

Pima County Natural Resources, Parks and Recreation Department

November 2005

Standard Specifications and Details for Park Development

Pre-Design Investigations

INDEX TO PRE-DESIGN INVESTIGATIONS

Pre-Design Investigations - Site Surveys	1
Pre-Design Investigations - Geotechnical Report	3
Pre-Design Investigations - Utility Investigations	5

PRE-DESIGN INVESTIGATIONS - SITE SURVEYS

Introduction:

A complete and accurate survey of each project site is essential for the design and engineering of park improvements. This survey information is also an important part of the permanent set of records maintained by the Pima County Natural Resource, Parks, and Recreation Department. A land survey shall be performed for each new or expanded park project and shall be as described below.

Information to be provided by Pima County:

The Pima County Natural Resources, Parks, and Recreation Department will provide the design consultant and/or surveyor with the following:

- A written legal description of the project site
- Authorization to enter the site for the purpose of performing a land survey
- A title report for the subject parcel(s)

Scope of Survey Work:

The scope of the survey work to be performed for each new or expanded park development project shall include:

- Field work as required to make tie-ins to existing benchmarks for horizontal and vertical controls
- Written documentation of benchmarks used for the subject survey
- The setting of field panels as required for aerial photography and survey work
- Aerial photography of the project site
- Field work as required to locate all boundary corners and as required to confirm the property line distances and bearings included in the legal description
- The installation of new or replacement corner pins as may be required
- Mapping of all recorded easements associated with the subject parcel
- Mapping of existing improvements on the project site, including, but not limited to: buildings, roads, pavements, fences, gates, overhead utilities, at-grade utility structures and appurtenances, and underground utility lines
- Topographic mapping using a one-foot contour interval supplemented with spot elevations at high points, low points, and other appropriate locations
- Spot elevations for fixed improvements including, but not limited to: finished floors, slabs, roadway and parking lot pavements, curbs, headers, courts, slabs, sidewalks, utility structures, manhole rims, storm drain inlets, storm drain inverts, and sanitary sewer inverts
- Mapping of the location and elevation of other site features that may be relevant to the proposed project including, but not limited to, rock outcrops, specimen trees, and saguaro cacti

PRE-DESIGN INVESTIGATIONS - SITE SURVEYS

Deliverables:

Work products to be delivered to the Design Consultant and the Pima County Natural Resources, Parks, and Recreation Departments shall include:

- A reproducible mylar copy of the rectified aerial photograph plotted at a scale of 1" = 40' or larger
- A reproducible mylar copy of the boundary, easement, culture, and topographic survey map, sealed and signed by the Registered Land Surveyor of record. (The map shall be dated and shall include a written summary of all vertical and horizontal benchmarks and controls used in conjunction with the survey)
- Digital files for the aerial photograph in a file format acceptable to the Natural Resources, Parks, and Recreation Department. (Files shall be provided on compact disk)
- Digital files for the survey map in AutoCad format. (The most recent release of AutoCad shall be utilized except as may be approved by the Natural Resources, Parks, and Recreation Department. Files shall be provided on compact disk)
- Legal descriptions and drawings of all new easements required for new project utilities. The legal descriptions and drawings shall be in the format needed for recordation

PRE-DESIGN INVESTIGATIONS - GEOTECHNICAL REPORT

Introduction:

Information related to surface and subsurface soil conditions on the project site is essential to the design and engineering of park structures, buildings and pavements. It is also important to have adequate information related to the character of the soil profile after completion of proposed grading. Geotechnical investigations shall be performed in conjunction with each design project and shall be as described below.

Information to be provided by Pima County:

The Pima County Natural Resources, Parks, and Recreation Department will provide the design consultant and/or the geotechnical engineer with the following:

- Results of environmental assessments as may have been performed by others to detect the presence of hazardous materials on the project site
- Authorization to enter the site for the purpose of performing geotechnical investigations

Scope of Geotechnical Investigation Work:

The scope of the geotechnical investigation work shall include:

- Soil borings in the vicinity of each proposed building or structure and the analysis of collected soil samples as required to identify and describe subsurface soil conditions and as required to establish soil bearing capacities
- Soil borings in the vicinity of each proposed parking lot and/or park road and the analysis of collected soil samples as required to develop recommendations for pavement section(s)
- Soil borings or test pits in all areas where trenching will be required for underground utility installation. (The borings and test pits shall be as required to determine the presence of bedrock, caliche, or other soil conditions unfavorable to the trenching work)
- Soil borings or test pits in all areas where surface grades will be lowered by grading. (The scope of the boring and test pit work shall be sufficient to determine the presence of bedrock, caliche, or other conditions detrimental to the planting and maintenance of turf grass and/or other landscape plantings)
- Infiltration tests in the vicinity of proposed leach fields as required for the design, engineering, and permitting of septic tank and leach field disposal systems, as applicable
- The collection of soil samples from project locations proposed for landscape developments and the analysis of the samples for horticultural properties. (The analysis to include measurement of soil; texture, pH, salinity, exchangeable cations, and nutrients)

PRE-DESIGN INVESTIGATIONS - GEOTECHNICAL REPORT

Deliverables:

The work product to be delivered to the Pima County Natural Resources, Parks, and Recreation Department shall be a Geotechnical Report that includes:

- Copies of all soil boring and test pit logs
- The results of laboratory analyses related to soil type, soil texture, plasticity index, and other relevant physical properties of the soil
- The results of laboratory analyses related to soil nutrients, soil fertility, and other horticultural properties of the soil
- A narrative summary, with accompanying maps, showing the approximate limits and depth of areas on the site with shallow bedrock, caliche, and/or other unfavorable soil conditions
- Recommendations for building foundation design
- Recommendations for post-tension slab design, as applicable
- Recommendations for flexible and rigid pavement design, as applicable
- Recommendations for the safe implementation of trenching work associated with underground utilities
- Recommendations for the grading and treatment of cut and fill slopes
- Recommendations for soil amendments and conditioners to be incorporated into the soil in areas to be planted with turf grass
- Recommendations for soil amendments and conditioners to be incorporated into the soil areas to be planted with trees and shrubs

PRE-DESIGN INVESTIGATIONS - UTILITY INVESTIGATIONS

Introduction:

The presence of existing utility systems in the vicinity of a project and the capacity of these utilities to support the proposed park development can have significant impact on the feasibility of the project and on the cost of construction. During the preliminary design phase of each project, the presence, condition, and capacity of utilities required for the proposed project shall be checked and documented.

Information to be provided by Pima County:

The Pima County Natural Resources, Parks, and Recreation Department will provide the design consultant with the following:

- The best available as-built drawings related to private (Parks Department) utilities as may be present on the project site

Scope of Utility Investigation Work:

The scope of the utility investigation work to be performed by the design consultant shall include contacting the appropriate utility companies to identify or confirm the following:

- The size and location of potable water mains in the vicinity of the site. (The investigation shall include confirmation that the potable water main(s) can be tapped for new potable water services)
- The static pressure in the potable water main at the proposed point-of-connection
- The size and location of reclaimed water mains in the vicinity of the site. (The investigation shall include confirmation that the reclaimed water main(s) can be tapped for new potable water services)
- The static water pressure in the reclaimed water main at the proposed point-of-connection
- The size, location, and depth of existing sanitary sewers in the vicinity of the project. (The investigation shall include confirmation that the sewer can be extended to serve new facilities on the project site)
- The location and type (voltage, etc.) of electric power lines in the vicinity of the project site. (The investigation shall include confirmation that the local electric power distribution system has the capacity to provide the service(s) required for the proposed park development)
- The location of telephone lines in the vicinity of the project site. (The investigation shall include confirmation that the local telephone system has the capacity to provide the service(s) required for the proposed park development)

PRE-DESIGN INVESTIGATIONS - UTILITY INVESTIGATIONS

Deliverables:

The work product to be provided to the Pima County Natural Resources, Parks, and Recreation Department shall include the items listed below. These items shall be included with the Schematic Design (or 30% Design) submittal.

The utility information shall be noted on the Schematic Design (or 30% Design) drawings or included in a supplemental report to be submitted with these drawings.

- Name of the potable water provider, the location of existing main to be tapped for the new service, the approximate location and size of new service, and the static water pressure at the proposed point of connection
- Name of the reclaimed water provider, location of existing main to be tapped for the new service, the approximate location and size of new service, and the static water pressure at the proposed point of connection
- Name of the sanitary sewer system operator, the location and size of the sewer line or manhole where the new connection will be made, the approximately routing of the new sewer, and the size of the sanitary sewer line(s) proposed for the project
- Name of the electric utility company serving the project site, the location of the existing power lines in the vicinity of the site, the approximate demand or load associated with the project, and the approximate location of new transformers and metered services
- Name of the telephone company serving the project site, the location of the existing telephone lines in the vicinity of the site, the quantity of phone lines required for the project, and the approximate location of new telephone pedestals and panels

Design, Design Review, and Construction Administration Checklists

INDEX TO CHECKLISTS

Playground Equipment and Surfacing Checklist	1
Irrigation System Checklist.....	5
Fencing, Gates, and Post-and-Cable Barriers Checklist	10
Landscape Work Checklist	13
Native Plant Salvage Work Checklist.....	17
Pre-Engineered Ramada Checklist	19
Pre-Engineered Shade Canopy Checklist	22
Pre-Engineered Restroom Building Checklist	25
Tall-Pots Checklist.....	28

PLAYGROUND EQUIPMENT AND SURFACING CHECKLIST

Purpose:

This checklist is intended for use by the design professional, the design reviewer, and the construction administrator on projects involving playground equipment, fitness / exercise equipment, and associated resilient surfacing.

Documents to be Coordinated:

1. The Project Plans
2. Standard Specification Section 02790 (Playground Equipment and Surfacing)
3. Standard Details P-900 through P-902, as applicable.

Design Phase Checklist - Standard Details:

1. Confirm that the appropriate Standard Details for the proposed playground equipment and surfacing are shown or referenced on the Project Plans. (See Standard Details P-900 through P-902).

Design Phase Checklist - Standard Specifications:

1. Confirm that Standard Specification Section 02790 (Playground Equipment and Surfacing) is referenced on the Project Plans.

Design Phase Checklist - General Requirements for Project Plans:

1. Confirm that the Project Plans show the location, layout, and grading of the curb and/or walkways to be installed at the perimeter of the proposed playground.
2. Confirm that the Project Plans show the location and layout of all play structures and associated signs with the limits of the use zones depicted.
3. Confirm that the Project Plans show the location and layout of all fitness equipment and associated signs with the limits of the use zones depicted.
4. Confirm that the Project Plans show rubberized resilient surfacing from an accessible perimeter walkway to all designated transfer stations associated with the play structure.
5. Confirm that the Project Plans indicate rubberized resilient surfacing and/or engineered wood fiber surfacing within all use zones associated with the play structure and/or fitness equipment.
6. Confirm that the Project Plans show or note the requirements for signs that designate the play structure as appropriate for certain age groups. (2-5 years and 5-12 years, typical).

PLAYGROUND EQUIPMENT AND SURFACING CHECKLIST

7. Confirm that the Project Plans show the relationship between the play structure (and its associated use zones) and the columns associated with pre-engineered shade canopies to be installed in the vicinity of the play structure, as applicable.

Design Phase Checklist - Notes to be Included on the Project Plans:

1. Confirm that Project Plans include a note stating that the Project Plans and Details are to be used in conjunction with the Standard Details and Specifications, and that specific products, models, dimensions, and features identified on the Project Plans take precedence over the general requirements of the Standard Details and Specifications.
2. Confirm that the colors for the playground equipment and fitness equipment are noted on the Project Plans. (Alternatively, confirm that a note is included requiring the Contractor to submit color chips to the Owner for color selection).
3. Confirm that the colors for the rubberized resilient surfacing are noted on the Project Plans. (Alternatively, confirm that a note is included requiring the Contractor to submit color chips to the Owner for surfacing color selection).

Construction Phase Checklist - Submittals to be made by Construction Contractor:

1. Contractor to submit a letter that the playground and fitness equipment is certified by the International Play Equipment Manufacturers Association (IPEMA). See Specification Section 02790, Paragraph 1.9-A.
2. Contractor to submit a letter that the rubberized resilient surfacing is certified by the International Play Equipment Manufacturers Association (IPEMA). See Specification Section 02790, Paragraph 1.9-B.
3. Contractor to submit a letter that the engineered wood fiber surfacing is certified by the International Play Equipment Manufacturers Association (IPEMA). See Specification Section 02790, Paragraph 1.9-C.
4. Contractor to submit an Equipment Installation / Use Zone Diagram for each play structure as provided by the playground equipment and/or fitness equipment manufacturer. See Specification Section 02790, Paragraph 1.9-D.
5. Contractor to submit color chips for the paint / powder coat and plastic components to be used for the play equipment and/or fitness equipment. See Specification Section 02790, Paragraph 1.9-E.

PLAYGROUND EQUIPMENT AND SURFACING CHECKLIST

6. Contractor to submit Manufacturer's Inspection, Maintenance, and Repair Instructions for the playground equipment, fitness equipment, and resilient surfacing materials. See Specification Section 02790, Paragraph 1.9-F.
7. Contractor to submit a sample of pea gravel if used as surfacing below or adjacent to fitness equipment. See Specification Section 02790, Paragraph 1.9-G.
8. Contractor to submit a copy of the Post-Installation Inspection and Certification Report as prepared by an independent, National Playground Safety Institute (NPSI) Certified Playground Safety Inspector. See Specification Section 02790, Paragraph 3.9-A.

Construction Phase Checklist - Inspections to be made by the Owner's Representative:

1. Verify that the forms for the perimeter curb are of a depth and alignment that is consistent with the Project Plans and the Standard Details.
2. Verify that the playground area has been excavated and graded to allow for the installation of drainage aggregate and resilient surfacing in accordance with the Standard Details.
3. Verify that the drainage aggregate and filter fabric have been installed in accordance with the Standard Details and Specifications.
4. Verify that temporary fencing is in place prior to the start of play structure erection. Fencing to be installed to prevent public use of the structure prior to final assembly, surfacing installation, and safety inspection / certification. See Specification Section 02790, Paragraph 3.5-A.
5. Verify that the play structure and fitness equipment are being installed by qualified personnel. See Specification Section 02790, Paragraphs 1.6-A and 1.6-B.
6. Verify that all play structure components and associated signs have been installed per the Project Plans and schedules.
7. Verify that the various types of resilient surfacing have been installed per the Project Plans and schedules.

Construction Phase Checklist - Inspections and Testing Work to be performed by an Independent Testing Laboratory:

1. Play structure, fitness equipment, surfacing, and related playground improvements to be inspected and certified by an independent, NPSI Certified, Playground Safety Inspector. See Specification Section 02790, Paragraph 3.9-A.

PLAYGROUND EQUIPMENT AND SURFACING CHECKLIST

Checklist - Turn-Over Equipment:

1. Contractor to provide the Owner with one copy of the play equipment installation manual for each play structure and unit of fitness equipment installed on the project. See Specification Section 02790, Paragraph 1.10-A-1.
2. Contractor to provide the Owner with one set of specialized tools as required for the installation and maintenance of the play structures and fitness equipment installed. See Specification Section 02790, Paragraph 1.10-A-2.
3. Contractor to provide the Owner with one quart of touch-up paint of each color used to finish the metallic portions of the play structure(s) and fitness equipment. See Specification Section 02790, Paragraph 1.10-A-3.

Checklist - Letters of Guarantee:

1. Letter of Guarantee for the play structure and fitness equipment installed. See Specification Section 02790, Paragraph 3.11-A.
2. Letter of Guarantee for resilient surfacing materials installed. See Specification Section 02790, Paragraph 3.11-B.

IRRIGATION SYSTEM CHECKLIST

Purpose:

This checklist is intended for use by the design professional, the design reviewer, and the construction administrator on projects involving the installation of landscape irrigation systems.

Documents to be Coordinated:

1. The Project Plans
2. Standard Specification Section 02800 (Irrigation System)
3. Standard Details P-300 through P-322, as applicable.

Design Phase Checklist - Standard Details:

1. Confirm that the appropriate Standard Details for the proposed irrigation equipment are shown or referenced on the Project Plans. (See Standard Details P-300 through P-322).

Design Phase Checklist - Standard Specifications:

1. Confirm that Standard Specification Section 02800 (Irrigation System) is referenced on the Project Plans.

Design Phase Checklist - General Requirements for Project Plans:

1. Confirm that the location and size of the water meter(s) to be installed to serve the project irrigation system are shown on the Project Plans.
2. For irrigation systems using potable water, confirm that the location and size of all backflow preventers are shown on the Project Plans.
3. For irrigation control systems to be connected to the Pima County NRP&R Department's central control system, confirm that a master valve and flow sensor of appropriate size are shown on the Project Plans. Confirm that a telephone service has been provided to allow for communication between the NRP&R Department's off-site work station and the on-site control equipment.
4. Confirm that the irrigation mainline is shown and sized on the Project Plans and that isolation valves are provided at appropriate locations along the mainline to facilitate system maintenance and repair.
5. Confirm that all remote control valve (RCV) assemblies are shown and sized on the Project Plans and that all RCV's are assigned to a specific controller station.

IRRIGATION SYSTEM CHECKLIST

6. Confirm that all lateral lines, for drip zone and turf zones, are shown and sized on the Project Plans.
7. Confirm that sleeves are shown and sized for all segments of mainline pipe and lateral line pipe to be installed under pavement.
8. Confirm that the type, number of stations, and proposed location for the controller(s) are shown on the Project Plans. Confirm that there will be spare stations on the controller for future system expansion, if appropriate.
9. Confirm that the manufacturer, model number, nozzle size, and other features of each sprinkler type used on the project are noted on the Project Plans.
10. Confirm that the manufacturer, model number, flow rate, and other features of each drip emitter type used on the project are noted on the Project Plans.
11. Confirm that the manufacturer, model number, size, and other features of all quick coupling valves (and/or other specialty valves) used on the project are noted on the Project Plans.
12. Confirm that turf irrigation system design has been evaluated using the Center for Irrigation Technology's SPACE (Sprinkler Profile and Coverage Evaluation) Software Program and that the predicted Distribution Uniformity (DU) for the irrigation system designed will be:
 - 70% or greater for Rotor Type Sprinkler Heads
 - 65% or greater for Fixed-Spray Type Sprinkler Heads

Design Phase Checklist - Notes to be Included on the Project Plans:

1. Confirm that Project Plans include a note stating that the Project Plans and Details are to be used in conjunction with the Standard Details and Specifications, and that specific products, models, dimensions, and features identified on the Project Plans take precedence over the general requirements of the Standard Details and Specifications.
2. Confirm that the Project Plans include a detailed Irrigation Equipment Schedule. The Standard Specifications and Details are non-proprietary and may not be sufficient, without the Irrigation Equipment Schedule, to ensure that all of the system components provided are fully compatible. The Irrigation Equipment Schedule should indicate the manufacturer, model number, and features / options associated with each irrigation system component utilized on the project.
3. Confirm that the Project Plans identify the duration of the initial Irrigation Maintenance period if other than the 60 days required by the Standard Specifications. See Specification Section 02800, Paragraph 3.20-C.

IRRIGATION SYSTEM CHECKLIST

4. Confirm that the Project Plans include a note identifying that an Irrigation Audit will be performed if the Pima County NRP&R Department has determined that an audit is appropriate for the subject project. The note should identify specific irrigation zones that will receive or be subject to the post-construction audit.

Construction Phase Checklist - Submittals to be made by Construction Contractor:

1. Contractor to submit marked-up manufacturer product specification sheets for all irrigation pipes, valves, applicators, and other system equipment and appurtenances required for the project. See Standard Specification Section 02800, Paragraph 1.9-A. Submittals to be received prior to the delivery of materials and equipment to the project site and prior to the start of irrigation system installation.
2. Contractor to submit As-Built Drawings of the irrigation system installed. The As-Built Drawings to include GPS coordinates for all system valves. See Specification Section 02800, Paragraph 1.9-B. As-Built Drawings to be received prior to Substantial Completion of the project.
3. Contractor to provide a copy of the Backflow Preventer Test Certificate for each backflow preventer installed on the project. See Specification Section 02800, Paragraph 3.3-A.

Construction Phase Checklist - Inspections to be made by the Owner's Representative:

1. Verify that the layout of the backflow preventers, mainlines, master valves, flow sensors, isolation valves, and remote control valves is consistent with the Project Plans. See Specification Section 02800, Paragraph 3.2-A.
2. Verify that the backflow preventer and associated security enclosure have been installed per the Standard Details and Specifications. See Specification Section 02800, Paragraphs 3.4-A and 3.4-B.
3. Verify that the layout and spacing of the irrigation sprinkler heads is uniform and consistent with the Project Plans. See Specification Section 02800, Paragraph 3.2-A.
4. Verify that the trenches for the irrigation mainline and lateral lines are consistent with the trench depth(s) and width(s) noted or shown on the Standard Details and Specifications. See Specification Section 02800, Paragraph 3.5-A.
5. Verify that sleeves have been installed in all locations where irrigation lines will be installed below pavements. Confirm that the locating wires have been installed at all sleeve ends in accordance with the Standard Details. See Specification Section 02800, Paragraph 3.6-A.

IRRIGATION SYSTEM CHECKLIST

6. Observe the pressure testing of all mainline pipe, verify that pressure testing has been successfully completed. See Specification Section 02800, Paragraph 3.8.
7. Verify that bedding material is placed below, on the sides of, and above all mainline and lateral line pipe per the Standard Details and Specifications. See Specification Section 02800, Paragraph 3.6-B.
8. Verify that the appropriate primer and solvent weld cement products are being used to construct all solvent weld PVC joints. See Specification Section 02800, Paragraphs 2.1-D and 3.7.
9. Verify that the low-voltage control wire and other communication cables are installed per the Standard Details and Specifications. See Specification Section 02800, Paragraphs 3.9-A and 3.9-B.
10. Verify that all mainline and lateral line trenches are backfilled in lifts and compacted in accordance with the Standard Details and Specifications. See Specification Section 02800, Paragraph 3.10-A, 3.10-B, and 3.10-C.
11. Verify that all irrigation system valves and associated valve access boxes have been installed per the Standard Details and Specification. See Specification Section 02800, Paragraph 3.11-A and 3.11-B.
12. Verify that the controller(s), cluster control unit(s), and associated security enclosures have been installed in accordance with the Standard Details and Specifications. See Specification Section 02800, Paragraphs 3.12-A and 3.12-B.
13. Verify that the controller(s) have been properly programmed and that on-site controllers and cluster control units are communicating with one another and with the NRP&R Department's off-site work station. See Specification Section 02800, Paragraph 3.12-C.
14. Verify that all sprinkler heads are properly adjusted as to height, radius of spray, and arc of spray. See Specification Section 02800, Paragraphs 3.14-A and 3.14-B.
15. Verify that emitters and distribution tubing have been installed per the Standard Details and Specifications. See Specification Section 02800, paragraph 3.15.A.
16. Verify that a complete operational test of the irrigation system has been satisfactorily performed in accordance with the Standard Specifications. See Specification Section 02800, Paragraph 3.17-A.

IRRIGATION SYSTEM CHECKLIST

17. Verify that an Irrigation Audit has been performed on all or designated portions of the turf irrigation system in accordance with the requirements noted on the Project Plans. See Specification Section 02800, Paragraph 3.20-A through 3.20-G. (If installed irrigation system does not meet the specified performance requirements, verify that a follow-up audit has been performed. See Specification Section 02800, Paragraph 3.20-H through 3.20-I).
18. Verify that all applicable irrigation system maintenance activities are being performed during the initial maintenance period. Periodic inspections will be required. See Specification Section 02800, Paragraph 3.21-C.

Construction Phase Checklist - Inspections and Testing Work to be performed by an Independent Testing Laboratory:

1. The turf irrigation system, or designated portions of the turf irrigation system, shall be audited by a Certified Irrigation Auditor. See Specification Section 02800, Paragraph 3.20-E.

Checklist - Turn-Over Equipment:

1. Contractor to provide the Owner with spare / replacement sprinkler heads, nozzles, remote control valves, and emitter access boxes. See Specification Section 02800, Paragraph 1.13-A.

Checklist - Letters of Guarantee:

1. Letter of Guarantee for the irrigation system installed. See Specification Section 02800, Paragraph 3.23-A.

FENCING, GATES, AND POST-AND-CABLE BARRIER CHECKLIST

Purpose:

This checklist is intended for use by the design professional, the design reviewer, and the construction administrator on projects involving chain-link fencing, backstops, dugouts, post-and-cable barriers, and park entry gates.

Documents to be Coordinated:

1. The Project Plans
2. Standard Specification Section 02830 (Fencing, Gates, and Post-and-Cable Barriers)
3. Standard Details P-400 through P-809, as applicable.

Design Phase Checklist - Standard Details:

1. Confirm that the appropriate Standard Details for the proposed fencing and gates are shown or referenced on the Project Plans. (See Standard Details P-400 through P-809).

Design Phase Checklist - Standard Specifications:

1. Confirm that Standard Specification Section 02830 (Fencing, Gates, and Post-and-Cable Barriers) is referenced on the Project Plans.

Design Phase Checklist - General Requirements for Project Plans:

1. Confirm that the Project Plans indicate the length, alignment, and height of all chain link fences to be installed on the project and that appropriate Standard Details for the chain link fence are referenced.
2. Confirm that the Project Plans show the location and type of all chain-link gates to be installed on the project and that appropriate Standard Details for the gates are referenced.
3. Confirm that the Project Plans indicate the length and alignment of all post-and cable barriers to be installed on the project site and that appropriate Standard Details are referenced.
4. Confirm that the Project Plans show the location of all openings and gates in the post-and-cable barrier and that appropriate Standard Details are referenced.
5. Confirm that the Project Plans show the location and width of all park entry gates and that appropriate Standard Details are referenced.
6. Confirm that the Project Plans show the location and alignment of all backstops to be installed on project and that appropriate Standard Details are referenced.

FENCING, GATES, AND POST-AND-CABLE BARRIER CHECKLIST

7. Confirm that the Project Plans show the location of all dugouts to be installed on the project and that appropriate Standard Details are referenced.
8. Confirm that the Project Plans include boundary survey information that can be referenced by the Contractor when surveying and staking fence lines to be installed along project boundaries. See Specification Section 02830, Paragraph 1.8-A.

Design Phase Checklist - Notes to be Included on the Project Plans:

1. Confirm that Project Plans include a note stating that the Project Plans and Details are to be used in conjunction with the Standard Details and Specifications, and that specific products, models, dimensions, and features identified on the Project Plans take precedence over the general requirements of the Standard Details and Specifications.
2. Confirm that the Project Plans include notes identifying paint colors to be used on the park entry gates and the post-and-cable barrier posts. See Specification Section 02830, Paragraphs 2.8-A and 2.8-B.

Construction Phase Checklist - Submittals to be made by Construction Contractor:

1. Contractor to submit product specification sheets for fencing materials and hardware. See Specification Section 02830, Paragraph 1.7-A.
2. Contractor to submit shop drawings for park entry gates, fabricated chain link gates wider than 5'-0", and fabricated hinges, latches, and hardware.

Construction Phase Checklist - Inspections to be made by the Owner's Representative:

1. Verify that the staked alignment of project fences is consistent with the Project Plans. See Specification Section 03830, Paragraph 3.2-A.
2. Verify that the excavations for post footings are of the depth and dimensions required by the Standard Details.
3. Verify that the all post / rail and other welded connections are complete and have been ground smooth and touched-up with zinc-based paint. See Specification Section 02830, Paragraph 3.4-B.
4. Verify that all chain-link fabric is of the gauge required by the Standard Specifications and that it has been attached to the fence framing members with clips of the appropriate gauge and at the required spacing.

FENCING, GATES, AND POST-AND-CABLE BARRIER CHECKLIST

5. Verify that expansion couplings have been installed in long, straight runs of chain-link fence as noted on the Project Plans or as required by the Standard Specifications. See Specification Section 02830, Paragraph 3.4-F.
6. Verify that post-and-cable barrier footings have been sloped to drain away from the post per the Standard Details.
7. Verify that clamps have been installed at post-and-cable barrier terminations and that there are no intermediate splices in the cable.
8. Verify that all gates and gate hardware operate correctly and have been installed per the appropriate Standard Details.
9. Verify that all non-galvanized ferrous metal fencing components have been primed, painted, and touched-up in accordance with Standard Specification 02830, Paragraph 3.8-A through Paragraph 3.8-D-1.

Construction Phase Checklist - Inspections and Testing Work to be performed by an Independent Testing Laboratory:

1. None unless specific requirements are identified on the Project Plans.

Checklist - Turn-Over Equipment:

1. None unless specific requirements are identified on the Project Plans.

Checklist - Letters of Guarantee:

1. Letter of Guarantee for the fencing, gates, and post-and-cable barriers installed. See Specification Section 02830, Paragraph 3.10-A.

LANDSCAPE WORK CHECKLIST

Purpose:

This checklist is intended for use by the design professional, the design reviewer, and the construction administrator on projects involving landscape improvements.

Documents to be Coordinated:

1. The Project Plans
2. Standard Specification Section 02900 (Landscape Work)
3. Standard Details P-100 through P-208, as applicable.

Design Phase Checklist - Standard Details:

1. Confirm that the appropriate Standard Details for the proposed plant types and landscape improvements are shown or referenced on the Project Plans. (See Standard Details P-100 through P-208).

Design Phase Checklist - Standard Specifications:

1. Confirm that Standard Specification Section 02900 (Landscape Work) is referenced on the Project Plans.

Design Phase Checklist - General Requirements for Project Plans:

1. Confirm that the limits of all natural or landscaped areas to be preserved are shown on the Project Plans.
2. Confirm that the species, size, and proposed location for all salvaged specimen plants to be replanted on the project site are shown on the Project Plans.
3. Confirm that the species, size, and proposed location for all nursery grown plants to be installed on the project site are shown on the Project Plans.
4. Confirm that the Project Plans include a comprehensive list or schedule of plants with species, sizes, and quantities noted.
5. Confirm that the limits of all areas to be planted with turf grass are shown on the Project Plans.
6. Confirm that the Project Plans identify the species and variety of turf grass to be planted, if other than as called for in the Standard Specifications. The Standard Specifications call for Common Bermuda Grass seed and "Midiron" Hybrid Bermuda Grass sprigs and sod. See Specification Section 02900, Paragraph 2.8-A, 2.8-B, and 2.8-C.

LANDSCAPE WORK CHECKLIST

7. Confirm that the Project Plans include a note indicating the method / materials to be used for planting turf grass. The Standard Specifications include the options of seeding, sprigging, or sodding. See Specification Section 02900, Paragraph 2.8-A.
8. Confirm that the limits of all areas to be seeded with native plants are shown on the Project Plans. If multiple seed mixes are to be used, confirm that the limits of areas to receive each seed mix are shown on the plans.
9. Confirm that the species and sowing rates for species to be included in the native plant seed mix (or mixes) are included on the Project Plans. The Standard Specifications refer to the Project Plans for this information. See Specification Section 02900, Paragraph 2.10-B.
10. Confirm that the type and limits of all proposed inorganic surfacing materials (such as decomposed granite) are shown on the Project Plans and that the color and gradation of the material is noted. See Specification Section 02900, Paragraph 2.11.
11. Confirm that the limits and types of various pavements and hardscape elements are shown on the Project Plans.

Design Phase Checklist - Notes to be Included on the Project Plans:

1. Confirm that Project Plans include a note stating that the Project Plans and Details are to be used in conjunction with the Standard Details and Specifications, and that specific materials, products, and features identified on the Project Plans take precedence over the general requirements of the Standard Details and Specifications.
2. Confirm that the Project Plans include a note clarifying the required planting soil mix for trees and shrubs. The Standard Specifications include the options “Prepared Soil” and “Prepared Topsoil.” See Specification Section 02900, Paragraphs 2.4-A and 2.4-B.
3. Confirm that the Project Plans include a note indicating requirements for special soil amendments for the tree and shrub planting soil mix if recommended by the Soils Report. If no special requirements are noted, a default mixture of amendments will be required. See Specification Section 02900, Paragraphs 2.4-A and 2.4-B.
4. Confirm that the Project Plans identify the duration of the initial Landscape Maintenance Period if other than the 60 days required by the Standard Specifications. See Specification Section 02900, Paragraph 3.17-C.

LANDSCAPE WORK CHECKLIST

Construction Phase Checklist - Submittals to be made by Construction Contractor:

1. Contractor to submit Certificates of Compliance for seed, sprigs, sod, and soil amendments. See Specification Section 02900, Paragraph 1.7-B.
2. Contractor to submit samples of decomposed granite, crushed rock, and/or rip-rap. See Specification Section 02900, Paragraph 1.7-C.

Construction Phase Checklist - Inspections to be made by the Owner's Representative:

1. Verify that the Contractor has marked and barricaded areas and individual plants to be preserved in place. Inspection should be made prior to the start of site clearing and grading work. See Specification Section 02900, Paragraph 3.5-A.
2. Verify that the plants delivered to the site are healthy, undamaged, without infestations of pests, and of the species and size(s) required. Inspection to be made as soon after the plants are delivered to the project site as possible. See Specification Section 02900, Paragraph 3.7-A.
3. Verify that the plant pits have been excavated to the dimensions detailed. Inspection to be made prior to the installation of prepared backfill and the installation of trees and shrubs. See Specification Section 02900, Paragraph 3.7-B.
4. If hard soils and poor drainage are of concern, verify that the Contractor has tested selected plant pits for drainage. If plant pit drainage does not meet specifications, verify that the Contractor has implemented the specified remedial actions. See Specification Section 02900, Paragraph 3.8-C.
5. Verify that the various steps associated with the preparation of soils in areas to be planted with turf grass have been implemented prior to the planting of seed, sprigs, or sod. Multiple inspections will be required. See Specification Section 02900, Paragraph 3.10-A through 3.10-H-1.
6. Verify that the various steps associated with the preparation of soils in areas to be planted with native plant seed have been implemented prior to the commencement of seeding operations. Multiple inspections may be required. See Specification Section 02900, Paragraph 3.15-A.
7. Verify that the subgrade below areas to receive decomposed granite or other inorganic surfacing materials have been treated with pre-emergent herbicide. Inspection to be made prior to the placement of the surfacing material.

LANDSCAPE WORK CHECKLIST

8. Verify that all applicable landscape maintenance activities are being performed during the Landscape Maintenance Period. Periodic inspections will be required. See Specification Section 02900, Paragraph 3.17-C.

Construction Phase Checklist - Inspections and Testing Work to be performed by an Independent Testing Laboratory:

1. None unless specific requirements are identified on the Project Plans.

Checklist - Turn-Over Equipment:

1. None unless specific requirements are identified on the Project Plans.

Checklist - Letters of Guarantee:

1. Letter of Guarantee for the plant materials installed. See Specification Section 02900, Paragraph 3.19-A.

NATIVE PLANT SALVAGE WORK CHECKLIST

Purpose:

This checklist is intended for use by the design professional, the design reviewer, and the construction administrator on projects involving native plant salvage and replanting work.

Documents to be Coordinated:

1. The Project Plans
2. Standard Specification Section 02910 (Native Plant Salvage Work)
3. Standard Details P-100 through P-107, as applicable.

Design Phase Checklist - Standard Details:

1. Confirm that the appropriate Standard Details for the proposed native plant salvage and replanting work are shown or referenced on the Project Plans. (See Standard Details P-100 through P-107).

Design Phase Checklist - Standard Specifications:

1. Confirm that Standard Specification Section 02910 (Native Plant Salvage Work) is referenced on the Project Plans.

Design Phase Checklist - General Requirements for Project Plans:

1. Confirm that all plant specimens shown on the Pima County Development Services approved Native Plant Preservation Plan are accounted for and shown on the Project Plans.
2. Confirm that the location of all plants to be salvaged are shown superimposed over an aerial photo of the site or otherwise clearly shown on the Project Plans.
3. Confirm that the native plant salvage work is fully integrated with the new planting work as shown on the Project Plans.
4. Confirm that a native plant salvage schedule is included on the Project Plans showing the species, height, caliper, and form of each plant to be salvaged as part of the project.
5. Confirm that the limits of all natural areas to be preserved are clearly shown on the Project Plans.
6. Confirm that the location of all specimen plants to be preserved-in-place, that are within the limits of grading, are clearly shown and that notes are provided to indicate that these specimens are to be protected.

NATIVE PLANT SALVAGE WORK CHECKLIST

Design Phase Checklist - Notes to be Included on the Project Plans:

1. Confirm that Project Plans include a note stating that the Project Plans and Details are to be used in conjunction with the Standard Details and Specifications, and that specific products, models, dimensions, and features identified on the Project Plans take precedence over the general requirements of the Standard Details and Specifications.

Construction Phase Checklist - Submittals to be made by Construction Contractor:

1. None unless specific submittal requirements are identified on the Project Plans.

Construction Phase Checklist - Inspections to be made by the Owner's Representative:

1. Verify that all plants to be salvaged and/or preserved-in-place are marked and tagged in the field. See Specification Section 02900, Paragraph 1.9-A.
2. Verify that natural areas or existing landscaped areas to be preserved are marked, fenced, or otherwise protected during the implementation of the project work.
3. Verify by date when specimen trees and shrubs are initially boxed in the field. Verify that trees and shrubs are retained in the field and irrigated for not less than 28 days in accordance with the Standard Specifications. See Specification Section 02910, Paragraph 3.6-A-4.
4. Verify that the salvaged plants are being maintained in the holding nursery in accordance with the Standard Specifications. See Specification Section 02910, Paragraphs 3.9-A and 3.9-B.
5. Verify that the salvaged plants are replanted as shown on the Project Plans and in accordance with the Standard Details.

Construction Phase Checklist - Inspections and Testing Work to be performed by an Independent Testing Laboratory:

1. None unless specific requirements are identified on the Project Plans.

Checklist - Turn-Over Equipment:

1. None unless specific requirements are identified on the Project Plans.

Checklist - Letters of Guarantee:

1. Letter of Guarantee for salvaged and replanted native plant specimens. See Specification Section 02910, Paragraph 3.10-A.

PRE-ENGINEERED RAMADA CHECKLIST

Purpose:

This checklist is intended for use by the design professional, the design reviewer, and the construction administrator on projects involving pre-engineered ramada structures.

Documents to be Coordinated:

1. The Project Plans
2. Standard Specification Section 13125 (Pre-Engineered Ramadas)
3. Standard Details P-2200 through P-2202, as applicable.

Design Phase Checklist - Standard Details:

1. Confirm that the appropriate Standard Detail for the proposed ramada structure is shown or referenced on the Project Plans. (See Standard Details P-2200 through P-2202).
2. Confirm that the appropriate Standard Detail for precast concrete picnic tables to be installed at the ramada is referenced on the Project Plans. (See Standard Details P-1003 and P-1004).
3. Confirm that the appropriate Standard Details for barbeque grills and associated pavement to be installed or constructed at the ramada are referenced on the Project Plans. (See Standard Details P-1005 through P-1007).

Design Phase Checklist - Standard Specifications:

1. Confirm that Standard Specification Section 13125 (Pre-Engineered Ramadas) is referenced on the Project Plans.

Design Phase Checklist - General Requirements for Project Plans:

1. Confirm that the finished floor elevation for the ramada is noted on the Project Plans.
2. Confirm that information is included on Project Plans showing the proposed location and orientation of the ramada structure.
3. Confirm that the electrical service to the ramada lighting and convenience outlets (if applicable) is shown on the Project Plans.
4. Confirm that the project electrical plans show or note quantity and location of electrical outlets to be installed at the ramada structure.
5. Confirm that the Project Plans show an ADA accessible route to the proposed ramada.

PRE-ENGINEERED RAMADA CHECKLIST

6. Confirm that the quantity and location of picnic tables to be installed at the ramada are shown or noted on the Project Plans.
7. Confirm that the location of the barbeque grill and associated accessible paving are shown or noted on the Project Plans.

Design Phase Checklist - Notes to be Included on the Project Plans:

1. Confirm that Project Plans include a note stating that the Project Plans and Details are to be used in conjunction with the Standard Details and Specifications, and that specific products, models, dimensions, and features identified on the Project Plans take precedence over the general requirements of the Standard Details and Specifications.
2. Confirm that Project Plans include a note(s) indicating that sealed Shop Drawings for the pre-engineered ramada structure will be made by the Contractor as part of a “Deferred Submittal.”
3. Confirm that the powder coat color(s) for the ramada frame are noted on the Project Plans. (Alternatively, confirm that a note is included requiring the Contractor to submit color chips to the Owner for powder coat color selection).
4. Confirm that the color for the ramada roof is noted on the Project Plans. (Alternatively, confirm that a note is included requiring the Contractor to submit color chips to the Owner for roof color selection).

Construction Phase Checklist - Submittals to be made by Construction Contractor:

1. Contractor to submit Shop Drawings for the ramada structure. The Shop Drawings are to be sealed by an Arizona registered Structural Engineer. Shop Drawings must include information related to: foundation, ramada framing, architectural components, and finishes. (See Standard Specification Section 13125, Paragraph 1.9-B).
2. Contractor to submit color chips / samples for powder coat colors and roof panels colors if not specifically noted on the Project Plans. (See Specification Section 13125, Paragraph 1.9-C).

Construction Phase Checklist - Inspections to be made by the Owner’s Representative:

1. Verify that electrical conduits have been installed below the ramada slab and to column locations, as applicable. Inspection(s) to be made prior to pouring the ramada floor slab.
2. Perform standard inspection(s) of finishes, fixtures, and equipment associated with the ramada structure.

PRE-ENGINEERED RAMADA CHECKLIST

Construction Phase Checklist - Inspections and Testing Work to be performed by an Independent Testing Laboratory:

1. Inspect work and test compaction of subgrade below footings and slab if required by the approved Shop Drawings.
2. Sample and test concrete for floor slab and footings if required by the approved Shop Drawings.
3. Perform special inspection of structural welding work if required by the approved Shop Drawings.

Checklist - Turn-Over Equipment:

1. N/A

Checklist - Letters of Guarantee:

1. Letter of Guarantee for the ramada structure. See Specification Section 13125, Paragraph 3.9-A.

PRE-ENGINEERED SHADE CANOPY CHECKLIST

Purpose:

This checklist is intended for use by the design professional, the design reviewer, and the construction administrator on projects involving pre-engineered shade canopies.

Documents to be Coordinated:

1. The Project Plans
2. Standard Specification Section 13126 (Pre-Engineered Shade Canopies)
3. Standard Detail P-2300

Design Phase Checklist - Standard Details:

1. Confirm that the appropriate Standard Detail for the proposed shade canopy is shown or referenced on the Project Plans. (See Standard Details P-2300 through 2301).

Design Phase Checklist - Standard Specifications:

1. Confirm that Standard Specification Section 13126 (Pre-Engineered Shade Canopies) is referenced on the Project Plans.

Design Phase Checklist - General Requirements for Project Plans:

1. Confirm that information is included on the Project Plans showing the proposed location and orientation of pre-engineered shade canopy.
2. Confirm that information is included on Project Plans showing relationship of shade canopy to playground equipment covered, including the manufacturer's designated fall zones for playground equipment.
3. Confirm that the Project Plans show an ADA accessible route to playground equipment transfer stations and demonstrate that shade canopy columns are not in conflict with the accessible routes.

Design Phase Checklist - Notes to be Included on the Project Plans:

1. Confirm that Project Plans include a note stating that the Project Plans and Details are to be used in conjunction with the Standard Details and Specifications, and that specific products, models, dimensions, and features identified on the Project Plans take precedence over the general requirements of the Standard Details and Specifications.

PRE-ENGINEERED SHADE CANOPY CHECKLIST

2. Confirm that Project Plans include note(s) indicating that sealed shop drawings for the pre-engineered shade canopy will be made by the Contractor as part of a “Deferred Submittal.”
3. Confirm that the powder coat color for shade canopy frame is noted on the Project Plans. (Alternatively, confirm that a note is included requiring Contractor to submit chips / samples to the Owner for powder coat color selection).
4. Confirm that the color for shade canopy fabric is noted on the Project Plans. (Alternatively, confirm that a note is included requiring Contractor to submit chips / samples to the Owner for fabric color selection).

Construction Phase Checklist - Submittals to be made by Construction Contractor:

1. Contractor to submit Shop Drawings for shade canopy, sealed by an Arizona registered Structural Engineer. The Shop Drawings to include information related to; foundation, structural framing, and structural connections. (See Specification Section 13126, Paragraph 1.10-B).
2. Contractor to submit color chips / samples for powder coat colors and roof fabric if colors are not specifically noted on the Project Plans. (See Specification Section 13126, Paragraphs 2.2-C.1, 2.4-D).

Construction Phase Checklist - Inspections to be made by the Owner’s Representative:

1. Perform standard inspection(s) of materials and installation of structure and fabric associated with the pre-engineered shade canopy.

Construction Phase Checklist - Inspections and Testing to be performed by an Independent Testing Laboratory:

1. Sample and test concrete from column foundations. (If required by the approved Shop Drawings).

Construction Phase Checklist - Inspections to be made by Certified Playground Safety Inspector

1. Verify that the top of footings are below required depth of resilient surfacing. (See Specification Section 02790, Paragraph 3.9-A).
2. Verify that the location of shade canopy columns are outside the fall zones associated with play equipment covered. (See Specification Section 02790, Paragraph 3.9-A).

PRE-ENGINEERED SHADE CANOPY CHECKLIST

Checklist - Turn-Over Equipment:

1. Manufacturer's Maintenance Instructions for Pre-Engineered Shade Canopy.

Checklist - Letters of Guarantee:

1. Letter of Guarantee for structural frame, frame finishes, and shade fabric. (See Specification Section 13126, Paragraph 3.6-A.

PRE-ENGINEERED RESTROOM BUILDING CHECKLIST

Purpose:

This checklist is intended for use by the design professional, the design reviewer, and the construction administrator on projects involving pre-engineered restroom buildings.

Documents to be Coordinated:

1. The Project Plans
2. Standard Specification Section 13130 (Pre-Engineered Restroom Buildings)
3. Standard Details P-2100 through P-2104, as applicable.

Design Phase Checklist - Standard Details:

1. Confirm that the appropriate Standard Detail for the proposed restroom building is shown or referenced on the Project Plans. (See Standard Details P-2000, P-2001, P-2002, P-2003, P-2004 and P-2005).

Design Phase Checklist - Standard Specifications:

1. Confirm that Standard Specification Section 13130 (Pre-Engineered Restroom Buildings) is referenced on the Project Plans.

Design Phase Checklist - General Requirements for Project Plans:

1. Confirm that the finished floor elevation for restroom is noted on the Project Plans.
2. Confirm that information is included on Project Plans showing the proposed location and orientation of the restroom building.
3. Confirm that the potable water service to restroom is shown on the Project Plans.
4. Confirm that the sanitary sewer connection to restroom is shown on the Project Plans.
5. Confirm that the electrical service to restroom (and site lighting electrical panels to be installed in the restroom) are shown on the Project Plans.
6. Confirm that the project electrical plans show or note quantity and location of electrical outlets to be installed in the restroom building work room /snack-bar space(s).
7. Confirm that a telephone service(s) for the irrigation controller (if applicable) and a telephone service for the work space / snack bar phone (if applicable) are shown on the Project Plans.

PRE-ENGINEERED RESTROOM BUILDING CHECKLIST

8. Confirm that the Project Plans show an ADA accessible route to all restroom entries, concession entries, and concession service windows, as applicable.

Design Phase Checklist - Notes to be Included on the Project Plans:

1. Confirm that Project Plans include a note stating that the Project Plans and Details are to be used in conjunction with the Standard Details and Specifications, and that specific products, models, dimensions, and features identified on the Project Plans take precedence over the general requirements of the Standard Details and Specifications.
2. Confirm that Project Plans include a note(s) indicating that sealed Shop Drawings for the pre-engineered restroom building will be made by the Contractor as part of “Deferred Submittal.”
3. Confirm that the paint colors for building exterior walls, building interior walls, doors, and trim are noted on the Project Plans. (Alternatively, confirm that a note is included requiring the Contractor to submit color chips to the Owner for paint color selection).
4. Confirm that the color for restroom metal roof is noted on the Project Plans. (Alternatively, confirm that a note is included requiring the Contractor to submit color chips to the Owner for roof color selection).

Construction Phase Checklist - Submittals to be made by Construction Contractor:

1. Contractor to submit Shop Drawings for the restroom building. The Shop Drawings are to be sealed by an Arizona registered Structural Engineer. Shop Drawings must include information related to: foundation, building structure, architectural components and finishes, building electrical system, building plumbing system. (See Standard Specification Section 13130, Paragraph 1.10-B).
2. Contractor to submit color chips / samples for paint colors and roof panels if colors are not specifically noted on the Project Plans. (See Specification Section 13130, Paragraphs 2.2-B, 2.2-C, 2.2-D, 2.4-A, and 2.5-A).

Construction Phase Checklist - Inspections to be made by the Owner’s Representative:

1. Verify that plumbing stub-outs below restroom building have been installed and tested. Inspection(s) to be made prior to placement of pre-engineered restroom building.
2. Verify that electrical, telephone, irrigation conduits have been installed below restroom building. Inspection(s) to be made prior to placement of pre-engineered restroom building.

PRE-ENGINEERED RESTROOM BUILDING CHECKLIST

3. Perform standard inspection(s) of finishes, fixtures, and equipment associated with restroom building and associated equipment.

Construction Phase Checklist - Inspections and Testing Work to be performed by an Independent Testing Laboratory:

1. Inspect work and test compaction of subgrade below building foundation.
2. Inspect work and test compaction of aggregate base course foundation.
3. Sample and test concrete. (If Shop Drawings indicate concrete is to be used in conjunction with restroom foundation construction).

Checklist - Turn-Over Equipment:

1. Operations and Maintenance Manual for Pre-Engineered Restroom Building.

Checklist - Letters of Guarantee:

1. Letter of Guarantee for building (walls, floors, roof decks, etc). See Specification Section 13130, Paragraph 3.7-A.
2. Letter of Guarantee for restroom building furnishings, fixtures, and equipment. See Specification Section 13130, Paragraph 3.7-B.

CHECKLIST FOR TALL-POT PLANTING

1. Auger hole so tall-pot will fit.
2. Fill hole completely with water.
3. Allow to drain.
4. Repeat steps 2 and 3.
5. Prior to placing container in hole, gently remove bottom wire basket with care to avoid damage to root system. Return container and galvanized wire stays to RWRD Nursery.
6. Set and install tall-pot root ball and plant to match adjacent surrounding grade, finish grade shall no be higher than level of original tall-pot soil.
7. Gently raise container from plant.
8. Backfill hole with native soil mix as container is raised.
9. Manually water the tall-pot plant to full depth of the root ball. Method of watering to be specified by Project Manger.
10. Add wire mesh protective barrier around plant if specified by Project Manager.

Standard Specifications

INDEX TO STANDARD SPECIFICATIONS

DIVISION 2

SITE WORK

Section 02790	Playground Equipment and Surfacing
Section 02800	Irrigation System
Section 02830	Fencing, Gates, and Post-and-Cable Barriers
Section 02900	Landscape Work
Section 02910	Native Plant Salvage work
Section 02920	Tall-Pots

DIVISION 13SPECIAL CONSTRUCTION

SECTION 13125	Pre-Engineered Ramadas
SECTION 13126	Pre-Engineered Shade Canopies
SECTION 13130	Pre-Engineered Restroom Buildings

SECTION 02790 - PLAYGROUND EQUIPMENT AND SURFACING

PART ONE: GENERAL

1.1 RELATED DOCUMENTS

- A. The General Provisions of the Contract, including all General and Supplementary Conditions and Supplements and Amendments to the General Conditions of the Contract apply to work specified in this section.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section includes, but is not limited to, the:
 1. Layout, grading, and subgrade preparation for the playground area(s)
 2. Layout, grading, and subgrade preparation for the fitness equipment area(s)
 3. Installation of concrete curbs and headers
 4. Supply and installation of playground equipment
 5. Supply and installation of fitness equipment
 6. Supply and installation of resilient surfacing materials
 7. Inspection, testing, and certification of the installed equipment and surfacing

The extent of the playground equipment, fitness equipment, and surfacing work is shown on the project drawings and details.

1.3 RELATED WORK

- A. Related work includes, but is not limited to:
 1. Site grading and drainage work
 2. The construction of landscape, hardscape, and irrigation improvements

1.4 COORDINATION

- A. The Contractor shall coordinate all playground equipment, fitness equipment, and surfacing work with the Owner's Representative. Work that is completed or in-progress shall be protected during the installation of the equipment and surfacing. The Contractor shall notify the Owner's Representative of field conditions which prevent installation of the equipment and surfacing as shown.

1.5 REQUIRED LICENSURE

- A. All work shall be performed by a Contractor licensed by the State of Arizona Registrar of Contractors. The commercial license classification held by the Contractor shall be appropriate for the work to be performed.

1.6 INSTALLER QUALIFICATION AND CERTIFICATION REQUIREMENTS

- A. Installation Contractor Qualifications: The playground/fitness equipment and surfacing shall be installed by an National Playground Contractor's Association (NPCA) qualified contractor.
- B. Installation Superintendent Qualifications: The installation of the playground / fitness equipment shall be performed under the direct supervision of an individual that is currently certified by the National Playground Safety Institute (NPSI) as a Certified Playground Safety Inspector.

1.7 COMPLIANCE WITH APPLICABLE REGULATIONS

- A. The Contractor shall comply with all local, state, and federal regulations regarding materials, methods of work, and disposal of excess and waste materials. The Contractor shall provide notices required by governmental authorities, request required inspections, obtain required permits, and pay for all associated fees.

1.8 REFERENCE SPECIFICATIONS

- A. Reference Specifications: The following specifications are, by reference, made a part of these project specifications. To the extent applicable, the project work shall be implemented in accordance with these reference specifications.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM F-1487-01 Playground Equipment for Public Use
 - 2. ASTM F-1292-04 Impact Attenuating Surfacing
 - 3. ASTM F-1951 Accessibility of Resilient Surfacing
 - 4. ASTM F-2075 Engineered Wood Fiber
- C. Americans with Disabilities Act:
 - 1. Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines, Published in the Federal Register on July 23, 2004 Chapter 10 Recreation Facilities, Section 1008 Play Areas
- D. Consumer Products Safety Commission:
 - 1. Handbook for Public Playground Safety, Publication # 325

1.9 SUBMITTAL REQUIREMENTS

- A. Playground / Fitness Equipment Manufacturer's Statement of Compliance: The Contractor shall submit a letter, signed by the playground equipment manufacturer, stating that the playground and fitness equipment supplied is certified by the International Play Equipment Manufacturers Association (IPEMA) to be in compliance with ASTM 1487-01. The Statement of Compliance shall be submitted to the Owner's Representative for approval prior to the start of installation work.
- B. Rubberized Resilient Surfacing Material Manufacturer's Statement of Compliance: The Contractor shall submit a letter, signed by the rubberized resilient surfacing material manufacturer, stating that the resilient surfacing material supplied is certified by the International Play Equipment Manufacturers Association (IPEMA) to be in compliance with ASTM F-1292-04. The Statement of Compliance shall be submitted to the Owner's Representative for approval prior to the start of installation work.
- C. Engineered Wood Fiber Resilient Surfacing Statement of Compliance: The Contractor shall submit a letter, signed by the engineered wood fiber resilient surfacing manufacturer, stating that the engineered wood fiber resilient surfacing material supplied is certified by the International Play Equipment Manufacturers Association (IPEMA) to be in compliance with ASTM F-2075-04 and ASTM F-1292-04. The Statement of Compliance shall be submitted to the Owner's Representative for approval prior to the start of installation work.
- D. Equipment Installation / Use Zone Diagram: The Contractor shall submit a diagram, as provided by the playground / fitness equipment manufacturer, illustrating the layout of the specified playground equipment and the limits of the required use zone(s) as specified in ASTM F 1487-01. The Installation / Use Zone Diagram shall be submitted to the Owner's Representative for approval prior to the start of installation work.
- E. Color Chips: The Contractor shall submit to the Owner's Representative, for review and approval, color chips for the painted (powder coated) and plastic components of the playground and fitness equipment.
- F. Inspection, Maintenance and Repair Instructions: The Contractor shall submit the following items to the Owner's Representative prior to the issuance of a Certification of Substantial Completion.
1. One (1) copy of the Playground Equipment Manufacturer's Inspection, Maintenance, and Repair Instructions.
 2. One (1) copy of the Fitness Equipment Manufacturer's Inspection, Maintenance, and Repair Instructions.

3. One (1) copy of the Rubberized Resilient Surfacing Manufacturer's Inspection, Maintenance, and Repair Instructions.
4. One (1) copy of the Engineered Wood Fiber Resilient Surfacing Material's Inspection and Maintenance Instructions.

G. Samples:

1. Sample of Pea Gravel: One cubic foot of the gradation and color proposed for use on the project.

1.10 CONTRACTOR PROVIDED MAINTENANCE TOOLS AND SUPPLIES

- A. Maintenance Tools and Supplies: The Contractor shall supply and turn-over to the Owner's Representative, prior to Final Acceptance of the Work, the following items:
1. One (1) copy of the playground equipment installation manual.
 2. One (1) set of specialized tools required for the installation and maintenance of the playground equipment.
 3. One (1) quart size can of paint for each color used to finish the metal components of the play structure(s) and fitness equipment.

1.11 DELIVERY AND STORAGE OF PLAYGROUND EQUIPMENT AND SURFACING MATERIALS

- A. Notification of Equipment and Material Deliveries: The Contractor shall notify the Owner's Representative within 48 hours of the time the playground equipment and surfacing materials are delivered to the site so that the Owner can inspect the condition of the delivered materials.
- B. Delivery of Playground/Fitness Equipment: Playground/fitness equipment shall be shipped and delivered to the site in protective shipping containers, boxes, or wrappings. All equipment damaged during shipping or delivery, as determined by the Owner's Representative, will be rejected.
- C. Delivery of Rubberized Resilient Surfacing Materials: Rubberized resilient surfacing materials shall be delivered to the site in the manufacturer's original, unopened containers.
- D. Delivery of Engineered Wood Fiber Resilient Surfacing Material: The engineered wood fiber resilient surfacing material shall be delivered to the site in bulk truckload(s) or in other approved packaging.

- E. Storage of Playground / Fitness Equipment: All playground / fitness equipment shall be stored in a secure location and protected from moisture, vandalism, or other damage.
- F. Storage of Rubberized Resilient Surfacing Materials: The rubberized resilient surfacing materials shall be stored under conditions as recommended by the material manufacturer.
- G. Storage of Engineered Wood Fiber Resilient Surfacing Materials: Except as may be approved, in writing, by the Owner's Representative, the engineered wood fiber material shall be moved directly from the delivery truck to the playground area to be surfaced and shall not be stockpiled on site. If temporary stockpiling of the material is approved by the Owner's Representative, it shall be done in a location and in a manner that prevents contamination of the material with soil, rock, or other material.

PART TWO: MATERIALS

2.1 CONCRETE FOR FOOTINGS, HEADERS, AND CURBS

- A. Concrete for Footings, Headers, and Curbs: Concrete shall be Class B concrete per the Pima County - City of Tucson Standard Specifications for Public Improvements (2003 or most recent Edition).

2.2 DRAINAGE AGGREGATE

- A. Drainage Aggregate: Drainage aggregate shall be clean crushed rock or gravel. Gradation shall be as 3/4" size, or as noted on the Project Plans.

2.3 FILTER FABRIC:

- A. Filter Fabric: Filter Fabric for the separation of drainage aggregate and resilient surfacing materials shall be a non-woven, needle-punched, heat bonded polypropylene material designed for use as a soil separator and drainage filter. The filter fabric manufacturer and model number shall be as noted on the Project Plans.

2.4 PEA GRAVEL SURFACING

- A. Pea Gravel Surfacing: Pea Gravel shall be screened to remove particles over three-eighths inch (3/8"). Except as may be approved by the Owner's Representative, all material used on the project shall be from the same source and shall match the approved sample.

2.5 ENGINEERED WOOD FIBER RESILIENT SURFACING

- A. Engineered Wood Fiber Resilient Surfacing: The engineered wood fiber resilient surfacing shall be comprised of softwoods and/or hardwoods and shall contain minimal amounts of

bark, twigs, leaf debris, or other materials. The majority of the material shall not exceed 1-1/2" and shall contain 10% to 20% fines to aid in compaction. The product shall be non-toxic and non-flammable. The material shall be IPMEA Certified and shall conform to ASTM F-1292 and ASTM F-2075-04. The engineered wood fiber material manufacturer and product number shall be as noted on the Project Plans.

2.6 RESILIENT WEAR MATS

- A. Resilient Wear Mats: Resilient wear mats for installation at slide exits and other designated locations shall consist of recycled rubber bound with a polyurethane or other binder to form a mat. The mat shall have a weight of 7.5 lbs. per square foot. The mat shall be 4' x 4' in size or of the minimum size noted on the Project Plans. The resilient wear mat manufacturer and model number shall be as noted on the Project Plans.

2.7 RUBBERIZED RESILIENT SURFACING MATERIALS

- A. General Requirements: The rubberized resilient surfacing shall be of the poured-in-place type. It shall carry the International Play Equipment Manufacturer's Association's (IPEMA's) Seal of Approval. If the surface is part of the accessible route it shall comply with ASTM F-1951-99, Standard Specification for Determination of Accessibility to Surface Systems Under and Around Playground Equipment.
- B. Aggregate Base Course Material: The aggregate base course material used as base course for the rubberized resilient surfacing material shall be aggregate base course (ABC) material as per the Pima County - City of Tucson Standard Specifications for Public Improvements (2003 or most recent Edition).
- C. Rubberized Resilient Surfacing:
1. General Requirements: The surfacing shall be a poured-in-place system with an impact attenuating substrate and a bonded wear surface. The surfacing manufacturer and model number shall be as noted on the Project Plans.
 2. Impact Attenuating Substrate: The substrate shall consist of shredded styrene butadiene rubber (SBR) adhered with a 100% solids polyurethane binder to form a resilient, porous material. Strands of SBR may vary from 0.5 mm to 2 mm in thickness. Foam or granular rubber shall not be utilized in the substrate. The binder shall not be less than 14 percent or more than 16 percent of the total weight of the rubber and shall provide 100 percent coating of the particles. The substrate shall be compatible with the wearing surface.
 - a. Thickness of Substrate: The substrate shall have a minimum thickness of 2-1/2 inches. The Contractor shall verify that the thickness of the substrate is adequate to meet the standards and specifications referenced herein.

3. Wearing Surface: The wear surface shall consist of ethylene propylene diene monomer (EPDM) particles adhered with a polyurethane binder formulated to produce a uniform, even surface. EPDM particles shall meet the requirements of ASTM D-412 for tensile strength and elongation. EPDM shall be peroxide cured with an EPDM content of 26% and shall include a processing aid to prevent hardness. The size of the rubber particles shall be not less than 1 mm or greater than 3 mm across. Binder shall not be less than 20% of the total weight of the rubber used in the wearing surface and shall provide a 100% coating of the particles. The wearing surface shall be porous.
 - a. Thickness of Wearing Surface: The wearing surface shall have a minimum thickness of ½ inch.
 - b. Color of Wearing Surface: The wearing surface color shall be as noted on the Project Plans.
4. Binder: Binder shall be an 88-41 material specifically designed for use with rubber granule material and outdoor installations. It shall be a single component polyurethane prepolymer formulated using a polymeric form of MDI.

2.8 PLAYGROUND EQUIPMENT

- A. General Requirements: All playground equipment shall carry the Seal of Approval from the International Play Equipment Manufacturer's Association (IPEMA) and shall comply with the standards and specifications referenced herein.
- B. Playground Equipment: The playground equipment shall be of the make, model, and manufacturer as noted on the Project Plans.
- C. Fitness Equipment: The fitness equipment shall be of the make, model, and manufacturer as noted on the Project Plans.
- D. Equipment Materials and Finishes:
 1. Colors: The playground equipment and fitness equipment shall be of the color noted on the Project Plans. If color is not noted, the Contractor shall submit a color schedule to the Owner's Representative for review and color selection. The color schedule shall be submitted to the Owner prior ordering the required equipment.

2.9 INCIDENTAL ITEMS

- A. Other Items: Other items required for the installation of the playground equipment shall be as per the manufacturer's written instructions, shall be in accordance with applicable codes, and shall be appropriate for the Work to be performed.

PART THREE: EXECUTION

3.1 BLUE STAKING

- A. **Blue Staking**: The Contractor shall request that the project site be Blue Staked prior to the start of any excavation work. Blue Staking shall be kept current during the course of the project. All utilities damaged by the Contractor shall be repaired or replaced by the Contractor, as required by the Owner or appropriate utility company, at the Contractor's expense.

3.2 LAYOUT AND STAKING

- A. **Layout of Playground Area and Component Equipment**: Prior to the start of playground construction, the Contractor shall lay out and stake the limits of the overall play area and the layout of the play equipment. The Contractor shall verify that there are adequate use zones and setbacks between each component piece of the play structure and other pieces of equipment and/or perimeter headers, curbs, and pavements. All deficiencies shall be called to the attention of the Owner's Representative. If necessary, the Contractor shall make adjustments to the layout and/or configuration of the play area. Adjustments shall be as approved by the Owner's Representative.

3.3 EXCAVATION FOR CONCRETE HEADERS AND RESILIENT SURFACING

- A. **Excavation and Grading**: The Contractor shall excavate existing soil as required to provide for the construction of perimeter concrete headers and for the installation of the resilient surfacing and associated drainage aggregate. The Contractor shall remove and dispose of all excess soil.

3.4 CONSTRUCTION OF CONCRETE HEADERS:

- A. **Construction of Perimeter Concrete Headers**: Concrete headers shall be constructed as detailed with expansion joints and control joints provided as detailed or noted. Exposed surfaces shall be finished with a light boom finish. All exposed edges shall be tooled to provide a radiused edge. Curing work shall be performed in accordance with the Pima County - City of Tucson Standard Specifications for Public Improvements.
 - 1. **Top of Header Finished Grades**: The top of the concrete header shall match the adjacent surface with the reveal as noted. Where the finished grade of the adjacent soil is uneven, the header shall be constructed to be level or with a uniform slope as approved by the Owner's Representative. Fine grading work shall be performed at the perimeter of play area to provide the reveal noted or detailed.

3.5 PLAYGROUND EQUIPMENT AND FITNESS EQUIPMENT INSTALLATION

- A. Temporary Fencing: Prior to the start of playground and fitness equipment installation, a temporary, 6' high (minimum) chain-link fence, or other Owner approved barrier, shall be installed around the playground to restrict access to the play equipment prior to completion of the playground equipment and surfacing work. The fence shall remain in place until the post installation inspection and certification work have been successfully completed.
- B. Installation of Posts and Concrete Footings: Equipment posts and concrete footings shall be constructed and installed in accordance with the playground equipment manufacturer's written instructions. The base of all posts anchored in concrete shall be marked to denote the appropriate elevation for the top of the concrete footing and the appropriate elevation for the top of the resilient surfacing to be installed later.
 - 1. Resilient Surfacing Finished Grade Markers: All markers indicating the finished grade of the resilient surfacing shall be protected and shall remain affixed to the playground equipment for future reference by the Owner's maintenance staff.
- C. Assembly and Testing of Playground Equipment: All playground equipment components and fasteners shall be assembled, checked, and tested in accordance with the equipment manufacturer's written instructions.
 - 1. Age Appropriate Warning Labels: All age appropriate warning labels provided by the manufacturer shall remain affixed to the playground equipment for future reference by the Owner's maintenance staff.

3.6 PEA GRAVEL SURFACING INSTALLATION

- A. Pea Gravel Surfacing: All areas to be surfaced with pea gravel shall be brought to the lines and grades shown on the drawings with allowances made for the depth of the gravel material. The pea gravel shall be installed over the subgrade to the depth noted on the plans.

3.7 RUBBERIZED RESILIENT SURFACING INSTALLATION

- A. Subgrade Preparation and Compaction: The subgrade shall be cleaned of all concrete, excess soil, and other debris and shall be graded to provide a clean and uniform subgrade surface. Areas that have been over-excavated and all fill material shall be compacted to not less than 95% of the maximum laboratory density.
- B. Placement and Compaction of Aggregate Base Course Material: The aggregate base course material shall be placed in lifts not exceeding six inches (6"), moistened, and compacted to a density of not less than 95% of the maximum laboratory density. The aggregate base course shall be graded to provide a uniform surface as required for the rubberized resilient surfacing.

- C. Mixing: All rubberized resilient surfacing material shall be mixed on site in a rotating tumbler in accordance with the manufacturer's written instructions.
- D. Substrate Installation: The substrate material shall be installed as one continuous pour without interruption. Installation techniques shall be as per the manufacturer's written instructions. The depth of the material shall be as detailed and as required to provide the impact attenuation required for the play equipment installed.
- E. Wearing Course Installation: Adhesive, as recommended by the manufacturer, shall be applied to the substrate and the wearing course material installed before the adhesive dries. The wearing course surface shall be troweled to a smooth even finish. The wearing course material shall be installed as a continuous pour without interruption. Installation techniques shall be as per the manufacturer's written instructions. The wearing course shall be installed without depressions or other irregularities that will result in the ponding of water on the surface of the rubberized resilient surfacing.
- F. Curing and Protection: The wearing course shall be allowed to cure for a minimum of 48 hours or as per the manufacturer's written instructions. During the curing period the surfacing material shall be protected from all traffic.

3.8 ENGINEERED WOOD FIBER RESILIENT SURFACING INSTALLATION

- A. Subgrade Preparation: The subgrade shall be cleaned of all concrete, excess soil, and other debris and shall be graded to provide a clean and uniform subgrade surface. Areas that have been over-excavated shall be compacted to the density of the adjacent, undisturbed soil.
- B. Placement of Drainage Aggregate: Drainage aggregate shall be placed and graded to provide a uniform course of clean aggregate material as detailed or noted. Drainage aggregate shall be kept clean of foreign material during the course of the work.
- C. Placement of Filter Fabric: After placement of the drainage aggregate, the filter fabric shall be installed and trimmed as detailed and as required to fully cover the drainage aggregate. Adjacent panels of filter fabric shall be overlapped by six inches (6"), minimum.
- D. Installation of Engineered Wood Fiber Resilient Surfacing: The engineered wood fiber resilient surfacing shall be installed as detailed and as required to provide the full depth of material detailed or noted. Allowance shall be made for settlement and compaction. Supplemental surfacing shall be supplied and installed as required.
- E. Installation of Wear Mats: Wear mats shall be installed at slide exits and at other designated locations. Mats shall be installed level and at a depth of six inches (6") below the surface of the engineered wood fiber resilient surfacing.

3.9 POST-INSTALLATION INSPECTION AND CERTIFICATION

- A. Post-Installation Inspection and Certification: After completion of the playground equipment and playground surfacing, the Contractor shall have the installation inspected by an independent inspector who has current certification as a National Playground Safety Institute (NPSI) Certified Playground Safety Inspector. If deficiencies are noted, they shall be repaired, replaced, or otherwise remedied and the installation re-inspected. A report, certifying that the installation meets all applicable requirements and signed by the inspector, shall be provided to the Owner prior to Substantial Completion of the Work.

3.10 CLEAN-UP

- A. Site Clean-up: The Contractor shall perform cleaning operations during the installation of the playground equipment, fitness equipment, and playground surfacing and upon completion of the project. The Contractor shall remove from the site all excess materials, debris, and equipment and shall legally dispose of all excess and waste materials. The Contractor shall repair all damage resulting from playground equipment, fitness equipment, and playground surfacing installation.

3.11 GUARANTEE:

- A. Playground Equipment Guarantee: The playground equipment manufacturer shall guarantee the playground equipment installed to be free from defects in materials and workmanship for a period of two (2) years commencing on the date of Substantial Completion of the Work. A written letter of guarantee, signed by the equipment manufacturer, shall be submitted to the Owner's Representative prior to Final Acceptance of the Work. The letter shall include the name, mailing address, phone number, and e-mail address of the manufacturer's representative to be contacted regarding guarantee issues. The letter shall specifically state that the manufacturer will make all necessary repairs to the equipment during the guarantee period in accordance with these specifications, at no cost to the Owner. The Contractor shall be responsible for obtaining the manufacturer's Letter of Guarantee and for submitting this information to the Owner's Representative.
- B. Rubberized Resilient Surfacing Guarantee: The rubberized resilient surfacing manufacturer shall guarantee the surfacing material installed to be free from defects in materials and workmanship for a period of two (2) years commencing on the date of Substantial Completion of the Work. A written letter of guarantee, signed by the surfacing manufacturer, shall be submitted to the Owner's Representative prior to Final Acceptance of the Work. The letter shall include the name, mailing address, phone number, and e-mail address of the manufacturer's representative to be contacted regarding guarantee issues. The letter shall specifically state that the manufacturer will make all necessary repairs to the surfacing during the guarantee period in accordance with these specifications, at no cost to the Owner. The Contractor shall be responsible for obtaining the manufacturer's Letter of Guarantee and for submitting this information to the Owner's Representative.

- C. Notification of Deficiencies: The Owner will provide written notification to the manufacturer(s) of deficiencies that occur during the guarantee period(s).
- D. Manufacturer's Response to Written Notification: The manufacturer shall perform the required repair or replacement work or provide the Owner with an acceptable schedule for the completion of the repair work within ten (10) calendar days of receipt of written notice. If the manufacturer fails to respond and perform the required repair work within the specified period, the Owner shall have the right to have the work performed by others and invoice the manufacturer for the cost of the work. The manufacturer agrees to pay all such charges.

END OF SECTION 02790

SECTION 02800 - IRRIGATION SYSTEM

PART ONE: GENERAL

1.1 RELATED DOCUMENTS

- A. The General Provisions of the Contract, including all General and Supplementary Conditions and Supplements and Amendments to the General Conditions of the Contract apply to work specified in this section.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section includes, but is not limited to, the:
 1. Coordination of new water meter installation
 2. Installation and testing of backflow preventers
 3. Excavation, backfill, and compaction of trenches
 4. Installation and pressure testing of mainline pipe
 5. Installation of lateral line pipe
 6. Installation of sleeves for pipe and wire under pavements
 7. Installation of mainline isolation valves
 8. Installation of master valve, flow sensor, and remote control valve assemblies
 9. Installation of quick-coupling valves
 10. Installation of automatic controllers and cluster control units
 11. Installation of communication cable, control wiring, and related equipment
 12. Installation of sprinkler heads and swing-joint risers
 13. Installation of drip emitters
 14. Installation of drip zone filters and pressure regulators
 15. Operational testing of the irrigation system
 16. Initial maintenance of the irrigation system

The extent of the irrigation work is shown on the drawings and details.

1.3 RELATED WORK

- A. Related work includes, but is not limited to, the:
 1. Installation / planting of trees, shrubs, and turf areas
 2. Construction hardscape and other site improvement

1.4 COORDINATION

- A. The Contractor shall coordinate all irrigation system work with the Owner's Representative. Work that is completed or in-progress shall be protected during the installation of the irrigation system. The Contractor shall notify the Owner's Representative of field conditions which prevent installation of the irrigation system as shown.

1.5 REQUIRED LICENSURE

- A. All work shall be performed by a Contractor licensed by the State of Arizona Registrar of Contractors. The commercial license classification held by the Contractor shall be appropriate for the work to be performed.

1.6 QUALIFICATIONS OF IRRIGATION SYSTEM INSTALLERS

- A. The irrigation system shall be installed by, and under the direct supervision of, individuals who have appropriate experience with the installation of irrigation systems similar to the system being installed. A supervisor, with not less than three-years of irrigation system installation experience, shall be on-site at all times when the project irrigation system is being installed.

1.7 COMPLIANCE WITH APPLICABLE REGULATIONS

- A. The Contractor shall comply with all local, state, and federal regulations regarding materials, methods of work, and disposal of excess and waste materials. The Contractor shall provide notices required by governmental authorities, request required inspections, obtain required permits, and pay for all associated fees.

1.8 REFERENCE SPECIFICATIONS

- A. American Society for Testing and Materials:

1. ASTM-D-1784 Specification for Rigid Polyvinylchloride Compounds
2. ASTM-D-1785-34 Specification for PVC Pipe, Schedules 40, 80, and 120
3. ASTM-D-2241-34 Specification for PVC Pipe (SDR-PR)
4. ASTM-D2564 Specification for Solvent Cements for PVC Pipe and Fittings
5. ASTM-D-2672 Specification for bell-end PVC Pipe
6. ASTM-F-656 Specifications for Primers to be used for Solvent Weld Joints of PVC Pipe

1.9 SUBMITTAL REQUIREMENTS

- A. Material and Equipment Information: The Contractor shall submit to the Owner's Representative, three (3) sets of catalog cuts for all irrigation system materials and equipment proposed for use on the project. The information submitted shall clearly indicate the type, model, and size of the equipment proposed and shall be sufficient for the Owner's Representative to determine if the proposed equipment meets the project specifications. No materials or equipment shall be ordered or incorporated into the Work until the material or equipment has been approved for use on the project. The submittal shall include information related to the following items, if required for the project.

1. Backflow Preventers
2. Backflow Preventer Security Enclosures
3. Mainline Pipe (Reclaimed)
4. Mainline Pipe (Potable)
5. Lateral Line Pipe (Reclaimed)
6. Lateral Line Pipe (Potable)
7. Fittings for Mainline Pipe
8. Fittings for Lateral Line Pipe
9. Solvent Weld Primer for PVC Pipe
10. Solvent Weld Cement for PVC Pipe
11. Isolation Valves (Ball Type)
12. Master Valves
13. Flow Sensors
14. Remote Control Valves
15. Quick Coupling Valves
16. Pressure Regulating Valves
17. Access Boxes for Master Valves
18. Access Boxes for Flow Sensors
19. Access Boxes for Remote Control Valves
20. Access Boxes for Ball Type Isolation Valves
21. Access Boxes for Quick-Coupling Valves
22. Controllers (Independent Control Units)
23. Satellite Controllers (for Central Control Systems)
24. Cluster Control Unit
25. Controller Security Enclosure (and/or pedestal)
26. Communication Cable
27. Conduit for Communication Cable
28. Pull Boxes for Communication Cable
29. Low Voltage Control Wire
30. Waterproof Wire Splices
31. Sprinkler Heads (Large Radius)
32. Sprinkler Heads (Medium Radius)
33. Sprinkler Heads (Pop-up Sprays)
34. Swing Joints for Large Radius Sprinklers
35. Swing Joints for Medium Radius Sprinklers
36. Swing Joints for Pop-up Spray Sprinkler Heads
37. Drip Emitters (Multi-outlet, all types)
38. Drip Emitters (Single Outlet)
39. In-Line Screen Filters
40. Emitter Distribution Tubing
41. Access Boxes for Emitters
42. Access Boxes for Flush Caps
43. Mainline Marking Tape

- B. As-Built Record Drawings: The Contractor shall submit to the Owner's Representative prior to Substantial Completion of the work, As-Built Record drawings for the irrigation system installed. The drawings shall indicate the location of all; mainlines, master valves, flow sensors, mainline isolation valves, remote control valves, quick coupling valves, and sleeves and pipelines under roadways or other paved surfaces.
1. Preliminary As-Built Drawings: Preliminary As-Built Drawings shall be prepared for the irrigation mainline and mainline isolation valves prior to the backfilling of mainline trenches. The Preliminary As-Built Drawings shall be presented to the Owner's Representative when the mainline is pressure tested. Approval of the pressure test and authorization to backfill the mainline trenches will be contingent upon submittal of acceptable Preliminary As-Built Drawings.
 2. Procedures to be Used to Document As-Built Locations: The location of all mainlines shall be identified by two or more dimensions from fixed objects such as curbs or structures. The location of all valves shall be identified by Global Positioning System (GPS) coordinates using the State Plane Coordinate System. The GPS equipment used to locate irrigation system valves shall be accurate to within +/-3 meters and shall be as approved by the Owner's Representative. A table listing all system valves and their corresponding coordinates shall be included on the As-Built Drawings.
 3. Format for Final As-Built Drawings: The Final As-Built Drawings shall be prepared with ink on mylar. The preparation of mylar reproductions of the drawings and the preparation of the drawings shall be at the Contractor's expense.

1.10 IRRIGATION SYSTEM DRAWINGS

- A. The irrigation drawings are diagrammatic and are intended to show the approximate location of outlets, equipment and piping. Certain runs of piping may be shown distorted for clarity. Minor adjustment to the layout of the system will be necessary. Significant adjustments to the layout, including all changes that effect the configuration of the system or length of piping runs, shall be approved by the Owner's Representative.

1.11 ACQUISITION AND INSTALLATION OF NEW METER(S) AND WATER SERVICE(S)

- A. Requests for and Installation of New (Reclaimed or Potable) Water Meters: The Contractor shall be responsible for contacting Tucson Water or the appropriate water company and requesting the installation of new water meters as shown on the Project Plans. If required, the Contractor shall obtain an "address" for each meter from Pima County. The Contractor shall pay for all fees and charges associated with the supply and installation of the new meter(s) and water service(s).

1.12 PAYMENT FOR WATER DURING CONSTRUCTION

- A. Payment for Irrigation Water Prior to Final Acceptance: The Contractor shall be responsible for paying all charges for (reclaimed and/or potable) water used for irrigation or for other purposes during construction, during the initial maintenance period, and up to the date of Final Acceptance of the landscape and irrigation improvements.
- B. Transfer of Water Meters to Pima County: At the time of Final Acceptance of the landscape and irrigation work, the Contractor shall submit a letter to the Owner's Representative requesting that the party billed for water service at the project site be changed from the Contractor to the Pima County Natural Resources, Parks and Recreation Department. The request shall note the date of Final Acceptance. Upon receipt of this request, the Owner will initiate a formal request to change the name of the party to be billed for water.

1.13 CONTRACTOR PROVIDED SPARE PARTS

- A. Contractor Provided Spare Parts: Prior to Substantial Completion of the Work, the Contractor shall turn-over the following spare parts to the Owner's Representative.
 - 1. Sprinkler Heads: Three (3) sprinklers of each type installed on the project
 - 2. Sprinkler Nozzles: . . . Three (3) sets for each sprinkler type installed on the project
 - 3. Remote Control Valves: One (1) of each size valve installed on the project
 - 4. Emitter Access Boxes: Ten (10) of each type installed on the project

PART TWO: MATERIALS

2.1 PIPE AND FITTINGS

- A. Color Coding of Pipe Conveying Reclaimed Water: All mainline and lateral line pipe used to convey reclaimed irrigation water shall be integrally color-coded purple pipe.
- B. PVC Mainline and Lateral Line Pipe: Mainline and lateral line pipe shall be PVC plastic pipe extruded from virgin parent materials. Pipe shall comply with ASTM standards D-1785-34 or D-2241-34 as applicable and shall be free from defects.
 - 1. Mainline Pipe: Mainline pipe, pipe subject to constant pressure, shall be Schedule 40 PVC pipe.
 - 2. Lateral Line Pipe: Lateral line pipe not subject to constant pressure shall be Schedule 40 PVC pipe.
 - 3. Sleeves for Pipe and Control Wire: Sleeves for irrigation pipe and control wire under roadways, parking lots, and walkways shall be Schedule 40 PVC pipe.

- C. PVC Pipe Fittings: PVC fittings shall be made from Type I, Grade I, PVC compounds conforming to ASTM D-1784, D-2672, and D-2241 as applicable.
1. PVC Fittings for Remote Control Valve Assemblies: PVC fittings for remote control valve assemblies, and as detailed for other locations, shall be Schedule 80 PVC.
 2. PVC Fittings for Mainlines and Lateral Lines: PVC fittings for mainlines and lateral lines shall be Schedule 40 PVC.
 3. Threaded PVC Pipe and Nipples: All threaded PVC pipe and nipples shall be Schedule 80 PVC.
 4. Swing Joints (3/4" and 1" Size): Swing joints shall be constructed of Schedule 80 PVC and shall be of the double swing type with "O" Ring connections.
 5. Swing Joints (1/2" Size): Swing joints shall be constructed of PVC with an operating pressure of up to 80 psi. Swing joints shall be of the double swing type.
- D. PVC Solvent Cement and Primer: Solvent cement and primer for joining PVC pipe and fittings shall be as approved by the pipe and fitting manufacturers and shall comply with ASTM Standards D-2564 and F-656.
1. Primer: Primer shall be manufactured for use on all Classes and Schedules of rigid PVC pipe and fittings, including Schedule 80. Color shall be purple.
 2. Solvent Weld Cement: Solvent weld cement shall be manufactured for use on all Classes and Schedules of rigid PVC pipe and fittings, including Schedule 80. It shall have a medium fast set-up time. Color shall be grey. Fast-set or "hot-glue" solvent weld cement shall not be utilized without written approval by the Owner's Representative.
- E. Steel Pipe and Fittings: Steel pipe and fittings shall be Schedule 40 galvanized steel pipe. Unless otherwise detailed on the Project Plans, steel pipe shall be used for backflow preventer risers only.
- F. Copper Pipe and Fittings: Copper pipe shall be Type K rigid pipe. Fittings shall be wrought copper or cast bronze fittings. Unless otherwise detailed on the Project Plans, copper pipe shall be used for backflow preventer risers only.
- G. Corrosion Protection Pipe Wrap: Pipe wrap for steel and copper pipe installed below grade shall be adhesive backed polyethylene tape specifically designed for the protection of buried metallic pipe.

2.2 BACKFLOW PREVENTERS

- A. Backflow Preventers: Backflow preventers shall be of the reduced pressure principle type with bronze body and stainless steel springs. The device shall be equipped with ball valves on the upstream and downstream ends. The backflow preventer manufacturer and model shall be as previously approved by Tucson Water. Size shall be as noted on the drawings.
- B. Backflow Preventer Security Enclosure: The backflow preventer security enclosure shall be fabricated from bent 1-1/4" diameter Schedule 40 steel pipe, 1" x 1" steel angle, and 13 gauge expanded metal panels. The enclosure shall be equipped with hinges and U-bolt hasp for padlocking. The enclosure shall have a powder coated finish. Color shall be "Desert Tan." The security enclosure manufacturer and model shall be as noted on the Project Plans.

2.3 AUTOMATED CONTROL VALVES

- A. Color Coding of Automated Control Valves for Reclaimed Water Systems: All control valves installed in irrigation systems using reclaimed water shall be equipped with flow control handles that are color coded purple.
- B. Master Valves (3" Size): Master valves (3" size) shall be of the globe / angle type with brass body and glass filled nylon bonnet. The valve shall be of the normally-closed or normally-open design as noted on the Project Plans. The valve shall be equipped with a heavy-duty 24 VAC solenoid. The valve shall be designed with a scrubber mechanism to prevent clogging when used with reclaimed water. The 3" size master valve manufacturer and model shall be as noted on the Project Plans.
- C. Master Valves (2" Size): Master valves (2" size) shall be of the globe type with brass body and bonnet. The valve shall be of the normally-closed design and shall be equipped with a heavy-duty 24 VAC solenoid. The valve shall be designed with a scrubber mechanism to prevent clogging when used with reclaimed water. The 2" size master valve manufacturer and model shall be as noted on the Project Plans.
- D. Remote Control Valves: Remote control valves shall be of the globe type with heavy duty glass filled nylon body and bonnet, nylon reinforced rubber diaphragm, stainless steel flow control stem, self-cleaning scrubber, and 24 volt heavy-duty solenoid. The remote control manufacturer, model, and size shall be as noted on the Project Plans.

2.4 MANUAL VALVES

- A. Color Coding of Manual Control Valves for Reclaimed Water Systems: All manual control valves installed in irrigation systems using reclaimed water shall be equipped with handwheels, on-off handles, or other permanent markings that are color coded purple.

- B. Gate Valves: Gate Valves shall be 200 psi rated WOG brass gate valves with female NPT threaded ends. Valves shall have a clear waterway equal to the full nominal diameter of the valve and shall be equipped with a handwheel and non-rising stem.
- C. Ball Valves: Ball valves shall be 400 p.s.i. rated WOG brass ball valves with threaded ends. Ball valves shall be equipped with resilient TFE seats and blow-out proof stems. Valve handle shall provide 1/4 turn on / off control.
- D. Quick Coupling Valves: Quick coupling valves shall be constructed of brass with a two piece design. Internal valve spring shall be of stainless steel. Valve shall be equipped with a self-closing thermoplastic rubber cover. The quick-coupling valve manufacturer and model shall be as noted on the Project Plans.
 - 1. Quick-Coupling Valve Key: Quick coupling valve keys shall be constructed of brass with galvanized steel handle. Key shall be furnished with brass hose swivel ell. Key shall be of the same manufacturer as the quick-coupling valve.
- E. In-line Pressure Regulating Valves: In-line pressure regulating valves shall be of the permanently assembled type with heavy-duty plastic body and FPT ends. The regulator shall have a pre-set outlet pressure of 30 or 40 psi as noted on the drawings. The pressure regulating valve manufacturer and model shall be as noted on the Project Plans.

2.5 CONTROLLERS AND CLUSTER CONTROL UNITS:

- A. Satellite Controllers: Controller(s) shall have a 12 hour watering duration for any and all stations and shall be capable of four independent programs with eight start times each. The controller shall be equipped with two master valve terminals and shall be capable of manual operation by program or station. The controller shall have a heavy-duty transformer capable of the simultaneous operation of up to nine 24 VAC, 7 VA solenoids. The controller(s) shall be installed in a heavy-duty, powder-coated, lockable steel cabinet. The controller shall be designed to function as a satellite controller with the Pima County Natural Resources, Parks, and Recreation Department's central control system. The controller manufacturer, model, and number of stations shall be as noted on the Project Plans.
- B. Combined Controller / Cluster Control Unit: The controller shall have the capacity to function as both a controller and cluster control unit (CCU). The device shall be fully compatible with the Pima County Natural Resources, Parks, and Recreation Department's central control system. The controller / CCU shall have a 12 hour watering duration for any and all stations and shall be capable of four independent programs with eight start times each. The controller / CCU shall be equipped with two master valve terminals and shall be capable of manual operation by program or station. The controller / CCU shall have a heavy-duty transformer capable of the simultaneous operation of up to nine 24 VAC, 7 VA solenoids. The controller / CCU shall be equipped with a modem for communication with Pima County's off-site central control workstation. The controller / CCU shall be installed

in a heavy-duty, powder-coated, lockable steel cabinet. The controller / CCU manufacturer, model, and number of stations shall be as noted on the Project Plans.

- C. Cluster Control Unit: The cluster control unit (CCU) shall be designed to function as a communication interface between the off-site central control workstation and the field satellite controllers. The CCU shall also be capable of receiving and processing data for system flow sensors. The CCU shall be housed in a seamless, drawn steel, lockable weatherproof cabinet. The cluster control unit manufacturer, model, and number of stations shall be as noted on the Project Plans.

2.6 FLOW SENSORS AND ACCESSORIES

- A. Flow Sensors: Flow sensors shall be of the six-blade impeller design with heavy duty PVC body. Flow sensors shall be manufactured by the controller / CCU manufacturer. Flow sensor manufacturer, type, model, and size shall be as noted on the Project Plans.
- B. Communication Cable: Communication cable between the flow sensor and the controller and between the controllers and the CCU shall be Type PE-39 shielded cable. Cable shall be compatible with the Pima County Natural Resource, Parks, and Recreation Department's central control system. Cable splicing devices shall be as approved by the control system and communication cable manufacturers.
 - 1. Conduit and Fittings for Communication Cable: Conduit and fittings for communication cable shall be Schedule 40 PVC conduit. Size shall be 3/4", minimum, or as required for the Work.
 - 2. Pull Boxes for Communication Cable Conduit: Pull boxes shall be constructed of HDPE plastic materials. Pull boxes shall be of the manufacturer and model as noted on the Project Plans. Box size and configuration shall be as follows:

Pull Boxes 19-3/4" x 13-1/8" Clear Opening x 12" Height

2.7 MISCELLANEOUS AND INCIDENTAL EQUIPMENT:

- A. Pulse Decoder: Shall be as manufactured by the flow sensor and controller manufacturer. The device shall transmit information from the flow sensor to the controller via a two-wire path. The device shall be encapsulated in a moisture and UV resistant case for outdoor installation. The pulse decoder model shall be as noted on the Project Plans.
- B. Pulse Transmitter: Shall be as manufactured by the flow sensor and controller manufacturer. The device shall be of the solid state design and appropriate for a two-wire communication system. The transmitter shall be housed in a NEMA enclosure with a digital read-out. The transmitter model shall be as noted on the Project Plans.

- C. Pulse Transmitter Power Supply: Shall be as manufactured by the flow sensor and controller manufacturer and shall be fully compatible with the other control equipment installed. The transmitter model shall be as noted on the Project Plans.
- D. Surge Protectors for Flow Sensor: Shall be as manufactured by the flow sensor and controller manufacturer and shall provide surge protection for the flow sensor. The surge protector model shall be as noted on the Project Plans.
- E. Surge Protector for Controller: Shall be as manufactured by the controller manufacturer and shall provide surge protection for the controller. The surge protector model shall be as noted on the Project Plans.
- F. Other Incidental Equipment: The Contractor shall provide and install all other incidental equipment required for the proper operation of the irrigation control system.

2.8 LOW VOLTAGE CONTROL WIRING

- A. Low Voltage Irrigation Control Wire: Control wire shall be Type UF and shall be of the size and type recommended by the valve manufacturer. Wire size for control wires shall be #14 AWG or as noted on the drawings. Wire size for common ground wires shall be #12 AWG or as noted on the drawings. Wire shall be Underwriters Laboratory (UL) approved for direct burial.

The color of the insulation on the low-voltage wire(s) shall be as follows:

- 1. Control Wire to Master Valve(s): Orange
- 2. Control Wire to Remote Control Valves: Red
- 3. Spare Control Wires (if noted on the project drawings): Green
- 4. Common Wire: White

- B. Waterproof Wire Splices: Wire splices shall be of the two piece, sealant filled type which permit connection of 2 or 3 wires of 18 through 10 gauge size. Wire splices shall be Underwriter Laboratory (UL) listed.

2.9 SPRINKLER HEADS:

- A. Color Coding of Sprinkler Heads for Reclaimed Water Systems: All sprinkler heads installed in irrigation systems using reclaimed water shall be equipped with rubber tops or collars that are color coded purple.
- B. Large Radius Gear Drive Sprinkler Heads: Large-radius, gear-drive sprinkler heads shall have a body, nozzle, and screen constructed of heavy duty plastic. Riser stem and retract spring shall be constructed of stainless steel. Inlet shall be 1 inch FPT and pop-up height shall be not less than inches (4"). Sprinklers shall be full circle or part circle. Part circle

heads shall be adjustable from approximately 40 to 310 degrees. Radius of spray on both full and part circle heads shall be adjustable. Nozzles shall be removable. Sprinklers shall be equipped with an internal anti-drain valve. The large-radius, gear-drive sprinkler heads (full and part circle) manufacturer, model, and nozzle size shall be as noted on the Project Plans.

- C. Medium Radius Gear Drive Sprinkler Heads: Medium-radius, gear-drive sprinkler heads shall have a body, nozzle, and screen constructed of heavy duty plastic. Riser stem and retract spring shall be constructed of stainless steel. Inlet shall be 3/4 inch FPT and pop-up height shall be not less than four inches (4"). Sprinklers shall be full circle or part circle. Part circle heads shall be adjustable from approximately 40 to 310 degrees. Radius of spray on both full and part circle heads shall be adjustable. Nozzles shall be removable. Sprinkler shall be equipped with an internal anti-drain valve. The medium-radius, gear-drive sprinkler head (full and part circle) manufacturer, model, and nozzle size shall be as noted on the Project Plans.
- D. Pop-Up Spray Sprinklers: Pop-up spray sprinklers shall have a heavy duty plastic body and riser stem, a stainless steel retract spring, and an integrally molded wiper seal. The pop-up spray sprinkler manufacturer, model, and nozzle size shall be as noted on the Project Plans.

2.10 DRIP EMITTERS:

- A. Eight-Outlet Drip Emitters: Emitters shall be of the type with eight independent / removable emitter ports. The pressure compensating ports available having flow rates of 0.5 to 24 gph. Emitter shall have a 1/2" FPT inlet. The eight-outlet emitter manufacturer and model shall be as noted on the Project Plans.
 - 1. Eight outlet drip emitters shall be used to irrigate specific plants of the species and sizes as noted on the Project Plans
- B. Six-Outlet Drip Emitters: Emitters shall be of the permanently assembled, pressure compensating, six-outlet type with 1/2" FPT inlets. The flow rate per outlet shall be nearly the same at inlet pressures of 15 to 50 psi. The six-outlet emitter manufacturer and model shall be as noted on the Project Plans.
 - 1. Six outlet emitters shall be used to irrigate specific plants of the species and sizes as noted on the Project Plans.
- C. Single Outlet Drip Emitters: Emitters shall be of the permanently assembled, pressure compensating, one outlet type with 1/2" FPT inlet. The flow rate per outlet shall be nearly the same at inlet pressures of 15 to 50 psi. The single outlet emitter manufacturer and model shall be as noted on the Project Plans.

