City of

FRESNO

DEPARTMENT OF PUBLIC WORKS

STANDARD DRAWINGS

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City of Fresno Department of Public Works
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ADDENDUM NO. 1
TO
CITY OF FRESNO 2010 STANDARD DRAWINGS
ADOPTED MARCH 4, 1970
RESOLUTION NO. 70-36
UPDATED VERSION APPROVED AUGUST 2010

This addendum is attached to and made a part of the above-entitled standard specifications.

The following City Standard Drawings have been amended as indicated below:

Replace:	Table of Contents
W-1	Revised material specifications and notes
W-2	Revised material specifications and notes

Reviewed and Approved:

Scott Mozier, P.E.
Assistant Director / City Engineer

6-10-11
Date

Patrick N. Wiemiller
Public Works Director

6/10/11
Date

ADDENDUM NO. 2
TO
CITY OF FRESNO
PUBLIC WORKS STANDARD SPECIFICATIONS
ADOPTED MARCH 4, 1970
RESOLUTION NO. 70-36
UPDATED VERSION APPROVED AUGUST 2010

This addendum is attached to and made a part of the above-entitled standard specifications.

The following City Standard Drawings have been amended as indicated below:

P-9:	Updated median island stamped concrete color from Davis Colors Brick Red to Davis Colors San Diego Buff.
P-48:	Revised compaction for backfill soil directly above buried pipe from 95% to 90%.
P-58:	Added note requiring compliance with Chapter 1000 of the Caltrans Highway Design Manual.
P-59:	Added note requiring compliance with Chapter 1000 of the Caltrans Highway Design Manual.
P-60:	Added standard drawing "Trail Details" as P-60. Existing drawing P-60 was combined with P-61.
P-61	Added the existing standard drawing P-60 details into P-61.
P-63:	Removed unused "See Note 4" annotation.
P-72:	Updated Standard Drawing reference from E-36 to E-35. Removed unnecessary language.
P-93:	Clarified steel reinforcement bars on the wall diagrams.
P-94:	Clarified steel reinforcement bars on the wall diagrams.
P-95:	Clarified steel reinforcement bars on the wall diagrams.
P-96:	Removed "Zone 3" references.
P-100:	Added detail for installation of Type N-1 (CA) and N-2 (CA) object markers onto barricade.
E-4:	Changed 2" cap in pullbox from mortar to concrete.
E-5:	Changed splice location from pullbox to hand hole.
E-21:	Revised Electrical Sealing Compound language and pull box lid requirements.
E-23:	Revised to specify that underground in-line splices are NOT permitted.
E-26:	Changed pole number numeral size from 2" to 1 ½"
E-34A:	Removed "24V" callout from lower input panel diagram.
E-35:	Corrected spelling error.
ITS-1:	Updated Standard Drawing references. Added No. 6 pull box

	requirement.
ITS-2:	Clarified ITS controller location diagram. Revised Note 3 for conduit size and reference.
ITS-3:	Revised notes, references, and added Note 9.
ITS-3A:	Added dimension from hub to back of walk. Added notes 9, 10, and 11. Revised note references.
ITS-11:	Revised fiber optic cable coil length.
ITS-13:	Revised fiber optic cable coil length.
ITS-18:	Revised camera mounting height. Added Note 5 and reference to note 5.
ITS-18A:	Changed coil length requirement in Note 2.
ITS-20:	Revised number of conduits going into communications cabinet and added minimum pipe height callout.
ITS-20A:	Revised number of conduits going into communications cabinet and added minimum pipe height callout.
ITS-21:	Changed cabinet callout in Note 1 from Rittal to Communications cabinet.
ITS-23:	Changed callout from Communications cabinet to Hub cabinet.
ITS-27A:	Removed ethernet extender option.
ITS-27B:	Changed "mesh node" callouts to "access point". Fixed Astro-Brac elbow inconsistency. Added Note 4.

In addition to the standard drawings, changes that have been made to the Standard Specifications are as follows:

Section 7-10.3	Revised language regarding traffic control and road closures. Added language addressing special events and grinding and slurry sealing of existing striping.
Section 13-3	Revised AC type from "Type B" to "Type A".
Section 23-1.11	Revised language, conduit type callout, and Standard Drawing reference.
Section 23-1.12	Revised language regarding lid inscriptions, pull box sizes, and added reference to Section 32 for ITS pull boxes.
Section 23-1.13	Revised language, conductor wire type, and spade terminal type.
Section 23-1.18	Added reference to Std. Drawing E-17.
Section 23-1.19	Revised language regarding signal heads, LED's, and signal faces.
Section 23-1.20	Deleted Section 23-1.20
Section 23-1.24	Revised language regarding Accessible Pedestrian Signal

	unit.
Section 23-1.25	Revised language regarding Emergency Vehicle Priority Control System component requirements.
Section 23-1.28	Revised language regarding signal turn on requirements.
Section 23-2	Added Specification for 2070L controller assembly and 332L controller cabinet. Revised conflict monitor to 2010ECL. Revised Detector Loop Test Page.
Section 23-3.4	Revised telephone number for Electrical Superintendent.
Section 23-3.13	Revised language regarding splice insulation.
Section 30-11	Revised language regarding pull box drainage.
Section 30-12	Revised language regarding conductor types and splice types.
Section 30-13	Added "or Equivalent" annotation to callout of fuse holder specific type.
Section 30-14	Revised language regarding conductor type, splice type, and location of electrical grounding.

Reviewed and Approved:

Scott Mozier, P.E.
Assistant Director / City Engineer

11/3/11
Date

Patrick N. Wiemiller
Public Works Director

11/3/2011
Date

ADDENDUM NO. 3
TO
CITY OF FRESNO
PUBLIC WORKS STANDARD SPECIFICATIONS
ADOPTED MARCH 4, 1970
RESOLUTION NO. 70-36
UPDATED VERSION APPROVED JANUARY, 2013

This addendum is attached to and made a part of the above-entitled standard specifications.

The following City Standard Drawings have been amended as indicated below:

P-31:	Width of Detectable Warning Devices changed to 4' Min. Note No. 10 revised.
P-32:	Removed offset pattern. Revised bump spacing. Revised note No. 1.
S-1	House branch material changed to SDR35. P-trap removed, replaced with two way cleanout. On note 6 "AND SECTION 17-5 OF CITY STANDARD SPECIFICATIONS" was added. Threaded solid cap was added. Note 7 added regarding connection direction.
S-2	Dimensions of manhole concrete collar and asphalt cover revised. Overall dimensions revised to 42" and 30". Pipe opening revised from 24"x39" to 24"x44". Changed "Lateral" to "Lateral for 8" and larger". Added 8" dimension of base via "A" dimension. General Note 4 added. "See Drawing S-5B" reference added. Replaced "AR4000 or AR8000" with "PG 64-10 asphalt". Replaced "Class A" with "6 sack". Added "In Street Installation" and "Non-street Installation".
S-3	Dimensions of manhole concrete collar and asphalt cover revised. Overall height dimensions revised to 42" and 30". "See Drawing S-5" replaced by "See Drawing S-5A" Note 1 "Pipe" was replaced by "Riser Sections" and "Class II R.C.P." was deleted. Note 3 added. Note 4 added. Replaced "AR4000 or AR8000" with "PG 64-10 asphalt". Replaced "Class A" with "6 sack".

	Added "In Street Installation" and "Non-street Installation". Replaced "Slope from above spring line to 2/3 diameter of pipe to side of manhole" with "Slope to start from the spring line of the sewer pipe and slope up to manhole barrel". Remove base design flow configuration. Replaced "Enlarged base to top of pipe surface to provide solid footing for precast manhole components" by "Enlarged base to pipe crown to provide solid footing for precast manhole components" Clearance between pipe and base of manhole was replaced from 4" to 8" MPR's was changed to MFR's
S-4	Dimensions of manhole concrete collar and asphalt cover revised. Note 4 added – Manhole coverings note. Note 5 added. Replaced "AR4000 or AR8000" with "PG 64-10 asphalt". Replaced "Class A" with "6 sack". Added "In Street Installation" and "Non-street Installation". Replaced "See Drawing S-5" with "See Drawing S-5B". Replaced "Slope from above spring line to 2/3 diameter of pipe to side of manhole" with "Construct bench as shown- Trowel Finish". Clearance between pipe and base of manhole was replaced from 4" to 8" Pitch "1:12 MIN." was replaced with "1:12" Replaced "Enlarged base to top of pipe surface to provide solid footing for precast manhole components" by "Enlarged base to pipe crown to provide solid footing for precast manhole components" Note 1 "Pipe" was replaced by "Riser Sections" and "Class II R.C.P." was deleted. Remove base design flow configuration. Old Note 2 "All reinforcing steel to be No.4 bars grade 60 steel, spaced 12" O.C. both ways in top, bottom & walls" was deleted.
S-5A	Replaced Drawing "S-5" with "S-5A". Replaced frame weight "191 lbs" with "180 lbs". Scale 1"=1'-0" was deleted
S-5B	Added drawing S-5B "Pamrex Ductile Iron Frame and Cover for Sewer Pipe 27" or Larger".
S-7	Added "Minimum Thickness 5/8"" for steel casing. Added spacing formula for steel casing. Replaced "In Jacked Steel Casing" in drawing title with "In Jacked Steel Casing and Non Jacked Steel Casing". On Note 6 P.C. was replaced by P.C.C.

S-8	Replaced "Elastomeric sleeve coupling with stainless steel bands" with "FERNCO stainless steel shield repair coupling bands or equal"

The following City Standard Drawings are new as indicated below:

S-11	Replaced "S-11" with "S-11A and S-11B".
S-12	New sheet added – "Manhole Base Design Flow Configuration Supplement to S-3 and S-4".

In addition to the standard drawings, changes that have been made to the Standard Specifications are as follows:

Section 17-2.2.1	Revise pipe size "18-30" to "18-48". Revise Min. Wall Thickness "T-1 only" to "PS-46" Add row in table to include pipe size "21-54", ASTM "F1803" and min. wall thickness "PS-46".
Section 17-2.2.4	"T-1 only" was replaced by "PS-46".
Section 17-3.2.8	Dimensions have been switched, giving priority to the English measurement standard instead of the metric.
Section 17-4	Dimensions have been switched, giving priority to the English measurement standard instead of the metric.
Section 17-5.1	Dimensions have been switched, giving priority to the English measurement standard instead of the metric.
Section 17-5.2	Dimensions have been switched, giving priority to the English measurement standard instead of the metric.
Section 17-5.3	Dimensions have been switched, giving priority to the English measurement standard instead of the metric. Revise last sentence of paragraph 5 to "Jetting and Flooding of trenches from the top is not permitted". Deleted paragraph 6 "Jetted backfill".
Section 17-5.4	Dimensions have been switched, giving priority to the English measurement standard instead of the metric.
Section 17-6	Revise last sentence of paragraph 2 "45%" to "45°". Add "Y branches must join the sewer main with flow in the same direction" at end of last paragraph.

