Jefferson County School District No. R-1
Support Services

TECHNICAL GUIDELINES

DIVISION 32 – EXTERIOR IMPROVEMENTS

AUGUST 2022

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DIVISION 32 – EXTERIOR IMPROVEMENTS

32 05 00 Common Work Results for Exterior Improvements – October 2010

- Creosote-containing materials are prohibited.
- Wood walking surfaces, steps are prohibited.

END SECTION 32 05 00

32 06 00 Schedules for Exterior Improvements – August 2015

- Flexible Pavement (Asphalt) Schedule

Minimum thickness in inches

LOCATION	BASE	ASPHALT	TOTAL	ALTERNATE DEEP STRENGTH SINGLE-LIFT ASPHALT
Bus and truck parking and drives	8	5	13	8
Automobile-only parking and drives	6	4	10	6
Play/Tennis Courts*, bicycles, trails	4	4	8	4

*Tennis Courts: asphalt only to patch and repair existing courts

END SECTION 32 06 00

32 10 00 Bases, Ballasts, and Paving – August 2015

- Work in this section is open to any product or material
- General
  1. Work in this section is for pavement on Jefferson County School District R-1 property.
  2. For pavement in rights-of-way, comply with standards, details and specifications of the appropriate governmental entity.
  3. Snowplow access is required to all paved vehicle, pedestrian, and recreational areas except play courts.
  4. Concrete paving is required at the following locations:
     a. Trash pick-up areas/dumpster pads
     b. Entrance walks
     c. Curbs, gutters, or edge strip for asphalt pavement
  5. Concrete paving is preferred at the following locations:
     a. Bus traffic/parking areas
     b. Service vehicle/loading dock areas
     c. Play pads
  6. Asphalt tennis court construction is prohibited except at existing conditions to repair or overlay.

- Restrictions:
  1. Limit use of unit pavers, subject to review and acceptance by the Owner.
- In the absence of other information, standards of the following organizations apply:
  1. Colorado Ready Mix Concrete Association (CRMCA)
  2. Portland Cement Association (PCA)
  3. American Association of State Highway and Transportation Officials (AASHTO)
  4. State of Colorado Department of Transportation (CDOT) Standard Specification for Roads and Bridges
- Submittals
  1. Mix Design Data:
     a. Required
  2. Test Reports:
     a. Required
  3. Closeout:
     a. All submittals listed above, updated to record status.
     b. Bituminous (Asphalt) Pavement Warranty:
        (1) One year labor and material warranty covering creeping, shoring, cracking, settling, and ponding.
- Base Course(s):
  1. No Requirements
- Gravel drainage fill:
  1. Per Geotechnical Engineer
- Flexible (Asphaltic Concrete) Pavement
  1. Fifteen-year life cycle design Type X or EX
  2. Gravel Base:
     a. Per Geotechnical report and
     b. Flexible Pavement Schedule (32 06 00)
  3. Base Course:
     a. Per Geotechnical report and
     b. Flexible Pavement Schedule (32 06 00)
  4. Wearing Course:
     a. Per Geotechnical report and
     b. Flexible Pavement Schedule (32 06 00)
  5. Reinforcing Mesh:
     a. Geofabric is required at bus/truck areas and preferred elsewhere.
     b. Install with 2 inch minimum overlay.
  6. Asphalt recycling is preferred for pavement reconstruction.
  7. Tennis Courts (at existing only): If new overlay or mill and replace, provide control or construction joints along net line and equally spaced between adjacent courts. Do not locate control or construction joints within the field of play.
- Concrete Paving reinforcing options:
  1. Fibrous reinforcement admixture preferred
  2. Non-woven polypropylene
  3. Wire fabric is not recommended.
     a. When engineered, use galvanized or stainless steel.
     b. At expansive soils, structural engineer shall provide appropriate design for slab
- Concrete flatwork for vehicle areas:

1. Cement:
   a. Conform to latest revised ASTM C150 Standard for Portland Cement.
   b. Minimum cement content = 560 pounds per cubic yard.
2. Aggregate:
   a. Maximum coarse aggregate dimension may not exceed ¼ of slab thickness.
   b. Free of ferrous material which could leach onto surface
3. Water:
   a. Potable
4. Water-cement ratio:
   a. Not to exceed 0.45
5. Minimum 4000 psi 28 day strength
6. Air entrainment:
   a. Not less than 4.5% and not more than 7.5% by volume
7. Curing and anti-spalling compound is required for all exterior flatwork.
8. Slump:
   a. 3.5 inches maximum
9. Base:
   a. Per Geotechnical report.
10. Deposit concrete within 90 minutes from the time water is added.
11. Minimum slab thickness for vehicle traffic = 5 inches
12. Control joints:
    a. ¼ of slab thickness
    b. 2'-0" maximum joint separation per inch of slab thickness (5 inch slab = 10'-0" joint spacing.
    c. Pattern:
       (1) Perpendicular and equidistant (square)
    d. Include control joint around obstructions such as manholes.
13. Concrete finish:
    a. Astroturf drag or equivalent
    b. Perpendicular to main traffic flow
14. Curb Cuts:
    a. Integral vertical curb type
    b. Warped planes are prohibited
    c. Comply with Accessibility requirements

- Concrete slabs for Tennis Courts
  1. Reference Division 3 for Post-tensioned Concrete
- Paving Specialties
  1. Pavement marking materials:
     a. Yellow color alkyd traffic paint meeting requirements of Section 708.05, "Pavement Marking Paint" of the Colorado Department of Highways Standard Specifications for Road and Bridge Construction.
     b. Blue and white color alkyd traffic paint for ADA compliance
- Unit Pavers:
  1. 100% compacted sand base is mandatory.
- Asphalt Emulsion Pavement Sealer
  1. Application-ready cold-applied homogeneous emulsified asphalt binder with fillers and non-asbestos fibers conforming to the following:
     a. Density: 10.5 to 11.5 lbs./gallon

b. Non-volatiles: 15% minimum; 30% maximum
c. Water dilution: None
d. Asbestos content: None
e. Specific gravity: 1.25 minimum

- Coal Tar Emulsion Pavement Sealer
  1. Pre-mixed, rubberized, high-solids, cold-applied, homogeneous coal tar pitch emulsion containing no asbestos and conforming to the following:

