN GENERAL NOTES, KEYNOTES AND LEGEND
B. SEE A30 SERIES SHEETS FOR EXTERIOR WALL TYPE DESCRIPTIONS AND GENERAL NOTES
C. SEE A31 SERIES SHEETS FOR INTERIOR WALL TYPE DESCRIPTIONS AND GENERAL NOTES



1 FIRST FLOOR REFERENCE PLAN
1/16" = 1'-0"

TCF
124 North 'I' St. Tacoma, WA
www.tcfarchitecture.com
P.253.572.3993

Client
ABERDEEN SD #5

Project
SOUTH SITE ELEMENTARY SCHOOL
2025-004
SOUTH SITE ELEMENTARY SCHOOL
Aberdeen, WA

Issue & Revision Dates

27 APRIL 2026	65% SD
29 MAY 2026	95% SD
10 JULY 2026	100% SD

100% SCHEMATIC DESIGN
Not for Construction

NOTE: DRAWING MAY BE REDUCED
0 8' 16' 32'

Drawn By Author
Checked By Checker

Sheet Title
FIRST FLOOR REFERENCE PLAN

A2.02a

Sheet Number Of

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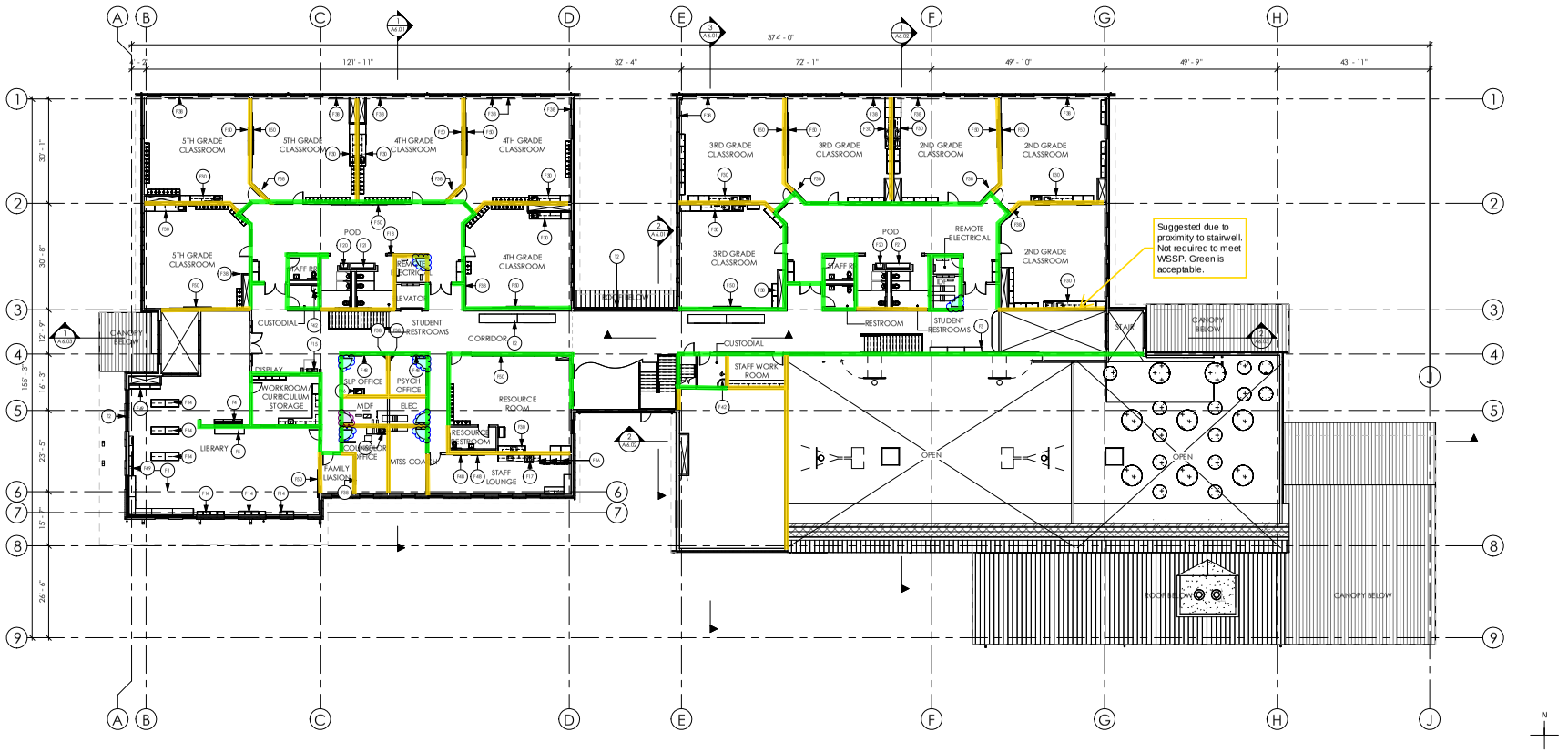
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KEYNOTES	
F1	BUILT-IN BENCH SEATING WITH OPEN BOOKSHELVES BELOW
F2	RAISED FLOOR OPENING, REFER TO DETAIL 1/ A21.01 (FIRST FLOOR, SIM)
F3	BUILT-IN BENCH SEATING WITH INTEGRATED CUSTOM HARDWOOD VENEER DISPLAY CASE
F4	CUSTOM FEATURE BOOK DISPLAY, APPROXIMATELY 6'-0" HIGH, WITH TRACELESS PLASTIC LAMINATE FINISH
F5	QUARTZ COUNTERTOP
F14	3' TALL BOOKSHELVES FOR DISPLAY
F15	DRINKING FOUNTAIN
F16	REFRIGERATOR
F17	OVEN/RANGE W/RESIDENTIAL HOOD
F18	BOTTLE FILLER
F20	CHILD HEIGHT TROUGH SINK

KEYNOTES	
F21	3 FAUCET TROUGH SINK
F30	TYP. CLASSROOM CASEWORK: SEE A80.01 FOR CASEWORK LAYOUTS
F38	MARKERBOARD
F42	FLOOR SINK, MOP/BROOM HOLODER, CHEMICAL DISPENSER, EYEWASH STATION
F46	OFFICE COUNTERTOP: PLAM COUNTERTOP WITH DROP-IN SINK, LOWER 3' BASE CABINET, WALL MOUNTED MIRROR
F48	MONITOR, OFCI
F49	FULL HEIGHT BOOKSHELVES
F50	TYPICAL CLASSROOM TEACHING WALL, SEE SHEET A80.01 FOR TYPICAL LAYOUT
T2	STOREFRONT

SHEET NOTES:

A. SEE SHEET A2.01 FOR FLOOR PLAN GENERAL NOTES, KEYNOTES AND LEGEND
B. SEE A30 SERIES SHEETS FOR EXTERIOR WALL TYPE DESCRIPTIONS AND GENERAL NOTES
C. SEE A31 SERIES SHEETS FOR INTERIOR WALL TYPE DESCRIPTIONS AND GENERAL NOTES



1 SECOND FLOOR REFERENCE PLAN
1/16" = 1'-0"

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Drawn By Author
Checked By Checker

Sheet Title
SECOND FLOOR REFERENCE PLAN

A2.03a
Sheet Number Of

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1 Executive Summary

This report is an updated summary of our preliminary acoustical design plan for the proposed South Site Elementary School in Aberdeen, Washington. The following report is updated with wood partition options and is based on the 100% Schematic Design progress set drawings dated July 10, 2026.

2 Acoustical Design Plan

The following section notes acoustical performance options based on the code requirements (ICC A117.1, WSSP, WAC), ANSI S12.60, and internal research and testing.

2.1 Site Assessment and Exterior Façade

An environmental noise study was conducted at the proposed building site to assess the existing ambient sound levels and WAC New School Facility Site Approval compliance. The recorded sound levels averaged 45 dBA and the site follows WAC criteria. A link to the environmental noise study report is available here.

Based on our study, exterior building glazing can be standard commercial exterior glass (1/4" glass – ½" air space – ¼" glass) and meet WAC interior noise criteria for students.

2.2 Partitions

The partitions are color-coded on the marked-up schematic design drawings for reference; click on this link to access the partition mark-up (UPDATED 7-22-2026)

Partition recommendations satisfy the minimum requirements as detailed in WSSP IEQ4.0, as well as enhanced recommendations detailed in WSSP IEQ4.1.

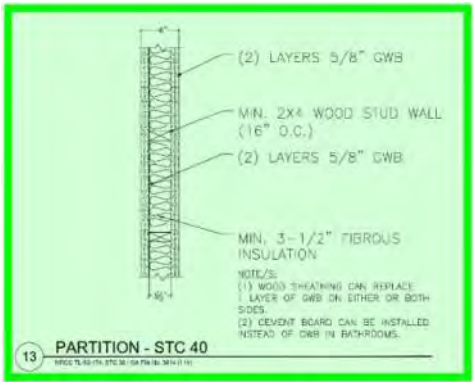
2.2.1 Partition Types

Recommended partition assembly details are noted in this section. South Site Elementary is assumed to use wood framing and studs due to coordination with TCF Architecture. For partitions with multiple layers of gypsum wall board, backerboard and drywall can replace one layer.

2.2.1.1 IEQ 4.0

Requirement / IEQ4.0 (Minimum)

STC 40: Core Learning to Hallway, Partitions with Doors

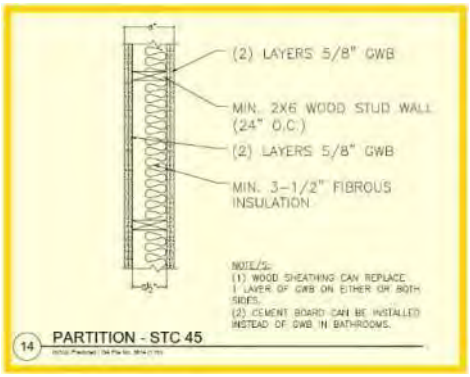


2+2 Wood Partition: Single Stud Wood Partition with (2) layers of GWB on both sides (1 layer on each or either side can be replaced with plywood sheathing and retain the acoustical performance), and insulation in cavity; 2"x4" studs at 24-inch o.c.

Extend Gypsum Board:

- ACT ceiling (CAC 32 or greater) on both sides: Extend layers a minimum of 6" above ACT.
- ACT ceiling on one side (minimum CAC 32): Extend at least one layer to structure on the open-to-structure side; extend partial height layers a minimum of 6" above ACT.
- Open-to-Structure: Extend all layers to structure when exposed ceiling is installed on both sides

STC 45: Core Learning to Core Learning, Sensitive Conditions



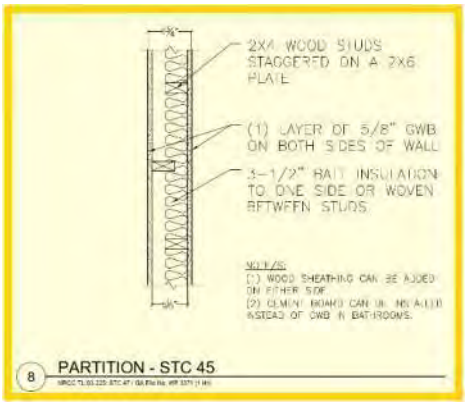
2+2 Wood Partition: Single Stud Wood Partition with (2) layers of GWB on both sides (1 layer on each or either side can be replaced with plywood sheathing and retain the acoustical performance), and insulation in cavity; 2"x6" studs at 24-inch o.c.

Extend Gypsum Board:

- ACT ceiling (CAC 32 or greater) on both sides: At least 1 layer extended to structure, other layers can stop 6" above ACT.
- ACT ceiling on one side (minimum CAC 32): Extend at least two layers to structure; on ACT side extend partial height layer a minimum of 6" above ACT.
- Open-to-Structure: Extend all layers to structure when exposed ceiling is installed on both sides

OR

1+1 Stagger Wood Partition: Stagger wood stud with (1) layer of 5/8" GWB on each side with insulation in each stud bay; adding one layer of sheathing on one or both sides will improve the acoustical performance; 2"x4" studs staggered on a 2"x6" wood plate.

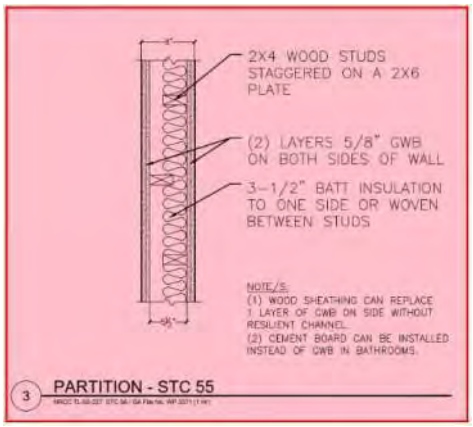


Extend Gypsum Board:

- ACT ceiling (CAC 32 or greater) on one or both sides: At least 1 layer extended to structure, other layer can stop 6" above ACT.
- Open-to-Structure: Extend all layers to structure when exposed ceiling is installed on both sides

STC 55: Conference Rooms, High-Performance Conditions

2+2 Stagger Stud Wood Partition: Stagger wood stud with (2) layers of 5/8" GWB on each side with insulation in each stud bay (1 layer on each or either side can be replaced with plywood sheathing and retain the acoustical performance), 2"x4" studs staggered on a 2"x6" plate.



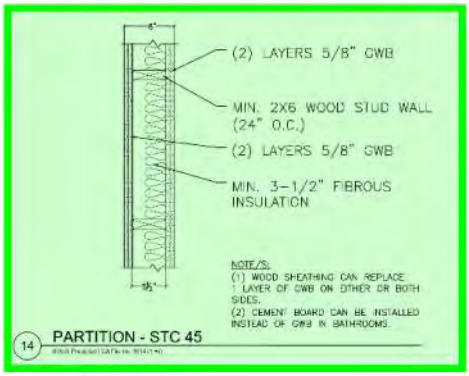
Extend Gypsum Board:

- ACT ceiling (CAC 32 or greater) on both sides: At least 2 layers extended to structure, other layers can stop 6" above ACT.
- ACT ceiling on one side (minimum CAC 32): Extend at least three layers to structure; on ACT side extend partial height layer a minimum of 6" above ACT.
- Open-to-Structure: Extend all layers to structure when exposed ceiling is installed on both sides.

2.2.1.2 IEQ 4.1

Suggested / IEQ 4.1 (1 Point)

STC 45: Core Learning to Hallway, Partitions with Doors



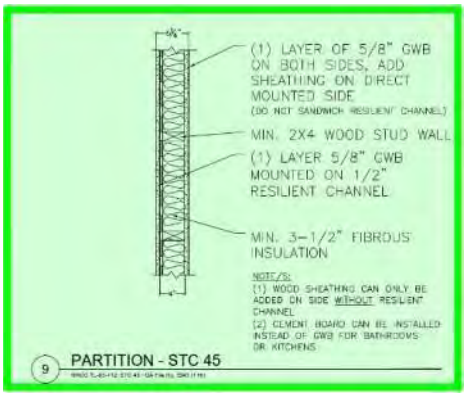
2+2 Wood Partition: Single Stud Wood Partition with (2) layers of GWB on both sides (1 layer on each or either side can be replaced with plywood sheathing and retain the acoustical performance), and insulation in cavity; 2”x6” at 24-inch o.c.

OR

1+1 Stagger Wood Partition: Stagger wood stud with (1) layer of 5/8” GWB on each side with insulation in each stud bay; adding one layer of sheathing on one or both sides will improve the acoustical performance. 2”x4” studs staggered on a 2”x6” plate.

OR

1+1 Wood Partition with Resilient Channel: Single Stud Wood Partition with (1) layer of GWB on each side, with resilient channel on one side and insulation in cavity*.