Section 17-7	Revise second sentence of first paragraph. Add "New connections must comply with drawing S-1, S-8 & S-9" to end of second paragraph. Delete paragraph eight (8) completely. Fifth paragraph "for use with his/her product" was deleted. Dimensions have been switched, giving priority to the English measurement standard instead of the metric.
Section 17-8.2	Dimensions have been switched, giving priority to the English measurement standard instead of the metric. Delete paragraph three (3) completely.
Section 17-8.3	Replace "C-76" with "C-478" at end of 1st paragraph.
Section 17-8.4	Dimensions have been switched, giving priority to the English measurement standard instead of the metric. Replace "2/3 the diameter" with "half" in 1st paragraph. Add new sentence at end of 2nd paragraph. Replace entire 3rd paragraph.
Section 17-8.5	Dimensions have been switched, giving priority to the English measurement standard instead of the metric.
Section 17-8.6	"Jiffy Rings" definition was added.
Section 17-8.7	S-11 was replaced with S-11A and S-11B.
Section 17-11	Dimensions on PVC Gravity Sewer Pipe table have been switched, giving priority to the English measurement standard instead of the metric.
Section 17-12	Replace "A tape cassette" with "An electronic copy" in 2nd paragraph. Replace "VHS format" with "DVD or in Mpeg file format", in 2nd paragraph. On requirement 1, "Testing" was replaced by "Video Inspection" On requirement 2, "testing" was replaced by "Inspection" and "test" by "Inspection. Replace "video tape" with "DVD" in Item 4 under Requirements for Sewer Video Inspections". On requirement 5, "Testing" was replaced by "Inspection" and "test" by "Inspected". Requirement 6, was changes to "In order to facilitate review a log of

the Inspections performed shall correlate from manholes, stationing, etc., between the Sewer Plans and the DVD produced"
Add items 7 through 13 under Requirements for Sewer Video Inspections".
Section with "INSPECTION OF NEW CONSTRUCTION-SEWER INFRASTRUCTURE MAIN SEWER LINES AND MANHOLES" (Including fees) was added.

Reviewed and Approved:

Robert N. Andersen, P.E.
Assistant Director

5/29/14
Date

Scott Mozier, P.E.
Public Works Director

6/9/14
Date

ADDENDUM NO. 4
TO
CITY OF FRESNO
PUBLIC WORKS STANDARD SPECIFICATIONS
ADOPTED MARCH 4, 1970
RESOLUTION NO. 70-36
UPDATED VERSION APPROVED JANUARY, 2013

This addendum is attached to and made a part of the above-entitled standard specifications.

The following City Standard Drawings have been amended as indicated below:

P-41	Added location in right-of-way for Recycled Water Main.
P-42	Added location in right-of-way for Recycled Water Main.

The following City Standard Drawings are new as indicated below:

RW-1	Recycled Water Main Identification
RW-2	Recycled water Valve and Valve Box
RW-3	Recycled Water Valve Extension
RW-4	1" Service Connection & Meter Box Installation
RW-5	1-1/2" & 2" Service Connection & Meter Box Installation
RW-6	4" Recycled Water Service
RW-7	Temporary 2" Recycled Water Blow-Off
RW-8	Recycled Water Blow-Off Assembly
RW-9	Recycled Water 1" or 2" Air Release/Vacuum Breaker Station
RW-10	Recycled Water 4" Air Release/Vacuum Breaker Station
RW-11	1" or 2" Air Release/Vacuum Breaker Valve Enclosure
RW-12	Recycled Water Main Separation Requirements
RW-13	Recycled Water Irrigation Information Sign
RW-14	Recycled Water Remote Control Irrigation valve Identification
RW-15	Recycled Water Backflow Preventer Identification
RW-16	Recycled Water Irrigation Box Cover Markings
RW-17	Recycled Water Irrigation System Clock Marking
RW-18	General Recycled Water Identification Tag
RW-19	Recycled Water Landscape Irrigation Head Identification
RW-20	Quick Coupling Valve
RW-21	Cross Connection Control Test Station
RW-22	Temporary Potable Water Supply To On-Site Recycled Water System
RW-23	Temporary Potable Water Supply To Recycled Water System

In addition to the standard drawings, Section 34 and Section 35 are new to the Standard Specifications as indicated below:

SECTION 33 – RECYCLED WATER FACILITIES DESIGN CRITERIA

PART I	**DEFINITIONS**
Section 33.1	Definitions
Section 33.2	Other Requirements
PART II	**GENERAL PROVISIONS**
Section 33.3	Other Requirements
Section 33.4	Enforcements
PART III	**DESIGN CRITERIA**
Section 33.5	Recycled Water Main Pressures, Capacities and Sizes
Section 33.6	Location of Air release Valve Assemblies
Section 33.7	Location of Blow-Off Assemblies
Section 33.8	Recycled Water Main Locations
Section 33.9	Criteria for the Separation
Section 33.10	Alternate Criteria for Construction
Section 33.11	Procedure for Water, Recycled Water and Sewer System Installations in Subdivisions
Section 33.12	Easements
Section 33.13	Depth of Recycled Water Mains
Section 33.14	Structural Requirements
Section 33.15	Design Criteria for Recycled Water Meters
PART IV	**MATERIALS**
Section 33.16	Requirements
Section 33.17	Pipe Materials
Section 33.18	Valves
Section 33.19	Appurtenances

SECTION 34 – RECYCLED WATER FACILITIES

Section 34.1	Scope
Section 34.2	General
Section 34.3	Polyvinyl Chloride (PVC) Pressure Pipe and Fittings Installation
Section 34.4	Ductile Iron Pressure Pipe and Fittings Installation
Section 34.5	Valve Casing and Lid Installation
Section 34.6	Earthwork for Ductile Iron and PVC Pipe Installation
Section 34.7	Backfilling and Tamping
Section 34.8	Testing and Sterilization

Section 34.9 Signage
Section 34.10 Abandonment

Reviewed and Approved:

Andrew Benelli P.E.
City Engineer

Oct. 15, 2014
Date

Scott Mozier, P.E.
Public Works Director

Oct. 15, 2014
Date

ADDENDUM NO. 5
TO
CITY OF FRESNO
PUBLIC WORKS STANDARD SPECIFICATIONS
ADOPTED MARCH 4, 1970
RESOLUTION NO. 70-36
UPDATED VERSION APPROVED October 15, 2014

This addendum is attached to and made a part of the above-entitled standard specifications.

The following City Standard Drawings have been amended as indicated below:

P-1	Adjusted minimum driveway lengths and pedestrian requirements.
P-2	Adjusted minimum driveway lengths and pedestrian requirements.
P-3	Added notes regarding compaction.
P-4	Added notes regarding compaction.
P-5	Added notes regarding compaction.
P-6	Revised and corrected notes.
P-7	Revised notes and implemented a minimum radius.
P-9	Provided soil compaction requirements.
P-10	Corrected notes and added notes regarding compaction.
P-18	Provided clarity.
P-28	Corrected dimensions and wheelchair ramp, corrected notes.
P-29	Corrected dimensions and wheelchair ramp, corrected notes.
P-30	Corrected dimensions and wheelchair ramp, corrected notes.
P-41	Added RW (Recycled Water) to this utility location guideline.
P-42	Added RW (Recycled Water) to this utility location guideline.
P-50	Added R-value testing requirements. Added notes 9 and 10.

P-51	Showed expressway barrier fences at expressways.
P-52	Corrected drawing to accurately reflect dimensions, corrected lane width dimensions.
P-54	Corrected drawing to accurately reflect dimensions, corrected lane width dimensions.
P-55	Removed former note #3.
P-56	Corrected drawing to accurately reflect dimensions. Added notes 5, 6 and 7.
P-58	Revised notes, decreased shoulder width and slope, and added shoulder material.
P-59	Increased soil compaction requirement, decreased shoulder width and slope, and added shoulder material.
P-69	Adjusted curve radii and provided a varied left turn lanes.
P-70	Adjusted curve radii and provided a varied left turn lanes.
P-75	Relocated the location of the expressway barrier fence and adjusted curve radii.
P-85	Removed bump outs and added soil compaction requirements.
P-97	Changed dimensions of temporary ponding basins.
E-1	Added drawing references to notes in lieu of former text, clarified text and drawing details.
E-2	Added drawing references to notes, clarified text, changed PVC conduit to NM.
E-3	Added drawing references to notes, clarified text.
E-4	Deleted, replaced with new drawings E-4A, E-4B & E-4C.
E-5	Added note regarding “no splices in pull boxes”.
E-13	Deleted PVC loop drawing, replaced with bike loop detector drawing.
E-14	Add note and symbol for Bike Loop Detector.

E-15	Changed 2-pole branch circuit breakers to 1-pole.
E-17	Added "Note 2", corrected service conduit size.
E-18	Changed 2-pole branch circuit breakers to 1-pole.
E-19	Changed "Note 2".
E-20	Changed "Note 2", added Ped PB Post reference.
E-21	Changed "Note 3" to "Lock Jaw Locking Lid".
E-24A	Modified drawing for clarity.
E-26	Updated part numbers.
E-27	Modified conduit drawing for clarity.
E-28	Deleted, replaced with E-4C.
E-34A	Corrected text errors in "Caution" note, changed "752" discriminator to "762".
E-34B	Deleted "Curve 3 or Delay 22" requirement, added detector number labels.
E-34C	Removed jumpers from diagram, added lower input panel diagram.
E-35	Changed "Note 3".
E-36	Changed 2-pole branch circuit breakers to 1-pole.
ITS-18A	Added (Gooseneck) to Title Block
	Added, Camera Cat 5 – "Red Taped"
	Updated, access hole see note 1, replaced with text, "access hole see note 2"
	Deleted reference, "See note 1"
	Callout beginning with, Cat 5e, deleted, "and power cables". And inserted text after RED, "electrical waterproof."
	Deleted, "See Note 2", replaced with text, "See Note 1"

Deleted "Note 1", text.
(Numbered Notes re-numbered accordingly.)

Note 1, inserted text after RED, "electrical waterproof", the word RED shall be made bold.

Note 2, Replaced second sentence with, "Use rubber grommet to seal."

Note 3, Removed period and Added, "or as directed by City engineer."

Note 4, Added.

Note 5, Added.

Note 6, Added.

ITS-20A — Added, Note 4, 5 & 6.

Side View & Front view, deleted 1" and replaced text with ¾".

Side View & Front view, Added, "Grounding Clamp (Acorn) ½" x 8' copper clad."

Updated callout, to, *Pipe height shall be 2"-3" above foundation.

Updated callout, deleted text Communication and replaced with," HDPE"

Side view and Front view drawing, added, grounding rod.

ITS-21 — Note 5, deleted "with approved lug", and added, "per current NEC Standards."

Drawing: deleted "120v to Transformer", text, and transformer depiction.

ITS-21A — Sheet deleted – "Model 336 Communication Cabinet Wiring Diagram".

ITS-21B — Add Callout, "Fiber Optic Jumper"

Delete, callout, "Camera Power Assembly ... Cable"

Add callout, 4' Cat5e Patch Cable"
Remove, Camera Power Assembly line drawing in its entirety.

ITS-22	Drawing: Added various callouts and expanded concrete foundation area. Added note 5, regarding foundation grounding.
ITS-23	Drawing: Added various callout notes and expanded concrete foundation area. 12" Concrete apron expanded to 48" around hub pedestal," 18" thick concrete foundation, 4"x4" #2 wire reinforced". Placement of round hand holes is 8.5" from hub pedestal within 48" concrete apron area. Added five numbered notes, regarding foundation construction.