COMPONENT	MAXIMUM	MINIMUM
Water %	54	-
Non-Volatiles %	54	47
Ash of Non-volatiles %	38	30
Solubility of Non-volatiles %	44	20
Specific Gravity	-	1.20
Asbestos Content:	Not allowed	Not allowed

  2. Include manufacturer's standard industrial-grade latex emulsion modifier/admixture with each coat.
- Chip Seal:
  1. Requires Jefferson County School District authorization
- Edge detail is mandatory for all pavement:
  1. Curb: Vertical profile with full cut at drives and ramps, or Curb and Gutter, or 12 inch wide reinforced concrete x depth of pavement
  2. Post-pavement keyed curb system is permitted.
- Drain Pans:
  1. Same material as pavement field
  2. Concrete drain pans within asphalt pavement are not recommended (cracks develop between dissimilar materials).
- Soil Sterilant
  1. Organic compound, minimum lateral leaching type
  2. Apply herbicide to areas under asphalt pavement where cut is 18 inches or less and imported fill areas except: within 20 feet of drip line of existing trees/shrubs to remain
- Sequence of Operation:
  1. Complete work in this section before installing exterior improvements accessories such as game posts, sleeves.
- Site Tolerances:
  1. Using a 10 foot long tested straightedge in any position
  2. Deviations on the surface of the finished pavement may not exceed 3/8 inch from designed elevations/ slopes.
- Field Quality Control
  1. Laser leveling is required for tennis courts
  2. Notification is required at least 24 hours in advance of the following:
     a. Starts of excavation, backfilling and compacting operations
     b. Staking of grades/elevations
     c. Subgrade placement
     d. Base course placement

e. Prime coat
f. Wearing surface placement

3. No vehicle traffic for 100 hours minimum

END SECTION 32 10 00

32 17 00 Paving Specialties – August 2015

- Work in this section is open to any product or material
- Parking Bumpers (Wheel Stops)
  1. Use is discouraged due to interference with snow removal operations
     a. Substitute a combination of striping and curbs
     b. Use with approval only; coordinate use with District Project Manager

END SECTION 32 17 00

32 18 00 Athletic and Recreational Surfacing – August 2020

- General:
  1. Fields are to follow ASBA recommendations in accordance with CHSAA rules and regulations.
  2. Any and all facility changes must go through the facility modification process.
     a. Surfaces outside normal material must be approved and are subject to safety testing.
     b. Need is determined by site microclimate and exposure conditions.

- Running Track:
  1. Scoria mixed with clay to comply with published standards of Colorado High School Activities Association.
     a. Concrete track curb required
  2. Asphalt Paving: Coordinate use with District Project Manager.
     a. Use is discouraged at the High School level.
- All Weather Running Track
  1. Restricted to specific products of specific manufacturers that have been previously approved by Jefferson County School District Facilities Services Department.
  2. Manufacturers
     a. General Acrylics Inc.
     b. Renner Sports/Benyon Sports Company – a Tarkett Sports Company
     c. Hellas Construction
     d. Approved Equivalent
  3. Products
     a. Paved-in-place polyurethane bound rubber granules sealed or top coat polyurethane and EPDM granules
        (1) Benyon BSS 200 / BSS 300
        (2) Hellas Equip Tracks S200 / V300
        (3) General Acrylics Spurtan BS / BSS / BV
        (4) Approved Equivalent
     b. Water-based polyurethane structural spray is preferred

   c. Post-Tensioned Concrete base is preferred over asphalt base
4. Submittals
   a. Complete product data including specifications, application rates and mixing instructions
   b. Material samples, 4" x 6" in size
   c. Shop Drawings for the track and field events striping plans, meeting current NFHS track regulations and standards
   d. A current IAAF Certificate proving the product to be installed meets the current IAAF Performance Standards for Synthetic Surfaced Athletic Tracks (Outdoor).
5. Quality Assurance
   a. Provide Level II Certification from a Professional Engineer or Licensed Land Surveyor, as defined by the American Sports Builders Association's "Guideline for Running Track Certification".
   b. Include certification on striping and slopes for NFHA standards.
   c. Verification of slopes shall occur prior to the application of surface, so that non-compliant areas can be addressed.
   d. Final certification of the slopes and striping shall occur after the surface is installed and the track is striped.
   e. The track surface shall be applied by a Certified Track Builder (CTB), which has successfully installed polyurethane materials included in these Technical Guidelines. The contractor shall have all appropriate licenses and be bondable
   f. Contractor references for five (5) similar, successfully executed projects are required
   g. Surface shall be tested for thickness per guidelines as published by the American Sports Builders Association, Quantitative Analysis of Installed Track Surfaces. A minimum of 100 readings shall meet or exceed specified depth. At no point shall the thickness be less than 65% of the specified depth.
6. Site Conditions
   a. Weather: Surfacing shall not be applied when the threat of freezing exists for the following 24 hours, rain is imminent or gusting winds are occurring
   b. Do not apply rubberized topping when base surface temperature is less than 45 degrees F. Ambient temperatures shall be 50 degrees and rising at the time of application
7. Warranty
   a. Provide 5-year warranty
8. Approved Installers:
   a. Renner Sports Surfaces, 775 Canosa Court, Denver, CO 80204, (303)825-3435
   b. Pre-approved Certified Track Builders

- Walking Paths and Trails
  1. Min. 3-inches thickness: crusher fines
  2. Metal edging.
  3. Weed barrier
- Playground Safety Surface
  1. Open to any product or material meeting the requirements of this Technical Guideline.
  2. Approved materials
     a. Engineered Wood Fiber
     b. Polyurethane