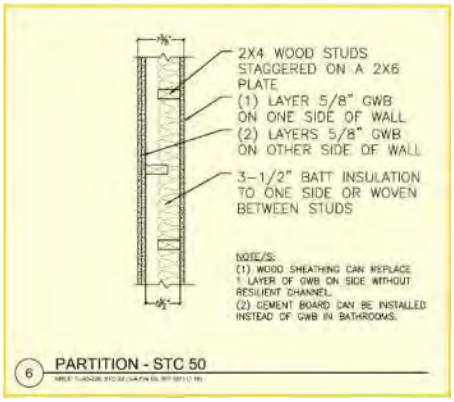
*Note the following acoustical challenges with resilient channel:

1. Wall-mounted shelving and/or devices will significantly reduce the acoustical performance of the wall
2. This adds ½” to the wall and only provides acoustical improvement when perfectly installed
3. This cannot be sandwiched with sheathing

Extend Gypsum Board:

- ACT ceiling (CAC 32 or greater) on one or both sides: At least 1 layer extended to structure, other layers can stop 6” above ACT.
- Open-to-Structure: Extend all layers to structure when exposed ceiling is installed on both sides

STC 50: Core Learning to Core Learning, Office to Office, Sensitive Conditions

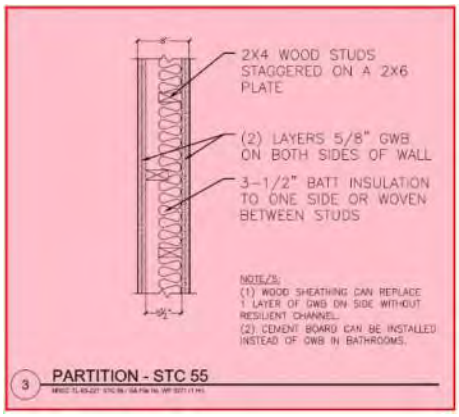


2+1 Stagger Wood Partition: Stagger wood stud with (1) layer of 5/8" GWB on one side and (2) layers of 5/8" GWB on other side with insulation in each stud bay. 2"x4" studs staggered on a 2"x6" plate.

Extend Gypsum Board:

- ACT ceiling (CAC 32 or greater) on both sides: At least 1 layer extended to structure, other layers can stop 6" above ACT.
- ACT ceiling on one side (minimum CAC 32): Extend at least two layers to structure; on ACT side extend partial height layer a minimum of 6" above ACT.
- Open-to-Structure: Extend all layers to structure when exposed ceiling is installed on both sides.

STC 55: Conference Rooms, High-Performance Conditions



2+2 Stagger Wood Partition: Stagger wood stud with (2) layers of 5/8" GWB on each side with insulation in each stud bay. 2"x4" studs staggered on a 2"x6" plate.

Extend Gypsum Board:

- ACT ceiling (CAC 32 or greater) on both sides: At least 2 layers extended to structure, other layers can stop 6" above ACT.
- ACT ceiling on one side (minimum CAC 32): Extend at least three layers to structure; on ACT side extend partial height layer a minimum of 6" above ACT.
- Open-to-Structure: Extend all layers to structure when exposed ceiling is installed on both sides

2.3 Operable Partitions

Operable Partition: Separating Music A121 and Gymnasium A123

If this is assumed to be a classroom to gym partition, the WSSP requirement is an STC 55, though WSSP and ANSI S12.60 do not call out performance requirements for operable partitions. To meet the project goals and expectations, the realized field-test performance is the critical. The specifications should note a performance requirement of a field-tested Noise Isolation Class (NIC) of **45** or greater when tested in accordance with ASTM E336. The laboratory-tested performance is less critical, but will likely exceed STC 55. The manufacturer should bid with the product that can consistently meet the performance specification.

Suggested Manufacturers: Advanced Equipment, Skyfold, or approved equal.

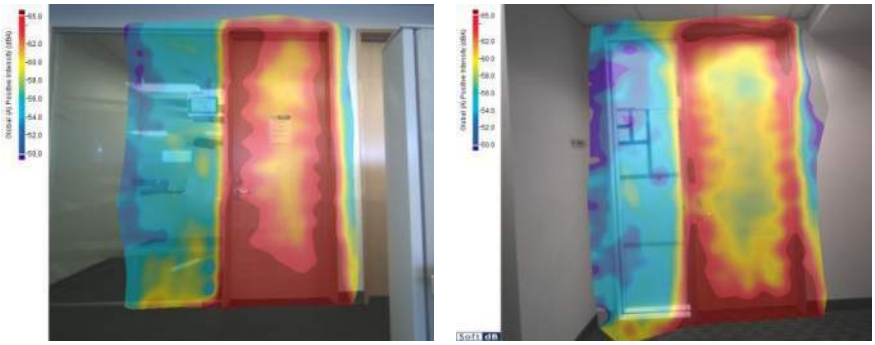
Operable Partition: Separating Gymnasium A123 and Commons/Cafeteria A124

This adjacency is less sensitive as both spaces are active spaces. The minimum suggested performance is an operable partition with a field-tested performance of Noise Isolation Class (NIC) **35**, when tested in accordance with ASTM E336; this would likely translate to a laboratory performance STC 45 or greater. Though the specification should clearly note the performance requirement.

Suggested Manufacturers: Advanced Equipment, Modernfold, or approved equal.

2.4 Door Seals

Doors for enclosed rooms need good seals to provide effective sound isolation. Door seals are suggested for all sensitive rooms with doors to busy or potentially noisy areas, noted in the section below. The acoustical performance of the door is less about the core and relite, but the seals that tightly compress around the frame and threshold of the door, the images below show examples of doors with glass relites that demonstrate this performance effect. Seals can be especially challenging for frameless glass and sliding doors.



Requirement / IEQ4.0 (Minimum): No requirement for door seals

Good Door Seals *shown with Blue clouds in partition mark-up*
For doors to rooms that desire speech privacy, implement the following; strongly recommended for private offices with sensitive conversations.

1. Install a door with a core weight of at least 4.0 psf
2. Install at least one row of adhesive jamb gasketing, such as Pemko S88 or S773.
3. Install door shoe (e.g. Pemko 2113) or sweep (e.g. Pemko 3151) with ¼" raised smooth saddle threshold.
    a. Automatic door bottom seals such as Pemko STC411 or STC4131 are an acceptable alternative but require regular maintenance to continually provide effective sound isolation performance.
4. For double doors, Install astragal seal (e.g., Pemko 311)

Enhanced Door Seals
Shown with Purple clouds in partition mark-up
1. Install a door with a core weight of at least 6.0 psf
2. Install at least two rows of adhesive jamb gasketing, such as Pemko S88 or S773, AND perimeter gasketing for the jambs (e.g. Pemko 316, Pemko 303, Pemko 296)
3. Install door shoe (e.g. Pemko 2212) and door sweep (e.g. Pemko 315) with ¼" raised smooth saddle threshold.
    a. Automatic door bottom seals such as Pemko STC411 or STC4131 are an acceptable alternative but require regular maintenance to continually provide effective sound isolation performance.
4. For double doors, Install meeting stiles seal (e.g., Pemko S771 on each door edge) with overlapping astragal (e.g., Pemko 375).

2.5 Floor-Ceiling & Roof Deck

There are two acoustical conditions for the floor-ceiling assembly: 1) airborne sound transmission, and 2) footfall noise.

Requirement / IEQ4.0 (Minimum): **STC 45 / IIC 45**
Composite metal with at least 2" thick concrete above the top of the metal profile with acoustical ceiling tile (for classrooms) with Ceiling Attenuation Class (CAC) 35 suspended 12" or more below deck, Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35)

To meet footfall requirement, IIC 45, install any flooring finish with mineral fiber ACT (CAC 35 or greater) suspended 12" or more below deck

Standard / IEQ4.1 (1 Point): **STC 50 / IIC 50**
Composite metal with at least 2" thick concrete above the top of the metal profile with acoustical ceiling tile (for classrooms) with Ceiling Attenuation Class (CAC) 35 suspended 12" or more below deck, Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35) and one of the following flooring finishes:

To meet footfall requirement, IIC 50, install one of the following flooring finishes:

- Commercial Carpet or Carpet Tile (no pad required)
- Wood or Vinyl Plank flooring installed with acoustical underlayment (e.g. Pliteq GenieMat RST02, Regupol Sonus Multi 3, or approved alternate)
- Emulating polished concrete flooring options with tested impact noise control (e.g. ECORE Rx Collection) or *Sika ComfortFloor Pro* (poured, sealed acoustic flooring system)
- Laboratory tested IIC 50 or greater resilient flooring with pre-attached acoustical backer

2.6 Room Finishes/Sound Absorption

The overall acoustical comfort of a space is directly correlated to the reverberation time within that room. The unit for absorption, Sabins, is a function of the quantity and acoustical efficiency of room finish materials. More acoustically efficient materials have an NRC rating closer to 1.0, which means less surface area is required to provide the same amount of Sabins compared to a lower NRC material (e.g., NRC 0.50).

$$Sabins = Surface\ Area\ (ft^2) * Sound\ Absorption\ Rating\ (NRC)$$

2.6.1 Classrooms under 10,000 ft^3 (Typical Classrooms)

The following recommendations assume 100% ceiling coverage with acoustical ceiling tiles at 11'-0" height with hard flooring.

Requirement / IEQ4.0 (Min.) & IEQ4.1 (1 Point): 0.6 seconds:

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.70 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35)

Enhanced / Bilingual & Hybrid Classroom Use:

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.80 and CAC 32)
    - Armstrong Ultima High NRC (NRC 0.80 / CAC 35)

OR

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.70 and CAC 32, AND
- Install 125 sq ft of felt or PET acoustical wall panels with a minimum thickness of 1" (FSorb, PolySorb, or comparable).

2.6.2 Offices

Principal A106, P.E. Office A119, Psych Office C173, MTSS Coach C179

There are no WSSP code requirements for these spaces. The following recommendations are based on the International Green Construction Code (IgCC) and best practices. Recommendations assume acoustical ceiling tile at 10'-0" elevation.

Minimum / IgCC:

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.70 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35)

Enhanced / Hybrid Meeting Functionality:

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.70 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35), AND
- Install 1" thick felt or PET acoustical wall panels across (2) perpendicular walls between 3'-0" and 7'-0" elevation to mitigate the risk of flutter echo (e.g. FSorb, PolySorb, or comparable)

2.6.3 Shared Office A107, A108

Both shared offices are showing partial hard ceiling surfaces and partial ACT ceiling. Use the following recommendations to meet IgCC criteria for open and private offices

Minimum / IgCC for open office & private office:

- Install ACT ceiling type for at least 50% of ceiling area with minimum performance NRC 0.70 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35), AND
- Install an additional 70 sq. ft. of 1" thick felt or PET acoustical wall panels on walls or remaining hard ceiling space (e.g. FSorb, PolySorb, or comparable)

Enhanced / Hybrid Meeting Functionality:

- Install ACT ceiling type for at least 50% of ceiling area with minimum performance NRC 0.80 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35), AND
- Install an additional 100 sq. ft. of 1" thick felt or PET acoustical wall panels on walls or remaining hard ceiling space (e.g. FSorb, PolySorb, or comparable)

2.6.4 Conference A104 (~2,160 ft^3)

No code requirement for this space. Recommendations are based on IgCC and expectations for hybrid work environments. This space is shown with partial acoustical linear wood planks with acoustical backing and partial ACT. Recommendations assume 10'-0" ceiling height.

Minimum / IgCC:

- Select both ACT and wood ceiling types with minimum performance NRC 0.70.
    - ACT Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35)
    - Linear Wood Ceiling BOD: Armstrong WOODWORKS Linear Veneered; select acoustical backing material with minimum NRC of 0.8 (e.g. Armstrong Calla Square Lay-in Panel – NRC 0.85, or 2" fiberglass/polyester/cotton)

Suggested / Hybrid Meeting Functionality:

- Follow minimum suggestions, AND
- Install a minimum of 50 sq. ft. of 1" thick felt or PET acoustical wall panels distributed across (2) perpendicular walls between 3'-0" and 7'-0" elevation.

Enhanced:

- Select both ACT and wood ceiling types with minimum performance NRC 0.80.
    - ACT Basis of Design: Armstrong Ultima High NRC (NRC 0.80 / CAC 35)
    - Linear Wood Ceiling BOD: Armstrong WOODWORKS Linear Veneered; select acoustical backing material with minimum NRC of 0.8 (e.g. Armstrong Calla Square Lay-in Panel – NRC 0.85, or 2" fiberglass/polyester/cotton)
- Install a minimum of 90 sq. ft. of 1" thick felt or PET acoustical wall panels distributed across (2) perpendicular walls between 3'-0" and 7'-0" elevation.

2.6.5 Staff Workroom C207

Minimum / IgCC:

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.70 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35)

Enhanced / Hybrid Meeting Functionality:

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.70 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35), AND
- Install 1" thick felt or PET acoustical wall panels across (2) perpendicular walls between 3'-0" and 7'-0" elevation to mitigate the risk of flutter echo (e.g. FSorb, PolySorb, or comparable)

2.6.6 Counselor Office C178

Counselors office is planned to be open to structure. Recommendations assume ceiling height average of 10'-0".

Minimum / IgCC for open office & private office:

Install **140 Sabins** with one of the following:

- 160 sq. ft. of 2" thick felt or PET panels across ceiling or walls with minimum NRC 0.9, OR
- 200 sq. ft. of 1" thick felt or PET panels across ceiling or walls with minimum NRC 0.7, OR
- 120 sq. ft. of vertical baffles with minimum NRC of 1.1
    - Sq. ft. represents one face of material

OR

- Replace counselor office ceiling with suspended ACT with minimum performance NRC 0.70 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35)

Enhanced / Hybrid Meeting Functionality:

Install **230 Sabins** with one of the following:

- 260 sq. ft. of 2" thick felt or PET panels on across ceiling or walls with minimum NRC 0.9, OR
- 330 sq. ft. of 1" thick felt or PET panels on across ceiling or walls with minimum NRC 0.7, OR
    - FSorb, PolySorb, or comparable
- 190 sq. ft. of vertical baffles with minimum NRC of 1.1
    - Sq. ft. represents one face of material

OR

- Replace counselor office ceiling with suspended ACT with minimum performance NRC 0.70 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35), AND
- Install an additional 50 sq. ft. of 1" thick felt or PET acoustical wall panels across (2) perpendicular walls between 3'-0" and 7'-0" elevation to mitigate the risk of flutter echo (e.g. FSorb, PolySorb, or comparable)

2.6.7 Sensory Room C208

This is assumed to be a private, single-occupancy room. Recommendations assume this is a quiet space not intended for phone call use.

Minimum / IgCC:

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.70 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35)

No additional measures are needed to achieve enhanced performance.

2.6.8 Gymnasium A123 (~175,000 ft^3)

The following assumes an average OTS height of 32'-0" based on elevation drawings in sheet A6.01

Space Type	Volume	Acoustic Criteria for Reverberation Time (RT) - seconds	
		IEQ4.0 (Minimum Req.)	IEQ4.1 (1 point)
Gymnasiums	V ≤ 150,000 ft^3	RT ≤ 1.7	RT ≤ 1.3
	150,000 ft^3 < V	RT ≤ 2.0	RT ≤ 1.5

Requirement / IEQ4.0 (Min.) 2.0s

This space needs **3,000 Sabins** to meet the WSSP requirement of 2.0 seconds in speech frequencies.

Material Options:

- Fully perforated acoustical metal roof deck with minimum NRC of **0.7**
    - *Verco Next Generation – 2" Acoustical Dovetail Roof Deck* with ½" plywood or roof board backing.
    - ASC Cellular Acustadeck – DGN-32AW with Poly-Iso cover board, OR
- 2,800 sq ft of vertically suspended baffles with minimum NRC of 1.1
    - Armstrong SOUNDSCAPES Blades, MBI Lapendary Panels (2"-4" Perf. PVC), 2" FSorb, or comparable

Standard / IEQ4.1 (1 Point)

This space needs **4,250 Sabins** to meet the WSSP IEQ4.1 requirement of 1.5 seconds in speech frequencies.