1. Single outlet emitters may be used to irrigate individual plants where the connection to a multi-outlet emitter is not practical.
- D. Emitter Distribution Tubing: Emitter distribution tubing shall be fabricated from polyvinyl materials with a 0.16" I.D. and a 0.22" O.D. The tubing manufacturer and model shall be as noted on the Project Plans.
- E. Emitter Lateral Line Flush Caps: Flush caps shall consist of a Schedule 40 PVC pipe riser, a Schedule 40 PVC male adapter fitting, and a Schedule 40 PVC threaded cap. Flush caps shall be assembled as detailed.

2.11 ACCESS BOXES:

A. Color Coding of Access Boxes:

1. Valve Boxes for Valves in Pipelines Conveying Reclaimed Water: All access boxes installed above valves in pipelines conveying reclaimed water, regardless of where the valve is to be installed, shall be equipped with tops or lids that are color coded purple.
2. Valve Boxes for Valves in Pipelines Conveying Potable Water: Access boxes installed above valves in pipelines conveying potable water shall be equipped with tops or lids that are green when the access box is installed within a turf area and tan when the access box is installed within a decomposed granite or other non-turf area.

B. Valve Access Boxes: Valve access boxes for gate valves, ball valves, master valves, flow sensors, remote control valve assemblies, and quick-coupling valves shall be constructed of HDPE plastic materials. Valve box covers shall be permanently marked with the words "control valve" or "irrigation". Valve access box shall be of the manufacturer and model as noted on the Project Plans. All boxes, exclusive of emitter line flush cap access boxes, shall be equipped with bolt-down lids. The access box manufacturer and model number(s) shall be as noted on the Project Plans. Box sizes and configurations shall be as follows:

1. Master Valves: 19-3/4" x 13-1/8" Clear Opening x 12" Height
2. Flow Sensors: 15-3/8" x 10-1/8" Clear Opening x 12" Height
3. Drip Zone Remote
Control Valve Assemblies: 19-3/4" x 13-1/8" Clear Opening x 12" Height
4. Turf Zone Remote
Control Valve Assemblies: 19-3/4" x 13-1/8" Clear Opening x 12" Height
5. Gate / Isolation Valves: 15-3/8" x 10-1/8" Clear Opening x 12" Height

- 6. Quick-Coupling Valves: 9-1/4" Diameter Clear x 10-1/8" Height
- 7. Emitter Line Flush Cap
Access Boxes: 6-7/8" Diameter Clear Opening x 9-5/16" Height
- C. Emitter Access Boxes for Single and Six-Outlet Emitters: Access boxes shall be constructed of UV resistant thermoplastic materials with a base diameter of approximately 7-3/4", a top diameter of approximately 5", and a snap-on lid. Box shall be slotted to accommodate pipe and distribution tubing. The emitter access box manufacturer and model shall be as noted on the Project Plans.
- D. Emitter Access Boxes for Eight Outlet Emitters: Access boxes shall be constructed of HDPE plastic materials. Access boxes shall have a 6-7/8" diameter clear opening and a 9-5/16" height. The access box manufacturer and model shall be as noted on the Project Plans.

2.12 MISCELLANEOUS IRRIGATION SYSTEM EQUIPMENT:

- A. In-Line Filter: In-line filters shall have a glass-filled nylon body with removable, 200 mesh, stainless steel screen, and manual flush port. The filter manufacturer and model shall be as noted on the Project Plans.
- B. Detectable Marking Tape: Detectable marking tape to be installed above all mainlines shall be a five mil thick, five-ply composition, polyethylene tape. The tape shall have a 20 gauge solid aluminum foil core that is encapsulated within the polyethylene material. The tape shall be three inches (3") wide.
 - 1. Tape for Reclaimed Water Irrigation Systems: Tape shall have the words "CAUTION, RECYCLED / RECLAIMED WATER LINE BELOW" printed at regular intervals. Tape color shall be purple. The detectable marking tape manufacturer and model shall be as noted on the Project Plans.
 - 2. Tape for Potable Water Irrigation Systems: Tape shall have the words "CAUTION, IRRIGATION LINE BELOW" printed at regular intervals. Tape color shall be green. The detectable marking tape manufacturer and model shall be as noted on the Project Plans.

PART THREE: EXECUTION

3.1 BLUE STAKING:

- A. Blue Staking: The Contractor shall request that the project site be Blue Staked prior to the start of any excavation or trenching work. Blue Staking shall be kept current during the course of the project. All utilities damaged by the Contractor shall be repaired or replaced by the Contractor, as required by the Owner or appropriate utility company, at the Contractor's expense.

3.2 LAYOUT

- A. Layout of Irrigation System: Prior to the start of trenching and excavation work, the Contractor shall layout the irrigation system, staking out the location of mainlines, master valves, flow sensors, remote control valves, sprinkler heads and other equipment as shown on the drawings. All deviations from the layout shown on the drawings impacting the length of piping runs or the configuration of the system shall be approved by the Owner's Representative.

3.3 WATER METER INSTALLATION

- A. Water Meter Installation: The Contractor shall coordinate the installation of new water meter(s) as specified herein. The location of the water meter shall be as approved by the water provider and the Owner's Representative.

3.4 BACKFLOW PREVENTER INSTALLATION

- A. Backflow Preventer: Backflow preventers shall be installed as detailed in all locations shown on the Project Plans. All backflow preventers shall be tested by an individual certified by Tucson Water or the appropriate water provider. Test certificates, signed by the tester, shall be filed with the water provider in accordance with the water utility's requirements.
- B. Backflow Preventer Security Enclosure: The backflow preventer security enclosure shall be installed as detailed. The device shall be positioned so as to allow for the opening and closing of the security enclosure without interfering with the backflow preventer.

3.5 TRENCHING FOR PIPE AND CONTROL WIRING

- A. Trenching: Trench excavations shall be straight and true with uniform bottom for bearing of pipe. Minimum depth of cover on pipe, sleeves, and wire shall be as follows:
 - 1. PVC Sleeves under Roadways and Parking Areas 18 inches
 - 2. PVC Sleeves for Mainlines under Walkways 18 inches
 - 3. PVC Sleeves for Lateral Lines under Walkways 12 inches
 - 4. PVC Mainline 18 inches
 - 5. Detectable Marking Tape over Mainline 8 inches
 - 6. PVC Lateral Lines 12 inches
 - 7. Control and Common Wires 18 inches
 - 8. Communication Cable / Conduit: 18 inches
- B. Barriers to Prevent Public Access to Open Trenches: The Contractor shall provide barriers as required to restrict public access to open irrigation trenches. Barriers shall be in compliance with applicable construction site safety regulations.

3.6 PLACEMENT OF SLEEVES AND (MAINLINE / LATERAL LINE) PIPE

- A. Sleeves: Sleeves shall be installed as detailed. Separate sleeve shall be provided for pipe and control wire. Sleeve size shall be as noted. If not noted, the sleeve shall be a minimum of two standard pipe sizes larger than the pipe enclosed.
- B. Mainline and Lateral Line Pipe: Place select backfill material in bottom of trench as detailed before laying pipe. Do not install pipe in trench that is wet or when conditions are otherwise unsuitable for the Work. Keep inside of pipe clean during installation. Snake pipe from side to side of trench to allow for expansion and contraction. Provide 2 inch minimum vertical and horizontal clearance between irrigation pipes. Provide 12 inch minimum clearance between irrigation pipes and pipe, conduit, or cable of other trades.

3.7 CONSTRUCTION OF PIPE JOINTS:

- A. PVC Pipe: Make all solvent weld joints using only procedures recommended by the pipe, fitting, and solvent weld cement manufacturers. Make all threaded connections using teflon tape on male threads.

3.8 FLUSHING AND PRESSURE TESTING OF MAINLINE:

- A. Notification: The Contractor shall notify the Owner's Representative of his intent to perform pressure testing 72 hours prior to the scheduled test time. Except as otherwise approved, all tests shall be performed in the presence of the Owner's Representative. The entire mainline shall be tested at one time except for instances where project phasing requires testing of individual segments of the mainline system.
- B. Tools and Equipment: The Contractor shall furnish all tools, materials, fittings, and equipment required for testing and shall make all temporary connections.
- C. Trench and Backfill Conditions for Testing: The trench(es) shall not be backfilled until pressure testing of mainline has been successfully completed. Center loading of mainline pipe during testing is acceptable. All joints shall be exposed during testing operations.
- D. Flushing: After all mainline piping and risers are connected in place and all related work is complete, open each control valve(s) and use a full head of water to flush the mainline system.
- E. Testing: The mainline shall be tested at a pressure of 100 psi for a period of 4 hours. For acceptance, the original test pressure shall be maintained for the duration of the test.
- F. Repairs: All leaks or defects which develop under pressure testing shall be promptly repaired and the test repeated until satisfactory results have been achieved. Repairs shall be made using only materials and procedures specified herein.

3.9 CONTROL WIRE INSTALLATION

- A. Control Wiring: Wires shall be snaked in trench locations shown on drawings at a uniform depth of 18 inches minimum relative to finish grade. A minimum of 1 foot in every 10 feet of trench shall be in excess for snaking the wire. Where ever possible, mainline trenches shall be used for installation of wire. Tie a loose 20 inch loop in all wiring at changes of direction of greater than 30 degrees and untie all loops after all connections have been made. All wiring shall be taped together every 10 feet using plastic electrical tape wrapped at least 2 times around the bundle of wires.
- B. Wire Splices: Each end of the control or "hot" wire and the common or "ground" wire shall be brought to the remote control valve and a coil of wire shall be neatly looped in the access box as detailed. Splices shall be made using waterproof wire splices. Wire shall be spliced at remote control valve locations only.

3.10 BACKFILLING OF TRENCHES

- A. Placement of Bedding Material: Place select backfill material around pipe to provide minimum cover shown on the details. Carefully tamp or water-in bedding material around pipe.
- B. Placement of Backfill: Place excavated material as backfill in lifts of six inches, maximum. Carefully compact each lift as work progresses. Grade top of trenches to be level with adjacent finished grade. All trenches improperly backfilled or where settlement occurs shall be re-excavated and compacted as specified.
- C. Removal of Excess Material: Excavated material that is removed from trenches and not used as backfill shall be carefully removed from the site and disposed of in an approved location at the Contractor's expense.

3.11 INSTALLATION OF VALVES AND VALVE ACCESS BOXES:

- A. Valves: Gate valves, ball valves, master valves, remote control valves, and quick coupling valves shall be installed as detailed. Use teflon tape on all threaded connections.
- B. Valve Access Boxes: Install valve access boxes such that top of box is parallel to and flush with the surrounding finished grade, or as detailed. Provide gravel sumps and brick footings as detailed. Where more than one access box is to be installed in a given location, group boxes together and keep boxes within a uniform alignment. Provide adequate clearance around enclosed valves to allow for valve operation and/ or removal.

3.12 CONTROL SYSTEM INSTALLATION

- A. Controller(s): The controller(s) or combination controller / cluster control unit devices shall be installed as detailed, in the location(s) approved by the Owner's Representative. Extend

electrical power and telephone connections to the new controller(s) as shown on the electrical plans and make connections. All work shall be in accordance with applicable code requirements.

- B. Cluster Control Unit: The cluster control unit(s) shall be installed as detailed, in the location(s) approved by the Owner's Representative. Electrical power, telephone, and communication cable connections to the cluster control unit(s) shall be made as shown on the electrical plans and as required for communication between the cluster control unit and the field devices installed (flow sensors, satellite controllers, etc.) and between the cluster control unit and the Pima County Natural Resources, Parks, and Recreation Department's off-site central control work station. All work shall be performed by a technician certified by the control system manufacturer and shall be in accordance with applicable code requirements.
- C. Programming of Controllers: The Contractor shall be responsible for the initial programming of all controllers. Programming work shall be performed by a technician certified by the control system manufacturer. Controllers shall be programmed to operate as stand-alone controller during construction and during the initial Contractor Maintenance Period.
 - 1. Verification of Central Control System Operation: Prior to Final Acceptance of the Work, the Contractor shall coordinate the programming of the satellite controllers with the Pima County Natural Resources, Parks, and Recreation Department staff. Testing shall be performed to ensure that the system installed in the field properly communicates with the Department's off-site workstation. Deficiencies associated with equipment installed by the Contractor shall be repaired by the Contractor prior to Final Acceptance of the Work.
- D. Grounding Equipment: Grounding equipment shall be installed at each controller in accordance with the controller manufacturer's written recommendations and applicable codes.
- E. Surge Protectors: Surge protectors shall be installed at each controller in accordance with the controller manufacturer's written recommendations.

3.13 FLOW SENORS AND COMMUNICATION CABLE:

- A. Flow Sensors: Flow sensors shall be installed as detailed and in accordance with the manufacturer's written instructions.
- B. Communication Cable: Communication cable shall be installed in conduit as specified. Pull boxes shall be installed in conduit runs and at all changes in direction greater than 30 degrees and at intervals not exceeding 200 linear feet.
- C. Incidental Equipment: Pulse decoders, pulse transmitters, transmitter power supplies, and surge protectors shall be installed at each flow sensor in accordance with the control system manufacturer's written recommendations.

3.14 SPRINKLER HEADS:

- A. Large-Radius and Medium-Radius, Gear-Drive Sprinkler Heads: Install gear drive sprinkler heads on double swing joints so that top of head matches finished grade as detailed. Use teflon tape on all threaded connections, exclusive of “O” ring connections. Flush lateral line and clean inlet screen prior to installation of nozzle. Adjust radius of spray and orientation of head and nozzle so that spray pattern matches the area to be irrigated and minimizes over-spray on to adjacent surfaces.
 - 1. Nozzle Adjustment: Sprinkler heads shall be installed with the nozzles noted on the drawings. If necessary to provide complete and uniform coverage, the Contractor shall remove and replace the specified nozzles and supply and install nozzles that are one size larger or one size smaller than that specified. Nozzle replacement work, if required, shall be performed by the Contractor at no cost to the Owner.
- B. Pop-up Spray Sprinkler Heads: Install pop-up sprinkler heads on swing joints so that top of head matches finished grade as detailed. Use teflon tape on all threaded connections, exclusive of “O” ring connections. Flush lateral line and clean inlet screen prior to installation of nozzle. Adjust radius of spray and orientation of head and nozzle so that spray pattern matches the area to be irrigated and minimizes over-spray on to adjacent surfaces.

3.15 DRIP EMITTERS:

- A. Drip Emitters: Install drip emitters in access boxes and extend distribution tubing to locations around the irrigated plant as detailed.

3.16 MISCELLANEOUS IRRIGATION EQUIPMENT:

- A. In-Line Filters: Install in-line filters as detailed. Position filter in access box so that the unit can be disassembled and the filter removed and/or replaced, without removal of the access box.
- B. Detectable Marking Tape: Install detectable marking tape above all mainline pipe as detailed.

3.17 OPERATIONAL TESTING:

- A. Operational Test: An operational test shall be performed by the Contractor after the irrigation system installation is complete. The test shall demonstrate that all controller and

control valves perform properly and that all sprinkler heads and emitters are operating correctly and are providing adequate irrigation water to landscape plantings. All tests shall be performed in the presence of the Owner's Representative. Irrigation system components found to be operating incorrectly or to be defective shall be replaced or repaired by the Contractor at no cost to the Owner.

- B. Schedule for Performance of Operational Test: The operational test shall be performed at the date and time of the Substantial Completion inspection. The operational test may be performed in advance of the Substantial Completion inspection, if requested by the Contractor. The request for an operational test inspection shall be submitted to the Owner's Representative not-less-than seven (7) days prior to the requested inspection date.

3.18 REPAIR OF DAMAGE BY LEAKS:

- A. Repair of Damage: The Contractor shall be responsible for damages to the slabs, curbs, roadways, walkways, piping systems, electrical systems, buildings and associated equipment and contents caused by leaks in the irrigation piping systems being installed or having been installed by him. The Contractor shall repair all damage so caused. All repair work shall be performed in a manner that is satisfactory to the Owner's Representative, and at no cost to the Owner.

3.19 CLEAN-UP:

- A. Clean up: Perform cleaning operations during the installation of the Work and upon completion of the project. Remove from the site all excess materials, debris, and equipment. Legally dispose of all excess and waste materials. Repair all damage resulting from irrigation system installation.

3.20 TURF IRRIGATION SYSTEM AUDIT:

- A. Applicability: An audit of the installed turf irrigation system shall be performed when the requirement for an audit is noted on the Project Plans.
- B. Scope of Audit: The scope of the irrigation audit shall include an evaluation of the Distribution Uniformity (DU) of the installed irrigation system within designated turf areas as noted on the Project Plans.
- C. Reference Standards and Procedures: The evaluation of the Distribution Uniformity (DU) shall be in accordance with definitions, standards, and procedures as published by the Center for Irrigation Technology at the University of California, Fresno.
- D. Schedule for Performance of Audit: The irrigation audit shall be performed and remedial actions implemented, as-needed, prior to Substantial Completion of the Work.

- E. Qualifications of the Individual Performing Audit: The individual performing the audit shall be a Certified Irrigation Auditor as certified by the Irrigation Association (IA).
- F. Payment for Audit Fees: Except as may be noted in the project documents, the Pima County NRP&R Department will hire the Irrigation Auditor directly and pay the fee for the initial audit and one (1) follow-up inspection, if needed. If additional inspections are required, the cost of the additional inspections shall be borne by the Contractor.
- G. Performance Standards: The audited Distribution Uniformity (DU) for the turf irrigation system(s) installed shall be as follows:
 - 1. For Rotor Type Sprinkler Heads: 65% Minimum
 - 2. For Fixed-Spray Type Sprinkler Heads: 60% Minimum
- H. Remedial Work: If the turf irrigation system installed does not meet the minimum Distribution Uniformity (DU) standards noted above, the Contractor shall be responsible for making required corrections and/or adjustments. Remedial work may include, but is not be limited to, correction of head spacing, replacement of incorrect nozzles, and repair of damaged or contaminated sprinklers. Remedial work shall be performed at the Contractor's expense.
- I. Reinspection of the Work: Installed systems that do not meet the specified Distribution Uniformity (DU) standards, as determined by audit, shall be reinspected by the Certified Irrigation Auditor after remedial work has been performed by the Contractor. Additional remedial work and reinspections will be required until the specified Distribution Uniformity (DU) has been achieved.

3.21 MAINTENANCE AND GUARANTEE:

- A. Maintenance during Construction: The Contractor shall operate and maintain the irrigation system during project construction. Operation and maintenance procedures shall include, but not be limited to: programming of the controller(s), repair / adjustment of sprinklers, repair / replacement of emitters, and replacement of defective installations. Maintenance during construction shall continue until the issuance of a Certificate of Substantial Completion .
- B. Inspection of Completed Irrigation Work: Upon substantial completion of the irrigation work, the Contractor shall notify the Owner's Representative who will schedule an inspection of the irrigation system improvements. During the inspection, items which are incomplete or which must be repaired or replaced will be identified. The Issuance of a Certificate of Substantial Completion will be contingent on the completion or correction of noted items.

- C. Maintenance after Substantial Completion: After issuance of a Certificate of Substantial Completion, the Contractor shall continue to operate and maintain the irrigation system for a period of 60 consecutive calendar days. Operation and maintenance procedures shall include, but not be limited to: programming of the controller(s), repair / adjustment of sprinklers, repair / replacement of emitters, and replacement of defective installations. Upon satisfactory completion of the initial Contractor maintenance period, the Owner will assume responsibility for irrigation system operation and maintenance.
1. Irrigation Maintenance Requirements: Activities and tasks associated with the 60 day maintenance period shall include, but not be limited to:
 - a. Daily inspection of the project to check on-site conditions and to perform activities required to correct safety deficiencies and/or to address field conditions impacting the proper operation of the irrigation system
 - b. Daily observation of the turf grass irrigation system operation to verify that sprinklers are performing correctly and that all turf areas are receiving adequate and appropriate irrigation water
 - c. Weekly checking and adjustment of the irrigation controller program(s) as needed to provide appropriate application of water to the project plantings
 - d. Weekly inspection of the operation of each sprinkler to check for proper pop-up and retraction, arc adjustment, radius adjustment, nozzle performance, rubber cover installation, and head height adjustment.\
 - e. Weekly inspection of the operation of each drip emitter to check for proper water flow from each of the emitter distribution tubing outlets
 - f. Weekly flushing of the in-line filter at each drip zone remote control valve assembly
 - g. As-needed repair of leaks and other system deficiencies
 - h. As-needed replacement of defective irrigation system equipment
 2. Suspension of Initial Contractor Maintenance Period for Non-Compliance: Failure to properly operate and maintain the irrigation system as specified herein, as determined by the Owner's Representative, will result in the suspension of the number of days being credited towards the initial 60 day Contractor maintenance period. The suspension will remain in effect until such time as the remedial actions required by the Owner's Representative have been implemented by the Contractor.

3.22 STANDARDS FOR FINAL ACCEPTANCE OF THE LANDSCAPE IMPROVEMENTS

- A. Standards for Acceptance of the Irrigation System: Standards for acceptance of the irrigation system include, but are not limited to, the following:
1. On-site control system (controller(s), CCU(s), and remote control valves) have been tested and are operating correctly

2. Communication between the on-site control system and the Pima County Natural Resources, Parks, and Recreation Department's off-site central control work station has been established and is working properly
3. All sprinkler heads are popping-up correctly and sealing in the up position during operation to eliminate flows from the perimeter of the riser stem
4. All sprinkler heads are retracting properly to the fully closed or down position
5. All sprinkler heads are set plumb so that riser stem extends vertically when in the up position
6. The arc of all part-circle sprinkler heads has been adjusted to provide water to turf grass areas and to avoid overspray on adjacent surfaces
7. The inlet screens and nozzles of all sprinkler heads have been cleaned and are set in the proper, sealed position
8. The radius of spray for all sprinklers has been adjusted to provide uniform coverage of the turf area with minimal overspray on to adjacent surfaces
9. The top of all sprinkler heads have been adjusted to match finished grade as detailed on the Project Plans
10. The rubber cover and/or top of all sprinkler heads are undamaged and correctly attached to the sprinkler
11. All drip emitter lateral lines have been flushed to remove contamination
12. All drip emitters are operating correctly and providing uniform flow the irrigated plants
13. All emitter distribution tubing has been extended to the locations detailed on the Project Plans and covered with soil or surfacing material as detailed
14. All irrigation system components are in place and operating as detailed on the Project Plans, as specified herein, as required by the irrigation equipment manufacturer, and as required for proper operation of the irrigation system

3.23 GUARANTEE:

- A. Guarantee: The Contractor shall guarantee the irrigation system to be free of defects in materials and workmanship for a period of one year from the date of Final Acceptance. All material and equipment that proves defective within that period shall be promptly repaired or replaced by the Contractor at no additional cost to the Owner. The guarantee period for any part so repaired or replaced shall be extended for a period of one year from the date of repair or replacement.

END OF SECTION 02800

SECTION 02830 - FENCING, GATES, AND POST-AND-CABLE BARRIERS

PART ONE: GENERAL

1.1 RELATED DOCUMENTS:

- A. The General Provisions of the Contract including all General and Supplementary Conditions and Supplements and Amendments to the General Conditions of the Contract apply to the work specified in this section.

1.2 DESCRIPTION OF WORK:

- A. The work specified in this section includes, but is not limited to, the:
 - 1. Fabrication and installation of chain link fences and backstops
 - 2. Fabrication and installation of chain link gates
 - 3. Fabrication and installation of park entry gates
 - 4. Fabrication and installation of post-and-cable barriers
- B. The extent of the work is shown on the drawings and details.

1.3 RELATED WORK:

- A. Related work includes, but is not limited to, the:
 - 1. Construction of landscape, hardscape, and irrigation improvements
 - 2. Site grading, paving, and miscellaneous construction

1.4 COORDINATION:

- A. The Contractor shall coordinate his work with the Owner's Representative. Work by others that is completed or in progress shall be protected during the installation of the fencing, gates, and post-and-cable barriers. The Contractor shall notify the Owner's Representative of field conditions which prevent the installation of the fencing, gates, and post-and-cable barrier as shown.

1.5 COMPLIANCE WITH APPLICABLE REGULATIONS:

- A. The Contractor shall comply with all local, state, and federal regulations regarding materials, methods of work and disposal of excess and waste materials. The Contractor shall provide notices required by governmental authorities, request required inspections, obtain required permits and pay for all associated fees.

1.6 REFERENCE SPECIFICATIONS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM-F-567 Practice for Installation of Chain Link Fence

1.7 SUBMITTAL REQUIREMENTS:

- A. Product Specification Sheets: The Contractor shall submit to the Owner's Representative for review and approval, three (3) copies of product specification sheets for all fencing materials and hardware to be utilized on the project. The specification sheets shall be highlighted to indicate the materials / options to be provided. No material shall be delivered to the site and or incorporated into the work until the required submittal for that material has been made and approved.
- B. Shop Drawings: The Contractor shall submit to the Owner's Representative for review and approval, shop drawings for the following items:
 - 1. Park entry gates
 - 2. All fabricated chain link gates wider than 5'-0"
 - 3. All fabricated hinges, latches, and hardware

The Contractor shall also submit shop drawing for all items where the proposed fabrication is different than as detailed or shown on the Project Plans or different than as shown or noted on the Standard Details and Specifications. All deviations from the Standard Details and Specifications shall be clearly noted for the Owner's review. Modified items shall not be delivered to the site or installed without shop drawings approved by the Owner's Representative.

1.8 SURVEY REQUIREMENTS:

- A. Contractor Surveying: The Contractor shall be responsible for all survey work required to install boundary fencing and gates as shown on the Project Plans and described in these specifications.

PART TWO: MATERIALS

2.1 CHAIN LINK FABRIC:

- A. Chain-Link Fabric for Park Fences: Fabric for fencing and gates (exclusive of backstops below 10'-0" and security fencing) shall be 9 Gauge with two inch (2") weave. Fabric shall be hot dipped galvanized with not less than 1.2 oz. of Zinc per square foot. Galvanizing shall be applied after weaving. Top and bottom selvages shall be knuckled. Fabric material shall be new.

- B. Chain-Link Fabric for Backstops: Fabric for backstops shall be 6 Gauge (for fencing below 10'-0") and 9 Gauge (for fencing above 10'-0"). All fabric shall have a two inch (2") weave. Fabric shall be hot dipped galvanized with not less than 1.2 oz. of Zinc per square foot. Galvanizing shall be applied after weaving. Top and bottom selvages shall be knuckled. Fabric material shall be new.
- C. Chain Link Fabric for Security Fences: Fabric for security fencing shall be 9 Gauge with two inch (2") weave. Fabric shall be hot dipped galvanized with not less than 1.2 oz. of Zinc per square foot. Galvanizing shall be applied after weaving. Top selvage shall be twisted and barbed. Bottom Selvage shall be knuckled. Fabric material shall be new.

2.2 CHAIN LINK FENCE AND GATE FRAMING MATERIALS:

- A. Framing Members: Framing members, including all posts, rails, braces, and gate frames, shall be Type I pipe, Schedule 40, hot dipped galvanized with not less than 1.8 oz. of Zinc per square foot of surface. Framing members shall be new and undamaged.
- B. Corner Posts: Corner posts up to six feet (6') tall shall have an O.D. of 2.875". Corner posts over six feet (6') tall shall have an O.D. of 4.00" unless otherwise noted on the Project Plans.
- C. Gate Posts: Gate posts for leaves up to six feet (6') tall shall have an O.D. of 2.875". Gate posts for leaves over six feet (6') shall have an O.D. of 4.00" unless otherwise noted on the Project Plans.
- D. Line Posts: Line posts up to six feet (6') high shall have an O.D. of 2.00". Line posts greater than six feet (6') shall have an O.D. of 2.875" unless otherwise noted on the Project Plans.
- E. Gate Frames: Gate frames shall be constructed of the specified pipe material and shall have an O.D. of 2.00" unless otherwise noted on the Project Plans. Gate frames shall be braced with mid-point bracing.
- F. Rails and Post Braces: Top, bottom, and intermediate rails and post braces shall have an O.D. of 1.625" unless otherwise noted on the Project Plans.
- G. Expansion Couplings: Expansion couplings shall be galvanized steel couplings sized for the rails within which they are to be installed.

2.3 CHAIN LINK FENCE FITTINGS AND ACCESSORIES:

- A. Tension Wires: Tension wire shall be 0.177" O.D. Marcellled steel tension wire with Class 2 galvanized coating.

- B. Post Brace Rod: Post brace rod shall be constructed of 0.375" steel rod with adjustable tightener. Rod and tightener shall be hot-dipped galvanized.
- C. Post Caps: All gate, end, and other posts with exposed tops shall be fitted with a post cap to exclude moisture. Caps shall be constructed of malleable steel with galvanized steel finish. Post caps shall be tack welded to the post or secured in a manner acceptable to the Owner's Representative.
- D. Stretcher Bars: Stretcher bars shall be not less than 3/16" by 3/4" in cross section and shall be not less than 2" shorter than the nominal height of the fabric with which they are used. Stretcher bars shall be constructed of galvanized steel.
- E. Stretcher Bar Bands: Bands for securing stretcher bars and fabric to terminal posts shall be formed from flat or beveled steel and shall have a minimum thickness after galvanizing of 0.078" and a minimum width of 3/4". Attachment bolts shall be 5/16" diameter galvanized carriage bolts with nuts.
- F. Fabric Clips: Clips for securing fabric to posts and rails shall be heavy duty galvanized steel wire clips. Clips for securing 6 gauge fabric shall be 6 gauge. Clips for securing 9 gauge fabric shall be 9 gauge. Clips for securing fabric to tension wire shall be corrosion resistant hog-rings.

2.4 CHAIN LINK FENCE GATE FITTINGS AND ACCESSORIES

- A. Gate Fittings for Swing Gates: Swing gates shall be equipped with two or three hinges per leaf as detailed on the Project Plans and with one cast metal fork latch. The latch shall have provisions for pad-locking. All gate fittings shall be hot-dipped galvanized.

2.5 CONCRETE FOR CHAIN LINK FENCE POST FOOTINGS

- A. Concrete for Post Footings: Concrete for chain link fence post footings shall be Class B concrete per the Pima County - City of Tucson Standard Specifications for Public Improvements (most recent edition). The 28 day compressive strength of the concrete shall be not less than 2500 psi.

2.6 PARK ENTRY GATES:

- A. Steel Pipe: Pipe for the construction of post and gate members shall be Schedule 40 black steel pipe. Pipe size shall be as detailed or noted.
- B. Hardware and Accessories: Hardware and accessories shall be as detailed and as per the approved shop drawings.
- C. Finishes: The park entry gates shall be primed and painted as specified herein. Reflective tape shall be installed on gate rails as detailed.

- D. Concrete for Post Footings: Concrete for park entry gate post footings shall be Class B concrete per the Pima County - City of Tucson Standard Specifications for Public Improvements (most recent edition). The 28 day compressive strength of the concrete shall be not less than 2500 psi.

2.7 POST-AND-CABLE BARRIERS:

- A. Posts: Posts shall be constructed of Schedule 40 black steel pipe. Size shall be as detailed or noted.
- B. Corner and End Panels: Corner and end panels shall be constructed of Schedule 40 black steel pipe. Size shall be as detailed or noted.
- C. Post Caps: All posts shall be fitted with a post cap to exclude moisture. Caps shall be constructed of malleable steel with galvanized steel finish. Post caps shall be tack welded to the post or secured in a manner acceptable to the Owner's Representative
- D. Cable: Cable shall be ½" diameter, 6 x 25, galvanized steel cable.
- E. Cable Clamps: Cable clamps shall be galvanized steel "U" clamps with two bolts. Size shall be appropriate for the securing of two stands of ½" cable.
- F. Finishes: Posts and end / corner panels shall be primed and painted as specified herein.
- G. Concrete for Post Footings: Standard Specifications for Public Improvements (most recent edition). The 28 day compressive strength of the concrete shall be not less than 2500 psi.

2.8 PAINT

- A. Primer for Ferrous (Non-Galvanized) Metals: Primer shall be a synthetic alkyd corrosion inhibiting primer manufactured for exterior ferrous metal surfaces. The primer manufacturer and primer type shall be as approved by the Owner's Representative.
- B. Finish Paint for Ferrous (Non-Galvanized) Metals: Paint shall be a 100% acrylic, low sheen enamel paint manufactured for application on exterior, primed ferrous metal surfaces. The paint manufacturer and paint type shall be as approved by the Owner's Representative.
 - 1. Color: Paint color shall be as noted on the drawings or as selected by the Owner's Representative.

PART THREE: EXECUTION

3.1 WORKMANSHIP:

- A. Workmanship: All chain fence installation work shall meet the requirements of ASTM-F-567 and shall be as approved by the Owner's Representative.

3.2 LAYOUT:

- A. Layout of Fence and Gates: The Contractor shall layout the alignment of all fences and shall stake the location of all corner and gate posts for approval by the Owner's Representative. Approval shall be obtained prior to the commencement of fence installation work. Adjustments in the layout of the fence or in gate locations shall be made as directed by the Owner's Representative.
 - 1. Survey: The Contractor shall be responsible for all survey work required for the layout of the perimeter / boundary fencing. .
 - 2. Adjustments to Avoid Conflicts with Existing Vegetation: After the initial staking by the Contractor, the Owner's Representative may direct the Contractor to make adjustments to the layout of the fence or post-and-cable barrier as required to avoid conflicts with existing vegetation or other improvements. No tree, shrub, or cactus shall be removed for fence or post-and-cable barrier installation except as approved by the Owner's Representative.

3.3 POST HOLE EXCAVATION AND FOOTINGS:

- A. Scheduling: Fence installation work shall be scheduled to occur after grades along designated fence lines have been brought to the finished grades shown on the drawings.
- B. Blue-Staking: The Contractor shall have the work area Blue-Staked prior to the start of any excavation work.
- C. Footings: Footing excavation and installation work shall be performed as detailed.
 - 1. Barricades: Barricades shall be provided by the Contractor to prevent public access to areas with open fence post excavations. Excavations shall not be left open overnight or during non-working periods without appropriate barricades or other access control measures.

3.4 CHAIN LINK FENCE INSTALLATION:

- A. Posts: Install corner, line, and gate posts as required to keep all posts plumb and aligned with the approved fence alignment. Allow adequate time for concrete footings to set-up before installing fabric or other fence components.

1. Shaping of Post Tops to Receive Top Rail: All posts to receive a top rail shall be shaped or notched to allow for a continuous butt joint between the post and top rail as detailed.
- B. Rails: Install all top, bottom and (where applicable) intermediate rails by welding rail to the (end, gate, and line) posts. The bottom and intermediate rails shall be shaped or notched to allow for a continuous butt joint between the rail and the post as detailed. Rails shall be welded to posts. Welds shall be continuous and shall be ground smooth and cleaned. All surfaces damaged by the welding operation shall be cleaned and finished with zinc based paint.
- C. Braces: Install braces at corners and at gates, and install post caps as detailed.
- D. Fabric: Cut fabric to form continuous piece between terminal posts. Pull fabric taught and secure to terminal posts with stretcher bar. Install tension wire at base of fabric as detailed (where applicable). Bottom of fabric shall be 1" to 2" above the approved finished grade along the fence line.
- E. Clips: Secure fabric to posts, rails, and braces at intervals not exceeding fifteen inches (15") on-center.
- F. Expansion Couplings: Install expansion couplings at 200' intervals or at the intervals noted on the Project Plans. Align couplings installed in top and bottom rails.

3.5 CHAIN LINK GATE INSTALLATION:

- A. Gates: Install gates plumb and level and check for proper operation of hinges and closure hardware. Make adjustments as needed to provide for normal gate operation as approved by the Owner's Representative.

3.6 PARK ENTRY GATE INSTALLATION

- A. Gate Post Installation: Install gate posts and footings as detailed. Allow adequate time for concrete footings to set-up before installing gates.
- B. Gate Installation: Install park entry gates as detailed and in accordance with the approved shop drawings. Adjust as needed or as directed by the Owner's Representative to allow for unobstructed operation of the gate and to ensure that gate panels align when the gate is in the closed position.
- C. Tie-Back Post Installation: Install tie back posts plumb, as detailed, and in the location needed to receive the gate. Adjust as required to allow gate to be locked in the open position as detailed on the Project Plans.

3.7 POST-AND-CABLE BARRIER INSTALLATION

- A. Post Installation: Install posts as detailed. Allow adequate time for concrete to set before installing cable.
- B. End / Corner Panel Installation: Install end / corner panels as detailed. Notch rails to provide continuous butt joint between rail and post. Weld all joints. Welds to be continuous. Grind smooth all welds. Install caps and tack weld to posts.
- C. Cable: Install cable as detailed and tension to provide a sag of not more than 4" when cable is loaded between posts. Wrap cable around terminal posts and secure with three (3) cable clamps.
 - 1. Splicing Restrictions: Cable shall terminated at end / corner panels only. The splicing of cable between end / corner panels is prohibited.

3.8 PAINTING OF POSTS, GATES, AND OTHER (NON-GALVANIZED) FERROUS METAL SURFACES

- A. Materials to be Painted: All ferrous metal materials used in the construction of fences, gates, and post-and-cable barriers that are not galvanized or powder coated shall be painted.
- B. Substrate Preparation: All substrate surfaces to receive paint shall be thoroughly cleaned to remove all rust, scale, and other foreign materials. Other surface preparation shall be performed in accordance with the paint manufacturer's written instructions.
- C. Prime Coat: All materials to be painted shall receive one-coat of rust inhibiting primer as specified herein and as recommended by the primer manufacturer. If damaged prior to the application of the finish coat, the primer shall be touched-up as-needed.
- D. Finish Coat: All materials to be painted shall receive two coats of finish paint as specified herein and as recommended by the finish paint manufacturer. Whenever possible, at least one finish coat shall be applied in the shop prior to the delivery of the item to the project site. The final coat may be applied in the field.
 - 1. Touch-Up: After completion of the installation, all painted surfaces shall be checked for damage. All damaged areas shall be prepared and painted.

3.9 CLEAN-UP:

- A. Clean-up: The Contractor shall clean-up all debris and excess materials during and upon completion of the work. The Contractor shall legally dispose of all excess and waste materials and shall repair all damage resulting from fence, gate, and post-and-cable barrier installation.

3.10 GUARANTEE:

- A. Guarantee: The Contractor shall guarantee all fencing, gates, and post-and-cable barrier to be free from defects in materials and workmanship for a period of two years. A written guarantee shall be submitted to the Owner's Representative prior to Final Acceptance of the Work.

END OF SECTION 02830

SECTION 02900 - LANDSCAPE WORK

PART ONE: GENERAL

1.1 RELATED DOCUMENTS:

- A. The General Provisions of the Contract including all General and Supplementary Conditions and Supplements and Amendments to the General Conditions of the Contract apply to the work specified in this section.

1.2 DESCRIPTION OF WORK:

- A. The work covered by this Section includes, but is not limited to, the:
 - 1. Fine grading of landscaped areas
 - 2. Excavation of plant pits
 - 3. Replanting of salvaged specimen trees
 - 4. Planting of nursery grown trees and shrubs
 - 5. Soil preparation for turf grass planting
 - 6. Planting and initial maintenance of turf grass
 - 7. Installation of decomposed granite and other aggregate surfacing materials
 - 8. The installation of concrete headers
 - 9. Hydroseeding of designated areas with native plant seed
 - 10. Clean up of soil, debris, and excess materials from the project site
 - 11. Initial maintenance of the landscape improvements
- B. The extent of the landscape work is shown on the drawings and details.

1.3 RELATED WORK:

- A. Related work includes, but is not limited to:
 - 1. Earthwork and site grading
 - 2. The installation of an automatic irrigation system
 - 3. The construction of other site improvements

1.4 COORDINATION:

- A. The Contractor shall coordinate all planting and related landscape work with the Owner's Representative. Work that is completed or in-progress shall be protected during installation of landscape plantings. The Contractor shall notify the Owner's Representative of field conditions which prevent the installation of landscape improvements as shown.

1.5 REQUIRED LICENSURE:

- A. All work shall be performed by a Contractor licensed by the State of Arizona Registrar of Contractors. The commercial license classification held by the Contractor shall be appropriate for the work to be performed

1.6 COMPLIANCE WITH APPLICABLE REGULATIONS:

- A. The Contractor shall comply with all local, state, and federal regulations regarding materials, methods of work, and disposal of excess and waste materials. The Contractor shall provide notices required by governmental authorities, request required inspections, obtain required permits, and pay for all associated fees.

1.7 SUBMITTAL REQUIREMENTS:

- A. General: The Contractor shall make the submittals identified below. Submittals shall be made and approved prior to the delivery of material to the site and its incorporation into the work.
- B. Certificates of Compliance: Submit three (3) copies of the following certificates of compliance to the Owner's Representative for review and approval, as applicable.
 - 1. Turf Grass Sod: The certificate, signed by the grower, shall indicate that the sod is of the species and variety specified or noted on the Project Plans.
 - 2. Turf Grass Sprigs: The certificate, signed by the grower, shall indicate that the sprigs are of the species and variety specified or noted on the Project Plans.
 - 3. Turf Grass Seed: The certificate, signed by the supplier, shall indicate the seed is of the species and variety specified or noted on the Project Plans, that it complies with these specifications, and that it is in compliance with applicable state statutes.
 - 4. Native Plant Seed: The certificate, signed by the supplier, shall indicate that the seed is of the species mix specified or noted on the Project Plans, that it complies with these specifications, and that it is in compliance with applicable state statutes.
 - 5. Organic Soil Conditioner: The certificate, signed by the supplier, shall indicate that the material complies with the project specifications.
 - 6. Fertilizer: The certificate shall be a copy of the manufacturer's guaranteed statement of analysis indicating compliance with these specifications.
 - 7. Soil Sulfur: The certificate shall be a copy of the manufacturer's guaranteed statement of analysis indicating compliance with these specifications.

8. Gypsum: The certificate shall be a copy of the manufacturer's guaranteed statement of analysis indicating compliance with these specifications.
- C. Samples: Submit the following samples to the Owner's Representative for review and approval.
1. Decomposed Granite and/or Crushed Rock: One cubic foot of the gradation and color proposed for use on the project.
 2. River Rock and/or Rip-Rap Material: One cubic foot of the gradation proposed for use on the project.

PART TWO: MATERIALS

2.1 TOPSOIL:

A. Topsoil: Topsoil shall be fertile, friable soil obtained from well-drained arable land which has or is producing healthy crops, grasses, or other vegetation. It shall be capable of sustaining healthy plant growth. The topsoil shall be reasonably free of subsoil, refuse, roots, heavy clay, clods, noxious weed seeds, phytotoxic materials, coarse sand, large rocks, and other deleterious materials. The topsoil shall have the following physical characteristics.

1. pH 6.0 to 8.3
2. Soluble Salts (ppm) 2000 (maximum)
3. Exchangeable Sodium (%) 5% (maximum)
4. Exchangeable Sodium (ppm) 300 (maximum)
5. P.I. 5 - 20
6. Gradation (Passing 2" Screen) 100 %
7. Gradation (Passing 1/2" Screen) 85 - 100 %
8. Gradation (Passing No. 40 Screen) 35 - 100 %

B. Native Soil: Native soil shall be the existing surface soil on the project site.

1. Removal of Extraneous Materials from Native Soils: Prior to the use of on-site native soil for the plant pit backfill, or for the preparation of planting beds for turf grass, all large roots, brush, rocks with a dimension of three inches (3") or larger, clay lumps, caliche, debris, and other extraneous material shall be removed from the soil and disposed of off-site.

2.2 SOIL AMENDMENTS

A. Organic Soil Conditioner: Organic soil conditioner shall be composted, ground, or shredded fir or ponderosa pine bark shavings with at least 85% able to pass through a 1/4" screen.

The pH shall not exceed 7.5. The material shall be hygroscopic or contain a wetting agent, and shall be Nitrogen stabilized with a 0.5 percent Nitrogen content.

- B. Soil Sulfur: Soil sulfur shall be agricultural sulfur for soil treatment. It shall be grained or pelleted, containing 90% (minimum) sulfur and 10% (maximum) inert ingredients. Soil sulfur shall be Disper-Sul Elemental Sulfur or approved equal.
- C. Gypsum: Gypsum shall be agricultural / horticultural gypsum specifically manufactured for use as a soil amendment.

2.3 FERTILIZERS

- A. General Requirements: All fertilizers used on the project shall be in pelleted form and of recent manufacture. Fertilizers shall be delivered to the site in the original unopened containers bearing the manufacturer's guaranteed statement of analysis.
- B. Ammonium Phosphate: Ammonium Phosphate (16-20-0) shall be commercial fertilizer containing in available form a minimum of 16% Nitrogen and 20% Phosphoric Acid.

2.4 PREPARED PLANTING SOIL MIX

- A. Prepared Soil for Trees and Shrubs: The prepared soil mix for the backfill of tree and shrub plant pits shall consist of a uniform mixture, by volume and loose measure, of the following components per cubic yard: 20 cubic feet of native/on-site soil, 7 cubic feet of organic soil conditioner, 4 lb. soil sulfur, and 3 lb. of ammonium phosphate fertilizer. Prepared planting soil shall be thoroughly blended prior to placement in plant pits.
- B. Prepared Topsoil for Trees and Shrubs: The prepared topsoil mix for the backfill of tree and shrub plant pits shall consist of a uniform mixture, by volume and loose measure, of the following components per cubic yard: 20 cubic feet of import topsoil, 7 cubic feet of organic soil conditioner, 4 lb. soil sulfur, and 3 lb. of ammonium phosphate fertilizer. Prepared topsoil shall be thoroughly blended prior to placement in plant pits.
- C. Prepared Planting Cacti and Stem Succulents: Prepared planting soil mix for cacti and stem succulents shall consist of on-site native soil with 0.25 lbs. of soil Sulfur incorporated into the soil backfill at each plant.
- D. Prepared Soil for Turf Areas: Prepared soil for turf areas shall be native, on-site soil with amendments incorporated as specified herein.

2.5 TOP-DRESSING MATERIALS

- A. Sand: Sand shall be washed mortar or concrete sand meeting the following gradation.

<u>Sieve Size</u>	<u>Percent Passing</u>
3/8"	100%
No. 4	95-100 %
No. 200	0-4%

2.6 NURSERY GROWN TREES, SHRUBS, AND CACTI

- A. Plant Form and Quality: All nursery grown trees, shrubs, cacti shall be normally developed individuals of their species. The habit of branching, development of foliage, and outline shall conform to grades of sound, first quality nursery stock for the subject species. All plants shall be free of disease, insects, insect eggs and larvae, animals, or animal damage.
- B. Plant Size: Plant size shall conform to the measurements specified on the plant list, and all provisions of "American Standard for Nursery Stock" by the American Association of Nurserymen, Inc. or the "Growers Committee Recommended Tree Specifications" by the Arizona Nursery Association, whichever is the more stringent specification. Minimum caliper and other dimensions shall be as noted on the drawings.
- C. Plant Root Systems: Container grown plants shall be in containers for a sufficient length of time for the root system to hold the earth when taken from the container but not long enough to become rootbound or cause a "hardening off" of the root system. No plant shall be loose in the root ball.

2.7 SALVAGED SPECIMEN PLANTS

- A. Salvaged Specimen Plants: Except as may be noted on the Project Plans, salvaged specimen trees, shrubs, stem succulents, and cacti shall be those plants salvaged from the project site in conjunction with this project.

2.8 TURF GRASS

- A. Turf Grass Sod: Sod shall be freshly cut sod of *Cynodon dactylon* Variety "Mid-Iron" (Mid-Iron Hybrid Bermuda Grass). Sod shall be cut from turf that is dense, healthy, and free of noxious weeds. Sufficient root system shall be provided to ensure the establishment of new turf after the sod has been installed. Sod shall be cut, delivered to the site and installed within a 24 hour period. Sod shall be protected from sun or wind-caused dehydration from the time of cutting to the time of installation.
1. Overseeding: Sod planted when the specified bermuda grass is dormant or nearing dormancy, as determined by the Owner's Representative, shall be overseeded with annual rye-grass. Overseeded sod shall be normal for the turf-grass industry.

2. Sod Netting: Sod shall be supplied without integrally netting. All netting or mesh used to separate sod rolls during transport shall be removed prior to sod installation. The netting material shall be removed from the project site.
- B. Turf Grass Sprigs: Sprigs shall be healthy living sprigs (stolons) of *Cynodon dactylon* Variety "Mid-Iron" (Mid-Iron Hybrid Bermuda Grass) and shall be supplied without adhering soil. Sprigs shall include two to three nodes and shall be 4 inches to 6 inches long. Sprigs shall be obtained from sources licensed to grow the specified variety and shall be cut from sod that is healthy and dense. Sprigs that are damaged during harvesting, transport or storage will be rejected.
- C. Turf Grass Seed: Seed shall be hulled *Cynodon dactylon* (Bermuda Grass) seed. The seed shall be from the latest season's crop and shall be delivered to the site in the original, unopened, containers bearing the supplier's guaranteed statement of analysis for: species mixture, purity, germination, weed content, and inert material content. The percentage of noxious weed seed allowable shall be as defined by current State of Arizona statutes related to agricultural seed. Seed that has become wet, moldy, or otherwise damaged during transit or storage will be rejected.

2.9 MATERIALS FOR TURF GRASS HYDROSEEDING AND/OR HYDROSPRIGGING

- A. Wood Fiber Mulch: Mulch shall be virgin or recycled wood cellulose fiber produced specifically for hydraulic application and shall not contain any germination or growth inhibiting substances. The mulch shall contain a temporary, non-toxic green dye to aid in the uniform application of the mulch slurry. When applied to the soil surface, the mulch shall form an absorbent cover that allows for the percolation of water into the underlying soil.
- B. Water: Water shall be potable.
- C. Turf Grass Sprigs: Sprigs shall be Hybrid Bermuda Grass sprigs as specified herein.
- D. Turf Grass Seed: Seed shall be Common Bermuda Grass seed as specified herein.

2.10 MATERIALS FOR NATIVE PLANT HYDROSEEDING

- A. Native Plant Seed: Seed shall be State Certified seed of the latest season's crop and shall be delivered to the site in the original, unopened, containers bearing the supplier's guaranteed statement of analysis for: species mixture, purity, germination, weed content, and inert material content. The percentage of noxious weed seed allowable shall be as defined by current State of Arizona statutes related to agricultural seed. Seed that has become wet, moldy, or otherwise damaged during transit or storage will be rejected.
- B. Seed Mix: The seed mix shall be as noted on the Project Plans.

- C. Wood Fiber Mulch: Mulch shall be virgin or recycled wood cellulose fiber produced specifically for hydraulic application and shall not contain any germination or growth inhibiting substances. The mulch shall contain a temporary, non-toxic green dye to aid in the uniform application of the mulch slurry. When applied to the soil surface, the mulch shall form an absorbent cover that allows for the percolation of water into the underlying soil.
- D. Water: Water shall be potable.

2.11 INORGANIC SURFACING MATERIALS

- A. Decomposed Granite Surfacing: Decomposed granite shall be durable granite material that has been screened to remove particles over one-quarter inch (1/4") in diameter or of the gradation noted on the Project Plans. Except as may be approved by the Owner's Representative, all material used on the project shall be from the same source and shall match the approved sample. The color of the decomposed granite shall be as noted on the Project Plans.
- B. Crushed Rock Surfacing: Crushed rock surfacing shall be durable granite material that has been crushed and screened to provide a uniform gradation of one-half inch (1/2"). Except as may be approved by the Owner's Representative, all material used on the project shall be from the same source and shall match the approved sample. The color of the crushed rock shall be as noted on the Project Plans.
- C. River Rock Surfacing and Rip-Rap: River rock for landscape surfacing and/or rip rap shall be Salt River Rock that has been screened to provide the range of rock sizes noted on the Project Plans. The river rock shall be free from soil, soil clumps, debris, and other extraneous materials. Except as may be approved by the Owner's Representative, all material used on the project shall be from the same source and shall match the approved sample.
- D. Angular Rock Rip-Rap: Angular rock for landscape surfacing and/or rip rap shall be native surface rock that has been screened to provide the range of rock sizes noted on the Project Plans. The rock shall be free from soil, soil clumps, debris, and other extraneous materials. Except as may be approved by the Owner's Representative, all material used on the project shall be from the same source and shall match the approved sample.

2.12 STAKING MATERIALS:

- A. Tree Stakes: Tree stakes shall be 2 inch (min.) diameter by 8 feet (min.) long peeled lodge pole pine stakes. Stakes shall be pressure treated with a wood preservative that is approved by state and federal regulatory agencies. Stakes longer than 8 feet shall be utilized, at no additional cost to the Owner, if required to properly support the trees installed on the project.

- B. Guy Wire: Guy Wire shall be 12 gauge, annealed, galvanized wire.
- C. Chaffing Guards: Chaffing guards shall be new, ½ or ¾ inch diameter, reinforced rubber or vinyl hose. Guards shall be 12 inches in length, minimum, as required to protect tree from damage by guy wires.

2.13 HORTICULTURAL CHEMICALS:

- A. Pre-emergent Herbicide: The pre-emergent herbicide shall be "Surflan" or approved equal.
- B. Post-emergent Herbicide: The post emergent herbicide shall be "Round-up" or approved equal.

PART THREE: EXECUTION

3.1 BLUE STAKING

- A. Blue Staking: The Contractor shall have the work area Blue Staked prior to the start of any landscape excavation work. Blue Staking shall be kept current during the course of the project. All utilities damaged by the Contractor shall be repaired or replaced by the Contractor, as required by the Owner or appropriate utility company, at the Contractor's expense.

3.2 INSPECTION OF EXISTING PLANTS

- A. Identification and Marking of Plants to be Preserved-in-Place: Individual plant specimens to be preserved-in-place, as shown on the Project Plans, have been identified with metal tags. The Contractor shall review the tagging, replace missing tags, and prominently mark with flagging tape or other approved method all specimen plants to be preserved-in-place.

3.3 PRUNING OF EXISTING TREES AND SHRUBS TO BE PRESERVED-IN-PLACE

- A. Pruning of Existing Trees and Shrubs to be Preserved-in-Place: Existing trees and shrubs to be preserved-in-place in close proximity to new park improvements shall be pruned to remove dead and broken limbs, to remove parasites (such as mistletoe), and to remove limbs that are in conflict with new park improvements such as walkways, drives, and parking lots. Pruned material shall be removed from the site or chipped and disposed of on-site. Disposal location and the manner of disposal shall be as approved the Owner's Representative.

3.4 REMOVAL OF TREES AND SHRUBS

- A. Removal of Existing Trees and Shrubs: Existing trees and shrubs not identified as to be preserved-in-place shall be removed. Cleared plant material shall be removed from the site or chipped and disposed of on-site. Disposal location and the manner of disposal shall be as approved the Owner's Representative.

3.5 PROTECTION OF PLANTS TO BE PRESERVED-IN-PLACE:

- A. Protection of Plants to be Preserved-in-Place: All plants designated as preserve-in-place shall be protected during project construction. The Contractor shall provide barricades around individual plants or areas. Plants that are damaged by the Contractor's activities shall be replaced with boxed specimen plants of the same species as the plant damaged. Replacement trees shall be 48" box size, minimum. Replacement shrubs shall be 24" box size, minimum. Replacement plants shall be provided and installed at the Contractor's expense.

3.6 LAYOUT:

- A. Layout: The Contractor shall layout his work, staking out the location of plant materials as shown on the drawings. Tree locations shall be approved by the Owner's Representative prior to the excavation of plant pits.

3.7 INSPECTION OF PLANT MATERIALS AND PLANT PITS:

- A. On-Site Inspection of Plant Materials at Time of Delivery: The Contractor shall notify the Owner's Representative of his intent to deliver plants to the project site 72 hours prior to the scheduled delivery time. The Owner's Representative may elect to inspect plants at the time of delivery. Plants that are rejected at the time of delivery shall be immediately removed from the project site.
- B. Inspection of Plant Pits: All plant pits shall be inspected and approved by the Owner's Representative prior to the placement of prepared soil or prepared topsoil and prior to the installation of plants.

3.8 PLANTING OF TREES, SHRUBS, AND CACTI:

- A. Seasonal Limitations: The planting of trees, shrubs, and cacti may be conducted at any time selected by the Contractor consistent with the overall project completion schedule. Planting operations conducted during extremely hot, cold, or windy periods shall be performed at the Contractor's risk. Plants which die or become damaged due to weather conditions shall be replaced by the Contractor at no additional cost to the Owner.

- B. Excavation of Plant Pits: Plant pits and plant beds shall be excavated to dimensions detailed. All rock in the excavated soil with a dimension of three inches (3") or larger, shall be removed and disposed of off-site.
- C. Tests for Drainage: When the excavation of plant pits is difficult and it appears that the drainage of irrigation water may not be adequate, the Owner's Representative may direct the Contractor to test selected plant pits for drainage. The testing of up to 25 percent of the total number of plant pits shall be performed by the Contractor, if requested, at no additional cost to the Owner. Testing shall consist of partially filling the pit with water and measuring the rate of infiltration. For acceptance, the pit shall drain at a rate of not less than 6" in 60 minutes. All pits which have not drained at the rate noted shall be deepened or relocated as directed by the Owner's Representative. Deepening shall consist of the construction of a 6" diameter "chimney" to the depth required to achieve an acceptable drainage rate. The deepening or relocation of up to 25 percent of the total number of plant pits shall be performed by the Contractor at no additional cost to the Owner.
- D. Plant Pit Sizes: Plant pit sizes shall be as indicated on the details for the plant type and container size noted.
- E. Removal of Plants from Containers: Plants in containers shall be removed from containers immediately prior to planting in a manner that will not injure the roots, stems, or foliage. Plants that are damaged during planting operations shall be replaced by the Contractor, at his expense, with plants of the same species, variety, and size as originally specified.
- F. Planting Depth: Trees and shrubs shall be set such that the top of the rootball relative to finished grade, is as detailed. Plants which settle shall be excavated, removed, and reset to match the detailed condition.
- G. Staking: Trees of the sizes noted herein as to be staked shall be staked and guyed the same day they are planted. The number of stakes and the manner in which trees are secured to stakes shall be as detailed.

3.9 PRUNING OF TREES AND SHRUBS

- A. Pruning of Trees and Shrubs: Trees and shrubs shall be pruned by qualified personnel as required to promote healthy plant development and form consistent with the park environment. Pruning work shall be performed in accordance with ANSI A-300 (Part 1)-2001: "Tree Care Operations - Tree, Shrub, and other Woody Plants Maintenance - Standard Practices."

3.10 PREPARATION OF AREAS FOR TURF GRASS PLANTING

- A. Completion of Soil Preparation and Irrigation System Installation: The planting of turf grass shall not commence until the soil preparation has been completed and the irrigation system in the area to be planted has been made fully operational.
- B. Schedule for Planting: Seed, sprigs, and sod that is not overseeded shall be planted between May 1 and July 15, only. Overseeded sod may be planted between October 1 and April 1.
- C. Ripping of Soils with Shallow Caliche or other Adverse Soil Conditions: When noted on the Project Plans, areas with shallow or other adverse soil conditions shall be ripped to a minimum depth of twelve inches (12") or to the depth noted on the plans, whichever is greater. The equipment used to scarify these areas shall have teeth with a spacing of not more than eighteen inches (18") on-center. If a single ripping bar is used, passes shall be made at 18" on-center. After ripping, the area shall be graded to the lines and grades shown or noted on the Project Plans.
- D. Subgrade Preparation: After completion of initial grading work, the subgrade in turf grass areas shall be ripped or scarified to a minimum depth of six inches (6") as required to eliminate surface compaction. If necessary the ripping / scarifying work shall be accomplished with two passes at right angles. Rock with a dimension of three inches 3" or greater shall be removed from soil surface.
- E. Application of Soil Amendments: Soil amendments shall be applied to the surface of the scarified subgrade at the rates noted on the Project Plans. If not noted on the plans, the following rates shall be utilized.

Soil Sulfur (DisperSul): 10 Lbs. per 1000 Square Feet
Fertilizer - Ammonium Phosphate (16-20-0): 5 Lbs. per 1000 Square Feet
Gypsum: 60 Lbs. per 1000 Square Feet
- F. Tilling of Amendments: Immediately following the application of soil amendments the area shall be tilled to thoroughly incorporate the amendments into the top six inches (6") of soil.
- G. Fine Grading and Rock Removal: The prepared soil shall be brought to the lines and grades shown on the plans. All rock with a dimension of 1" or larger shall be removed from the soil surface. Rock removal shall be repeated after the irrigation system has been made operational and the initial irrigation cycles conducted.
 - 1. Grading of Turf Grass Fields: The finished grades in all turf grass athletic fields shall be established using laser leveling techniques.

2. Surface Tolerances: The finished grades in turf grass areas shall be within plus or minus 1/10 of a foot of the grades noted on the drawings or interpolated from the contours shown on the drawings. Within the field areas the surface shall not vary more than 3/4 inch from the bottom surface of a ten foot (10') straightedge when the straightedge is laid on the prepared soil surface.

H. Coordination with Irrigation Work: The planting of turf grass shall not commence until the irrigation system has been made fully operational within the work area.

1. Pre-Irrigation of Areas to be Planted with Turf Grass: The irrigation system in all areas to be planted with turf grass shall be operated as required to wet the top four inches (4") of soil and as required for settlement of soil in graded areas. Areas that settle shall be filled or repaired as required to meet the surface tolerances noted herein.

3.11 HYDROSEEDING OF TURF GRASS AREAS

A. Turf Grass Hydroseeding: The hydroseed slurry shall be made immediately prior to its application and shall consist of the following materials.

Seed: 100 Lbs. Pure Live Seed (PLS) per Acre
Wood Fiber Mulch: 2000 lbs. per Acre
Water: As required for slurry application

B. Slurry Application: The hydroseed slurry shall be applied to provide uniform coverage over the designated area(s). The Contractor shall take appropriate measures to prevent seed and mulch from being applied to areas not designated to be planted with turf grass and shall clean-up all over-spray on walls, paved surfaces, or areas surfaced with decomposed granite.

C. Irrigation of Seeded Areas: Immediately following sprigging operations, the planted area shall be irrigated. Thereafter, the area shall be kept continuously moist until the turf grass has become established. After establishment, the area shall be irrigated daily, or at other appropriate interval, until Final Acceptance of the Work.

3.12 HYDROSPRIGGING OF TURF GRASS AREAS

A. Turf Grass Hydrosprigging: The hydrosprig slurry shall be made immediately prior to its application and shall consist of the following materials.

Sprigs: 50 Bushels (minimum) per Acre
Wood Fiber Mulch: 2000 lbs. per Acre
Water: As required for slurry application

- B. Slurry Application: The hydrosprig slurry shall be applied to provide uniform coverage over the designated area(s). The Contractor shall take appropriate measures to prevent sprigs and mulch from being applied to areas not designated to be planted with turf grass and shall clean-up all over-spray on walls, paved surfaces, or areas surfaced with decomposed granite.
- C. Irrigation of Sprigged Areas: Immediately following sprigging operations, the planted area shall be irrigated. Thereafter, the area shall be kept continuously moist until the turf grass has become established. After establishment, the area shall be irrigated daily, or at other appropriate interval, until Final Acceptance of the work.

3.13 SODDING OF TURF GRASS AREAS

- A. Placement of Sod: Sod shall be laid with tight joints and with ends of rolls offset from the adjacent end joint. Open joints shall be top-dressed with sand. Topdressing work shall be completed within 24 hours of the placement of sod. The installed sod shall be rolled with a water-filled, hand-propelled drum roller or other approved equipment.
- B. Irrigation of Sodded Areas: Immediately following sodding operations, the planted area shall be irrigated. Thereafter, the area shall be kept continuously moist until the turf grass has become established. After establishment, the area shall be irrigated daily, or at other appropriate interval, until Final Acceptance of the work.

3.14 TURF GRASS MOWING AND REFERTILIZATION

- A. Mowing: After initial establishment, the turf grass area shall be mowed not less than one time per week until Final Acceptance of the Work. Mowing shall be performed with a reel-type mower with no more than 50% of the blade length removed with each cutting.
- B. Refertilization: Forty-five days after the initial installation of the sod, it shall be refertilized with Ammonium Phosphate (16-20-0) fertilizer at a rate of 4 lbs. per 1000 square feet.

3.15 NATIVE PLANT HYDROSEEDING WORK

- A. Soil Preparation: All areas to be seeded shall be brought to the lines and grades shown on the plans. Areas used for haul roads or otherwise compacted during project construction shall be scarified to a depth of four inches (4"). Surface rock with a dimension of four inches (4") or greater, shall be removed and disposed of off-site.
- B. Hydroseed Slurry: The hydroseed slurry shall be made immediately prior to its application and shall consist of the following materials.

Native Plant Seed: Rates as specified on the Project Plans
 Wood Fiber Mulch: 2000 lbs. per acre
 Water: As required for slurry application

- C. Slurry Application: The hydroseed slurry shall be applied to provide uniform coverage over the designated area(s). The Contractor shall take appropriate measures to prevent seed from being applied to areas not designated to receive seed, and shall clean-up all over-spray on walls, paved surfaces, or areas surfaced with inorganic surfacing materials.

3.16 INORGANIC SURFACING MATERIALS

- A. Decomposed Granite Surfacing: All areas to be surfaced with decomposed granite shall be brought to the lines and grades shown on the drawings with allowances made for the depth of the surfacing material. Prior to the placement of the decomposed granite, the subgrade shall be treated with pre-emergent herbicide. The herbicide application shall be made in accordance with the manufacturer's written instructions and shall be made by an Applicator licensed by the State of Arizona. The decomposed granite shall be installed over the treated subgrade to the depth noted on the plans. The material shall be fine graded, wetted, and rolled with a hand propelled, water filled drum roller.
 - 1. Reveal at Paved Surfaces: A reveal shall be provided as the interface of decomposed granite / crushed rock areas and paved surfaces. The reveal dimension shall be as detailed. Where not detailed, the reveal shall be one inch (1").
- B. Crushed Rock, River Rock, and Rip-Rap Surfacing: All areas to be surfaced with crushed rock, river rock, or rip-rap shall be brought to the lines and grades shown on the drawings with allowances made for the depth of the surfacing material. Prior to the placement of the rock material, the subgrade shall be treated with pre-emergent herbicide. The herbicide application shall be made in accordance with the manufacturer's written instructions and shall be made by an Applicator licensed by the State of Arizona. The rock material shall be installed over the treated subgrade to the depth noted on the Project Plans.
 - 1. Reveal at Paved Surfaces: A reveal shall be provided as the interface of decomposed granite / crushed rock areas and paved surfaces. The reveal dimension shall be as detailed. Where not detailed, the reveal shall be one inch (1").

3.17 LANDSCAPE MAINTENANCE:

- A. Maintenance During Construction: The Contractor shall maintain all trees, shrubs, cacti, turf areas, hydroseeded areas, decomposed granite, and other landscape improvements during project construction. Maintenance shall include, but not be limited to: irrigation, fertilization, pruning, mowing, weed removal, clean-up, herbicide application, and repair of damaged staking. Plants or turf areas which die or become diseased during the construction period, shall be replaced at no additional cost to the Owner. Maintenance during construction shall continue until issuance of a Certificate of Substantial Completion.

- B. Inspection of Completed Landscape Planting Work: Upon completion of the landscape planting work, the Contractor shall notify the Owner's Representative who will schedule an inspection of the landscape improvements. During the inspection items which are incomplete or which must be repaired or replaced will be identified. Completion or correction of items noted will be required prior to the issuance of a Certificate of Substantial Completion.
- C. Maintenance after Substantial Completion: After issuance of a Certificate of Substantial Completion, the Contractor shall continue to operate and maintain the landscape improvements for a period of 60 consecutive calendar days. Maintenance shall include, but not be limited to: irrigation, fertilization, pruning, mowing, weed removal in decomposed granite or raked-earth areas, site clean-up, herbicide application, and repair of damaged staking. Plants or turf areas which die or become diseased during the maintenance period, shall be replaced at no additional cost to the Owner. After satisfactory completion of the maintenance period, the Owner will assume responsibility for landscape maintenance.
1. Landscape Maintenance Requirements: Activities and tasks associated with the 60 day maintenance period shall include, but not be limited to:
- a. Daily inspection of the site to check on site conditions and to perform remedial activities required to correct safety deficiencies and/or to address field conditions impacting the health of landscape plantings
 - b. Weekly mowing of all turf areas
 - c. Weekly removal of surface rock larger than one inch (1") from all turf areas
 - d. Weekly repair of surface irregularities within all turf areas
 - e. Weekly repair of all damaged tree staking
 - f. As-specified refertilization of all turf areas
 - g. As-needed replanting of all turf areas with insufficient turf grass development
 - h. As-needed replacement of dead, damaged, or diseased plants
 - i. As-needed pruning of plants as required for plant development as appropriate for park environment
 - j. As-needed application of horticultural chemicals to control diseases and pests
 - k. As-needed implementation of measures to protect plants from animal damage
 - l. As-needed repair of erosion
 - m. As-needed removal of weeds from areas with decomposed granite or other inorganic surfacing
 - n. As-needed fine grading of areas with decomposed granite or other inorganic surfacing
 - o. As-needed reseeding or repair of damage to areas hydroseeded with native plants
 - p. As-needed clean-up of landscape improvements and park facilities

2. Suspension of Initial Contractor Maintenance Period for Non-Compliance: Failure to comply with the maintenance requirements specified herein, as determined by the Owner's Representative, will result in the number of days being credited to the initial 60 day maintenance period being suspended. The suspension will remain in effect until such time as the remedial action(s) required by the Owner's Representative have been implemented by the Contractor.

3.18 STANDARDS FOR FINAL ACCEPTANCE OF THE LANDSCAPE IMPROVEMENTS

- A. Standards for Acceptance of Trees, Shrubs, and Cacti: Standards for acceptance of trees, shrubs, cacti, and other plants include, but are not limited to, the following:
 1. All trees, shrubs, cacti, and other plants are in place as shown on the Project Plans, including replacement plants, as required
 2. All tree stakes, guy wires, and chaffing guards are in-place and adjusted as shown on the Project Plans
 3. All trees have been pruned in accordance with these specifications
- B. Standards for Acceptance of Turf Grass: Standards for acceptance of turf grass areas include, but are not limited to, the following:
 1. Turf grass areas are free of surface rock larger than 1" in diameter
 2. Turf grass cover has successfully been established in all designated areas
 3. Surface irregularities (depressions, humps, etc.) in all turf grass areas have been repaired
 4. Turf grass has been mowed in accordance with these specifications
 5. Turf grass has been refertilized in accordance with these specifications
 6. Turf grass diseases have been successfully treated as required for a healthy stand of grass
- C. Standards for Acceptance of Areas with Inorganic Surfacing: Standards for acceptance of areas with inorganic include, but are not limited to, the following:
 1. Surfacing is free from erosion and displacement of material
 2. The finished grade of surfacing material has been maintained and the surface has been raked to provide neat and clean appearance
 3. The reveal where the surfacing material abuts paved surfaces has been maintained or re-established as detailed or noted on the Project Plans.
 4. Surfacing is free of weeds, turf grass, and other plants except as shown noted on the Project Plans

- D. Standards for Acceptance of Areas Seeded with Native Plants: Standards for acceptance of areas seeded with native plants include, but are not limited to, the following:
1. Areas are free from erosion and displacement of soil material
 2. Areas where seed and mulch have been displaced have been reseeded and remulched
 3. Native plants are established or germinating consistent with seasonal temperatures and precipitation

3.19 GUARANTEE:

- A. Contractor Installed Plant Material: The Contractor shall guarantee all Contractor installed plant materials for a period of one year commencing on the date of Final Acceptance. Plants which become diseased or which die during the guarantee period, for reasons other than neglect, improper maintenance, Acts-of-God, or causes deliberate, as determined by the Owner's Representative, shall be replaced by the Contractor at no additional cost to the Owner.

END OF SECTION - 02900

SECTION 02910 - NATIVE PLANT SALVAGE WORK

PART ONE: GENERAL

1.1 RELATED DOCUMENTS

- A. The General Provisions of the Contract, including all General and Supplementary Conditions and Supplements and Amendments to the General Conditions of the Contract apply to work specified in this section.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section includes, but is not limited to, the:
 1. Salvage, maintenance, and replanting of specimen native trees and shrubs
 2. Salvage, maintenance, and replanting of specimen cacti and stem succulents
 3. Set-up, operation, and removal of a temporary plant holding nursery

The extent of the native plant salvage work is shown on the drawings and details.

1.3 RELATED WORK

- A. Related work includes, but is not limited to, the:
 1. Construction / installation of landscape improvements.
 2. Installation of an automatic irrigation system.

1.4 COORDINATION

- A. The Contractor shall coordinate all native plant salvage work with the Owner's Representative. Work that is completed or in-progress shall be protected during the implementation of native plant salvage work. The Contractor shall notify the Owner's Representative of field conditions which prevent implementation of the native plant salvage and replanting work as shown.

1.5 REQUIRED LICENSURE

- A. All work shall be performed by a Contractor licensed by the State of Arizona Registrar of Contractors. The commercial license classification held by the Contractor shall be appropriate for the work to be performed.

1.6 COMPLIANCE WITH APPLICABLE REGULATIONS

- A. The Contractor shall comply with all local, state, and federal regulations regarding materials, methods of work, and disposal of excess and waste materials. The Contractor shall provide notices required by governmental authorities, request required inspections, obtain required permits, and pay for all associated fees.

1.7 REQUIRED EXPERIENCE

- A. The Contractor shall have prior experience with the successful implementation of native plant salvage work and shall provide the Owner's Representative with the project name, project location, client contact name, and client contact's phone number for not less than three (3) previous projects involving the sideboxing of specimen native trees and the transplanting of specimen cacti. The Owner reserves the right to reject any and all contractors who cannot demonstrate the specified prior experience.

1.8 TEMPORARY HOLDING NURSERY

- A. Holding Nursery: It shall be the responsibility of the Contractor to establish an on-site holding nursery for the temporary storage and maintenance of the salvaged plants.
 - 1. Nursery Location: The nursery shall be in the on-site location(s) shown on the plans.
 - 2. Nursery Security: It shall be the responsibility of the Contractor to provide security fencing for the temporary holding nursery.
 - 3. Water Source: The Contractor shall provide a temporary water source for the holding nursery and shall pay all charges and fees for temporary and/or permanent meters.
 - 4. Irrigation System: The on-site holding nursery shall be developed with an automatic drip irrigation system for all boxed trees and shrubs. The Contractor shall be responsible for the design, installation, operation, and subsequent removal of the irrigation system. The drip irrigation system shall be as approved by the Owner's Representative.
 - 5. Payment for Water Used at On-Site Holding Nursery: The Contractor shall be responsible for payment of all charges for water used at the on-site holding nursery.

1.9 VERIFICATION OF PLANTS TO BE SALVAGED

- A. Field Verification of Plants to be Salvaged: The specimen plants to be salvaged are shown of the Project Plans and are tagged with metal tags and colored flagging tape. The Contractor shall verify the location and identification number of all plants to be salvaged. The Contractor shall notify the Owner's Representative of all plants shown on the plans but not found or adequately identified in the field at the start of native plant salvage work.

1.10 PLANT REMOVAL PERMITS AND TAGS

- A. Plant Permits: The acquisition of all State of Arizona Department of Agriculture permits and tags, as may be required for the shipment of plants off-site including the shipment of plants to a temporary off-site holding nursery, shall be the responsibility of the Contractor.

1.11 SUBSTITUTE PLANTS

- A. Substitute Plants: The Contractor may propose the salvage of substitute plants for the specimen plants shown or listed on the project drawings if, in the opinion of the Contractor, the proposed substitute plant has a higher probability of survival than the designated plant. Substitute plants shall be of the same species and approximate size as the designated plant. Approval of the substitute plants will be at the sole discretion of the Owner's Representative. If approved, the substitution shall be made a no additional cost to the Owner.

1.12 EXCESS PLANTS

- A. Definition of Excess Plants: Plants within the approved Limits of Grading as shown on the drawings that are not identified as "Plants to be Salvaged" or "Plants to be Preserved-in-Place" are considered excess plants.
- B. Disposition of Excess Plants: Excess plants may be salvaged by the Contractor. Excess plants that are salvaged may be stored in the temporary holding nursery for potential use as replacement plants for salvaged plants that die during the plant guarantee period. Excess plants may also be salvaged and removed from the site by the Contractor. All labor, materials, and equipment used to salvage excess plants shall be at the Contractor's expense. The Contractor shall also be responsible for the acquisition of State of Arizona Department of Agriculture permits / tags required for the transport of excess plants off-site.

PART TWO: MATERIALS

2.1 PLANT MATERIALS TO BE SALVAGED

- A. Trees and Shrubs: Trees and shrubs to be salvaged are existing trees and shrubs on the project site. The approximate location and the species, size and type of plant are shown or noted on the project drawings.
- B. Cacti, Stem Succulents, and Related Plants: Cacti, stem succulents, and related plants to be salvaged are existing plants on the project site. The approximate location and the species, size, and type of plant are shown or noted on the project drawings.

2.2 BOXING MATERIALS

- A. Box Materials: The lumber and other materials used in the construction of boxes for specimen plants shall be new and shall be standard for the native plant salvage industry.
- B. Banding Materials: Banding shall be heavy duty steel banding.

2.3 PREPARED SOIL BACKFILL MATERIAL

- A. Prepared Soil Backfill for Trees and Shrubs: Soil backfill for salvaged trees and shrubs shall consist of a uniform mixture of native soil from the project site with soil amendments. Amendments and application rates shall be as follows:
 - 1. Soil Sulfur: 4.0 lbs. per Cubic Yard of Backfill
 - 2. Fertilizer (Ammonium Phosphate 16-20-0): 3.0 lbs. per Cubic Yard of Backfill
- B. Prepared Soil Backfill for Cacti, Stem Succulents, and Ocotillo: Soil backfill for cacti, stem succulents, and ocotillo shall be a uniform mixture of native on-site soil and amendments. Amendments and application rates shall be as follows:
 - 1. Soil Sulfur: 4.0 lbs. per Cubic Yard of Backfill

2.4 TEMPORARY IRRIGATION SYSTEM MATERIALS AND EQUIPMENT

- A. Irrigation Materials and Equipment: The materials and equipment used in the construction of the irrigation system for the temporary holding nursery shall be new, durable, and adequate for the provision of adequate water to the stored specimen plants. They shall be free of leaks and other defects.

PART THREE: EXECUTION

3.1 BLUE STAKING

- A. Blue Staking: The Contractor shall request that the project site be Blue Staked prior to the start of any excavation work. Blue Staking shall be kept current during the course of the project. All utilities damaged by the Contractor in conjunction with the native plant salvage work shall be repaired or replaced by the Contractor, as required by the Owner or appropriate utility company, at the Contractor's expense.

3.2 VEHICULAR ACCESS TO THE SITE

- A. Vehicular Access to the Site: Vehicular access to the plants to be salvaged shall be from within the approved limits of grading. Vehicular access to plants from areas outside the approved limits of grading is prohibited.

3.3 PROTECTION OF PLANTS AND NATURAL AREAS TO BE PRESERVED

- A. Protection of Plants and Natural Areas to be Preserved: All plants and natural areas outside the limits of grading, or designated as to be preserved-in-place, shall be protected during the implementation of the native plant salvage work.

3.4 APPROVED SALVAGING TECHNIQUES

- A. Tree Salvaging Techniques: All trees shall be salvaged using approved side-boxing techniques. The transplanting of trees with a tree spade will not be allowed.
- B. Shrub Salvaging Techniques: All shrubs shall be salvaged using approved side-boxing techniques. The transplanting of shrubs with a tree spade will not be allowed.
- C. Cacti, Stem Succulents, and Ocotillo Salvaging Techniques: Cacti, stem succulents, and ocotillo shall be salvaged using bare-root transplanting techniques. Other techniques may be used if approved by the Owner's Representative.

3.5 MINIMUM BOX SIZES FOR TREES AND SHRUBS

- A. Minimum Box Sizes for Trees: Except as approved by the Owner's Representative, minimum box sizes for trees shall be as listed below. Larger box sizes may be utilized if deemed necessary or appropriate by the Contractor. The minimum box sizes are based on caliper of the tree trunk (for single trunk trees) or the combined caliper of the two largest trunks (for multi-trunk trees) as follows:

<u>Tree Caliper</u>	<u>Minimum Box Size</u>
1.0" - 2.5"	24" Box
2.0" - 4.0"	30" Box
3.5" - 5.5"	36" Box
5.0" - 7.5"	42" Box
7.0" - 9.5"	48" Box
9.0" - 11.5"	54" Box
11.0" - 13.5"	60" Box
13.0" - 15.5"	66" Box
15.0" - 17.5"	72" Box

- B. Minimum Box Sizes for Shrubs: Box sizes for shrubs shall be as selected by the Contractor and as required to ensure the survival of the shrub after transplanting.

3.6 SALVAGING AND REPLANTING OF TREES AND SHRUBS

- A. Salvaging of Trees and Shrubs: Trees and shrubs shall be salvaged as follows:
 - 1. Pruning: The plant shall be pruned to facilitate salvage work. Pruning work shall be implemented in accordance with technical bulletin ANSI-A-300-1995.
 - 2. Excavation of Rootball: The sides of the rootball shall be excavated in a manner that maintains an intact root ball and soil mass.

3. Installation of Side Panels: The side panels of the box shall be installed and secured.
4. In-field Irrigation: The plant shall be watered daily, or at other interval approved by the Owner's Representative, for a period of not less than 28 days. The volume of water applied shall be sufficient to keep all soil within the box continuously wet.
5. Installation of Box Bottom Panel: Upon completion of the in-field holding and irrigation period, the roots extending below the bottom of the box shall be cut and the bottom box panel shall be installed and secured with metal banding.
6. Transporting to Holding Nursery: The boxed plant shall then be transported to the temporary on-site holding nursery where it can be irrigated daily. Lifting and transporting equipment shall be of the size, type, and capacity that will prevent damage to the plant and/or root ball box.
7. Maintenance of Trees and Shrubs in the Holding Nursery: Salvaged trees and shrubs shall be maintained in the holding nursery as specified herein.
8. Backfilling of Excavations: Excavations resulting from the removal of plants shall be backfilled. The backfilling of excavations shall be completed on the same day as the plant is removed. Backfilling operations in areas to be paved shall be performed in manner that ensure the compaction required under the pavement for the full depth of the excavation.
9. Replanting of Trees and Shrubs: Salvaged / boxed trees and shrubs shall be replanted in the locations shown or noted on the Project Plans. Replanting work shall not begin until the area to be planted has been brought to appropriate finished grade and the irrigation system has been made fully operational. Boxed trees and shrubs shall be transported and placed using equipment of a size, type, and capacity that will prevent damage to the plant and/or root ball box.

3.7 SALVAGE AND REPLANTING OF SAGUARO CACTI

- A. Salvaging and Replanting of Saguaro Cacti: Saguaro cacti shall be salvaged using bare root techniques. Sufficient root shall be included with the saguaro to facilitate the re-establishment of the plant after transplanting. Saguaro cacti shall be salvaged as follows:
 1. Marking of Plant Orientation: All saguaro cacti to be transplanted shall be marked with a small marking of water based paint to indicate the north side of the plant in its original location.
 2. Installation of Temporary Supports: Saguaro shall be supported as required for the safe implementation of the work. Support may consist of anchoring and bracing the saguaro to a truck-mounted moving rig.

3. Excavation of Root System: The root system shall be excavated as required to provide an adequate root system for survival after transplanting. Roots shall be cut with a sharp saw or shears.
4. Inoculation of Root System: Immediately following the removal of the saguaro from its original location, all cut or damaged portions of the root system shall be treated with soil sulfur and antibiotic.
5. Transporting of Saguaro Cacti Spears up to Eight Feet Tall: Saguaro cacti spears up to eight feet in height may be transplanted using a truck or trailer mounted saguaro transplanting rig or other equipment selected by the Contractor.
6. Transporting of Saguaro Cacti Spears Taller than Eight Feet and Saguaros with Arms: Except as approved by the Owner's Representative, all saguaro spears greater than eight feet in height and all saguaros with arms shall be moved using a truck or trailer mounted saguaro moving rig. The rig shall be capable of supporting and stabilizing the entire length of the main stem and all arms during the transplanting operation.
7. Replanting of Saguaro Cacti: Except as approved by the Owner's Representative, saguaro cacti shall be replanted in the final replanting locations as shown on the drawings. Saguaro cacti shall be replanted with not more than 1/10th of the green stem portion of the saguaro buried below grade, up to a maximum of two feet (2'-0"). The plant pit shall be backfilled with the prepared planting soil mix specified herein.
8. Orientation of Saguaro Cacti: The orientation of all saguaro cacti after transplanting shall match the orientation of the plant prior to transplanting.
9. Installation of Temporary Shade Cloth: The top of all transplanted saguaros shall be covered with shade cloth as detailed. The shade cloth shall be secured to the plant in a manner that does not cause injury.
10. Bracing: Temporary bracing shall be provided by the Contractor if needed to stabilize the saguaro after planting. Padding shall be provided to prevent the bracing from damaging the saguaro. Bracing and padding shall be subject to the review and approval of the Owner's Representative.

3.8 SALVAGING AND REPLANTING OF CACTI (OTHER THAN SAGUARO), STEM SUCCULENTS, AND OCOTILLO:

- A. Salvaging of Cacti, Stem Succulents, and Ocotillo: Cacti (other than saguaros), stem succulents, and ocotillo shall be salvaged using bare root techniques. Salvage and replanting work shall be performed as follows:

1. Excavation of Root System: The root system shall be excavated as required to provide an adequate root system for survival after transplanting. Roots shall be cut with a sharp saw or shears.
2. Healing-in of Plants at Holding Nursery: All salvaged cacti, ocotillo, and stem succulents shall be transported to the temporary on-site holding nursery and healed-in. Plants shall be periodically irrigated as required for the subject species. Plants shall be protected from damage.
3. Replanting of Cacti (other than Saguaros), Stem Succulents, and Ocotillo: Plants shall be replanted as detailed in the locations shown on the Project Plans. Irrigation shall be extended only to plants of those species noted on the drawings.

3.9 MAINTENANCE OF PLANTS IN THE ON-SITE HOLDING NURSERY

- A. Maintenance of Salvaged Trees and Shrubs: All trees and shrubs shall be irrigated daily or at other interval approved by the Owner's Representative. The daily application of water shall be sufficient to keep the entire soil volume within the root ball continuously moist. Irrigation applications shall be adjusted based on changes in weather conditions.
- B. Maintenance of Cacti, Stem Succulents, and Ocotillo: Plants shall be maintain in a manner appropriate for the species and as required to ensure the health of the plant.

3.10 MAINTENANCE

- A. Maintenance during Construction: The Contractor shall operate the on-site holding nursery and maintain all salvaged plants during construction and until all salvaged plants have been replanted on the project site.
- B. Inspection of Completed Replanting Work: Upon completion of the native plant salvage and replanting work, the Contractor shall notify the Owner's Representative who will schedule an inspection of the subject work. During the inspection, items which are incomplete or which must be repaired or replaced will be identified. Completion or correction of items noted will be required prior to the issuance of a Certificate of Substantial Completion.
- C. Maintenance after Substantial Completion: After issuance of a Certificate of Substantial Completion, the Contractor shall continue to operate and maintain the salvaged and replanted plants for a period of 60 consecutive calendar days. Maintenance shall include, but not be limited to: irrigation, fertilization, pruning, weed removal, and the as-needed application of horticultural chemicals. Salvaged and replanted plants which die or become diseased during the maintenance period, shall be replaced at no additional cost to the Owner. Replacement plants shall be of the same size and species as the plant being replaced. After satisfactory completion of the maintenance period, the Owner will assume responsibility for plant maintenance.

1. Suspension of Initial Contractor Maintenance Period for Non-Compliance: Failure to properly maintain the salvaged and replanted native plants as specified herein, as determined by the Owner's Representative, will result in the suspension of the number of days being credited towards the initial 60 day Contractor maintenance period. The suspension will remain in effect until such time as the remedial actions required by the Owner's Representative have been implemented by the Contractor.

3.11 GUARANTEE

- A. Salvaged Plant Guarantee: The Contractor shall guarantee all Contractor salvaged and replanted native plants for a period of one year commencing on the date of Final Acceptance. Plants which become diseased or which die during the guarantee period, for reasons other than neglect, improper maintenance, Acts-of-God, or causes deliberate, as determined by the Owner's Representative, shall be replaced by the Contractor at no additional cost to the Owner. Replacement plants shall be of the same size and species as the original plant. To satisfy the plant guarantee requirements, the plant shall:
 1. Exhibit healthy growth throughout the plant structure.
 2. Be free from significant die back within branches or portions of the plant.
 3. Be reasonably free from insects or other infestations that would reduce the plant's long-term potential for survival.
 4. Be reasonably free from physical damage to the trunk, branches, or foliage that would reduce the plant's long term potential for survival.

END OF SECTION 02910

SECTION 02920 - TALL-POTS

PART ONE: GENERAL

1.1 RELATED DOCUMENTS:

- A. The General Provisions of the Contract including all General and Supplementary Conditions and Supplements and Amendments to the General Conditions of the Contract apply to the work specified in this section.

1.2 DESCRIPTION OF WORK:

- A. The work under this section consists of furnishing all equipment, materials and labor necessary to complete the planting operation of tall-pot plants, and maintaining the tall-pot plants during the establishment period in accordance with plans and these technical specifications. Contractor shall be responsible for the purchase, transport, and installation to include planting of tall-pot plants with Liquid Fence Deer and Rabbit Repellant and (optional) wire cages, and DriWATER Irrigation Supplement, and doing all work required installing the tall-pot plants in strict compliance with the Plans and Specifications. The Project Manager shall approve all equipment and methods prior to performing the work. It is the contractor's responsibility to assure that the correct equipment to perform the work is on site and the properly trained personnel are present to operate that equipment.

Tall-pot plants shall remain at the nursery until twenty-four (24) hours prior to installation. Plants shall be placed by tall-pot pit at project site only when pit has been properly augured, watered and approved by Engineer. Contractor is certifying that pit is proper depth and properly watered within last 24 hours if a tree is placed by the hole.

All crewmembers at the project site to augur pits, water, and plant tall-pot plants should be trained by a supervisor in a language that they can clearly understand at the beginning of each workday. It should not be assumed that new crewmembers will get proper instruction from other crew members. Each crewmember shall be provided with a written checklist in the appropriate language. All crewmembers and other personnel shall be provided with a written "chain of command" sheet for each project site including the names and contact information for the Project Manager and the planting crew leader and supervisor. The supervisor shall check all tall-pot planting steps (with plans and specifications in hand) prior to planting each group of tall-pot plants.

- B. The work covered by this Section includes, but is not limited to, the:
 - 1. Fine grading of landscaped areas
 - 2. Material procurement
 - 3. Material testing

4. Soil preparation
 5. Planting of nursery stock
 6. Planting of tall-pots
- C. The extent of the landscape work is shown on the drawings and details.

1.3 RELATED WORK:

- A. Related work includes, but is not limited to:
1. Earthwork and site grading
 2. The installation of an automatic irrigation system
 3. The construction of other site improvements

1.4 COORDINATION:

- A. The Contractor shall coordinate all planting and related landscape work with the Project Manager. Work that is completed or in-progress shall be protected during installation of landscape plantings. The Contractor shall notify the Project Manager of field conditions, which prevent the installation of landscape improvements as shown.

1.5 REQUIRED LICENSURE:

- A. All work shall be performed by a Contractor licensed by the State of Arizona Registrar of Contractors. The commercial license classification held by the Contractor shall be appropriate for the work to be performed

1.6 COMPLIANCE WITH APPLICABLE REGULATIONS:

- A. The Contractor shall comply with all local, state, and federal regulations regarding materials, methods of work, and disposal of excess and waste materials. The Contractor shall provide notices required by governmental authorities, request required inspections, obtain required permits, and pay for all associated fees.

1.7 SUBMITTAL REQUIREMENTS:

- A. General: The Contractor shall make the submittals identified below. Submittals shall be made and approved prior to the delivery of material to the site and its incorporation into the work.
- B. Certificates of Compliance: Submit three (3) copies of the following certificates of compliance to the Owner's Representative for review and approval, as applicable.
1. Organic Soil Conditioner: The certificate, signed by the supplier, shall indicate that the material complies with the project specifications.

2. Fertilizer: The certificate shall be a copy of the manufacturer's guaranteed statement of analysis indicating compliance with these specifications.
3. Soil Sulfur: The certificate shall be a copy of the manufacturer's guaranteed statement of analysis indicating compliance with these specifications.
4. Gypsum: The certificate shall be a copy of the manufacturer's guaranteed statement of analysis indicating compliance with these specifications.

PART TWO: MATERIALS

2.1 TALL-POT PLANTS:

A. Work shall include, but is not limited to: site fine grading; material procurement; material testing; soil preparation; planting of nursery stock; planting of tall-pot plants with Liquid Fence Deer and Rabbit Repellent and (optional) wire cages; DriWATER Irrigation Supplement (SoilMoist® or other polymer-based products are NOT acceptable watering products/equivalents for arid land planting) installations to designated plants per the plans, details, and schedule, and complete replacement of each DriWATER Irrigation Supplement installation at the specified application frequency per the specifications; the fabrication and installation of landscaping protective cage installations; staking; seed mix installation; landscape surface preparation; landscape restoration where necessary; obtaining and paying all required permits and fees; providing all necessary traffic control; and maintenance, establishment and warranty of all landscape work. Subsection 3.1 – Tall-Pot Pits.

2.2 PRODUCTS:

A. DriWATER Irrigation Supplement: Furnish Time-Released Watering Packages (TRWP), water bound in the form of a solid gel that slowly converts to liquid when placed in the microbiological environment of natural soils. TRWP unit should consist of a one (1) quart 205# paper carton stock container measuring 2.765 by 2.764 by 7.625, biodegradable and printed with non-toxic vegetable ink. Ingredients are to consist of 97.85 percent potable water, two (2) percent cellulose gum and .15 percent aluminum sulfate. SoilMoist® or other polymer-based products are NOT acceptable watering products for arid land planting.

Known manufacturers are DriWATER Irrigation Supplement, Inc., Santa Rosa, CA (800) 255-8458; and Rain Bird Corporation (Rain Bird Irrigation Supplement) (800)724-6247, <http://www.rainbird.com/landscape/products/accessories/RBIS.htm>. Additional applications of TRWP shall be applied when directed by the Project Manager.

Several factors will govern the amount of DriWATER Irrigation Supplement required (e.g., plant species and size, soil type, sun and wind exposure, etc.). See manufacturer's recommendations for the amount of DriWATER Irrigation Supplement to be used.

The rate at which product liquefies varies based on several factors resulting in usage life that may be shorter than 30 or 90 days. Users are advised to check product at two weeks prior to the specified application time.

- * The recommended number of units is based on average needs of medium water use plant material.*
- * The amount of units used can be adjusted for extreme dry or wet climate conditions.*
- * Excessive heat, wind and plants with extensive foliage or fruit will require additional watering.*

B. Tall-pot plants: Five (5) quarts (minimum dependent on factors previously mentioned) - one (1) quart poured into the bottom of the tall pot pit prior to installation of tall pot plant and four (4) quarts installed at the soil surface - will be required at the time of the planting.

Additional applications (four [4] quarts minimum) are required during the maintenance/establishment period. Dependent on annual rainfall and duration of the wet season, more than one application may be needed. If planting occurs in late spring or during the summer and there hasn't been significant rain, DriWATER Irrigation Supplement should be replaced after 30-45 days.

PART THREE: EXECUTION

3.1 TALL-POT PITS:

A. Tall-pot pits shall be sized per the details, unless otherwise indicated in the Plans and Specifications. Generally, tall-pot plant pits are augured with an eight-inch diameter auger to a depth of 36-inches.

Tall-pot pit backfill may utilize on-site native soil as long as the soil meets the specifications for Native Planting Backfill Mix.

In rocky site conditions, on-site soils to be used for backfill may be screened to meet the specifications for maximum aggregate content in topsoil. Backfill mix shall consist of "native" soil (no caliche in backfill mix). Remove all inorganic material greater than 1" in size. Refer to Section 02900.2.1.B.1 for removal of sub-surface conditions affecting the installation or health of plants.

Nested or layered aggregate or other infertile materials located beyond the limits of the plant pit or within the potential root growth zone of the plants shall be considered a subsurface obstruction and removed as specified.

