

Troy Schools District

RFP #2324-06

BP#2A – High School Athletics Renovations Phase #1 –

Addendum #2

December 7, 2023

Content Included in this Addendum:

Cover Page (1 Page)

Barton Malow Write Up (2 Pages)

TMP Architecture, Inc. Addendum #2 (50 Pages)

TOTAL PAGES: 53 Pages

December 7, 2023

Troy School District – RFP #2324-06
BP #2A – High School Athletics Renovations Phase #1

Addendum #2 Bidder Clarifications

A. General Clarifications

B. Clarifications and Additions to Work Scopes

- **Site Work Work Scopes**
 - Added spec section 11 6833 for Athletic Field Equip & Backstops to assigned specification sections.
- **Synthetic Turf Work Scopes**
 - Added spec section 32 1815 for Synthetic Turf to assigned specifications sections.
 - Added spec section 32 1852 for Performance Shock Pad assigned specifications sections.

C. RFI Responses

Q: 6x6 Wood timbers and not shown in bullpen section cuts. Please advise. Page LD1.08

A: Details have been revised in Addendum #2

Q: Please provide details for the relocated batting cages and provide a note for new turf at the baseball batting cage.

A: Sheet LD1.09 reissued as a part of Addendum #2

Q: Please provide details and cuts for the turf area at the pavers. does this area need drainage? Please advise.

A: Details have been included as part of Addendum #2

Q: Do we want to tie the toilet room downspouts into the storm drainage? Please advise.

A: Not Required

Q: The relocated storage building calls for an aggregate base. Should the base be concrete so we can have something to attach the turf wood nailer to? Please advise.

A: Building requires an aggregate base. Provide concrete turf anchor at perimeter of building.

Q: Spec section for protective netting was removed between DD to CD drawings. Please advise.

A: Requirements for protective netting have been included in Specifications Section 11 6833 Athletic Field Equipment

Q: Should the fence post be installed behind the turf anchor in all locations? Should the turf anchor be independent from all fence posts? If the fence post or footings heave it will take the turf anchor along with it. Please advise.

A: Fence posts should be incorporated within turf anchors as detailed

Q: The specifications for the Synthetic Turf Batting Cages and Bullpens it calls out for .5625" pile height with a 5mm secondary backing as well as a 1.25" pile height with an 8mm secondary backing. Which thickness turf and pad is intended for use?

A: Use the .5625" pile height and 5mm secondary backing for batting cage and bullpen turf.

Q: On page c-2.1 it shows demoing the storm line and structures under existing bleachers. Bleachers are not being removed. Please advise.

A: Addressed in Addendum #2. Cut and Cap fill with flowable fill.



Addendum

Date December 6, 2023
Project Name Troy School District - Athens High School Athletics & Troy High School Athletics
TMP Project No(s). 22103D, 22104E
Bid Package No. 02A
Addendum No. Two (2)

ADDENDUM NO. 1 WAS PREVIOUSLY ISSUED ON DECEMBER 6, 2023.

The Bidding Documents are modified, supplemented, or augmented as follows and the Addendum is hereby made a part of the proposed Contract Documents.

The following Drawing(s) and Attachment(s) are issued with this Addendum:

Drawing No(s): 22103D – Athens HS: None
22104E – Troy HS: C-2.1, C-4.4, C-4.5, C-6.0, C-6.1, C6.2, C-7.0, C-7.1, C-8.0, C-8.1, L2.05, LD1.02, LD1.05, LD1.08, LD1.09, LD1.12, LD1.20
Attachment(s): Specification Section(s): 11 6833, 32 1815, 32 1852

Item No.	Specification Changes
SC-1	Refer to Section No. 00 0110 – TABLE OF CONTENTS (not reissued): A. Added section 32 1852 “PERFORMANCE SHOCK PAD” to Table of Contents.
SC-2	Refer to Section No. 11 6833 – ATHLETIC FIELD EQUIPMENT (reissued): A. Revised paragraph 2.4.B graphics as indicated.
SC-3	Refer to Section No. 32 1815 – SYNTHETIC TURF (reissued): A. Added paragraph 1.1.B.2 as indicated. B. Revised paragraphs 1.7.F 1.7.G tables as indicated. C. Revised paragraph 1.8.B.9 as indicated. D. Revised paragraph 2.2.A.1 table as indicated. E. Revised paragraph 2.2.D.1.b as indicated. F. Revised paragraph 3.2.B.6 as indicated. G. Revised SAMPLE SYNTHETIC TURF WARRANTY paragraph 1.1.D as indicated.

December 6, 2023

Troy School District - Athens High School Athletics and Troy High School Athletics

TMP Project No(s). 22103D & 22104E

Bid Package No. 02A

Addendum No. Two (2)

Page 2 of 4

- SC-4 Refer to Section No. 32 1852 – PERFORMANCE SHOCK PAD (new):
- A. Issued new specification section, complete.

22104E – Troy High School:

Item No.	Civil Drawing Changes
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- | | |
|------|--|
| CD-1 | Refer to Drawing No. C2.1 (reissued): <ul style="list-style-type: none">A. Revised demolition scope as indicated.B. Added notes to protect track and fence as indicated.C. Added notes to abandon storm sewers in locations indicated. |
| CD-2 | Refer to Drawing No. C-4.4 (reissued): <ul style="list-style-type: none">A. Revised scope of grading as indicated.B. Adjusted match spot elevations at existing fence line locations as indicated.C. Delete inlet as indicated. Revised grading along path between inlets at Varsity Baseball field. Revised grading at Baseball field as indicated. |
| CD-3 | Refer to Drawing No. C-4.5 (reissued): <ul style="list-style-type: none">A. Revised scope of grading as indicated.B. Adjusted match spot elevations at existing fence line locations as indicated.C. Deleted inlet as indicated. Revised grading along path between inlets at Varsity Baseball field. Revised grading at Baseball field as indicated. |
| CD-4 | Refer to Drawing No. C-6.0 (reissued): <ul style="list-style-type: none">A. Revised drains as indicated.B. Deleted inlet in conflict with existing fence as indicated.C. Revised inlet 22 outlets as indicated.D. Revised slopes at pipes adjusted as indicated.E. Revised structure table to match new invert locations as indicated. |
| CD-5 | Refer to Drawing No. C-6.1 (reissued): <ul style="list-style-type: none">A. Revised drains as indicated.B. Deleted inlet in conflict with existing fence as indicated.C. Revised inlet 22 outlets as indicated. |

December 6, 2023

Troy School District - Athens High School Athletics and Troy High School Athletics

TMP Project No(s). 22103D & 22104E

Bid Package No. 02A

Addendum No. Two (2)

Page 3 of 4

- D. Revised slopes at pipes adjusted as indicated.
- E. Revised structure table to match new invert locations as indicated.

- CD-6 Refer to Drawing No. C-6.2 (reissued):
- A. Revised structure tables as indicated.
 - B. Deleted inlet in conflict with existing fence as indicated.
 - C. Revised inlet 22 outlets as indicated.
 - D. Revised slopes at pipes adjusted as indicated.
 - E. Revised structure table to match new invert locations as indicated.
- CD-7 Refer to Drawing No. C-7.0 (reissued):
- A. Revised storm sewer profiles as indicated.
- CD-8 Refer to Drawing No. C-7.1 (reissued):
- A. Revised storm sewer profiles as indicated.
- CD-9 Refer to Drawing No. C-8.0 (reissued):
- A. Revised STORM SEWER SYSTEM DESIGN table as indicated.
 - B. Revised drainage around impacted grading adjustments as indicated.
 - C. Revised sizing spreadsheet as indicated.
- CD-10 Refer to Drawing No. C-8.1 (reissued):
- A. Revised drainage plan as indicated.
 - B. Revised drainage around impacted grading adjustments as indicated.
 - C. Revised sizing spreadsheet as indicated.

Item No. Athletic Fields Drawing Changes

- LD-1 Refer to Drawing No. L2.05 (reissued):
- A. Updated drainage layout at synthetic turf plaza area as indicated.
 - B. Revised Utility Legend as indicated.
- LD-2 Refer to Drawing No. LD1.02 (reissued):
- A. Added Details #16 and #17 for landscape turf and drainage details as indicated.

December 6, 2023

Troy School District - Athens High School Athletics and Troy High School Athletics

TMP Project No(s). 22103D & 22104E

Bid Package No. 02A

Addendum No. Two (2)

Page 4 of 4

- LD-3 Refer to Drawing No. LD1.05 (reissued):
 A. Revised Detail #4 with updated elevation as indicated.
- LD-4 Refer to Drawing No. LD1.08 (reissued):
 A. Revised Detail #1 and #2 of bullpen layouts as indicated.
 B. Inserted Details #7 and #8 as indicated.
- LD-5 Refer to Drawing No. LD1.09 (reissued):
 A. Revised Details #1 and #2 to identify manufacturer's standard batting
 cage sizes as indicated.
 B. Added sample manufacturer footing detail as indicated.
 C. Revised Turf Section Detail as indicated.
- LD-6 Refer to Drawing No. LD1.12 (reissued):
 A. Added Detail #14 for Home Plate Forming System as indicated.
- LD-7 Refer to Drawing No. LD1.20 (new):
 A. Issued new sheet, complete.

Item No. Architectural Drawing Changes

- AD-1 Refer to Drawing No. TS.1 (not reissued):
 A. Added the following sheet to ATHLETIC FIELDS list of drawings:
 LD1.20 STORAGE BUILDING DETAILS

END OF ADDENDUM NO. 2 - BID PACKAGE NO. 02A

TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

Section	Title	Issued
00 0101	Title Page	CD
00 0110	Table of Contents	CD
00 0115	List of Drawings	CD
00 8200	Availability of Electronic Files	CD
00 8200.02	Electronic Files Release Form (Free)	CD

SPECIFICATIONS GROUP

GENERAL REQUIREMENTS SUBGROUP

DIVISION 01 - GENERAL REQUIREMENTS

Section	Title	Issued
01 2300	Alternates	CD
01 2500	Substitution Procedures	CD
01 2500.01	TMP Substitution Request Form	CD
01 3000	Administrative Requirements	CD
01 3000.01	TMP Submittal and Sample Transmittal Form	CD
01 4000	Quality Requirements	CD
01 4100	Regulatory Requirements	CD
01 4216	Definitions	CD
01 4219	Reference Standards	CD
01 4533	Code-Required Special Inspections and Procedures	CD
01 6000	Product Requirements	CD
01 7000	Execution and Closeout Requirements	CD
01 7329	Cutting and Patching	CD
01 7800	Closeout Submittals	CD
01 7900	Demonstration and Training	CD

FACILITY CONSTRUCTION SUBGROUP

DIVISION 02 – EXISTING CONDITIONS

Section	Title	Issued
02 4100	Demolition	CD
02 4110	Salvage & Relocation of Field Items	CD

DIVISION 03 - CONCRETE

Section	Title	Issued
03 3000	Cast-in-Place Concrete	CD
03 3003	Cast-in-Place Concrete Requirements for Floor Slabs	CD
03 3005	Cast In Place Concrete- Athletics	CD
03 3053	Concrete Turf Anchor	CD
03 3800	Post-Tensioned Concrete	CD

DIVISION 04 - MASONRY

Section	Title	Issued
04 2000	Unit Masonry	CD

DIVISION 05 - METALS

Section	Title	Issued
05 5000	Metal Fabrications	CD

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

Section	Title	Issued
06 1000	Rough Carpentry	CD
06 1050	Turf Wood Nailer	CD
06 1600	Sheathing	CD
06 1753	Shop-Fabricated Wood Trusses	CD

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

Section	Title	Issued
07 1113	Bituminous Dampproofing	CD
07 2119	Foamed-In-Place Insulation	CD
07 2423	Direct-Applied Finish System	CD
07 2726	Fluid-Applied Membrane Air Barriers	CD
07 4113	Metal Roof Panels	CD
07 6200	Sheet Metal Flashing and Trim	CD
07 8400	Firestopping	CD
07 9200	Joint Sealants	CD

DIVISION 08 - OPENINGS

Section	Title	Issued
08 1612	FRP-Faced Aluminum Doors and Frames	CD

08 3100	Access Doors and Panels	CD
08 3613	Sectional Doors	CD
08 7100	Door Hardware	CD

DIVISION 09 - FINISHES

Section	Title	Issued
09 2900	Gypsum Board	CD
09 6513	Resilient Bases and Accessories	CD
09 9123	Interior Painting	CD

DIVISION 10 - SPECIALTIES

Section	Title	Issued
10 0100	Miscellaneous Specialties	CD
10 1423	Panel Signage	CD
10 2113.18	Solid Composite Toilet Compartments	CD
10 2800	Toilet, Bath, and Laundry Accessories	CD
10 4400	Fire Protection Specialties	CD
10 7516	Flagpoles	CD

DIVISION 11 - EQUIPMENT

Section	Title	Issued
11 6826	Net Tension System	CD
11 6833	Athletic Field Equip & Backstops	CD, ADD2
11 6834	Football Goalpost	CD
11 6836	Soccer & Lacrosse Goals	CD
11 6837	Shaded Dugout Structure	OR
11 6838	Baseball Equipment	CD
11 6840	Field Event Construction	OR
11 6843	Scoreboard	CD

DIVISION 12 - FURNISHINGS

Not Used

DIVISION 13 - SPECIAL CONSTRUCTION

Section	Title	Issued
13 3400	Pre-Cast Concrete Structure	CD
13 3515	Bleachers	CD

DIVISION 14 - CONVEYING EQUIPMENT

Not Used

FACILITY SERVICES SUBGROUP**DIVISION 20 – COMMON MECHANICAL REQUIREMENTS**

Section	Title	Issued
20 0500	Mechanical General Requirements	CD
20 0510	Basic Mechanical Materials and Methods	CD
20 0513	Motors	CD
20 0519	Meters and Gages	CD
20 0529	Hangers and Supports	CD
20 0547	Mechanical Vibration Controls	CD
20 0553	Mechanical Identification	CD
20 0700	Mechanical Insulation	CD

DIVISION 21 – FIRE SUPPRESSION

Not Used

DIVISION 22 - PLUMBING

Section	Title	Issued
22 1116	Domestic Water Piping	CD
22 1119	Domestic Water Piping Specialties	CD
22 1316	Sanitary Waste and Vent Piping	CD
22 1319	Drainage Piping Specialties	CD
22 3300	Electric Domestic Water Heaters	CD
22 4200	Plumbing Fixtures	CD
22 4600	Security Plumbing Fixtures	CD
22 4700	Drinking Fountains, Water Coolers and Cuspidors	CD

DIVISION 23 – HEATING VENTILATING AND AIR CONDITIONING (HVAC)

Section	Title	Issued
23 0500	Common Work Results for Hvac	CD
23 0593	Testing, Adjusting, and Balancing	CD
23 0933	Temperature Controls	CD
23 3113	Metal Ducts	CD
23 3300	Duct Accessories	CD
23 3423	Power Ventilators	CD
23 3713	Diffusers, Registers, and Grilles	CD
23 3723	Air Intake And Relief Hoods	CD
23 8241	Propeller Fan Unit Heaters - Steam, Hot Water, Electric	CD

23 8244	Centrifugal Fan Cabinet Unit Heaters (Electric)	CD
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DIVISION 25 – INTEGRATED AUTOMATION

Not Used

DIVISION 26 – ELECTRICAL

Section	Title	Issued
26 0010	Electrical General Requirements	CD
26 0519	Conductors and Cables	CD
26 0526	Grounding and Bonding	CD
26 0529	Hangers and Supports for Electrical Systems	CD
26 0533	Raceways and Boxes	CD
26 0553	Electrical Identification	CD
26 0573	Overcurrent Protective Device Coordination and Arc-Flash Hazard Study	CD
26 0923	Lighting Control Devices	CD
26 2200	Dry-Type Transformers (600 V and less)	CD
26 2416	Panelboards	CD
26 2726	Wiring Devices	CD
26 2813	Fuses	CD
26 2816	Enclosed Switches and Circuit Breakers	CD
26 2913	Enclosed Controllers	CD
26 5119	LED Interior Lighting	CD
26 5600	Exterior Lighting	CD

DIVISION 27 – COMMUNICATIONS

Section	Title	Issued
27 5119	Field Utility Boxes	CD

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

Not Used

SITE AND INFRASTRUCTURE SUBGROUP**DIVISION 31 – EARTHWORK**

Section	Title	Issued
31 1000	Site Preparation	CD
31 2010	Earthwork	CD
31 3219	Geotextile Fabric	CD

DIVISION 32 – EXTERIOR IMPROVEMENTS

Section	Title	Issued
32 1123	Aggregate Drainage Layer	CD
32 1809	Synthetic Turf – Batting Cages & Bullpen	CD
32 1811	Synthetic Turf - Landscape	CD
32 1815	Synthetic Turf	CD, ADD2
32 1819	Synthetic Turf – Baseball & Softball	CD
32 1822	Infield Mix – Red Clay	CD
32 1831	Shot Put Material	CD
32 1836	Acrylic Tennis Court Surface – Concrete	CD
32 1852	Performance Shock Pad	ADD2
32 3100	Chain Link Fence	CD
32 8400	Irrigation	CD
32 9119	Topsoil	CD
32 9223	Lawn – Athletic Sod	CD
32 9227	General Lawn Restoration	CD
32 9300	Exterior Plants	OR

DIVISION 33 – UTILITIES

Section	Title	Issued
33 4605	Subdrainage Systems – Sand	CD
33 4615	Subdrainage Systems – Turf DrainTile	CD

END OF SECTION

SECTION 11 6833 – ATHLETIC FIELD EQUIPMENT

PART 1- GENERAL

1.1 RELATED DOCUMENTS

- A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.
- B. Related Sections:
 - 1. Section 03 3000 Cast In Place Concrete – Athletics
 - 2. Section 31 2010 Earthwork - Athletics
 - 3. Section 32 3100 Chainlink Fence – Galvanized

1.2 SCOPE

- A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary for the installation of the following:
 - 1. Tension Ball Safety Netting System and Accessories
 - 2. Protective Safety Net System
 - 3. Field Wall Protective Padding and Accessories
 - 4. Pre-Fabricated On-Deck Circles

1.3 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
 - 1. National Federation of State High School Associations (NFHS)
 - 2. National Collegiate Athletic Association (NCAA)
 - 3. International Association of Athletics Federations (IAAF)
 - 4. American Sports Builders Association (ASBA)
 - 5. Manufacturers Data and Recommended Installation Requirements

1.4 SUBMITTALS

- A. Manufacturers Product Data
 - 1. Provide manufacturers product data prior to actual field installation work, for Architects or Owners representatives review.
 - 2. Stamped and Sealed Drawings and Calculations by a Licensed Professional Engineer of Record in the State of Project Location for all Tension Backstop Net Systems and Protective Safety Net Systems.
- B. Shop Drawings
 - 1. Provide drawings of the manufacturers recommended installation and foundation requirements prior to actual field installation work, for Architects or Owners representatives review.
 - 2. Manufacturer is responsible to provide signed and sealed engineered drawings of backstop system and protective safety net system, including support pole design, concrete footings design/requirements, and other pertinent information for a complete installation.
 - 3. Provide color renderings as necessary, complete with dimensions of proposed padding and pre-fabricated on-deck circles, to attain a final approval package from the Owner.

1.5 QUALITY ASSURANCE

- A. Manufacturers warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to industry standards and inspection requirements.
- B. Soil Conditions: The design criteria for these specifications are based on soil conditions with 2,000 psf or greater lateral load.

1.6 PRODUCT DELIVERY AND STORAGE

- A. Net System Warranty Guarantee: The Contractor and any Sub-contractor hereunder shall guarantee their respective work against defective materials or workmanship for a minimum period of two (2) year from the date of filing notice of completion or acceptance by Owner, unless noted otherwise in the Contract Documents or manufacturer's warranty is greater.
- B. Wall Padding Warranty Guarantee: The Contractor and any Sub-contractor hereunder shall guarantee their respective work against defective materials or workmanship for a minimum period of three (3) years from the date of filing notice of completion or acceptance by Owner, unless noted

otherwise in the Contract Documents. Refer to specific Manufacturer's Limited Warranty.

PART 2 - PRODUCTS

2.1 INTEGRATED WALL PAD BACKSTOP

A. BASIS OF DESIGN:

Sportsfield Specialties, Inc.
P.O. Box 231
41155 State Highway 10
Delhi, NY 13753
p. 888-975-3343
f. 607-746-8481
www.sportsfieldspecialties.com

B. COMPONENTS:

1. Upright Support Posts – Fabricated, Sized and Configured as Required:
 - a. Height Above Finish Grade as Noted. Netting System manufacturer is responsible for sizing of posts and footings as required for Delegated Design.
 - b. Powder Coated Finish (Black)
 - c. Direct embedded post installation
 - d. Stainless Steel or Hot Dipped Galvanized Assembly Hardware - Quantities, Sizes and Configurations as Required
2. Wall Pad Backstop Rail Support Structure and Mounting Brackets:
 - a. Quantity and Configuration as Required
 - b. 2 ½" SQ. x 11 Gauge Wall Thickness Steel Rail Support Structure
 - c. 7 Ga. Steel Bracketry for Rail Mounting
 - d. Super Durable Powder Coated Black Finish with Enhanced Resistance to UV and Fade
3. Wall Pads and Backer Board:
 - a. Length, Height, and Configuration as Required
 - b. 18 oz. Exterior Vinyl – Color to be selected by Owner
 - c. Padding to be placed on BOTH sides of the wall
 - d. ¾" Advantech® Water Resistant Sheathing Panel, Sealed and Stained with Exterior Grade Black Finish
 - e. Graphics to include: School Name, Mascot Name and (2) logos. Logos to be provided to Contractor in .eps format upon Contract Award
 - f. Aluminum Z-Clip Style Mounting Brackets, (2) Sets per Pad
 - g. 11 Ga. Steel U-Bracket for Backer Board Mounting, Super Durable Powder Coated Black Finish with Enhanced Resistance to UV and Fade
4. Included Accessories:
 - a. Hot Dipped Galvanized Attachment and Assembly Hardware - Quantities, Sizes and Configurations as Required
 - b. Black Rope for Net Binding Attachment to Wire Rope Support Structure – Quantities and Configurations as Required
 - c. Stamped and Sealed Drawings and Calculations by a Licensed Professional Engineer of Record in the State of Project Location
 - d. Model Specific Hardware Kit and Installation Instructions
 - e. One (1) Year Limited Manufacturer's Product Warranty

2.2 STRAIGHT POLE SAFETY NETTING SYSTEM (Multi-Purpose Field)

- A. Basis of Design: Model # BSS420 – Pre-Engineered 20 Foot Straight Pole Safety Netting System and Accessories as Manufactured and/or Supplied by Sportsfield Specialties, Inc.
(www.sportsfieldspecialties.com).
- B. COMPONENTS:
 1. BSS420 StormGuard® Professionally Pre-Engineered Break-Away Ball Safety Netting System Straight Poles:
 - a. Height Above Finish Grade as Noted.

- b. 4.0" Schedule 40 Aluminum Pipe, length as noted on plans. Posts shall be factory applied powder coated Black finish.
 - c. Direct embedded post installation. Netting System manufacturer is responsible for sizing of footings as required for Delegated Design.
 - 2. Net with Perimeter Rope Binding
 - a. General dimensions shall be as noted on plans. Contractor is responsible for field verifying site conditions before ordering netting.
 - b. Mesh Size: 1-3/4 inches square mesh, #36 Nylong
 - c. Sewn 1/4" diameter braided rope binding on perimeter edges
 - d. Color: Black
 - 3. Accessories
 - a. Stainless Steel and/or Galvanized Steel Assembly Hardware
 - b. Fixed Welded Upper Tab & Adjustable Lower Bracket with Tensioned Vertical Slide Cable System
 - c. Secure Snap Clips for Net Attachment
 - d. 3/16" Diameter Galvanized Wire Rope Black Vinyl Coated to 1/4" Diameter
 - e. Aluminum Ground Sleeve Caps
- 2.2 STRAIGHT POLE SAFETY NETTING SYSTEM (Track / Baseball Field)**
 - A. Basis of Design: Model # BSS640 – Pre-Engineered 40 Foot Straight Pole Safety Netting System and Accessories as Manufactured and/or Supplied by Sportsfield Specialties, Inc. (www.sportsfieldspecialties.com).
 - B. COMPONENTS:
 - 1. BSS640 StormGuard® Professionally Pre-Engineered Break-Away Ball Safety Netting System Straight Poles:
 - a. Height Above Finish Grade as Noted.
 - b. 6.625" Schedule 40 Aluminum Pipe, length as noted on plans. Posts shall be factory applied powder coated Black finish.
 - c. Direct embedded post installation. Netting System manufacturer is responsible for sizing of footings as required for Delegated Design.
 - 2. Net with Perimeter Rope Binding
 - a. General dimensions shall be as noted on plans. Contractor is responsible for field verifying site conditions before ordering netting.
 - b. Mesh Size: 1-3/4 inches square mesh, #36 Nylong
 - c. Sewn 1/4" diameter braided rope binding on perimeter edges
 - d. Color: Black
 - 3. Accessories
 - a. Stainless Steel and/or Galvanized Steel Assembly Hardware
 - b. Fixed Welded Upper Tab & Adjustable Lower Bracket with Tensioned Vertical Slide Cable System
 - c. Secure Snap Clips for Net Attachment
 - d. 3/16" Diameter Galvanized Wire Rope Black Vinyl Coated to 1/4" Diameter
 - e. Aluminum Ground Sleeve Caps
- 2.3 CHAINLINK FENCE PROTECTIVE PADDING AND ACCESSORIES**
 - A. Chainlink Fence Padding and Accessories as Manufactured and/or Supplied by:
Sportsfield Specialties, Inc.
P.O. Box 231
41155 State Highway 10
Delhi, NY 13753
p. 888-975-3343
f. 607-746-8481
www.sportsfieldspecialties.com
 - B. COMPONENTS:
 - 1. BCLPPSG Chainlink Fence Protective Padding:

- a. Dimensions: 6"W x Variable Length x 3" Thick
 - b. Outdoor Vinyl Encasement:
 - 1. High UV Resistance
 - 2. Total Weight: 18 oz./yd² (ASTM D3776)
 - 3. Construction: 84% Vinyl Coating, 16% Polyester Fabric (ASTM D751)
 - 4. Tongue Tear: Warp 93 lbs., Fill 68 lbs. (ASTM D751)
 - 5. Grab Tensile: Warp 232 lbs., Fill 213 lbs. (ASTM D751)
 - 6. Adhesion: Warp 28 lbs/in, Fill 40 lbs/in (ASTM D751)
 - 7. Abrasion: > 1000 Cycles (ASTM D3389-94)
 - 8. Cold Crack: -49° F (ASTM D2136)
 - 9. Rot, Mildew and Fungus Resistant: Yes
 - 10. Flame Resistance: None
 - 11. Colors to be selected by Owner from Manufacturer standard colors.
 - c. 3" Thick High Impact 1580 Polyurethane Foam
 - 1. Density: 1.45 – 1.55 pcf (ASTM D3574)
 - 2. Impression Load Deflection (4" x 25" x 25" Sample)
 - a. 25%: 75 – 85 (ASTM D3574)
 - b. 65%: 128 – 145 (ASTM D3574)
 - c. Support Factor 65/25: 1.7 min (ASTM D3574)
 - 3. Resilience (% Rebound): 40 – 48 (ASTM D3574)
 - 4. Tear Resistance: 1.5 – 2.5 lbs/in (ASTM D3574)
 - 5. Static Fatigue:
 - a. % Loss @ 25% ILD: Less than 35 (ASTM D3574)
 - b. % Loss in Thickness: Less than 10 (ASTM D3574)
 - 6. Flammability: Passes with Class 1 Fabric (California TB 117-2013)
 - a. Vinyl Seams Double Stitched Using 6 lb. Bonded Polyester Black Thread
 - b. Includes Two (2) 1.5"W Vinyl Flaps with #2 Stainless Steel Grommets 12" On-Center
 - 7. Secured to Chain-Link Fence Using 14"L x 120 lb. Break Strength UV Resistant Nylon Zip-Ties
 - a. 1-Year Manufacturer's Limited Product Warranty
- 2.4 PRE-MANUFACTURED ON-DECK CIRCLES**
- A. BASIS OF DESIGN: "Power Deck On-Deck Circles" – as Manufactured and/or Supplied by Big Signs (www.bigsigns.com).
 - B. COMPONENTS:
 - 1. Size: 6'-0" diameter, constructed of high-density foam and PVC surface.
 - 2. Quantity: Two (2) pairs: (1) pair provided for baseball, (1) pair provided for softball
 - 3. Colors and Graphics: On-deck circles shall include custom graphics, with final layout and colors to be selected by Owner. Manufacturer shall include graphic design services necessary to achieve final Owner Selection. Precedence images are as follows:

Revised: **ADD2**



Baseball On-Deck Circle – Qty: (2)



Softball On-Deck Circle – Qty: (2)

PART 3 - EXECUTION

3.1 INSTALLATION OF EQUIPMENT

- A. Coordinate installation with other trades.
- B. All equipment shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings. Concrete anchoring foundations to be determined by others based on local soil conditions and building codes. Installer should have a minimum of five (5) installations of the specified products or similar experience in the previous three (3) years.

3.2 CLEAN UP AND DISPOSAL

- A. Remove from the site all equipment, materials, and debris resulting from construction work including this section. Leave work area neat and clean and in a condition acceptable by the Landscape Architect and Owner. All work shall be complete, ready for use, at the time of final acceptance

END OF SECTION

SECTION 32 1815 – SYNTHETIC TURF – MULTI-PURPOSE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section is a part of the entire set of Contract Documents, including General and Supplementary Conditions. Drawings shall be coordinated with the applicable provisions of the other parts.
- B. Related Sections:
 - 1. Section 32 1123 Aggregate Drainage Layer
 - 2. **Section 32 1852 Performance Shock Pad **ADD2****

1.2 SCOPE OF WORK

- A. The work under this section includes the following:
 - 1. Furnish all labor, materials and equipment, necessary for the complete installation of a multi-purpose synthetic turf system.
 - 2. Procure and install infill material
 - 3. Pre and Post Installation Testing
 - 4. Warranty Guarantees
 - 5. Maintenance Equipment
 - 6. Installation of synthetic grass surfacing system shall include all incidental work required to complete the work described herein, as shown on the Drawings, and included in related Specifications.

1.3 REFERENCES

- A. Reference herein to any technical society, organization, group, or regulation are made in accordance with the following abbreviations, and unless noted or specified otherwise, all work under this Section shall conform to the latest edition as applicable.
- B. American Society for Testing and Materials (ASTM):

D418	Standard Test Method for Testing Pile Yarn Floor Covering Construction
D789	Yarn Melting Point
D1335	Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings
D1577	Standard Test Method for Linear Density of Textile Fiber
D1682	Standard Method of Test for Breaking Load and Elongation of Textile Fabrics
D2256	Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method (breaking Strength and Elongation)
D2859	Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
D3218	Standard Test for Fiber Thickness (Microns)
D4491	Water Permeability of Geotextiles by Permittivity
D5034	Standard Test Method of Breaking Strength and Elongation of Textile Fabrics (Grab Test)
D5035	Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
D5848	Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering
F355	Standard Test Method for Impact Attenuation of Playing Surface Systems and Materials
F1015	Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces
F1551	Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials
F1936	Standard Specification for Impact Attenuation of Turf Playing Systems as Measured in the Field
F2117	Standard Test Method for Vertical Rebound Characteristics of Sports Surface/Ball Systems; Acoustical Measurement
F2765	Standard Specification for Total Lead Content in Synthetic Grass Fibers

C. Federation Internationale de Football Association (FIFA)

FIFA 09/EN 13672	Simulated Wear/Abrasion Resistance
EN ISO 20105-A02	Artificial Weathering (3,000 hours UVA)
EN 13864	Artificial Weathering (3,000 hours UVA) Pile Yarn Tensile Strength

D. National Collegiate Athletic Association (NCAA)

E. National Federation of State High School Associations (NFHS)

F. Michigan High School Athletic Association (MHSAA)

G. Synthetic Turf Council (STC)

H. American Sports Builders Association (ASBA)

1.4 QUALITY ASSURANCE

- A. In the event conflicts exist between information contained in this Specification and in other parts of the Contract documents, Bidder shall assume that the more stringent and highest performing solution is required.
- B. Following acceptance of bids and evaluation of all product related information submitted with bid and requested additionally, the Owner reserves the right to award based on factors other than low bid.
- C. Manufacturer Qualifications:
1. Have not had a Surety or Bonding Company finish work on any contract within the last five (5) years.
 2. Have not been disqualified or barred from performing work for any public Owner or contracting entity.
 3. Shall have documented financial strength to fully service and warrant the systems installed. An audited financial statement for the past fiscal year shall be provided upon the request of the Owner or Landscape Architect.
 4. Must be a member in good standing of the Synthetic Turf Council (STC) and/or American Sports Builders Association (ASBA). Prospective bidder shall employ one ASBA Synthetic Turf Certified Field Builder.
 5. All products and installation methods shall meet or exceed the current guidelines of the NFHS, NCAA, all applicable ASTM State and Federal Standards, and all current guidelines set forth by the Synthetic Turf Council.
 6. Prospective bidder must be experienced in the manufacturing of infilled synthetic turf systems. Turf Manufacturer/Installer shall have fifty (50) fields in the last (5) five years of the same synthetic turf system being proposed with the same manufacturer, product and infill proposed for this project. This includes the fiber, backing, the secondary backing and installation method.
 7. Product shall meet the following criteria:
 - a. Have a NCAA Division 1 football field installed with parallel slit or monofilament fiber product.
 - b. Have a football field of 85,000 sq. ft. or more of the exact specified material, including the infill material and fiber, in play for at least two years with the same turf manufacturer and company proposed for this field.
 - c. Verification that provider meets these requirements shall be included with Bid.
- D. Installer Qualifications:
1. The Turf Contractor must provide competent workmen skilled in the installation of synthetic turf material, including, but not limited to, gluing or sewing seams, gluing inlays, proper installation of the infill material, and competency in installing performance shock pads (if required). The Installer shall have a representative onsite to certify the installation and warranty compliance.
 2. The assigned designated Supervisory Personnel on the project must be certified, in writing by the Turf Manufacturer, as competent in the installation of the proposed material. Should there be a change in the assigned designated Supervisory Personnel, the Owner and/or Landscape Architect shall be notified in writing within 48 hours of change.