The following City Standard Drawings are new as indicated below:

E-4A	Traffic Signals concrete pull boxes.
E-4B	Streetlights concrete pull boxes.
E-4C	Streetlights point of service concrete pull boxes.
E-37	332L Cabinet foundation.
ITS-18B	Traffic Signal Mounted IP Camera.
ITS-21C	336 Communication Cabinet Wiring Diagram, 1 of 2.
ITS-21D	Model 336 Communication Cabinet Power Distribution, 2 of 2.
ITS-28A	ITS Wireless Pole Repeater Installation (Powered through street light)
ITS-28B	ITS Wireless Pole Repeater Installation (Powered through service pedestal).
ITS-28C	Repeater Circuit Breaker
ITS-29A	ITS Hub Cabinet, I of 2
ITS-29B	ITS Hub Cabinet, Plate Anchor, 2 of 2

In addition to the standard drawings, changes that have been made to the Standard Specifications are as follows:

13-5	Changed "Seal Coat" to "Slurry Seal" and aggregate type and asphalt emulsion gradation.
16-6	New Section added, "Pave Back Requirements for City Streets".
16-7	Revised Section number for old Section 16-6
17-2.2.1	Changing Pipe Size from 18-48 to 18-60. ASTM F 679 now goes up to 60-inch.
	Changing Pipe Size from 21-54 to 18-60. ASTM F1803 has changed.
17-2.2.2	Added text "or pipe stiffness" to #3 regarding identification marks.
17-2.2.3 B	In paragraph 3 added the word "of" to make the sentence grammatically correct.
	In Property chart, row 5, replaced "o" with degree symbol. Typo error.
	In Property chart, row 7, replaced 70 with 72. Updated to match F477 ASTM Standard.
	In Property chart, row 7, replaced "o" with degree symbol. Typo error.
17-2.2.4	In paragraph A, removed D 3033. This standard no longer exists.
	In paragraph A, added F 1803. New ASTM standard
	In paragraph A, revised the word "manufacture" to "manufacturer" to correct a spelling error.
	In paragraph B, replaced "E" the degrees symbol for all temperature references. Typo error.
17-2.3.1	In paragraph 2, added degree symbol to 360. Was left out.
17-2.3.2	Added "or C-655" as an option for ASTM reinforced concrete pipe.
17-2.4	Removed the word "State" from State Standard. This is not a state standard.

17-7 In paragraph 2, changed the word "providing" to "provided". Fixing grammatical error.

In paragraph 2, deleted the last sentence "New connections must comply with drawing S-1, S-8, and 2-9." This sentence is covered in paragraph 1 of this section.

17-8.1 Change "Standard Drawings S-2 through S-5" to "Standard Drawings S-2 through S-4". S-5 doesn't apply.
Change "slope 1:12" to "slope minimum 1:12". Makes it consistent with call out in the sewer drawing.

17-8.2 Changed paragraph 4 to read "Manholes shall not be installed in flow channels of gutters, or in depressions subject to storm waters or other infiltration, sidewalks, roundabouts, brick crosswalks or have any brick surrounding the manhole cover." To avoid damage to existing structures.

17-8.3 In paragraph 1, remove "Class II" from sentence. No longer referenced in the City Standard.

In paragraph 4, change "Class II" to "6 sack" to better define concrete requirements.

Add paragraph 5, which reads: "Unless specified otherwise, manholes on sewer mains 12 inches in diameter or larger, or on any size sewer mains within 600 feet of and connected to sewer mains 30 inches in diameter or larger shall be lined with T-lock or coated with one of the following: Raven 400 or Raven 405, products of RLS Solutions; Neopoxy 5300 series, products of Neopoxy International; or Quadex Structure Guard, a product of Quadex." The coating will aid in protecting the manhole from corrosion.
Add paragraph 6, which reads: "Approved products shall be applied per manufacturer's specifications. No substitutions are acceptable." To ensure proper installation.

17-8.4 In paragraph 2, removed "size and" from sentence 2, to make it consistent with Standard Drawing S-12.

In paragraph 4, added sentence "When connecting to the existing stub-outs and the plug is removed, a new square cut shall be done to the existing stub-out prior to connection on the new sewer main." To ensure a smooth transition and eliminate build-up.

17-8.5 Changed section title from "Removal" to "Abandon and Removal". This section now covers manholes being abandoned and removed.

17-9 Revised thimble to stub. Added sentence, "When connecting to the existing stubs and the plug is removed, a new square circumferentially cut shall be done to the existing stub prior to connection on the new sewer main." To ensure a smooth transition and eliminate build-up.

17-12 Added 2 new requirements, numbered 3 and 4. To ensure adequate video inspection and assure proper installation.

Requirements 3 through 13 changed to 5 through 15.

Requirement 7 (now 9), added "to identify any rolled gasket in" to the sentence for clarification.

In paragraph 1, changed "is" to "will be" to correct grammatical error.

Change hourly pricing from $135.39 to $134.39

23-1.1 Paragraph 2: Delete "latest edition" reference.

23-1.5 Paragraph 1 added, requiring the continued operation of existing systems.

23-1.7 Paragraph 2: Remove first sentence regarding use of Portland Cement Concrete

Paragraph 5: Add text "in pole foundations".

Paragraph 6: added 3rd sentence restricting cabinet modification.

Paragraph 11: added "as shown in Dwg. E-37"

23-1.9 Paragraph 2: Clarified use of PVC conduit.

Paragraph 6: Clarified bonding bushings shall have integral lay-in lugs

Paragraph 8: Added sentence regarding conduits not placed under sidewalk and that they will be encase in slurry.

Paragraph 10: Add note, "No 90° elbows shall be installed unless specified or approved.

23-1.10	Paragraph 4: Clarify PG&E lid requirement. Deleted Fyberlite pull box lids. Paragraph 6: Clarify concrete collar depth.
23-1.11	Paragraph 8: Detailed pushbutton conductor installation . Paragraph 10: Clarified "stranded" wire and tinning of loose strands. Paragraph 11: Clarified AMP/TYCO 320359 terminals for load bay only. Paragraph 12: Deleted AMP/TYCO terminal usage on input terminal blocks. Deleted coaxial cable references.
23-1.12	Moved fuses from hand hole to luminaire.
23-1.13	Paragraph 3: Clarified use of proper ring terminal for stranded ground wire.
23-1.15	Paragraph 2: Added "when allowed".
23-1.18	Paragraph 9: "When allowed" reused pedestrian signals shall have an LED ... Deleted obsolete reference to medium base lamp socket. Deleted obsolete LED power consumption and arrangement references.
23-1.19	Paragraph 1: Noted; Detectors shall "be supplied by an approved manufacturer and"... Deleted obsolete reference to encased loop wire. Paragraph 3: Clarified DLC "IMSA spec. 50-2" requirement. Paragraph 4: Detailed DLC drain wire termination.
23-1.20	Paragraph 2: Updated; Pedestrian pushbuttons shall meet or exceed "the 2010" ADA req. Paragraph 6: DLC connection to pushbutton.
23-1.21	Updated audible Pedestrian Signal specs, deleted obsolete text.

23-1.22	Paragraph 3: Deleted green monitor requirement. Paragraph 8: Detailed detector mounting requirements. Paragraph 9: Changed phase selector type from 752 to 762 or equiv.
23-1.23	Paragraph 1,2,3: Changed luminaire from HPS to LED. Moved fuse location from the hand hole to the luminaire, added luminaire internal fuse requirement. Paragraph 6: Added reference to DWG. E-25, noted adhesive backed numbers shall be Almetek PS-2.5 or equivalent, pole numbers shall be shown on "as-built" plans.
23-1.25	Added Note "2", requiring pre-inspection one day prior to turn-on.
23-1.26	added Manual of Traffic Control "Caltrans adopted" notations.
23-2	Deleted references to Model 170E controllers and 332A controller cabinets. Listed required modifications per Dwgs. E-34A, E-34B and required equipment and quantities. Changed approved controller manufacturer to Naztec 2070L.
23-3.5	Add paragraph 1 requiring existing systems to remain operational.
23-3.7	Paragraph 3: Noted all dirt and debris to be cleaned before pouring concrete.
23-3.8	Paragraph 2: Specified all hand hole covers must be steel. Paragraph 6: Added reference to DWG. E-25, noted adhesive backed numbers shall be Almetek PS-2.5 or equivalent, pole numbers shall be shown on "as-built" plans.
23-3.9	Paragraph 6: Clarified bonding bushings shall have integral lay-in lugs. Paragraph 13: Added note pertaining to conduit entry in bottom of pull boxes in non-concrete areas. Deleted PVC bushing requirement.
23-3.10	Paragraph 3: Updated locking lid specifications. Paragraph 6: Changed conduit bottom entry specifications for pull boxes in non-concrete areas.

23-3.12	Relocated fuse from hand hole to luminaire, specified fuse holder.
23-3.16	Changed luminaire from HPS to LED, specified internal fuse. Added reference to DWG. E-25, noted adhesive backed numbers shall be Almetek PS-2.5 or equivalent, pole numbers shall be shown on "as-built" plans.
23-3.17	Paragraph 2: Added "long life" to PEC spec.
23-4	Added Ornamental Street Lighting specifications.
28-3	Specified minimum application of a slurry seal application when removing pavement markings.
30	Deleted section, incorporated into section 23.
31-9	Added, 18 fiber optic holding racks
	Deleted, "steps to climb down into the vault for maintenance"
	Added, conduits shall extend minimum 6", 8" maximum, beyond the inner wall of any vault or structure
	Deleted, "pull box" added vault
31-10	Added, 18 fiber optic holding racks
	Deleted, "steps to climb down into the vault for maintenance"
	Added, conduits shall extend minimum 6", 8" maximum, beyond the inner wall of any vault or structure
	Deleted, "pull box" added "vault"
31-11	Added, conduit shall be certified by the manufacturer with a Letter of Certification documenting that the conduit meets the performance requirements and material requirements of ASTM F2160. Communication conduit shall be marked with the ASTM F2160 designation. In the event of a discrepancy between these specifications and ASTM F2160, the requirements of ASTM F2160 shall govern.
	Added, one conduit shall be installed with a tonable pull tape.

The following City Standard Specifications are new as indicated below:

35-1	General
35-2	Sewer Crossings
35-3	Recycled Water Crossings

ADDENDUM NO. 6
TO
CITY OF FRESNO
PUBLIC WORKS STANDARD SPECIFICATIONS
ADOPTED MARCH 4, 1970
RESOLUTION NO. 70-36
UPDATED VERSION APPROVED June, 2015

This addendum is attached to and made a part of the above-entitled standard specifications.

