



ALBUQUERQUE PUBLIC SCHOOLS

Facilities Design + Construction / Maintenance & Operation

Site Design Directives, Standards Specifications and Standard Details for Site Design and Construction

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Albuquerque Public Schools
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Albuquerque Public Schools Landscape and Site Design Directives

Planting Design Directives

Planting Designs for all APS District Properties shall emphasize the use of Tree Plantings, both ornamental and shade, and large-scale shrubs. Ornamental shrub plantings should be avoided. Ornamental shrub plantings should be used sparingly and should be used to emphasize the primary building entrance. The reason for this directive is that the APS Grounds department is simply not able to maintain shrub beds and shrub plantings. The APS Grounds Department does not have the personnel required to perform weeding, deadheading, or chemical herbicide and pesticide applications that extensive ornamental shrub beds require.

The following items are required for all APS Planting Plans.

- All shade trees shall be a minimum 2.5" caliper, or larger.
- All ornamental trees (flowering pear, flowering plum, etc.) shall be a minimum 2" caliper, or larger.
- All shrubs shall be a minimum 5 gallon or larger.
- All shrubs shall be xeric plantings.
- All landscape areas are to be designed so that there is no site run-off of irrigation water.
- Tree wells located within paved areas shall have a minimum interior area of 10'x10'.
- The following trees and shrubs shall not be planted on APS District Property:

Green and White Ashes
Elms (except Lace Bark Elms)
Kentucky Coffee tree
Black Locust
Sugar and Silver Maple
Poplars, Cottonwoods, and Aspen Trees
Spruces
Golden Rain tree
Box Elder (except Sensation Maple)
Willows (except Desert Willow)
Russian Olives
Pyracantha
Ponderosa Pine
Pinon Pine
Sycamores
Oleander
Junipers
Cotoneasters
Euonymous

- All landscape and irrigation projects shall be reviewed by a representative of Albuquerque Public Schools and shall include representatives of both Facilities Design and Construction and Grounds Department.

Albuquerque Public Schools Landscape and Site Design Directives

- All landscape areas shall receive aggregate mulches as a ground cover in the form of gravel mulches and/or crusher fines. Minimum depth of all gravel mulches shall be 2" depth and the minimum depth of all crusher fine mulches shall be 3" depth. All mulch areas shall receive filter fabric unless the mulch is crusher fines that are installed in high traffic areas. The landscape architect shall consult with the APS Grounds Department to determine whether filter fabric is required or not. Organic mulches are not allowed on district properties except for the use of bark mulch rings at tree plantings.
- Aggregate mulch sizes shall be limited to the smallest size aggregate that is practical for each specific installation. Aggregate mulches larger than 1" size (for example: 2"-4" cobble) will not be allowed on APS district properties except for use on steep slope areas (3:1 and greater) and drainage areas. See the APS Drainage Design Directive Section for requirements in these areas. All aggregate mulches used on slope areas and drainage areas shall be a minimum 4"-8" rip-rap material (or larger). All aggregate mulches used in drainage areas near buildings shall be embedded in concrete to prevent the stones from being dislodged. The design of sloped areas adjacent to or near buildings shall include the use of retaining walls, etc. to step grades and avoid the use of mulches on steep slopes. Crusher fines shall not be used in areas that are steeper than 10:1 and in areas that are to be used for conveying drainage or temporarily holding storm water run-off.
- All trees planted in turf areas shall receive a minimum of 2" depth and 6' diameter bark mulch ring at the base of each tree. The bark shall be kept back away from the trunk of the tree to prevent rotting.

Grass Sodding/ Playfields and Athletic Fields

Grass sod shall be limited to use on playfields and athletic fields only. Ornamental turf shall not be used on APS District properties.

- Sodded Turf shall be used on fields sized greater than one (1) acre. Any field one acre or less shall be required to have artificial turf installed (see Artificial Turf Design Directives)
- Turf Grass species shall be limited to Bluegrass species mix unless otherwise prior approved by the APS Grounds Department. (For Example: Blue Grass – Bermuda Grass Mix). Turf Grass species mixes such as "Park Blend" shall not be used on APS District Properties. Turf grass species shall be noted on the construction drawings and shall not be included in the written specifications.
- Grass seeding shall not be used on playfields and athletic fields
- All playfields and athletic fields shall be fenced with temporary construction fencing during the establishment period. The new playfield

Albuquerque Public Schools Landscape and Site Design Directives

and athletic field will not be available for use by the school during the establishment period. The establishment period will be twelve months (one year) from the date of final acceptance. The cost of temporary construction fencing shall be paid for by APS through their on-call fencing contract and the costs of this fencing shall be included in the Landscape Architect's Opinion of Probable Construction Cost estimate for the project.

- All sodded turf areas and associated irrigation systems shall be designed so that there is **no off site run-off** of irrigation water.
- All sodded turf areas shall have full head to head coverage irrigation systems. (See Irrigation Design Directives)
- All sodded turf areas shall have a concrete mow curb consisting of a minimum 6" wide x 6" deep concrete mow curb around the entire edge of turf.
- A porous landscape buffer of ¼" minus crushed gravel shall separate all turf areas from all street curbs. The buffer shall be a minimum of 18" wide and 6" deep. The grass shall be separated from the buffer area with the required concrete mow curb. The top surface of the buffer shall be two inches below the top of the mow curb and two inches below the top of street curb.
- All turf playfields and athletic fields greater than one acre shall have an irrigation system water audit performed prior to the installation of the sodded turf. A copy of the water audit shall be submitted to APS Grounds Department for review prior to installation of sodded turf. Any installed irrigation system that does not meet the minimum audit requirements shall be modified and a re-audit performed and approved prior to installation of sodded turf.

Ornamental Native Grass and Native Grass Re-Veg Seeding

- Native grass seeding shall only be used as an ornamental landscape treatment if the areas are irrigated. If permanent fencing is not in place around native grass seed areas, a temporary construction fence shall be required for any native grass seeded areas and this fencing shall remain in place for a period of no less than 12 months (one year) as an establishment period. The cost for this temporary fencing shall be paid for by APS through their on-call fencing contract and the cost of this fencing shall be included in the Landscape Architect's Opinion of Probable Construction Cost estimate for the project.
- Landscape Designs shall only use native Grass Re-Veg Seeding in perimeter areas of a site that are not accessible to students.

Albuquerque Public Schools Landscape and Site Design Directives

Irrigation System Design Directives

- Prior to starting irrigation designs for any new or existing APS district property, Landscape Architects shall contact the APS Water Resource Specialist with APS Grounds Department to discuss the design scope, intent, equipment required, etc.
- All irrigation designs must be approved by the APS Water Resource Specialist prior to bidding or construction.
- The APS Water Resource Specialist must be represented at all pre-construction conferences and must be present for all required irrigation testing and for the final project walk-through meetings.
- The Landscape Architect shall provide the contractor with copies of the APS Irrigation Pressure Test Forms for use during all irrigation inspections. See attached forms.
- All irrigation plans shall meet the requirements of the City of Albuquerque Water Conservation Landscaping and Water Waste Ordinance and the Bernalillo County Water Conservation Ordinance.
- Whenever an irrigation plan involves modification to an existing irrigation system, the existing system shall be modified as necessary to bring the existing system into compliance with the City of Albuquerque and Plumbing Code requirements for backflow prevention.
- Irrigation Controllers shall be Motorola controllers. The specific type of controller and size of controller shall be as selected by the APS Water Resources Specialist. Controllers shall be placed in a fenced enclosure along with the backflow device. Fenced enclosure shall be 6 feet tall with a 3 foot wide gate, and provide 3 feet minimum clearance around controller and backflow preventer. Irrigation controllers shall not be placed inside of buildings or inside walled enclosures.
- An irrigation audit shall be required for all high water use turf areas. High water use turf areas less than one acre are not allowed on APS District Properties.
- Irrigation systems shall be designed so that the system has the capacity to place 2 inches of water per week on high water use turf grasses. This water shall be applied in a six day period during a watering window from 10 pm to 7 am.
- Each irrigation plan shall include a quick coupler valve to be installed at the lowest elevation possible on the irrigation mainline.
- To the extent practical, all irrigation systems shall have a separate water meter. In all cases, irrigation systems with high water turf areas or large planted areas shall have separate water meters.
- Reduced pressure backflow prevention devices installed in an insulated, heated hot box shall be used at all irrigation points of connection. The use of PVB's and AVB's will not be allowed on APS District Properties.

Albuquerque Public Schools Landscape and Site Design Directives

Electrical service shall be extended to the hot box location. To the extent practical. Hot boxes and Irrigation controllers shall be installed in the same location and shall be placed inside a standard APS fenced enclosure. If electrical is not available the APS Water Resources Specialist shall decide on an alternate solution.

- All irrigation plans shall state the following information:
 1. existing static pressure at meter or point of connection
 2. plans shall include a system performance chart that provides the following information for each control valve:
 - a. Control valve number. Irrigation control valves shall be labeled numerically.
 - b. Valve Brand, and model number
 - c. Irrigation head brand and model number.
 - d. Irrigation head nozzle size.
 - e. Irrigation head spacing.
 - f. Irrigation head gallons per minute.
 - g. Total gallons per minute for each valve and for total project.
 - h. Design operating pressure at the head.
 - i. Precipitation rate at design operating pressure.
 - j. Length of time required to operate valves in order to apply 0.33 inches of water.
- Whenever possible, systems shall use pressure regulating valves.
- The following statement shall appear on the face of each irrigation plan. "At the time of final acceptance, the Contractor shall demonstrate to the Landscape Architect and the Owner, that the operating pressure at each head has been adjusted to match the specified design operating pressure for each valve."
- Bubbler heads shall be low flow pressure compensating bubblers.
- **DRIP IRRIGATION SYSTEMS WILL NOT BE USED ON APS DISTRICT PROPERTIES.**
- Irrigation systems on slopes shall be designed so that heads at bottom of slope are on separate valves from heads on side and top of slope.
- Irrigation systems shall be designed so that there is no off site run-off of irrigation water.
- The APS Water Resources Specialist shall determine the selection of all irrigation product brands and models.

Artificial Turf Design Directives

- Any field one acre or less shall be required to have artificial turf installed.
- Slit Film: Use for athletic or play field applications with the following criteria.

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- Smaller field (50,000 square feet or less) such as for elementary schools
 - Where much of the foot traffic will be in flat shoes
 - Baseball/softball fields
 - Multipurpose fields
 - Good in high traffic areas
 - Areas that require G-max testing
- **Monofilament:** Newer turf product than slit film. Aesthetically looks more like real grass than slit film. Use for any athletic or play field application with the following criteria.
 - Fields larger than 30,000 square feet such as sports fields
 - Soccer/football fields
 - Multipurpose fields
 - Recently installed at Wilson and Milne Stadiums
 - Areas that require G-max testing
- **Synthetic Grass Surfacing:** This artificial turf surfacing looks like real grass and should be used primarily in areas such as courtyards, plazas, landscape areas, and areas that don't require G-max testing.
- Specifications for these artificial turfs are included in these standards.
- Irrigation is required where trees or shrubs are planted in or adjacent to the artificial turf.
- Drainage requirements apply for artificial turf areas the same as grass fields.

Albuquerque Public Schools Drainage Design Directives

General Drainage Directives in Landscape/Planting areas

All roof drains shall have a paved swale extending from the point where the roof drain exists to a point where it exits the landscaped area. These swales shall be paved with either concrete, or rip-rap that is embedded in cement. No loose cobble swales shall be allowed on APS District Properties.

All drainage swales that pass through a landscape/planting area shall be paved with either concrete, or rip-rap that is embedded in cement. No loose cobble swales shall be allowed on APS District Properties. The paved swale shall extend from the point where it exits the landscape area.

Water harvesting in landscape areas is encouraged. The depressions for harvesting must be shallow enough to drain quickly upon a storm event and shall not hold water for more than 5,760 minutes or 96 hours. Depressions greater than 18 inches in depth or not draining within 96 hours must be fenced.

Sidewalk culverts shall not be used on APS District Properties. In the event the Design Professional wishes to employ a sidewalk culvert, a formal letter must be submitted to the Staff Architect requesting a "Design Variance", which includes a justification for the request.

Whenever a drainage drop inlet occurs in either a landscape area or future landscape area (bare dirt area) there shall be an apron of cemented rip-rap placed around the entire drop inlet. This rip-rap apron shall be at least 18" wide. This rip-rap apron is in addition to the standard concrete apron and will not be substituted for the standard concrete apron.

Compliance with NPDES Phase II MS4 Rules and Regulations

Albuquerque Public Schools recognizes its responsibility to comply with EPA Rules and Regulation related to storm water quality. The Design Professional shall adhere to the Watershed Based Permit governing APS facilities in Bernalillo County and the City of Albuquerque DPM. A pre-design meeting with the permitting local agency is highly recommended to ensure APS is compliant on all Grading & Drainage permits.

NM 811 METHOD – CONTRACTOR PROCEDURES FOR APS/FDC UTILITY LINE SPOTTING

Contractor Responsibilities:

1. Submit complete electronic (email) request for line spotting a minimum of two working days (48 hours; all time references herein exclude weekends and State holidays) in advance of the planned sub-surface disturbance (including, but not limited to, excavation, trenching, boring, probing or drilling) to New Mexico 811, phone: 811 or website: www.NM811.org . The request must include the following:
 - Individual responsible (Requestor) and company name, email address and phone and fax contact information of the requesting excavator;
 - The associated APS project number APS facility or school name and brief description and the purpose of the type of work to be done.
 - Name and email of the APS Construction Manager.
 - The excavation site must be pre-marked in white. (Required by Statute)
 - An accurate physical description and address of the location and size of the excavation site to be line spotted at this time.
 - Driving instructions if outside Metropolitan Albuquerque.
 - Spotting instructions.
 - Any appropriate remarks regarding access to or hazards at the site.
2. Have a representative available if needed on site to assist line spotters in designation of line spotting area(s) and clarify any instructions upon request from line spotters.
3. Line spots are good for 10 working days. Requests should be limited to the amount of work that can be completed in that time frame. An excavator may only request a Relocate ticket for circumstances beyond their control i.e. inclement weather, site access issues, etc.
4. Do not proceed with any sub-surface disturbance until the 48 hour window has expired and Requestor verifies via phone or website that the ticket has been cleared or marked by all utility operators.
5. Wide Area Locates should not be used unless a specific work plan can be developed and followed by all excavators on site. It will be the General Contractors responsibility to develop and ensure that all sub-contractors, APS and the APS On-Call Subsurface Utility Consultant agree to follow the plan.
6. Design locates will be scheduled as soon as possible but may require more than 48 hours to complete.
7. APS On-Call Subsurface Utility Consultant will update the One-Call Ticket status on the NM811 website prior to expiration.
8. If there are site access issues or other unforeseen delays, APS On-Call Subsurface Utility Consultant will contact the requestor and APS personnel to apprise them of the delay.
9. APS On-Call Subsurface Utility Consultant will email a report to APS Staff Architect and CM or other APS project personnel. This report will contain the information regarding the utilities marked and results of the on-site utility investigation. Photos will be recorded of sites and will be available on request. APS On-Call Subsurface Utility Consultant will not contact requestor directly.

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Irrigation Pressure Test Form Main, Wire & RCV

Page 1 of ____

Date of Testing:

Construction Company Name:

Project Name:

School Name

School Address:

Mainline Test

Visual Inspection Notes:

Start Time

End Time

Pressure

Pressure

Backflow Device Inspection

Type of Device:

Model No.:

Hot Box No.:

Heat Tape installed? Yes No

Heat Tape plugged in? Yes No

RP Test Form Turned In? Yes No

Visual Inspection Notes:

Flow Meter Inspection

Type of Device:

Model No.:

Communication Cable installed? Yes No

Read Switch Test Performed? Yes No

Installed w/ flow in correct direction? Yes No

Visual Inspection Notes:

24 Volt Wire Inspection

Visual Inspection Notes:

APS Representative

Date

Contractor Representative

Date

Albuquerque Public Schools

Irrigation Pressure Test Form Main, Wire & RCV

Page 2 of ____

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

APS Representative

Date

Contractor Representative

Date

Albuquerque Public Schools

Irrigation Pressure Test Form Main, Wire & RCV

Page ____ of ____

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

Remote Control Valve Inspection - Valve# _____

Visual Inspection Notes:

APS Representative

Date

Contractor Representative

Date

SECTION 32 18 16.16

ARTIFICIAL GRASS – SLIT-FILM 2.25”

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish all labor, materials, tools and equipment necessary to install slit-film artificial grass as indicated on the plans and as specified herein; including components and accessories required for a complete installation. Including but not limited to
 - 1. Acceptance of prepared sub-base.
 - 2. Coordination with related trades to ensure a complete, integrated, and timely installation: Aggregate base course, sub-base material (tested for permeability), grading and compacting, piping and drain components (when required); as provided under its respective trade section.

1.2 SUBMITTALS

- A. Substitutions: Other products are acceptable if in compliance with all requirements of these specifications. Submit alternate products to Architect for approval prior to bidding.
 - 1. Provide substantiation that proposed system does not violate any other manufacturer's patents, patents allowed or patents pending.
 - 2. Provide a sample copy of insured, non-prorated warranty and insurance policy information.
- B. Submittal Procedures. Submit for approval prior to fabrication.
- C. Shop Drawings:
 - 1. Indicate field layout; field marking plan and details for the specified sports; i.e., NFHS Football; roll/seaming layout; methods of attachment, field openings and perimeter conditions.
 - 2. Show installation methods and construction indicating field verified conditions, clearances, measurements, terminations, drainage.
 - 3. Provide joint submission with related trades when requested by Architect.
- D. Product Data:
 - 1. Submit manufacturer's catalog cuts, material safety data sheets (MSDS), brochures, specifications; preparation and installation instructions and recommendations; storage, handling requirements and recommendations.
 - 2. Submit fiber manufacturer's name, type of fiber and composition of fiber.
 - 3. Submit data in sufficient detail to indicate compliance with the contract documents.
 - 4. Submit manufacturer's instructions for installation.
 - 5. Submit manufacturer's instructions for maintenance for the proper care and preventative maintenance of the synthetic turf system, including painting and markings.

- E. Samples: Submit samples, 6 x 6 inches, illustrating details of finished product in amounts as required by General Requirements, or as requested by Architect.
- F. Product Certification:
 - 1. Submit manufacturer's certification that products and materials comply with requirements of the specifications.
 - 2. Submit test results indicating compliance with Reference Standards.
- G. Project Record Documents: Record actual locations of seams, drains and other pertinent information in accordance with Specifications and General Requirements.
- H. List of existing installations: Submit list including respective Owner's representative and telephone number.
- I. Warranties: Submit warranty and ensure that forms have been completed in Owner's name and registered with approved manufacturer.
- J. Testing data to the Owner to substantiate that the finished field meets the required shock attenuation, as per ASTM F1936.
- K. Submit Bills of Lading/Material Delivery Receipts for synthetic turf infill materials. Bills of lading shall bear the name of the project/delivery address, quantity of materials delivered, source/location of origin of infill materials and/or manufacturer, and date of delivery.
- L. Testing Certification: Submit certified copies of independent (third-party) laboratory reports on ASTM testing:
 - 1. Pile Height, Face Weight & Total Fabric Weight, ASTM D5848.
 - 2. Primary & Secondary Backing Weights, ASTM D5848.
 - 3. Tuft Bind, ASTM D1335.
 - 4. Grab Tear Strength, ASTM D1682 or D5034.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section. The turf contractor and/or the turf manufacturer:
 - 1. Shall be experienced in the manufacture and installation of slit-film grass turf for a minimum of three years. This includes use of a slit-film fiber, and the installation method.
 - 2. Shall have 100 fields in play for at least two years. Fields shall be 65,000 ft² or more
 - 3. Turf manufacturer shall have installed a minimum of 5 fields that are at least 8 years old, which is equal to the respective warranty period.
 - 4. Shall have a minimum of five installations in the State of New Mexico.
 - 5. Shall have a minimum of 100 installations in North America with a slit-film fiber, each field of 65,000 ft² or more.
 - 6. Shall provide third party certification confirming minimum requirement for tuft bind.
- B. Installer: Company shall specialize in performing the work of this section. The Contractor shall provide competent workmen skilled in this specific type of synthetic grass installation.

1. The designated Supervisory Personnel on the project shall be certified, in writing by the turf manufacturer, as competent in the installation of specified slit-film material, including sewing seams and proper installation of the infill mixture.
 2. Installer shall be certified by the manufacturer and licensed.
 3. The installer supervisor shall have a minimum of 5 years experience as either a construction manager or a supervisor of synthetic turf installations
- C. Pre-Installation Conference: Conduct conference at project site at time to be determined by Architect. Review methods and procedures related to installation including, but not limited to, the following:
1. Inspect and discuss existing conditions and preparatory work performed under other contracts.
 2. In addition to the Contractor and the installer, arrange for the attendance of installers affected by the Work, The Owner's representative, and the Architect.
- D. The Contractor shall verify special conditions required for the installation of the system.
- E. The Contractor shall notify the Architect of any discrepancies.
- 1.4 DELIVERY, STORAGE, AND HANDLING
- A. Comply with Section 01 60 00, Product Requirements.
 - B. Prevent contact with materials that may cause dysfunction.
 - C. Deliver and store components with labels intact and legible.
 - D. Store materials/components in a safe place, under cover, and elevated above grade.
 - E. Protect from damage during delivery, storage, handling and installation. Protect from damage by other trades.
 - F. Inspect all delivered materials and products to ensure they are undamaged and in good condition.
- 1.5 SEQUENCING AND SCHEDULING
- A. Coordinate the Work with installation of work of related trades as the Work proceeds.
 - B. Sequence the Work in order to prevent deterioration of installed system.
- 1.6 WARRANTY AND GUARANTEE
- A. See Section 01780 - Closeout Submittals, For Additional Warranty Requirements.
 - B. The Contractor shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf for a period of eight (8) years from the date of substantial completion. The turf manufacturer must verify that their representative has inspected the installation and that the work conforms to the manufacturer's requirements. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer. The warranty shall be fully third party insured;

prepaid for the entire 8 year term and be non-prorated. The Contractor shall provide a warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's representative. Prior to final payment for the synthetic turf, the Contractor shall submit to owner notification in writing that the field is officially added to the annual policy coverage, guaranteeing the warranty to the Owner. The insurance policy must be underwritten by an "AM Best" A rated carrier and must reflect the following values:

1. Pre-Paid 8-year insured warranty.
 2. Insured Warranty Coverage must be provided in the form of 1 single policy
 3. Maximum per claim coverage amount of at least \$10,000,000.
 4. Minimum of fifteen million dollar (\$15,000,000) annual aggregate
 5. Must cover full 100% replacement value of total square footage installed, minimum of \$7.00 per sq. ft. (in case of complete product failure, which will include removal and disposal of the existing surface)
 6. Policies that include self-insurance or self-retention clauses shall not be considered.
 7. Policy cannot include any form of deductible amount.
 8. Sample policy must be provided at time of bid to prove that policy is in force. A letter from an agent or a sample Certificate of Insurance will not be acceptable.
- C. The artificial grass system must maintain a G-max of less than 200 for the life of the Warranty as per ASTM F1936

1.7 MAINTENANCE SERVICE

- A. Contractor shall train the Owner's facility maintenance staff in the use of the turf manufacturer's recommended maintenance equipment.
- B. Manufacturer must provide maintenance guidelines to the facility maintenance staff.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Approved manufacturers are as follows:
 1. FieldTurf USA
175 N. Industrial Blvd
Calhoun, GA 30701
P: 303-775-6773

Model: XT-57 – with 3 lbs. rubber and 3 lbs. sand

2. ProGrass LLC
960 Penn Avenue, 8th Floor
Pittsburgh, PA 15222
P: 412-434-6003

Model: Infinity 45 – with 3 lbs. rubber and 3 lbs. sand

3. AstroTurf
2680 Abutment Road
Dalton, GA 30721
P: 800-723-8873

Model: XPE 42 – with 3 lbs. rubber and 3 lbs. sand

4. Alternate: FieldTurf Classic HD FTHD-57

2.2 MATERIALS AND PRODUCTS – BASE BID

- A. Artificial grass system materials shall consist of the following:
 1. Carpet made of slit-film polyethylene fibers tufted into a perforated backing.
 2. Infill: Graded sand and rubber crumb that partially covers the carpet.
 3. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass slit-film turf.
- B. The installed artificial grass slit-film turf shall have the following minimum properties:

<u>Standard</u>	<u>Property</u>	<u>Specification</u>
ASTM D1577	Fiber Denier	9,000+
ASTM D3218	Tape Thickness	100 Microns
ASTM D5823	Pile Height	2.25"
ASTM D5793	Stitch Gauge	3/8" - 3/4"
ASTM D5848	Pile Weight	33oz/square yard
ASTM D5848	Primary Backing	7oz/square yard
ASTM D5848	Secondary Backing	16+oz/square yard
ASTM D5848	Total Weight	56oz/square yard
ASTM D1335	Tuft Bind (Without Infill)	8+ lbs
ASTM D5034	Grab Tear (Width)	>200 lbs/force
ASTM D5034	Grab Tear (Length)	>200 lbs/force
ASTM D4491	Carpet Permeability	>40 inches/hour
ASTM F1936	Impact Attenuation (Gmax)	<200
	Infill Material Depth	1.5 inches
	Sand Infill Component	3 lbs/square foot

SBR Rubber Infill Component	3 lbs/square foot
Total Product Weight	920 oz/square yard

- C. Carpet shall consist of slit-film fibers tufted into a primary backing with a secondary backing.
- D. Carpet Rolls shall be 15' wide rolls.
 - 1. Rolls shall be long enough to go from field sideline to sideline.
 - 2. Where the playing field is for football, the perimeter white line shall be tufted into the individual sideline rolls.
- E. Backing:
 - 1. Primary backing to be comprised of two or more layers of polypropylene fabric.
 - 2. Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
 - 3. Perforated (with punched holes), backed carpet are acceptable.
- F. Infill materials shall be approved by the manufacturer.
 - 1. The infill shall consist of a resilient-layered, granular system, comprising selected and graded sand and SBR rubber crumb
 - 2. The sand component of the infill must represent 50% of the total infill, by weight.
- G. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.
- H. Thread for sewing seams of turf shall be as recommended by the synthetic turf manufacturer.
Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

MATERIALS AND PRODUCTS – ALTERNATE

- I. Artificial grass system materials shall consist of the following:
 - 1. Carpet made of slit-film polyethylene fibers tufted into a non-perforated porous backing.
 - 2. Infill: Graded sand and cryogenic rubber crumb that partially covers the carpet.
 - 3. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass slit-film turf.
- J. The installed artificial grass slit-film turf shall have the following properties:

<u>Standard</u>	<u>Property</u>	<u>Specification</u>
ASTM D1577	Fiber Denier	10,800
ASTM D3218	Tape Thickness	130 Microns
ASTM D5823	Pile Height	2.25"
ASTM D5793	Stitch Gauge	3/4"
ASTM D5848	Pile Weight	33oz/square yard

ASTM D5848	Primary Backing	7+oz/square yard
ASTM D5848	Secondary Backing	14+oz/square yard
ASTM D5848	Total Weight	54+oz/square yard
ASTM D1335	Tuft Bind (Without Infill)	8+ lbs
ASTM D5034	Grab Tear (Width)	>200 lbs/force
ASTM D5034	Grab Tear (Length)	>200 lbs/force
ASTM D4491	Carpet Permeability	>40 inches/hour
ASTM F1936	Impact Attenuation (Gmax)	<200
	Infill Material Depth	1.5 inches
	Sand Infill Component	6.2lbs/square foot
	SBR Rubber Infill Component	2.2lbs/square foot
	Total Product Weight	1264oz/sq. yard

- K. Carpet shall consist of slit-film fibers tufted into a primary backing with a secondary backing.
- L. Carpet Rolls shall be 15' wide rolls.
 - 1. Rolls shall be long enough to go from field sideline to sideline.
 - 2. Where the playing field is for football, the perimeter white line shall be tufted into the individual sideline rolls.
- M. Backing:
 - 1. Primary backing to be comprised of two layers of polypropylene fabric.
 - 2. Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
 - 3. Perforated (with punched holes), backed carpet are unacceptable.
- N. Infill materials shall be approved by the manufacturer.
 - 1. The infill shall consist of a resilient-layered, granular system, comprising selected and graded sand and SBR cryogenic rubber crumb
 - 2. The sand component of the infill must represent 50% of the total infill, by weight.
- O. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.
- P. Thread for sewing seams of turf shall be as recommended by the synthetic turf manufacturer.
- Q. Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

2.3 QUALITY CONTROL IN MANUFACTURING

- A. The manufacturer shall own and operate its own manufacturing plant in North America. Both tufting of the field fibers into the backing materials and coating of the turf system must be done in-house by the turf manufacturer. Outsourcing of either is unacceptable.

- B. The manufacturer's full-time in-house certified inspectors shall perform pre-tufting fiber testing on tensile strength, elongation, tenacity, denier, shrinkage, and twist i.e., turns per inch, upon receipt of fiber spools from fiber manufacturer.
- C. The manufacturer shall have its own, in-house laboratory where samples of turf are retained and analyzed, based on standard industry tests, performed by full-time, in-house, certified inspectors.

2.4 QUALITY CONTROL IN FIBER MANUFACTURING

Synthetic turf fiber must perform in a uniform manner or manufacturer quality control issues in the extrusion processes will be suspected. Linear Low Density Polyethylene Polymer ("LLDPE") and batch additives obtained from a reputable manufacturer are required to manufacture superior quality slit-film yarn. The master batch formula must include a UV stabilizer package added to its polymer base.

Adequate UV protection is essential to the long-term durability of any artificial grass fiber. Typically, stabilizer packages for polyethylene fibers have three components that protect the fibers from degradation: (1) primary antioxidants; (2) secondary antioxidants; and (3) UV stabilizers.

2.5 FIELD GROOMER & SWEEPER

- A. Supply field groomer as part of the work.
 - 1. Field Groomer shall include a towing attachment compatible with a field utility vehicle.
 - 2. Field Groomer shall be a FieldTurf GroomRight
 - 3. Field Sweeper shall include a towing attachment compatible with a field utility vehicle.
 - 4. Field Sweeper shall be a FieldTurf SweepRight

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that all sub-base leveling is complete prior to installation.
- B. Installer shall examine the surface to receive the synthetic turf and accept the sub-base planarity in writing prior to the beginning of installation.
 - 1. Acceptance is dependent upon the Owner's test results indicating compaction and planarity are in compliance with manufacturer's specifications.
 - 2. The surface shall be accepted by Installer as "clean" as installation commences and shall be maintained in that condition throughout the process.
- C. Compaction of the aggregate base shall be 95%, in accordance with ASTM D1557 (Modified Proctor procedure); and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 0-1/2" from design grade.

- D. Correct conditions detrimental to timely and proper completion of Work.
- E. Do not proceed until unsatisfactory conditions are corrected.
- F. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Prior to the beginning of installation, inspect the sub-base for tolerance to grade.
- B. Sub-base acceptance shall be subject to receipt of test results (by others) for compaction and planarity that sub-base is in compliance with manufacturer's specifications and recommendations.
- C. Dimensions of the field and locations for markings shall be measured by a registered surveyor to verify conformity to the specifications and applicable standards. A record of the finished field as-built measurements shall be made.
- D. When requested by Architect, installed sub-base shall be tested for porosity prior to the installation of the slit-film turf. A sub base that drains poorly is an unacceptable substrate

3.3 INSTALLATION - GENERAL

- A. The installation shall be performed in full compliance with approved Shop Drawings.
- B. Only trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, topdressing or brushing operations.
- C. The designated Supervisory personnel on the project must be certified, in writing by the turf manufacturer, as competent in the installation of this material, including sewing seams and proper installation of the Infill mixture.
- D. Designs, markings, layouts, and materials shall conform to all currently applicable National Collegiate Athletic Association rules, NFHS rules, and/or other rules or standards that may apply to this type of synthetic grass installation. Designs, markings and layouts shall first be approved by the Architect or Owner in the form of final shop drawings. All markings will be in full compliance with final shop drawings.

3.4 INSTALLATION

- A. Install at location(s) indicated, to comply with final shop drawings, manufacturers'/installer's instructions.
- B. The Contractor shall strictly adhere to specified procedures. Any variance from these requirements shall be provided in writing, by the manufacturer's on-site representative, and submitted to the Architect and/or Owner, verifying that the changes do not in any way affect the Warranty. Infill materials shall be approved by the manufacturer and installed in accordance with the manufacturer's standard procedures.

- C. Carpet rolls shall be installed directly over the properly prepared aggregate base. Extreme care shall be taken to avoid disturbing the aggregate base, both in regard to compaction and planarity.
 - 1. Repair and properly compact any disturbed areas of the aggregate base as recommended by manufacturer
- D. Full width rolls shall be laid out across the field.
 - 1. Turf shall be of sufficient length to permit full cross-field installation from sideline to sideline.
 - 2. No cross seams will be allowed in the main playing area between the sidelines.
 - 3. Each roll shall be attached to the next roll utilizing standard state-of-the-art sewing procedures.
 - 4. When all of the rolls of the playing surface have been installed, the sideline areas shall be installed at right angles to the playing surface.
- E. Artificial turf panel seams shall be sewn. Other than extension inlays, seams secured by other means including gluing are unacceptable. Installation shall be 99% sewn.
 - 1. Minimum gluing will only be permitted to repair problem areas, corner completions, and to cut in any logos or inlaid lines as required by the specifications.
 - 2. Seams shall be flat, tight, and permanent with no separation or fraying.
 - 3. In the case of all lines and logos, turf carpet must be sheared to the backing (do not cut the backing) and adhered using hot melt adhesives.
- F. Infill Materials:
 - 1. Infill materials shall be applied in numerous thin lifts. The turf shall be brushed as the mixture is applied. The infill material shall be installed to a depth determined by the manufacturer.
 - 2. Infill materials shall be installed to fill the voids between the fibers and allow the fibers to remain vertical and non-directional. The Infill installation consists of a base layer of sand followed by a final application of specifically sized rubber that completes the system. The Infill shall be installed to the depth of 1.5”.
- G. Non-tufted or inlaid lines and markings shall be painted in accordance with turf and paint manufacturers’ recommendations. Number of applications will be dependent upon installation and field conditions.
- H. Synthetic turf shall be attached to the perimeter edge detail in accordance with the manufacturer’s standard procedures.
- I. Upon completion of installation, the finished field shall be inspected by the installation crew and an installation supervisor.

3.5 FIELD MARKINGS

- A. Field markings shall be installed in accordance with approved shop drawings. If football is designated as the primary sport, all five yard lines will be tufted-in.
- B. Balance of sports markings will be inlaid or painted in accordance with the Drawings.

- C. Center field logo shall be either painted or inlaid according to artwork indicated on Drawings and in accordance with manufacturer's standard palette of turf colors.
- D. End-zone letters and logos shall be either painted or inlaid according to artwork and fonts indicated on the Drawings, and in accordance with manufacturer's standard palette of turf colors.

3.6 ADJUSTMENT AND CLEANING

- A. Do not permit traffic over unprotected surface.
- B. Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.
- C. All usable remnants of new material shall become the property of the Owner.
- D. The Contractor shall keep the area clean throughout the project and clear of debris.
- E. Surfaces, recesses, enclosures, and related spaces shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

3.7 PROTECTION

- A. Protect installation throughout construction process until date of final completion.

END OF SECTION 32 18 16.16
ARTIFICIAL GRASS – SLIT FILM

SECTION 32 18 16.16

ARTIFICIAL GRASS – MONOFILAMENT 2.25"

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish all labor, materials, tools and equipment necessary to install monofilament artificial grass as indicated on the plans and as specified herein; including components and accessories required for a complete installation. including but not limited to
 - 1. Acceptance of prepared sub-base.
 - 2. Coordination with related trades to ensure a complete, integrated, and timely installation: Aggregate base course, sub-base material (tested for permeability), grading and compacting, piping and drain components (when required); as provided under its respective trade section.

1.2 SUBMITTALS

- A. Substitutions: Other products are acceptable if in compliance with all requirements of these specifications. Submit alternate products to Architect for approval prior to bidding.
 - 1. Provide substantiation that proposed system does not violate any other manufacturer's patents, patents allowed or patents pending.
 - 2. Provide a sample copy of insured, non-prorated warranty and insurance policy information.
- B. Submittals Procedures. Submit for approval prior to fabrication.
- C. Shop Drawings:
 - 1. Indicate field layout; field marking plan and details for the specified sports; i.e., NFHS Football; roll/seaming layout; methods of attachment, field openings and perimeter conditions.
 - 2. Show installation methods and construction indicating field verified conditions, clearances, measurements, terminations, drainage.
 - 3. Provide joint submission with related trades when requested by Architect.
- D. Product Data:
 - 1. Submit manufacturer's catalog cuts, material safety data sheets (MSDS), brochures, specifications; preparation and installation instructions and recommendations; storage, handling requirements and recommendations.
 - 2. Submit fiber manufacturer's name, type of fiber and composition of fiber.
 - 3. Submit data in sufficient detail to indicate compliance with the contract documents.
 - 4. Submit manufacturer's instructions for installation.
 - 5. Submit manufacturer's instructions for maintenance for the proper care and preventative maintenance of the synthetic turf system, including painting and markings.
- E. Samples: Submit samples, 6 x 6 inches, illustrating details of finished product in amounts as

required by General Requirements, or as requested by Architect.

- F. Product Certification:
 - 1. Submit manufacturer's certification that products and materials comply with requirements of the specifications.
 - 2. Submit test results indicating compliance with Reference Standards.
- G. Project Record Documents: Record actual locations of seams, drains and other pertinent information in accordance with Specifications and General Requirements.
- H. List of existing installations: Submit list including respective Owner's representative and telephone number.
- I. Warranties: Submit warranty and ensure that forms have been completed in Owner's name and registered with approved manufacturer.
- J. Testing data to the Owner to substantiate that the finished field meets the required shock attenuation, as per ASTM F1936.
- K. Submit Bills of Lading/Material Delivery Receipts for synthetic turf infill materials. Bills of lading shall bear the name of the project/delivery address, quantity of materials delivered, source/location of origin of infill materials and/or manufacturer, and date of delivery.
- L. Testing Certification: Submit certified copies of independent (third-party) laboratory reports on ASTM testing:
 - 1. Pile Height, Face Weight & Total Fabric Weight, ASTM D5848.
 - 2. Primary & Secondary Backing Weights, ASTM D5848.
 - 3. Tuft Bind, ASTM D1335.
 - 4. Grab Tear Strength, ASTM D1682 or D5034.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section. The turf contractor and/or the turf manufacturer:
 - 1. Shall be experienced in the manufacture and installation of monofilament grass turf for a minimum of three years. This includes use of a monofilament fiber, and the installation method.
 - 2. Shall have 100 fields in play for at least two years. Fields shall be 65,000 ft² or more
 - 3. Turf manufacturer shall have installed a minimum of 5 fields that are at least 8 years old, which is equal to the respective warranty period.
 - 4. Shall have a minimum of 5 installations in the State of New Mexico.
 - 5. Shall have a minimum of 100 installations in North America with a monofilament fiber, each field of 65,000 ft² or more.
 - 6. Shall provide third party certification confirming minimum requirement for tuft bind.
- B. Installer: Company shall specialize in performing the work of this section. The Contractor shall provide competent workmen skilled in this specific type of synthetic grass installation.
 - 1. The designated Supervisory Personnel on the project shall be certified, in writing by

- the turf manufacturer, as competent in the installation of specified monofilament material, including sewing seams and proper installation of the infill mixture.
 - 2. Installer shall be certified by the manufacturer and licensed.
 - 3. The installer supervisor shall have a minimum of 5 years experience as either a construction manager or a supervisor of synthetic turf installations
- C. Pre-Installation Conference: Conduct conference at project site at time to be determined by Architect. Review methods and procedures related to installation including, but not limited to, the following:
- 1. Inspect and discuss existing conditions and preparatory work performed under other contracts.
 - 2. In addition to the Contractor and the installer, arrange for the attendance of installers affected by the Work, The Owner's representative, and the Architect.
- D. The Contractor shall verify special conditions required for the installation of the system.
- E. The Contractor shall notify the Architect of any discrepancies.
- 1.4 DELIVERY, STORAGE, AND HANDLING
- A. Prevent contact with materials that may cause dysfunction.
 - B. Deliver and store components with labels intact and legible.
 - C. Store materials/components in a safe place, under cover, and elevated above grade.
 - D. Protect from damage during delivery, storage, handling and installation. Protect from damage by other trades.
 - E. Inspect all delivered materials and products to ensure they are undamaged and in good condition.
- 1.5 SEQUENCING AND SCHEDULING
- A. Coordinate the Work with installation of work of related trades as the Work proceeds.
 - B. Sequence the Work in order to prevent deterioration of installed system.
- 1.6 WARRANTY AND GUARANTEE
- A. The Contractor shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf for a period of eight (8) years from the date of substantial completion. The turf manufacturer must verify that their representative has inspected the installation and that the work conforms to the manufacturer's requirements. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer. The warranty shall be fully third party insured; prepaid for the entire 8 year term and be non-prorated. The Contractor shall provide a warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's representative. Prior to

final payment for the synthetic turf, the Contractor shall submit to owner notification in writing that the field is officially added to the annual policy coverage, guaranteeing the warranty to the Owner. The insurance policy must be underwritten by an "AM Best" A rated carrier and must reflect the following values:

1. Pre-Paid 8-year insured warranty.
 2. Insured Warranty Coverage must be provided in the form of 1 single policy
 3. Maximum per claim coverage amount of at least \$10,000,000.
 4. Minimum of fifteen million dollar (\$15,000,000) annual aggregate
 5. Must cover full 100% replacement value of total square footage installed, minimum of \$7.00 per sq. ft. (in case of complete product failure, which will include removal and disposal of the existing surface)
 6. Policies that include self-insurance or self-retention clauses shall not be considered.
 7. Policy cannot include any form of deductible amount.
 8. Sample policy must be provided at time of bid to prove that policy is in force. A letter from an agent or a sample Certificate of Insurance will not be acceptable.
- C. The artificial grass system must maintain a G-max of less than 200 for the life of the Warranty as per ASTM F1936

1.7 MAINTENANCE SERVICE

- A. Contractor shall train the Owner's facility maintenance staff in the use of the turf manufacturer's recommended maintenance equipment.
- B. Manufacturer must provide maintenance guidelines to the facility maintenance staff.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Approved manufacturers are as follows:

1. FieldTurf USA
175 N. Industrial Blvd
Calhoun, GA 30701
P: 303-775-6773

Model: FieldTurf XM6-57

2. ProGrass LLC
960 Penn Avenue, 8th Floor
Pittsburgh, PA 15222
P: 412-434-6003

Model: GameTurf – with 3lbs rubber, 3lbs sand

2. Shaw Sports Turf
185 South Industrial Blvd
Calhoun, GA 30701
P: 770-795-1159

Model: Shaw Powerblade HP – with 3lbs rubber, 3lbs sand

2.2 MATERIALS AND PRODUCTS – BASE BID

- A. Artificial grass system materials shall consist of the following:
 1. Carpet made of monofilament polyethylene fibers tufted into a perforated backing.
 2. Infill: Graded sand and rubber crumb that partially covers the carpet.
 3. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass monofilament turf.
- B. The installed artificial grass monofilament turf shall have the following minimum properties:

<u>Standard</u>	<u>Property</u>	<u>Specification</u>
ASTM D1577	Fiber Denier	9,000+
ASTM D3218	Tape Thickness	200 Microns
ASTM D5823	Pile Height	2.25"
ASTM D5793	Stitch Gauge	3/8" - 3/4"
ASTM D5848	Pile Weight	33oz/square yard
ASTM D5848	Primary Backing	7oz/square yard
ASTM D5848	Secondary Backing	16+oz/square yard
ASTM D5848	Total Weight	56oz/square yard
ASTM D1335	Tuft Bind (Without Infill)	8+ lbs
ASTM D5034	Grab Tear (Width)	>200 lbs/force
ASTM D5034	Grab Tear (Length)	>200 lbs/force
ASTM D4491	Carpet Permeability	>40 inches/hour
ASTM F1936	Impact Attenuation (Gmax)	<200
	Infill Material Depth	1.5 inches
	Sand Infill Component	3lbs/square foot
	SBR Rubber Infill Component	3lbs/square foot
	Total Product Weight	920oz/square yard

- C. Carpet shall consist of monofilament fibers tufted into a primary backing with a secondary backing.
- D. Carpet Rolls shall be 15' wide rolls.