- Tennis Court
  1. Restricted to specific products of specific manufacturers that have been previously approved by Jefferson County School District Facilities Services Department.
  2. Approved Manufacturers
     a. Renner Sports/Benyon Sports Company – A Tarkett Sports Company
     b. Sports Court of the Rockies
     c. General Acrylics, Inc.
     d. Hellas Construction, Inc.
     e. Approved Equivalent
  3. Products
     a. Latex acrylic
     b. Post-tensioned concrete base
     c. Reference Section 32 31 00 Fences and Gates for fencing and windscreens
  4. Submittals
     1) Manufacturer specifications for components, color chart and installation instructions.
     2) Authorized Applicator Certificate from the surface system manufacturer.
     3) ITF Pace Classification Certificate for the system to be installed.
     4) Shop Drawings for the tennis court striping plans, meeting current NFHS tennis regulations and standards.
     5) Reference list from the installer of at least 5 projects of similar scope completed in the last 3 years.
  5. Site Conditions
     1) Application temperature shall be a minimum of 50°F, and surface temperature not above 130°F. Do not apply when surface is wet or if rain is imminent or forecast, or if nighttime temperatures are to be lower than 45°F. Keep from freezing. Do not store in direct sunlight for an extended period of time.
  6. Warranty
     2) The contractor shall guaranty their respective work against defective materials or faulty workmanship for a period of one (1) year from the date of completion, and that the colored surface will not wear through for a period of two (2) years.
- Natural Turf
  1. Reference Section 32 90 00 - Plantings
- Synthetic Turf
  1. Restricted to specific products of specific manufacturers that have been previously approved by Jefferson County School District Facilities Services Department.
  2. Manufacturers
     a. Basis-of-Design Product: Subject to compliance with requirements, provide Greenfields USA IRONTURF, or approved substitution by one of the following:
        (1) Greenfields USA – Tencate
        (2) FieldTurf – Tarkett
        (3) Shaw Sports Turf
        (4) AstroTurf
        (5) Desso
     b. Source Limitations: Obtain all components of synthetic turf system including fibers and backing from a single manufacturer.

3. Polypropylene systems are categorically prohibited
4. Submittals
   a. Samples
      (1) (2) 8" x 8" product samples without infill of each product proposed (green)
      (2) (2) product color samples "wheel" or "strip" of manufacturer standard colors
      (3) One-quart sample of any infill materials including any alternative infill
      (4) 8" x 8" sample of sewn seam if used
      (5) 8" x 8" sample of glued seam if used
   b. Finished product sample, minimum 10" x 10" mock-up shall be filled to a proper depth and represent the exact system and materials which will be installed in the project
   c. Turf edging nailer board, approximately 18" long.
   d. Test Reports for sieve analysis, compaction, infiltration
   e. 8 year minimum, 10-year minimum for woven turf products, maintenance contract terms and conditions
   f. Seaming Plan. Show all rolls/panels and seams planned for the area.
   g. Striping Plans, including colors, sport hierarchy, all dimensions
   h. Installation details, edge detail.
   i. Including turf materials profile, fasteners, seaming, drainage system, sleeving accommodations, and all other information needed for approval.
   j. Provide documentation for synthetic turf meeting ADA guidelines.
5. Design and Configuration
   a. Crowned subgrade (1/2% minimum) is preferred where site conditions allow.
   b. Liner per geotechnical report.
   c. 4-inch gravel sub-base/drainage layer (or as recommended by the geotechnical report)
   d. 2-inch fines leveling course
   e. Perimeter drainage system and curb
   f. Chevron or herringbone pattern underdrain (as recommended by the geotechnical report)
   g. Laser grade and slope control
   h. Sand/recycled rubber infill, in correct proportion for type of sport played on field
   i. Alternative infill materials to be evaluated on a project-by-project basis
   j. Shock Attenuation Pads
      (1) Product must carry a 25-year product warranty that includes the removal and repair or replacement of underlayment pad. 100% recyclable (cradle-to-cradle)
      (2) If Powerbase YSR pad is utilized the gravel sub-base may be eliminated at the designer, Owner and geotechnical engineer's discretion.
         (a) SP series (gravel sub-base likely required)
   k. GreensGroomer or other groomer recommended by Owner shall be provided for each school site as part of the project.

6. Field Design Recommendations
   a. Multi-Use Athletic Fields
      (1) For fields with high use, high programmed hours, including, but not limited to, multi-use fields striped for football, soccer and lacrosse, the following system is recommended:
      (2) Woven turf with dual-fibered (monofilament / slit film) 2-inch – 2 ¼-inch pile height.
      (3) Field striping: Football = white, soccer = yellow, lacrosse = blue. Hierarchy shall be in the ordered listed.
      (4) Lacrosse Unified Boys and Girls Striping per NFHS is preferred.
   b. Baseball / Softball Fields (limited use - with approval of District's Director of Site Maintenance Only)
      (1) Baseball and softball fields have varying turf systems throughout the field:
         (a) Infield
         (i) Design should consider brown color turf or alternating green panels at 7-1/2 foot intervals.
         (ii) 100% slit film fibers 2-inch pile height, 50 oz/ yd^2 min.
         (iii) Infill – cryogenic SBR rubber 1.5 lbs/SF + silica sand 5.4 lbs/SF
         (iv) All baseball and softball infield surfaces must be approved by the District's Director of Site Maintenance.
         (b) Outfield
         (i) Design should consider alternating green panels at 15-foot intervals
         (ii) Dual-fiber turf system, 2-inch pile height, 50 oz/ yd^2 min.
         (iii) Infill – cryogenic SBR rubber 2.6 lbs/SF + silica sand 3.65 lbs/SF
         (iv) Gmax should be less than 200 for life of field
         (c) Warning Track
         (i) 12-foot wide brown colored turf fibers (12' minimizes waste from trimming radii) increase width to 15' if outfield is straight sections (i.e. no radius)
         (ii) Infill – Silica sand with top dress layer of 3/8-inch minus volcanic gravel for texture/noise to alert players. Lava Rock sports infill by FieldTurf or approved equal.
7. Installation
   a. Installer shall have a minimum of 5 years local Colorado experience.
   b. Installer shall have field installation crews residing in the State of Colorado to provide timely warranty response.
8. Construction
   a. Year round
      (1) Turf Seams Glued when air temperature is 50 degrees or higher.