The following City Standard Drawings have been amended as indicated below:

E-1	Added reference to Standard Specifications Section 23-3.16 for Luminaire and 23-3.1 for Photoelectric Cell.
E-2	Added reference to Standard Specifications Section 23-3.16 for Luminaire and 23-3.1 for Photoelectric Cell.
E-3	Added reference to Standard Specifications Section 23-3.16 for Luminaire and 23-3.1 for Photoelectric Cell.
E-7	Changed light wattage reference to Local or Safety as defined in Standard Specifications Section 23-3.16; also changed luminaire symbol to filled circle for Local and open circle for Safety.
E-8	Changed light wattage reference to Local or Safety as defined in Standard Specifications Section 23-3.16.
E-9	Changed light wattage reference to Local or Safety as defined in Standard Specifications Section 23-3.16; also changed luminaire symbol to filled circle for Local and open circle for Safety.
E-10	Changed light wattage reference to Local or Safety as defined in Standard Specifications Section 23-3.16
P-76	Added Note to increase vehicle stacking.
P-77	Added Note to increase vehicle stacking.
RW-2	Added tracer wire Added minimum concrete pad thickness of 6" (typ) Added butterfly valve option
RW-6	Changed meter box lid type

Added tracer wire
Removed transition coupler
Removed Note 5
Removed Note 6
Added note to drawing stating elbow can be 45° (typ.)
Clarified note to drawing regarding stamp in curb face
Clarified Note 4 regarding thickness of concrete slab

RW-7

Added tracer wire
Raised finish grade on drawing
Revised note on drawing regarding end cap
Revised Note 1
Revised note on drawing regarding pipe material from copper to galvanized
Added note to drawing regarding elbow
Removed petcock note on drawing
Added gate valve call out on drawing

RW-8

Added tracer wire

RW-9

Added minimum clearances to concrete pad
Added tracer wire
Revised copper pipe callout from soft to "K" Rigid
Revised meter stop callout to corp stop
Clarified type of solder joints
Clarified type of saddle
Revised galvanized pipe callout between air valve and the adjacent below grade elbow to Type "K" Rigid Copper
Removed water valve and valve box from drawing
Revised galvanized adapter callout to copper

RW-10

Added tracer wire
Added gate valve requirement for 4" and above to drawing
Added minimum concrete pad thickness of 6" (typ)

S-2

Added minimum collar width of 12" (Typ.)
Revised General Note 2 regarding lining and coating material.

S-3

Added minimum collar width of 12" (Typ.)
Added note to drawing on manhole frame and cover regarding 27" diameter pipes.
Revised Note 4 regarding lining and coating material.

S-4

Added minimum collar width of 12" (Typ.)

Revised Note 3 regarding lining and coating material.

S-5B Added Note 8 regarding placement of manhole cover opening.

S-7 Replace "S-7" with "S-7A and S-7B"

S-8 Changed house branch Tee Fitting material to SDR35 to match uniform plumbing code
Changed compression fitting to Gasket PVC Hub
Added "Total gap not to exceed ½"" note to ensure proper connection is made.

S-9 Clarified Note 4 regarding maximum extension of the saddle into the sewer main.

S-10 Replace "Ref. Std. Dwg. P-40" with "Ref. Std. Dwg. P-48"

S-11A Added note to "Min. Model Height" to address heights less than minimum.

S-12 Correction to Note 2.

The following City Standard Drawings are new as indicated below:

P-87 NEWSRACKS IN SPECIAL DISTRICTS – Created new Public Works Standard Drawing for Newsracks in Special Districts as required by proposed City Ordinance to add Article 7 to Chapter 13 of the Fresno Municipal Code.

RW-24 Tracer Wire Splice Connection Detail

In addition to the standard drawings, changes that have been made to the Standard Specifications are as follows:

7-3 Revised to substitute most current City of Fresno insurance requirements

23-16 Changed luminaire from HPS to LED light source (complete replacement of listed section)

23-17 Paragraph 2: Added "long life" to PEC spec.

Reviewed and Approved:

Andrew Benelli, P.E.
City Engineer

June 25, 2015
Date

Scott Mozier, P.E.
Public Works Director

June 25, 2015
Date

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Reviewed and Approved:

Andrew Benelli, P.E.
City Engineer

Aug 28, 2015
Date

Scott Mozier, P.E.
Public Works Director

8/28/2015
Date

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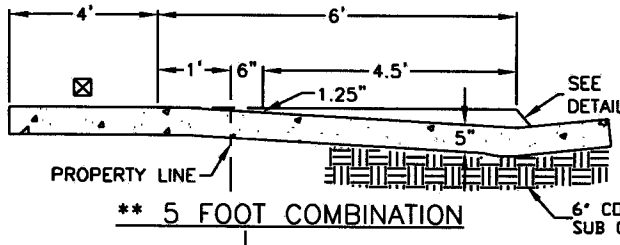
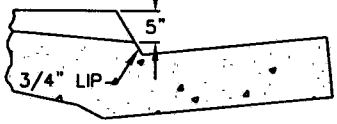
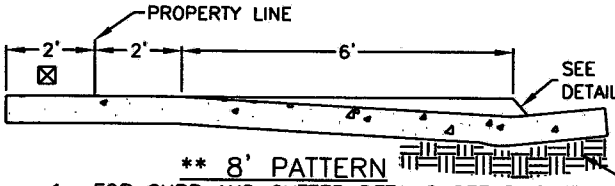
DENOTES UNOBSTRUCTED ONSITE PEDESTRIAN LANDING AREA PER A.D.A. REQUIREMENTS
PEDESTRIAN EASEMENT REQUIRED



** 5 FOOT COMBINATION

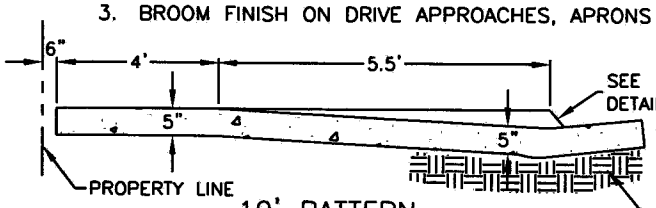


DETAIL "A"



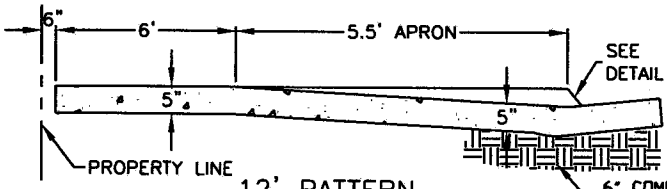
** 8' PATTERN

1. FOR CURB AND GUTTER DETAILS SEE DWG. P-5
2. ** 5' AND 8' PATTERNS ARE FOR USE ON RETROFITS AND/OR WITH APPROVAL OF THE CITY ENGINEER.
3. BROOM FINISH ON DRIVE APPROACHES, APRONS

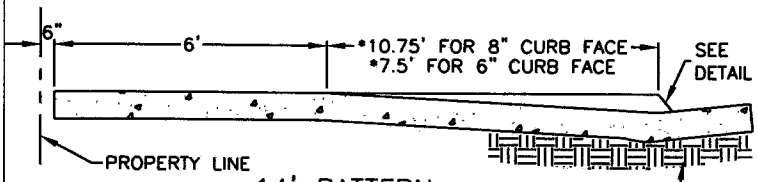


10' PATTERN

NOTE: CONSTRUCT WEAKENED PLANE JOINT ON CENTERLINE WHEN WIDTH IS 10 FEET OR GREATER.



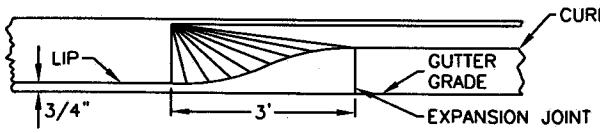
12' PATTERN



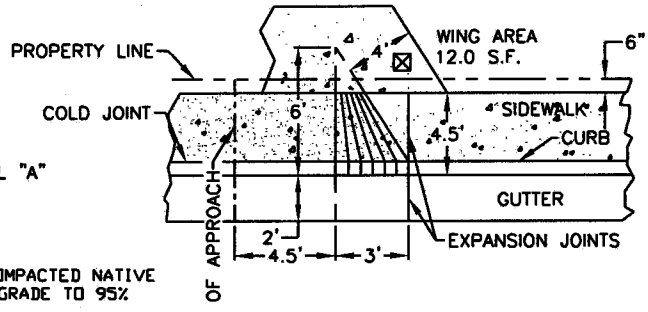
14' PATTERN

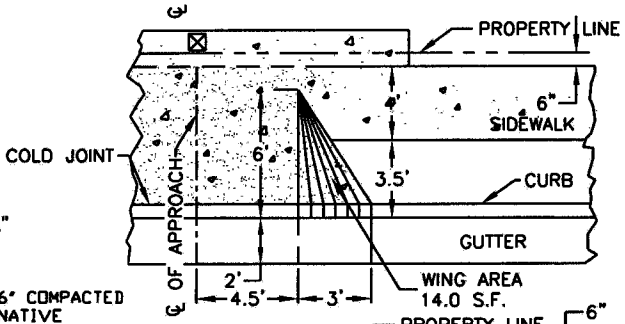
NOTE: DRIVEWAY APPROACH THICKNESS SHALL BE 6" WHEN USAGE IS OTHER THAN WITH NORMAL PASSENGER VEHICLES.

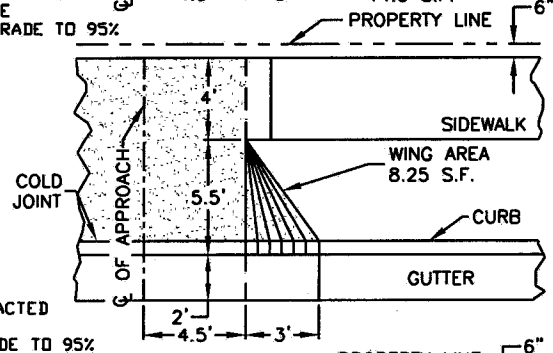
* MINIMUM LENGTH OF APRON

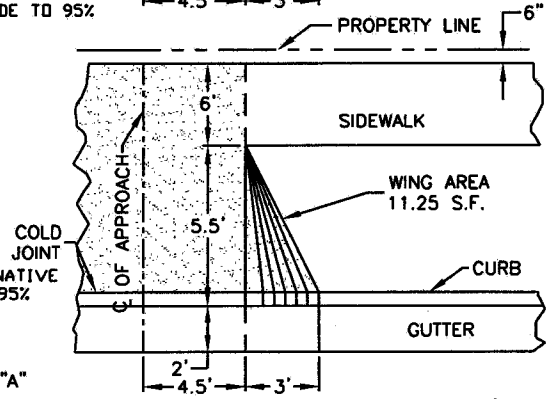


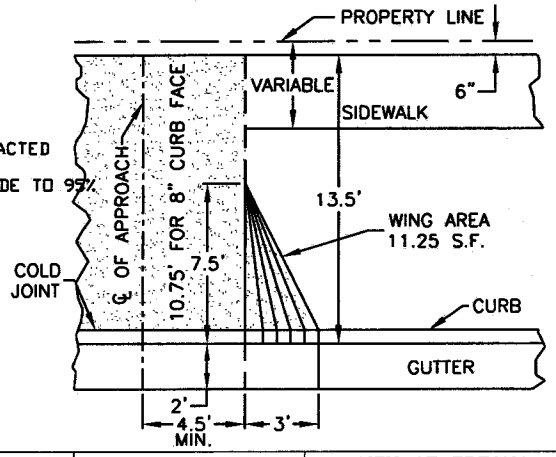
ELEVATION











RESIDENTIAL DRIVEWAY APPROACHES

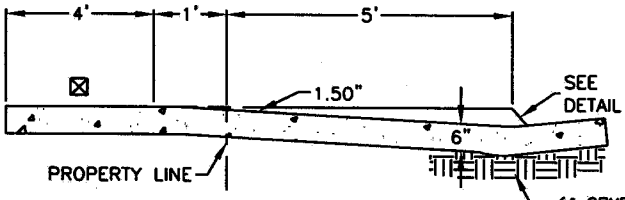
FOR 14' - 12' - 10' - 8' PATTERN AND FOR 5' COMBINATION

REF. & REV. JUNE 2015

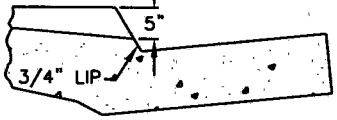
CITY OF FRESNO

P-1

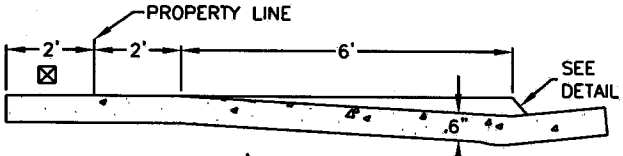
DENOTES UNOBSTRUCTED ONSITE PEDESTRIAN LANDING AREA PER A.D.A. REQUIREMENTS
PEDESTRIAN EASEMENT REQUIRED