In areas of caliche or in hard dig conditions, tall-pot pits shall be over-excavated to a minimum depth of thirty-six (36) inches and a minimum width of forty-eight (48) inches, gypsum shall be evenly added to the bottom of the pit, and the pit backfilled with native planting backfill mix compacted to between eighty-five (85) percent and ninety

(90) percent compaction prior to auguring of tall pot pit. The tall-pot pit shall be filled with water and allowed to drain twice prior to installation of tall-pot plant. Contractor shall notify the Project Manager if pit does not drain within 48 hours.

All pits shall be excavated to the detailed dimensions with the sides of pit roughened or scarified. Prior to installing tall pot plants, the Project Manager is to visually inspect the tall-pot pits for proper size and depth. The Contractor shall make all necessary arrangements with the Project Manager to have the tall-pot pits inspected. The Project Manager may reject any tall-pot pits, which shall be re-excavated / prepared by the Contractor.

In areas of very soft, sandy, or cobble soils where the tall-pot pit caves in as the augur is removed, filling the hole with water prior to planting is not necessary. The tall pot pit shall be augured 8"-12" in diameter to the depth dimensioned on the plans and specifications to loosen the soil column. The pit shall then be cleared to the width dimensioned on the plans and specifications, and the tall pot plant placed into the pit. The pit shall then be backfilled with Native Backfill Mix while lifting the tall-pot tube and filling the pit with water creating a Native Backfill Mix slurry. The tall-pot pit shall be thoroughly watered at the end of each days planting session.

3.2 TALL-POT WATERING:

- A. Tall-Pot Plants shall be thoroughly "soak watered" until water drips out the bottom of the tube in the nursery one day prior to delivery to project site, or at the project site just after delivery.

Once the Tall-Pot Plant is in the pit and the pit has been back filled, the plant must be "soak watered" to remove all air pockets in the planting pit soil column per the Plans and Specifications. Use of a water sprayer at the base of the plant is NOT acceptable for this step.

Where no irrigation system is provided, one (1) quart of DriWATER Irrigation Supplement shall be poured into the bottom of the pit prior to inserting the tall pot plant, and four (4) quarts of DriWATER Irrigation Supplement shall be installed at grade level per the plans and specifications and the manufactures recommendations. Installation of product should be in accordance with the Plans and Specifications and the manufacturer recommendations.

3.3 TALL-POT PLANT PROTECTIONS:

- A. Biodegradable plant protectors are no longer specified for tall pot planting.

Liquid Fence Deer and Rabbit Repellant shall be sprayed according to the manufacturer's recommendation on the foliage of all tall-pot plants planted that day.

Liquid Fence shall be reapplied according to the manufacturer's recommendation or per the contract specifications.

Wire cages are optional and may be installed around Tall-Pot Plants during planting to help prevent damage from herbivores. If wire cages are used they shall be two (2) feet in diameter and three (3) feet tall. Cages shall have open tops to prevent damage to the tip of the plant. Cages shall be secured at the project site by burying the cages three (3) inches below soil grade. Wire cages shall be marked with a red flag.

Growth of plants inside wire cages must be monitored and the cages removed if they begin to restrict plant growth, or after one full growing season (12-15 months) whichever comes first.

3.4 PLANT GUARANTEE AND MAINTENANCE:

- A. Unless otherwise authorized, the Contractor shall maintain and be responsible for all landscape areas and materials on a continuous basis as installations are completed during the course of work and until final project acceptance.

All existing and new plants shall be kept in a healthy, growing condition by watering, pruning (**do not prune tall pot plants**), spraying, weeding and any other necessary operations or maintenance. Plant basins (including tall-pot basins) and beds shall be kept free of weeds, and other undesirable vegetation. Plants shall be inspected at least once per week and appropriate maintenance performed.

Final Maintenance Inspection: At the end of the ninety (90) day maintenance/establishment period a final inspection will be performed. If, after this inspection, the Owner agrees that all planting areas are weed free and plant materials are in satisfactory growing condition, written Notice of Acceptance will be given to the Contractor for landscape installation.

3.5 WARRANTY:

- A. Warranty plant materials to be in a healthy thriving condition for specific periods at or after the completion of the maintenance/establishment period as follows:

Tall-pot plant material – one year from the date of substantial completion.

3.6 PLANT ESTABLISHMENT PERIOD:

- A. The Contractor shall request an inspection by the Engineer whenever substantial completion of the planting and related work has been accomplished. After this initial inspection, and subject to the Engineer's approval of the work, the Engineer will issue a written field notification to the Contractor setting the effective, beginning date for plant

establishment. The plant establishment period shall be for a period of ninety (90) calendar days, but is subject to extension by the Engineer if the landscape areas are improperly maintained, appreciable plant replacement is required, or other corrective work becomes necessary.

At final project acceptance or at the end of the plant establishment period, the Project Manager or representative will make a final acceptance inspection of the planted areas.

END OF SECTION - 02920

SECTION 13125 - PRE-ENGINEERED RAMADAS

PART ONE: GENERAL

1.1 RELATED DOCUMENTS

- A. The General Provisions of the Contract, including all General and Supplementary Conditions and Supplements and Amendments to the General Conditions of the Contract apply to the work specified in this section.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section includes, but is not limited to, the:
 - 1. Preparation and submittal of shop drawings for the pre-engineered ramada structure and associated foundations
 - 2. Acquisition of permits as required for ramada construction
 - 3. Construction of concrete foundations and floor slabs
 - 4. Supply and installation of the pre-engineered ramada structure
- B. The extent of the work is shown on the drawings and details.

1.3 RELATED WORK

- A. Related work includes, but is not limited to, the:
 - 1. Construction of hardscape improvements
 - 2. Construction of landscape improvements
 - 3. Installation of a new irrigation system

1.4 COORDINATION

- A. The Contractor shall coordinate his work with the Owner's Representative. Work that is completed or in-progress shall be protected during the installation of pre-engineered ramada structure(s). The Contractor shall notify the Owner's Representative of field conditions which prevent the installation of the ramada as shown.

1.5 REQUIRED LICENSURE

- A. All work shall be performed by a Contractor licensed by the State of Arizona Registrar of Contractors. The commercial license classification held by the Contractor shall be appropriate for the work to be performed.

1.6 COMPLIANCE WITH APPLICABLE REGULATIONS

- A. The Contractor shall comply with all local, state, and federal regulations regarding materials, methods of work, and disposal of excess and waste materials. The Contractor shall obtain and pay for all required inspections, permits, and fees and shall provide notices required by governmental authorities.

1.7 APPLICABILITY OF STANDARD DRAWINGS AND DETAILS

- A. Applicability of Standard Drawings and Details: Standard Drawings and Details as adopted and published by the Pima County Natural Resources, Parks, and Recreation Department may be included with, or referenced on, the Project Plans. These Standard Drawings and Details are intended to show the overall size, configuration, and general features associated with the proposed ramada structure. These Standard Drawings and Details are intended to be used as the basis for the preparation of sealed shop drawings. The approved shop drawings shall govern the fabrication, construction, and installation of the pre-engineered ramada.

1.8 REFERENCE STANDARDS

- A. Reference Specifications: The following specifications are, by reference, made a part of these specifications. To the extent applicable, all project work shall be implemented in accordance with the specifications listed below.
- B. American Institute of Steel Construction (AISC)
 - 1. AISC Standard Specifications
- C. American Iron and Steel Institute (AISI)
 - 1. AISI Specifications for Cold Formed Members
- D. American Welding Society (AWS)
 - 1. AWS Specifications for Structural Welding
- E. American Concrete Institute (ACI):
 - 1. ACI-315-92 Details and Detailing of Concrete Reinforcement
- F. Steel Structures Painting Council
 - 1. SSPC-SP10 Specification for Near-White Blast Cleaning
- G. American Society for Testing and Materials
 - 1. ASTM-A307 Specification for Carbon Steel Externally Threaded Fasteners
 - 2. ASTM-A-325 Specification for High Strength Bolts for Structural Steel Joints
 - 3. ASTM-A-500 Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

4. ASTM-A-570 Specification for Hot-Rolled Carbon Steel Sheet, Structural Quality
- H. Pima County - City of Tucson
1. Pima County - City of Tucson - Standard Specifications for Public Improvements
 2. Pima County - City of Tucson - Standard Details for Public Improvements

1.9 SUBMITTAL REQUIREMENTS:

- A. General: The Contractor shall make the submittals identified below. Submittals shall be made and approved prior to the delivery of materials to the site and its incorporation into the work.
- B. Shop Drawings: The Contractor shall obtain from the pre-engineered ramada structure manufacturer complete shop drawings for the proposed ramada. The shop drawings shall be sealed by an Arizona Registered Professional Structural Engineer and shall be submitted to the Owner for review and approval. The information to be included on the Shop Drawings shall include, but may not be limited to, the items listed below:
1. Code Analysis Data: The shop drawings shall list the name and date of all applicable codes used in the design of the building.
 2. Design Load Data: The shop drawings shall identify design loads for roof dead load, roof live load, wind load, and seismic load.
 3. Structural Notes and Calculations: The shop drawings shall include general notes related to the ramada frame, the concrete foundation, reinforcing steel, welding, and other structural features.
 4. Foundation Plans and Details: The shop drawings shall include complete details for ramada foundations and footings.
 5. Ramada Elevations: The shop drawings include scaled, dimensioned elevations of the proposed ramada.
 6. Framing Plans: The shop drawings shall include plans and details showing the configuration and size of all columns, beams, and other structural members. The plans shall indicate materials to be used as fasteners.
 7. Roofing Plans: The shop drawings shall include details for the installation of the metal roof deck and all other roofing system components.
 8. Electrical Plans: Where applicable, the shop drawings shall include plans, details, diagrams, and calculations for the ramada electrical and lighting systems.

- C. Color Samples: The Contractor shall submit color samples for the ramada frame color and the ramada metal roofing. Where the colors have been noted on the Project Plans, the samples shall be for the Owner's verification. Where colors have not been noted on the Project Plans, a complete set of standard color options shall be submitted for the Owner's review and selection.

1.10 APPLICABLE CODES AND STANDARDS:

- A. Applicable Codes: Except as modified by the project drawings, or other project specific documents, the pre-engineered ramada shall be designed and constructed to comply with the:
 - 1. International Building Code (IBC): 2003 or most recent edition.
 - 2. National Electric Code (NEC): 2005 or most recent edition

1.11 BUILDING PERMITS:

- A. Permits for Pre-Engineered Ramadas with Prior State of Arizona Approval: The Contractor shall be responsible for the processing of shop drawings for buildings with prior approval by the State of Arizona Office of Manufactured Housing. Processing shall be as required to obtain permits from local government authorities for utility connections and other features not covered by State of Arizona prior approval(s).
 - 1. Inspections: The Contractor shall be responsible for scheduling and coordinating all State of Arizona required inspections. Reports, signed by the State of Arizona's authorized inspector, demonstrating compliance with applicable State requirements shall be submitted to the Owner, prior to Substantial Completion of the Work.
- B. Permits for Pre-Engineered Ramadas without Prior State of Arizona Approval: The Contractor shall be responsible for submitting shop drawings and obtaining permits for pre-engineered ramadas that do not have prior State of Arizona approval. The shop drawings and associated reports and calculations shall be complete and shall include all information required by Pima County (or other local jurisdiction) for drawing approval and issuance of required permits.
 - 1. Inspections: The Contractor shall be responsible for scheduling and coordinating all required inspections. Inspections, approvals, and documentation shall be as required by the subject building permit.

PART TWO: MATERIALS

2.1 RAMADA - GENERAL REQUIREMENTS

- A. Ramada Manufacturer and Model Number: The pre-engineered ramada manufacturer and model number shall be as noted on the Project Plans.
- B. Ramada Size: The length, width, column spacing, eave height, overall roof height, and roof pitch shall be as noted on the Project Plans.
- C. Ramada Roof Configuration: The ramada roof type and configuration shall be as noted on the Project Plans.

2.2 STRUCTURAL FRAMING

- A. Structural Framing: Framing members shall be constructed of structural steel tube in compliance with ASTM A500, Grade B or cold-rolled box sections in compliance with ASTM A570, Grade 55.
 - 1. Framing Member Shapes and End Conditions: All ramada framing members shall be tubes or similar shapes without exposed flanges that could attract nesting birds or insects. All tube ends shall be closed with a welded plate to prevent access by birds or insects.
 - 2. Factory Finish on Frame Members: All frame members shall be powder coated. The steel frame shall be shot blasted in accordance with SSPC-SP-10 to near white conditions. The powder coating shall then be applied using an electrostatic spray process and then baked to 450 degrees F. to fuse it to the metal.
 - 3. Frame Color: The color of all powder coated frame members shall be as noted on the Project Plans or as selected by the Owner.

2.3 FASTENERS

- A. Fasteners: Fasteners shall be structural bolts in compliance with ASTM A325, or anchor bolts, self-tapping screws, or rivets in accordance with ASTM A307.

2.4 ROOFING SYSTEM

- A. Metal Roofing Panels: The ramada roof shall consist of a ribbed metal roofing system with raised ribs at 12" on-center. The rib height shall be approximately 1-3/16" high. Roof panels shall be constructed of 22 gauge sheet steel. The metal panels shall be factory primed with a Galvalume or other approved primer. The top surface of the panel shall be finished with a Kynar paint system. Color shall be as noted on the Project Plans or as selected by the Owner.

- B. Roof Trim: The roof shall be furnished with all required ridge caps, eave trim, and other accessories. The metal trim shall be of the same gauge and finish as the roofing panels.
- C. Fasteners and Sealants: Fasteners and sealants shall be as recommended by the ramada / roofing system manufacturer and in accordance with the approved shop drawings.

2.5 FOUNDATIONS

- A. Reinforced Concrete Foundations: The reinforced concrete foundations shall be in accordance with the approved shop drawings.
- B. Anchor Bolts: Anchor bolts shall be in accordance with the approved shop drawings.

2.6 RAMADA LIGHTING AND ELECTRICAL SYSTEMS

- A. Compliance with Applicable Codes: All electrical and lighting system components shall comply with applicable codes.
- B. Electrical Service to Ramada Structure: The electrical service to the ramada structure shall be as noted and shown on the Project Plans.
- C. Ramada Light Fixtures: The ramada light fixture shall be a ceiling mounted light fixture. The light fixtures shall be housed in a vandal resistant housing with a UV stabilized, injection molded, high strength polycarbonate lens. Fasteners shall be vandal resistant. The fixture manufacturer, model number, and lamp type shall be as noted on the Project Plans.
- D. Electrical Outlets: Electrical outlets shall be provided as noted and detailed on the Project Plans. The outlets shall be of the GFI type and shall be enclosed in weatherproof boxes.
- E. Conduit: Conduit for power distribution to the ramada light fixture and outlets shall be rigid steel conduit. All exposed conduit shall be securely anchored to the ramada frame in accordance with the approved shop drawings.
- F. Lighting Controls: Controls for the ramada lighting shall be as noted on the Project Plans. Controls shall include a photocell for automatic turn-on when at dusk and a timer for shut-off at the designated park closing time.

PART THREE: EXECUTION

3.1 FABRICATION

- A. **General:** All base plates, stiffener plates, U-Clips, and end plates shall be factory welded into place. Holes for bolted connections shall be factory cut.
- B. **Welds:** All welded connections shall be made by certified welders in accordance with AWS Specifications and under the supervision of an AWS certified welding inspector.

3.2 BLUE STAKING:

- A. **Blue Staking:** The Contractor shall request that the project site be Blue Staked prior to the start of pre-engineered ramada structure construction. Blue Staking shall be kept current during the course of the project. All utilities damaged by the Contractor shall be repaired or replaced by the Contractor, as directed by the Owner or appropriate utility company, at the Contractor's expense.

3.3 LAYOUT:

- A. **Layout:** The Contractor shall lay out the location of the pre-engineered ramada structure indicating the location and elevation of the proposed ramada floor. The Contractor shall notify the Owner's Representative who will inspect and approve (and/or adjust) the location of the structure.

3.4 FOUNDATION CONSTRUCTION:

- A. **Foundation Construction:** The reinforced concrete foundations shall be constructed in accordance with the approved shop drawings. Manufacturer provided templates shall be used to locate and secure anchor bolts, as applicable.

3.5 ON-SITE ASSEMBLY AND ERECTION OF RAMADA STRUCTURE

- A. **Installation of the Pre-Engineered Structures:** The installation work shall be supervised and performed by qualified individuals with experience on similar projects.
- B. **Touch-up and Repair:** Ramada components that are damaged during shipment and/or erection shall be touched-up using manufacturer approved paints and finishes. Components damaged in a manner that precludes touch-up work, as determined by the Owner's Representative, shall be replaced with new components.

3.6 FLOOR SLAB CONSTRUCTION AND FINISHING

- A. Subgrade Preparation: Prior to the construction of the ramada floor slab, the subgrade shall be fine graded, prepared, and compacted as noted on the Project Plans. The subgrade work shall be inspected and tested prior to the construction of the floor slab.
- B. Floor Slab Construction and Finishing: The ramada floor slab shall be constructed, finished and cured as noted and detailed on the Project Plans.

3.7 ELECTRICAL SERVICE TO RAMADA LIGHTING AND OUTLETS

- A. Electrical Service to Ramada Lighting and Outlets: The electrical service to the ramada lighting and electrical outlets shall be as shown or noted on the Project Plans and as required by applicable code requirements.

3.8 WORKMANSHIP AND PROTECTION OF EXISTING IMPROVEMENTS:

- A. Protection of Existing Improvements: Prior to the start of the pre-engineered ramada structure installation, the location of all subsurface improvements shall be verified. Surface and subsurface improvements shall be protected during construction. Repairs to damaged improvements shall be performed by the Contractor, as directed by the Owner, at the Contractor's expense.

3.9 GUARANTEE:

- A. Guarantee: The pre-engineered ramada structure shall be guaranteed to be free from defects in materials and workmanship for a period of two (2) years. A written letter of guarantee shall be submitted to the Owner's Representative prior to Final Acceptance of the Work.

END OF SECTION - 13125

SECTION 13126 - PRE-ENGINEERED SHADE CANOPIES

PART ONE: GENERAL

1.1 RELATED DOCUMENTS

- A. The General Provisions of the Contract, including all General and Supplementary Conditions and Supplements and Amendments to the General Conditions of the Contract apply to the work specified in this section.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section includes, but is not limited to, the:
 - 1. Preparation and submittal of shop drawings for the pre-engineered shade canopies
 - 2. Acquisitions of permits as required for shade canopy construction
 - 3. Construction of concrete foundations
 - 4. Supply and installation of the pre-engineered shade canopies
- B. The extent of the work is shown on the drawings and details.

1.3 RELATED WORK

- A. Related work includes, but is not limited to, the:
 - 1. Installation of playground structures and resilient surfacing
 - 2. Construction of landscape, hardscape, and irrigation improvements

1.4 COORDINATION

- A. The Contractor shall coordinate his work with the Owner's Representative. Work that is completed or in-progress shall be protected during the installation of pre-engineered shade canopies. The Contractor shall notify the Owner's Representative of field conditions which prevent the installation of the shade canopies as shown.

1.5 REQUIRED LICENSURE

- A. All work shall be performed by a Contractor licensed by the State of Arizona Registrar of Contractors. The commercial license classification held by the Contractor shall be appropriate for the work to be performed.

1.6 COMPLIANCE WITH APPLICABLE REGULATIONS

- A. The Contractor shall comply with all local, state, and federal regulations regarding materials, methods of work, and disposal of excess and waste materials. The Contractor

shall obtain and pay for all required inspections, permits, and fees and shall provide notices required by governmental authorities.

1.7 APPLICABILITY OF STANDARD DRAWINGS AND DETAILS

- A. Applicability of Standard Drawings and Details: Standard Drawings and Details as adopted and published by the Pima County Natural Resources, Parks, and Recreation Department may be included with, or referenced on, the Project Plans. These Standard Drawings and Details are intended to show the overall size, configuration, and general features associated with the proposed shade canopy. These Standard Drawings and Details are intended to be used as the basis for the preparation of sealed shop drawings. The approved shop drawings shall govern the fabrication, construction, and installation of the pre-engineered shade canopy.

1.8 REFERENCE SPECIFICATIONS

- A. Reference Specifications: The following specifications are, by reference, made a part of these specifications. To the extent applicable, all project work shall be implemented in accordance with the specifications listed below.
- B. American Institute of Steel Construction (AISC)
1. AISC Standard Specifications
- C. American Iron and Steel Institute (AISI)
1. AISI Specifications for Cold Formed Members
- D. American Welding Society (AWS)
1. AWS Specifications for Structural Welding
- E. American Concrete Institute (ACI):
1. ACI-315-92 Details and Detailing of Concrete Reinforcement
- F. Steel Structures Painting Council
1. SSPC-SP10 Specification for Near-White Blast Cleaning
- G. American Society for Testing and Materials
1. ASTM-A-36 Specification for Structural Steel
2. ASTM A-53 Specification for Pipe, Black Steel and Galvanized, Welded and Seamless
3. ASTM-A307 Specification for Carbon Steel Externally Threaded Fasteners
4. ASTM-A-500 Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
5. ASTM-A-570 Specification for Hot-Rolled Carbon Steel Sheet, Structural Quality

6. ASTM-F-1487 Standard Consumer Product Safety Performance Specification for Playground Equipment for Public Use

H. Pima County - City of Tucson

1. Pima County - City of Tucson - Standard Specifications for Public Improvements
2. Pima County - City of Tucson - Standard Details for Public Improvements

1.9 APPLICABLE CODES:

- A. Applicable Codes: Except as modified by the project drawings, or other project specific documents, the pre-engineered ramada shall be designed and constructed to comply with the International Building Code (IBC), 2003 or most recent edition.

1.10 SUBMITTAL REQUIREMENTS:

- A. General: The Contractor shall make the submittals identified below. Submittals shall be made and approved prior to the delivery of materials to the site and its incorporation into the work.
- B. Shop Drawings: The Contractor shall obtain from the pre-engineered shade canopy manufacturer complete shop drawings for the proposed structure. The shop drawings shall be sealed by an Arizona Registered Professional Structural Engineer and shall be submitted to the Owner for review and approval. The information to be included on the Shop Drawings shall include, but may not be limited to, the items listed below:
1. Structural Notes and Calculations: The shop drawings shall include general notes related to the shade canopy frame, the concrete footings, and other structural features.
 2. Foundation Plans and Details: The shop drawings shall include complete details for shade canopy footings.
 3. Shade Canopy Elevations: The shop drawings include scaled, dimensioned elevations of the proposed shade canopy.
 4. Framing Plan: The shop drawings shall include plans and details showing the configuration and size of all columns and other structural members. The plans shall indicate hardware to be used for frame member connections.
 5. Shade Fabric Information: The shop drawings shall include information related to the shade fabric and its connection to the shade canopy frame.
 6. Structural Calculations: The shop drawings shall be provided with structural calculations for the shade canopy structure.

- C. Color Samples: The Contractor shall submit color samples for the shade canopy frame color and the shade fabric. Where the colors have been noted on the Project Plans, the samples shall be for the Owner's verification. Where colors have not been noted on the Project Plans, a complete set of standard color options shall be submitted for the Owner's review and selection.

1.11 BUILDING PERMITS:

- A. Permits for Shade Canopies: The Contractor shall be responsible for submitting shop drawings, structural calculations, and other information as required to obtain the permits necessary for the installation of the shade canopies.
 - 1. Inspections: The Contractor shall be responsible for scheduling and coordinating all required inspections. Inspections, approvals, and documentation shall be as required by the subject building permit.

PART TWO: MATERIALS

2.1 SHADE CANOPIES - GENERAL REQUIREMENTS

- A. Shade Canopy Manufacturer and Model Number: The shade canopy manufacturer and model number shall be as noted on the Project Plans.
- B. Shade Canopy Size: The length, width, column spacing, eave height, overall roof height, and roof pitch shall be as noted on the Project Plans.
- C. Shade Roof Configuration: The shade canopy roof type and configuration shall be as noted on the Project Plans.

2.2 STRUCTURAL FRAMING

- A. Steel Columns: Steel columns shall be constructed of structural steel tube in accordance with ASTM-A-53, Grade B.
- B. Other Structural Members: Structural members other than columns shall be structural steel in accordance with ASTM-A-36.
 - 1. Framing Member Shapes and End Conditions: All shade canopy framing members shall be tubes or similar shapes without exposed flanges that could attract nesting birds or insects. All tube ends shall be closed with a welded plate to prevent access by birds or insects.

C. Factory Finish on Frame Members: All frame members shall be powder coated. The steel frame shall be shot blasted in accordance with SSPC-SP-10 to near white conditions. The powder coating shall then be applied using an electrostatic spray process and then baked to 450 degrees F. to fuse it to the metal.

1. Frame Color: The color of all powder coated frame members shall be as noted on the Project Plans or as selected by the Owner.

2.3 FASTENERS

A. Fasteners: Fasteners shall be structural bolts in compliance with ASTM-A-307.

2.4 SHADE FABRIC

A. Shade Fabric: The shade fabric shall be constructed from high density polyethylene with ultraviolet (UV) inhibiting additives. The fabric shall utilize a monofilament and tape construction that is knitted in a manner that will prevent unraveling if cut. The fabric shall meet the following standards:

1. Finish: Stentored
2. Tear Strength - Warp: 220 lbs.
3. Tear Strength - Weft: 462 lbs.
4. Burst Strength: 37.7 PSIA
5. Roll Width: 9.8 feet
5. Minimum Temperature: - 22 degrees F.
6. Maximum Temperature: +176 degrees F.

B. Shade Fabric Edges: Shade fabric edges shall be strengthened with a non-tear vinyl material.

C. Fabric Sleeves and Pockets: All fabric sleeves and pockets shall be reinforced with protective webbing.

D. Shade Fabric Color: The shade fabric color shall be as noted on the Project Plans or as selected by the Owner's Representative.

2.5 WIRE ROPE AND HARDWARE:

A. Wire Rope and Hardware: Wire rope shall be 1/4" nominal diameter, 7 strand, with 19 wires per strand, minimum. The wire rope shall have a minimum tensile strength of 9,000 lbs. Wire rope fittings and cable hardware shall be in accordance with the shade canopy manufacturer's recommendations.

2.6 FOUNDATIONS

- A. Reinforced Concrete Foundations: The reinforced concrete foundations shall be in accordance with the approved shop drawings.
- B. Anchor Bolts: Anchor bolts shall be in accordance with the approved shop drawings.

PART THREE: EXECUTION

3.1 FABRICATION

- A. General: All base plates, and plates for bolted connections shall be factory welded into place. Holes for bolted connections shall be factory cut.
- B. Welds: All welded connections shall be made by certified welders in accordance with AWS Specifications and under the supervision of an AWS certified welding inspector.

3.2 BLUE STAKING:

- A. Blue Staking: The Contractor shall request that the project site be Blue Staked prior to the start of pre-engineered shade canopy construction. Blue Staking shall be kept current during the course of the project. All utilities damaged by the Contractor shall be repaired or replaced by the Contractor, as directed by the Owner or appropriate utility company, at the Contractor's expense.

3.3 LAYOUT:

- A. Layout: The Contractor shall lay out the location of the pre-engineered shade canopy for the Owner's review and approval. The Contractor shall confirm that all shade canopy columns are outside the designated fall zone of the playground equipment being covered. The Contractor shall also confirm that the height of the canopy above the play structure(s) is in accordance with ASTM-F-1487.

3.4 FOUNDATION CONSTRUCTION:

- A. Foundation Construction: The reinforced concrete foundations shall be constructed in accordance with the approved shop drawings. Manufacturer provided templates shall be used to locate and secure anchor bolts, as applicable.
- B. Foundations in Areas with Resilient Surfacing: The top of all foundations located within playground areas with resilient surfacing shall be at an elevation that is below the required, specified, or detailed depth of the resilient surfacing.

3.5 ON-SITE ASSEMBLY AND ERECTION OF SHADE CANOPY

- A. Installer Qualifications: The installation work shall be supervised and performed by qualified individuals with experience on similar projects.
- B. Installation of the Shade Canopy: The shade canopy shall be installed in accordance with the approved shop drawings and in accordance with the manufacturer's recommendations. Care shall be take to protect existing site improvements during the installation process.
- C. Protection of Fabric: The shade fabric shall be protected during installation. Shade fabric that is damaged or torn during transport, storage, or installation shall be removed and replaced.
- D. Touch-up and Repair of Framing: Shade canopy frame components that are damaged during shipment and/or erection shall be touched-up using manufacturer approved paints and finishes. Components damaged in a manner that precludes touch-up work, as determined by the Owner's Representative, shall be replaced with new components.

3.6 GUARANTEE:

- A. Guarantee: The shade canopy shall be guaranteed to be free from defects in materials and workmanship for guarantee periods listed below

Guarantee for Structural Frame:	10 Years
Guarantee Period for Powder Coating on Frame:	5 Years
Guarantee for Fabric:	5 Years

The guarantee for the fabric shall cover significant fading, tearing, ripping, and/or discoloration. A written letter of guarantee shall be submitted to the Owner's Representative prior to Final Acceptance of the Work.

END OF SECTION - 13126

SECTION 13130 - PRE-ENGINEERED RESTROOM BUILDINGS

PART ONE: GENERAL

1.1 RELATED DOCUMENTS

- A. The General Provisions of the Contract including all General and Supplementary Conditions and Supplements and Amendments to the General Conditions of the Contract apply to the work specified in this section.

1.2 DESCRIPTION OF WORK

- A. The work covered by this Section includes, but is not limited to, the:
 - 1. Preparation and submittal of shop drawings for pre-engineered restroom buildings
 - 2. Acquisition of permits as required for restroom construction
 - 3. Supply and installation of pre-engineered restroom building(s)
 - 4. Supply and installation of fixtures, furnishings, and equipment associated with the pre-engineered restroom building(s)
- B. The proposed location, size, configuration, and architectural finishes associated with the pre-engineered restroom building(s) shall be shown or noted on the project drawings.

1.3 RELATED WORK

- A. Related work includes, but is not limited to:
 - 1. Site grading, earthwork, and subgrade compaction
 - 2. Extension of a potable water service to the pre-engineered restroom building
 - 3. Extension of an electrical service to the pre-engineered restroom building
 - 4. Connection of the restroom to the sanitary sewage system (where applicable)
 - 5. Connection of the restroom building to an on-site septic tank / leach field disposal system (where applicable).
 - 6. Construction of walkways for public access to the pre-engineered restroom building

1.4 COORDINATION

- A. The Contractor shall coordinate all pre-engineered restroom building work with the Owner's Representative. Work that is completed or in-progress shall be protected during the installation of the restroom. The Contractor shall notify the Owner's Representative of field conditions which prevent the installation of restroom buildings as shown.

1.5 REQUIRED LICENSURE

- A. All work shall be performed by a Contractor licensed by the State of Arizona Registrar of Contractors. The commercial license classification held by the Contractor shall be appropriate for the work to be performed.

1.6 COMPLIANCE WITH APPLICABLE REGULATIONS

- A. General Requirements: The Contractor shall comply with all local, state, and federal regulations regarding materials, methods of work, and disposal of excess and waste materials. The Contractor shall provide notices required by governmental authorities, request required inspections, obtain required permits, and pay for all associated fees.

1.7 COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA)

- A. Compliance with the Americans with Disabilities Act: Access to the restroom building (including access to storage and work areas where applicable), circulation within the building, access to plumbing fixtures, and all other aspects of the building shall be in full compliance with the Americans with Disabilities Act and related design guidelines.

1.8 APPLICABILITY OF STANDARD DRAWINGS AND DETAILS

- A. Applicability of Standard Drawings and Details: Standard Drawings and Details as adopted and published by the Pima County Natural Resources, Parks, and Recreation Department may be included with, or referenced on, the Project Plans. These Standard Drawings and Details are intended to show the overall size, floor plan configuration, and general features associated with the proposed restroom building. These Standard Drawings and Details are intended to be used as the basis for the preparation of sealed shop drawings. The approved shop drawings shall govern the fabrication, construction, and installation of the pre-engineered restroom building.

1.9 REFERENCE STANDARDS

- A. Reference Specifications: The following specifications are, by reference, made a part of these specifications. To the extent applicable, all project work shall be implemented in accordance with the specifications listed below.
- B. American Concrete Institute (ACI):
 - 1. ACI-301R Specifications for Structural Concrete for Buildings
 - 2. ACI-315-92 Details and Detailing of Concrete Reinforcement

- C. American Society for Testing and Materials (ASTM)
 - 1. ASTM-A-36 Specification for Structural Steel
 - 2. ASTM-A-615 Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement
 - 3. ASTM-A-82-95 Specification for Steel Wire, Plain, for Concrete Reinforcement
 - 4. ASTM-C-150-97 Standard Specifications for Portland Cement
 - 5. ASTM-C-33-97 Standard Specifications for Concrete Aggregates
 - 6. ASTM-C-920-97 Specification for Elastomeric Joint Sealants

- D. American Welding Society (AWS)
 - 1. AWS-D-1.4 Structural Welding Code - Reinforcing Steel

- E. Pima County - City of Tucson
 - 1. Pima County - City of Tucson - Standard Specifications for Public Improvements
 - 2. Pima County - City of Tucson - Standard Details for Public Improvements

1.10 SUBMITTAL REQUIREMENTS:

- A. General: The Contractor shall make the submittals identified below. Submittals shall be made and approved prior to the delivery of materials to the site and its incorporation into the work.

- B. Shop Drawings: The Contractor shall obtain from the pre-engineered restroom building manufacturer complete shop drawings for the proposed structure. The shop drawings shall be sealed by an Arizona Registered Professional Structural Engineer and shall be submitted to the Owner for review and approval. The information to be included on the Shop Drawings shall include, but may not be limited to, the items listed below:
 - 1. Code Analysis Data: The shop drawings shall list the name and date of all applicable codes used in the design of the building. Building area, occupancy type, type of construction, and occupancy load shall also be identified.

 - 2. Design Load Data: The shop drawings shall identify design loads for roof dead load, roof live load, floor live load, wind load, and seismic load.

 - 3. Structural Notes and Calculations: The shop drawings shall include general notes related to the building foundation, concrete, reinforcing steel, welding, and other structural features.

 - 4. Foundation Plans and Details: The shop drawings shall include complete details for on-site constructed foundation work and for foundation slabs and structural components to be constructed with the pre-engineered building.

5. Floor Plans: The shop drawings shall include scaled, dimensioned floor plans. The floor plans shall show wheelchair turning radii and other information as required to demonstrate compliance with accessibility standards.
6. Building Elevations: The shop drawings shall include scaled, dimensioned building elevations with all doors, windows, vent panels, and exterior building features shown or noted.
7. Building Sections: The shop drawings shall include building sections as required to show the location and size of interior partition walls and other pertinent building features.
8. Plumbing Plans, Riser Diagrams, and Fixture Schedules: The shop drawings shall include plumbing plans showing the proposed location and mounting of all plumbing fixtures. Riser diagrams and a plumbing fixture schedule shall also be provided.
9. Electrical Plans, Diagrams, Schedules, and Calculations: The shop drawings shall include electrical plans, riser diagrams, lighting fixture schedules, panel schedules, and load calculations.

1.11 APPLICABLE CODES AND STANDARDS:

- A. Applicable Codes: Except as modified by the project drawings, or other project specific documents, the pre-engineered rest-room building shall be designed and constructed to comply with:
 1. International Building Code (IBC): 2003 or most recent edition
 2. National Electric Code (NEC): 2005 or most recent edition
 3. Uniform Plumbing Code (UPC): 2000 or most recent edition

1.12 BUILDING PERMITS:

- A. Permits for Pre-Engineered Buildings with Prior State of Arizona Approval: The Contractor shall be responsible for the processing of shop drawings for buildings with prior approval by the State of Arizona Office of Manufactured Housing. Processing shall be as required to obtain permits from local government authorities for utility connections and other features not covered by State of Arizona prior approval(s).
 1. Inspections: The Contractor shall be responsible for scheduling and coordinating all State of Arizona required inspections. Reports, signed by the State of Arizona's authorized inspector, demonstrating compliance with applicable State requirements shall be submitted to the Owner, prior to Substantial Completion of the Work.

- B. Permits for Pre-Engineered Buildings without Prior State of Arizona Approval: The Contractor shall be responsible for submitting shop drawings and obtaining permits for pre-engineered buildings that do not have prior State of Arizona approval. The shop drawings and associated reports and calculations shall be complete and shall include all information required by Pima County (or other local jurisdiction) for drawing approval and issuance of required permits.
1. Inspections: The Contractor shall be responsible for scheduling and coordinating all required inspections. Inspections, approvals, and documentation shall be as required by the subject building permit.

PART TWO: MATERIALS

2.1 SUBGRADE AND FOUNDATION:

- A. Subgrade: The subgrade below the building foundation shall be as noted on the Project Plans and as recommended in the Geotechnical Engineering Report for the project.
- B. On-Site Constructed Foundation: The foundation shall be constructed of aggregate base course material. The material shall comply with Section 303 of the Pima County - City of Tucson Standard Specifications for Public Improvements (most recent edition). Dimensions and compaction shall be as noted on the approved shop drawings and as recommended in the Geotechnical Engineering Report for the project.

2.2 BUILDING WALLS, FLOOR SLABS, AND ROOF DECKS:

- A. Building Walls, Floor Slabs, and Roof Decks: Walls, floors, and roof decks shall be constructed of reinforced concrete. The floor, walls, and roof deck shall be cast as an integral unit or units at the fabricator's off-site plant.
1. Concrete: All concrete for floors, walls, and roof decks shall have a 28-day compressive strength of not less than 5,000 psi.
 2. Reinforcing Steel: Reinforcing steel shall be Grade 60 deformed rebar complying with ASTM A-615.
 3. Weld Plates and Anchors: Steel for weld plates and anchors shall comply with ASTM A-36.
- B. Exterior Building Wall Finishes: All exterior walls shall be textured. Texture shall be as noted on the Project Plans and in accordance with the approved shop drawings. Texturing shall be accomplished with a formliner, or other approved method. After curing, the exterior walls shall be primed and painted with an industrial grade paint this is specifically manufactured for application over a concrete substrate. Paint color shall be as noted on the drawings or as selected by the Owner.

- C. Interior Building Wall Finishes: All interior walls shall have a smooth finish. After curing, the walls shall be primed and painted with an industrial grade, two part, epoxy paint that is specifically manufactured for application on a concrete substrate. Paint color shall be as noted on the drawings or as selected by the Owner.
- D. Interior Floor Finishes: All interior floors shall have a troweled, smooth finish. After curing, the floors shall be finished with an industrial grade, slip-resistant, two-part epoxy floor paint that is specifically manufactured for application on a concrete floor substrate. Paint color shall be as noted on the drawings or as selected by the Owner.

2.3 JOINT SEALANTS

- A. Joint Sealants: Joint sealants shall consists of rolled polyurethane foam rope and a non-sag, non-staining, polyurethane caulking compound meeting ASTM-C-920-79.

2.4 ROOFING SYSTEM

- A. Roofing Panels: The roof deck shall be covered with a ribbed metal roofing system with raised ribs at 12" on-center. Rib height shall be approximately 1-1/4". Roof panels shall be constructed of 22 gauge steel sheet. The panels shall be factory primed with a Galvalume or other approved primer. The exposed surface of the panel shall be finished with a factory applied silicon modified polyester finish or a flourpolymer resin finish. Color shall be as noted on the Project Plans or as selected by the Owner.
 - 1. Trim and Fasteners: The roofing system provided shall be furnished with all required ridge caps, eve closures, weatherproof fasteners, sealants, and other hardware. Metal trim shall be of the same gauge and finish as the metal roofing panels. Fasteners and sealants shall be as recommended by the roofing system manufacturer.

2.5 BUILDING DOORS

- A. Doors: Doors shall be extra heavy-duty, pre-hung metal doors with matching metal frame. The door frame shall be secured to the building with heavy-duty, concealed, vandal resistant anchoring devices. All doors shall be equipped with stainless steel kick-plates (on the inside of the door only), heavy-duty hinges, and door sweeps. Doors shall be factory finished with rust-inhibiting primer and industrial grade exterior enamel paint. Color shall be as noted on the drawings or as selected by the Owner.

2.6 DOOR HARDWARE

- A. Door Handles: Door handles shall be of the heavy-duty, lever operated type constructed from cold-rolled steel that is zinc dichromate plated to protect it against rust and corrosion. The lever shall be a minimum of 5-1/4" in length. The lever handles shall operate independently on the inside and outside of the door.

- B. Deadbolt Locks: All doors shall be equipped with heavy-duty, single-bolt deadbolt locks. Locks shall be as manufactured by Schlage, Model B-800, Heavy-Duty "Primus" Series High Security Lock(s). Due to the Pima County Natural Resources, Parks, and Recreation Department's need to standardize locks and stock replacement units / parts, substitute brands and models will not be approved.

2.7 DOOR SIGNS

- A. Door Signs: Molded plastic signs with etched surfaces shall be installed on or adjacent to the Women's and Men's room doors. Signs shall include international symbols and shall have raised Braille letters. All signs shall comply with ADA requirements.

2.8 PIPING AND PLUMBING FIXTURES

- A. Piping: All water supply piping shall be copper with copper or compatible metal fittings. All waste and vent piping shall be Schedule 40 PVC with Schedule 40 or Schedule 80 PVC fittings.
 - 1. Pipe Location: Except for supply lines under the floor slab and pipe penetrations through interior building walls, all water supply, waste, and vent lines shall be installed in an exposed condition within the building plumbing chase.
- B. Shut-off Valves: Each lavatory, toilet, and urinal shall be equipped with its own shut-off valve. The valve shall be installed in the plumbing chase.
- C. Toilets: Toilets shall be prison-grade fixtures manufactured from 14 gauge, Type 304, welded, seamless, stainless steel. Toilets shall be wall-mounted toilet fixtures with mounting height as required by ADA. Mounting fasteners shall be accessible for the plumbing chase, only.
 - 1. Flush Valves: Toilets shall be equipped with an institutional grade, wall-mounted, push-button operated flush valve. The flush valve shall be installed in the plumbing chase.
- D. Urinals: Urinals shall be prison-grade fixtures manufactured from 14 gauge, Type 304, welded, seamless, stainless steel. Urinals shall be wall-mounted with mounting height as required by ADA. Mounting fasteners shall be accessible from the plumbing chase, only.
 - 1. Flush Valves: Urinals shall be equipped with an institutional grade, wall-mounted, push-button operated flush valve. The flush valve shall be installed in the plumbing chase, only.
- E. Lavatories: Lavatories shall be prison-grade fixtures manufactured from 14 gauge, Type 304, welded, seamless, stainless steel. Lavatories shall be wall-mounted with mounting

height as required by ADA. Mounting fasteners shall be accessible from the plumbing chase, only.

1. Faucet: Lavatories shall be equipped with a single push-button operated metering faucet. Faucet shall be chrome plated.
- F. Eye-Wash and Shower: Where noted or shown on the Project Plans, an eye-wash / emergency shower shall be installed in the plumbing chase or the work / storage space associated with the restroom building. The Eye-Wash / Emergency Shower shall comply with applicable ADA and Occupational Safety and Health Administration (OSHA) standards.

2.9 RESTROOM ACCESSORIES AND EQUIPMENT

- A. Grab Bars: Grab bars shall be provided and installed as required for compliance with ADA. Grab bars shall be prison-grade fabricated from Type 304, 22 gauge stainless steel. Fasteners shall be concealed.
- B. Toilet Paper Dispensers: Toilet paper dispensers shall be provided and installed. Mounting location shall be in compliance with ADA. Dispenser shall consist of a 18 gauge stainless steel frame with a stainless steel tube that can be padlocked to the frame.
- C. Stainless Steel Mirrors: Mirrors shall be constructed of Type 304, 20 gauge, bright annealed stainless steel with returns that conceal the backing material. The backing material shall be 1/4" thick masonite. Mirrors shall be secured to the wall with tamper resistant mounting screws. Mirror dimensions shall be approximately 16" wide by 24" high.
- D. Hand-Dryers: Hand dryers shall be of the surface mounted, push-button operated, heated-air, blower type. The unit shall be wall mounted in accordance with ADA standards using concealed fasteners. The cover shall be fabricated from gray cast-iron with porcelain enamel finish. The nozzle shall be fabricated from diecast zinc with chrome finish. The nozzle shall be fixed. The motor shall be 1/10 hp, 115 volt, 20 amp, 60 Hz motor. The heating element shall be a 2300 watt element with an integral automatic resetting circuit breaker.

2.10 ELECTRICAL SERVICE AND LIGHTING

- A. Compliance with Applicable Codes: All electrical and lighting system components shall comply with applicable codes.
- B. Electrical Service to Building: The electrical service to the rest room building shall be as noted and shown on the Project Plans.

- C. Interior Lighting: Ceiling mounted light fixtures shall be installed in the women's restroom, the men's restroom and, where applicable, interior storage and work spaces. Light fixtures shall consist of metal backplate and ends with a UV stabilized, injection molded, high strength polycarbonate lens. Fasteners shall be vandal resistant. Lamps shall be fluorescent.
1. Power to Ceiling Lights: Power to all ceiling lights shall be conduit that has been cast in the concrete ceiling and/or wall panels.
 2. Lighting Controls: Lighting in public restroom spaces shall be controlled with an electronic 7-day time switch. Lighting in storage and work spaces shall be controlled with wall mounted manual switches.
- D. Exterior Lighting: A wall mounted light fixture (or fixtures) shall be provided at the public entries to the restroom building. The light fixture shall consist of a diecast aluminum housing with reinforcing ribs on the exposed sidewalls. The lens shall be a one-piece, injection molded, high-strength polycarbonate lens. Fasteners shall be vandal resistant. Lamps shall be high-pressure sodium. Fixtures shall comply with the Tucson / Pima County Outdoor Lighting Code.
1. Power to Wall Mounted Exterior Lights: Power to all exterior light fixtures shall be in conduit that has been cast on the concrete wall and/or ceiling panels.
 2. Lighting Controls: Exterior lighting shall be controlled with an electronic 7-day time switch. The control of the exterior lights shall be independent of the control for interior lights.

2.11 ELECTRICAL OUTLETS IN WORK / STORAGE SPACES:

- A. Electrical Outlets: Wall mounted GFI outlets shall be provided in all work / storage spaces. The quantity of outlets and the mounting height above the finished floor shall be as per the approved shop drawings.
1. Power to Electrical Outlets: Power to all electrical outlets shall be conduit that has been cast on the concrete wall and/or ceiling panels.

2.12 VENTS AND WINDOWS:

- A. Vents: All restroom spaces (women's room, men's room, and storage / work spaces) shall have natural ventilation. Ventilation shall consist of openings in the precast concrete structure that are covered with heavy-duty, painted steel, louvered vent panels that are secured to prevent unauthorized removal. Vent size and vent panel materials shall be as per the approved shop drawings.

- B. Windows: Windows shall be provided in all restroom spaces (women's room, men's room, and storage / work spaces) to provide for natural daylighting. Windows shall be non-operable. Window frames shall be heavy-duty steel frames secured in a manner that prevents unauthorized removal. Glazing shall be 1/4" thick frosted Lexan.

PART THREE: EXECUTION

3.1 BLUE STAKING

- A. Blue Staking: The Contractor shall have the work area Blue Staked prior to the start of any excavation or foundation work. Blue Staking shall be kept current during the course of the project. All utilities damaged by the Contractor shall be repaired or replaced by the Contractor, as required by the Owner or appropriate utility company, at the Contractor's expense.

3.2 SUBGRADE AND FOUNDATION WORK

- A. Subgrade Preparation and Foundation Construction: The subgrade below the building and the building foundation shall be constructed per the approved shop drawings. All subgrade and foundation work shall be inspected, tested, and approved prior to the placement of the pre-engineered restroom building.

3.3 UTILITY STUB-UPS

- A. Utility Stub-Ups: All conduits, pipe, and other utility appurtenances that will be below the building shall be installed, tested, and approved prior to the placement of the pre-engineered restroom building.

3.4 PLACEMENT OF PRE-ENGINEERED BUILDING

- A. Placement of the Pre-Engineered Restroom Building: The pre-engineered restroom building shall be delivered to the site, off-loaded, and set on the approved foundation. The work shall be performed using equipment of a type and with a capacity that is suitable for the work. Placement of the building shall be accomplished in a manner that avoids damage to the pre-engineered restroom and/or damage to other site improvements.
 - 1. Tolerances: The pre-engineered structure shall be set so that all floors are level and all walls are plumb. Where multiple building sections are utilized, the adjacent units shall match in elevation and alignment and shall be as required to make the connections shown or noted on the approved shop drawings.
 - 2. On-Site Welding: Welded connections between adjacent units shall be made as shown or noted on the approved shop drawings. Welds shall be ground smooth, cleaned, and painted to match adjacent surfaces.

3.5 UTILITY CONNECTIONS

- A. Utility Connections: Water, sewer, electrical, and where applicable, phone connections shall be made in accordance with the approved shop drawings, applicable codes, and the subject utility company standards.

3.6 TESTING, ADJUSTMENT, AND TOUCH-UP

- A. Testing: All doors, locks, light fixtures, plumbing fixtures, valves, and other equipment installed in the pre-engineered restroom shall be tested and adjusted as needed to ensure proper operation.
- B. Touch-Up: All building surfaces and installed equipment damaged during the placement of the pre-engineered restroom and/or the installation of equipment shall be touched up. Touch-up painting shall be accomplished with the same paint products and colors as used in conjunction with the initial painting work.
- C. Caulking of Joints: All joints between abutting sections of pre-engineered building shall be caulked or sealed to provide a permanent, weather and insect tight joint.

3.7 GUARANTEE:

- A. Guarantee for Building Components: All building floors, walls, roof decks, roofing systems, doors, and door frames shall be guaranteed to be free from defects in materials and workmanship for a period of ten years. A written letter of guarantee shall be submitted to the Owner's Representative prior to Final Acceptance of the Work.
- B. Guarantee for Furnishings, Fixtures, and Equipment: All furnishings, fixtures, and equipment installed in the pre-engineered restroom building shall be guaranteed to be free from defects in materials and workmanship for a period of two years. A written letter of guarantee shall be submitted to the Owner's Representative prior to Final Acceptance of the Work.

END OF SECTION - 13130

Standard Details

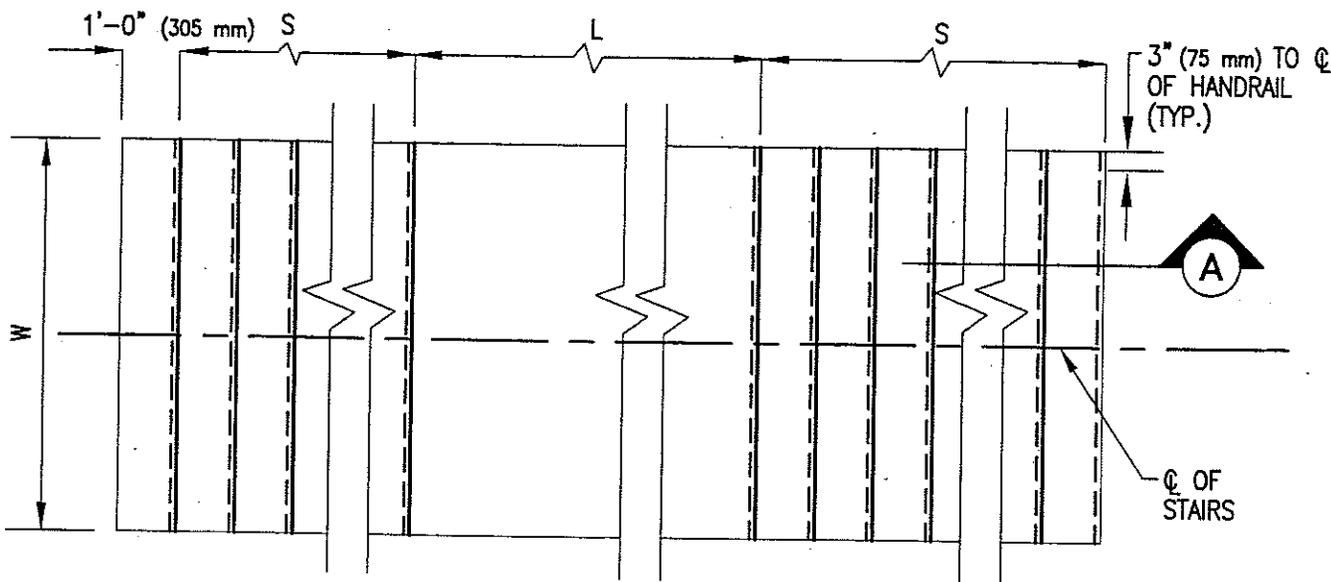
CITY OF TUCSON

AND

PIMA COUNTY

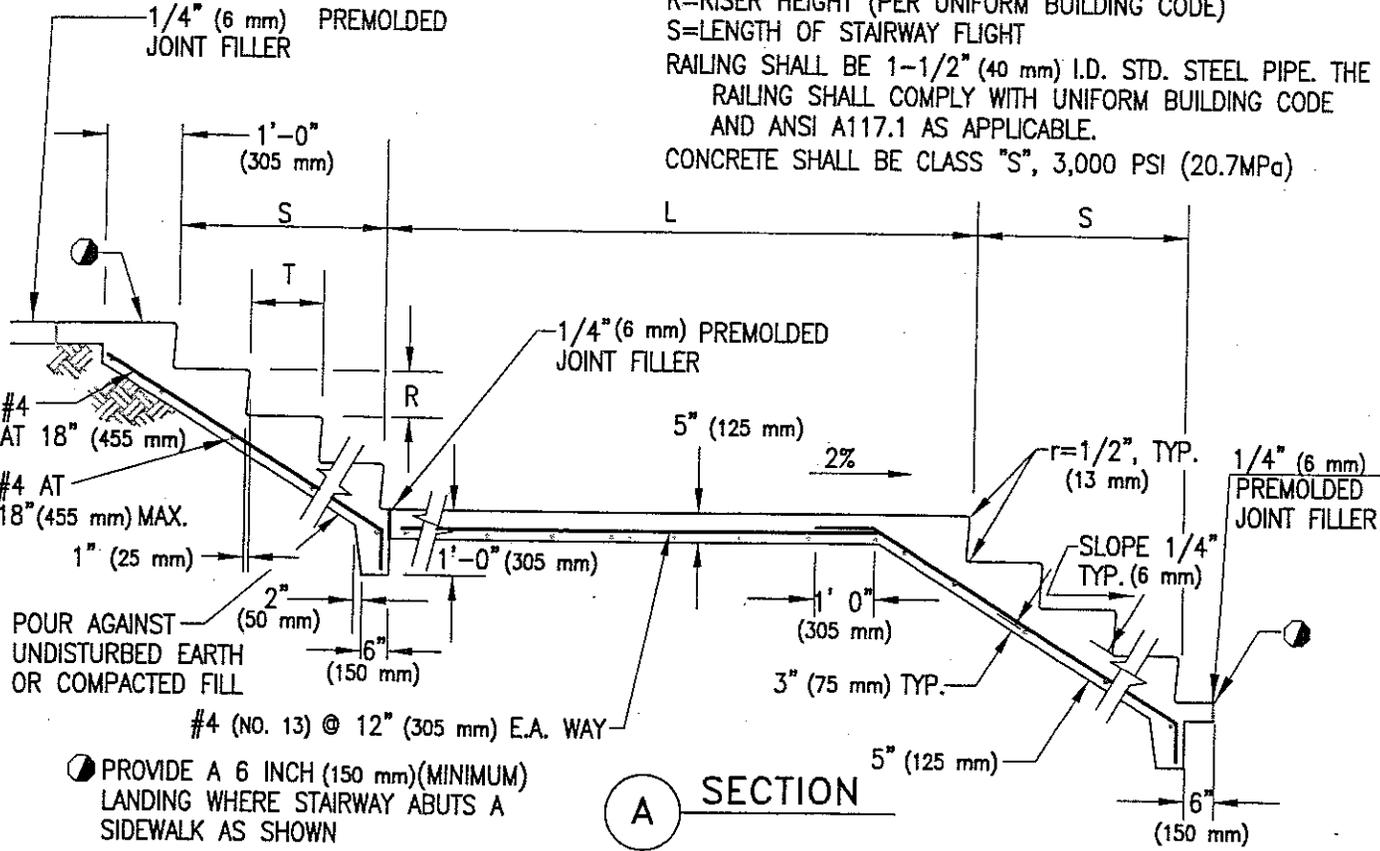
STANDARD DETAILS FOR PUBLIC IMPROVEMENTS

- 2003 -



PLAN

REFER TO THE PROJECT PLANS FOR FOLLOWING INFORMATION:
 STAIRWAY LOCATION
 W=WIDTH OF STAIRWAY (PER UNIFORM BUILDING CODE)
 L=LENGTH OF LANDING
 T=TREAD LENGTH (PER UNIFORM BUILDING CODE)
 R=RISER HEIGHT (PER UNIFORM BUILDING CODE)
 S=LENGTH OF STAIRWAY FLIGHT
 RAILING SHALL BE 1-1/2" (40 mm) I.D. STD. STEEL PIPE. THE RAILING SHALL COMPLY WITH UNIFORM BUILDING CODE AND ANSI A117.1 AS APPLICABLE.
 CONCRETE SHALL BE CLASS "S", 3,000 PSI (20.7MPa)



A SECTION

● PROVIDE A 6 INCH (150 mm) (MINIMUM) LANDING WHERE STAIRWAY ABUTS A SIDEWALK AS SHOWN

1048.DWG 06/03/00 15:47

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/88		CONCRETE		104
REVISED:		STAIRWAY		SHEET 1 OF 1
7/02				

1-1/2" (40 mm) I.D. STD.
STEEL PIPE RAILS W/POST
@ 5' (1.5 m) O.C

ALTERNATE LOCATION
OF LOWER RAIL

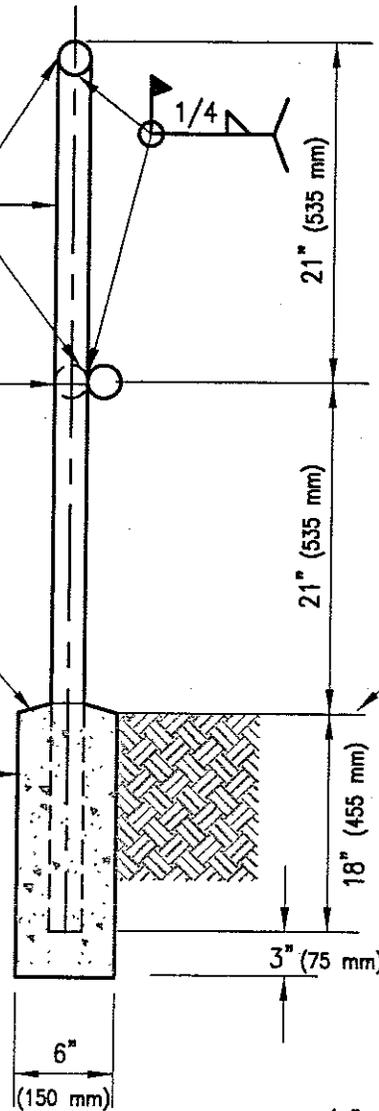
SLOPE AWAY
FROM POST

UTILITY CONC. PER
STD. SPEC 922

FINISHED GRADE

SEE SHEET 2 OF 2
FOR END TREATMENTS

SECTION



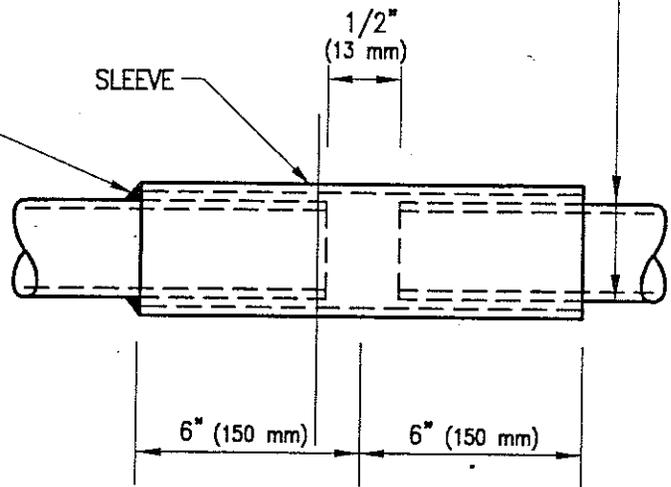
1-1/2" (40 mm) I.D. STD. STEEL PIPE

TACK WELD
(ONE END ONLY)

SLEEVE

NOTES:

1. EXPANSION JOINTS FOR UPPER AND LOWER RAILS SHALL OCCUR AT THE SAME LOCATION.
2. EXPANSION JOINTS SHALL BE LOCATED AT 30 FOOT (9 m) INTERVALS (MAXIMUM).
3. WHEN APPROVED BY THE ENGINEER, AN INTERNAL SLEEVE MAY BE USED AT EXPANSION JOINTS.



EXPANSION JOINT DETAIL

ISSUED:

10/88

REVISED:

7/02



STANDARD DETAIL

BARRICADE
RAILING

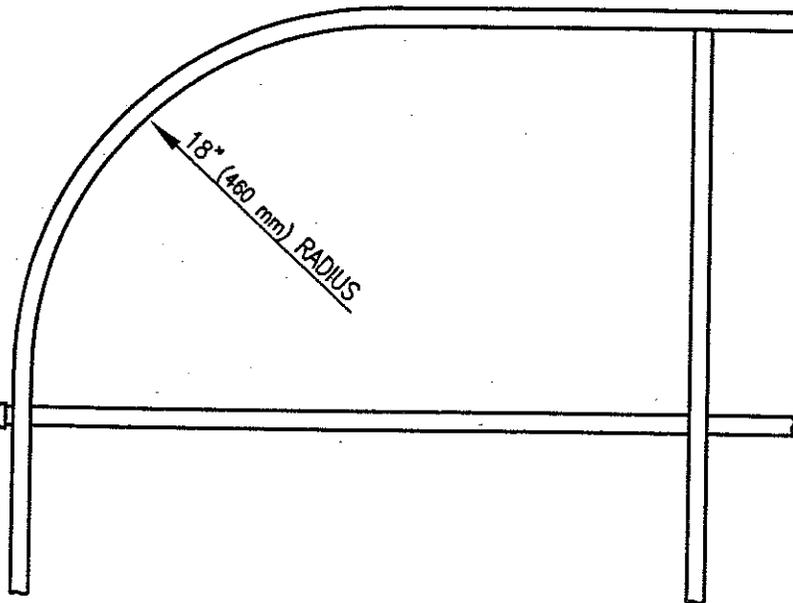


DETAIL NO.

105

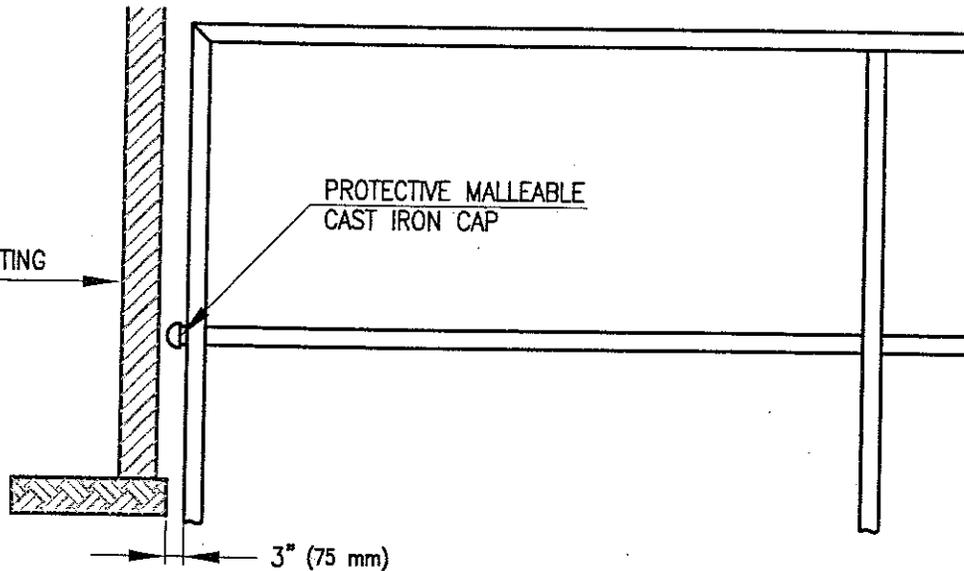
SHEET 1 OF 2

PROTECTIVE MALLEABLE
CAST IRON CAP



END TREATMENT 'A'

EXISTING



END TREATMENT 'B'

REFER TO SHEET 1 OF 2
FOR RAILING DETAILS

ISSUED:

6/91

REVISED:

7/02



STANDARD DETAIL

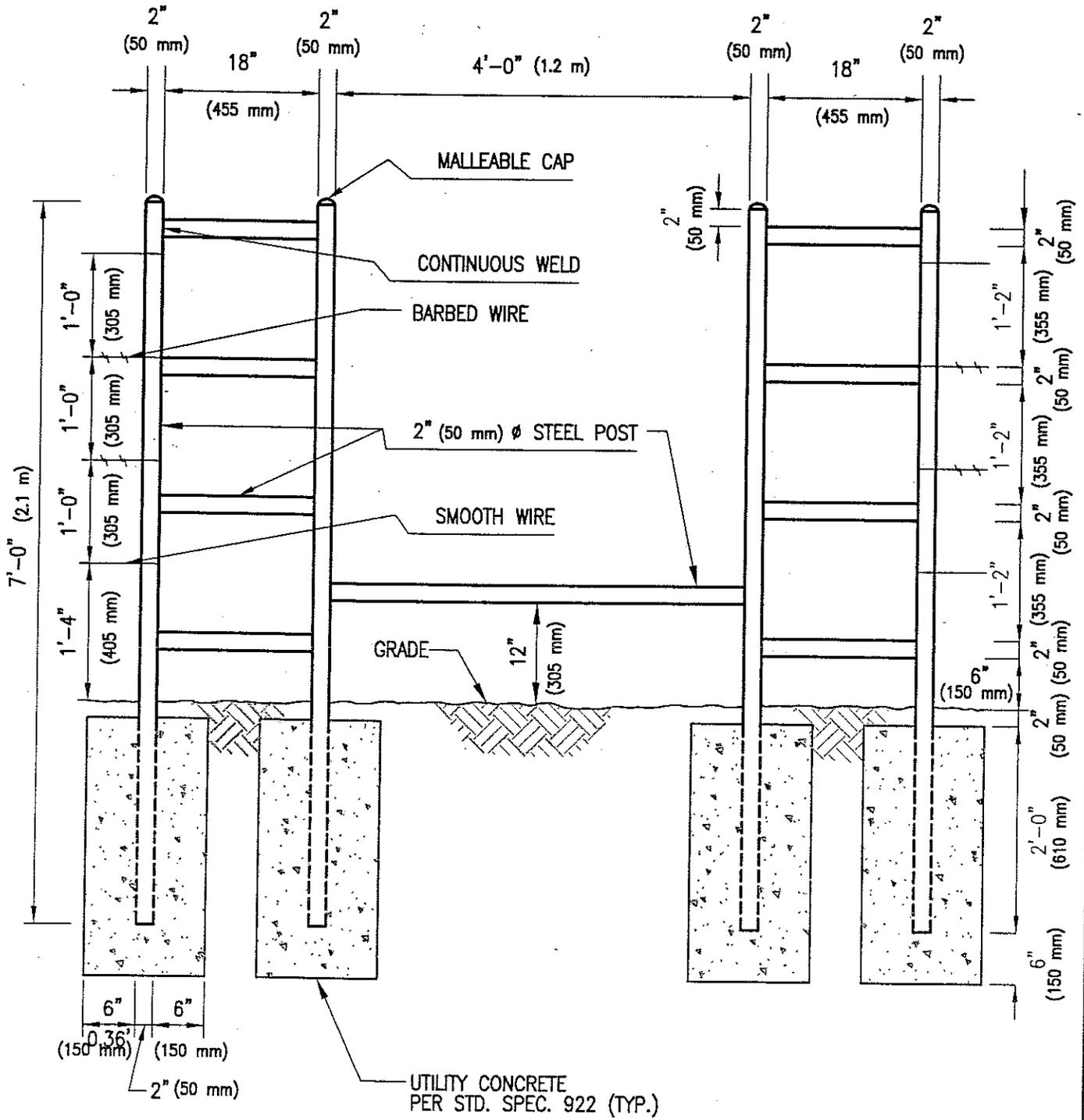
BARRICADE
RAILING



DETAIL NO.

105

SHEET 2 OF 2



NOTE: DELETE BARBED WIRE WHEN BARRICADE RAILING (STANDARD DETAIL 105) IS USED.

ISSUED:	
9/00	
REVISED:	
7/02	

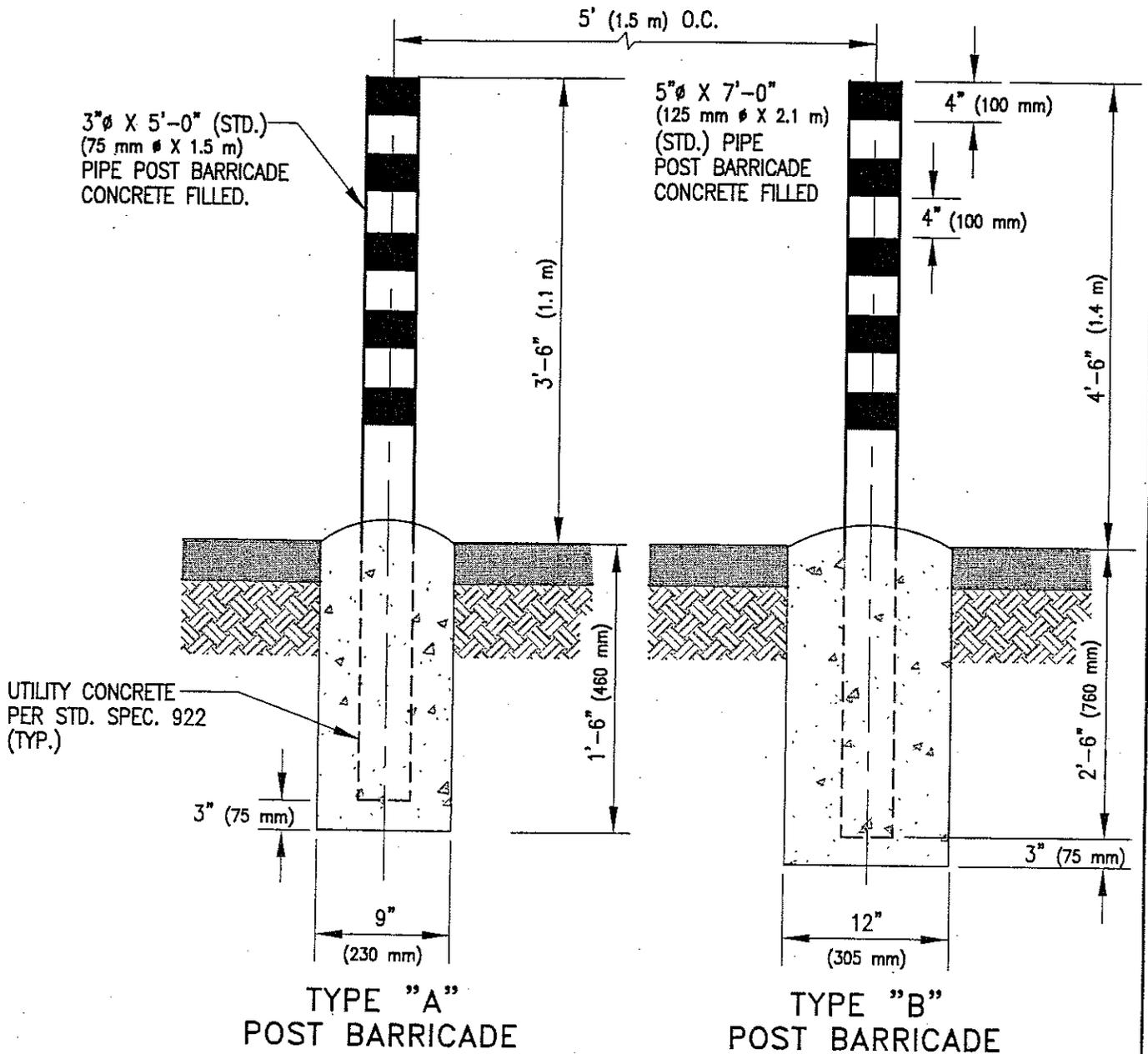


STANDARD DETAIL
HORSE GATE



DETAIL NO.	
105.1	
SHEET 1 OF 1	

105105.DWG 09/03/00 15.



NOTE:

POST BARRICADES SHALL BE PAINTED WITH ONE PRIME COAT OF RED OXIDE (PAINT NO.1). ONE FINISH COAT OF DULL BLACK ENAMEL PER SECTION 1002 OF THE STANDARD SPECIFICATIONS AND STRIPES CONSISTING OF 4" (100 mm) BANDS OF YELLOW REFLECTORIZED TAPE SHALL BE USED UNLESS OTHERWISE SPECIFIED ON THE PLANS.

FINISH COLOR COMBINATIONS, OTHER THAN THAT SPECIFIED ABOVE, SHALL BE SUBMITTED TO THE AGENCY FOR APPROVAL.

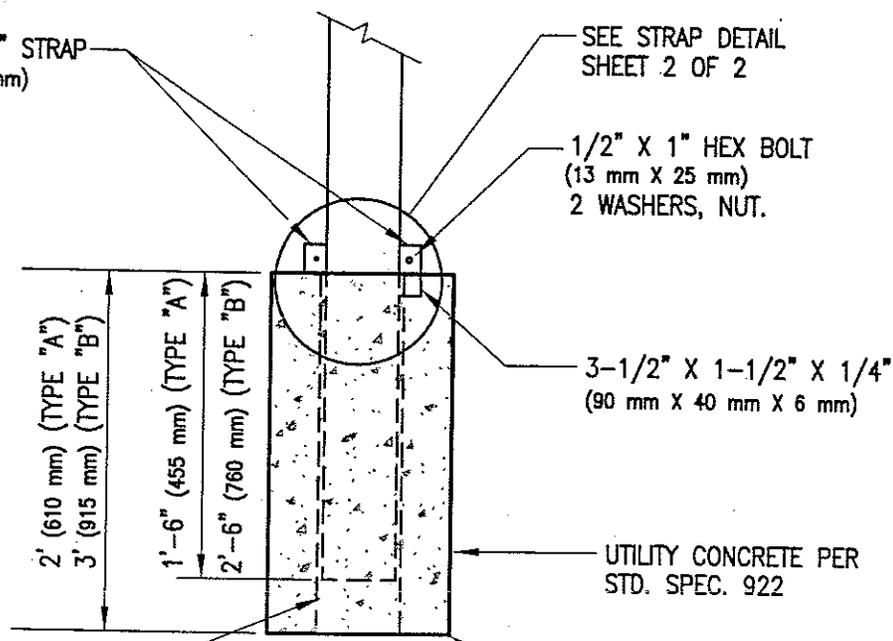
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ISSUED:		STANDARD DETAIL		DETAIL NO.
10/88		POST BARRICADES		106
REVISED:				SHEET 1 OF 1
7/02				

2" X 1-1/2" X 1/4" STRAP
(50 mm X 40 mm X 6 mm)

SEE STRAP DETAIL
SHEET 2 OF 2

1/2" X 1" HEX BOLT
(13 mm X 25 mm)
2 WASHERS, NUT.



3-1/2" X 1-1/2" X 1/4"
(90 mm X 40 mm X 6 mm)

UTILITY CONCRETE PER
STD. SPEC. 922

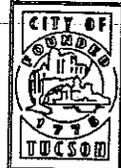
STD. PIP SLEEVE
4"Ø X 2' (100 mm X 610 mm) (TYPE "A")
6"Ø X 3' (150 mm X 915 mm) (TYPE "B")

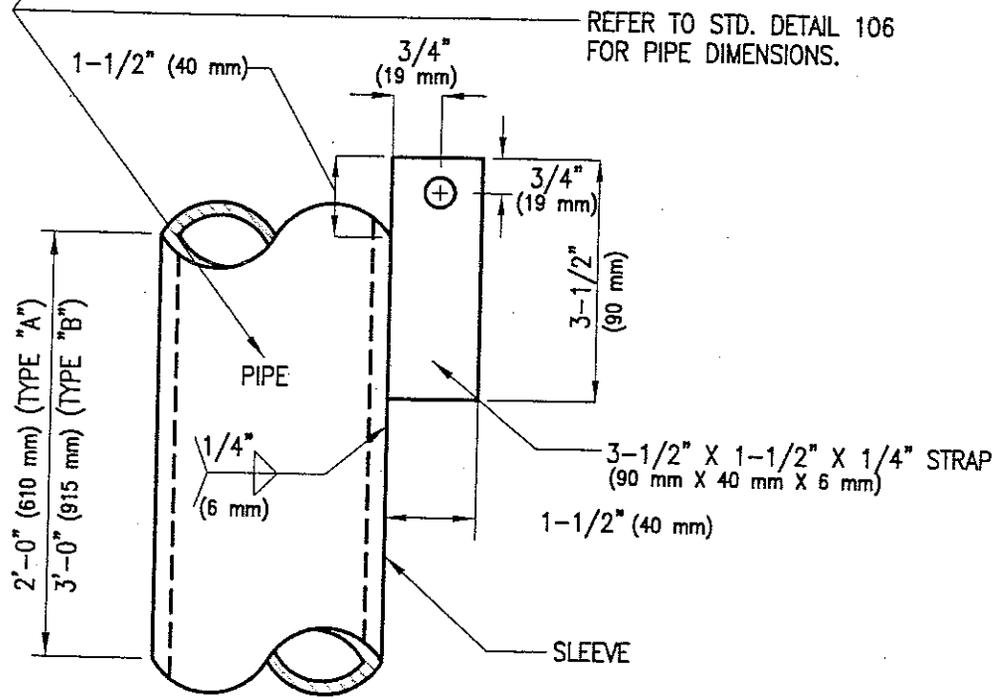
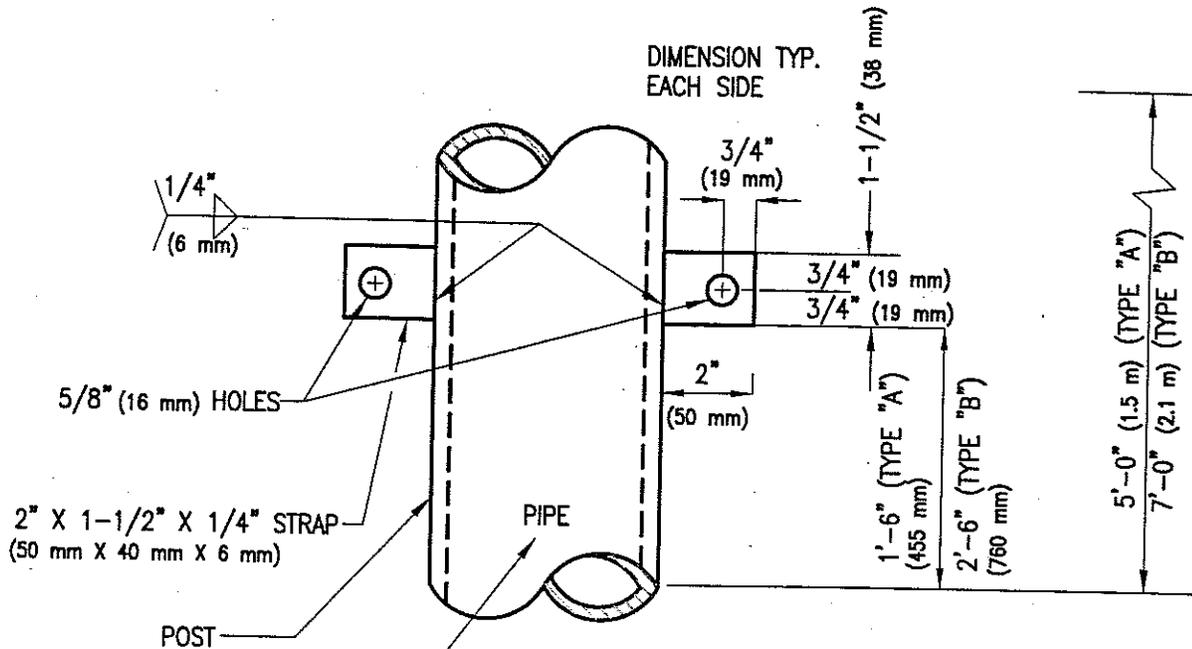
REFER TO STD. DETAIL 106
FOR FOOTING DIMENSIONS

NOTES:

1. REMOVABLE POST BARRICADE SHALL NOT BE CONCRETE FILLED.
2. HAND TIGHTEN BOLT & NUT USING WASHERS EACH SIDE OF STRAPS. CUT BOLT APPROX. 1/8" (6 mm) FROM FACE OF NUT & PEEN EXPOSED END OF BOLT.
3. REFER TO STD. DETAIL 106 FOR POST DETAILS.

107018.DWG 08/02/00 08.

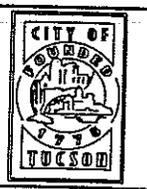
ISSUED:		STANDARD DETAIL		DETAIL NO.
10/88		REMOVABLE		107
REVISED:		POST BARRICADE		SHEET 1 OF 2
7/02				



STRAP DETAIL

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ISSUED:	
10/88	
REVISED:	
7/02	

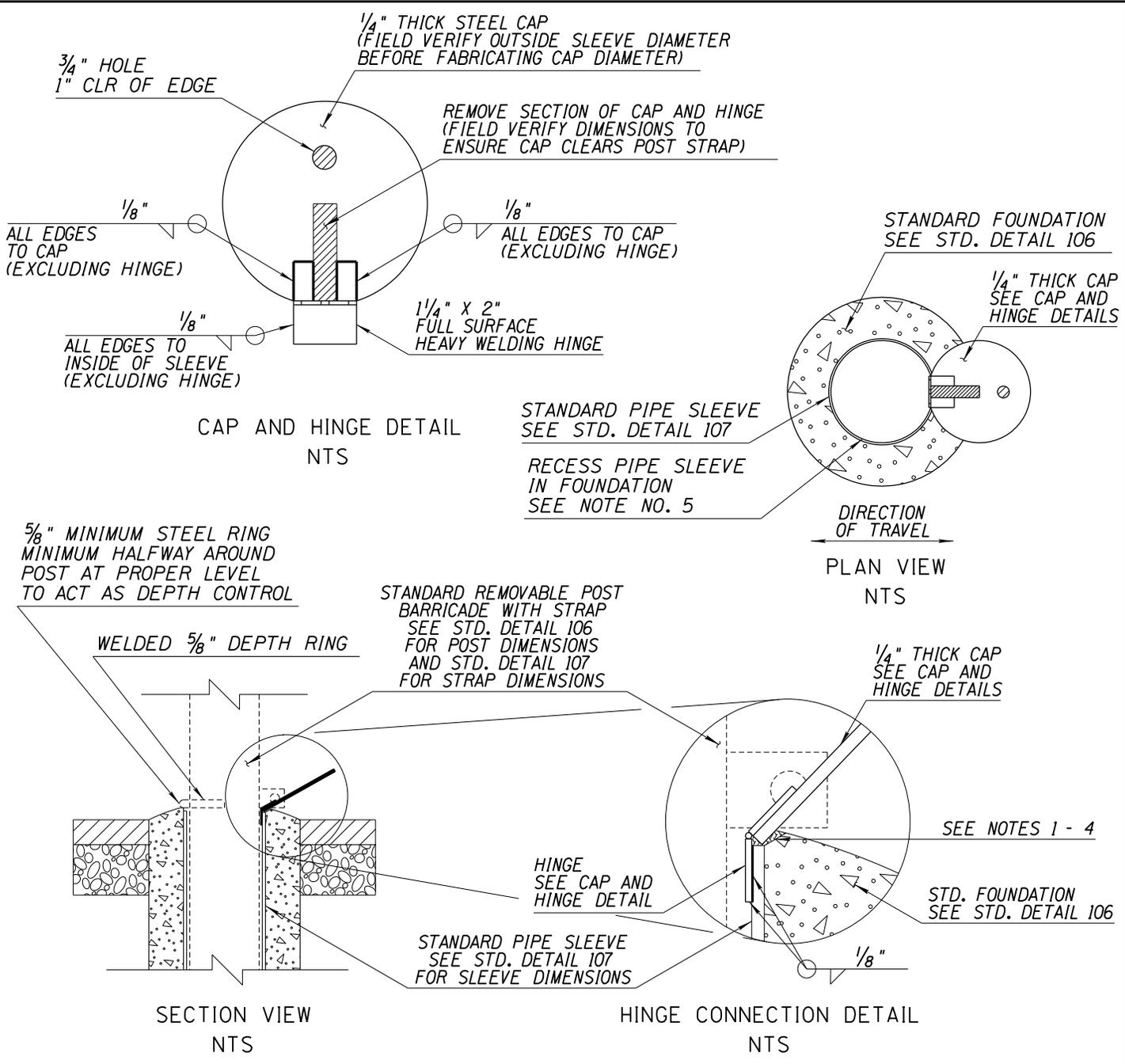


STANDARD DETAIL

REMOVABLE POST BARRICADE



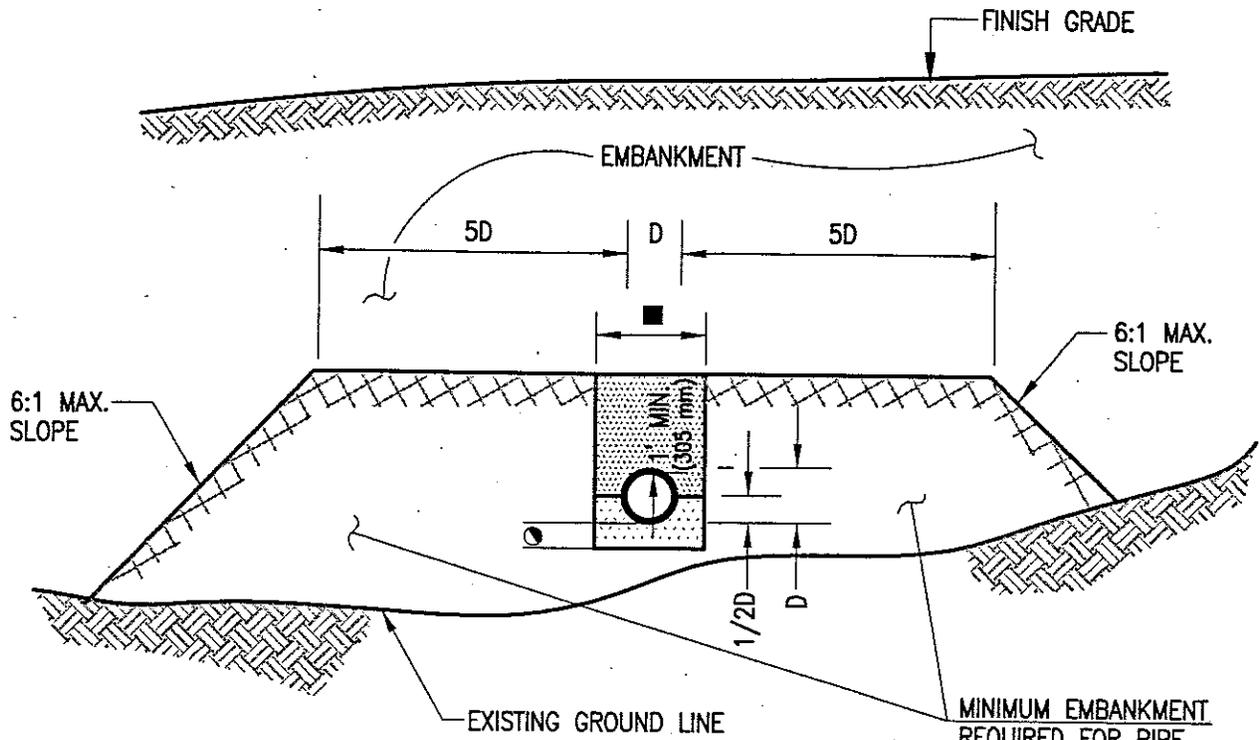
DETAIL NO.	
107	
SHEET 2 OF 2	



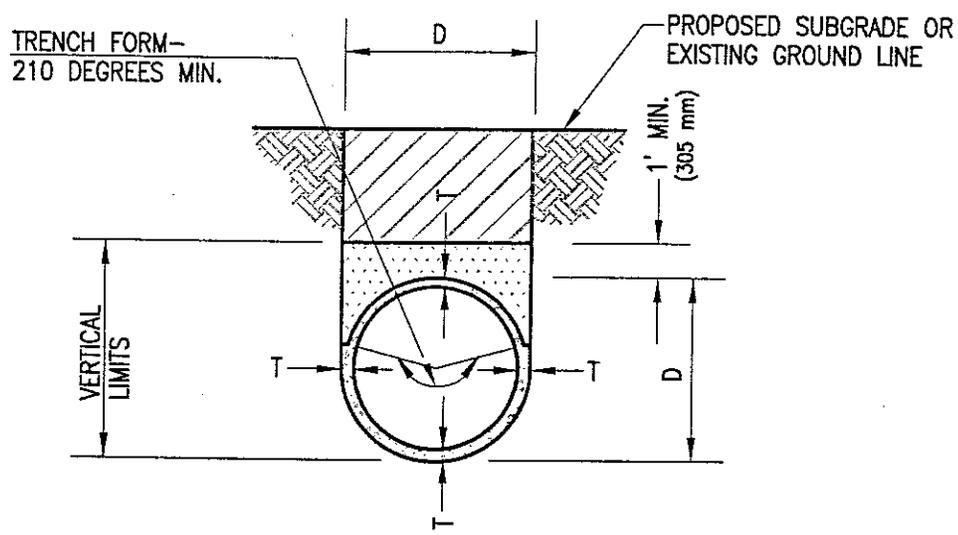
GENERAL NOTES:

1. WHEN ATTACHING HINGE TO EXISTING STANDARD PIPE SLEEVE, FIELD ADJUST TO ENSURE REMOVABLE POST AND HINGE FIT IN SLEEVE. REMOVE PORTION OF STANDARD SLEEVE AND CONCRETE FOUNDATION AS NECESSARY.
2. WHEN NEW REMOVABLE POST BARRICADE ASSEMBLY IS BEING CONSTRUCTED, REMOVE 1 1/4" X 2" SECTION FROM TOP OF SLEEVE FOR HINGE AND WELD.
3. FIELD VERIFY PLACEMENT OF HINGE TO ENSURE FULL ROTATION.
4. ENSURE THAT THE TOP OF HINGE IS BELOW THE TOP OF THE CONCRETE FOUNDATION AND PIPE SLEEVE.
5. FOR EXISTING POST BARRICADES, RECESS PIPE SLEEVE IN FOUNDATION TO RECEIVE FLUSH CAP WHEN IN CLOSED POSITION.

ISSUED: 09/11		STANDARD DETAIL		DETAIL NO.
REVISED: 01/13		REMOVABLE POST BARRICADE CAP AND HINGE		107A
				SHEET 1 OF 1



NON-TRENCH CONDITIONS



TRENCH CONDITIONS

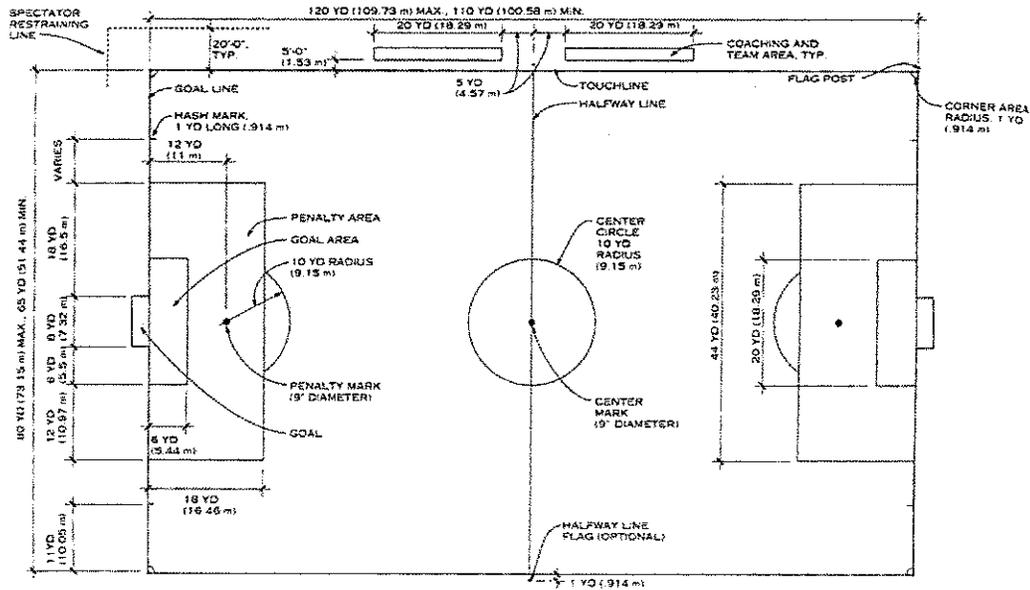
NRCIPCP* IN NATURAL GROUND OR IN EMBANKMENT
 *NRCIPCP=NON-REINFORCED CAST-IN-PLACE CONCRETE PIPE

REFER TO SHEET 3 OF 3 FOR NOTES AND SYMBOLS

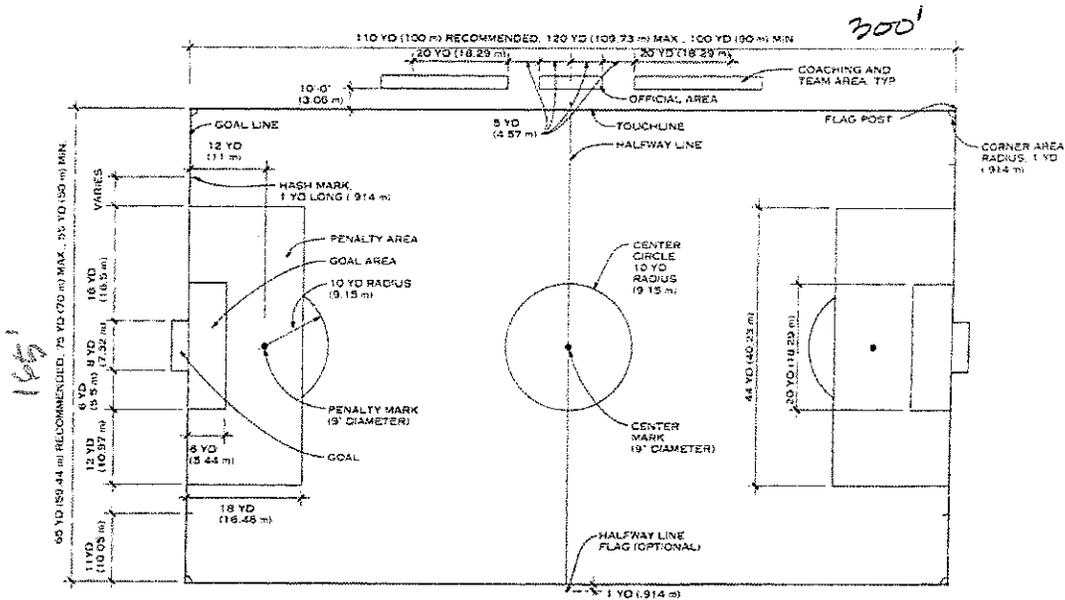
198018.DWG 07/26/00 17:30

ISSUED:		STANDARD DETAIL		DETAIL NO.
10/88		PIPE BEDDING		108
REVISED:				SHEET 1 OF 5
7/02				

ATHLETIC FIELD LAYOUTS



NCAA SOCCER- Recommended field dimensions are 75 yd. (90m.) wide x 120 yd. (109.73 m.) long. Field markings should be 4 in. (0.10 m.) wide.



HIGH SCHOOL SOCCER- Recommended field dimensions for middle school soccer are 55 yd. (50m.) wide x 100 yd. long. Field markings should be 4 in. (0.10 m.) wide.