1. Rolls shall be long enough to go from field sideline to sideline.
 2. Where the playing field is for football, the perimeter white line shall be tufted into the individual sideline rolls.
- E. Backing:
1. Primary backing to be comprised of two or more layers of polypropylene fabric.
 2. Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
 3. Perforated (with punched holes), backed carpet are acceptable.
- F. Infill materials shall be approved by the manufacturer.
1. The infill shall consist of a resilient-layered, granular system, comprising selected and graded sand and SBR rubber crumb
 2. The sand component of the infill must represent 50% of the total infill, by weight.
- G. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.
- H. Thread for sewing seams of turf shall be as recommended by the synthetic turf manufacturer.

Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

MATERIALS AND PRODUCTS – ALTERNATE

- I. Artificial grass system materials shall consist of the following:
1. Carpet made of monofilament polyethylene fibers tufted into a non-perforated porous backing.
 2. Infill: Graded sand and cryogenic rubber crumb that partially covers the carpet.
 3. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass monofilament turf.
- J. The installed artificial grass monofilament turf shall have the following properties:

<u>Standard</u>	<u>Property</u>	<u>Specification</u>
ASTM D1577	Fiber Denier	10,800
ASTM D3218	Tape Thickness	235 Microns
ASTM D5823	Pile Height	2.25"
ASTM D5793	Stitch Gauge	3/4"
ASTM D5848	Pile Weight	36oz/square yard
ASTM D5848	Primary Backing	7oz/square yard
ASTM D5848	Secondary Backing	14+oz/square yard
ASTM D5848	Total Weight	57oz/square yard
ASTM D1335	Tuft Bind (Without Infill)	8+ lbs
ASTM D5034	Grab Tear (Width)	>200 lbs/force
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ASTM D4491	Carpet Permeability	>40 inches/hour

ASTM F1936	Impact Attenuation (Gmax)	<200
	Infill Material Depth	1.5 inches
	Sand Infill Component	6.2lbs/square foot
	SBR Rubber Infill Component	2.2lbs/square foot
	Total Product Weight	1267oz/sq. yard

- K. Carpet shall consist of ridged monofilament fibers tufted into a primary backing with a secondary backing.
- L. Carpet Rolls shall be 15' wide rolls.
 - 1. Rolls shall be long enough to go from field sideline to sideline.
 - 2. Where the playing field is for football, the perimeter white line shall be tufted into the individual sideline rolls.
- M. Backing:
 - 1. Primary backing to be comprised of two or more layers of polypropylene fabric.
 - 2. Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
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- B. The manufacturer's full-time in-house certified inspectors shall perform pre-tufting fiber testing on tensile strength, elongation, tenacity, denier, shrinkage, and twist i.e., turns per inch, upon receipt of fiber spools from fiber manufacturer.
- C. The manufacturer shall have its own, in-house laboratory where samples of turf are retained and analyzed, based on standard industry tests, performed by full-time, in-house, certified inspectors.

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Synthetic turf fiber must perform in a uniform manner or manufacturer quality control issues in the extrusion processes will be suspected. Linear Low Density Polyethylene Polymer ("LLDPE") and batch additives obtained from a reputable manufacturer are required to manufacture superior quality monofilament yarn. The master batch formula must include a UV stabilizer package added to its polymer base.

Adequate UV protection is essential to the long-term durability of any artificial grass fiber. Typically, stabilizer packages for polyethylene fibers have three components that protect the fibers from degradation: (1) primary antioxidants; (2) secondary antioxidants; and (3) UV stabilizers.

2.5 FIELD GROOMER & SWEEPER

- D. Supply field groomer as part of the work.
 - 1. Field Groomer shall include a towing attachment compatible with a field utility vehicle.
 - 2. Field Groomer shall be a FieldTurf GroomRight
 - 3. Field Sweeper shall include a towing attachment compatible with a field utility vehicle.
 - 4. Field Sweeper shall be a FieldTurf SweepRight

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that all sub-base leveling is complete prior to installation.
- B. Installer shall examine the surface to receive the synthetic turf and accept the sub-base planarity in writing prior to the beginning of installation.
 - 1. Acceptance is dependent upon the Owner's test results indicating compaction and planarity are in compliance with manufacturer's specifications.
 - 2. The surface shall be accepted by Installer as "clean" as installation commences and shall be maintained in that condition throughout the process.
- C. Compaction of the aggregate base shall be 95%, in accordance with ASTM D1557 (Modified Proctor procedure); and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 0-1/2" from design grade.
- D. Correct conditions detrimental to timely and proper completion of Work.
- E. Do not proceed until unsatisfactory conditions are corrected.
- F. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Prior to the beginning of installation, inspect the sub-base for tolerance to grade.

- B. Sub-base acceptance shall be subject to receipt of test results (by others) for compaction and planarity that sub-base is in compliance with manufacturer's specifications and recommendations.
- C. Dimensions of the field and locations for markings shall be measured by a registered surveyor to verify conformity to the specifications and applicable standards. A record of the finished field as-built measurements shall be made.
- D. When requested by Architect, installed sub-base shall be tested for porosity prior to the installation of the half-diamond monofilament turf. A sub base that drains poorly is an unacceptable substrate

3.3 INSTALLATION - GENERAL

- A. The installation shall be performed in full compliance with approved Shop Drawings.
- B. Only trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, topdressing or brushing operations.
- C. The designated Supervisory personnel on the project must be certified, in writing by the turf manufacturer, as competent in the installation of this material, including sewing seams and proper installation of the Infill mixture.
- D. Designs, markings, layouts, and materials shall conform to all currently applicable National Collegiate Athletic Association rules, NFHS rules, and/or other rules or standards that may apply to this type of synthetic grass installation. Designs, markings and layouts shall first be approved by the Architect or Owner in the form of final shop drawings. All markings will be in full compliance with final shop drawings.

3.4 INSTALLATION

- A. Install at location(s) indicated, to comply with final shop drawings, manufacturers'/installer's instructions.
- B. The Contractor shall strictly adhere to specified procedures. Any variance from these requirements shall be provided in writing, by the manufacturer's on-site representative, and submitted to the Architect and/or Owner, verifying that the changes do not in any way affect the Warranty. Infill materials shall be approved by the manufacturer and installed in accordance with the manufacturer's standard procedures.
- C. Carpet rolls shall be installed directly over the properly prepared aggregate base. Extreme care shall be taken to avoid disturbing the aggregate base, both in regard to compaction and planarity.
 - 1. Repair and properly compact any disturbed areas of the aggregate base as recommended by manufacturer
- D. Full width rolls shall be laid out across the field.
 - 1. Turf shall be of sufficient length to permit full cross-field installation from sideline to sideline.

2. No cross seams will be allowed in the main playing area between the sidelines.
 3. Each roll shall be attached to the next roll utilizing standard state-of-the-art sewing procedures.
 4. When all of the rolls of the playing surface have been installed, the sideline areas shall be installed at right angles to the playing surface.
- E. Artificial turf panel seams shall be sewn. Other than extension inlays, seams secured by other means including gluing are unacceptable. Installation shall be 99% sewn.
1. Minimum gluing will only be permitted to repair problem areas, corner completions, and to cut in any logos or inlaid lines as required by the specifications.
 2. Seams shall be flat, tight, and permanent with no separation or fraying.
 3. In the case of all lines and logos, turf carpet must be sheared to the backing (do not cut the backing) and adhered using hot melt adhesives.
- F. Infill Materials:
1. Infill materials shall be applied in numerous thin lifts. The turf shall be brushed as the mixture is applied. The infill material shall be installed to a depth determined by the manufacturer.
 2. Infill materials shall be installed to fill the voids between the fibers and allow the fibers to remain vertical and non-directional. The Infill installation consists of a base layer of sand followed by a final application of specifically sized rubber that completes the system. The Infill shall be installed to the depth of 1.5”.
- G. Non-tufted or inlaid lines and markings shall be painted in accordance with turf and paint manufacturers’ recommendations. Number of applications will be dependent upon installation and field conditions.
- H. Synthetic turf shall be attached to the perimeter edge detail in accordance with the manufacturer’s standard procedures.
- I. Upon completion of installation, the finished field shall be inspected by the installation crew and an installation supervisor.

3.5 FIELD MARKINGS

- A. Field markings shall be installed in accordance with approved shop drawings. If football is designated as the primary sport, all five yard lines will be tufted-in.
- B. Balance of sports markings will be inlaid or painted in accordance with the Drawings.
- C. Center field logo shall be either painted or inlaid according to artwork indicated on Drawings and in accordance with manufacturer’s standard palette of turf colors.
- D. End-zone letters and logos shall be either painted or inlaid according to artwork and fonts indicated on the Drawings, and in accordance with manufacturer’s standard palette of turf colors.

3.6 ADJUSTMENT AND CLEANING

- A. Do not permit traffic over unprotected surface.
- B. Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.
- C. All usable remnants of new material shall become the property of the Owner.
- D. The Contractor shall keep the area clean throughout the project and clear of debris.
- E. Surfaces, recesses, enclosures, and related spaces shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

3.7 PROTECTION

- A. Protect installation throughout construction process until date of final completion.

END OF SECTION 32 18 16.16
ARTIFICIAL GRASS – MONOFILAMENT 2.25”

SECTION 32 18 13

SYNTHETIC GRASS SURFACING

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish all labor, materials, tools and equipment necessary to install synthetic grass surfacing system as indicated on the plans and as specified herein; including components and accessories required for a complete installation, including but not limited to:
 - 1. Acceptance of prepared sub-base.
 - 2. Coordination with related trades to ensure a complete, integrated, and timely installation: aggregate base course, sub-base material (tested for permeability), grading and compacting, piping and drain components (when required); as provided under its respective trade section.

1.2 REFERENCE STANDARDS

- A. ASTM – American Society for Testing and Materials.
 - 1. D1577 - Standard Test Method for Linear Density of Textile Fiber.
 - 2. D5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering.
 - 3. D1338 - Standard Test Method for Tuft Bind of Pile Yarn Floor Covering.
 - 4. D1682 - Standard Method of Test for Breaking Load and Elongation of Textile Fabrics.
 - 5. D5034 - Standard Test Method of Breaking Strength and Elongation of Textile Fabrics (Grab Test).
 - 6. D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - 7. D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.

1.3 PERFORMANCE REQUIREMENTS

- A. Completed synthetic grass surfacing system shall be capable of meeting the following performance requirements:
 - 1. ASTM D4491: Water permeability test. Synthetic grass surface shall drain at a rate of 250 inches or more, of water per hour.
 - 2. ASTM D1338: Tuft bind. Synthetic grass surfacing shall have a tuft bind, without infill material of 8 pounds or more.

1.4 SUBMITTALS

- A. Substitutions: Other products are acceptable if in compliance with all requirements of these specifications. Submit alternate products to Architect for approval prior to

bidding.

1. Provide substantiation that proposed system does not violate any other manufacturer's patents, patents allowed or patents pending.
 2. Provide a sample copy of insured, non-prorated warranty and insurance policy information.
- B. Submit for approval prior to fabrication.
- C. Product Data:
1. Submit manufacturer's catalog cuts, material safety data sheets (MSDS), brochures, specifications; preparation and installation instructions and recommendations.
 2. Submit fiber manufacturer's name, type of fiber and composition of fiber.
 3. Submit data in sufficient detail to indicate compliance with the contract documents.
 4. Submit manufacturer's instructions for installation.
- D. Samples: Submit samples, illustrating details of finished product in amounts as required by General Requirements, or as requested by Architect.
- E. List of existing installations: Submit list including respective Owner's representative and telephone number.
- F. Warranties: Submit warranty and ensure that forms have been completed in Owner's name and registered with approved manufacturer.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Engaged in manufacturing synthetic grass surfacing products for a minimum of fifteen (15) years.
1. The Manufacturer shall be experienced in the manufacturing and installation of specified type of synthetic grass surfacing system. This includes use of a ridged monofilament fiber, texturized monofilament fiber, backing, the backing coating, and the installation method.
 2. The Manufacturer shall own and operate its own manufacturing plant. Manufacturing the fiber, tufting of the fibers into the backing materials and coating of the synthetic grass system must be done in-house by manufacturer.
 3. The Manufacturer must hold ISO 9001, ISO 14001 and OHSAS 18001 certifications demonstrating its manufacturing efficiency with regards to quality, environment and safety management systems.
- B. Installer/Contractor Qualifications: Company shall specialize in performing the work of this section.
1. The Company shall provide competent workmen skilled in this specified type of synthetic grass system installation.
 2. The designated Supervisory Personnel on the project shall be certified, in writing by the manufacturer, as competent in the installation of specified type of synthetic grass system, including gluing seams and proper installation of the infill material.

3. The Company shall be certified by the manufacturer and licensed (if required).
- C. Pre-Installation Conference: Conduct conference at project site at time to be determined by Architect. Review methods and procedures related to installation including, but not limited to, the following:
 1. Inspect and discuss existing conditions and preparatory work performed under other contracts.
 2. In addition to the Contractor and the installer, arrange for the attendance of installers affected by the Work, The Owner's representative, and the Architect.
- D. The Installer/Contractor shall verify special conditions required for the installation of the synthetic grass system if required.
- E. The Installer/Contractor shall notify the Architect of any discrepancies.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store components with labels intact and legible.
- B. Store materials/components in a secure manner, under cover and elevated above grade.
- C. Protect from damage during storage, handling and installation. Protect from damage by other trades.
- D. Inspect all delivered materials and products to ensure they are undamaged and in good condition.

1.7 SEQUENCING AND SCHEDULING

- A. Coordinate the Work with installation of work of related trades as the Work proceeds.
- B. Sequence the Work in order to prevent deterioration of installed system.

1.8 WARRANTY

- A. Warranty Requirements.
- B. The Installer/Contractor shall provide a warranty to the Owner that covers defects in materials and workmanship of the synthetic grass product for a period of eight (8) years from the date of substantial completion. The synthetic grass manufacturer must verify that their representative has inspected the installation and that the work conforms to the manufacturer's requirements. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer. The warranty shall be fully third party insured; pre-paid for the entire 8 year term and be non-prorated. The Installer/Contractor shall provide a warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's representative. The insurance policy must be underwritten by an "AM Best" A rated carrier and must reflect the following values:

1. Pre-Paid 8-year insured warranty.
2. Maximum per claim coverage amount of \$32,000,000.
3. Minimum of thirty-two million dollar (\$32,000,000) annual aggregate.
4. Must cover full 100% replacement value of total square footage installed.
5. Policies that include self-insurance or self-retention clauses shall not be considered.
6. Policy cannot include any form of deductible amount.
7. Sample policy must be provided at time of bid to prove that policy is in force. A letter from an agent or a sample Certificate of Insurance will not be acceptable.

PART 2 - PRODUCTS

2.1 MANUFACTURER AND DISTRIBUTOR

- A. Approved Manufacturer: FieldTurf USA, Inc. 175 N. Industrial Blvd, Calhoun, GA 30701
- B. Approved Distributor: Westwind Landscape Construction, Inc. 2739 Vassar Pl. NE Alb., NM 87107

2.2 MATERIALS AND PRODUCTS

- A. Synthetic grass surfacing system shall consist of the following:
 1. Synthetic grass surfacing made with a combination of ridged monofilament polyethylene fibers and texturized monofilament fibers, tufted into a fibrous, non-perforated, porous backing.
 2. Infill: Graded dust-free silica sand and cryogenic rubber crumb that partially covers the synthetic grass. Graded dust-free acrylic coated silica sand may be substituted for silica sand as requested by Architect.
 3. Glue, thread, seaming fabric and other materials used to install and mark the synthetic grass.
- B. Synthetic grass surfacing system shall have the following properties:

<u>Standard</u>	<u>Property</u>	<u>Specification</u>
ASTM D1577	Fiber Denier	10800
	HALS UV Stabilizer	10000 ppm
	Inner Face Support Ridges	≥6
	Outer Face Support Ridges	≥10
ASTM D1577	Secondary Fiber Denier	5000

ASTM D5823	Pile Height	1.625"
ASTM D5793	Stitch Gauge	3/8"
ASTM D5848	Pile Weight	65 oz/square yard
ASTM D5848	Primary Backing	7oz/square yard
ASTM D5848	Secondary Backing	22 oz/square yard
ASTM D5848	Total Weight	94 oz/square yard
ASTM D1338	Tuft Bind (Without Infill)	8+ lbs
ASTM D4491	Turf Permeability	250 inches/hour
	Infill Material Depth	1 inch
	Infill Component	2.75 lbs/square foot
	Total Product Weight	490 oz/square yard

- C. Synthetic grass surfacing product shall consist of ridged monofilament fibers and texturized monofilament fibers tufted into a primary backing with a secondary backing.
- D. Backing:
 - 1. Primary backing shall be a double-layered polypropylene fabric treated with UV inhibitors.
 - 2. Secondary backing shall consist of an application of porous urethane to permanently lock the fiber tufts in place.
 - 3. Perforated (with punched holes), backed turf is unacceptable.
 - 4. Turf with attached scrim in lieu of porous urethane is unacceptable.
- E. Primary fiber shall be 10,800 denier, low friction, and UV-resistant fiber measuring not less than 1.625 inches high. Secondary fiber shall be 5000 denier.
- F. Infill materials shall be approved by the manufacturer.
 - 1. Infill shall consist of graded dust-free silica sand. Graded dust-free acrylic coated silica sand may be substituted for silica sand as requested by Architect.
- G. Glue and seaming fabric, for seaming of synthetic grass shall be as recommended by the synthetic grass manufacturer.

2.3 QUALITY CONTROL IN MANUFACTURING

- A. The manufacturer shall own and operate its own manufacturing plant in North America. Both tufting of the fibers into the backing materials and coating of the turf system must be done in-house by the synthetic grass manufacturer. Outsourcing of either is unacceptable.
- B. The manufacturer shall have full-time certified in-house inspectors at their manufacturing plant that are experts with industry standards.
- C. The manufacturer's full-time in-house certified inspectors shall perform pre-tufting fiber testing on tensile strength, elongation, tenacity, and denier, upon receipt of fiber spools from fiber manufacturer.
- D. Primary backing shall be inspected by the manufacturer's full-time certified in-house inspectors before tufting begins.

- E. The manufacturer's full-time in-house certified inspectors shall verify "pick count", yarn density in relation to the backing, to ensure the accurate amount of face yarn per square inch.
- F. The manufacturer's full-time, in-house, certified inspectors shall perform product inspections at all levels of production including during the tufting process and at the final stages before the synthetic grass is loaded onto the truck for delivery.
- G. The manufacturer shall have its own, in-house laboratory where samples of synthetic grass are retained and analyzed, based on standard industry tests, performed by full-time, in-house, certified inspectors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that all sub-base leveling is complete prior to installation.
- B. Installer/Contractor shall examine the surface to receive the synthetic grass and accept the sub-base planarity in writing prior to the beginning of installation.
 - 1. Acceptance is dependent upon the Owner's test results indicating compaction and planarity are in compliance with manufacturer's specifications.
 - 2. The surface shall be accepted by Installer as "clean" as installation commences and shall be maintained in that condition throughout the process.
- C. Compaction of the aggregate base shall be 95%, in accordance with ASTM D1557 (Modified Proctor procedure); and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 0-1/2 inch from design grade.
- D. Correct conditions detrimental to timely and proper completion of Work.
- E. Do not proceed until unsatisfactory conditions are corrected.
- F. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Prior to the beginning of installation, inspect the sub-base for tolerance to grade.
- B. Sub-base acceptance shall be subject to receipt of test results (by others) for compaction and planarity that sub-base is in compliance with manufacturer's specifications and recommendations.
- C. When requested by Architect, installed sub-base shall be tested for porosity prior to the installation of the synthetic grass system. A sub base that drains poorly is an unacceptable substrate.

3.3 INSTALLATION

- A. The installation shall be performed in full compliance with approved Shop Drawings.

- B. Only trained technicians, skilled in the installation of synthetic grass systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, top-dressing or brushing operations.
- C. The designated Supervisory personnel on the project must be certified, in writing by the manufacturer, as competent in the installation of this material, including gluing seams and proper installation of the Infill material.
- D. Install at location(s) indicated, to comply with final shop drawings, manufacturers'/installer's instructions.
- E. The Installer/Contractor shall strictly adhere to specified procedures. Any variance from these requirements shall be provided in writing, by the manufacturer's on-site representative, and submitted to the Architect and/or Owner, verifying that the changes do not in any way affect the Warranty. Infill materials shall be approved by the manufacturer and installed in accordance with the manufacturer's standard procedures.
- F. Synthetic grass system shall be installed directly over the properly prepared aggregate base. Extreme care shall be taken to avoid disturbing the aggregate base, both in regard to compaction and planarity.
 - 1. Repair and properly compact any disturbed areas of the aggregate base as recommended by manufacturer.
 - 2. Seams shall be flat, tight, and permanent with no separation or fraying.
- G. Infill Materials:
 - 1. Infill materials shall be applied in thin lifts. The turf shall be brushed as the material is applied. The infill material shall be installed to a depth determined by the manufacturer.
 - 2. Infill material shall be installed in a systematic order.
 - 3. Infill materials shall be installed to fill the voids between the fibers and allow the fibers to remain vertical and non-directional. The Infill installation consists of graded dust-free silica sand. Graded dust-free acrylic coated silica sand may be substituted for silica sand as requested by Architect.
 - 4. The Infill materials shall be installed to a depth of 1". Infill density shall consist of 2.75 pounds of graded silica sand per square foot. The Infill shall be placed so that there is a void of .625" to the top of the fibers.
 - 5. The Installer/Contractor shall keep area clean throughout the project and clear of debris. Upon completion of installation, the finished project shall be inspected by the installation crew and an installation supervisor.

3.4 PROTECTION

- A. Protect completed synthetic grass surfacing system throughout construction process until project completed.

END OF SECTION 32 18 13

SYNTHETIC GRASS SURFACING

SECTION 32 31 13

CHAIN LINK FENCING AND GATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish all labor, materials, tools and equipment necessary to install chain link fence and gates as indicated on the plans and as specified herein; including components and accessories required for a complete installation.

1.2 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain link fences.
 - 1. Fence posts, rails and fittings.
 - 2. Chain link fabric, reinforcements, and attachments.
- B. Shop Drawings: Show locations of fences, posts, rails, tension wires, details of extended posts, extension arms, latches, hardware and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, sections, details of post anchorage, attachment, bracing, and other required installation and operational clearances.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed chain link fences similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for chain link fences shown in the Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 CHAIN LINK FABRIC

- B. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle, or as indicated in the drawings. Comply with ASTM A 392, CLFMI CLF 2445, and requirements indicated below.
- C. Steel Wire Fabric: Metallic-coated 9 gauge wire.
 - 1. Mesh Size: 2" Diamond mesh
 - 2. Weight of Metallic (Zinc) Coating: ASTM A 392, Type II, Class 1, 1.2 ounce/square foot with zinc coating applied before weaving.

3. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.
- D. Selvage: Knuckled top and bottom, or as indicated in the drawings.
- E. Wind Screen, Provide in locations if indicated on drawings or directed by APS personnel. Typical material to be ci-Permatex black mesh vinyl coated polyester fabric, with 85% opacity manufactured by ci Fabrics 800-622-7169 or approved substitution. Fence structure must accommodate the additional wind pressure the wind screen creates.

1.5 FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 for framing and the following:
 1. Group IA, round steel pipe, Schedule 40.
 2. Fence Height: As indicated in the drawings or as directed by APS personnel.
 3. Strength Requirements: Light industrial according to ASTM F 1043.
 4. Post Size and Thickness: According to ASTM F 1043.
 - a. Top Rail: 1-5/8 inches O.D., unless otherwise noted in the drawings.
 - b. Line Post: 2-3/8 inches O.D., unless otherwise noted in the drawings.
 - c. End, Corner and Pull Post: 2-7/8 inches O.D., 4.64 pounds per foot, unless otherwise noted in the drawings.
 5. Coating for Steel Framing: Type C, Zn-5-A1-MM alloy, consisting of not less than 1.8 ounce/square foot coating.

1.6 TENSION WIRE

- A. General: Provide horizontal tension wire extended along bottom of fence fabric.
- B. Metallic-Coated Steel Wire: 7 gauge, marcelled tension wire complying with ASTM A 817, ASTM A 824, and Type II, zinc coated (galvanized) by hot-dip process, with matching chain link fabric coating weight.

2.4 FITTINGS

- A. General: Comply with ASTM F 626.
- B. Post and Line Caps: Provide for each post.
- C. Rail and Brace Ends: Attach rails securely to each corner, pull, and end post with fitting or by welding as indicated in the drawings or as directed by APS personnel.
- D. Rail Fittings: provide the following where indicated in the drawings or directed by APS personnel:
 1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches long.

2. Rail Clamps: Line and corner boulevard clamps for connecting rails in the fence line-to-line posts.
- E. Tension and Brace Bands: Pressed steel.
- F. Tension Bars: Steel, length not less than 2 inches shorter than full height of chain link fabric. Provide one bar for end post, and two for each corner and pull post, unless fabric is integrally woven into post.
- G. Tie Wires, Clips, and Fasteners: Standard round galvanized wire ties for attaching chain link fabric to posts, rails, and frames.

2.5 GATE MATERIALS

- A. Chain Link Fabric, Framing, and Fittings: as specified in this Section.
- B. Hardware:
 1. Latches: Provide latches as indicated in the drawings or as directed by APS personnel permitting operation from both sides of gate.
 2. At swing-type gates provide Manufacturer recommended hinges.
- C. Gate frame and railings shall be welded as shown in the drawings.

2.6 MISCELLANEOUS MATERIALS

- A. Cast-in-place Concrete: Portland cement complying with ASTM C 150, Type I aggregates complying with ASTM C 33, and potable water for ready-mixed concrete complying with ASTM C 94/C 94M.
- B. Non-shrink, Nonmetallic Grout: Premixed, factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by Manufacturer, for exterior applications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance.
 1. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.
 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines, gates and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION, GENERAL

- A. Install chain link fencing to comply with ASTM F 567 and more stringent requirements specified.
- B. Install fencing on established boundary lines inside property line.

3.4 CHAIN LINK FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacing shown in the drawings or as directed by APS personnel, in firm, undisturbed soil.
- B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
 - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect above ground portion of posts from concrete splatter.
- C. Terminal Posts: Locate terminal end, corner, and gate at 10 feet o.c. or as shown in documents or do as directed by APS personnel.
- D. Line Posts: Space line posts uniformly at 10 feet o.c. or as shown in the drawings.
- E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing.
 - 1. Install braces at end and gate posts and at both sides of corner and pull posts.
 - 2. Install intermediate rails with fittings or by welding as shown in the drawings.
- F. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten Fabric to tension wire with 0.120-inch diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated in the drawings before stretching fabric.
 - 1. Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.
- G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install with fittings or by welding as shown in the drawings.
- H. Chain Link Fabric: Fabric for athletic fields shall be applied to the inside of posts adjacent to the field of play. Leave 1 inch between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension

after pulling force is released.

- I. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull and gate posts with tension bands spaced not more than 15 inches o.c.
- J. Tie Wire: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
 - 1. Maximum Spacing: Tie fabric to line posts and top rail at 12 inches o.c. and to braces at 24 inches o.c.
- K. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.5 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

END OF SECTION 32 31 13
CHAIN LINK FENCING AND GATES

SECTION 32 80 00

IRRIGATION SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY:

- A. The work consists of installing a complete underground sprinkler system as shown on the Drawings and as specified hereafter. The Contractor performing this work shall furnish all labor, equipment, materials and permits necessary for the completion of the system, except those specified to be furnished by others. Unless otherwise specified or indicated on the Drawings, the construction of the sprinkler system shall include the furnishing, installing and testing of all pipe, fittings, valves, heads, controllers, wires, air release and vacuum valves, backflow preventers, inlet and discharge piping, manual drain valves, valve boxes, water meters, and all other components pertinent to the plans and specifications of this system. The Contractor shall perform all trenching, excavating, boring, backfilling, compacting, concrete pouring, electrical work, welding, and any other work necessary for the completion of the project.

1.02 SUBMITTALS:

- A. Prepare and make five sets of submittals providing manufacturer's specifications and "cut sheets" on all controllers, heads, backflow preventers, valves, pumps and other equipment as required.
- B. At Final Walkthrough: Contractor shall provide copies of checklist with dates and signatures of required tests and checks to Owner.
- C. Prior to laying sod or seed: provide a copy of passing water audit to Owner's representative.

1.03 RECORD DRAWINGS:

- A. The contractor shall provide and keep up to date complete set of "record" drawings which shall be corrected daily to show all changes in the location of sprinkler heads, controllers, backflow preventers, valves, drains, meters, points of connection, pull boxes and wire splice boxes, pipe and wire routing and other changes that may have been made from the original drawings and specifications as provided to him/her. All gate valves, manual drains, wire splice and automatic and manual valve locations shall be shown with actual measurements to reference points so they may be easily located in the field. Valve locations shall be shown with actual measurements to reference points so they may be easily located in the field.
- B. At the time of final acceptance, the Contractor shall furnish a set of reproducible "record" drawings prepared by a qualified draftsman showing the entire completed system as actually installed. This is the responsibility of

the Contractor and shall be accurate and to scale. The irrigation layout and legend shall be modified to designate any "record" changes. This "record" drawing shall be drawn on a project base sheet or autocadd base drawing provided by the Owner's Representative. The final drawings shall be dated and clearly labeled "RECORD DRAWING".

- C. The Contractor shall also provide and install in the controller enclosure at the project site, a legible reduction of the Record Drawing, laminated in plastic.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. All materials shall be new and without flaws or defects of any type and shall be the best of their class and kind. All materials shall have a minimum guarantee of one year against material defects or defective workmanship.
- B. All material shall be the brands and types notes on the Drawings or as specified herein or prior approved equivalent.
- C. The irrigation system was designed around equipment manufactured by specific companies as a standard. Approved equal equipment by other manufacturers may be used only with the approval of the Owner's Representative and APS Water Resources Specialist. Request for approval of non-specified materials must be submitted to the Owner's Representative a minimum of seven (7) days prior to opening of bids. Submission of irrigation sprinkler heads for approval as equal shall only be considered if submitted heads match the precipitation rate, gallons per minute and spacing of specified sprinkler heads.

2.02 PLASTIC PIPE AND FITTINGS:

- A. Plastic Pipe: All mainline pipe, from the point of connection to the zone valve, with a diameter of two inches (2") or less shall be Schedule 40 PVC and shall conform to ASTM D 1785; mainline pipe with a diameter of two and one-half inches (2-1/2") or greater shall be Class 200 "O" ring gasket pipe, SDR 21; lateral line piping downstream of the zone valves which is 3/4" in diameter and greater shall be Schedule 40 PVC and shall conform to ASTM D 1785. Solvent shall meet ASTM L 2774 and D 2855 requirements. All PVC pipe shall be continuously marked with identification of the manufacturer, type, class and size and shall be free of holes, foreign material, blisters, wrinkles, dents or sunburn.
- B. Location Wire: Irrigation line location wire shall be solid copper, PVC Insulated, UL Approved underground feeder wire, #14, Blue.
- C. PVC Fittings: Fittings on PVC lines shall be Schedule 40 PVC, Type 1, Cell Classification 1345-B, and shall comply with ASTM D 2466.
- D. Threaded Nipples: All threaded PVC nipples shall be Schedule 80 Molded PVC pipe. All galvanized nipples shall be Schedule 40 galvanized steel pipe.

- E. Mechanical Joints: All mainline pipe 3" and larger shall have ductile iron mechanical joints at all changes of direction, reductions, and end caps. All mechanical joints shall be mechanically restrained with ductile iron restraints.

2.03 VALVES AND VALVE BOXES:

- A. Valves: Valves for use in electrically controlled automatic control systems shall be diaphragm actuated and hydraulically operated solenoid valves as specified on the Drawings.
- B. Valve Boxes: Valve boxes shall be as noted on the Drawings and as called for in the APS Standard Irrigation Details.

2.04 SPRINKLER HEADS AND BUBBLERS:

- A. Sprinkler heads and bubblers shall be as specified and installed as shown on the Drawings and as called for in the APS Standard Irrigation Details.

2.05 CONTROLLER

- A. Controllers shall be as specified on the Drawings and as called for in the APS Standard Irrigation Details. The exact controller type and size shall be approved by the APS Water Resources Specialist prior to ordering and installation.

2.06 BACKFLOW PREVENTER:

- A. The backflow prevention device shall be as specified on the Drawings and it shall comply with the City of Albuquerque Cross Connection Control Ordinance, the National Plumbing Code, and the New Mexico Licensing and Regulation Department. Contractors installing backflow prevention devices shall hold New Mexico "MS6" license and personnel performing the installation shall hold a New Mexico Journeyman Sprinkler (JS6) license. Testing and repairs of backflow preventers shall only be performed by personnel who are certified in the testing and repair of backflow preventers.

2.07 CEMENTS, CLEANERS/PRIMERS AND JOINT COMPOUNDS:

- A. Cement shall be #2200 series Uni-Weld or Rectorseal Cold low temperature plastic pipe cement for use on all sizes schedules of PVC pipe and fittings. Cement must be NSSF approved and meet ASTM D 2564 requirements.
- B. Cleaner/primer shall be #8700 United Elchem hi-etch cleaner/primer.
- C. All threaded connections between metal to metal, PVC to metal and PVC to PVC shall be made using RECTORSEAL #5 slow dry, soft set, thread sealing compound. Thread sealing compound shall not be used on threaded connections between sprinkler and nipple or bubbler and nipple.
- D. All "O" ring gasket and pipe spigot ends shall be lubricated using the lubricant recommended or supplied by the pipe manufacturer. If the pipe manufacturer

does not provide a lubricant for the pipe, use IPS Weld-on #787 gasket lube as manufactured by Industrial Polychemical Service.

2.08 WIRE:

- A. Wire for the 120 Volt Wiring shall be solid copper (or stranded copper in larger wire sizes), installed in a complete conduit system, minimum $\frac{3}{4}$ inch trade size, using wrapped rigid 90 ells for risers. Minimum size of wire shall be #12 AWG, with #10 AWG for runs over 100ft. For runs over 200 ft. consult project engineers of record for wire sizes.
- B. Wire for the 24 volt wiring shall be solid copper wire, PVC insulated UL approved underground feeder wire for direct burial in ground. Common wires shall be #12, white, except as noted on Drawings. The wire shall be supplied in either 500' or 2,500' rolls. The control wires shall be #14 of any color other than white unless otherwise-directed by owner's representative.
- C. Wire splicing Materials: All wire splices shall be made water-tight using "DryConn", "Ideal Twister Direct Bury", or other UL approved direct bury wire connectors using a silicone based gel inside the connector. This helps prevent corrosion of electrical connections.
- D. All 120V wiring and conduits shall be 18" minimum bury depth, as per NEC art. 300.

2.09 OTHER MISCELLANEOUS FITTINGS AND MATERIALS:

All other miscellaneous fittings and materials shall be specified on the Drawings.

PART 3 - EXECUTION

3.01 GENERAL:

- A. This section includes installation specifications for all items installed as part of the sprinkler irrigation system. Certain construction procedures or minor equipment installation procedures may have been omitted from these specifications that are necessary for the proper installation of the system. In any case, all materials and equipment shall be installed in a neat and workmanlike manner according to manufacturer's recommendations and specifications, local and state codes, as shown on the Drawings and as specified herein.

3.02 PRODUCT HANDLING:

- A. The Contractor shall be responsible for correct procedures in loading, unloading, staking, transporting and handling all materials to be used in the system. The Contractor shall avoid rough handling which could affect the useful life of equipment. Pipe shall be handled in accordance with the manufacturer's recommendations on loading, unloading and storage.

3.03 EXCAVATION AND TRENCHING:

- A. The Contractor shall stake out the location of each run of pipe and all sprinkler heads and valves prior to trenching. Each run of the system shall be approved by the Owner's Representative before actual installation is started.
- B. Excavation and trenching for pipe lines shall be true and line with the trench banks and as nearly vertical as practical. The width of the trenches shall not be greater than necessary to permit proper joining, tamping, backfilling, bedding or any other installation procedures that may be necessary. Trench widths shall also be wide enough so that there will be a minimum horizontal and vertical separation of 4" between pipes in the same trench.
- C. In areas where trees are present, trench lines will be adjusted on the site to eliminate any damage to tree roots.
- D. Trench depths shall be sufficient to provide the specified pipe cover as described elsewhere in these specifications or as noted on the Drawings. In rocky areas the trenching depth shall be 6" below normal trench depth to allow for pipe bedding as described in other portions of these specifications.
- E. Depth of bury: Minimum cover over mainline and lateral piping shall be as noted on the drawings.

3.04 PIPE AND FITTINGS INSTALLATION:

- A. Installation of plastic pipe and fittings shall be in accordance with the manufacturer's recommendations and procedures and as mentioned in the specifications. Manufacturer's recommended procedures for making solvent weld fittings and restrained mechanical joint fittings shall be strictly adhered to. Only solvent cements, cleaners, primers or lubricants, gaskets, and bolts and nuts recommended or supplied by the pipe manufacturer shall be used.
- B. Caution shall be exercised by the Contractor in handling, loading, unloading, and storing of PVC pipe and fittings. All PVC pipe shall be stored and transported in a vehicle with a bed long enough to allow the pipe to lie flat without subjecting it to undue bending or concentrated external load at any point. Any section of pipe that has been dented or damaged or in any other way found to be defective, either before or after laying shall be replaced with sound pipe without additional expense to the Owner.
- C. Before installation, the inside of the pipe shall be cleaned of all dirt and foreign matter and shall be kept in a clean condition during and after the laying of pipe. When work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth or other foreign substances will enter the pipe or fittings. Where pipe ends are left for future expansion or connections, they shall be valved and capped as directed on the irrigation system drawings.
- D. All PVC pipe and fittings shall be assembled to permit the pipe or fittings to be jointed at the true parallel position of the fittings. Placement of pipe in curving trenches which cause excessive bending and stress of pipe and fittings

will not be permitted. No excess piping or fittings shall be permitted in the installation of the system, which may increase pressure loss or potential blockage.