3. Supervisory Personnel shall remain onsite at all times during the installation.
4. The installer shall provide documentation for the following: Fifteen (15) reference projects consisting of Synthetic Multi-Sport Grass Fields of 75,000 square-feet or larger within the past three (3) years which details the following criteria:
 - a. Project Name and Location
 - b. Project Scope
 - c. Construction timeline
 - d. Construction Cost
 - e. Reference name, title, affiliation, and contact information
- E. Pre-Installation Field Verification:
 1. Base Acceptance:
 - a. The synthetic turf manufacturer and/or installation contractor shall perform an inspection of the field base onto which the synthetic turf system is to be installed and to examine the finished surface for required compaction, permeability and grade tolerances.
 - b. Upon correction of any discrepancies between the required materials, application and tolerance, the Owner's representative shall provide test results for compaction, permeability and planarity that are in compliance with the project plans and specifications. The turf installer shall accept the aggregate stone base via a written certification of acceptance of the base for installation of subsequent layers of the synthetic turf system.
 - c. The acceptance of the base construction should be included in the certification for warranty validation.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Properly store all materials in accordance with manufacturer's recommendations.
 1. Deliver products in original, unopened packaging with manufacturer's identification clearly legible. All products shall be received by Contractor.
 2. All materials shall be stored in a location directed by the Owner and acceptable to the Contractor.
 3. Protect materials from puncture, dirt, grease, water, moisture, mechanical abrasion, excessive heat or cold, or other damaging circumstances.
- B. Upon delivery and prior to installation of synthetic turf system and materials, Contractor shall inspect the materials as follows:
 1. For damaged or defective items.
 2. Measure synthetic turf roll lengths, perforations, and uniformity of product and color.
 3. Adhesives and seaming tape shall arrive in sealed dry containers or packaging and shall be kept in adequate temperatures per manufacturers written requirements.
 4. Rubber infill shall arrive in sacks or bags without any tears or loose material. Rubber shall arrive dry and loose: no rubber will be accepted that is bulked or solid.
 5. Sand Infill:
 - a. Bagged Material: shall arrive without any tears and shall be free from contamination of site materials.
 - b. Bulk Material: deliver materials in clean, washed and covered trucks to eliminate contamination during transportation. Onsite stockpiling locations shall be coordinated with the Owner. Stockpile only in areas free of debris and away from drainage routes and structures. Cover all materials with plastic or geotextile if materials are to be stockpiled more than 48 hours.
 6. Any material(s) that does not meet minimum specified criteria is grounds for rejection.
- C. At time of delivery, lot numbers for each carpet roll shall be provided to Construction Manager or Owner's Representative to validate carpet supplied. Lot numbers shall be provided as part of close-out documentation.

1.6 SUBMITTALS

- A. Bid Submittals
 1. Proposal package shall include the following information to assist in the preliminary review

process:

- a. Manufacturer qualifications/references as noted herein.
 - b. Installer qualifications/references as noted herein.
 - c. Samples of non-infilled turf product for all colors required, minimum 8"x8" in size. Bidders may elect to submit a color roll of standard manufacturer colors with their bid in lieu of individual samples.
 - d. Fiber manufacturer's name, type of fiber and composition of fiber.
 - e. Product being bid meets or exceeds pre-manufacturer testing
 - f. Sample Manufacturer's Warranty and Third-Party Insured Warranty
 - g. Sample insurance policy for the Third-Party Insured Warranty
 2. The following letters, on the submitting company's letterhead and signed by a company officer, shall be submitted with the Bid:
 - a. A letter confirming that the Bid Documents have been completely reviewed by qualified representatives of the submitting company acknowledging that the materials and system proposed are adequate for the applications shown and will not impact the system warranty.
 - b. The Bidder shall provide written documentation that system for which they are bidding, does not violate any known or pending patents for specified products.
 - B. Post-Award Submittals
 1. Shop Drawings – Submit the following for approval:
 - a. Complete scaled and dimensional drawing, in full color, showing all field lines, markings, inlays, and boundaries in specified colors required for project. All markings shall be tufted in the factory or field inlaid, unless noted otherwise. Custom logos can be provided by Landscape Architect in AutoCad format to expedite shop drawing process.
 - b. Roll/seaming layout Plan
 - c. Details on field construction, noting any details that may deviate from the Drawings or Specifications including, but not limited to: edge detail, goal post detail, covers for access to subsurface structures, etc.
 2. Provide certified copies of independent (third-party) laboratory testing reports per section 1.7 Quality Control Testing.
 3. Fiber manufacturer's name, type of fiber and composition of fiber.
 4. Proposed infill composition, including pounds of sand and pounds of rubber per square foot. Provide (3) one-pound samples of sand and rubber (in separate bags).
 5. Rubber, with certification of availability, from supplier guaranteeing product supply reserved for the Troy School District. Certification shall include:
 - a. Type and origin of raw material (certify that it comes from tires)
 - b. Production facility
 - c. Production method (cryo or ambient)
 - d. Fiber content (%)
 - e. CRI sieve/gradation analysis
 - f. The provider the of CRI shall provide in writing that they maintain an ongoing Quality Control program meeting all the standards of the STC Guidelines for CRI Used in Synthetic Turf Fields and capable of meeting all the specifications described herein.
 6. Maintenance Equipment: Submittals shall include: product data specifications, operational instructions, etc.
- 1.7 QUALITY CONTROL TESTING**
- A. All testing services shall be the responsibility of and paid for by the submitting or awarded Contractor, unless noted otherwise. All testing noted herein shall be performed by a third-party testing agency that is ISO 17025 certified and approved by the Landscape Architect.
 - B. Testing by independent laboratory must be for current materials and testing not older than twelve (12) months from project Bid Date.
 - C. Any material tested and found non-compliant with the specifications may be rejected. The Contractor shall be required to submit material that is compliant with the specifications.
 - D. The Owner, or the Landscape Architect on the Owner's behalf, reserves the right to independently

test any material. Any testing performed by the Owner will be at the Owner's expense. The Contractor is responsible to bear the cost of any testing of product found to be non-compliant. Contractor will bear the cost of all retesting as required by the Owner.

- E. Pre-Manufacturing Testing: Contractor shall submit to Landscape Architect a copy of the test results certified by the independent Testing Laboratory prior to manufacturing of the synthetic turf for the project. Testing data required is as follows:

SYNTHETIC GRASS YARN		
PROPERTY	TEST METHOD	REQUIREMENT
Pile Height	ASTM D 5823	± 1/8" of specification
Pile Weight	ASTM D 5848	± 5% of specification
Total Weight	ASTM D 5848	± 5% of specification
Tuft Bind (w/o infill)	ASTM D 1335	> 8 lbs
Melting Point	ASTM D 789	> 235 degrees F
Denier	ASTM D 1907	± 10% of specifications
Pill Burn Test	ASTM D2859	8 Passed / 0 Failed
Microns	ASTM D3218	± 10% of specifications
Breaking Strength (length)	ASTM D 5034	> 283 lbs./ft
Breaking Strength (width)	ASTM D 5034	> 200 lbs./ft
Fiber Abrasiveness Index	ASTM F 1015	< 35
Lead Content	ASTM F 2765-09	< 50 ppm
Artificial Wearing (3,000 hours UVA) Turf Color Change	EN ISO 20105-A02	> Gray Scale 3
Artificial Wearing (3,000 hours UVA) Pile Yarn Tensile Strength	EN 13864	< 50% reduction

SYNTHETIC GRASS BACKING MATERIALS		
PROPERTY	TEST METHOD	REQUIREMENT
Primary Backing Weight	ASTM D 5848	± 2 oz./yd2 of specification
Secondary Backing Weight	ASTM D 5848	± 2 oz./yd2 of specification

SYNTHETIC GRASS INFILL MATERIALS		
PROPERTY	TEST METHOD	REQUIREMENT
Safety of Toys Part 3	EN 71-3	Pass
Safety of Synthetic Turf Infill	ASTM F 3188	Pass
Infill Size Gradation	EN 933	
Infill Bulk Density	EN 1097	
Artificial Weathering (3,000 hours UVA) Infill Color Change	EN ISO 20105-A02	> Gray Scale 3

SYNTHETIC GRASS SYSTEM		
PROPERTY	TEST METHOD	REQUIREMENT
Lisport Simulated Wear	EN 13672	> 50,000 passes without splitting

- F. Post Manufacturing/Pre-Shipment Testing: Contractor shall submit to Landscape Architect a copy

of the test results certified by the Independent Testing Laboratory prior to shipping of the synthetic turf product. Any test result not meeting specifications is grounds for rejection of product, in whole or in part. Testing requirements are as follows:

1. Test sample shall be from five random rolls manufactured for this project. Proof of documentation must be provided upon delivery of the carpet to the job site.
2. Test results to identify manufacturer, date of test(s), lab technician, project, lot number, etc.

SYNTHETIC GRASS SURFACING CARPET		
PROPERTY	TEST METHOD	REQUIREMENT
Tuft Bind (w/o infill)	ASTM D 1335	> 8 lbs
Stitch Gauge	ASTM D 5793	< 1/2"
Pile Height	ASTM D 5823	± 1/8" of specification
Pile Weight	ASTM D 5848	± 5% of specification
Total Weight	ASTM D 5848	± 5% of specification
Perforations	Visual	> 3/16" dia., spaced 4" o.c.
Denier	ASTM D 418 or 1907	± 10% of specification
Primary Backing Weight	ASTM D 5848	± 2 oz./yd2 of specification
Secondary Backing Weight	ASTM D 5848	± 2 oz./yd2 of specification
Breaking Strength (length)	ASTM D 5034	> 283 lbs./ft
Breaking Strength (width)	ASTM D 5034	> 200 lbs./ft
Pill Burn Test	ASTM D2859	8 Passed / 0 Failed
Lead Content	ASTM F 2765-09	< 50 ppm

SYNTHETIC GRASS SURFACING SYSTEM (carpet, infill)		
PROPERTY	TEST METHOD	REQUIREMENT
Water Infiltration Rate	ASTM F 1551	> 16 in./hr.
Infill Depth Measurement	EN 1969	± 10% of specification (1/2" exposed fiber)
Impact Attenuation	ASTM F 1936	< 165-G's 120 G's w/ pad
Impact Attenuation, Head Injury Criteria (HIC)	EN 1177	< 900 @ 1.3m WITH PAD ONLY **ADD2**

- G. Post Installation Testing: Upon substantial completion, the Contractor shall perform a one-time test of the items listed below. Contractor shall submit to Landscape Architect, a copy of these test results, certified by the independent Testing Agency.
1. Testing shall be completed on-site within five (5) days upon completion of the installation.
 2. Following field testing, it shall be the Contractor's responsibility to correct any part of the system deemed non-compliant with the specifications.

SYNTHETIC GRASS SURFACING SYSTEM (carpet, infill)		
PROPERTY	TEST METHOD	REQUIREMENT
Infill Depth Measurement	EN 1969	± 10% of specification (1/2" exposed fiber)
Impact Attenuation (min. 10 locations)	ASTM F 1936	< 165-G's 120G's w/ pad **ADD2** (individual, not average results)

3. Any testing desired after the initial testing shall be the responsibility and obligation of the Owner.

1.8 WARRANTY GUARANTEE

A. Warranty Testing

1. Upon substantial completion, the Contractor shall perform a one-time test of the five items

- listed below. Contractor shall submit to Landscape Architect, a copy of these test results, certified by the independent Testing Agency.
2. Any testing desired after the initial testing shall be the responsibility and obligation of the Owner.
- B. Synthetic Turf System Warranty:
1. The Contractor shall be responsible to provide a Pre-Paid and non-prorated Manufacturer/Installer Warranty Guarantee (referred to herein as "Warranty") for the synthetic grass system for a minimum non-prorated period of eight (8) years from the date of Certificate of Substantial Completion. Synthetic grass system refers to synthetic turf materials, infill materials, installation materials and installation workmanship.
 2. \$5,000,000.00 per each insured warranty and \$15 Million dollar annual aggregate for all warranties issued during each 12-month period of the 8-Year warranty.
 3. Infill material shall be warranted against breakdown of material outside of project specifications and failure to adhere to EN 71-3 and ASTM F3188 Testing Requirements.
 4. The Turf Manufacturer's Warranty must be underwritten by a third-party Best "A" Rated (or better) Insurance Carrier listed in the A.M. Best Key Rating Guide. Warranty shall be guaranteed to cover the items set forth in this Specification for the full eight (8) year period.
 5. Insured Warranty coverage must be provided in the form of one (1) single policy.
 6. Policies that include self-insurance or self-retention clauses shall not be considered.
 7. Policy cannot include any form of deductible amount nor should the Owner be responsible for any deductible.
 8. A sample policy shall be provided at the time of Bid to prove that policy is in force. A letter from an agent of sample Certificate of Insurance will not be acceptable.
 9. The artificial grass field turf must maintain an ASTM 1936 G-max between **140-165 80-165 (w/pad)** ****ADD2**** for the life of the Warranty.
- C. Warranty Requirements:
1. The materials utilized in the synthetic turf system shall be guaranteed for the designated usage:
 - a. Football, Rugby, Soccer, Baseball, Softball, Lacrosse, Field Hockey
 - b. Marching Band
 - c. Physical Education and Intramural Sports Programs
 - d. Physical Education exercises and other similar uses
 - e. Pedestrian traffic
 - f. Pneumatic rubber-tired maintenance and service equipment, designated for use on athletic fields and golf courses
 - g. Shot put and discus throwing events compliant with manufacturer recommendations
 - h. Graduations and Ceremonies compliant with manufacturer recommended floor protection
 2. Warranty Coverage on Materials:
 - a. General wear and damage caused from UV degradation
 - b. Excessive fiber wear weathering
 - c. Wrinkling, panel movement, or panel shrinkage
 - d. Seam integrity
 - e. Drainage (of Carpet and Infill only)
 - f. Flammability
 3. Warranty Coverage on Workmanship:
 - a. Warranty shall cover defects in the installation workmanship for full warranty period. Workmanship includes, but not limited to, seam installation (glued and sewn), inlay installation, proper installation of infill materials, and securing of turf system to nailer board.
 - b. The Turf Manufacturer shall verify that Supervisory Personnel have inspected the installation and that the work conforms to the manufacturer's requirements.
 4. Warranty Replacement:
 - a. The warranty shall specifically exclude acts of vandalism and acts of God beyond the

- control of the Owner or the Manufacturer.
- b. All items covered by the Warranty are to be replaced or repaired with new materials, including installation at the sole expense of the warranting manufacturer for the life of the warranty period. Replacement or repair of affected areas shall include all necessary materials, labor, and transportation costs to complete repairs.
 - c. Must have a provision to either make a cash refund or repair/replace such portions of the installed materials that are no longer serviceable to maintain a playable surface.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All components and their installation method shall be designed and manufactured for use on outdoor athletic fields. The finished surface shall resist abrasion and cutting from normal use.
- B. The materials and turf system should be able to withstand full climatic exposure and shall be resistant to insects, rot, fungus, mildew, ultraviolet light degradation, heat degradation, and shall be non-allergenic and non-toxic.
- C. The turf system shall consist of an artificial grass-like surface pile, which shall be tufted into a primary backing and coated with a secondary backing to lock in the tufted fibers. The turf system shall be constructed to maximize dimensional stability and to resist damage and normal wear and tear from its designated uses.
- D. The entire turf system shall have the basic characteristics of flow-through drainage, allowing free movement of surface runoff through the turf system where such water may flow to the sub-base and field drainage system. The Turf System shall remain free-draining at all times before, during, and after the infill materials are installed.
- E. Turf fibers shall be a proven athletic caliber yarn designed specifically for outdoor use and shall resemble natural grass appearance, texture and color. Streaks, discoloration, or different dye lots shall not be accepted and may be grounds for product rejection. The turf fiber shall provide good traction in all types of weather with the use of conventional sneakers type shoes, composition mold sole athletic shoes, baseball spikes, and screw-on football cleats.
- F. In addition to the tufted lines, inlaid lines and logos, the pile surface shall be suitable for both temporary and permanent line markings using paint specifically developed for this use and as recommended by the turf manufacturer.
- G. The Turf Fabric surface shall be constructed and installed in minimum roll widths of 15 feet with no longitudinal or transverse seams, except for inlaid lines with finished roll assembly.
- H. All adhesives used in bonding the inlaid markings to the adjacent carpet shall be resistant to moisture, bacteria and fungus attacks, and resistant to ultraviolet radiation. Adhesives used shall be as recommended by the Turf Manufacturer.

2.2 PRODUCTS

- A. Synthetic Turf Products:
 1. The synthetic turf material and resilient infill shall be in accordance with the following:

Physical Properties	Minimum Specification Requirements
Pile Height	2.25-2.00" **ADD2**
Fiber Composition	Polyethylene, Parallel-Slit
Pile Ribbon Weight	46 oz./sy
Primary Backing Weight	8 oz./sy
Secondary Backing Weight	24 oz./sy
Total Product Weight	78 oz./sy
Denier	8,000
Fiber Thickness	>100 microns
Primary Backing Material	Polypropylene
Secondary Backing Material	Polyurethane
Turf Bind	> 8 lbs w/o infill

Approved Yarn Suppliers	Tencate XP Blade Plus Polytex (Duramax Minimum) *Proprietary fiber may only be used if it has been pre-approved by Architect within 6 months' time from date of Project Bid
Grab Tear Strength – Width	300 lbs/force
Grab Tear Strength – Length	180 lbs/force
Stitch Gauge	< 1/2"

**Note: Exceptions to Specifications shall be outlined within Proposal

- B. Carpet Backing:
- The primary backing shall consist of a one part, three component polyester/polypropylene backing and treated with UV inhibitors.
 - The secondary backing shall consist of an application of porous polyurethane, heat activated to permanently lock fibers in place. Products using latex based secondary backings will not be acceptable.
 - Perforations:
 - Synthetic turf surfacing shall be perforated to provide vertical drainage or the secondary backing can be applied to the tufted fiber rows. Complete synthetic grass system shall drain in excess of 10" per hour.
 - Perforations shall be uniformly spaced at 4 inches, in both directions.
 - Perforations shall be tested by passing a 3/8" drill bit through the holes with no more than 7 lbs. pressure.
- C. Turf Panels, Markings and Logos
- The carpet shall be delivered in 15-foot wide rolls with the four 4 inch white, 5-yard lines tufted into the ends of each roll.
 - The rolls shall be of sufficient length to go from sideline to sideline. The perimeter white line shall be tufted into the individual sideline rolls. Head seams between the sidelines of the football field will not be acceptable.
 - All field lining, marking, field boundary system with the team area limits, logos, etc. shall be the same material (yarn, infill, and backing) as the playing field system.
 - Lines, logos, and graphics to be installed per the design documents and approved shop drawings are to be tufted in the factory to the maximum extent practical. Those not tufted in the factory shall be inlaid in the field.
 - Logos and inlays shall be true and shall not vary more than 1/2" from specified width and location.
 - The primary fiber color of the playing field shall be Field Green.
 - Primary Field Markings and Lines:
 - Football: 4" White
 - Soccer: 4" Yellow
 - Men's Lacrosse: 4" Royal Blue
 - Women's Lacrosse: 4" Red
- D. Infill Materials:
- Infill Materials shall be uniformly filled to a depth which leaves no more than 1/2" of exposed pile after settlement.
 - Infill materials shall be new material and consist of a homogeneous non-compacting mixture of uniformly sized ambient and/or cryogenic SBR crumb rubber and silica sand.
 - For installations over ~~aggregate stone base (no shock pad)~~ **shock pad**, the crumb rubber content shall be approximately ~~60-70%~~ **30-40%** by weight and the sand content shall be ~~30-40%~~ **60-70%** ****ADD2**** by weight. Manufacturer shall provide proposed infill ratios based on pre-installation testing.
 - Crumb Rubber:
 - The CRI used in artificial turf fields shall be derived from used whole vulcanized automobile, SUV, and truck tires (DOT tires for over the road). Buffing's, bladders and tubes shall not be used as feedstock for CRI. No factory tires rejects are allowed.
 - The Crumb Rubber shall have a specific gravity range from 1.1 minimum to 1.2 maximum

as determined by ASTM D 297.

- c. Shall be free of all metal and produced with 100% recycled automobile or truck tires. The material shall have a size not to exceed 10 mesh nor smaller than 20 mesh.
- d. The fine particles shall not exceed 10% and shall have no visible evidence of steel particles present in the final synthetic turf surfacing.
- e. Crumb rubber shall be UV stable and resistant to heat degradation.
- f. Rubber Mesh

Sieve Size	*Mesh (ASTM E-11) Percent Retained
8	
12	1.3%
16	58.8%
20	38.2%
30	1.0%
40	0.0%
50	0.0%
PAN	Not-to-exceed 0.004%

3. Silica Sand:

- a. Round, uniformly-sized pure silica sand
 - b. Sized between US Sieve 20 to 40
- E. Maintenance Equipment: Turf Contractor/Manufacturer shall provide the following equipment as part of the Base Bid.
- a. Groomer/Sweeper combined unit shall be:
 - i. "Turfcare TCA1400 with magnet" by SMG (attn: Kevin Dorney- (425) 687-1560)
 - b. Maintenance equipment proprietary to Turf Manufacturer may be submitted as a Voluntary Alternate to the project.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall perform all work in strict accordance to the Contract Drawings, Approved Shop Drawings and manufacturer's written specifications and instructions.
- B. The Contractor shall be responsible for the inspecting, verifying, and completing all installed work of this section.
- C. Environmental Conditions: The Contractor shall not perform any work if the conditions for working are:
 - 1. Ambient air temperatures are below 45 degrees F.
 - 2. Material temperatures are below 45 degrees F.
 - 3. Surfaces are wet or damp.
 - 4. Rain is imminent or falling.
 - 5. Conditions exist or are imminent, which will be unsuitable to installation requirements of the systems specified herein. Humidity levels will be inside the limits recommended by the adhesive manufacturer to obtain optimum bonding characteristics of the surfaces.

3.2 EXAMINATION

- A. Acceptance of Base Construction: Upon completion of the base and drainage work, a written "Certification of Acceptance of the Base Construction" is required from the synthetic turf manufacturer and/or installation contractor (referred to herein as "Surfacing Contractor") prior to proceeding with any installation work under this section of the specifications.
- B. The Certification shall include but not be limited to the acceptance of the following:
 - 1. Surfacing Contractor has reviewed the base construction finish surface and is accepting the construction is acceptable for application of work under this Section.
 - 2. Surfacing Contractor has been provided testing results of water permeability and accepts the

- results to place the synthetic turf material.
3. The materials and method of installation for the aggregate stone base construction is in conformance with the manufacturer's current recommendations for the application of the turf to be installed under this section.
 4. Surfacing Contractor has reviewed the base construction with representatives of the Site Contractor and Landscape Architect and all parties are satisfied with the compaction and planarity of the surface.
 5. The base construction finish surface is clean and free of contaminants.
 6. Continuing with the installation of the synthetic turf materials **and performance shock pad **ADD2*** without issuance of a Certification of Acceptance Letter shall be considered as an approval of the base by the Turf Contractor.
- C. All discrepancies between the required materials, application and tolerance requirements noted by the installer shall be brought immediately to the attention of the Contractor and Landscape Architect. Failure to immediately inform the Site Contractor and Landscape Architect of any prior work which does not meet the required specifications for installation of the artificial turf surfacing system shall be considered an acceptance by the installer of the non-conforming work.

3.3 **INSTALLATION OF TURF AND COMPONENTS**

A. GENERAL:

1. All installation shall be done in strict accordance with the manufacturer's current written installation instructions approved by the Landscape Architect.
2. The synthetic turf shall be staged and unrolled as necessary for a daily installation. No material shall be allowed to remain unrolled for a period of 24 hours prior to installation.
3. In the event of damage during delivery, staging, or installation, immediately make all repairs and replacements necessary to the approval of the Landscape Architect and at no additional cost to the Owner.
4. The pile lay of the turf shall be installed facing the home bleacher side of the field, unless noted otherwise. During the turf panel installation process, the Contractor shall continuously check the field layout dimensions in all directions.

B. SEAMS

1. All panel seam spacing shall be held to a minimum of 15 feet in width unless prior approval of seaming diagram indicates a lesser panel width.
 - a. For fields with football yardlines, all seams shall be adjacent to 4" white yardline. Yardlines placed in the middle of the carpet roll will not be permitted. See Section 2.2, C. #1, this Specification.
2. The mechanical or adhesive bonding of all system material components shall provide a permanent, tight, secure and hazard free athletic playing surface.
3. All panel seams are to be held to the absolute minimum and as approved by Landscape Architect. Ridges or tenting of seams is not acceptable. Gaps greater than 1/8" are not acceptable.
4. Seams within the body of the field shall be sewn with a high strength polyester fiber cord.
 - a. Sewn seams shall be butt-sewn with a double loop lock stitch.
 - b. Hand-bagger type seam stitching is not permitted.
 - c. Seams shall lay flat after infill installation.
5. Traverse panel seams shall be securely sewn or glued and lay flat. A minimum of 5" of seaming tape and glue shall extend on either side of the seam

C. LINES, MARKINGS, AND INLAYS

1. Lines and markings shall be tufted in the factory to the greatest extent possible during manufacturing.
2. Lines and markings not tufted in the factory are to be field cut, inlaid and glued with manufacturer approved adhesive or hot-melt. Shaving and gluing of inlays is not a permitted method of installation.
3. All lines and markings shall be installed and verified prior to installation of infill material.
4. All inlays shall have a 12" wide manufacturer approved seaming tape, which is fully coated with

adhesive.

a. Bonding surfaces shall be clean, dry and free from grease, oil, wax, or other contaminants.

5. All seams and inlays shall be thoroughly brushed or picked before infill materials are installed.
6. All seams and inlays shall be fully fastened with no loose areas. At no time should pulling of section allow for separation of the turf from the seaming tape. Gaps greater than 1/8" are not acceptable.

7. Install turf as required to boxes/lids as shown on plans.

D. TURF EDGES AND TERMINATION

1. The perimeter of the field shall be firmly secured to the wood nailer edge, for the life of the warranty and as detailed, using stainless steel or hot dipped galvanized fasteners, minimum 1" in length. Fastener spacing shall not exceed 12 inches on-center.
2. Final infill level shall be flush with adjacent anchor curb.

E. INFILL INSTALLTION

1. No infill materials shall be installed until the synthetic turf system is fully installed with all lines, markings, and logos. Infill level on box covers/lids shall be flush with adjacent turf infill.
2. The infilling operation shall only take place with dry material, dry field conditions, and no forecasted threat of rain or snow.
3. Open utility grates and drains shall be covered by turf installer prior to placing infill.
4. The synthetic turf surface shall be thoroughly brushed prior to installation of infill materials to remove any wrinkles.
5. The infill shall be installed at a rate determined by the manufacturer. Infill material shall be thoroughly raked and brushed into the turf fibers during each pass of the broadcasting unit.
6. The infill shall not leave more than 1/2" exposed fiber after settlement.

2.4 CLEANING

- A. Contractor shall be responsible for clean up of all materials utilized on a daily basis. Upon completion of installation, all surrounding areas, including turf area, shall be clean and in "game" condition.
- B. Contractor shall utilize magnetic bar to remove any metal objects within the field prior to infill and after infill, before final acceptance.
- C. Contractor shall be responsible to neatly place attic stock on pallets and deliver to a suitable location as directed by Owner.
- D. All excess infill outside of the playing surface shall be properly removed and disposed of and deemed acceptable to Owner and Landscape Architect.

2.5 ACCEPTANCE, MAINTENANCE, AND PROJECT CLOSE-OUT

A. ACCEPTANCE

1. Should any imperfections develop in the surface areas prior to the final acceptance of the work and deemed to not have been vandalism or an Act of God, they shall be removed and replaced with new materials. All such repair work shall be done at no additional cost to the Owner.
2. Final acceptance will be issued to the Contractor as described and issued with a formal "Certificate of Substantial Completion". The Owner or Landscape Architect will not be responsible for any additional acceptance requirements by the Contractor or their subcontractors.

B. MAINTENANCE

1. Following turf system installation, the Turf Contractor shall be responsible for training the Owner's personnel in necessary maintenance of the turf system. Prior to conducting training, Contractor shall assemble and test all maintenance equipment. Equipment should be fully functional and ready to use at the time of training.
2. Owner Training shall include review and demonstration of the following items:
 - a. Daily / Weekly fiber, infill and seam inspections
 - b. Hand grooming low infill and techniques for placing infill
 - c. Emergency seam repair
 - d. Proper methods for field sweeping and grooming: including demonstration of hook-up,

- detachment, transporting, and use of all equipment.
- e. Field Snow Plowing (as applicable)
- f. Protection of surface for events
- g. Procedure for Warranty Claims
- 3. Maintenance training shall take place no later than fourteen (14) days after "Quality Control/Post-Installation Testing" is completed.
- C. PROJECT CLOSE-OUT
 - 1. Contractor shall furnish three (3) copies of Maintenance Manuals, which shall include all necessary instructions for the proper care and preventative maintenance of the turf system, including painting, markings, small repair procedures, and cleaning.
 - 2. Maintenance Manual shall include list of procedures required to maintain surface condition and activities to be avoided, including static and dynamic load limits, snow clearing, etc.
 - 3. Provide Project Record Documents: Record actual locations of seams and other pertinent information.
 - 4. Provide sample Maintenance Log Book and proposed Testing Schedule for all required testing during Warranty Period.
- D. ATTIC STOCK
 - 1. The Contractor shall supply and deliver an additional 50 lineal feet of full width material ($\pm 750\text{sf}$), plus 100 lineal feet of each 4" line color installed.
 - 2. The Contractor shall supply and deliver (1) bag of additional rubber infill material to the Owner. The rubber infill shall be placed in RubberMaid 50 gallon containers with covers and wheels.