Material Options:

- Fully perforated acoustical metal roof deck with minimum NRC of **0.9**
    - *Verco Next Generation – 2" Acoustical Dovetail Roof Deck* with 2" Poly-Iso coverboard with plain deck insulation.
    - ASC Cellular Acustadeck – DGN-32AW with Fiberglass cover board, OR
- 3,800 sq ft of vertically suspended baffles with minimum NRC of 1.1

- Armstrong SOUNDSCAPES Blades, MBI Lapendary Panels (2"-4" Perf. PVC), 2" FSorb, or comparable

Enhanced Noise Control

This space needs **5,250 Sabins** to meet the noise control goals with up to 30 children actively playing based on noise control research associated with room volume and Sound Strength (G).

Material Options:

Option 1:

- Fully perforated acoustical metal roof deck with minimum NRC of **1.0**
  - *Verco Next Generation – 2" Acoustical Dovetail Roof Deck* with 2" Fiberglass cover board with plain deck insulation, AND
- Install an additional **500 Sabins** with one of the following:
  - 450 sq ft of vertically suspended baffles with minimum NRC of 1.1
    - Armstrong SOUNDSCAPES Blades, MBI Lapendary Panels (2"-4" Perf. PVC), 2" FSorb, or comparable, OR
  - 550 sq ft of 2" thick felt or PET acoustical wall panels with minimum NRC 0.9, OR
  - 715 sq ft of 1" thick felt or PET acoustical wall panels with minimum NRC 0.7

Option 2:

- 4,750 sq ft of vertically suspended baffles with minimum NRC of 1.1
  - Armstrong SOUNDSCAPES Blades, MBI Lapendary Panels (2"-4" Perf. PVC), 2" FSorb, or comparable

2.6.9 Commons/Cafeteria A124 (~105,000 ft^3)

This space has planned suspended polycarbonate canopies, basis of design: 3form Shapes Symphony. Solid polycarbonate canopies will reflect sound generated in the cafeteria and limit the sound absorption performance of acoustic treatment located in the roof deck system. Our preference is to install acoustically transparent canopies or install a multi-layered vertical baffle system in place of the canopies. Recommendations assume 32'-0" ceiling height, with canopies at 17'-0" AFF.

Space Type	Volume	Acoustic Criteria for Reverberation Time (RT) - seconds	
		IEQ4.0 (Minimum Req.)	IEQ4.1 (1 point)
Multi-Purpose, Commons, Cafeterias	V ≤ 100,000 ft^3	RT ≤ 1.5	RT ≤ 1.2
	100,000 ft^3 < V	RT ≤ 1.7	RT ≤ 1.4

Requirement / IEQ4.0 (Min.) 1.7s
This space needs **2,250 Sabins** to meet the WSSP 4.0 requirement of 1.7 seconds in speech frequencies.

Material Options:

- Use 3form product as planned (limit to 15% of ceiling area) and install a fully perforated acoustical metal roof deck with minimum NRC of **0.8**
  - *Verco Next Generation – 2" Acoustical Dovetail Roof Deck* with plain deck insulation.
  - ASC Cellular Acustadeck – DGN-32AW with Fiberglass cover board

OR

- Replace 3form canopies with a minimum of 200 sq. ft. of acoustical ceiling clouds or baffles with minimum NRC of 0.9
  - Arktura SoundStar 24", MBI Lapendary Panels (2"-4" Perf. PVC), 2" FSorb, or comparable, AND
- Install a fully perforated acoustical metal roof deck with minimum NRC of **0.7**
  - *Verco Next Generation – 2" Acoustical Dovetail Roof Deck* with plain deck insulation.
  - ASC Cellular Acustadeck – DGN-32AW with Poly-Iso cover board

Suggested / IEQ4.1 (1 Point) 1.4s
This space needs **2,800 Sabins** to meet the WSSP 4.1 requirement in speech frequencies.

Material Options:

- Use 3form product as planned and install a fully perforated acoustical metal roof deck with minimum NRC of **0.8**
  - *Verco Next Generation – 2" Acoustical Dovetail Roof Deck* with 1/2" roofboard coverboard with plain deck insulation.
  - ASC Cellular Acustadeck – DGN-32AW with Fiberglass cover board, AND
- Install an additional **300 Sabins** on walls below the canopies with one of the following:
  - 340 sq ft of 2" thick felt or PET acoustical wall panels with minimum NRC 0.9, OR
  - 430 sq ft of 1" thick felt or PET acoustical wall panels with minimum NRC 0.7

OR

- Replace 3form canopies with a minimum of 700 sq. ft. of acoustical ceiling clouds with minimum NRC of 0.9
    - Arktura SoundStar 24", MBI Lapendary Panels (2"-4" Perf. PVC), 2" FSorb, or comparable, AND
- Install a fully perforated acoustical metal roof deck with minimum NRC of **0.7**
    - *Verco Next Generation – 2" Acoustical Dovetail Roof Deck* with ½" plywood or roof board backing.
    - ASC Cellular Acustadeck – DGN-32AW with Poly-Iso cover board

Enhanced Noise Control

This space needs **3,600 Sabins** to meet the noise control goals for up to 30 children actively playing/talking based on noise control research Sound Strength (G).

- Replace 3form canopies with a tiered baffle system with a minimum of 1,100 sq. ft. of acoustical ceiling clouds/baffles with minimum NRC of 0.9
    - Arktura SoundStar 24", MBI Lapendary Panels (2"-4" Perf. PVC), 2" FSorb, or comparable, AND
- Install a fully perforated acoustical metal roof deck with minimum NRC of **0.9**
    - *Verco Next Generation – 2" Acoustical Dovetail Roof Deck* with 2" Poly-Iso coverboard with plain deck insulation.
    - ASC Cellular Acustadeck – DGN-32AW with Fiberglass cover board, OR

2.6.10 Music A121 (~12,300 ft^3)

The following recommendations assume acoustical ceiling tiles at 10'-0" elevation.

Requirement (classification as classroom) / IEQ4.0 (Min.) & IEQ4.1 (1 Point): 0.7 seconds

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.70 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35)

Suggested / Full-spectrum absorption

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.70 and CAC 32.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35), AND
- Install a minimum of 100 sq. ft. of 2" to 4" thick acoustical wall panels across a minimum of (2) walls.
    - 2" FSorb, 4" MBI Colorsonix, Kinetics Hardside 4"

Enhanced / Use with Drums, Cymbals, Amplified Instruments

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.80 and CAC 35 (e.g., Armstrong Ultima High NRC – NRC 0.80 / CAC 35), AND
- Install a minimum of 150 sq. ft. of 4" thick acoustical wall panels across a minimum of (2) walls.
    - 4" MBI Colorsonix, Kinetics Hardside 4"

2.6.11 Library C221 (~19,400 ft^3)

The library RCP drawings show a partial ACT and acoustical linear planks wood ceiling system, microperforated, with acoustical backing with metal grid system.

Requirement (classification as classroom) / IEQ4.0 (Min.) & IEQ4.1 (1 Point): 0.7 seconds

For areas with planned ACT:

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.70 and CAC 32 or greater.
    - Basis of Design: Armstrong School Zone Fine Fissured (NRC 0.70 / CAC 35)

For areas with planned linear wood ceiling system:

- Select an acoustically rated hardwood ceiling system with minimum NRC of 0.6
    - BOD: Armstrong WOODWORKS Linear Veneered; select acoustical backing with minimum NRC of 0.7 (e.g., Armstrong School Zone Fine Fissured Infill – NRC 0.70)

Enhanced

For areas with planned ACT:

- Select acoustical ceiling tile (ACT) with minimum performance NRC 0.80 and CAC 32 or gretaer.
    - Armstrong Ultima High NRC – NRC 0.80 / CAC 35

For areas with planned linear wood ceiling system:

- Select an acoustically rated hardwood ceiling system with minimum NRC of 0.7

- BOD: Armstrong WOODWORKS Linear Veneered; select acoustical backing with minimum NRC of 0.85 (e.g. 1" fiberglass or Armstrong Calla Square lay-in pannel infill)

2.6.12 Reception A101 (~6,000 ft^3)

There is not a specific WSSP requirement for reception spaces. The following recommendations are based on criteria for multipurpose/commons spaces. The provided drawings show a linear wood acoustical ceiling system. Calculations assume 11'-0" ceiling height.

Minimum / IEQ4.1 for multipurpose/commons (1.2s)

- Select an acoustically rated wood ceiling system with absorptive core, minimum NRC of 0.4
  - BOD: Armstrong WOODWORKS Linear Veneered; select acoustical backing with minimum NRC of 0.5 (e.g., Armstrong Fine Fissured Square Lay-in Panel – NRC 0.55)

Suggested

- Select an acoustically rated wood ceiling system with absorptive core, minimum NRC of 0.6
  - BOD: Armstrong WOODWORKS Linear Veneered; select acoustical backing with minimum NRC of 0.7 (e.g. Armstrong School Zone Fine Fissured Infill – NRC 0.70, or 1" fiberglass/polyester/cotton)

3 Mechanical System Noise & Vibration Control

A full mechanical system noise and vibration review will be completed once mechanical system drawings and equipment cut sheets with sound power data is available. Based on preliminary coordination with Metrix Engineers, this report includes an environmental noise analysis for (2) proposed exterior air to water heat pumps (AWHPs) to serve heating and cooling.

3.1.1 AWHPs

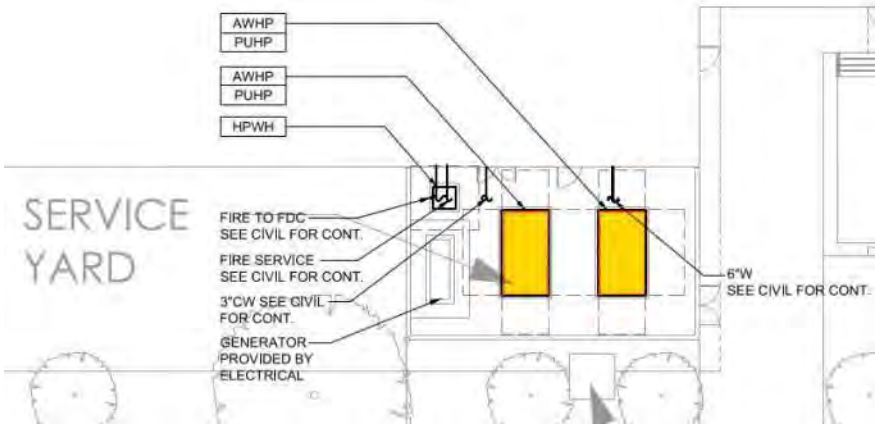


Figure 1: Mechanical Site Plan with AWHPs

Make/Model: Aermec / NYG1000XHºJ700
Operating Conditions: 90 tons / 750,500 Btu/hr (Cooling/Heating)
Location: Service Yard
Serves: Building

Table 1: Manufacturer Published Sound Power Levels (re: 1 pico-W)

Condition	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	LwA
Nominal Cooling	98	86	89	85	80	72	66	90

Radiated
The service yard is adjacent to the Central Mechanical and Main Electrical rooms on the first floor. These unoccupied spaces do not have sound level requirements.

The proposed screening wall is planned to be 10'-0" high CMU wall. The most sensitive adjacent interior receivers are the Psych Office C173 and Counselor Office C178 on the second floor above the service yard.

Minimum: Install casement-style windows with standard commercial glazing (STC 35 or greater, 1/4" glass – ½" air gap – ¼" glass) will meet the minimum performance.
Suggested: Install casement-style windows with improved glazing, minimum STC 38 (e.g., ¼" acoustically laminated – ½" air – ¼" glass).

Radiated noise to residential properties

Units are located 120'-0" from nearest residential property line to the south. The South Site Elementary is a Class B EDNA and residential properties are Class A EDNA as defined by the Greys Harbor County Municipal Code. The daytime sound level limit at the property line is **57 dBA.**

The predicted sound level at shared residential property line is 54 dBA without the 10'-0" screen wall. However, this predicted sound level would be perceived as 40% louder than the current ambient conditions, based on the on-site environmental noise assessment. The proposed 10'-0" screen wall would reduce the noise to align with the current ambient conditions and reduce the noise to the nearest outdoor school areas (e.g., pick-up/drop off).

Vibration Isolation

1) Install braided metal flexible pipe connections in the mechanical yard before piping enters the building vertical shaft.
2) Install units on concrete housekeeping pad

No additional vibration isolation mounts are necessary for exterior on-grade installation.

4 Performance Criteria

4.1 WAC 246-366-110 Sound Control.

(1) In new construction, plans submitted under WAC 246-366-040 shall specify ventilation equipment and other mechanical noise sources in classrooms are designed to provide background sound which conforms to a noise criterion curve or equivalent not to exceed NC-35. The owner shall certify equipment and features are installed according to the approved plans.

(2) In new construction, the actual background noise at any student location within the classroom shall not exceed 45 dBA (Leqx) and 70 dB (Leqx) (unweighted scale) where x is thirty seconds or more. The health officer shall determine compliance with this section when the ventilation system and the ventilation system's noise generating components, e.g., condenser, heat pump, etc., are in operation.

4.2 2017 ICC A117.1, Chapter 8: Special Rooms and Spaces

4.2.1 Section 808: Enhanced Acoustics for Classrooms

808.1 General. Classrooms not exceeding 20,000 cubic feet (565 m^3) and required to provide enhanced acoustics shall comply with Section 808.

808.2 Reverberation Time. Classroom reverberation times shall comply with either Section 808.1.1 or Section 808.2, depending on the size of the room.

808.2.1 Performance Method. For each of the octave frequency bands with center frequencies of 500, 1000, and 2000 Hz, the reverberation time (T60) shall not exceed the times specified below.

1. 0.6 seconds in classrooms with volumes up to and including 10,000 cubic feet (285 m^3)
2. 0.7 seconds in classrooms with volumes of more than 10,000 cubic feet (285 m^3), but less than 20,000 cubic feet (566 m^3)

Reverberation times shall apply to fully-furnished, unoccupied classrooms. Reverberation times shall be field verified via measurements over a minimum 20 dB decay in each octave frequency band in accordance with ASTM E2235lised in Section 106.2.13.

808.2.2 Prescriptive Method. The Noise Reduction Coefficient (NRC) ratings for floor, wall and ceiling surface finishes shall conform to the following equations:

For a classroom with a volume less than or equal to 10,000 cubic feet (285 m^3):

(NRC-floor x S-floor) + (NRC-ceiling x S-ceiling) + (NRC-wall x S-wall) > or = Volume / 12

For a classroom with a volume between 10,000 cubic feet (285 m^3) and 20,000 cubic feet (565 m^3):

(NRC-floor x S-floor) + (NRC-ceiling x S-ceiling) + (NRC-wall x S-wall) > or = Volume / 14

Where:
NRC-floor = NRC rating of floor finish material
NRC-ceiling = NRC rating of ceiling finish material
NRC-wall = NRC rating of wall acoustical treatment (acoustic wall panel - AWP)
S-xxx = Surface Area in sq ft

Where a floor, ceiling or wall has multiple surface finishes, the NRC x S product for each surface finish shall be added to the left side of the equation.

808.3 Ambient Sound Level. Classroom ambient sound levels shall comply with Sections 808.3.1 and 808.3.2. Ambient sound levels from sound sources outside and inside the classroom shall be evaluated individually. The greatest one-hour averaged sound levels shall be evaluated at the loudest usable location I the room at a height of 36-inches (915 mm) to 42-inches (1065 mm) above the floor and no closer than 36-inches (915 mm) from any wall, window or object. The ambient sound levels limits shall apply to fully-furnished, unoccupied classrooms, and with only permanent HVAC, electrical and plumbing systems functioning. Classroom equipment, including, but not limited to, computers, printers and fish tank pumps shall be turned off during these measurements.