END SECTION 32 18 00

32 31 00 Fences and Gates – October 2010

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Jefferson County School District, R-1 Board Policy applies to work in this section
- Specified requirements apply equally to temporary and permanent construction.
- Alternate types of fencing in lieu of chain link fencing may be considered, particularly at the elementary level, in order to satisfy local, unique conditions.
  1. Carefully evaluate options to assure long-term durability, low maintenance, ease of maintenance, proper control and comparable life cycle cost to chain link fence.
  2. Fences not meeting these criteria may be installed if adjacent property owners agree to maintain the fence and contribute toward the excess costs of the alternate fence type.
- In the absence of other information, standards of the following organizations apply:
  1. International Fence Industry Association Inc.
- Submittals
  1. Shop Drawing:
     a. Required
  2. Closeout:
     a. All submittals listed above
        (1) Updated to record status
- Batting Cages and Dugouts
  1. Review design with District Project Manager for approval of layout, location, and materials
  2. Engineered stamped drawings are required
- Wind Screen:
  1. Tennis courts only
  2. Need is determined by site microclimate and exposure conditions.
- Decorative Fences:
  1. Limit to protect or highlight ornamental areas only.
     a. Estate fence
     b. Split rail fence
- Chain Link Fence:
  1. Fabric:
     a. 9 gauge galvanized wire up to 12'-0" single height
     b. 1-¾ inch mesh at tennis courts and baseball/softball backstops
     c. 2 inch mesh at all other locations
     d. Knuckle both selvages
     e. Plastic clad fabric is not recommended.
     f. Place fabric on Jefferson County School District R-1 side of post.
     g. Maintain 2 inch clearance to grade.
  2. Posts:
     a. Schedule 40 galvanized or SS40.
     b. Line Posts: 2 inch nominal (2.375 inches o.d.)
     c. Terminal, corner, and pull posts: 2½ inch nominal (2.875 inches o.d.)
     d. Single gate up to 6'-0" posts: 2½ inch nominal (2.875 inches o.d.)

e. Double gate posts and single over 6'-0": 3 inch nominal (3.5 inches o.d.)
f. Set property line fence post centerline 6 inches inside property line.
g. Excavate 9 inch diameter x 30 inch minimum depth.
h. 10'-0" o.c. maximum spacing, regardless of fence height
i. Set plumb and aligned in concrete terminating at finish grade
j. Backfill

3. Top Rail:
   a. 1-5/8 inch nominal (1.660 inches o.d.)
   b. Longest lengths available
   c. 6 inch expansion couplings with 3 inch overlap
4. Center and Bottom Rail:
   a. 1-¼ inch nominal (1.66 inch o.d.)
   b. Required for fences over 6'-0" high
   c. Welded connection to posts is preferred.
   d. Bottom Rail:
      (1) Required at PE and athletic field fences
5. Truss Rods:
   a. 3/8-inch diameter with anchor and turnbuckle
   b. Install diagonally from top of all terminal posts to bottom of nearest line post and diagonally each way in gates.
6. Tension Bars:
   a. ¼ inch x ¾ inch (minimum) single piece lengths equal to fabric height
7. Tension Clamps:
   a. 14 gauge x 1 inch
   b. Install at 15 inches o.c. maximum
8. Tension wire:
   a. 9 gauge
   b. Required where no bottom rail is installed
   c. Weave continuous strand between terminal posts for entire lengths of bottom edge and 24 inches above bottom edge of fabric.
   d. Secure to fabric with clamp rings at 24 inches o.c. and tie to each post.
   e. Twist 2 turns and bend to prevent hazard.
9. Fence Fasteners:
   a. 12-gauge wire
   b. Space at 12 inches o.c. on line posts and 24 inches o.c. on rails and braces.
10. Post Caps:
    a. Rounded, weather-tight closure
    b. Same material and diameter as post
    c. Install one per post.
11. Gate frames:
    a. 1-1/2 inch nominal (1.9 inches o.d.)
    b. Limiters are required at sport court gates (tennis, multipurpose courts).
    c. Welded construction only
12. Hinges:
    a. Malleable iron
    b. Non-lift-off type
    c. 180 degree swing
    d. 1 pair up to 6'-0" height

e. 1-½ pair up to 8'-0"

13. Latches:
    a. Integral padlock eye
    b. Operable from either side
    c. Fork type for single gate
    d. Plunger bar for double gates
    e. Set double gate plunger bar strike in concrete.
14. Wind Screen:
    a. #18 vinyl fabric windscreen
15. Barrier Post:
    a. 3 inches (min.) steel post x 48 inches (min.) with full concrete fill
16. Standard property line fence height = 6'-0".
17. Mow strip:
    a. 12 inches wide concrete centered on fence line
    b. Required at property line fence and preferred elsewhere

- Backstops:
  1. Welded construction only
  2. Continuous top and bottom rails
  3. 2 x 12 wolmanized wood baseboard
     a. Single piece between posts
     b. Trex boards acceptable
  4. Remainder of construction is to be consistent with requirements for Chain Link Fences
- Execute fencing only after finish grading is complete.
- Site Tolerances:
  1. To facilitate snow removal, set fence line 8'-0" (minimum) away from vehicle pavement.

END SECTION 32 31 00

32 31 10 Baseball and Softball Dugouts – August 2019

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Utilize the District's standard prototype design and configuration.
- Construction:
  1. Nominal Size: 8 ft x 40 ft
  2. Concrete slab-on-grade
  3. Open-air construction with sloped roof structure
  4. Walls: reinforced masonry or open chain link fence
     a. Reinforced masonry walls require continuous footings
  5. Chain link fence: See Section 32 31 00 for components
  6. Roof Structure:
     a. Tube steel spanning between steel columns or resting on reinforced masonry
     b. Corrugated roof decking with plywood, underlayment membrane, and roof shingles
- Submittals
  1. Shop Drawing:

a. Required for full fabrication of components
2. Closeout:
   a. All submittals listed above
      (1) Updated to record status

32 31 20 Batting Cages – August 2019

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Location: Coordinate with District Project Manager
- Utilize the District's standard prototype design and configuration.
- Construction:
  1. Nominal Size: 80 ft x 15 ft single. Additional cages at 80 ft x 15 ft each.
  2. Reinforced concrete piers with welded galvanized posts and structure. Diagonal bracing at corners and as required
  3. Open-air construction with overhead welded net support
  4. Chain link fence: See Section 32 31 00 for components
- Netting
  1. 70 ft x 12 ft x 12 ft cage net attached to cables
- Play surface:
  1. 4-inch Class 1 compacted road base over min. 6-inch compacted Class 6 road base
  2. Sub-drainage may be required

32 32 00 Retaining Walls – October 2010

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Retaining walls are generally not recommended.
  1. Embankments are preferred for safety reasons.
- Wood timbers / railroad ties:
  1. Prohibited
- Masonry construction:
  1. Prohibited except for interlocking systems

END SECTION 32 32 00

32 34 00 Fabricated Bridges – October 2010

- Work in this section is open to any product or material
- Footbridges:
  1. 5'-0" maximum clear width