END OF SECTION

SAMPLE SYNTHETIC TURF WARRANTY

1.1 Warranty

- A. System Installer/Manufacturer (“_____”) hereby warrants to Troy School District subject to the limitations and conditions set forth below, that its entire synthetic turf installation described as _____, is free from defects in material workmanship, meets or exceeds the specifications, and shall (for a period of EIGHT (8) YEARS from the date of final acceptance) remain acceptable for multiple sports activities.
- B. System Installer/Manufacturer warrants to Troy School District that its synthetic turf system shall not unevenly fade, shall not fail, shrink, expand, flood, tear, bubble and shall not reflect unusual excessive wear and shall meet specified Gmax values, for a period of EIGHT (8) YEARS from the date of Certificate of Substantial Completion. In the event that the synthetic turf shall unevenly fade, fail, shrink, expand, flood, tear, bubble or reflect excessive water, System Installer/Manufacturer shall repair and/or replace such areas of the synthetic turf that are affected.
- C. System Installer/Manufacturer warrants to Troy School District that the installation of the entire synthetic turf and all associated turf components (i.e. Inlays and seams) shall be performed in a professional manner under the supervision of highly-trained employees familiar in the installation of their tufted synthetic turf system. The supervisor and key installers shall have installed synthetic turf systems for at least three (10) previous system installations.
- D. System Installer/Manufacturer warrants that the finished synthetic turf system shall have an initial G-max (shock attenuation) value of approximately ~~140~~ 80 ****ADD2**** G's and shall not become harder than 165 G's over the life of the system at any point on the field of play. The manufacturer shall make only the necessary repairs if, at any time during the warranty period, the G-max force at any point exceeds the specified 165 G's.
- E. The term “not fade” in the context of this warranty shall mean that the synthetic grass material remain a uniform shade of green or the other colors installed with no significant loss of color as defined by not greater than 20% loss or shade reduction.
- F. The term “not fail” or “excessive wear” as used in the context of this warranty shall mean that the length and weight of the face yarn or pile material in the synthetic grass surface shall not have been decreased by more than 6% per year according to ASTM D418, nor exceed 20% during the warranty period.
- G. System Installer/Manufacturer shall warrant seams against separation, puncturing, bubbling, etc., for any reason.
- H. This warranty does not cover any defect, failure, damage or undue wear in or to the synthetic turf system caused by or connected with abuse, neglect, deliberate act, Act of God, casualty, static or dynamic loads exceeding recommended levels, footwear having metal cleats, spikes, or similar projections (other than conventional football, baseball, soccer or rugby shoes having cleats of not more than 1/2” in length).

- I. System Installer/Manufacturer shall be allowed to examine the synthetic turf system regarding any claim which Troy School District makes, to be present at and to analyze the results of all tests conducted by Troy School District or others, and to conduct such tests incurred by Troy School District or others with respect to such tests.
- J. All claims made by Troy School District under this warranty must be made in writing to System Installer/Manufacturer.
- K. This warranty, when signed and notarized by all parties, shall constitute a contract made in the State of Michigan and shall be governed by the laws thereof.
- L. Contractor shall provide an independent 3rd party insurance policy to cover all items identified above.

OWNER: Troy School District

DATE: _____

BY: _____

CONTRACTOR:

DATE: _____

BY: _____

MANUFACTURER:

DATE: _____

BY: _____

SECTION 32 1852 – PERFORMANCE SHOCK PAD

****ADD2****

PART 1- GENERAL

1.1 SUMMARY

- A. This section is part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.
- B. Related Sections:
 - 1. Section 32 1123 Aggregate Drainage Layer
 - 2. Section 32 1815 Synthetic Turf – Multi-Purpose

1.2 SCOPE

- A. This document defines requirements for the installation and operating performance of an athletic field synthetic base underlayment material needed for a synthetic turf field. Defined are the primary system requirements for insuring optimum safety of the playing surface (impact attenuation/surface playability) and high capacity subsurface drainage of the installed playing field.
- B. Performance Shock Pad Manufacturer is required to provide an executed letter signed by an officer of the company confirming materials will be shipped to the project site at the timeframe noted in the Contract Documents. Manufacturer's not able to fulfill this requirement will be subject to penalties and/or liquid damages as identified in the Contract Documents.

1.3 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. American Society for Testing and Materials (ASTM), International Standards Organization (ISO) and European Committee for Standardization (EN):
 - a. EN 12616 – Water Infiltration Rate
 - b. ISO 8295 – Plastic Film and Sheet – Determination of Coefficient of Friction
 - c. ISO 4897 – Cellular plastics - Determination of the coefficient of linear thermal expansion
 - d. ISO 8301 – Thermal Resistance
 - e. ISO 1798 – Standard Specification for Flexible Materials-Tensile Strength
 - f. ASTM F355 – Standard Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials
 - g. EN 14809 – Surfaces for sports areas - Determination of vertical deformation
 - h. ISO 1856 – Flexible cellular polymeric materials -- Determination of compression set
 - i. ASTM G22-76 – Determining the Resistance of Plastics to Bacteria
 - j. ASTM G21-96 – Determining Resistance of Synthetic Materials to Fungi
 - k. ESSM 105-d – Environmental Compatibility of Elastic Synthetic Surfaces on Sports Grounds
 - l. ASTM F925 – Test Method for Resistance to Chemicals of Resilient Flooring
- B. The sub-base (underlayment) material is to be manufactured in an ISO-9000 certified facility. No exceptions allowed.
- C. Company must demonstrate successful installations in the United States for at least 5 million sq. feet of manufacturers material.
- D. Use only new materials manufactured and shipped for the specific installation. No used or refurbished materials are to be installed. Manufacturer must provide documentation of material content and MSDS sheet for submittal package.

- E. Product to be shipped as flat panels on prepackaged pallets. Pallets to be wrapped with heavy-duty barrier for protection from moisture and UV exposure.
- F. Seams should be mechanically locked into place by hand without use of additional materials, glue, fasteners or secondary processes and equipment.
- G. Material must be installed using manufacturers guidelines, without exception.
- H. Manufacturer must provide written procedures to selected turf supplier for the installation of turf on top of underlayment.
- I. Turf Contractor must send G-Max test results to Underlayment manufacturer once completed.

1.4 SUBMITTALS

- A. General: Bidding contractor must identify performance base system with bid package. If a non-specified product is identified, the proposed alternate product must be submitted and pre-approved by the design architect/engineer 10 days prior to the bid opening. If bidding contractor does not identify a manufacturer, the Township/School District will assume that the specified product is included in the bid package and will not consider substitutions.
- B. Product Data: Submit 8" x 8" product sample and technical data sheet.
- C. Shop Drawings: Submit cross-sectional view showing product installation in relation to sub-base and synthetic turf (including edge attachment).
- D. Test Data: Submit listing of all applicable test data for compliance to specifications. All testing to be performed by independent sources following applicable ASTM or other internationally recognized standards and procedures.
- E. Installation: Submit copy of product installation instructions. Submit copy turf installation recommendations.
- F. Warranty: Submit copy of product 16 -Year warranty coverage.

PART 2 - PRODUCTS

A. OPTION 1

- 1. Description: Expanded Polypropylene Composite
- 2. Product Requirements: An impact energy absorbing sub-base drainage material designed specifically for use with synthetic turf is required. The specified material must have both impact absorption and drainage properties that meet the following typical performance requirements
 - a. Thickness: 0.55" (14mm) +/- 2mm
 - b. Material Density 3.85 lbs/CF
 - c. Area/Panel 15.9 SF/Panel
 - d. Weight: 2.81 lbs/panel
 - e. Permeability >50 in/hr
 - f. Vertical Deformation <4 mm w/o turf overlay (EN14809)
 - g. Product must be made in United States of America
 - h. Product must be of a homogeneous material composition. Variable material content will not be accepted

B. OPTION 2

1. Description: Thermal Bonded (closed cell) Cross-Linked Polyethylene Foam
2. Product Requirements: An impact energy absorbing sub-base drainage material designed specifically for use with synthetic turf is required. The specified material must have both impact absorption and drainage properties that meet the following typical performance requirements
 - a. Thickness: 0.79" (20mm) +/- 2mm
 - b. Material Density 0.82 lbs/SF
 - c. Area/Panel 23.1 SF/Panel
 - d. Permeability >1000 in/hr
 - e. Vertical Deformation <7 mm w/o turf overlay (EN14809)
 - f. Product must be made in United States of America

C. OPTION 3

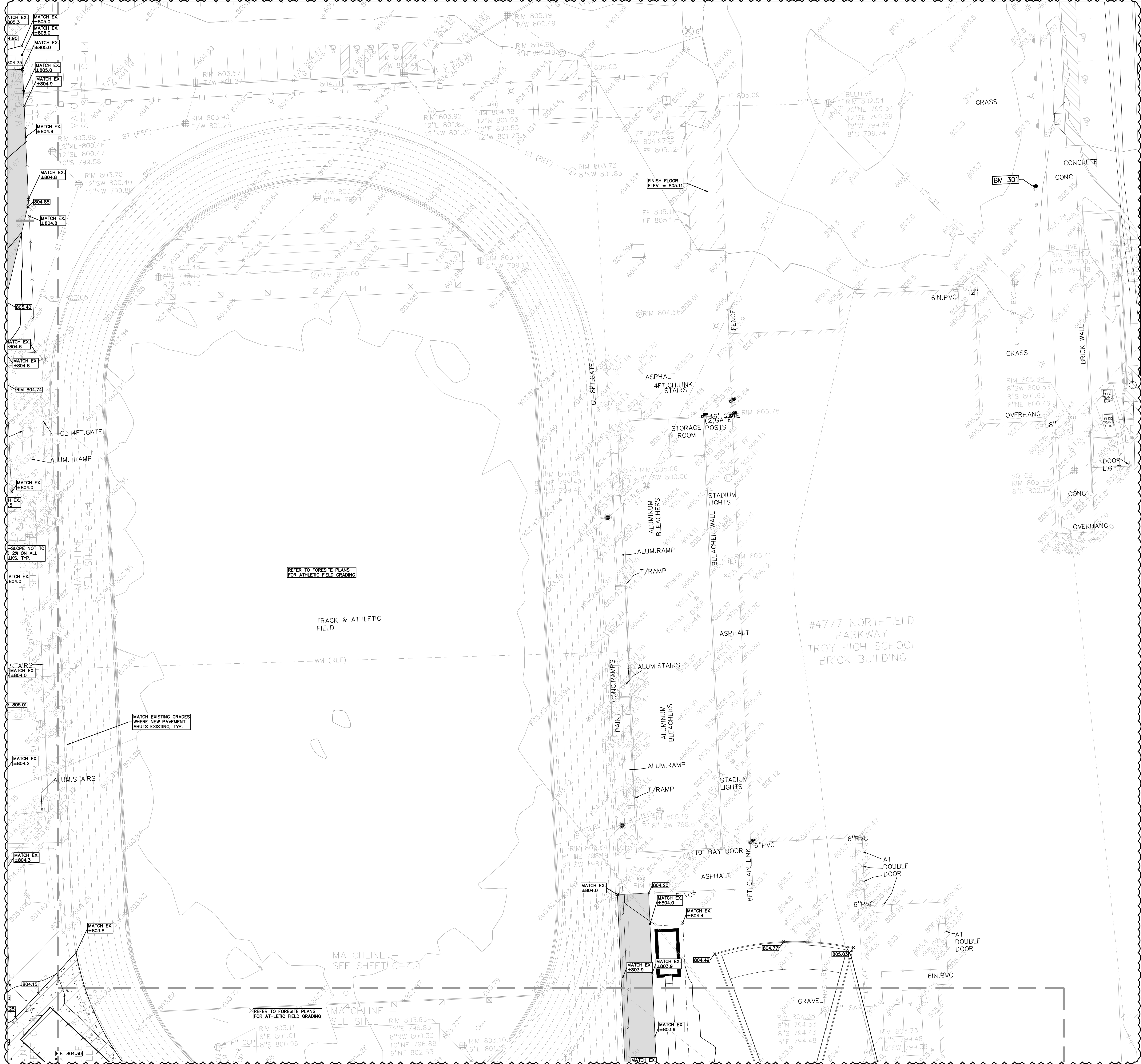
1. Product Substitutions
 - a. Product substitutions are allowed only in accordance with pre-bid substitution request procedures outlined in the contract documents. No substitutions will be allowed after the bid date. Bidding contractor must identify performance base system with bid package. If a non-specified product is identified, the proposed alternate product must be submitted and pre-approved by the design architect/engineer 10 days prior to the bid opening. If bidding contractor does not identify a manufacturer, the Township/School District will assume that the specified product is included in the bid package and will not consider substitutions.

PART 3 – EXECUTION
3.1 INSTALLATION

- A. Finished aggregate base installation workmanship must be approved in advance by the pad manufacturer. Approvals to be based on a physical inspection performed at the site prior to installation of any pad material.
- B. Manufacture shall provide written installation instructions and procedures and on-site supervision during material installation. On-site supervision will be waived if site contractor can provide 3 projects references demonstrating successful product installation.
- C. Finished pad base installation workmanship must be approved in advance by the synthetic turf manufacturer. Approvals to be based on a physical inspection performed at the site prior to installation of any synthetic turf material.
- D. Surplus Pad Material: Contractor shall provide a minimum 100 sf of surplus pad material.
- E. Project Completion- Upon completion of installation, a walk-through will be conducted to inspect the quality of work and ensure all details meet specifications. A punch list of unacceptable or incomplete items will be documented and agreed upon for completion prior to final project closeout and acceptance.

END OF SECTION

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GRADING LEGEND:

- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

T/C = TOP OF CURB	G = GUTTER GRADE
T/P = TOP OF PAVEMENT	F.G. = FINISH GRADE
T/S = TOP OF SIDEWALK	RIM = RIM ELEVATION
T/W = TOP OF WALL	BW = BOTTOM OF WALL

REFER TO GRADING NOTES ON SHEET C-4.4

RETAINING WALL NOTE:
TOP OF WALL (T/W) AND BOTTOM OF WALL (B/W) GRADES ARE THE FINISH GRADE AT THE TOP AND BOTTOM OF THE RETAINING WALL, NOT ACTUAL TOP AND BOTTOM OF THE WALL STRUCTURE

EARTHWORK BALANCING NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPORTING OR EXPORTING ALL MATERIALS AS REQUIRED TO PROPERLY GRADE THIS PROJECT TO THE FINISHED ELEVATIONS SHOWN ON THE APPROVED PLANS. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION OF CUT AND FILL QUANTITIES AND ALLOW FOR REMOVAL OF EXCESS OR IMPORTATION OF ADDITIONAL MATERIAL AT NO ADDITIONAL COST TO THE OWNER.

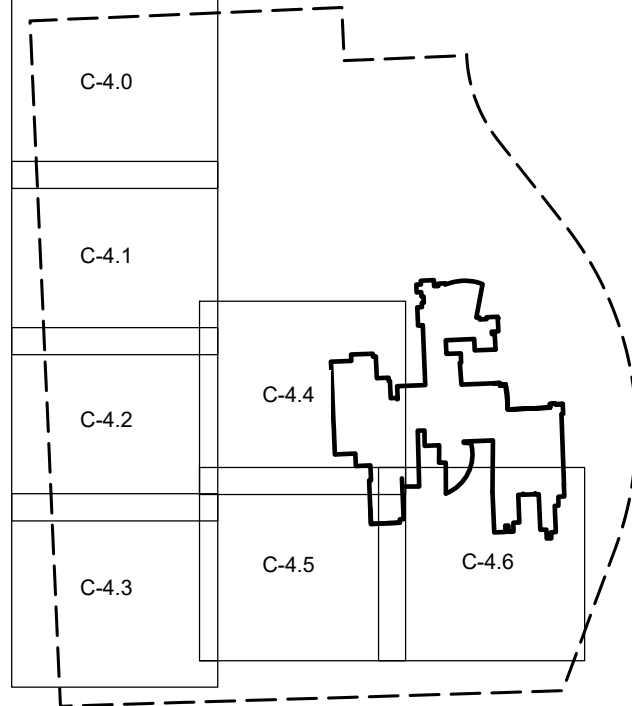
BENCHMARKS:
(NAD 83)

BM #300
BM DESCRIPTION: FOUND CHISELED SQUARE (DESC. AS CHISELED "X") ON E. SIDE OF SECOND LIGHT POLE BASE AS DESCRIBED
ELEV. - 805.54

BM #301
BM DESCRIPTION: FOUND CHISELED SQUARE (DESC. AS CHISELED "X") ON E. SIDE OF 5TH LIGHT POLE BASE AS DES.
ELEV. - 806.21

BM #350
FOUND MAG NAIL WIPEA WASHER IN W. SIDE OF 2ND LIGHT POLE BASE SOUTH OF LONG LAKE IN ENTRANCE BLVD. PAINTED "BM 300"
ELEV. - 810.71

BM #351
FOUND MAG NAIL (NO TAG - PAINT WORN OFF) IN W. SIDE OF LIGHT POLE BASE - SHOWN ON TOPO AS "BM 301"
ELEV. - 810.71



0 10 20 40
SCALE: 1" = 20'



TMP ARCHITECTURE INC
1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS, MICHIGAN 48302
PH: 248.338.4561 FX: 248.338.0233
EM: INFO@TMP-ARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT

PEAGROUP
t: 844.813.2949
www.peagroup.com

PROJECT TITLE
**Troy High School
Athletic Fields
Bid Package No. 02A**

**Troy School District
Troy, Michigan**

DRAWING TITLE
**DETAILED
GRADING PLAN**

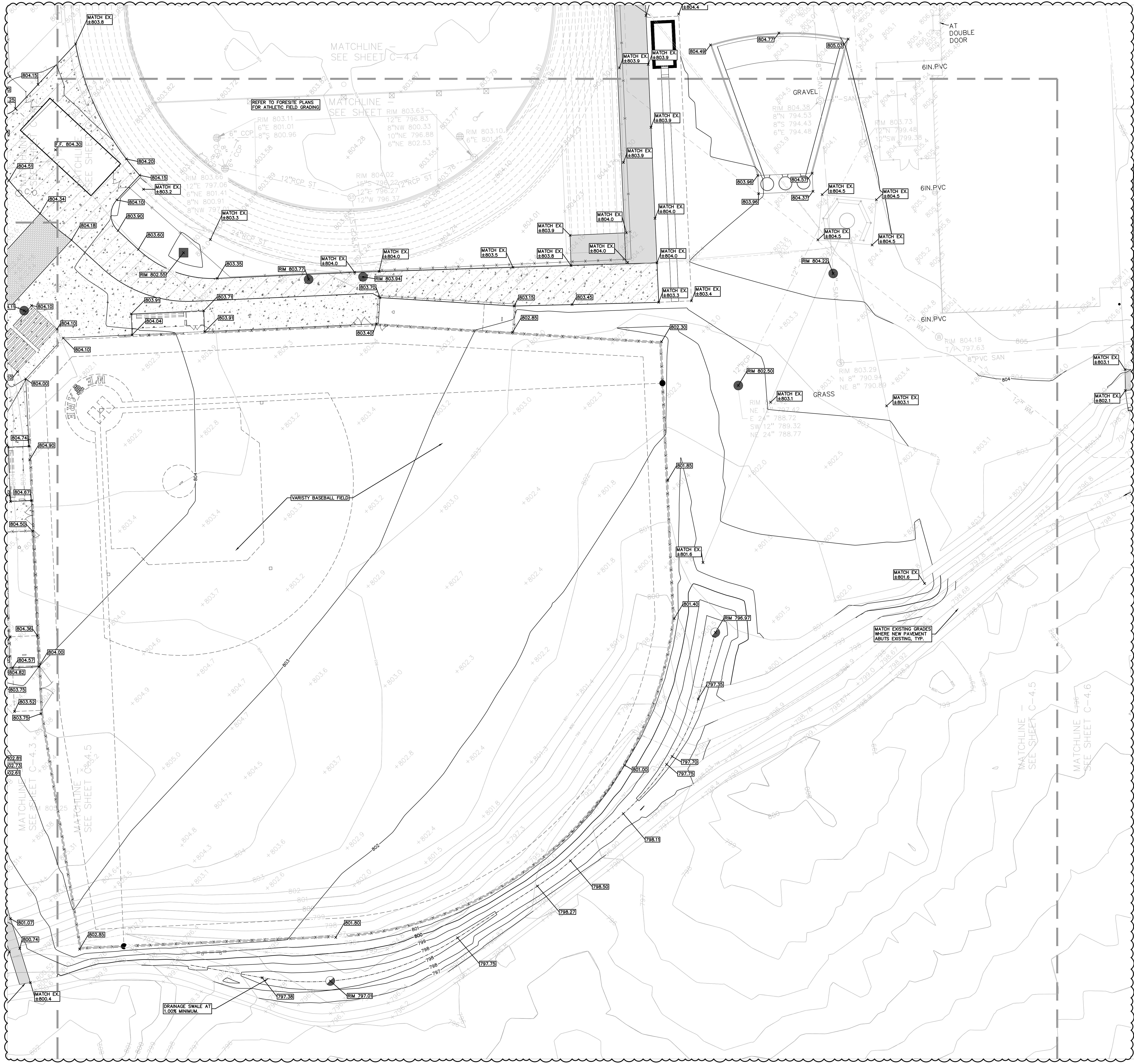
ISSUE DATES

12-06-2023	ADDENDUM NO. 2
11-09-2023	CONSTRUCTION DOCUMENTS

DATE:	ISSUED FOR:
DRAWN:	JW
CHECKED:	TD
APPROVED:	TD

PROJECT NO.
22104E
DRAWING NO.
C-4.4

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GRADING LEGEND:

- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
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ABBREVIATIONS

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REFER TO GRADING NOTES ON SHEET C-4.3

RETAINING WALL NOTE:
TOP OF WALL (TW) AND BOTTOM OF WALL (BW) GRADES ARE THE FINISH GRADE AT THE TOP AND BOTTOM OF THE RETAINING WALL, NOT ACTUAL TOP AND BOTTOM OF THE WALL STRUCTURE

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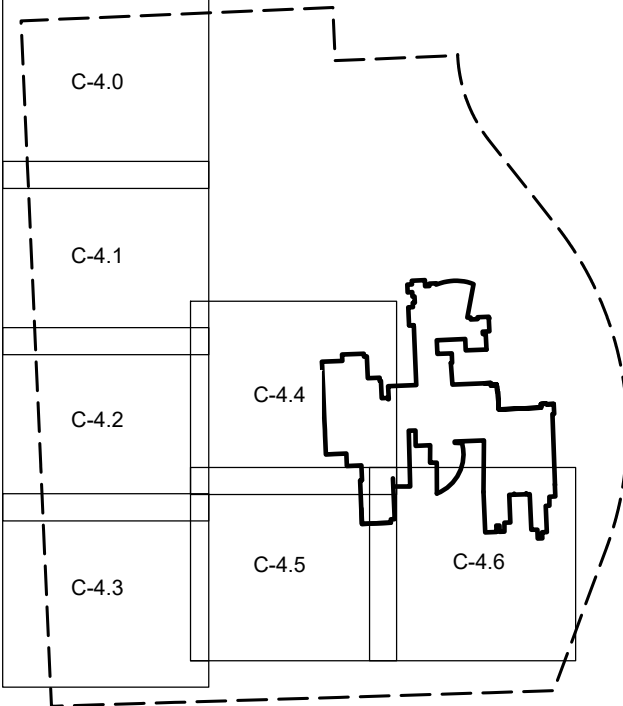
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SCALE: 1" = 20'



TMP ARCHITECTURE INC
1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS • MICHIGAN • 48302
PH • 248.338.4561 FX • 248.338.0223
EM • INFO@TMP-ARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT



PROJECT TITLE
**Troy High School
Athletic Fields
Bld Package No. 02A**

**Troy School District
Troy, Michigan**

DRAWING TITLE
**DETAILED
GRADING PLAN**

ISSUE DATES

12-06-2023	ADDENDUM NO. 2
11-09-2023	CONSTRUCTION DOCUMENTS

DATE: ISSUED FOR:

DRAWN: JW

CHECKED: TD

APPROVED: TD

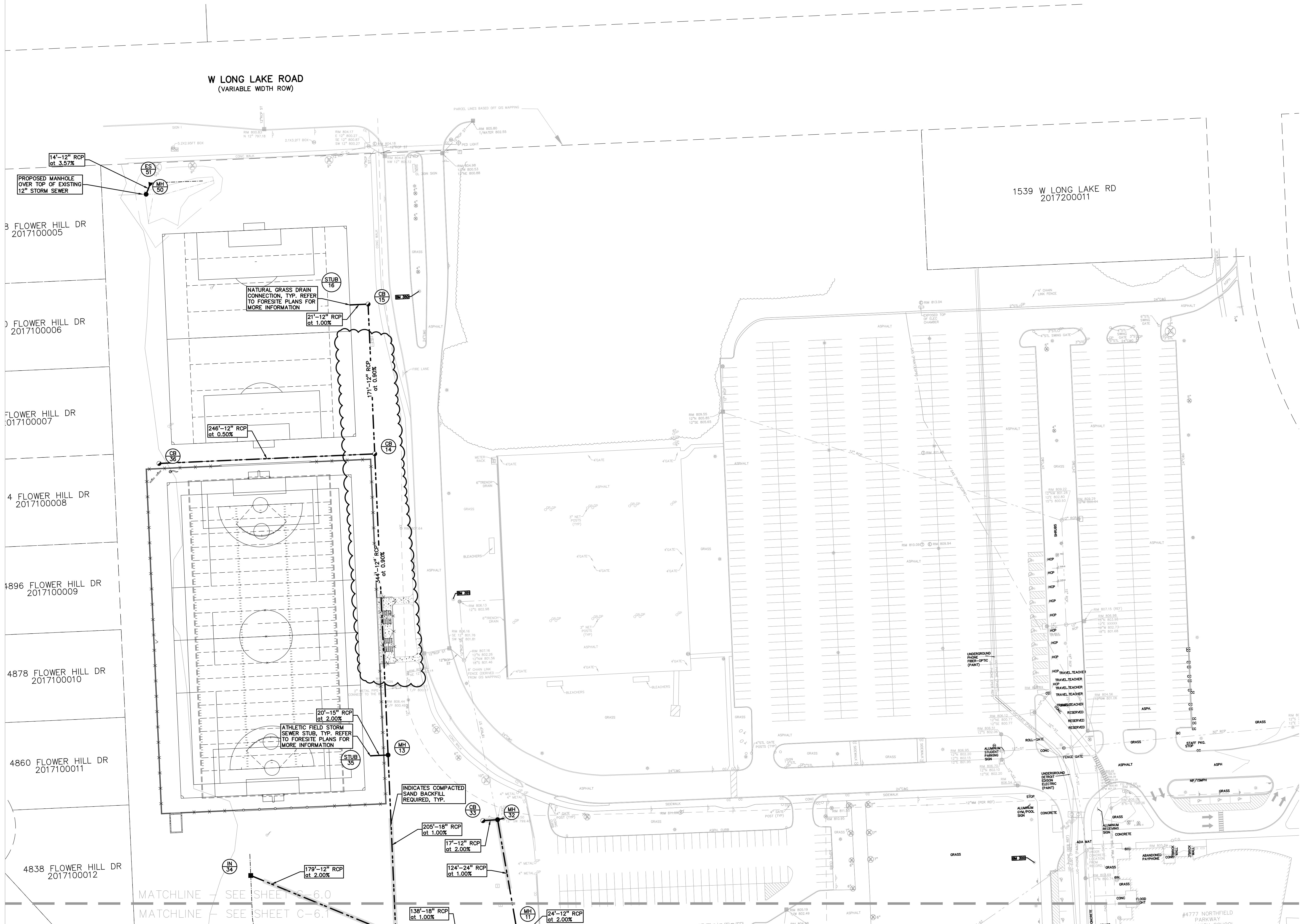
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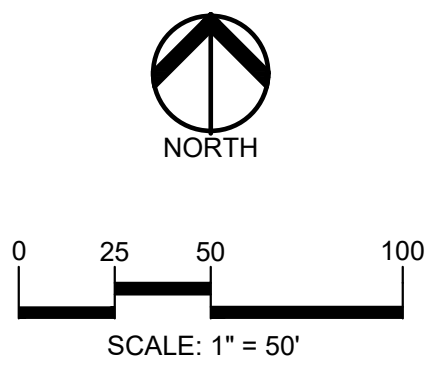


UTILITY LEGEND:	
—OH-ELEC-WV—	EX. OH. ELEC. POLE & GUY WIRE
—UG-CATV—	EX. U.G. CABLE TV & PEDESTAL
—UG-COM—	EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
—UG-ELEC—	EX. U.G. ELEC. MANHOLE, METER & HANDHOLE
—	EX. GAS LINE
⊗	EX. GAS VALVE & GAS LINE MARKER
⊠	EX. TRANSFORMER & IRRIGATION VALVE
—	EX. WATER MAIN
⊗	EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
⊗	EX. WATER VALVE BOX & SHUTOFF
—	EX. SANITARY SEWER
⊗	EX. SANITARY CLEANOUT & MANHOLE
⊗	EX. COMBINED SEWER MANHOLE
⊗	EX. STORM SEWER
⊗	EX. CLEANOUT & MANHOLE
⊗	EX. SQUARE, ROUND, & BEEHIVE CATCH BASIN
⊗	EX. YARD DRAIN & ROOF DRAIN
⊗	EX. UNIDENTIFIED STRUCTURE
—	PROPOSED WATER MAIN
⊗	PROPOSED HYDRANT AND GATE VALVE
⊗	PROPOSED TAPPING SLEEVE, VALVE & WELL
⊗	PROPOSED POST INDICATOR VALVE
—	PROPOSED SANITARY SEWER
⊗	PROPOSED SANITARY CLEANOUT & MANHOLE
—	PROPOSED STORM SEWER
⊗	PROPOSED STORM SEWER CLEANOUT & MANHOLE
⊗	PROPOSED CATCH BASIN, INLET & YARD DRAIN

NOTE:
CONTRACTOR SHALL VERIFY ALL QUANTITIES. ANY DEVIATIONS TO THE PLAN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF PEA GROUP FOR VERIFICATION, PRIOR TO BIDDING.

PREMIUM TRENCH BACKFILL NOTE:
ALL UTILITIES UNDER PAVEMENT OR WITHIN 3' OF THE EDGE OF PAVEMENT (OR WITHIN THE 45° LINE OF INFLUENCE OF PAVEMENT) SHALL HAVE MOOT CLASS II GRANULAR BACKFILL COMPACTED TO 95% MAX. DRY DENSITY (ASTM D-1557).

UTILITY STRUCTURE NOTE:
REFER TO STRUCTURE TABLES ON SHEET C-6.2 FOR DETAILS.