** 5 FOOT COMBINATION

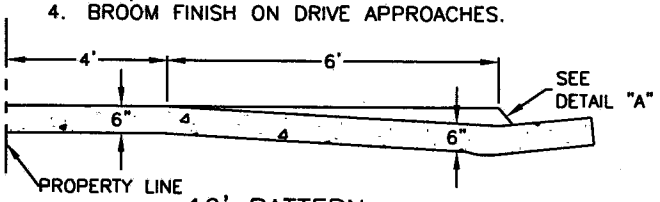


DETAIL "A"



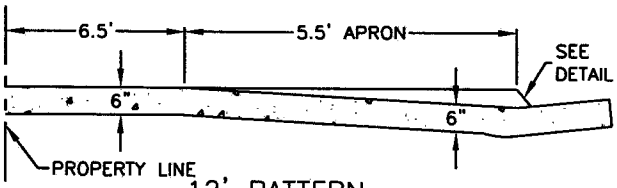
** 8' PATTERN

1. FOR CURB AND GUTTER DETAILS SEE DWG. P-5
2. CONCRETE SHALL BE 6 SACK MIX.
3. ** 5' AND 8' PATTERNS ARE FOR USE ON RETROFITS AND/OR WITH APPROVAL OF THE CITY ENGINEER.
4. BROOM FINISH ON DRIVE APPROACHES.

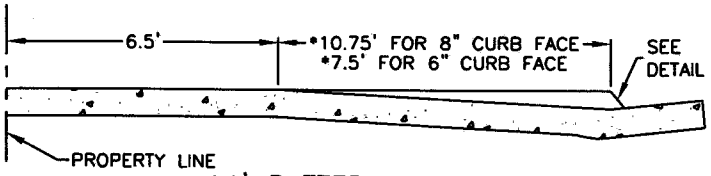


10' PATTERN

NOTE: CONSTRUCT WEAKENED PLANE JOINT ON CENTERLINE WHEN WIDTH IS 10 FEET OR GREATER.



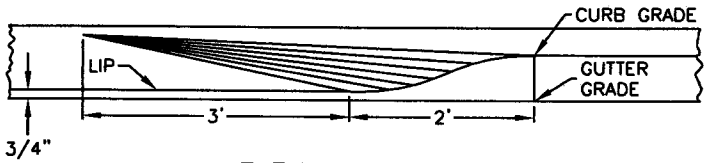
12' PATTERN



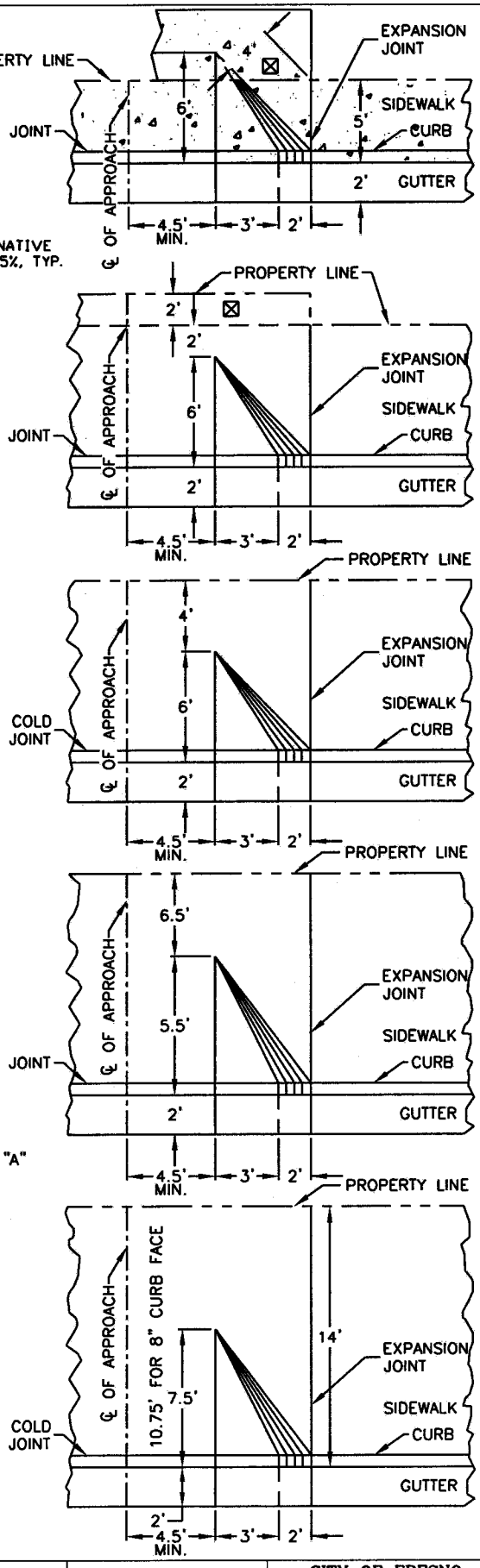
14' PATTERN

NOTE: APRON MAY BE EXTENDED TO THE NEAREST SCORE LINE GREATER THAN THE MINIMUM DISTANCE FROM THE CURB. MAXIMUM APRON SLOPE IS 7.5%.

* MINIMUM LENGTH OF APRON



ELEVATION



COMMERCIAL DRIVEWAY APPROACHES

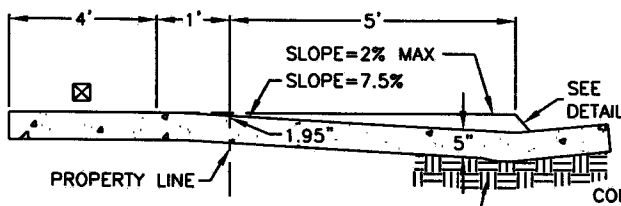
FOR 14' - 12' - 10' - 8' PATTERN AND FOR 5' COMBINATION

REF. & REV. JUNE 2015

CITY OF FRESNO

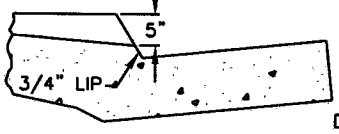
P-2

DENOTES UNOBSTRUCTED ONSITE PEDESTRIAN ☒ LANDING AREA PER A.D.A. REQUIREMENTS
PEDESTRIAN EASEMENT REQUIRED

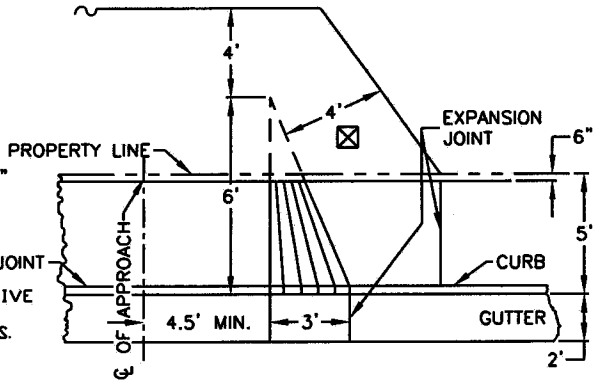


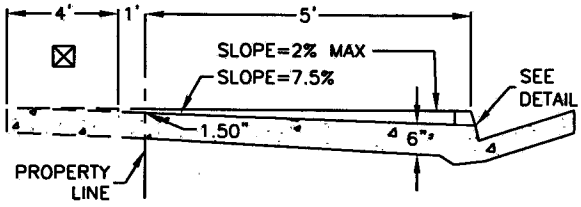
** RESIDENTIAL 5' COMBINATION

6" COMPACTED NATIVE SUBGRADE TO 95%, TYP. ALL PATTERNS.