808.3.1 Sound sources outside of the classroom. Classroom ambient sound levels shall not exceed 35 dBA and 55 dBC due to intruding noise from sound sources outside of the classroom, whether from the exterior or from other interior spaces.

808.3.2 Sound sources inside the classroom. Classroom ambient sound levels shall not exceed 35 dBA and 55 dBC from noise from sound sources inside the classroom.

4.3 WSSP 2023

4.3.1 IEQ4.0 & 4.1: Acoustic Performance

Purpose: Provide the acoustical qualities necessary for good speech communication between students and teachers in classrooms and other learning spaces.

Background Noise

Error! Reference source not found. provides the maximum unoccupied background noise levels generated from HVAC system noise, which is quantified (during design) as the Noise Criteria (NC). The overall noise levels from all sources: environmental noise intrusion, interior building systems, and HVAC systems, shall not exceed 45 dBA to meet the minimum requirements and 40 dBA for 1 point within core learning spaces.

Table 2: Background Noise Level Criteria

Space Type	Acoustic Criteria for NC / dBA	
	IEQ4.0 (Minimum Req.)	IEQ4.1 (1 point)
Classrooms, Core Learning Spaces, and Libraries	NC 35 / 45 dBA	NC 30 / 40 dBA
Corridors, Common Areas, and Gymnasiums	NC 45 / 50 dBA	NC 40 / 45 dBA

Sound Transmission and Impact Insulation

Table 3 provides the minimum airborne sound isolation, defined by Sound Transmission Class (STC), and footfall insulation, defined by Impact Insulation Class (IIC), for Classrooms and Core Learning Spaces. The field-tested sound transmission performance, defined by Noise Isolation Class (NIC) when tested in accordance with ASTM E336, has a five (5) point tolerance from the stated values.

Table 3: Sound Transmission and Impact Insulation Criteria

Space Type	Adjacent Space Type	Acoustic Criteria for Airborne Sound Isolation (STC)	
		IEQ4.0 (Minimum Req.)	IEQ4.1 (1 point)
Classrooms and Core Learning Space	Classrooms and Core Learning Space	STC 45	STC 50
	Corridor, Hallway, or Common Area*	STC 40	STC 45
	Gymnasium, Band/Music Room, Cafeteria, or Mechanical Room	STC 55	STC 60
	Bathroom	STC 50	STC 55
	Space type (Above)	Acoustic Criteria for IIC	
	Classroom and Core Learning Space	IIC 45	IIC 50

* The current WSSP IEQ4 section on interior airborne sound isolation does not make note of considerations for doors. Whereas the cited standard ANSI S12.60 notes that following in 5.4.2.4:

> *5.4.2.4* Interior door assemblies and up to 1 m^2 (10 ft^2) of window glazing area immediately adjacent to the door opening into core learning spaces from corridors, stairways, offices, or conference rooms shall achieve an STC rating of 30 or greater in their operable condition. The STC rating for interior entry doors into music rooms from corridors or staircase areas shall be at least 40 if such

doors are within 9 m (30 ft) of a door to a core learning space. A vestibule entry composed of two sets of doors with STC ratings of 30 or greater shall be considered to conform to the STC 40 requirement.

Room Reverberation

Table 4 outlines the maximum average (unoccupied) reverberation times (RT) within speech frequencies, between 500 Hz to 2000 Hz, based on the room use and room volume.

Table 4: Room Reverberation Criteria

Space Type	Volume	Acoustic Criteria for Reverberation Time (RT) - seconds	
		IEQ4.0 (Minimum Req.)	IEQ4.1 (1 point)
Classrooms and Core Learning Spaces	V ≤ 10,000 ft^3	RT ≤ 0.6	RT ≤ 0.6
	10,000 ft^3 < V	RT ≤ 0.7	RT ≤ 0.7
Gymnasiums	V ≤ 150,000 ft^3	RT ≤ 1.7	RT ≤ 1.3
	150,000 ft^3 < V	RT ≤ 2.0	RT ≤ 1.5
Multi-Purpose, Commons, Cafeterias	V ≤ 100,000 ft^3	RT ≤ 1.5	RT ≤ 1.2
	100,000 ft^3 < V	RT ≤ 1.7	RT ≤ 1.4

Research on speech clarity and speech intelligibility has found that the performance thresholds for core learning spaces are maximum levels and should be reduced by 15% to 25% for special needs and English as second language populations. Research into noise control within large volume spaces, such as gymnasiums, commons, and cafeterias, has found a direct correlation with ceiling height and sound absorption that on average is 30% less than the IEQ4.1 values noted in Table 4; based on ANSI S12.60.

4.3.2 IEQ4.2: Sound Amplification

For one (1) point:

Provide accommodations for a sound amplification system and an assistive listening system in all classroom spaces.

- A sound amplification system to amplify the teacher's voice, via wired or wireless microphones, and to amplify audio-visual presentations.
- A dedicated or portable assistive listening device (system) to amplify the teacher's voice, via wired or wireless microphones, and to amplify audio-visual presentations.

A properly designed sound system is an effective method for increasing the speech level in a classroom, thereby increasing the signal-to-noise ratio (SNR), signal being the voice you want to hear above all the other background noise. In addition to improved speech intelligibility, the use of a sound system can significantly reduce voice fatigue for the teacher or presenter, and improve speech perception. It is important to note that amplified speech does not reduce the requirement

for background noise control, because communication between students, and between student and teacher, must continue to be facilitated by a low background noise level.
For compliance with this credit, the sound system must:

- Provide uniform sound distribution at all student seating areas within a classroom. Uniformity is confirmed if measurements across all student seating areas are within +/- 2 dB in the 1/1-octave band centered on 2,000 Hertz.
- Provide distribution to all student seating areas within a classroom utilizing either dedicated or portable assistive listening systems.
- Provide a minimum signal-to-noise ratio of 15 dB across all student seating areas. Uniformity is confirmed if A-weighted amplified speech sound level measurements are 15 dB above background sound levels across all student seating areas.
- In addition, designers are encouraged to meet the maximum unoccupied background noise levels of 40 dBA, as set in IEQ4.1. Relying solely on amplification is not considered best practice.

4.3.3 IEQ4.3: Acoustical Consultant

1 point

Retain the services of an experienced acoustical consultant (with a minimum of ten years experience in Educational Facilities). Prior to the conclusion of Schematic Design, the consultant must be involved in the design process and provide integrated team review, outline specifications and acoustic performance requirements, code sheet requirements, and general acoustic performance input.

By Design Development, provide review and recommendations of architectural and mechanical systems, specifications, and basic system details or edits.

By the Bid Period, have provided Contract document coordination, review, and input.

During construction and prior to occupancy, provide submittal review for acoustic related items, and site observations of installed acoustic components and systems.

4.4 ANSI 12.60-2010

Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools

5.4.2: Indoor-to-indoor attenuation of airborne sound

- 5.4.2.1: Wall and floor-ceiling assemblies that separate enclosed or open-plan core learning spaces from adjacent spaces shall be designed to achieve the minimum STC ratings specified in Table 4. The STC rating requirements of Table 4 also shall apply to the design of temporary partitions that subdivide a learning space.

Table 5: Minimum STC ratings required for single or composite wall and floor-ceiling assemblies that separate a core learning space from an adjacent space

Space Adjacent to Classroom or Core Learning Space	Acoustic Criteria for Airborne Sound Isolation (STC)
Other enclosed or open plan core learning space, therapy room, health care room and space requiring a high degree of acoustical privacy [a), b)]	STC 50
Common-use and public-use toilet room and bathing room [a)]	STC 53
Corridor, staircase, office, or conference room [c), d)]	STC 45
Music room, music performance space, auditorium, mechanical equipment room, [e)] cafeteria, gymnasium, or indoor swimming pool.	STC 60

a) These requirements do not apply to toilets opening only into the core learning space and used only by occupants of the core learning space.
b) A 20 cm (8") concrete masonry unit wall having a surface weight density of at least 180 kg/m2 painted and sealed on both sides, acoustically sealed at the entire perimeter and extending from the floor slab to the structural deck above, is an acceptable alternate assembly that conforms to the intent of 5.4.2.1.
c) For corridor, office, or conference room walls containing doors, the basic wall, exclusive of the door, shall have an STC rating as shown in the appropriate column in this table. The entrance door shall conform to the requirements of 5.4.2.4.
d) When acoustical privacy is required, the minimum composite STC rating, including the effects of doors, of the partitions around an office or conference room, shall be increased to 50.
e) The isolation between core learning spaces and mechanical equipment rooms shall have a STC rating of 60 or greater unless it is shown that the sound level in the mechanical equipment room combined with a lower STC rating can achieve the required sound level in the core learning space. In no case shall the design STC between such spaces be less than 45.

Commentary-5.4.2.1: Sound isolation of ancillary spaces

- Recommendations are given in Table 5 for STC ratings for isolation of ancillary spaces from one another or from other spaces.

Table 6: Minimum STC ratings recommended between an ancillary space and adjacent spaces

Receiving Ancillary Learning Space	Adjacent Space			
	Corridor or Staircase[a], Common-Use, and Public-Use Toilet and Bathing Room[b]	Music Room	Office or Conference Room[a]	Mechanical Equipment Room[f], Cafeteria, Gymnasium, or Indoor Swimming Pool
Corridor Used as Ancillary Learning Space	STC 45	STC 60[c]	STC 45[d]	STC 55[c]
Music Room	STC 40	STC 60	STC 60[e]	STC 60
Office or Conference Room	STC 45	STC 60[g]	STC 45[d]	STC 60

a) For corridor, staircase, office or conference room walls containing entrance doors to the ancillary learning space, the STC rating of the basic wall, exclusive of the door, should be 45. The entrance door should conform to the requirements of 5.4.2.4.
b) The STC rating for an ancillary space/toilet partition does not apply when the toilet is private and connected to a private office. An STC rating greater than 45 may be required for separating a quiet office or conference room from a common-use or public-use toilet or bathing room.
c) When the corridor will not be used as an ancillary learning space, the minimum STC rating may be reduced to not less than 45. Use of corridors as ancillary learning spaces should be avoided when they are located next to the noisy spaces indicated in the table by the high STC ratings.
d) When acoustical privacy is needed for conversations in an office or conference room, the minimum rating should be a composite STC of 50 instead of 45 that includes the effects of any doors or windows etc.
e) An STC rating of 60 is justified to prevent the music space from interfering with hearing in the office or conference room.
f) Isolation between ancillary learning spaces and mechanical equipment rooms is dependent on the noise level in the mechanical equipment room and can be less than STC 60 in some cases but should never be less than STC 45. g) The STC rating of 60 does not apply when the office is for the music teacher and opens to the music room.

4.5 International Green Construction Code (IgCC)

The following are the design criteria outlined within the 2018 International Green Construction Code (IgCC) section 801.3.3 Acoustical Control with respect to interior background noise, interior sound transmission (airborne and structure-borne), reverberation time, and sound emissions to nearby receiving properties. This standard is based on the 2017 ASHRAE 189.1 *Standard for the Design of High-Performance Buildings.*

4.5.1 Sound Isolation & Impact Sounds

Wall assemblies serve as barriers to sound from adjacent spaces and noise generated within a space. The performance of each assembly differs based on the source of the noise and the sensitivity of the receiver. Both the source and the receiver vary with each project and for each space in the building. Designing walls for conference rooms require a higher performance assembly for sound isolation.

The following table outlines the minimum Sound Transmission Class (STC) ratings based on room adjacencies and ASHRAE 189.1 for commercial occupancies. STC or Sound Transmission Class is a single number rating that represents the decibel reduction provided by the separating assembly; the non-normalized field-tested performance is Noise Isolation Class (NIC). The non-normalized measurements represent the occupants' perception of airborne and structure-borne sound transmission within the finished spaces. Interior wall assemblies separating adjacent interior spaces shall be designed and constructed to provide airborne sound isolation that complies with the minimum cSTC (composite Sound Transmission Class – rating of all components of the total assembly as a whole) values specified in **Table 7**. For wall and floor-ceiling assemblies separating different room types, the greater of the two cSTC values shall apply.

Table 7: Minimum Sound Isolation Ratings

Room Type	cSTC[c,d]	NIC*	IIC
Exercise, gym or pool	55	45	50[a]
Mechanical, electrical, and elevator machinery rooms[b]	60	55	n/a
Conference and teleconference rooms	50	45	50
Enclosed offices	45	40	45
Open offices	n/a	n/a	45
Office to Corridor/Open-Office (with door)*	30	25	n/a
Office to Corridor/Open-Office (no door)*	45	40	n/a
Conference Room to Corridor/Open-plan Office (with door)*	30	25	n/a
Conference Room to Corridor/Open-plan Office (no door)*	45	40	n/a

a. The ICC value listed addresses footfall noise but not exercise related vibration born sound. Exercise-related vibration-borne sound should comply with the background requirements in Table 801.3.3.2
b. Minimum cSTC and IIC values are not required between adjacent rooms of the same room type.
c. For operable partitions and walls containing doors, windows, or both, the minimum cSTC ratings shall be 5 less than the values listed in the table.
d. The minimum composite STC values shall be 15 less than the specified cSTC values for walls having doors that open to corridors or open offices.
*Not included in IgCC, based on internal research.

4.5.2 Reverberation Time

The reverberation time T_{60} for designated *spaces* shall be calculated in accordance with ANSI/ASA S12.60-2010, Part 1, Annex A, for the octave bands 500, 1000, and 2000 Hz and shall not exceed the values specified in **Table 8**.

Table 8: Maximum Reverberation Times

Room Type	Maximum Reverberation Time in octave bands 500, 1000, and 2000 Hz (seconds)
Meeting and banquet rooms < 3000 ft^3	0.8
Meeting and banquet rooms 3000 ft^3 up to 8000 ft^3	1.0
Meeting and banquet rooms > 8000 ft^3 up to 30,000 ft^3	1.2
Enclosed offices	0.6
Conference/teleconference rooms	0.6
Open-plan offices	0.6
Library study and reading areas	1.0
Gymnasiums and natatoriums	2.0

4.6 City of Aberdeen Municipal Code

The city of Aberdeen Municipal Code does not outline maximum sound power levels. Section 34-108. – Noise in Residential Areas, outlines a nighttime nuisance code as follows:

" No person shall cause a noise that would disturb a reasonably prudent person of ordinary sensibilities. This restriction shall be effective between the hours of 10:00 p.m. and 7:00 a.m. in residentially zoned areas adjacent to residentially zoned areas."

The relevant noise code is outlined by Grays Harbor County.

4.7 Greys Harbor County Municipal Code

Grays Harbor County noise ordinance, Chapter 9.12, adopts the Washington state Administrative Code (WAC) chapters 173-60 and 173-60-040. It is assumed the code also adopts the Environmental Designation for Noise Abatement (EDNA) definitions set forth by the State Code.

173-60-040 - Maximum Permissible Environmental Noise Levels

(1) No person shall cause or permit noise to intrude into the property of another person which noise exceeds the maximum permissible noise levels set forth below in this section.
(2)(a) The noise limitations established are as set forth in the following table after any applicable adjustments provided for herein are applied.

Table 9: Maximum Permissible Environmental Noise Level Limits

	EDNA OF RECEIVING PROPERTY			
EDNA OF NOISE SOURCE		Class A	Class B	Class C
	Class A	55 dBA	57 dBA	60 dBA
	Class B	57	60	65
	Class C	60	65	70

(b) Between the hours of 10:00 p.m. and 7:00 a.m. the noise limitations of the foregoing table shall be reduced by 10 dBA for receiving property within Class A EDNAs.
(c) At any hour of the day or night the applicable noise limitations in (a) and (b) above may be exceeded for any receiving property by no more than:
(i) 5 dBA for a total of 15 minutes in any one-hour period; or
(ii) 10 dBA for a total of 5 minutes in any one-hour period; or
(iii) 15 dBA for a total of 1.5 minutes in any one-hour period.