SOCCER FIELDS
not to scale

INDEX TO STANDARD DETAILS

Field and Court Layouts:

- P-001 Little League Baseball Field Layout
- P-002 Little League Baseball Field Fence Layout
- P-003 Pony League Field Layout
- P-004 Pony League Field Fence Layout
- P-005 Full-Size Baseball Field Layout
- P-006 Full-Size Baseball Field Fence Layout
- P-007 Fast-Pitch Softball Field Layout
- P-008 Fast-Pitch Softball Field Fence Layout
- P-009 Adult Slow-Pitch Softball Field Layout
- P-010 Adult Slow-Pitch Softball Field Fence Layout
- P-011 Home Plate, Base, and Pitcher's Rubber Layout
- P-012 Pitcher's Mound Layout (Baseball)
- P-013 Home Plate (Baseball and Softball)
- P-014 Base Anchor (Baseball and Softball)
- P-015 Infield / Outfield - Base Path Interface (Baseball and Softball)

- P-020 Basketball Court Layout
- P-021 Basketball Key Striping Plan
- P-022 Basketball Post, Backboard, and Goal

- P-030 Sand Volleyball Court Layout
- P-031 Sand Volleyball Court Net Posts
- P-032 Sand Volleyball Court Boundary Rope and Anchor
- P-033 Sand Volleyball Court Concrete Header

Planting / Salvaged Native Plants:

- P-100 Tree Planting - Boxed Salvaged Specimen
- P-101 Shrub Planting - Boxed Salvaged Specimen
- P-102 Ocotillo Planting - Salvaged Specimen
- P-103 Saguaro Planting - Salvaged Specimen - ($\leq 8'$)
- P-104 Saguaro Planting - Salvaged Specimen - ($> 8'$)
- P-105 Barrel and Columnar Cactus Planting - Salvaged Specimen
- P-106 Stem Succulent Planting - Salvaged Specimen
- P-107 Prickly Pear and Cholla Planting - Salvaged Cutting

INDEX TO STANDARD DETAILS

Planting / Nursery Stock:

- P-200 Tree Planting - 30" and Larger Box Size
- P-201 Tree Planting - 24" Box and 15 Gallon Size
- P-202 Tree Planting (Hard Soil Conditions) - 24" Box and 15 Gallon Size
- P-203 Shrub / Ground Cover Planting - 1, 5, and 15 Gal. Size
- P-204 Shrub / Ground Cover Planting - (Hard Soil Conditions) 1, 5, and 15 Gal. Size
- P-205 Barrel and Columnar Cactus Planting - Container Grown
- P-206 Stem Succulent Planting - Container Grown
- P-207 Prickly Pear and Cholla Planting - Container Grown
- P-208 Rodent Protection Cage for Trees
- P-209 Tall-Pot Planting

Irrigation:

- P-300 Backflow Preventer in Security Enclosure
- P-301 Irrigation Controller / CCU in Freestanding Security Enclosure
- P-302 Irrigation Controller / CCU in Wall Mounted Security Enclosure
- P-303 Irrigation Controller / CCU - Interior Wall Mounted
- P-304 Master Valve Assembly
- P-305 Flow Sensor Assembly
- P-306 Mainline Isolation (Gate) Valve Assembly - 2-1/2" to 4" Size
- P-307 Mainline Isolation (Ball) Valve Assembly - 1/2" to 2" Size
- P-308 Quick-Coupling Valve Assembly
- P-309 Remote Control Valve Assembly - Turf Zones
- P-310 Remote Control Valve Assembly - Drip Zones
- P-311 Pipe Trenching and Backfill - Mainlines, Laterals, and Marking Tape
- P-312 Sleeve Under Street or Parking Lot
- P-313 Sleeve Under Walkway or Shared Use Path
- P-314 Multi-Outlet Emitter - Six Outlet
- P-315 Emitter Distribution Tubing Layout at Tree - Six Outlet
- P-316 Multi-Outlet Emitter - Eight Outlet
- P-317 Emitter Distribution Tubing Layout at Tree - Eight Outlet
- P-318 Single-Outlet Emitter
- P-319 Emitter Distribution Tubing Layout at Shrubs
- P-320 Emitter Line Flush Cap in Access Box
- P-321 Gear Drive Sprinkler
- P-322 Pop-Up Spray Sprinkler

INDEX TO STANDARD DETAILS

Post and Cable Barrier:

- P-400 Post-and-Cable Barrier
- P-401 Post and Cable Barrier End / Corner Post
- P-402 Maze Gate
- P-403 Post-and-Cable Barrier, End / Corner Post, Plan View

Entry Gates:

- P-500 Park Entry Gate - Gate Panel
- P-501 Park Entry Gate - Gate Post
- P-502 Park Entry Gate - Tie-Back Post
- P-503 Park Entry Gate - Tie-Back Anchor and Locking Mechanism

Chain Link Fencing and Gates:

- P-600 Chain Link Fence - Typical Framing Plan
- P-601 Chain Link Fence - Up to 6'-0" Height
- P-602 Chain Link Fence - >6'-0" to 10'-0" Height
- P-603 Chain Link Gate - Single Swing - 6'-0" Max. Height / 5'-0" Max. Width
- P-604 Chain Link Gate - Single Swing - 10'-0" Max. Height / 10'-0" Max. Width
- P-605 Chain Link Gate - Single Swing - 6'-8" Height in 10'-0" Fence
- P-606 Chain Link Gate - Double Swing - 6'-0" Max. Height / 24'-0" Max. Width
- P-607 Chain Link Gate - Double Swing - 10'-0" Max. Height / 24'-0" Max. Width
- P-608 Chain Link Security Fence - 8'-0" Height
- P-609 Removable Outfield Fence Panels

Backstops:

- P-700 Backstop Layout - Little League Baseball, Pony League Baseball, and Fast-Pitch Softball Fields
- P-701 Backstop Layout - Full-Size Baseball and Adult Slow-Pitch Softball Fields
- P-702 Backstop Framing Plan - Little League Baseball, Pony League Baseball, and Fast-Pitch Softball Fields
- P-703 Backstop Framing Plan - Full-Size Baseball and Adult Slow-Pitch Softball Fields
- P-704 Section through Backstop
- P-705 Backstop Cantilevered Panel Connection to Backstop Posts

INDEX TO STANDARD DETAILS

Baseball / Softball Dugouts:

P-800	Dugout - Plan
P-801	Dugout - Closed End Elevation
P-802	Dugout - Gate End Elevation
P-803	Dugout - Front (Field Side) Elevation
P-804	Dugout - Rear (Spectator Side) Elevation
P-805	Dugout Gate
P-806	Dugout Equipment Shelf
P-807	Dugout Roof
P-808	Dugout Electrical Outlet
P-809	Water Cooler Shelf
P-810A	Batting Cage - Plan
P-810B	Batting Cage - Roof Plan
P-810C	Batting Cage - Elevations
P-810D	Batting Cage - Roof Frame

Playground Headers and Surfacing:

P-900	Rubberized Resilient Surfacing
P-901	Engineered Wood Fiber Surfacing
P-902	Playground Header

Site Furniture:

P-1000	Boulder Detail
P-1001	Accessible Drinking Fountain
P-1002	Accessible Drinking Fountain with Pet Water Fountain
P-1003	Precast Concrete Picnic Table
P-1004	Precast Concrete Bench
P-1005	Standard Barbeque Grill
P-1006	Group Barbeque Grill
P-1007	Barbeque Grill Layout
P-1008	3 Tier Bleachers
P-1009	5 Tier Bleachers

Pathway and Trail Paving:

P-1100	Decomposed Granite Path
P-1101	Asphaltic Concrete Path
P-1102	Asphaltic Concrete Path at Bank Protection

INDEX TO STANDARD DETAILS

Miscellaneous Park Facilities:

- P-1200 Horseshoe Pit - Layout
- P-1201 Horseshoe Pit - Section through Pit and Backstop
- P-1202 Horseshoe Pit - Backstop Elevation

Maintenance Yard and Building:

- P-2000 Maintenance Yard
- P-2001 Maintenance Building

Pre-Engineered Restrooms:

- P-2100 Restroom Building - Type 1
- P-2101 Restroom Building - Type 2
- P-2102 Restroom Building - Type 3
- P-2103 Restroom Building - Type 4 (With Snack Bar)
- P-2104 Restroom Building - Type 5 (With Maintenance Shop)
- P-2105 Restroom Building - Type 6

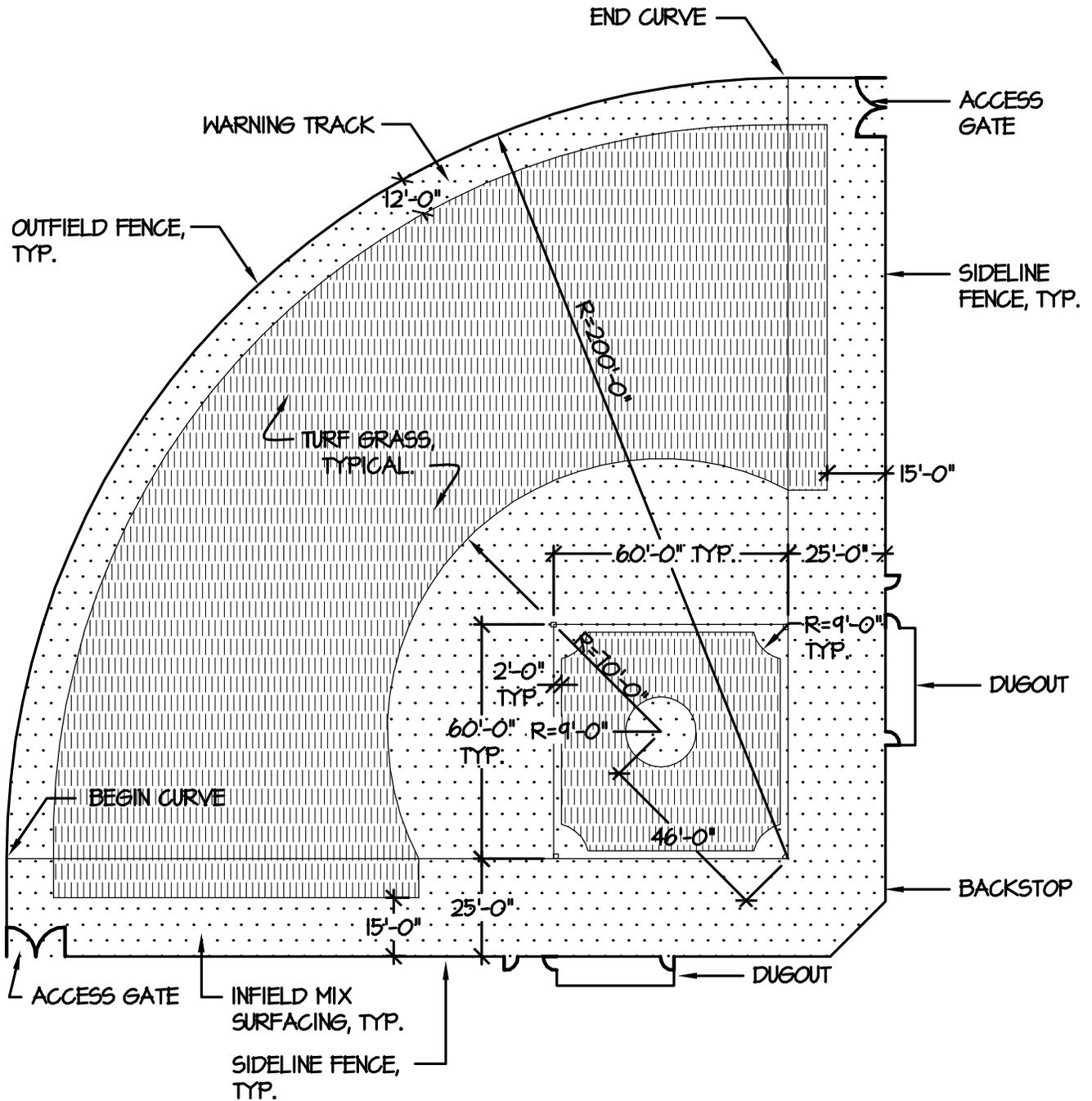
Pre-Engineered Ramadas:

- P-2200 Ramada - Type 1 (16'x16')
- P-2201 Ramada - Type 2 (20'x24')
- P-2202 Ramada - Type 3 (20'x34')

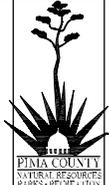
Pre-Engineered Shade Canopies:

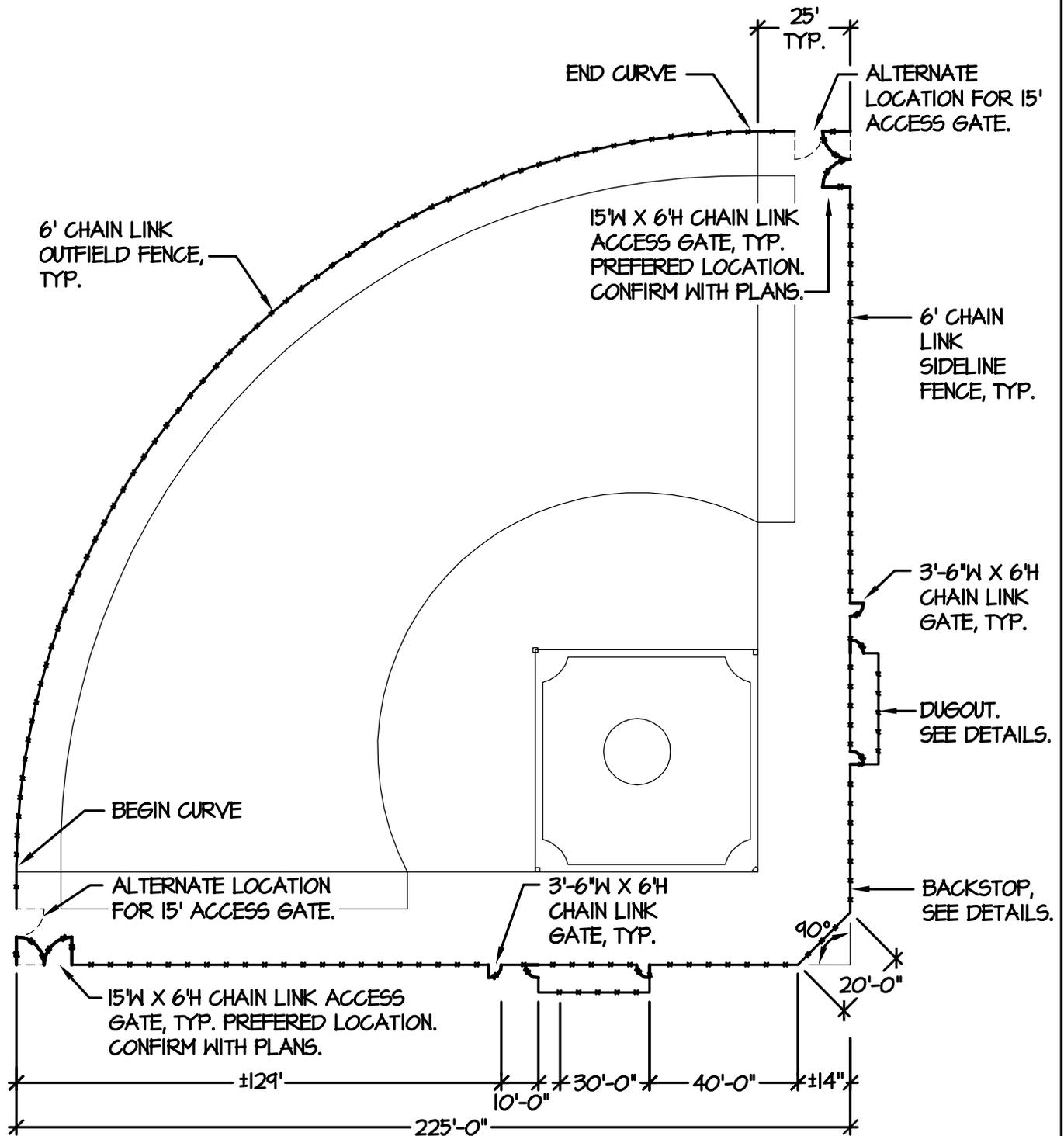
- P-2300 Typical Shade Canopy above Play Equipment
- P-2301 Typical Shade Canopy above Bleachers

NOTE: DELETE WARNING TRACK WHERE OUTFIELD IS ALSO USED AS PART OF OTHER ATHLETIC FIELD OR RECREATIONAL PLAYFIELD.



SCALE: N.T.S.

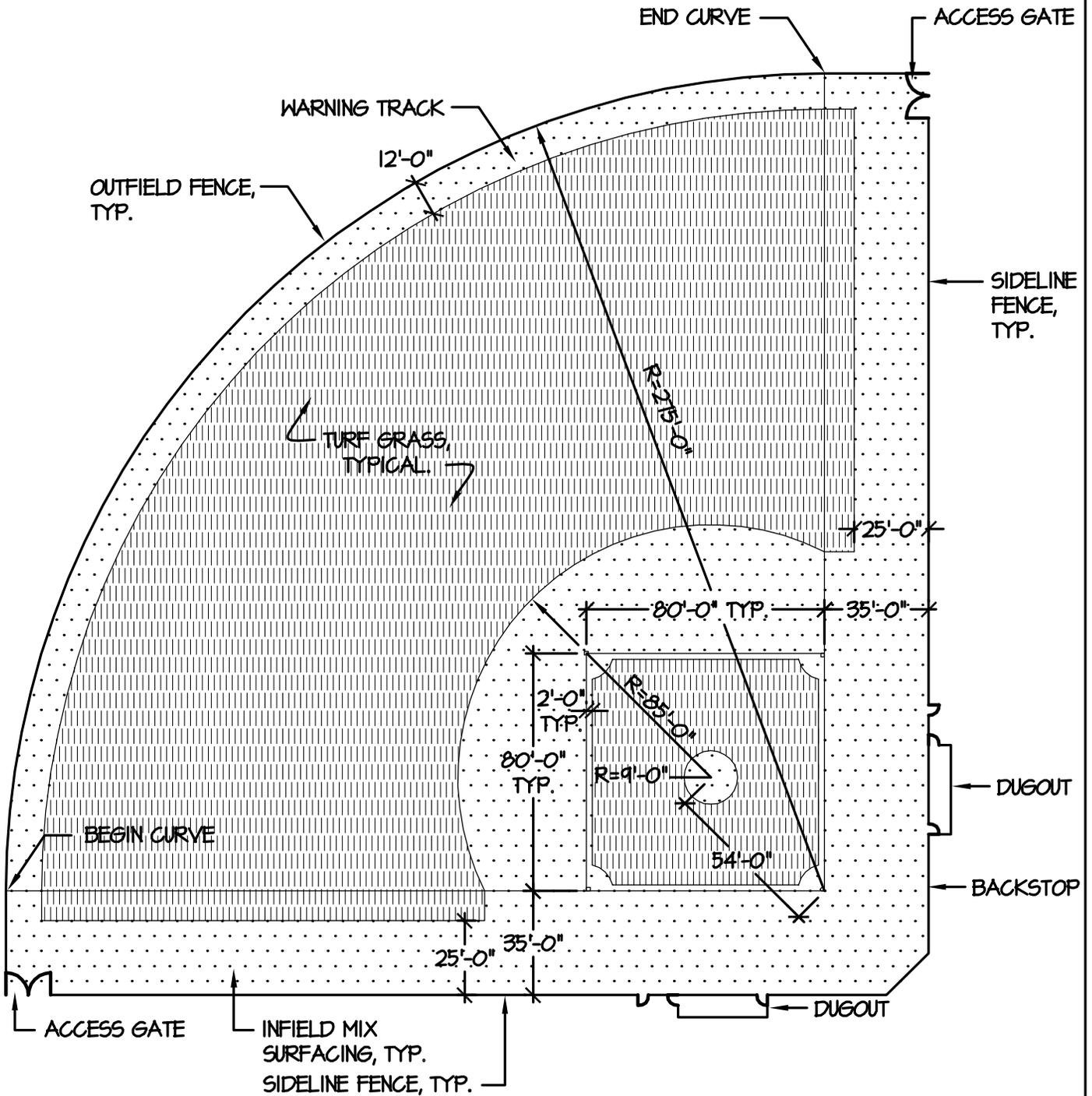
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		P-001
REVISED:		LITTLE LEAGUE BASEBALL		SHEET 1 OF 1
MOYR		FIELD LAYOUT		



SCALE: N.T.S.

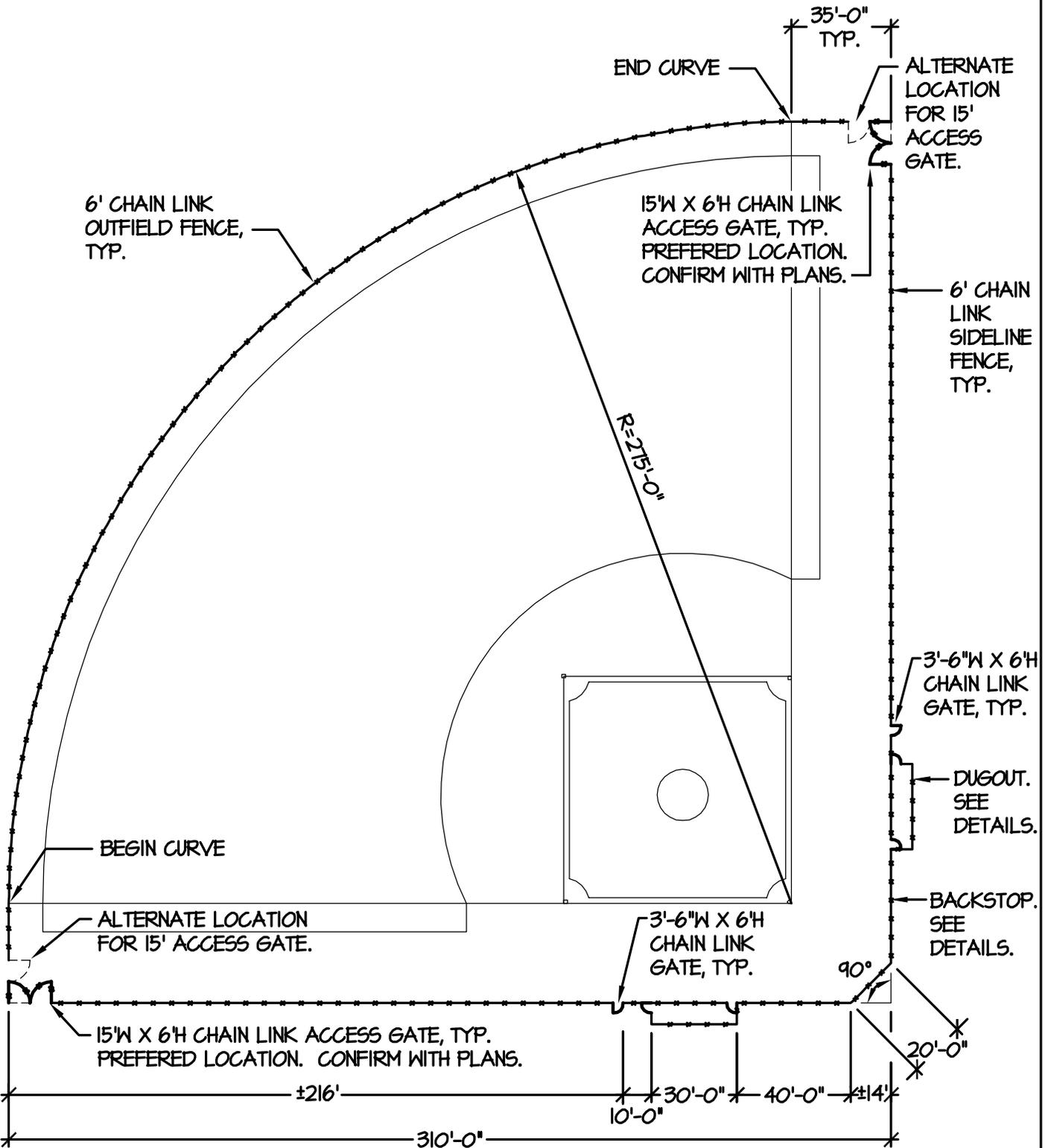
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		P-002
REVISED:		LITTLE LEAGUE BASEBALL FIELD		
MOYR		FENCE LAYOUT		SHEET 1 OF 1

NOTE: DELETE WARNING TRACK WHERE OUTFIELD IS ALSO USED AS PART OF OTHER ATHLETIC FIELD OR RECREATIONAL PLAYFIELD.

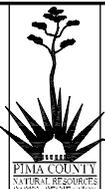


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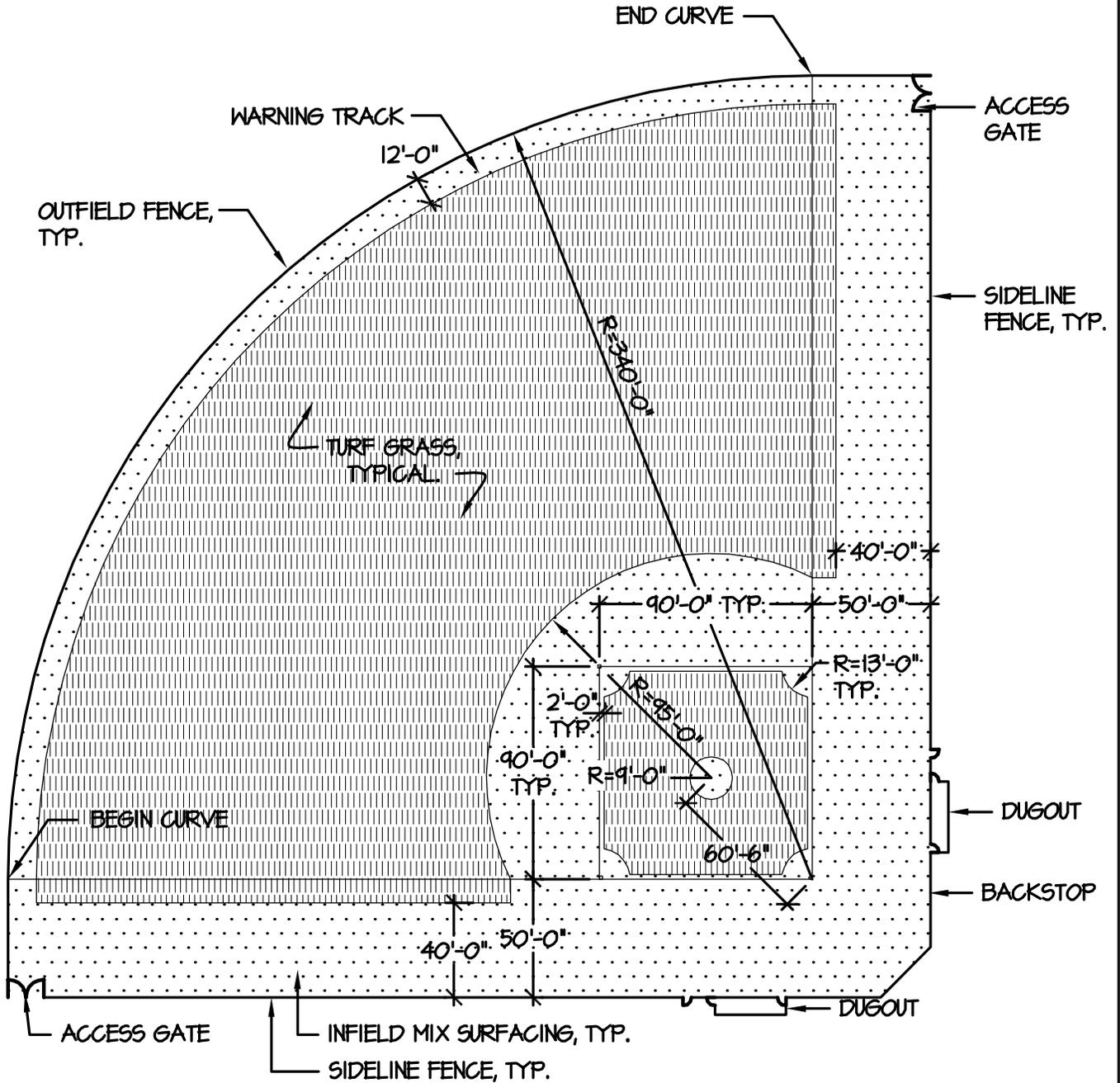
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		P-003
REVISED:		PONY LEAGUE BASEBALL		
MOYR		FIELD LAYOUT		SHEET 1 OF 1



SCALE: N.T.S.

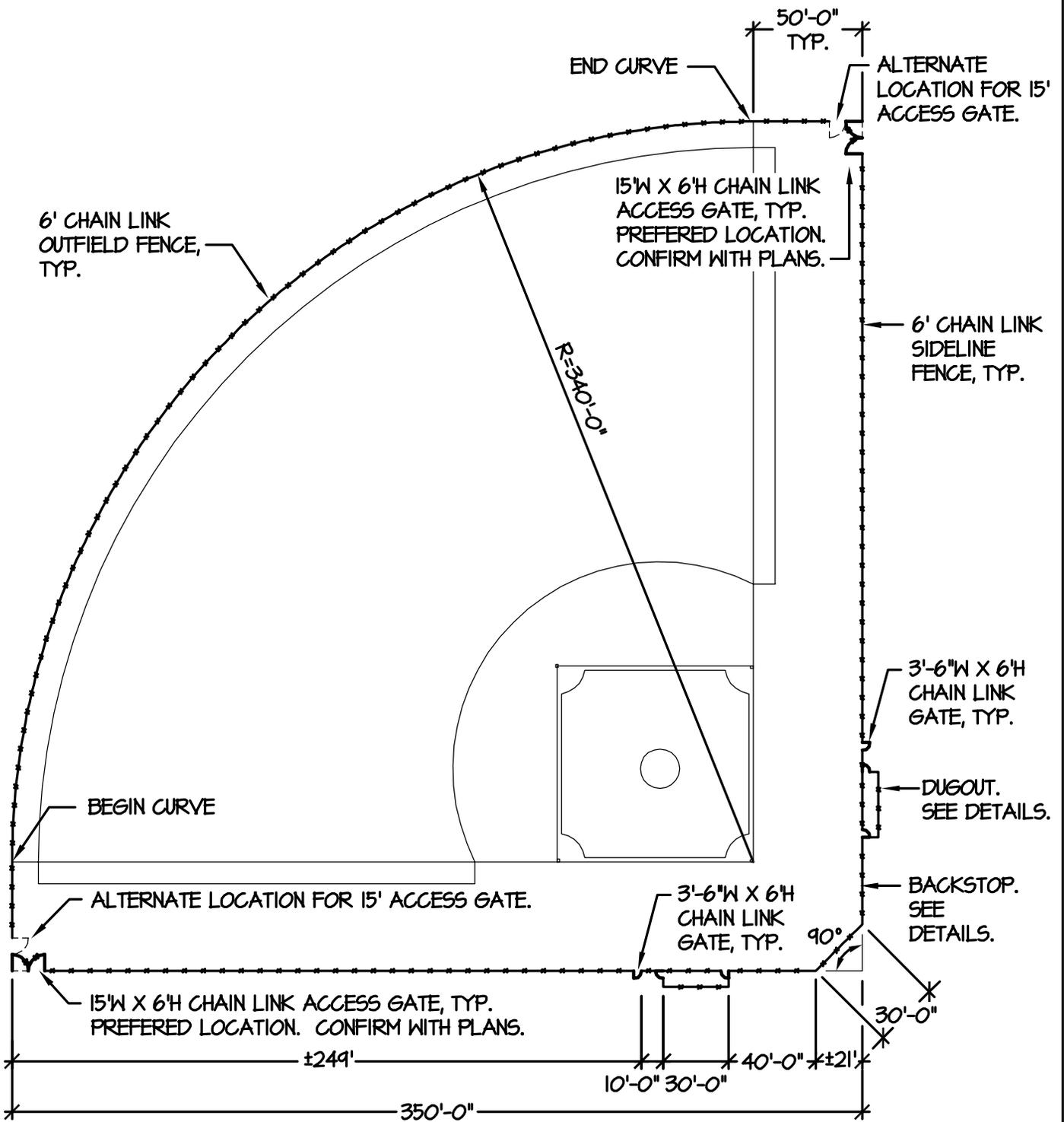
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		P-004
REVISED:		PONY LEAGUE BASEBALL FIELD		SHEET 1 OF 1
MOYR		FENCE LAYOUT		

NOTE: DELETE WARNING TRACK WHERE
 OUTFIELD IS ALSO USED AS PART
 OF OTHER ATHLETIC FIELD OR
 RECREATIONAL PLAYFIELD.

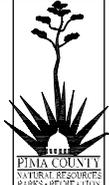


SCALE: N.T.S.

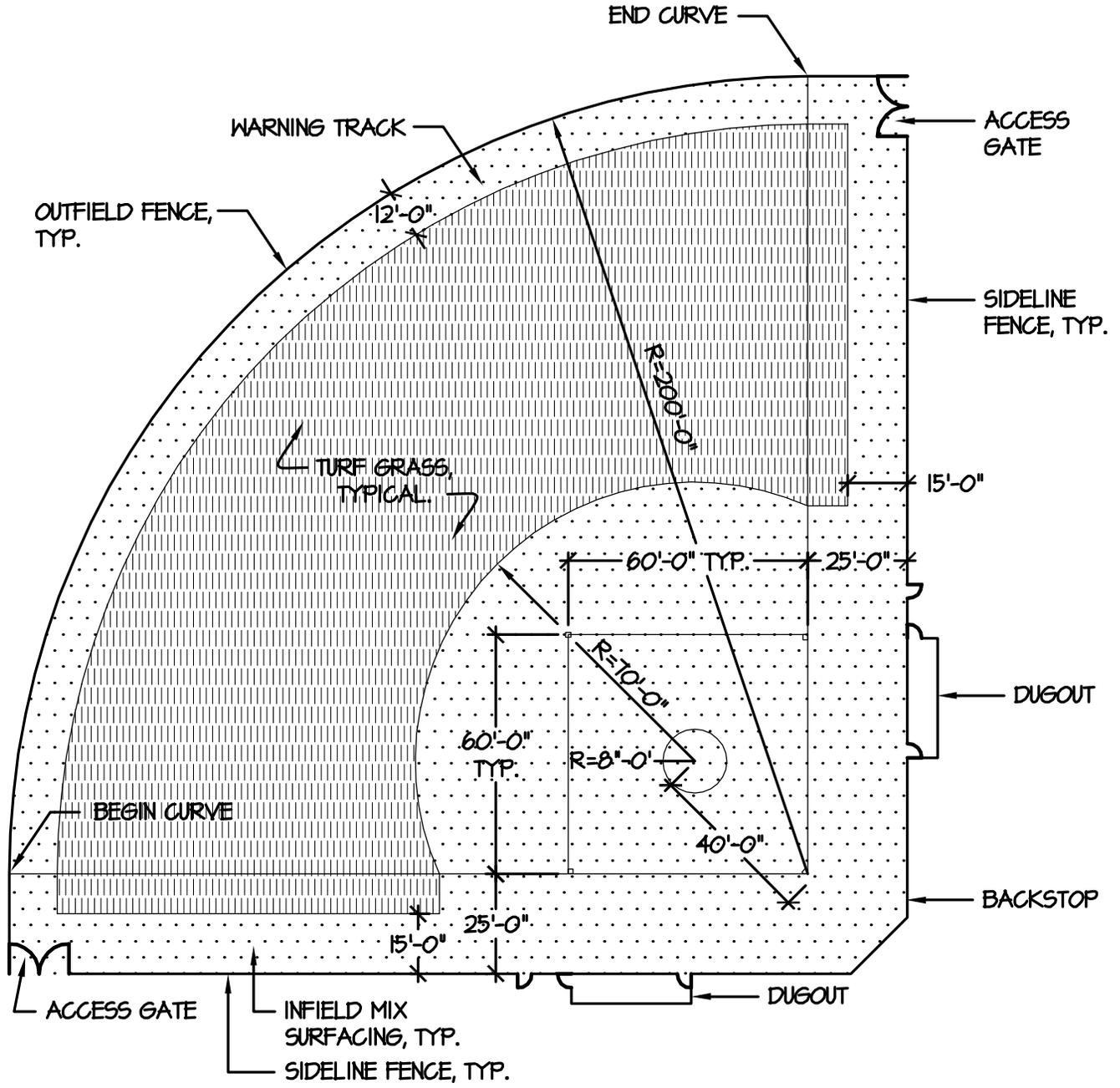
ISSUED: 11/05 REVISED: MOYR		STANDARD DETAIL FIELD & COURT LAYOUTS: FULL-SIZE BASEBALL FIELD LAYOUT		DETAIL NO. P-005 SHEET 1 OF 1
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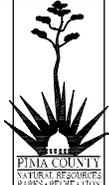
SCALE: N.T.S.

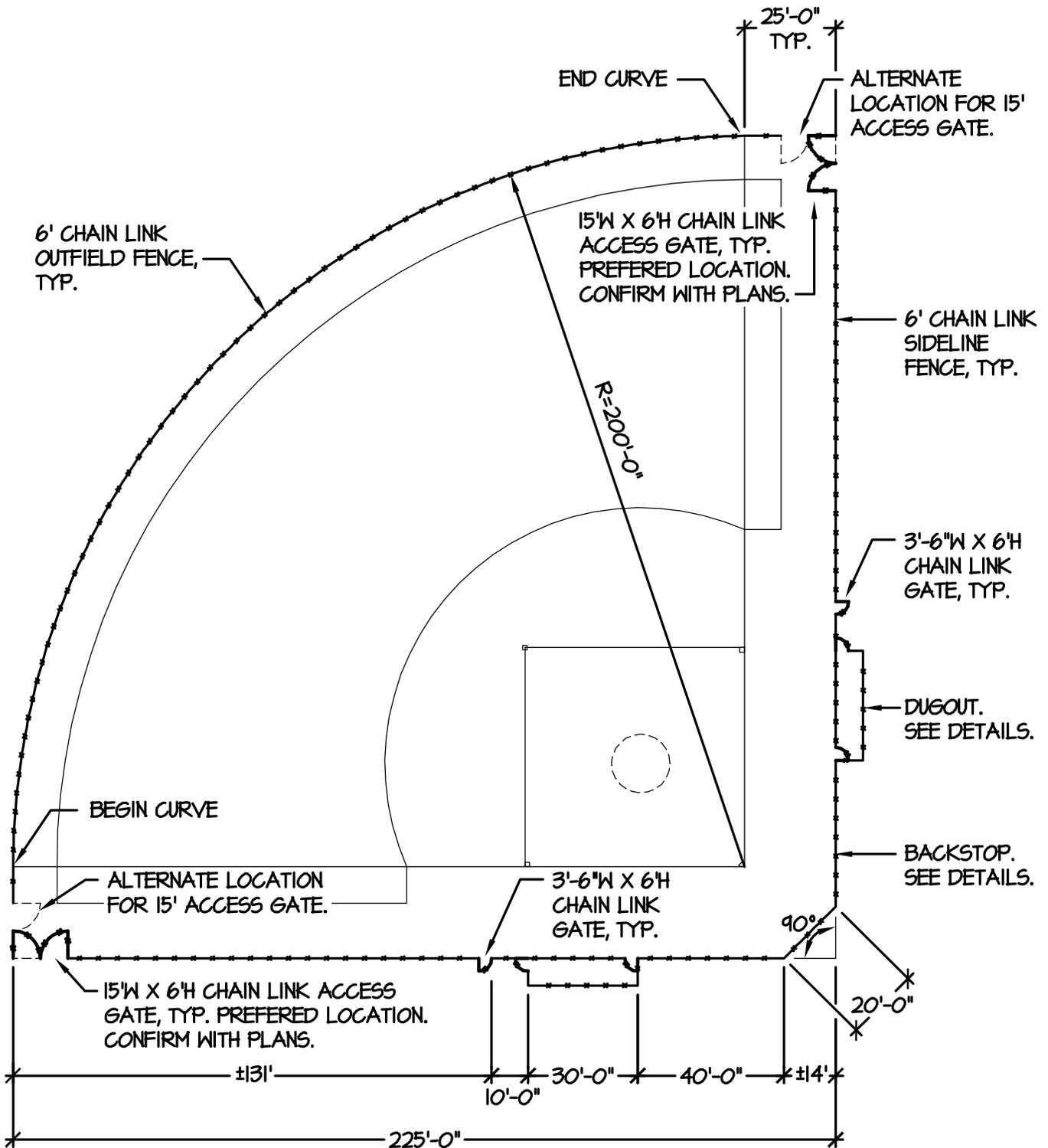
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		<p style="font-size: 24pt; text-align: center;">P-006</p>
REVISED:		FULL-SIZE BASEBALL FIELD		
MOYR		FENCE LAYOUT		SHEET 1 OF 1

NOTE: DELETE WARNING TRACK WHERE OUTFIELD IS ALSO USED AS PART OF OTHER ATHLETIC FIELD OR RECREATIONAL PLAYFIELD.

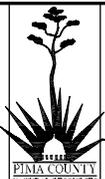


SCALE: N.T.S.

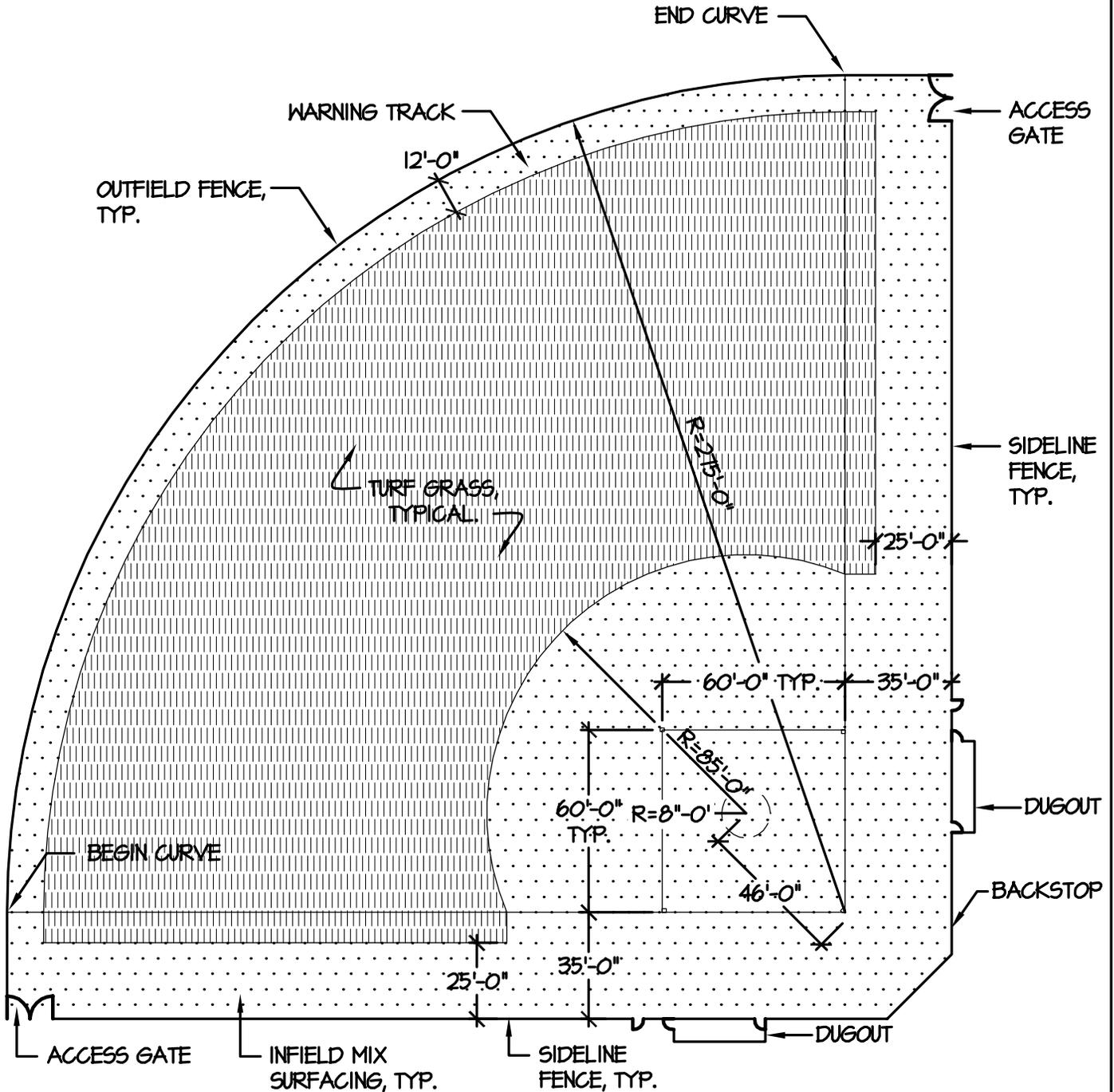
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		P-007
REVISED:		FAST-PITCH SOFTBALL		SHEET 1 OF 1
MOYR		FIELD LAYOUT		



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		P-008
REVISED:		FAST-PITCH SOFTBALL FIELD		
MOYR		FENCE LAYOUT		SHEET 1 OF 1

NOTE: DELETE WARNING TRACK WHERE OUTFIELD IS ALSO USED AS PART OF OTHER ATHLETIC FIELD OR RECREATIONAL PLAYFIELD.



SCALE: N.T.S.

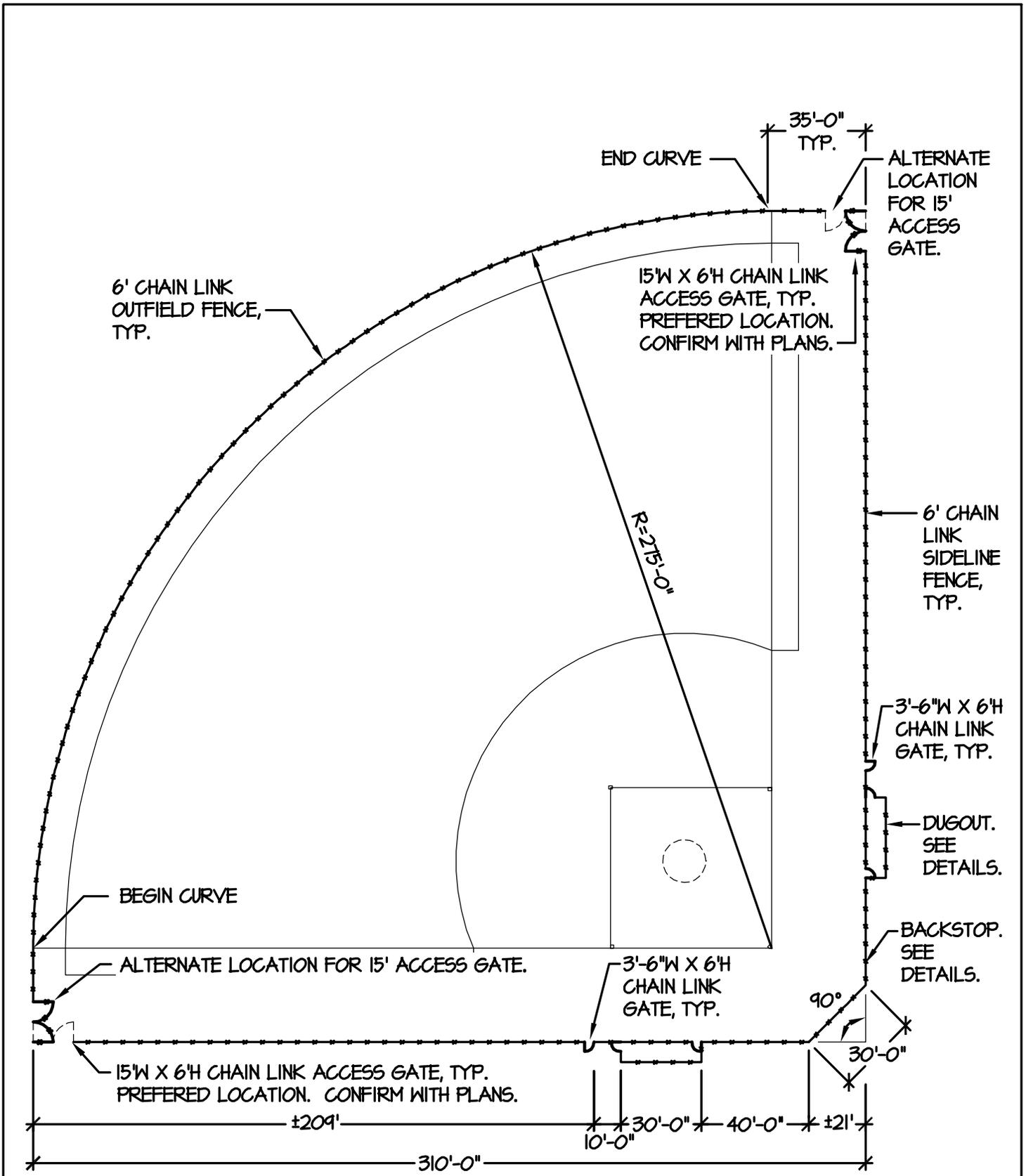
ISSUED:	
11/05	
REVISED:	
MOYR	



STANDARD DETAIL
 FIELD & COURT LAYOUTS:
 ADULT SLOW PITCH SOFTBALL
 FIELD LAYOUT



DETAIL NO.
P-009
SHEET 1 OF 1

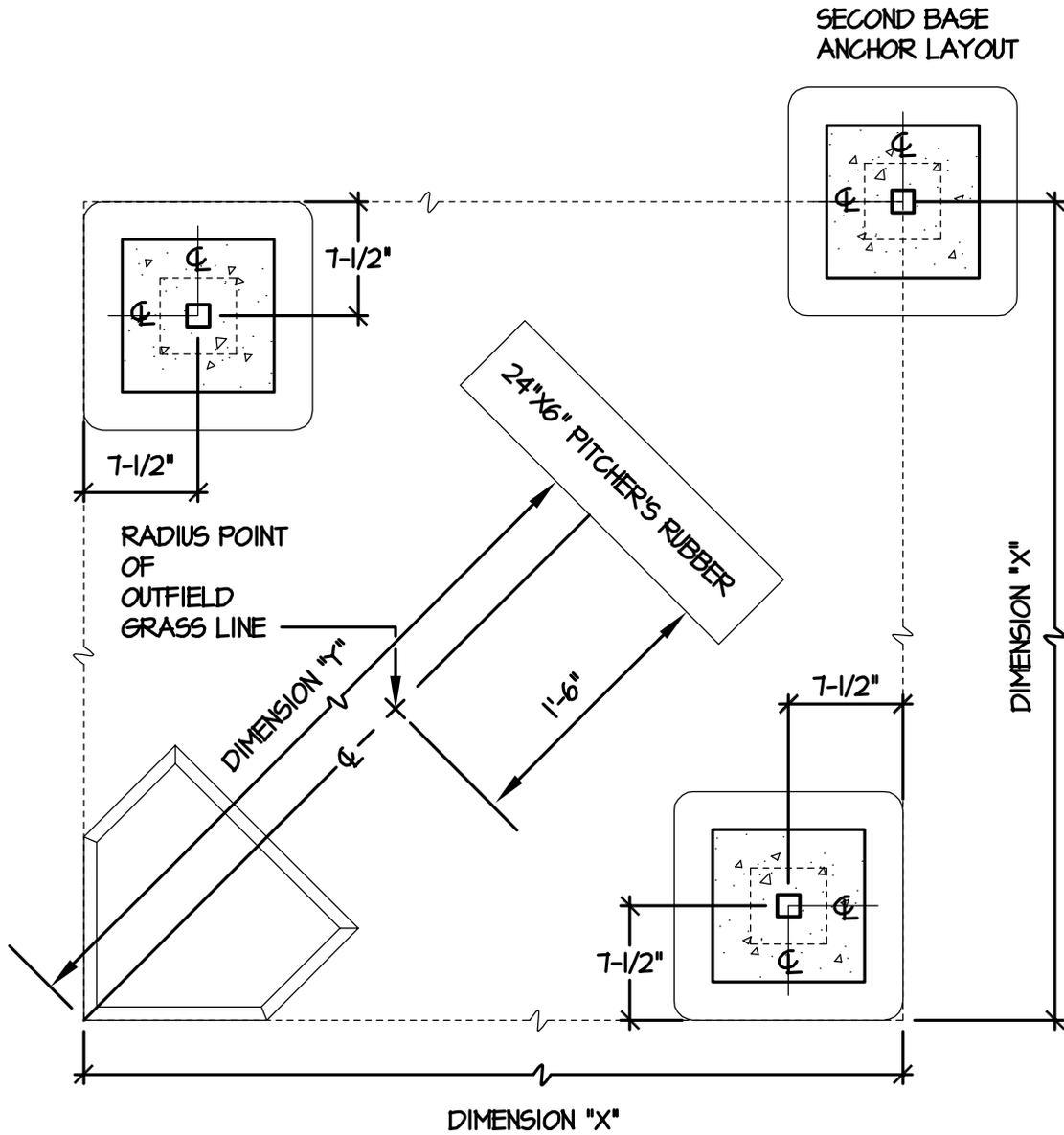


SCALE: N.T.S.

<p>ISSUED: 11/05</p> <p>REVISED: MOYR</p>		<p>STANDARD DETAIL FIELD & COURT LAYOUTS:</p> <p>ADULT SLOW PITCH SOFTBALL FIELD FENCE LAYOUT</p>		<p>DETAIL NO. P-010</p> <p>SHEET 1 OF 1</p>
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FIELD LAYOUT DIMENSIONS

	X	Y
LITTLE LEAGUE	60'-0"	46'-0"
PONY LEAGUE	80'-0"	54'-0"
BASEBALL	90'-0"	60'-6"
STD. SOFTBALL	60'-0"	40'-0"
ADULT REC. SOFTBALL	60'-0"	46'-0"



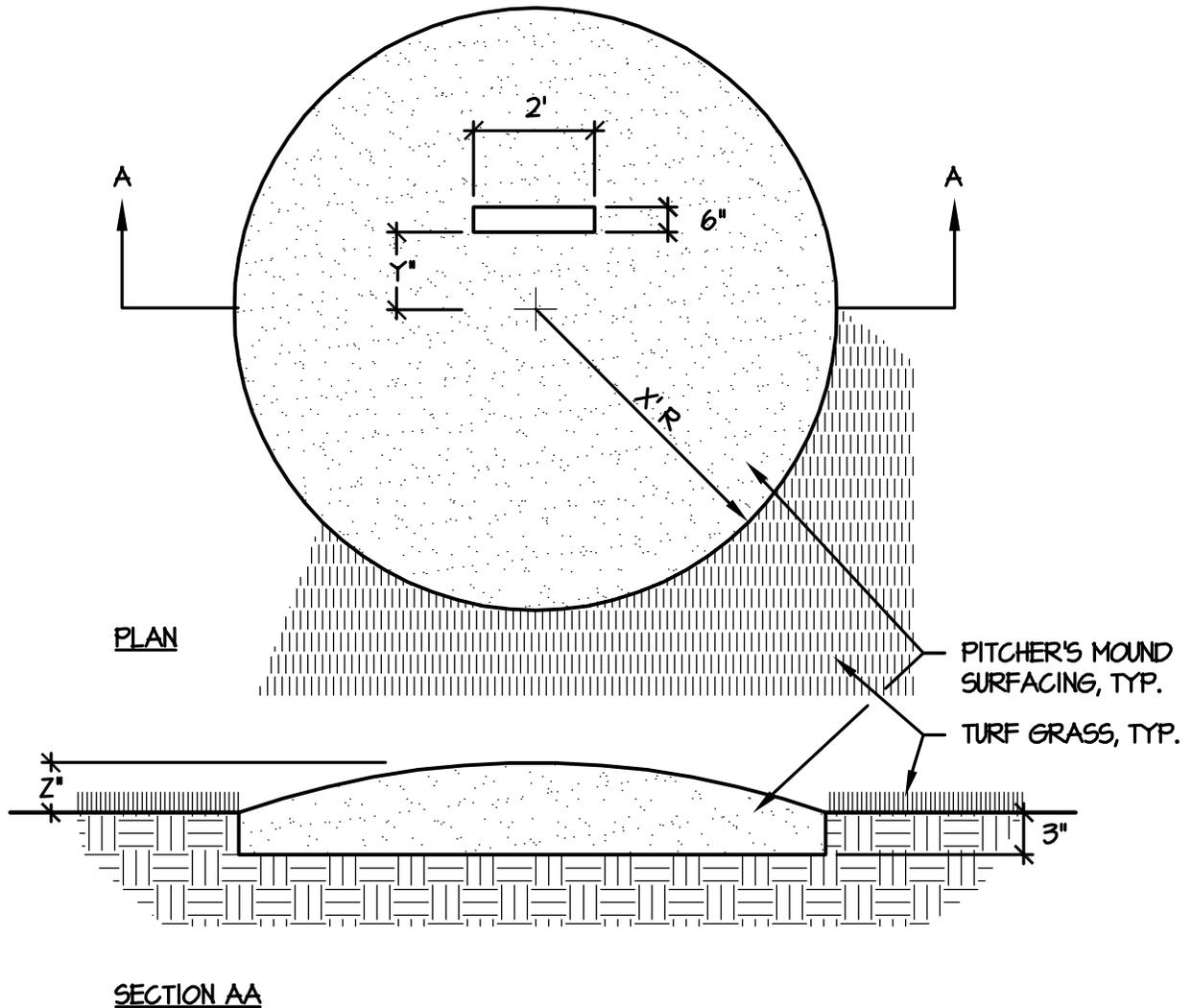
SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL FIELD & COURT LAYOUTS:		DETAIL NO. P-011
REVISED: MOYR		HOME PLATE, BASE, AND PITCHER'S RUBBER LAYOUT		SHEET 1 OF 1

PITCHER'S MOUND DIMENSIONS

	X	Y	Z
LITTLE LEAGUE	5'-0"	1'-6"	0'-6"
PONY LEAGUE	9'-0"	1'-6"	0'-8"
BASEBALL	9'-0"	1'-6"	0'-10"

NOTE: Z DIMENSION IS ELEVATION ABOVE HOME PLATE.



SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL FIELD & COURT LAYOUTS:		DETAIL NO.
REVISED: MOYR		PITCHER'S MOUND LAYOUT (BASEBALL)		P-012
				SHEET 1 OF 1

PERMANENT MARKER
SEE BELOW

BEVELED EDGE
OF HOME PLATE

INFIELD SOIL MIX

ATTACH SPIKES TO HOME PLATE AND
SET IN CONCRETE BASE. TOP SURFACE
OF HOME PLATE TO BE LEVEL AND AT
ELEVATION SHOWN ON PLANS.

PLAN

CAST-IN-PLACE
CONCRETE BASE

FINISHED GRADE

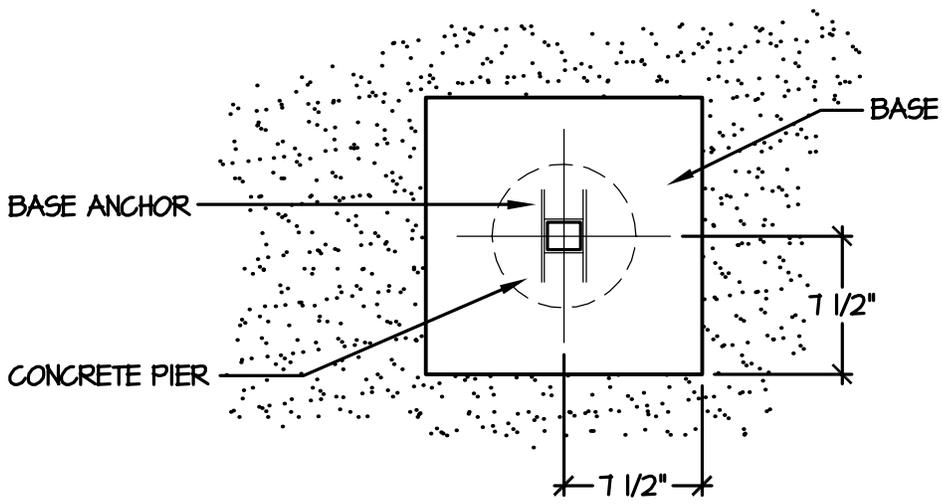
8" DIA. CONCRETE PIER,
12" DEEP

1" ϕ STEEL ROD AS PERMANENT
MARKER FOR FIELD LAYOUT.

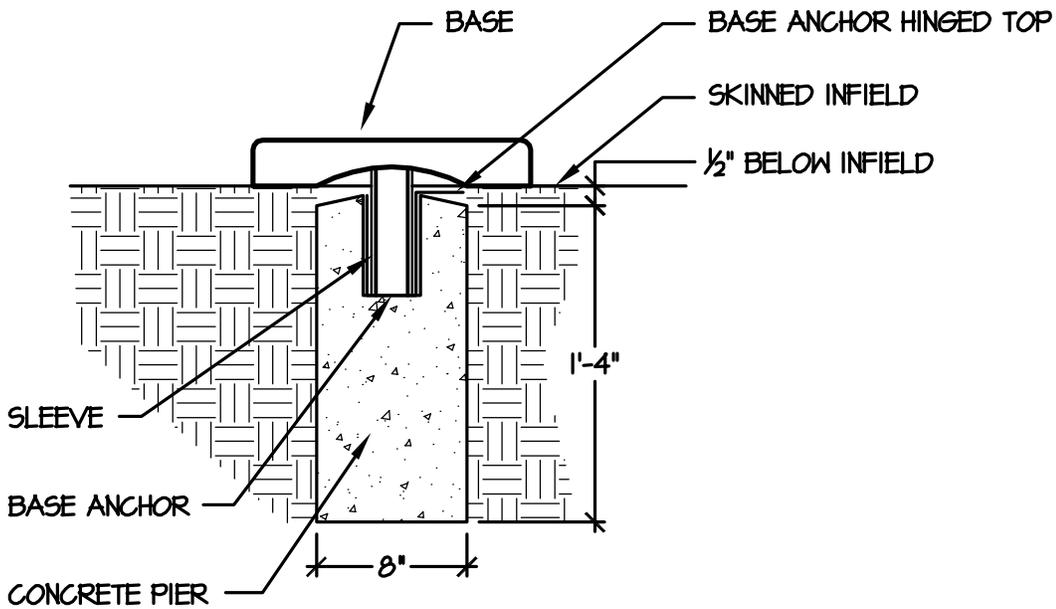
SECTION

SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		P-013
REVISED:		HOME PLATE		
MO/YR		(BASEBALL AND SOFTBALL)		SHEET 1 OF 1

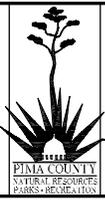


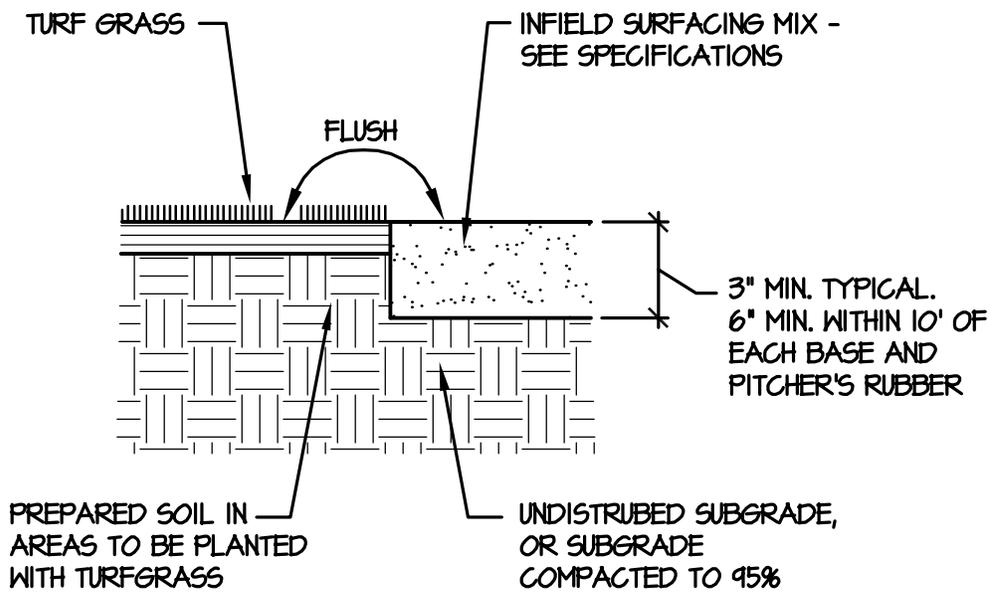
PLAN



SECTION

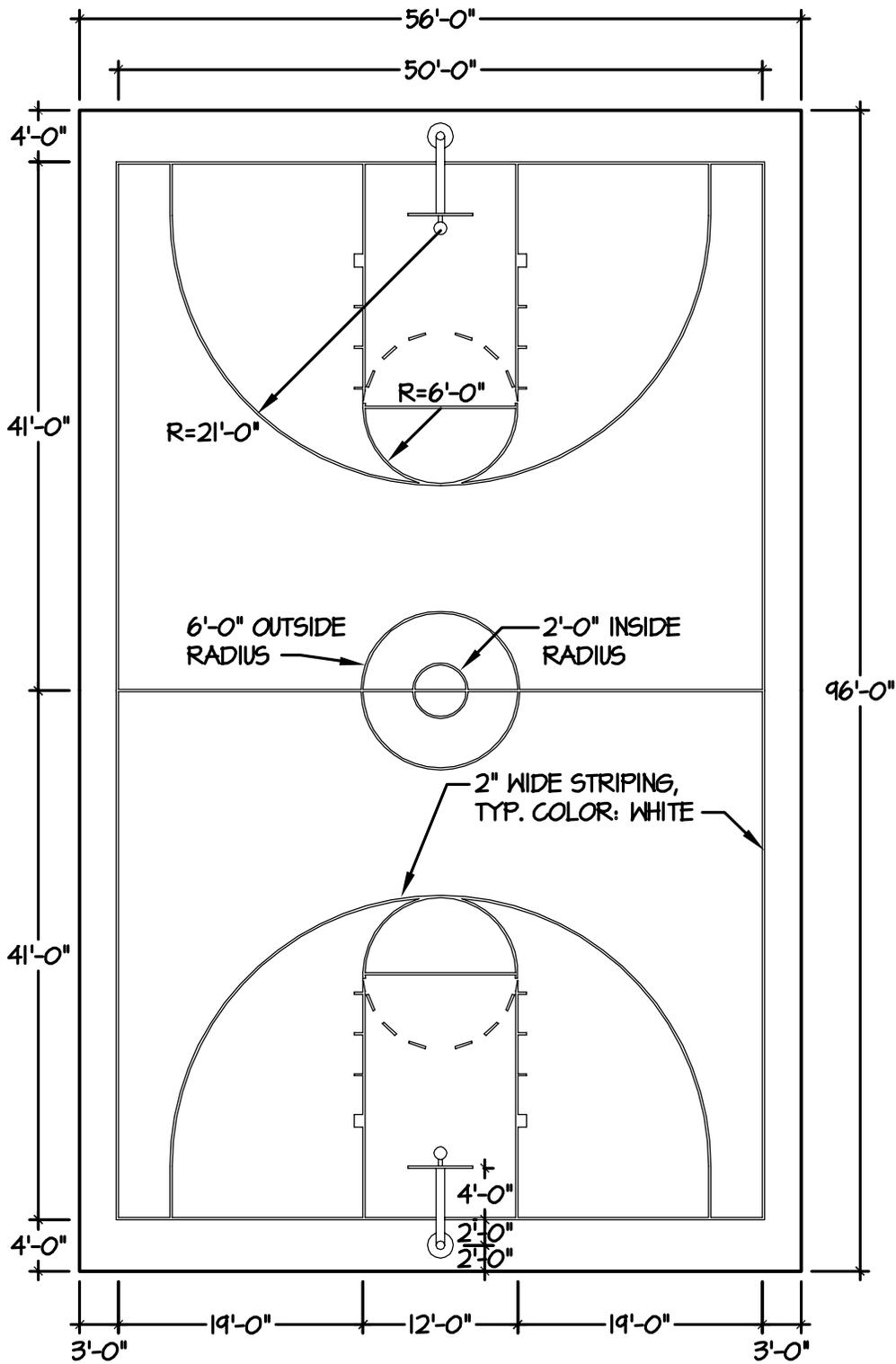
SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL FIELD & COURT LAYOUTS:		DETAIL NO.
REVISED:		BASE ANCHOR (BASEBALL AND SOFTBALL)		P-014
MOYR				SHEET 1 OF 1



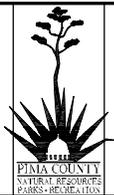
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		P-015
REVISED:		INFIELD / OUTFIELD - BASE PATH INTERFACE (BASEBALL AND SOFTBALL)		
MOYR				



SCALE: N.T.S.

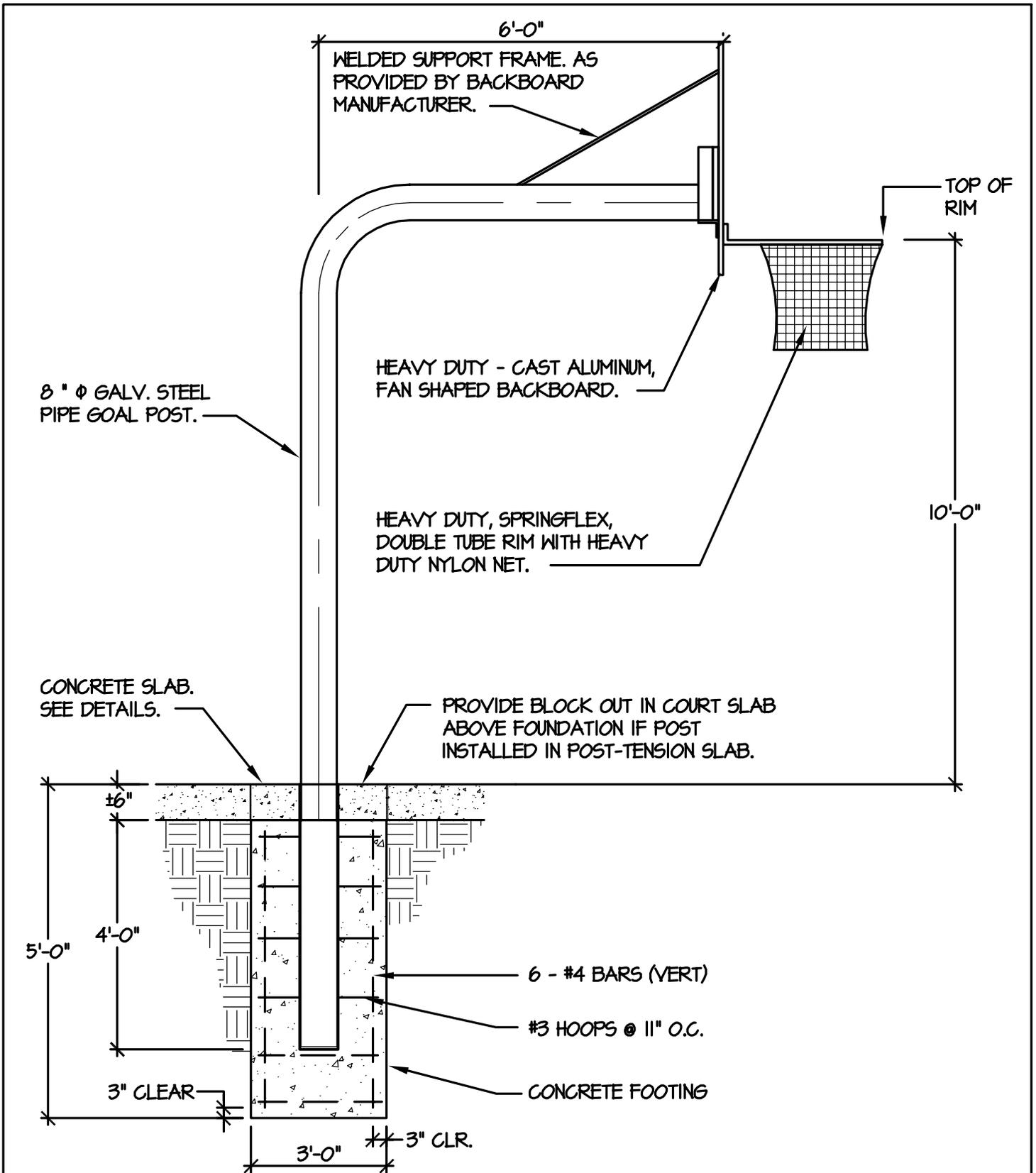
ISSUED:	
11/05	
REVISED:	
MOYR	



STANDARD DETAIL
 FIELD & COURT LAYOUTS:
 BASKETBALL COURT LAYOUT

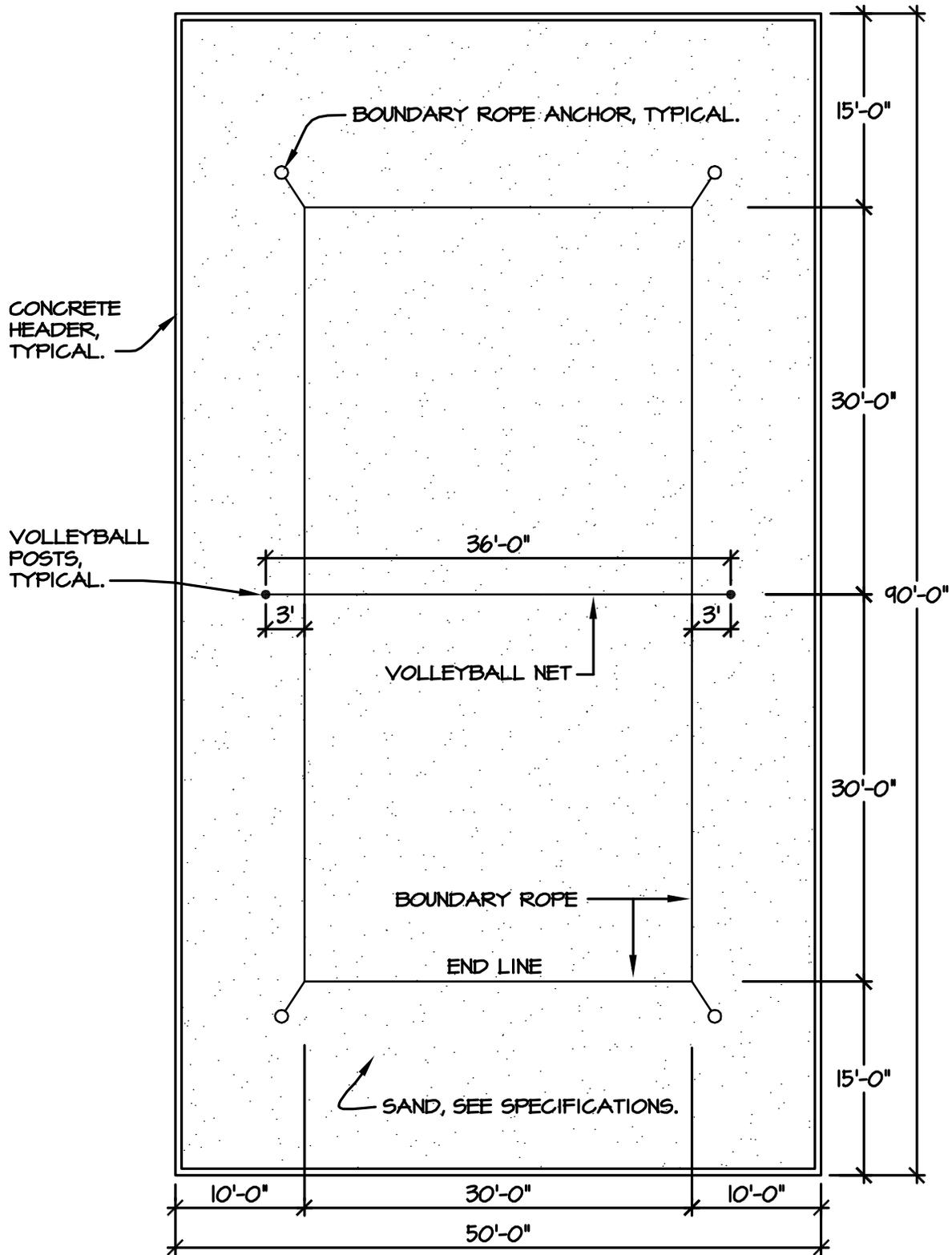


DETAIL NO.	
P-020	
SHEET 1 OF 1	

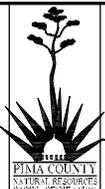


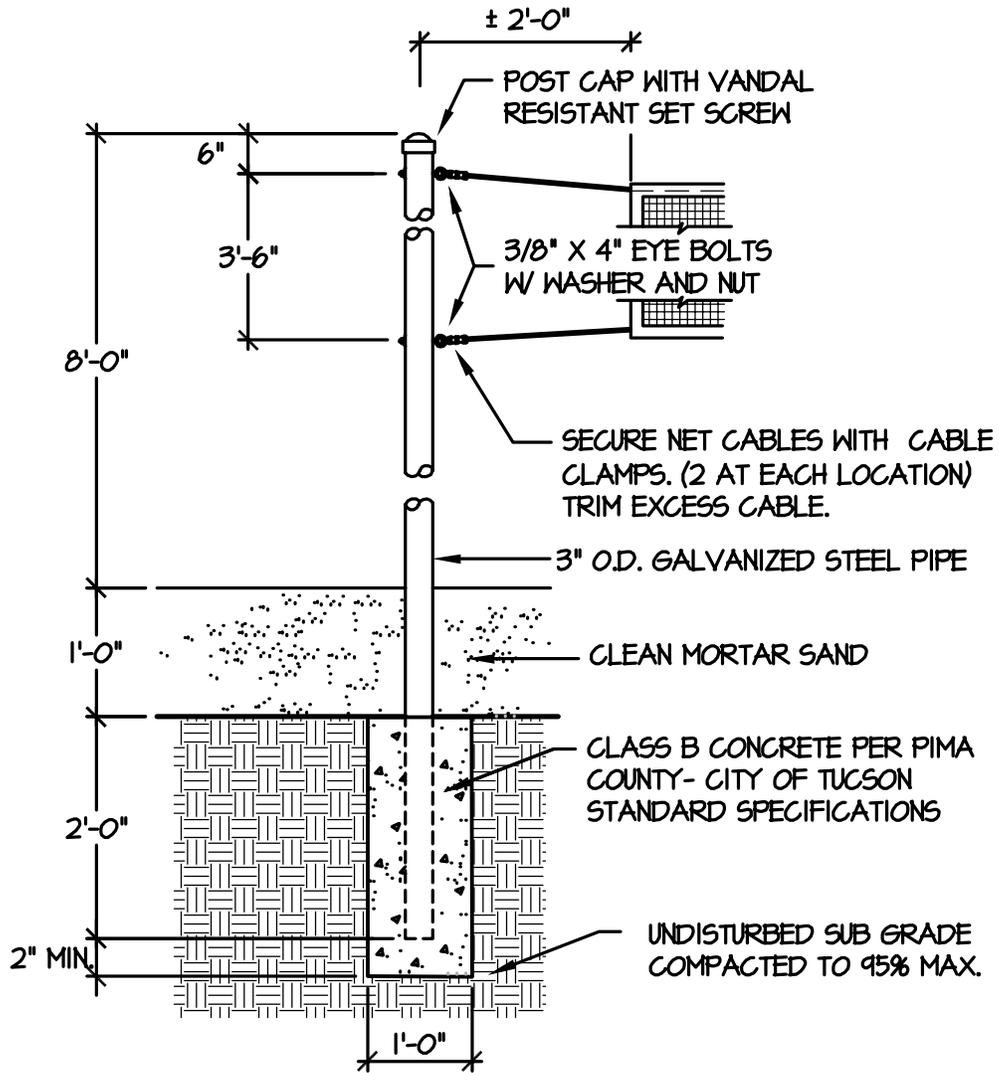
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		P-022
REVISED:		BASKETBALL POST, BACKBOARD & GOAL		
MOYR				SHEET 1 OF 1

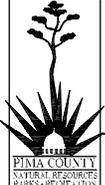


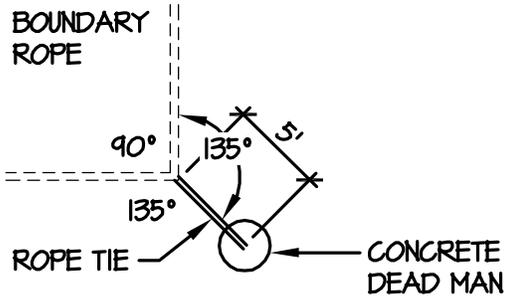
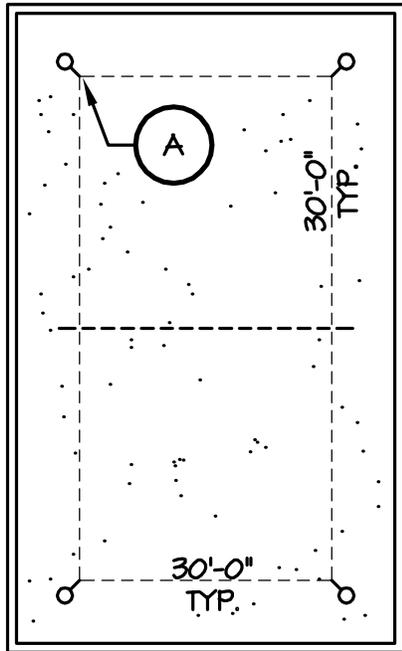
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		P-030
REVISED:		SAND VOLLEYBALL COURT LAYOUT		
MOYR		SHEET 1 OF 1		

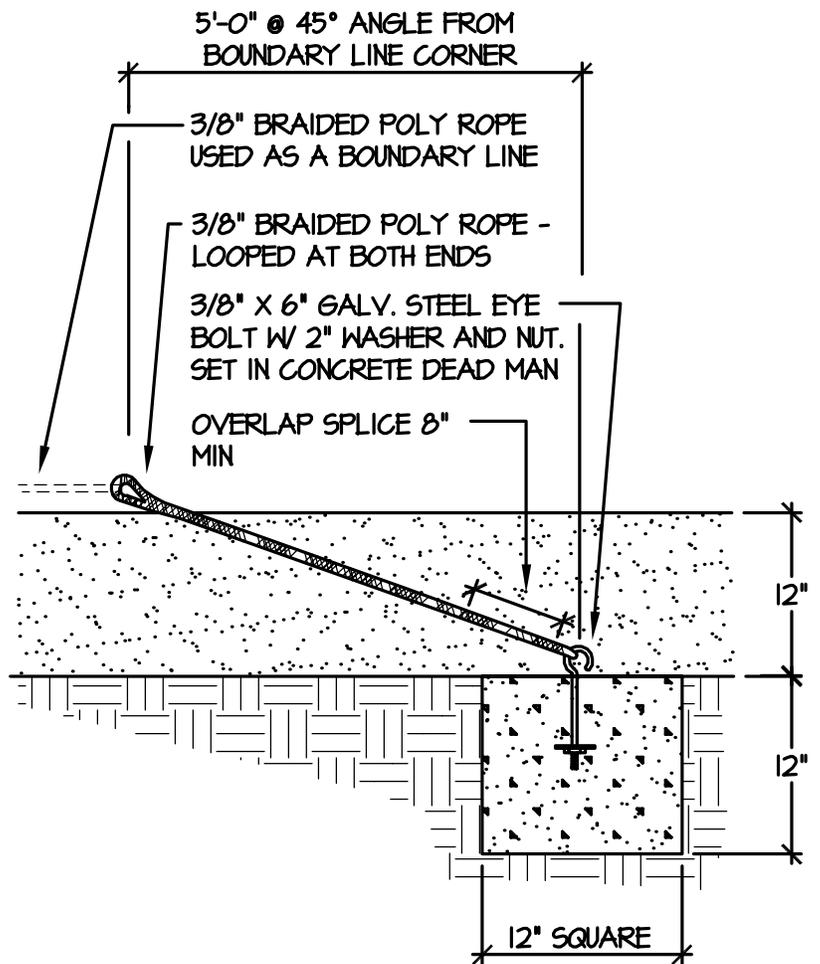


SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL		DETAIL NO.
REVISED: MOYR		FIELD & COURT LAYOUTS:		P-031
		SAND VOLLEYBALL NET POSTS		
				SHEET 1 OF 1

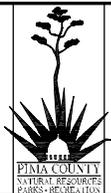


A ROPE CORNER FOOTING



SCALE: N.T.S.

ISSUED:	
11/05	
REVISED:	
MOYR	



STANDARD DETAIL
FIELD & COURT LAYOUTS:

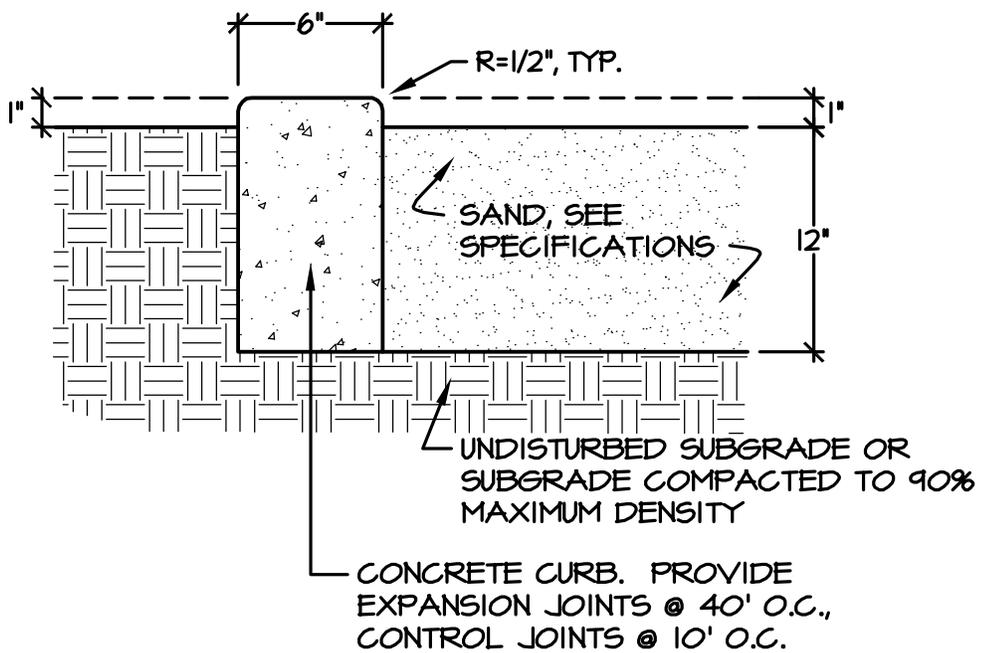
SAND VOLLEYBALL
BOUNDARY ROPE AND ANCHOR



DETAIL NO.

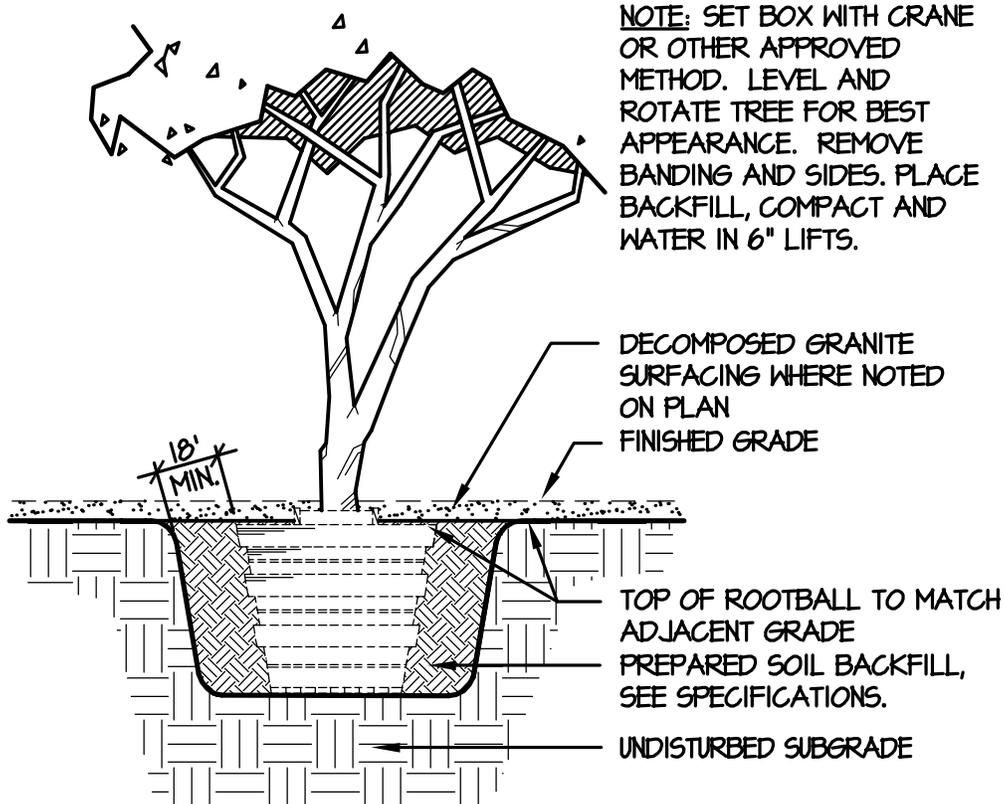
P-032

SHEET 1 OF 1



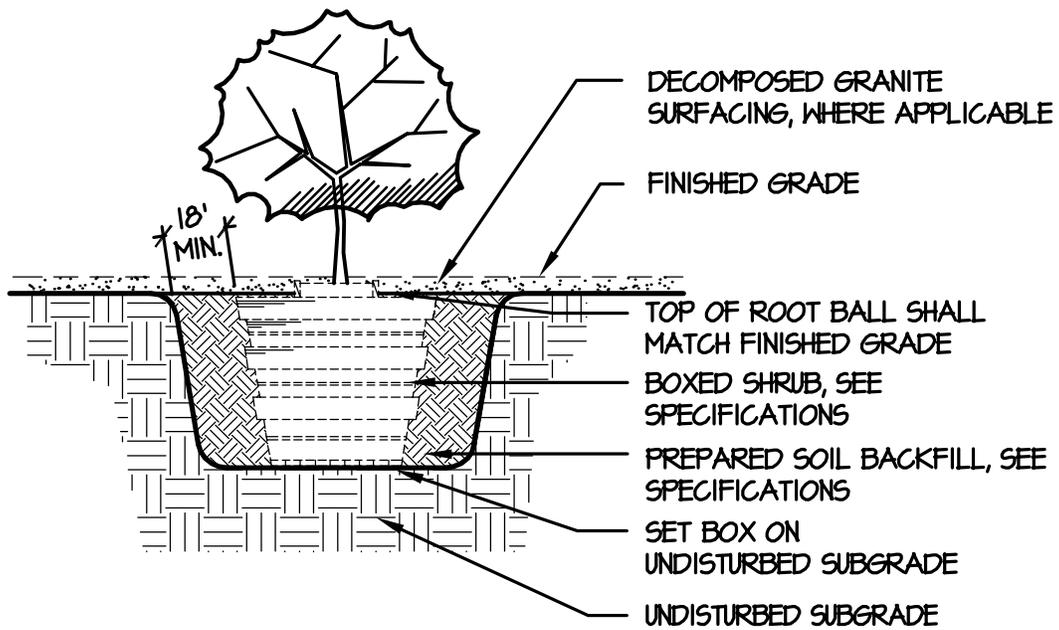
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		FIELD & COURT LAYOUTS:		P-033
REVISED:		SAND VOLLEY BALL COURT		
MO/YR		CONCRETE HEADER		SHEET 1 OF 1



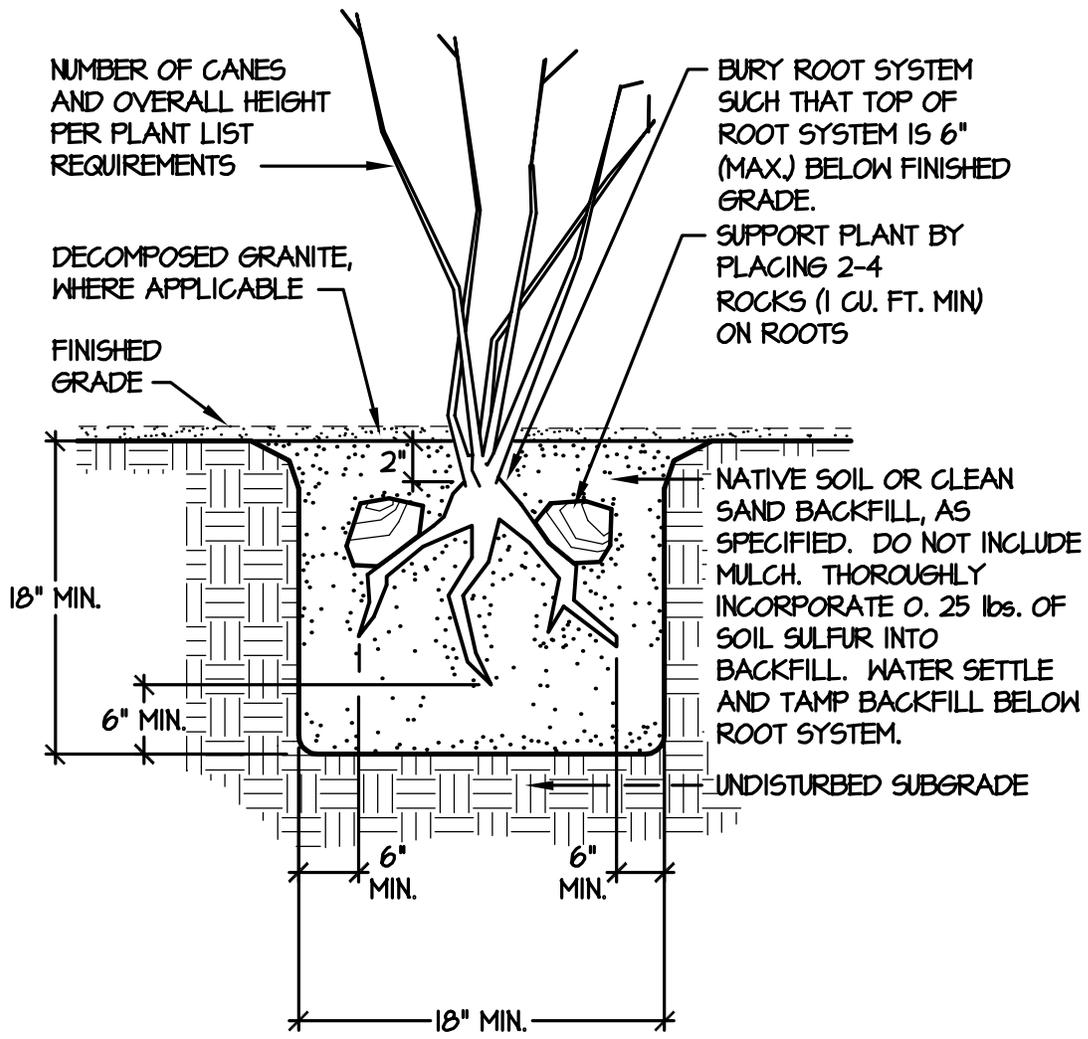
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / SALVAGED NATIVE PLANTS:		P-100
REVISED:		TREE PLANTING - BOXED SALVAGED SPECIMEN		
MO/YR		SHEET 1 OF 1		

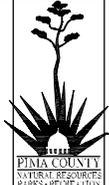


SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / SALVAGED		P-101
REVISED:		NATIVE PLANTS:		
MOYR		SHRUB PLANTING - BOXED SALVAGED SPECIMEN		SHEET 1 OF 1

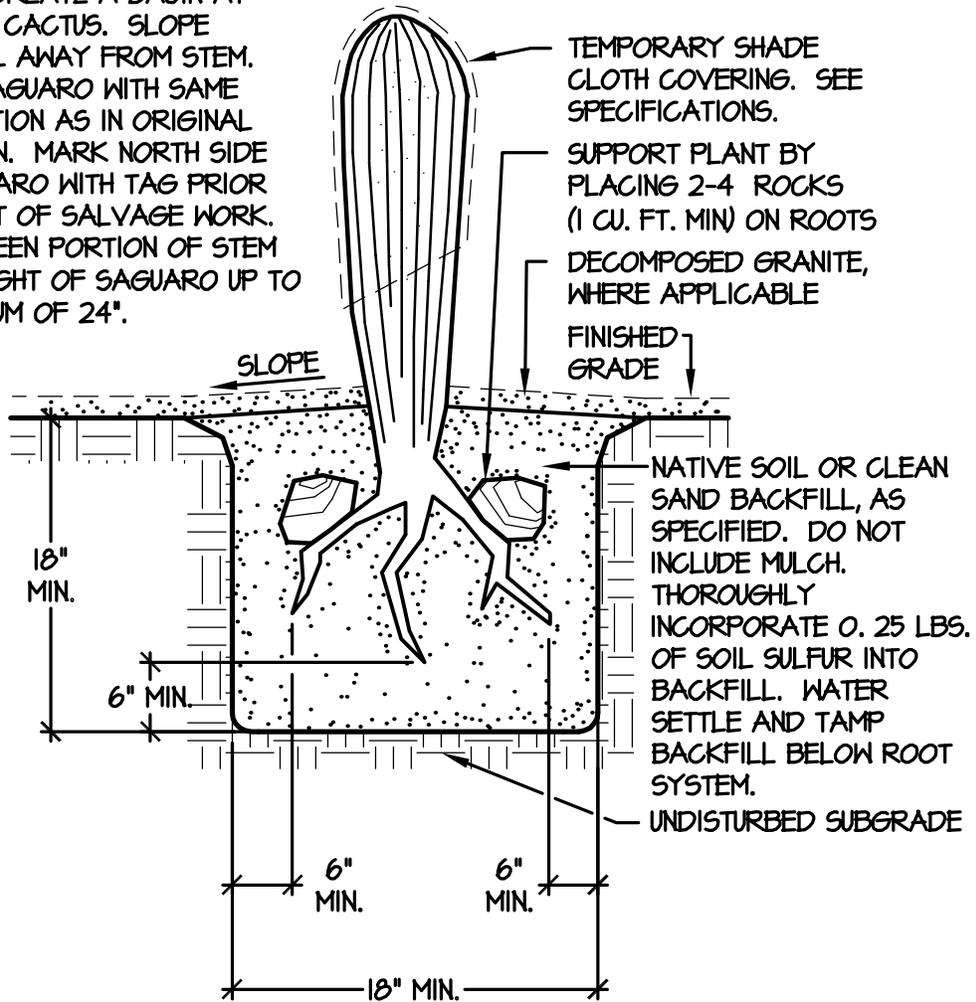


SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / SALVAGED		P-102
REVISED:		NATIVE PLANTS:		
MOYR		OCOTILLO PLANTING - SALVAGED SPECIMEN		SHEET 1 OF 1

NOTES:

1. SET MAIN STEM OF CACTUS PLUMB AS VIEWED FROM ALL SIDES.
2. DO NOT CREATE A BASIN AT BASE OF CACTUS. SLOPE BACKFILL AWAY FROM STEM.
3. PLANT SAGUARO WITH SAME ORIENTATION AS IN ORIGINAL LOCATION. MARK NORTH SIDE OF SAGUARO WITH TAG PRIOR TO START OF SALVAGE WORK.
4. BURY GREEN PORTION OF STEM 1/10th HEIGHT OF SAGUARO UP TO A MAXIMUM OF 24".