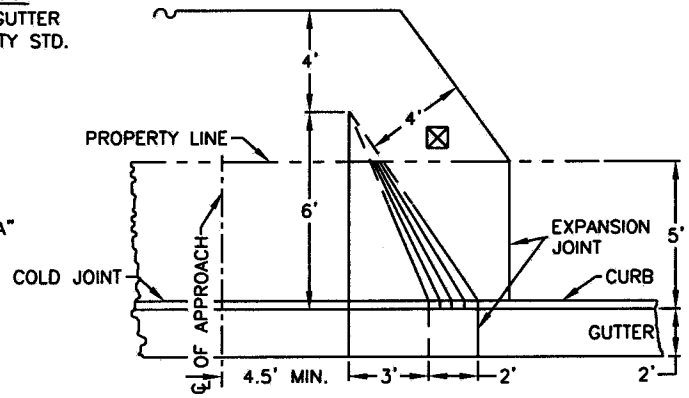


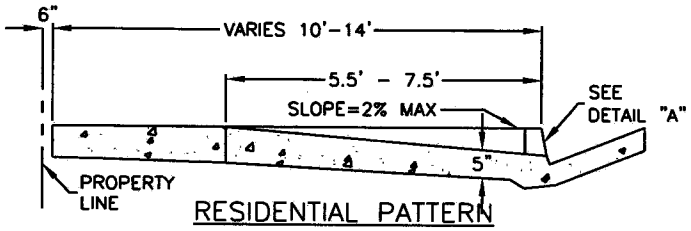
DETAIL "A"
FOR CURB & GUTTER DETAILS, SEE CITY STD. P-5



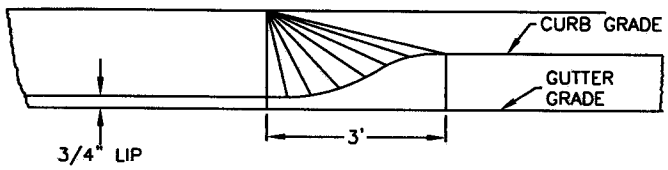


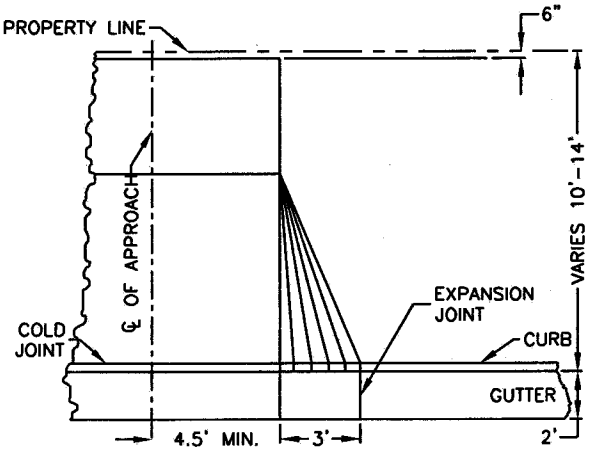
** COMMERCIAL 5' COMBINATION

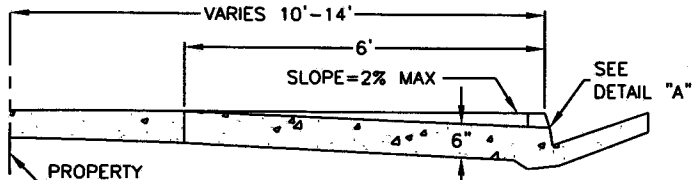




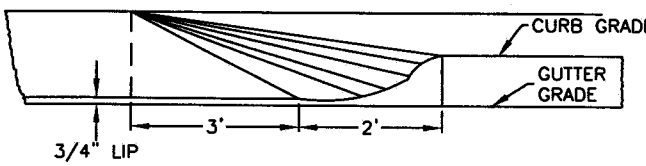
RESIDENTIAL PATTERN

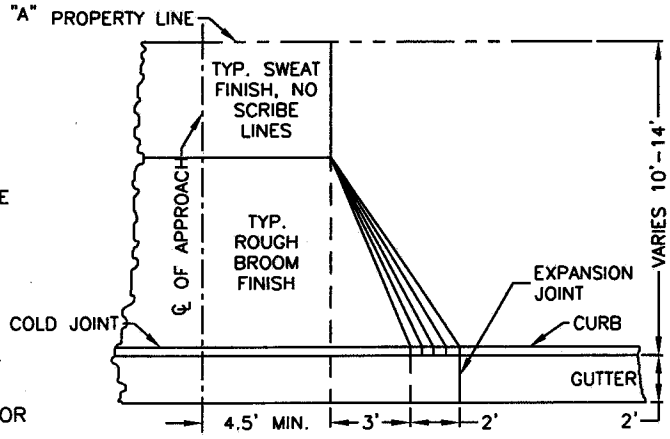






COMMERCIAL PATTERN





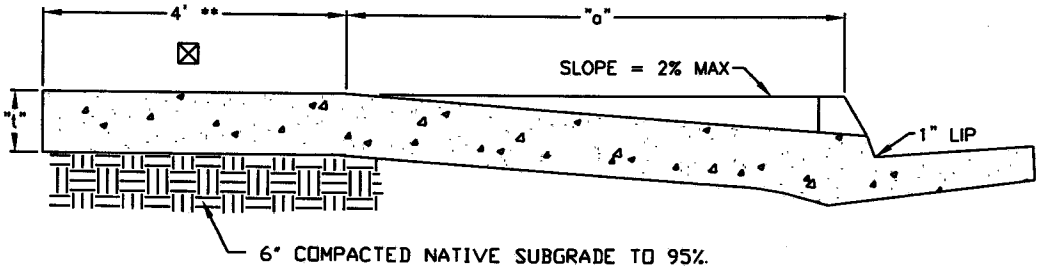
NOTE: WHERE STANDARD WALK IS NOT REQUIRED BY ORDINANCE OR WHERE WALK HAS BEEN WAIVED.
** 5' PATTERNS ARE FOR USE ON RETROFITS AND/OR WITH APPROVAL OF THE CITY ENGINEER.

DRIVEWAY APPROACHES
FOR VARIOUS CURB PATTERNS

REF. & REV.
JUNE 2015

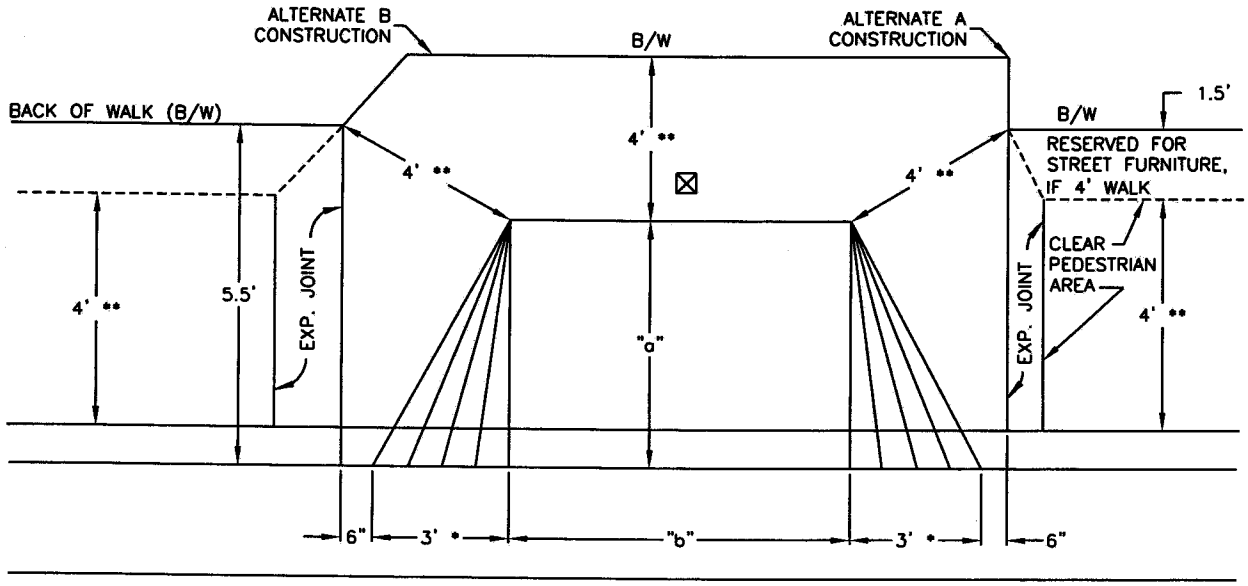
CITY OF FRESNO
P-3

☒ = DENOTES UNOBSTRUCTED ONSITE PEDESTRIAN LANDING AREA REQUIRED IN ACCORDANCE WITH A.D.A. A PUBLIC PEDESTRIAN EASEMENT SHALL BE DEDICATED IF 4' SIDEWALK EXTENDS INTO PRIVATE PROPERTY.



"a" = 3.75' FOR 1 OR 2 DWELLING UNITS
"a" = 4.75' FOR MULTIFAMILY, OFFICE, AND COMMERCIAL WITH UP TO 10 PARKING SPACES.
"a" = 5.75' FOR MULTIFAMILY, OFFICE, AND COMMERCIAL WITH MORE THAN 10 PARKING SPACES.
"t" = RESIDENTIAL EQUALS 5", COMMERCIAL USE EQUALS 6".

"b" = 9', SINGLE FAMILY RESIDENTIAL D.W.
"b" = 12', ONE WAY EXIT
"b" = 15', ONE WAY ENTRANCE
"b" = 22', TWO WAY D.W.

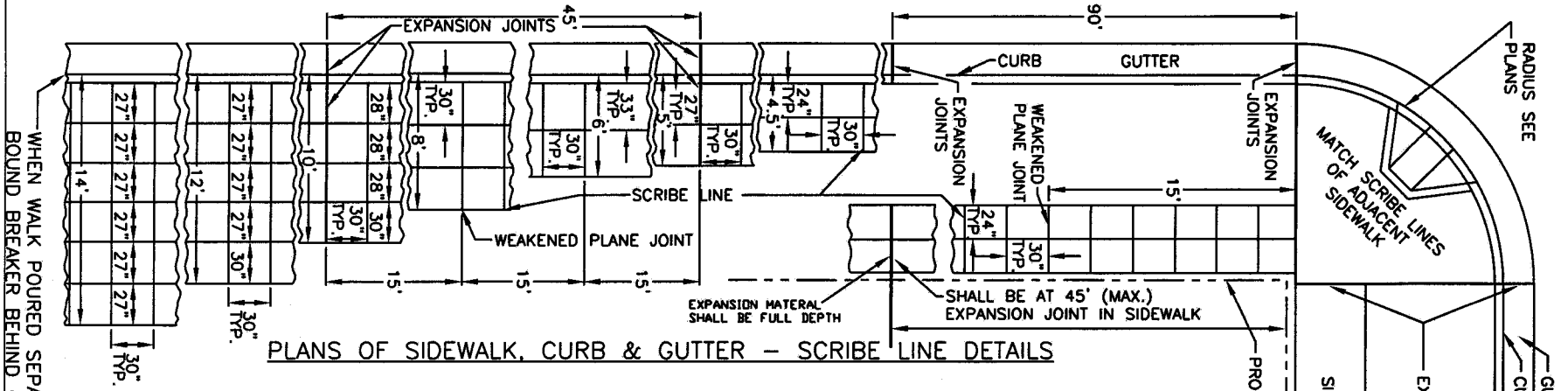


*5' FLARE IF ON STREET PARKING IS PROHIBITED.

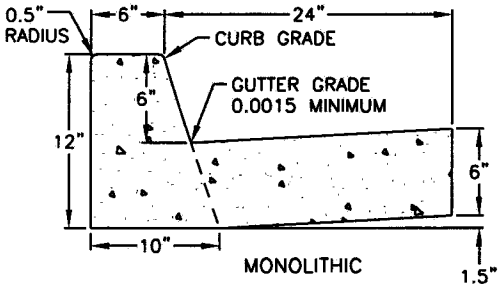
**SIDEWALK WIDTH, 4.0' MINIMUM, FOR ADA REQUIREMENTS, CROSS SLOPE NOT TO EXCEED 2%. SIDEWALK CAN BE CONSTRUCTED IN ACCORDANCE WITH ALTERNATES (A) OR (B) ABOVE OR AS APPROVED BY THE CITY.