END SECTION 32 34 00

32 70 00 Wetlands – October 2010

- Comply with Federal, State, and jurisdictional requirements

END SECTION 32 70 00

32 80 00 Irrigation – August 2021

- Work in this section is restricted to specific products of specific manufacturers that have been previously approved by Jefferson County School District, R-1 Facilities Services Department.
- To the greatest extent feasible, Jefferson County School District, R-1 school sites should be designed and landscaped to minimize the need for artificial irrigation.
- Automatic irrigation system is required for all landscaped and non-native sodded/seeded areas of the site
    1. EXCEPT: Elementary school playfields above 7000 feet elevation
- Quick-coupler irrigation is prohibited except at native grass and natural landscaping
    1. System to be permanent at these areas
    2. Irrigation shall be used for period of two years to establish native seed / sod areas
        a. System will be used periodically thereafter to maintain healthy plantings.
- Xeriscape unpaved areas within 10 feet of building perimeter
- Storm water systems should be integrated into the landscaping and irrigation site design
- Coordinate installation of electrical power to controller.
- Submittals
    1. Product Data:
        a. Required
    2. Shop Drawing:
        a. System layout including:
            (1) Wiring
            (2) Wiring schematic
            (3) Controller chart
    3. Design Data, Test Reports, Certificates, Manufacturer Instructions, Manufacturer Field Reports
        a. Written certification of backflow prevention test
    4. Closeout:
        a. All submittals listed above
            (1) Updated to record status.
        b. Operation and Maintenance manual and DVD demonstration of operation
        c. 3 copies of zone chart
            (1) Laminated
        d. Reproducible as-built system CAD file and drawings
        e. One year system operation warranty
- Quality Assurance
    1. Design to operate a maximum of 9 hours x 5 days per week for peak irrigation.
    2. Verify available water pressure prior to design.
    3. Design should avoid or minimize sprinkler heads (or quick coupler valves) in the following locations:

    a. High activity areas of the site, such as playfields
    b. Near building surfaces/foundations
    c. Near paved pedestrian and vehicle areas
- Extra Materials:
    1. One head of each type
    2. Controller keys, valve keys, quick coupler keys
    3. Hose swivels for quick couplers
- Maintenance Issues
    1. Space valves in manifolds to allow access for repairs.
        a. 24 inch separation preferred
    2. Blowout and initial start-up per Jefferson County School District, No. R-1 personnel.
- Valve boxes are prohibited within the boundaries of playfields and athletic fields.
- Pumps (as required):
    1. Centrifugal type activated by flow switch and controller relay.
- Backflow preventer:
    1. Reduced Pressure Principle Vacuum Breaker
    2. Locate in main building or heated, secure structure.
- Mainline pipe:
    1. PVC, ASTM D2241 or Commercial Standard CS256 Type I, normal impact Class 200 (SDR 21) with continuous permanent marking identifying manufacturer and grade
    2. 2-1/2 inch or larger diameter bell end are prohibited.
- Copper pipe:
    1. Type K is required between meter and backflow preventer.
- Branch line pipe (intermittent pressure):
    1. PVC:
        a. ASTM D2241
        b. Normal impact class 200 (SDR 21) Commercial Standard CS256, Type I
    2. Polyethylene is prohibited.
    3. 2-1/2 inch or larger diameter bell end are prohibited.
- Risers:
    1. Rotary head or Quick-coupler valve:
        a. PVC schedule 80 nipple adjustable double swing joint riser
    2. Lawn spray head:
        a. Same as above or soft plastic "cutoff" nipple
    3. Flexible pipe may be used with spiral fittings for 3/4 inch and smaller diameter.
- Main line fittings:
    1. PVC Schedule 40 molded
    2. Solvent weld type
- Gasket fitting type is prohibited.
- Branch line joints:
    1. Suitable for solvent weld
- Branch line fittings: PVC: ASTM D2241, Type 1, with appropriate pressure rating.
- Gate Valves:
    1. Cast iron or bronze
        a. Rated to 150 psi (minimum)
    2. Resilient wedge

   a. Waterway equal to full nominal diameter of valve.
3. Activation:
   a. Square nut at sleeves
   b. Wheel handle at manhole or open areas
4. Open = counterclockwise

- Manual and Semi-automatic valves:
  1. Bronze, angle type, 200 lb. class with cross type operating handles
- Automatic control valves:
  1. Rainbird Type EFA-CP Automatic Controller Valve
  2. Cast brass body and bonnet globe-type
  3. Ball valve of plastic or brass installed in-line upstream
  4. Normally closed, integrally-molded, single-seat, diaphragm-operated, 2-way, 24-volt solenoid activated with manual bleed plug and flow adjustment.
  5. Atmosphere-vented and 3 way solenoid valves are prohibited.
- Quick-coupler valves:
  1. 2 piece, 150 psi rated cast brass with rubber lid
- Sprinkler heads:
  1. Rainbird Series 50 Pop Up Gear Driven Heads
  2. Hunter Popup Gear Driven Heads (excluding I-40 heads)
  3. Heavy-duty plastic gear-driven, with interchangeable nozzles serviceable from top and stainless steel shaft
  4. Plastic body spray-type heads with retraction springs and filtering screen and bubblers may be used in small ornamental areas.
  5. Protective rubber covers are required at all areas.
  6. Purple color rotor top is required to signify non-potable water.
- Wiring:
  1. Type UF with 4/64 inch U.L. listed insulation for underground burial for class II circuits.
  2. Common:
     a. White coded wire
     b. 12 gauge
     c. 14 gauge permitted for runs up to 1000 lineal feet.
  2. Multi strand wire is prohibited
- Solenoid:
  1. Single color coded 14 gauge wire to each solenoid.
- Remote Control Hydrometer
  1. Separate master valve and flow meter wired to controller
  2. Combination turbine type water meter and diaphragm actuated solenoid control valve mounted in a single globe style valve body
  3. Meter should power a gear mechanism, which activates a reed switch that transmits a pulse at a pre-determined flow rate.
  4. Unit should include integral flow guides to eliminate the need for straight pipe allowances before and after the valve.
  5. Main valve should fully open and close drip-tight in response to electrical signal
  6. Automatic station shut off during overflow conditions and complete shut down when mainline breaks are detected
  7. Compatible with pump station operation, built-in pump start relay, UL listed reset circuit breakers