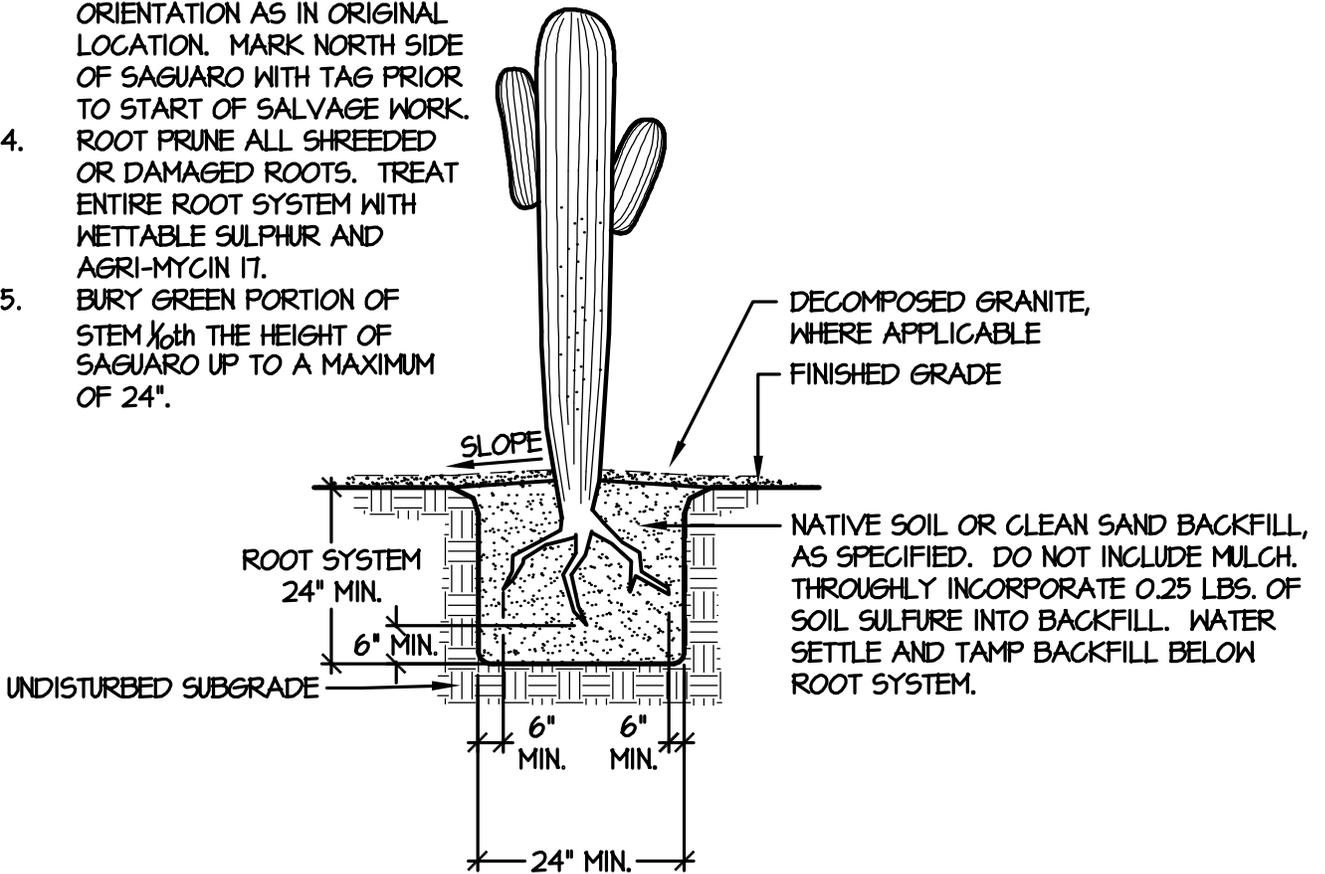


SCALE: N.T.S.

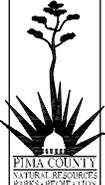
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / SALVAGED NATIVE PLANTS:		P-103
REVISED:		SAGUARO PLANTING - SALVAGED SPECIMEN (≤8')		SHEET 1 OF 1
MOYR				

NOTE:

1. SET MAIN STEM OF CACTUS PLUMB AS VIEWED FROM ALL SIDES.
2. DO NOT CREATE A BASIN AT BASE OF CACTUS. SLOPE BACKFILL AWAY FROM STEM.
3. PLANT SAGUARO WITH SAME ORIENTATION AS IN ORIGINAL LOCATION. MARK NORTH SIDE OF SAGUARO WITH TAG PRIOR TO START OF SALVAGE WORK.
4. ROOT PRUNE ALL SHREDED OR DAMAGED ROOTS. TREAT ENTIRE ROOT SYSTEM WITH WETTABLE SULPHUR AND AGRI-MYCIN 17.
5. BURY GREEN PORTION OF STEM $\frac{1}{2}$ th THE HEIGHT OF SAGUARO UP TO A MAXIMUM OF 24".

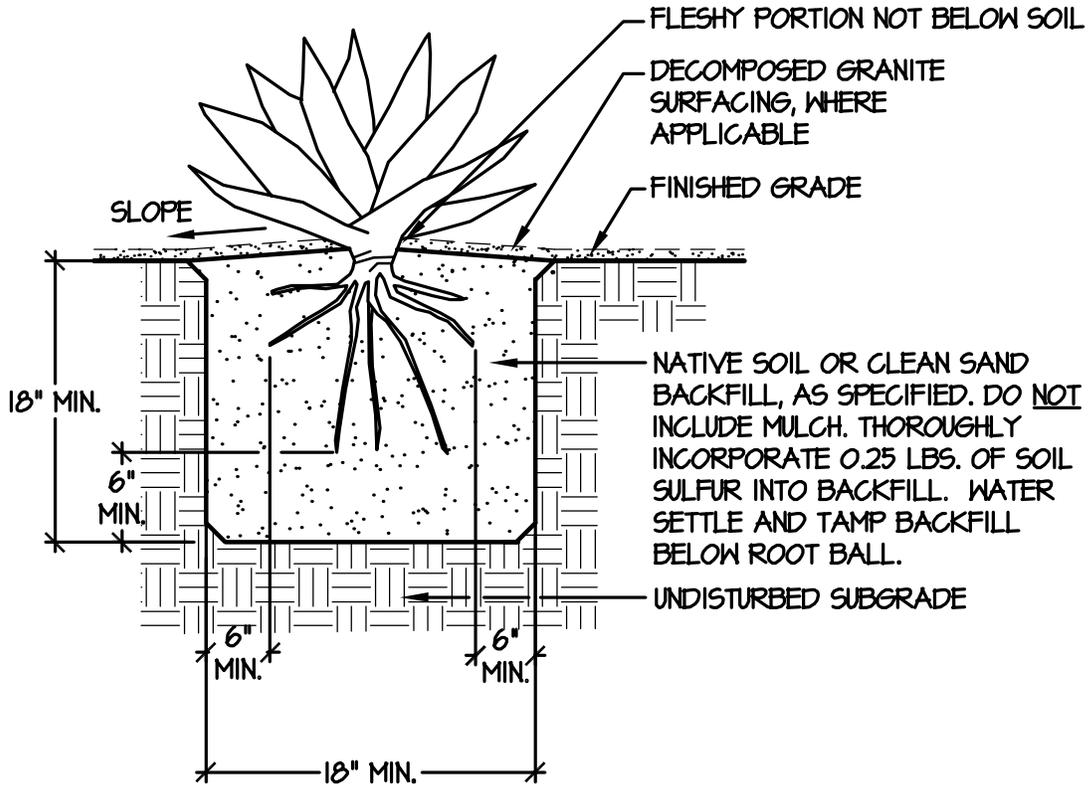


SCALE: N.T.S.

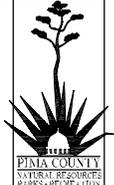
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / SALVAGED NATIVE PLANTS:		P-104
REVISED:		SAGUARO PLANTING - SALVAGED SPECIMEN (≤8')		
MOYR				SHEET 1 OF 1

NOTES:

1. **DO NOT** CREATE A BASIN AT BASE OF CACTUS. SLOPE BACKFILL AWAY FROM STEM.
2. HARDENED PORTION OF AGAVE SHALL NOT SHOW ABOVE FINISHED GRADE. FLESHY PORTION NOT BELOW SOIL.
3. THIS DETAIL APPLIES TO SALVAGED STOCK OF THE GENERA AGAVE, ALOE, DASYLIRION, HESPERALOE, NOLINA AND YUCCA.

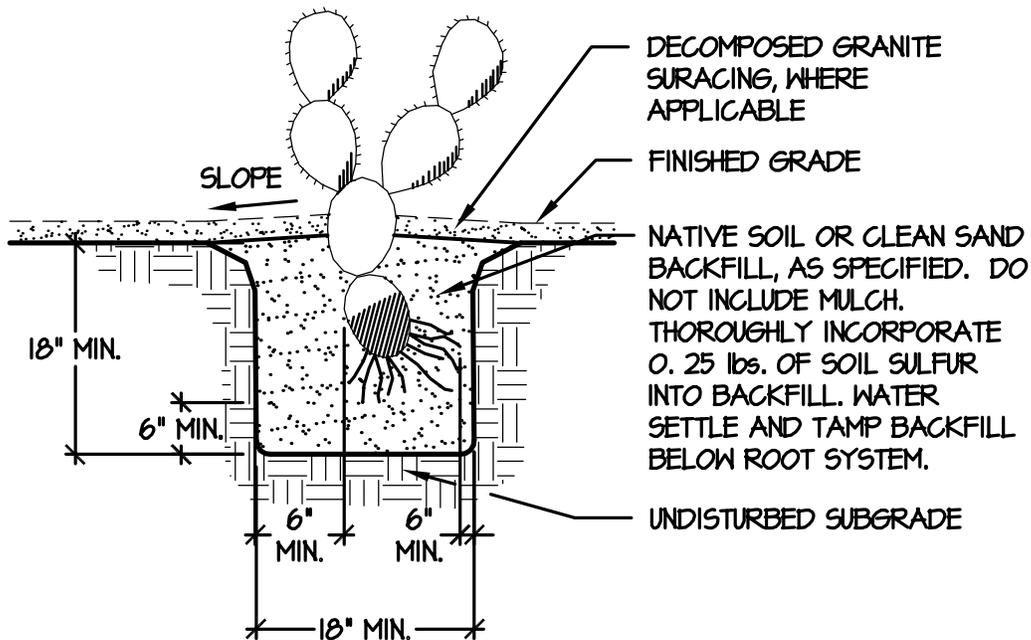


SCALE: N.T.S.

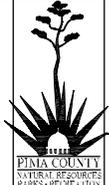
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / SALVAGED NATIVE PLANTS:		P-106
REVISED:		STEM SUCCULENT PLANTING -		SHEET 1 OF 1
MOYR		SALVAGED SPECIMEN		

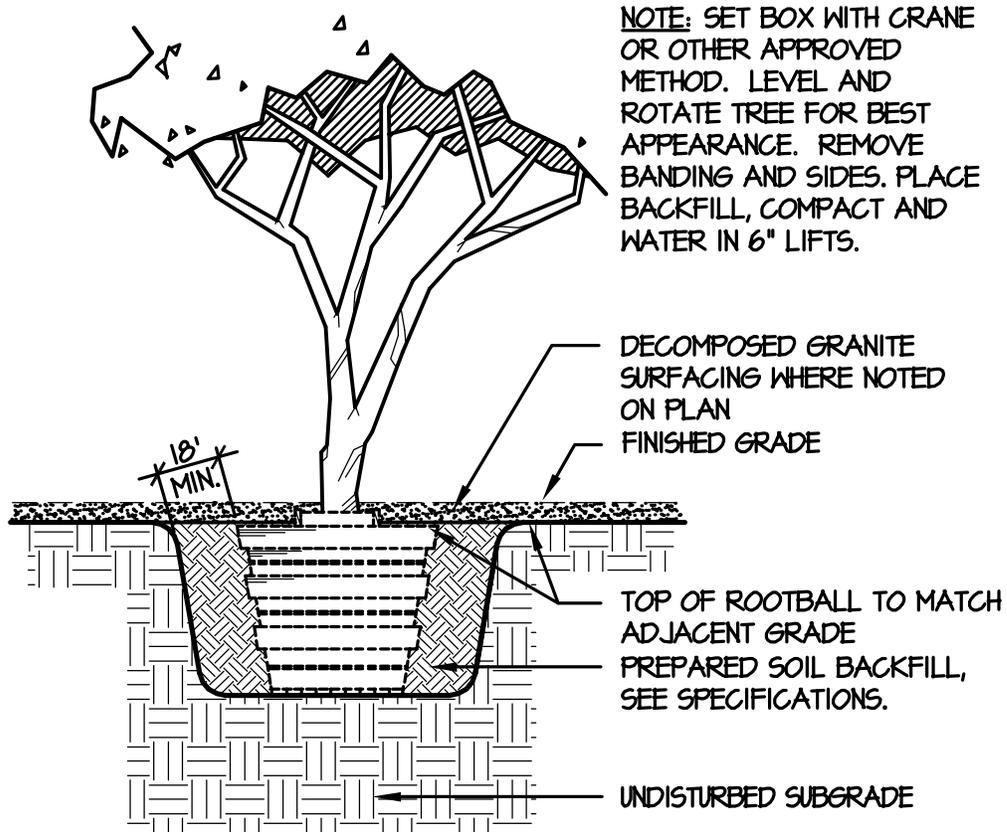
NOTES:

1. DO NOT CREATE BASIN AT BASE OF CACTUS. SLOPE BACKFILL AWAY FROM PLANT.
2. BURY ONE FULL PAD, MINIMUM.
3. THIS DETAIL APPLIES TO SALVAGED STOCK OF THE GENUS OPUNTIA.



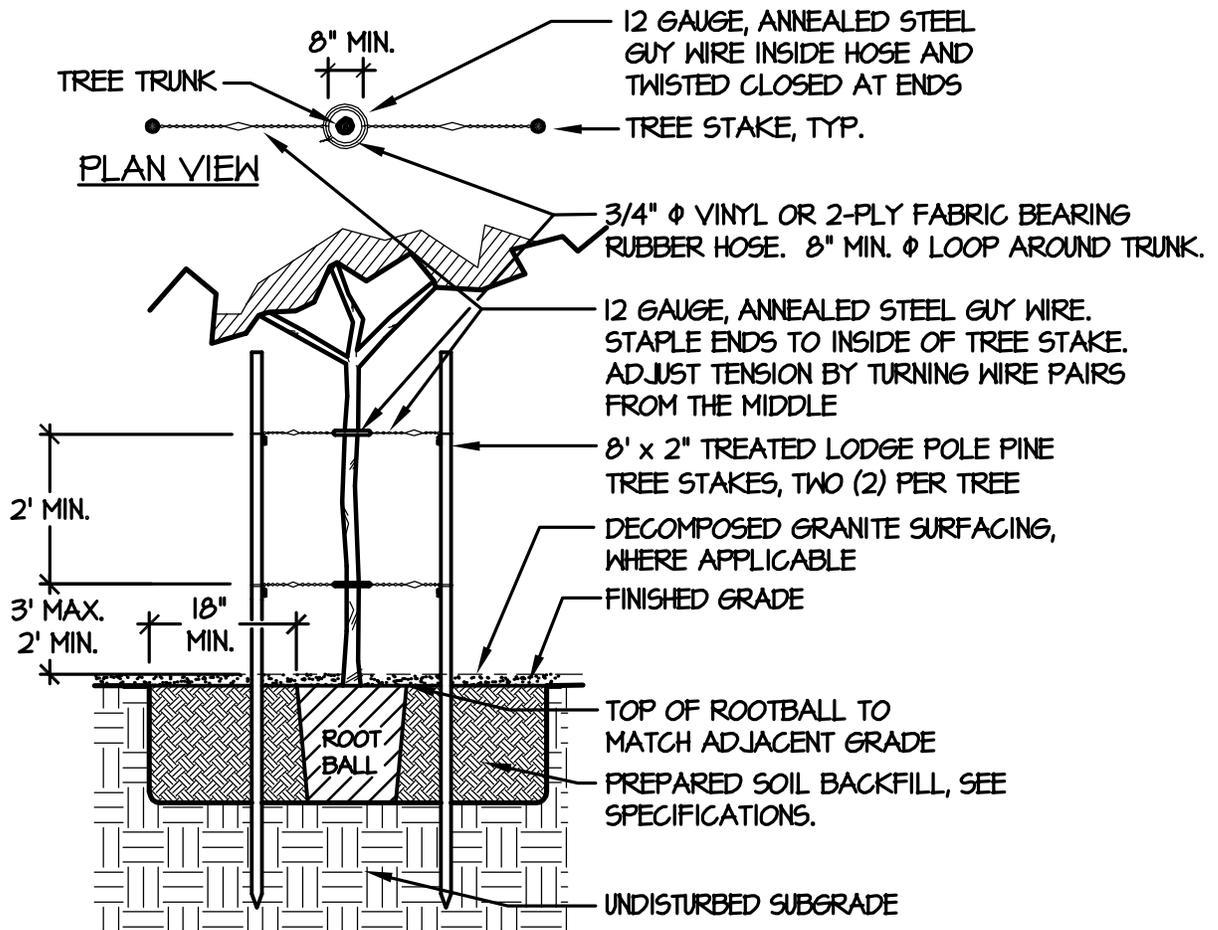
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / SALVAGED		P-107
REVISED:		NATIVE PLANTS:		
MOYR		PRICKLY PEAR AND CHOLLA CACTUS PLANTING - SALVAGED CUTTING		SHEET 1 OF 1



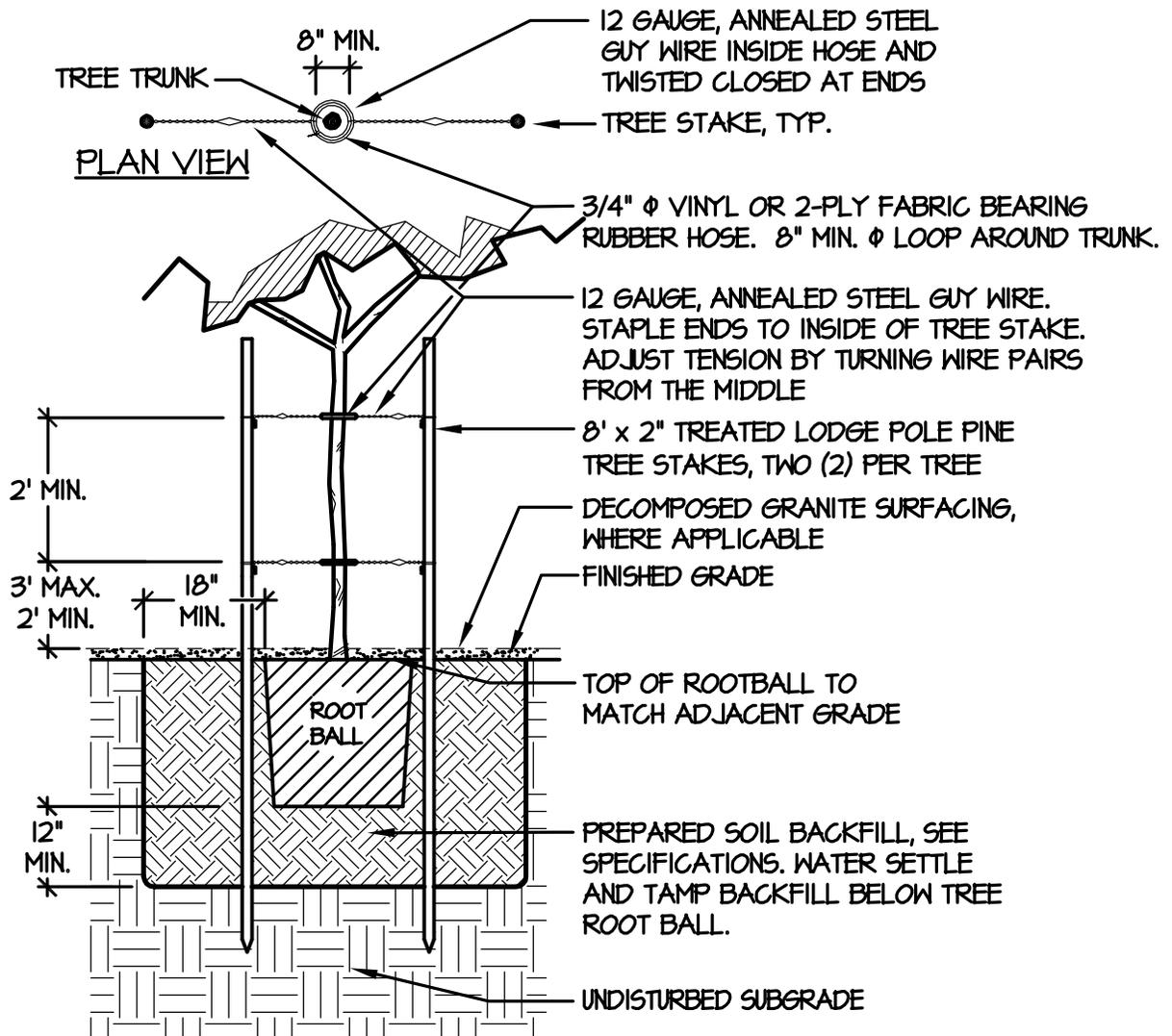
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING NURSERY		P-200
REVISED:		STOCK:		SHEET 1 OF 1
MO/YR		TREE PLANTING - 30" & LARGER BOX SIZE		



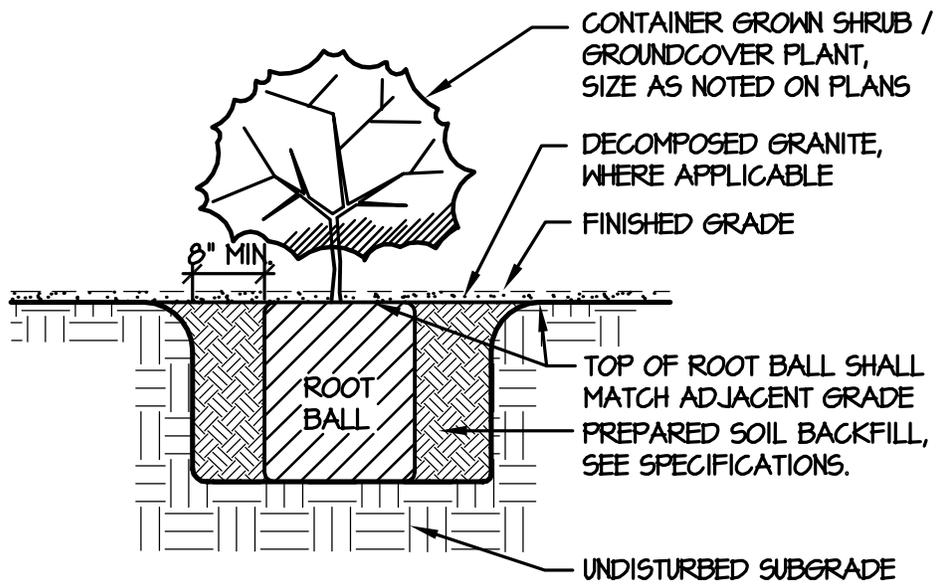
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / NURSERY		P-201
REVISED:		STOCK:		SHEET 1 OF 1
MO/YR		TREE PLANTING - 24" BOX & 15 GAL. SIZE		



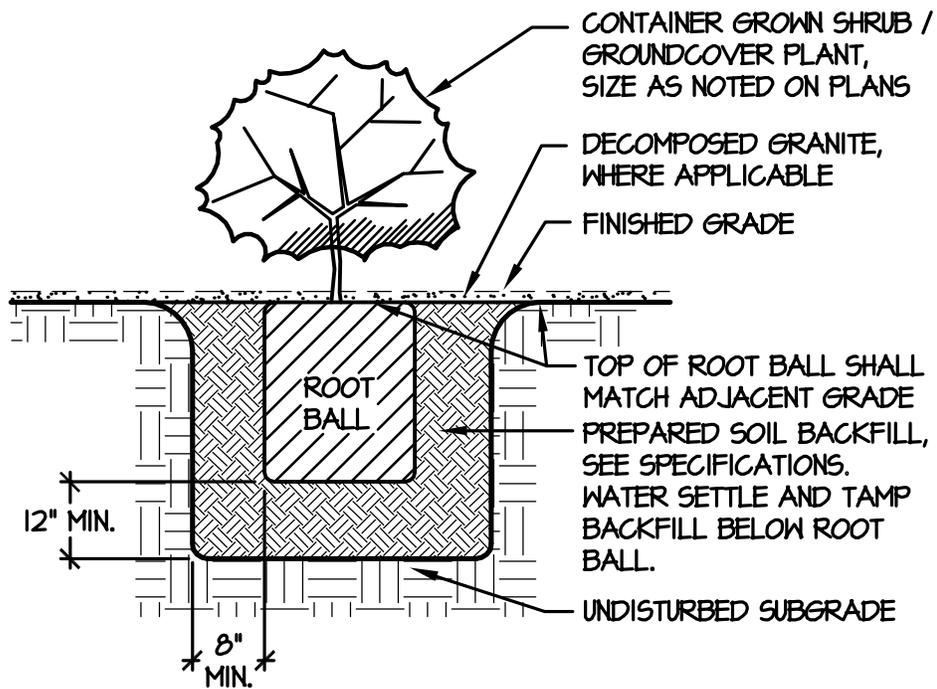
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / NURSERY		P-202
REVISED:		TREE PLANTING - HARD SOIL		SHEET 1 OF 1
MO/YR		CONDITIONS 24" BOX & 15 GAL. SIZE		



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / NURSERY		P-203
REVISED:		STOCK:		SHEET 1 OF 1
MO/YR		SHRUB / GROUND COVER PLANTING - 1, 5 & 15 GAL. SIZE		

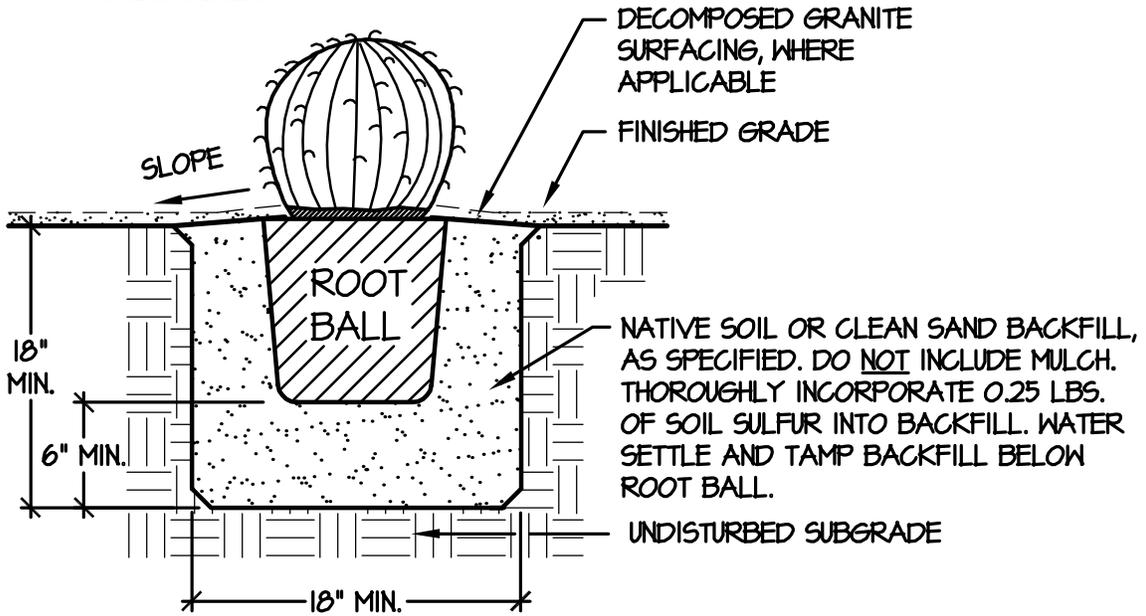


SCALE: N.T.S.

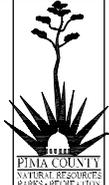
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / NURSERY		P-204
REVISED:		STOCK:		SHEET 1 OF 1
MO/YR		SHRUB / GROUND COVER - HARD SOIL CONDITIONS PLANTING - 1, 5 & 15 GAL. SIZE		

NOTES:

1. DO NOT CREATE A BASIN AT BASE OF CACTUS. SLOPE BACKFILL AWAY FROM STEM.
2. SET CACTUS SO THAT TOP OF ROOT BALL MATCHES ADJACENT GRADE.
3. THIS DETAIL APPLIES TO NURSERY GROWN STOCK OF THE GENERA CARNEGIEA, CEREUS, FERROCACTUS AND STENOCEREUS.

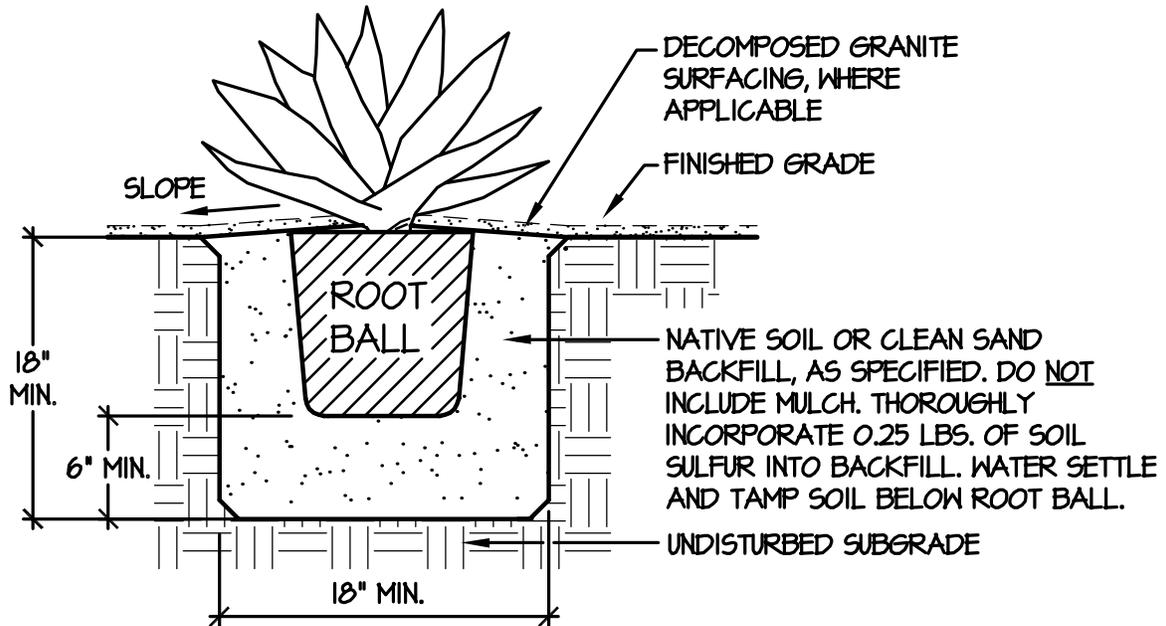


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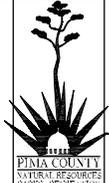
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / NURSERY STOCK:		P-205
REVISED:		BARREL AND COLUMNAR CACTUS PLANTING - CONTAINER GROWN		
MOYR				SHEET 1 OF 1

NOTES:

1. DO NOT CREATE A BASIN AT BASE OF AGAVE. SLOPE BACKFILL AWAY FROM STEM.
2. SET STEM SUCCULENT SO THAT TOP OF ROOT BALL MATCHES ADJACENT GRADE.
3. THIS DETAIL APPLIES TO NURSERY GROWN STOCK OF THE GENERA AGAVE, ALOE, DASYLIRION, HESPERALOE, NOLINA AND YUCCA.

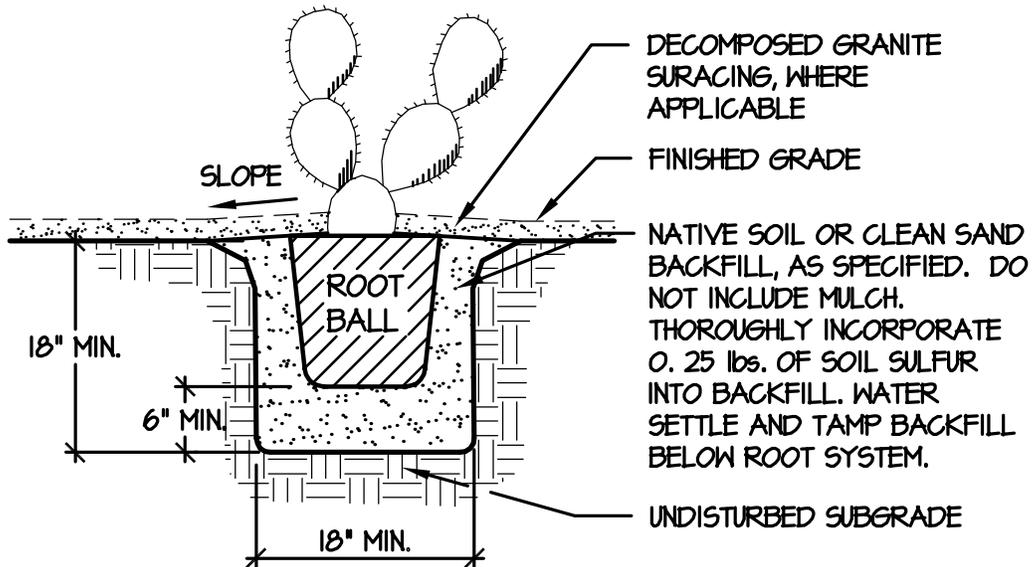


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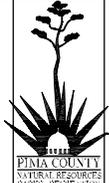
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / NURSERY STOCK:		P-206
REVISED:		STEM SUCCULENT PLANTING -		SHEET 1 OF 1
MOYR		CONTAINER GROWN		

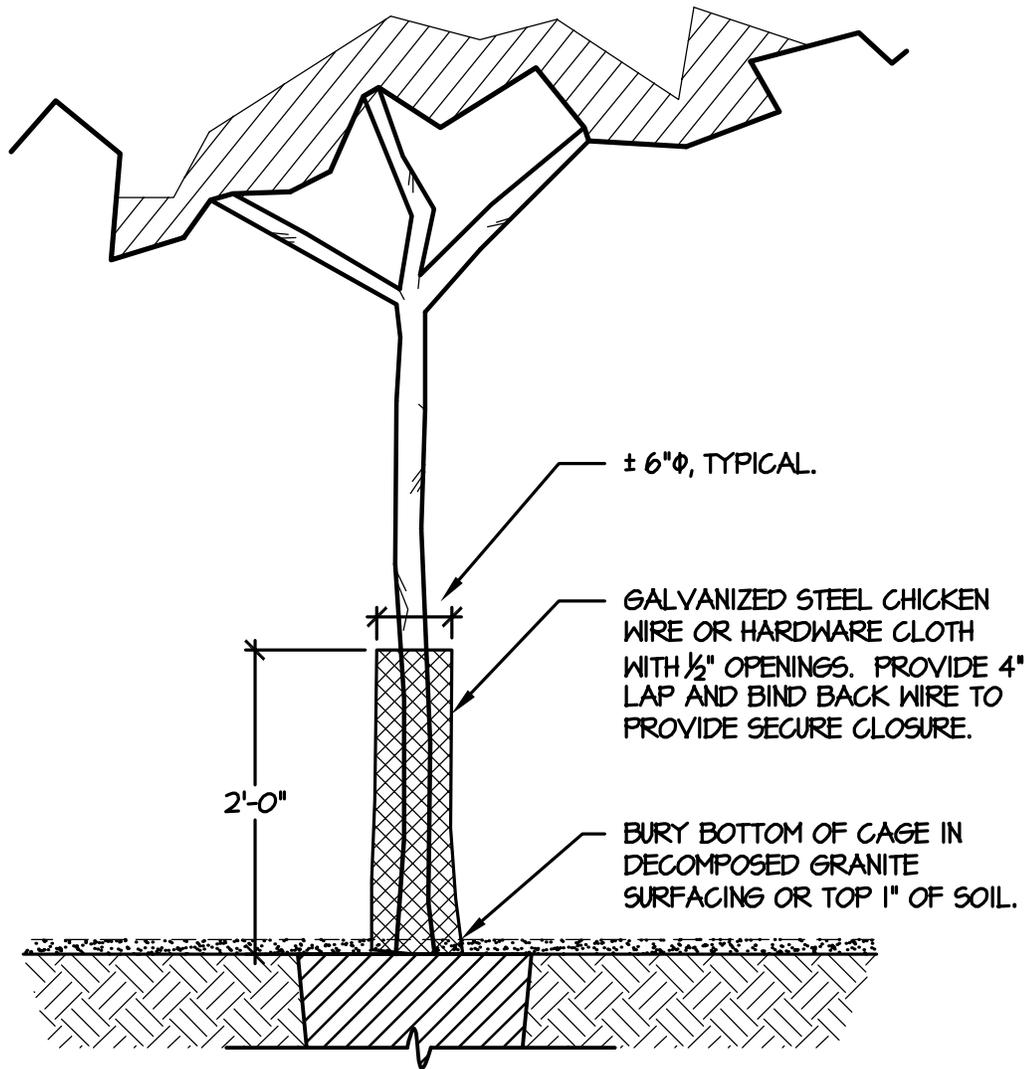
NOTES:

1. DO NOT CREATE BASIN AT BASE OF CACTUS. SLOPE BACKFILL AWAY FROM PLANT.
2. SET CACTUS SO THAT TOP OF ROOT BALL MATCHES ADJACENT GRADE.
3. THIS DETAIL APPLIES TO NURSERY GROWN STOCK OF THE GENUS OPUNTIA.



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / NURSERY STOCK:		P-207
REVISED:		PRICKLY PEAR & CHOLLA CACTUS		SHEET 1 OF 1
MOYR		PLANTING (CONTAINER GROWN)		

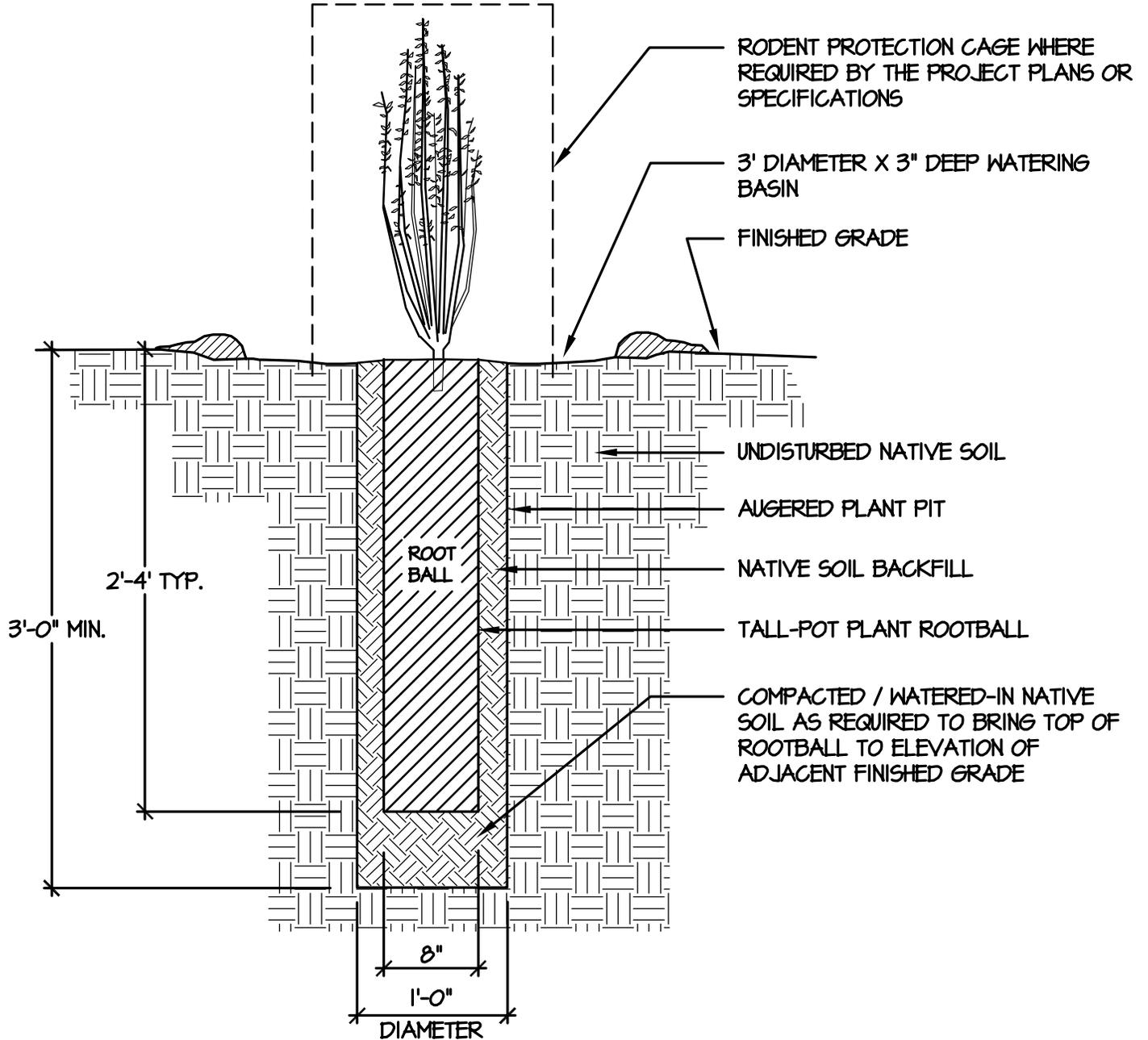


SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLANTING / NURSERY		P-208
REVISED:		STOCK:		SHEET 1 OF 1
MO/YR		RODENT PROTECTION CAGE FOR TREES		

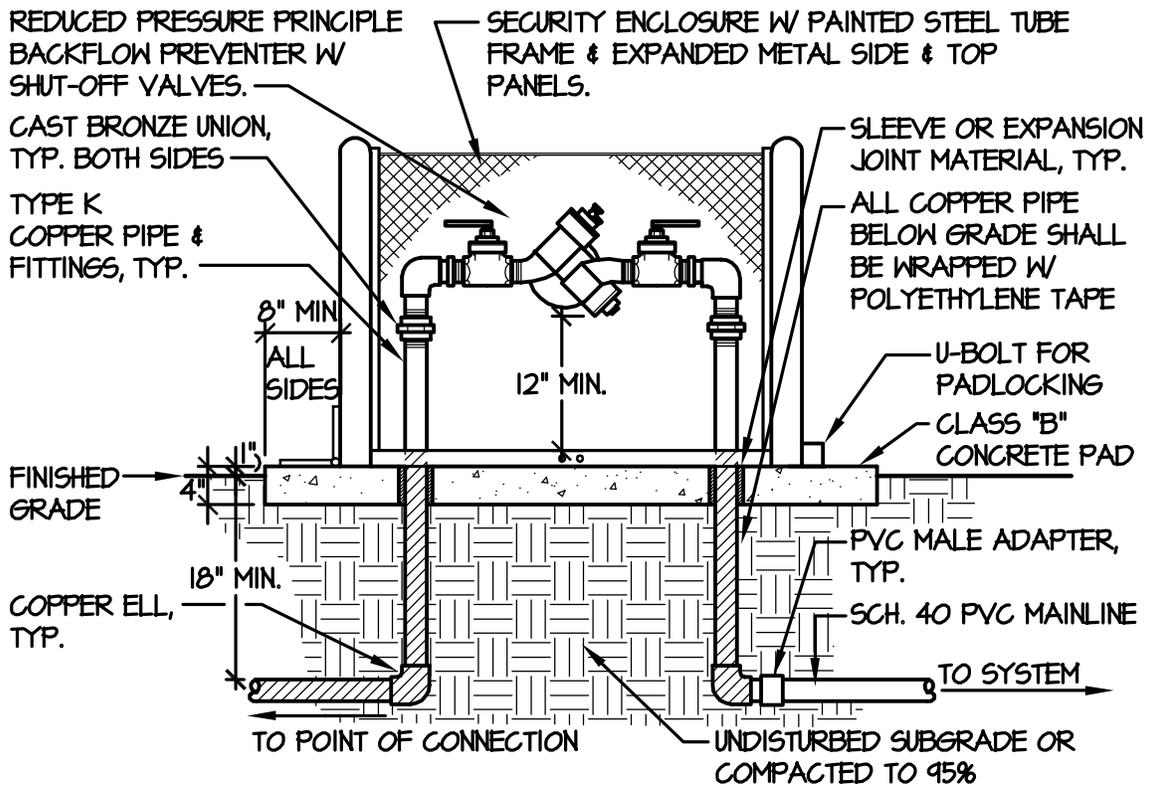
NOTES:

1. EXCAVATED PLANT PITS SHALL BE FILLED WITH WATER AND ALLOWED TO DRAIN THREE TIMES PRIOR TO THE PLANTING OF THE TALL-POT NURSERY STOCK.
2. REMOVE TALL-POT BOTTOM SCREEN PRIOR TO THE START OF PLANTING OPERATIONS.
3. THE PLANT ROOTBALL AND TALL-POT CONTAINER SHALL BE INSERTED INTO THE EXCAVATED HOLE PRIOR TO REMOVAL OF THE CONTAINER.
4. AFTER INSTALLATION IN THE PIT, THE TALL-POT CONTAINER SHALL BE CAREFULLY REMOVED FROM THE ROOTBALL BY RAISING THE CONTAINER WITH HAY-HOOKS OR OTHER APPROPRIATE EQUIPMENT.
5. AFTER REMOVAL FROM THE CONTAINER, THE PLANT SHALL BE BACKFILLED WITH NATIVE SOIL AND WATERED-IN TO PREVENT SETTLEMENT.
6. THE TALL-POT CONTAINERS AND SCREENS SHALL BE RETURNED UNDAMAGED TO THE OWNER.

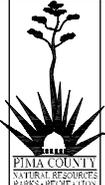


SCALE: N.T.S.

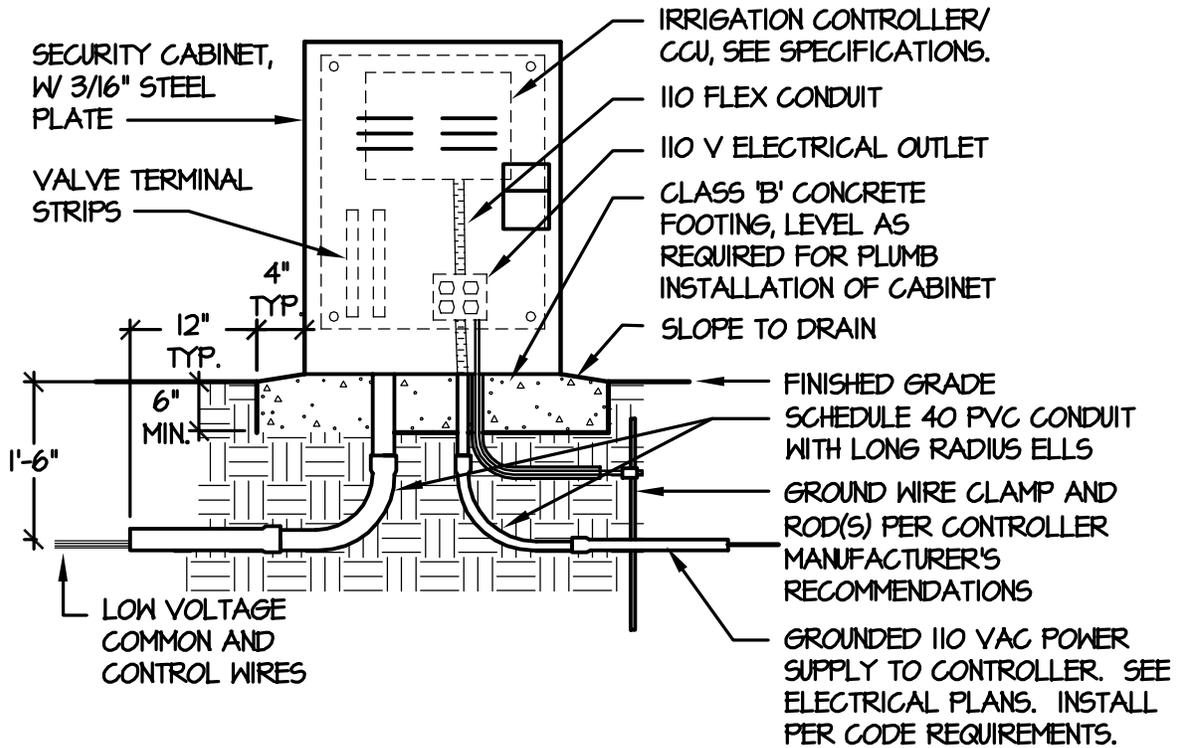
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/10		PLANTING / NURSERY		P-209
REVISED:		STOCK:		SHEET 1 OF 1
MO/YR		TALL-POT PLANTING		



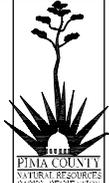
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-300
REVISED:		BACKFLOW PREVENTER IN SECURITY ENCLOSURE		
MOYR				SHEET 1 OF 1

NOTE: COORDINATE INSTALLATION OF IRRIGATION CONTROLLER WITH OWNER'S REPRESENTATIVE. BEFORE INSTALLATION, OBTAIN APPROVAL FOR CONTROLLER LOCATION, WIRE ROUTING AND PROPOSED CONNECTION TO ELECTRICAL SERVICE.

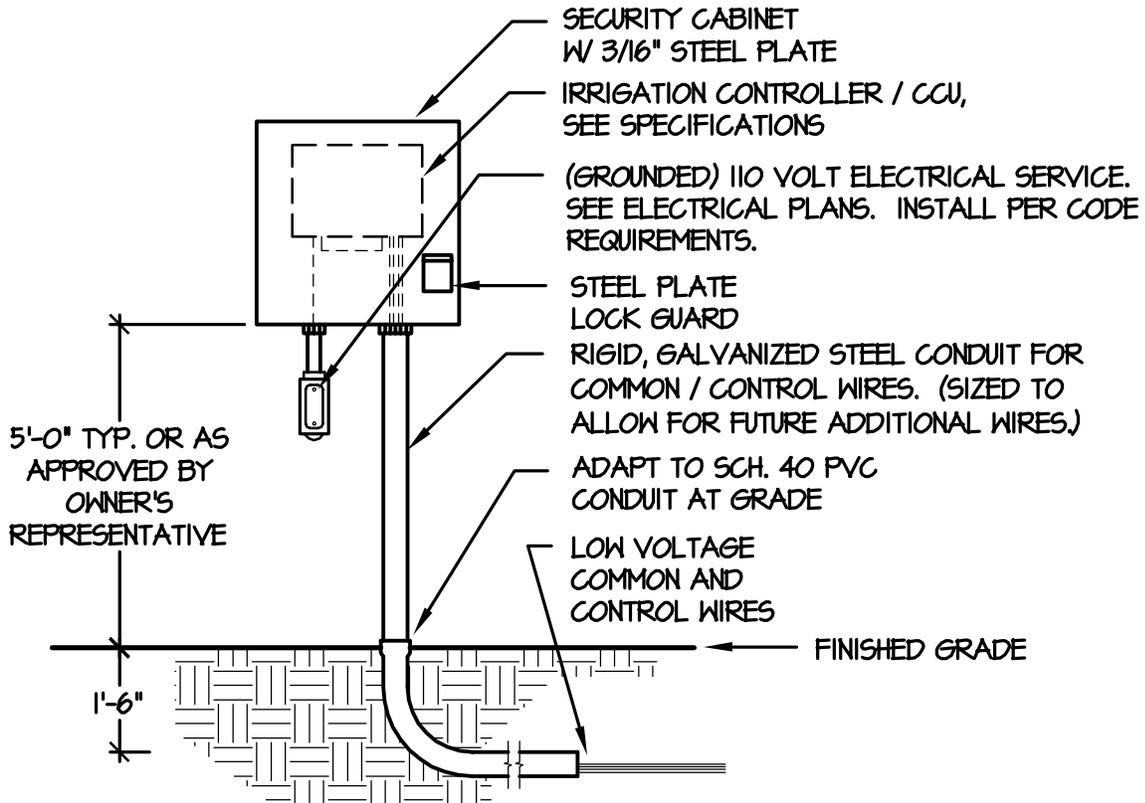


SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-301
REVISED:		IRRIGATION CONTROLLER / CCU		SHEET 1 OF 1
MO/YR		IN FREE STANDING SECURITY ENCLOSURE		

NOTES:

1. COORDINATE INSTALLATION OF IRRIGATION CONTROLLER WITH OWNER'S REPRESENTATIVE. BEFORE INSTALLATION, OBTAIN APPROVAL FOR CONTROLLER LOCATION, WIRE ROUTING AND PROPOSED CONNECTION TO ELECTRICAL SERVICE.
2. SECURE CABINET TO WALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS OR PER APPROVED SHOP DRAWINGS.

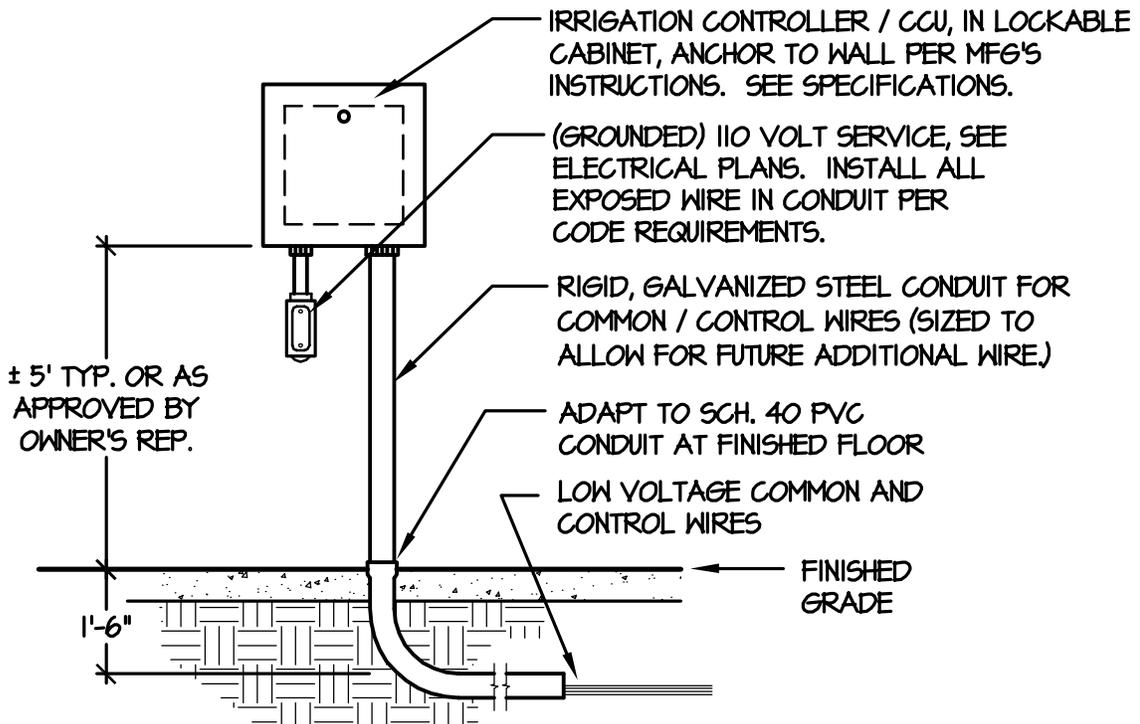


SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-302
REVISED:		IRRIGATION CONTROLLER / CCU IN WALL MOUNTED SECURITY		SHEET 1 OF 1
MOYR		ENCLOSURE		

NOTES:

1. COORDINATE INSTALLATION OF IRRIGATION CONTROLLER WITH OWNER'S REPRESENTATIVE. BEFORE INSTALLATION, OBTAIN APPROVAL FOR CONTROLLER LOCATION, WIRE ROUTING, AND PROPOSED CONNECTION TO ELECTRICAL SERVICE.
2. SECURE CABINET TO WALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS OR PER APPROVED SHOP DRAWINGS.

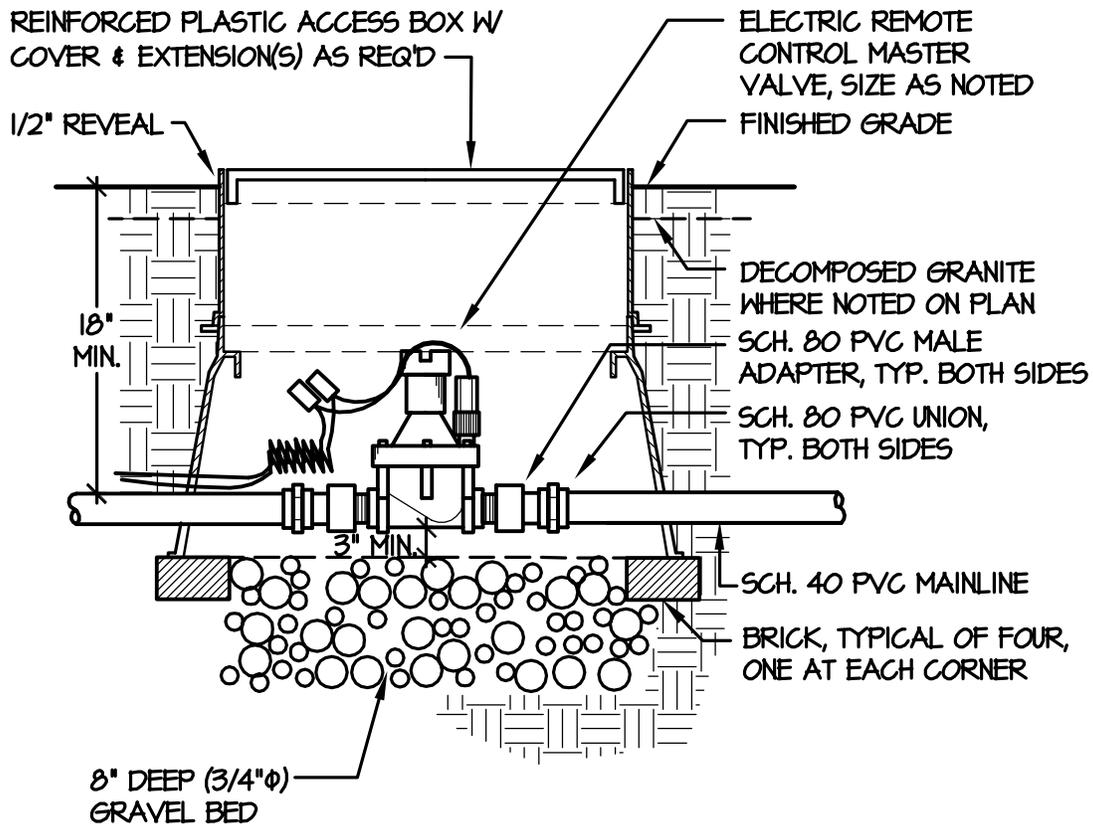


SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-303
REVISED:		IRRIGATION CONTROLLER / CCU		SHEET 1 OF 1
MO/YR		INTERIOR WALL MOUNTED		

NOTES:

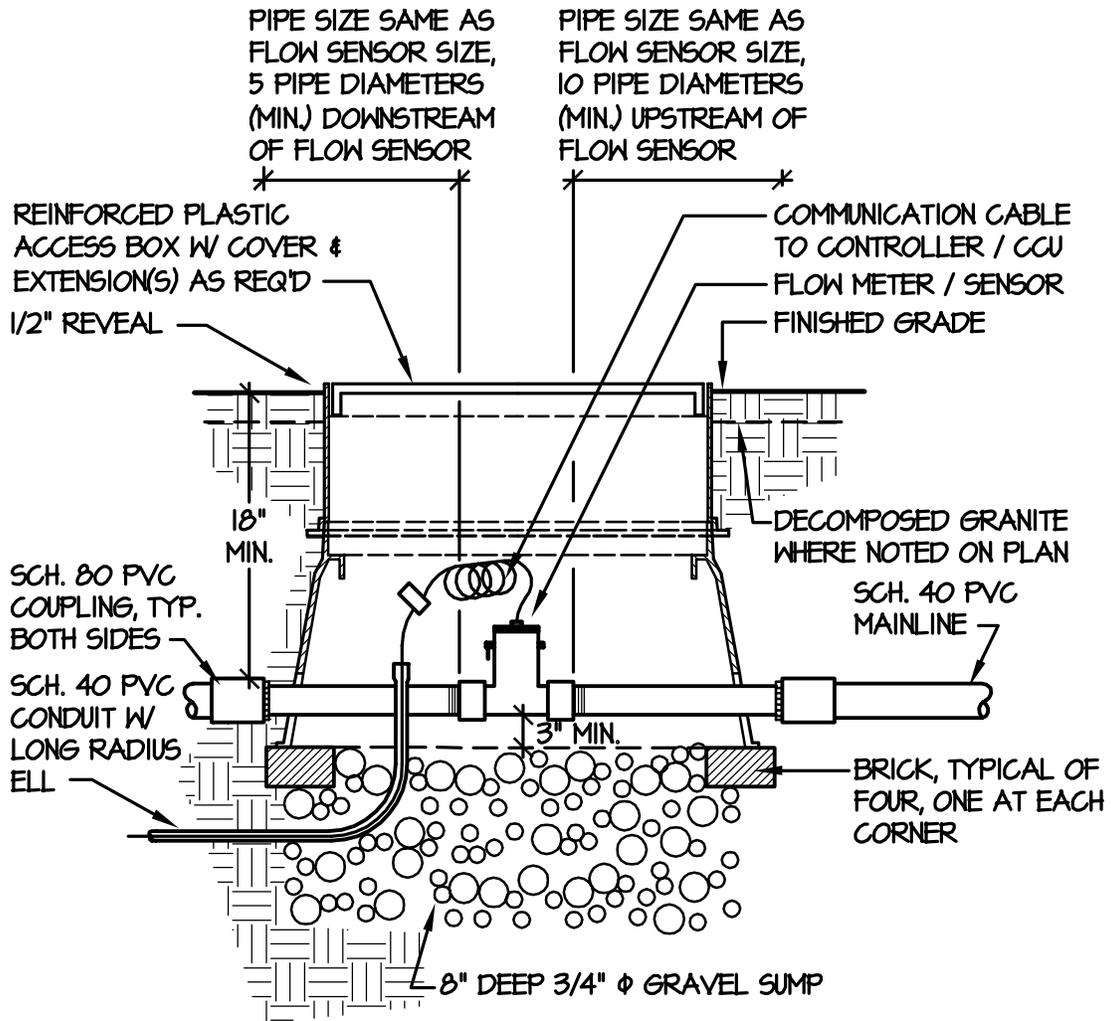
1. ALL WIRES TO BE INSTALLED PER LOCAL CODE. TAPE AND BUNDLE WIRES EVERY 20'. PROVIDE EXPANSION COIL AT EACH WIRE CONNECTION IN VALVE BOX (WRAP AROUND 1/2" ϕ PIPE 15 TIMES).
2. COMPACT SOIL AROUND VALVE BOX TO SAME DENSITY AS ADJACENT UNDISTURBED SOIL.
3. ALL THREADED PVC JOINTS SHALL BE WRAPPED WITH TEFLON TAPE.



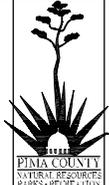
SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL		DETAIL NO.
REVISED:		IRRIGATION:		P-304
MO/YR		MASTER VALVE ASSEMBLY		SHEET 1 OF 1

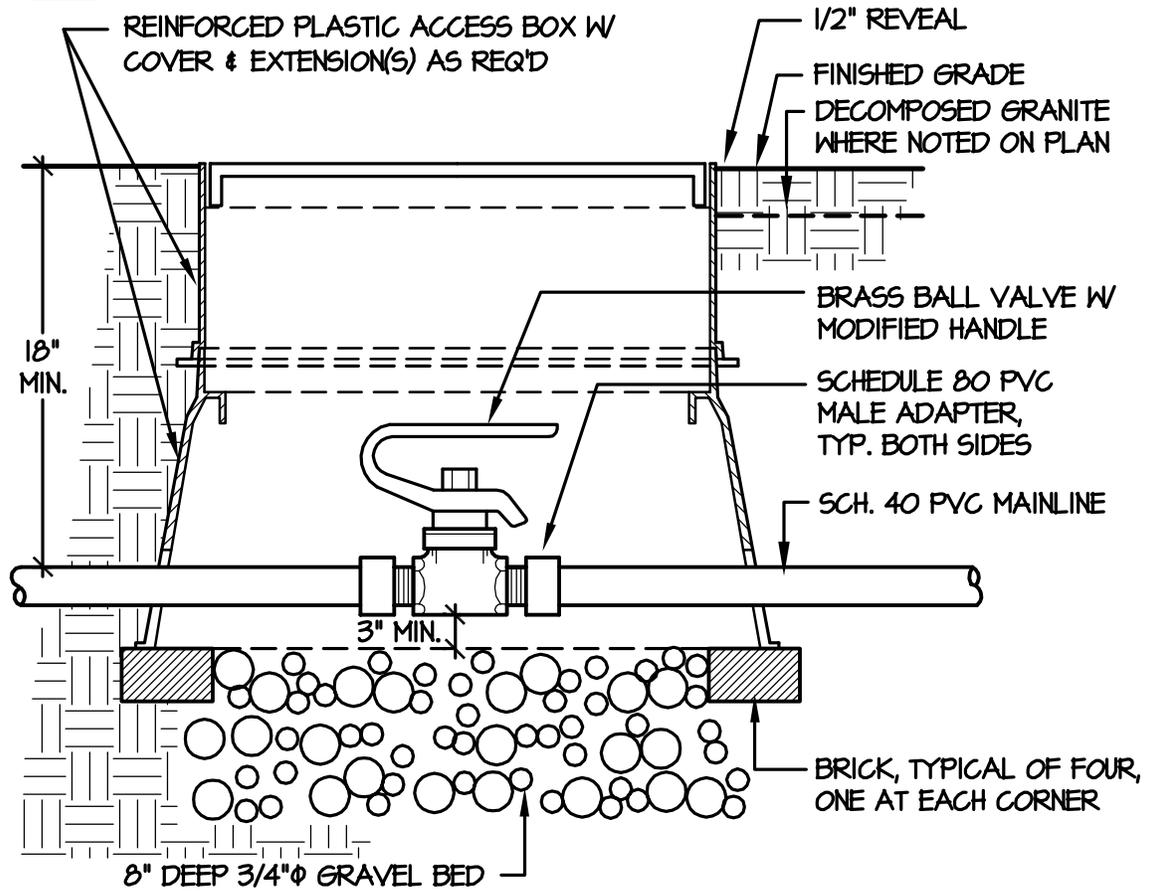
NOTE: PROVIDE PULSE DECODER, PULSE TRANSMITTER, PULSE TRANSMITTER POWER SUPPLY, AND SURGE PROTECTOR IN ACCORDANCE WITH FLOW SENSOR / CONTROL SYSTEM MANUFACTURER'S RECOMMENDATIONS.



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-305
REVISED:		FLOW SENSOR ASSEMBLY		SHEET 1 OF 1
MO/YR				

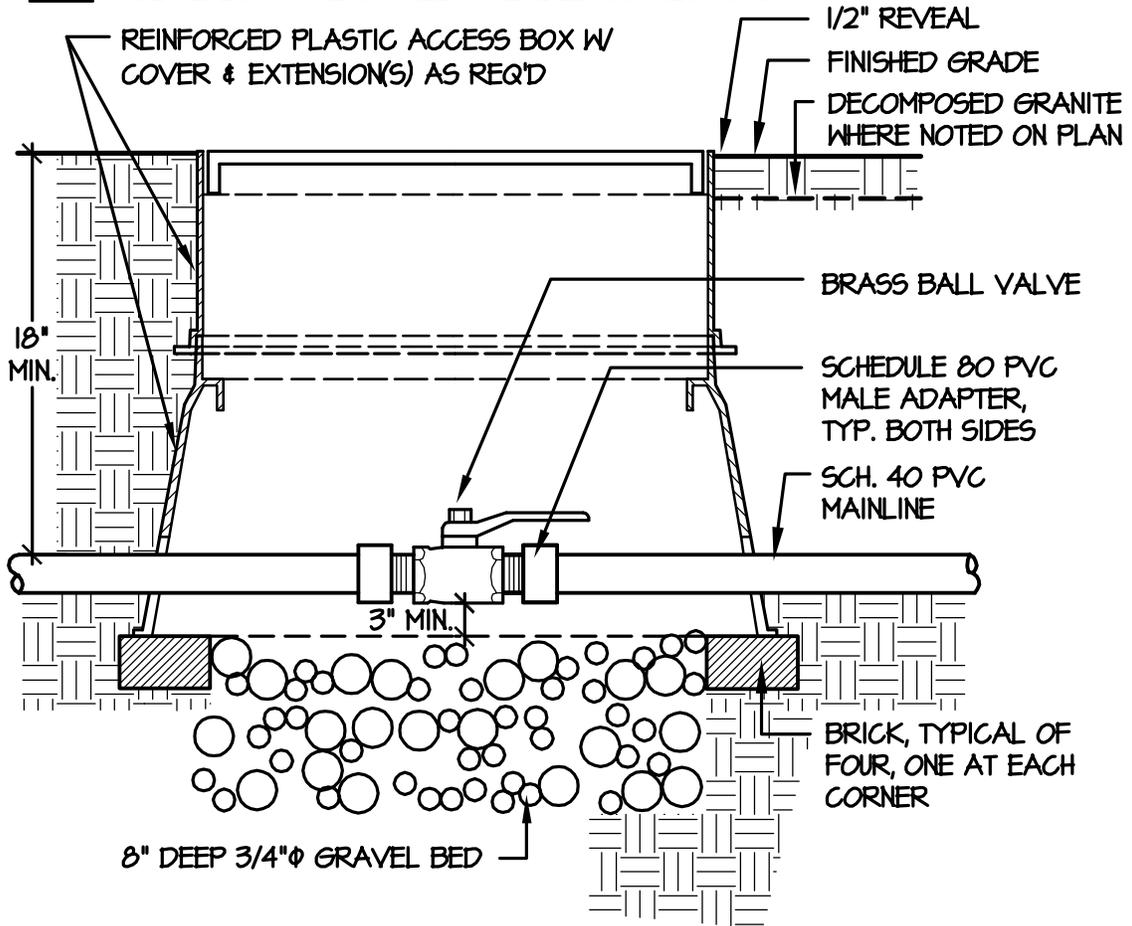
NOTE: USE TEFLON TAPE ON ALL THREADED CONNECTIONS.



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.	
11/05		IRRIGATION: MAINLINE ISOLATION (BALL) VALVE (2 1/2" TO 4" SIZE)		P-306	
REVISED:					SHEET 1 OF 1
MOYR					

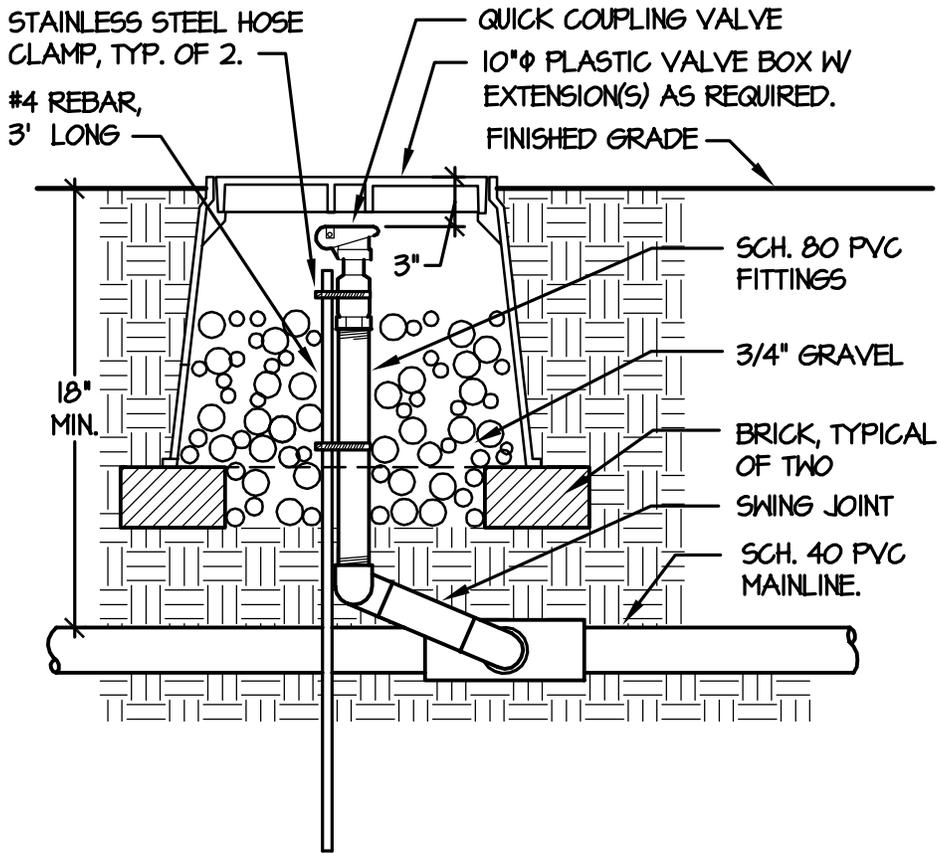
NOTE: USE TEFLON TAPE ON ALL THREADED CONNECTIONS.



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-307
REVISED:		MAINLINE ISOLATION		SHEET 1 OF 1
MO/YR		(BALL) VALVE (1/2" TO 2" SIZE)		

NOTE: USE TEFLON TAPE ON ALL THREADED CONNECTIONS.

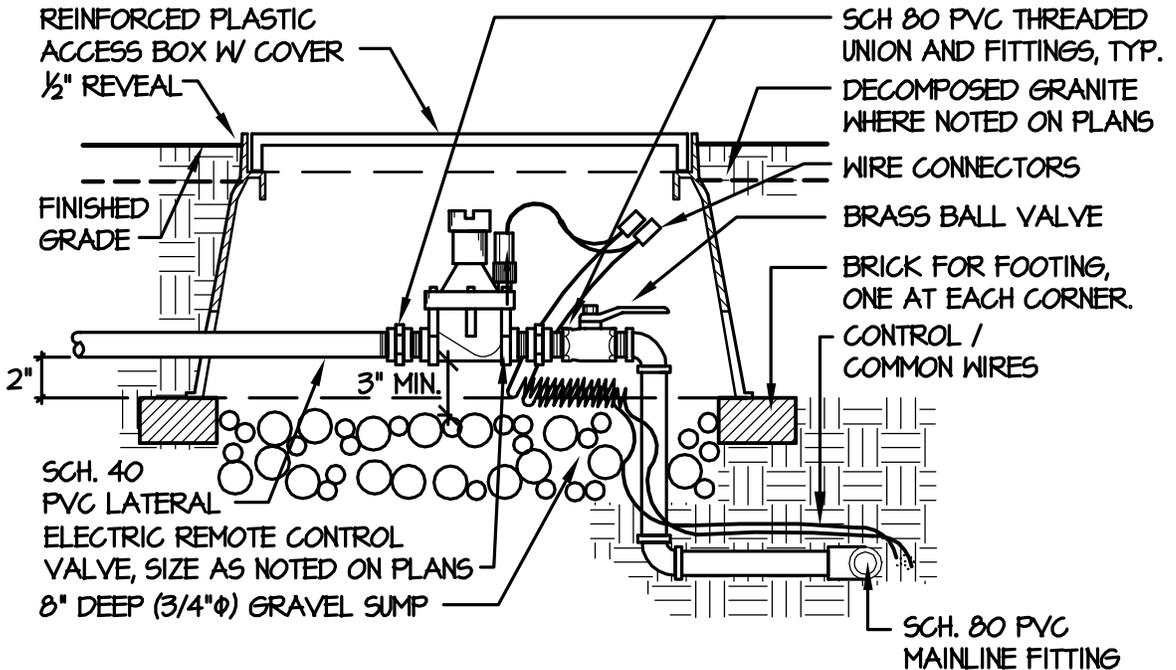


SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-308
REVISED:		QUICK COUPLING VALVE		SHEET 1 OF 1
MO/YR		ASSEMBLY		

NOTES:

1. ALL WIRES TO BE INSTALLED PER LOCAL CODE. TAPE AND BUNDLE WIRES EVERY 20'. PROVIDE EXPANSION COIL AT EACH WIRE CONNECTION IN VALVE BOX (WRAP AROUND 1/2" ϕ PIPE 15 TIMES).
2. COMPACT SOIL AROUND VALVE BOX TO SAME DENSITY AS ADJACENT UNDISTURBED SOIL.
3. ALL THREADED PVC JOINTS SHALL BE WRAPPED WITH TEFLON TAPE.

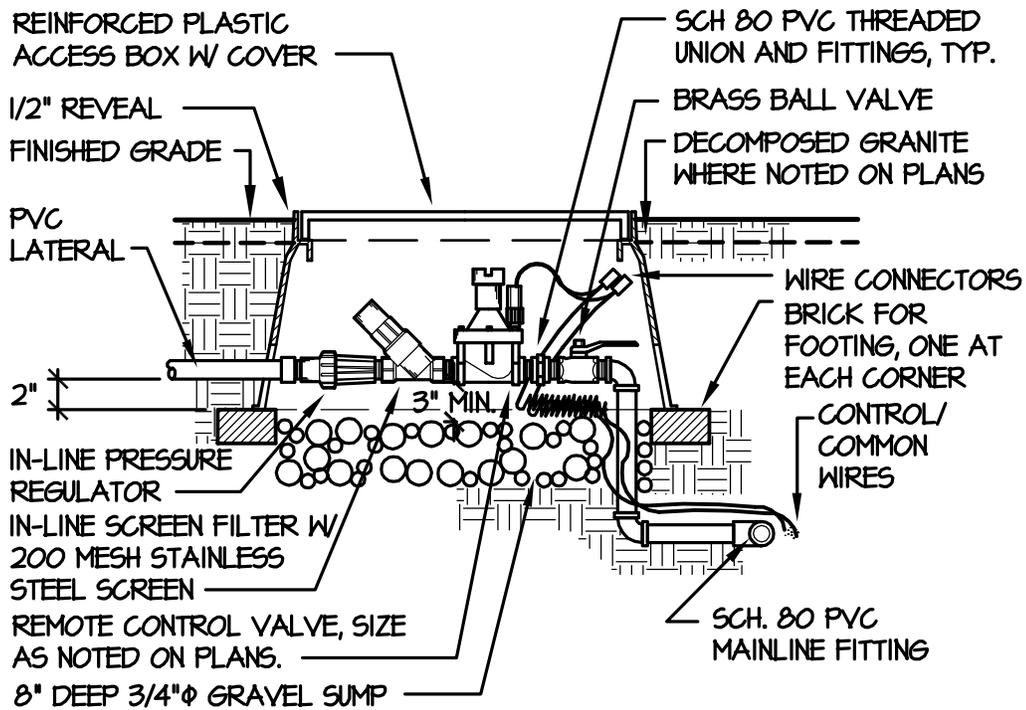


SCALE: N.T.S.

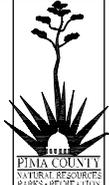
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-309
REVISED:		REMOTE CONTROL VALVE		SHEET 1 OF 1
MOYR		ASSEMBLY - TURF ZONES		

NOTES:

1. ALL WIRES TO BE INSTALLED PER LOCAL CODE. TAPE AND BUNDLE WIRES EVERY 20'. PROVIDE EXPANSION COIL AT EACH WIRE CONNECTION IN VALVE BOX (WRAP AROUND 1/2" ϕ PIPE 15 TIMES).
2. COMPACT SOIL AROUND VALVE BOX TO SAME DENSITY AS ADJACENT UNDISTURBED SOIL.
3. ALL THREADED PVC JOINTS SHALL BE WRAPPED WITH TEFLON TAPE.

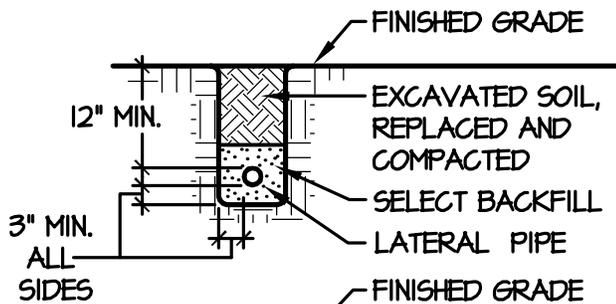


SCALE: N.T.S.

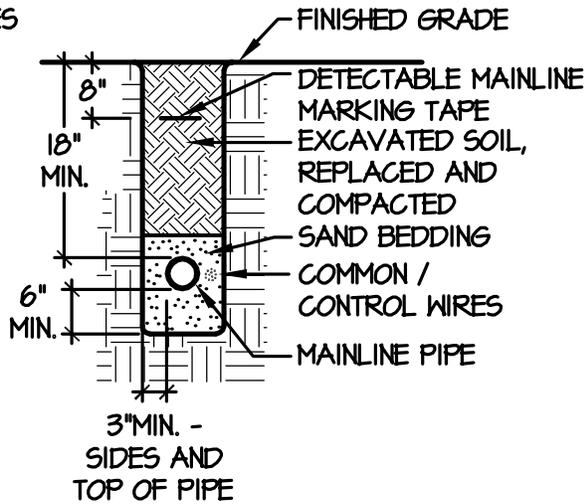
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-310
REVISED:		REMOTE CONTROL VALVE		SHEET 1 OF 1
MOYR		ASSEMBLY - DRIP ZONES		

NOTES:

1. SELECT BACKFILL SHALL BE SAND OR SOIL FREE OF ROCKS AND STONES LARGER THAN 1/4" DIA.
2. BACKFILL MATERIAL SHALL BE WATERED IN AND COMPACTED TO DENSITY OF ADJACENT UNDISTURBED SOIL.

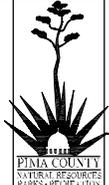


PVC LATERAL/
DRIP SYSTEM
HEADER PIPE

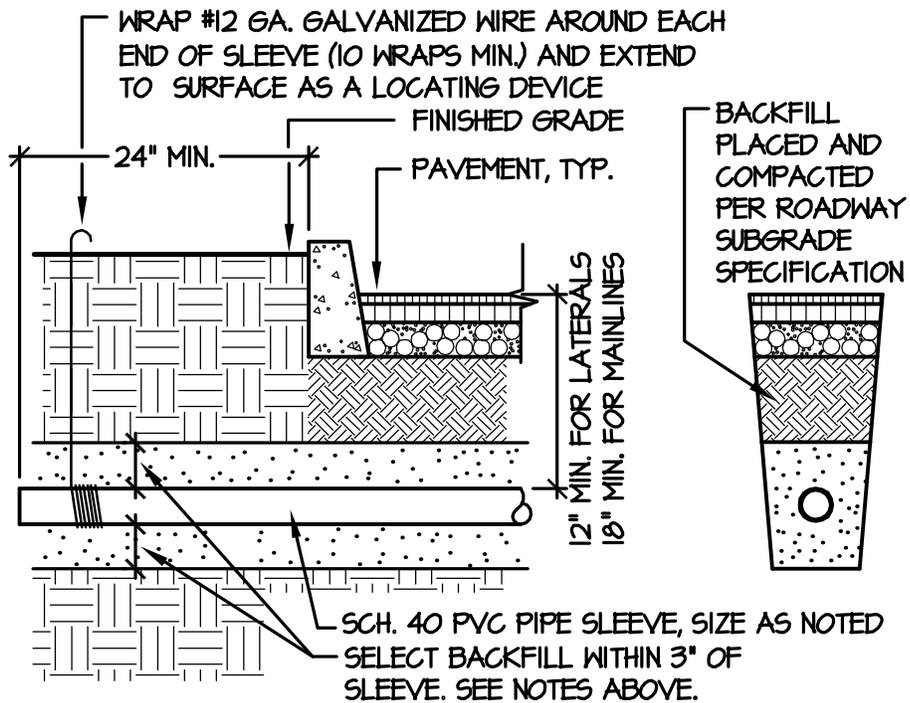


PVC MAINLINES
AND LOW
VOLTAGE
CONTROL WIRES

SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.	
11/05		IRRIGATION: PIPE TRENCHING AND BACKFILL - MAINLINES, LATERALS, & MARKING TAPE		P-311	
REVISED:					SHEET 1 OF 1
MO/YR					

NOTE: BACKFILL WITHIN 3" OF SLEEVE SHALL BE FREE OF ROCKS AND STONES LARGER THAN 1/4"φ. IF ROCK CANNOT BE REMOVED FROM EXCAVATED SOIL, PROVIDE CLEAN SAND BEDDING.



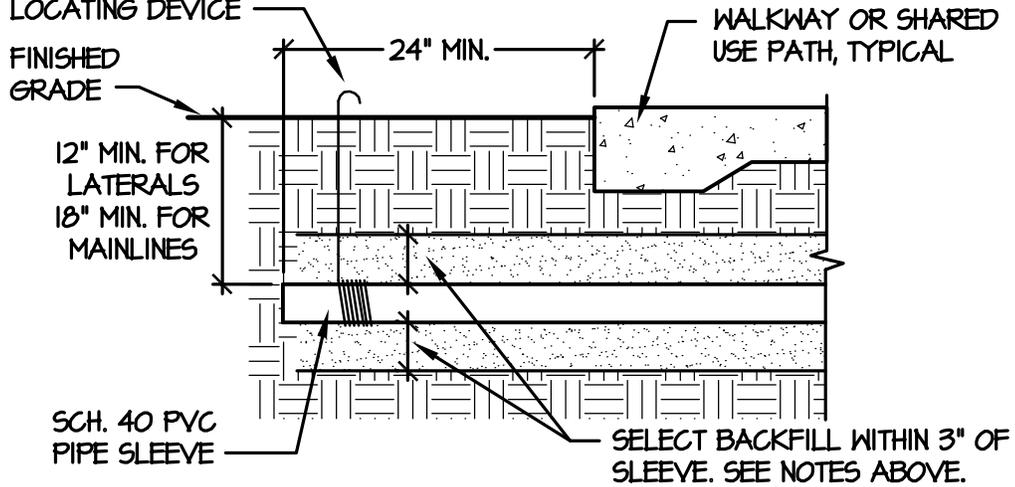
SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL		DETAIL NO.
REVISED: MOYR		IRRIGATION: SLEEVE UNDER STREET OR PARKING LOT		P-312
				SHEET 1 OF 1

NOTES:

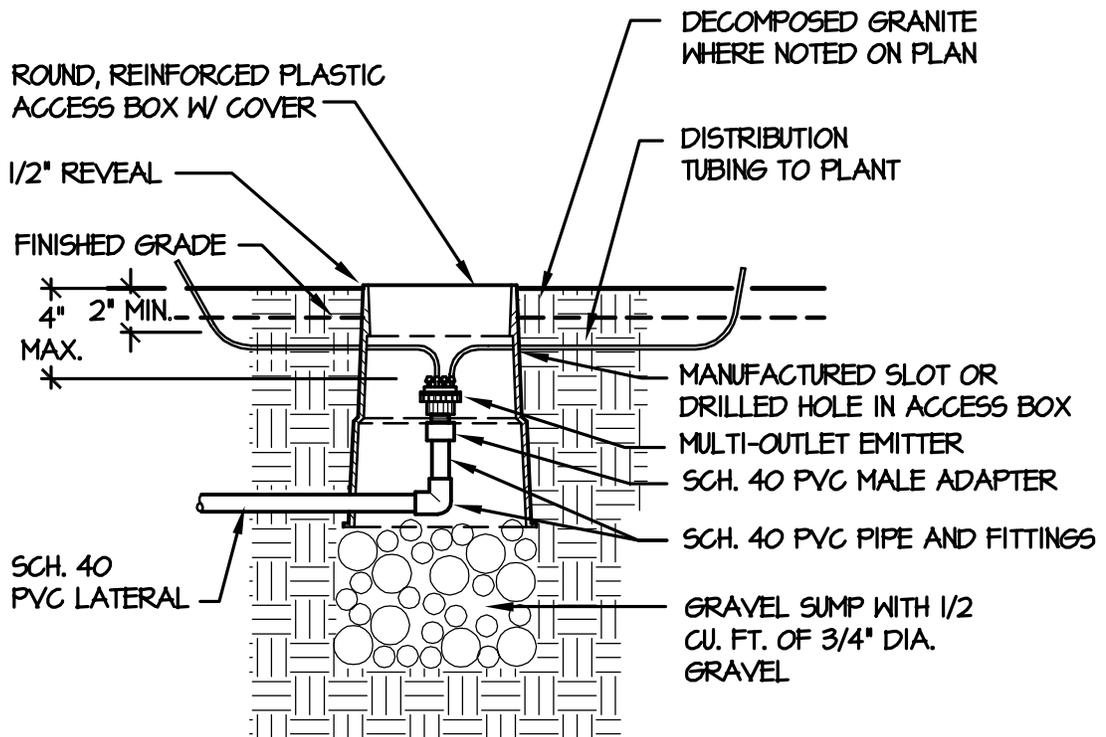
1. SLEEVES UNDER WALKWAYS SHALL BE SCHEDULE 40 PVC PIPE. SIZE SHALL BE AS NOTED ON PLANS.
2. BACKFILL WITHIN 3" OF SLEEVE SHALL BE FREE OF ROCKS AND STONES LARGER THAN 1/4" DIA. IF ROCK CANNOT BE REMOVED FROM EXCAVATED SOIL, PROVIDE CLEAN SAND BEDDING.

WRAP #12 GA. GALVANIZED WIRE AROUND EACH END OF SLEEVE (10 WRAPS MIN.) AND EXTEND TO SURFACE AS A LOCATING DEVICE



SCALE: N.T.S.

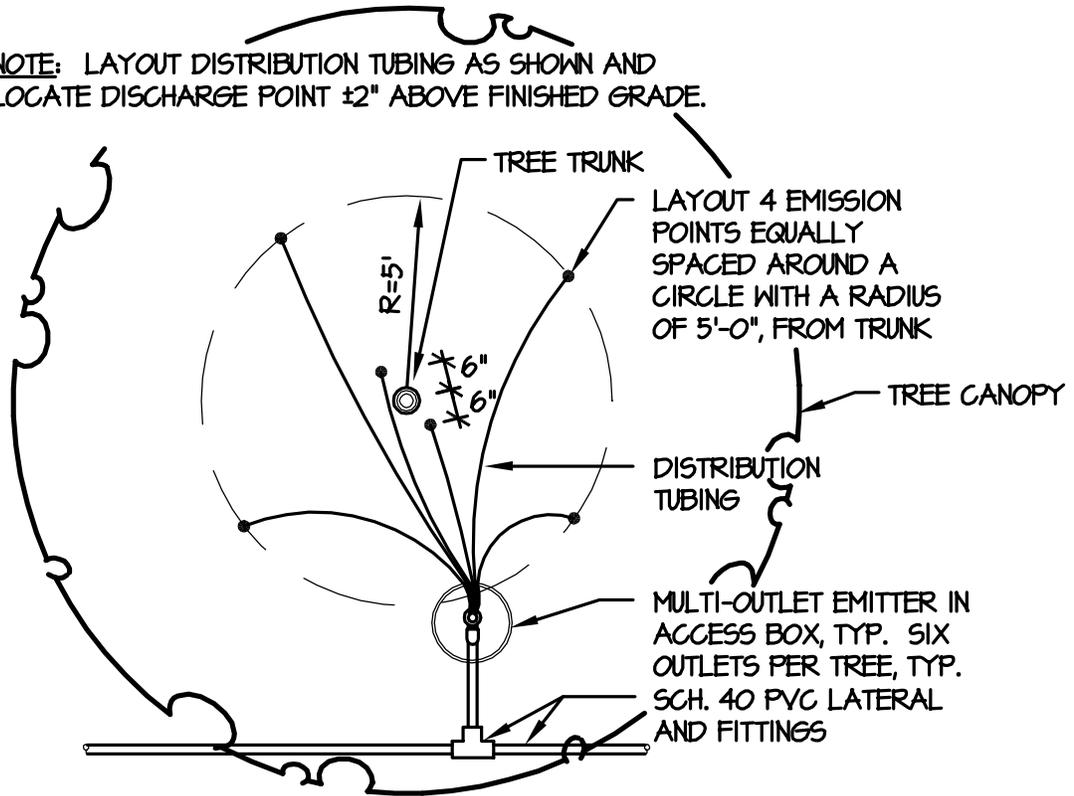
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-313
REVISED:		SLEEVE UNDER WALKWAY OR SHARED USE PATH		
MO/YR		SHEET 1 OF 1		



SCALE: N.T.S.