5 Conclusion

This report is a summary of our preliminary design review based on 95% SD Drawing set of the South Site Elementary School in Aberdeen, Washington. A complete review of mechanical HVAC systems will be completed during the Design Development phase.

Please contact us with any questions and additional coordination.

All the best,



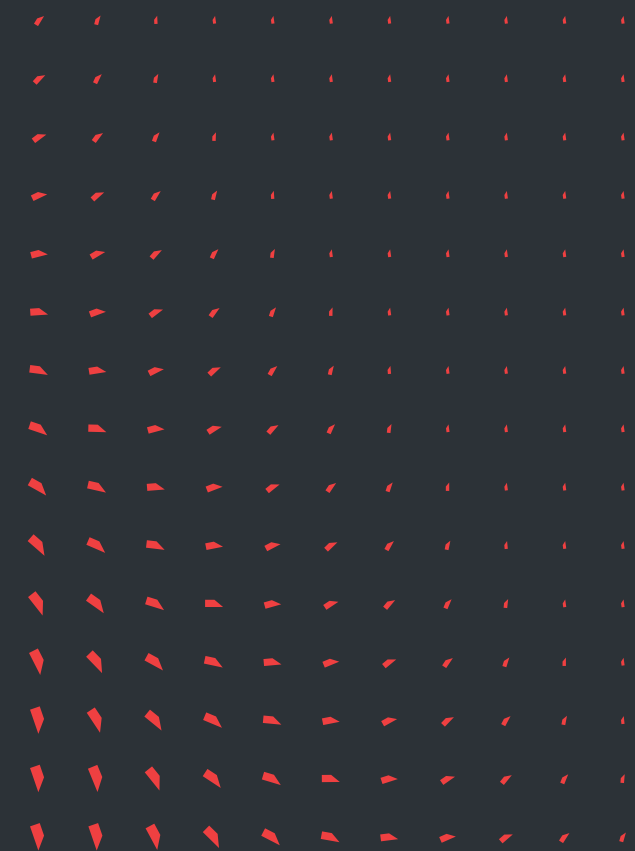
JACKSON CHRISTIAN
STAFF CONSULTANT



ERIK MILLER-KLEIN, PE, INCE BOARD CERTIFIED
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888.978.3667 / TOLL-FREE
ERIK.MK@TENOR-ENG.COM
WWW.TENOR-ENG.COM

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VIII. Community Event



HANDOUT FORM - RESULTS

- **What type of playground activities does your child enjoy most?**
  - Four Square
  - Swings, ladder zones, basketball
  - Soccer
  - Slides
  - Playground, library, & gym
  - Four square, Swings
  - Climbing toys
- **Which outdoor experiences would you like to see more of at our school?**
  - Four Square
  - Slides and bigger swings
  - Soccer, basketball, volleyball
  - Grass, woodchips, less cement
  - Use a playground
  - Basketball & Soccer
  - Cultural & races for different causes "Earth Day" "Cancer"
  - Interactive thinking
  - Sport games
  - Field trips, school garden
  - Comfort benches, nature walks
  - A track of our own so we don't need the middle schools
  - More active items
  - Bikes, outdoor sports, baseball field, soccer field
  - A track of our own so we don't need the middle schools
  - A field day every month school carnival
  - More grass less concrete, swings
  - Ways to engage each other
  - Field & Nature walks
- **What playground features would encourage your child to spend more time outside?** (ie. Swings, benches, walking trails, etc)
  - Four Square
  - Swings, slides, and soccer field
  - Swings, trails
  - Things to run on/ climb on
  - Swings and slides
  - Swings, garden
  - Walking trails
  - Biking, walking trails

BOARD DOT - RESULTS

PLAY STRUCTURES & CLIMBING

Traditional	32
Inclusive	30
Rope Climber	51
Obstacle Course	**63**

ART & CREATIVITY

Chalk Wall	**35**
Murals	30
Student Art Display	10
Gardening	16

NATURE EXPLORATION

Exploration Trails	21
Logs & Boulders	13
Hillside Play	**50**
Labyrinth	20

SPORT GAMES

Asphalt Play	27
Basketball	17
Wall Ball	19
Soccer Goals	**36**

ACTIVE SWING

Belt	16
Basket	26
Hammock	34
Duo	**42**

HANGOUT SPACES

Group Hangout	20
Outlook Corners	7
Friendship Benches	13
Hammock	**24**

ACTIVE SPINNING

Flush Spin Platform	27
Seat Spinner	14
Net Spin	**28**
Standing Spinner	**28**

SCHOOL IDENTITY

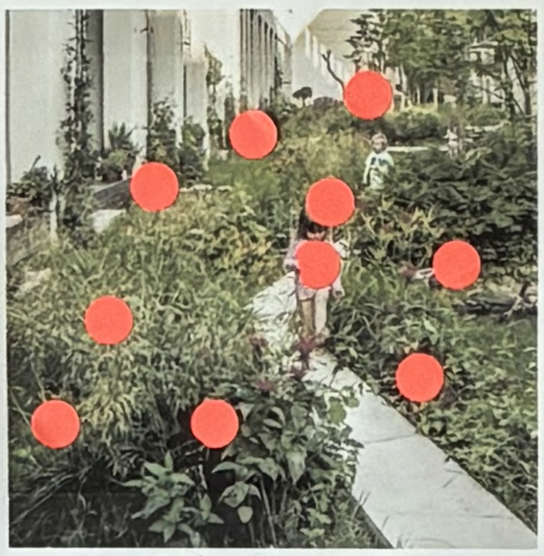
Logging	20
Husky	**53**
Animal	22
Cultural	8

NEW SOUTH SITE ELEMENTARY SCHOOL

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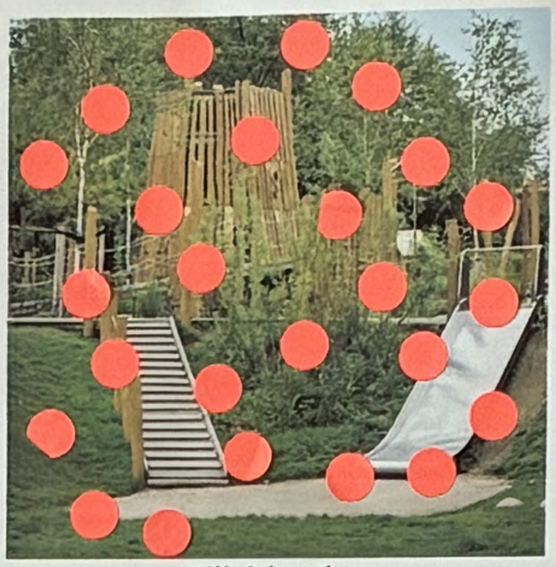
NATURE EXPLORATION