- E. Before installing the pipe, all rubbish and large rocks shall be removed from the trenches. If the soil is extremely rocky, the trenches shall be bedded with dirt or sand as outlined in other portions of these specifications. Material used for pipe bedding shall be approved by the Owner's Representative. The full length of each section of the pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells, joints and couplings.
- F. Pipe shall not be laid in water or when trench or weather conditions are unsuitable for the work. Any water which may be encountered or may accumulate in the trenches or excavation shall be pumped out or otherwise removed as necessary to keep the bottom of the trench or excavation free and clear of water during the progress of the work. Pipe shall not be laid when the temperature is 32 degrees F or below.
- G. PVC pipe will expand or contract at the rate of 1" per 10 degree F change of temperature. Therefore, the pipe shall be installed in a manner so as to provide for expansion and contraction as recommended by the manufacturer.
- H. The minimum horizontal and vertical clearance between lines in the same trench shall be 4".
- I. After all sprinkler piping, risers, valves, thrust blocks, etc., have been installed and partially backfilled as specified in other parts of these specifications, the control valve shall be opened and a full head of water used to flush out the system. After the system is thoroughly flushed, risers shall be capped off and the system pressure tested in accordance with the testing section of these specifications. At the conclusion of the pressure test, the heads shall be installed and the backfill operation completed.

3.05 SOLVENT WELDING PROCEDURE:

- A. PVC plastic pipe shall be squarely cut utilizing a hacksaw with a blade of 18 or 24 teeth per inch.
- B. Burrs left from cutting shall be wiped off with a clean dry cloth.
- C. Utilizing a cleaner/primer, thoroughly clean the mating pipe end and the fitting socket with a clean, dry cloth.
- D. Apply a uniform coat of solvent cement to the outside of the pipe end with a non-synthetic brush or dauber.
- E. In like manner, apply a thin coating of solvent cement to the inside of the fitting socket.
- F. Re-apply a light coat of solvent cement to the pipe end and quickly insert it into the fitting to the full depth of the fitting socket.

- G. Rotate the pipe or fitting approximately $\frac{1}{4}$ turn to insure even distribution of the solvent cement.
- H. Hold in position for approximately 30 seconds.
- I. Wipe off any excess solvent cement that forms as a bead around the outer shoulder.
- J. Care should be taken so as not to use an excess amount of solvent cement that could cause burrs or obstructions to form on the inside of the pipe joint.
- K. Solvent weld joints shall be allowed to cure for at least 24 hours before pressure is applied to the system.

3.06 BACKFILLING:

- A. Upon completion of a particular section of the irrigation system, and after sufficient time has elapsed for the curing of solvent weld joints, partial backfilling can begin, leaving all joints, risers and connections exposed for visual inspection during the hydrostatic testing. Only upon successful completion of the hydrostatic test can the backfill operation be completed for any one particular section.
- B. All backfill material shall be subject to approval by the Owner's Representative. Backfill material shall be free from rock, large stones, brush, sod, frozen material or other unsuitable substances that may damage pipe during the backfilling operations.
- C. In the event that the material from the excavation or trenching is found to be unsuitable for use in backfill by the Owner's Representative, it shall be removed from the site and properly disposed of by the Contractor and at his own expense. The Contractor shall then, at no additional cost to the Owner, arrange for, purchase, and furnish suitable backfill material consisting of earth, loam, sandy clay, sand or other approved materials free of large clods of earth or sharp stones and capable of attaining the same relative density of the surrounding ground.
- D. In rocky areas, the trench depth shall be 6" below the normal trench depth to allow for 6" of suitable backfill as padding for the pipe. In like manner, there shall be at least 6" of padding on all sides of the pipe as a padding against the rock wall of the trench.
- E. All mainline piping shall have irrigation line location wire installed in the trench six (6") above the pipe.
- F. Backfill shall be placed in horizontal layers not exceeding 6" in depth and shall be thoroughly tamped, or water compacted to near original density or so that no settling will result. Backfill shall be placed to the original ground level. If settlement of trenches occurs within one (1) year from date of completion, it shall be the Contractor's responsibility to refill trenches and re-seed or sod the repaired areas.

3.07 SADDLE TAPS:

- A. No saddle taps shall be permitted unless approved by the Owner's Representative.

3.08 THRUST BLOCKS:

- A. Concrete thrust blocks shall be provided where necessary to resist system pressure. Thrust blocks shall be constructed at all direction changes, size changes, valves and terminations or at any other points of the systems that will result in an unbalanced thrust line for equipment 2-1/2" and larger. Do not obstruct outlets of fittings which are intended for future connections. Thrust blocks shall be poured against undisturbed earth and in accordance with the APS Standard Details.

3.09 SLEEVED CROSSING:

- A. Unless otherwise noted on plans, all piping installed under sidewalks, roadways, parking lots, paved areas, etc. shall be sleeved in Class 200 PVC pipe two (2) sizes larger than the pipe to be sleeved. Wiring shall be placed in a separate sleeve from that of the pipe crossing and shall be a minimum 1 1/4" Class 200 PVC. Ends at sleeves shall be sealed with duct tape following installation of wire or piping. A marker consisting of a piece of scrap PVC pipe painted bright orange shall be placed so that one end extends just above finished grade at each end of the sleeve marking location for future use.

3.10 SPRINKLER HEAD INSTALLATION:

- A. Sprinkler heads shall be of the type and make specified and shall be installed as shown on the Drawings and per APS Standard Details. Sprinkler heads shall be installed with a 4" space between the edge of the sprinkler head and curbs, walls, driveways, building wall, etc. Heads shall be installed in the vertical position and backfilled and compacted to near original density.
- B. Sprinkler head spacing shall not exceed the spacing shown and shall be in the location and configuration as shown on the Drawings. Contractor shall verify turf area dimension while staking sprinkler head location. Sprinkler heads shall be spaced to achieve uniform coverage. If the spacing shown on the Drawings differs from the spacing needed to achieve uniform coverage in the field, uniform coverage in the field will take precedence over location shown on the drawing. The location of sprinkler heads shall be flagged/staked in the field and the location shall be approved by the APS Water Resources Specialist and the Owner's Representative prior to installation.
- C. After all piping and risers are in place and connected and before installation of the sprinkler heads, all control valves for a given section shall be fully opened and a full head of water shall be used to flush out the system. If water pressure without the heads installed is not sufficient to provide adequate water flow from end risers, the Contractor shall cap off enough heads closest to the water source to provide adequate flushing of the end riser assemblies.

3.11 CONTROLLER INSTALLATION:

- A. The controller location is indicated on the Drawings. The Contractor shall familiarize himself with the requirements of making the power connections at the locations noted (120 volt supply to the Controller) and shall include the cost to complete this portion of the contract in his price to the Owner unless otherwise directed by the Owner's representative.
- B. The Controller shall be mounted and wired according to the manufacturer's recommended procedures and as specified herein and on the Drawings.
- C. For Controllers installed inside of vaults or other enclosures see Section 3.14, 120 Volt Controller Power Wiring
- D. When Controllers are mounted outside of any building, vault, or enclosure, the Contractor shall direct wire the 120 volt power supply to the Controller, using conduit methods described in section 2.08 "Wire", and using a wrapped rigid metal conduit above grade.
- E. Remote control valves shall be connected to Controller in the numerical sequences as shown on the Drawings or as directed by the Owner's Representative.

3.12 AUTOMATIC CONTROL VALVE INSTALLATION:

- A. All automatic control valves shall be of the type and size as indicated on the Drawings. Installation shall be according to these specifications, the Drawings and the manufacturer's recommendations.
- B. The valve boxes shall be of the size and type as shown in the details drawings.
- C. Valve wire splices shall be waterproofed using "Dryconn", "Ideal Twister Direct Bury" Connectors, (or approved equal) and the Contractor shall provide a 36" wire expansion coil to facilitate raising splices to ground level without cutting wires.

3.13 24 VOLT CONTROL VALVE WIRING:

- A. All wire installation procedures as described herein shall be checked to conform to local codes.
- B. The Contractor shall install the 24 volt control valve wiring in the same trench as the irrigation mainline. Only when it is not possible for the wires to be installed in the mainline trench, they shall be installed in the lateral pipe trench. All wires shall be laid below the pipe. In no case shall the wire be laid on top of the pipe. The wires shall be laid loose in the trench and taped together at 10'-0" intervals. When trenches used for piping are not appropriate for routing wire, Contractor shall install wire in a separate trench, 18" deep.
- C. Wire splices, other than at valve box locations shall be kept to a minimum and if needed shall be made only at common splice points and placed in a wire

splice box as shown in the detail drawings and in the APS standard drawings. All wire splices shall be made water-tight using "DryConn", "Ideal Twister Direct Bury", or other UL approved direct bury wire connectors using a silicone based gel inside the connector. This helps prevent corrosion of electrical connections.

- D. At control wire splices, the Contractor shall provide a 36" wire expansion coil to facilitate raising splices to ground level without cutting wires.
- E. All continual wire shall be one color and in no case shall wires of different colors be spliced together.
- F. All 24 volt wiring shall be installed in EMT conduit when inside a building. All 24 volt wiring installed on exterior building walls shall be installed in rigid in metal conduit.

3.14 120 VOLT CONTROLLER POWER WIRING:

- A. The Contractor shall familiarize himself with the work required to complete this portion of the installation. All 120 volt wiring shall be installed in accordance with local, state and national electric codes. The 120 volt service shall consist of one (1) black (phase) one (1) white (Neutral) wire, per circuit and a green insulated grounding conductor.
- B. 120 volt power shall be supplied to the Controller location by a licensed electrician.
- C. Heating Equipment/Tapes. Supply a dedicated 120V 20A circuit to controller location for connection of heat equipment or heat tapes. This circuit shall be independent of the controller wiring, and shall be installed with the same conduit and wiring methods as section 2.08 "Wire". If connected heat equipment/tape electrical load exceeds 16A, then a separate 120V circuit shall be run with an independent neutral conductor. Grounding (green) conductor can be shared if in same conduit and box. All power circuits shall comply with 2011 NEC art 427.22 Ground Fault Protection of Equipment. This NEC requirement shall be accomplished with type GFEP circuit breakers or an integral device supplied as part of the heating equipment that is sensitive to leakage currents of 6mA-50mA. Power receptacles and electronic equipment/apparatus shall be installed away from discharge of backflow preventers. Power receptacles shall be of industrial grade quality, 20A rated, simplex type for heat equipment/tapes and duplex type for controllers of same quality and rating. All receptacles shall have cast metal "in-use" covers, and permanently labeled to which device they serve.

3.15 MANUAL DRAIN VALVES:

- A. Manual drain valves shall be of the size and type as indicated and at the locations as shown on the Drawings or as approved by the Owner's Representative.

3.16 TESTING:

- A. Upon completion of the irrigation systems mainline, the entire mainline shall be tested for a one hour period at 100 psi, unless otherwise notes. Prior to testing, the mainline shall be partially backfilled, leaving all joints and connections exposed for visual inspection. All dirt shall be flushed from the system and the line filled with water to remove air. The mainline shall be brought to static pressure. A pressure gauge and temporary valve shall be installed at the end of the mainline to permit air pressure to be applied to the main. A pressure of 100 psi must be retained for a one hour period. Any leaks resulting in the one hour pressure test shall be repaired and the system retested until the system passes the test.
- B. Upon completion of the lateral piping sections, each lateral system shall be pressure tested for one hour at 100 psi. On systems using flex nipples, or swing joints, the lateral system shall be tested prior to installation of the flex nipples or swing joints. Prior to testing the lateral lines shall be partially backfilled leaving all joints and connections exposed for visual inspection. All air and dirt shall be flushed from the system and all open fittings shall be capped. The testing procedure shall be the same as used for the mainline. If after one hour not visual leakage has occurred and the 100 psi pressure has been retained, the heads shall be installed, and the backfill operation completed. Any leaks resulting from the hydrostatic test shall be repaired and the system retested until the system passes the test.

3.17 ADJUSTING OF SYSTEM:

- A. After completion of testing and installation, the Contractor shall adjust all valves for the proper operating pressure and adjust all sprinklers and bubblers for uniform coverage and even flow. Contractor shall wire the Controller (valve/station) as directed by the APS Water Resource Specialist or the Owners Representative. The valve number will be indicated on the Controller panel for each station. Contractor will program Controller to provide optimum sprinkler system performance.

3.18 IRRIGATION AUDIT:

- A. If the turf area being watered by the irrigation system has a total area of one or more acres, the Contractor must have a Landscape Irrigation Audit performed as required by the City of Albuquerque Water Conservation Landscaping and Water Waste Ordinance and the Bernalillo County Water Conservation Ordinance. The audit must be performed prior to the installation of sodded turf or seed. The system must be adjusted to meet the required minimum efficiency requirements prior to installation of the turf or seed.

3.19 CLEAN UP:

- A. The Contractor shall continuously keep a neat and orderly area in which he is installing the system. Disposal of rubbish and waste material resulting from

the installation shall be continual. Upon completion of the system, the Contractor shall remove from the Owner's property at his own expense, all temporary structures, rubbish waste material, tools and equipment resulting from or used in the installation of the system.

3.20 PROTECTION OF EXISTING UTILITIES:

- A. The Contractor shall be responsible for locating all cables, conduits, piping, and any other utilities or structures that may be encountered either above or below ground. All necessary precautions must be taken by the Contractor to prevent any damage to these existing utilities and improvements. In the event that such damage should occur from his operations, the Contractor shall repair or replace damaged utilities to their original condition at no additional expense to the Owner. Prior to excavation, the Contractor shall coordinate and execute existing private and non-private utility designation. Public right-of-way and utility easement designation marking shall be made by calling NM 811, "Call before you dig" as defined in NMSA 62-14-5 "Marking of Facilities". APS owned and operated utilities shall be designated prior to any excavation by contacting the District's on-call representative. All designation shall comply with 62-14-5, whereby a person intending to commence an excavation and upon advance notice, shall locate and mark on the surface the actual horizontal location, within twelve inches by some means of location, of the underground facilities in or near the area of the excavation so as to enable the person engaged in excavation work to locate the facilities in advance of and during the excavation work.

3.21 ROCK:

- A. If the Contractor encounters rock or other unfavorable trenching conditions, additional compensation may be considered. When material from the excavation or trenching is unsuitable for use as backfill, additional backfill material suitable for this purpose shall be brought in at the expense of the Contractor. It shall be of the Contractor's responsibility to remove and dispose of all unsuitable materials removed from the trench that cannot be used in the backfill operation.

3.22 FINAL ACCEPTANCE:

- A. When the Contractor is satisfied that the system is operating properly, that it is balanced and adjusted, that all work and clean-up is completed he shall issue notice of completion to the Owner's Representative requesting a final inspection. The Owner's Representative will respond to the notice of completion by the Contractor and shall appear with the Owner's representatives from Facilities Design and Construction and Maintenance and Operations for an inspection of the project. At that time the Contractor shall demonstrate the operation of each system in its entirety. In judging the work, no allowance for deviation from the Original Drawings and Specifications will

be made unless prior approval from the Owner's representative has been obtained.

- B. Any inconsistency to the Specifications or the Drawings shall be noted by the Owners Representative and a written copy of required corrections shall be given to the Contractor. Any work deemed not acceptable shall be re-worked to the complete satisfaction of the Owner's Representative.
- C. When the completed work and the "IRRIGATION RECORD DRAWINGS", certification of backflow inspection, keys and maintenance manual have been reviewed and approved by the Owner's Representative, a written acceptance of the project signed by the Owner's Representative will be given to the Contractor.

3.23 OPERATIONAL INSTRUCTION:

- A. After the system has been tested and accepted, the Contractor along with the Owner's Representative shall instruct the representative of APS M&O in the operation and maintenance of the system.
- B. The Contractor shall provide the Owner's Representative with two (2) keys for the following:
 - 1. Controllers
 - 2. Any Locking Assembly in need of keyed access.
- C. The Contractor shall provide the Owner with two copies of a Maintenance Manual bound in a three ring binder. The maintenance manual shall include copies of the approved submittals, Controller operations manuals and manufacturer's warranties on all irrigation products.

3.24 SYSTEM MAINTENANCE AND GUARANTEE:

- A. For a period of one (1) year from final acceptance of the system, the Contractor will promptly furnish and install, without cost to Owner, any and all parts or materials which prove defective in material or workmanship. Damage due to irrigation system line breaks shall be repaired and brought to original condition by the Contractor at no expense to the Owner.
- B. For a period of one (1) year from final acceptance of the system, the Contractor shall repair any settlement of trenches by one of the following methods as directed by the Owner's Representative.
 - 1. Bring to grade by top-dressing (raking topsoil into the grass).
 - 2. Bring to grade with topsoil and seed.
 - 3. Remove existing sod, fill depression with topsoil, and replace with new sod to match existing sod.
 - 4. Repair by any of the above methods must result in a smooth, level area. Maintenance of repaired areas shall be the responsibility of the Owner.

3.25 INSPECTION:

A. The following inspections shall be the minimum required inspections during the course of construction. Additional inspections shall be made at any time at the discretion of the Owner's Representative. It shall be the responsibility of the Contractor to notify the Owner's Representative, in writing, 24 hours in advance of each required inspection. The sequence of required inspections shall not be changes from the sequence listed below. The Contractor shall not proceed with work of the next sequence without written approval of the work of the previous sequence. The Contractor shall attach a copy of the written inspection approvals to all applications for payment.

1. Inspect staked/flagged locations of mainline, valves, laterals and sprinkler heads.
2. Inspect and pressure test mainline installation.
3. Inspect 24 volt control wire installation.
4. Inspect and pressure test automatic valves and lateral irrigation installation.
5. Inspect automatic controller installation and operation.
6. Inspect sprinkler and bubbler head placement, coverage and operating pressure prior to planting.
7. Inspect at end of maintenance period.

END OF SECTION 32 80 00
IRRIGATION SYSTEMS

SECTION 32 92 00

GRASS SODDING

PART 1 – GENERAL

1.01 SUMMARY:

- A. Work under this section consists of preparing all areas indicated on the drawings for grass sodding according to the specifications including furnishing and installing all sod, fertilizer and soil amendments as specified herein. Sod will typically be installed on playfields, athletic fields and auxiliary space.
 - 1. No sodding shall take place if frozen conditions exist.

1.02 REFERENCE STANDARDS:

- A. American Sod Producers Association (ASPA) – Guideline Specifications to sodding.
- B. Turfgrass Producers International (TPI) – Guideline Specifications to Turfgrass Sodding.
- C. All work under this section shall meet the standards and guidelines for grass sodding as set forth by the Albuquerque Bernalillo County Water Utility Authority (ABCWUA).

1.03 DEFINITIONS:

- A. Grass Sod – Grass is a family of herbaceous plants with narrow leaves growing from the base used for sports fields, lawns and other areas of APS facilities. Grass used on APS facilities is made up of Kentucky Bluegrass and Ryegrass mix.

PART 2 - PRODUCTS

2.01 SOD MATERIAL:

- A. Grass Sod: Sod shall be as specified in the APS Design Directives. A sample of sod and a written submittal of the seed mix shall be submitted to the OWNERS REPRESENTATIVE a minimum of fifteen (15) days prior to laying of sod. It shall be vigorous, well rooted healthy turf free from disease, insect pests, weeds, other grasses, stones and other harmful or deleterious matter.
- B. Sod shall be cut by an approved mechanical sod cutter to a thickness of not more than 1" or less than ½". Sod pieces shall be cut a maximum of 18" wide. Handling of sod shall be done in a manner that will prevent tearing,

breaking, dying or any other damage. Sod shall be installed in place on the site not more than 24 hours after cutting.

- C. Sod shall have no more than ½" of loose thatch. The sod shall be dense enough so that an entire strip can be lifted by the top 10% of the piece without breaking.
- D. Large complete rolls of sod will be used for large areas.

2.02 ORGANIC AMENDMENT: Organic amendment shall consist of:

- A. 70% by volume, organic compost. Compost to be screened to ½" minus, pH not to exceed 7.0. Electrical conductivity (EC) of compost not to exceed 3.5 mnhos/cm. Percentage of organic matter shall be not less than 1%, by weight. Carbon to nitrogen ratio of compost shall not exceed 50:1.
- B. 10% by volume, "Ecolite" (clinoptilolite zeolite). Ecolite shall be screened to pass a #40 mesh screen.
- C. 20% by volume, "Moisturelite", screened to pass a #40 mesh.
- D. Components to be homogeneously mixed, in ten cubic yard batches to provide a uniform product, free from weed seeds, sticks, rocks, or other deleterious material.
- E. Humates, diatomaceous earth and other amendments may be considered with OWNERS REPRESENTATIVE or APS approval.
- F. The organic amendment shall be as produced by the company identified below or approved equal:
Gro-Well Brands Inc.
9000 Bates Road SE
Albuquerque, NM 87105
(505) 877-8670
- G. Each delivery shall have a load ticket. The load ticket shall list:
Source of Mixture
Approximate Volume of Load
Date of Delivery of loading
Name of Individual representing the source
 - 1. Ticket shall be collected and provided to the OWNER'S REPRESENTATIVE.

2.03 FERTILIZER

- A. Use 16-8-8 fertilizer for all new grass areas.

PART 3 - EXECUTION

3.01 SOIL TESTING:

- A. Testing of soil for soil amendment, and fertilizer application rates shall be conducted. Testing shall include organic content and pollutant content. If it is discovered that due to site soil conditions organic amendment or fertilizer rates should be adjusted the contractor shall make a request for adjustment of the OWNERS REPRESENTATIVE.

3.02 SOD BED PREPARATION:

- A. Prior to start of soil preparation all finish grades shall be established and approved by the ENGINEER, LANDSCAPE ARCHITECT OR OWNERS REPRESENTATIVE as meeting the requirements of the grading plan.
- B. Apply a uniform 2" layer of organic amendment and 4 lbs. Of starter fertilizer per each 1000 square feet to the entire area to be sodded. After application of organic amendment and starter fertilizer all areas to be sodded shall be ripped with a motograder to a depth of twelve inches and thoroughly rototilled to a minimum depth of 6 inches. Prior to laying sod OWNER'S REPRESENTATIVE shall check the depth of ripping and rototilling. After rototilling in cross directions, drag soil to an even grade matching the grading plan, then roll for firmness.

3.03 SODDING:

A. INSTALLATION:

1. If precipitation has occurred within 2 days of sodding, sod shall not be installed until soil has sufficiently dried to a moistened stage.
2. Two days before laying sod the area to be sodded shall be irrigated to allow settling to occur prior to installation. If setting has occurred, clean fill shall be applied to settlement area and soil bed shall be prepared as described under 3.02 Sod Bed Preparation.
3. If precipitation has not occurred irrigate area to be sodded lightly to moisten the soil. Do not irrigation less than two (2) days prior to sod installation.
4. Before laying sod, the finish grade shall be brought to a firm, even surface, free from stones or lumps, and graded to provide drainage. The finish grade shall be inspected and approved by the OWNER'S REPRESENTATIVE prior to laying any sod.
5. Lay sod over moistened soil lightly raking the soil ahead of each sod strip. Sod shall be fitted together tightly so that no joint is visible, and sod is

tamped firmly and evenly by hand. Stake as required on slopes. Also see APS Site Design Directives.

6. Roll sod with a drum roller in two directions to ensure sod is firm and evenly applied to soil. Adjust sod if seams separate and roll again.
7. Water all sodded areas immediately after final rolling with a fine spray to a depth of 4". If soil settlement occurs repeat above steps for installation as necessary. Irrigate all sodded areas as often as necessary to promote healthy grass growth. Do not over-irrigate. Mowing during the maintenance period will be scheduled so that the grass is maintained at a height no shorter than two (2) inches and no greater than three (3) inches.

3.04 MAINTENANCE AND PROTECTION:

- A. Maintenance and protection shall continue for thirty (30) days, or until the entire landscape project is accepted. Acceptance shall only occur after all sod is well rooted.

3.05 INSPECTIONS:

- A. The following inspections shall be the minimum required inspections during the course of construction. Additional inspections during the course of construction could be made at any time at the discretion of the OWNER'S REPRESENTATIVE.
- B. It shall be the responsibility of the Contractor to notify the OWNER'S REPRESENTATIVE, in writing, 48 hours in advance of each required inspection.
- C. The sequence of required inspections shall not be changed from the sequence listed below. The Contractor shall not proceed with work of the next sequence without written approval of the work of the previous sequence. The Contractor shall attach a copy of the written inspection approvals to all applications for payment. Payment will not be approved for items which have not been inspected and approved in writing. Each phase of soil preparation shall be inspected in the process.
 1. OWNER'S REPRESENTATIVE shall inspect the depth of ripping and rototilling during the soil preparation phase.
 2. Finish grade shall be inspected.
 3. Sod shall be inspected prior to installation to ensure grades are correct.
 4. Sod shall be inspected after installation is complete.

5. Sod shall be inspected at the end of the 30 day maintenance period.
6. Sod shall be inspected 6 months after completion.
7. Sod shall be inspected 12 months after completion.

3.06 GUARANTEE:

- A. All sod shall be guaranteed to be in alive, healthy, and in a normal growing condition following the date of final acceptance by the Owner's Representative through one twelve month growing season. Sod that is dead or in an unhealthy, impaired growth condition shall be removed and replaced by the Contractor as directed by the Owner's Representative at no additional cost to the Owner.

END OF SECTION 32 92 00
GRASS SODDING

SECTION 32 93 00

LANDSCAPE PLANTING

PART 1 - GENERAL

1.01 SUMMARY:

- A. Work under this section consists of the planting of trees, shrubs, and ground covers, including the furnishing of all labor, equipment, and materials and performing all work in accordance with the Drawings and Specifications.
 - 1. Plant installation shall occur during the growing season from April 1 until October 1 unless permission is given to install plants outside the growing season by the OWNERS REPRESENTATIVE.
 - 2. Plant installation should not occur if frozen conditions exist.

1.02 PLANT NAMES:

- A. The botanic and common plant names used on the drawings shall be in conformity with the approved names given in Standardized Plant Names, 1980 Edition (or the most recent edition), published by the American Joint Committee on Horticultural Nomenclature. The names of plant varieties not included therein should generally be in conformity with the names accepted in the nursery trade.

1.03 PLANT MATERIAL SUBSTITUTIONS:

- A. Plant material substitutions shall not be made without the written permission of the OWNER'S REPRESENTATIVE. Within two (2) weeks of bid acceptance the CONTRACTOR shall submit proof that plant materials have been secured to the OWNERS REPRESENTATIVE. If proof that plant materials have been secured is not submitted within two (2) weeks of bid acceptance, substitutions shall not be allowed and plant materials shall be installed in the next successive growing season that plants are available.

PART 2 PRODUCTS

2.01 PLANT MATERIALS

- A. A complete plant list, including quantities, sizes and other requirements is shown on the construction drawings. In the event that discrepancies occur between quantities of plants indicated in the plant list and on the construction drawings, the plant quantities indicated on the drawings shall govern. In the event that discrepancies occur between the caliper size and the container size as indicated in the plant list and on the drawings, the caliper size indicated on

the drawings and the minimum caliper size indicated in the APS Landscape Design Directives shall govern.

2.02 PLANT MATERIAL QUALITY

- A. Plant material quality, size and condition shall be in accordance with American Standard for Nursery Stock, 1980, as published by the Committee on Horticultural Standards of the American Association for Nurserymen, Inc. the drawings, and the following requirements:
1. All plants shall be typical for their species or variety. All plants shall have normal, well developed branches and vigorous root systems. They shall be sound, healthy, vigorous, and free from defects, disfiguring knots, and abrasions of the bark, sunscald injuries, plant diseases, insect eggs, borers, and all other forms of infections.
 2. Unless otherwise stated on drawings or approved by the Owner's Representative, all plants shall be nursery grown and shall be tagged with nursery labels indicating species and variety.
 3. Container grown plant materials shall have been grown in its delivery container for not less than six (6) months, but not more than two (2) years. Any root bound or poorly rooted material will not be accepted.
 4. Balled and burlap plant materials shall have a solid ball of earth of minimum specified size and held in place securely by burlap and a stout twine or rope. Broken or loose balls will not be accepted.
 5. Unless specifically noted on the drawings, all trees shall have a single trunk that is straight and free of "dog legs", "crooks", "Y-crotches", or other disfiguring shapes. The central leader of all trees shall not have been pruned. Trees with double leaders are not acceptable unless otherwise noted on drawings.
 6. Specimen or Character Plants may have disfigured or multiple trunks as noted on drawings and approved by OWNERS REPRESENTATIVE.
 7. All plant materials shall have a uniform shape around its complete circumference. Plant material with irregular branching patterns or with branching patterns more highly developed on one side than on other sides shall not be accepted unless otherwise noted.
 8. The Owner's Representative shall inspect all plant material at the Contractor's yard or at a wholesale nursery of the Contractor's choice prior to delivery to the job site. All material shall then be inspected at the job site prior to planting and after planting.
 9. The Owner's Representative shall be the judge of the quality and acceptability of all plant material. All rejected material shall be immediately removed from the site and replaced with acceptable material at not additional cost to the Owner.

2.03 PLANTING SOIL MIXTURE:

- A. Planting Soil Mixture is to be a mixture of one part backfill amendment to three parts of existing soil. The Backfill Amendment shall consist of:
1. 70% by volume, organic compost. Compost to be screened to ½" minus, pH not to exceed 7.0. Electrical conductivity (EC) of compost not to exceed 3.5 nmhos/cm. Percentage of organic matter shall be not less than 1% by weight. Carbon to nitrogen ratio of compost shall not exceed 50:1.
 2. 20% by volume, "Moisture-lite" screened to pass a #40 mesh.
 3. 10% by volume, "Ecolite" screened to pass a #40 mesh.
 4. Components to be homogeneously mixed, in ten cubic yard batches to provide a uniform product, free from weed seeds, sticks, rocks, or other deleterious material.
 5. The backfill amendment shall be a produced by:
Growell or equal product
RR9, Box 862
2nd and Bates Rd., SW
Albuquerque, New Mexico 87105
(505) 877-8670
 6. Each Delivery shall have a load ticket. The load ticket shall list:
Source of Mixture
Approximate volume of load
Date of delivery or loading
Name of individual representing the source
Ticket shall be collected and provided to the Owner's Representative.

2.04 MULCH

- A. All landscape areas shall receive aggregate mulches of a type and size as specified on drawings. All aggregate mulches shall be installed at a minimum depth of 2" and shall be installed over filter fabric unless otherwise specified. All crusher fine mulches shall be installed at a minimum depth of 3" and shall be installed over filter fabric unless otherwise specified or, specifically directed by OWNER'S REPRESENTATIVE.

PART 3 EXECUTION

3.01 PLANTING OPERATIONS:

- A. Planting operations as specified herein shall begin only when the irrigation system has been installed and inspected, and other work including placing of topsoil to finished grade has progressed sufficiently to permit planting and shall be performed only during favorable weather conditions in accordance with accepted practice.

- B. In any one day, only those plant materials intended to be planted that day shall be delivered to the project site. Unless otherwise approved by the OWNER'S REPRESENTATIVE, all plant materials shall be located where shown on the plan except when adjustments are required due to field conditions. The location of all trees and shrubs shall be staked by the Contractor before making any excavations, and locations shall be inspected by the OWNER'S REPRESENTATIVE prior to installation.

3.02 PLANTING:

- A. All planting and backfilling shall be performed in accordance with accepted nursery practice, the drawings, and the following requirements:
 - 1. The contractor shall take care when backfilling planters to provide adequate compaction of the fill materials in order to prevent settling around planting beds.
 - 2. The contractor shall prepare all planting pits and install plants as shown on drawings. Plants shall be set plumb and straight unless drawings indicate otherwise.
 - 3. Backfill for planting pits shall consist of the specified Planting Soil Mixture unless drawings indicate otherwise. The plant shall be positioned in the hole, and backfilled. The backfilling shall be completed, and material tamped. When pit is nearly filled with backfill, water thoroughly and allow water to soak away. If settling of backfill occurs after watering, add more backfill to bring to finish grade.
 - 4. After completion of planting, all trees shall be pruned at the direction of the OWNER'S REPRESENTATIVE.

3.03 MULCHING:

- A. Mulching shall be completed as indicated on the drawings.

3.04 MAINTENANCE AND PROTECTION:

- A. Maintenance and protection of trees, shrubs, and ground cover shall begin immediately following the last operation of installation for each plant and shall continue until the entire landscape project is accepted by the OWNERS REPRESENTATIVE. Maintenance shall include watering, weeding, cultivating, removal and replacement of dead plant material, removal of debris, resetting of trees to upright positions, restoration of earth basins, and such other operations as may be necessary for the health of the planted stock and the general appearance of the landscaped areas. Care shall include protection of planted stock from damages resulting from trespass, erosion (including watering), weather, vandalism, disease and other hazards.

3.05 GURANTEE:

- A. All plant materials shall be guaranteed to be in a live, healthy, and normal growing condition following the date of final acceptance by the Owner's Representative through one twelve month period. Plant materials that are dead or in an unhealthy, impaired growth condition shall be removed and replaced by the Contractor as directed by the OWNERS REPRESENTATIVE at no additional cost to the Owner. Replacement material shall be of equal quality, size, and species as that which is being replaced and shall be approved by the OWNERS REPRESENTATIVE prior to planting. Any plants replaced after the first six months of the guarantee period shall also be under warranty for six months after the replanting date.
- B. If plant materials die, replacement of dead plant materials shall occur within 15 days of plant death as determined by the OWNERS REPRESENTATIVE.

3.06 INSPECTIONS:

- A. The following inspections shall be the minimum required inspections during the course of construction. Additional inspections shall be made at any time at the discretion of the OWNERS REPRESENTATIVE.
- B. It shall be the responsibility of the Contractor to notify the OWNERS REPRESENTATIVE, 48 hours in advance of each required inspection.
- C. The sequence of required inspections shall not be changed from the sequence listed below. The Contractor shall not proceed with the work of the next sequence without written approval of the work of the previous sequence.
 - 1. Inspect plant material at Contractor's yard or Nursery prior to delivery to job site.
 - 2. Inspect staked locations of materials prior to planting.
 - 3. Inspect material at the job site prior to and during planting.
 - 4. Inspect the planting depth of Trees
 - 5. Inspect at the time of final acceptance by the OWNERS REPRESENTATIVE.
 - 6. Inspect 6 months after final completion.
 - 7. Inspect 12 months after final completion.

END OF SECTION 32 93 00
LANDSCAPE PLANTING

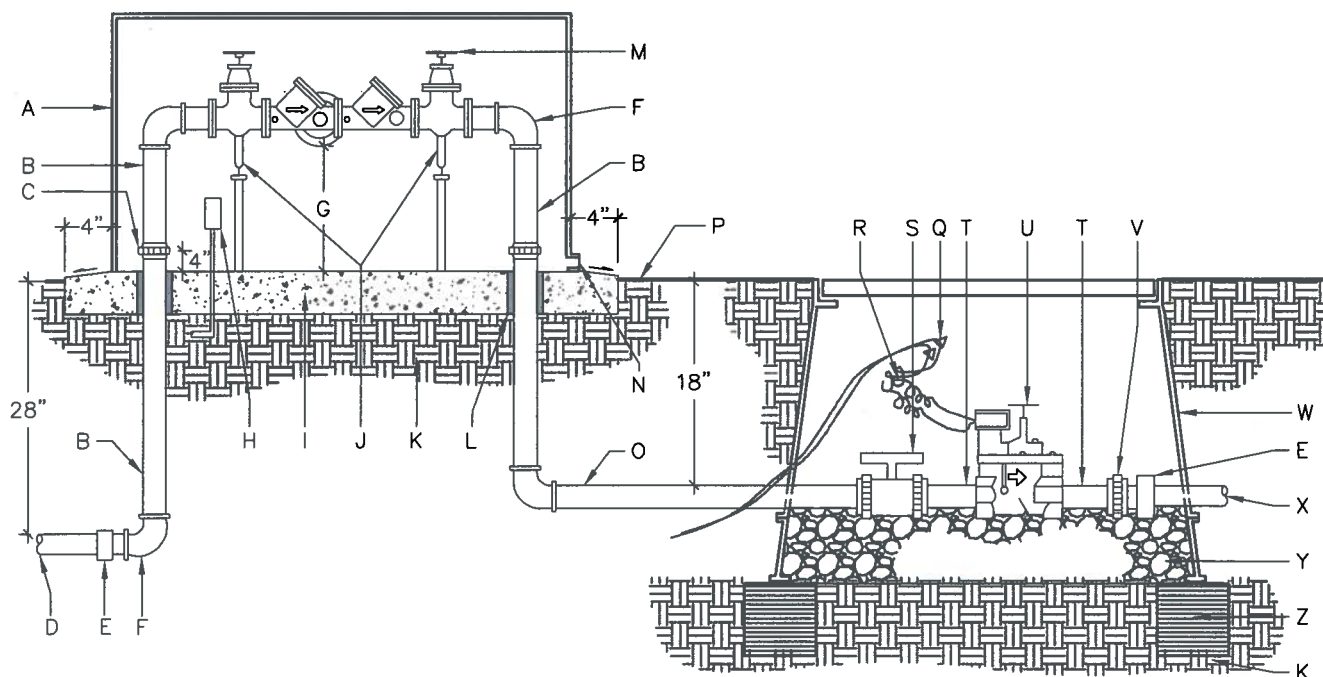


ALBUQUERQUE PUBLIC SCHOOLS

LANDSCAPING IRRIGATION, PLANTING AND SITE DETAILS

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CONSTRUCTION NOTES

- A. PROTECTIVE ENCLOSURE— FIBERGLASS INSULATED ENCLOSURE
- B. GALVANIZED NIPPLE.
- C. GALVANIZED UNION (MIN. 4" ABOVE GRADE).
- D. SERVICE LINE TO WATER METER, NO OUTLETS ALLOWED.
- E. PVC MIP ADAPTER.
- F. GALVANIZED ELL.
- G. 30" MAX., 12" MIN. (FROM LOWEST POINT OF ASSEMBLY TO TOP OF SLAB).
- H. ELECTRIC OUTLET FOR HEATED PROTECTIVE ENCLOSURE. NOT TO BE PLACED UNDER RELIEF VALVE. PROVIDE HEAT SOURCE (HEAT TAPE).
- I. MIN. 4" CONCRETE SLAB.
- J. PROVIDE METALLIC OR REINF. CONCRETE SUPPORTS ON UNITS GREATER THAN 2".
- K. COMPACTED SUBGRADE.
- L. ADEQUATE SLEEVING.
- M. RPBA BACKFLOW PREVENTER (REFERENCE DRAWINGS).

- N. DRAIN, SIZE TO HANDLE FULL DISCHARGE OF RELIEF VALVE.
- O. SCHEDULE 80 PVC NIPPLE 3' MINIMUM.
- P. FINISH GRADE, MATERIAL VARIES REFERENCE PLANS.
- Q. DRYCONN IDEAL TWISTER DIRECT BURY CONNECTORS.
- R. 24" WIRE EXPANSION COIL.
- S. TRUE UNION SCHEDULE 80 PVC BALL VALVE.
- T. SCHEDULE 80 PVC 4" NIPPLE.
- U. ELECTRIC VALVE (REFERENCE DRAWINGS FOR SIZE).
- V. SPEARS SCHEDULE 80 PVC UNION.
- W. BROOKS PRODUCTS INC., 1730 PB-18 BODY (ABS) VALVE BOX W/ BOLT DOWN COVER (ABS) AND ONE 8" EXTENSION.
- X. NON-CONSTANT PRESSURE IRRIGATION MAINLINE.
- Y. 1" DIAMETER WASHED ROCK.
- Z. 8"x8"x16" SOLID CMU BLOCK.