8. Valve and meter should be maintainable without removing valve body from the line.

- Rain gauge:
  1. Adjustable setting type
  2. Glen-Hilton Products, Inc. Mini Clik II Rain Sensor, Calsense Rain-Bucket
  3. No substitutions
- Solvent and Glue:
  1. Per pipe manufacturer
- Dielectric connectors:
  1. Mandatory at all joints between dissimilar metals
- Valve Boxes:
  1. 10 or 12 inch bright color polyiron with locking cover and extensions to adjust to grade level
- Automatic Controller
  1. Hunter I-Core Series or Calsense
     a. No Substitutions without Owner approval
  2. General
     a. Hard wired (not plug-in) with integral surge protection
     b. 48 station capacity
     c. Security code access
     d. Weather proof enclosure
     e. 24 volt, stepped down immediately before the timer
     f. Solid state microprocessor type with digital readout.
  3. Display on front panel of control unit and through an EIA standard RS-232-C port for on site or remote downloading of:
     a. Current Moisture level
     b. 31 day history reporting
        (1) Program parameters
        (2) Moisture levels
        (3) Watering activity in both time and volume
        (4) Error log
     c. Bookkeeping feature including a log of up to 100 of the last manual input events (program changes, moisture setting changes, etc.)
  4. Capable of stand-alone, remote, or network operation as follows:
     a. Scan each station and use moisture sensor data as its primary water application criterion.
     b. Provide, without additional wiring, an application of irrigation water to a follower station each time its assigned leader station has an application of irrigation water.
     c. Through peripherals, monitor electrical, flow, and sensor problems in the field and react appropriately
     d. Capable of operating without respect to sensor reading from input at the control unit and without additional wiring
     e. System networking option that allows control and data transfer (in either IBM or Macintosh format) with a central computer and networking of multiple automatic controllers using commercially available communications software through non-dedicated telephone lines.
     f. Immediate repeat cycle option
     g. Automatic start at any hour capability
     h. Accurate incremental station timing from 2 to 60 minutes

i. Capable of manual shutdown, advance, or start any or all stations without affecting programming
j. Built-in pump start circuit relay (if necessary), U.L. listed reset circuit breakers.

5. Programming
   a. A minimum of four standard automatic programs that allow use of couplers without triggering a flow error or require operation of master valves and with the following capabilities:
      (1) Up to 23 hour 59 minute watering window
      (2) Independent window open and close times
      (3) Allow continuous scanning of active stations during the watering window
      (4) Option to use or not use moisture sensor input
      (5) 3 optional exception periods during the watering window that will disallow watering during the exception period and resume program operation when the exemption period is over
      (6) Allow simultaneous and overlapping program operation
   b. Syringe program with the following capabilities:
      (1) Independent start time
      (2) Variable station run times that apply individually to each station in the syringe program
      (3) Duration time equal to the sum of run times of the stations in the program
      (4) Water each station in the program once, in any sequence
   c. Quick coupler program with the following capabilities:
      (1) No stations assigned
      (2) Independent calendar for legal watering days
      (3) Independent start and stop times
      (4) Independent allowable flow value
   d. User programmable for simultaneous operation of a minimum 1 to 3 stations and the following independent station settings:
      (1) Assignment to none, one, or more programs
      (2) High and low moisture levels
      (3) High and low flow values
      (4) Run time
      (5) Minimum soak time
      (6) Total station watering time per window
   e. Controller adjustable moisture settings for leader stations without a third wire to sensor
      (1) High value above which the station will not water
      (2) Low value that the station must reach before it will allow further watering
      (3) Convey bypassed watering cycle information to central computer
6. Identification of and response to special situations as follows:
   a. Electrical problems such as wiring breaks, shorts, or bad solenoids
   b. Sensor malfunction
   c. Excessive or inadequate water flow during active irrigation cycle
   d. Unauthorized water flow during inactive cycle
7. Control:
   a. Peripheral equipment of other manufacturers
   b. Permit economical retrofit of existing automatic systems to central control
   c. Control either normally open or normally closed 24-volt master valves

d. Interface to monitor water flow readings from an appropriate electronic pulsing flow meter.
e. Ability to control an auxiliary irrigation water pump through a 24 volt control or dry contact switch with an independent power supply

- Execution Summary
  1. Trenching:
     a. Uniform and straight with firm and uniform bottom.
     b. 24 inch (min.) 36 inch (max.) ground cover to top of pipe for mainline
     c. 16 inches for rotary heads
     d. 10 inches for spray heads
     e. Trenching is optional for pipe 1¼ inches or less which may be "pulled."
  2. Setting:
     a. Uniform firm bearing for the entire length of line.
     b. Wedging or blocking is prohibited.
  3. Thrust Blocking:
     a. Required
  4. Tracer Wire:
     a. Comply with Division 33 for Tracer Wire requirements.
     b. Install warning caution tape above all underground main irrigation lines.
     c. Install at all underground main irrigation lines, to run with each line.
     d. Standard Colors:
        (1) Purple: Reclaimed water, irrigation, or slurry lines
  5. \Heads:
     a. Set to precise elevations 1½ inches above finish grade and 1 inch above seeded areas, ¼ inch below and 6 inches away from adjacent pavement and 12 inches away from building.
     b. Set swing joint angles between 20 and 45 degrees.
  6. Compaction:
     a. Match original density and grade.
     b. Crown for future settlement if original density cannot be achieved.
  7. Pipe, valves, fittings:
     a. Thoroughly clean and maintain clear and unobstructed.
  8. Sleeves:
     a. Required at all sub-pavement irrigation lines and where line changes direction
     b. Use at least 2 nominal pipe sizes larger than irrigation pipe.
     c. Cut squarely with tubing cutter, hand saw or hack saw and remove burrs.
  9. Valves: Mount in line with threaded connections (to be removable).
     a. Install Remote Control Hydrometer directly after backflow preventer
     b. Isolation valves:
        (1) Required to permit maintenance without complete shutdown of system.
     c. Remote control valves:
        (1) Separate valve box required for each valve
     d. Master valve
        (1) Normally closed
  10. Wiring:
      a. Run adjacent to pipe in same trench.
      b. Run at least one additional wire along main line for <u>each</u> 8 automatic valves in the system.

c. Identify additional wires on "as-built" documents.
d. Locate electrical connections at valve boxes with sealant in watertight connectors