Exploration Trails



Logs & Boulders

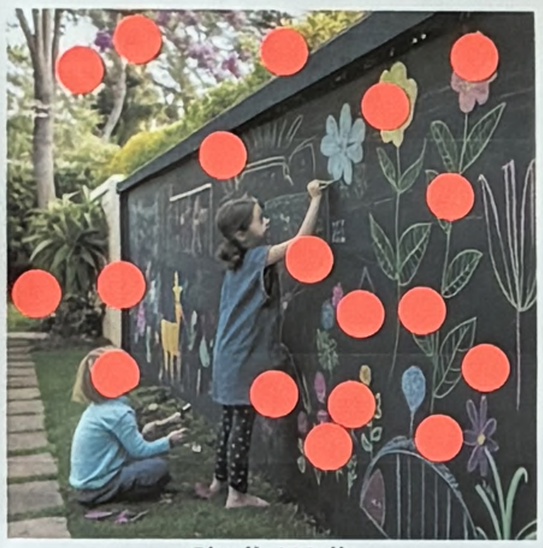


Hillside Play

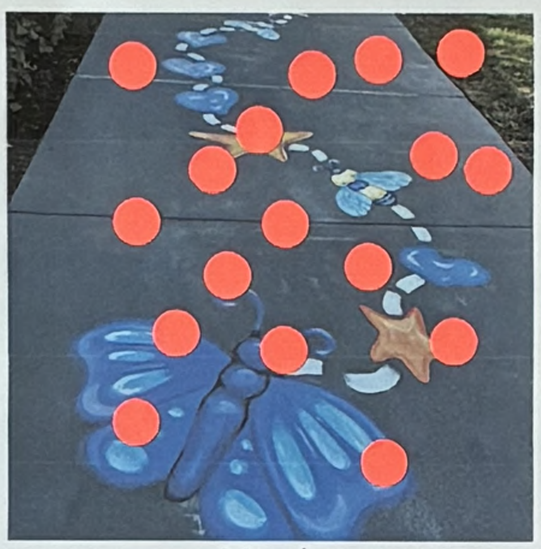


Labyrinth

ART & CREATIVITY



Chalk Walls



Murals

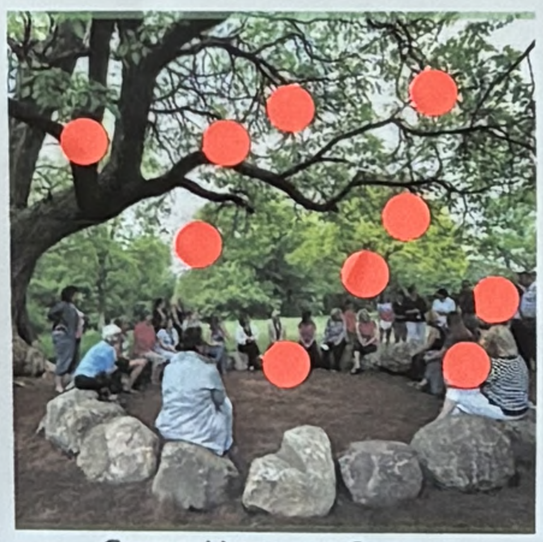


Student-Created Art Displays



Gardening

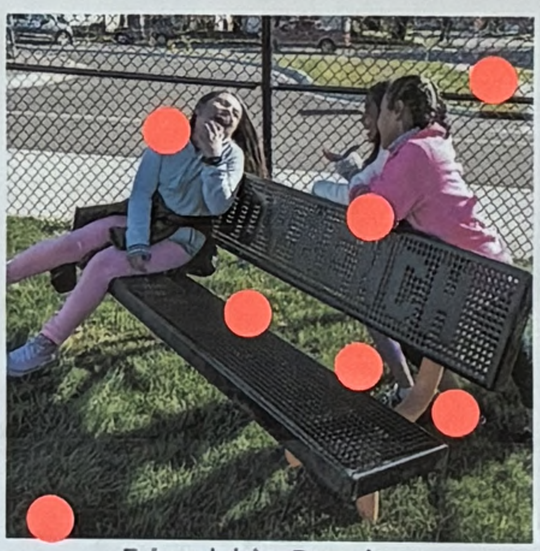
HANG OUT SPACES



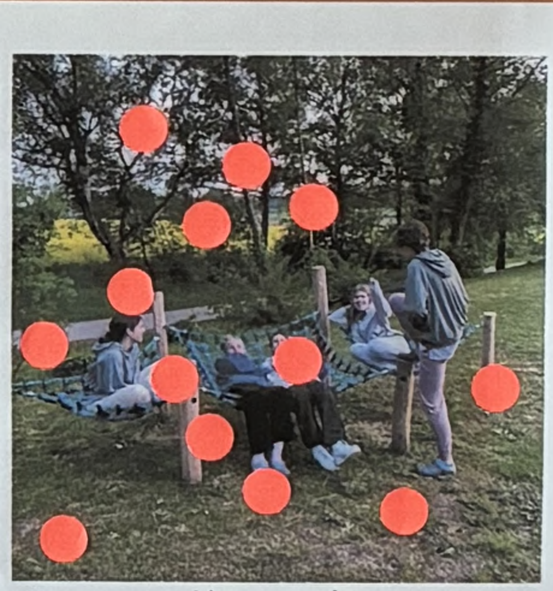
Group Hangout Spaces



Outlook Corners



Friendship Benches

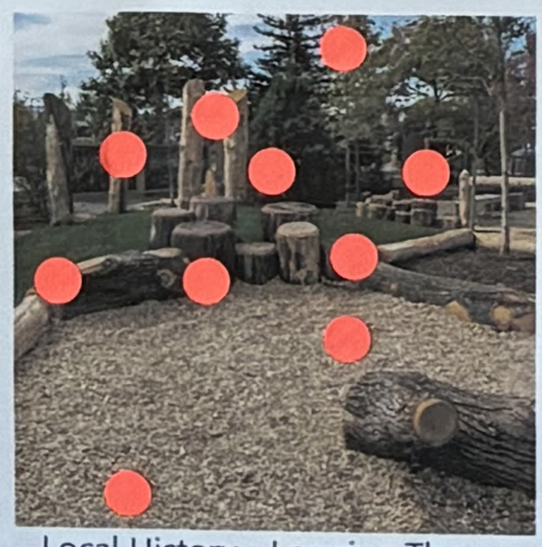


Hammocks

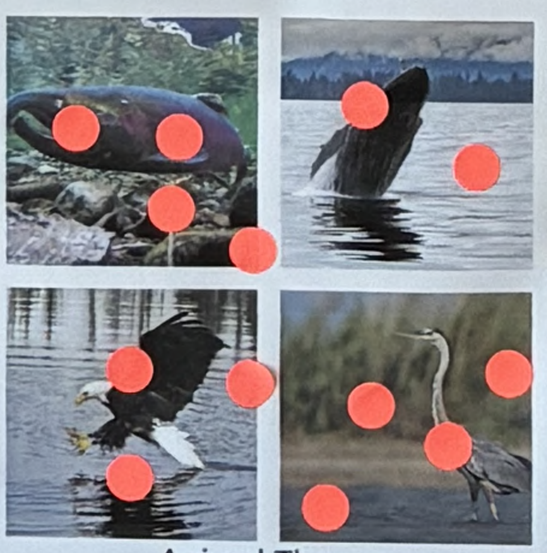
SCHOOL IDENTITY



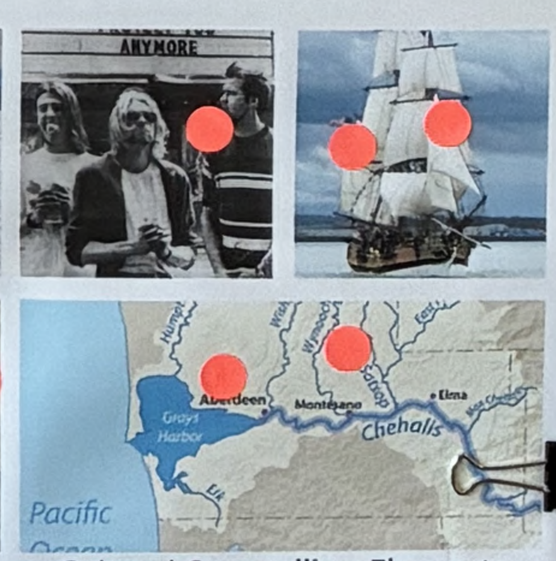
School Mascot Theme



Local History - Logging Theme



Animal Theme



Cultural Storytelling Elements

SiteWorkshop
LANDSCAPE ARCHITECTURE

NEW SOUTH SITE ELEMENTARY SCHOOL

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PLAY STRUCTURES & CLIMBING

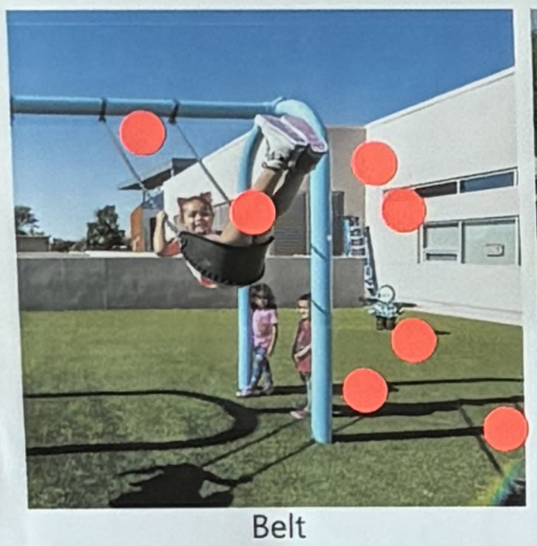

Traditional Playground

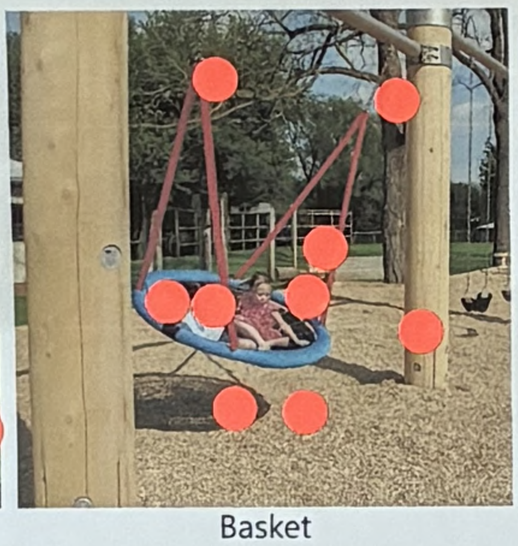

Inclusive Play

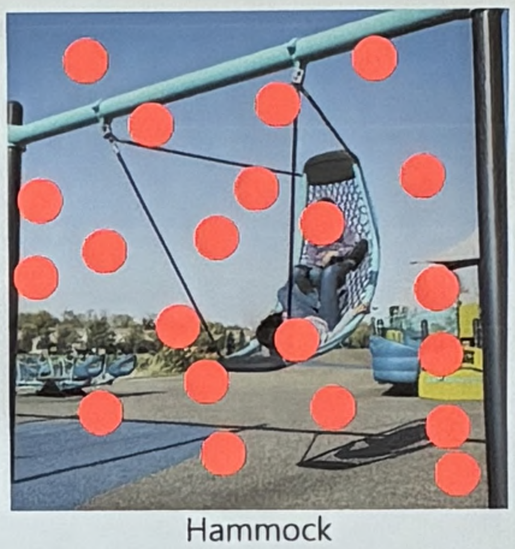

Rope Climbers


Obstacle Courses

ACTIVE SWINGING

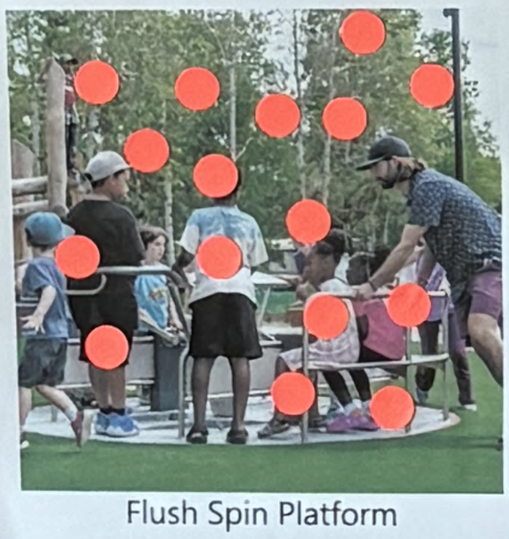

Belt


Basket


Hammock

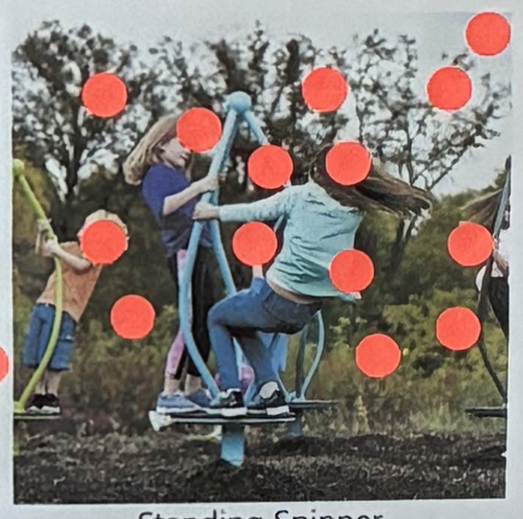

Duo

ACTIVE SPINNING

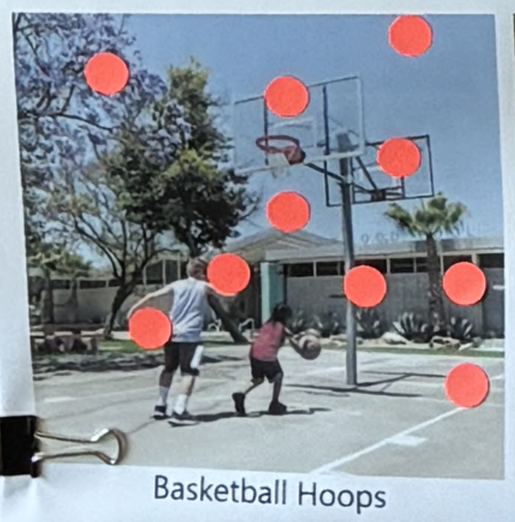

Flush Spin Platform


Seat Spinner

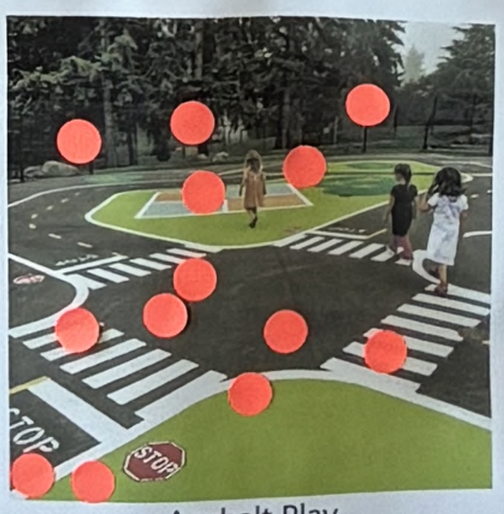

Net Spin


Standing Spinner

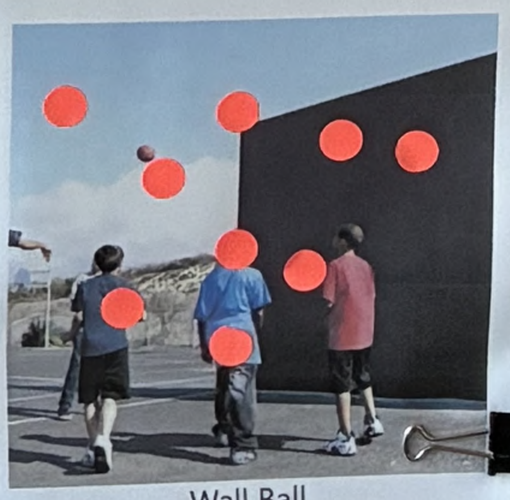
SPORTS & GAMES


Basketball Hoops


Soccer Goals



Asphalt Play


Wall Ball

SiteWorkshop
LANDSCAPE ARCHITECTURE

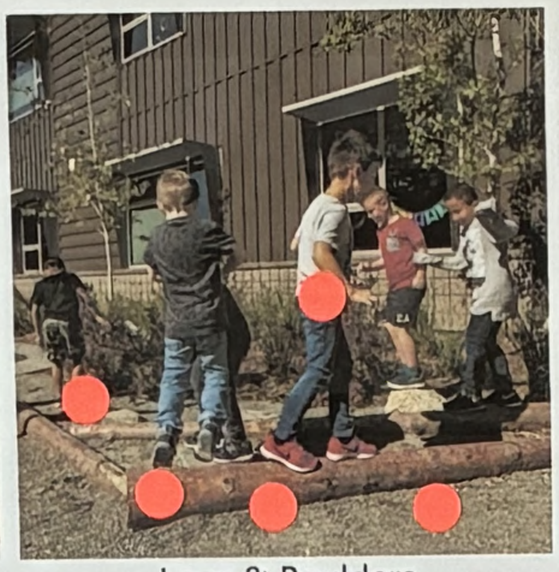
NEW SOUTH SITE ELEMENTARY SCHOOL

Adventure Starts Here!

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NATURE EXPLORATION


Exploration Trails

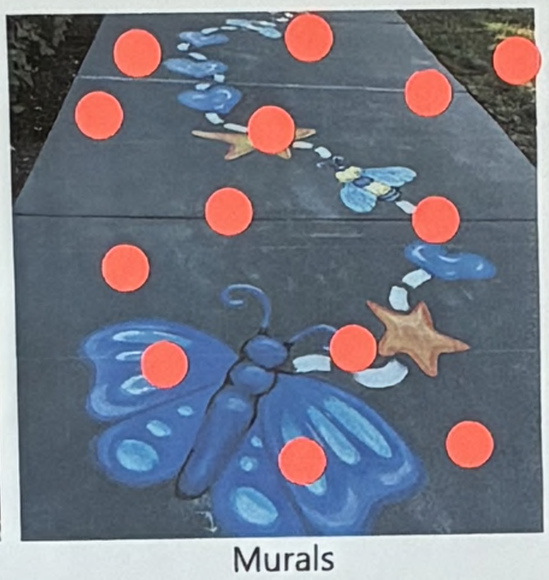

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Labyrinth

ART & CREATIVITY

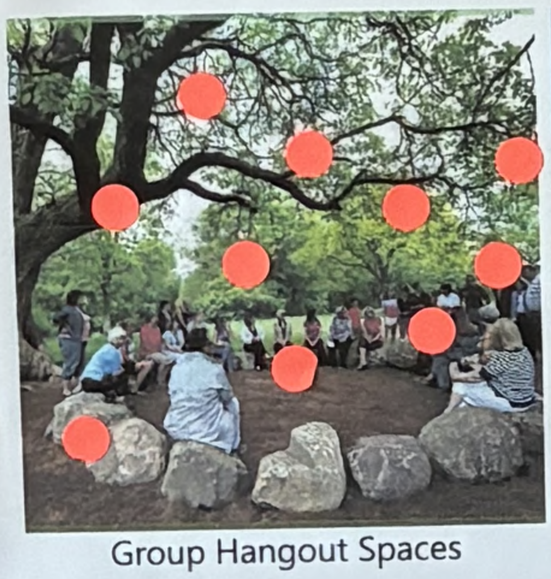

Chalk Walls

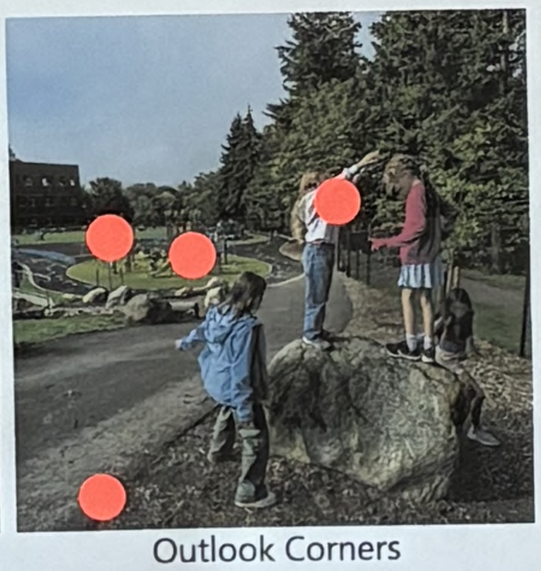

Murals

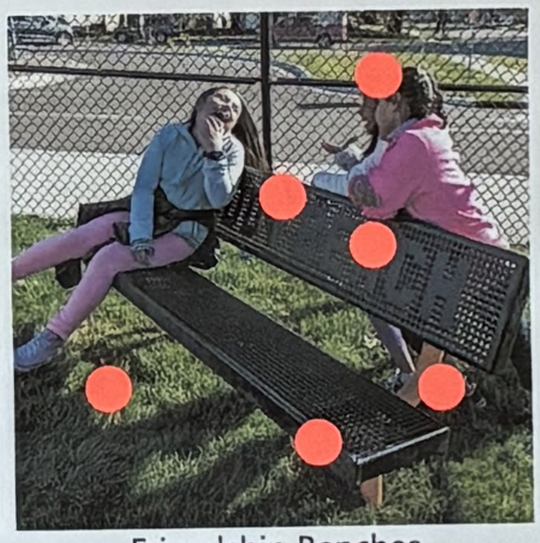

Student-Created Art Displays

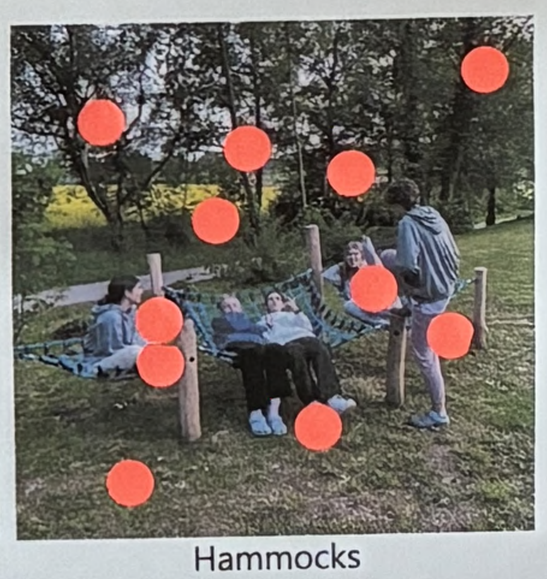

Gardening

HANG OUT SPACES


Group Hangout Spaces

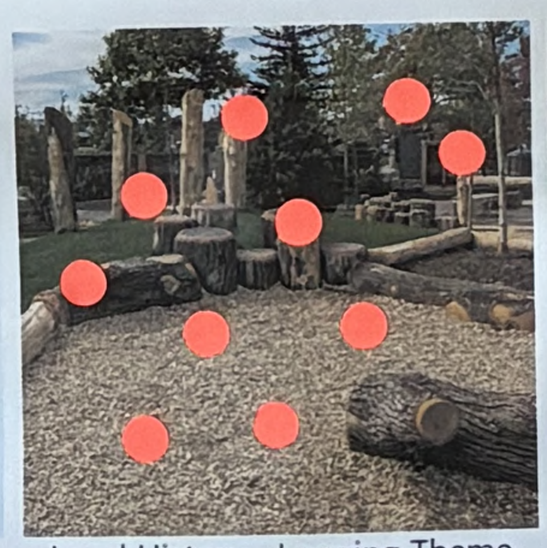

Outlook Corners

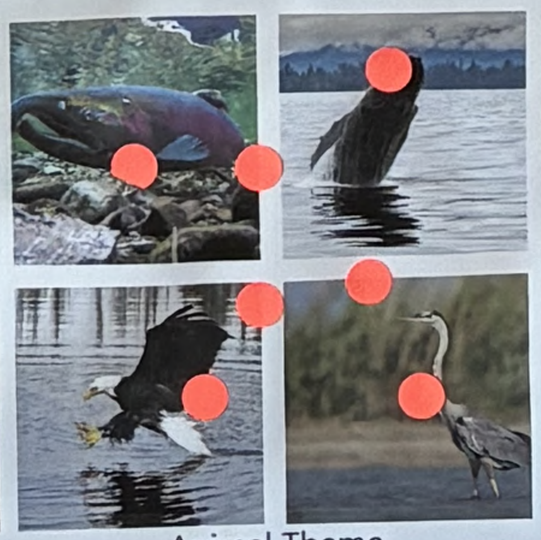

Friendship Benches


Hammocks

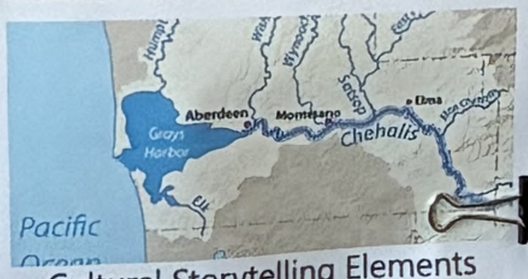
SCHOOL IDENTITY


School Mascot Theme


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SiteWorkshop
LANDSCAPE ARCHITECTURE