TMP ARCHITECTURE INC
1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS • MICHIGAN • 48302
PH • 248.338.4561 FX • 248.338.0223
EM • INFO@TMP-ARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT



PROJECT TITLE
**Troy High School
Athletic Fields
Bid Package No. 02A**

**Troy School District
Troy, Michigan**

DRAWING TITLE
UTILITY PLAN - NORTH

ISSUE DATES

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12-06-2023 ADDENDUM NO. 2
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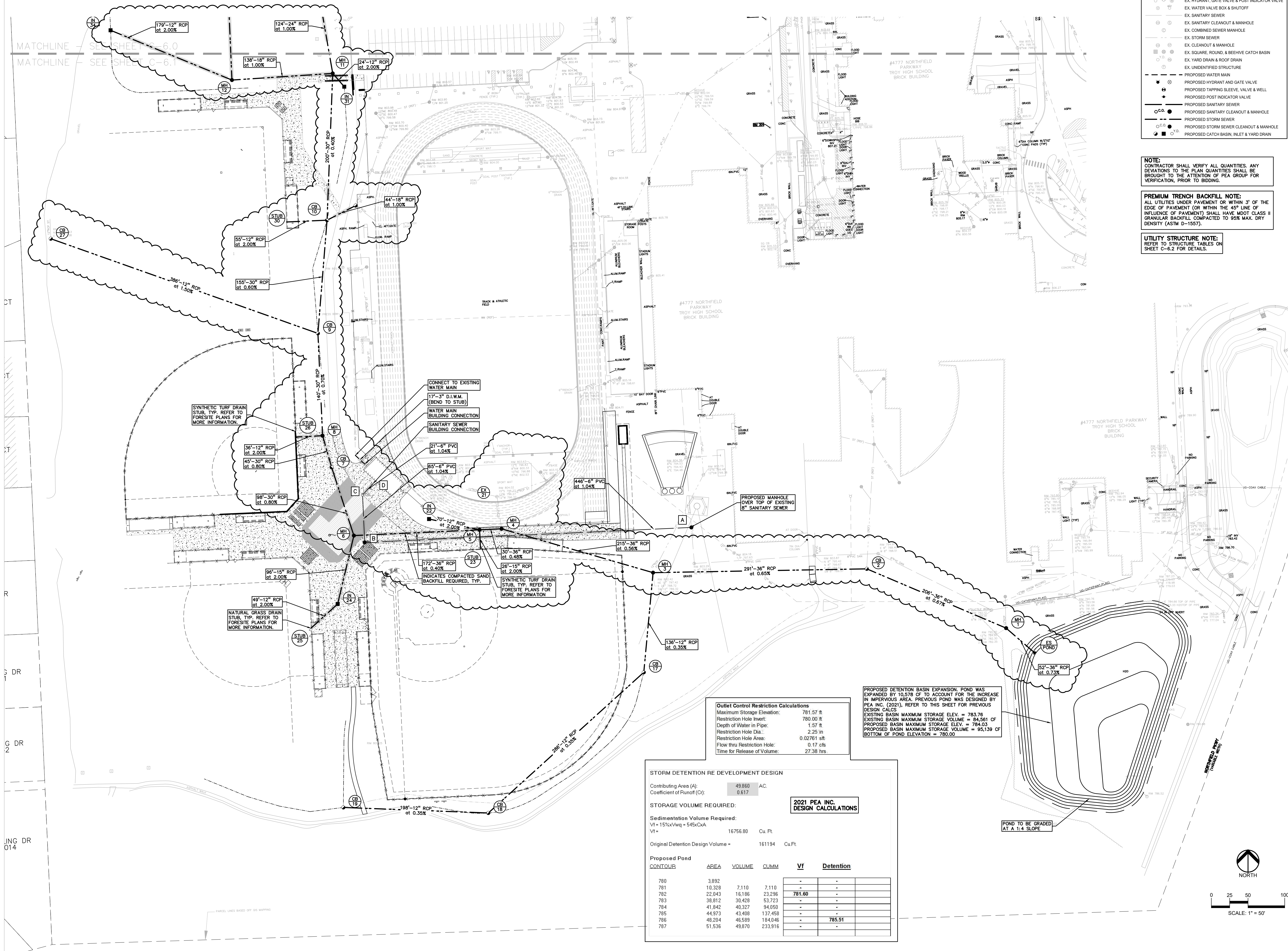
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C-6.0

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UTILITY LEGEND:

- OH-ELEC-W-C EX. OH. ELEC. POLE & GUY WIRE
- UG-CATV EX. U.G. CABLE TV & PEDESTAL
- UG-COMM EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- UG-ELEC EX. U.G. ELEC. MANHOLE, METER & HANDHOLE
- EX GAS LINE
- EX GAS VALVE & GAS LINE MARKER
- EX TRANSFORMER & IRRIGATION VALVE
- EX WATER MAIN
- EX HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX WATER VALVE BOX & SHUTOFF
- EX SANITARY SEWER
- EX SANITARY CLEANOUT & MANHOLE
- EX COMBINED SEWER MANHOLE
- EX STORM SEWER
- EX CLEANOUT & MANHOLE
- EX SQUARE, ROUND, & BEEHIVE CATCH BASIN
- EX YARD DRAIN & ROOF DRAIN
- EX UNIDENTIFIED STRUCTURE
- PROPOSED WATER MAIN
- PROPOSED HYDRANT AND GATE VALVE
- PROPOSED TAPPING SLEEVE, VALVE & WELL
- PROPOSED POST INDICATOR VALVE
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY CLEANOUT & MANHOLE
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER CLEANOUT & MANHOLE
- PROPOSED CATCH BASIN, INLET & YARD DRAIN

NOTE:
CONTRACTOR SHALL VERIFY ALL QUANTITIES. ANY DEVIATIONS TO THE PLAN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF PEAGROUP FOR VERIFICATION, PRIOR TO BIDDING.

PREMIUM TRENCH BACKFILL NOTE:
ALL UTILITIES UNDER PAVEMENT OR WITHIN 3' OF THE EDGE OF PAVEMENT (OR WITHIN THE 45° LINE OF INFLUENCE OF PAVEMENT) SHALL HAVE MOOT CLASS II GRANULAR BACKFILL COMPACTED TO 95% MAX. DRY DENSITY (ASTM D-1557).

UTILITY STRUCTURE NOTE:
REFER TO STRUCTURE TABLES ON SHEET C-6.2 FOR DETAILS.

Outlet Control Restriction Calculations

Maximum Storage Elevation: 781.57 ft
Restriction Hole Invert: 780.00 ft
Depth of Water in Pipe: 1.57 ft
Restriction Hole Dia.: 2.25 in
Restriction Hole Area: 0.02761 sq ft
Flow thru Restriction Hole: 0.17 cfs
Time for Release of Volume: 27.38 hrs

PROPOSED DETENTION BASIN EXPANSION: POND WAS EXPANDED BY 10,578 CF TO ACCOUNT FOR THE INCREASE IN IMPERVIOUS AREA. PREVIOUS POND WAS DESIGNED BY PEAGROUP, INC. (2021). REFER TO THIS SHEET FOR PREVIOUS DESIGN CALC. EXISTING BASIN MAXIMUM STORAGE ELEV. = 783.76 EXISTING BASIN MAXIMUM STORAGE VOLUME = 84,561 CF PROPOSED BASIN MAXIMUM STORAGE ELEV. = 784.03 PROPOSED BASIN MAXIMUM STORAGE VOLUME = 95,139 CF BOTTOM OF POND ELEVATION = 780.00

STORM DETENTION RE DEVELOPMENT DESIGN

Contributing Area (A): 49.860 AC.
Coefficient of Runoff (Ct): 0.617

STORAGE VOLUME REQUIRED:

Sedimentation Volume Required:
 $V_s = 15\% \times V_{wq} = 545 \text{ Cu.Ft.}$
Original Detention Design Volume = 161194 Cu.Ft.

2021 PEAGROUP, INC. DESIGN CALCULATIONS

CONTOUR	AREA	VOLUME	CUMM	Vf	Detention
780	3.892	-	-	-	-
781	10.323	7.110	7.110	-	-
782	22.043	16.186	23.296	781.60	-
783	38.812	30.428	53.723	-	-
784	41.842	40.327	94.050	-	-
785	44.973	43.408	137.458	-	-
786	48.204	46.589	184.046	-	785.51
787	51.536	49.870	233.916	-	-

TMP ARCHITECTURE

TMP ARCHITECTURE INC
1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS • MICHIGAN • 48302
PH: 248.338.4561 FX: 248.338.0223
EM: INFO@TMP-ARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT

PEAGROUP

t: 844.813.2949
www.peagroup.com

PROJECT TITLE
Troy High School
Athletic Fields
Bid Package No. 02A

Troy School District
Troy, Michigan

DRAWING TITLE
UTILITY PLAN - SOUTH

ISSUE DATES

DATE	ISSUED FOR:
12-06-2023	ADDENDUM NO. 2
11-09-2023	CONSTRUCTION DOCUMENTS

DRAWN JW
CHECKED TD
APPROVED TD

PROJECT NO.
22104E

DRAWING NO.
C-6.1

STORM STRUCTURES		
STUB	FUTURE-1	(1" DIA./0' SUMP) RIM = 807.38 12" W 803.19
MH	1	(7" DIA./0' SUMP) RIM = 792.40 36" NW 783.38 12" N 784.90 36" SE 783.38
CB	2	(5' DIA./2' SUMP) RIM = 795.18 36" W 784.77 12" N 789.61 36" SE 784.77
MH	3	(5' DIA./0' SUMP) RIM = 802.42 36" W 786.66 12" S 786.26 12" NE 797.42 36" E 786.66
MH	4	(5' DIA./0' SUMP) RIM = 803.94 36" W 787.86 15" N 796.02 36" E 787.86
MH	5	(5' DIA./0' SUMP) RIM = 803.77 36" W 788.01 15" S 792.00 12" W 795.00 36" E 788.01
MH	6	(6' DIA./0' SUMP) RIM = 804.32 30" N 789.09 15" S 790.09 36" E 788.69
CB	7	(5' DIA./2' SUMP) RIM = 803.85 30" N 789.88 30" S 789.88
MH	8	(5' DIA./0' SUMP) RIM = 804.89 30" N 790.23 12" W 791.43 30" S 790.23
CB	9	(5' DIA./2' SUMP) RIM = 803.30 30" N 791.21 12" W 792.41 30" S 791.21
CB	10	(7" DIA./2' SUMP) RIM = 803.75 30" N 792.14 12" W 793.34 18" NE 792.94 30" S 792.14
MH	11	(5' DIA./0' SUMP) RIM = 806.33 18" W 793.74 12" SE 796.68 24" N 793.34 30" S 792.94
MH	12	(5' DIA./0' SUMP) RIM = 807.92 18" N 795.12 12" W 795.52 18" E 795.12
MH	13	(4' DIA./0' SUMP) RIM = 807.84 12" N 797.57 15" W 797.37 18" S 797.17
CB	14	(4' DIA./2' SUMP) RIM = 806.25 12" N 800.66 12" W 800.66 12" S 800.66
CB	15	(4' DIA./2' SUMP) RIM = 806.45 12" W 802.20 12" S 802.20
STUB	16	(1" DIA./0' SUMP) RIM = 807.75 12" E 802.41
CB	17	(4' DIA./2' SUMP) RIM = 796.97 12" SW 788.74 12" N 788.74
CB	18	(4' DIA./2' SUMP) RIM = 797.01 12" W 789.74 12" NE 789.74
CB	19	(4' DIA./2' SUMP) RIM = 799.00 12" E 790.43
EX	21	(4' DIA./2' SUMP) RIM = 804.03 15" S 796.22
IN	22	(2" DIA./2' SUMP) RIM = 802.56 12" E 796.41
STUB	23	(1" DIA./2' SUMP) RIM = 803.60 15" N 792.52
IN	24	(2" DIA./2' SUMP) RIM = 803.60 12" SW 792.21 15" N 792.01
STUB	25	(1" DIA./0' SUMP) RIM = 804.34 12" NE 793.18
STUB	26	(1" DIA./0' SUMP) RIM = 805.04 12" E 792.16
CB	27	(4' DIA./2' SUMP) RIM = 802.08 12" N 792.41 12" E 798.21
CB	28	(5' DIA./2' SUMP) RIM = 804.74 18" SE 793.38 12" NE 795.52 18" SW 793.38
STUB	29	(1" DIA./0' SUMP) RIM = 804.36 18" NW 794.10
STUB	30	(1" DIA./0' SUMP) RIM = 806.00 12" E 794.45
IN	31	(2" DIA./2' SUMP) RIM = 803.60 12" NW 797.16
MH	32	(5' DIA./0' SUMP) RIM = 804.53 12" W 795.39 18" N 799.29 12" E 799.33 24" S 794.59
CB	33	(4' DIA./2' SUMP) RIM = 803.50 12" E 795.72
IN	34	(2" DIA./2' SUMP) RIM = 804.41 12" E 799.10
STUB	35	(1" DIA./0' SUMP) RIM = 807.99 15" E 797.77
CB	36	(4' DIA./2' SUMP) RIM = 806.25 12" E 801.90
MH	50	(4' DIA./0' SUMP) RIM = 801.50 12" N 798.50 12" W 798.40

EXISTING STORM STRUCTURES		
EX	EX-1	EXISTING STRUCTURE RIM = 806.86 12" N 802.26 18" S 801.46
EX	EX-2	EXISTING STRUCTURE RIM = 807.00 12" E 802.98 12" S 802.98

END SECTIONS	
51	END SECTION 12" 799.00
POND	END SECTION 56" 783.00

SANITARY STRUCTURES	
A	MH (4' DIA.) RIM = 804.22 6" W 792.26 8" N 792.16 8" S 792.16
B	MH (4' DIA.) RIM = 804.11 6" N 797.00 6" E 796.90
D	STUB (1' DIA.) RIM = 804.34 6" SW 797.89

SANITARY CLEANOUTS	
C	C.O. IN BOX RIM = 804.52 INV. 797.67



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BLOOMFIELD HILLS • MICHIGAN • 48302
PH • 248.338.4561 FX • 248.338.0223
EM • INFO@TMP-ARCHITECTURE.COM

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PROJECT TITLE
**Troy High School
Athletic Fields
Bid Package No. 02A**

**Troy School District
Troy, Michigan**

DRAWING TITLE
**UTILITY STRUCTURE
TABLES**

ISSUE DATES

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12-06-2023	ADDENDUM NO. 2
11-09-2023	CONSTRUCTION DOCUMENTS

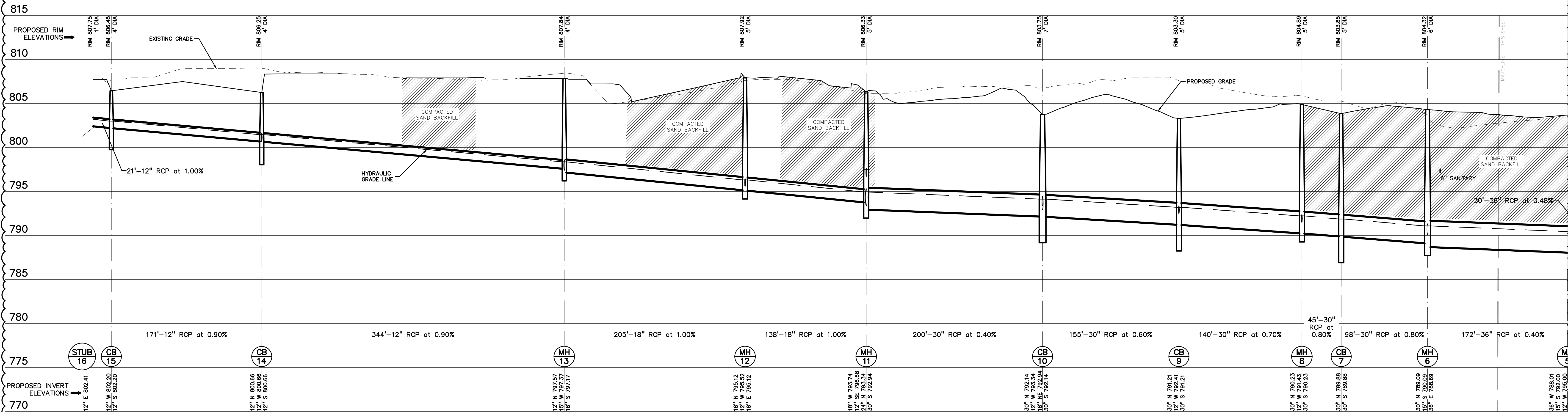
DATE:	ISSUED FOR:
DRAWN:	JW
CHECKED:	TD
APPROVED:	TD

PROJECT NO.

22104E

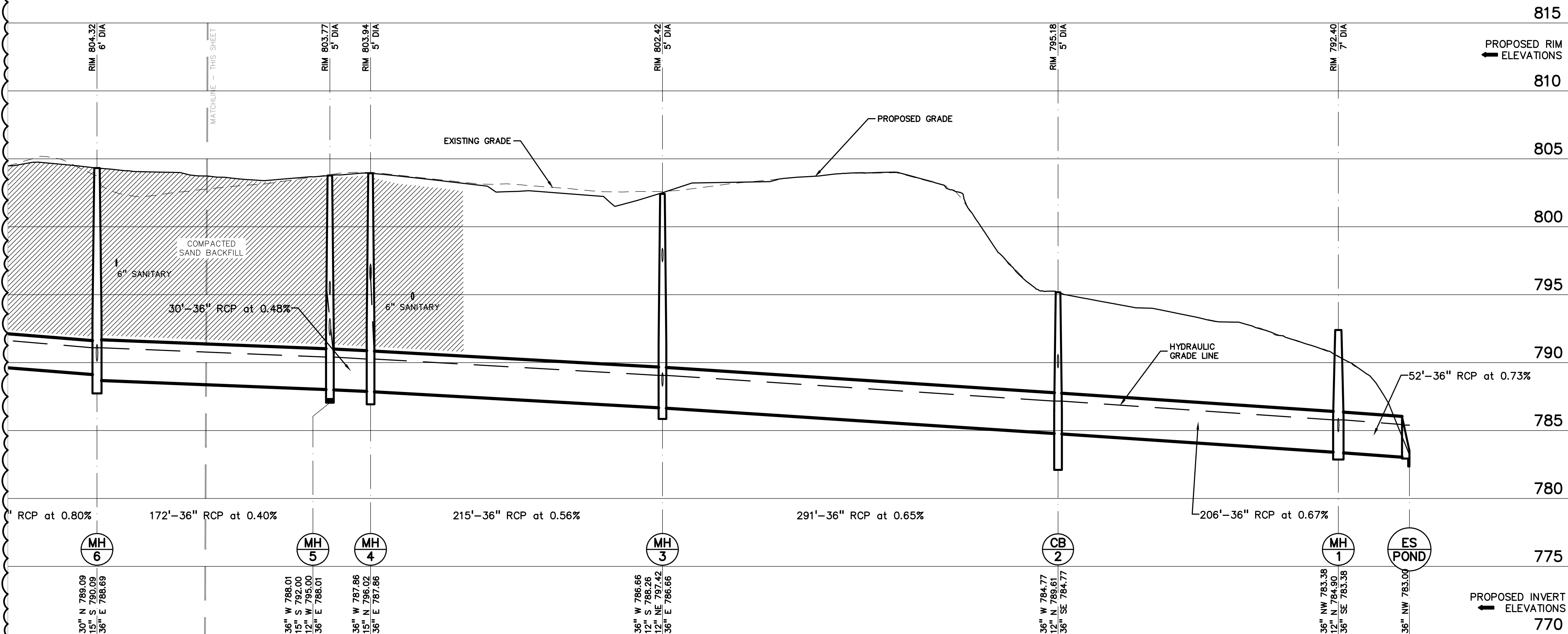
DRAWING NO.

C-6.2



ST 16-POND PROFILE

HORIZ: 1" = 50'
VERT: 1" = 5'



HORIZ: 1" = 50'
VERT: 1" = 5'



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1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS • MICHIGAN • 48302
PH • 248.338.4561 FX • 248.338.8223
EM • INFO@TMP-ARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT



t: 844.813.2949
www.peagroup.com

PROJECT TITLE

**Troy High School
Athletic Fields
Bld Package No. 02A**

**Troy School District
Troy, Michigan**

DRAWING TITLE
**STORM SEWER
PROFILES**

ISSUE DATES

12-06-2023	ADDENDUM NO. 2
11-09-2023	CONSTRUCTION DOCUMENTS

DATE: ISSUED FOR:

DRAWN: JW

CHECKED: TD

APPROVED: TD

PROJECT NO.

22104E

DRAWING NO.

C-7.0



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PROJECT TITLE
**Troy High School
Athletic Fields
Bld Package No. 02A**

**Troy School District
Troy, Michigan**

DRAWING TITLE
**STORM SEWER
PROFILES**

ISSUE DATES

12-06-2023 ADDENDUM NO. 2
11-09-2023 CONSTRUCTION DOCUMENTS

DATE ISSUED FOR:

DRAWN JW

CHECKED TD

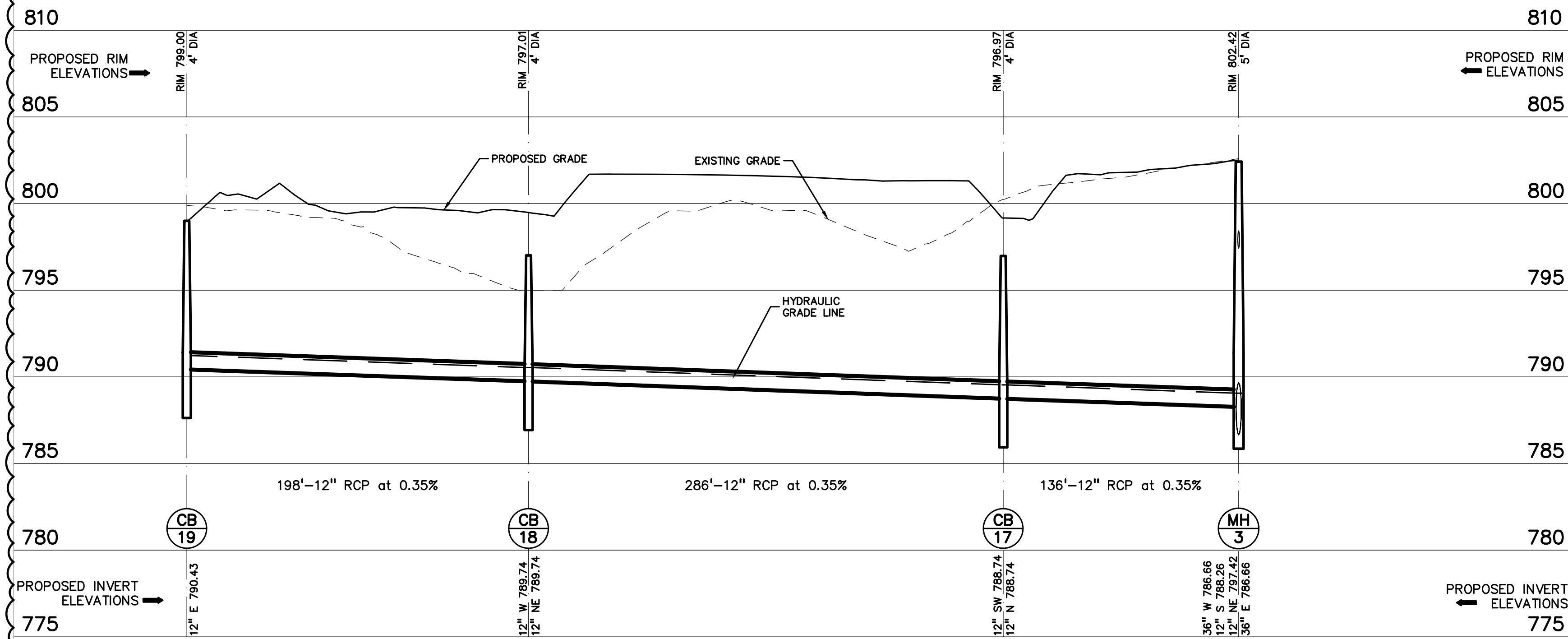
APPROVED TD

PROJECT NO.

22104E

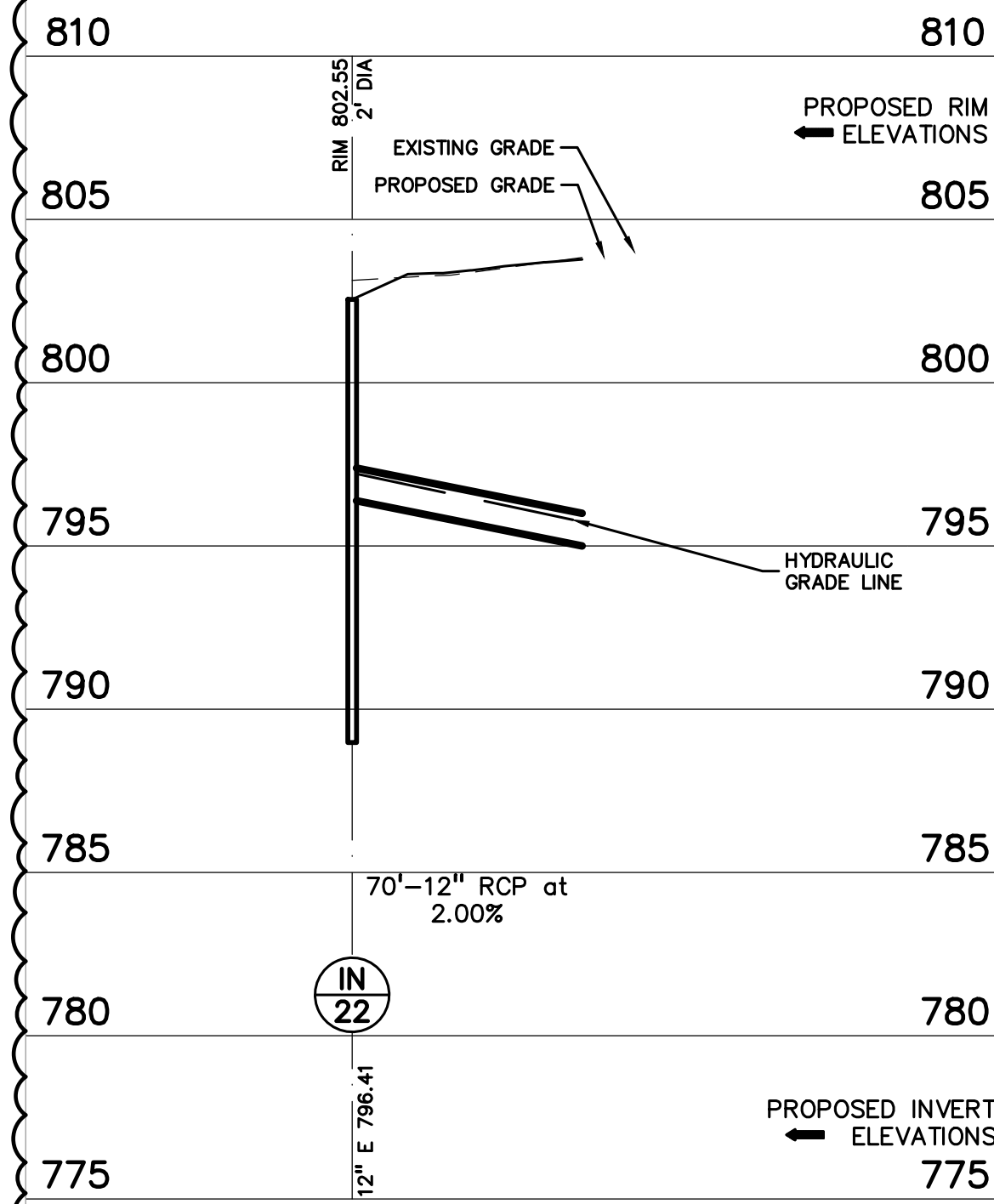
DRAWING NO.

C-7.1



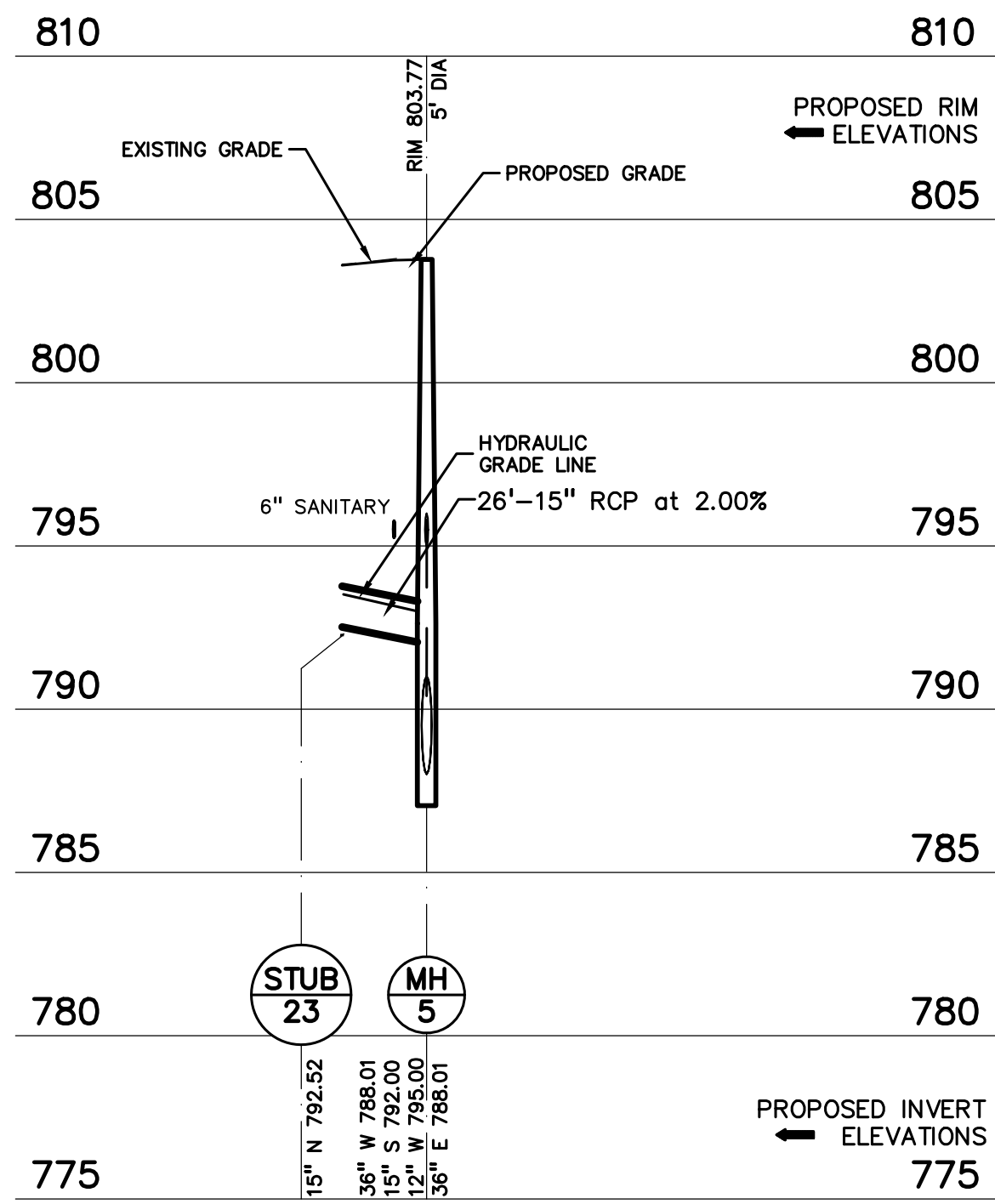
ST 19-3 PROFILE

HORIZ: 1" = 50'
VERT: 1" = 5'



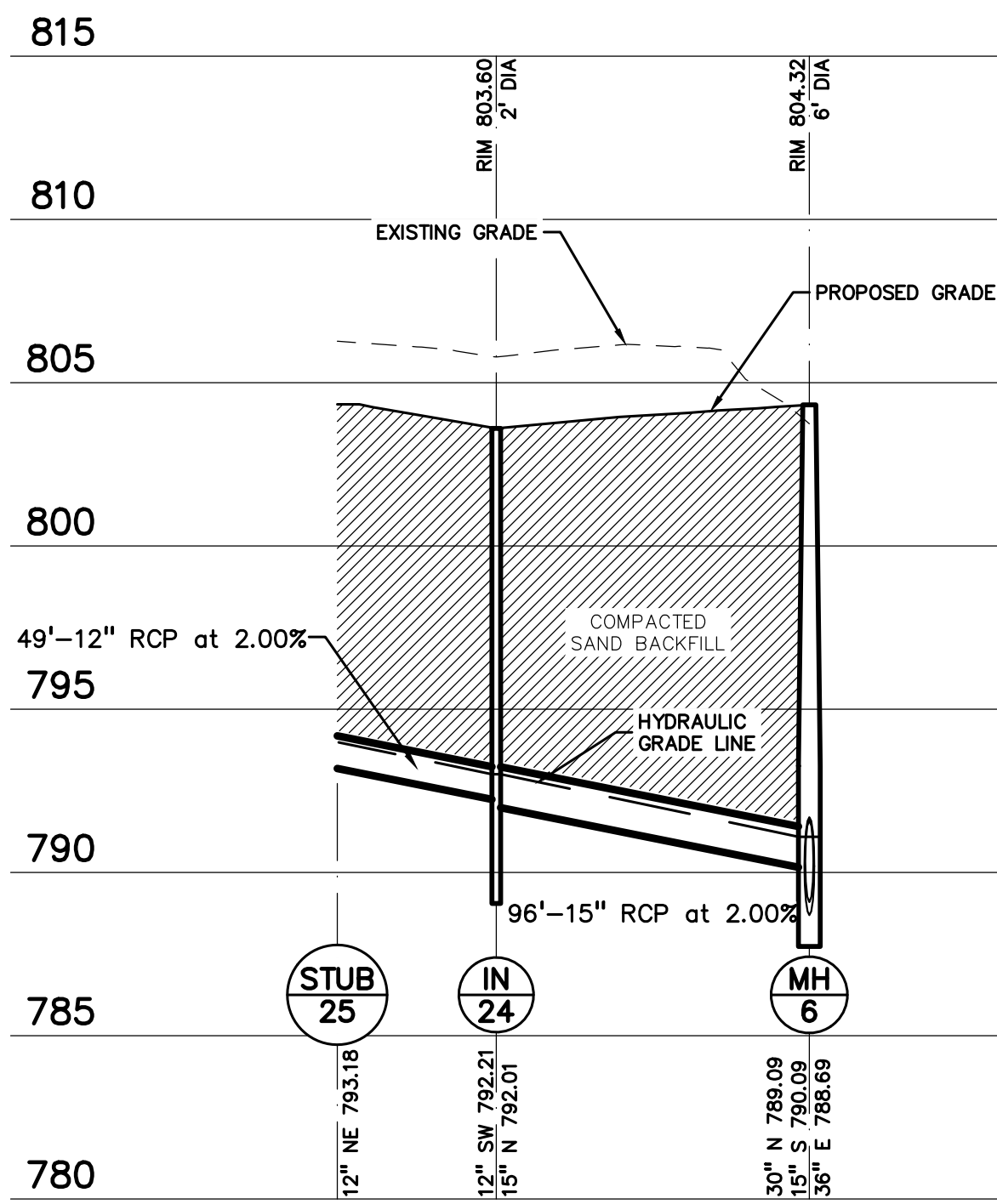
ST 22-5 PROFILE

HORIZ: 1" = 50'
VERT: 1" = 5'