GENERAL NOTES

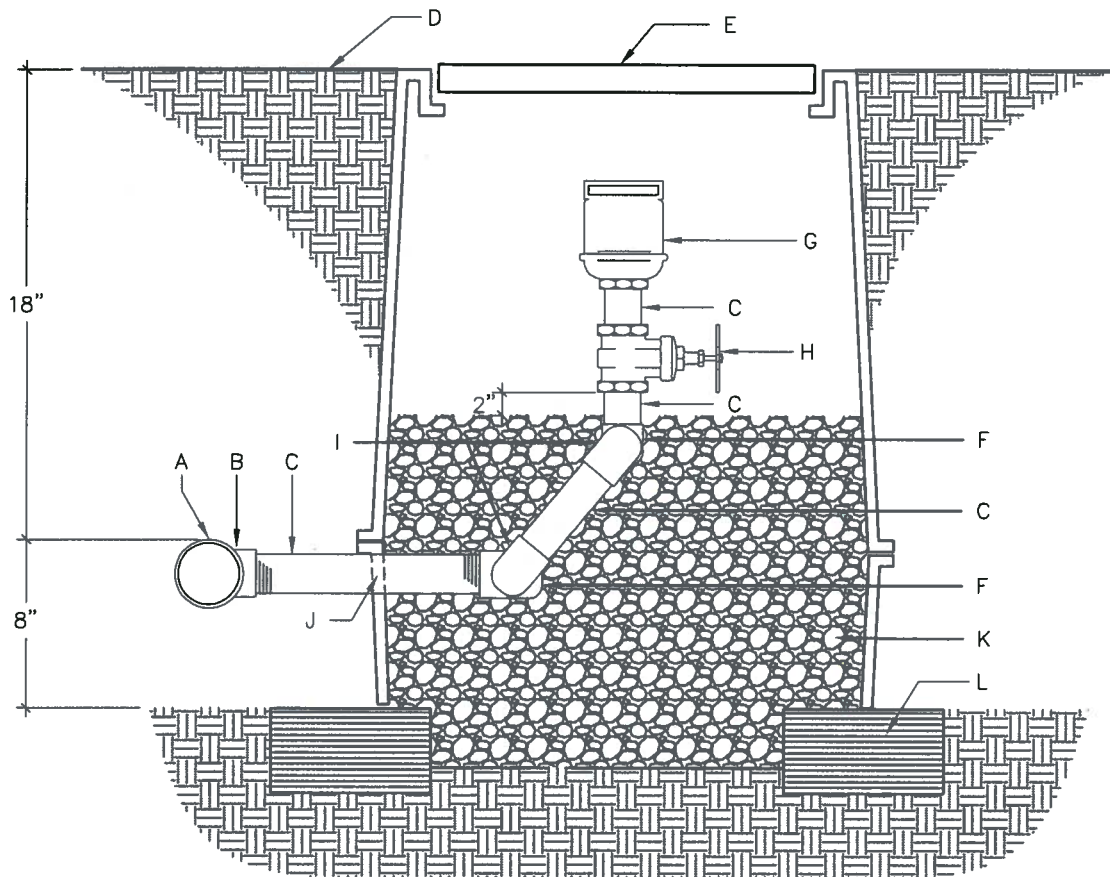
1. HORIZONTAL RPBA INSTALLATION REQUIRED.
2. ABOVE GRADE RPBA INSTALLATION REQUIRED.
3. WATER LINE PRESSURE AND TEMPERATURE MUST NOT EXCEED RATED CAPACITY OF RPBA.
4. PROTECT FROM FREEZING WITH POSITIVE HEAT SOURCE AND INSULATION.
5. DO NOT INSTALL IN FLOOD PRONE AREAS.
6. INSTALL WATER HAMMER ARRESTORS & THERMO EXPANSION PROTECTION AS NECESSARY.
7. METALLIC RISER PIPING REQUIRED.
8. JOINTS TO BE ADEQUATELY RESTRAINED.
9. DEVIATION FROM THESE SPECIFICATIONS MUST HAVE PRIOR WRITTEN APPROVAL FROM THE ADMINISTRATIVE AUTHORITY.
10. CONCRETE MOWSTRIP SHALL BE INSTALLED AROUND THE ENTIRE PERIMETER OF THE MASTERVALVE AND RPBA ASSEMBLY. MOWSTRIP SHALL BE A MIN. OF 12" FROM PIPING AND VALVE BOX. (OPTIONAL, DEPENDING ON APPLICATION).
11. MASTER METER FLOW METER SHALL BE INSTALLED DOWNSTREAM OF MASTER VALVE UNLESS DIRECTED OTHERWISE BY APS PERSONELL.



MASTER VALVE WITH RPBA ASSEMBLY

Albuquerque Public Schools
February 2014





CONSTRUCTION NOTES

- A. IRRIGATION MAINLINE.
- B. IRRIGATION MAINLINE TEE.
- C. SCH 80 PVC NIPPLE.
- D. FINISH GRADE (FLUSH WITH VALVE BOX IN TURF, 1/2" BELOW TOP OF VALVE BOX IN MULCH).
- E. CARSON INDUSTRIES, LLC OR APPROVED EQUAL 1730-18 VALVE BOX WITH 1730-3B BOLT DOWN COVER AND ONE 8" EXTENSION. COLOR TO MATCH ADJACENT MATERIAL (TURF-GREEN, MULCH-TAN) OR PURPLE IF RECLAIMED WATER SYSTEM.
- F. SCH 40 PVC ELL.
- G. AIR RELEASE VALVE (SEE LEGEND).
- H. BRASS GATE VALVE.
- I. SCH 40 PVC ST. ELL.

- J. CUT NOTCH IN VALVE BOX EXTENSION FOR NIPPLE. EDGE OF NOTCH SHALL BE MAXIMUM 1/2" FROM EDGE OF PIPE.
- K. 3/4" TO 1" DIAMETER CRUSHED GRAVEL, 6" DEPTH. GRAVEL SHALL BE WASHED FREE OF DIRT AND FINES.
- L. 8"x8"x16" SOLID CMU BLOCK (FOUR PER VALVE BOX).

GENERAL NOTES

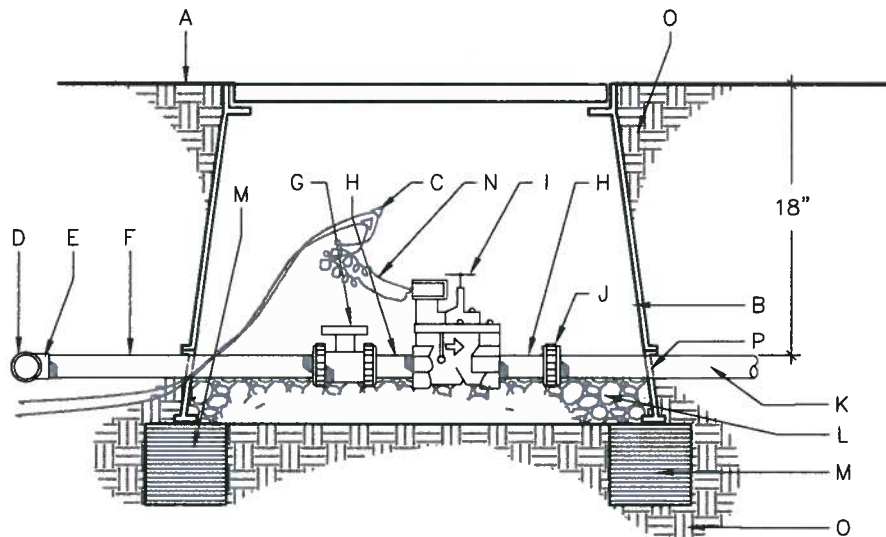
1. INSTALL AN 8"x8"x16" SOLID CMU BLOCK AT EACH CORNER OF VALVE BOX.
2. AIR RELIEF VALVE SHALL BE INSTALLED DOWNSTREAM OF THE MASTER VALVE AT HIGHPOINT OF MAINLINE.



AIR RELEASE VALVE

Albuquerque Public Schools
February 2014





CONSTRUCTION NOTES

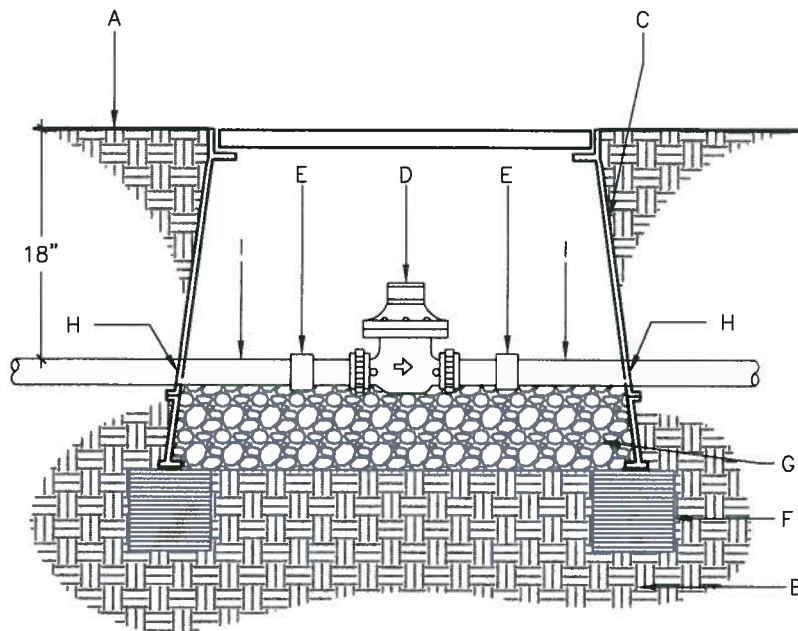
- A. FINISH GRADE (FLUSH WITH VALVE BOX IN TURF, 1/2" BELOW TOP OF VALVE BOX IN MULCH).
- B. CARSON INDUSTRIES, LLC OR APPROVED EQUAL 1730-18 VALVE BOX WITH 1730-3B BOLT DOWN COVER AND ONE 8" EXTENSION. COLOR TO MATCH ADJACENT MATERIAL (TURF-GREEN, MULCH-TAN) OR PURPLE IF RECLAIMED WATER SYSTEM.
- C. DRYCONN IDEAL TWISTER DIRECT BURY CONNECTORS.
- D. IRRIGATION MAINLINE/LATERAL MAINLINE.
- E. IRRIGATION MAINLINE SERVICE TEE OR ELL.
- F. SCHEDULE 80 PVC NIPPLE.
- G. SPEARS TRUE UNION SCHEDULE 80 PVC BALL VALVE.
- H. SCHEDULE 80 PVC 4" NIPPLE.
- I. ELECTRIC VALVE (SEE PLAN).
- J. SPEARS SCHEDULE 80 PVC UNION.
- K. LATERAL IRRIGATION LINE.
- L. 3/4" TO 1" DIAMETER CRUSHED GRAVEL, 6" DEPTH. GRAVEL SHALL BE FREE OF DIRT AND FINES.
- M. 8" X 8" X 16" SOLID CMU BLOCK.
- N. 24" WIRE EXPANSION COIL.
- O. SUBGRADE COMPACTED TO 95% MAXIMUM DENSITY.
- P. CUT NOTCH IN VALVE BOX EXTENSION FOR NIPPLE. EDGE OF NOTCH SHALL BE MAXIMUM 1/2" FROM EDGE OF PIPE.

GENERAL NOTES

1. INSTALL 8" X 8" X 16" SOLID CMU BLOCK AT EACH CORNER OF THE VALVE BOX.
2. WASH ROCK SHALL BE INSTALLED FLUSH WITH BOTTOM OF PIPE AND VALVE.



ELECTRIC VALVE



CONSTRUCTION NOTES:

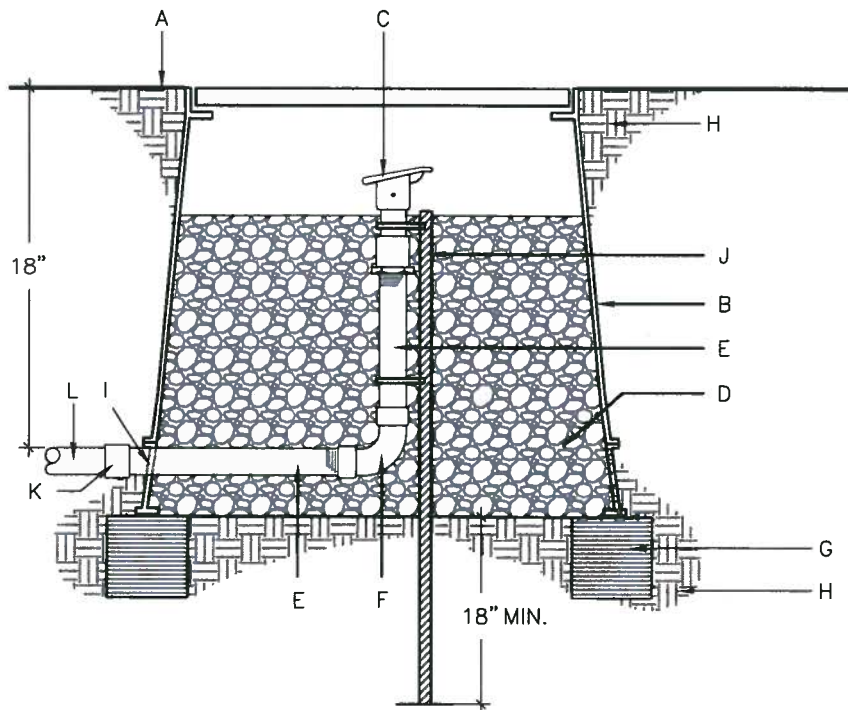
- A. FINISH GRADE, MATERIAL VARIES REFERENCE PLANS.
- B. COMPACTED SUBGRADE.
- C. BROOKS PRODUCTS INC., 1730 PB-18 BODY (ABS) VALVE BOX W/ BOLT DOWN COVER (ABS) AND ONE 8" EXTENSION.
- D. MASTER METER BRAND FLOW METER (SEE LEGEND).
- E. THREADED BRASS COUPLING.
- F. 8"x8"x16" SOLID CMU BLOCK.
- G. 1" WASH ROCK
- H. CUT NOTCH IN VALVE BOX EXTENSION FOR PIPE. EDGE OF NOTCH SHALL BE MAXIMUM 1/2" FROM EDGE OF PIPE.
- I. SCH. 80 TOE NIPPLE



IRRIGATION FLOW METER

Albuquerque Public Schools
February 2014





CONSTRUCTION NOTES

- A. FINISH GRADE (FLUSH WITH VALVE BOX IN TURF, 1/2" BELOW TOP OF VALVE BOX IN MULCH).
- B. CARSON INDUSTRIES, LLC OR APPROVED EQUAL 1730-18 VALVE BOX WITH 1730-3B BOLT DOWN COVER AND ONE 8" EXTENSION. COLOR TO MATCH ADJACENT MATERIAL (TURF-GREEN, MULCH-TAN) OR PURPLE IF RECLAIMED WATER SYSTEM.
- C. RAINBIRD 33 DRC QUICK COUPLER VALVE (OR APPROVED EQUAL).
- D. 3/4" TO 1" DIAMETER CRUSHED GRAVEL, FULL DEPTH. GRAVEL SHALL BE WASHED FREE OF DIRT AND FINES.
- E. 12" SCH 40 GALVANIZED RISER.
- F. SCHEDULE 40 GALVANIZED ELL.
- G. 8" X 8" X 16" SOLID CMU BLOCK
- H. SUBGRADE COMPACTED TO 95% MAXIMUM DENSITY.

- I. CUT NOTCH IN VALVE BOX EXTENSION FOR NIPPLE. EDGE OF NOTCH SHALL BE MAXIMUM 1/2" FROM EDGE OF PIPE.
- J. TEE POST (MINIMUM 18' DEPTH INTO GRADE), SECURED TO IRRIGATION COMPONENTS WITH MINIMUM 17 GA. GALVANIZED WIRE.
- K. SCH 40 GALVANIZED THREADED COUPLING
- L. SCH 80 PVC TOE NIPPLE

GENERAL NOTES

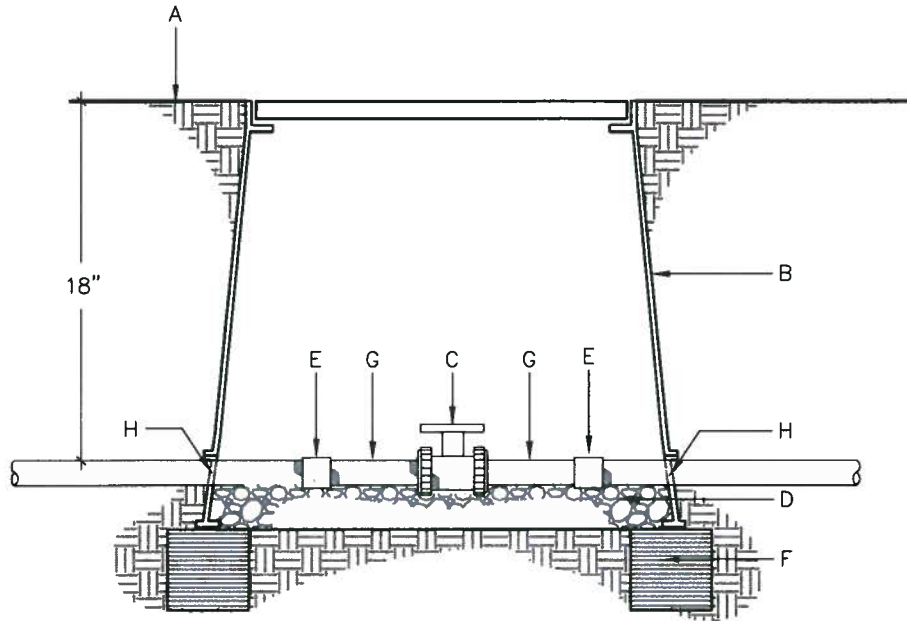
1. INSTALL AN 8" X 8" X 16" SOLID CMU BLOCK AT EACH CORNER OF THE VALVE BOX.
2. INSTALL A BALL VALVE IMMEDIATELY UPSTREAM OF THE QUICK COUPLER VALVE.



QUICK COUPLER VALVE

Albuquerque Public Schools
February 2014





CONSTRUCTION NOTES

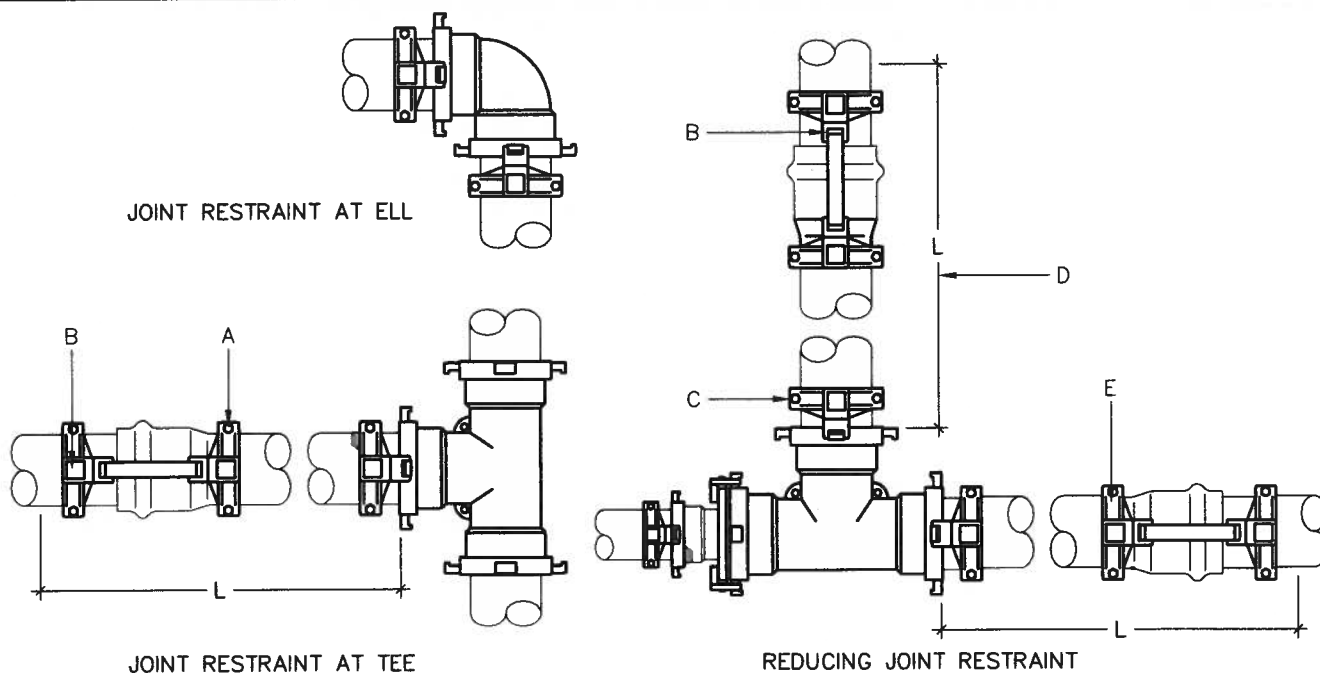
- A. FINISH GRADE (FLUSH WITH VALVE BOX IN TURF, 1/2' BELOW TOP OF VALVE BOX IN MULCH).
- B. CARSON INDUSTRIES, LLC OR APPROVED EQUAL 1730-18 VALVE BOX WITH 1730-3B BOLT DOWN COVER AND ONE 8" EXTENSION. COLOR TO MATCH ADJACENT MATERIAL (TURF-GREEN, MULCH-TAN) OR PURPLE IF RECLAIMED WATER SYSTEM.
- C. SPEARS TRUE UNION SCHEDULE 80 PVC BALL VALVE.
- D. 3/4" TO 1" DIAMETER CRUSHED GRAVEL, 6" DEPTH. GRAVEL SHALL BE FREE OF DIRT AND FINES.
- E. SCHEDULE 40 PVC COUPLER.
- F. 8"X 8"X 16" SOLID CMU BLOCK.
- G. SCHEDULE 80 PVC 12" NIPPLE.
- H. CUT NOTCH IN VALVE BOX EXTENSION FOR NIPPLE. EDGE OF NOTCH SHALL BE MAXIMUM 1/2" FROM EDGE OF PIPE.

GENERAL NOTES

1. INSTALL AN 8"X8"X16" SOLID CMU BLOCK AT EACH CORNER OF THE VALVE BOX.
2. WASH ROCK SHALL BE INSTALLED FLUSH WITH BOTTOM OF PIPE AND VALVE.



ISOLATION VALVE



MINIMUM RESTRAINED LENGTH ("L") IN FEET

PIPE SIZE	DEGREE OF BEND				STEP REDUCTION			DEAD END	GATE VALVE
	11	22	45	90	1	2	3		
2	1	1	2	6				19	10
2.5	1	2	4	9	4			23	12
3	2	3	6	11	8	10		30	15
4	2	4	9	20	14	20	31	45	23
6	3	6	13	29	30	40	53	63	31
8	4	8	15	38	33	55	63	75	38
10	5	9	19	45	31	56	75	96	48
12	5	10	21	53	54	58	79	112	56
14	6	11	24	58	30	70	74	118	58
16	6	13	27	65	30	54	90	130	65

1 STEP REDUCTION IS ONE PIPE SIZE DOWN (I.E. 8X6)

2 STEP REDUCTION IS TWO PIPE SIZE DOWN (I.E. 8X4)

3 STEP REDUCTION IS THREE PIPE SIZE DOWN (I.E. 8X3)

CONSTRUCTION NOTES

- A. DUCTILE IRON JOINT RESTRAINT AT BRANCH TEE.
- B. DUCTILE IRON JOINT RESTRAINT, PIPE TO PIPE.
- C. DUCTILE IRON JOINT RESTRAINT AT REDUCING JOINT TEE.
- D. NOTE: THE DISTANCE (L) THE MAINLINE PIPE MUST BE RESTRAINED VARIES.
SEE CHART "A"
- E. PROVIDE ADDITIONAL PIPE TO PIPE JOINT RESTRAINTS UPSTREAM AND DOWNSTREAM OF BRANCH TEE.

GENERAL NOTES

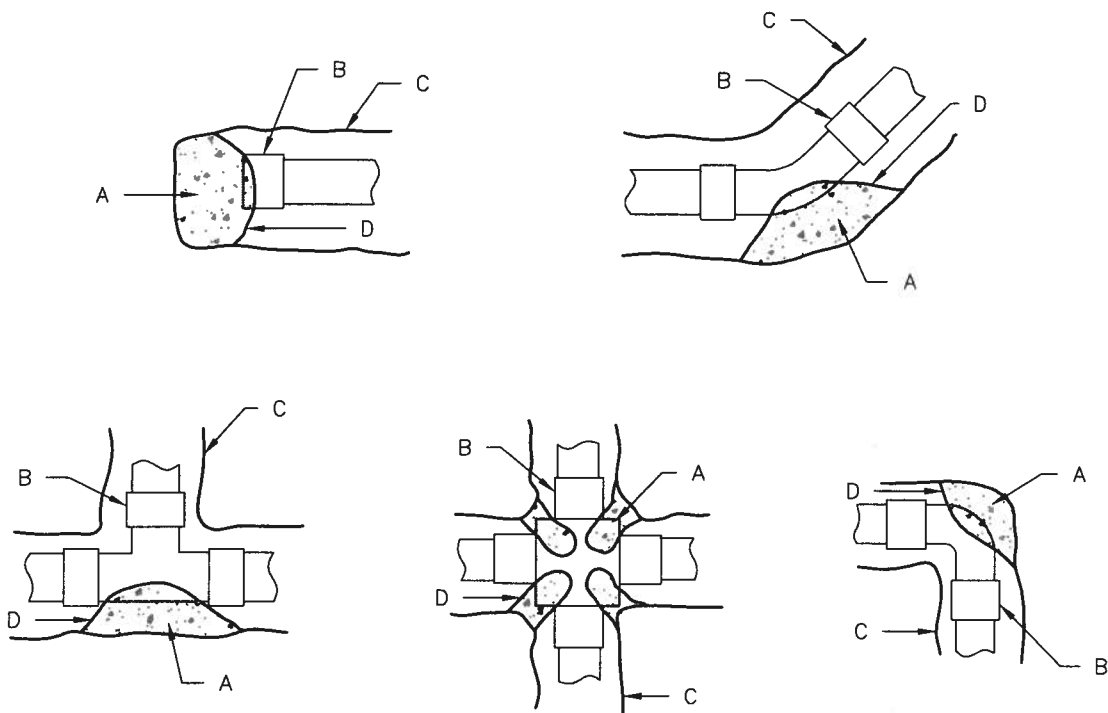
1. BOTTOM OF TRENCH AT JOINT RESTRAINT TO BE SOLID UNDISTURBED SOIL OR FILL COMPACTED TO 95% MODIFIED PROCTOR DENSITY.
2. ALL JOINT RESTRAINTS TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.



MECHANICAL RESTRAINTS

Albuquerque Public Schools
February 2014





CONSTRUCTION NOTES

- A. CONCRETE THRUST BLOCK PLACED AGAINST SOLID UNDISTURBED SOIL.
- B. PVC FITTING.
- C. PIPE TRENCH.
- D. 10 MIL. PLASTIC SHEETING.

GENERAL NOTES

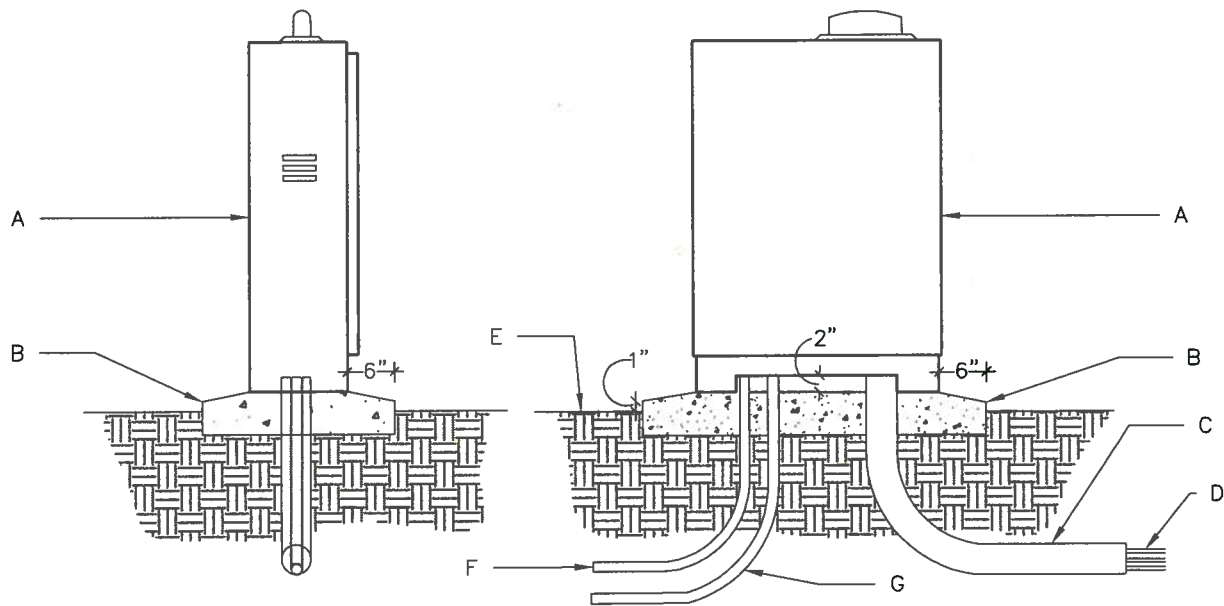
1. PVC FITTINGS SHALL BE PROTECTED FROM CONCRETE BY PLACING 10 MIL. PLASTIC SHEETING BETWEEN CONCRETE AND FITTING.



THRUST BLOCKS

Albuquerque Public Schools
February 2014





CONSTRUCTION NOTES

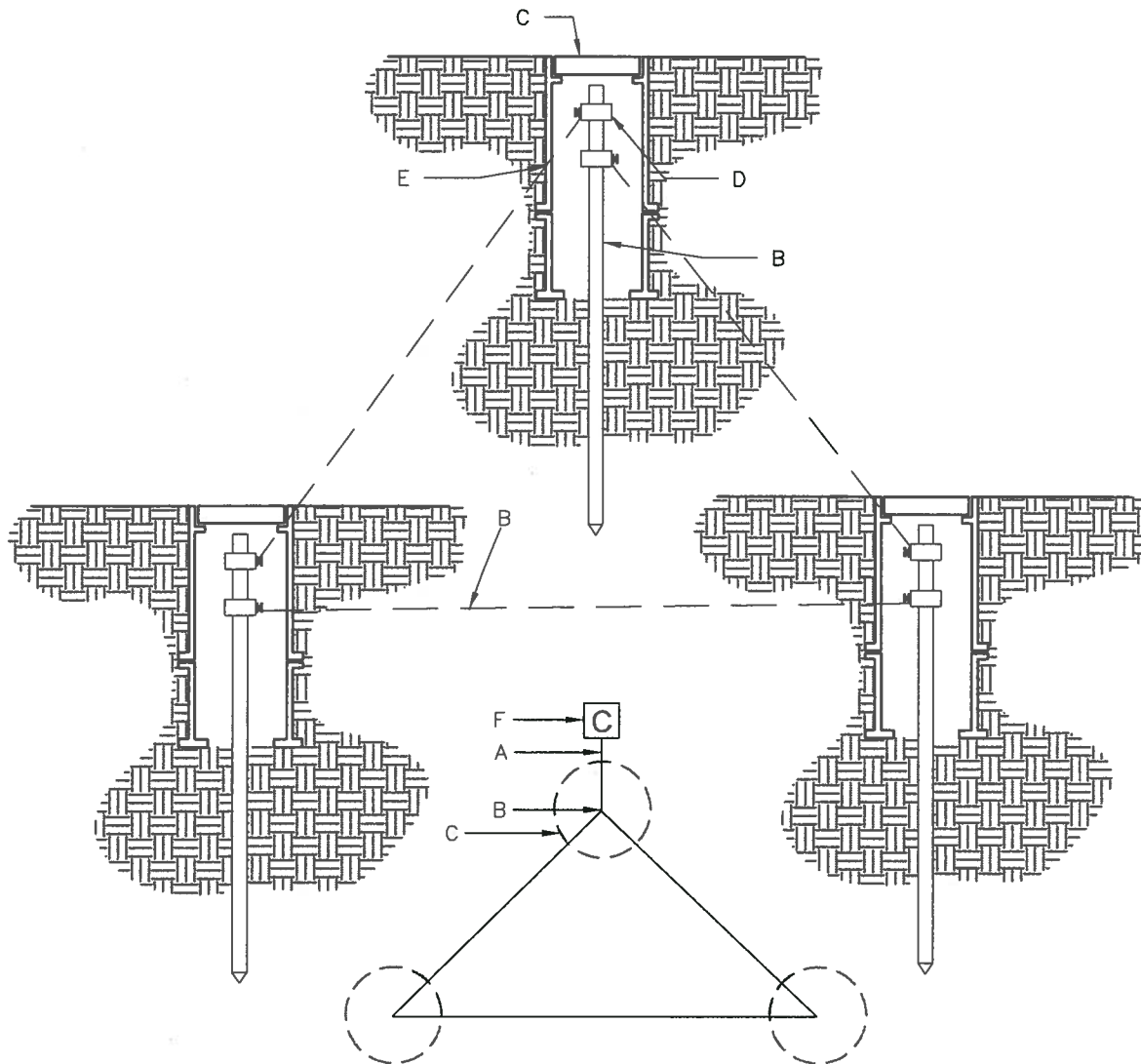
- A. IRRIGATION CONTROLLER ENCLOSURE WITH PEDESTAL, SEE IRRIGATION LEGEND. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
- B. POURED CONCRETE BASE, 6" MINIMUM THICKNESS. EXTEND CONCRETE 6" BEYOND OUTSIDE DIMENSIONS OF ENCLOSURE WITH 2% SLOPE FOR DRAINAGE.
- C. PVC LONG SWEEP ELL (24 VOLT WIRE) EXTEND 12" PAST CONCRETE PAD.
- D. DIRECT BURIAL CONTROL WIRES TO CONTROL VALVES.
- E. FINISH GRADE
- F. 120 VOLT SERVICE IN CONDUIT, PER N.E.C.
- G. 3/4" CONDUIT FOR GROUNDING. REFER TO IRRIGATION CONTROLLER GROUNDING DETAIL.



PEDESTAL MOUNT IRRIGATION CONTROLLER

Albuquerque Public Schools
February 2014





CONSTRUCTION NOTES

- A. #6 AWG WIRE FROM IRRIGATION CONTROLLER TO GROUND ROD. WIRE SHALL BE INSTALLED TO BE TAUT.
- B. 8' LENGTH GROUND ROD, PLACE IN IRRIGATED AREA A MINIMUM OF 16' FROM ONE ANOTHER WITH ONE ROD A MINIMUM., OF 12' FROM CONTROLLER. (OPTION: REPLACE GROUNDING RODS WITH $\frac{1}{8}$ " X 12" X 18" COPPER PLATE, BURIED AT 12" DEPTH. SOLDER #6 BARE COPPER WIRE TO PLATE.)
- C. 7" DIAMETER X 9" DEEP BROOKS 700 SERIES VALVE BOX WITH COVER.
- D. GROUND ROD CLAMP.
- E. DRILL A SMALL HOLE IN VALVE BOX TO KEEP WIRE TAUT.
- F. CONTROLLER

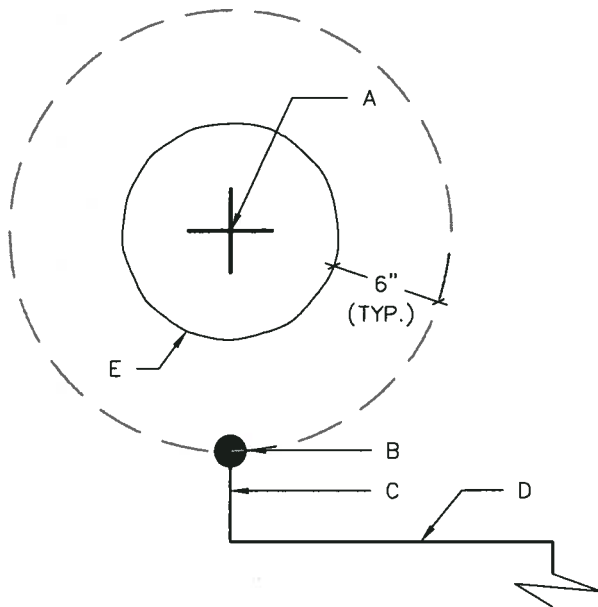
GROUNDING RODS TO BE LOCATED IN TURF OR NEXT TO AN IRRIGATION BUBBLER. CONTRACTOR SHALL PERFORM AN OHMS TEST FOR GROUNDING RODS TO VERIFY THAT THE CONTROLLER IS PROPERLY GROUNDED. CONTRACTOR SHALL PROVIDE LANDSCAPE ARCHITECT A HARD COPY OF THIS TEST.



IRRIGATION CONTROLLER GROUNDING DETAIL

Albuquerque Public Schools
February 2014

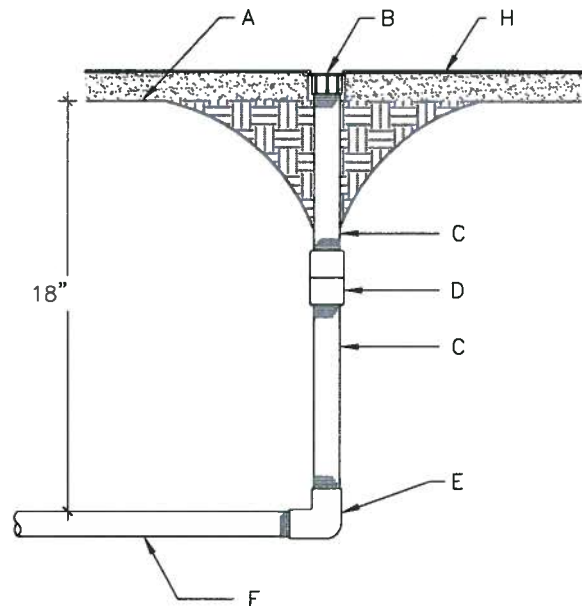




SHRUB BUBBLER LAYOUT

CONSTRUCTION NOTES FOR BUBBLER LAYOUT

- A. CENTER OF SHRUB.
- B. BUBBLER (SEE IRRIGATION LEGEND) ONE PER SHRUB, TYP. (CENTERED).
- C. 3/4" LATERAL.
- D. LATERAL PIPING- SIZE AS PER PLAN.
- E. EDGE OF ROOTBALL



BUBBLER ASSEMBLY

CONSTRUCTION NOTES

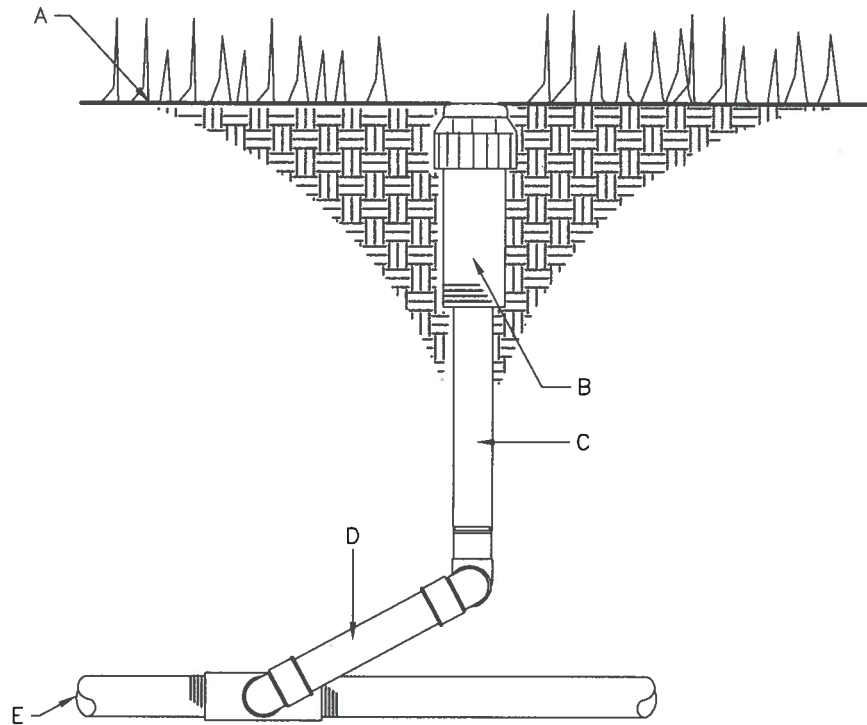
- A. FINISH GRADE
- B. PRESSURE COMPENSATING BUBBLER (SEE LEGEND). TOP OF BUBBLER SET FLUSH WITH TOP OF MULCH.
- C. 1/2"x 6" SCH. 80 PVC NIPPLE.
- D. 1/2" SCH. 80 PVC THREADED COUPLING.
- E. 1/2" SCH. 80 PVC NIPPLE (12" LENGTH OR AS REQUIRED).
- F. SCH. 40 PVC LATERAL FITTING WITH 1/2" FIPT OUTLET.
- G. LATERAL PIPING, SIZE PER PLAN.
- H. TOP OF MULCH.



IRRIGATION BUBBLER HEAD SHRUB LAYOUT

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February 2014





CONSTRUCTION NOTES

- A. FINISH GRADE.
- B. SPRINKLER HEAD (SEE PLAN).
- C. SCH. 80 PVC NIPPLE. (LENGTH & SIZE SHALL DEPEND ON THE SIZE OF THE SPRINKLER HEAD).
- D. LASCO 1/2" UNITIZED SWIVEL JOINT #T522-212 OR APPROVED EQUAL.
- E. LATERAL PIPE.