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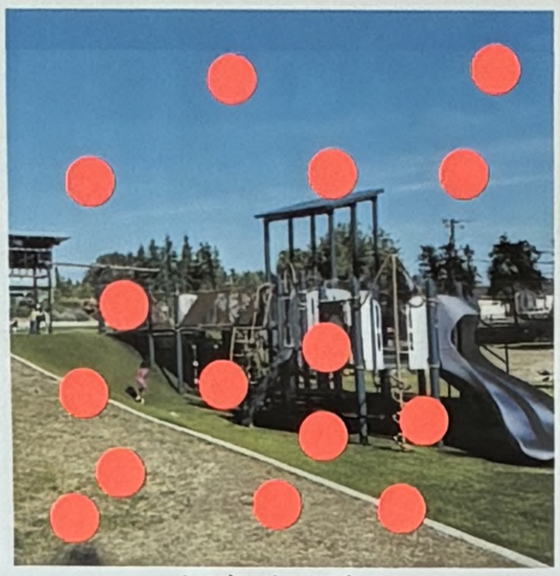
Adventure Starts Here!

place a dot on your favorite play features

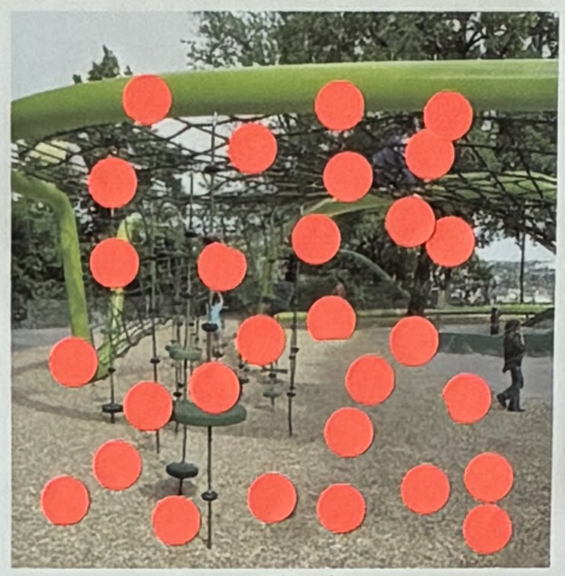
PLAY STRUCTURES & CLIMBING



Traditional Playground



Inclusive Play



Rope Climbers



Obstacle Courses

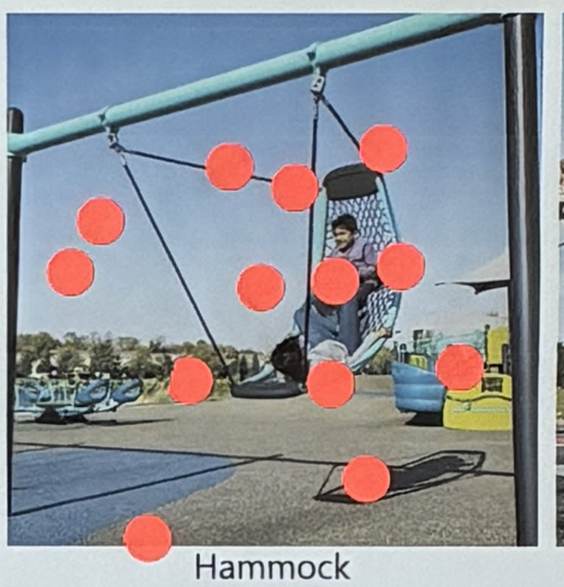
ACTIVE SWINGING



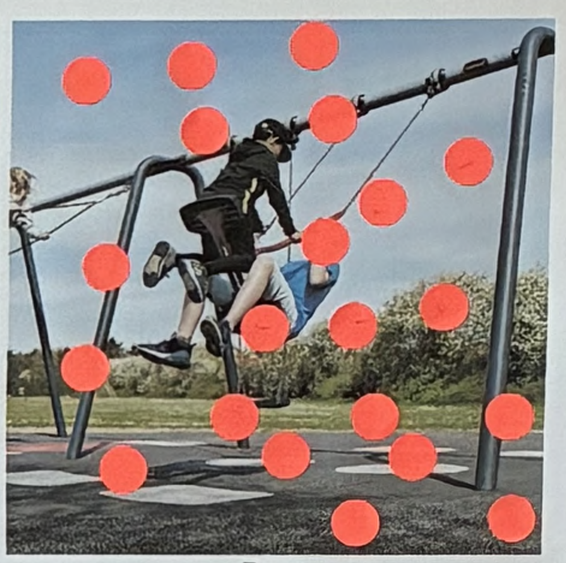
Belt



Basket

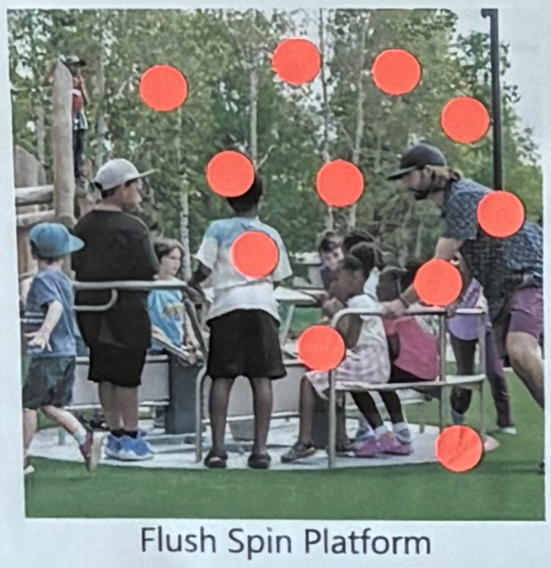


Hammock



Duo

ACTIVE SPINNING



Flush Spin Platform



Seat Spinner

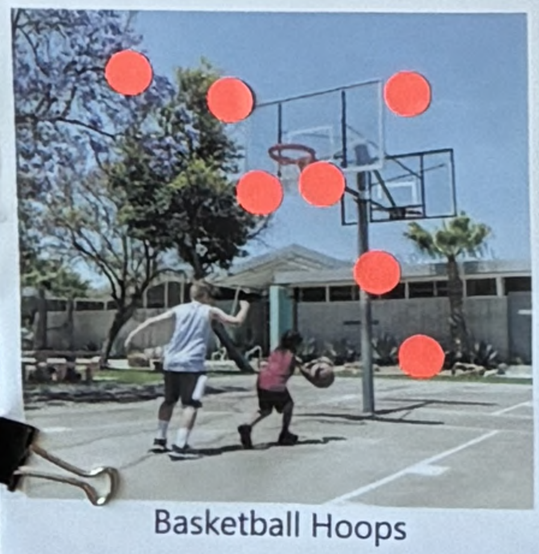


Net Spin

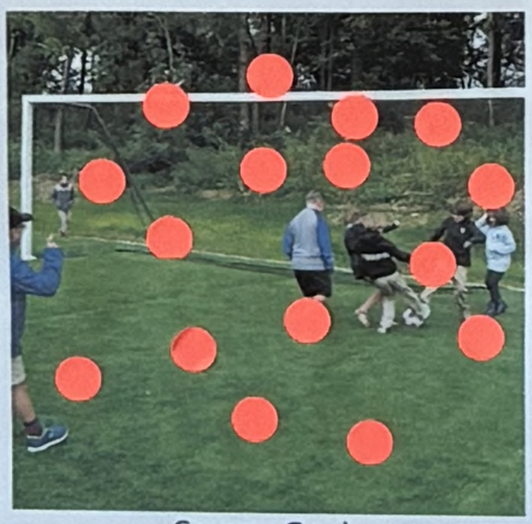


Standing Spinner

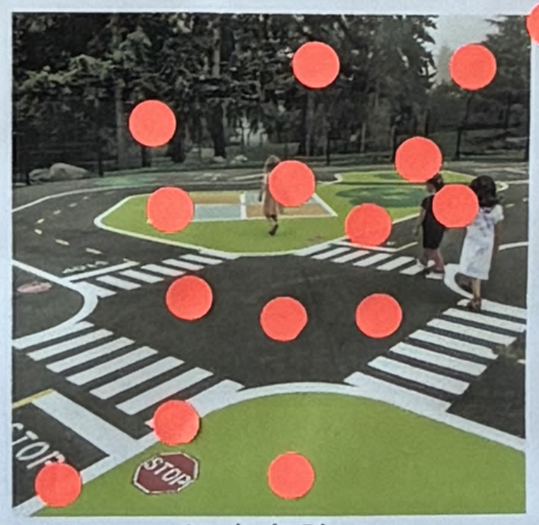
SPORTS & GAMES



Basketball Hoops



Soccer Goals



Asphalt Play



Wall Ball

SiteWorkshop
LANDSCAPE ARCHITECTURE

TCF

IX. Meeting Minutes

MEETING MINUTES

Design Advisory Committee #5
Date: 2/5/26
Project Name: South Site Elementary

Attendance:

Present	Name	Representing	Email
Yes	Steve Wachtler	TCF Architecture	stevew@tcfarchitecture.com
Yes	Andrew Hickman	TCF Architecture	andrew@tcfarchitecture.com
Yes	Glenn Myles	TCF Architecture	glennm@tcfarchitecture.com
Yes	Harika Chowdary	TCF Architecture	harika@tcfarchitecture.com
Yes	Traci Sandstrom	South Site Elementary	tsandstrom@asd5.org
Yes	Courtney Sandstrom	South Site Elementary	csandstrom@asd5.org
Yes	Tosha Love	South Site Elementary	tlove@asd5.org
Yes	Lori Gay	South Site Elementary	lgay@asd5.org
Yes	Rees Sturm	South Site Elementary	resturm@asd5.org
Yes	Manny Saldivar Aguirre	ESD 112	Manuel.saldivar-aguirre@esd112.org
Yes	Robert Muszal	ESD 112	Robert.muszal@esd112.org
Yes	Andy Twyman	ESD 112	Andrew.twyman@esd112.org

Meeting Overview

Introductions & Presentations:

1. Steve provided an overview of the site context.
2. Andrew reviewed Ed Spec adjacency concepts.
3. Glenn presented overall program requirements and introduced Site Plan and Floor Plan options.

Overall Site Considerations

- Design team is working through site access options with the city. The result of those conversations could lead to changes to the overall site design presented.
- Review of flat vs. sloped areas
- Parking capacity and circulation discussed
- Landscaping to be integrated later to soften site edges

Site Plan Option 1:

- ~180 parking stalls (parking count may be negotiable with City – Andy & Manuel)
- Dedicated bus drive lane potentially be increased from 24’ to 28’ to allow parallel parking during large events
- Playfield approx. 5’ lower than paved play area
- Retaining walls anticipated, working to limit obstruction to neighboring properties
- ESD 112 said that they have received positive neighborhood feedback when talking about the project

Floor Plan:

- Add **Student store, playground accessible restroom** adjacent to Cafeteria/Commons
- Staff liked oversized corridors allow breakout spaces
- Clear main entry and improved parent/visitor check-in requested
- Reception to have visibility into Health Room
- **Calming room required**; separated but located near Administration

Site Plan Option 2:

- Larger footprint than **Option 1**
- Advantages include:
    1. More dynamic spaces
    2. Increased daylight
    3. Larger pod areas
    4. Better storefront visibility
    5. Pocket outdoor play areas north of classrooms
- May complicate building form adding to building cost

Floor Plan

- Two workrooms requested (upper and lower levels) or Dedicated printers for offices
- SLP spaces for 1:1 or small groups (pods acceptable; consider larger size space)
- Family room requires storage for clothing & pantry
- Food Bank program on Fridays requires dedicated storage. Could be tied to ASB or PTO room.
- Overall needs for **additional storage** requested

Preferences & Feedback

- Preference expressed for **Option 1** due to:
    1. Greater efficiency
    2. Ability for student drop-off on the north side between classroom wings. Leeway in layout is beneficial
    3. No requirement for transparency to pod spaces from central spine
    4. Maximizing usable space
    5. Covered play towards the play area supports student queuing and supervision
- Second-floor restrooms:
    1. Not critical
    2. Can be reduced or relocated around Mech/ Music rooms

Action Items & Next Steps

- Send **digital copies of site floor plan options** to DAC staff for feedback
- Leave physical boards available for review
- Staff to collect comments in **2 weeks**

MEETING MINUTES

Design Advisory Committee #6
Date: 03/05/26
Project Name: South Site Elementary

Attendance:

Present	Name	Representing	Email
Yes	Steve Wachtler	TCF	stevew@tcfarchitecture.com
Yes	Albert DeSantis	TCF	albert@tcfarchitecture.com
Yes	Glenn Myles	TCF	glennm@tcfarchitecture.com
Yes	Harika Chowdary	TCF	harika@tcfarchitecture.com
Yes	Traci Sandstrom	ASD	tsandstrom@asd5.org
Yes	Courtney Sandstrom	ASD	csandstrom@asd5.org
Yes	Tosha Love	ASD	tlove@asd5.org
Yes	Christine Vanairsdale	ASD	cvanairsdale@asd5.org
Yes	Jessica Prosch	ASD	jprscg@asd5.org
Yes	Lori Gay	ASD	lgay@asd5.org
Yes	Rees Sturm	ASD	resturm@asd5.org
Yes	Leslie Lujan	ASD	llujan@asd5.org
Yes	Manny Saldivar Aguirre	ESD 112	Manuel.saldivar-aguirre@esd112.org
Yes	Robert Muszal	ESD 112	Robert.muszal@esd112.org
Yes	Andy Twyman	ESD 112	Andrew.twyman@esd112.org

Meeting Overview

Introductions & Presentations:

1. Steve provided introductions and outlined next steps for the project.
2. TCF discussed the goal of translating project aspirations into building form and materials
3. Glenn presented & facilitated a Q&A session addressing DAC #5 comments.

Overall Site Considerations

- Parking counts were discussed. TCF will provide a comparison of existing vs proposed parking numbers. Parking breakdowns and labeling include Staff parking, Parent / drop-off parking, ADA parking, Code required EV parking spaces.
- Future Drawings will also include Vehicle queue capacity to ensure they do not interfere with parking stalls.
- Drone views were proposed from the school's floor levels. TCF to follow up with ESD 112.

First Floor Plan:

- Switch the location of the student store and restroom within the commons area. This will allow a coiling counter door from the Store to the exterior.
- For security and maintenance reasons, it was recommended that Student store & restroom spaces not be directly accessible from the exterior.
- A reduction in the main corridor width to 8-10' wide was acceptable at the East Vestibule at the Student Store and Restroom.
- ASD requested emergency outdoor access from the gym for students. TCF clarified the plan is diagrammatic currently and a door will be a required exit for the gymnasium however it would be exit only as it leads to the service yard side of the building.

Second Floor Plan

- Glenn raised concern regarding lack of natural daylight in POD spaces and mentioned that it will require further evaluated by the design team.
- The updated classroom arrangement put younger students closer to the East Play-yards as requested in previous ASD comments. Current classroom arrangement was approved by ASD.

Preferences & Feedback

- Library / Administration

  1. ASD preferred the Library and Admin Office spaces have views North with priority of the Library over the Admin.
  2. TCF to evaluate design options and cost impact to achieve views from these areas.