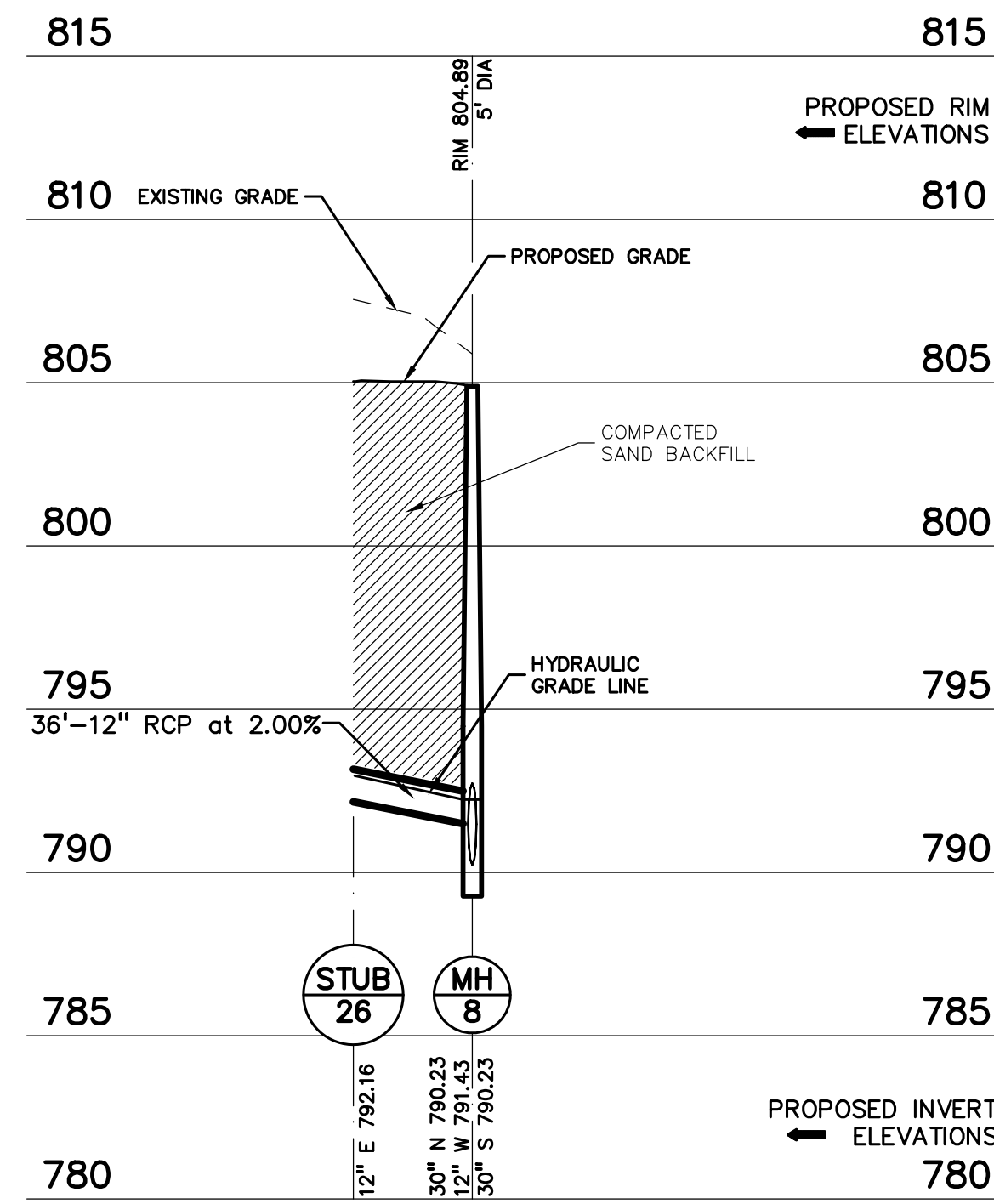
ST 23-5 PROFILE

HORIZ: 1" = 50'
VERT: 1" = 5'



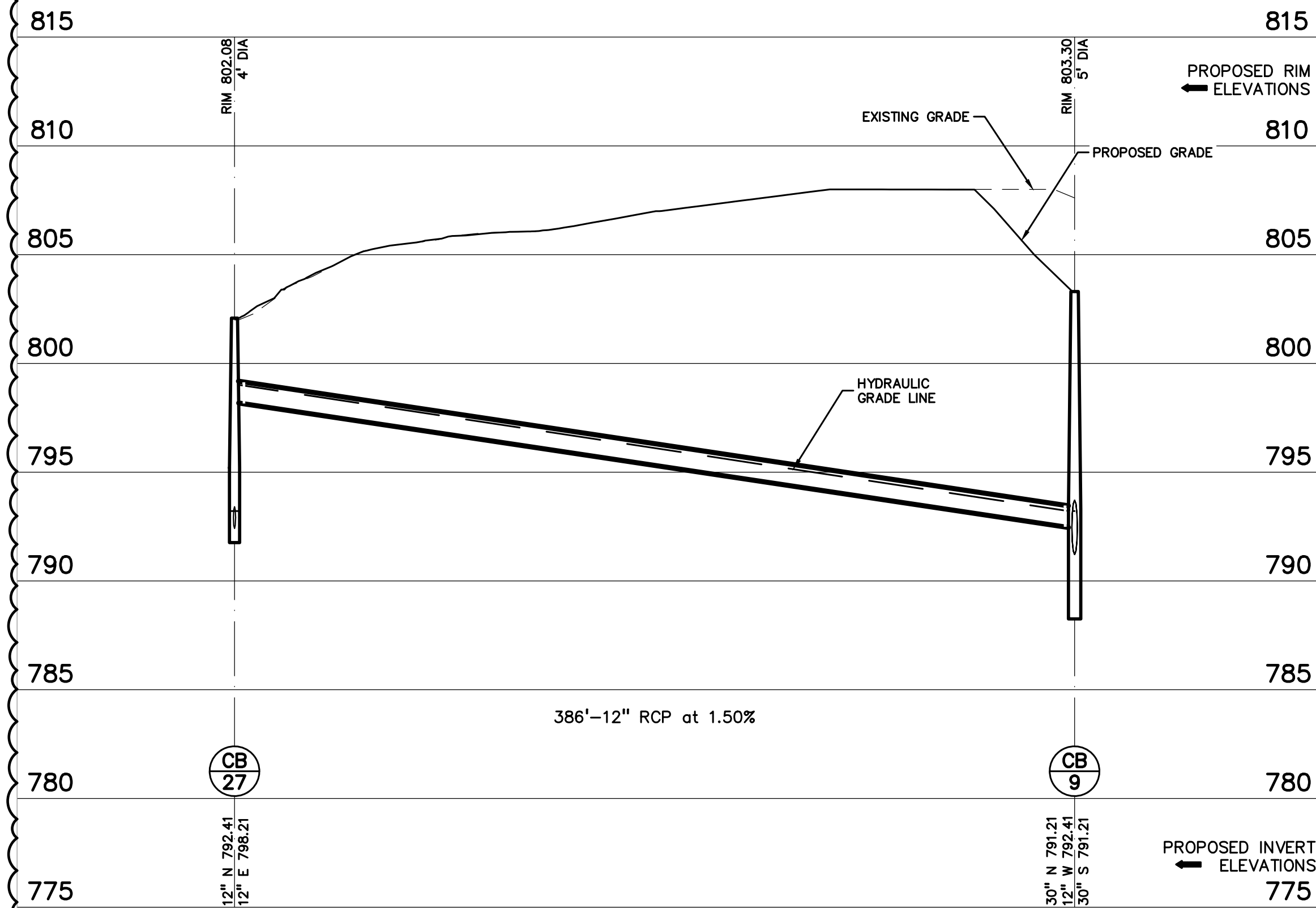
ST 25-6 PROFILE

HORIZ: 1" = 50'
VERT: 1" = 5'



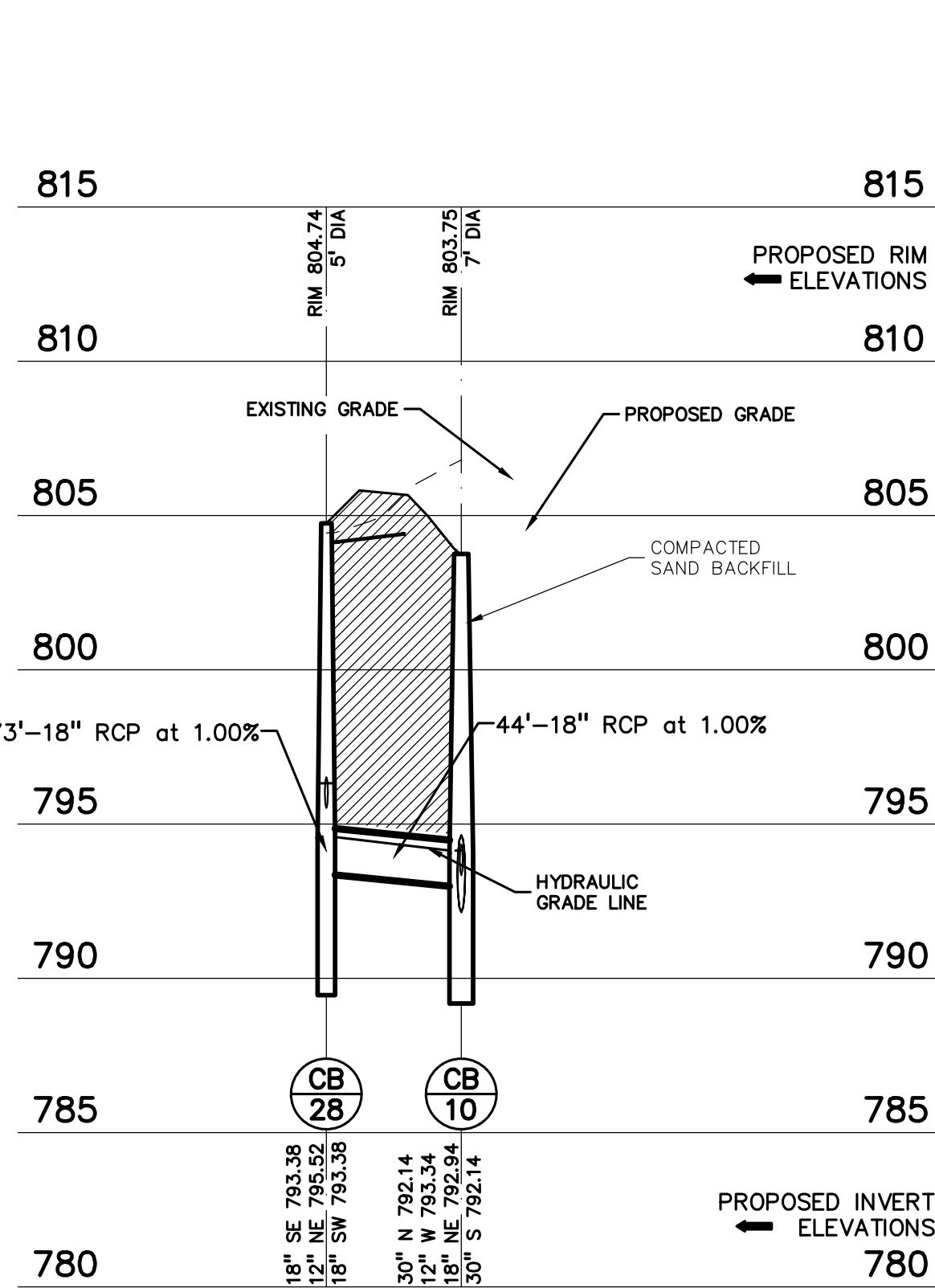
ST 26-8 PROFILE

HORIZ: 1" = 50'
VERT: 1" = 5'



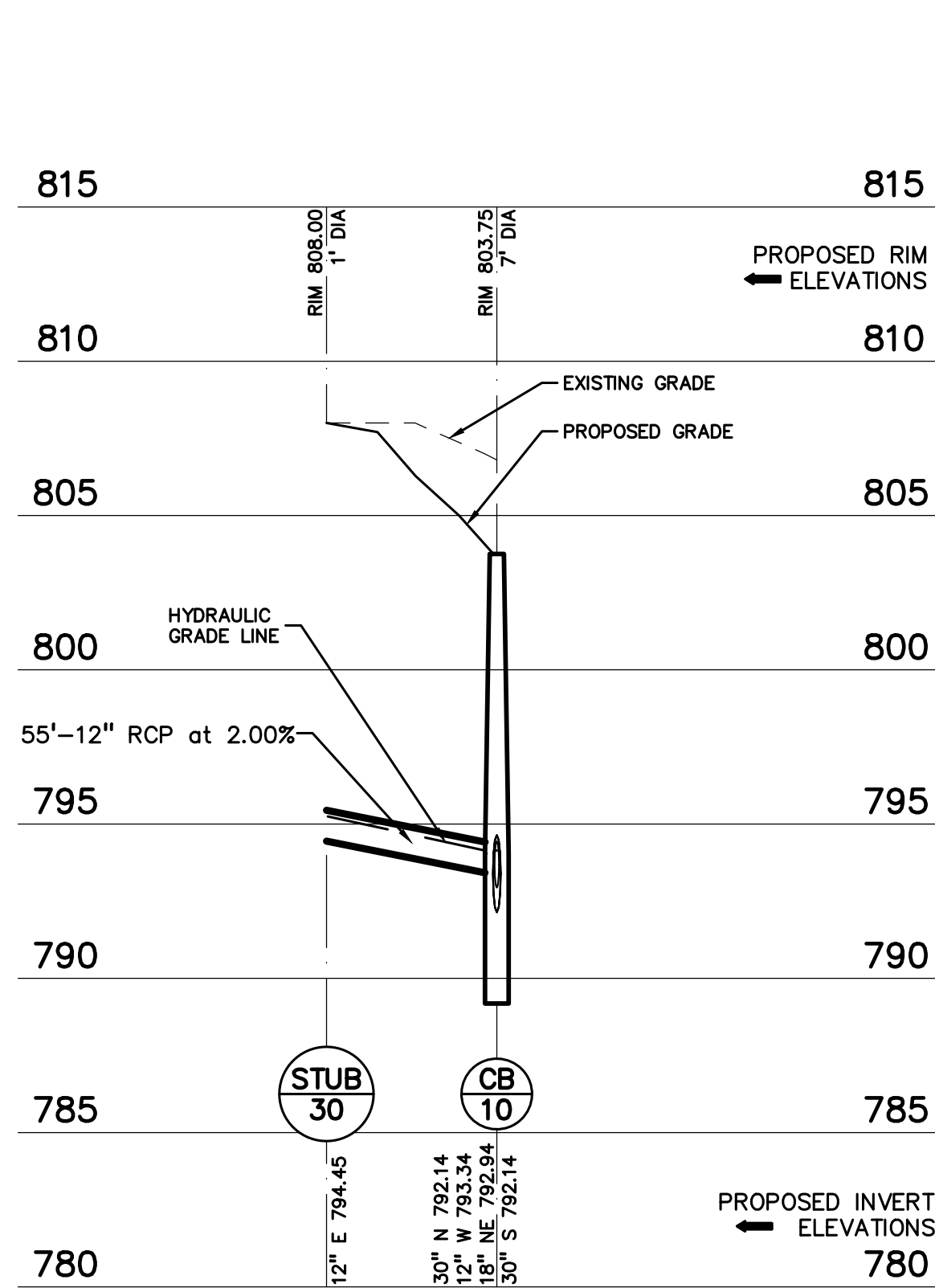
ST 27-9 PROFILE

HORIZ: 1" = 50'
VERT: 1" = 5'



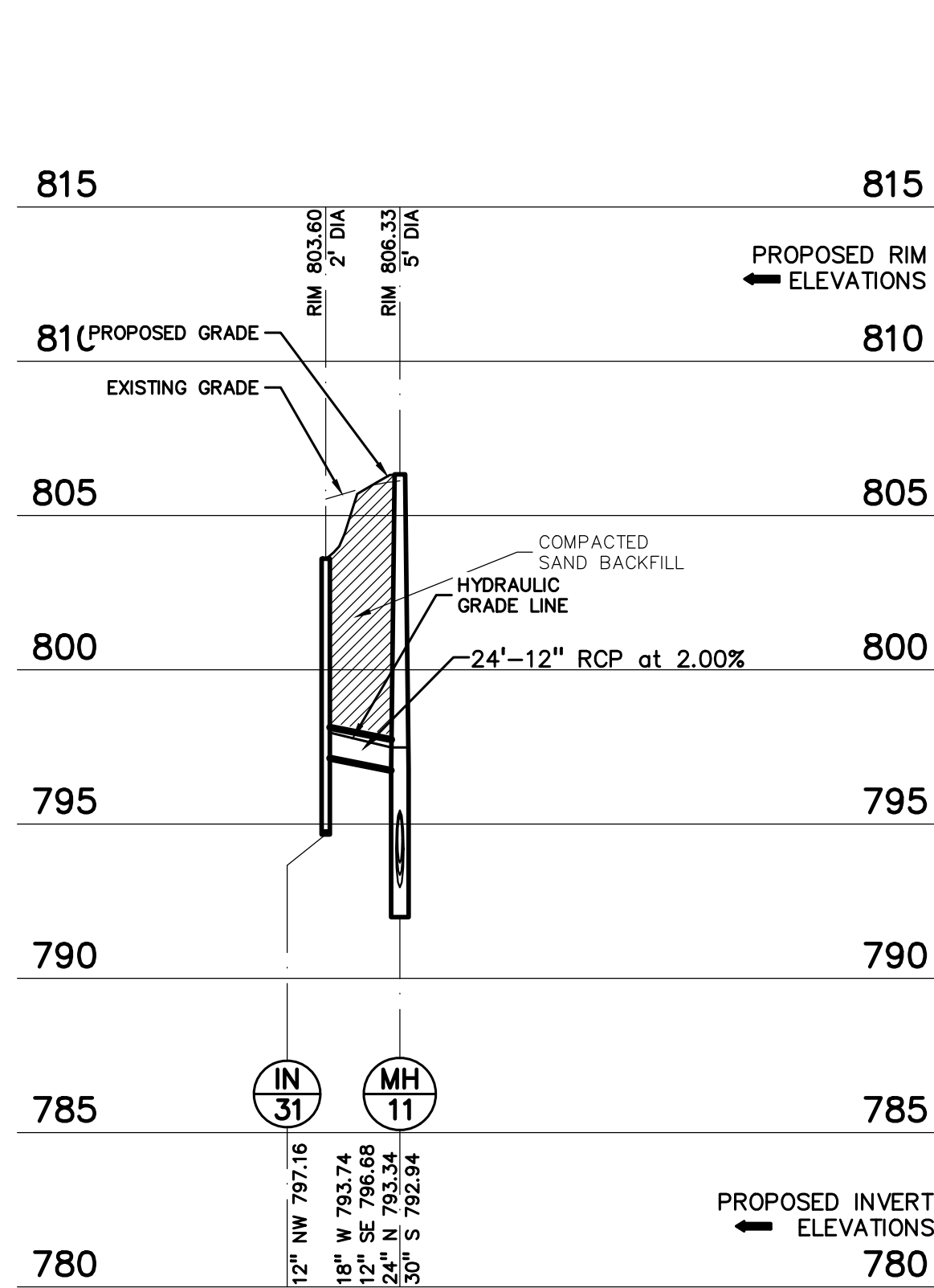
ST 28-10 PROFILE

HORIZ: 1" = 50'
VERT: 1" = 5'



ST 30-10 PROFILE

HORIZ: 1" = 50'
VERT: 1" = 5'



ST 31-11 PROFILE

HORIZ: 1" = 50'
VERT: 1" = 5'

Drawing File: S:\PROJECTS\2023\23-031 TROY SCHOOLS 2022 BIDDING\3.CONSTRUCTION\TROY ATHLETICS\TROY HIGH (C-8-0)A4H-230301-11A.dwg
Date: 05/20/2023 10:29am



STORM SEWER SYSTEM DESIGN

Location: Oakland County

$I = \frac{B}{(T+D)^E}$ $B = 50.12$ $D = 9.17$ $E = 0.81$
 $C = \text{varies}$
 $T = 15 \text{ (min.)}$ Pipe "n" Value = 0.013

FROM STR	TO STR	AREA (A) (Acres)	COEF. C	A x C	TOTAL AREA (AxC) (Acres)	TOTAL AREA (Acres)	TIME t (min.)	INT. I (in/hr)	FLOW Q (cfs)	PIPE CAP. (cfs)	PIPE DIA. (in.)	PIPE LENGTH (ft.)	PIPE SLOPE (%)	MIN HG PER "Q"	VEL. FULL (ft./sec)	TIME FLOW (min.)	H.G.L. ELEV. UP STREAM	H.G.L. ELEV. DOWN STREAM	RIM ELEV. UP STREAM	RIM ELEV. DOWN STREAM	INVERT ELEV. UP STREAM	INVERT ELEV. DOWN STREAM	PIPE COVER UP STREAM	PIPE COVER DOWN STREAM	HGL COVER UP STREAM	HGL COVER DOWN STREAM
16	15	1.49	0.30	0.45	0.45	1.49	15.00	3.80	1.70	3.58	12	21	1.00	0.23%	4.5	0.1	803.21	803.00	807.75	806.45	802.41	802.20	4.17	3.08	4.54	3.45
15	14	0.00	0.00	0.00	0.45	1.49	15.00	3.79	1.70	3.38	12	171	0.90	0.23%	4.3	0.7	803.00	801.46	806.45	806.25	802.20	800.66	3.08	4.42	3.45	4.79
14	13	0.15	0.30	0.04	0.50	1.67	15.80	3.70	1.85	3.38	12	344	0.90	0.27%	4.3	1.3	801.46	798.37	806.25	807.84	800.66	797.57	4.42	9.10	4.79	9.47
13	12	0.00	0.00	0.00	1.92	3.98	17.10	3.55	6.82	10.50	18	205	1.00	0.42%	5.9	0.6	798.37	796.32	807.84	807.92	797.17	795.12	8.96	11.10	9.47	11.60
12	11	0.00	0.00	0.00	2.19	4.74	17.70	3.49	7.65	10.50	18	138	1.00	0.53%	5.9	0.4	796.32	794.94	807.92	806.33	795.12	793.74	11.10	10.88	11.60	11.39
11	10	0.00	0.00	0.00	6.82	11.78	18.10	3.44	23.48	25.94	30	200	0.40	0.33%	5.3	0.6	794.94	794.14	806.33	803.75	792.94	792.14	10.80	8.82	11.39	9.61
10	9	0.24	0.53	0.13	9.20	15.50	18.70	3.38	31.13	31.77	30	155	0.60	0.58%	6.5	0.4	794.14	793.21	803.75	803.30	792.14	791.21	8.82	9.30	9.61	10.09
9	8	0.37	0.48	0.18	9.75	17.12	19.10	3.35	32.62	34.32	30	140	0.70	0.63%	7.0	0.3	793.21	792.23	803.30	804.89	791.21	790.23	9.30	11.86	10.09	12.65
8	7	0.00	0.00	0.00	10.47	18.31	19.40	3.32	34.73	36.69	30	45	0.80	0.72%	7.5	0.1	792.23	791.88	804.89	803.85	790.23	789.88	11.86	11.18	12.65	11.97
7	6	0.29	0.86	0.25	10.72	18.60	19.50	3.31	35.46	36.69	30	98	0.80	0.75%	7.5	0.2	791.88	791.09	803.85	804.32	789.88	789.09	11.18	12.43	11.97	13.23
6	5	0.00	0.00	0.00	12.23	21.61	19.70	3.29	40.23	42.18	36	172	0.40	0.36%	6.0	0.5	791.09	790.41	804.32	803.77	789.09	788.01	12.29	12.43	13.23	13.97
5	4	0.00	0.00	0.00	14.10	24.49	20.20	3.24	45.72	46.21	36	30	0.48	0.47%	6.5	0.1	790.41	790.26	803.77	803.94	788.01	787.86	12.43	12.74	13.37	13.67
4	3	0.00	0.00	0.00	15.26	25.99	20.30	3.23	49.36	49.91	36	215	0.56	0.55%	7.1	0.5	790.26	789.06	803.94	802.42	787.86	786.66	12.74	12.43	13.67	13.36
3	2	0.95	0.95	0.90	16.78	28.47	20.80	3.19	53.49	53.77	36	291	0.65	0.64%	7.6	0.6	789.06	787.17	802.42	795.18	786.66	784.77	12.43	7.08	13.36	8.01
2	1	0.95	0.56	0.54	17.30	29.43	21.40	3.14	54.54	54.59	36	205	0.67	0.66%	7.7	0.4	787.17	785.78	795.18	790.90	784.77	783.38	7.08	4.18	8.01	5.12
1	POND	1.39	0.65	0.91	18.21	30.82	21.80	3.11	56.59	56.99	36	52	0.73	0.72%	8.1	0.1	785.78	785.40	790.90	786.69	783.38	783.00	4.18	0.35	5.12	1.29
19	18	0.63	0.37	0.23	0.23	0.63	15.00	3.80	0.88	2.11	12	198	0.35	0.06%	2.7	1.2	791.23	790.54	799.00	797.01	790.43	789.74	7.41	6.10	7.77	6.47
18	17	0.13	0.36	0.05	0.28	0.76	16.20	3.65	1.03	2.11	12	286	0.35	0.08%	2.7	1.8	790.54	789.54	797.01	796.97	789.74	788.74	6.10	7.07	6.47	7.44
17	3	0.76	0.42	0.32	0.60	1.52	18.00	3.45	2.07	2.11	12	136	0.35	0.34%	2.7	0.8	789.54	789.06	796.97	802.42	788.74	788.26	7.07	12.99	7.44	13.36
23	5	2.63	0.63	1.66	1.66	2.63	15.00	3.80	6.30	9.14	15	26	2.00	0.95%	7.4	0.1	793.52	793.00	803.60	803.77	792.52	792.00	9.64	10.34	10.08	10.77
21	4	1.50	0.78	1.16	1.16	1.50	15.00	3.80	4.42	9.14	15	44	2.00	0.47%	7.4	0.1	797.23	797.02	804.03	803.94	796.22	796.02	6.37	6.48	6.80	6.92
22	5	0.25	0.83	0.21	0.21	0.25	15.00	3.80	0.79	5.04	12	70	2.00	0.05%	6.4	0.2	797.21	795.80	802.55	803.77	796.41	795.00	4.98	7.61	5.34	7.97
25	24	2.48	0.41	1.01	1.01	2.48	15.00	3.80	3.85	5.04	12	49	2.00	1.17%	6.4	0.1	793.98	793.01	804.34	803.60	793.18	792.21	9.99	10.22	10.35	10.59
24	6	0.53	0.93	0.50	1.51	3.01	15.10	3.79	5.71	9.14	15	96	2.00	0.78%	7.4	0.2	793.01	791.09	803.60	804.32	792.01	790.09	10.15	12.79	10.59	13.23
26	8	1.18	0.61	0.72	0.72	1.18	15.00	3.80	2.73	5.04	12	36	2.00	0.59%	6.4	0.1	792.96	792.23	805.04	804.89	792.16	791.43	11.71	12.29	12.07	12.65
27	9	1.25	0.30	0.38	0.38	1.25	15.00	3.80	1.43	4.36	12	386	1.50	0.16%	5.6	1.2	799.01	793.21	802.08	803.30	798.21	792.41	2.71	9.72	3.07	10.09
28	28	2.19	0.81	1.77	1.77	2.19	15.00	3.80	6.74	10.50	18	73	1.00	0.41%	5.9	0.2	795.30	794.58	804.36	804.74	794.10	793.38	8.54	9.66	9.05	10.17
28	10	0.00	0.00	0.00	1.77	2.19	15.20	3.77	6.74	10.50	18	44	1.00	0.41%	5.9	0.1	794.58	794.14	804.74	803.75	793.38	792.94	9.66	9.10	10.17	9.61
30	10	1.29	0.37	0.48	0.48	1.29	15.00	3.80	1.81	5.04	12	55	2.00	0.26%	6.4	0.1	795.25	794.14	808.00	803.75	794.45	793.34	12.39	9.24	12.75	9.61
31	11	0.41	0.60	0.25	0.25	0.41	15.00	3.80	0.94	5.04	12	24	2.00	0.07%	6.4	0.1	797.96	797.48	803.60	806.33	797.16	796.68	5.27	8.49	5.64	8.85
33	32	0.94	0.83	0.78	0.78	0.94	15.00	3.80	2.97	5.04	12	17	2.00	0.69%	6.4	0.0	796.52	796.19	803.50	804.53	795.72	795.39	6.61	7.98	6.98	8.35
32	11	0.00	0.00	0.00	4.38	6.63	15.00	3.80	16.62	22.62	24	124	1.00	0.54%	7.2	0.3	796.19	794.94	804.53	806.33	794.59	793.34	7.70	10.74	8.35	11.39
FUTURE-1	EX-2	3.41	0.73	2.48	2.48	3.41	15.00	3.80	9.40	3.56	12	20	1.00	6.97%	4.5	0.1	809.85	808.24	807.38	807.00	803.19	802.98	3.02	2.85	-2.27	-1.24
EX-2	EX-1	0.00	0.00	0.00	2.48	3.41	15.10	3.79	9.40	3.70	12	67	1.08	6.97%	4.7	0.2	808.24	803.57	807.00	806.86	802.98	802.26	2.85	3.43	-1.24	3.29
EX-1	32	2.28	0.49	1.12	3.60	5.69	15.30	3.76	13.52	11.36	18	186	1.17	1.86%	6.4	0.5	803.57	800.49	806.86	804.53	801.46	799.29	3.69	3.54	3.29	4.04
34	12	0.76	0.36	0.27	0.27	0.76	15.00	3.80	1.03	5.04	12	179	2.00	0.08%	6.4	0.5	799.90	796.32	804.41	807.92	799.10	795.52	4.15	11.24	4.51	11.60
35	13	2.31	0.62	1.42	1.42	2.31	15.00	3.80	5.40	9.14	15	20	2.00	0.70%	7.4	0.0	798.77	798.37	807.99	807.84	797.77	797.37	8.78	9.03	9.22	9.47
36	14	0.03	0.30	0.01	0.01	0.03	15.00	3.80	0.04	2.52	12	246	0.50	0.00%	3.2	1.3	802.70	801.46	806.25	806.25	801.90	800.66	3.16	4.42	3.55	4.79



TMP ARCHITECTURE INC

1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS • MICHIGAN • 48302
PH • 248.338-4541 FX • 248.338-0223
EM • INFO@TMP-ARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT



t: 844.813.2949
www.peagroup.com

PROJECT TITLE

**Troy High School
Athletic Fields
Bid Package No. 02A**

**Troy School District
Troy, Michigan**

DRAWING TITLE

**DRAINAGE PLAN -
NORTH**

ISSUE DATES

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12-06-2023 ADDENDUM NO. 2

11-09-2023 CONSTRUCTION DOCUMENTS

DATE ISSUED FOR:

DRAWN JW

CHECKED TD

APPROVED TD

PROJECT NO.

22104E

DRAWING NO.

C-8.0



0 25 50 100
SCALE: 1" = 50'



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1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS • MICHIGAN • 48302
PH • 248.338.4561 FX • 248.338.0223
EM • INFO@TMP-ARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT



PROJECT TITLE
**Troy High School
Athletic Fields
Bid Package No. 02A**

**Troy School District
Troy, Michigan**

DRAWING TITLE
**DRAINAGE PLAN -
SOUTH**

ISSUE DATES

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12-06-2023 ADDENDUM NO. 2
11-09-2023 CONSTRUCTION DOCUMENTS

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DRAWING NO.