GENERAL NOTES

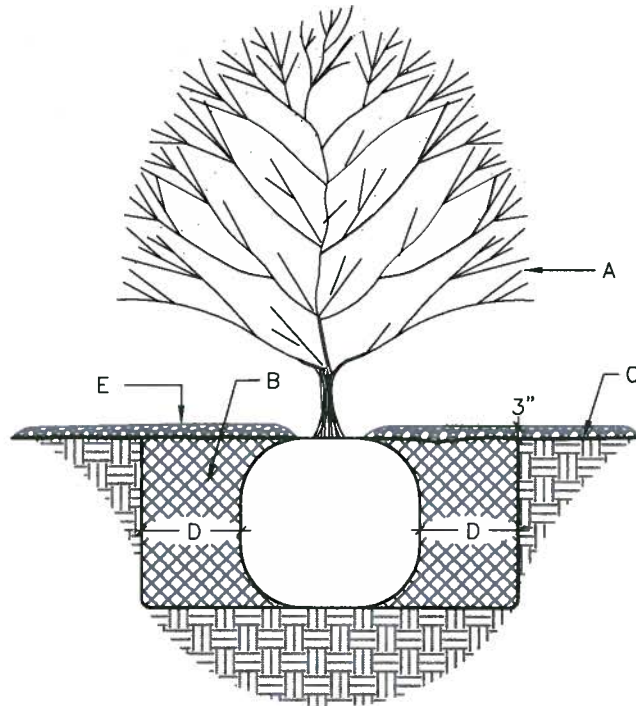
1. THIS DETAIL SHALL BE USED FOR POP-UP SHRUB SPRAY, POP-UP TURF SPRAY, GEAR DRIVEN AND ROTARY SPRINKLER HEADS.
2. LATERAL LINE TESTING SHALL BE COMPLETED PRIOR TO THE INSTALLATION OF THE SWING JOINT ASSEMBLY. LATERAL TESTING SHALL BE ACCOMPLISHED BY INSTALLING A PLUG IN THE OUTLET OF LATERAL LINE TEES AND ELLS.
3. TOP OF SPRINKLER HEAD SHALL BE SET FLUSH WITH FINISH GRADE IN TURF AND 1/2" ABOVE GRADE IN MULCH.



SPRINKLER HEAD WITH SWING JOINT

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February 2014





GENERAL NOTES

1. STABILIZE SOIL BELOW ROOTBALL PRIOR TO PLANTING TO PREVENT SHRUB FROM SETTLING.

CONSTRUCTION NOTES

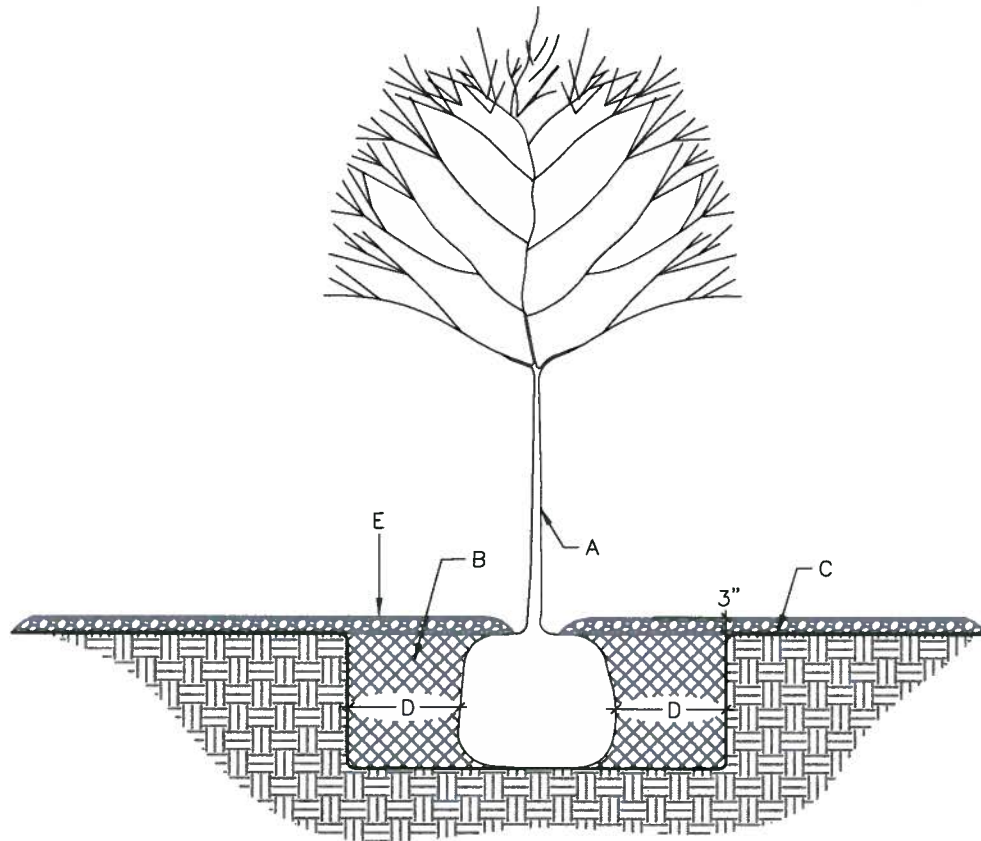
- A. SHRUB.
- B. PLANTING SOIL MIXTURE (REFERENCE THE SPECIFICATIONS).
- C. FINISH GRADE.
- D. SPACE BETWEEN THE ROOT BALL AND THE SIDE OF PLANTING PIT TO BE EQUAL TO THE DIAMETER OF THE ROOT BALL.
- E. 3" DEPTH BARK MULCH OR REFERENCE THE PLANS



ISOLATED SHRUB PLANTING

Albuquerque Public Schools
February 2014





GENERAL NOTES

1. STABILIZE SOIL BELOW ROOTBALL PRIOR TO PLANTING TO PREVENT TREE FROM SETTLING.
2. TOP OF ROOTBALL INDICATES LEVEL AT WHICH TREE WAS GROWN AND DUG; THIS REPRESENTS THE LEVEL AT WHICH THE TREE SHOULD BE INSTALLED; THAT LEVEL MAY BE EXCEEDED BY ONLY A ONE INCH LAYER OF SOIL.
3. PRIOR TO BACKFILLING TREE, ALL WIRE, ROPE AND SYNTHETIC MATERIAL SHALL BE REMOVED FROM THE TREE AND THE PLANTING PIT.
4. PRIOR TO BACKFILLING ALL BURLAP SHALL BE CUT AWAY FROM THE ROOTBALL.

CONSTRUCTION NOTES

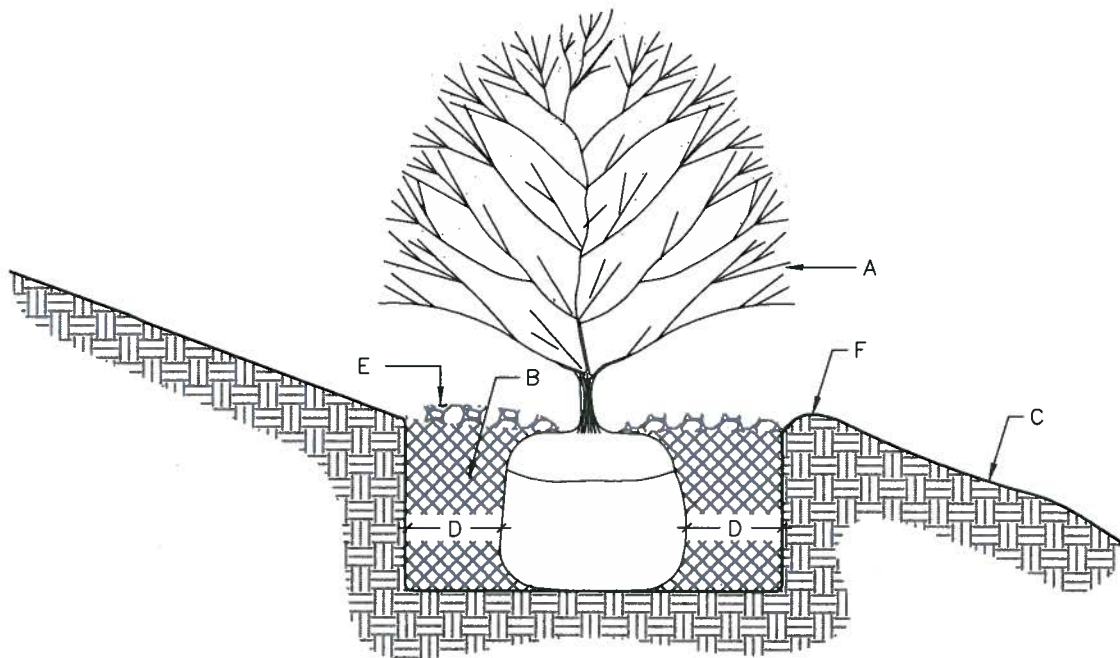
- A. TREE.
- B. PLANTING SOIL MIXTURE (REFERENCE THE SPECIFICATIONS).
- C. FINISH GRADE.
- D. SPACE BETWEEN THE ROOT BALL AND THE SIDE OF PLANTING PIT TO BE EQUAL TO THE DIAMETER OF THE ROOT BALL.
- E. 3" DEPTH BARK MULCH OR REFERENCE THE PLANS.



ISOLATED TREE PLANTING

Albuquerque Public Schools
February 2014





GENERAL NOTES

1. STABILIZE SOIL BELOW ROOTBALL PRIOR TO PLANTING TO PREVENT SHRUB FROM SETTLING.

CONSTRUCTION NOTES

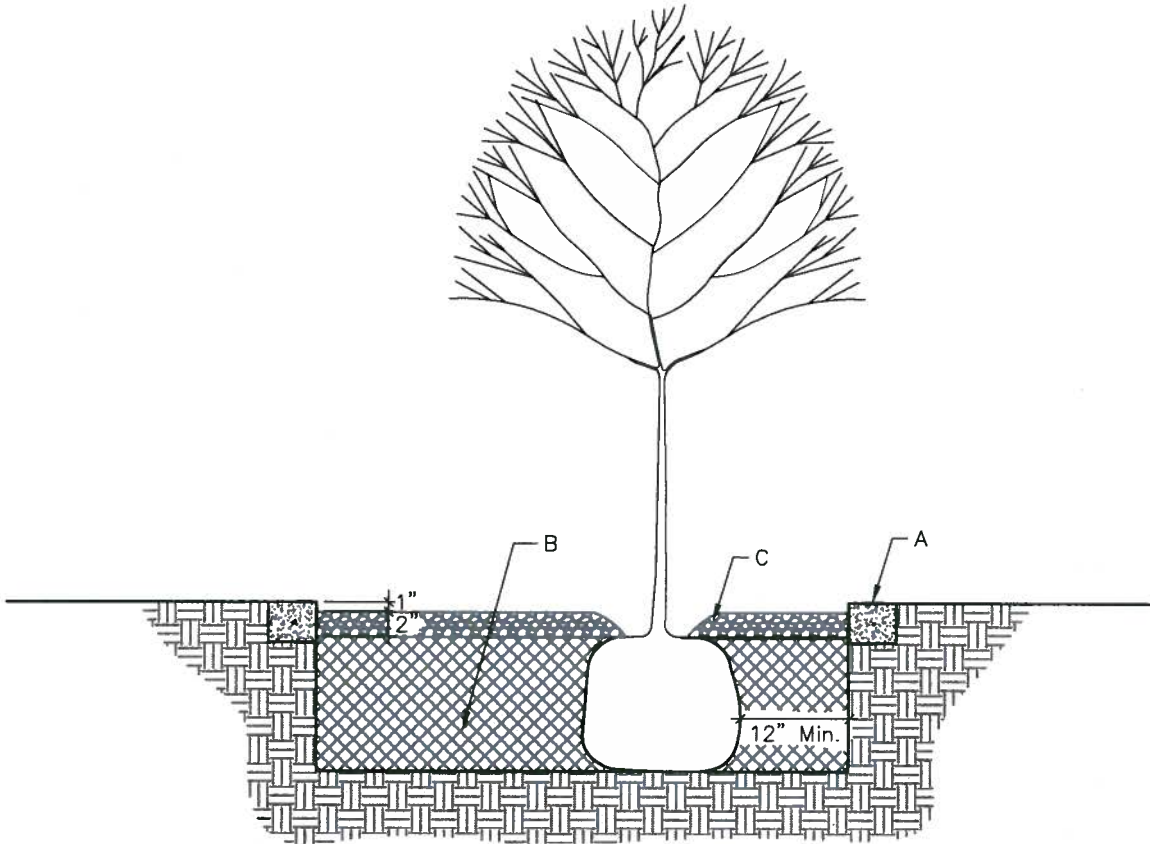
- A. SHRUB.
- B. PLANTING SOIL MIXTURE (REFERENCE THE SPECIFICATIONS).
- C. FINISH GRADE.
- D. SPACE BETWEEN THE ROOT BALL AND THE SIDE OF PLANTING PIT TO BE EQUAL TO THE DIAMETER OF THE ROOT BALL.
- E. BARK MULCH (REFERENCE THE SPECIFICATIONS).
- F. EARTH DAM TO RETAIN WATER



SHRUB PLANTING ON SLOPE

Albuquerque Public Schools
February 2014





GENERAL NOTES

1. STABILIZE SOIL BELOW ROOTBALL PRIOR TO PLANTING TO PREVENT TREE FROM SETTLING.
2. TOP OF ROOTBALL INDICATES LEVEL AT WHICH TREE WAS GROWN AND DUG; THIS REPRESENTS THE LEVEL AT WHICH THE TREE SHOULD BE INSTALLED; THAT LEVEL MAY BE EXCEEDED BY ONLY A ONE INCH LAYER OF SOIL.
3. PRIOR TO BACKFILLING TREE, ALL WIRE, ROPE AND SYNTHETIC MATERIAL SHALL BE REMOVED FROM THE TREE AND THE PLANTING PIT.
4. PRIOR TO BACKFILLING ALL BURLAP SHALL BE CUT AWAY FROM THE ROOTBALL.

CONSTRUCTION NOTES

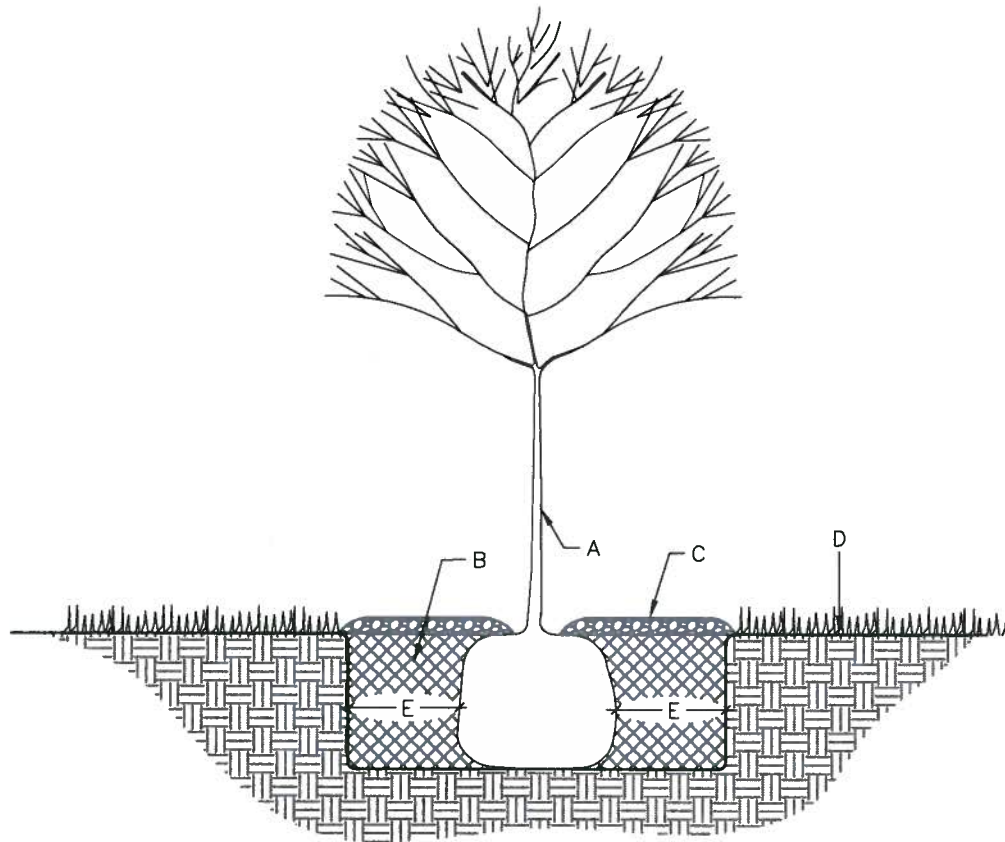
- A. MATERIAL VARIES (REFERENCE THE DRAWINGS).
- B. PLANTING SOIL MIXTURE (REFERENCE THE SPECIFICATIONS).
- C. BARK MULCH OR REFERENCE THE PLANS.



TREE IN PLANTER

Albuquerque Public Schools
February 2014





GENERAL NOTES

1. STABILIZE SOIL BELOW ROOTBALL PRIOR TO PLANTING TO PREVENT TREE FROM SETTLING.
2. TOP OF ROOTBALL INDICATES LEVEL AT WHICH TREE WAS GROWN AND DUG; THIS REPRESENTS THE LEVEL AT WHICH THE TREE SHOULD BE INSTALLED; THAT LEVEL MAY BE EXCEEDED BY ONLY A ONE INCH LAYER OF SOIL.
3. PRIOR TO BACKFILLING TREE, ALL WIRE, ROPE AND SYNTHETIC MATERIAL SHALL BE REMOVED FROM THE TREE AND THE PLANTING PIT.
4. PRIOR TO BACKFILLING ALL BURLAP SHALL BE CUT AWAY FROM THE ROOTBALL.

CONSTRUCTION NOTES

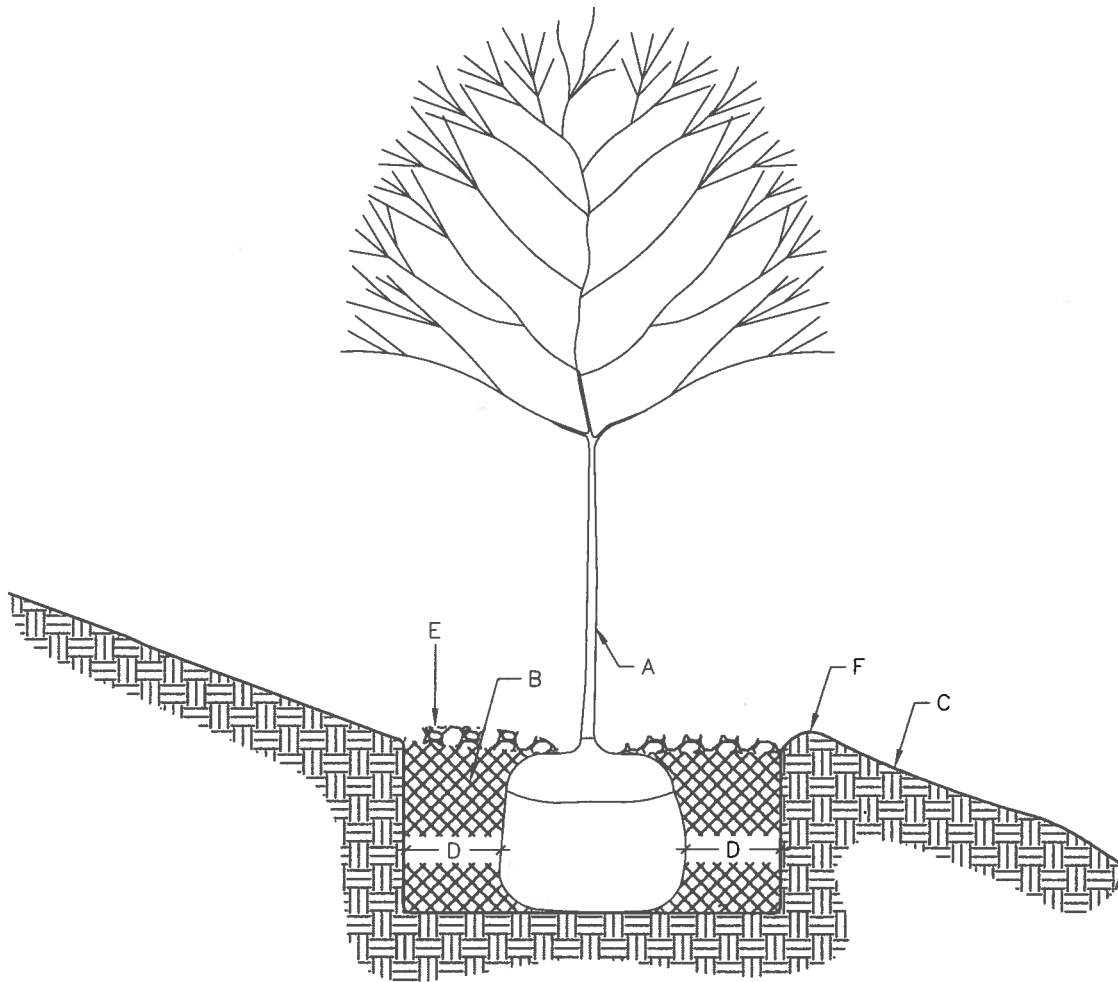
- A. TREE.
- B. PLANTING SOIL MIXTURE (REFERENCE THE SPECIFICATIONS).
- C. 4" DEPTH OF BARK MULCH.
- D. TURF AT FINISH GRADE.
- E. SPACE BETWEEN THE ROOTBALL AND THE SIDE OF PLANTING PIT TO BE EQUAL TO THE DIAMETER OF THE ROOT BALL.



TREE PLANTED IN TURF

Albuquerque Public Schools
February 2014





GENERAL NOTES

1. STABILIZE SOIL BELOW ROOTBALL PRIOR TO PLANTING TO PREVENT TREE FROM SETTLING.
2. TOP OF ROOTBALL INDICATES LEVEL AT WHICH TREE WAS GROWN AND DUG; THIS REPRESENTS THE LEVEL AT WHICH THE TREE SHOULD BE INSTALLED; THAT LEVEL MAY BE EXCEEDED BY ONLY A ONE INCH LAYER OF SOIL.
3. PRIOR TO BACKFILLING TREE, ALL WIRE, ROPE AND SYNTHETIC MATERIAL SHALL BE REMOVED FROM THE TREE AND THE PLANTING PIT.
4. PRIOR TO BACKFILLING ALL BURLAP SHALL BE CUT AWAY FROM THE ROOTBALL.

CONSTRUCTION NOTES

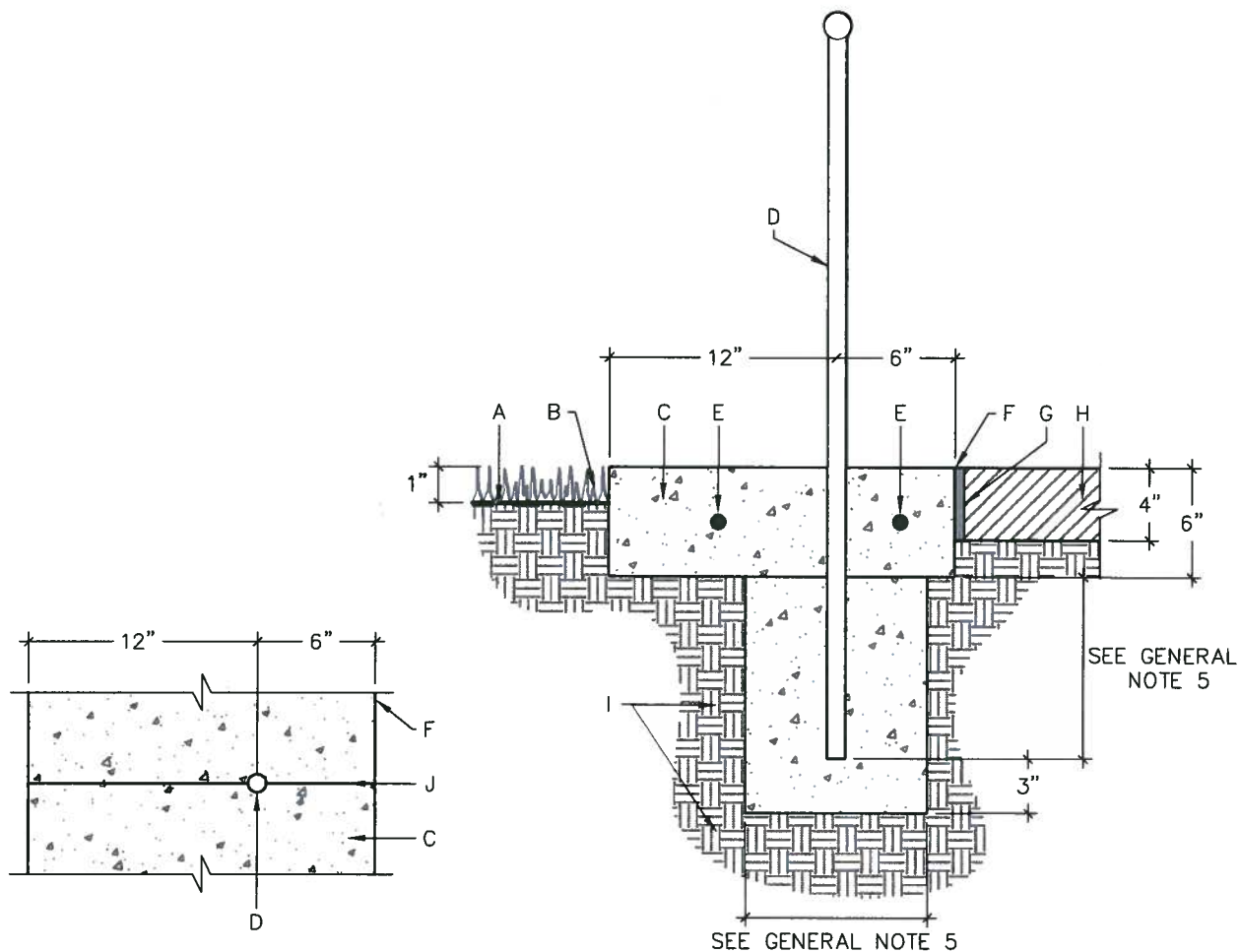
- A. TREE.
- B. PLANTING SOIL MIXTURE (REFERENCE THE SPECIFICATIONS).
- C. FINISH GRADE.
- D. SPACE BETWEEN THE ROOT BALL AND THE SIDE OF PLANTING PIT TO BE EQUAL TO THE DIAMETER OF THE ROOT BALL.
- E. BARK MULCH (REFERENCE THE SPECIFICATIONS).
- F. EARTH DAM TO RETAIN WATER



TREE PLANTING ON SLOPE

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February 2014





CONSTRUCTION NOTES

- A. FINISH GRADE.
- B. SEEDED OR SODDED TURF (REFERENCE THE DRAWINGS).
- C. 3000 PSI CONCRETE EDGER WITH BRUSH FINISH (SEE SECTION 101).
- D. FENCE POST (REFERENCE PLANS).
- E. No.3 REBAR HORIZONTAL AND CONTINUOUS.
- F. TOOLED EDGE (TYP.).
- G. 1/2" EXPANSION JOINT MATERIAL IF ADJACENT TO HARDSCAPE.
- H. MATERIAL VARIES (REFERENCE THE DRAWINGS). PROVIDE 1/2" LIP IF MULCH MATERIAL.
- I. SUBGRADE COMPACTED TO 95% MAXIMUM DENSITY.
- J. CONTROL JOINT

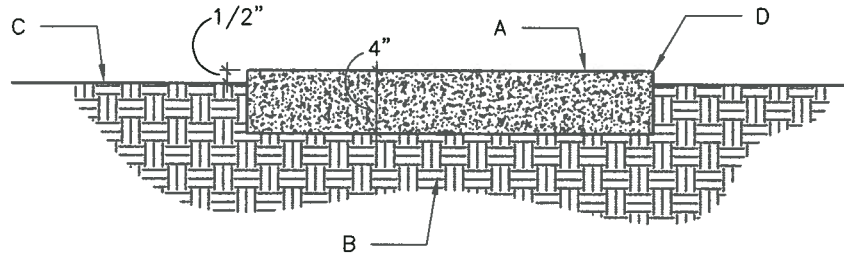
GENERAL NOTES

1. A 12" CONCRETE EDGER SHALL BE PLACED ON THE TURF SIDE OF THE FENCE AND A 6" EDGER SHALL BE PLACED ON THE NON-TURF SIDE OF THE FENCE.
2. CONTROL JOINTS SHALL BE PLACED AT 5' O.C.
3. EXPANSION JOINTS SHALL BE PLACED AT 20' O.C AND WHERE THE MOWSTRIP ABUTS ANOTHER HARD SURFACE.
4. TOP OF EDGER SHALL BE LEVEL WITH THE TURF AT FINISH GRADE.
5. REFERENCE THE PLANS OR APS STANDARD FENCING DETAILS FOR FENCE INSTALLATION INFORMATION.

○ CONCRETE EDGER AT FENCE

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February 2014





CONSTRUCTION NOTES

- A. 3000 PSI CONCRETE SIDEWALK WITH BROOM FINISH.
- B. SUBGRADE COMPACTED TO 95% MAXIMUM DENSITY
- C. MATERIAL VARIES.
- D. TOOLED EDGE. (TYP.)

GENERAL NOTES

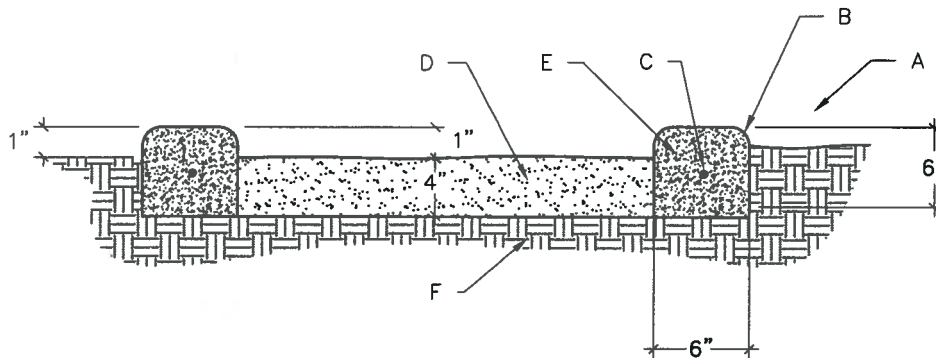
1. CONCRETE WIDTH DETERMINED BY DRAWINGS.
2. CONTROL JOINTS SHALL BE PLACED AT 5' ON CENTER.
3. EXPANSION JOINTS SHALL BE PLACED AT 20' ON CENTER, AND WHERE THE CONCRETE WALK ABUTS ANOTHER HARD SURFACE
4. THE CONCRETE WALK CROSS SLOPE SHALL BE SLOPED AT 2% (MAXIMUM) ACROSS THE WIDTH OF THE WALK. REFERENCE THE GRADING PLAN.



CONCRETE WALK

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February 2014





CONSTRUCTION NOTES

- A. MATERIAL VARIES, (REFERENCE THE DRAWING).
- B. TOOLED EDGE. (TYP.)
- C. #3 REBAR, HORIZONTAL AND CONTINUOUS.
- D. CRUSHER FINES ROLLED FOR COMPACTION.
- E. 3000PSI CONCRETE MOWSTRIP WITH BRUSHED FINISH.
- F. SUBGRADE COMPACTED TO 95%.

GENERAL NOTES

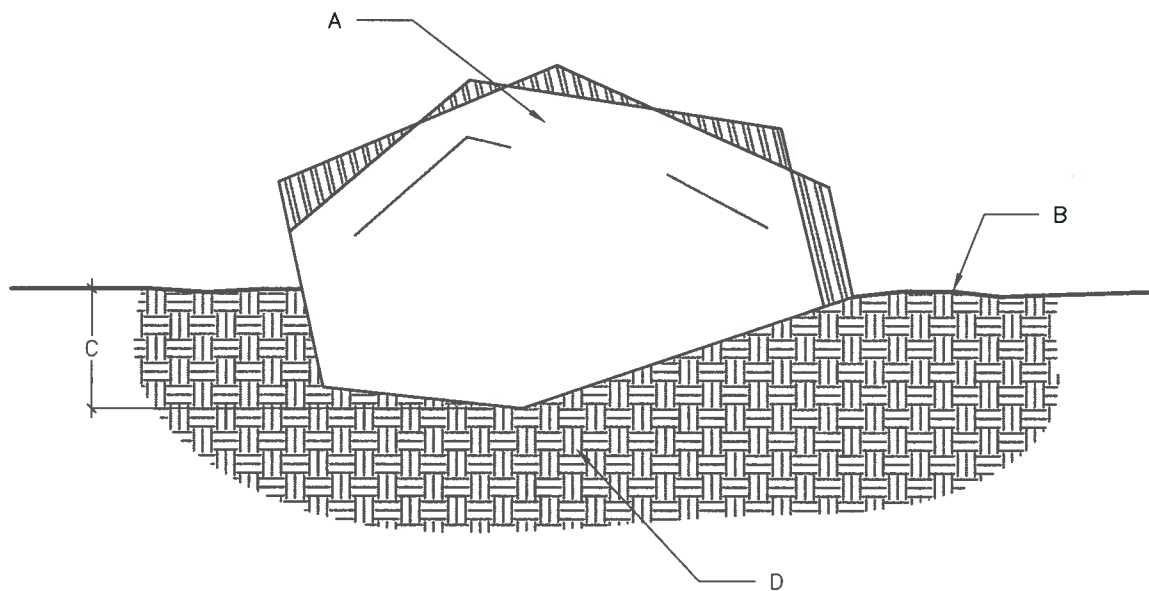
1. CONTROL JOINTS SHALL BE PLACED AT 5' ON CENTER.
2. EXPANSION JOINTS SHALL BE PLACED AT 20' ON CENTER, AND WHERE THE MOWSTRIP ABUTS ANOTHER HARD SURFACE
3. THE CONCRETE MOWSTRIP MAY BE EXTRUDED, BUT SHALL MEET THE STANDARDS OF THIS DETAIL.
4. SAMPLE OF THE CRUSHED SAND SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATION FOR APPROVAL PRIOR TO INSTALLATION.



CRUSHER FINES TRAIL/WALK

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February 2014





CONSTRUCTION NOTES

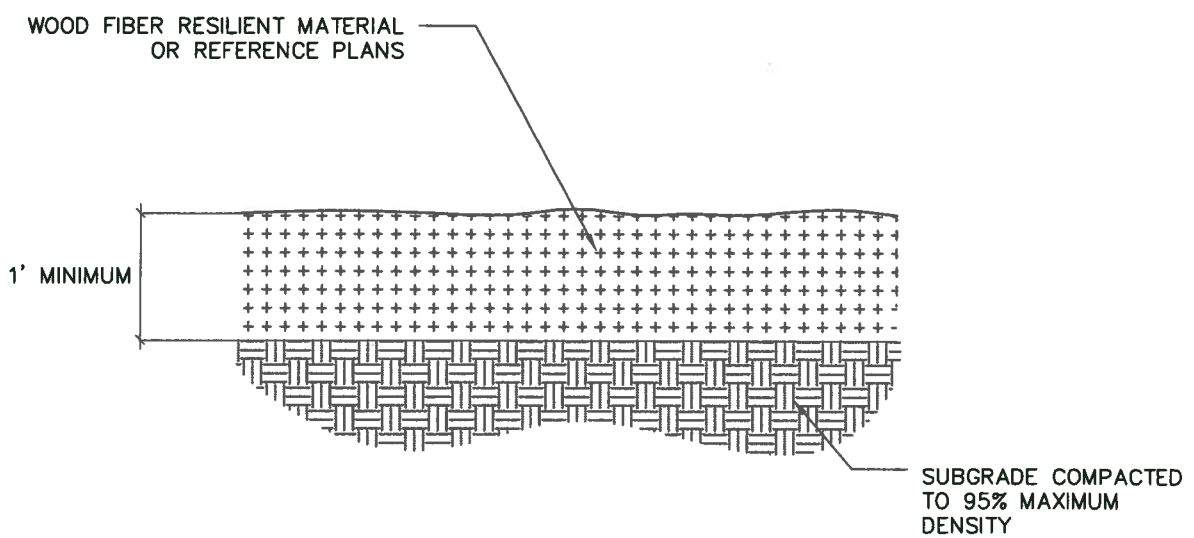
- A. BOULDER, SEE PLANS.
- B. FINISH GRADE.
- C. DEPTH OF BURY SHALL BE $1/3$ THE HEIGHT OF THE BOULDER.
- D. SUBGRADE COMPACTED TO 95% MAXIMUM DENSITY.



LANDSCAPE BOULDER INSTALLATION

Albuquerque Public Schools
February 2014

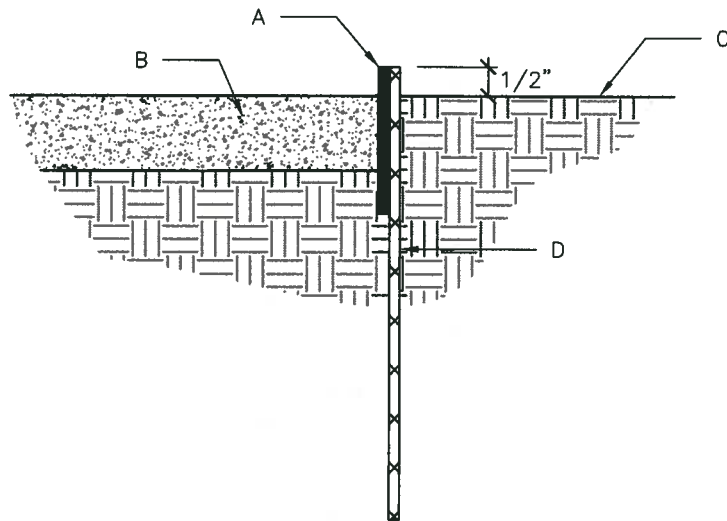




RESILIENT SURFACE AT PLAY AREA DETAIL

Albuquerque Public Schools
February 2014

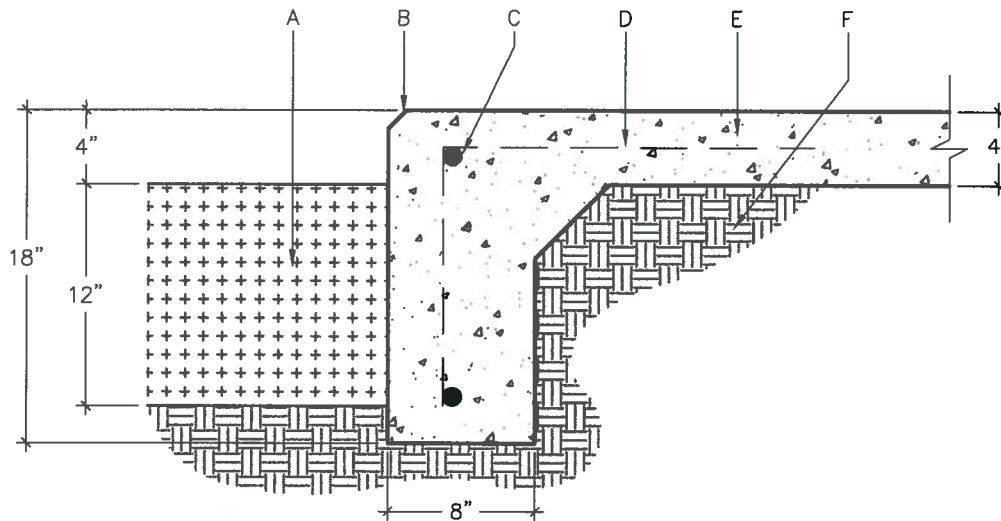




CONSTRUCTION NOTES

- A. STEEL EDGING SPECIFIED ON PLANS.
- B. PLANTING BED, SOD, OR AGGREGATES, SEE PLANS.
- C. FINISH GRADE.
- D. STAKE LENGTH AND SPACING SPECIFIED ON PLANS.





CONSTRUCTION NOTES

- A. WOOD FIBER RESILIENT MATERIAL OR REFERENCE PLANS.
- B. CHAMFERED EDGE.
- C. No. 4 REBAR HORIZONTAL AND CONTINUOUS.
- D. No. 4 REBAR AT 12" O.C.
- E. 3000 PSI CONCRETE PAVING/SIDEWALK
- F. SUBGRADE COMPACTED TO 95% MAXIMUM DENSITY.

GENERAL NOTES

1. CONTROL JOINTS SHALL BE PLACED AT 5' O.C.
2. EXPANSION JOINTS SHALL BE PLACED AT 20' O.C AND WHERE THE TURNDOWN ABUTS ANOTHER HARD SURFACE.