11. Valve boxes:
    a. Inconspicuous locations only
    b. Provide vertical separation to prevent contact with main line.
    c. Spacing between remote control valves = 2' - 0" minimum
12. Locate above-ground assemblies and components in secure, insulated, and heated structures
13. Locate controller within the grounds storage room or building with a view toward irrigated areas to the greatest extent possible.
14. Locate rain gauge to prevent vandalism.
15. Pumps
    a. Leave unencumbered copper pipe downstream of backflow device to accommodate future retrofit to central control.
        (1) 2' - 0" horizontal
        (2) 1' – 6" sides and overhead

- Field Quality Control
  1. Do not stack pipes in trench.
  2. Do not run main lines and laterals parallel with storm drainage flows and other areas subject to erosion
  3. Do not mix head types within a zone.
  4. Buried wire splices are prohibited.
  5. Pressurize completed mainline for 2 hours at normal pressure (120 lbs. for 1 hour on pump systems).
  6. Test heads in each valve zone for 10 minutes minimum.
  7. Operate controller through 2 complete cycles or each zone for 2 minutes minimum.
  8. Repair leaks and repeat above tests.
  9. Flush entire system for 2 minutes at normal operational pressure immediately before installing heads, nozzles, or plugs.
     a. Removable nozzle heads may be installed prior to flushing.
  10. System acceptance requirements:
      a. No leaks during any test procedure
      b. Pattern coverage per design.
  11. Complete all of the above before commencing sod or seeding operations
- Adjusting/Cleaning
  1. Clean up daily.
     a. Remove all scrap pipe, debris, and surplus materials from trenches and work site.
  2. Tighten pop-up nozzles.
  3. Adjust radius and gallonage settings on heads with adjustable stems.
  4. Perform final adjustment of head levels and coverages during turf establishment.
- Demonstration
  1. Demonstrate and test system operation and performance in the presence of system designer, construction project manager, operations personnel, and facility manager.
     a. Use of controller
     b. Flow/coverage
     c. Rain gauge
     d. System startup (spring)
     e. System shutdown and winterization (fall)

END SECTION 32 80 00

32 90 00 Planting – October 2021

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Source of imported topsoil is subject to the review and approval of Jefferson County School District, R-1
  1. Topsoil
     a. Thoroughly disc and rototill topsoil to a depth of 8 to 12 inches before installation of irrigation system and landscaping
     b. Add and till other amendments according to soils analysis before seeding or sodding
     c. After installation of irrigation system and completion of grading, distribute 3 cubic yards of topsoil per 1000 square feet (130 cubic yards per acre) of area to receive non-native grass
     d. Minimum topsoil depth:
        (1) 8 inch depth at athletic (football, baseball, softball, soccer) and general multipurpose playfields and play areas.
        (2) 4 inch depth elsewhere
     e. Import material requires prior approval by Jefferson County School District, R-1
     f. Amended Topsoil (As determined by soils analysis):
        (1) Rocks over 1-1/2 inch diameter are prohibited
        (2) 50% wood byproduct screened to 5/8 inch minimum dimension
        (3) 50% cow or bull manure
            (a) Composted at 130°F for 72 hours minimum
            (b) Weed free
            (c) pH = 7.1 to 8.1
     g. Mulch:
        (1) Wood and bark are prohibited
- Do not locate trees in proximity of overhead electrical or telephone lines. Coordinate locations as required with utility companies.
- Work in this section:
  1. To be complete upon building occupancy.
  2. Includes protection of existing landscaping from construction activities, including indirect damage such as erosion.
- Every effort should be made to schedule lawns, grass, and sod work to permit 2 full growing seasons before occupancy.
- Warranty
  1. Lawns, grass, sod, shrub, trees, groundcover, native grass:
     a. One-year warranty with supplemental one year warranty for each warranty replacement item.
- Restrictions
  1. For elementary schools above 7000 feet elevation, limit sod to decorative, building perimeter areas.
  2. Fruit-bearing trees are categorically prohibited.
  3. Minimum distance separation to building/foundation:

a. Sod: 5'-0"
b. Shrub: 5'-0"
c. Tree: 10'-0"

- Recommended minimum sizes:
  1. Deciduous trees: 2 inch caliper
  2. Evergreen trees: 6 feet tall
- Mixes
  1. Grass:
     a. Activity and decorative areas:
        (1) Sod required:
            (a) 4 variety bluegrass blend including 1 part Elite drought tolerant + 1 part Elite shade tolerant, 1 part aggressive, + 1 part dense.
     b. Other areas:
        (1) Native grass species
     c. Embankments:
        (1) Sod or seed
     d. Athletic fields
        (1) Sod
            (a) Jumbo or wide / long rolls required
                1. 4 variety bluegrass blend including 1 part Elite drought tolerant + 1 part Elite shade tolerant, 1 part aggressive, + 1 part dense.
        (2) All baseball and softball infield surfaces must be approved by the District's Director of Site Maintenance.
- Approved Tree and Plant Species
  1. Shade Trees:
     a. Hackberry
     b. Honeylocust, Imperial (Gleditsia triaconthos inermis 'Imperial')
     c. Honeylocust, Shademaster (Gleditsia triaconthos inermis 'Shademaster')
     d. Honeylocust, Skyline (Gleditsia triaconthos inermis 'Sunburst')
     e. Maple, Emerald Queen or Norway (Acer platanoides 'Emerald Queen')
     f. Maple, Walsach
     g. Maple, Schwedler (Acer platanoides 'Schwedler')
     h. Maple, Sugar (Acer saccharinum)
  2. Ornamental Trees
     a. Alder, Native
     b. Alder, Thinleaf (Alnus tenuifolia)
     c. Crabapple, Spring Snow Fruitless
     d. Maple, Ginnala (Acer ginnala)
  3. Evergreen Trees
     a. Fir, Douglas (Pseudotsuga menziesii var. glauca)
     b. Juniper, Colorado Green (Juniperus scopulorun 'Cologreen')
     c. Pine, Ponderosa (Pinus ponderosa)
     d. Pine, Foxtail or Bristlecone (Pinus aristata)
     e. Pine, Austrian (Pinus nigra)
     f. Spruce, Colorado Blue (Picea gungens glauca)
  4. Dwarf Shrubs 3 - 5 feet high
     a. Dwarf Rabbit Brush Kelsey
     b. Apache Plume