C-8.1





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1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS, MICHIGAN 48302
PH: 248.338.4561 FX: 248.338.0223
EM: INFO@TMPARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT



PROJECT TITLE
**Troy High School
Athletic Fields
Bid Package No. 02A**

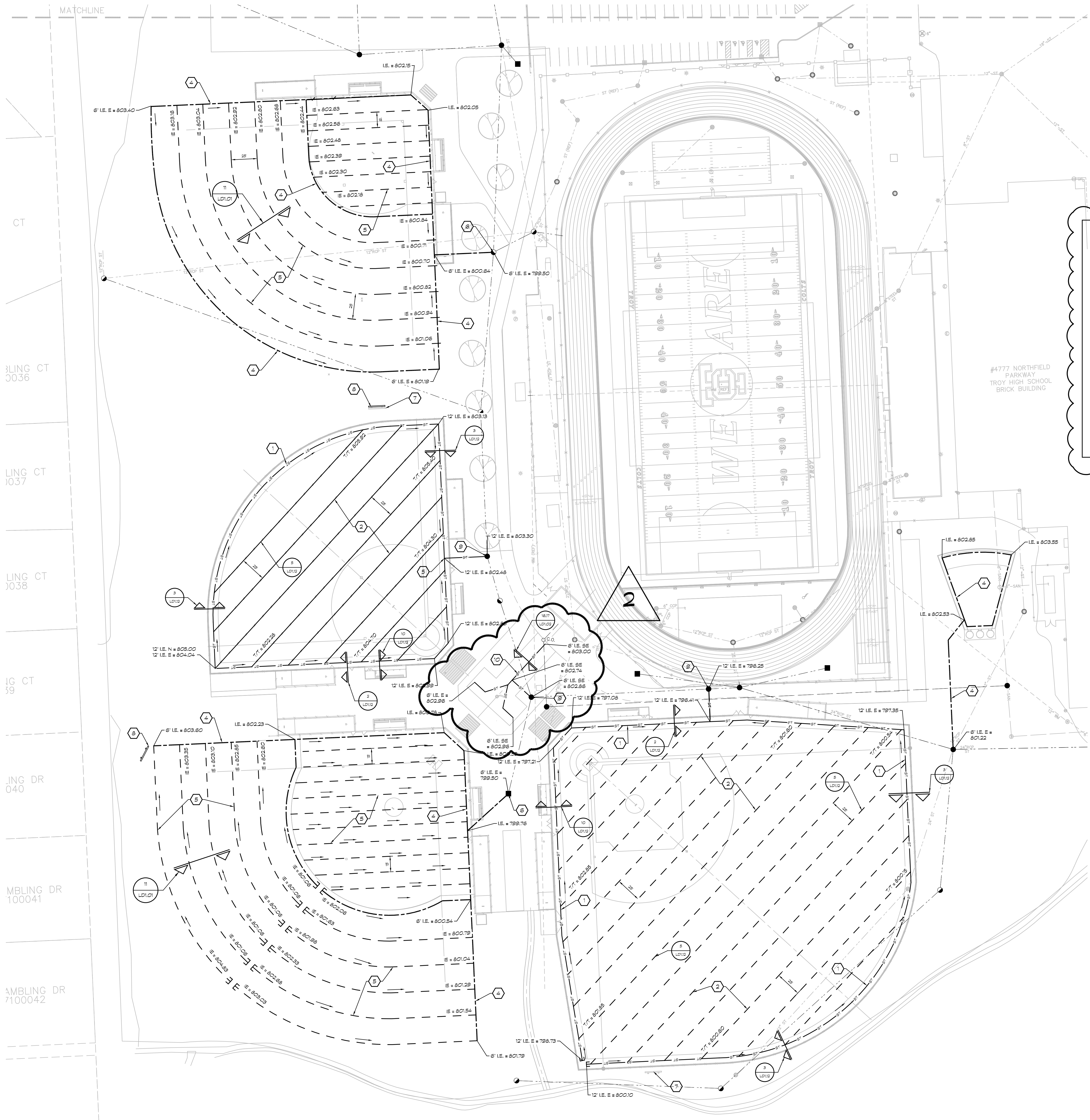
Troy School District
Troy, Michigan

DRAWING TITLE
**Athletics Drainage Plan
Area B**

ISSUE DATES	
12-06-2023	ADDENDUM NO. 2
11-08-23	CONSTRUCTION DOCUMENTS

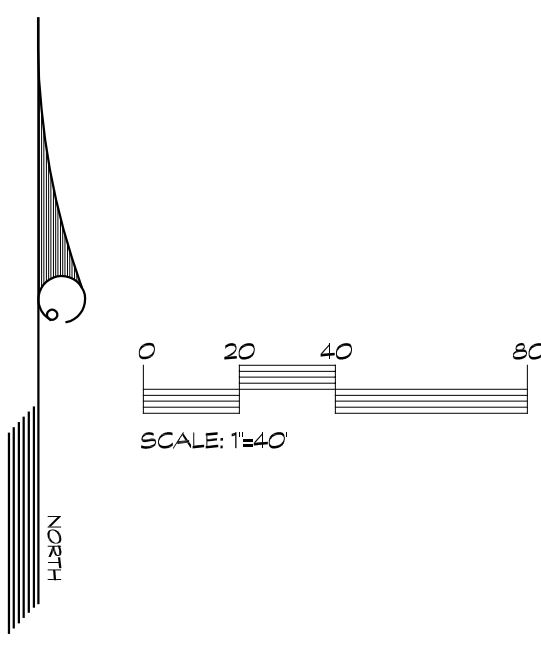
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DRAWN	JCI/BS/RS
CHECKED	MDS
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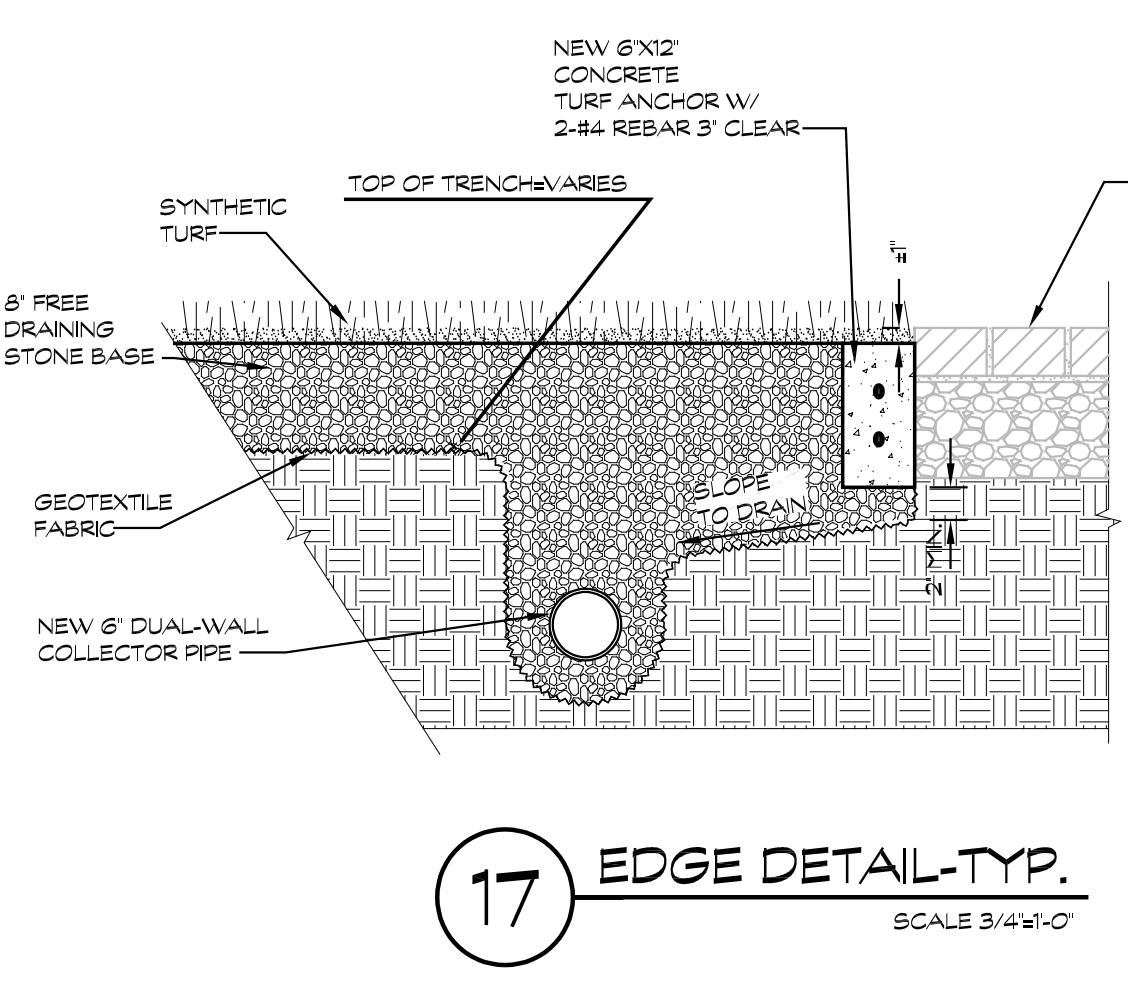
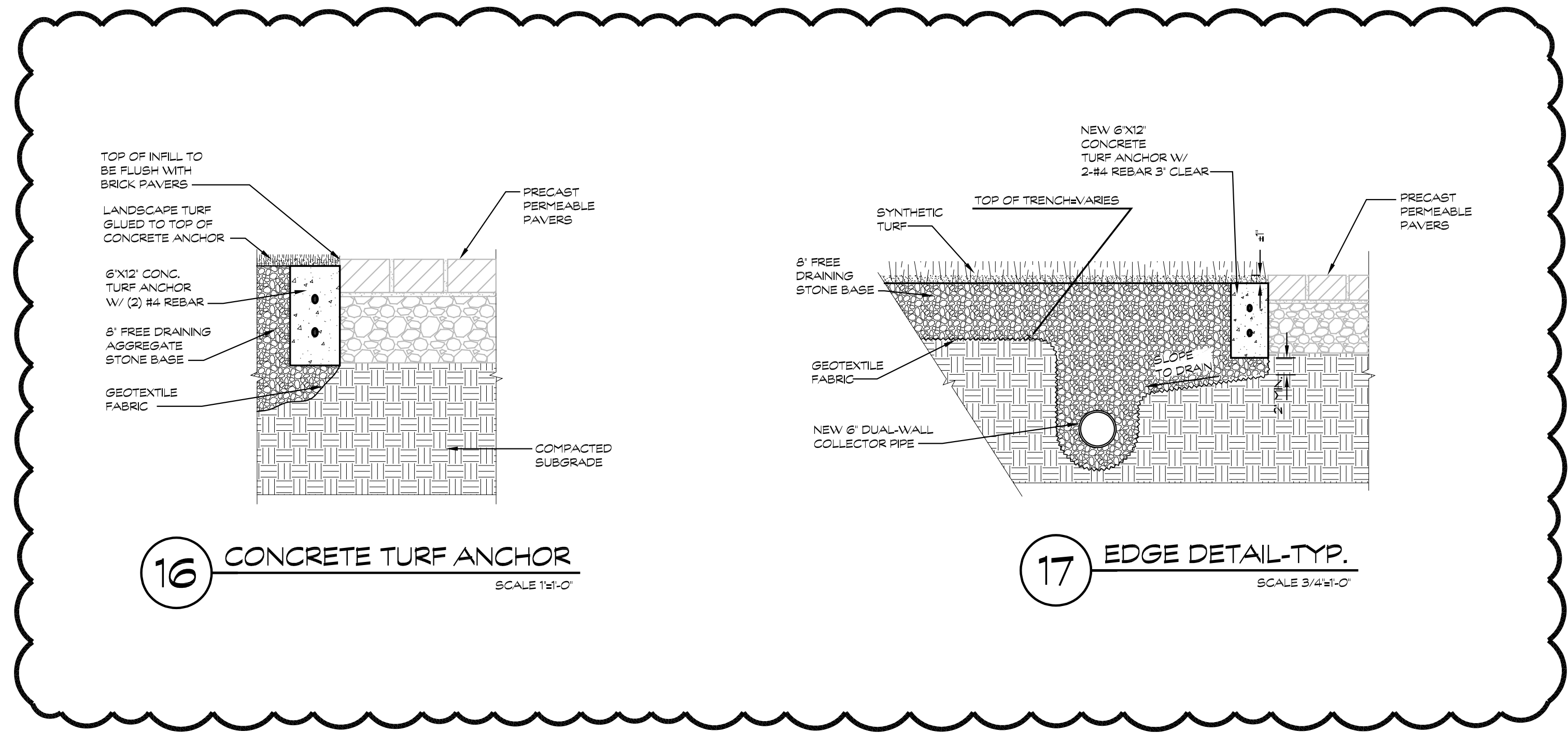
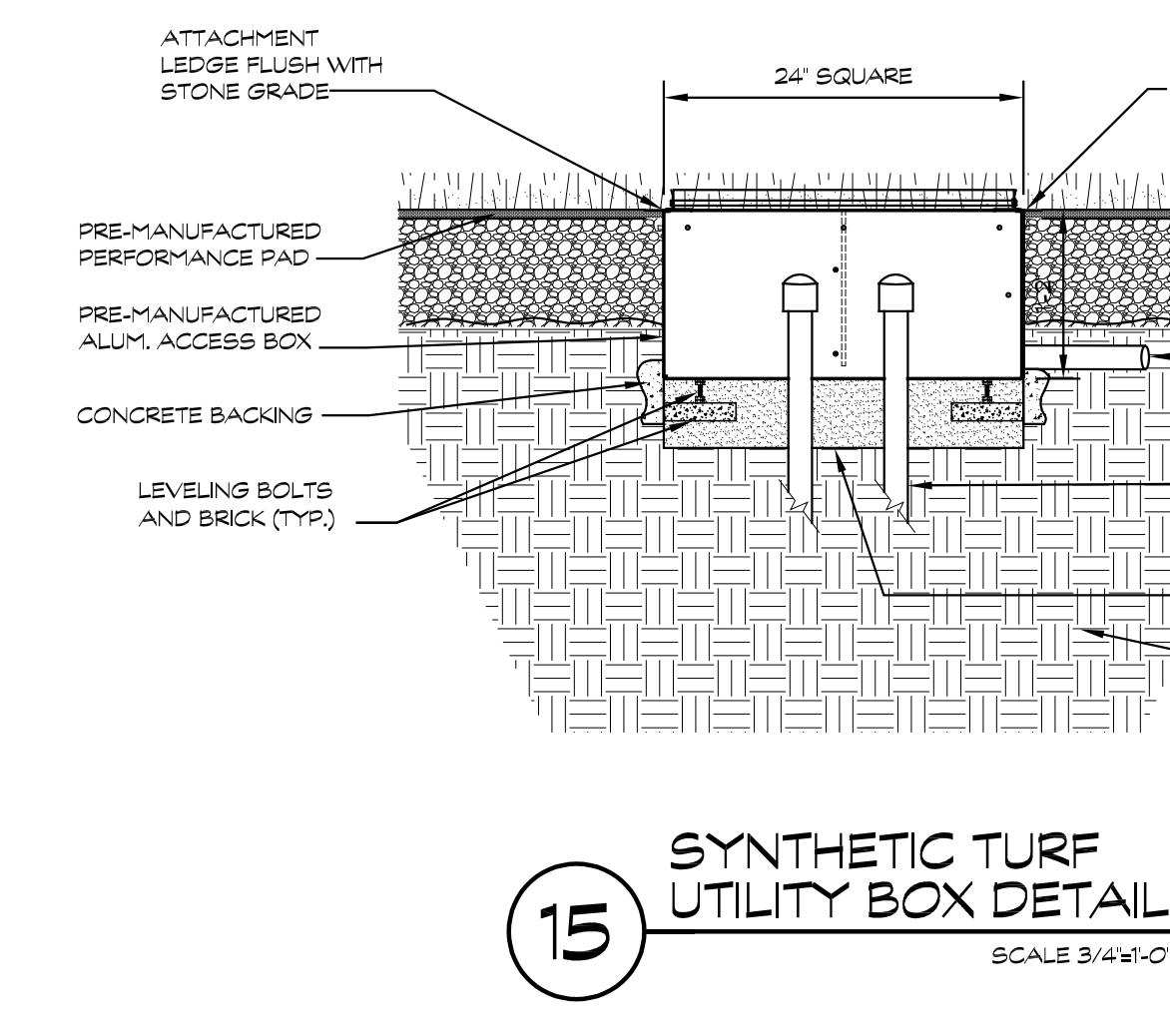
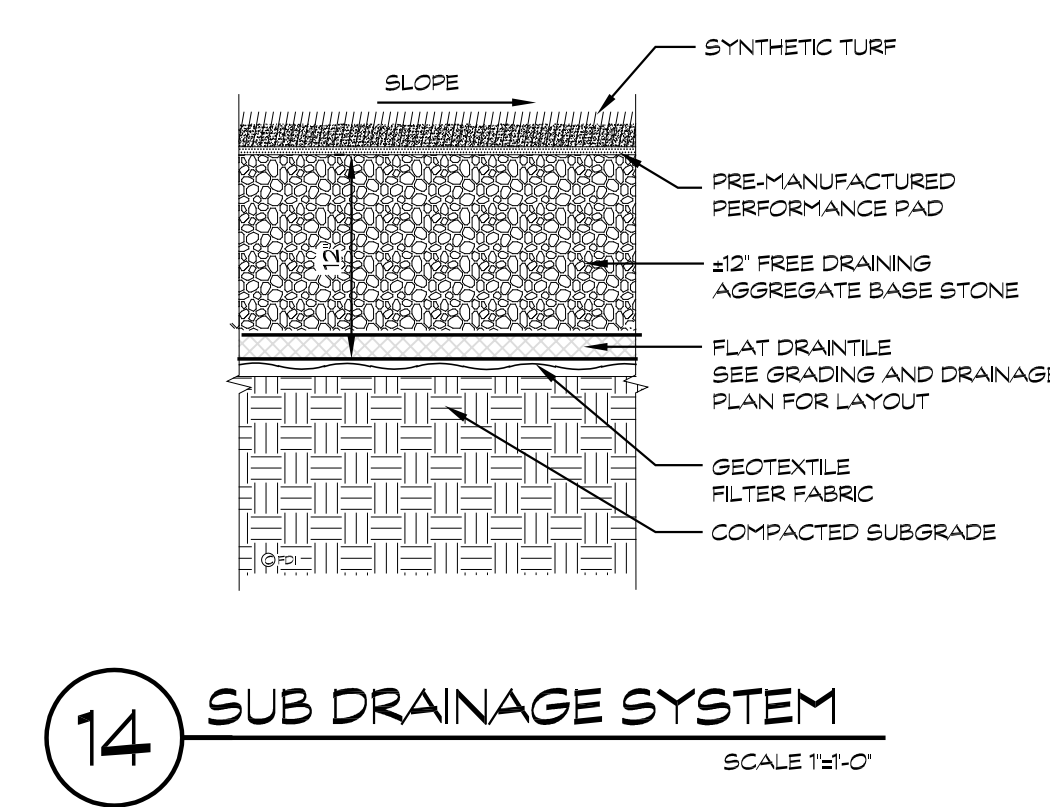
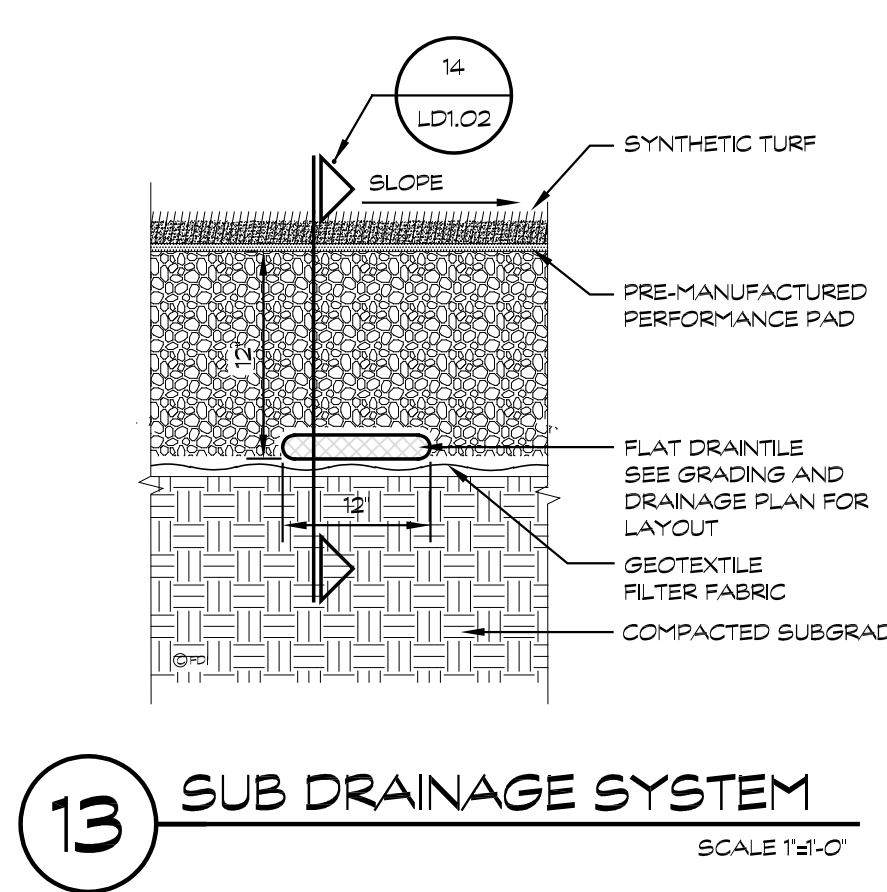
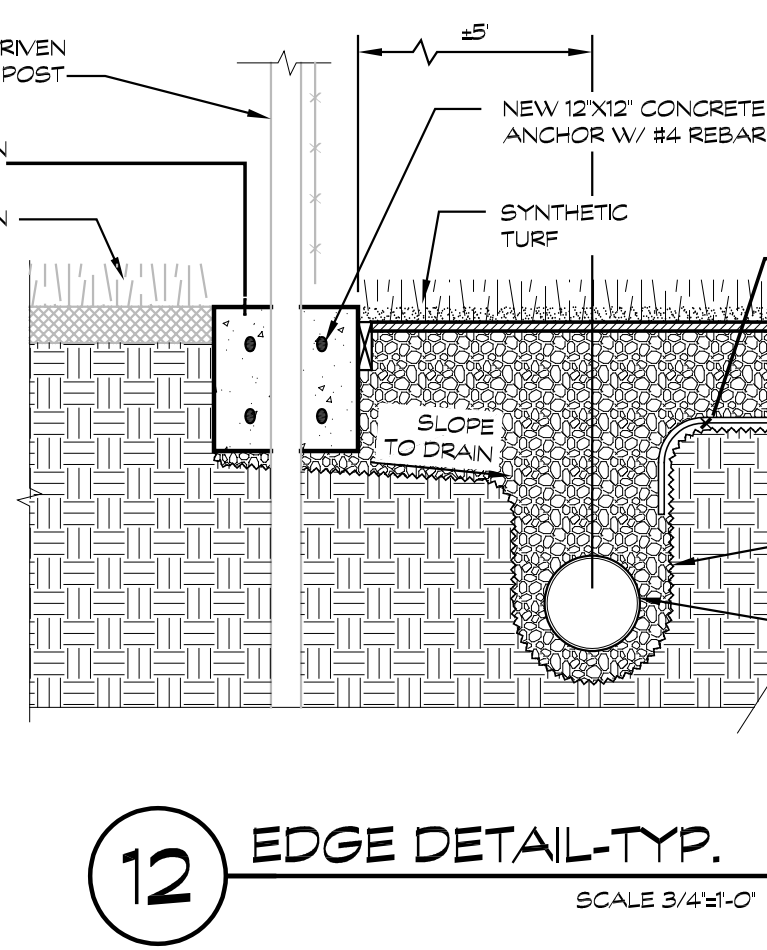
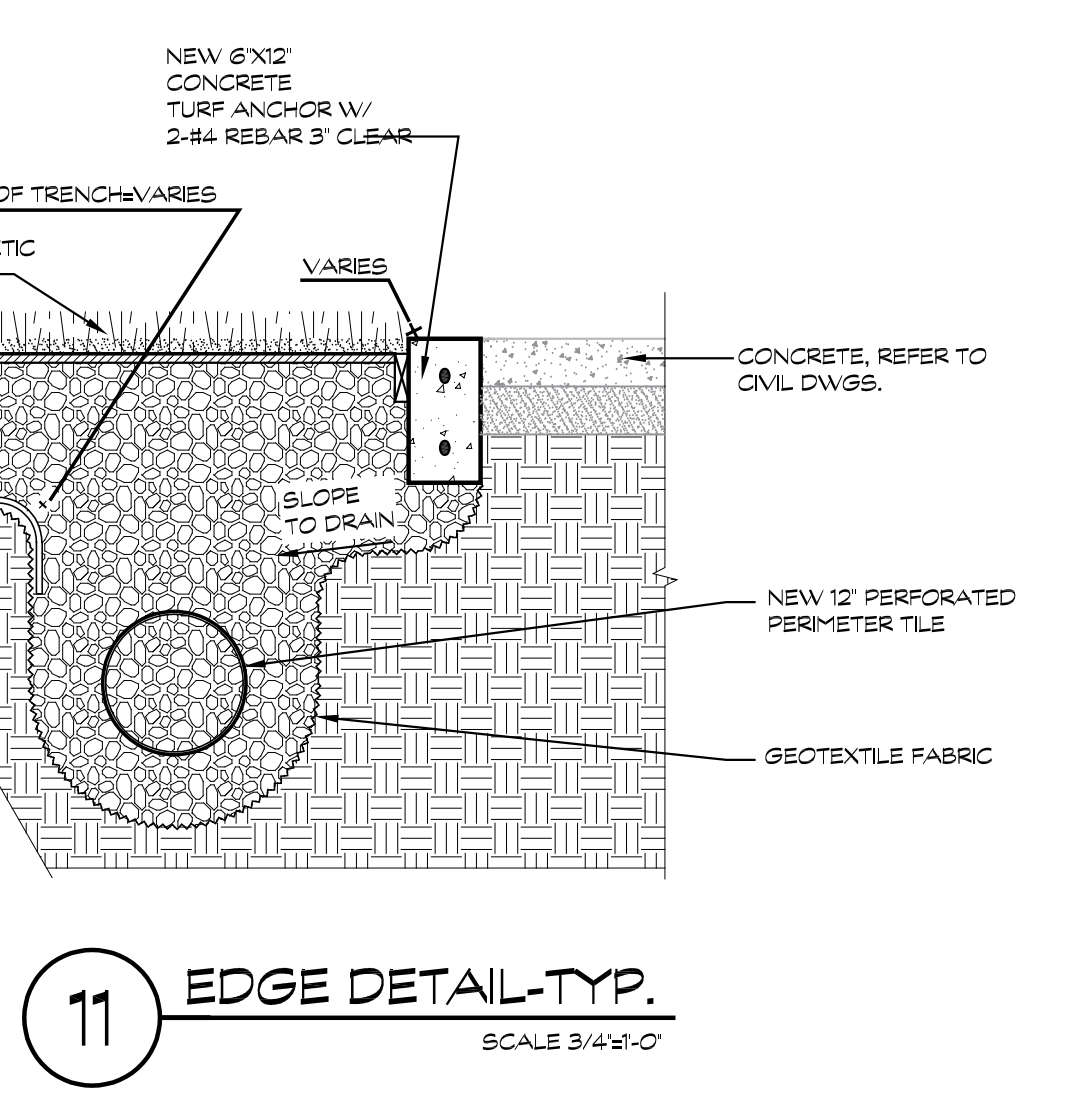
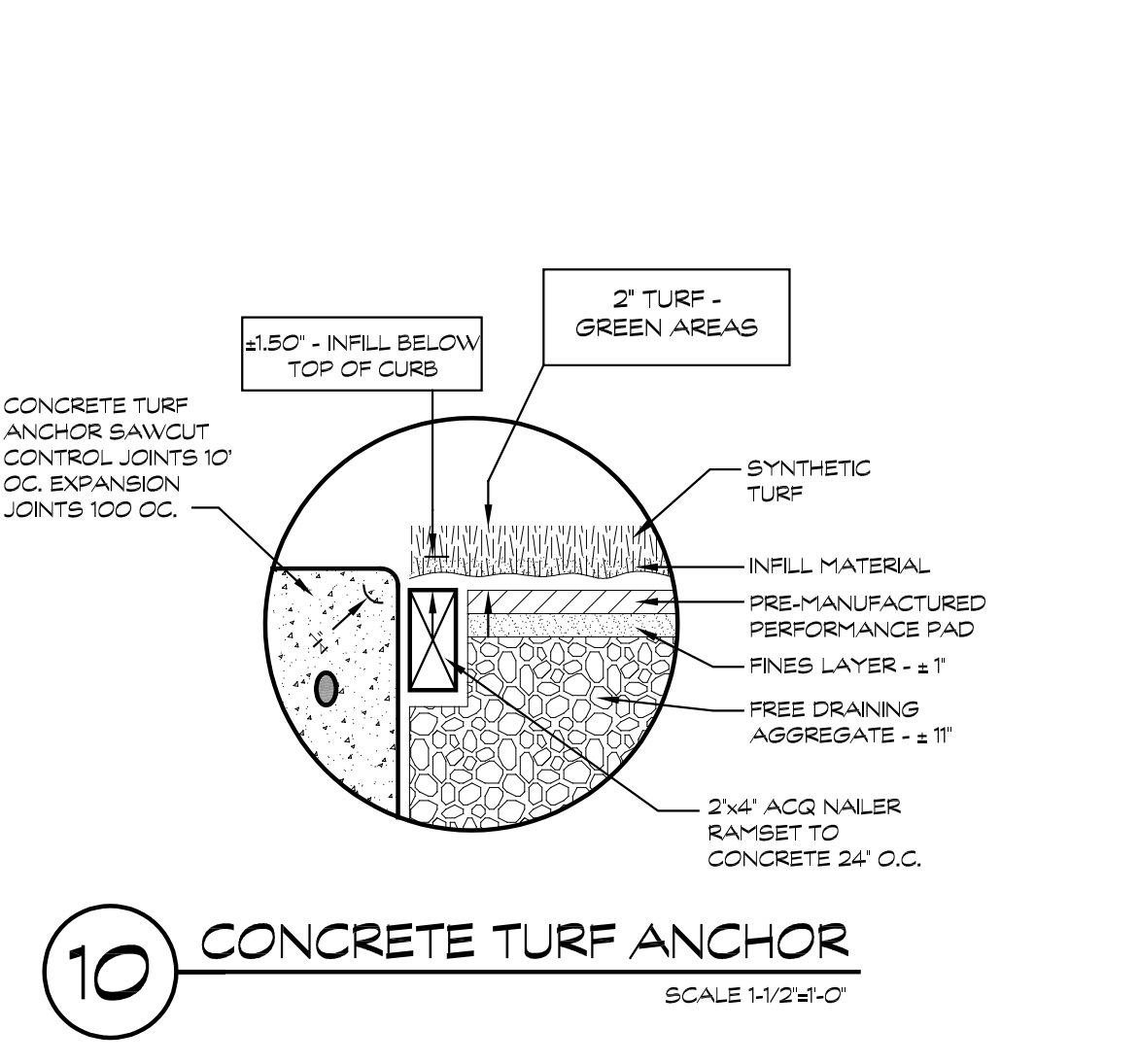
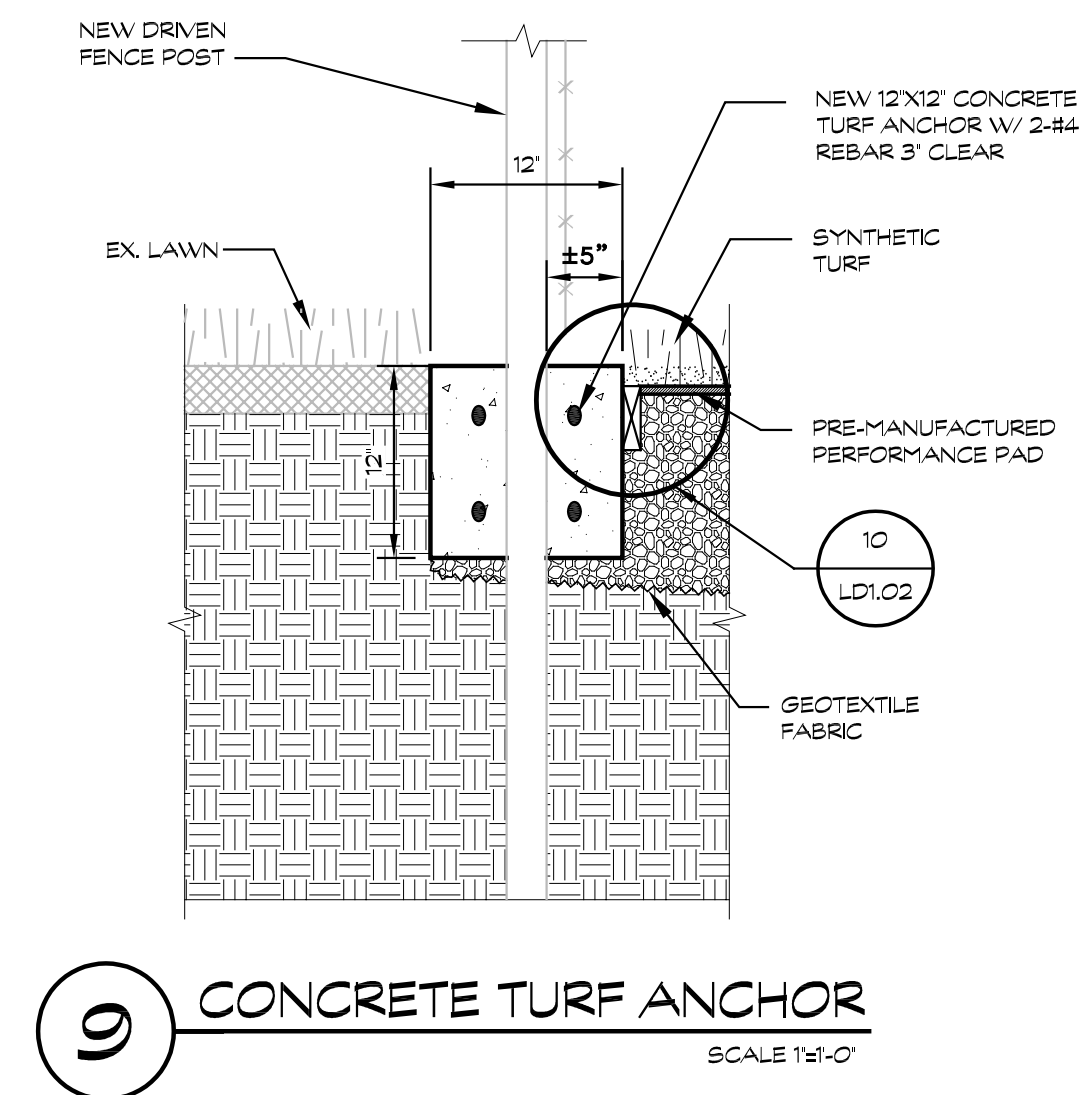
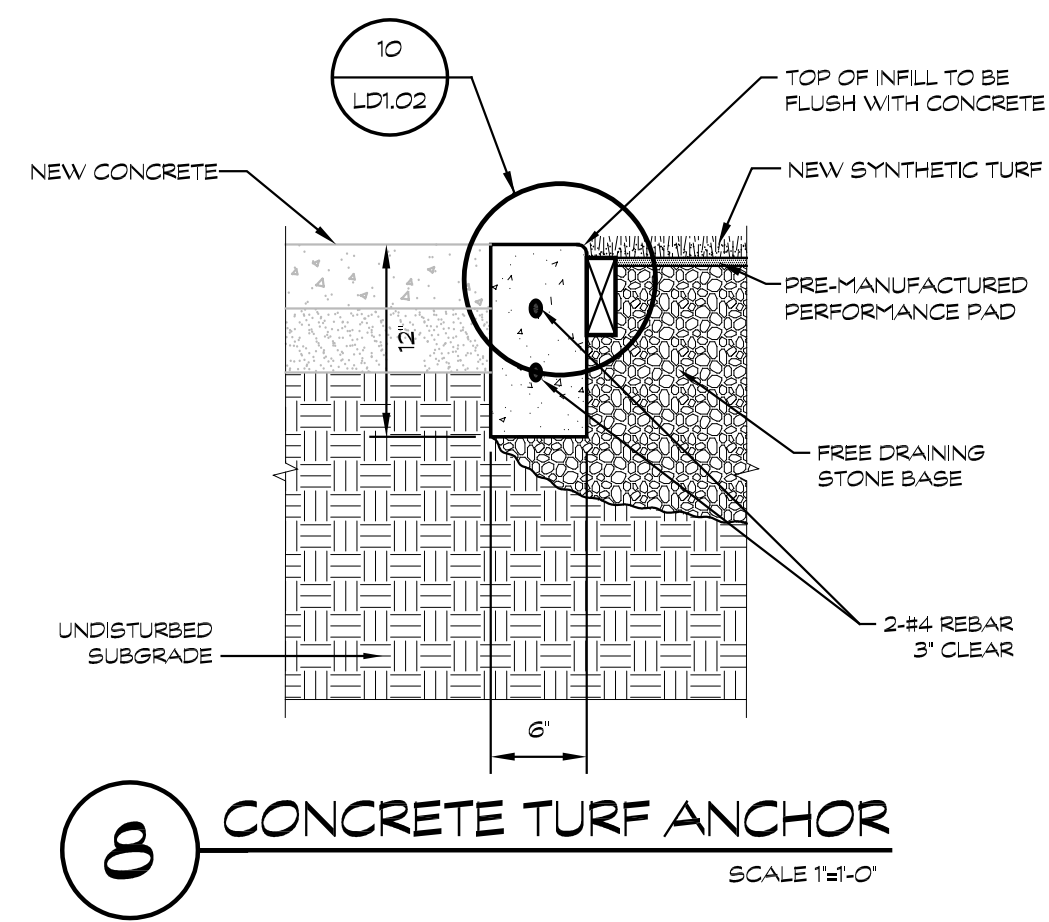
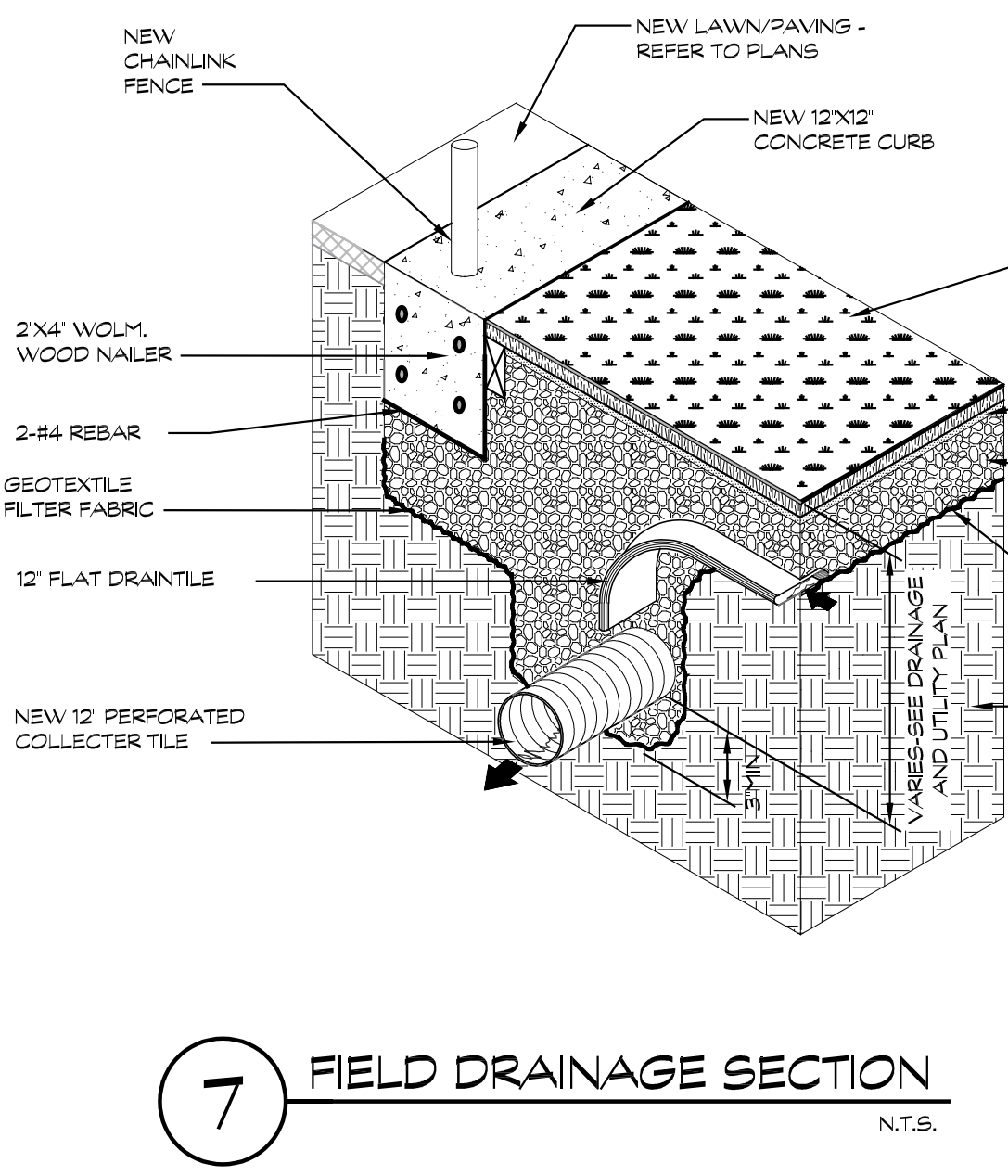
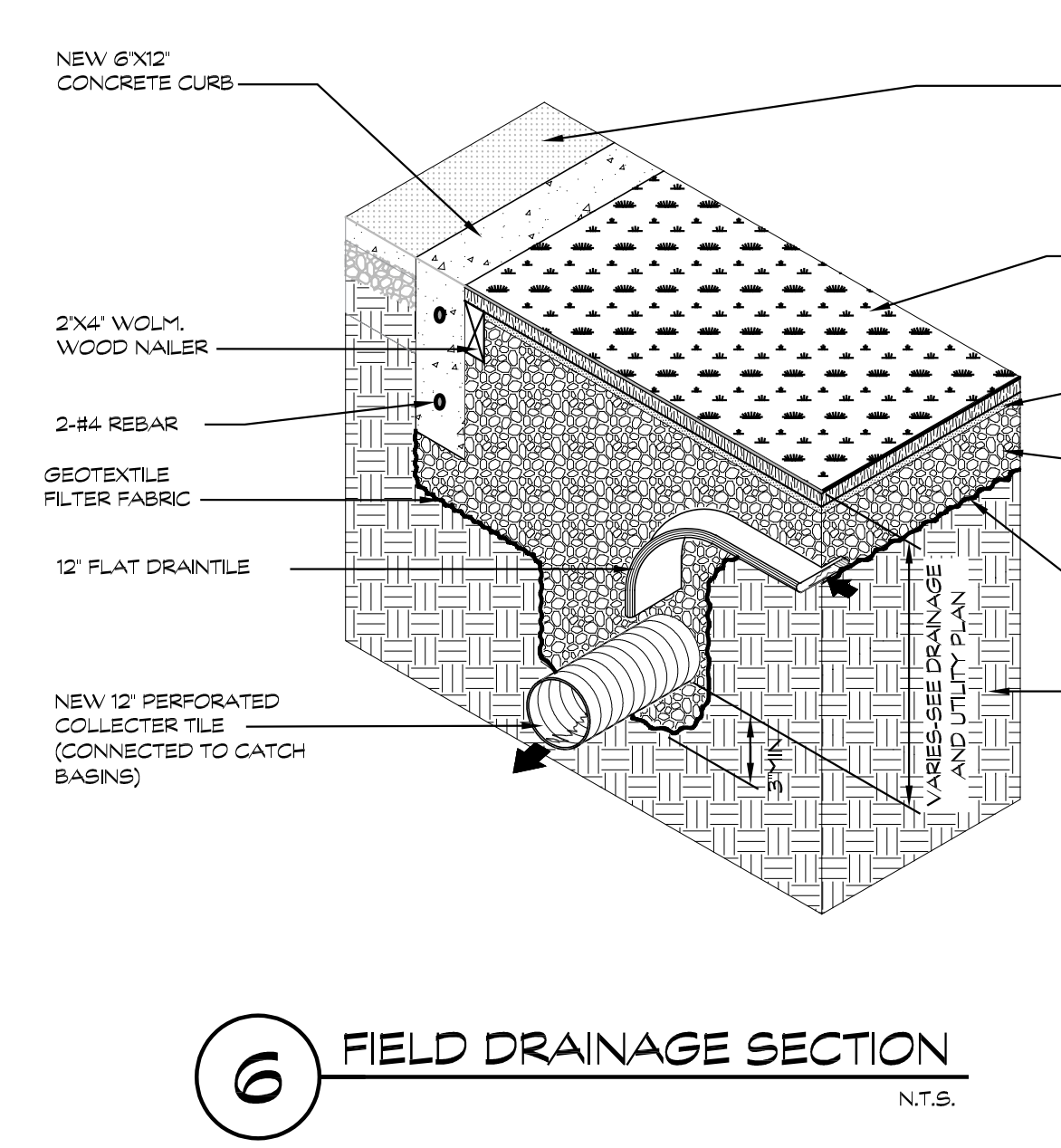
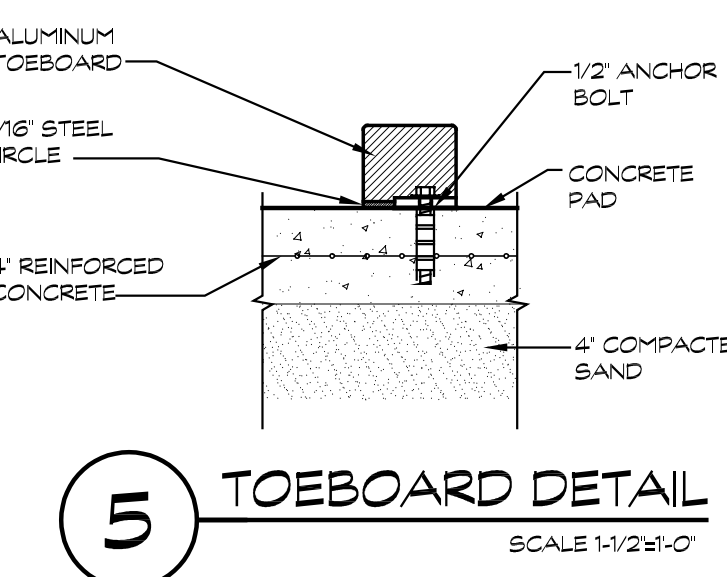
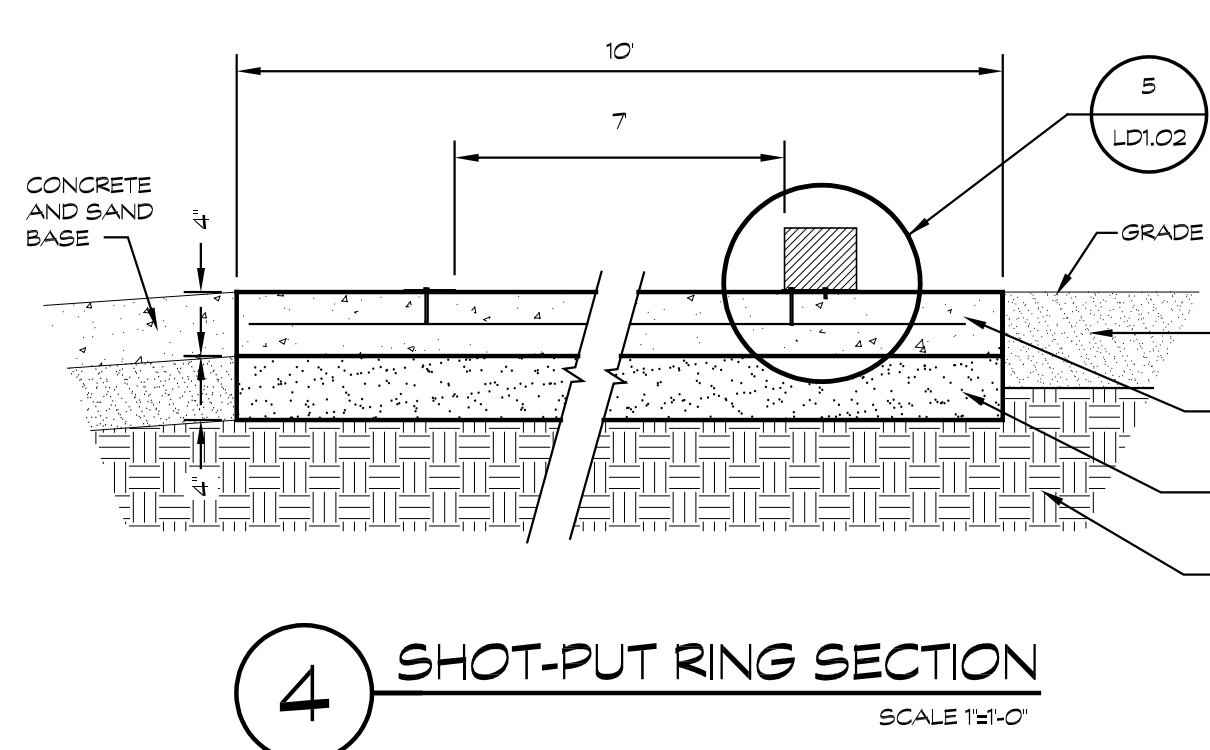
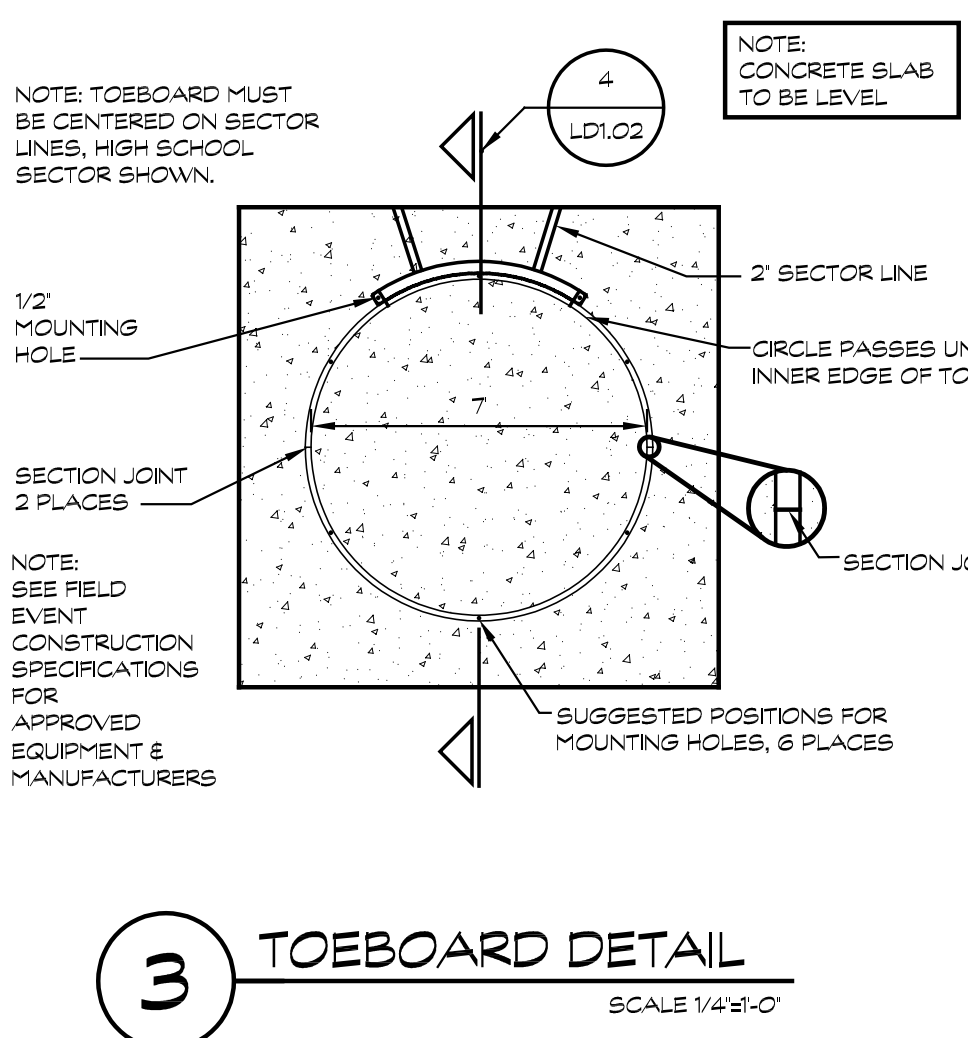
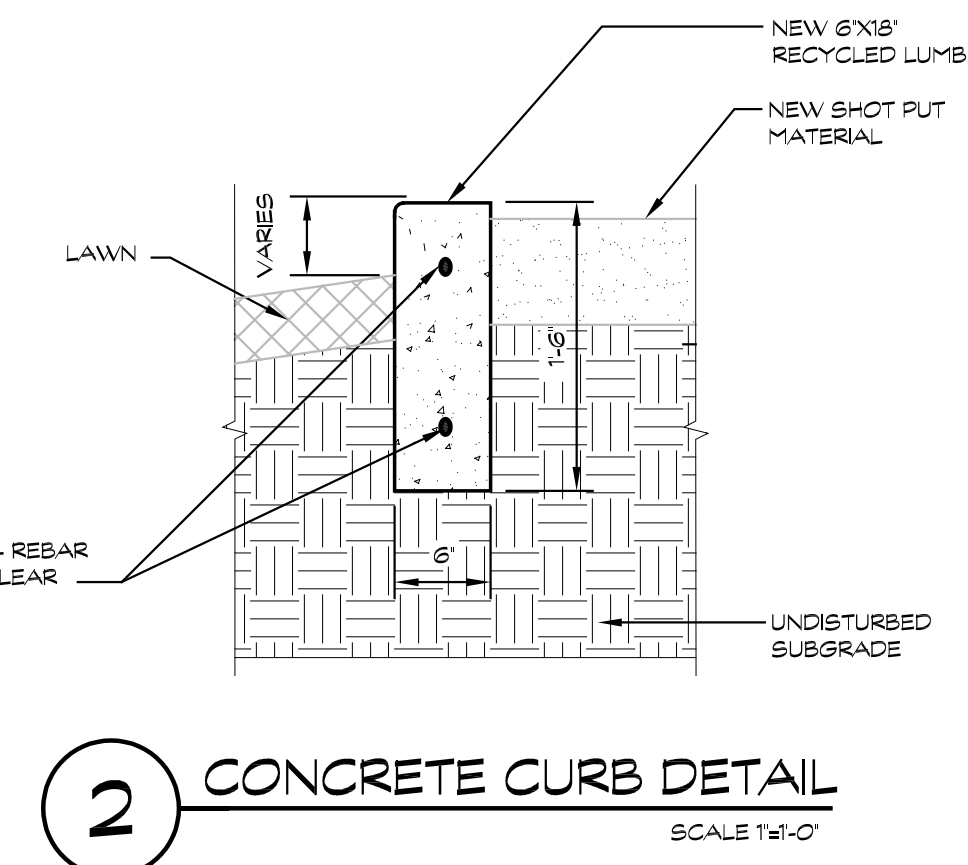
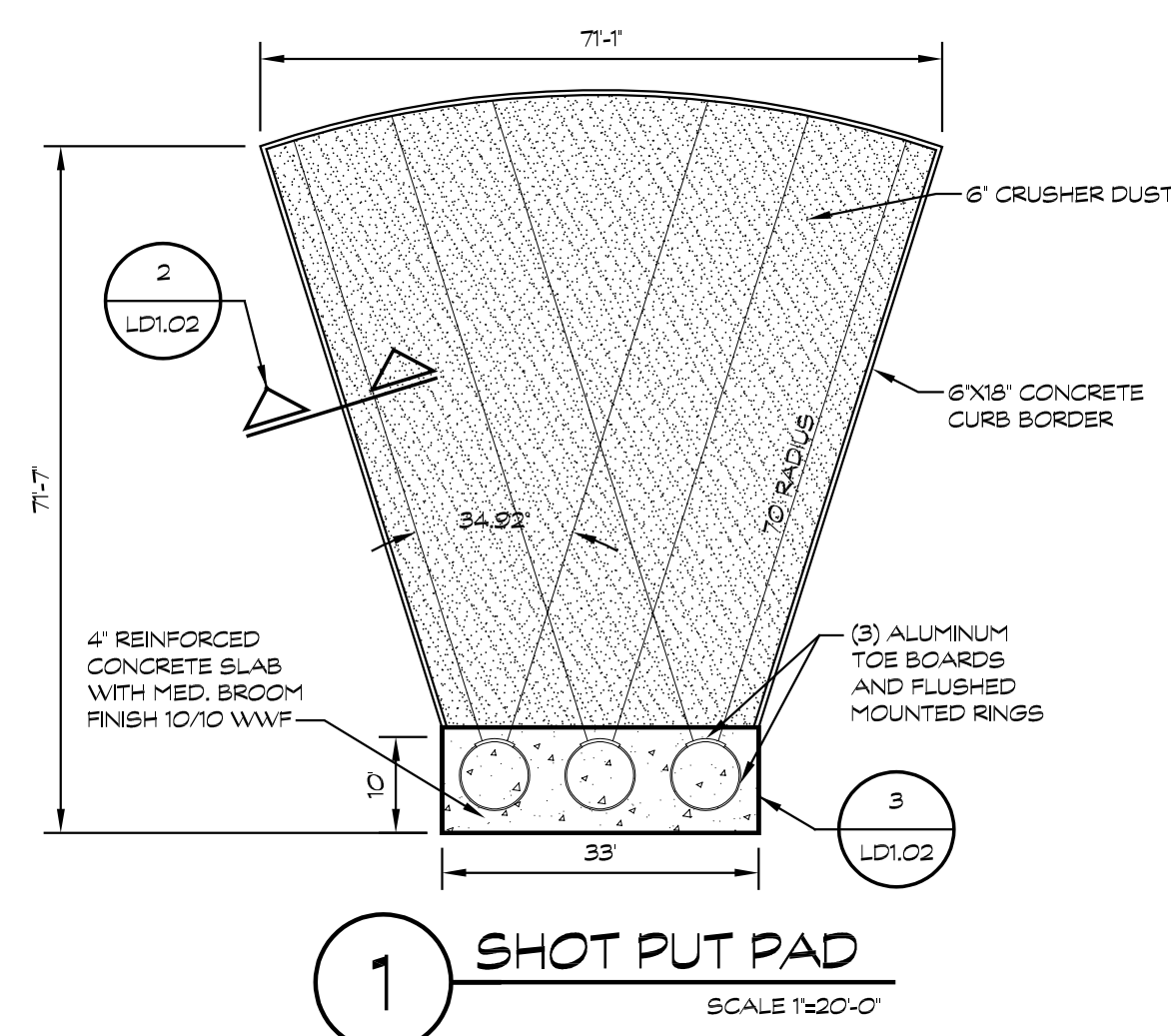
PROJECT NO.
22104E
DRAWING NO.
L2.05