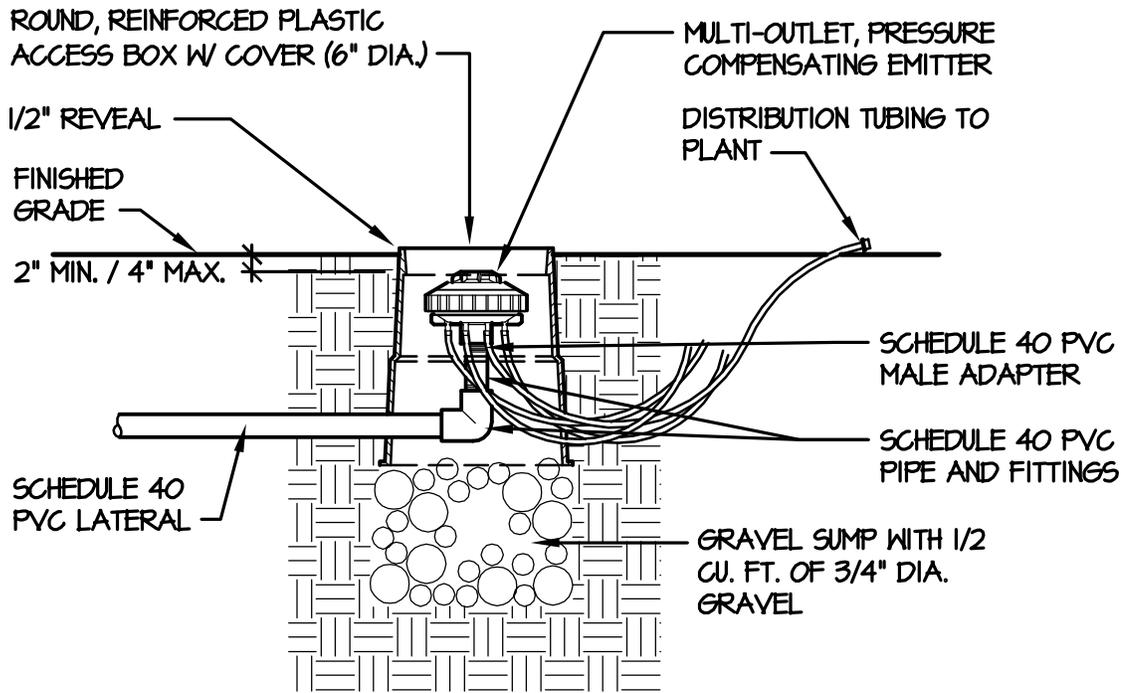
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-314
REVISED:		MULTI OUTLET EMITTER - SIX		SHEET 1 OF 1
MOYR		OUTLET		

NOTE: LAYOUT DISTRIBUTION TUBING AS SHOWN AND LOCATE DISCHARGE POINT $\pm 2"$ ABOVE FINISHED GRADE.

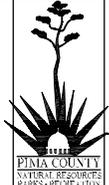


SCALE: N.T.S.

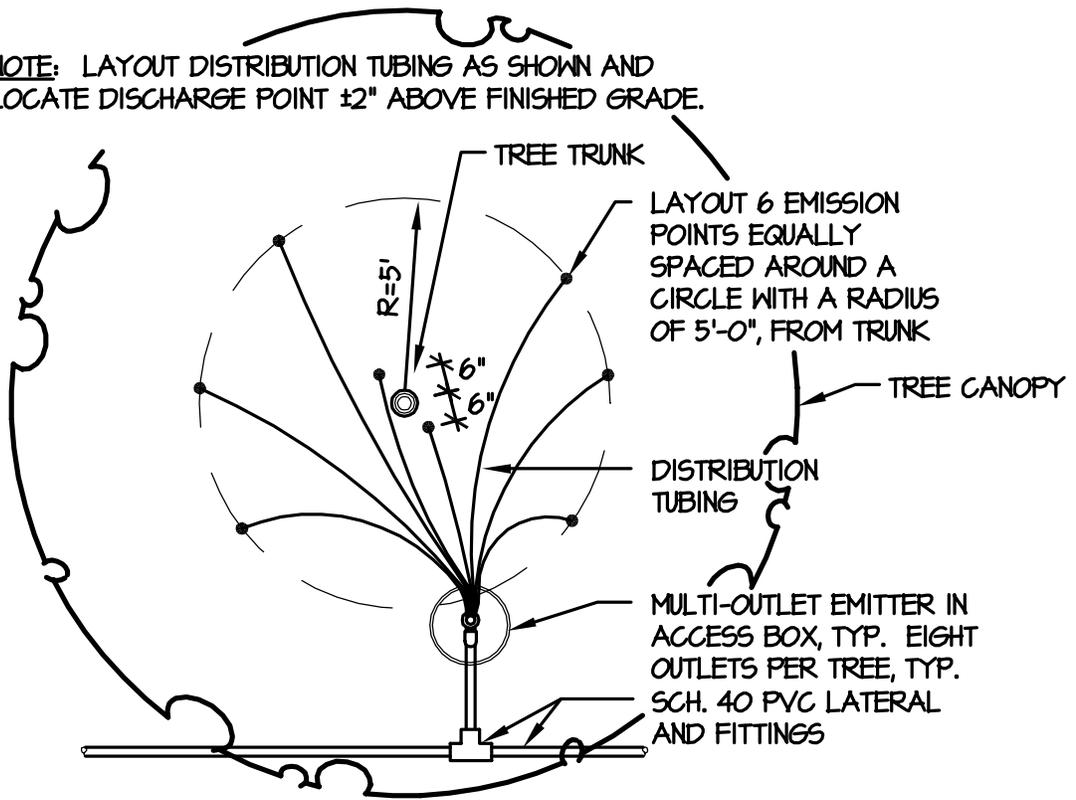
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION: EMITTER DISTRIBUTION TUBING LAYOUT AT TREE - SIX OUTLET		P-315
REVISED:				
MO/YR				



SCALE: N.T.S.

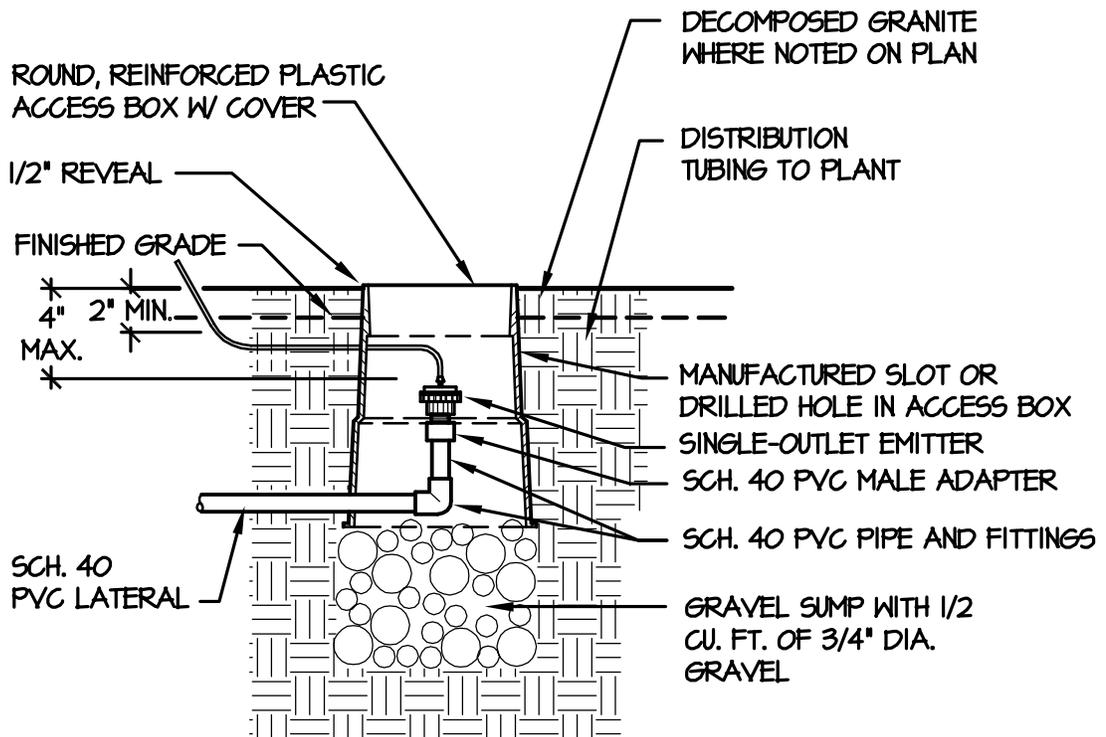
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-316
REVISED:		MULTI OUTLET EMITTER		SHEET 1 OF 1
MO/YR		- EIGHT OUTLET		

NOTE: LAYOUT DISTRIBUTION TUBING AS SHOWN AND LOCATE DISCHARGE POINT $\pm 2"$ ABOVE FINISHED GRADE.



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION: EMITTER DISTRIBUTION TUBING LAYOUT AT TREE - EIGHT OUTLET		P-317
REVISED:				SHEET 1 OF 1
MOYR				

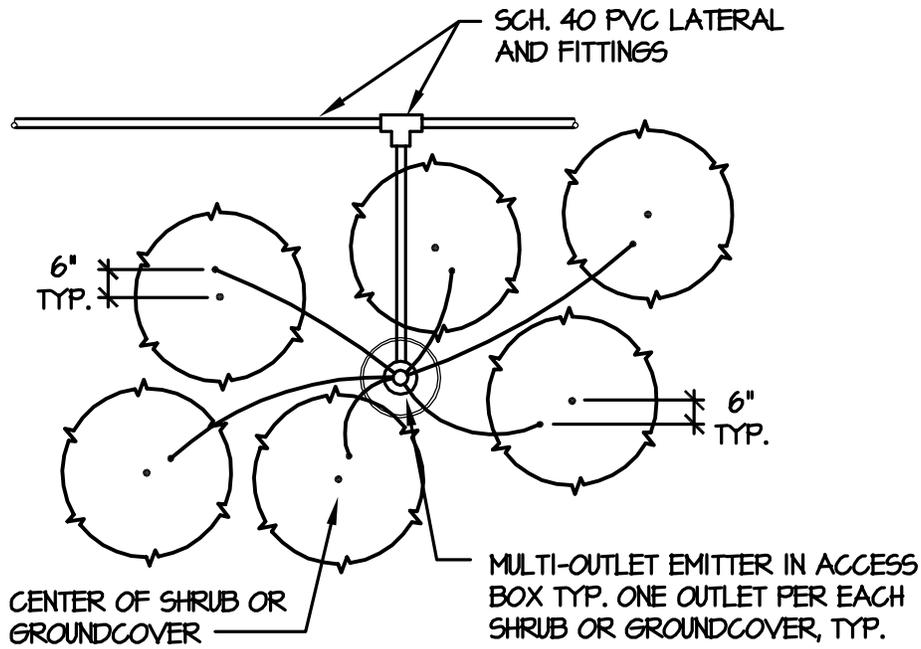


SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL		DETAIL NO.
REVISED: MOYR		IRRIGATION:		P-318
		SINGLE OUTLET EMITTER		
				SHEET 1 OF 1

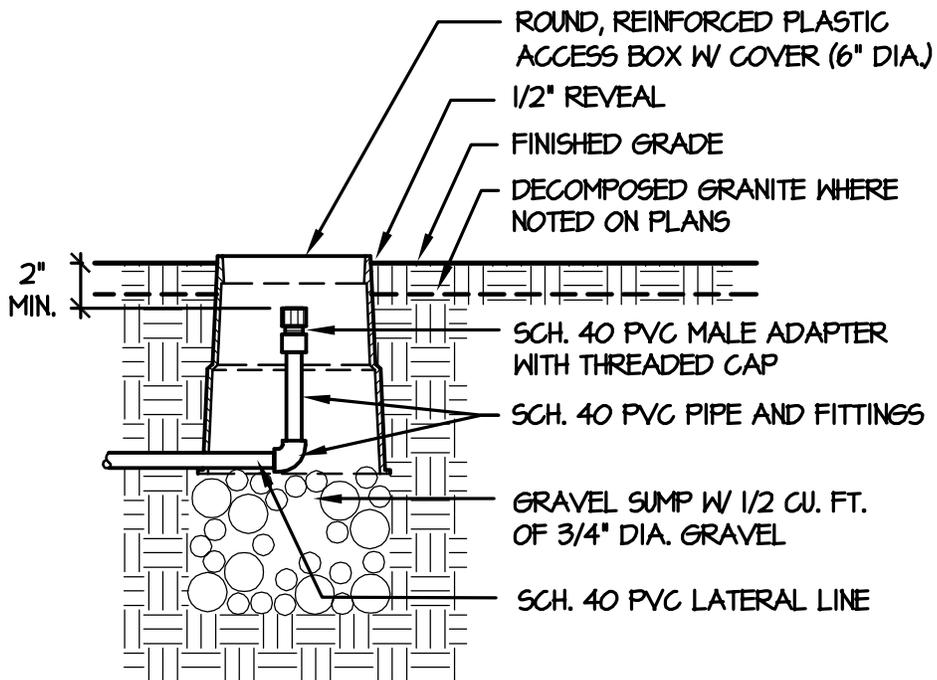
NOTES:

1. LENGTH OF DISTRIBUTION TUBING SHALL NOT EXCEED 8'-0".
2. LAYOUT DISTRIBUTION TUBING AS SHOWN AND LOCATE DISCHARGE POINT 2" ABOVE FINISHED GRADE.



SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL		DETAIL NO.	
REVISED: MOYR		IRRIGATION: EMITTER DISTRIBUTION TUBING LAYOUT AT SHRUBS		P-319	
					SHEET 1 OF 1

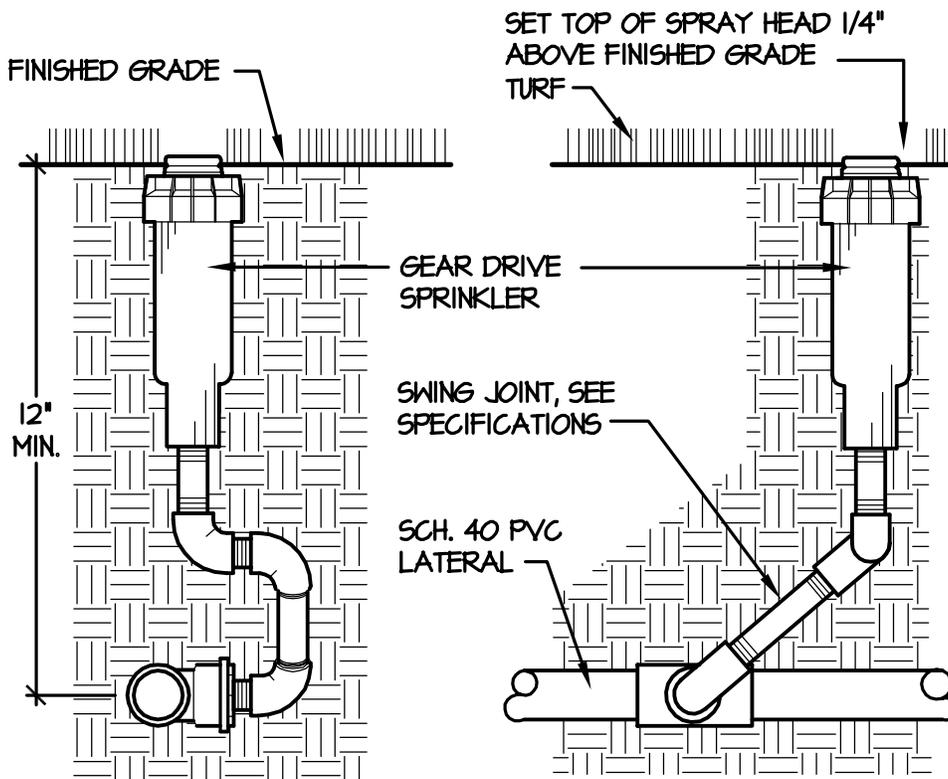


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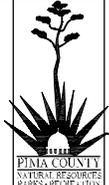
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-320
REVISED:		EMITTER LINE FLUSH CAP IN ACCESS BOX		SHEET 1 OF 1
MOYR				

NOTE:

1. SET SPRINKLER HEAD A MINIMUM OF 6" FROM ANY ADJACENT PAVING OR EDGER.
2. SWING JOINT: PIPE SIZE EQUAL TO SPRINKLER INLET SIZE.

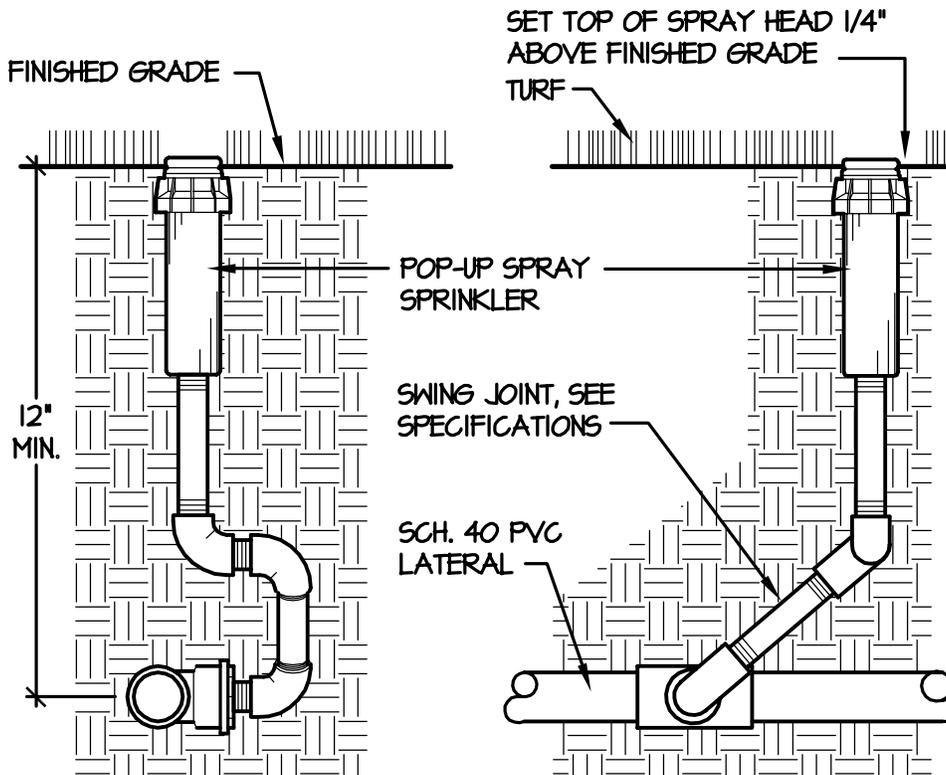


SCALE: N.T.S.

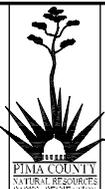
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		IRRIGATION:		P-321
REVISED:		GEAR DRIVE SPRINKLER		SHEET 1 OF 1
MOYR				

NOTE:

1. SET SPRINKLER HEAD A MINIMUM OF 6" FROM ANY ADJACENT PAVING OR EDGER.
2. SWING JOINT: PIPE SIZE EQUAL TO SPRINKLER INLET SIZE.

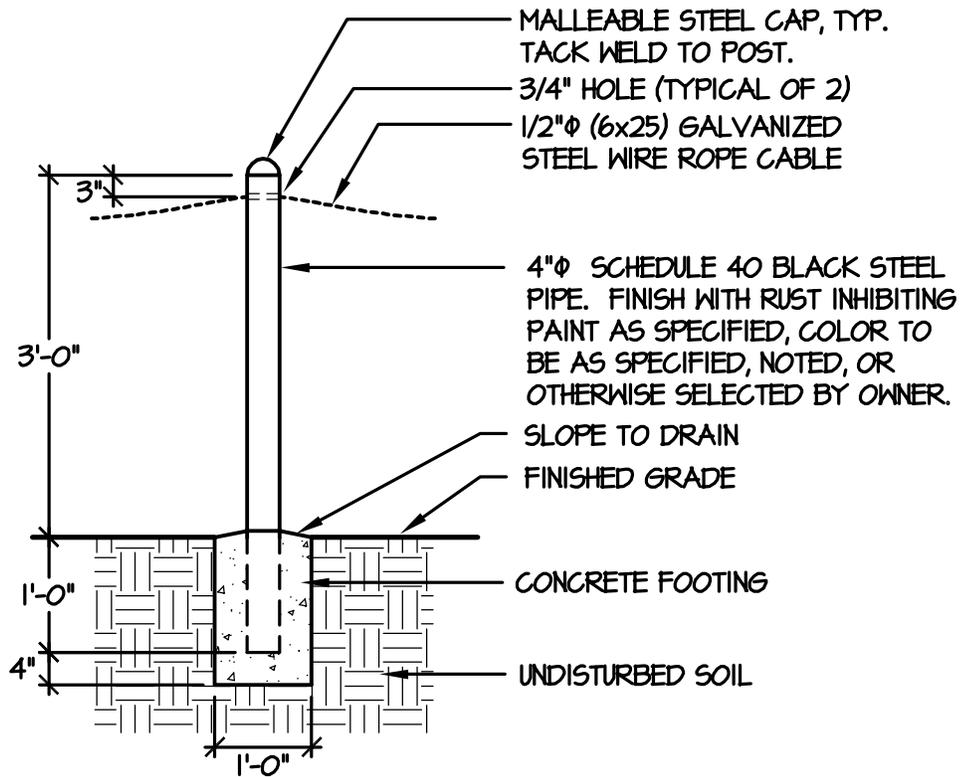


SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL		DETAIL NO.
REVISED: MOYR		IRRIGATION: POP-UP SPRAY SPRINKLER		P-322
				SHEET 1 OF 1

NOTES:

1. CABLE TO BE TERMINATED AT END/CORNER PANELS ONLY. SPLICING OF CABLE BETWEEN END/CORNER PANELS IS PROHIBITED.
2. DISTANCE BETWEEN POSTS SHALL BE 12'-0".

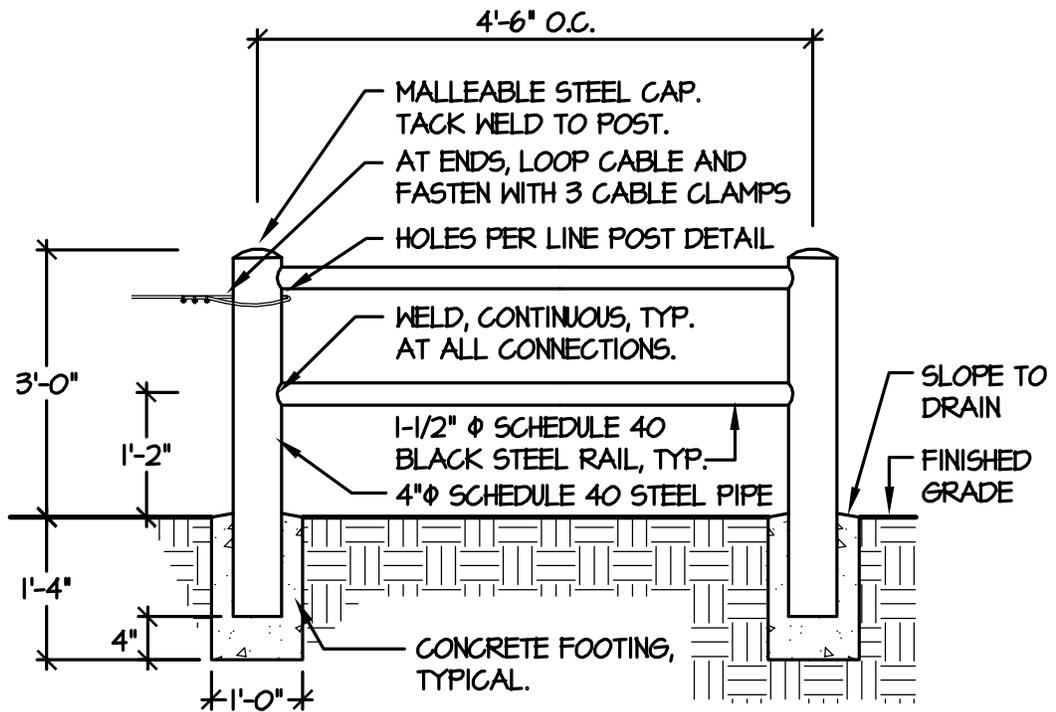


SCALE: N.T.S.

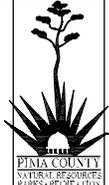
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		POST & CABLE BARRIER:		P-400
REVISED:		POST & CABLE BARRIER		
MO/YR		SHEET 1 OF 1		

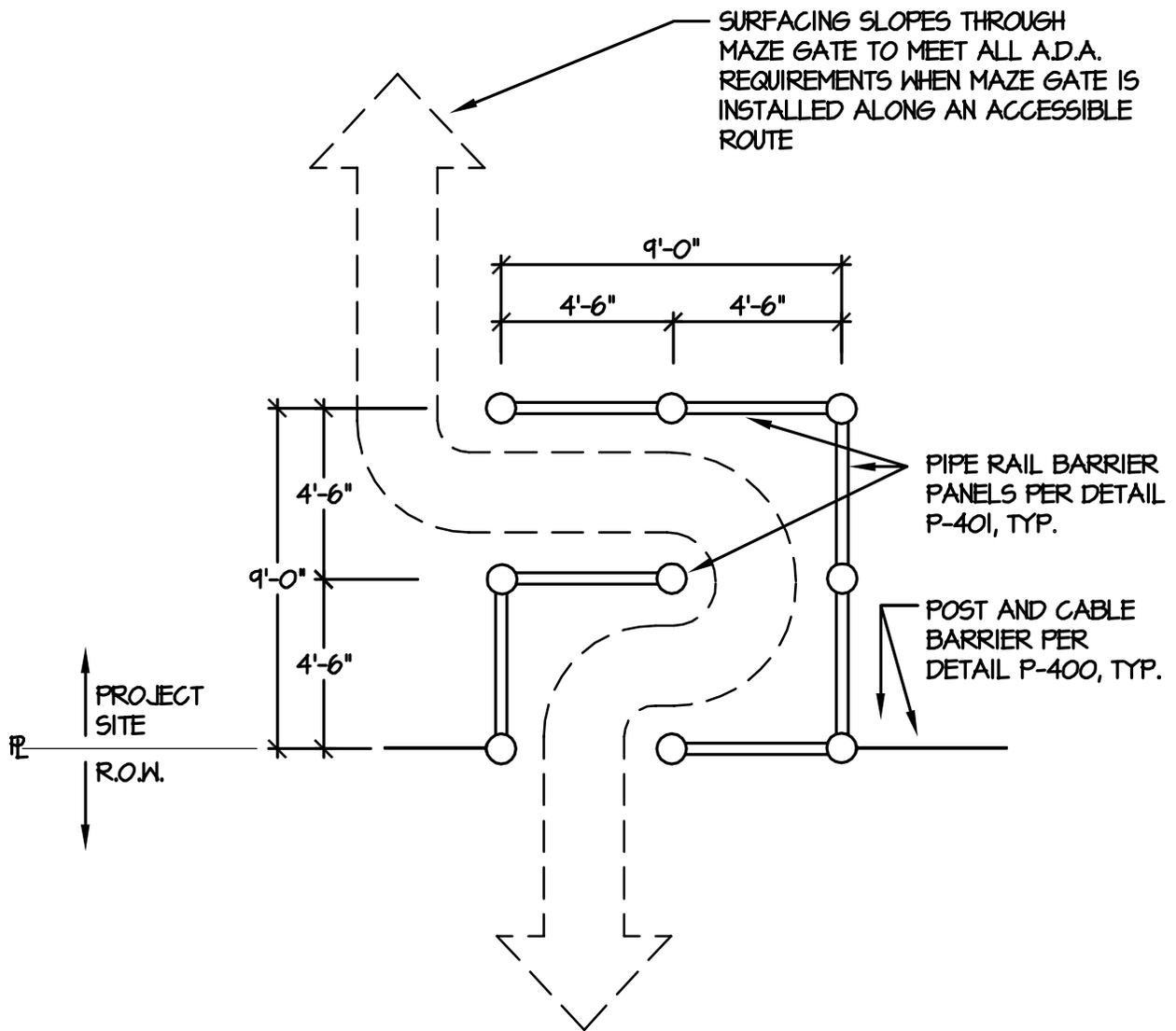
NOTES:

1. GRIND SMOOTH ALL WELDS. PAINT ALL POSTS AND RAILS WITH RUST INHIBITING PAINT AS SPECIFIED. COLOR TO BE AS SPECIFIED, NOTED, OR SELECTED BY OWNER.
2. AT CORNERS, PROVIDE SECOND 'END CONDITION' PANEL AT RIGHT ANGLE TO FIRST.

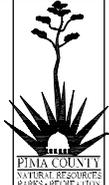


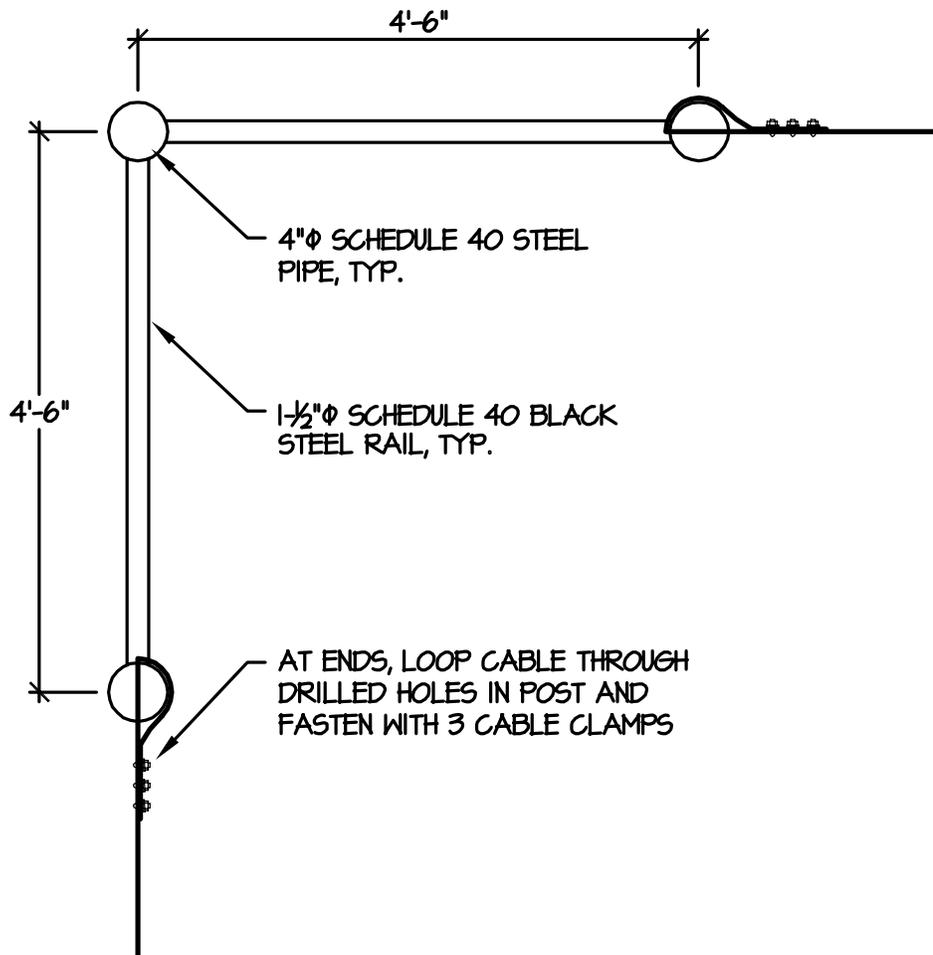
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		POST & CABLE BARRIER:		P-401
REVISED:		POST & CABLE BARRIER, END & CORNER PANEL		SHEET 1 OF 1
MOYR				



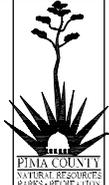
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		POST & CABLE BARRIER:		P-402
REVISED:		MAZE GATE IN		
MOYR		POST-AND-CABLE BARRIER		SHEET 1 OF 1



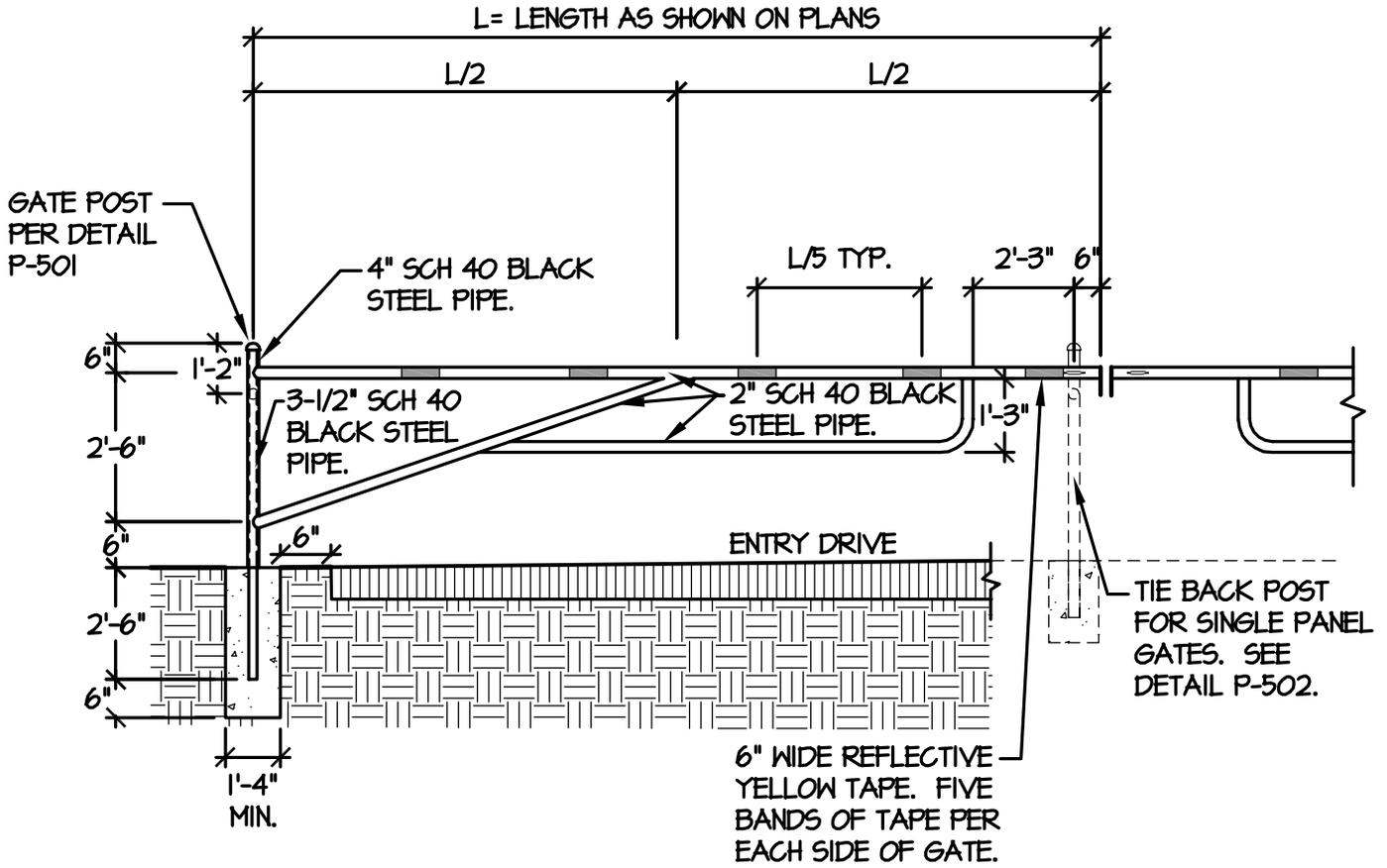
PLAN

SCALE: N.T.S.

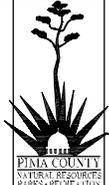
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		POST & CABLE BARRIER:		P-403
REVISED:		POST & CABLE BARRIER, END & CORNER PANEL PLAN VIEW		
MO/YR		SHEET 1 OF 1		

NOTE:

1. GATE AND POSTS TO BE PRIMED AND PAINTED AS SPECIFIED. FINISH COLOR TO BE AS SPECIFIED, NOTED, OR AS SELECTED BY OWNER.
2. GATE PANEL SHOWN IS TYPICAL OF 2 PANELS REQUIRED FOR EACH PARK ENTRY GATE.

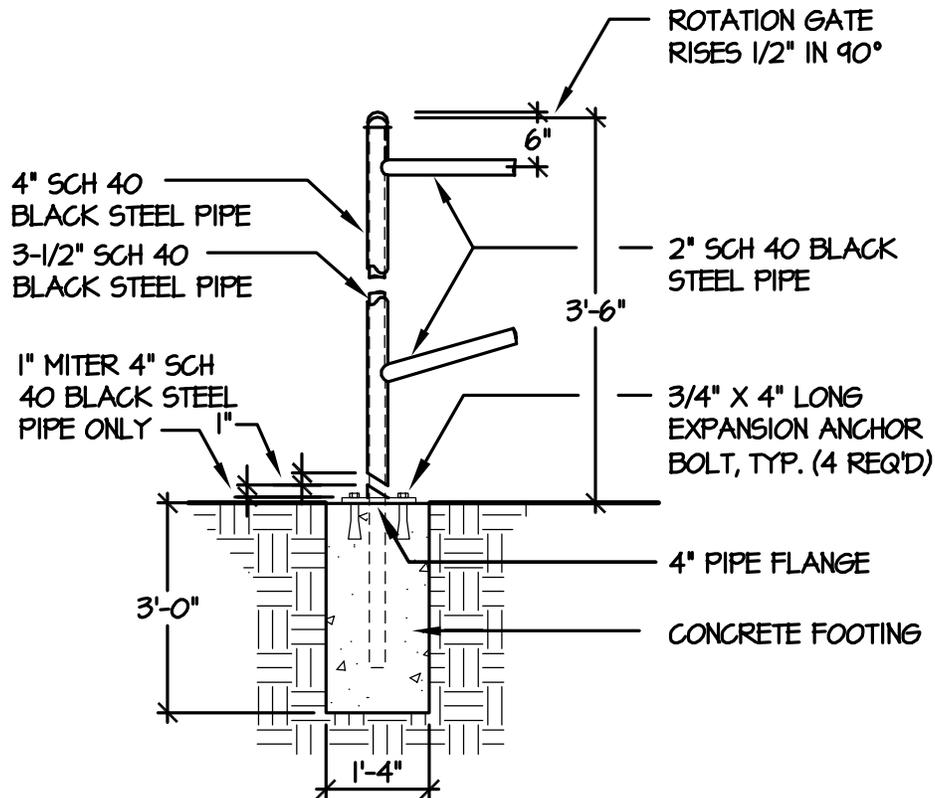


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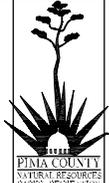
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		ENTRY GATES:		P-500
REVISED:		PARK ENTRY GATE - GATE PANEL		
MOYR				

NOTE:

- I. GATE AND POSTS TO BE PRIMED AND PAINTED AS SPECIFIED. FINISH COLOR TO BE AS SPECIFIED, NOTED, OR AS SELECTED BY OWNER.

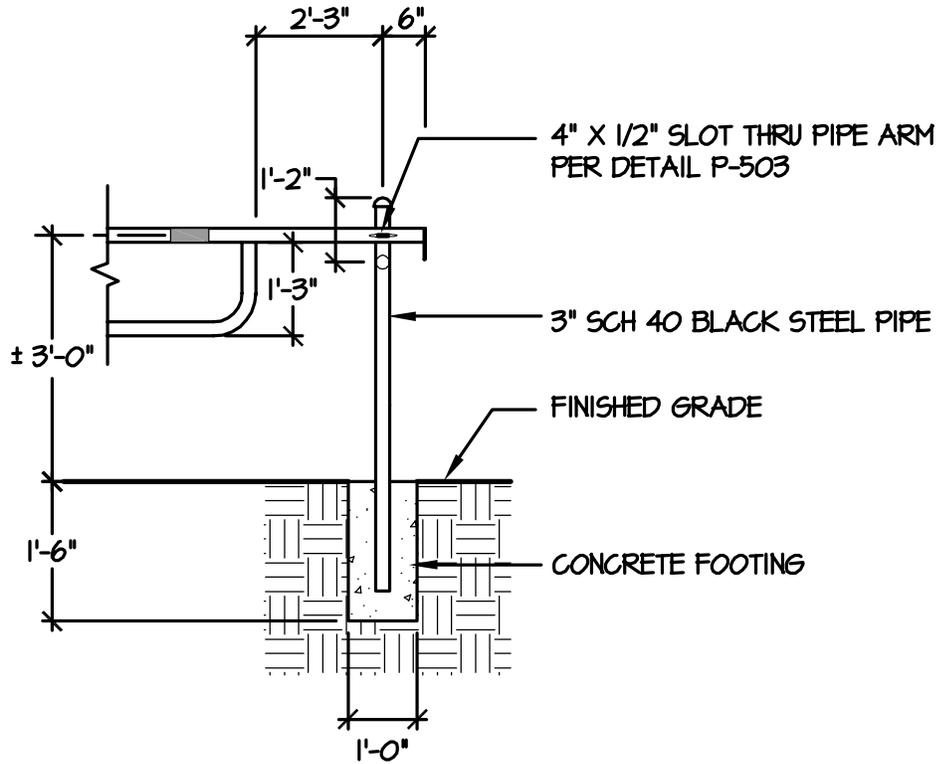


SCALE: N.T.S.

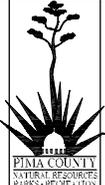
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		ENTRY GATES:		P-501
REVISED:		PARK ENTRY GATE - GATE POST		
MOYR				SHEET 1 OF 1

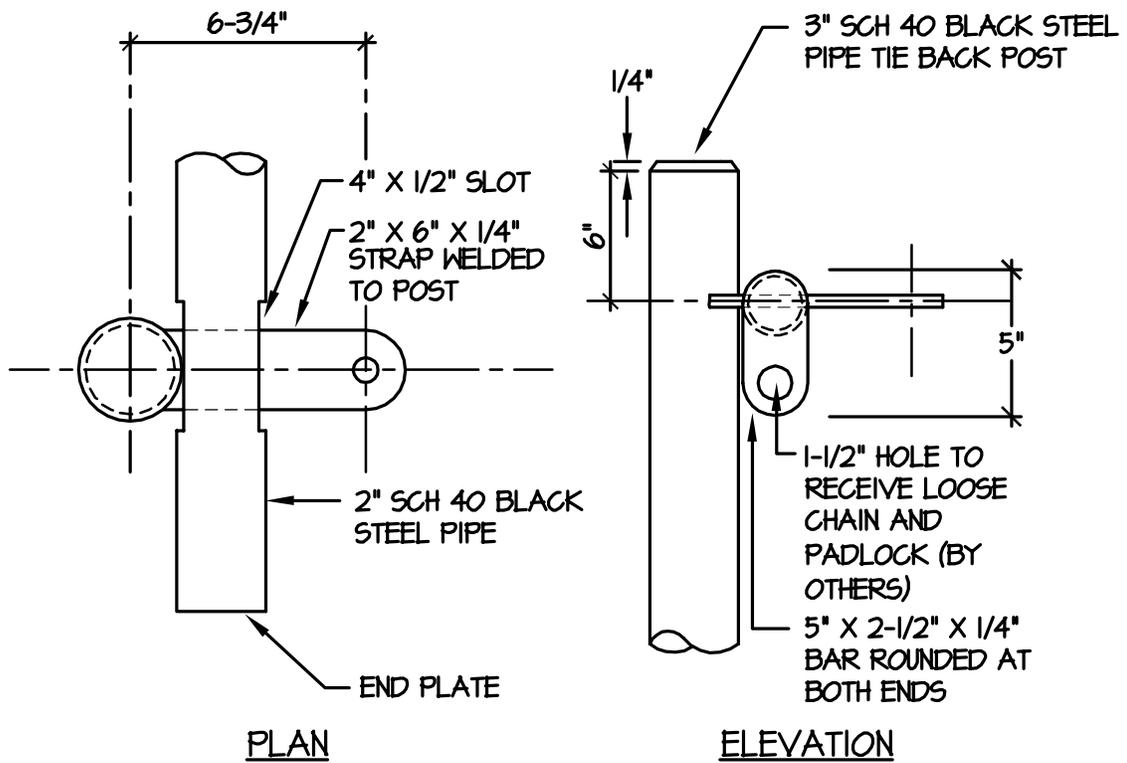
NOTE:

1. GATE AND POSTS TO BE PRIMED AND PAINTED AS SPECIFIED. FINISH COLOR TO BE AS SPECIFIED, NOTED, OR AS SELECTED BY OWNER.



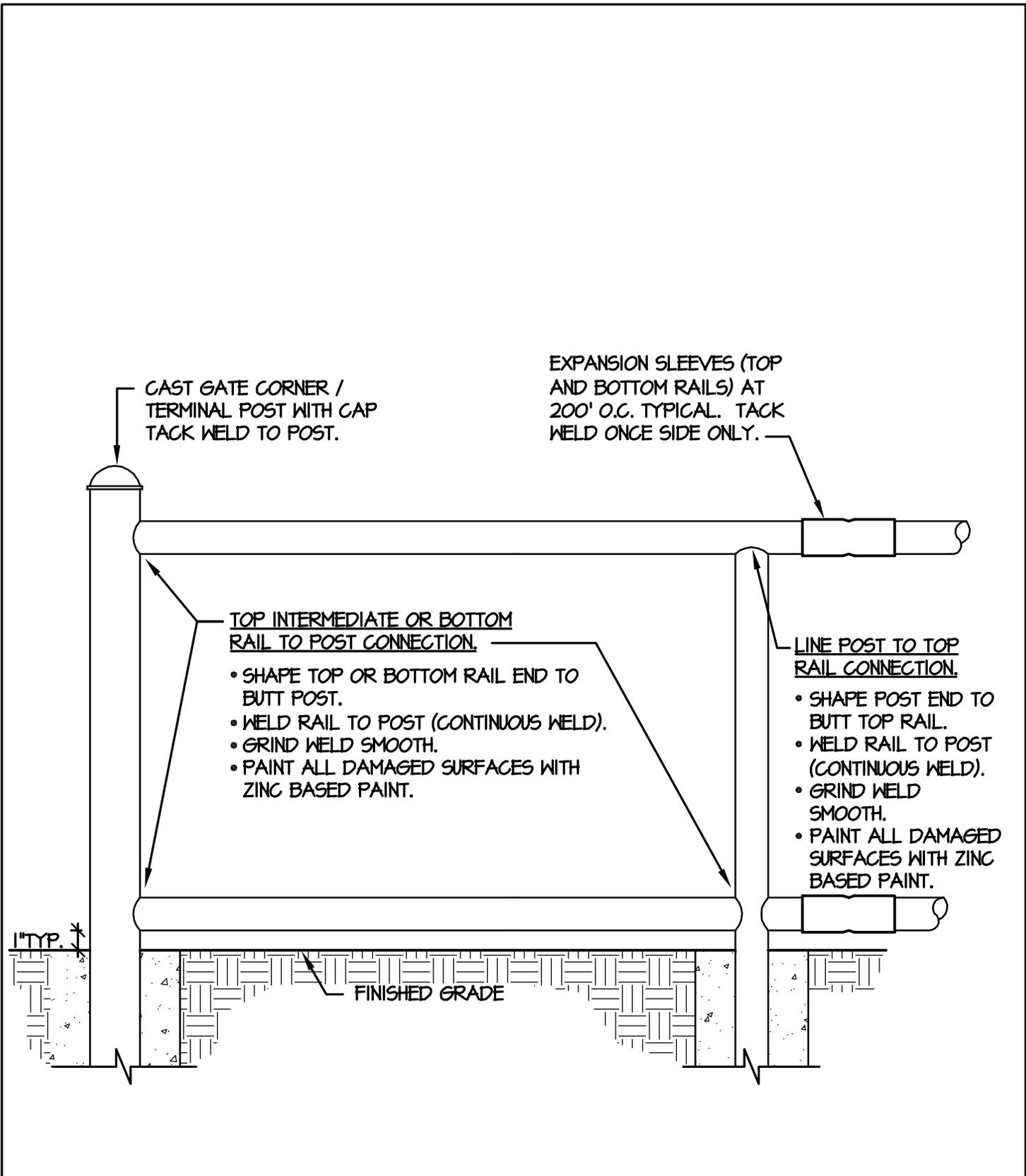
SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL ENTRY GATES:		DETAIL NO. P-502
REVISED: MOYR		PARK ENTRY GATE - TIE BACK POST		SHEET 1 OF 1



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		ENTRY GATES:		P-503
REVISED:		PARK ENTRY GATE - TIE BACK		SHEET 1 OF 1
MOYR		ANCHOR AND LOCKING MECHANISM		



CAST GATE CORNER /
TERMINAL POST WITH GAP
TACK WELD TO POST.

EXPANSION SLEEVES (TOP
AND BOTTOM RAILS) AT
200' O.C. TYPICAL. TACK
WELD ONCE SIDE ONLY.

TOP INTERMEDIATE OR BOTTOM
RAIL TO POST CONNECTION.

- SHAPE TOP OR BOTTOM RAIL END TO BUTT POST.
- WELD RAIL TO POST (CONTINUOUS WELD).
- GRIND WELD SMOOTH.
- PAINT ALL DAMAGED SURFACES WITH ZINC BASED PAINT.

LINE POST TO TOP
RAIL CONNECTION.

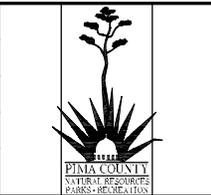
- SHAPE POST END TO BUTT TOP RAIL.
- WELD RAIL TO POST (CONTINUOUS WELD).
- GRIND WELD SMOOTH.
- PAINT ALL DAMAGED SURFACES WITH ZINC BASED PAINT.

1" TYP. *

FINISHED GRADE

SCALE: N.T.S.

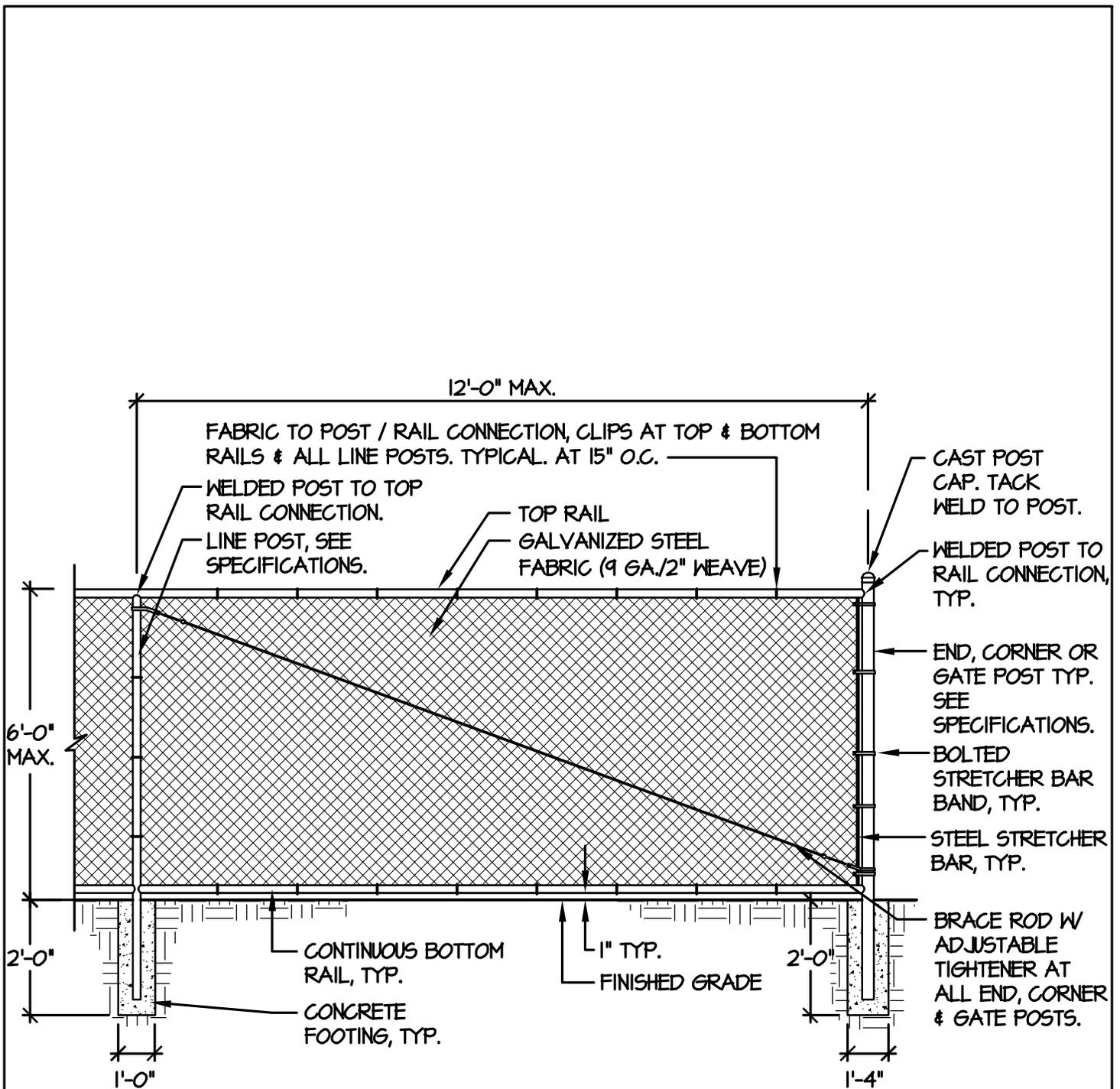
ISSUED:	
11/05	
REVISED:	
MOYR	



STANDARD DETAIL
CHAIN LINK FENCING
& GATES:
CHAIN LINK FENCE
TYPICAL FRAMING PLAN

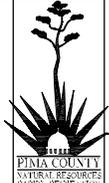


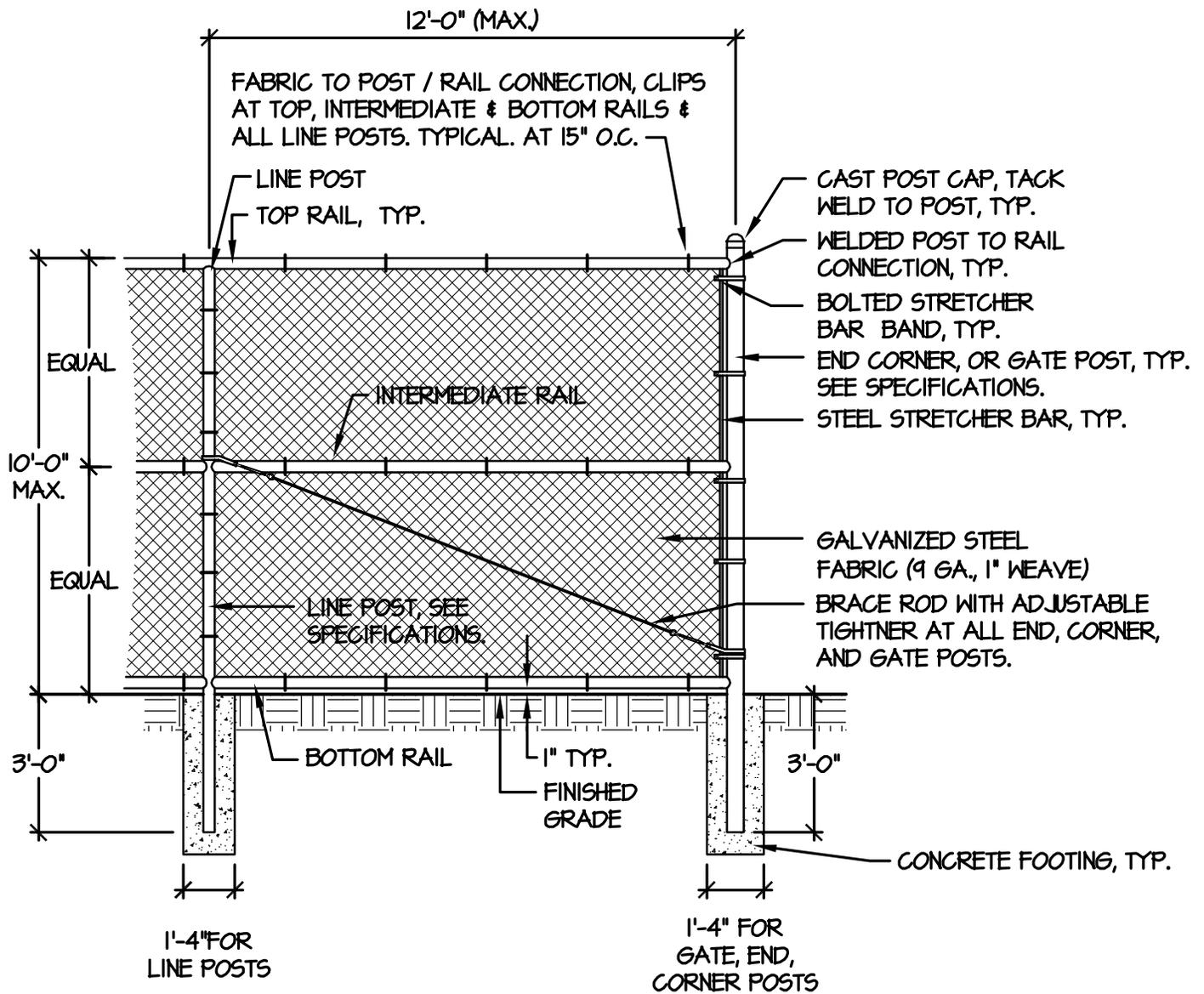
DETAIL NO.
P-600
SHEET 1 OF 1



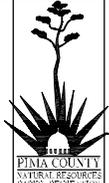
NOTE: INSTALL FABRIC ON FIELD / PUBLIC USE SIDE OF FENCE, WHERE APPLICABLE.

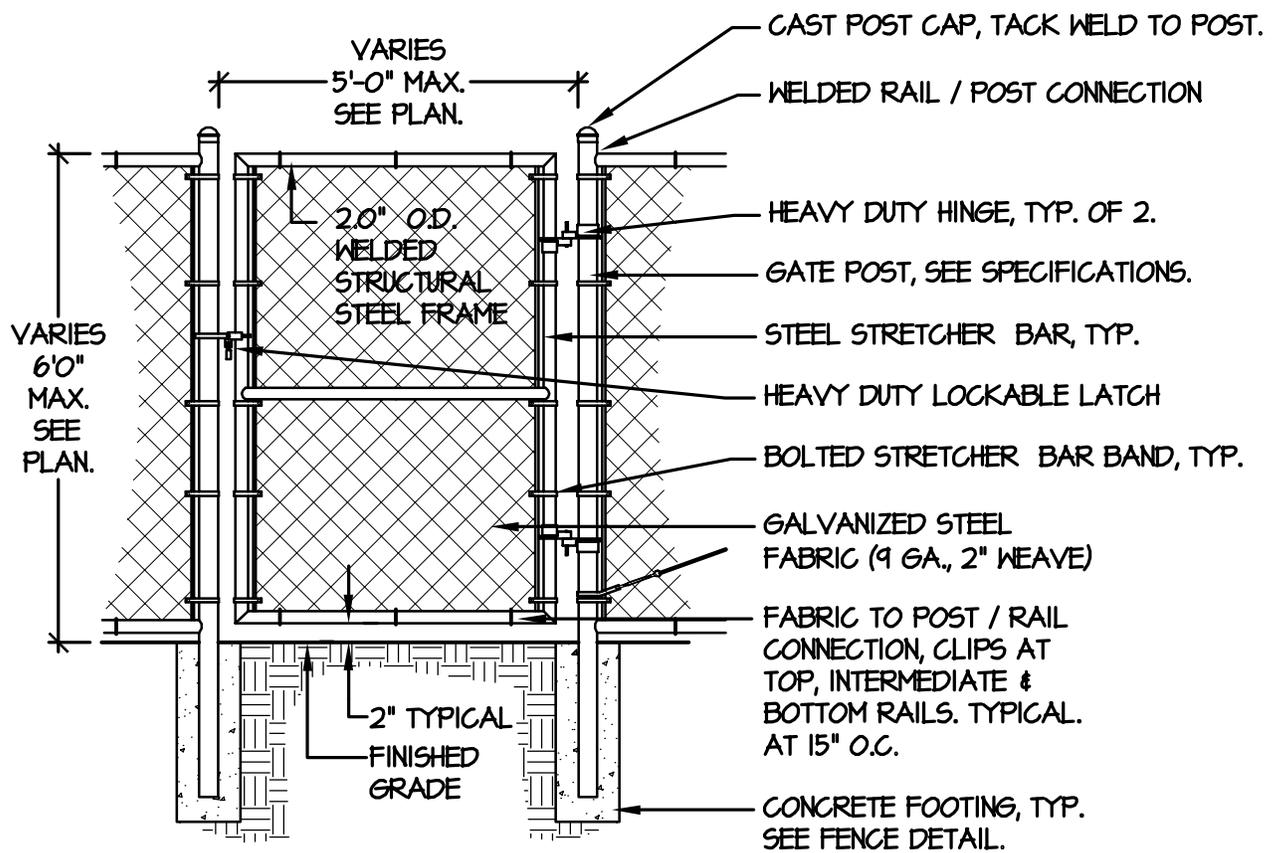
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL CHAIN LINK FENCING & GATES: CHAIN LINK FENCE UP TO 6'-0" IN HEIGHT		DETAIL NO.
11/05				P-601
REVISED:				SHEET 1 OF 1
MOYR				

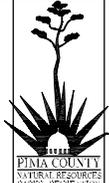


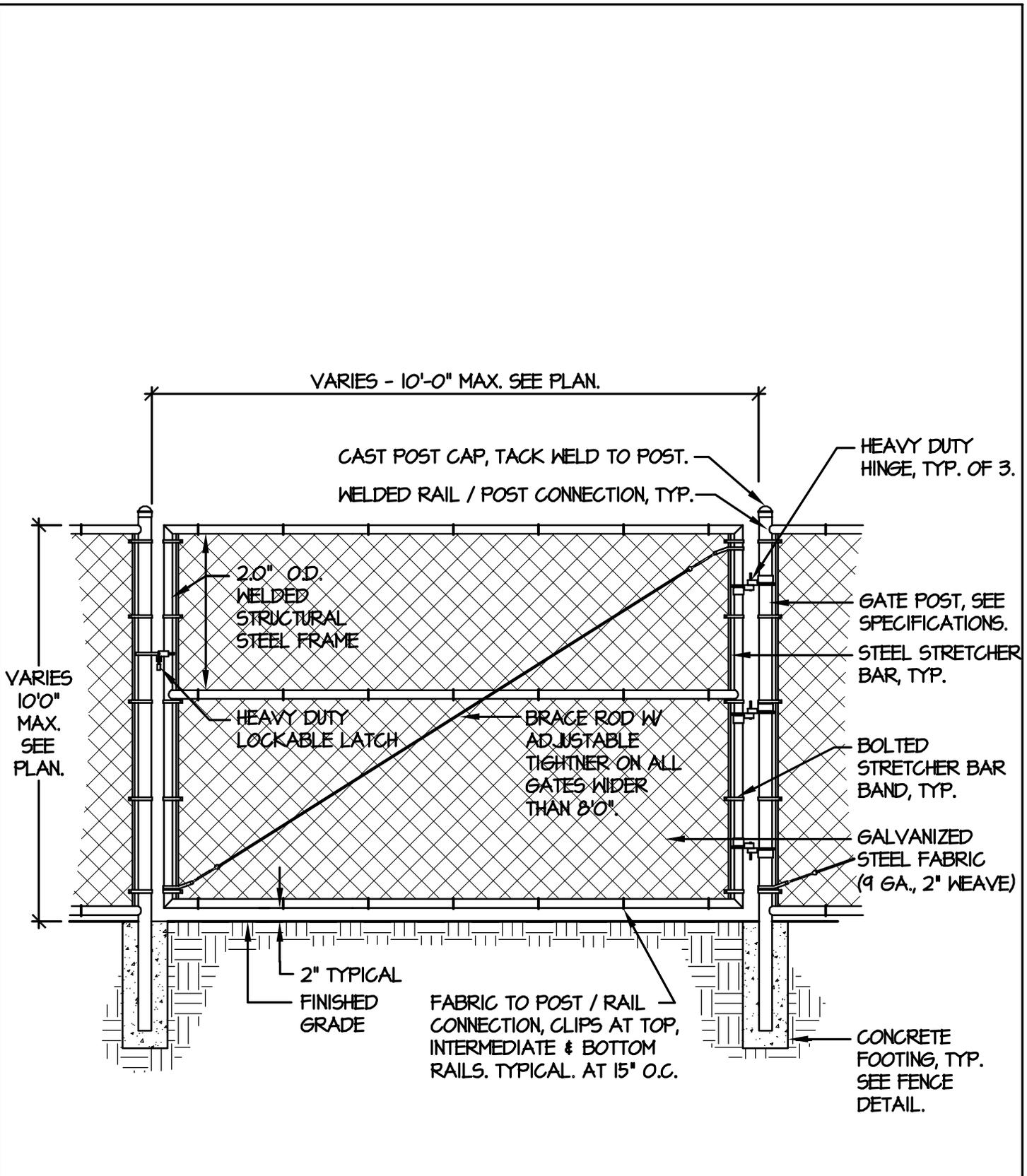
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		CHAIN LINK FENCING & GATES:		P-602
REVISED:		CHAIN LINK FENCE		SHEET 1 OF 1
MOYR		> 6'-0" TO 10'-0" IN HEIGHT		



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		CHAIN LINK FENCING & GATES:		P-603
REVISED:		CHAIN LINK GATE - SINGLE SWING		SHEET 1 OF 1
MOYR		6'-0" MAX. HEIGHT - 5'-0" MAX. WIDTH		



SCALE: N.T.S.

ISSUED:	11/05
REVISED:	MOYR

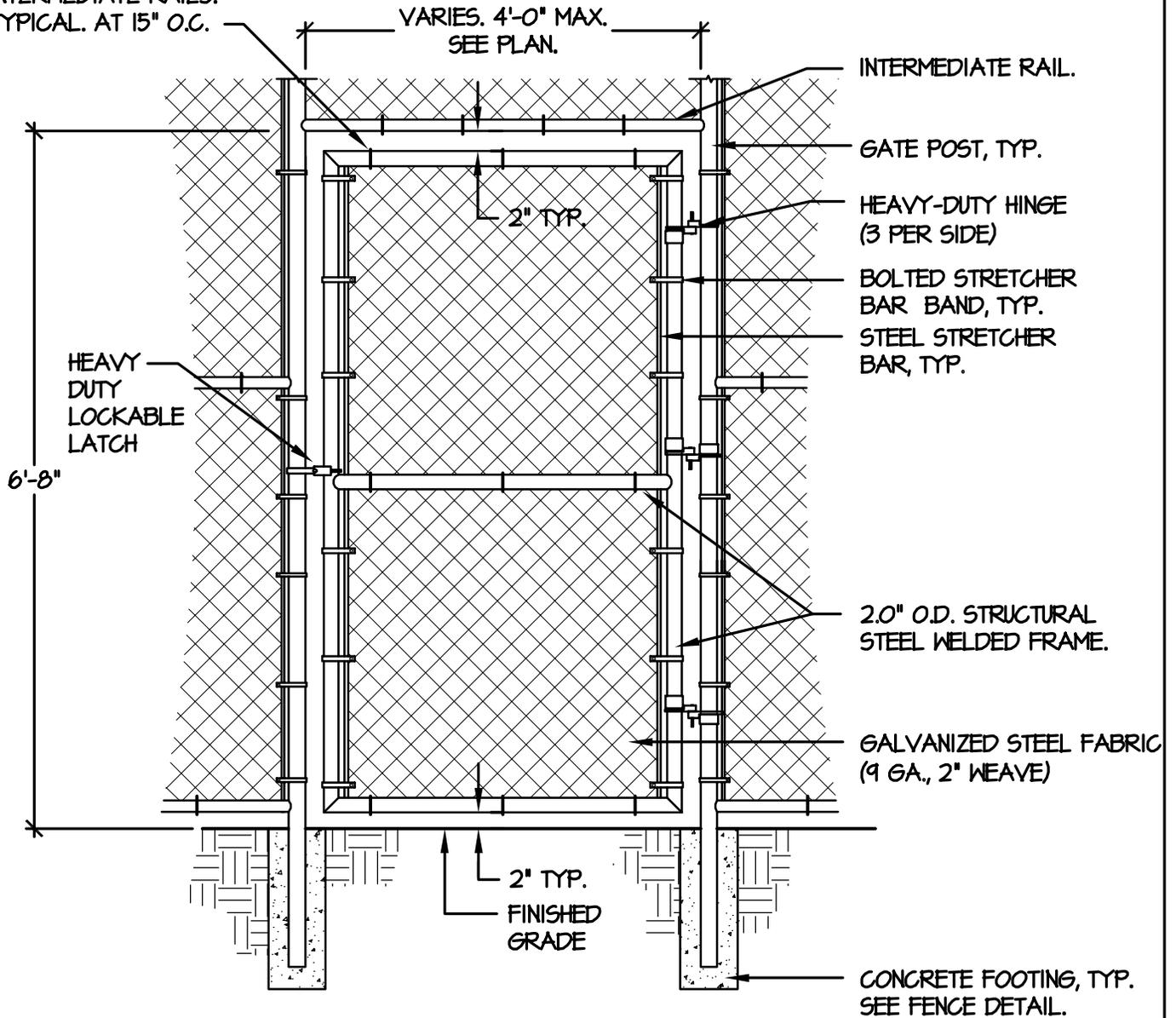


STANDARD DETAIL
 CHAIN LINK FENCING
 & GATES:
 CHAIN LINK GATE - SINGLE SWING
 10'-0" MAX. HEIGHT - 10'-0" MAX. WIDTH



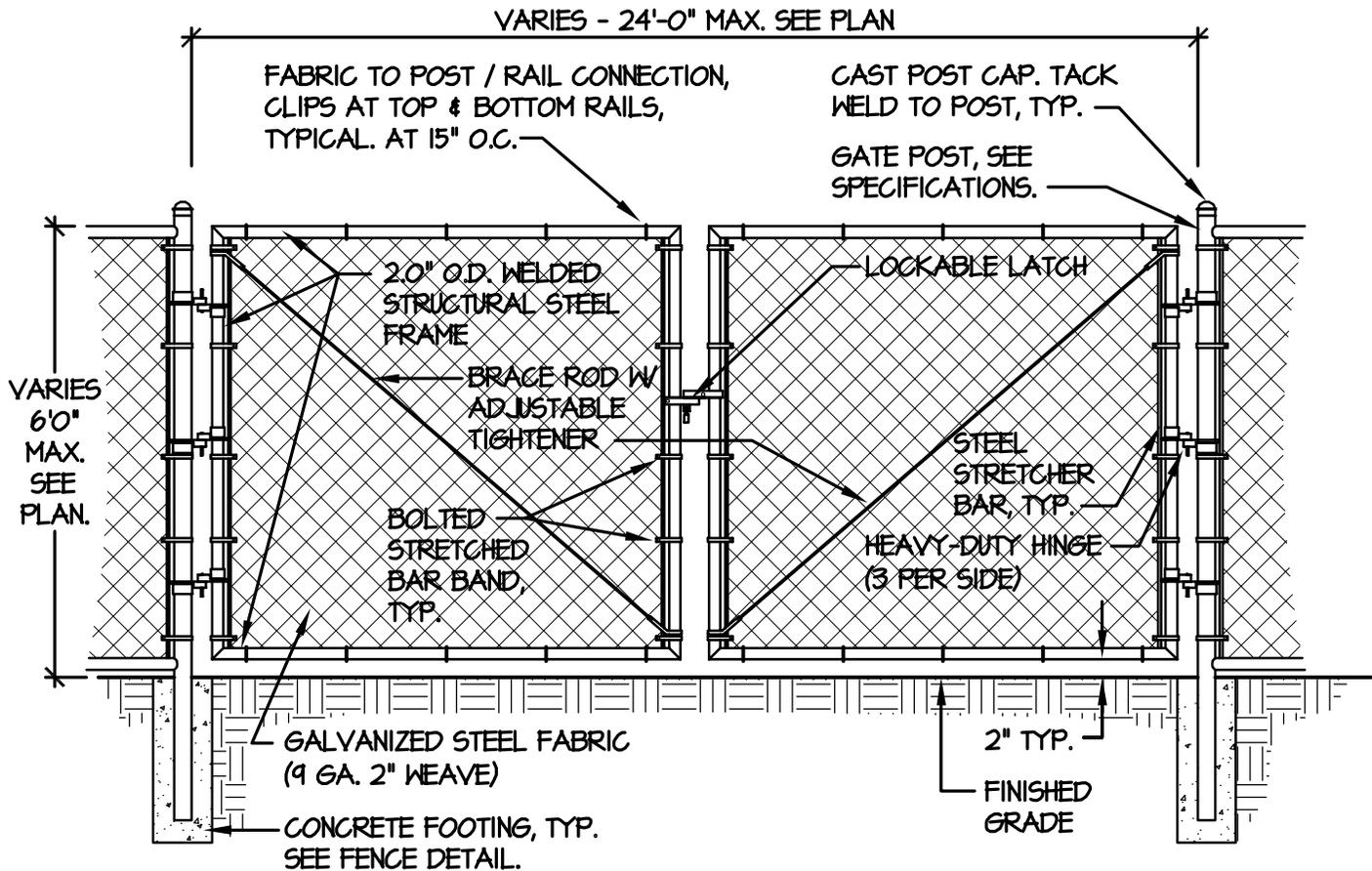
DETAIL NO.	P-604
SHEET 1 OF 1	

FABRIC TO RAIL
 CONNECTION, CLIPS AT
 TOP, BOTTOM &
 INTERMEDIATE RAILS.
 TYPICAL. AT 15" O.C.



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		CHAIN LINK FENCING & GATES:		P-605
REVISED:		CHAIN LINK GATE - SINGLE SWING		SHEET 1 OF 1
MOYR		6'-8" HEIGHT IN 10'-0" FENCE		



SCALE: N.T.S.

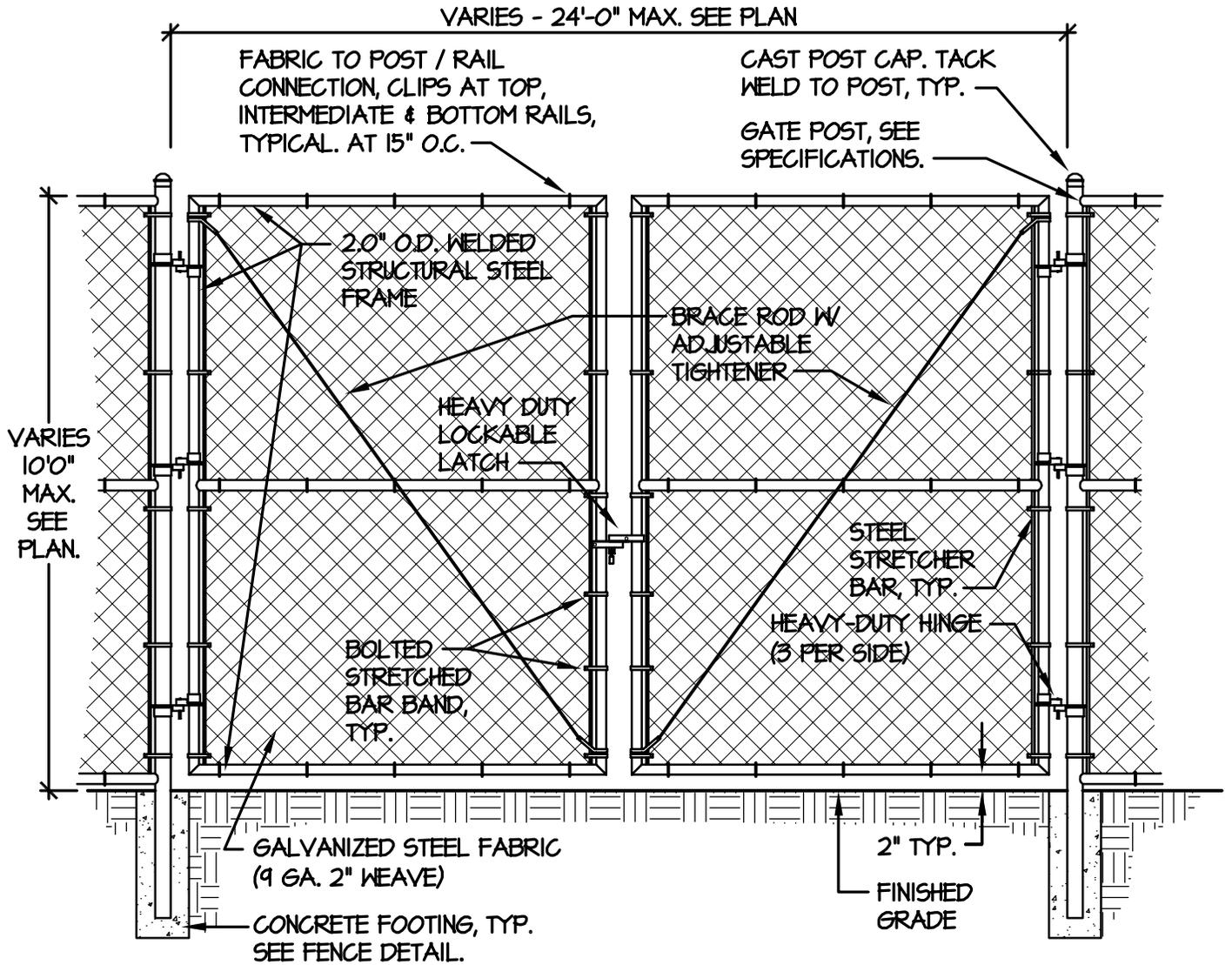
ISSUED:
11/05
REVISED:
MOYR



STANDARD DETAIL
 CHAIN LINK FENCING
 & GATES:
 CHAIN LINK GATE - DOUBLE SWING
 6'-0" MAX. HEIGHT - 24'-0" MAX. WIDTH



DETAIL NO.
P-606
 SHEET 1 OF 1



SCALE: N.T.S.

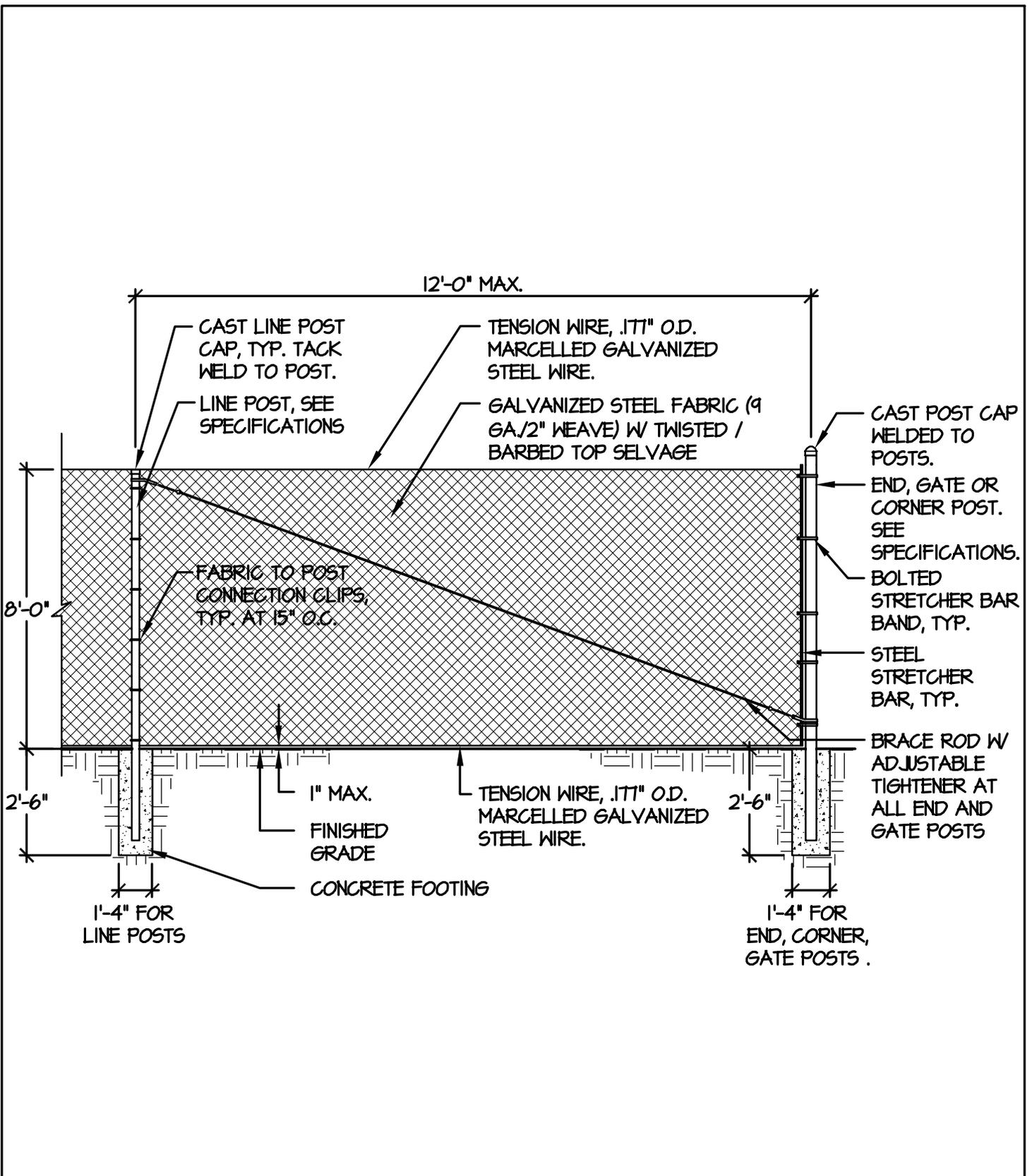
ISSUED:	
11/05	
REVISED:	
MOYR	



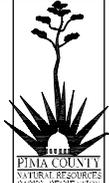
STANDARD DETAIL
CHAIN LINK FENCING & GATES:
 CHAIN LINK GATE - DOUBLE SWING
 10'-0" MAX. HEIGHT - 24'-0" MAX. WIDTH

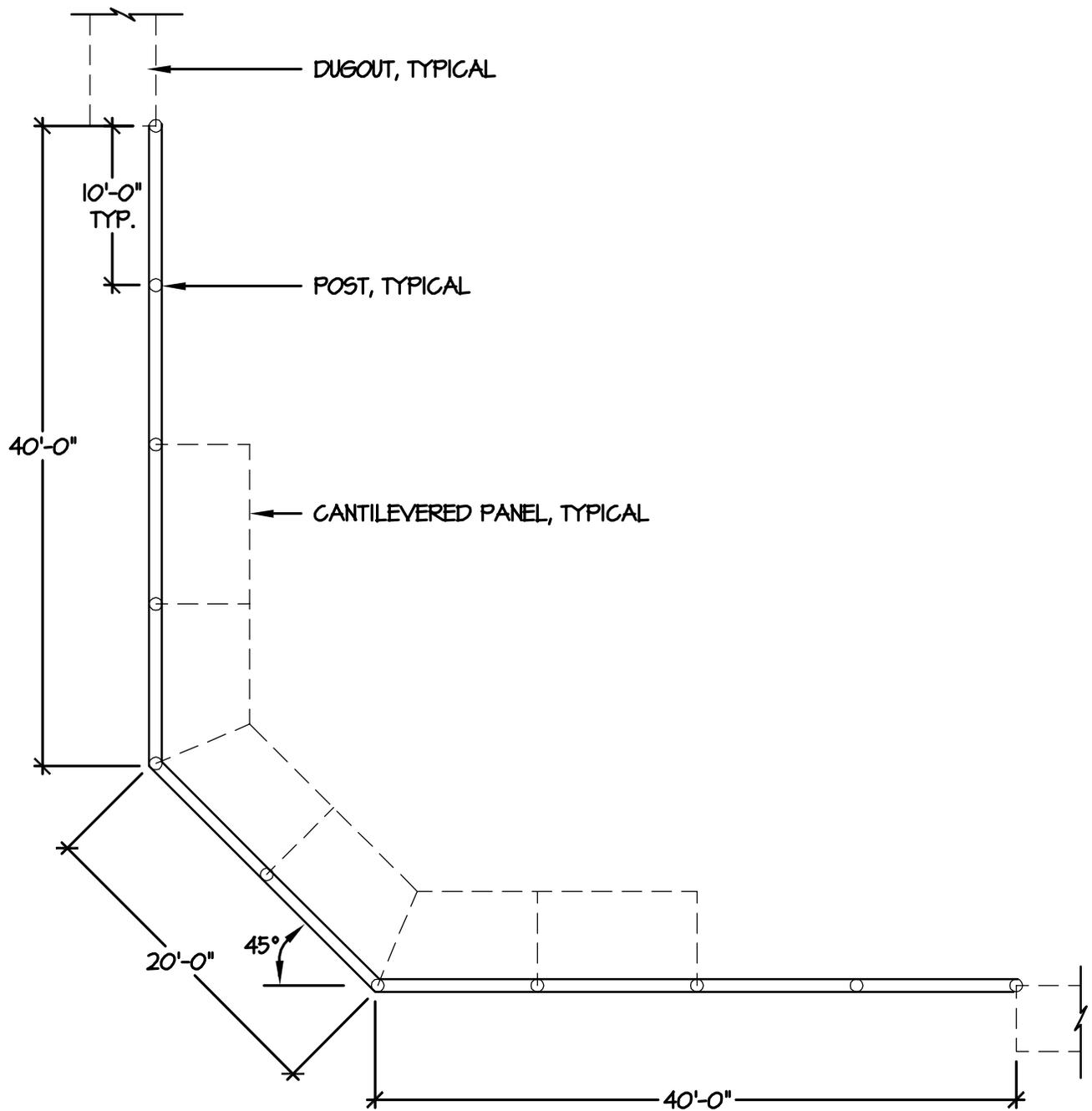


DETAIL NO.
P-607
SHEET 1 OF 1



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		CHAIN LINK FENCING & GATES:		P-608
REVISED:		CHAIN LINK SECURITY FENCE -		SHEET 1 OF 1
MOYR		8'-0" HEIGHT		



SCALE: N.T.S.

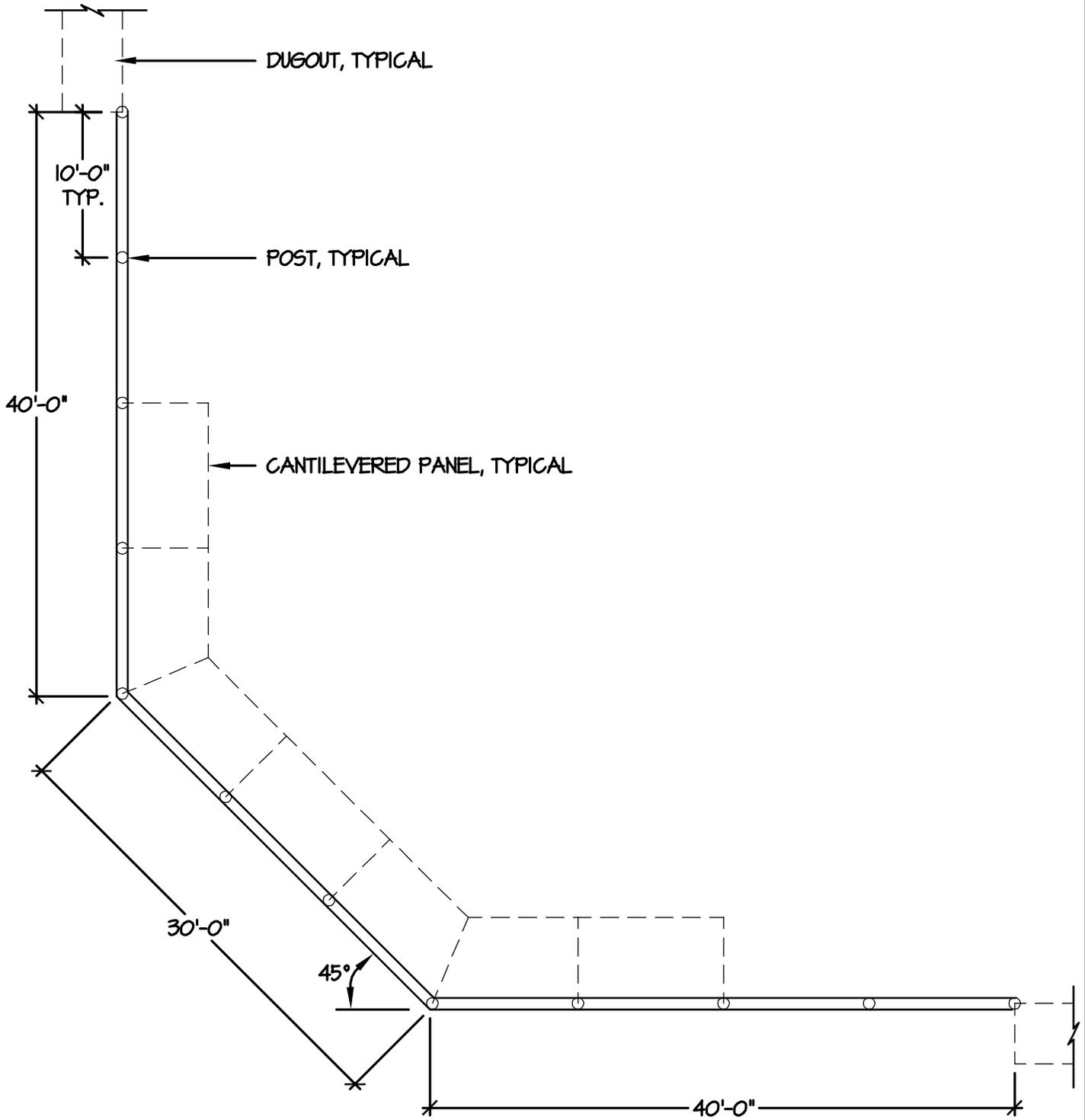
ISSUED:	
11/05	
REVISED:	
MOYR	



STANDARD DETAIL
BACKSTOPS
 BACKSTOP LAYOUT -
 LITTLE LEAGUE BASEBALL,
 PONY LEAGUE BASEBALL, AND
 FAST-PITCH SOFTBALL FIELDS



DETAIL NO.
P-700
SHEET 1 OF 1



SCALE: N.T.S.

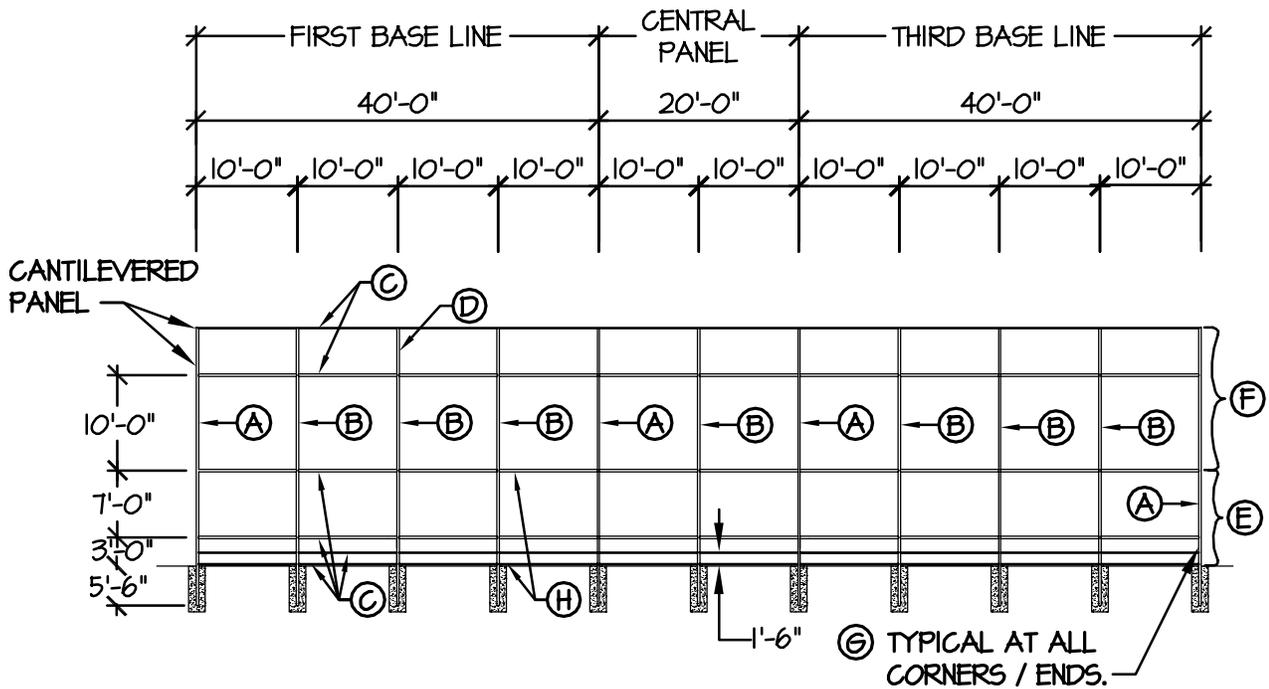
ISSUED:	
11/05	
REVISED:	
MOYR	



STANDARD DETAIL
BACKSTOPS
 BACKSTOP LAYOUT -
 FULL-SIZE BASEBALL, AND ADULT
 SLOW-PITCH SOFTBALL FIELDS



DETAIL NO.
P-701
SHEET 1 OF 1

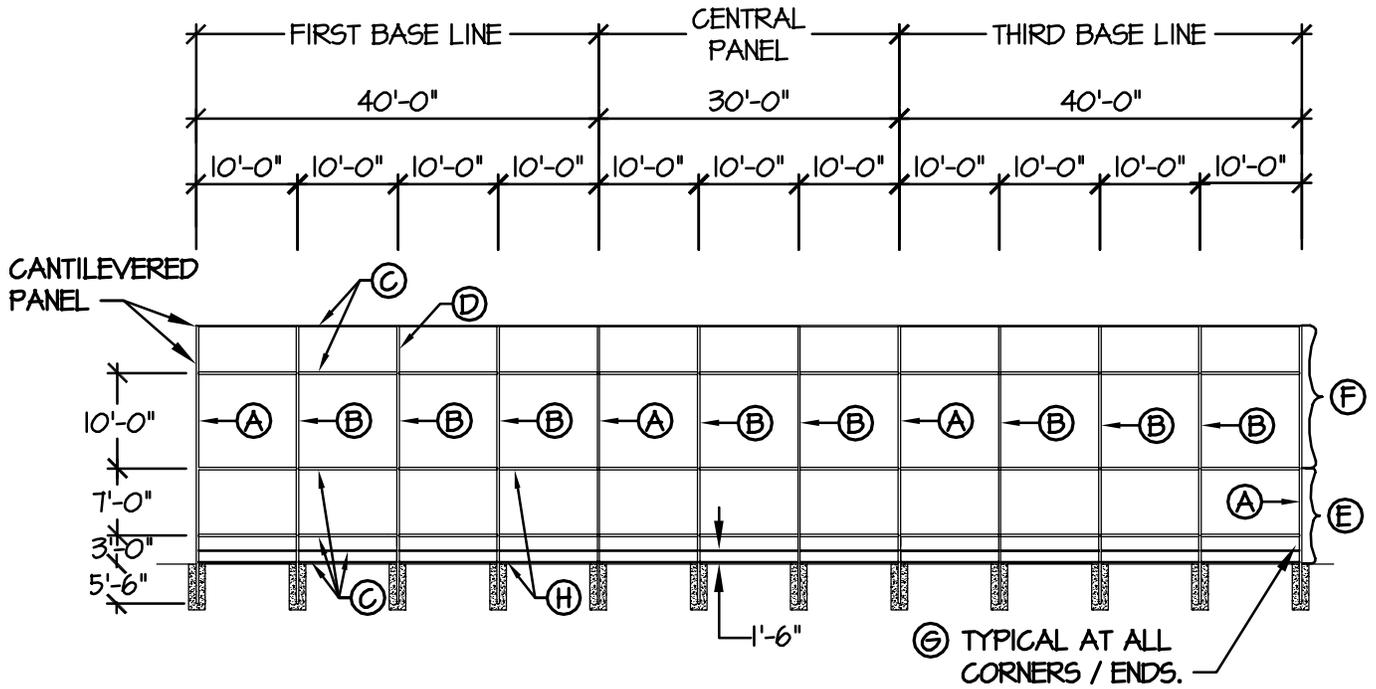


- (A) CORNER POST (4.0" O.D.)
- (B) LINE POST (4.0" O.D.)
- (C) TOP, BOTTOM AND INTERMEDIATE RAIL (1 7/8" O.D.)
- (D) CANTILEVERED FRAME (1 7/8" O.D.)
- (E) CHAIN LINK FABRIC - 6 GA./2" WEAVE (BOTTOM OF BACKSTOP TO 10')
- (F) CHAIN LINK FABRIC - 9 GA./2" WEAVE (10' TO TOP OF BACKSTOP)
- (G) STRETCHER BAR W/ STRETCHER BAR BANDS AT 12" O.C. TYPICAL.
- (H) HORIZONTAL STRETCHER BAR WITH STAINLESS STEEL BANDING CLAMPS AT 12" O.C. TYPICAL. (BOTTOM RAIL AND 10' INTERMEDIATE RAILS ONLY).