- Exterior Massing & Design Considerations:

  ASD team "preferred"

  1. Openness, Volumes, Large windows, reflective or colorful elements visible through windows.
  2. Playful elements to take advantage of the change in grade from the school to the field with elements like slides.
  3. Exposed Wood structural elements expressed, but protected from the weather
  4. Curved roof forms, Roof overhangs
  5. Modulation of the façade with a mix of materials, changes in plane, and roof forms
  6. Pop of color
  7. Potential mix of colored brick
  8. A building that evokes 'fun' and is 'inviting'
  9. Good night-lighting of outdoor plaza and courtyard spaces
  10. 'Lantern' effect in evening of welcoming glass areas at entries

  ASD team asked to avoid

  11. Industrial appearance/ character
  12. Flat roofs and flat walls devoid of modulation
  13. Colors – Orange & Green – as shown in the presentation

Action Items & Next Steps

- Provide parking comparison (Existing Vs proposed) including stall breakdown & label ADA and EV parking stalls.
- Illustrate vehicle queuing capacity in site diagrams.
- Study daylight options for POD spaces
- Evaluate view opportunities from Library and to a lesser degree, Administration spaces.
- Development of Exterior Massing and Architectural Expression.
- Drone view footage from the proposed levels of First and Second Floor.

MEETING MINUTES

Design Advisory Committee #7
Date: 4/2/26
Project Name: South Site Elementary

Attendance:

Present	Name	Representing	Email
✓	Steve Wachtler	TCF Architecture	stevew@tcfarchitecture.com
✓	Albert DeSantis	TCF Architecture	albert@tcfarchitecture.com
✓	Glenn Myles	TCF Architecture	glennm@tcfarchitecture.com
✓	Harika Chowdary	TCF Architecture	harika@tcfarchitecture.com
✓	Brie Braukmann	TCF Architecture	brie@tcfarchitecture.com
✓	Traci Sandstrom	South Site Elementary	tsandstrom@asd5.org
✓	Courtney Sandstrom	South Site Elementary	csandstrom@asd5.org
✓	Tosha Love	South Site Elementary	tlove@asd5.org
✓	Lori Gay	South Site Elementary	lgay@asd5.org
✓	Rees Sturm	South Site Elementary	resturm@asd5.org
✓	Leslie Lujan	South Site Elementary	llujan@asd5.org
✓	Breanna Gentry	South Site Elementary	bgentry@asd5.org
✓	Tiffini Galvan	South Site Elementary	tgalvan@asd5.org
✓	Jessica Prosch	South Site Elementary	jprosch@asd5.org
✓	Christine Vanairsdale	South Site Elementary	cvanairsdale@asd5.org
✓	Manny Saldivar Aguirre	ESD 112	Manuel.saldivar-aguirre@esd112.org
	Robert Muszal	ESD 112	Robert.muszal@esd112.org
	Andy Twyman	ESD 112	Andrew.twyman@esd112.org

Meeting Overview:

Introductions & Presentations:

1. Albert & Steve reviewed comments from the previous DAC meeting
2. Expectations for today's presentation and discussion were outlined.
3. Reviewed the existing school parking conditions and total parking counts.

Proposed Site Plan:

1. Development of the parking along the North side avoided due to topography
2. Bus/fire truck access are separated parent drop-off circulation
3. Incorporated Parking Islands as required by City Zoning
4. Site is estimated to accommodate approximately 150 striped parking stalls and were compared to the existing school parking count with 60 striped stalls and potential for 84 on misc paved areas (144 total existing).
5. Potential opportunities on the new site for overflow parking include:
   - - Parallel parking along the fire lane, which will still allow emergency vehicles to pass
   - Use of the paved play area for after-hours event parking.
6. DAC noted the current count of 4 school buses with potential to increase to 6 buses.
7. DAC agreed that the proposed and potential parking counts would be sufficient.

Floor Plans:

TCF reviewed pro's & cons of both floor plan options (refer to the attached document) and discussed updates to the previously presented floor plan layouts.

1. A'The knuckle' was added between the Administration & Classroom wing and, Classrooms & Activity wings which alleviates the long corridor with light and views and access to the courtyards.
2. The outdoor TK Covered Play area was introduced. This area is covered by the second floor classrooms above and serves as secure and accessible outdoor covered play space.

Preferences & Feedback

DAC expressed a preference for Option 2 (all classrooms facing north), based on:

1. Line of sight for Admin and control over Safety & monitoring & wayfinding
2. Views for Classrooms
3. Cost effectiveness & efficiency of mechanical systems and access (as noted by TCF & consultants). It was noted that mechanical systems serving classrooms would benefit from the same exposure to prevent simultaneous cooling and heating for North vs South Pods. Independent cooling of the Admin vs classroom pod would be a less expensive system. Mechanical attic access could also be simplified.

Exterior Design & Render Perspectives

1. TCF presented two material schemes in the elevations representing the durable material options that are the District standards including prefinished fiber cement panels, masonry, and metal cladding.
2. Warm tones were reviewed, including opportunities for accent colors and window configurations studies.
3. Proposed material Strategies:
   - Brick cladding at Administration and Library areas
   - Brick used as plinth/ base at classrooms
   - Fiber cement as a 'wood look' material to provide contrasting texture/color to masonry
4. Key design elements like Mechanical Attic Integration, Clerestory along the corridor spine, High window clerestory in the Gym, Covered play areas directly off the Commons
5. Exterior paint color palettes were reviewed across a range of spectrum. DAC showed preference for Blue Color Schemes with follow up feedback noting, the Board will have the Ultimate decision of approval in the selection of School color.
6. DAC responded positively to the overall Exterior Materials shown in renders, including Brick and Cladding elements, and Black Steel columns at overhangs.

Action Items & Next Steps

1. Develop variations of blue and explore purple as part of color Schemes.
2. Provide material Samples in the next DAC meeting
3. TCF to develop Option 2 (Classrooms on the same side – North) and relationship of grade levels and Specialty classrooms.
4.

Follow – up / Feedback:

1. The selected exterior accent color will represent the school's identity and will require Board approval. Recommendation: Consider incorporating the existing school purple if continuity is desired (similar to the current shade used at University of Washington).
2. Consider minimizing travel distances for TK and Kindergarten students between classrooms, cafeteria, and playground areas.
3. ESD 112 sent the requested School buses counts & details to TCF.

MEETING MINUTES

Design Advisory Committee #8
Date: 05/01/26
Project Name: South Site Elementary

Attendance:

Present	Name	Representing	Email
✓	Steve Wachtler	TCF Architecture	stevew@tcfarchitecture.com
✓	Albert DeSantis	TCF Architecture	albert@tcfarchitecture.com
	Glenn Myles	TCF Architecture	glennm@tcfarchitecture.com
✓	Harika Chowdary	TCF Architecture	harika@tcfarchitecture.com
	Brie Braukmann	TCF Architecture	brie@tcfarchitecture.com
	Traci Sandstrom	South Site Elementary	tsandstrom@asd5.org
	Courtney Sandstrom	South Site Elementary	csandstrom@asd5.org
✓	Tosha Love	South Site Elementary	tlove@asd5.org
✓	Lori Gay	South Site Elementary	lgay@asd5.org
✓	Rees Sturm	South Site Elementary	resturm@asd5.org
✓	Leslie Lujan	South Site Elementary	llujan@asd5.org
	Breanna Gentry	South Site Elementary	bgentry@asd5.org
✓	Tiffini Galvan	South Site Elementary	tgalvan@asd5.org
✓	Jessica Prosch	South Site Elementary	jprosch@asd5.org
✓	Christine Vanairsdale	South Site Elementary	cvanairsdale@asd5.org
✓	Manny Saldivar Aguirre	ESD 112	Manuel.saldivar-aguirre@esd112.org
	Robert Musial	ESD 112	Robert.musial@esd112.org
✓	Andy Twyman	ESD 112	Andrew.twyman@esd112.org
✓	Rebecca Fuchs	Site workshop	rebeccaf@siteworkshop.net
✓	Maria Arevalo Martinez	Site Workshop	mariam@siteworkshop.net
✓	Lynn Green	CTE Director, ASD	lgreen@asd5.org

Meeting Overview:

Introductions & Presentations:

1. TCF reviewed ongoing design updates & prior CLT meeting feedback.
2. Landscape Site Design presentation was led by Rebecca, covering site planning, entries and circulation; field size; inclusive play and nature exploration; and outdoor learning environments.
3. SPED planning considerations were presented based on CLT input and Tracy's feedback.

Site Plan & Floor plans:

1. Site Plan: Key priorities include Safe and efficient traffic separation (Bus, Parent and Service) while maintaining required fire lane access.
    a. DAC preferred:
    - Bus drop-off/ Pickup at North Entry,
    - Parent drop-off at West and South Entries for pickup and lineup of Students.
    b. Parent drop-off has parking lane and passing lane (airport style)
    c. Integration of early play areas near West and South entries, with fencing near outdoor music/ Play Zone.
    d. Secondary fencing around covered play areas with controlled access to playfields.
    e. Franklin Street access to be for Fire Dpt largest truck for emergency use only.

f. Wetland Study in Progress to inform final decisions of allowable Field size. District Admin prefers full field for leasing opportunity however priority is to best school use. DAC prefers reduced field with integrated Nature play

2. Circulation & Entry Experience:
   a. Focused on clear, controlled entry points and safe circulation flow.
   b. Strong emphasis from DAC on "no" neighborhood access except for planned events.
   c. Play areas integrated near Arrival zones on West Entry including Asphalt play are desirable.
   No access to play before school because of safety.
   Like the idea of subtle play (rocks and logs) at entries near parent drop-off.
   d. Use of fencing and controlled access points for safety. Opportunity to utilize fire lane for play during non-bus hours.
   e. Consideration of covered areas for weather protection and to line-up students for Pick-up/ Drop-off.
   There is a before school program where students arrive early (have funding for the next 5 years).
   f. Opening the side of landscape to the South, next to Admin was seen as potentially good but not ideal next to the Admin offices. Could work if use of the area for play is limited to pickup time vs during school day.

3. Floor Plans:
   a. Floor plans continue to develop with focus on SPED needs on Calming/ de-escalation rooms. Strong emphasis on locating outside of Administration. A separate meeting will be held to discuss Calming space size and location with Principal and SPED leads. Manny indicated he will set up a meeting.
   b. DAC requested storage for extra clothing and food supplies for the Family Liaison.
   c. The PE office was suggested to be part of the same space as the storage vs a separate room. TCF to implement.

4. Landscape: Play & Outdoor Learning Environments.
   a. DAC expressed interest in a range of Play elements like Play mounds, hill play, traffic garden, flexible lawn space (for field day use), Swings (for SPED students), Nature play & Inclusive Design.
   b. Strong support for Nature based inclusive play environments. Use of low-cost natural materials (logs, wood, trees). Consideration of liability, maintenance & pest control.
   c. Emphasis on Intentional, Sensory rich play environments, Outdoor program for students, Gathering spaces and Outdoor staff seating areas on the South side of the building.
   d. Pre-K outdoor play can spill out into adjacent open space
   e. Placeholder for gardening area with dedicated storage shed.
   f. Exploration of asphalt vs natural play zones.
   g. Sensory areas integrated into the play field strongly supported and prioritized over a full playfield. And a strong interest for Walking path around field with opportunities for experimentation and science tie-in.
   h. U-12 field would be a revenue source if feasible given grading, cost, and allowing room for other types of desired play.
   i. Staff outdoor area is desired if room.

Preferences & Feedback

DAC expressed interest in:

1. Nature plays and inclusive design with low-cost natural materials. This type of landscape/play can be a good way to keep kids occupied while waiting for Parents to pick up and still looks good / part of landscaping.
2. Clear and safe circulation during Pickup/ Drop off
3. Preferred not to share the field with the neighborhood.
4. Final field decisions will need input from wetland study.
5. Support for sensory play over single large play field.
6. Importance of covered areas at Entry/ Exit zones.

Action Items & Next Steps

1. Manny to set up meeting to discuss SPED – Calming space with Principal and SPED Leads.
2. TCF to include dedicated storage area for the Family Liaison.
3. Opportunity to extend play when fenced to fire lane and stripe the fire lane zone.
4. Develop secondary fencing at the covered play with gates to playfield if bus loop continues through play area. Pavement markings for games can be done on this portion of bus loop.
5. Review wetland study outcomes once available.
6. Widen Front landscape play area, fence after outdoor music play via elimination of some parking
7. Update Pre-K and Outdoor Play renderings.
8. Landscape to follow up on long term maintenance with natural logs.

MEETING MINUTES

TCF

DAC MINUTES #9

Date: 5/21/26

Project Name: South Site Elementary

Attendance:

Present	Name	Representing	Email
✓	Albert deSantis	TCF Architecture	albert@tcfarchitecture.com
✓	Glenn Myles	TCF Architecture	glen@tcfarchitecture.com
✓	Harika Chowdary	TCF Architecture	harika@tcfarchitecture.com
✓	Brie Braukmann	TCF Architecture	brie@tcfarchitecture.com
✓	Robert Musial	Construction Services Group	robert.musial@esd112.org
✓	Manuel Saldivar-Aguirre	Construction Services Group	manuel.saldivar-aguirre@esd112.org
✓	Maria Arevalo Martinez	Site Workshop	mariam@siteworkshop.net
✓	Rees Sturm	Stevens – Teacher	resturm@asd5.org
✓	Tiffini Galvan	Stevens – Teacher	tgalvan@asd.org
✓	Breanna Gentry	Stevens – BSS	bgentry@asd5.org
✓	Leslie Lujan	Stevens – Cook	llujan@asd5.org
✓	Christine Vanairsdale	Stevens – Teacher	cvanairsdale@asd5.org
✓	Courtney Sandstrom	Aberdeen School District	csandstrom@asd5.org
✓	Traci Sandstrom	Aberdeen School District	tsandstrom@asd5.org

Item #	Discussion Topic	Notes/Coordination
1.0	**Site**	• Weather Protection o At bus loop peninsula –important to staff due to inclement weather. Asked to be made a priority – will be discussed after cost estimate set • Site will likely have two detention ponds • Pick up/drop off o The portion directly in front of the building may be congested. Could be striped and signed to prevent drop off in that location. o The designated pick up lane will deter parents from parking in wrong spot. Will go in hand with setting up parking / drop off protocol. o There is opportunity for parents to park and drop off as well, especially along north parking strip as there is a sidewalk leading to the entry.
1.1	**Floor Plans**	• Mechanical attic and roof access being addressed • Sensory room o Sensory replaces the smaller calming/ deescalation rooms o Sensory = proactive, scheduled time o Deescalation = reactive
2.1	**Exterior - Landscaping**	• Outdoor learning – potential now that bus loop is gone at the north side of the building o Fenced-in play at south of building being explored by landscape architects o Interest in shade gardens, outdoor classrooms • Retaining wall @ south mostly eliminated in place of partial retaining rockery walls to preserve existing trees. • City will likely set requirements for landscaping (irrigation, buffers) that the design will follow

		• Slow-growing, easy upkeep makes for easier maintenance is important and Flowers are not desired due to student allergies.
2.2	**Massing & Exterior Character**	• Entry "U" shape canopy o Concern with alcove space above main canopy will be a maintenance challenge to keep clean/ free of debris. o No flat roofs in project beyond canopies • Super graphic o Well received. Could be developed to include landmarks, historical sites, school location • Materials o Positive reception to materials used, locations of materials, proportions of materials. o Reflects "Grays Harbor" design – brick and metal are a part of the history of the area and meets District standards
2.3	**Colors**	• Exterior Colors o Colors presented appear too muted and dark for an elementary school o Purple is a hard color to work with and is not a favorite. Traci indicated purple should not dictate color scheme. o TCF noted the challenge of the purple not clashing with chosen materials. The exterior color scheme will go hand-in-hand with brigh interiors being developed. o TCF will review making the overall exterior color scheme lighter and explore more opportunities to color accents where it makes sense ie around windows o Purple appears too dark in renderings o Blue on the back of the building was a well-received color
3.0	**Cost Estimate**	• Cost Estimate will be complete in early June. o Covered Canopies at the drop off areas will be treated as an Additive Alternate.

Aberdeen School District

South Side Elementary



AUGUST 2026

Schematic Design Report

TCF Architecture
124 N. "I" Street Tacoma, WA 98403
tcfarchitecture.com