UTILITY LEGEND:

- NEW 12" HDPE DUAL-WALL STORM AT 0.5% SLOPE
- NEW 12" CORRUGATED FLAT DRAIN TILE
- NEW 24"X24" PRE-MANUFACTURED TURF BOX FOR NEW ELECTRICAL. BOXES ALONG CURB SHALL ADJUST CURB. COORDINATE LOCATION WITH ELECTRICAL DRAWINGS AND COORDINATE IN THE FIELD. SEE DETAIL #10, SHEET L2.01.
- NEW 6" PERFORATED DRAIN TILE (MIN. 18" COVER)
- NEW 4" PERFORATED DRAIN TILE (MIN. 18" COVER)
- FIELD CONNECT NEW PERFORATED DRAIN TILE TO DRAINAGE STRUCTURE
- NEW SCOREBOARD, STEEL, AND FOOTINGS. COORDINATE ALL UTILITY WORK WITH ELECTRICAL DRAWINGS
- RELOCATED SCOREBOARD WITH NEW STEEL AND FOOTINGS. COORDINATE ALL UTILITY WORK WITH ELECTRICAL DRAWINGS
- FIELD CONNECT NEW FIELD STORM TO NEW DRAINAGE STRUCTURE
- NEW 6" HDPE DUAL-WALL STORM AT 0.5% SLOPE





2



TMP ARCHITECTURE INC
1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS - MICHIGAN - 48302
PH - 248.336.4561 FX - 248.336.0223
EM - INFO@TMPARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT



PROJECT TITLE
**Troy High School
Athletic Fields
Bid Package No. 02A**

Troy School District
Troy, Michigan

DRAWING TITLE
**Field Event and Site
Details**

ISSUE DATES

12-06-2023	ADDENDUM NO. 2
11-08-23	CONSTRUCTION DOCUMENTS
DATE:	ISSUED FOR:
DRAWN	JCI/B/RD
CHECKED	MDS
APPROVED	BSL

PROJECT NO.

22104E

DRAWING NO.