UNFOLDED ELEVATION OF BACKSTOP

SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL		DETAIL NO.
REVISED:		BACKSTOPS		P-702
MOYR		BACKSTOP FRAMING PLAN - LITTLE LEAGUE BASEBALL, PONY LEAGUE BASEBALL AND FAST PITCH SOFTBALL FIELDS		SHEET 1 OF 1

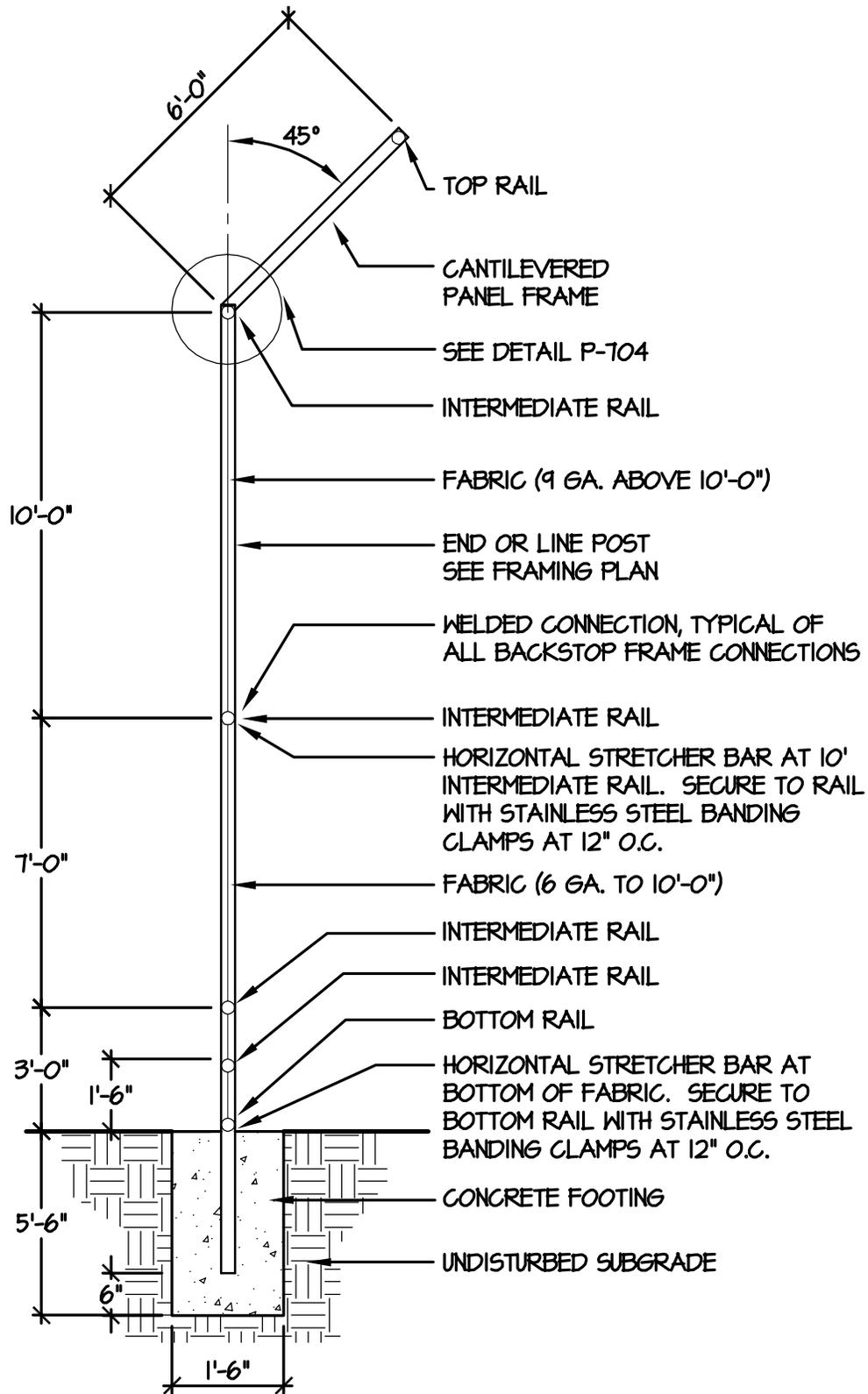


- (A) CORNER POST (4.0" O.D.)
- (B) LINE POST (4.0" O.D.)
- (C) TOP, BOTTOM AND INTERMEDIATE RAIL (1 1/8" O.D.)
- (D) CANTILEVERED FRAME (1 1/8" O.D.)
- (E) CHAIN LINK FABRIC - 6 GA./2" WEAVE (BOTTOM OF BACKSTOP TO 10')
- (F) CHAIN LINK FABRIC - 9 GA./2" WEAVE (10' TO TOP OF BACKSTOP)
- (G) STRETCHER BAR W/ STRETCHER BAR BANDS AT 12" O.C. TYPICAL.
- (H) HORIZONTAL STRETCHER BAR WITH STAINLESS STEEL BANDING CLAMPS AT 12" O.C. TYPICAL. (BOTTOM RAIL AND 10' INTERMEDIATE RAILS ONLY).

UNFOLDED ELEVATION OF BACKSTOP

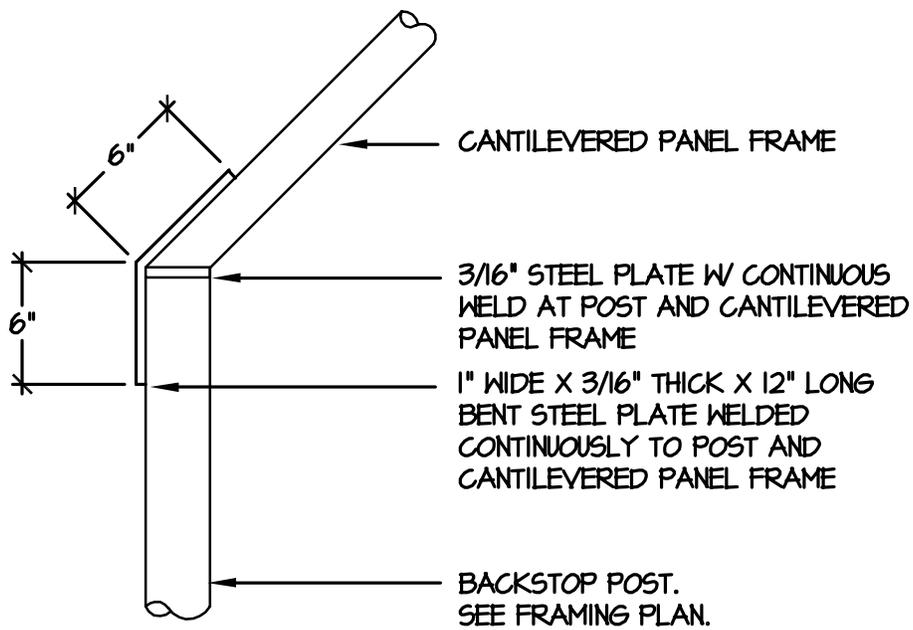
SCALE: N.T.S.

ISSUED: 11/05 REVISED: MOYR		STANDARD DETAIL BACKSTOPS BACKSTOP FRAMING PLAN - FULL-SIZE BASEBALL & ADULT SLOW PITCH SOFTBALL FIELDS		DETAIL NO. P-703 SHEET 1 OF 1
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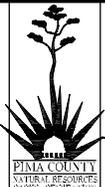


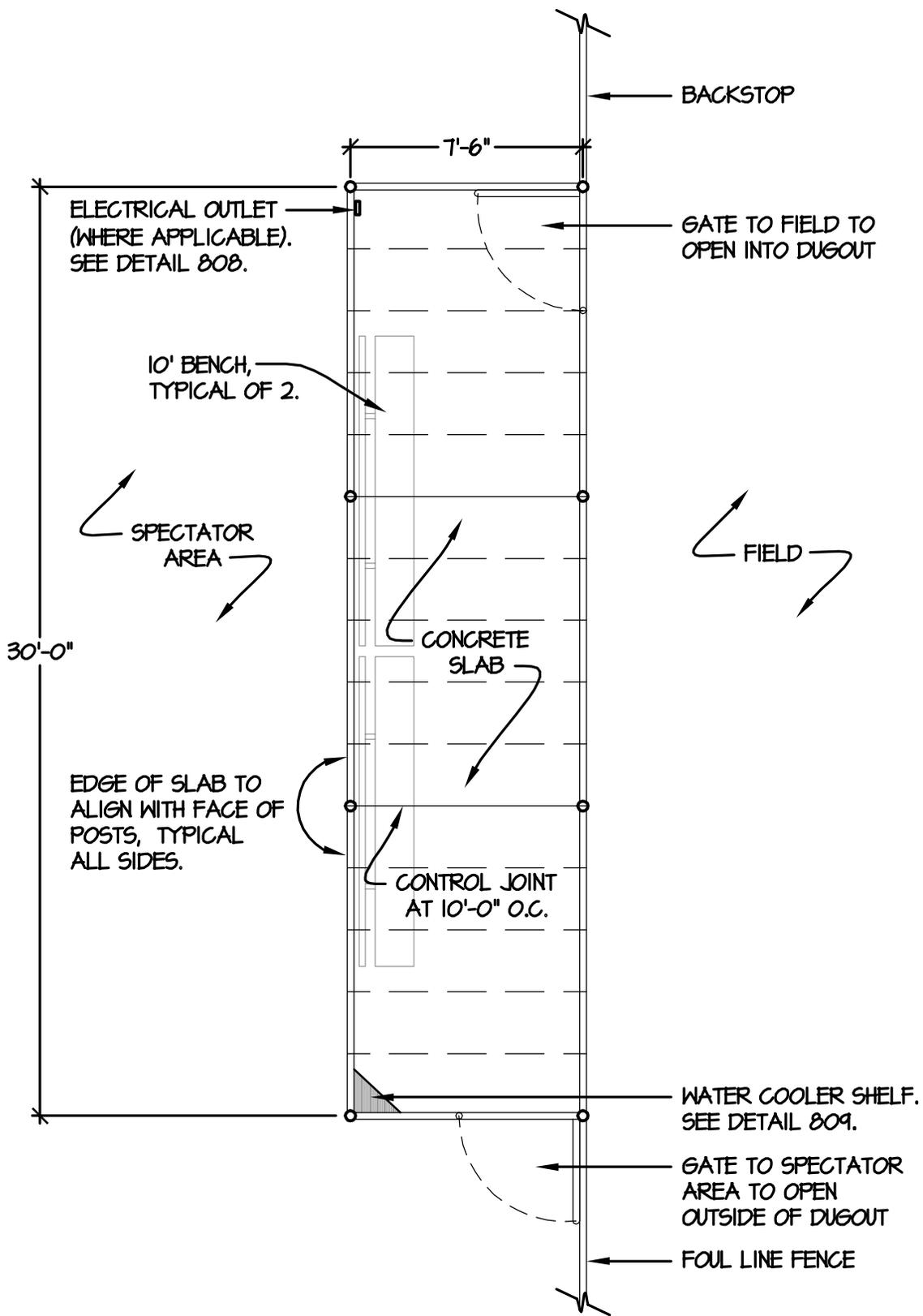
SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL BACKSTOPS:		DETAIL NO.
REVISED:		SECTION THROUGH BACKSTOP		P-704
MOYR		SHEET 1 OF 1		



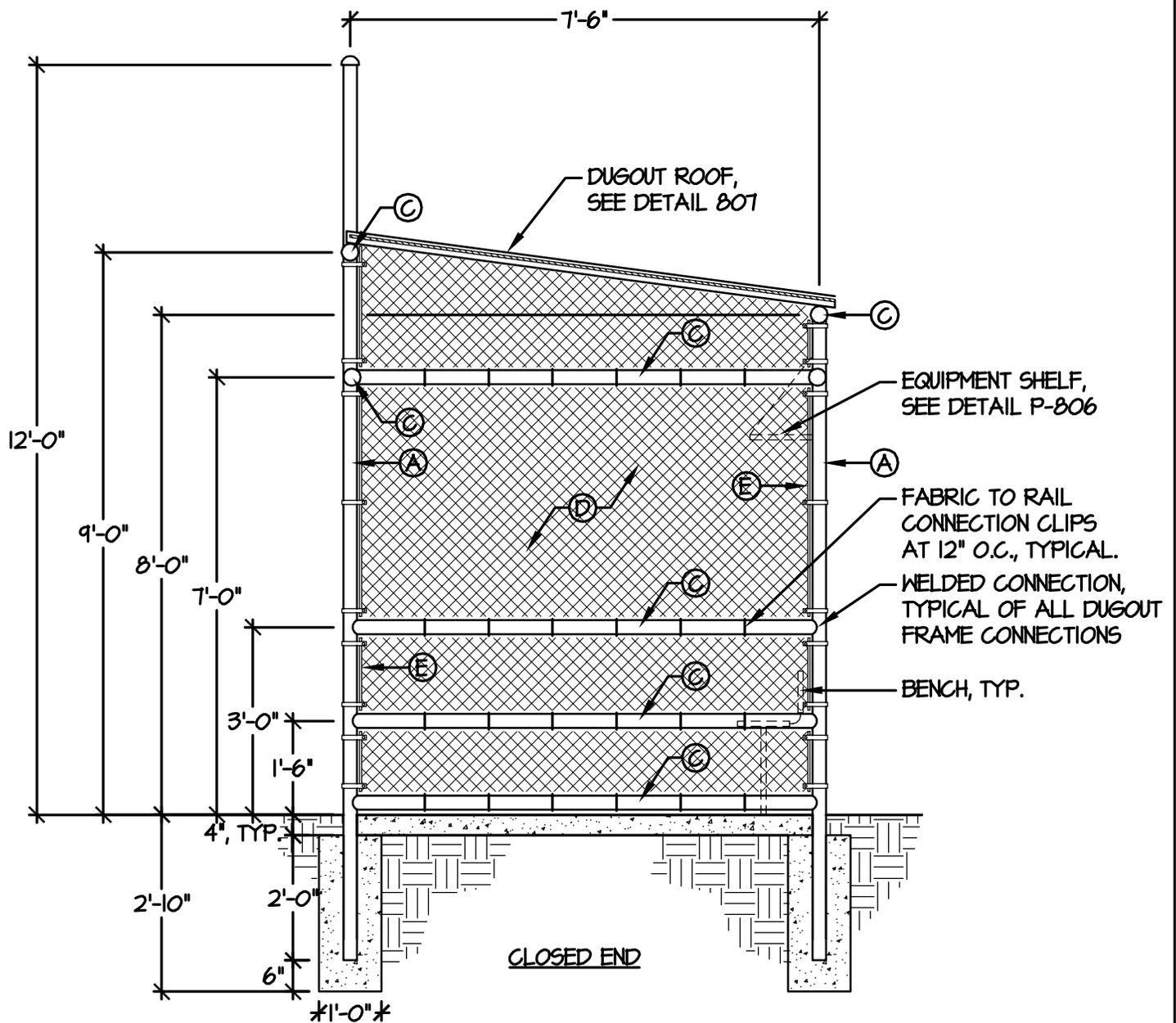
SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL BACKSTOPS		DETAIL NO.
REVISED:		BACKSTOP CANTILEVERED PANEL CONNECTION TO BACKSTOP POSTS		P-705
MO/YR		SHEET 1 OF 1		



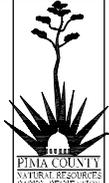
SCALE: N.T.S.

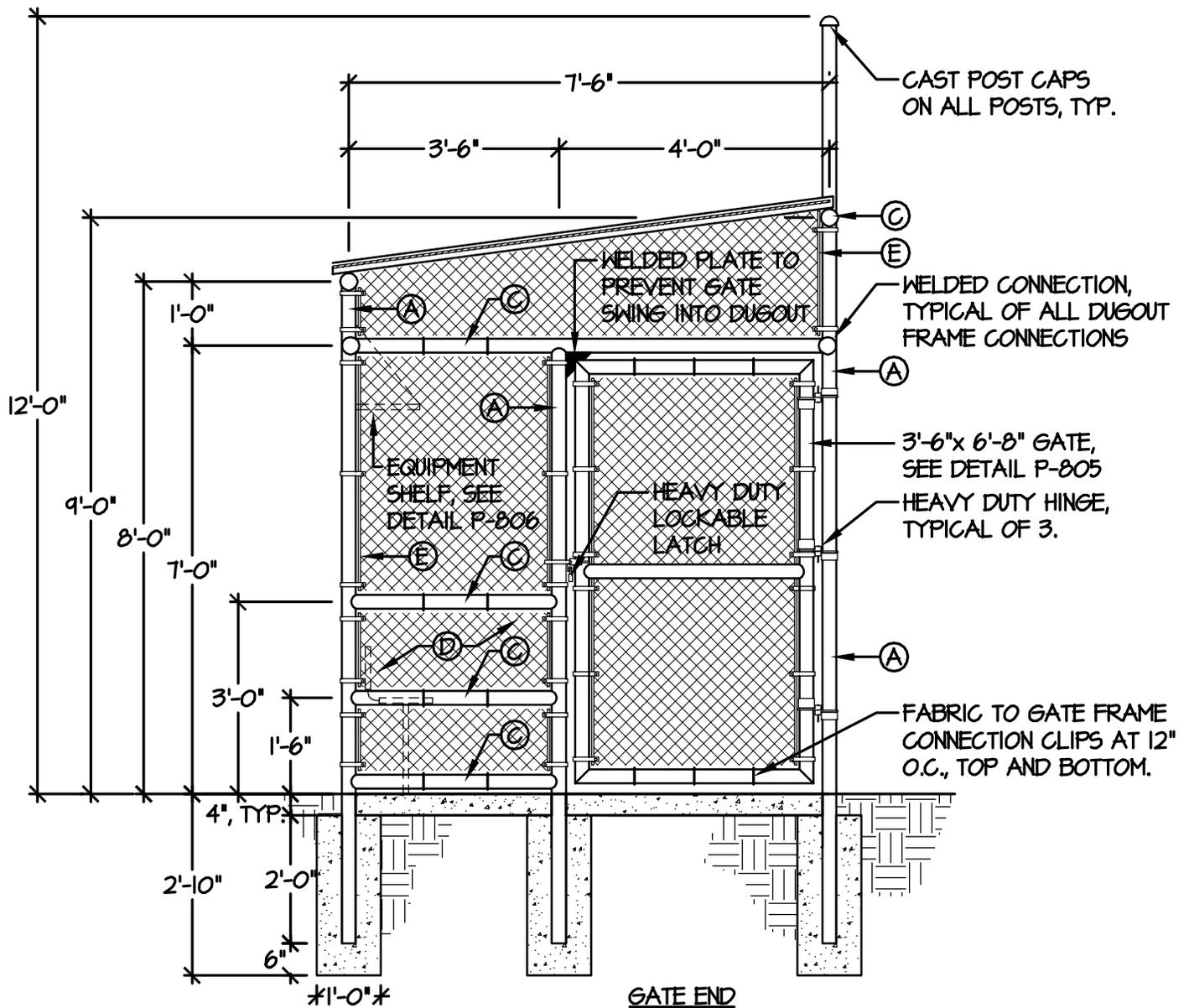
ISSUED:		STANDARD DETAIL BASEBALL / SOFTBALL DUGOUTS: DUGOUT PLAN		DETAIL NO.
11/05				P-800
REVISED:				SHEET 1 OF 1
MO/YR				



- (A) DUGOUT CORNER OR GATE POST (2 1/8" O.D.)
- (B) DUGOUT LINE POST (2" O.D.)
- (C) DUGOUT TOP, BOTTOM AND INTERMEDIATE RAIL (1 7/8" O.D.)
- (D) DUGOUT CHAIN LINK FABRIC (9 GA./2" WEAVE)
- (E) DUGOUT STRETCHER BAR W/ STRETCHER BAR BANDS AT 12" O.C., TYPICAL.

SCALE: N.T.S.

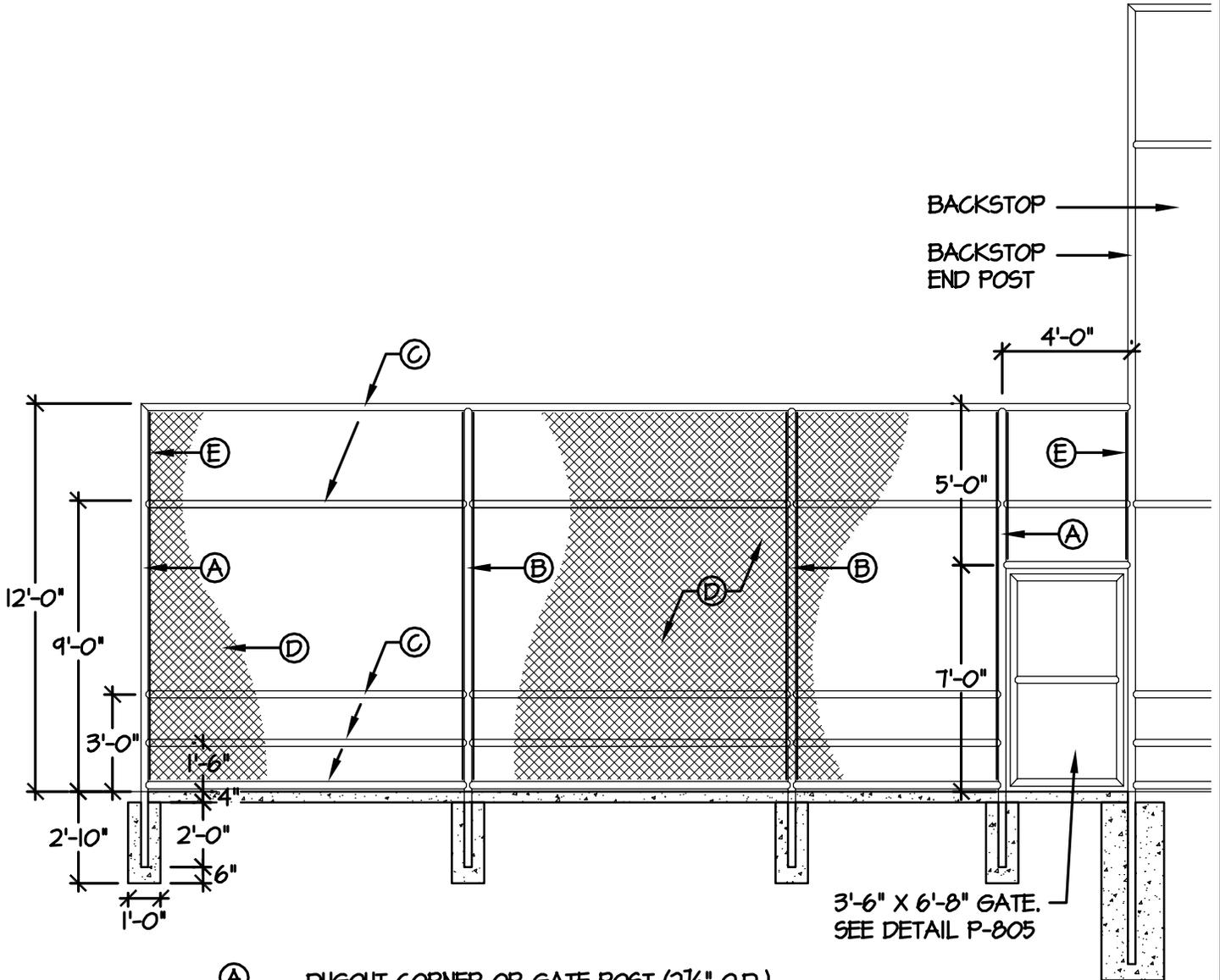
<p>ISSUED: 11/05</p> <p>REVISED: MOYR</p>		<p>STANDARD DETAIL BASEBALL / SOFTBALL DUGOUTS: DUGOUT - CLOSED END ELEVATION</p>		<p>DETAIL NO. P-801 SHEET 1 OF 1</p>
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- (A) DUGOUT CORNER OR GATE POST (2 1/8" O.D.)
- (B) DUGOUT LINE POST (2" O.D.)
- (C) DUGOUT TOP, BOTTOM AND INTERMEDIATE RAIL (1 7/8" O.D.)
- (D) DUGOUT CHAIN LINK FABRIC (9 GA./2" WEAVE ON ENDS AND REAR. 6 GA./2" WEAVE ON FIELD SIDE)
- (E) DUGOUT STRETCHER BAR W/ STRETCHER BAR BANDS AT 12" O.C., TYPICAL.

SCALE: N.T.S.

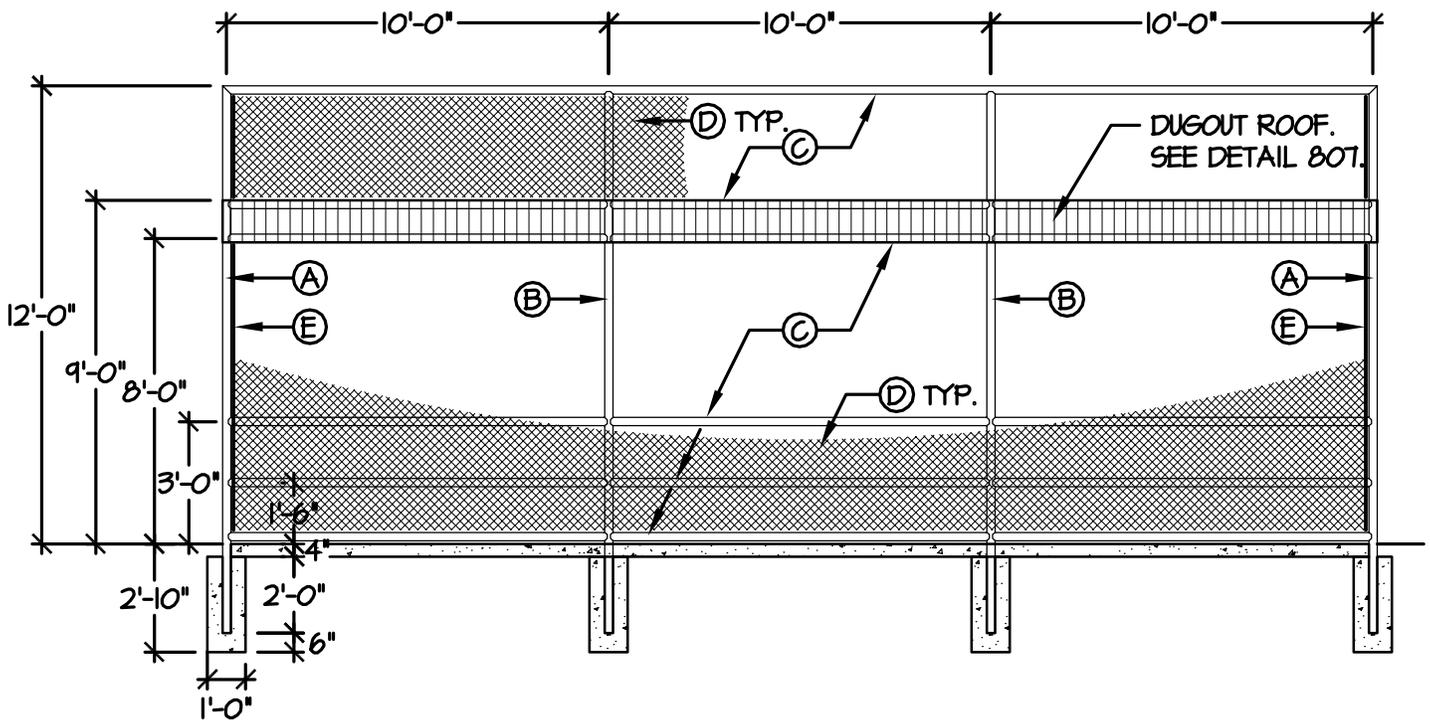
ISSUED: 11/05		STANDARD DETAIL BASEBALL / SOFTBALL DUGOUTS: DUGOUT - GATE END ELEVATION		DETAIL NO. P-802
REVISED: MOYR				SHEET 1 OF 1



- (A) DUGOUT CORNER OR GATE POST (2 1/8" O.D.)
- (B) DUGOUT LINE POST (2" O.D.)
- (C) DUGOUT TOP, BOTTOM AND INTERMEDIATE RAIL (1 1/8" O.D.)
- (D) DUGOUT CHAIN LINK FABRIC (9 GA./2" WEAVE ON ENDS AND REAR. 6 GA./2" WEAVE ON FIELD SIDE.)
- (E) DUGOUT STRETCHER BAR W/ STRETCHER BAR BANDS AT 12" O.C., TYPICAL.

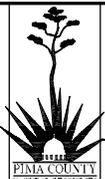
SCALE: N.T.S.

ISSUED: 11/05 REVISED: MOYR		STANDARD DETAIL BASEBALL / SOFTBALL DUGOUTS: DUGOUT - FRONT (FIELD SIDE) ELEVATION		DETAIL NO. P-803 SHEET 1 OF 1
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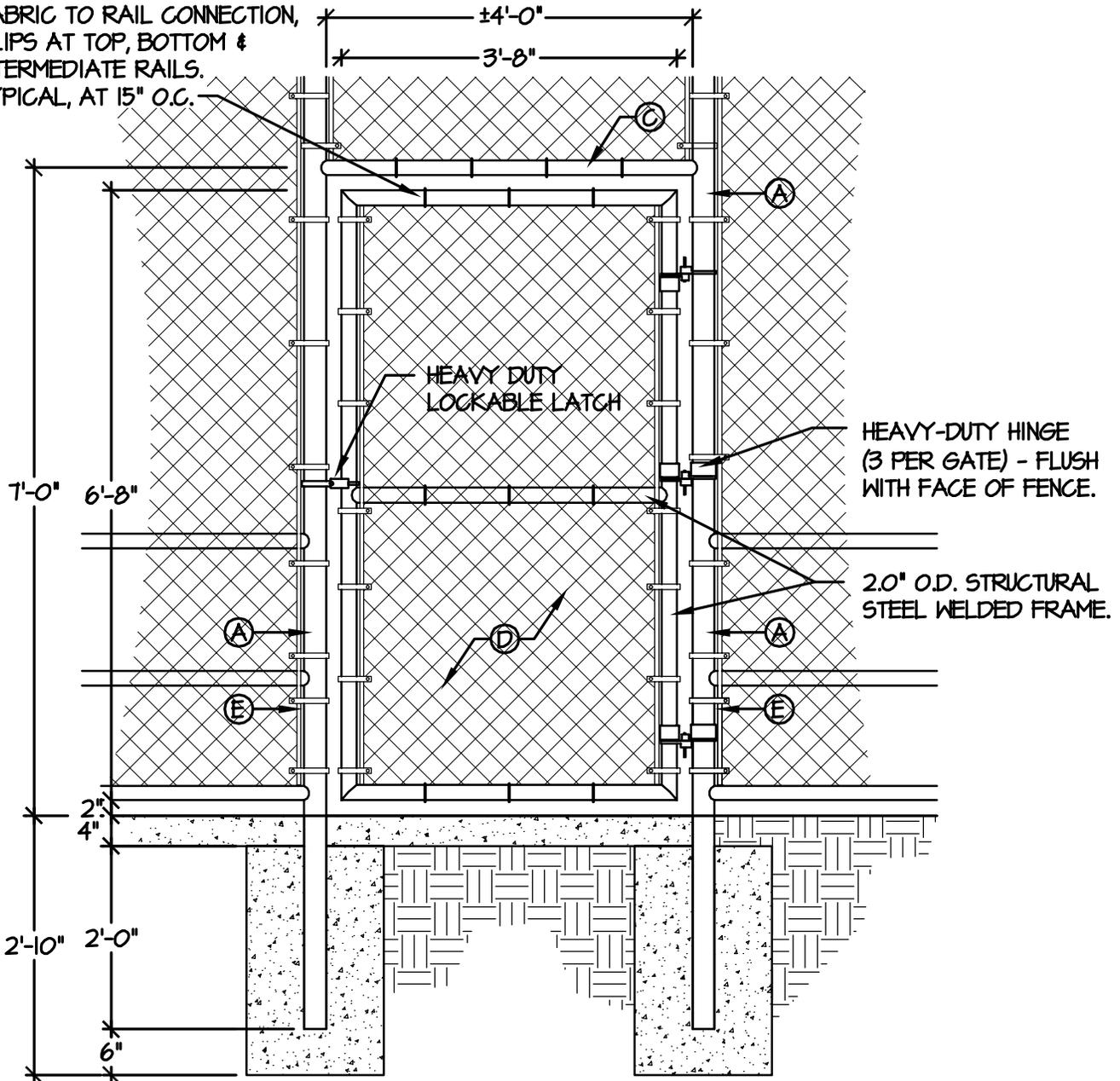


- (A) DUGOUT CORNER OR GATE POST (2 $\frac{1}{8}$ " O.D.)
- (B) DUGOUT LINE POST (2" O.D.)
- (C) DUGOUT TOP, BOTTOM AND INTERMEDIATE RAIL (1 $\frac{1}{8}$ " O.D.)
- (D) DUGOUT CHAIN LINK FABRIC (9 GA./2" WEAVE ON ENDS AND REAR. 6 GA./2" WEAVE ON FIELD SIDE.)
- (E) DUGOUT STRETCHER BAR W/ STRETCHER BAR BANDS AT 12" O.C., TYPICAL.

SCALE: N.T.S.

ISSUED: 11/05 REVISED: MOYR		STANDARD DETAIL BASEBALL / SOFTBALL DUGOUTS: DUGOUT - REAR (SPECTATOR SIDE) ELEVATION		DETAIL NO. P-804 SHEET 1 OF 1
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FABRIC TO RAIL CONNECTION,
CLIPS AT TOP, BOTTOM &
INTERMEDIATE RAILS.
TYPICAL, AT 15" O.C.



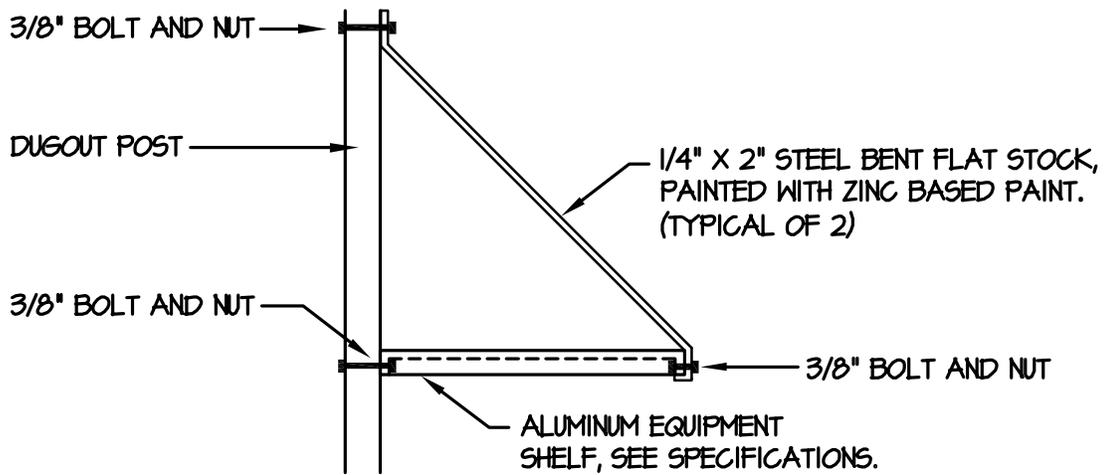
- (A) DUGOUT CORNER OR GATE POST (2 1/8" O.D.)
- (B) DUGOUT LINE POST (2" O.D.)
- (C) DUGOUT TOP, BOTTOM AND INTERMEDIATE RAIL (1 1/8" O.D.)
- (D) DUGOUT CHAIN LINK FABRIC (9 GA./2" WEAVE ON ENDS AND REAR. 6 GA./2" WEAVE ON FIELD SIDE.)
- (E) DUGOUT STRETCHER BAR W/ STRETCHER BAR BANDS AT 12" O.C., TYPICAL.

SCALE: N.T.S.

<p>ISSUED: 11/05</p> <p>REVISED: MOYR</p>		<p>STANDARD DETAIL BASEBALL / SOFTBALL DUGOUTS: DUGOUT GATE</p>		<p>DETAIL NO. P-805</p> <p>SHEET 1 OF 1</p>
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NOTES:

1. NUTS TO BE INSTALLED BELOW SHELF. CUT EXCESS BOLT AT NUT AND GRIND SMOOTH, TYPICAL.
2. TACK WELD ALL NUTS AFTER INSTALLATION TO PREVENT UNAUTHORIZED REMOVAL.
3. INSTALL ONE 12'-0" LONG SHELF. CENTERED ON BACK SIDE OF DUGOUT.
4. INSTALL SHELF AT 6'-0" ABOVE DUGOUT FLOOR.

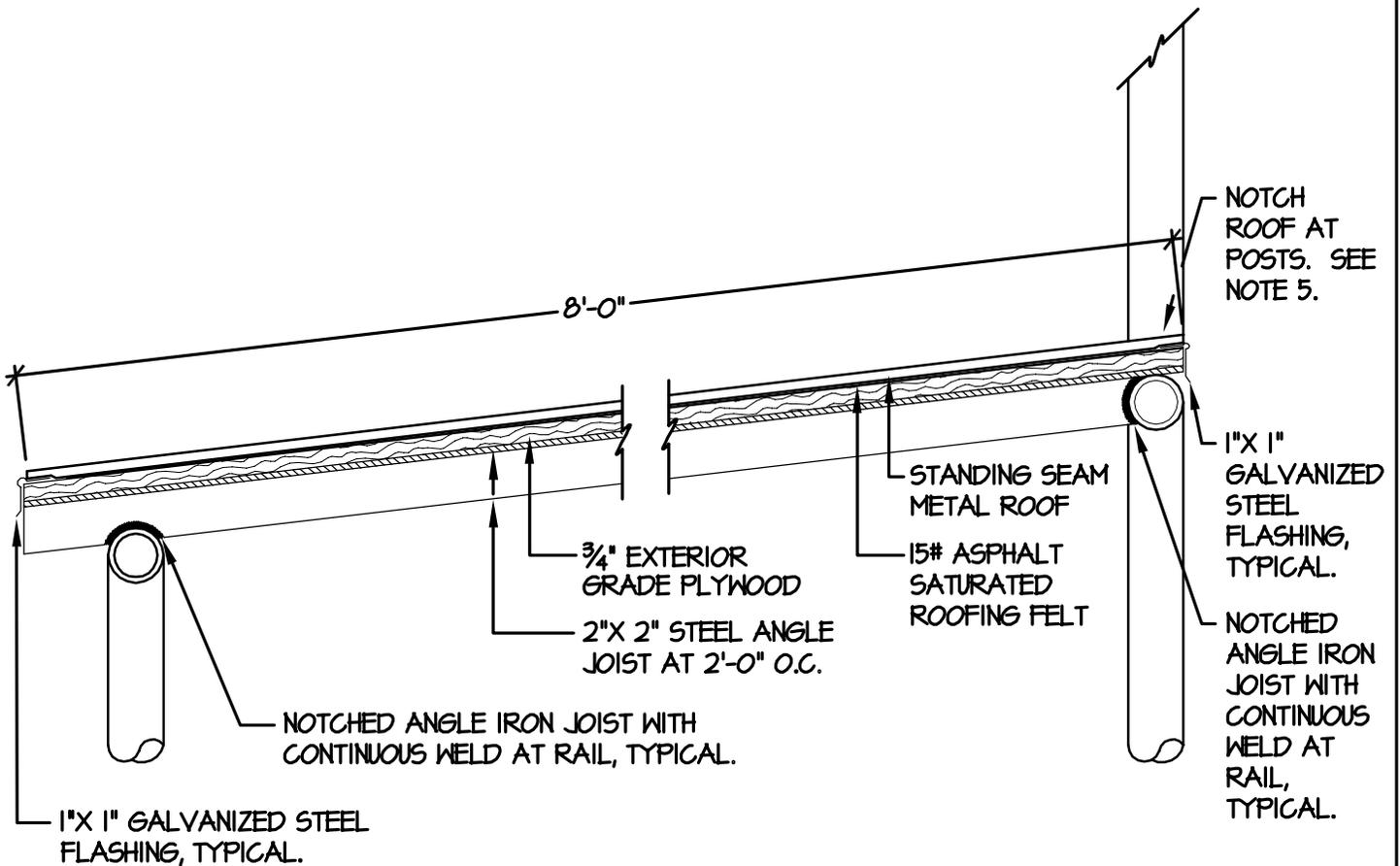


SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL		DETAIL NO.
REVISED: MO/YR		BASEBALL / SOFTBALL DUGOUTS:		P-806
		DUGOUT EQUIPMENT SHELF		
				SHEET 1 OF 1

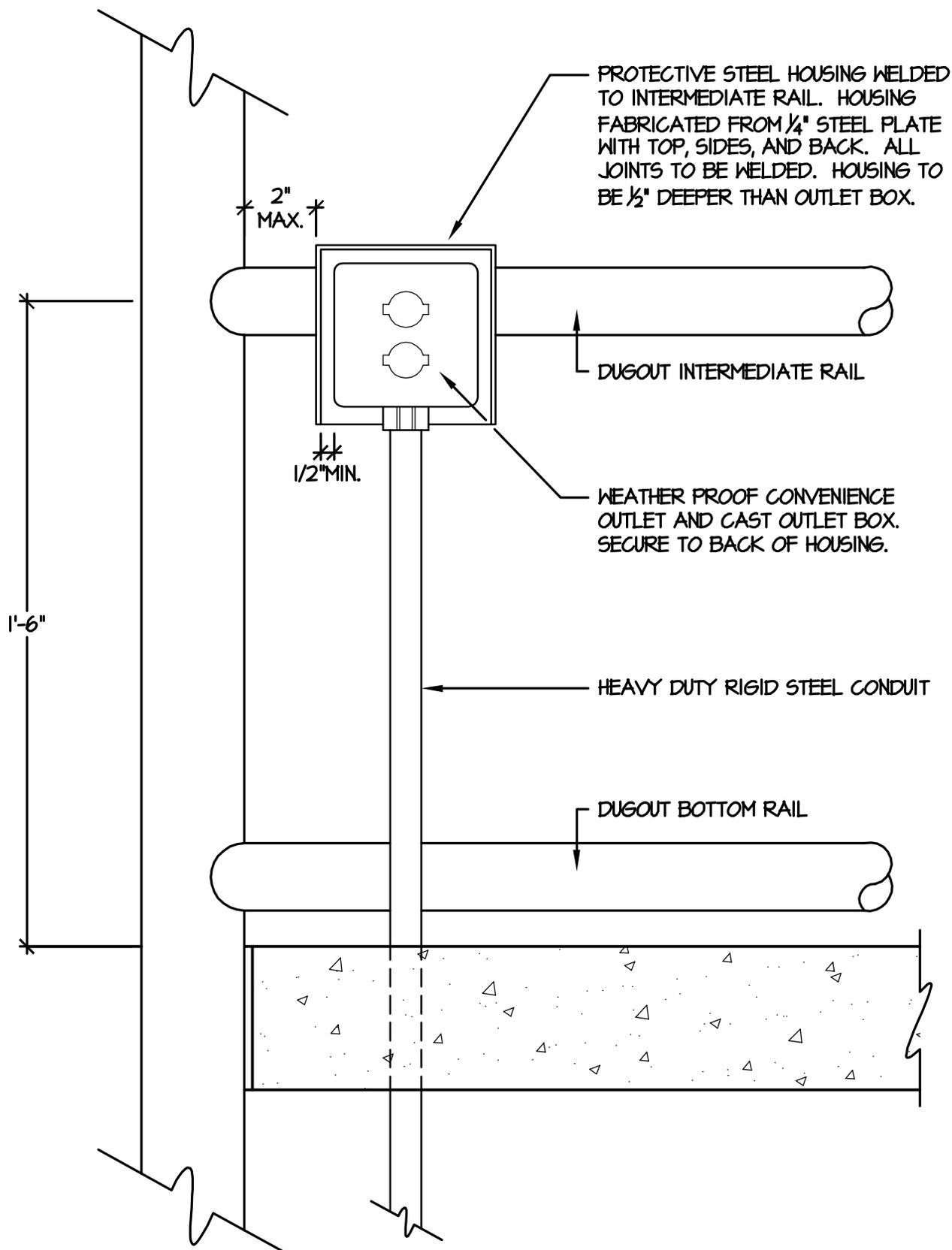
NOTES:

1. SECURE PLYWOOD DECK TO STEEL ANGLE JOISTS WITH $\frac{3}{4}$ " SELF-TAPPING SCREWS AT 12" O.C. SCREWS SHALL EXTEND BELOW ANGLE JOIST A MAXIMUM OF $\frac{1}{2}$ ".
2. SECURE ASPHALT SATURATED ROOFING FELT TO PLYWOOD DECK WITH $\frac{3}{4}$ " GALVANIZED ROOFING NAILS.
3. SECURE METAL ROOF PANELS TO ROOF DECK WITH NEOPRENE WASHER SCREWS. SCREW LENGTH, TYPE, SIZE, LOCATION, AND SPACING AS RECOMMENDED BY THE METAL ROOFING SYSTEM MANUFACTURER.
4. PAINT EXPOSED BOTTOM OF PLYWOOD DECK AND ROOF JOISTS WITH INDUSTRIAL GRADE EXTERIOR PAINT. COLOR TO BE LIGHT GRAY TO APPROXIMATE THE COLOR OF GALVANIZED DUGOUT FRAMING MEMBERS.
5. NOTCH ROOF DECK AND METAL ROOFING WHERE (FIELD SIDE) DUGOUT POSTS EXTEND ABOVE ROOF. FLASH ALL EXPOSED EDGES.



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		BASEBALL / SOFTBALL		P-807
REVISED:		DUGOUTS:		SHEET 1 OF 1
MOYR		DUGOUT ROOF		

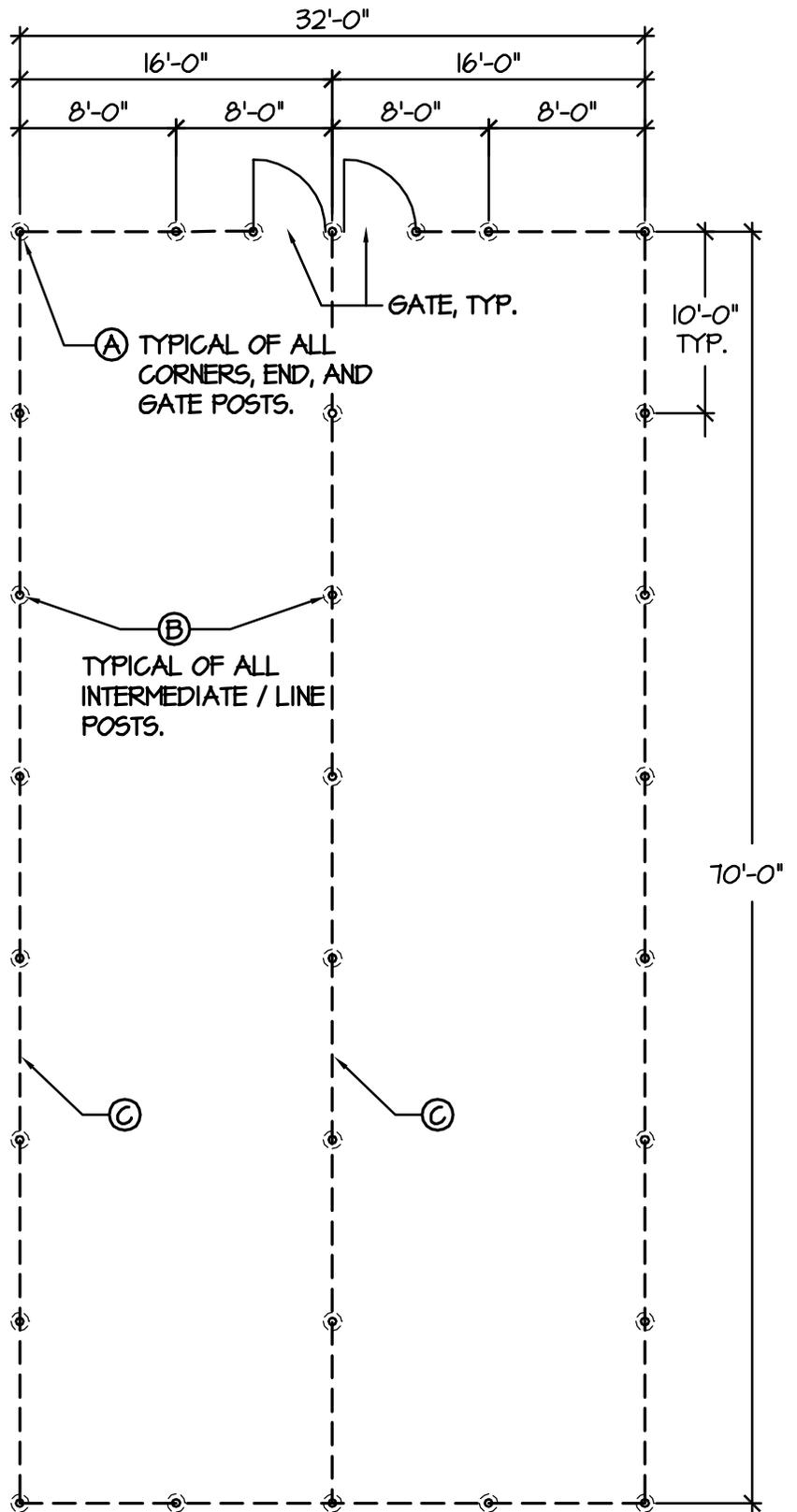


SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		BASEBALL / SOFTBALL		P-808
REVISED:		DUGOUTS:		
MOYR		DUGOUT ELECTRICAL OUTLET		SHEET 1 OF 1

○ NOTES

- Ⓐ CORNER GATE AND END POSTS, 2-7/8" O.D. SCHEDULE 40, GALVANIZED, ROUND STEEL TUBE.
- Ⓑ INTERMEDIATE AND LINE POSTS, 1-7/8" O.D. SCHEDULE 40, GALVANIZED, ROUND STEEL TUBE.
- Ⓒ CHAIN LINK FABRIC. 9 GA./2" WEAVE.



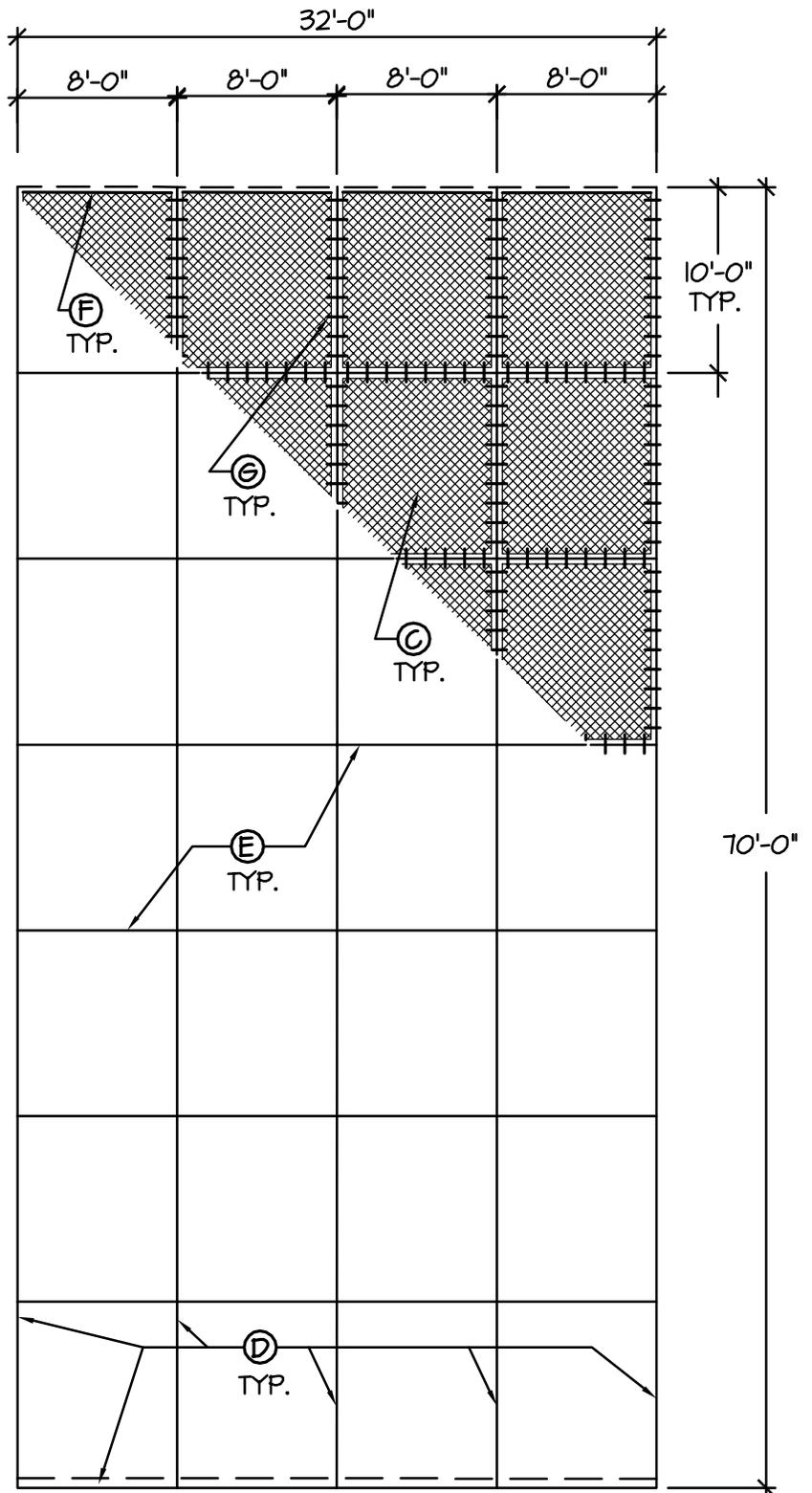
PLAN

SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
12/10		BATTING CAGE		P-810A
REVISED:		PLAN		
MO/YR				

○ NOTES

- Ⓐ CORNER GATE AND END POSTS, 2-7/8" O.D. SCHEDULE 40, GALVANIZED, ROUND STEEL TUBE.
- Ⓑ INTERMEDIATE AND LINE POSTS, 1-7/8" O.D. SCHEDULE 40, GALVANIZED, ROUND STEEL TUBE.
- Ⓒ CHAIN LINK FABRIC. 9 GA./2" WEAVE.
- Ⓓ TOP, BOTTOM, AND INTERMEDIATE RAIL. 1-7/8" O.D. SCHEDULE 40, GALVANIZED, ROUND STEEL TUBE.
- Ⓔ INTERMEDIATE ROOF FRAME MEMBER, 2-3/8" AND 1-7/8" O.D. SCHEDULE 40, GALVANIZED, ROUND STEEL TUBE(S) AS DETAILED.
- Ⓕ STRETCHER BAR. 3/4" X 3/8" GALVANIZED STEEL STRETCHER BAR WITH 3/4" X 0.078" GALVANIZED STEEL ANCHORING BANDS AT 12" O.C.
- Ⓖ GALVANIZED STEEL FABRIC-TO-RAIL CLIPS AT 12" O.C.



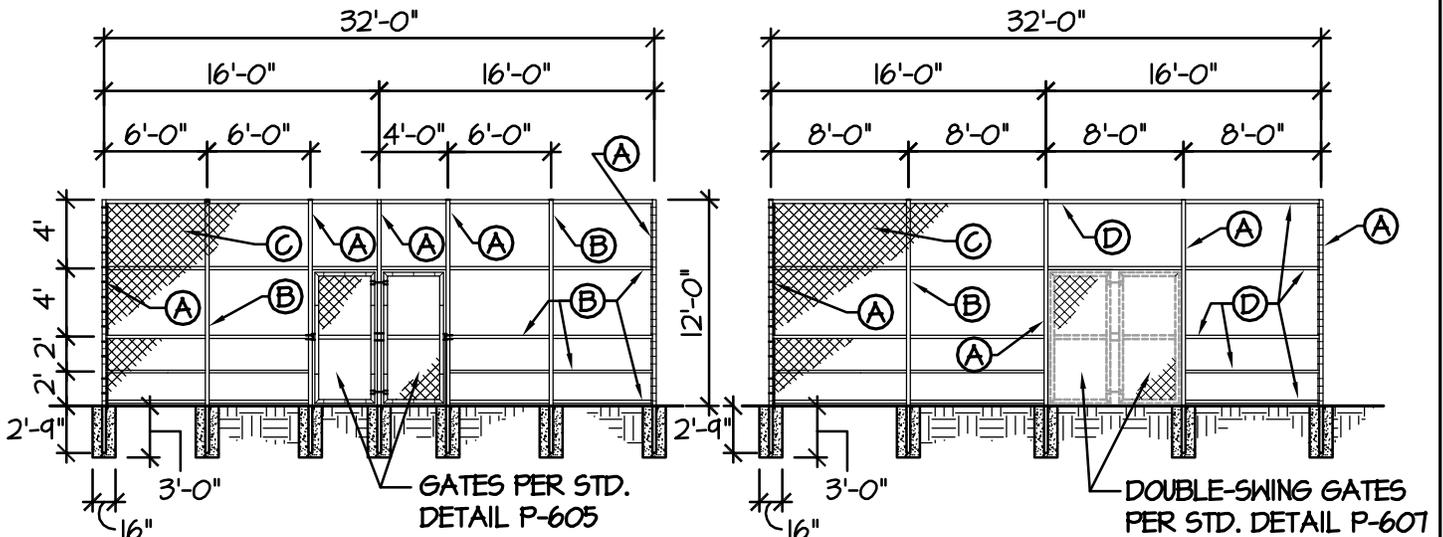
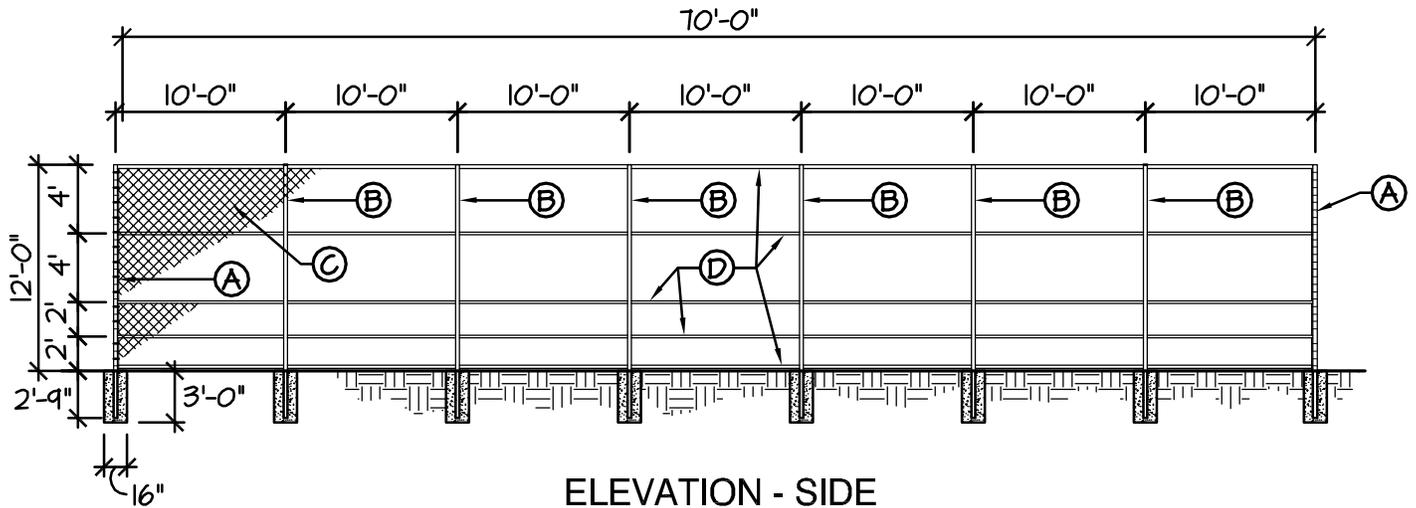
PLAN

SCALE: N.T.S.

ISSUED: 12/10		STANDARD DETAIL BATTING CAGE ROOF PLAN		DETAIL NO.
REVISED: MO/YR				P-810B
SHEET 2 OF 4				

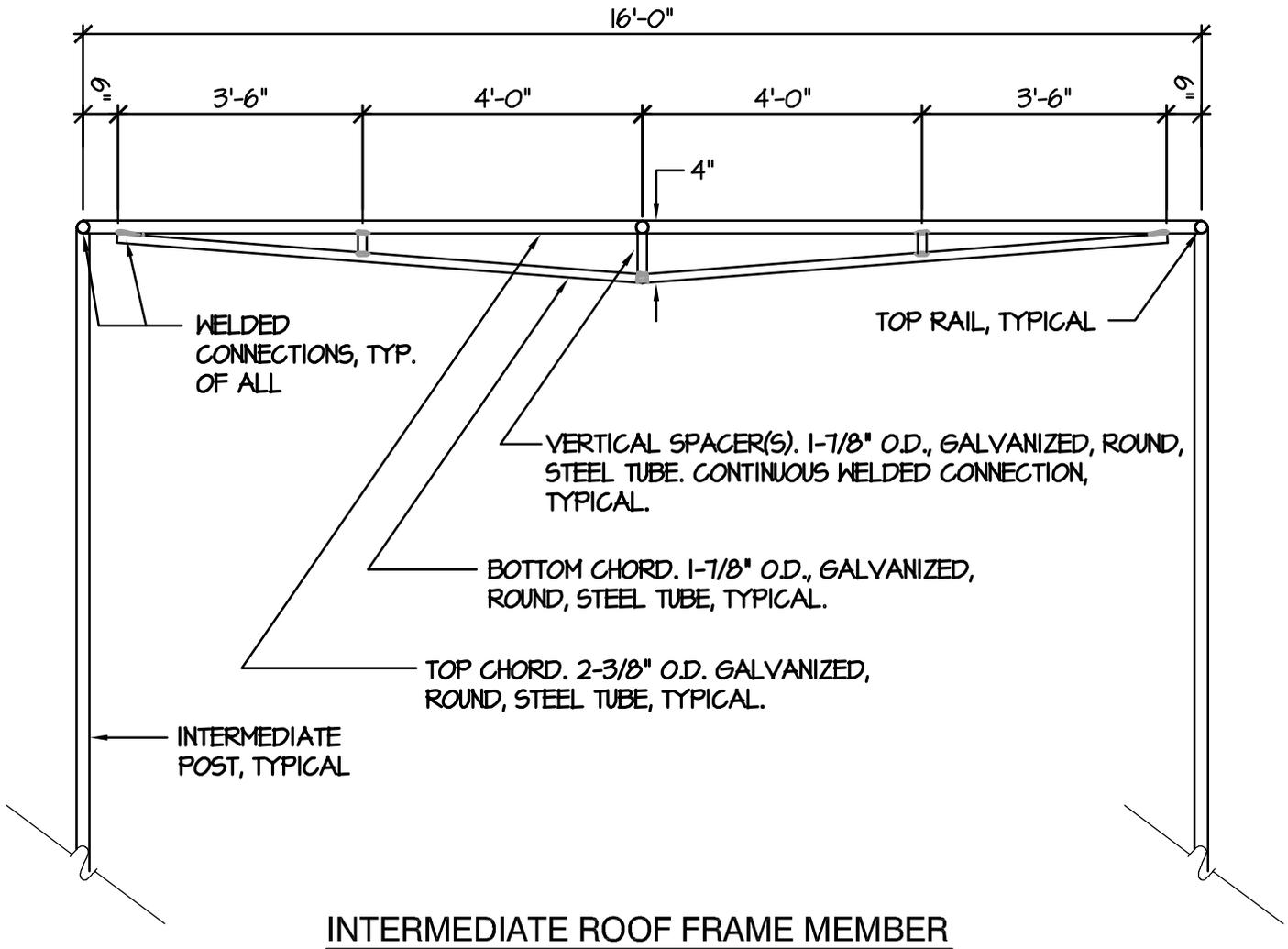
○ NOTES

- (A) CORNER GATE AND END POSTS, 2-1/8" O.D. SCHEDULE 40, GALVANIZED, ROUND STEEL TUBE.
- (B) INTERMEDIATE AND LINE POSTS, 1-7/8" O.D. SCHEDULE 40, GALVANIZED, ROUND STEEL TUBE.
- (C) CHAIN LINK FABRIC. 9 GA./2" WEAVE.
- (D) TOP, BOTTOM, AND INTERMEDIATE RAIL. 1-7/8" O.D. SCHEDULE 40, GALVANIZED, ROUND STEEL TUBE.
- (E) INTERMEDIATE ROOF FRAME MEMBER, 2-3/8" AND 1-7/8" O.D. SCHEDULE 40, GALVANIZED, ROUND STEEL TUBE(S) AS DETAILED.
- (F) STRETCHER BAR. 3/4" X 3/8" GALVANIZED STEEL STRETCHER BAR WITH 3/4" X 0.078" GALVANIZED STEEL ANCHORING BANDS AT 12" O.C.
- (G) GALVANIZED STEEL FABRIC-TO-RAIL CLIPS AT 12" O.C.



SCALE: N.T.S.

ISSUED: 12/10		STANDARD DETAIL BATTING CAGE ELEVATIONS		DETAIL NO. P-810C
REVISED: MO/YR				SHEET 3 OF 4

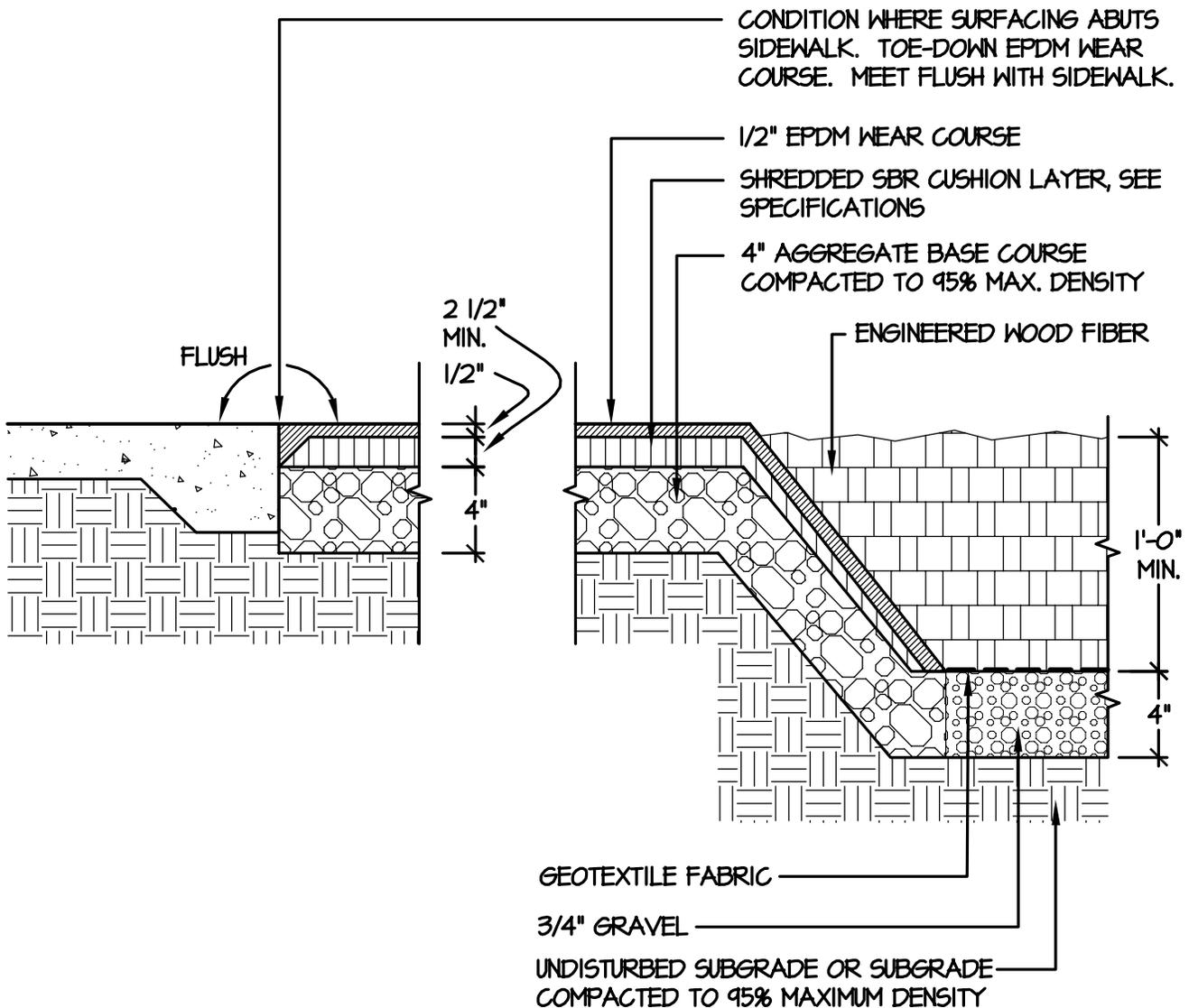


SCALE: N.T.S.

ISSUED: 12/10		STANDARD DETAIL		DETAIL NO.
REVISED:		BATTING CAGE		P-810D
MO/YR		INTERMEDIATE ROOF FRAME MEMBER		SHEET 4 OF 4

NOTES:

1. ENGINEERED WOOD FIBER SURFACING TO BE INSTALLED OVER ENTIRE PLAYGROUND AREA EXCEPT WHERE POURED IN PLACE RUBBERIZED RESILIENT SURFACING OCCURS.
2. RUBBERIZED RESILIENT SURFACING'S WEAR COURSE COLOR SHALL BE 50% BLACK AND 50% COLORS AS SELECTED BY THE OWNER'S REPRESENTATIVE.
3. SEE SPECIFICATIONS FOR ADDITIONAL SAFETY SURFACING REQUIREMENTS.
4. CONTRACTOR TO CONFIRM REQUIRED DEPTH OF RUBBERIZED RESILIENT SURFACING FOR EQUIPMENT INSTALLED AND SHALL INCREASE DEPTH IF REQUIRED.

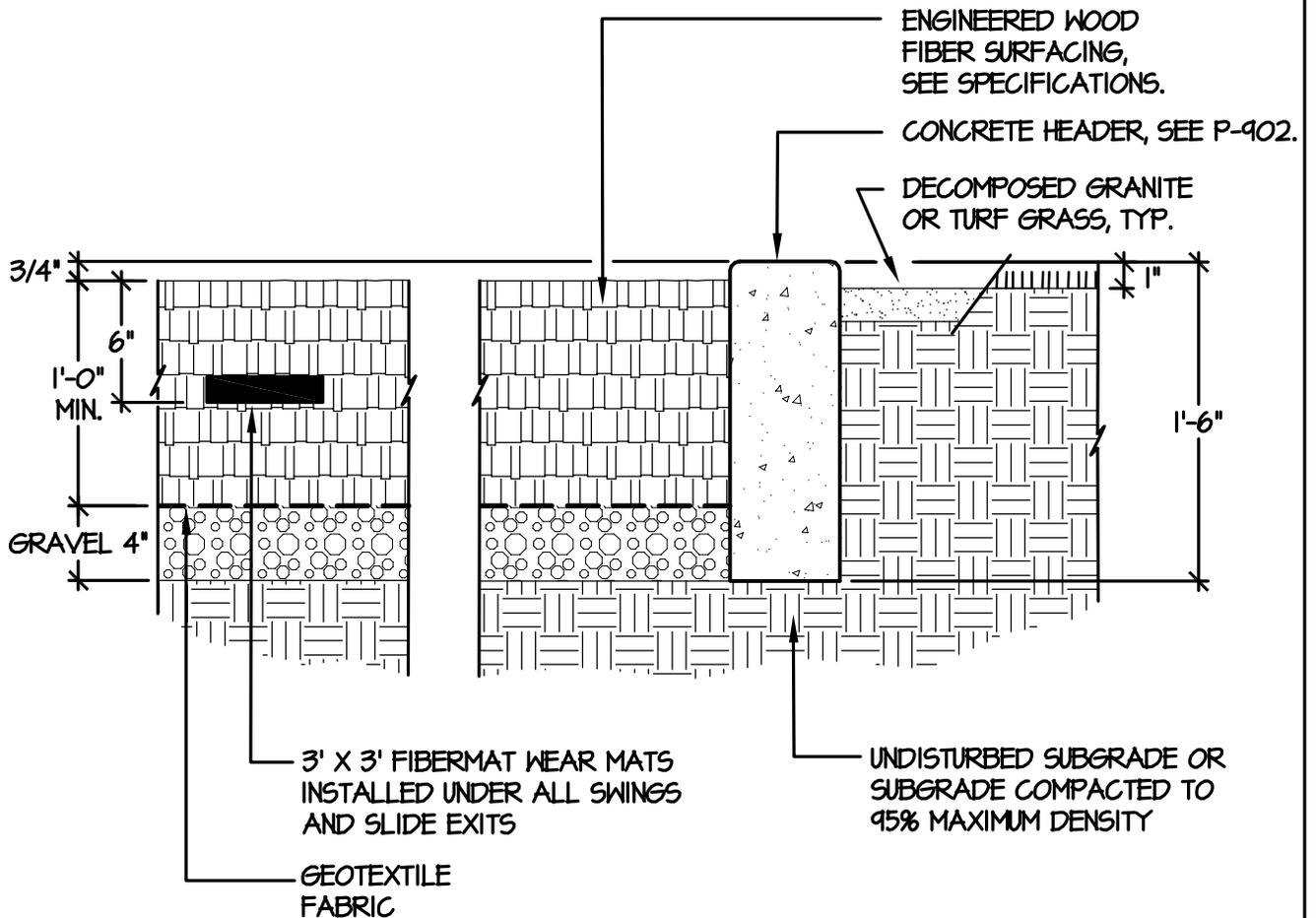


SCALE: N.T.S.

ISSUED:		<p align="center">STANDARD DETAIL PLAYGROUND HEADERS AND SURFACING: RUBBERIZED RESILIENT SURFACING</p>		DETAIL NO.
11/05				P-900
REVISED:				SHEET 1 OF 1
MOYR				

NOTES:

1. ENGINEERED WOOD FIBER SURFACING TO BE INSTALLED OVER ENTIRE PLAYGROUND AREA EXCEPT WHERE POURED IN PLACE RUBBERIZED RESILIENT SURFACING OCCURS.
2. SEE SPECIFICATIONS FOR ADDITIONAL SAFETY SURFACING REQUIREMENTS.
3. CONTRACTOR TO CONFIRM REQUIRED DEPTH OF ENGINEERED WOOD FIBER SURFACING FOR EQUIPMENT INSTALLED AND SHALL INCREASE DEPTH IF REQUIRED.

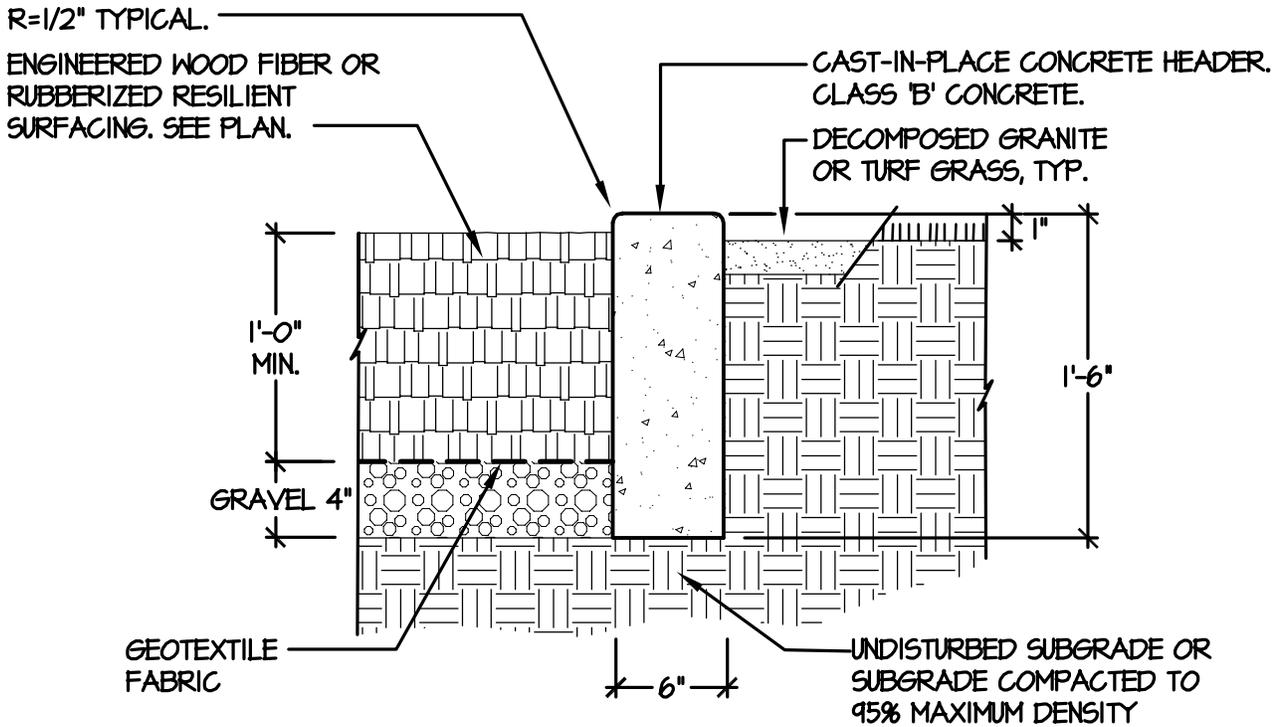


SCALE: N.T.S.

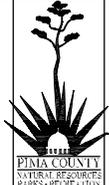
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLAYGROUND HEADERS AND SURFACING:		P-901
REVISED:		ENGINEERED WOOD FIBER SURFACING		
MOYR				SHEET 1 OF 1

NOTES:

1. PROVIDE EXPANSION JOINTS EVERY 40' MAX. AND CONTROL JOINTS EVERY 10' MAX. IN CONCRETE HEADER.
2. TOP OF CONCRETE HEADER SHALL MEET FLUSH WHEREVER IT CONTACTS OTHER PAYEMENT OR CURBS. PROVIDE 1/2" BITUMINOUS JOINT FILLER WERE HEADER MEETS NEW SIDEWALK.

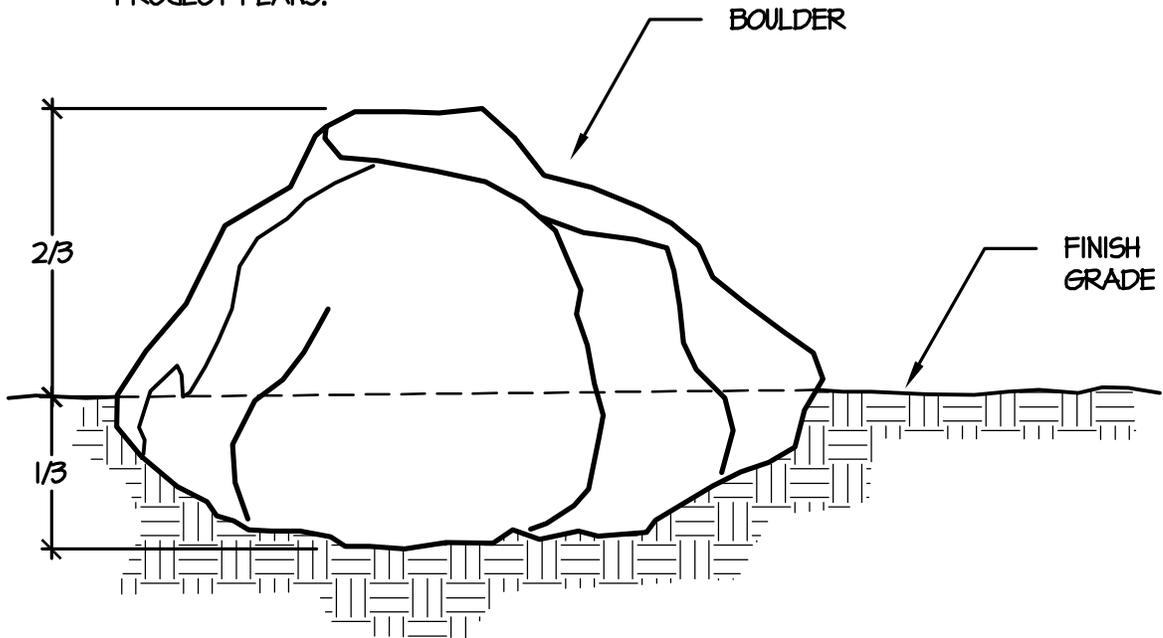


SCALE: N.T.S.

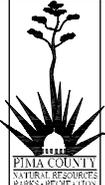
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PLAYGROUND HEADERS AND SURFACING:		P-902
REVISED:		PLAYGROUND HEADER		SHEET 1 OF 1
MOYR				

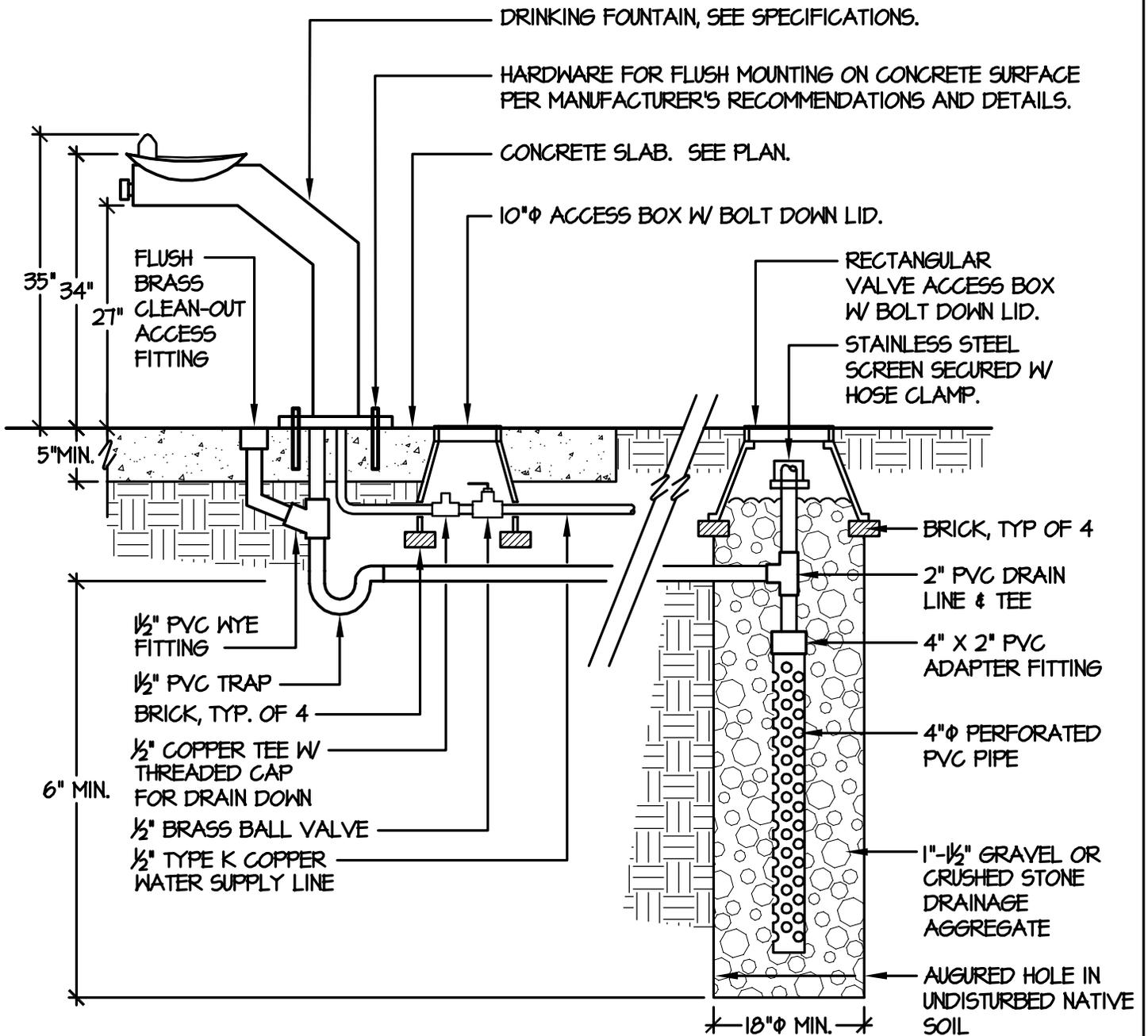
NOTE:

1. BOULDER TO BE SET WITH MINIMUM $\frac{1}{3}$ MASS BELOW FINISH GRADE.
2. ALL BOULDERS TO BE FROM SURFACE LOCATIONS, WEATHERED AND UNBROKEN.
3. BOULDER SIZE(S) AS NOTED ON THE PROJECT PLANS.