TURNDOWN CURB AT PLAY AREA

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February 2014





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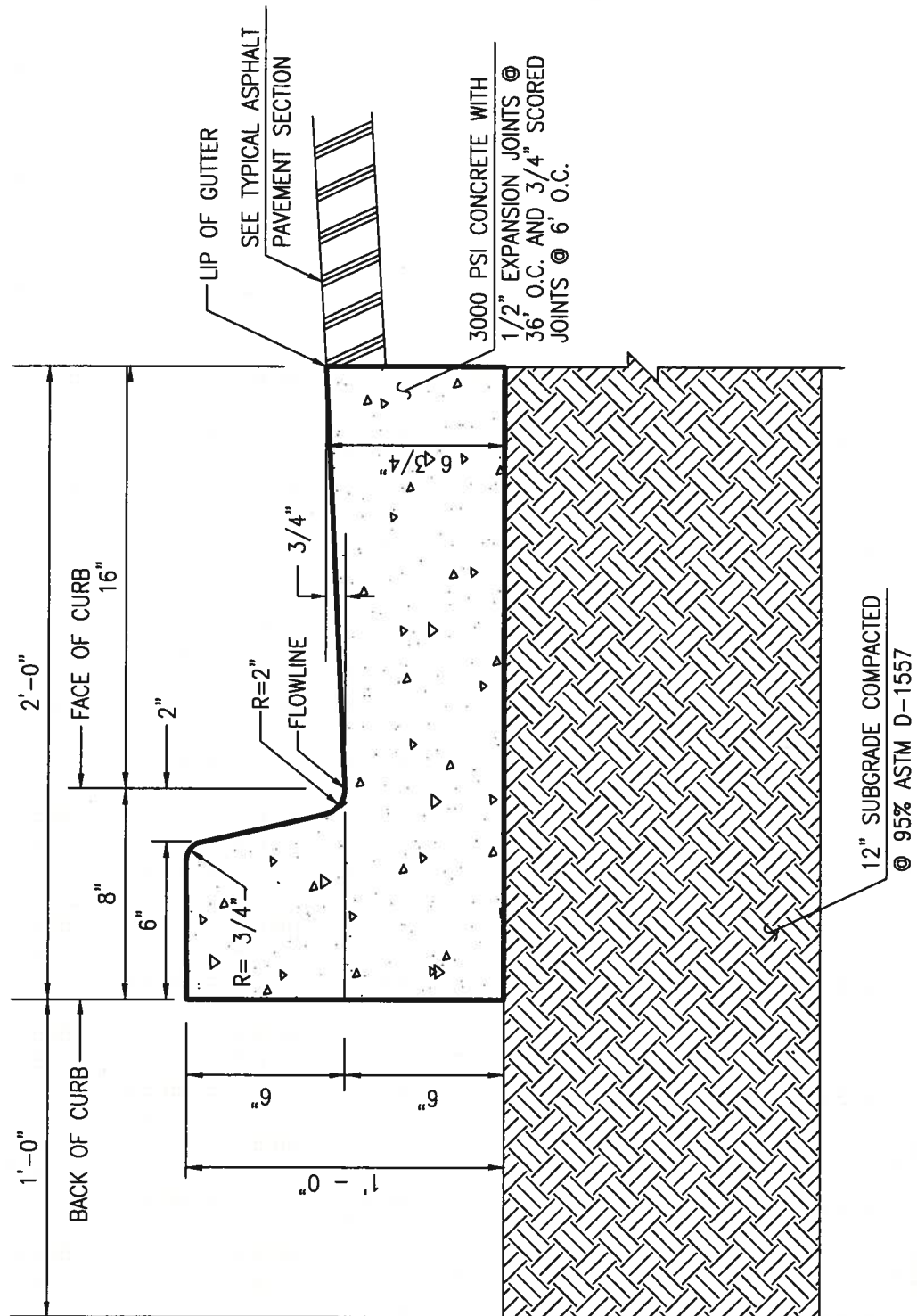
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TYPICAL SIX-INCH CURB AND GUTTER SECTION

DRAWN BY: HMCB

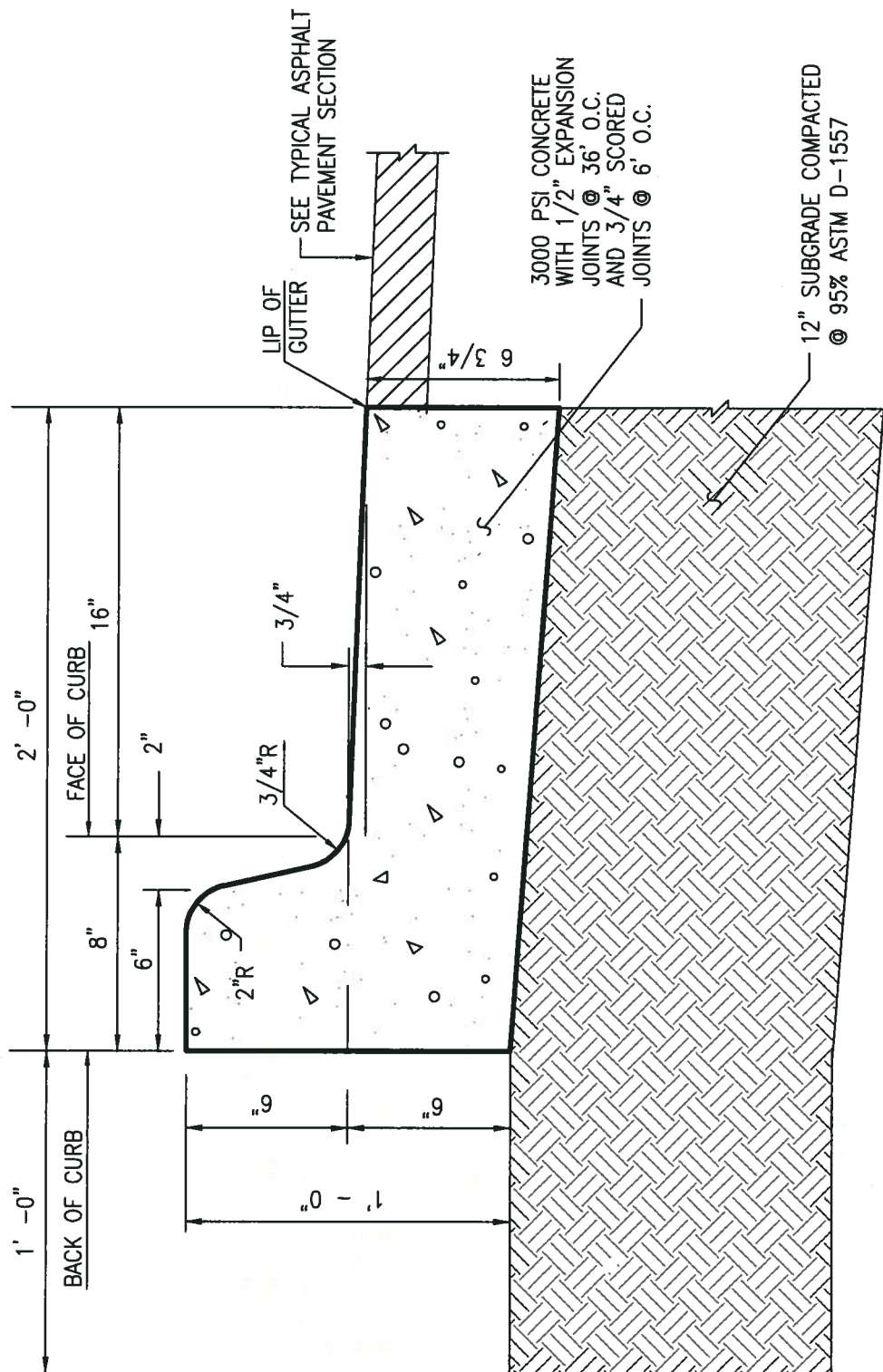
REVIEWED BY: APS

DATE ISSUED: 01/30/14

SCALE: 1" = 0'-6"

STD DWG:

P-101



**NOTE: USE THIS SECTION FOR CASES WHERE PAVING
SLOPES AWAY FROM FACE OF CURB**



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**TYPICAL SIX-INCH DEPRESSED CURB
AND GUTTER SECTION**

DRAWN BY: HMCg

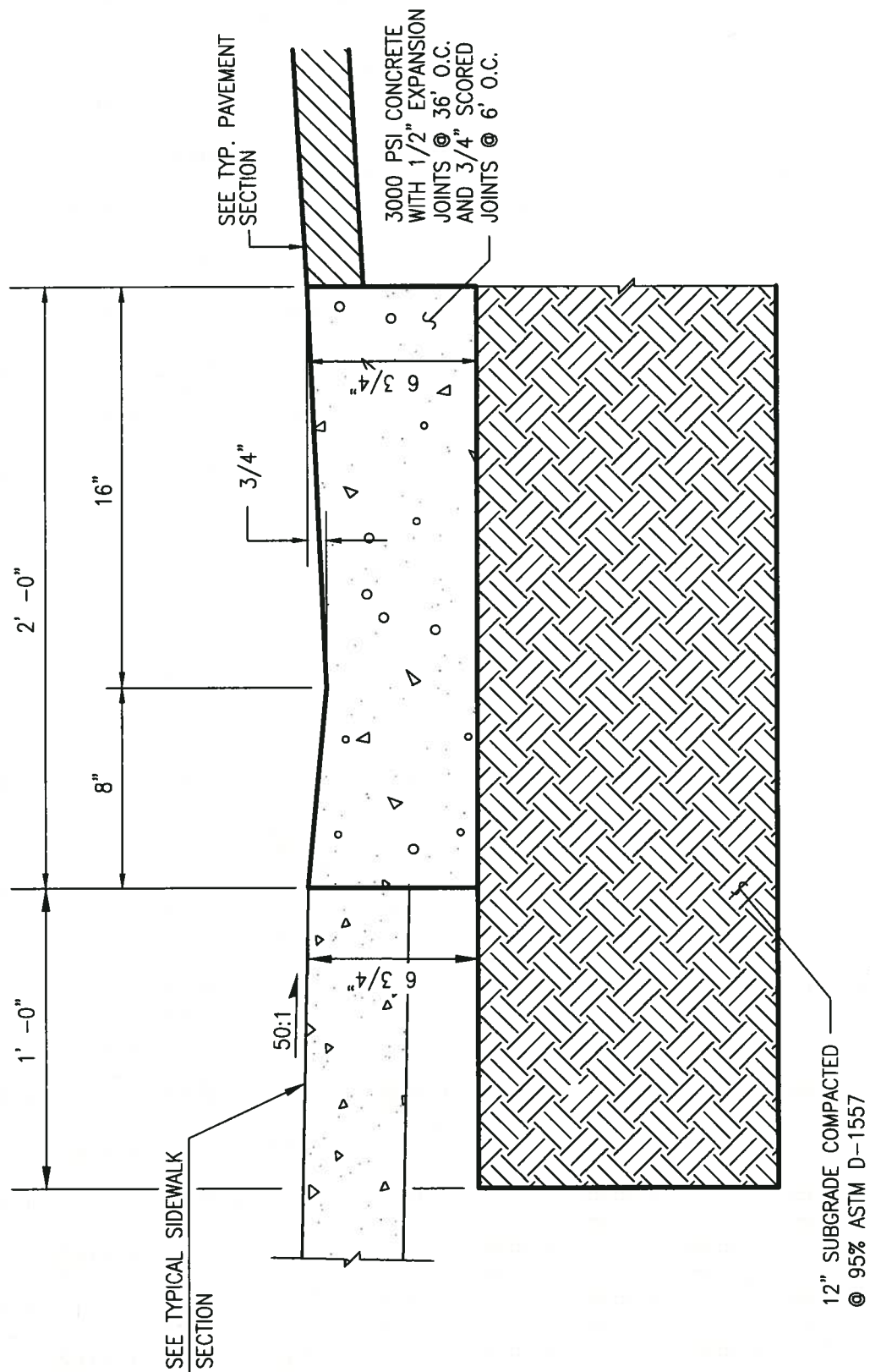
REVIEWED BY: APS

DATE ISSUED: 01/30/14

SCALE: 1" = 0'-6"

STD DWG:

P-101A



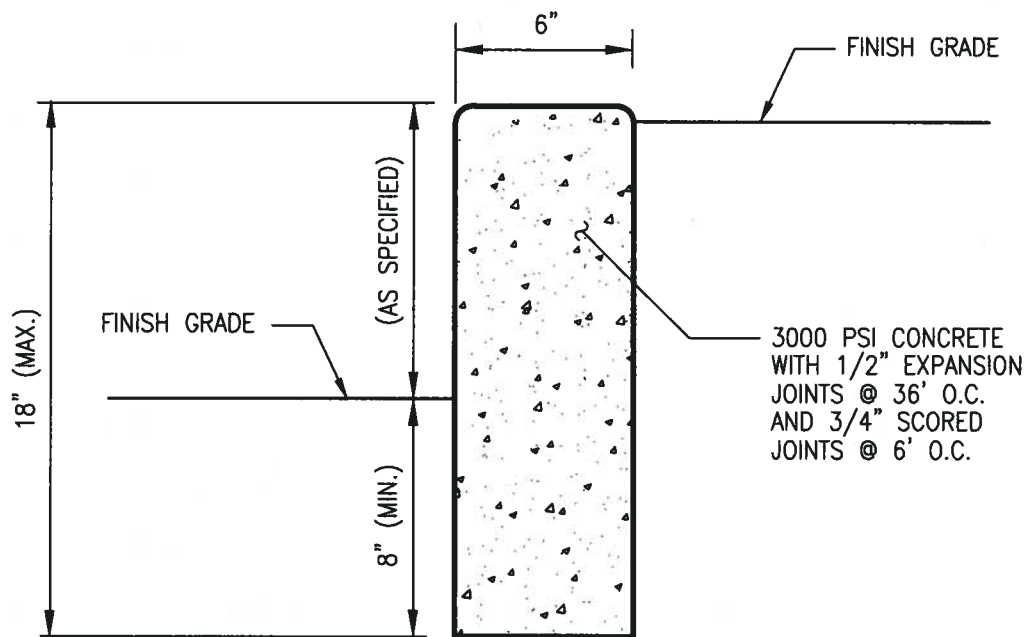
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**TYPICAL CURB AND GUTTER @ ACCESS
RAMP SECTION**

DRAWN BY: HMC
REVIEWED BY: APS
DATE ISSUED: 01/30/14
SCALE: 1" = 0'-6"

STD DWG:

P-102



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TYPICAL HEADER CURB SECTION

DRAWN BY: HMC

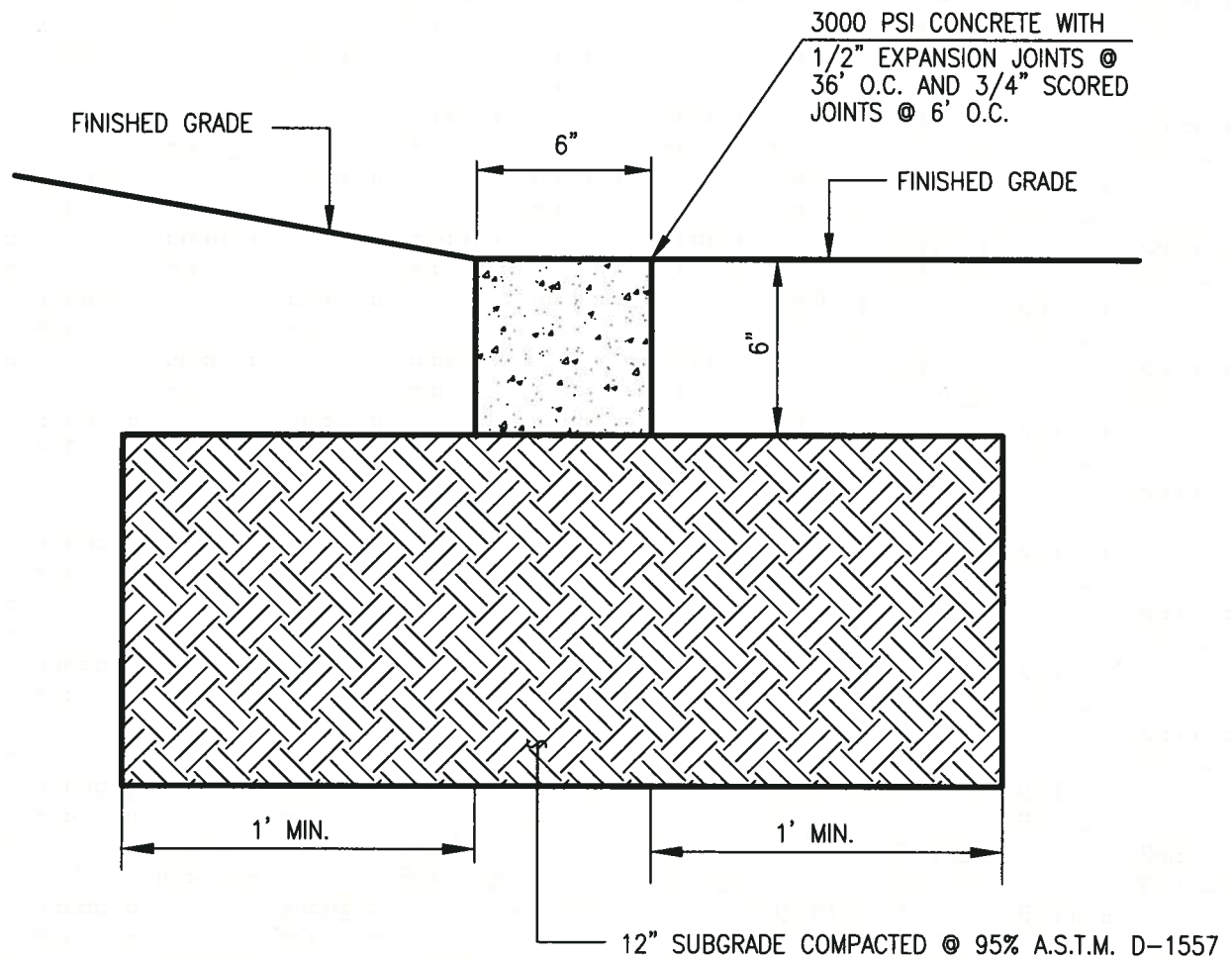
REVIEWED BY: APS

DATE ISSUED: 01/30/14

SCALE: 1" = 0'-6"

STD DWG:

P-103



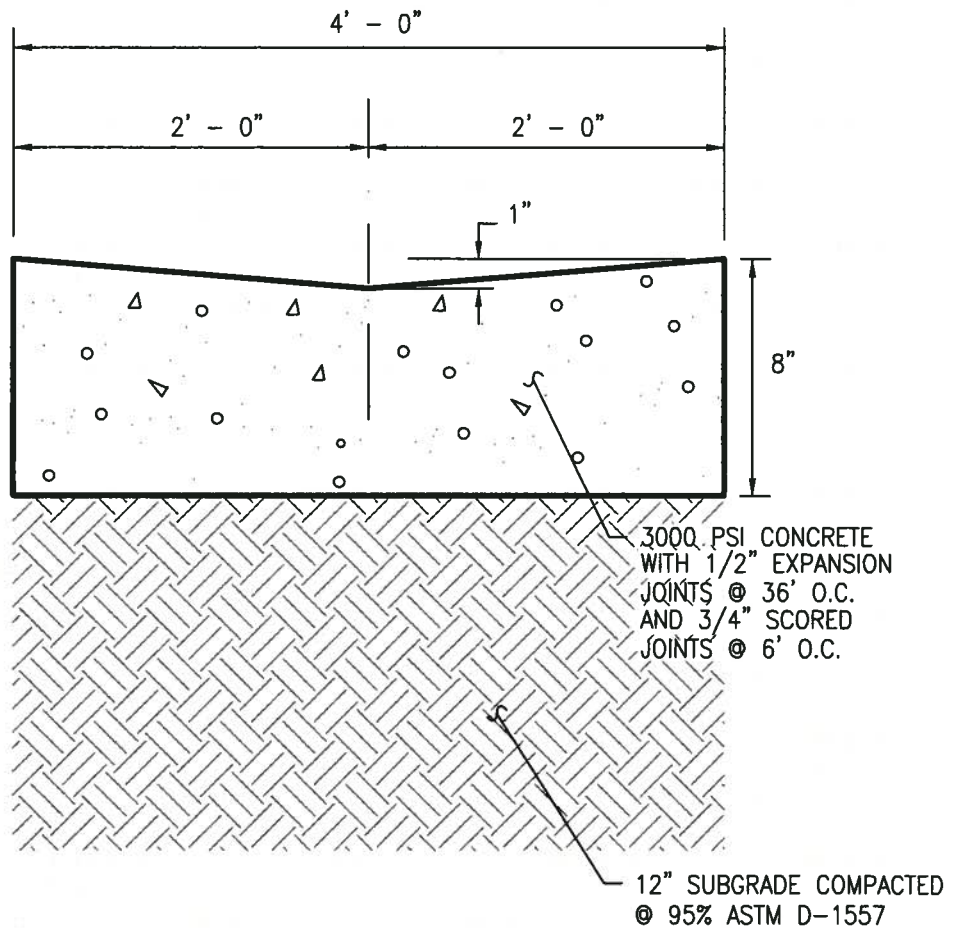
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TYPICAL MOW CURB SECTION

DRAWN BY: HMCG
REVIEWED BY: APS
DATE ISSUED: 06/25/14
SCALE: 1" = 0'-6"

STD DWG:

P-104



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TYPICAL VALLEY GUTTER SECTION

DRAWN BY: HMC

REVIEWED BY: APS

DATE ISSUED: 01/30/14

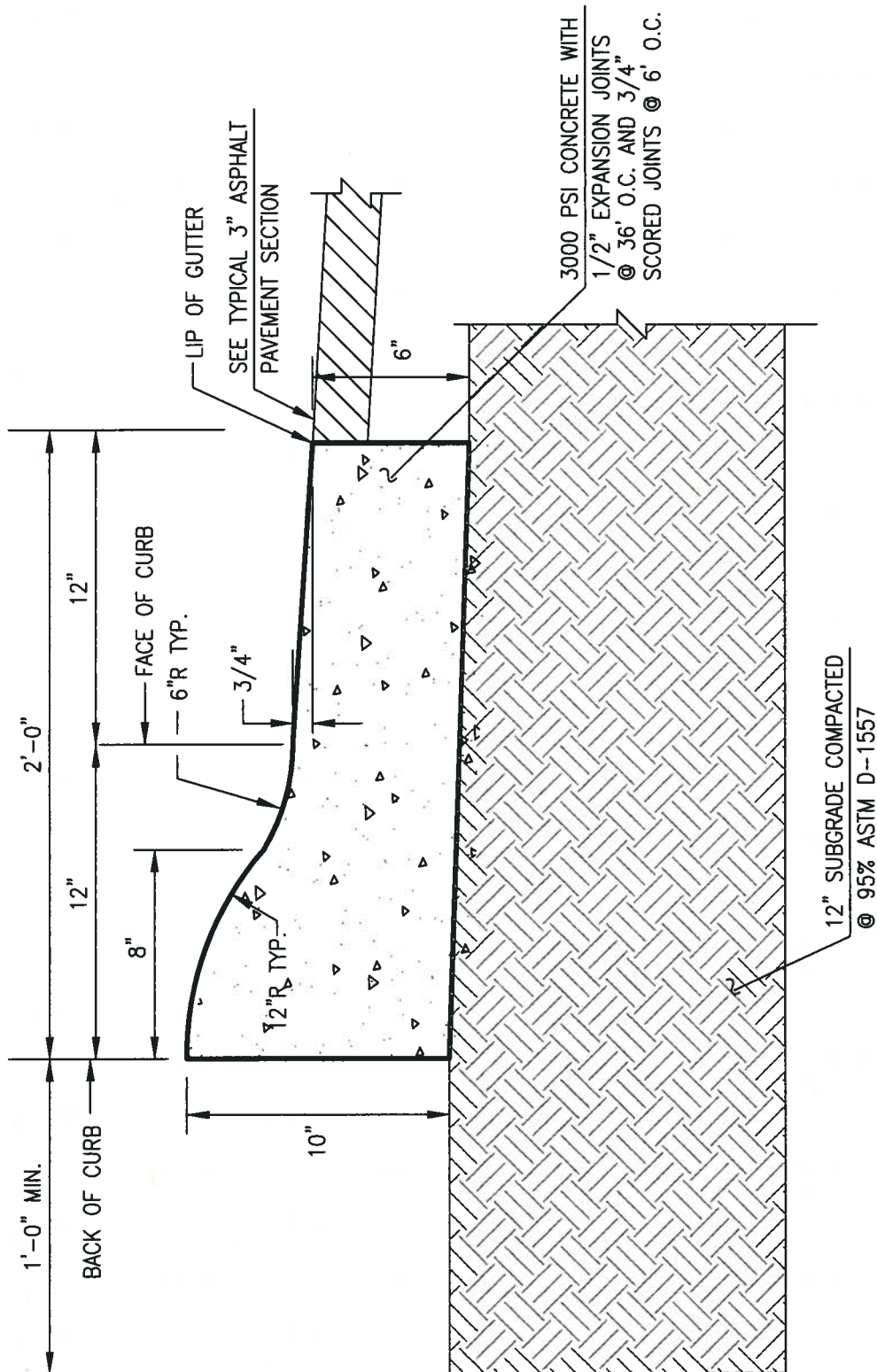
SCALE: 1" = 1'-0" (H); 1" = 0'-6" (V)

STD DWG:

P-105



P-106



**NOTE: USE THIS SECTION FOR CASES WHERE PAVING
SLOPES AWAY FROM FACE OF CURB**



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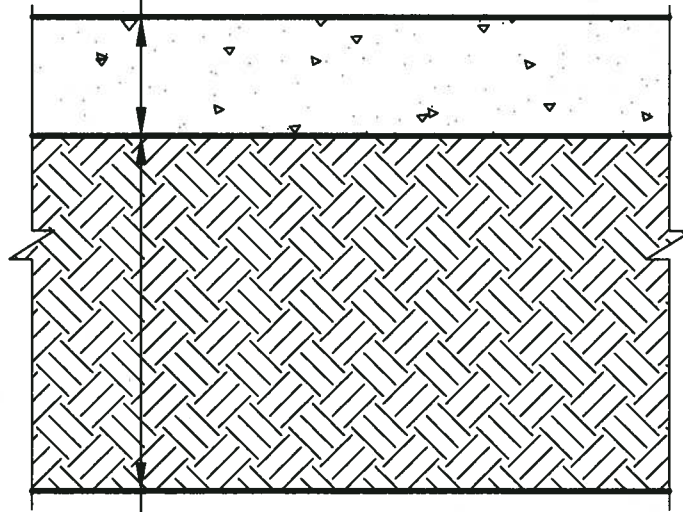
**TYPICAL MOUNTABLE DEPRESSED
CURB AND GUTTER SECTION**

DRAWN BY: HMCB
REVIEWED BY: APS
DATE ISSUED: 01/30/14
SCALE: 1" = 0'-6"

STD DWG:

P-106A

4" 3000 P.S.I. CONCRETE PAVING, MEDIUM BROOM FINISH
WITH 1/2" EXPANSION JOINTS @ 36' O.C. AND 3/4"
SCORED JOINTS @ 6' O.C.



12" SUBGRADE COMPACTED @ 95% A.S.T.M. D-1557



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TYPICAL CONCRETE SIDEWALK SECTION

DRAWN BY: HMCB

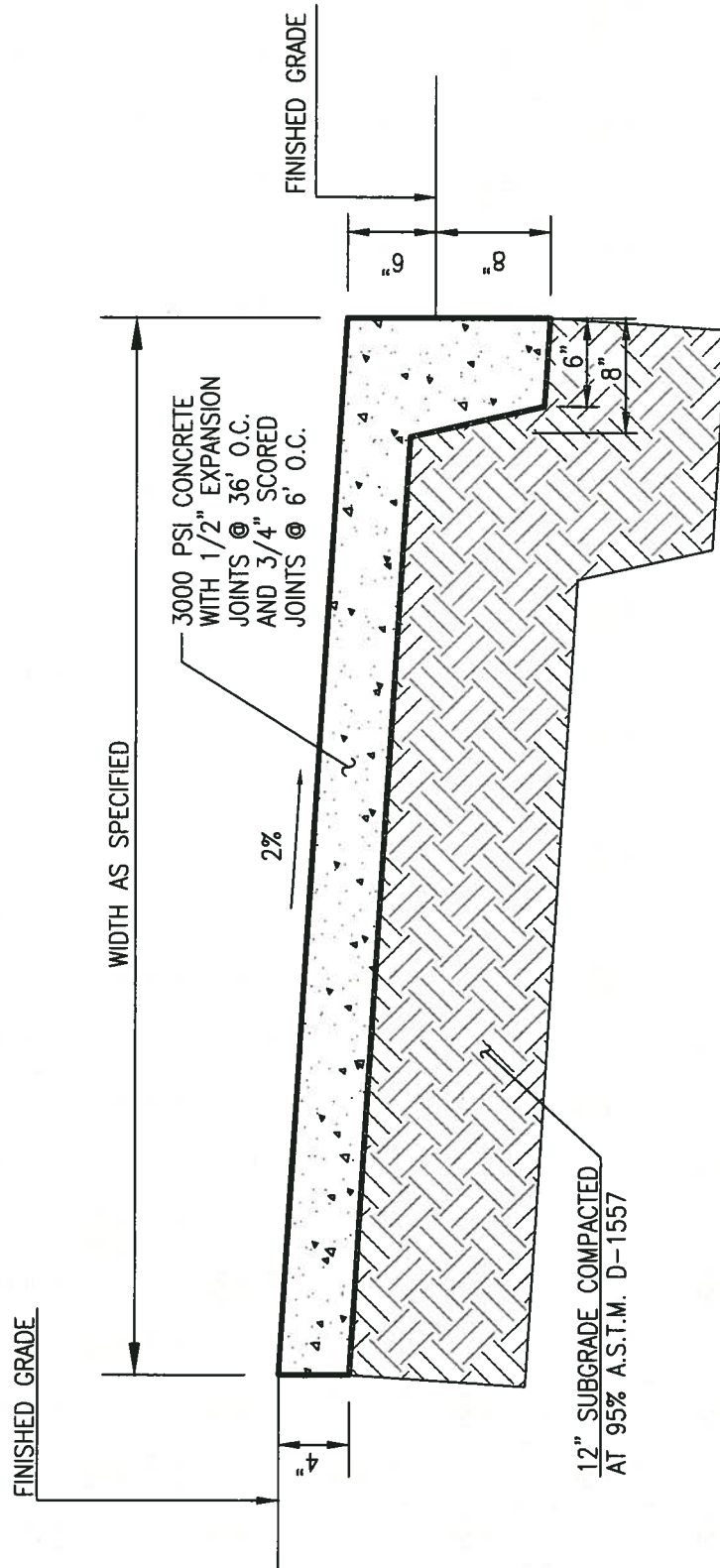
REVIEWED BY: APS

DATE ISSUED: 01/30/14

SCALE: 1" = 0'-6"

STD DWG:

P-201



**ALBUQUERQUE
PUBLIC SCHOOLS**
Expect great things!

TYPICAL TURNDOWN SIDEWALK SECTION

DRAWN BY: HMC

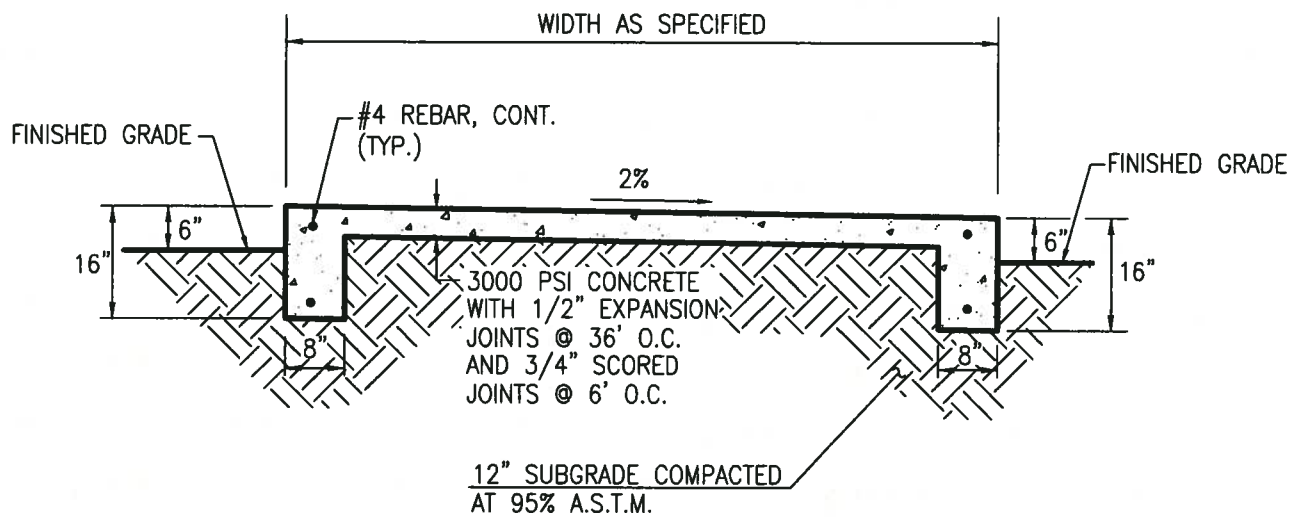
REVIEWED BY: APS

DATE ISSUED: 01/30/14

SCALE: 1" = 1'-0"

STD DWG:

P-202



**ALBUQUERQUE
PUBLIC SCHOOLS**
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**TYPICAL DOUBLE TURNDOWN
SIDEWALK SECTION**

DRAWN BY: HMC

REVIEWED BY: APS

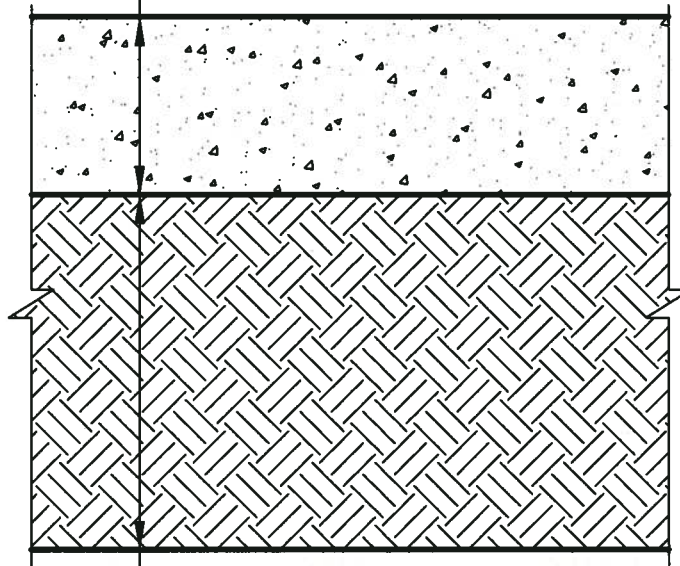
DATE ISSUED: 01/30/14

SCALE: 1" = 2'-0"

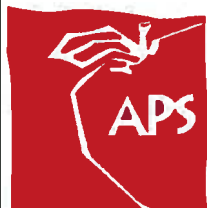
STD DWG:

P-203

6" 3000 P.S.I. CONCRETE PAVING, MEDIUM BROOM FINISH
WITH 1/2" EXPANSION JOINTS @ 36' O.C. AND 3/4"
SCORED JOINTS @ 6' O.C.



12" SUBGRADE COMPACTED @ 95% A.S.T.M. D-1557



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TYPICAL CONCRETE PAVEMENT SECTION

DRAWN BY: HMCB

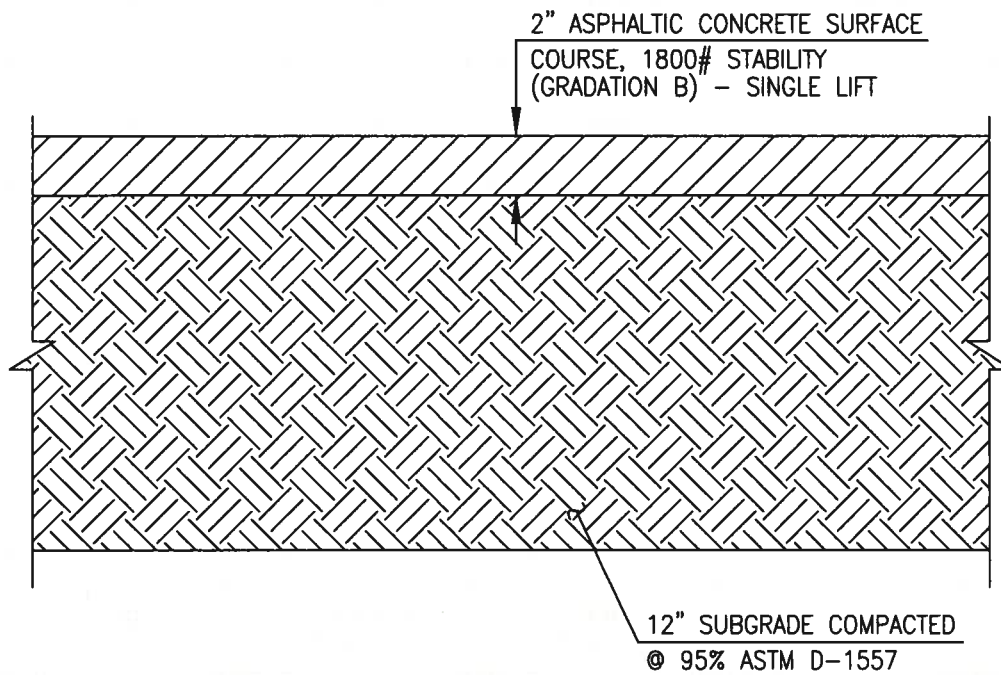
STD DWG:

REVIEWED BY: APS

DATE ISSUED: 01/30/14

SCALE: 1" = 0'-6"

P-204



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**TYPICAL 2" ASPHALT PAVING SECTION
(PEDESTRIAN TRAFFIC AREAS)**

DRAWN BY: HMCG

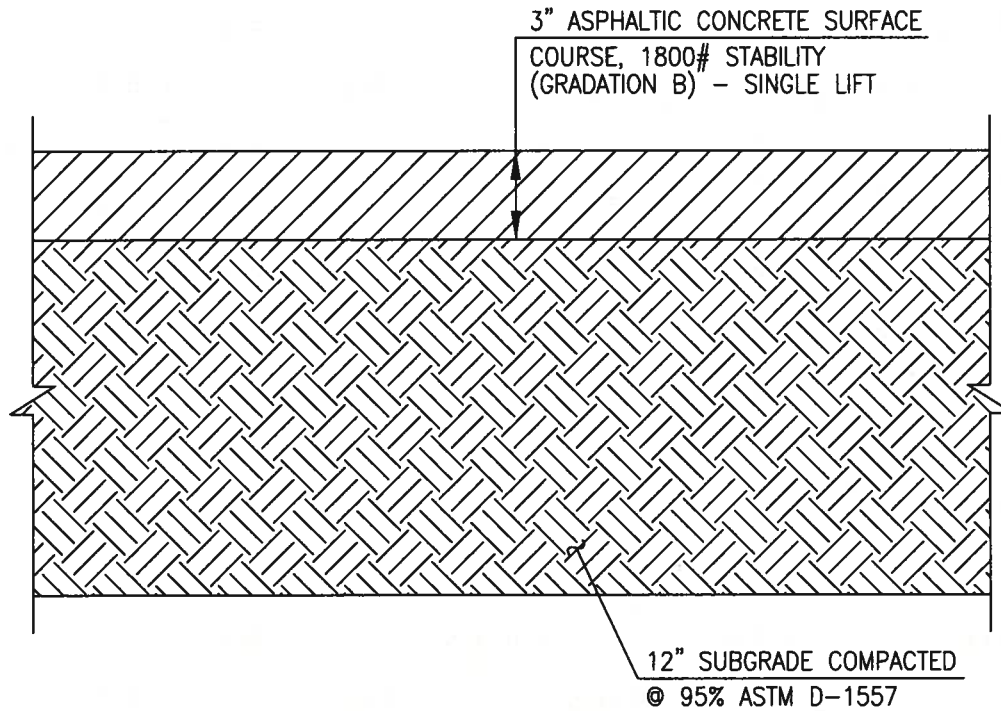
REVIEWED BY: APS

DATE ISSUED: 01/30/14

SCALE: 1" = 0'-6"

STD DWG:

P-301



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**TYPICAL 3" ASPHALT PAVING SECTION
(VEHICULAR TRAFFIC AREAS)**

DRAWN BY: HMCg

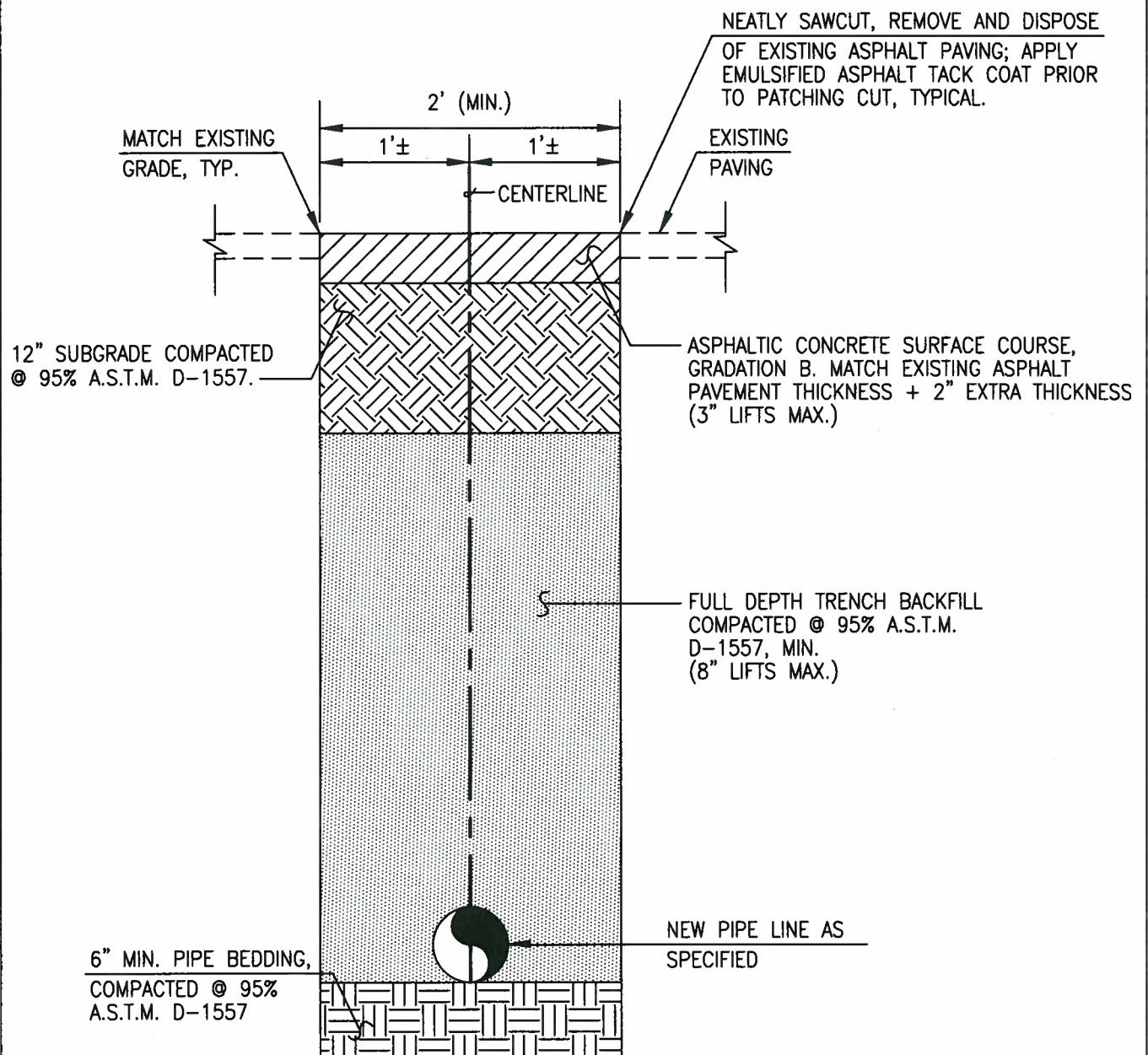
REVIEWED BY: APS

DATE ISSUED: 01/30/14

SCALE: 1" = 0'-6"

STD DWG:

P-302



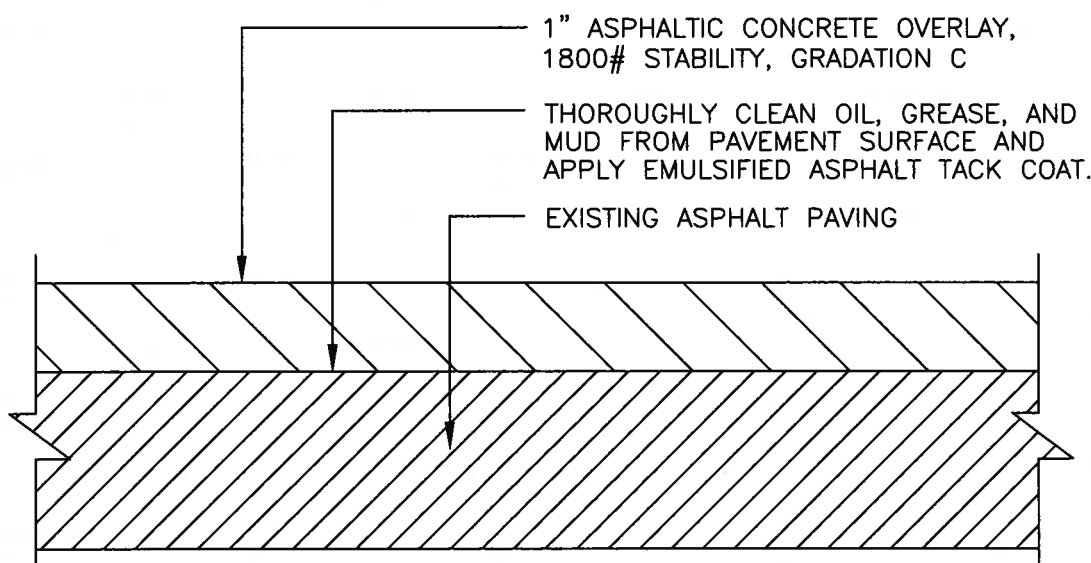
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**TYPICAL PRIVATE PAVING UTILITY CUT
AND PAVING REPLACEMENT SECTION**

DRAWN BY: HMC
REVIEWED BY: APS
DATE ISSUED: 01/30/14
SCALE: 1" = 1'-0"

STD DWG:

P-303



**ALBUQUERQUE
PUBLIC SCHOOLS**
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TYPICAL OVERLAY PAVEMENT SECTION

DRAWN BY: HMC

REVIEWED BY: APS

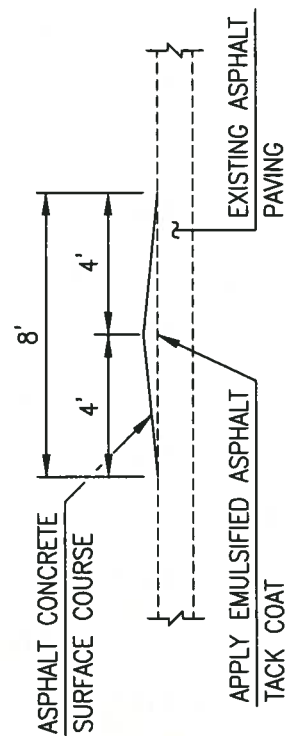
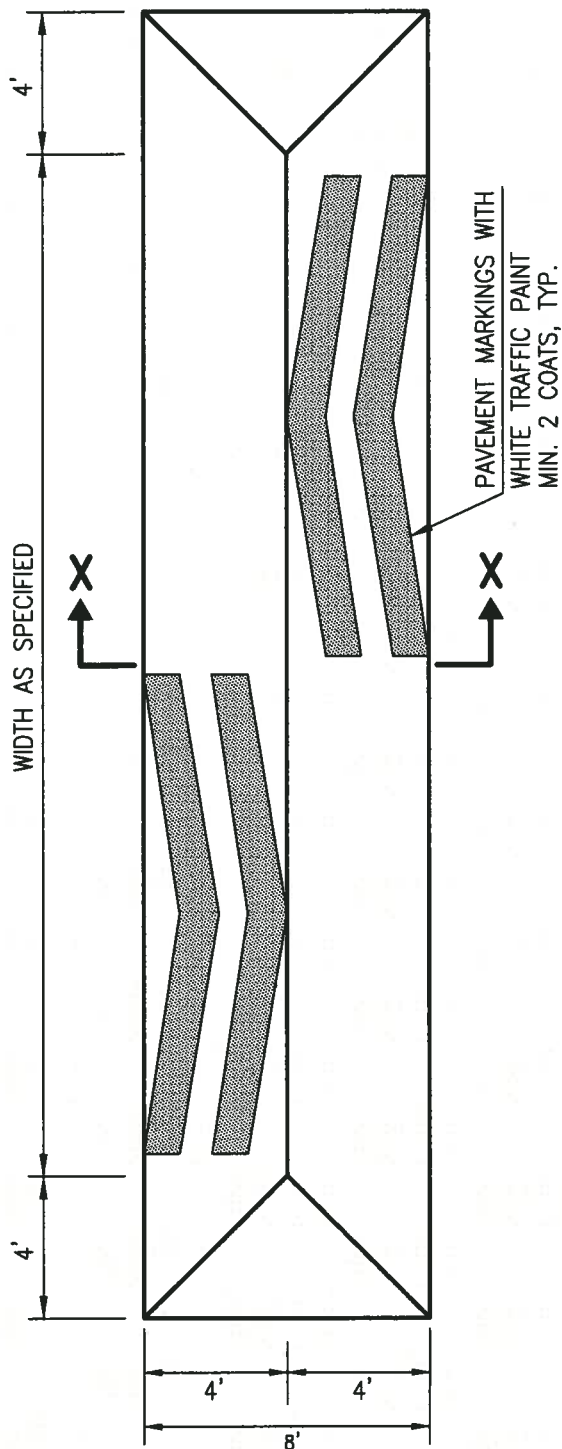
DATE ISSUED: 01/30/14

SCALE: 1" = 0'-4"

STD DWG:

P-304





SECTION X-X



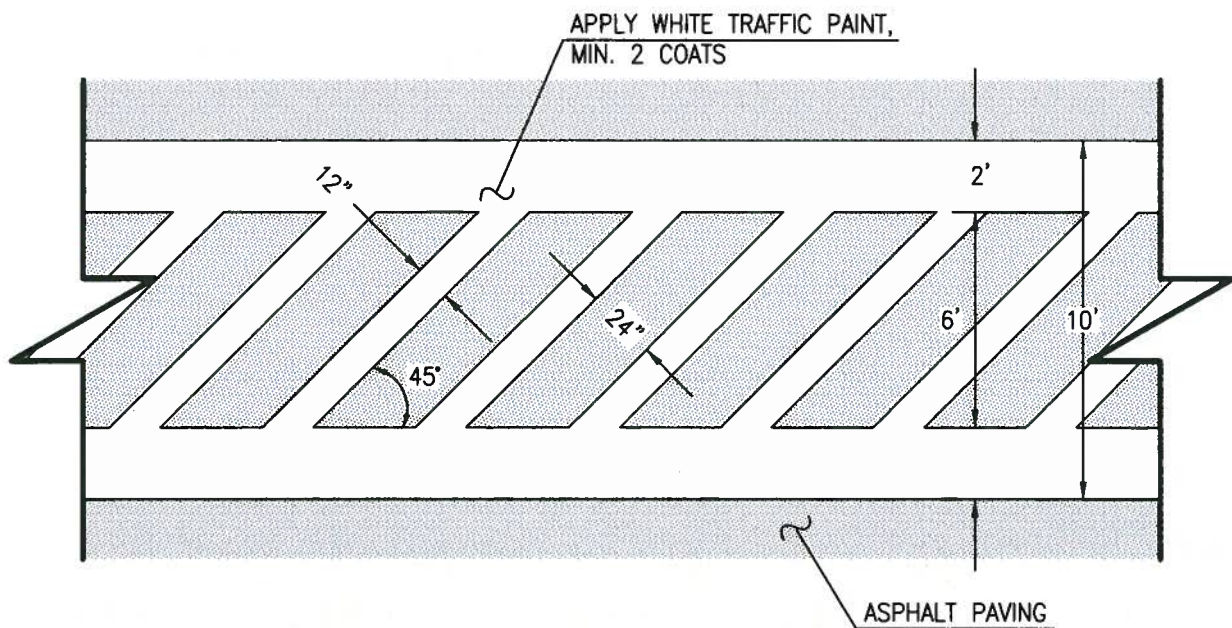
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PUBLIC SCHOOLS**
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TYPICAL SPEED HUMP DETAIL WITH PAVEMENT MARKINGS

DRAWN BY: HMC
REVIEWED BY: APS
DATE ISSUED: 01/30/14
SCALE: 1" = 5'-0"

STD DWG:

P-305A



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**TYPICAL CROSSWALK DETAIL -
OPTION 1**

DRAWN BY: HMC

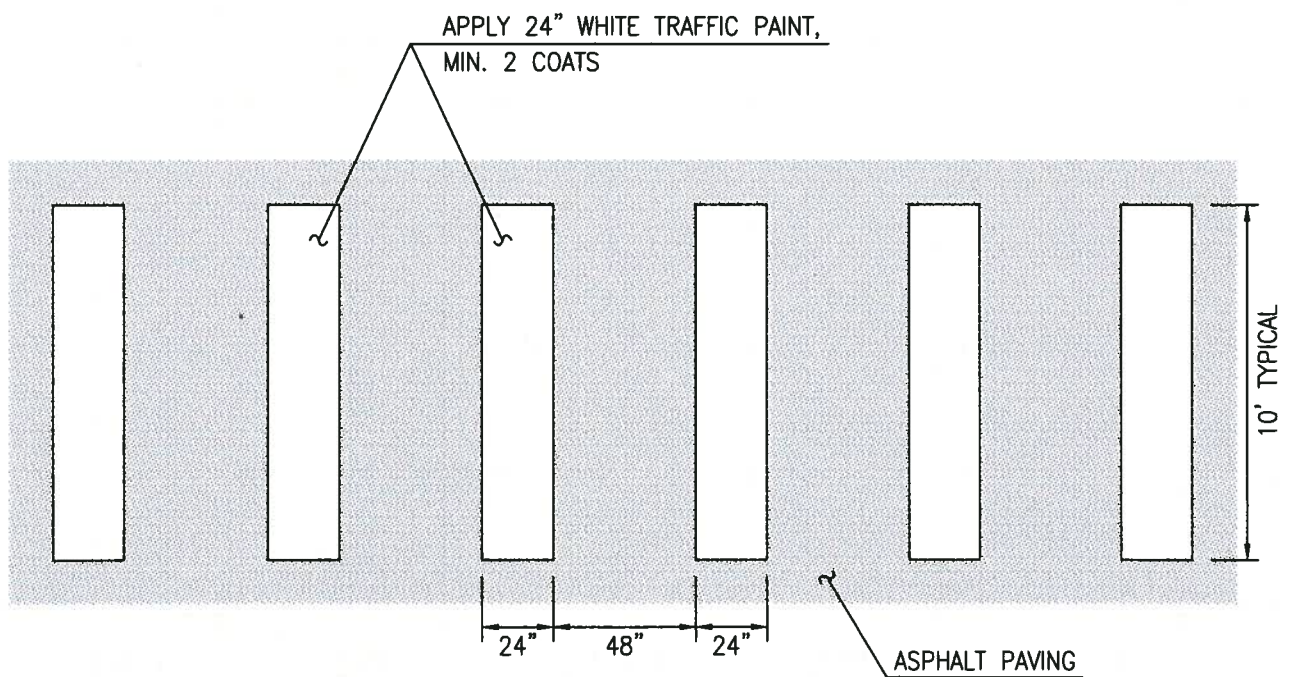
REVIEWED BY: APS

DATE ISSUED: 04/02/14

SCALE: 1" = 5'-0"

STD DWG:

P-401



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**TYPICAL CROSSWALK DETAIL -
OPTION 2**

DRAWN BY: HMCB

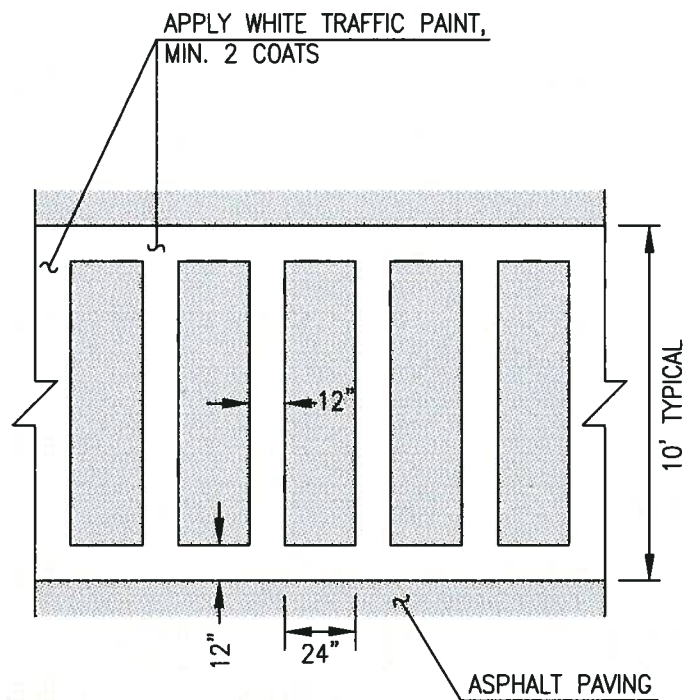
REVIEWED BY: APS

DATE ISSUED: 04/02/14

SCALE: 1" = 5'-0"

STD DWG:

P-401A



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**TYPICAL CROSSWALK DETAIL -
OPTION 3**

DRAWN BY: HMC

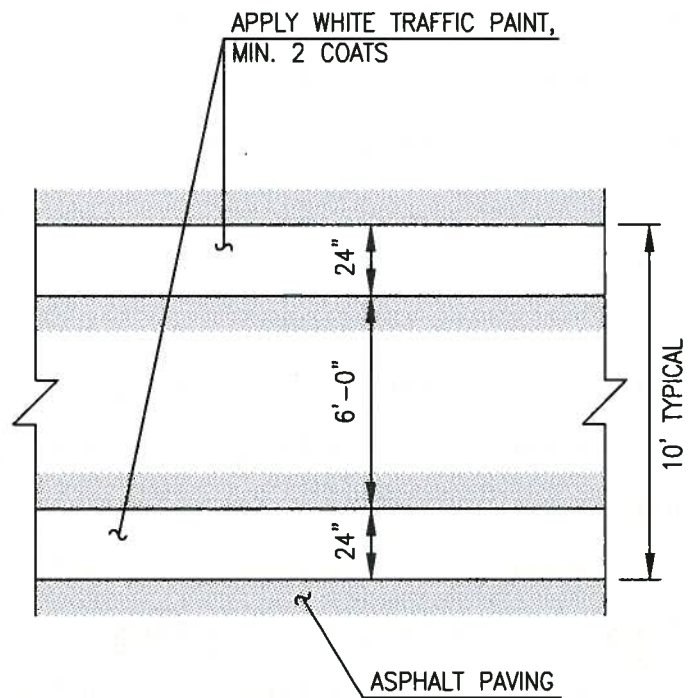
REVIEWED BY: APS

DATE ISSUED: 04/02/14

SCALE: 1" = 5'-0"

STD DWG:

P-401B



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**TYPICAL CROSSWALK DETAIL -
OPTION 4**

DRAWN BY: HMC

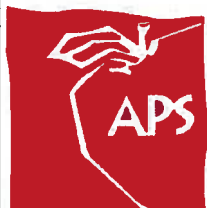
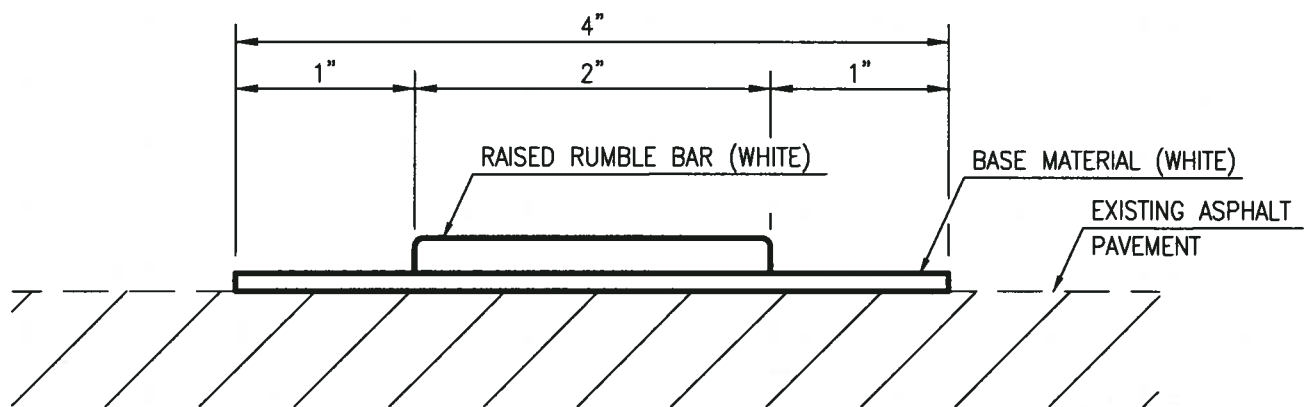
REVIEWED BY: APS

DATE ISSUED: 04/02/14

SCALE: 1" = 5'-0"

STD DWG:

P-401C



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TYPICAL RUMBLE BAR SECTION

DRAWN BY: HMCB

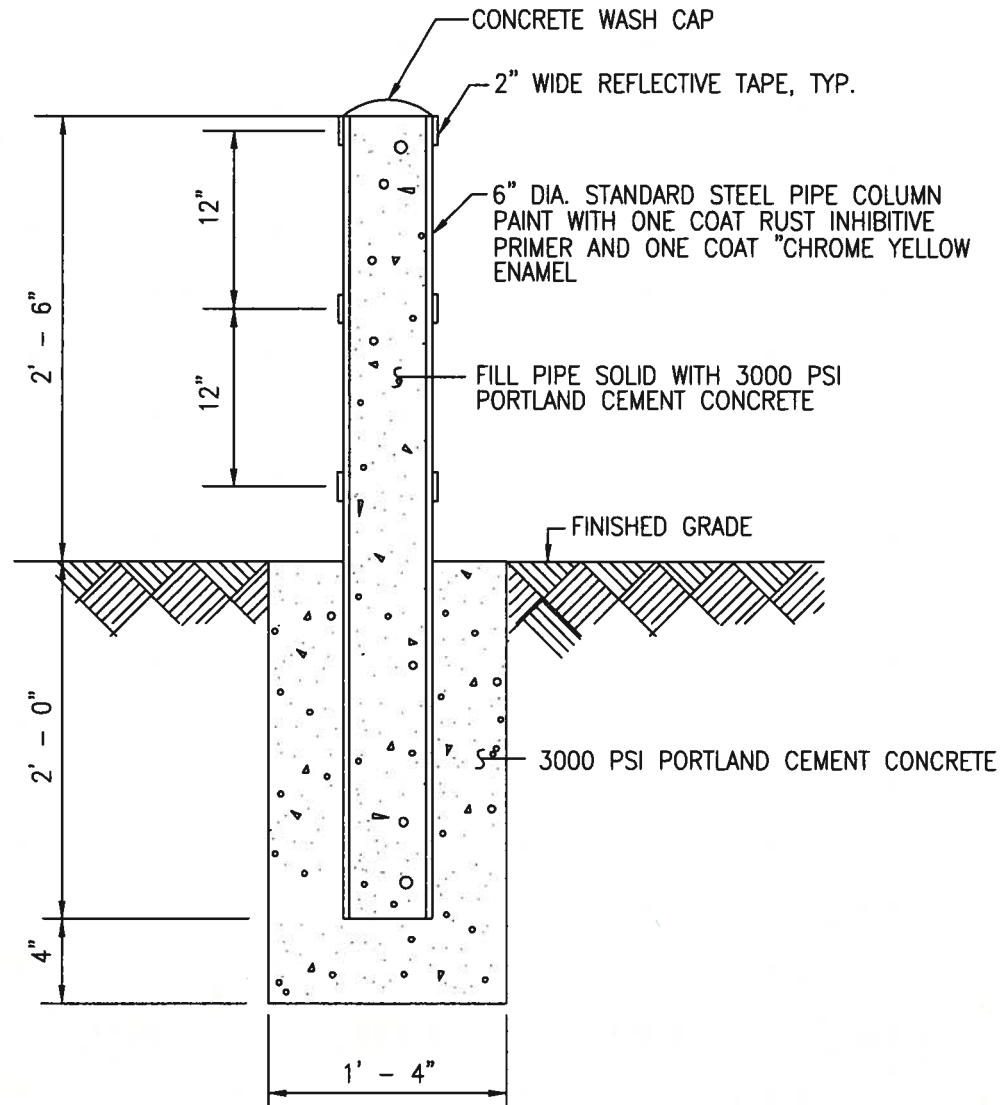
REVIEWED BY: APS

DATE ISSUED: 01/30/14

SCALE: 1" = 1'-0"

STD DWG:

P-402



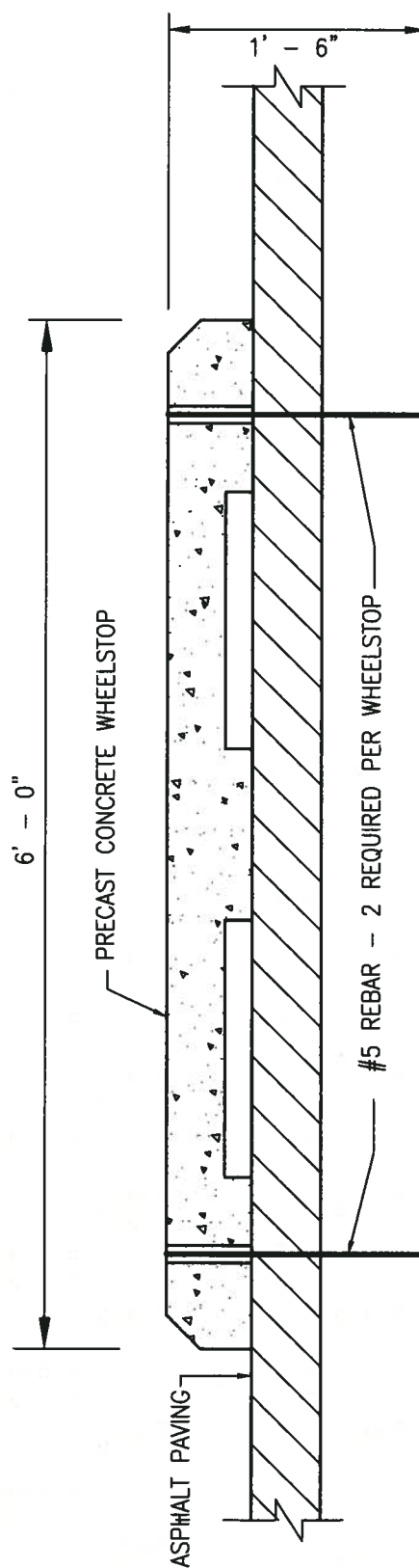
**ALBUQUERQUE
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TYPICAL BOLLARD SECTION

DRAWN BY: HMCB
REVIEWED BY: APS
DATE ISSUED: 01/30/14
SCALE: 1" = 1'-0"

STD DWG:

P-501



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TYPICAL WHEELSTOP SECTION

DRAWN BY: HMC

REVIEWED BY: APS

DATE ISSUED: 01/30/14

SCALE: 1" = 1'-0"

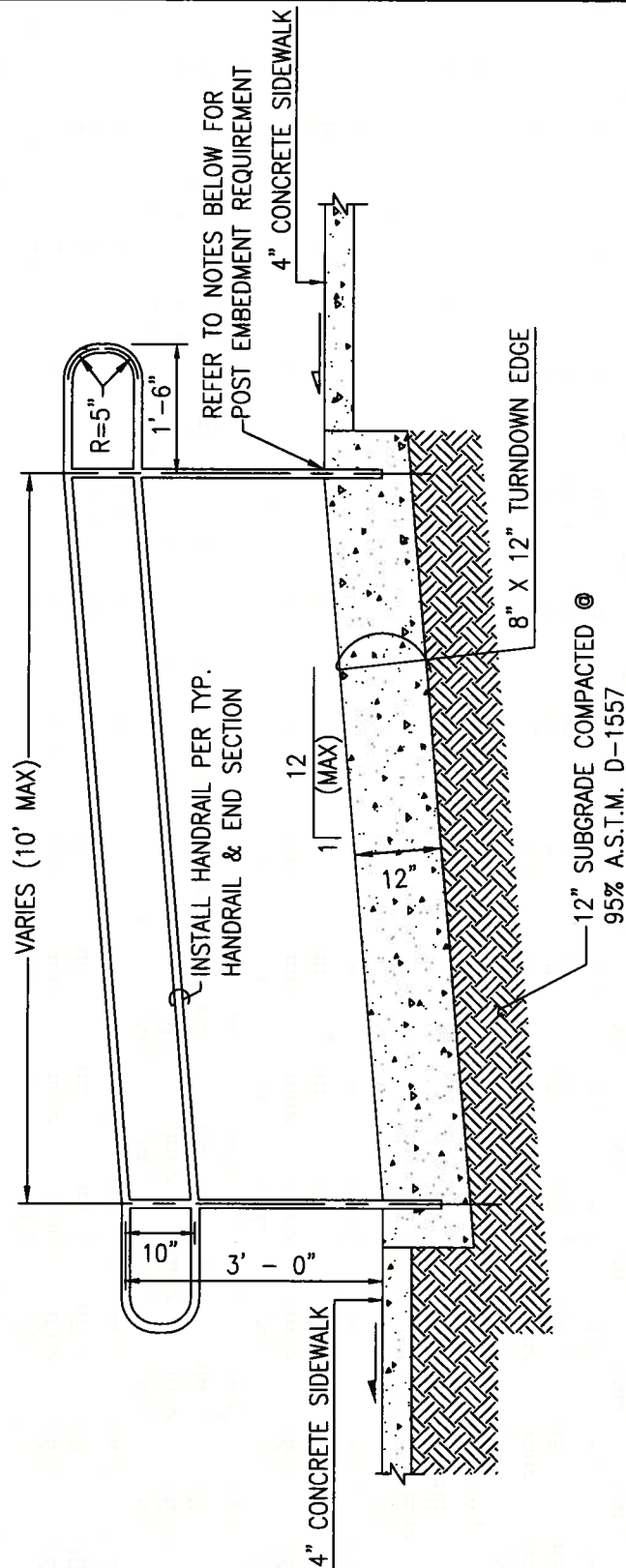
STD DWG:

P-502



TYPICAL PARKING LOT ISLAND GEOMETRY

P-503



RAILING NOTES:

1. SET 1 1/4" POSTS INTO 2" CORED HOLE IN CONCRETE 8" DEEP AND FILL REMAINING VOID WITH A NON-SHRINKING, QUICK SETTING GROUT (SUCH AS BURKE STONE) TO 1/2" BELOW FINISHED SURFACE. FILL THE LAST 1/2" OF VOID WITH A POLYURETHANE SEALING MATERIAL. FOLLOW MANUFACTURERS DIRECTIONS FOR ALL MATERIALS USED. MAINTAIN RAILING HEIGHTS ON DRAWINGS.
2. WELD AND GRIND SMOOTH ALL JOINTS; PRIME THE FABRICATED PIECES COMPLETELY WITH RED OXIDE PRIMER AND FINISH WITH TWO COATS OF EXTERIOR FLAT LATEX PAINT, COLOR: _____ CONTRACTOR SHALL SUBMIT COLOR SAMPLE TO ARCHITECT.



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LONGITUDINAL ACCESS RAMP W/ HANDRAIL SECTION

DRAWN BY: HMCB

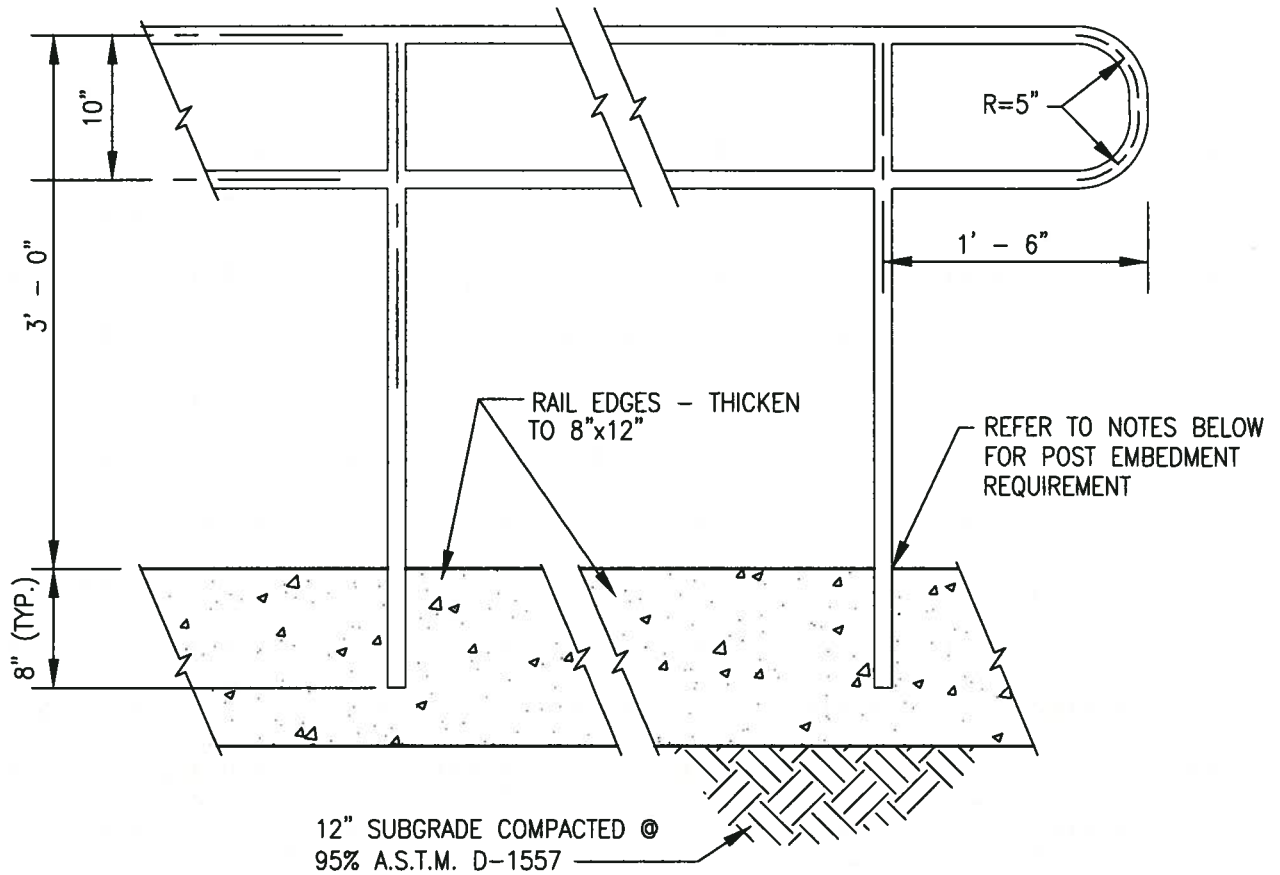
REVIEWED BY: APS

DATE ISSUED: 01/30/14

SCALE: 1" = 2'-0"

STD DWG:

P-504



RAILING NOTES

1. SET 1 1/4" POSTS INTO 2" CORED HOLE IN CONCRETE 8" DEEP AND FILL REMAINING VOID WITH A NON-SHRINKING, QUICK SETTING GROUT (SUCH AS BURKE STONE) TO 1/2" BELOW FINISHED SURFACE. FILL THE LAST 1/2" OF VOID WITH A POLYURETHANE SEALING MATERIAL. FOLLOW MANUFACTURERS DIRECTIONS FOR ALL MATERIALS USED. MAINTAIN RAILING HEIGHTS ON DRAWINGS.
2. WELD AND GRIND SMOOTH ALL JOINTS; PRIME THE FABRICATED PIECES COMPLETELY WITH RED OXIDE PRIMER AND FINISH WITH TWO COATS OF EXTERIOR FLAT LATEX PAINT, COLOR: _____ CONTRACTOR SHALL SUBMIT COLOR SAMPLE TO ARCHITECT.



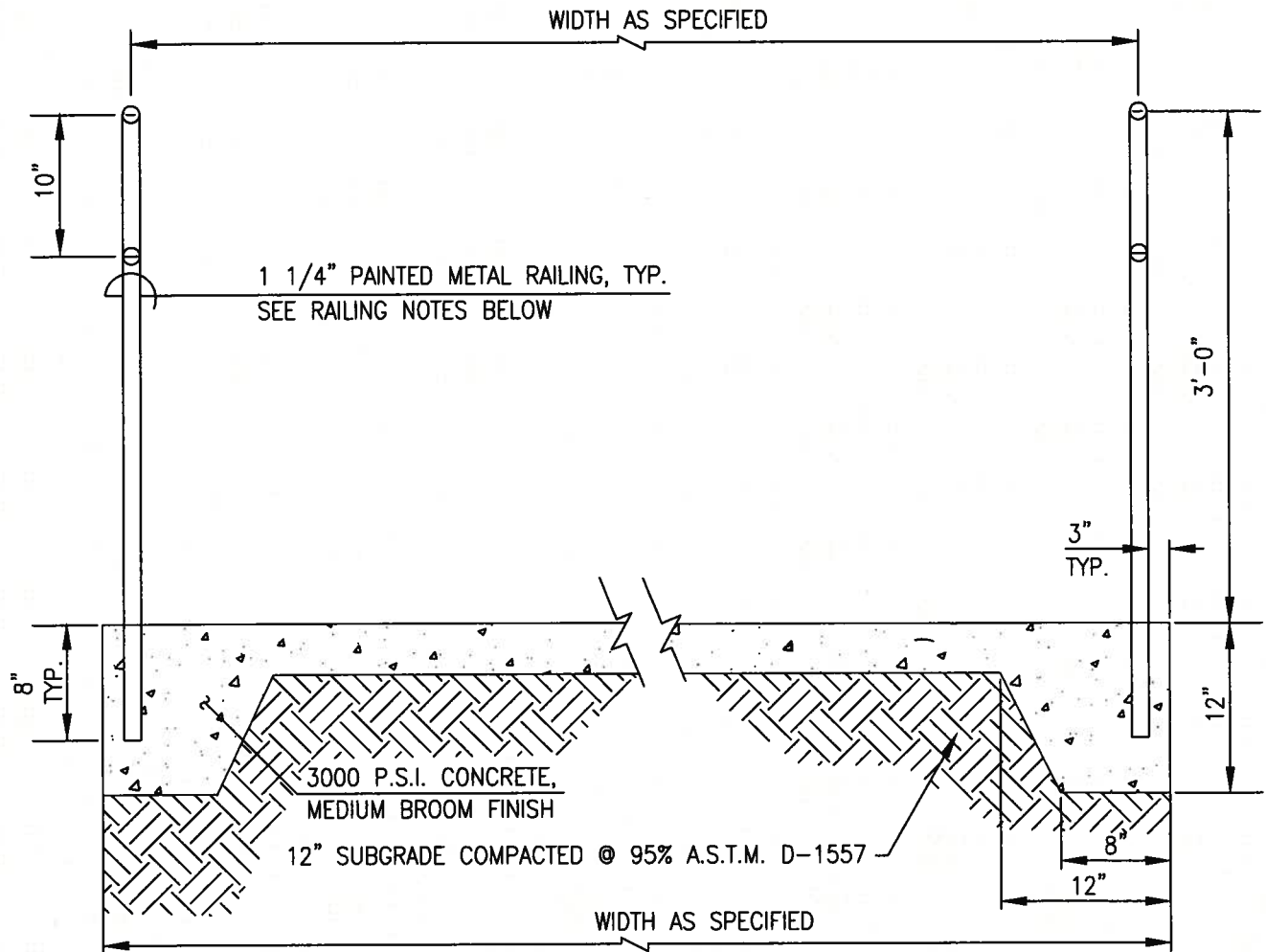
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TYPICAL HANDRAIL AND END SECTION

DRAWN BY: HMCB
REVIEWED BY: APS
DATE ISSUED: 01/30/14
SCALE: 1" = 1'-0"

STD DWG:

P-505



RAILING NOTES

1. SET 1 1/4" POSTS INTO 2" CORED HOLE IN CONCRETE 8" DEEP AND FILL REMAINING VOID WITH A NON-SHRINKING, QUICK SETTING GROUT (SUCH AS BURKE STONE) TO 1/2" BELOW FINISHED SURFACE. FILL THE LAST 1/2" OF VOID WITH A POLYURETHANE SEALING MATERIAL. FOLLOW MANUFACTURERS DIRECTIONS FOR ALL MATERIALS USED. MAINTAIN RAILING HEIGHTS ON DRAWINGS.
2. WELD AND GRIND SMOOTH ALL JOINTS; PRIME THE FABRICATED PIECES COMPLETELY WITH RED OXIDE PRIMER AND FINISH WITH TWO COATS OF EXTERIOR FLAT LATEX PAINT, COLOR: _____ CONTRACTOR SHALL SUBMIT COLOR SAMPLE TO ARCHITECT.