   c. Alpine Current
   d. Dwarf Artic Blue Willow
   e. Goldflame Spirea
   f. Miss Kim Lilac
   g. Bearberry Cotoneaster
5. Medium Shrubs 6 - 8 feet high
   a. Variegated Dogwood
   b. Rabbitbrush
   c. Purple-leaf Sand Cherry
   d. Golden Current
   e. Common Purple Lilac
   f. Common White Lilac
   g. Fern Bush
   h. True-leaf Mountain Mahogany
6. Ground Covers
   a. Border Jewel
   b. Whiplash Daisy
   c. Snow in Summer
   d. Periwinkle
   e. Creeping Phlox
7. Vines
   a. Silver Lace Ivy
   b. Englemann Ivy
8. Spreading and Creeping Evergreens
   a. Prince of Wales Juniper
   b. Blue Rug Juniper
   c. Blue Chip Juniper
   d. Broadmoor Juniper
   e. Buffalo Juniper
   f. Scandia Juniper
   g. Salt brush (native)
   h. Emerald Mound Honeysuckle
   i. Arnolds Dwarf Forsythia
   j. Dwarf Lead Plant low-dense
   k. Privet
   l. Potentilla
9. Large Shrubs 10-15 feet high
   a. Common Purple Lilac
   b. Little Leaf Mockorange
   c. Curl-leaf Mountain Mahogany
   d. Buffalo Berry
   e. New Mexican Privet
   f. Burning Bush
10. Upright Evergreens
   a. Wichita Juniper
   b. Colorado Green Juniper
11. Mounding Evergreens
   a. Mugo Pine

12. Broadleaf Evergreens
    a. Euonymus Manhattan
    b. Green Daphne
    c. Oregon Grapeholly
    d. Yuccas
13. Ornamental Grasses
    a. Miscanthus
    b. Blue Fescue
    c. Blue Avena
14. Perennials
    a. Columbine
    b. Aster
    c. Coreopsis
    d. Dianthus
    e. Veronica
    f. Penstemon
    g. Day Lily

END SECTION 32 90 00

32 90 05 Gardens – August 2021

Work in this section is applicable to both single and multi-plot gardens located on Jeffco School Sites.

- Reference District-wide Garden Guidelines
- Prior to construction/planting submit the following:
    1. Facility Modification Form.
    2. "Business Plan" indicating sponsor, funding sources, administrative support, community supporters.
    3. A garden plan consisting of drawings describing the proposed plan, the location on the property, any obstructions or improvements that could impact the location.
    4. Maintenance plan indicating responsible parties, planting dates, fall clean-up responsibilities.
    5. A Jeffco Schools Garden Checklist.
    6. Garden plans must be submitted prior to January 15 of the proposed planting season.
- The documentation will be reviewed and a recommendation made to the Community Superintendent by Planning & Construction and Facilities Management. Approval by the Community Superintendent must be granted prior to construction/planting.
- Initial site preparation.
    1. Sponsor will strip sod in preparation of single plot sites.
    2. Facility Management will provide utility locates, sponsor to relocate or reconfigure irrigation lines using approved irrigation contractor.
- **Single Plot Gardens:**

1. School to appoint 'advocate' who will monitor and be responsible for garden condition.
2. Maximum plot size 10' x 15'.
3. Raise plot to 18" above grade using untreated cedar timbers.
4. Provide and place topsoil, supplemented as required. If topsoil is stocked on site provide appropriate storm water BMPs until material is placed.
    a. Composting is not permitted.
    b. Pesticides are not permitted.
    c. Due to stormwater regulations, fertilizer cannot be stored on site. If used, fertilizer must be brought to site and distributed in gardens immediately. Only organic fertilizers should be used to minimize potential for stormwater pollution. Do not over fertilize, use only a minimal amount according to manufacturer directions.
    d. Bat houses are not permitted
    e. Composting bins or areas are allowed only with approval of the Executive Director of Facilities and Construction Management and shall be approved on a pilot basis only.
5. During growing season maintain plot by removing dead material, weeds, selective pruning, etc.
6. At the end of planting season, remove dead plant material off-site.
7. Facility Management will advise sponsor when irrigation will be activated and deactivated.
8. Should the plot or garden be abandoned or vacated the school shall be responsible for the cost of reclamation and restoration.

- Initial site preparation.
    1. Sponsor will strip sod in preparation of multi-plot sites.
    2. Facility Management will provide utility locates. Sponsor to reimburse Facility Maintenance or use approved irrigation contractor to relocate or reconfigure irrigation lines.
    3. Sponsor or oversight group will stake, prepare beds and paths between beds.
    4. Garden area shall be enclosed with 4' chain link fencing or appropriate plant material. Refer to Technical Guidelines Section 32 31 00 for requirements. A concrete or crusher fine mow strip shall be provided.
    5. Jeffco Schools shall designate a location for a sponsor-provided shed used for storage of garden implements. Sheds shall comply with Section 13 34 24.
- **Multi-Plot or Community Gardens:**
    1. School or Community Garden oversight group shall designate representatives who will monitor and be responsible for garden condition.
    2. Community Garden oversight group shall register and distribute plots, collect user fees, monitor condition of garden during growing season.

3. At the end of planting season, remove dead plant materials off-site.
4. Maximum plot size 10' x 15'. Maximum number of plots 30.
5. Plots shall be raised above grade approximately 6" and bordered with cedar 2"x 8".
6. Provide and place topsoil at each plot, supplemented as required. If topsoil is stocked on site provide appropriate storm water BMPs until material is placed.
    a. Composting is not permitted.
    b. Pesticides are not permitted.
    c. Due to stormwater regulations, fertilizer cannot be stored on site. If used, fertilizer must be brought to site and distributed in gardens immediately. Only organic fertilizers should be used to minimize potential for stormwater pollution. Do not over fertilize, use only a minimal amount according to manufacturer directions.
    d. Bat houses are not permitted
    e. Composting bins or areas are allowed only with approval of the Executive Director of Facilities and Construction Management and shall be approved on a pilot basis only.
7. Plots shall be separated by 3' min. to 5' wide crusher fine walkway all four sides.
8. Shade structures and seating shall comply with Technical Guidelines 12 93 00 and 13 34 23..
9. Irrigation spigots on a quick coupler will be provided at the rate of 1 per four plots. Where practical the irrigation line will be a part of the site's irrigation system, on a dedicated zone and controlled by time-clock.
10. Results of soils testing for RCRA heavy metals in imported soil shall be provided to Jeffco Environmental Services for review.
11. Should the Community Garden become abandoned the school will be responsible for the removal of wood borders, paths, fencing, reconfigure irrigation and reclamation and restoration of the site.

END SECTION 32 90 05