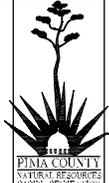


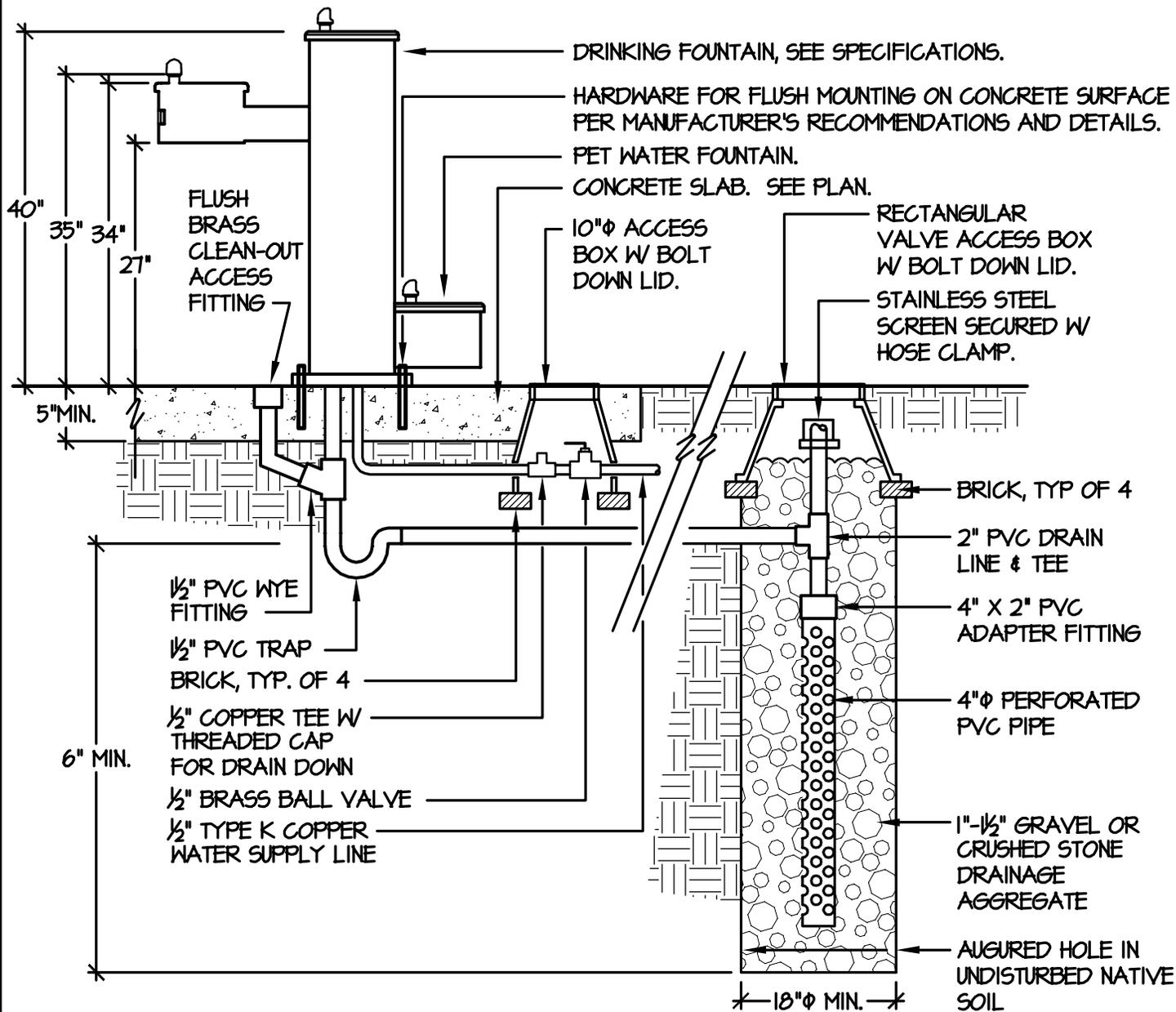
SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL SITE FURNITURE:		DETAIL NO.	
REVISED: MO/YR		BOULDER DETAIL		P-1000	
					SHEET 1 OF 1

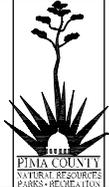


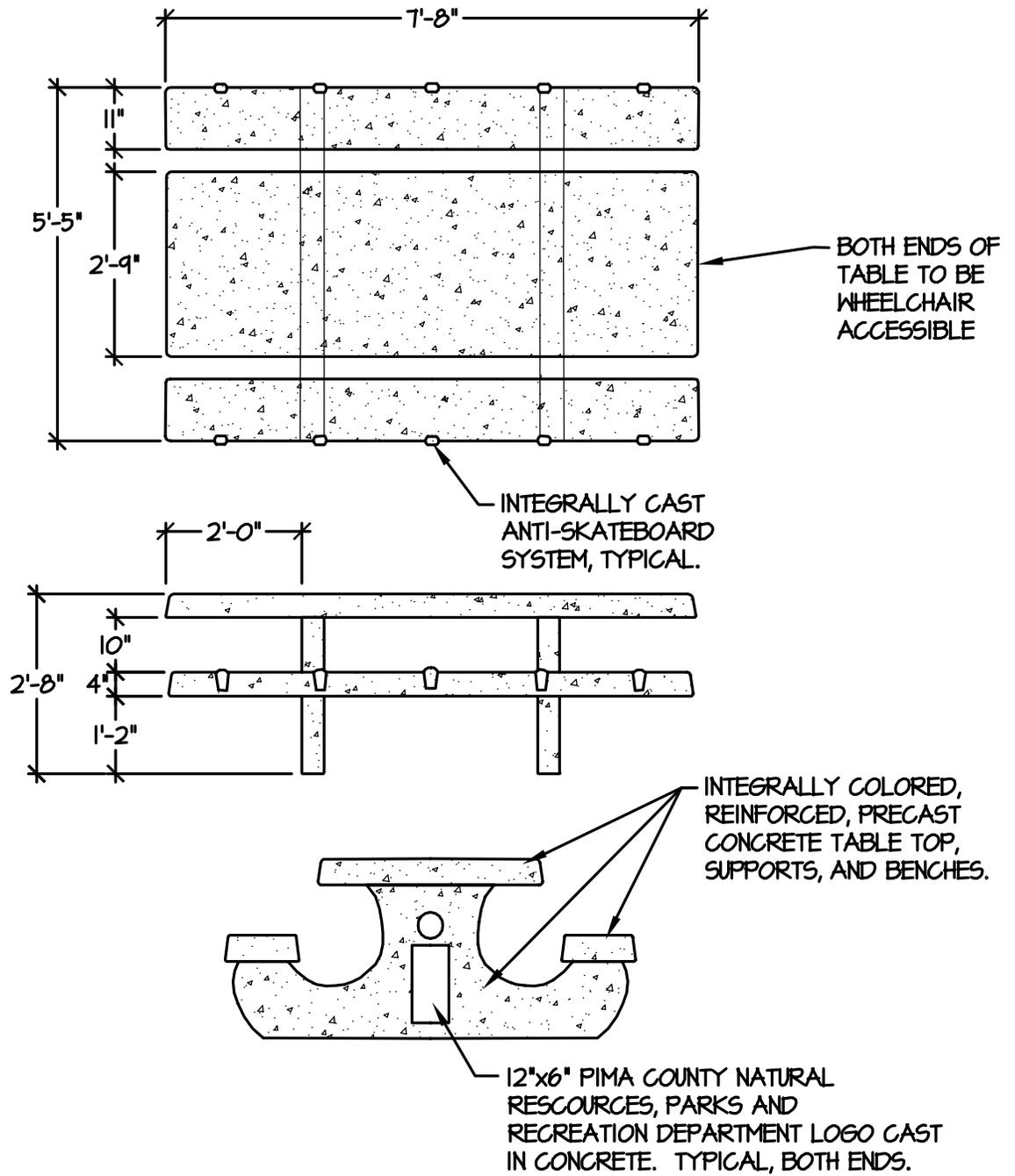
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		SITE FURNITURE:		P-1001
REVISED:		ACCESSIBLE		
MOYR		DRINKING FOUNTAIN		SHEET 1 OF 1



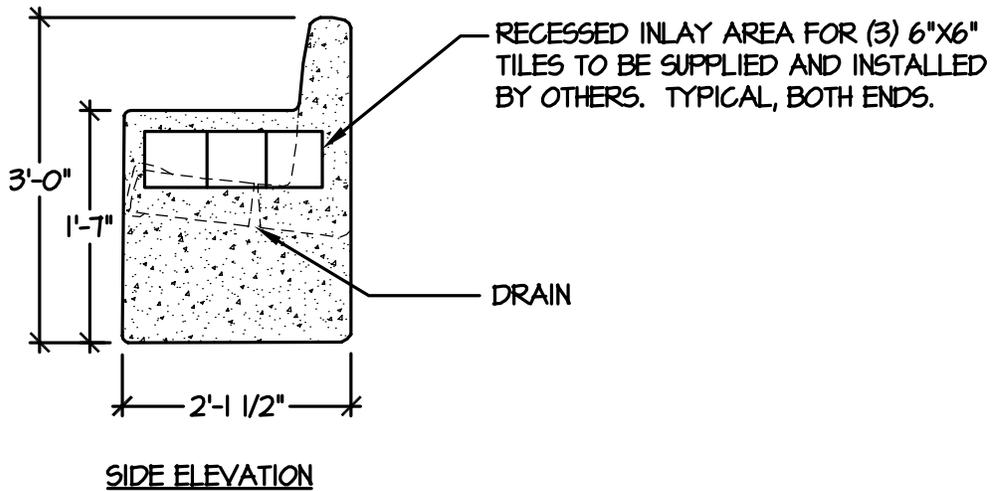
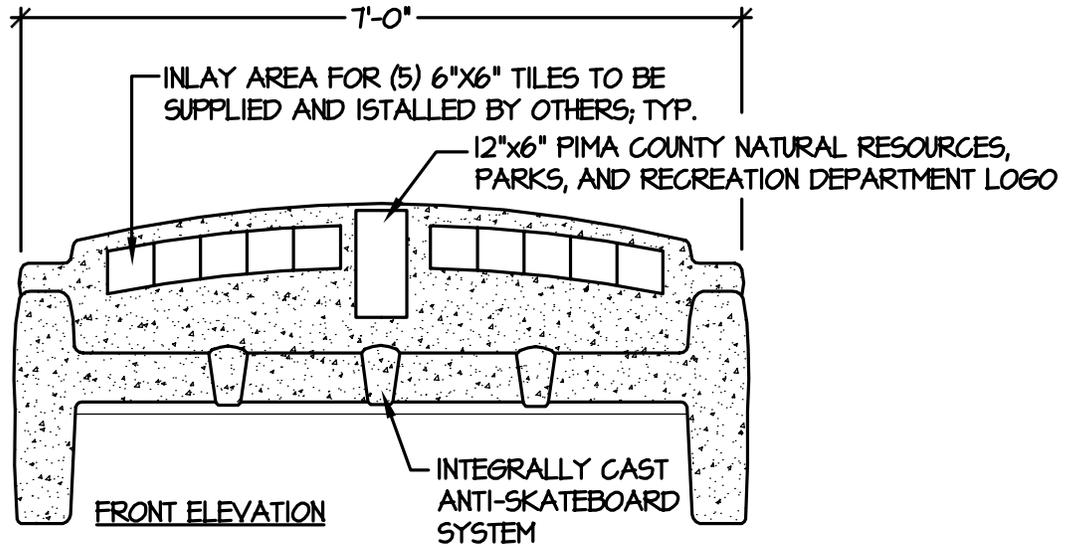
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		SITE FURNITURE:		P-1002
REVISED:		ACCESSIBLE DRINKING FOUNTAIN		
MOYR		WITH PET WATER FOUNTAIN		



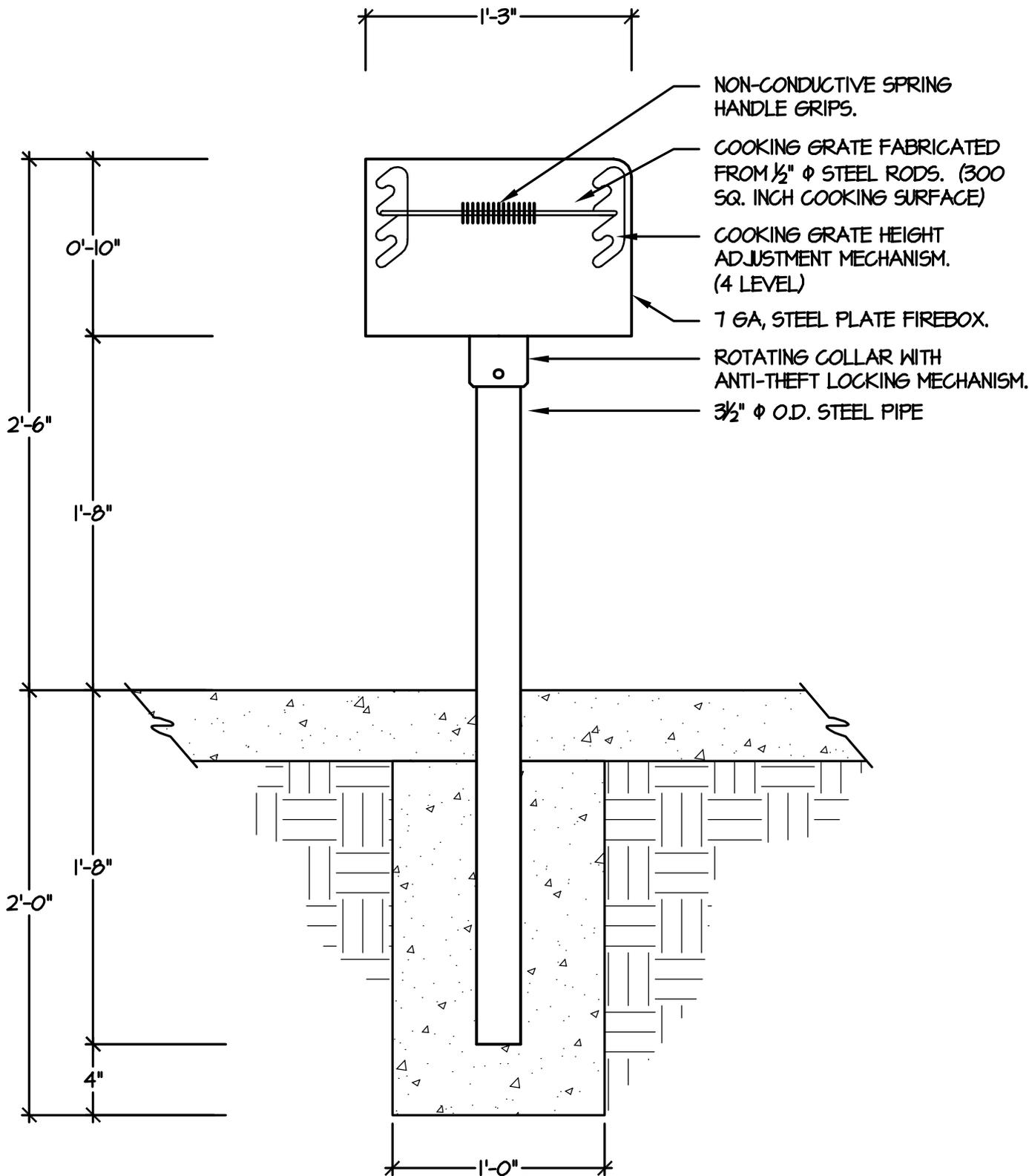
SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL SITE FURNITURE:		DETAIL NO.
REVISED: MOYR		PRECAST CONCRETE PICNIC TABLE		P-1003
		SHEET 1 OF 1		

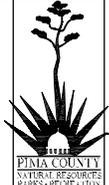


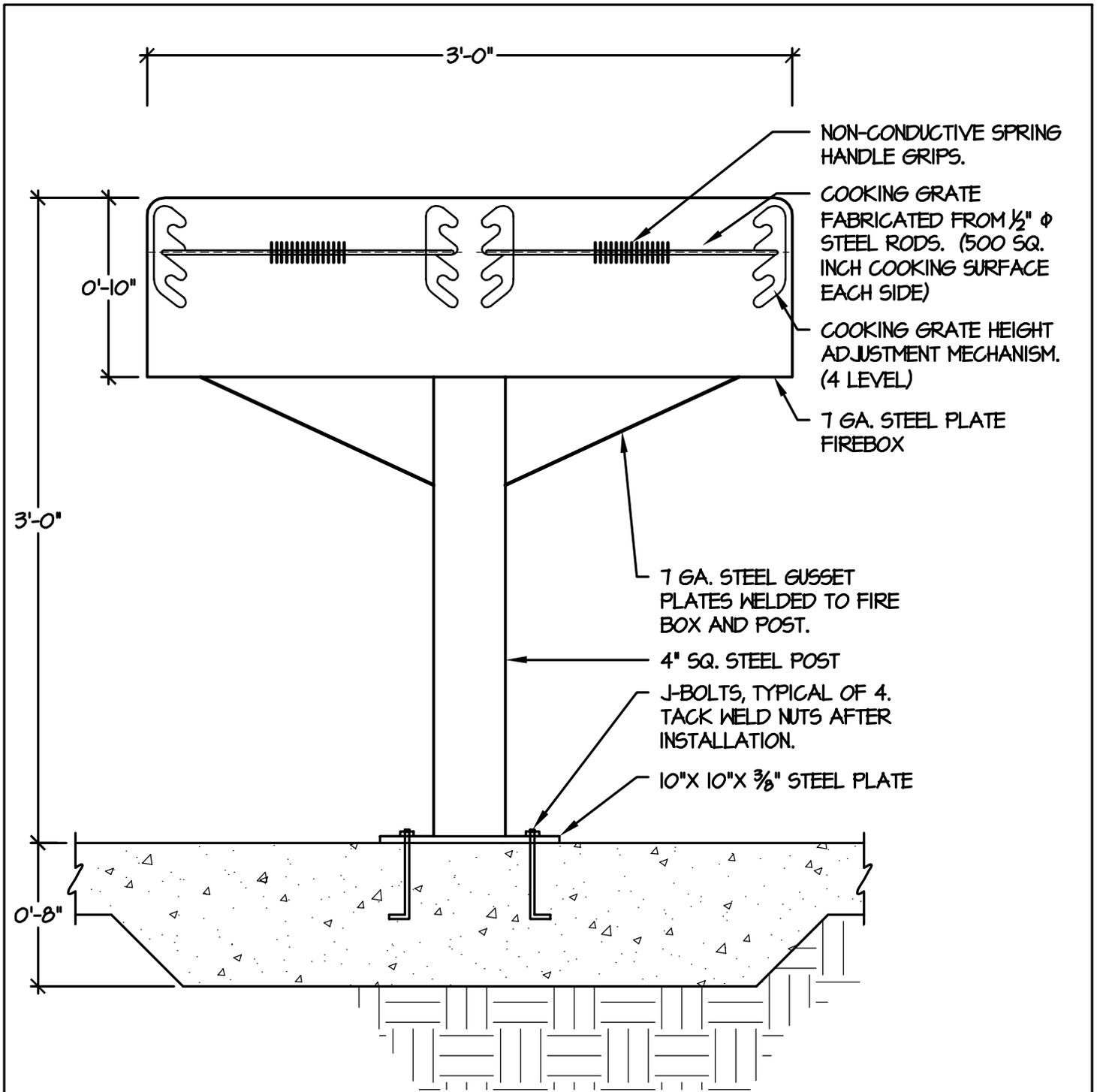
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		SITE FURNITURE:		P-1004
REVISED:		PRECAST CONCRETE BENCH		
MOYR				



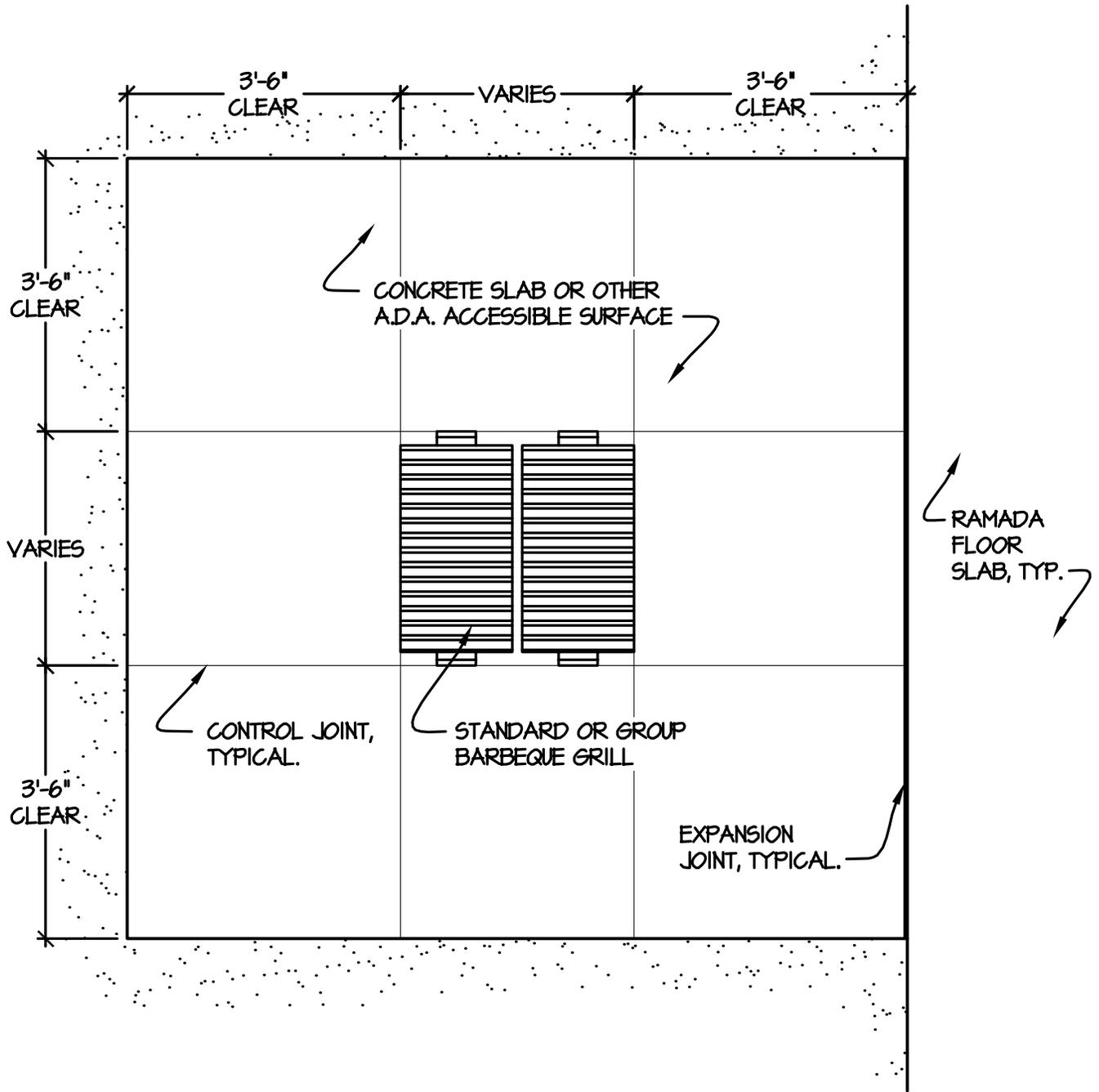
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		SITE FURNITURE:		P-1005
REVISED:		STANDARD BARBEQUE GRILL		
MOYR		SHEET 1 OF 1		

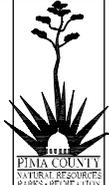


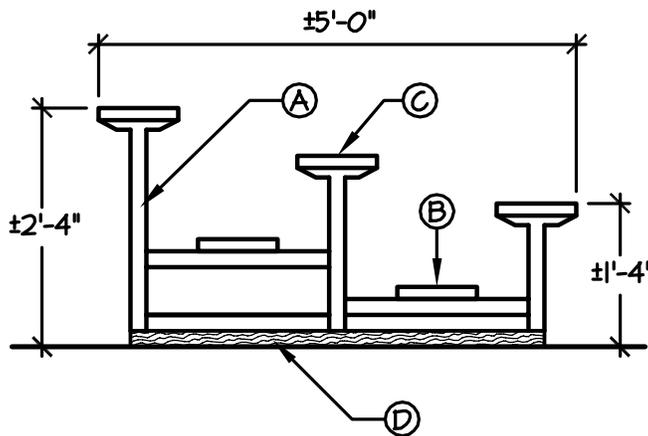
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		SITE FURNITURE:		P-1006
REVISED:		GROUP BARBEQUE GRILL		SHEET 1 OF 1
MOYR				



SCALE: N.T.S.

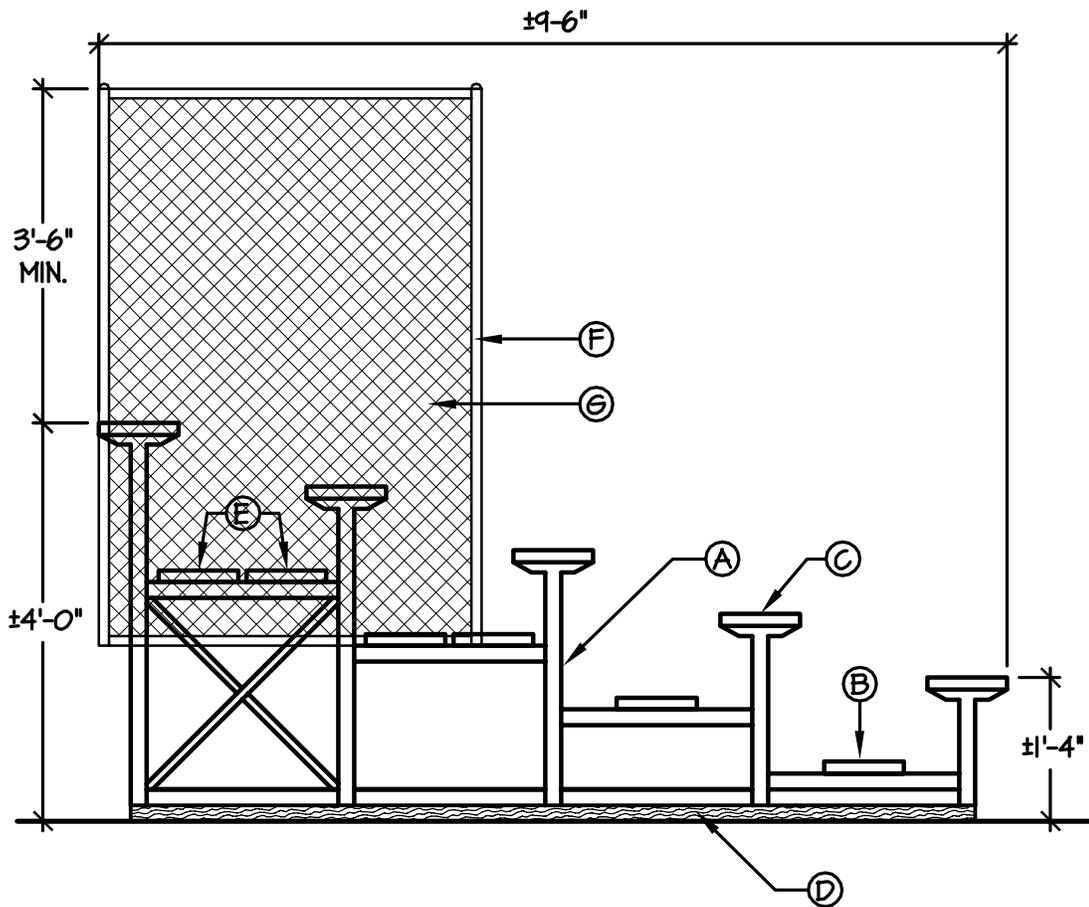
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		SITE FURNITURE:		P-1007
REVISED:		BARBEQUE GRILL LAYOUT		
MOYR		SHEET 1 OF 1		



- (A) GALVANIZED STEEL ANGLE FRAME AND CROSS BRACING WITH HEAVY DUTY GALVANIZED STEEL HARDWARE.
- (B) 10" WIDE X 2" DEEP EXTRUDED ANODIZED ALUMINUM FOOT PLANK WITH CONCEALED FASTENERS AND EXTRUDED ALUMINUM END CAPS.
- (C) 10" WIDE X 2" DEEP EXTRUDED ANODIZED ALUMINUM SEAT WITH CONCEALED FASTENERS AND EXTRUDED ALUMINUM ENDCAPS.
- (D) 2X6 PRESSURE TREATED LUMBER GROUND SILL, TYPICAL.

SCALE: N.T.S.

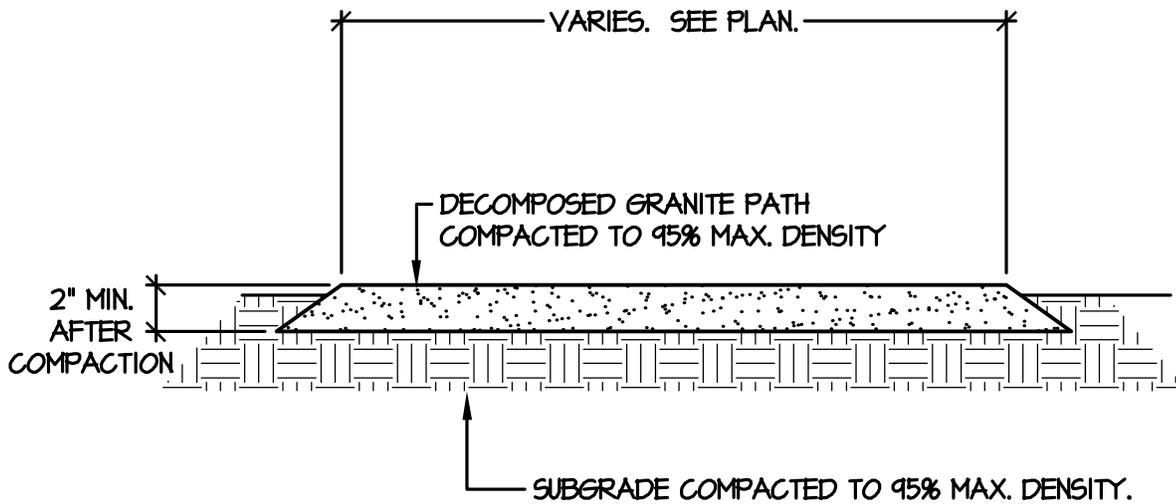
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		SITE FURNITURE:		P-1008
REVISED:		3 TIER BLEACHERS		
MOYR				



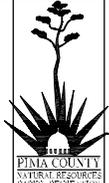
- (A) GALVANIZED STEEL ANGLE FRAME AND CROSS BRACING WITH HEAVY DUTY GALVANIZED STEEL HARDWARE.
- (B) 10" WIDE X 2" DEEP EXTRUDED ANODIZED ALUMINUM FOOT PLANK WITH CONCEALED FASTENERS AND EXTRUDED ALUMINUM END CAPS.
- (C) 10" WIDE X 2" DEEP EXTRUDED ANODIZED EXTRUDED ALUMINUM SEAT WITH CONCEALED FASTENERS AND EXTRUDED ALUMINUM ENDCAPS.
- (D) 2X6 PRESSURE TREATED LUMBER GROUND SILL, TYPICAL.
- (E) DOUBLE FOOT PLANKS FOR 4TH AND 5TH ROWS.
- (F) GALVANIZED STEEL TUBE GAURDRAIL FRAME BOLTED AND/OR WELDED TO BLEACHER FRAME.
- (G) CHAIN LINK FABRIC OR VERTICAL BAR SAFETY BARRIER PER CODE REQUIREMENTS.

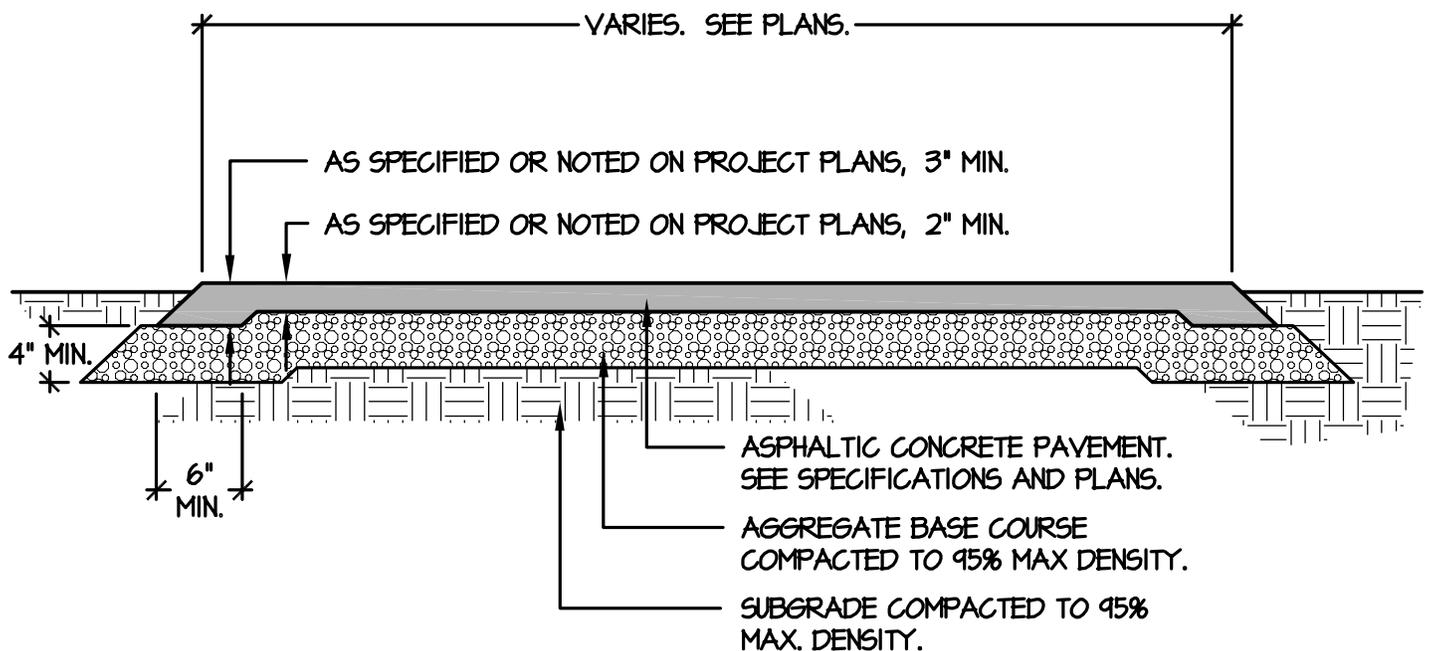
SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL SITE FURNITURE:		DETAIL NO.	
REVISED: MOYR		5 TIER BLEACHERS		P-1009	
					SHEET 1 OF 1



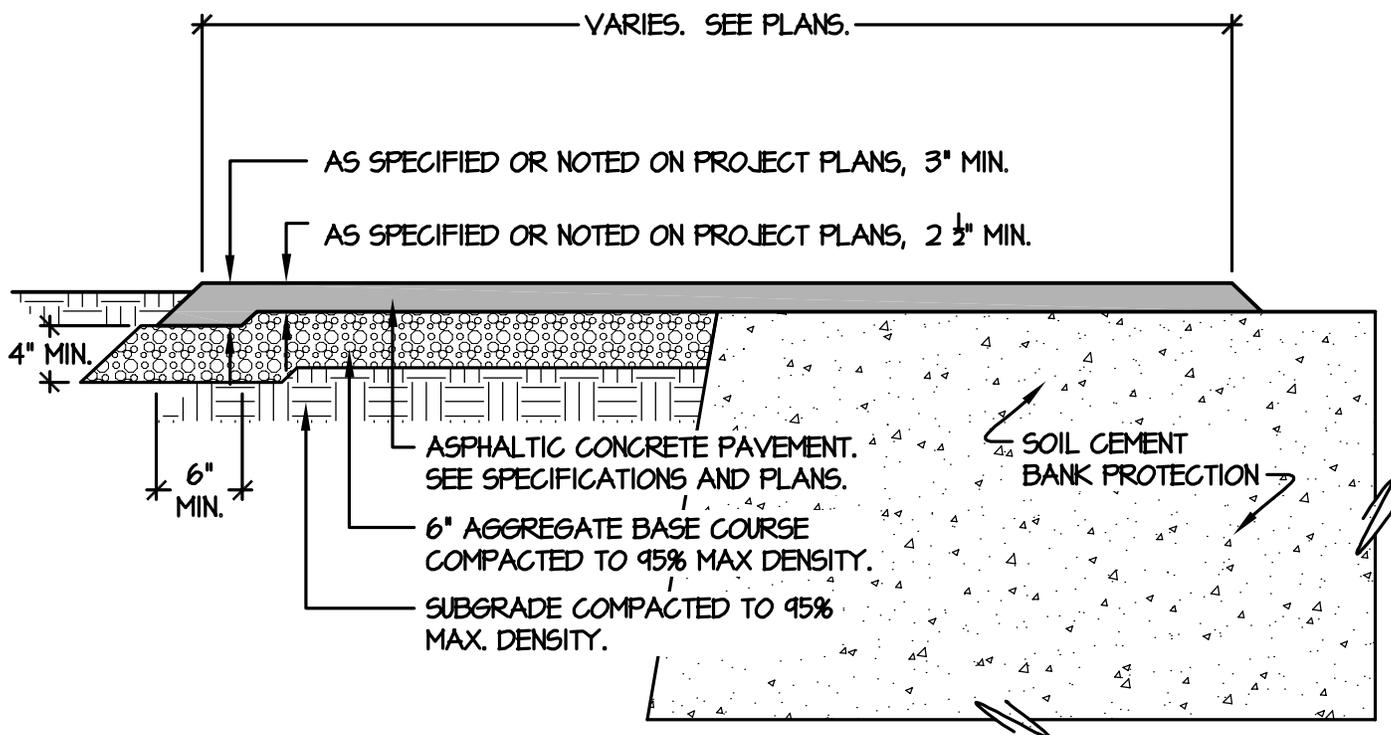
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PATHWAY & TRAIL PAVING:		P-1100
REVISED:		DECOMPOSED GRANITE PATH		
MOYR		SHEET 1 OF 1		



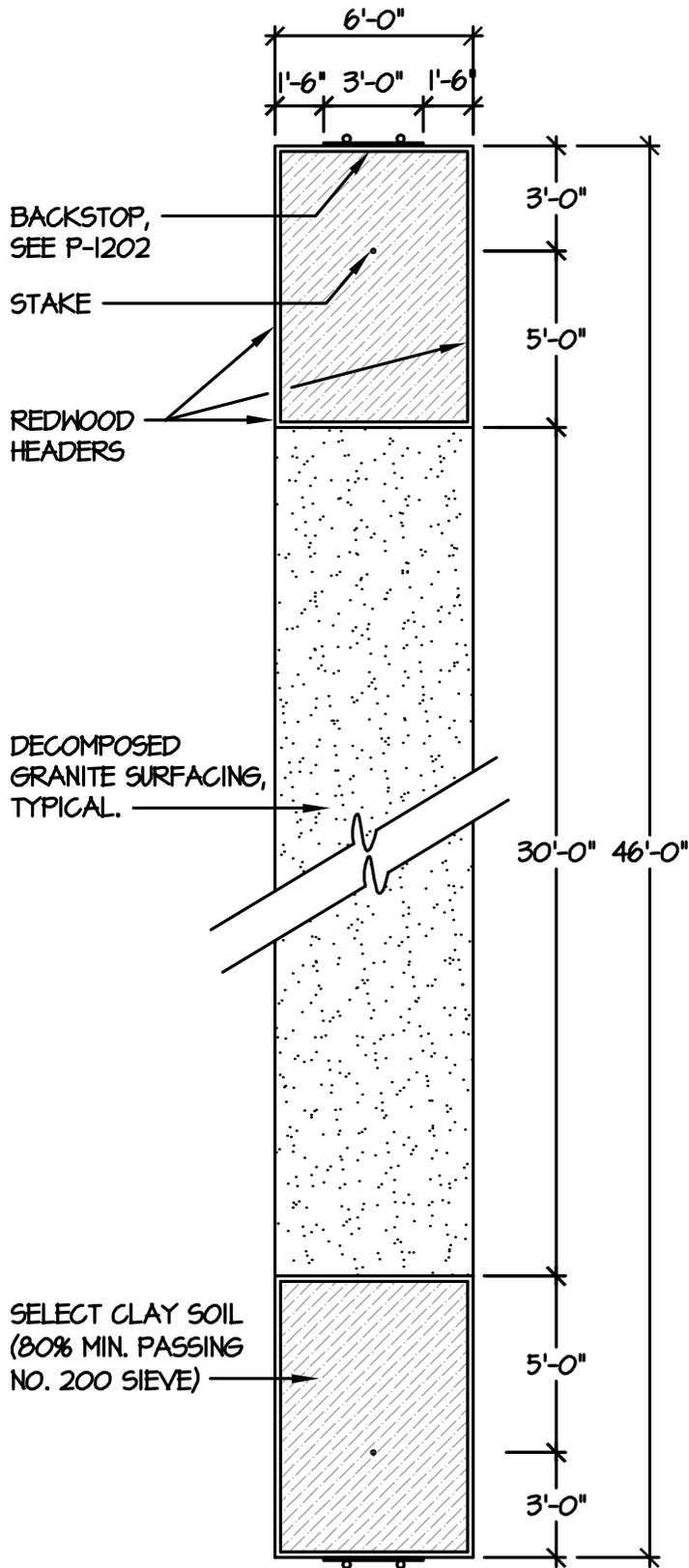
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05				PATHWAY & TRAIL PAVING:
REVISED:		ASPHALTIC CONCRETE PATH		SHEET 1 OF 1
MOYR				



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PATHWAY & TRAIL PAVING:		P-1102
REVISED:		ASPHALTIC CONCRETE PATH AT BANK PROTECTION		
MOYR		SHEET 1 OF 1		



SCALE: N.T.S.

ISSUED:
11/05
REVISED:
MOYR



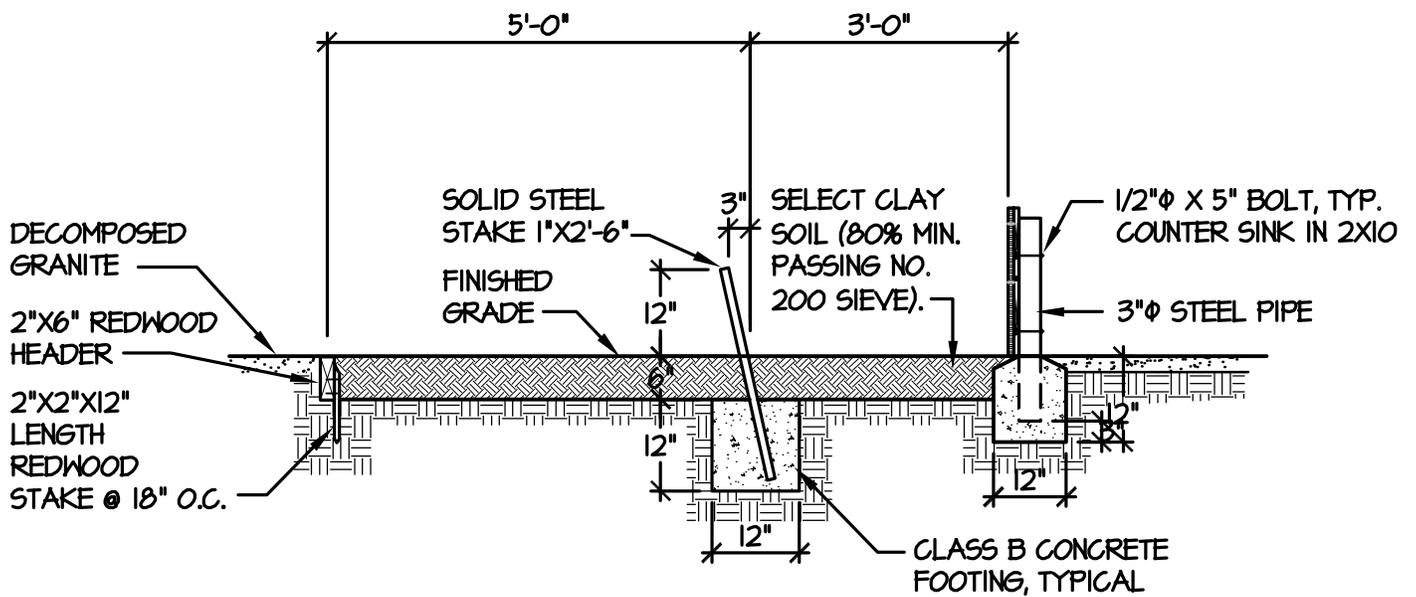
STANDARD DETAIL
 MISCELLANEOUS PARK FACILITIES:
 HORSESHOE PIT LAYOUT



DETAIL NO.
P-1200
SHEET 1 OF 1

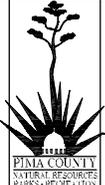
NOTES:

- I. BACKSTOP AND POSTS TO BE PRIMED AND PAINTED AS SPECIFIED OR AS NOTED ON THE PROJECT PLANS. FINISH COLOR AS SPECIFIED, NOTED OR SELECTED BY OWNER.



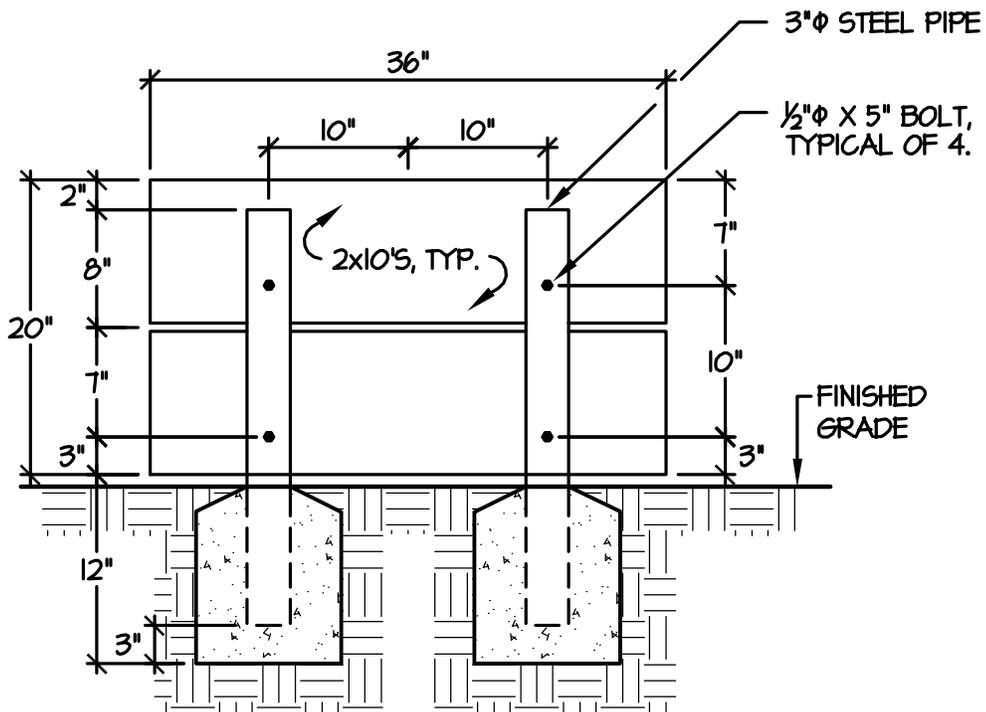
NOTE: ALL REDWOOD SHALL BE CONSTRUCTION HEART GRADE

SCALE: N.T.S.

<p>ISSUED: 11/05</p> <p>REVISED: MOYR</p>		<p>STANDARD DETAIL MISCELLANEOUS PARK FACILITIES: HORSESHOE PIT SECTION THROUGH PIT AND BACKSTOP</p>		<p>DETAIL NO. P-1201 SHEET 1 OF 1</p>
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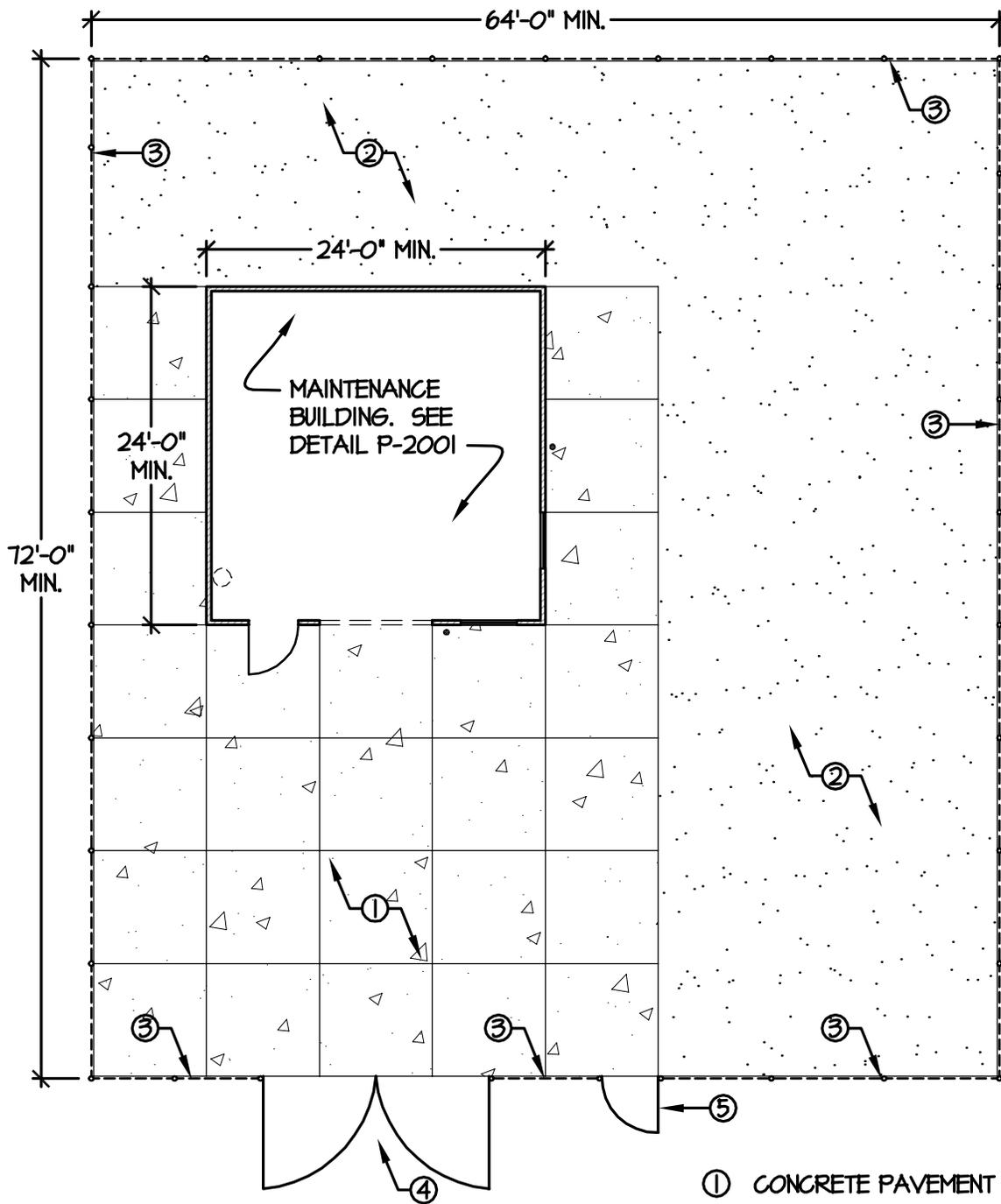
NOTES:

- I. BACKSTOP AND POSTS TO BE PRIMED AND PAINTED AS SPECIFIED OR AS NOTED ON THE PROJECT PLANS. FINISH COLOR AS SPECIFIED, NOTED OR SELECTED BY OWNER.



SCALE: N.T.S.

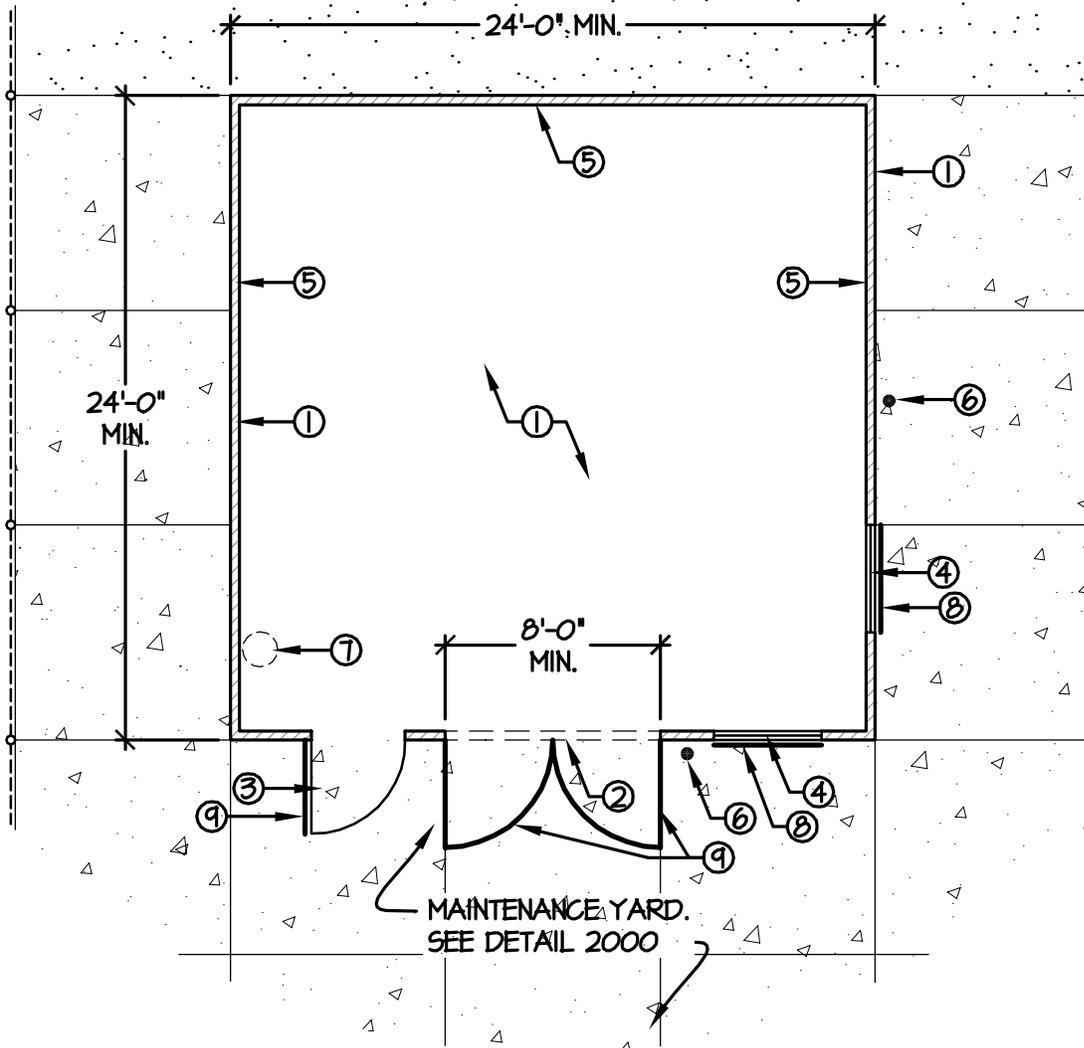
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		MISCELLANEOUS PARK FACILITIES:		P-1202
REVISED:		HORSESHOE PIT BACKSTOP		
MOYR		ELEVATION		SHEET 1 OF 1



- ① CONCRETE PAVEMENT
- ② GRAVEL PAVEMENT
- ③ 10'-0" HIGH CHAIN LINK FENCE
- ④ 16'-0" WIDE X 10'-0" HIGH CHIAN LINK GATE
- ⑤ 4'-0" WIDE X 6'-8" HIGH CHAIN LINK PEDESTRIAN GATE IN 10'-0" FENCE

SCALE: N.T.S.

ISSUED:		STANDARD DETAIL MAINTENANCE YARD AND BUILDING: MAINTENANCE YARD		DETAIL NO.
10/05				P-2000
REVISED:				SHEET 1 OF 1
MOYR				



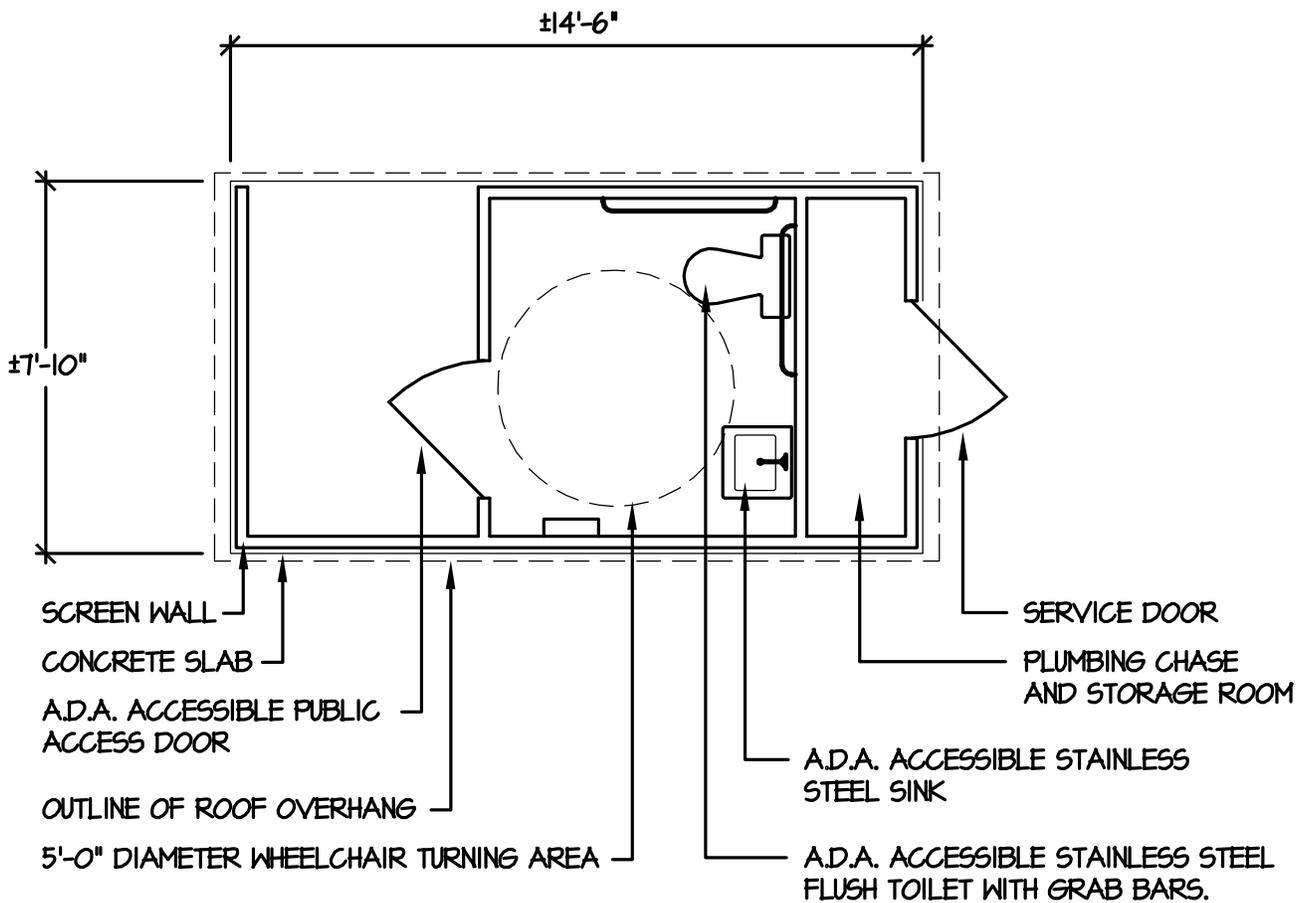
- ① CONCRETE MASONRY BUILDING WITH CONCRETE FLOOR
- ② HEAVY-DUTY OVERHEAD DOOR
- ③ HEAVY-DUTY STEEL STANDARD DOOR
- ④ WINDOWS
- ⑤ SCREENED VENTILATION PANELS
- ⑥ HOSE BIB
- ⑦ EMERGENCY EYE WASH/SHOWER
- ⑧ PAINTED STEEL SECURITY BARS
- ⑨ PAINTED STEEL BAR, SECURITY GATE

NOTE:

I. THIS DETAIL IS INTENDED TO SHOW BASIC LAYOUT AND FEATURES OF MAINTENANCE BUILDING. SEE PROJECT PLANS FOR STRUCTURAL, ARCHITECTURAL, ELECTRICAL, AND MECHANICAL PLANS AND DETAILS.

SCALE: N.T.S.

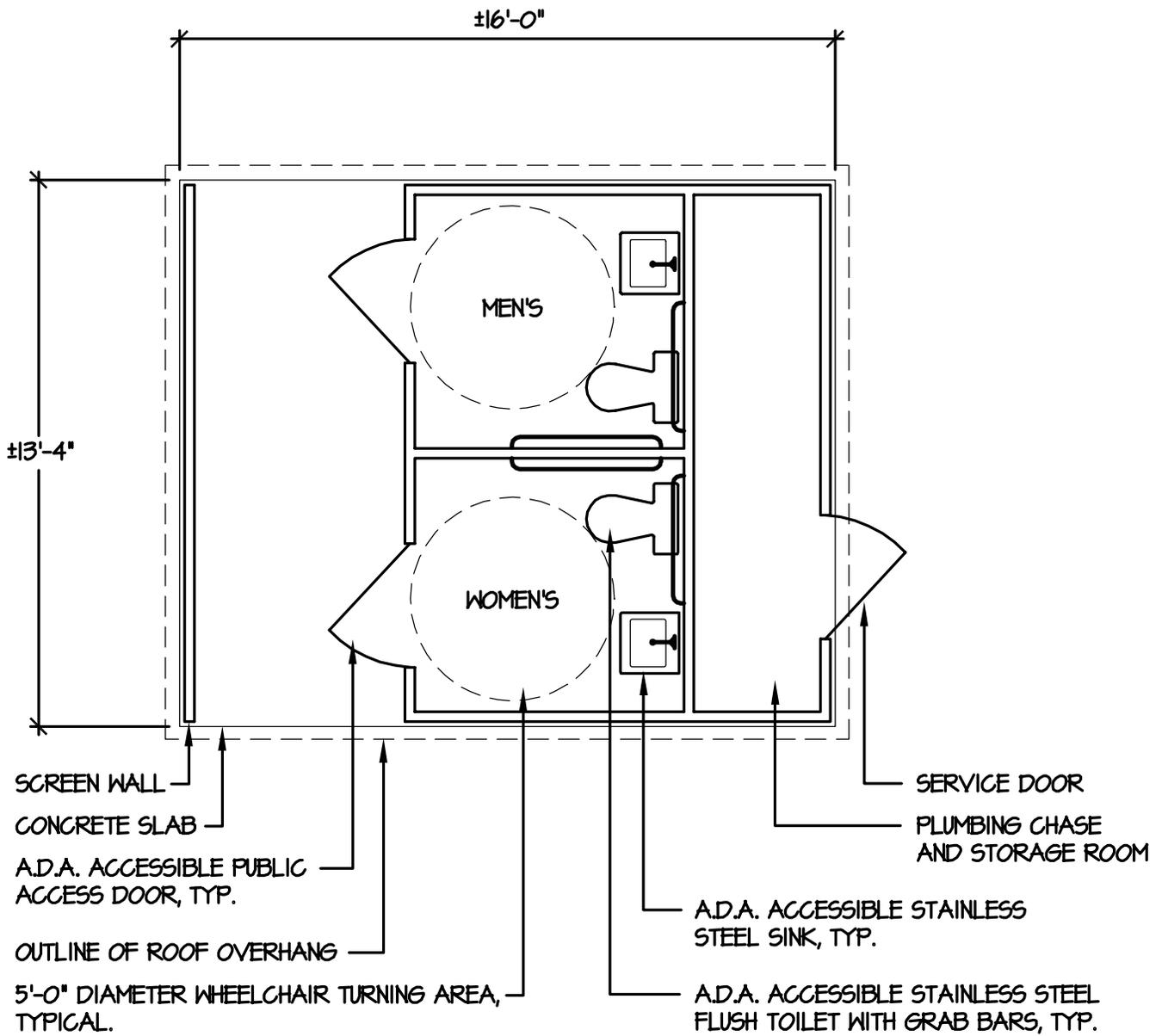
ISSUED:		<p>STANDARD DETAIL MAINTENANCE YARD AND BUILDING: MAINTENANCE BUILDING</p>		DETAIL NO.
10/05				P-2001
REVISED:				SHEET 1 OF 1
MOYR				



NOTE: THIS DETAIL IS INTENDED TO SHOW BASIC LAYOUT AND FEATURES OF THE PROPOSED RESTROOM BUILDING. SEE PROJECT PLANS FOR ADDITIONAL REQUIREMENTS. SEE STANDARD SPECIFICATIONS FOR SHOP DRAWING REQUIREMENTS.

SCALE: N.T.S.

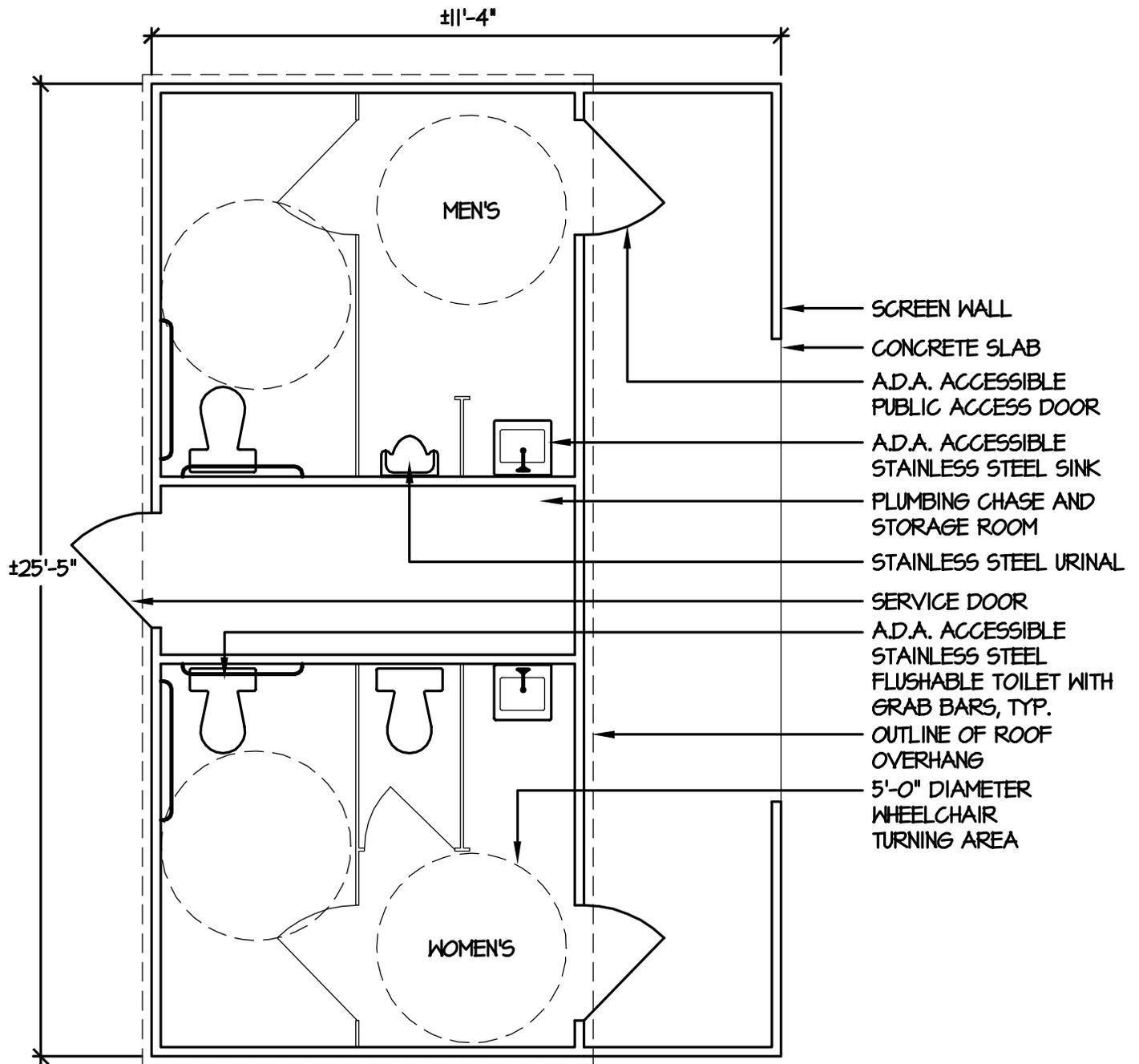
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PARK BUILDINGS:		P-2100
REVISED:		RESTROOM BUILDING, TYPE 1		
MOYR				



NOTE: THIS DETAIL IS INTENDED TO SHOW BASIC LAYOUT AND FEATURES OF THE PROPOSED RESTROOM BUILDING. SEE PROJECT PLANS FOR ADDITIONAL REQUIREMENTS. SEE STANDARD SPECIFICATIONS FOR SHOP DRAWING REQUIREMENTS.

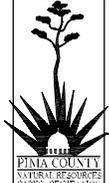
SCALE: N.T.S.

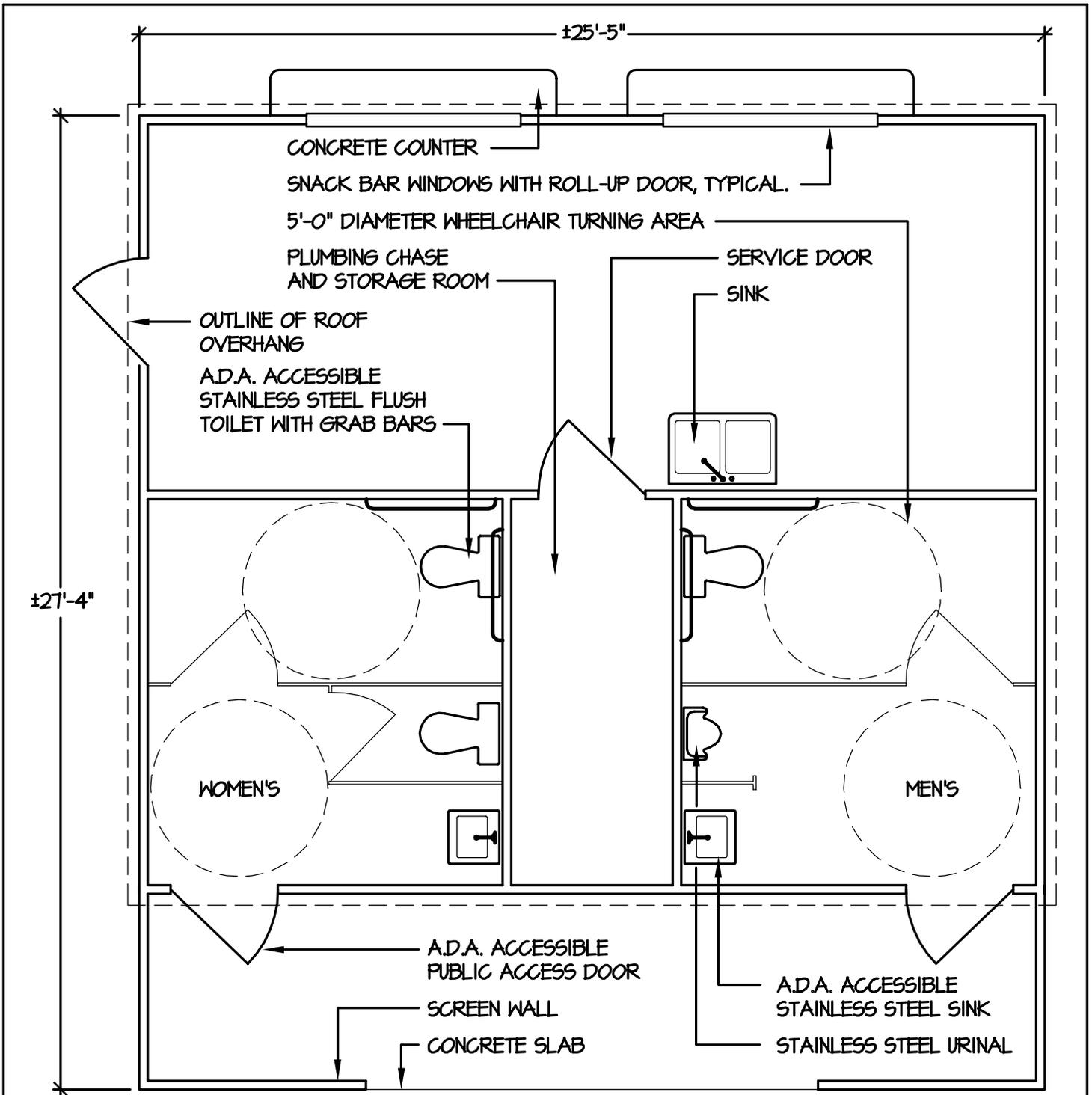
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05				PARK BUILDINGS:
REVISED:		RESTROOM BUILDING, TYPE 2		SHEET 1 OF 1
MOYR				



NOTE: THIS DETAIL IS INTENDED TO SHOW BASIC LAYOUT AND FEATURES OF THE PROPOSED RESTROOM BUILDING. SEE PROJECT PLANS FOR ADDITIONAL REQUIREMENTS. SEE STANDARD SPECIFICATIONS FOR SHOP DRAWING REQUIREMENTS.

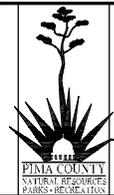
SCALE: N.T.S.

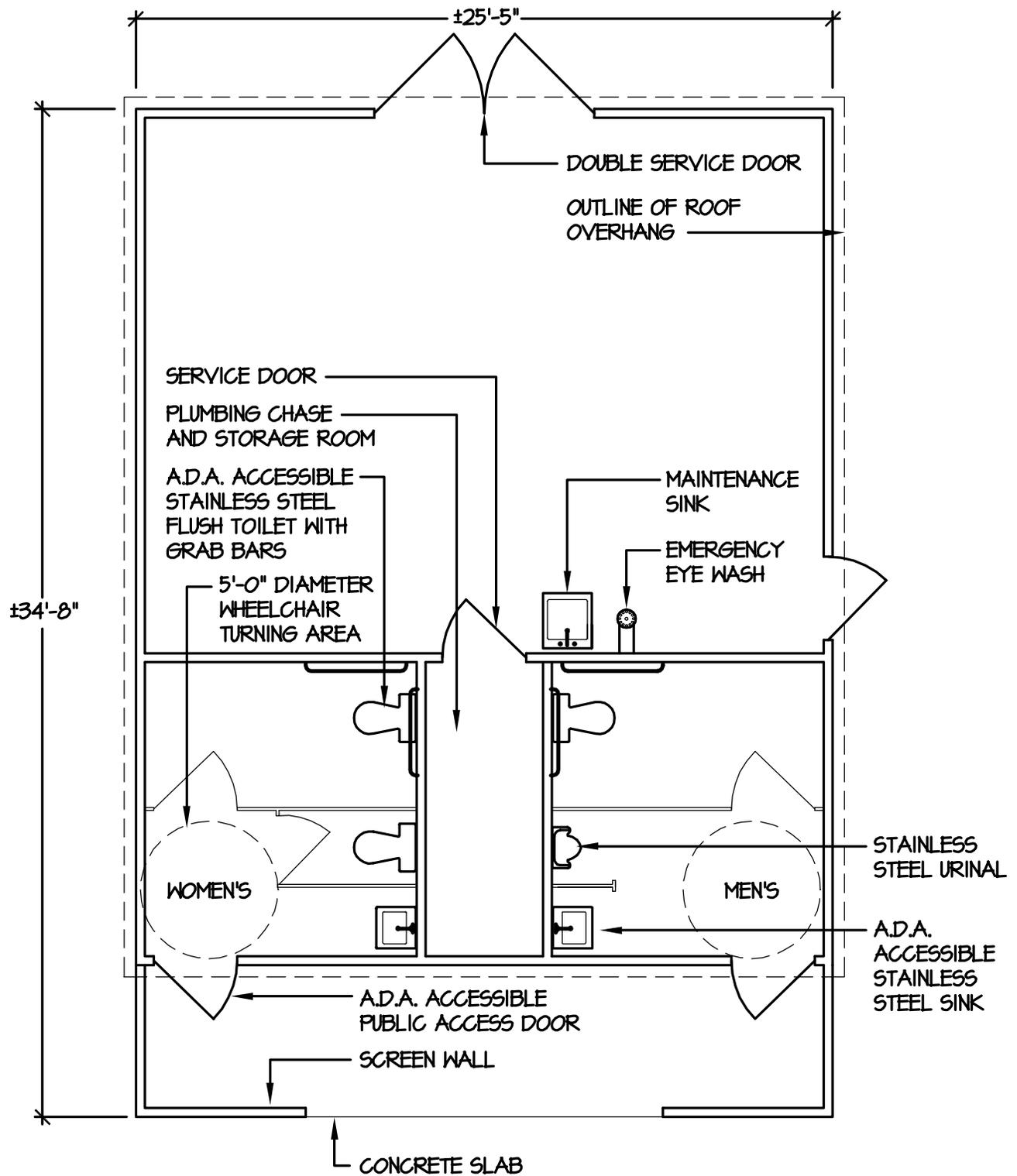
ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05				PARK BUILDINGS:
REVISED:		RESTROOM BUILDING, TYPE 3		SHEET 1 OF 1
MOYR				



NOTE: THIS DETAIL IS INTENDED TO SHOW BASIC LAYOUT AND FEATURES OF THE PROPOSED RESTROOM BUILDING. SEE PROJECT PLANS FOR ADDITIONAL REQUIREMENTS. SEE STANDARD SPECIFICATIONS FOR SHOP DRAWING REQUIREMENTS.

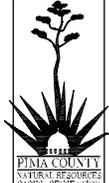
SCALE: N.T.S.

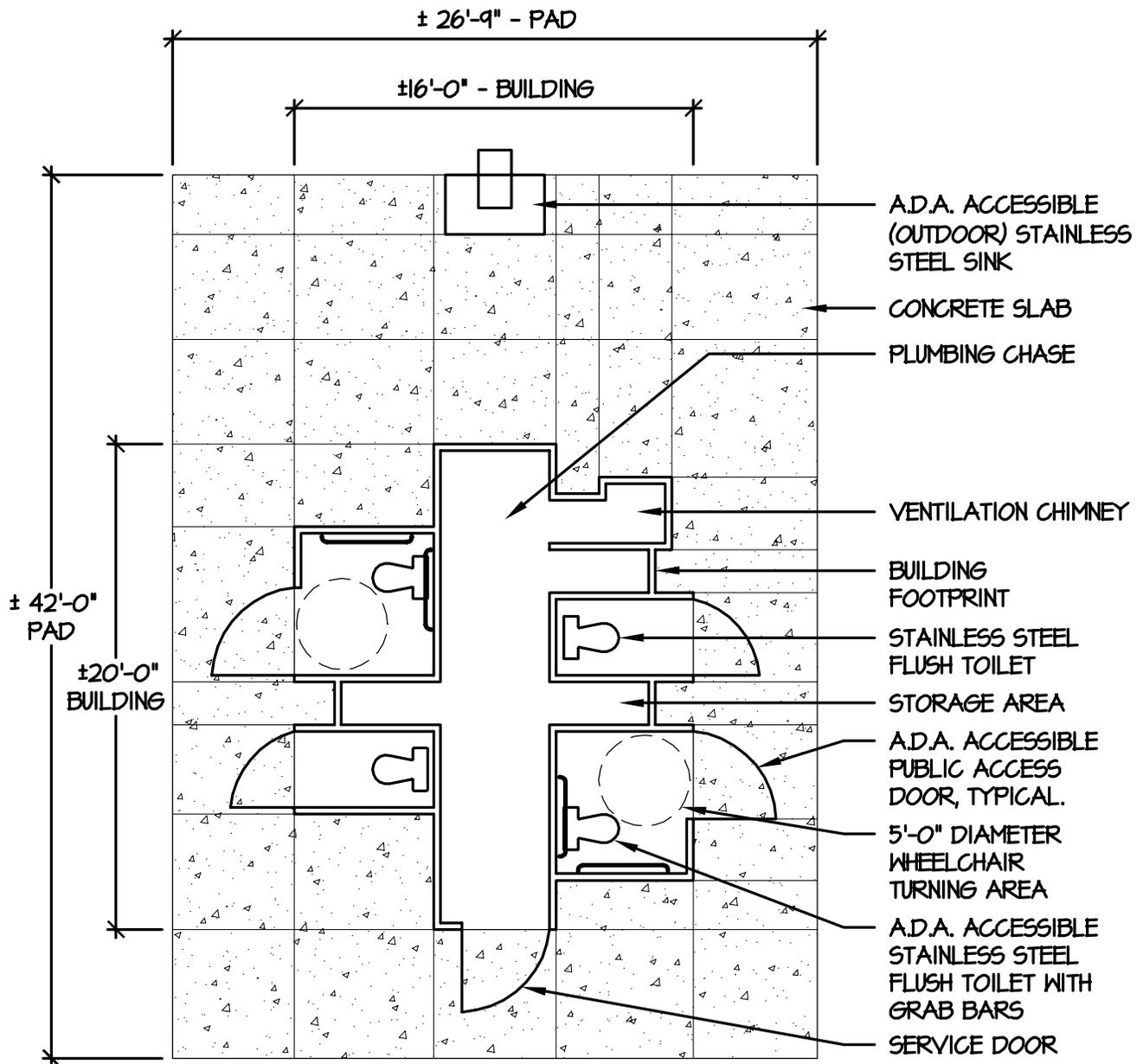
ISSUED: 11/05		STANDARD DETAIL PARK BUILDINGS:		DETAIL NO.
REVISED:		RESTROOM BUILDING, TYPE 4 (WITH SNACK BAR)		P-2103
MOYR		SHEET 1 OF 1		



NOTE: THIS DETAIL IS INTENDED TO SHOW BASIC LAYOUT AND FEATURES OF THE PROPOSED RESTROOM BUILDING. SEE PROJECT PLANS FOR ADDITIONAL REQUIREMENTS. SEE STANDARD SPECIFICATIONS FOR SHOP DRAWING REQUIREMENTS.

SCALE: N.T.S.

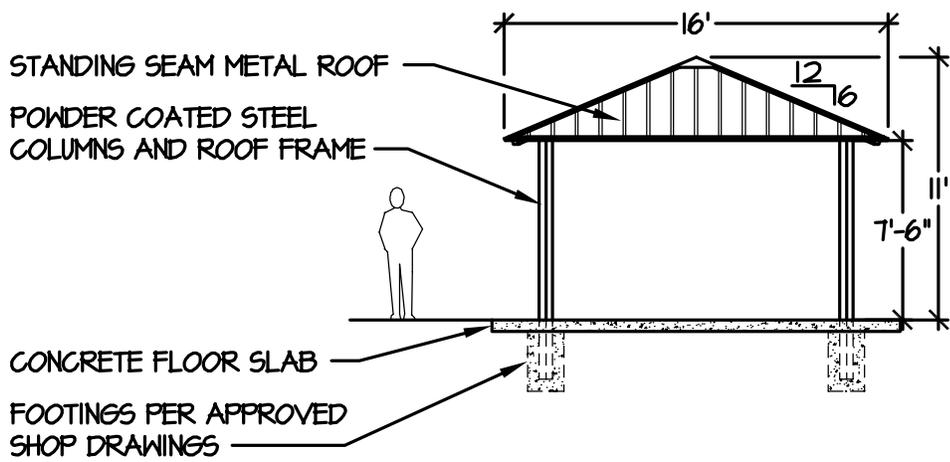
ISSUED: 11/05		STANDARD DETAIL PARK BUILDINGS:		DETAIL NO.	
REVISED: MOYR		RESTROOM BUILDING, TYPE 5 (WITH MAINTENANCE SHOP)		P-2104	
				SHEET 1 OF 1	



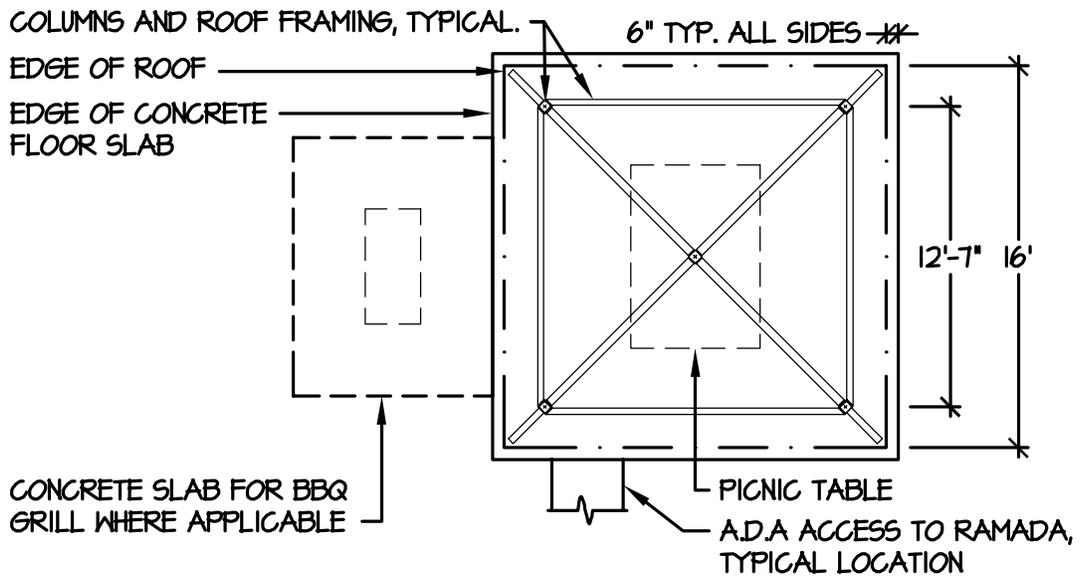
NOTE: THIS DETAIL IS INTENDED TO SHOW BASIC LAYOUT AND FEATURES OF THE PROPOSED RESTROOM BUILDING. SEE PROJECT PLANS FOR ADDITIONAL REQUIREMENTS. SEE STANDARD SPECIFICATIONS FOR SHOP DRAWING REQUIREMENTS.

SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05				PARK BUILDINGS:
REVISED:		RESTROOM BUILDING, TYPE 6		SHEET 1 OF 1
MOYR				



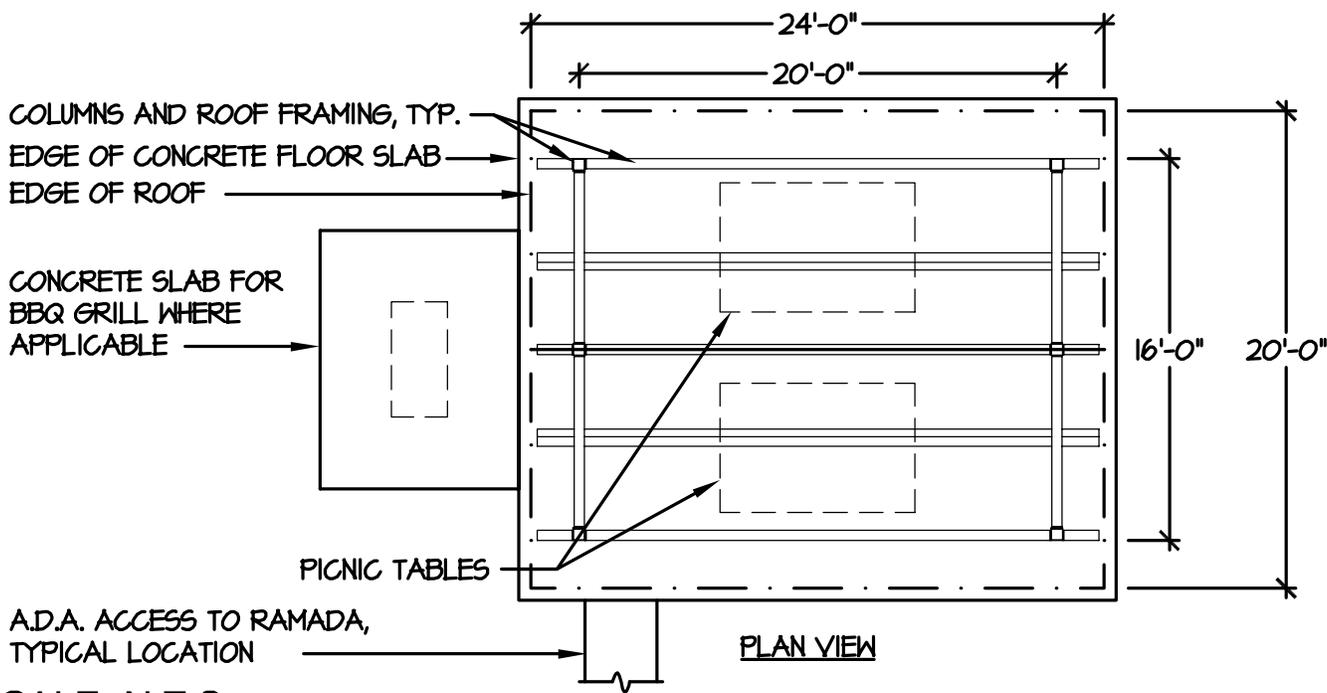
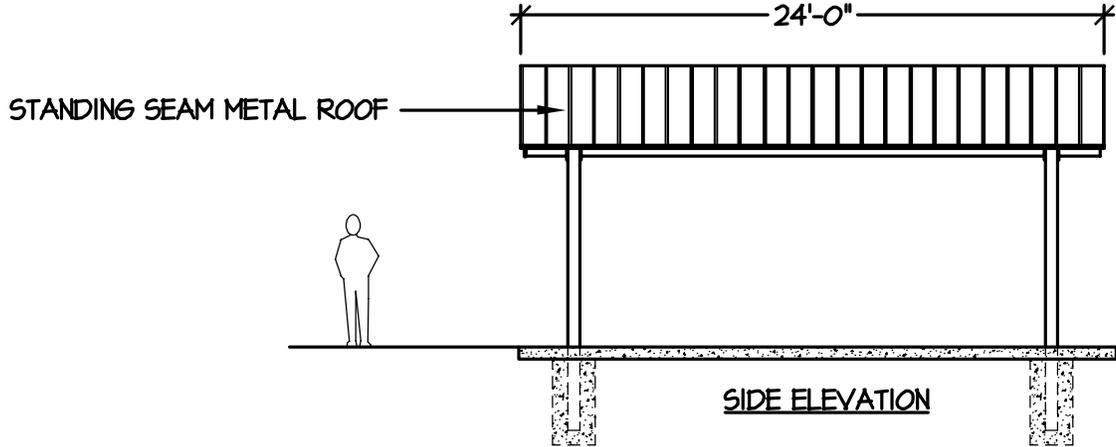
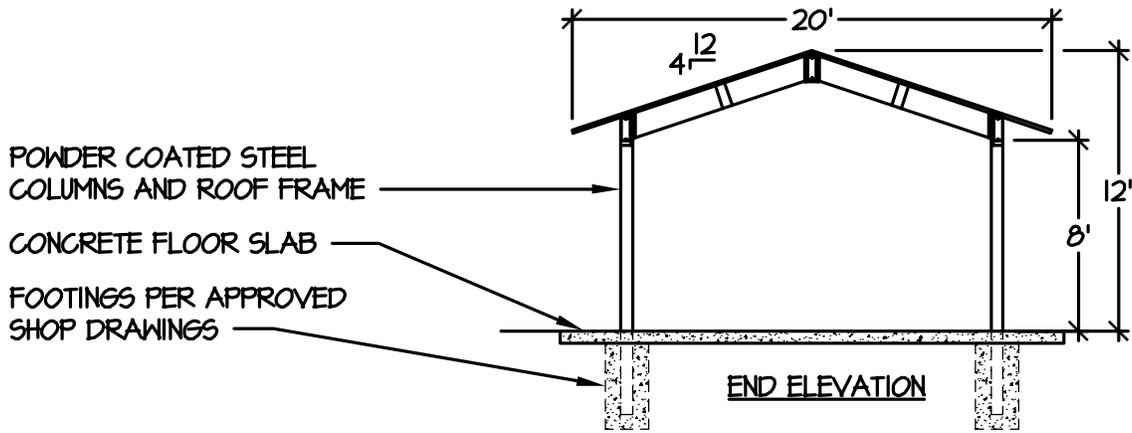
ELEVATION



PLAN VIEW

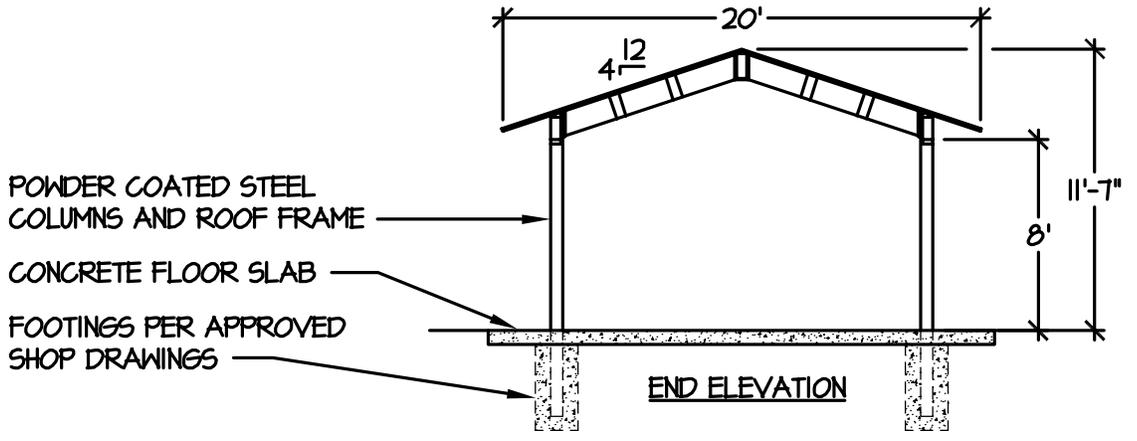
SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PARK BUILDINGS:		P-2200
REVISED:		RAMADA - TYPE 1 (16' x 16')		SHEET 1 OF 1
MOYR				

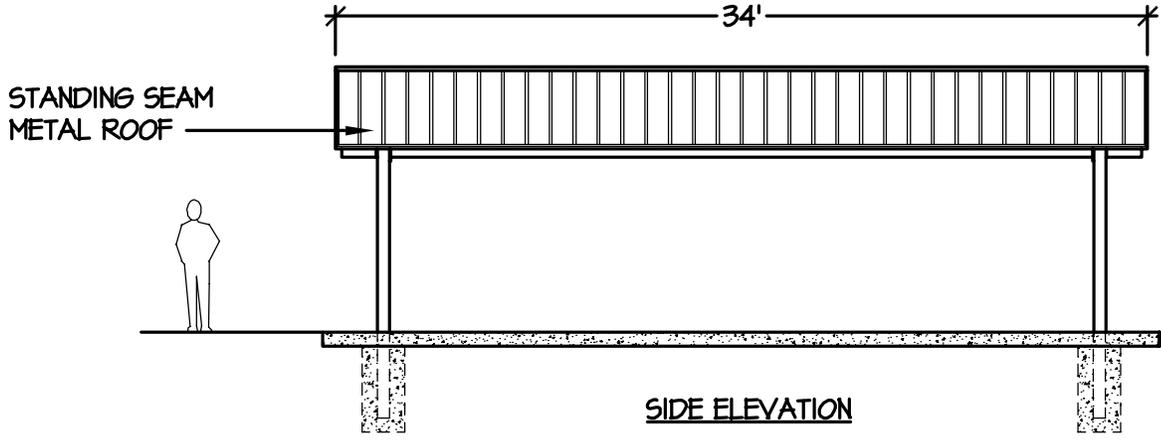


SCALE: N.T.S.

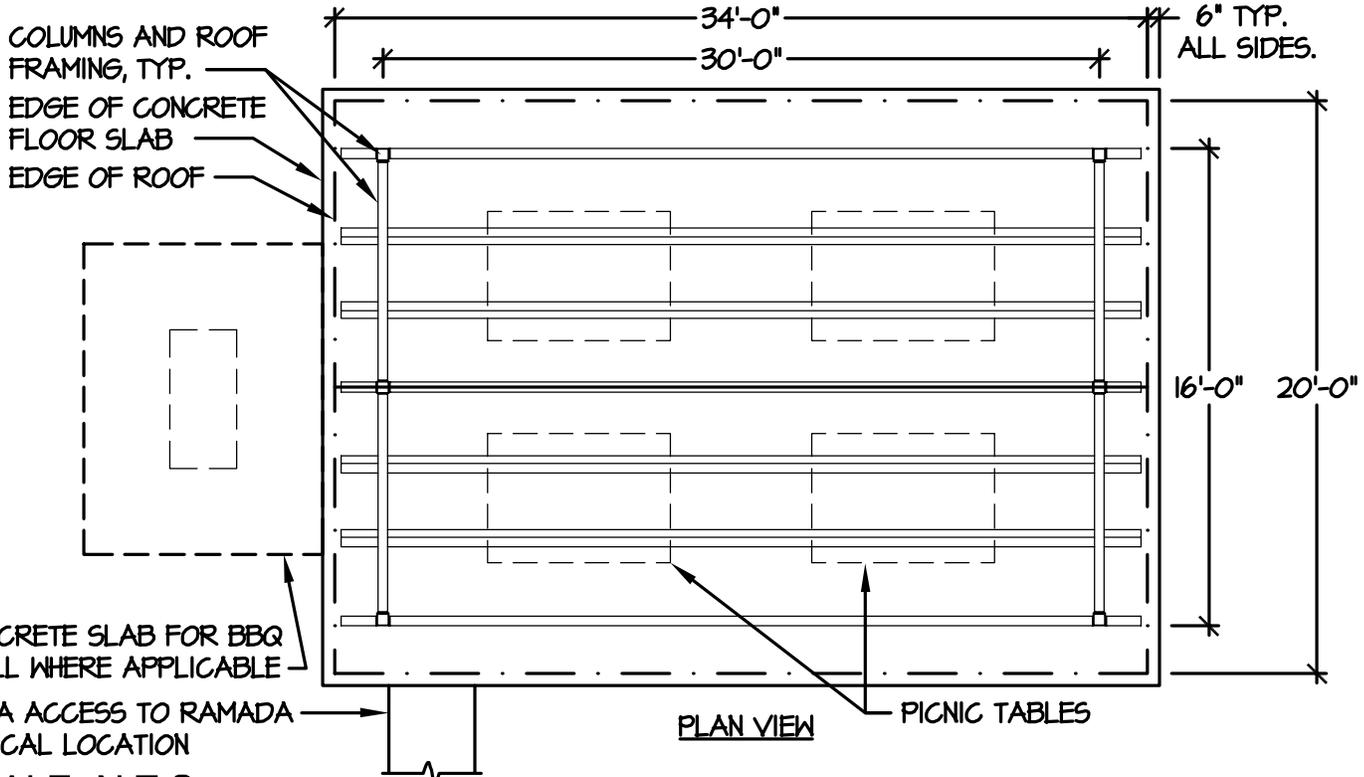
ISSUED: 11/05		STANDARD DETAIL PARK BUILDINGS:		DETAIL NO.
REVISED:		RAMADA - TYPE 2 (20' x 24')		P-2201
MO/YR		SHEET 1 OF 1		



END ELEVATION



SIDE ELEVATION



PLAN VIEW

SCALE: N.T.S.

ISSUED:	11/05
REVISED:	MOYR



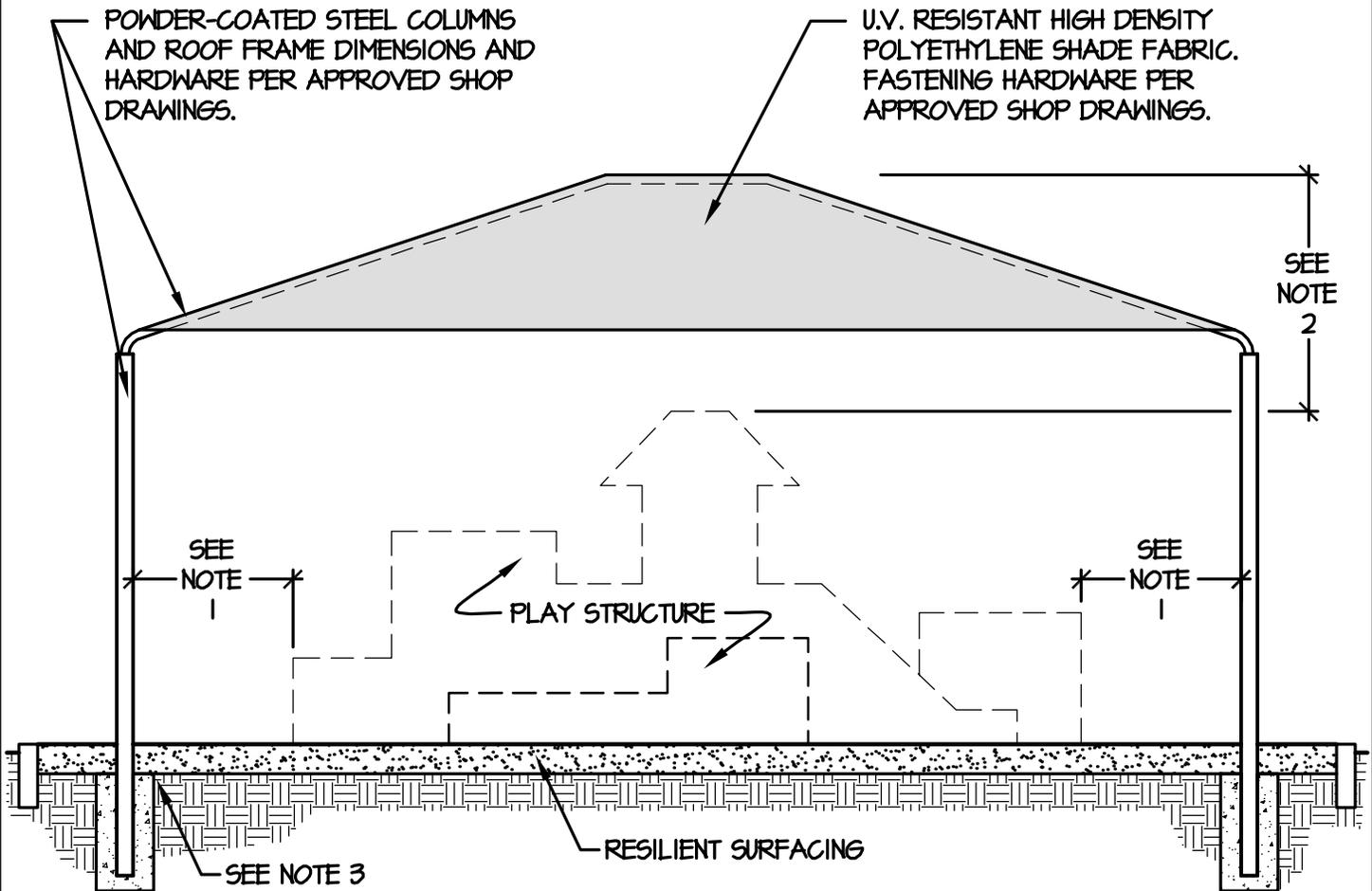
STANDARD DETAIL
PARK BUILDINGS:
 RAMADA - TYPE 3 (20' x 34')



DETAIL NO.
P-2202
 SHEET 1 OF 1

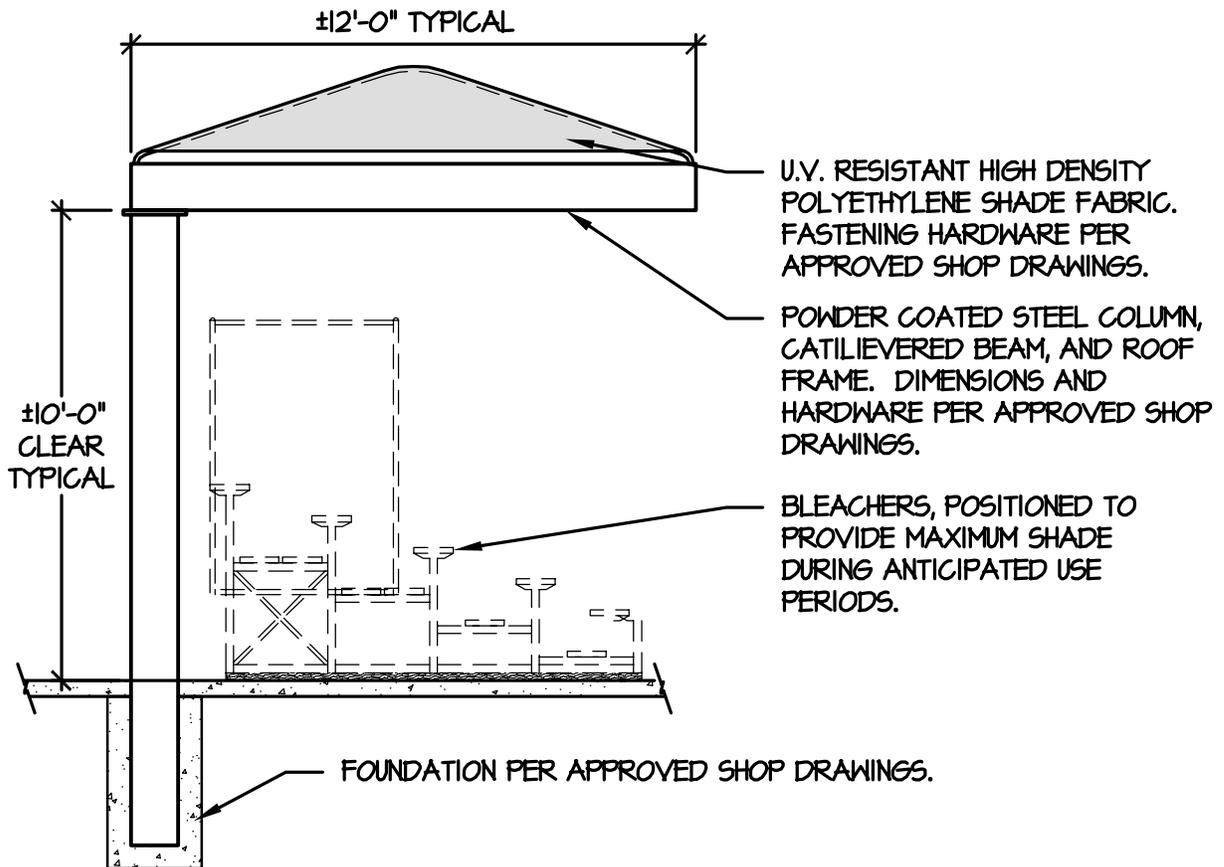
NOTES:

1. SHADE CANOPY COLUMNS SHALL BE LOCATED OUTSIDE THE DESIGNATED FALL ZONE FOR THE PLAYGROUND EQUIPMENT COVERED / SHADED.
2. THE DISTANCE BETWEEN THE DESIGNATED PLAY SURFACE OF THE STRUCTURE (OR PIVOT POINTS OF SWINGS) AND THE SHADE CANOPY FRAMING AND FABRIC SHALL COMPLY WITH ASTM F-1487 "STANDARD CONSUMER PRODUCT SAFETY PERFORMANCE SPECIFICATION FOR PLAYGROUND EQUIPMENT FOR PUBLIC USE." (DIMENSION SHALL BE 7'-0" TYPICAL. VERIFY FOR THE PLAYGROUND EQUIPMENT AND SHADE CANOPY TO BE INSTALLED).
3. THE TOP OF ALL SHADE CANOPY COLUMN FOOTINGS LOCATED IN AREAS WITH RESILIENT SURFACING SHALL BE BELOW THE REQUIRED DEPTH OF THE RESILIENT SURFACING.



SCALE: N.T.S.

ISSUED: 11/05		STANDARD DETAIL		DETAIL NO.
REVISED: MOYR		PRE-ENGINEERED SHADE CANOPIES:		P-2300
		TYPICAL SHADE CANOPY ABOVE PLAY EQUIPMENT		SHEET 1 OF 1



SCALE: N.T.S.

ISSUED:		STANDARD DETAIL		DETAIL NO.
11/05		PRE-ENGINEERED SHADE		P-2301
REVISED:		CANOPIES:		
MO/YR		TYPICAL SHADE CANOPY ABOVE BLEACHERS		SHEET 1 OF 1