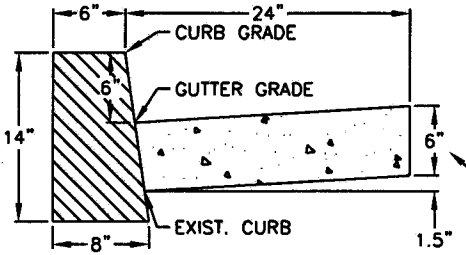
LOCAL STREET DRIVEWAY APPROACHES FOR MONOLITHIC SIDEWALKS	REF. & REV. JUNE 2015	CITY OF FRESNO P-4

CONSTRUCTION DETAILS
FOR CONCRETE SIDEWALK, CURB & GUTTER



PLANS OF SIDEWALK, CURB & GUTTER – SCRIBE LINE DETAILS

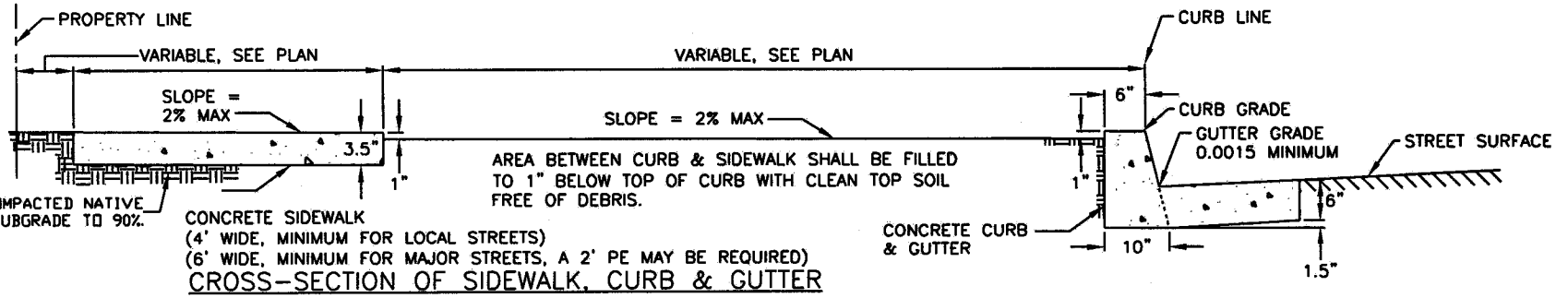




SECTIONS OF CURB & GUTTER

NOTE:
WHEN REQUIRED BY THE ENGINEER THE CONTRACTOR SHALL FILL AND/OR GRADE AREA BETWEEN NEW GUTTER AND EXISTING STREET SURFACE WITH A.C. SURFACING TO A MIN. DEPTH OF 4" TO MEET EXISTING STREET SURFACING. COMPACTION SHALL BE MADE TO THE SATISFACTION OF THE ENGINEER. CLEAN FACE OF EXIST CURB BEFORE POURING CONCRETE GUTTER.

NOTE:
WHERE SIDEWALK IS NOT CONSTRUCTED, CUT OR FILL FROM 1" BELOW TOP OF CURB TO PROPERTY LINE AT A SLOPE OF 1/4" PER FOOT. A STEEPER SLOPE OF UP TO 10% MAY BE USED IN EXISTING RESIDENTIAL NEIGHBORHOODS WHERE (1) THE CONSTRUCTION OF SIDEWALK IS NOT EXPECTED IN THE FUTURE, (2) THE STEEPER SLOPE IS COMPATIBLE WITH THE ADJACENT PROPERTY, AND (3) THE STEEPER SLOPE WILL ELIMINATE THE NEED FOR A RETAINING WALL. SLOPES IN EXCESS OF 10% MAY BE APPROVED BY THE PUBLIC WORKS DIRECTOR ON A CASE-BY-CASE BASIS. 4' MINIMUM SIDEWALK FOR LOCAL STREETS AND 6' MINIMUM SIDEWALK FOR MAJOR STREETS.



CROSS-SECTION OF SIDEWALK, CURB & GUTTER

REF. & REV.
JUNE 2015

CITY OF FRESNO

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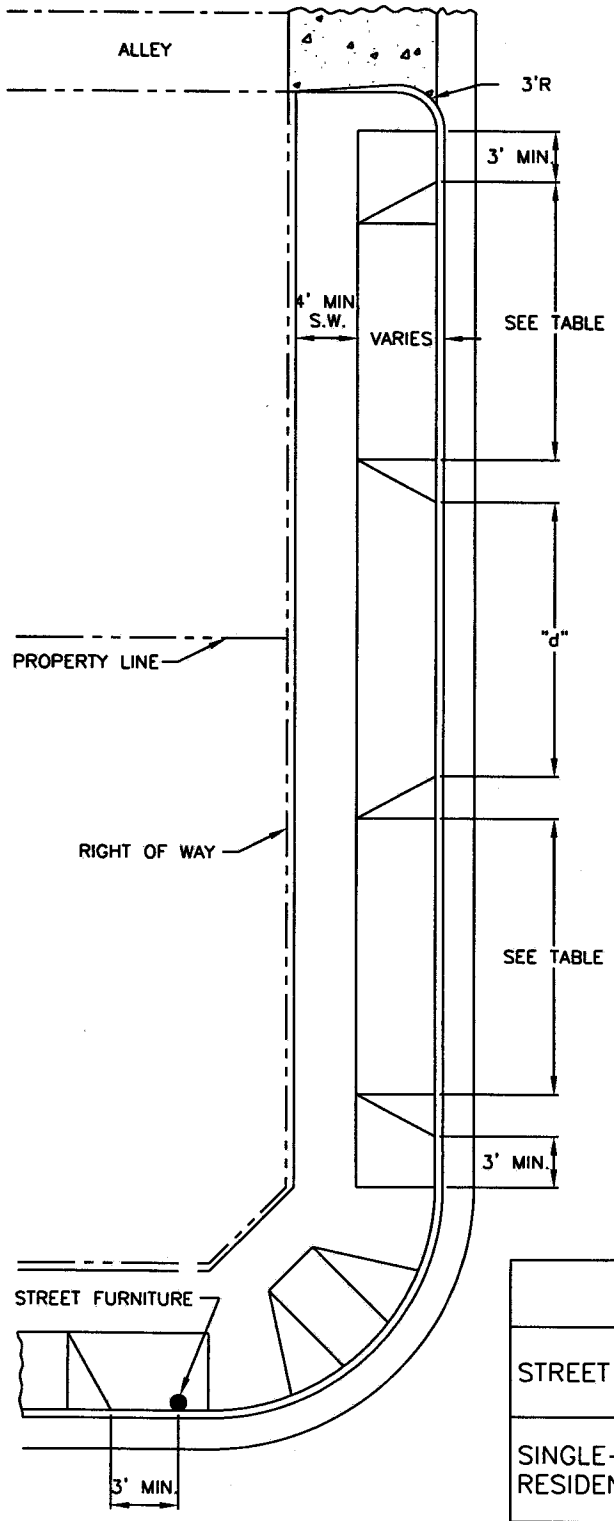

NOTES:

1. NO MORE THAN 60% OF STREET FRONTAGE SHALL BE CONSTRUCTED AS DRIVEWAY OPENINGS.
2. "d" = 6' MINIMUM AND LESS THAN 12' OR GREATER THAN 20'.
3. THE TRAFFIC ENGINEER MAY APPROVE >35', <40'.
4. IN COMMERCIAL, INDUSTRIAL, AND MULTI-FAMILY DEVELOPMENTS, CITY ENGINEER MAY APPROVE ≥40'.
5. MAJOR STREETS: PROVIDE 10' OF RED CURBING (3 COATS) ON BOTH SIDES OF DRIVEWAY APPROACHES.
6. FOR COMMERCIAL, INDUSTRIAL OR MULTI-FAMILY: 16' MIN.
7. ANY DRIVEWAY APPROACHES ON MAJOR STREET WITHIN 300' OF MAJOR INTERSECTIONS REQUIRE THE APPROVAL OF THE TRAFFIC ENGINEER. THE TRAFFIC ENGINEER MAY APPROVE ONE DRIVEWAY APPROACH WITHIN THAT ENTIRE LENGTH. ADDITIONAL DRIVEWAY APPROACHES REQUIRE THE REVIEW AND APPROVAL OF THE CITY ENGINEER.

DRIVEWAY OPENING

	MINIMUM		MAXIMUM	
STREET TYPE	MAJOR STREET	LOCAL STREET	MAJOR STREET	LOCAL STREET
SINGLE-FAMILY RESIDENTIAL DRIVE	18'	12'	24' ③	35'
ALL OTHER TWO-WAY	30'	24'	35' ④	35'
ONE-WAY ENTRANCE	18'	15' ⑥	24'	24'
ONE-WAY EXIT	12' ⑥	12' ⑥	24'	24'

DRIVEWAY OPENING AND CLEARANCE REQUIREMENTS

REF. & REV. JUNE 2015

CITY OF FRESNO

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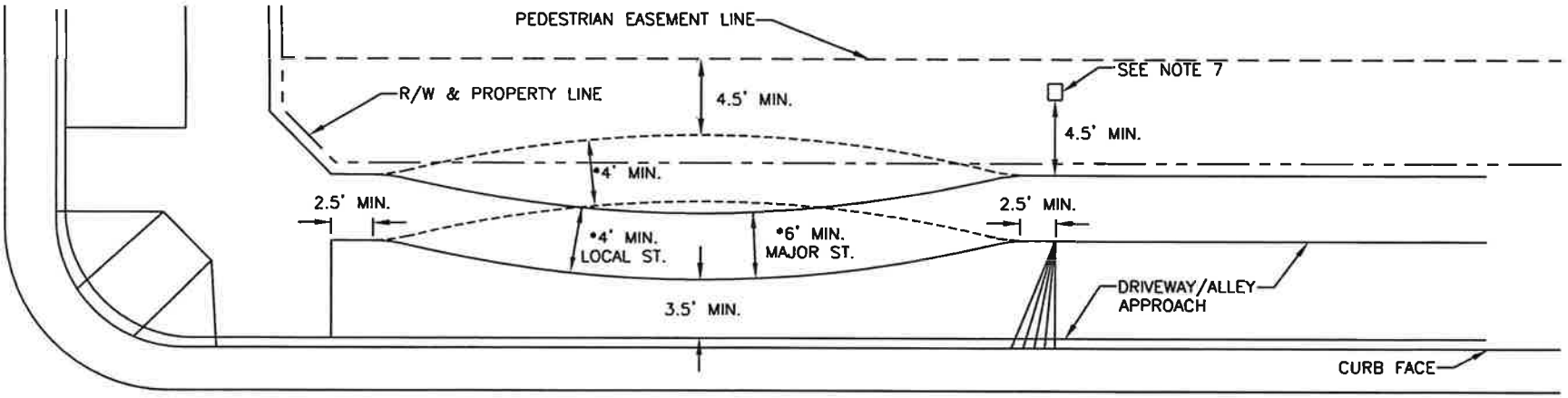
CURVILINEAR SIDEWALK