LD1.02



TMP ARCHITECTURE INC
1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS - MICHIGAN - 48302
PH - 248.338.4561 FX - 248.338.0023
EM - INFO@TMPARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT



PROJECT TITLE
**Troy High School
Athletic Fields
Bid Package No. 02A**

Troy School District
Troy, Michigan

DRAWING TITLE
Bullpen Details

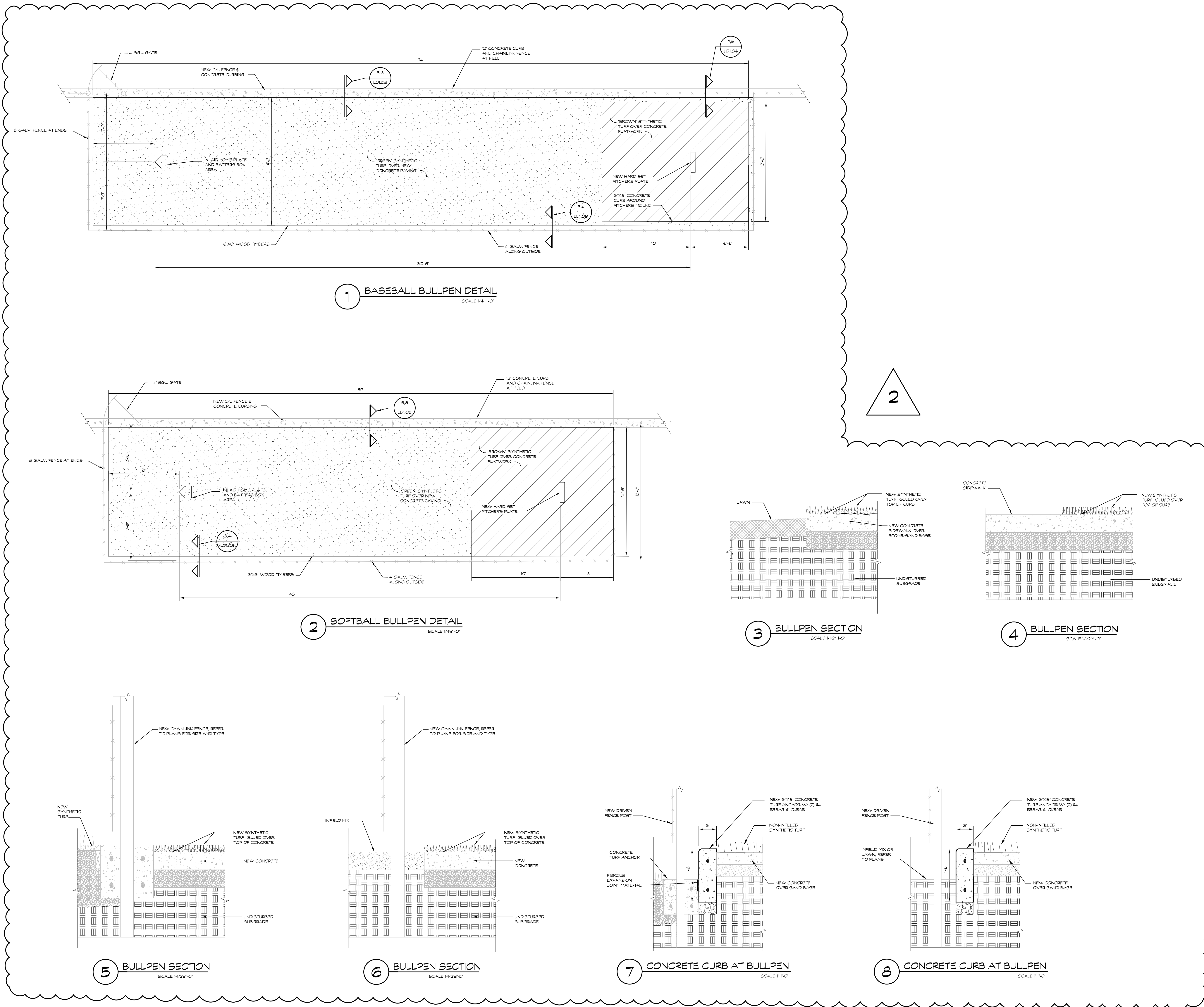
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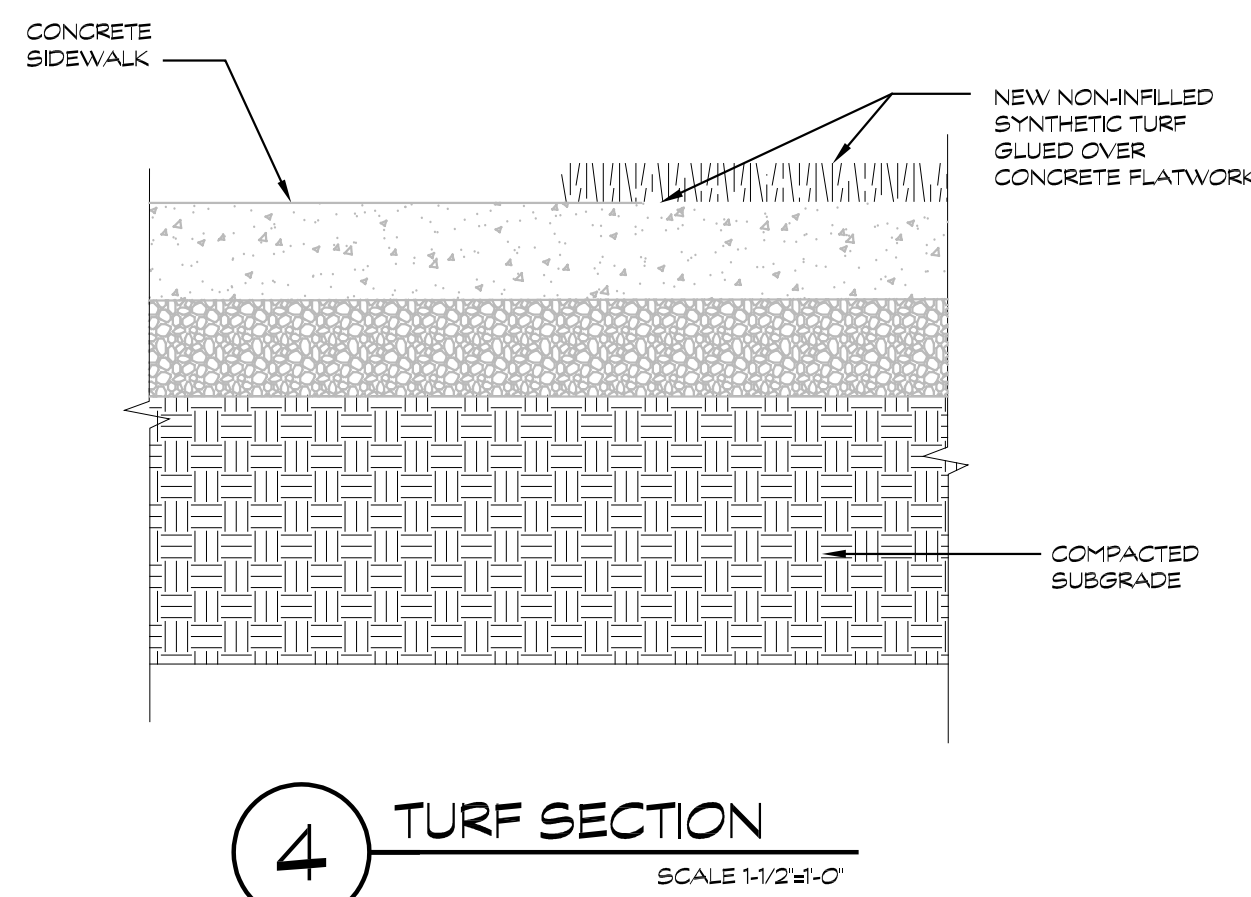
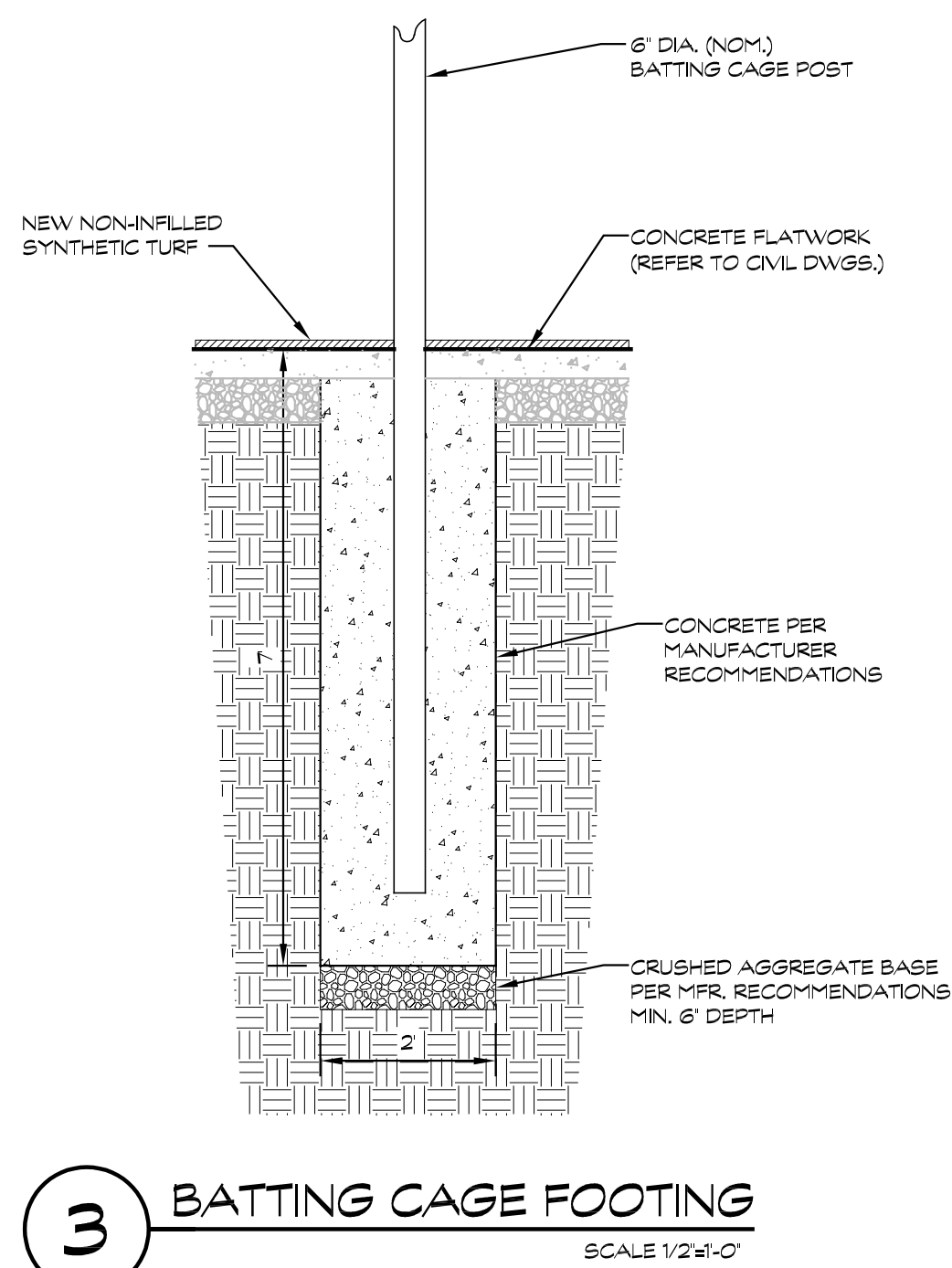
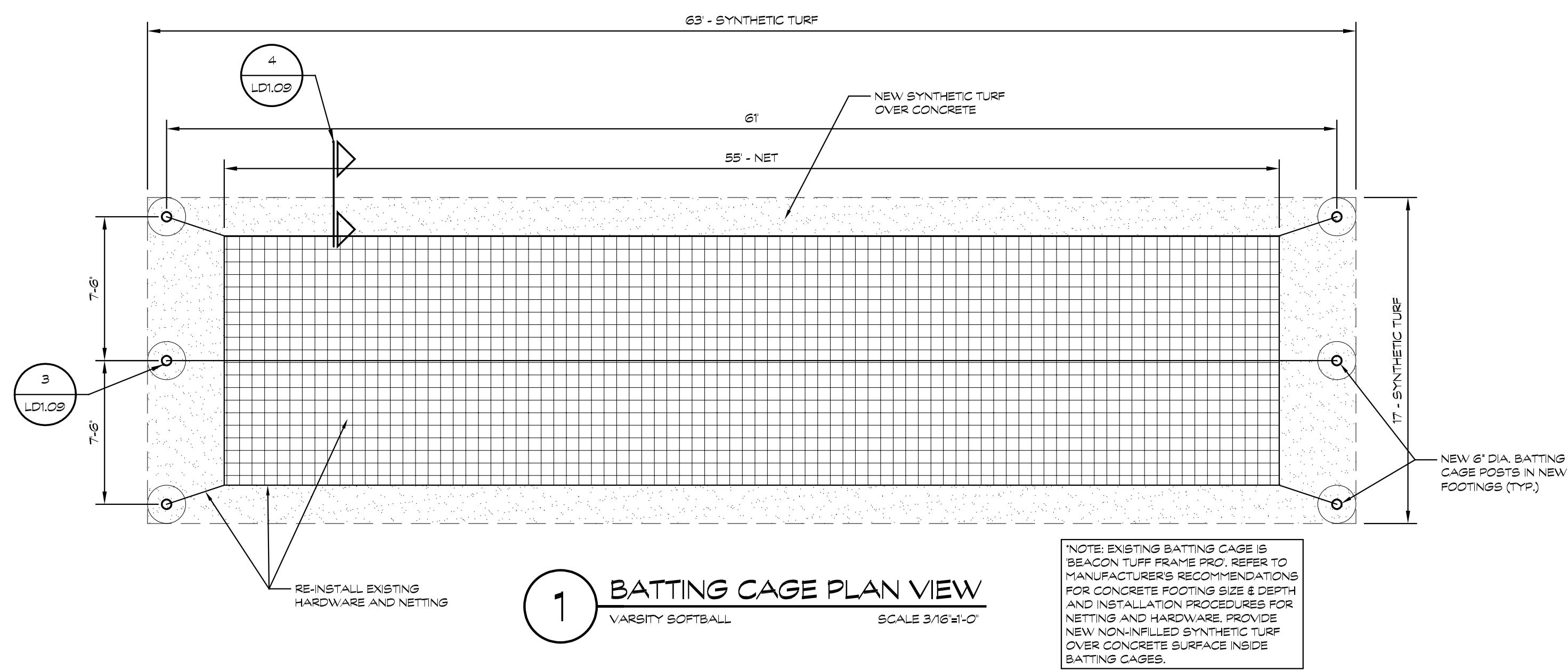
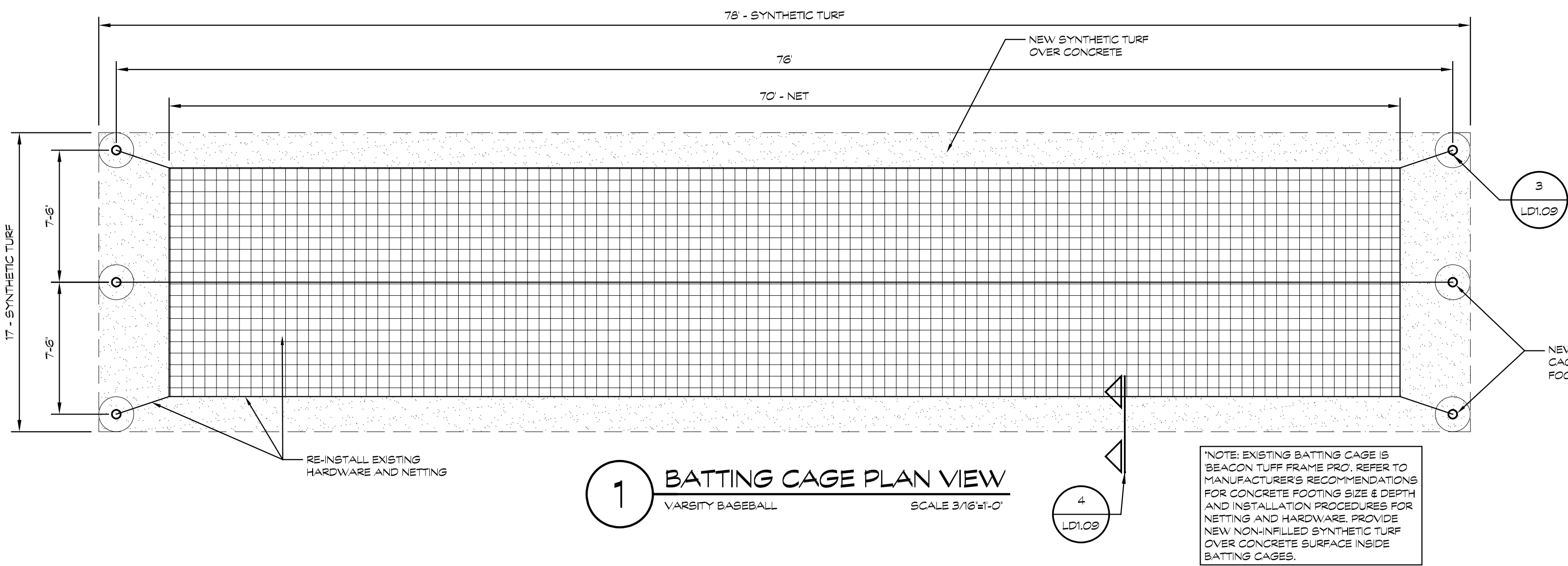
12-06-2023	ADDENDUM NO. 2
11-08-23	CONSTRUCTION DOCUMENTS

DATE:	ISSUED FOR:
DRAWN	JCI/B/RD
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APPROVED	BSL

PROJECT NO.
22104E

DRAWING NO.
LD1.08





2



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1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS • MICHIGAN • 48302
PH: 248.338.6561 FX: 248.338.0023
EM: INFO@TMPARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT



PROJECT TITLE
**Troy High School
Athletic Fields
Bid Package No. 02A**

Troy School District
Troy, Michigan

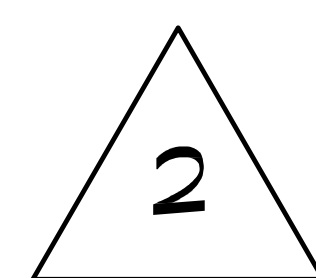
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**Batting Cage
Details**

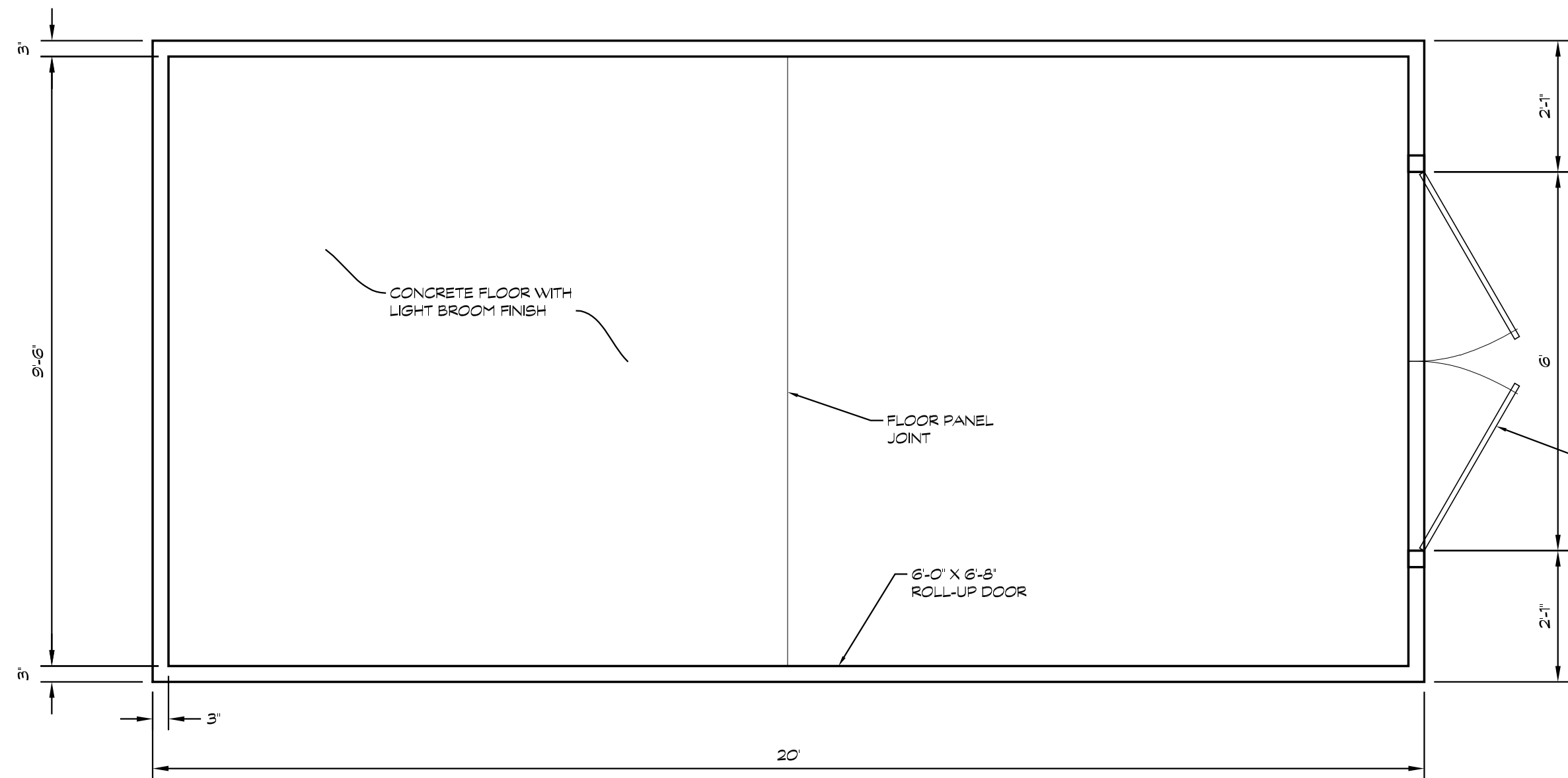
ISSUE DATES

12-06-2023	ADDENDUM NO. 2
11-09-23	CONSTRUCTION DOCUMENTS

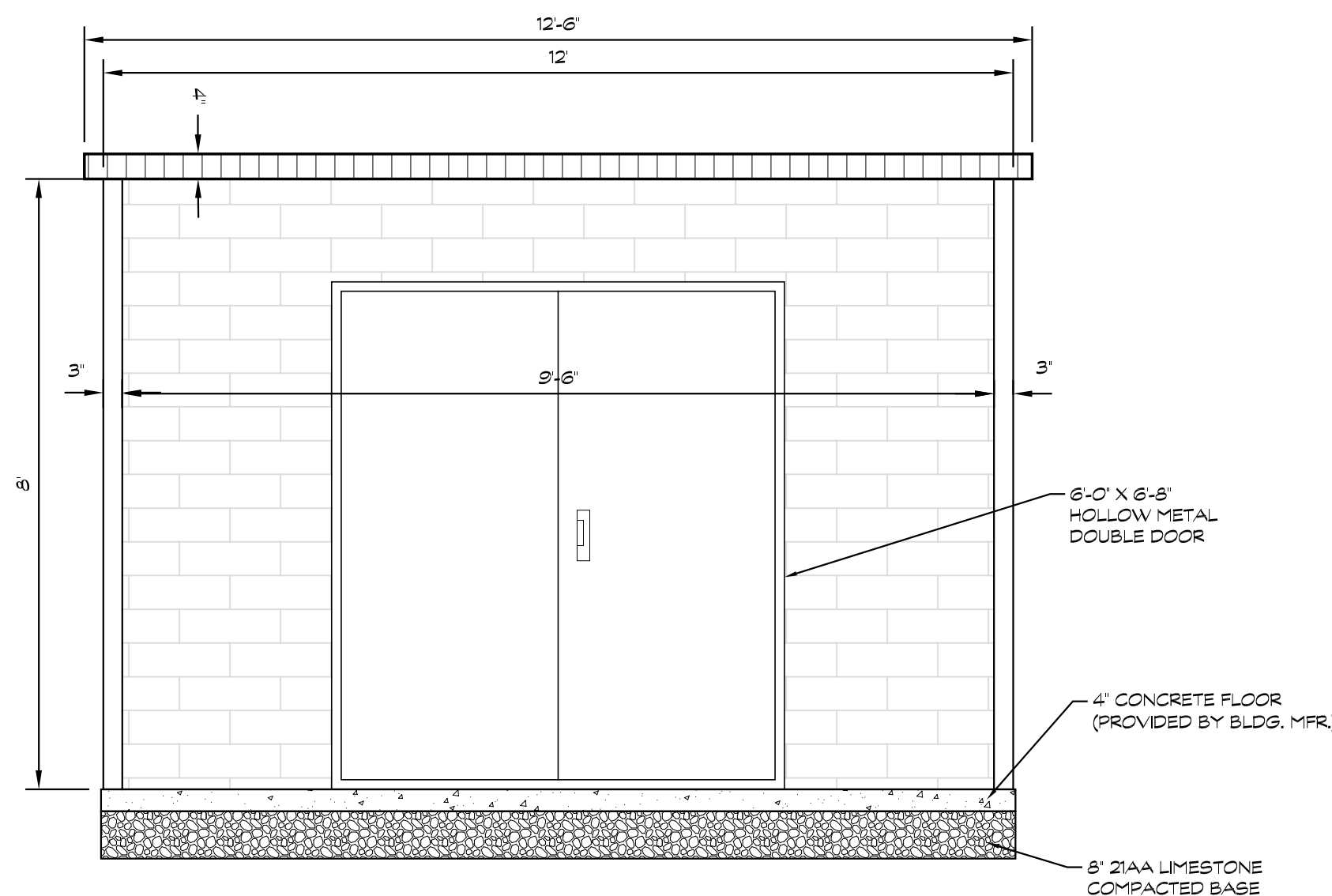
DATE:	ISSUED FOR:
DRAWN	JCL/BS/KD
CHECKED	MDS
APPROVED	BSL

PROJECT NO.
22104E
DRAWING NO.
LD1.09

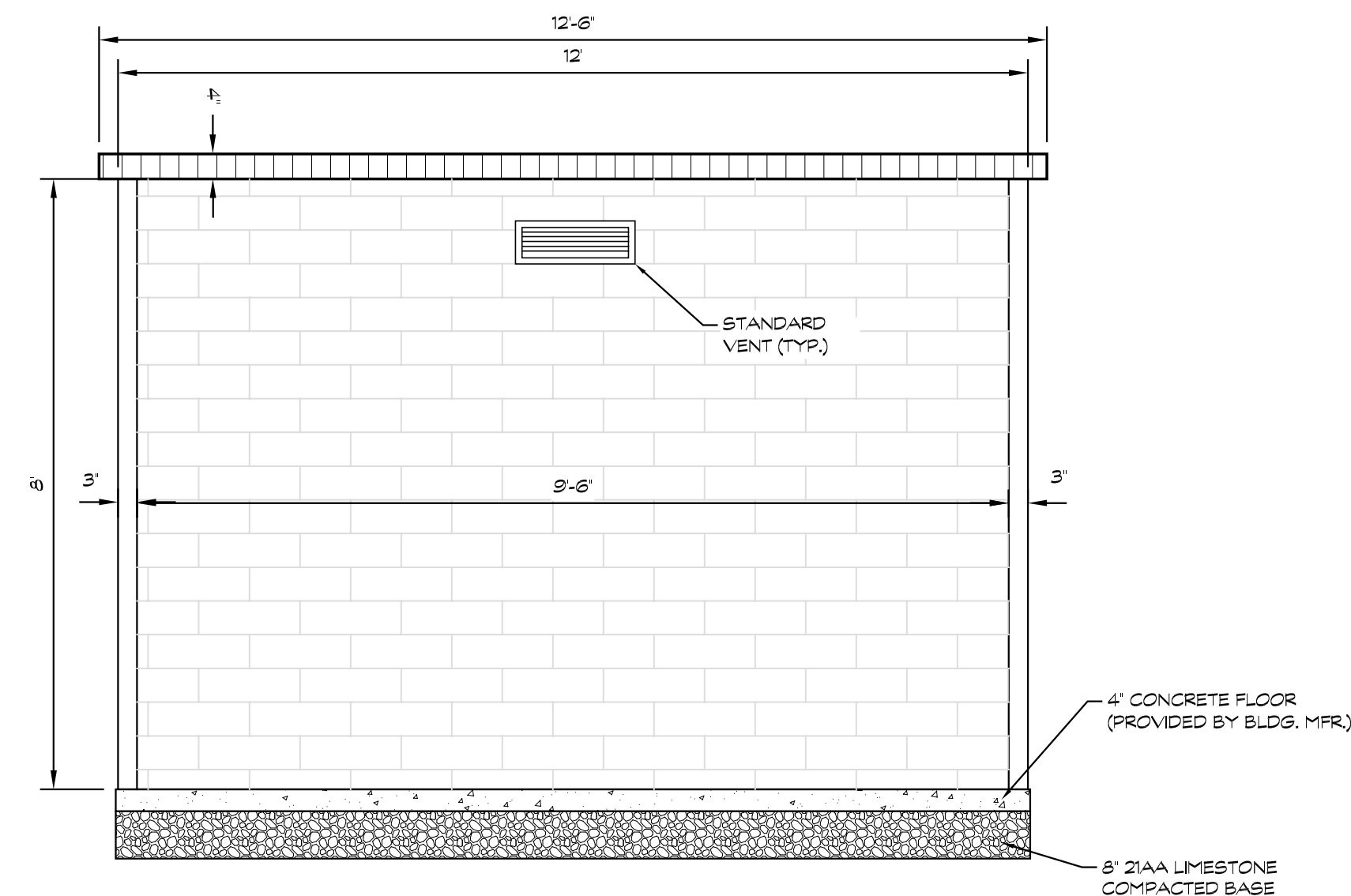




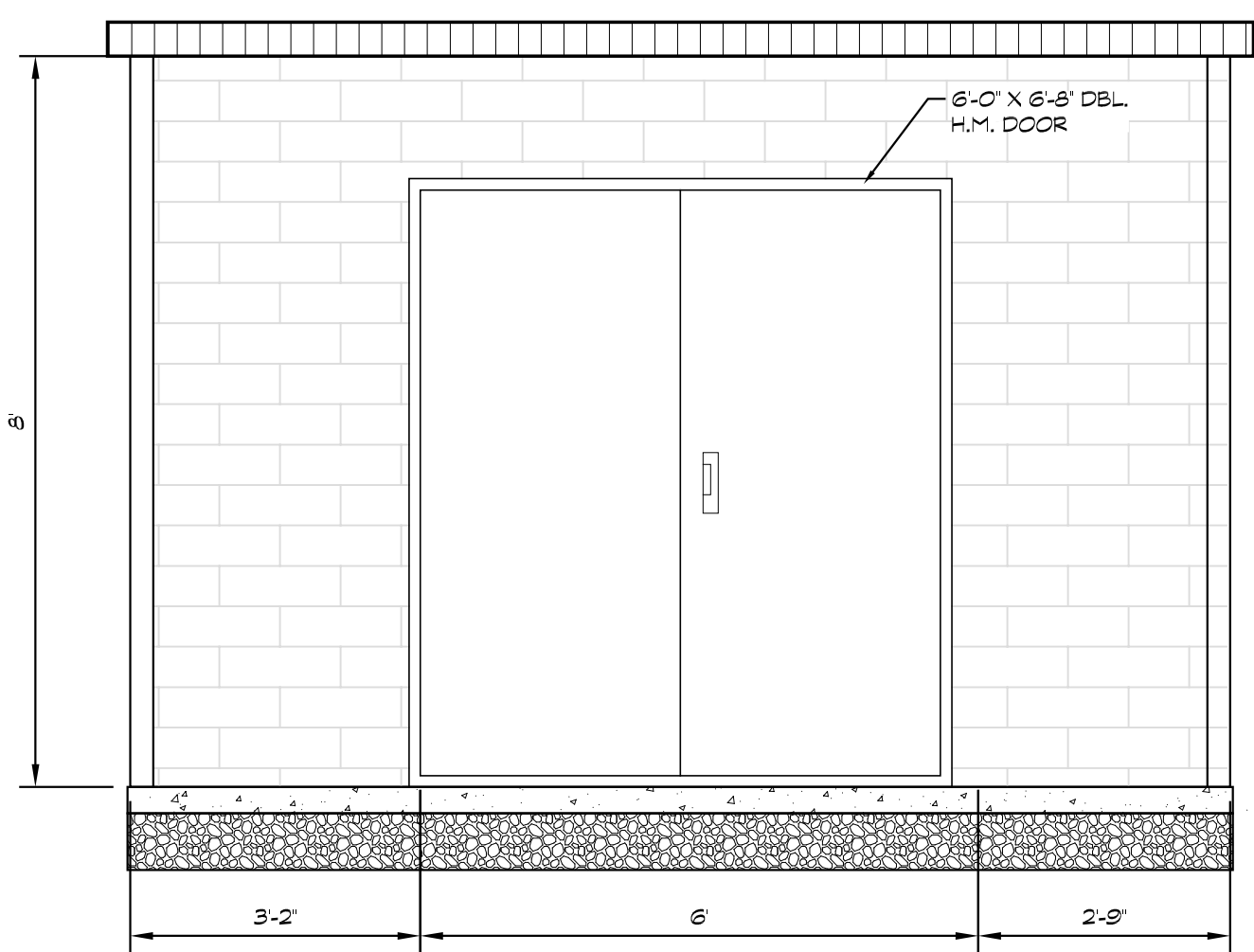
1 BUILDING FLOOR PLAN
SCALE 1/2"=1'-0"



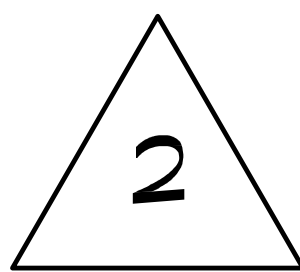
2 FRONT BUILDING SECTION
10'X20' BUILDING SCALE 1/2"=1'-0"



3 REAR BUILDING SECTION
10'X20' BUILDING SCALE 1/2"=1'-0"



4 BUILDING FRONT ELEVATION
10'X10' BUILDING SCALE 1/2"=1'-0"



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1191 WEST SQUARE LAKE ROAD
BLOOMFIELD HILLS - MICHIGAN - 48302
PH - 248.338.4561 TX - 248.338.0223
EM - INFO@TMPARCHITECTURE.COM

REGISTRATION SEAL

CONSULTANT



PROJECT TITLE

**Troy High School
Athletic Fields
Bid Package No. 02A**

Troy School District
Troy, Michigan

DRAWING TITLE
**Storage Building
Details**

ISSUE DATES

12-06-2023	ADDENDUM NO. 2
11-08-23	CONSTRUCTION DOCUMENTS

DATE: ISSUED FOR:

DRAWN	JCJ/B/RD
CHECKED	MDS
APPROVED	BSL

PROJECT NO.

22104E

DRAWING NO.

LD1.20