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ACCESS RAMP WITH HANDRAIL CROSS SECTION

DRAWN BY: HMCg

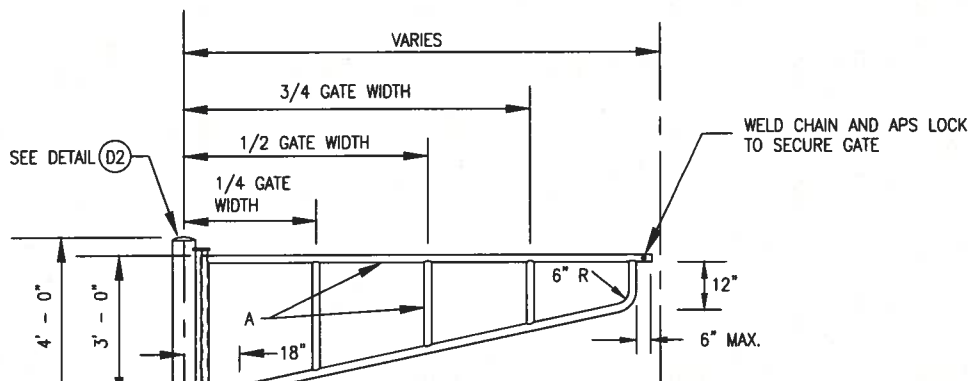
REVIEWED BY: APS

DATE ISSUED: 01/30/14

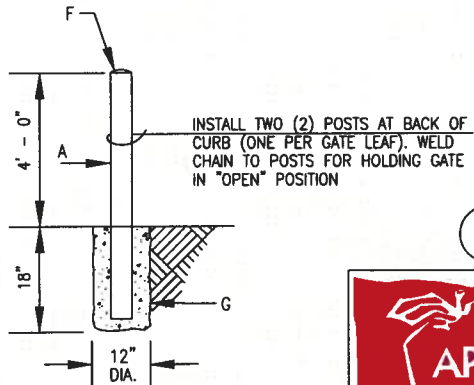
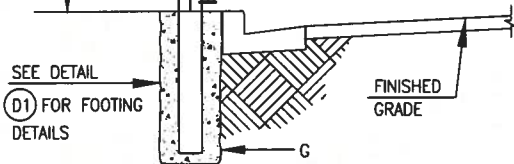
SCALE: 1" = 1'-0"

STD DWG:

P-506

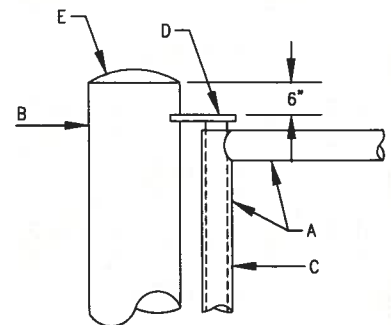
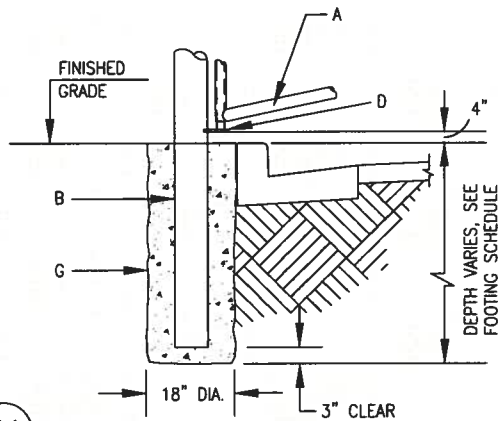


SEE DETAIL
(D1) FOR FOOTING
DETAILS



GATE HOLD BACK DETAIL, N.T.S.

(D1) N.T.S.



(D2) N.T.S.

GENERAL NOTES:

- ALL WELDED AND CUT AREAS TO BE CLEANED THOROUGHLY WITH A WIRE BRUSH AND PAINTED.
- GATE HOLD BACKS SHALL BE LOCATED SO PIPE GATE LEAFS ARE HELD BACK BEHIND BACK OF CURB.
- REFER TO FOOTING SCHEDULE BELOW FOR FOOTING DEPTH.

CONSTRUCTION NOTES:

- 2 3/8" DIA. GALV. PIPE, SCH 40, PAINT W/ 2 COATS ALUM. PAINT (YELLOW)
- 6 5/8" DIA. GALV. PIPE, SCH 40, PAINT W/ 2 COATS ALUM. PAINT (YELLOW)
- 1 1/2" DIA. GALV. PIPE
- 3" x 3" x 1/2" STEEL PLATE
- 6 5/8" STEEL CAP
- 2 3/8" STEEL CAP
- 3,000 PSI CONCRETE

FOOTING SCHEDULE

PIPE GATE WIDTH	FOOTING DEPTH
WIDTH ≤ 24'	36"
WIDTH > 24'	48"



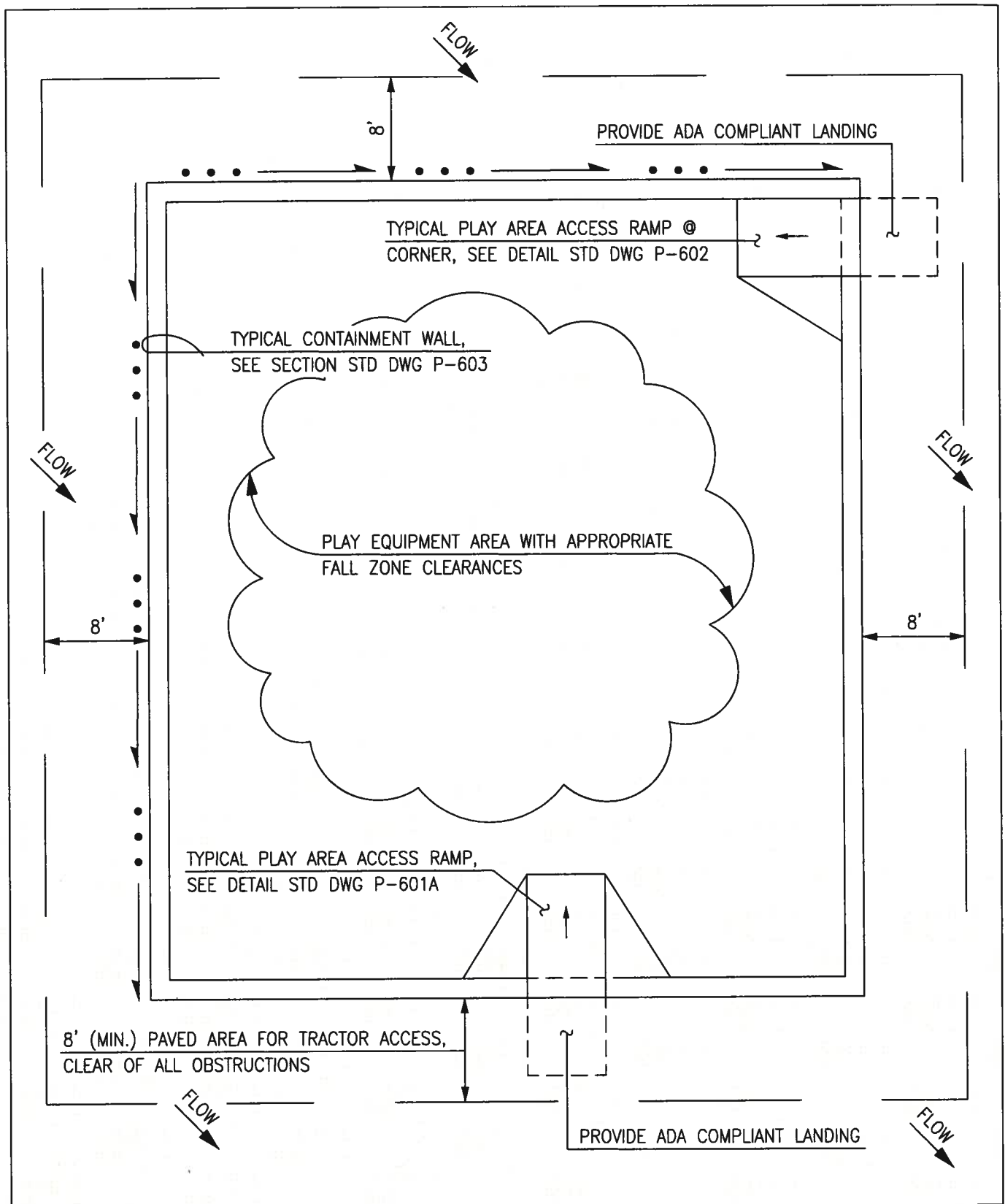
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TYPICAL PIPE GATE

DRAWN BY: HMC
REVIEWED BY: APS
DATE ISSUED: 03/28/14
SCALE: NTS

STD DWG

P-507



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TYPICAL PLAY AREA CONFIGURATIONS

DRAWN BY: HMCB

REVIEWED BY: APS

DATE ISSUED: 07/14/14

SCALE: N.T.S.

STD DWG:

P-600A

GENERAL NOTES:

1. ALL PLAY AREA CONSTRUCTION SHALL COMPLY WITH THE NEW MEXICO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION – 1987, PUBLISHED BY THE NEW MEXICO CHAPTER AMERICAN PUBLIC WORKS ASSOCIATION. (REVISED 12/06)
2. REFER TO ALBUQUERQUE PUBLIC SCHOOL FACILITIES DESIGN & CONSTRUCTION DEPARTMENT FOR ADA PLAYGROUND EQUIPMENT GUIDELINES. IF A CONFLICT EXISTS, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.
3. COORDINATE PLAY AREA DIMENSIONS WITH PLAYGROUND EQUIPMENT MANUFACTURER TO ENSURE FALL ZONE CRITERIA IS MET.
4. PLAYGROUND EQUIPMENT SHALL BE PRIOR APPROVED BY APS PLAYGROUND EQUIPMENT OVERSIGHT.
5. EXISTING PLAYGROUND EQUIPMENT MUST BE AUDITED AND EVALUATED BY APS PLAYGROUND EQUIPMENT OVERSIGHT PRIOR TO DESIGN AND/OR CONSTRUCTION.
6. ALL MODIFICATIONS TO EXISTING PLAY AREAS MUST BE COORDINATED WITH AND OBTAIN PRIOR APPROVAL FROM APS PLAYGROUND EQUIPMENT OVERSIGHT.
7. ALL LANDINGS SHALL BE ADA COMPLIANT.
8. ALL SLOPES MUST BE ADA COMPLIANT.
9. ENGINEERED WOOD FIBER (EWF) FILL SHALL COMPLY WITH CURRENT ADA, ASTM AND CPSC RULES AND REQUIREMENTS.
10. SAND IS NOT AN ADA COMPLIANT PLAYGROUND SURFACE AND SHALL NOT BE USED IN CONJUNCTION WITH PLAYGROUND EQUIPMENT.
11. FALL ZONE CLEARANCE MUST BE CONSIDERED IN PLAY AREA DESIGN.
12. DRAINAGE SHALL BE DIRECTED AWAY FROM AND NOT INTO PLAY AREAS.
13. UTILITIES SHALL NOT BE INSTALLED BENEATH PLAY AREAS.
14. UTILITIES (OVERHEAD CABLING) SHOULD NOT BE LOCATED ABOVE PLAY AREAS. WHEN UNAVOIDABLE, CONSULT WITH APS PLAYGROUND EQUIPMENT OVERSIGHT.



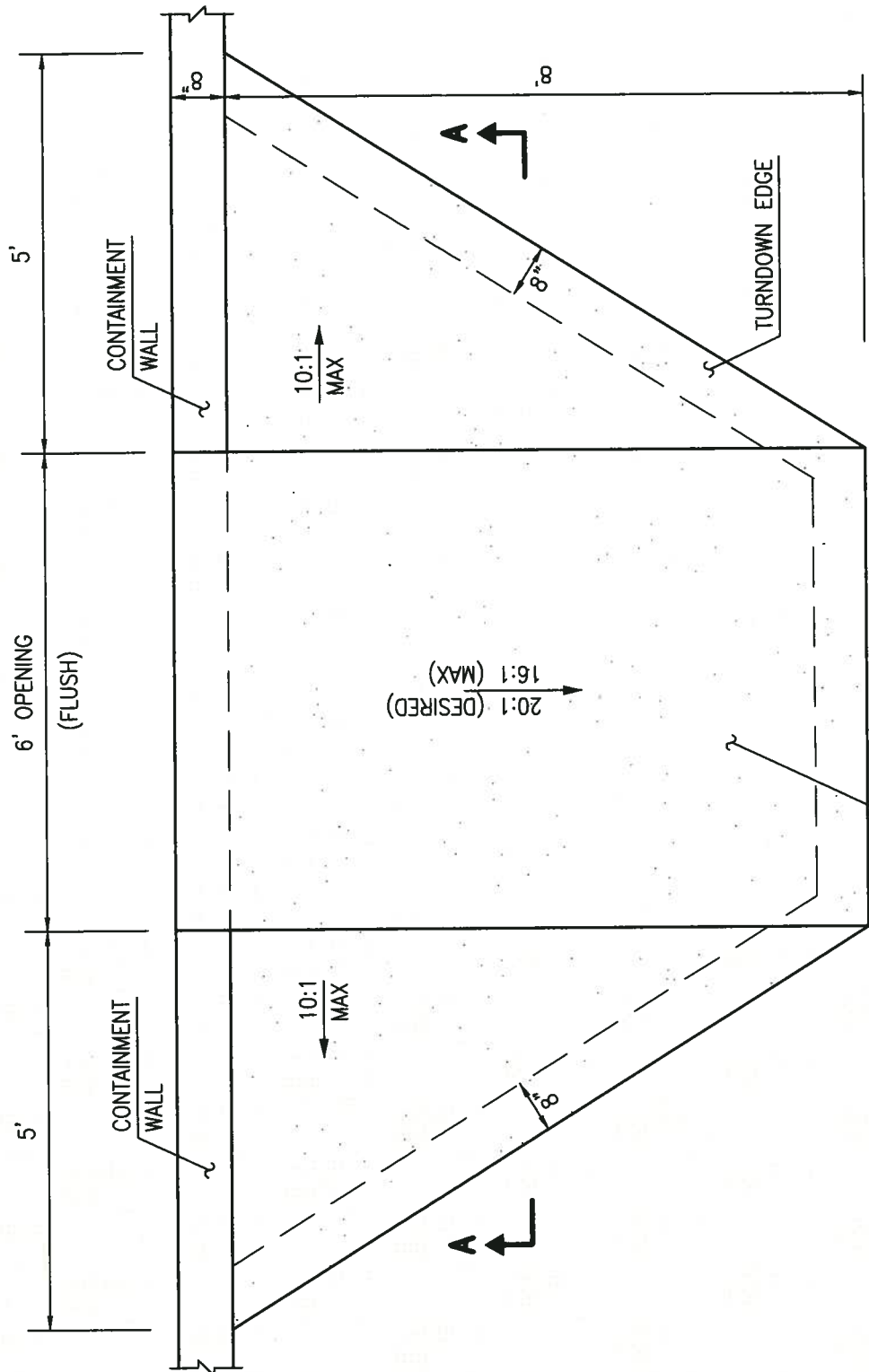
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PLAYGROUND GENERAL NOTES

DRAWN BY: HMC
REVIEWED BY: APS
DATE ISSUED: 07/14/14
SCALE:

STD DWG:

P-600B



CONSTRUCT 4", 3000 PSI CONCRETE
PAVING RAMP, MEDIUM BROOM FINISH,
W/ 12" SUBGRADE COMPACTED @
95% ASTM D-1557



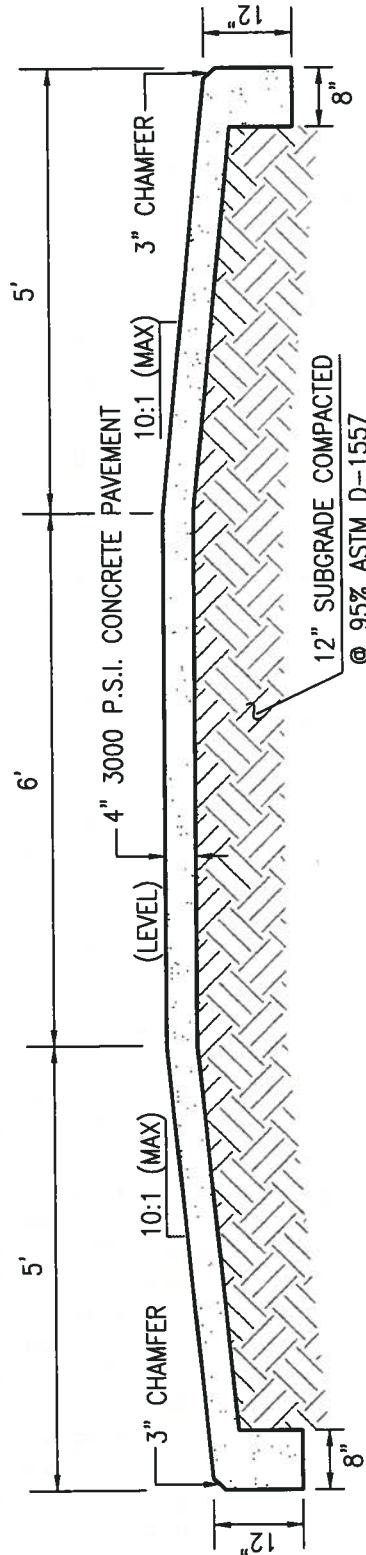
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TYPICAL PLAY AREA ACCESS RAMP DETAIL

DRAWN BY: HMC
REVIEWED BY: APS
DATE ISSUED: 06/24/14
SCALE: 1" = 2'-0"

STD DWG:

P-601A



SECTION A-A



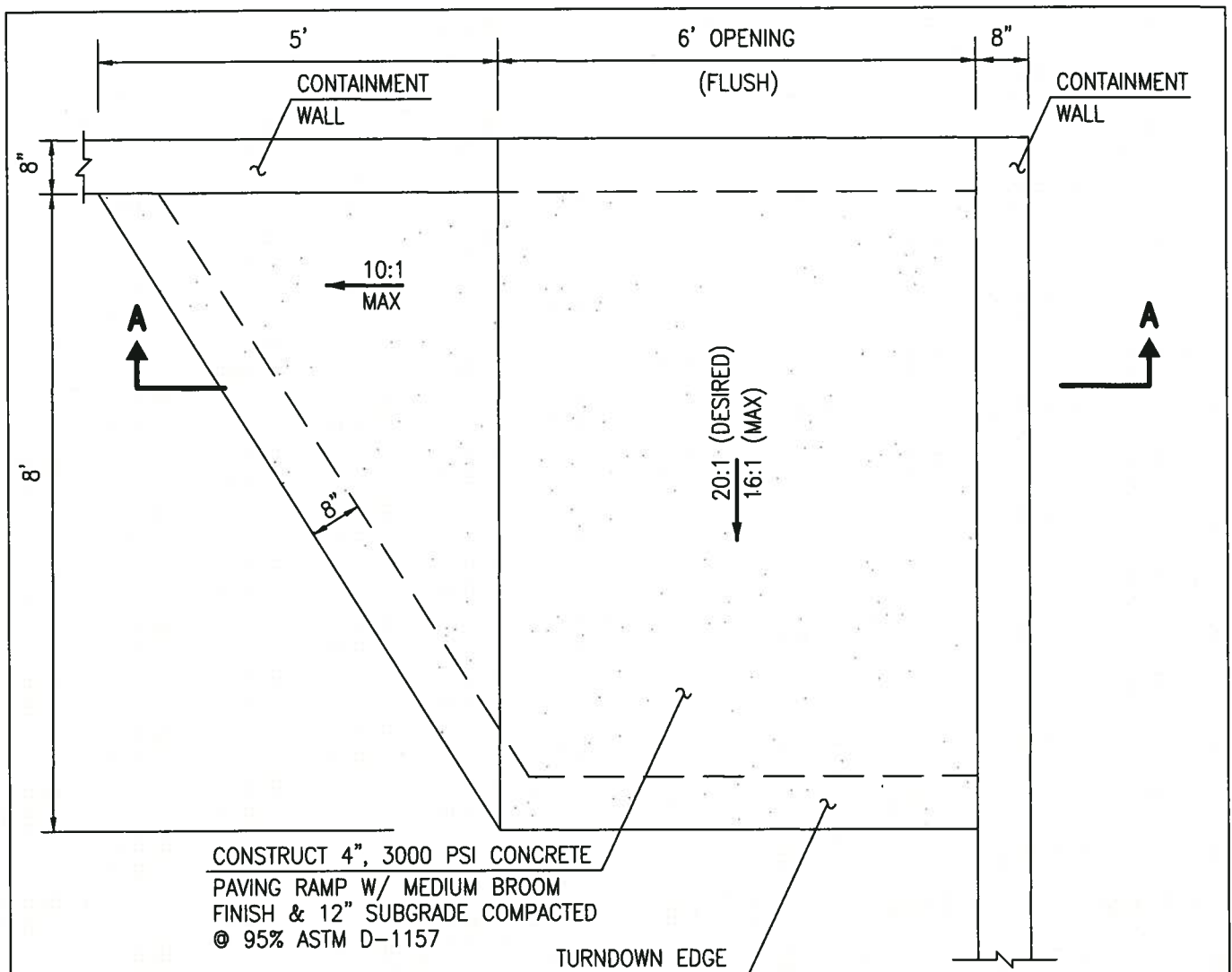
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TYPICAL PLAY AREA ACCESS RAMP SECTION A-A

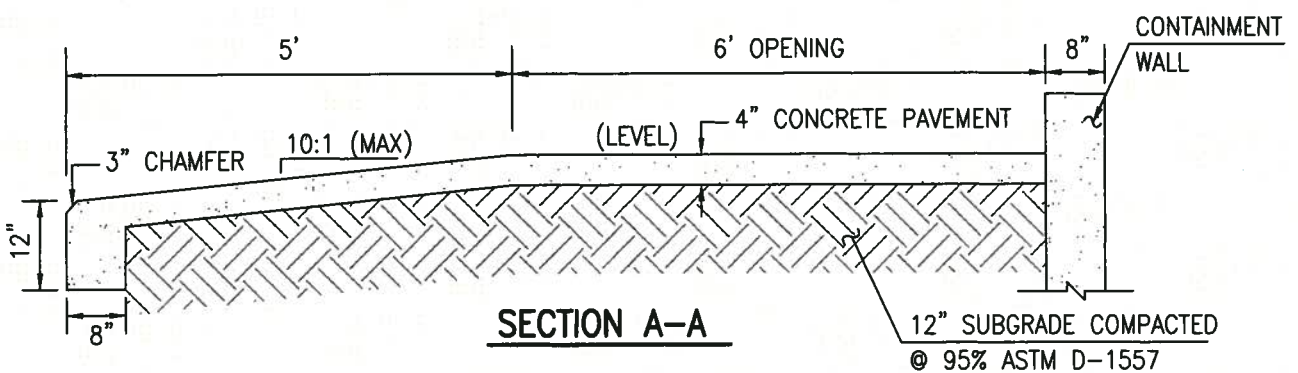
DRAWN BY: HMCG
REVIEWED BY: APS
DATE ISSUED: 06/24/14
SCALE: 1" = 2'-0"

STD DWG:

P-601B



DETAIL



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TYPICAL PLAY AREA ACCESS RAMP @ CORNER

DRAWN BY: HMCB
REVIEWED BY: APS
DATE ISSUED: 06/24/14
SCALE: 1" = 2'-0"

STD DWG:

P-602



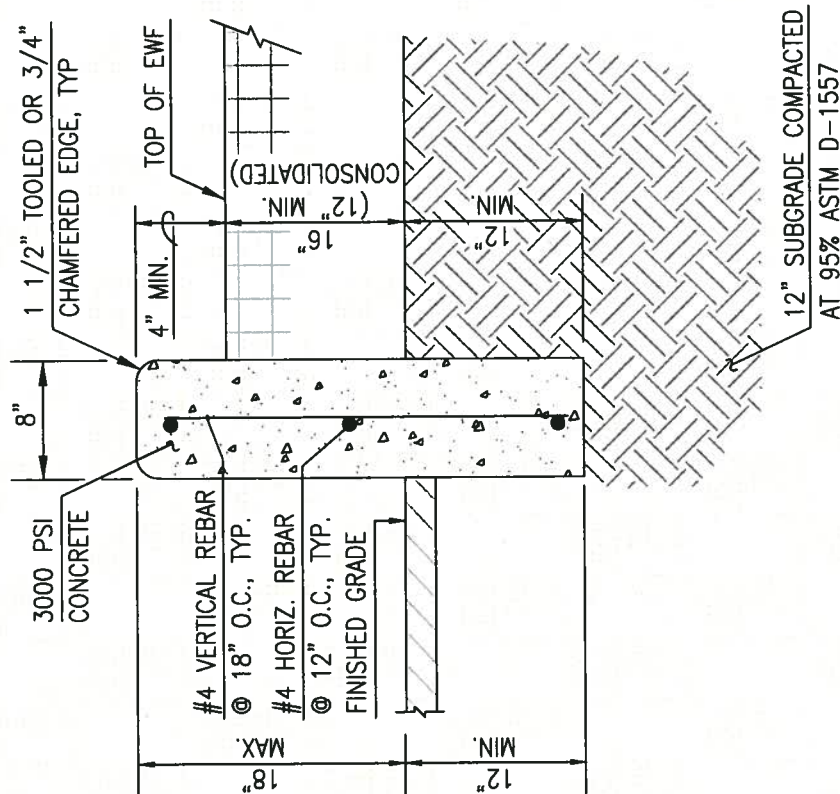
**ALBUQUERQUE
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TYPICAL PLAY AREA CONTAINMENT WALL SECTION

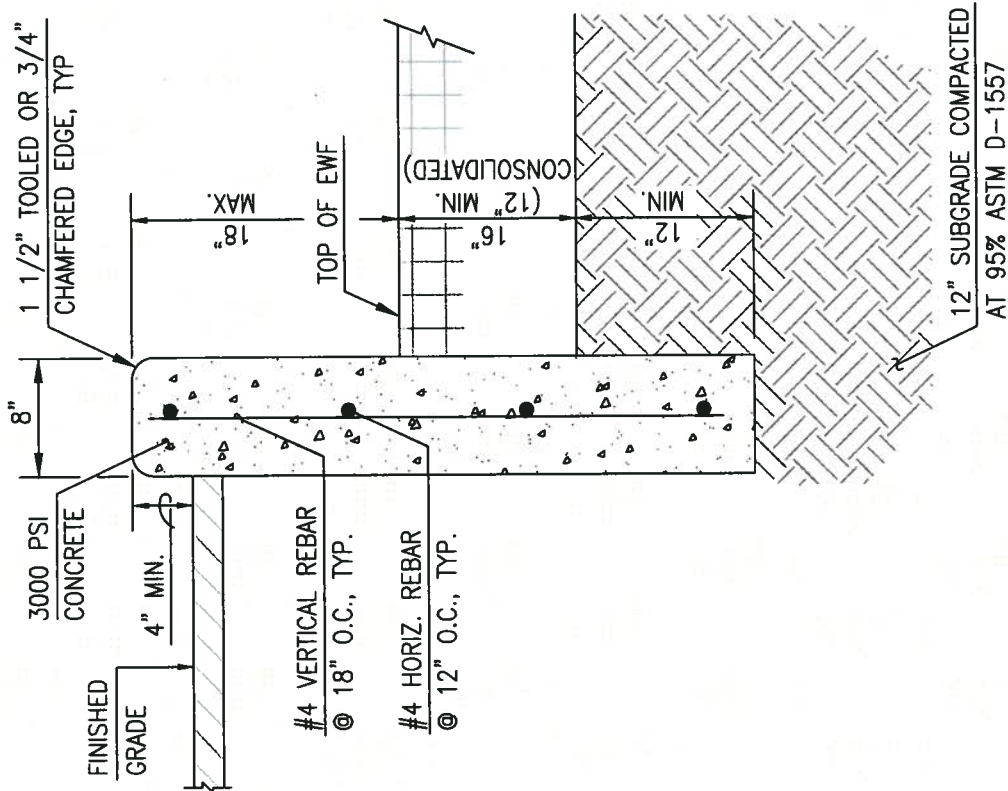
DRAWN BY: HMCB
REVIEWED BY: APS
DATE ISSUED: 07/14/14
SCALE: 1" = 1'-0"

STD DWG:

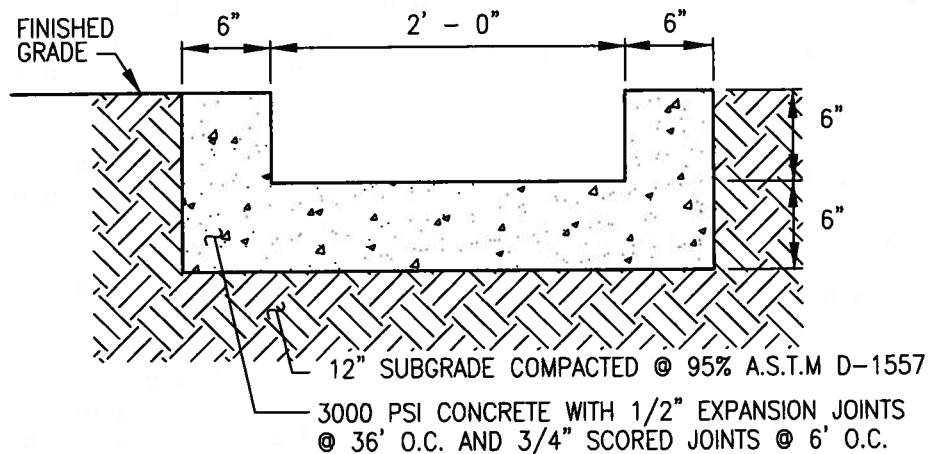
P-603



1.) FINISHED GRADE BELOW PLAY AREA

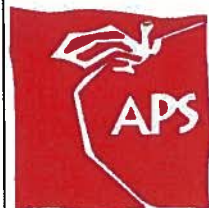


2.) FINISHED GRADE ABOVE PLAY AREA



NOTES:

1. 2' OPENING WIDTH SHOWN IS FOR TYPICAL APPLICATION; HOWEVER, WIDTH MAY VARY AS A FUNCTION OF APPLICATION USED AND CAPACITY REQUIRED. RECOMMENDED MIN. WIDTH = 12", MAX WIDTH = 5'. OPENING'S GREATER THAN 5' SHOULD INCLUDE BOLLARDS AT ENTRANCE AND/OR EXIT TO PREVENT VEHICULAR ACCESS.
2. 6" OPENING HEIGHT SHOWN IS FOR TYPICAL APPLICATION; HOWEVER, HEIGHT MAY VARY AS A FUNCTION OF CAPACITY REQUIRED, ENTRANCE CONDITIONS (I.E. HEADWALL HEIGHT, OUTLET PIPE SIZE, ETC) AND EXIT CONDITIONS (I.E. CURB HEIGHT, TURNDOWN SIDEWALK HEIGHT, ETC). RECOMMENDED MIN. HEIGHT = 4", MAX. HEIGHT = 24"
3. 6" SIDEWALL WIDTH SHOWN IS FOR TYPICAL APPLICATION; HOWEVER, WIDTH MAY VARY TO MATCH ADJACENT OR CONNECTING STRUCTURES (I.E. EXISTING WALLS, TOP OF CURBS, HEADWALLS, ETC). RECOMMENDED MIN. WIDTH = 6", MAX. WIDTH = 12"



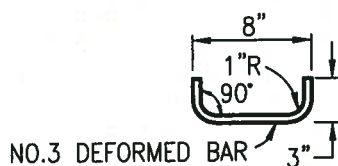
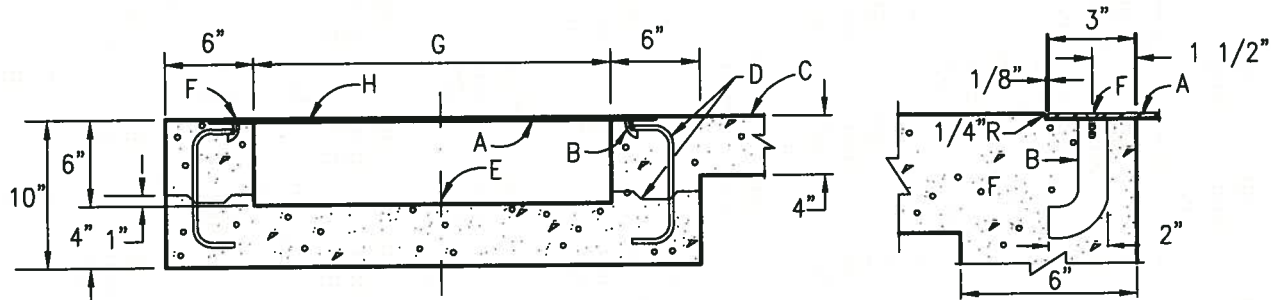
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TYPICAL RUNDOWN SECTION

DRAWN BY: HMC
REVIEWED BY: APS
DATE ISSUED: 06/25/14
SCALE: 1" = 1'-0"

STD DWG:

D-101



DOWEL DETAIL

SCALE: 1" = 1'

CONSTRUCTION NOTES:

- A. 3/8" CHECKERED STEEL PLATE.
- B. ROD ANCHOR 1" x 5"
- C. SIDEWALK GRADE
- D. DOWEL AND JOINT, (OPTIONAL).
- E. GUTTER FLOWLINE ELEV.
- F. 3/8" x 1" F.H. C'SUNK STAINLESS STEEL MACHINE SCREW.
- G. DRAIN WIDTH, 24" MAX. 12" MIN.
- H. AFTER CLEANING SURFACE OF SCALE, RUST, OILS, ETC., PAINT GRATE WITH ONE SHOP COAT RED OXIDE, TWO FINISH COATS OF ALUMINUM PAINT (AASHTO M 69).

NOTE: USE ONLY WHERE INVERT IS NOT PRONE TO CLOGGING WITH / BY TURF, MULCH, SOIL, ETC.



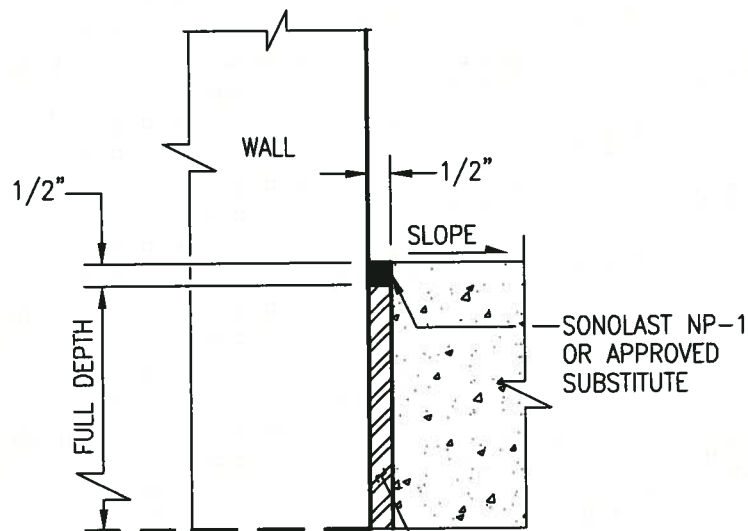
**ALBUQUERQUE
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TYPICAL SIDEWALK CULVERT SECTION

DRAWN BY: HMC
REVIEWED BY: APS
DATE ISSUED: 06/25/14
SCALE: 1" = 1'-0"

STD DWG:

D-102



POLYETHYLENE FOAM FILLER, PLASTAZOTE
OR APPROVED SUBSTITUTE TO DEPTH OF
SLAB DO NOT ATTACH WITH NAILS OR
BONDING AGENT.



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TYPICAL POLYETHYLENE EXPANSION JOINT SECTION

DRAWN BY: HMC

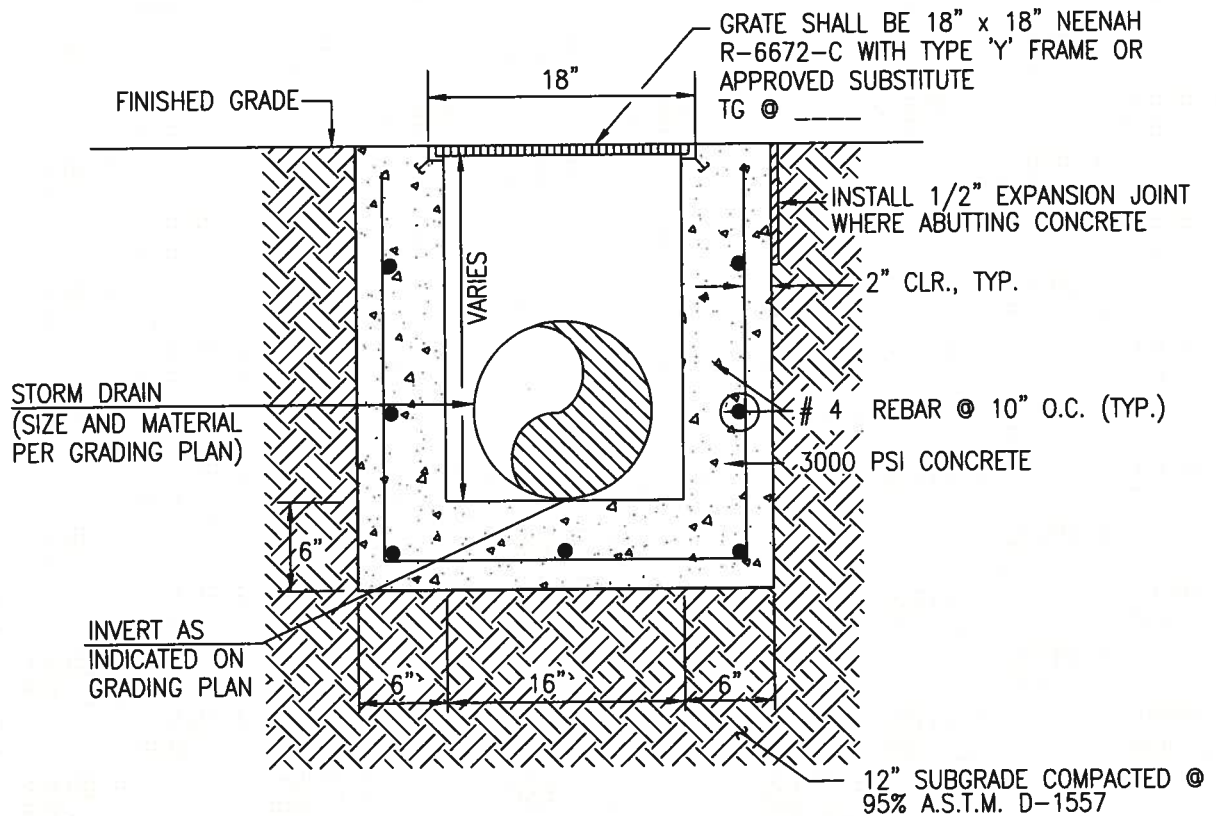
REVIEWED BY: APS

DATE ISSUED: 06/25/14

SCALE: NTS

STD DWG:

D-103



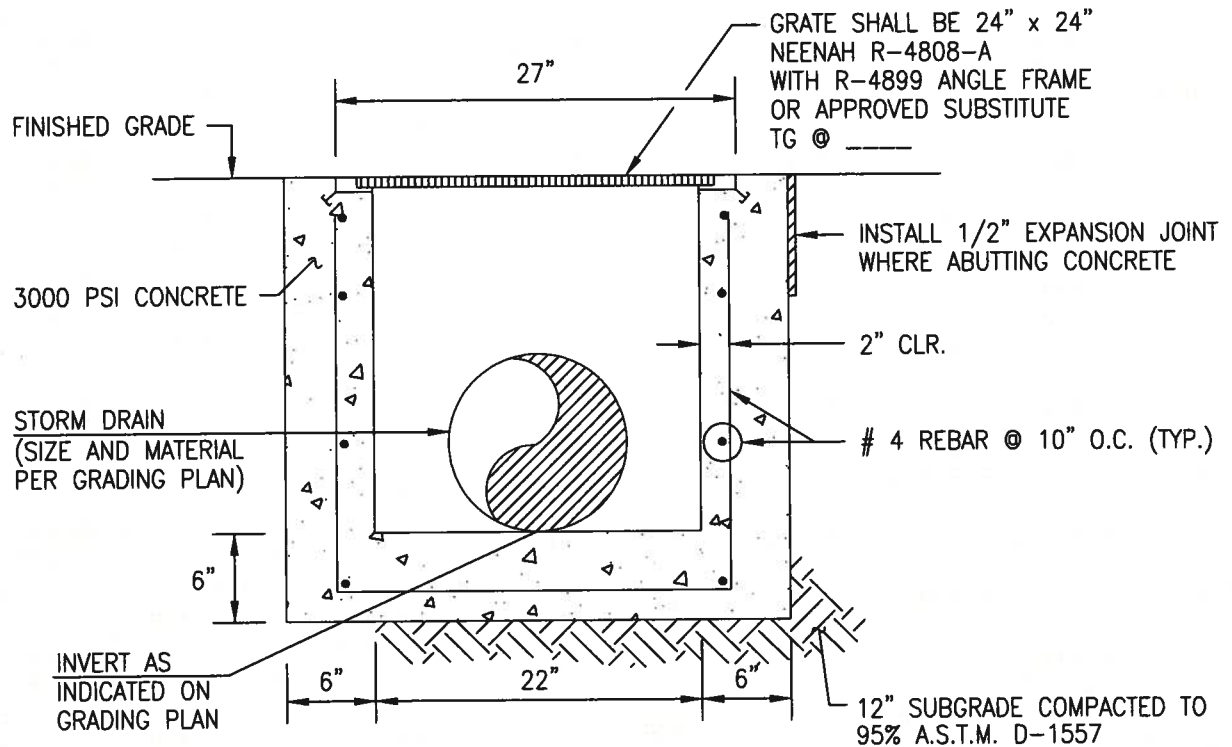
**ALBUQUERQUE
PUBLIC SCHOOLS**
Expect great things!

TYPICAL 18"x18" STORM INLET SECTION

DRAWN BY: HMCB
REVIEWED BY: APS
DATE ISSUED: 01/29/14
SCALE: 1" = 1'-0"

STD DWG:

D-104



**ALBUQUERQUE
PUBLIC SCHOOLS**
Expect great things!

TYPICAL 24"x24" STORM INLET SECTION

DRAWN BY: HMC
REVIEWED BY: APS
DATE ISSUED: 06/25/14
SCALE: 1" = 1'-0"

STD DWG:

D-105