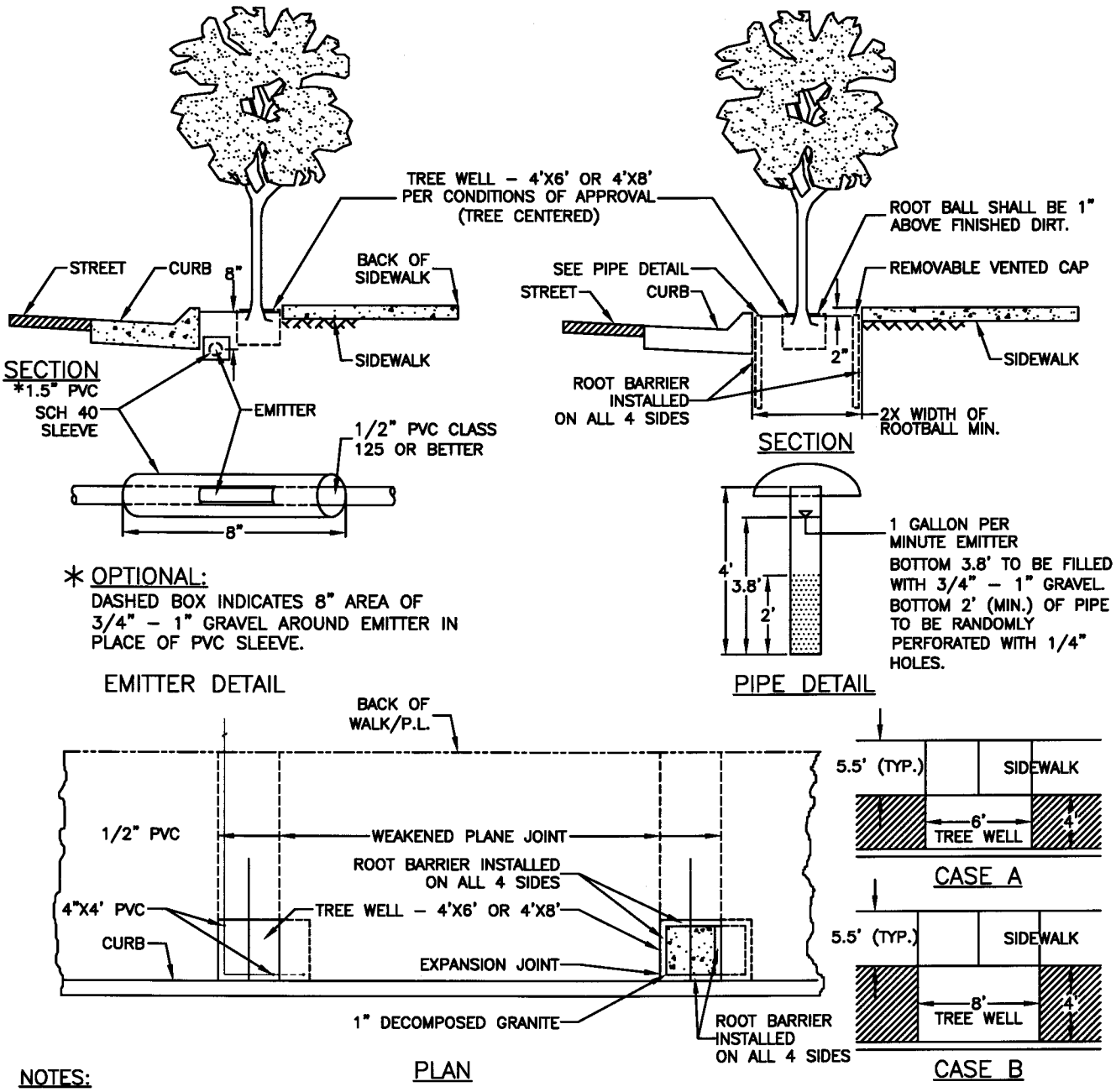


NOTES:

1. PRECISE DATA SHALL BE PROVIDED TO STAKE THE ALIGNMENT AND SET APPROPRIATE GRADES.
2. SIDEWALK CONSTRUCTION SHALL CONFORM TO CITY STANDARD SPECIFICATIONS.
3. SIDEWALK WIDTH SHALL NOT VARY, EXCEPT WHERE APPROVED BY THE CITY ENGINEER; MINIMUM WIDTH SHALL BE 4' (6' ON MAJOR STREETS).
4. LANDINGS AND DIRECT ACCESS TO THE CURVILINEAR SIDEWALK SHALL BE PROVIDED TO EXISTING AND PROPOSED BUS STOP ZONES (INCLUDING SHELTERS AND BENCHES).
5. SIDEWALK LOCATION AT DRIVEWAY AND ALLEY APPROACHES AND AT LANDINGS AT STREET INTERSECTIONS SHALL BE ADJACENT TO THE PROPERTY LINE (STANDARD LOCATION, IN STREET R/W).
6. AT STREET INTERSECTION LANDINGS THE CURVILINEAR PATTERN SHALL COMMENCE AFTER A MINIMUM 2.5' LONG STANDARD SECTION OF SIDEWALK (ALIGNED PERPENDICULAR TO THE STANDARD LANDING AREA); THE WIDTH OF THE 2.5' LONG SECTION SHALL COINCIDE WITH THE ESTABLISHED CURVILINEAR SIDEWALK WIDTH.
7. SIDEWALK SHALL NOT BE CLOSER THAN 3.5' TO THE CURB FACE AND 4.5' TO ON-SITE PARKING LOT, STRUCTURES AND OTHER ITEMS WHICH MAY BE DETRIMENTAL TO PUBLIC SAFETY AND AESTHETIC VALUE.
8. ALL SIDEWALKS OUTSIDE THE PUBLIC RIGHT-OF-WAY SHALL BE IN RECORDED PEDESTRIAN EASEMENTS.
9. AT STREET INTERSECTIONS, SIDEWALK LOCATION SHALL BE INCORPORATED INTO THE DESIGN FOR PROPOSED HANDICAP RAMPS.
10. MINIMUM RADIUS 150'.

REF. & REV.
JUNE 2015

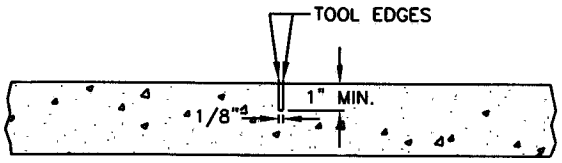
CITY OF FRESNO
P-7



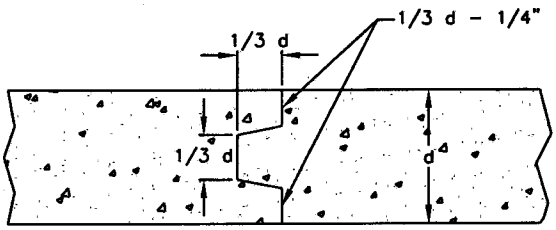
NOTES:

1. FORM LUMBER FOR TREE WELL SHALL BE 2" X 4".
2. NO TREE WILL BE PLANTED UNLESS WATER IS PROVIDED TO PLANTER AREA.
3. 1" DECOMPOSED GRANITE IS REQUIRED WHEN TREE PLANTING IS NOT IN CONJUNCTION WITH PROJECT.
4. ALL DRIP SYSTEMS SHALL BE EQUIPPED WITH 200 MESH FILTER, PRESSURE REGULATOR, AND A CLEAN OUT TO FLUSH THE SYSTEM ANNUALLY.
5. ALL PLASTIC TUBING UNDER CONCRETE SHALL BE 1/2" PVC CLASS 125 OR BETTER AND SLEEVED AT 2.5 TIMES THE DIAMETER OF THE PIPE.
6. TIMECLOCK SHALL HAVE THE CAPACITY TO BE SET TO 40 MINUTES PER IRRIGATION STATION DURING THE MONTHS OF JULY AND AUGUST AND PROPORTIONAL TO CLIMATIC CONDITIONS FOR THE REMAINDER OF THE YEAR.
7. MAINTAIN 4' CLEAR SIDEWALK WIDTH BETWEEN TREE WELL AND BACK OF SIDEWALK.
8. TREE WELL SIZE CAN BE INCREASED DEPENDING ON SIDEWALK WIDTH.

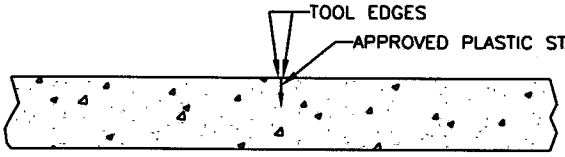
TREE WELL DESIGN	REF. & REV. AUG., 2010	CITY OF FRESNO P–8



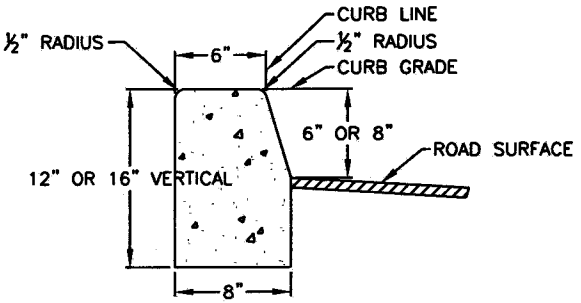
WEAKENED PLANE JOINT DETAILS



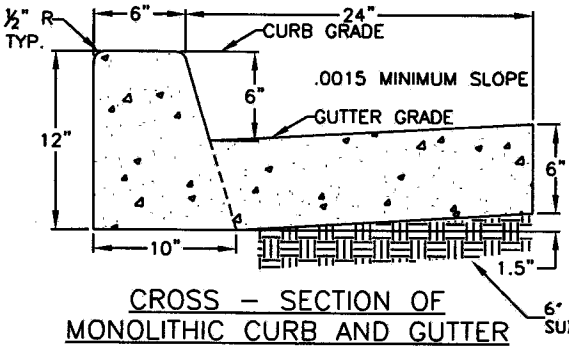
CONSTRUCTION JOINT DETAILS



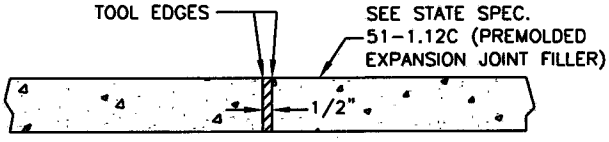
ALTERNATE DESIGN WEAKENED PLANE JOINT



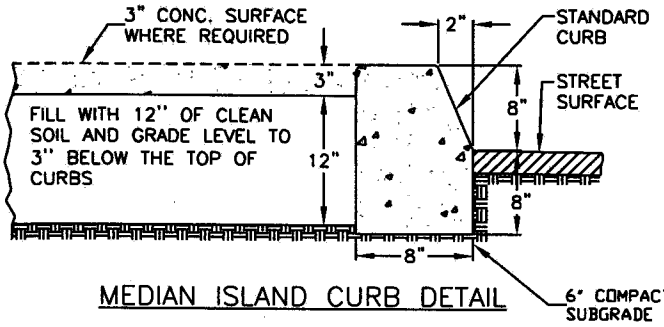
CROSS – SECTION OF CURB



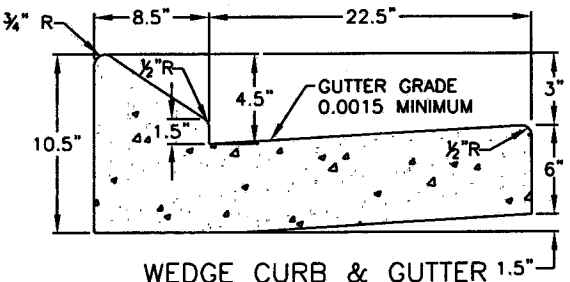
CROSS – SECTION OF MONOLITHIC CURB AND GUTTER



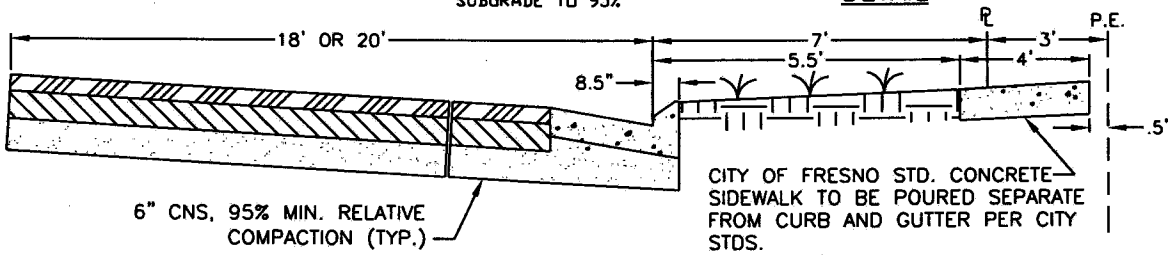
EXPANSION JOINT DETAIL



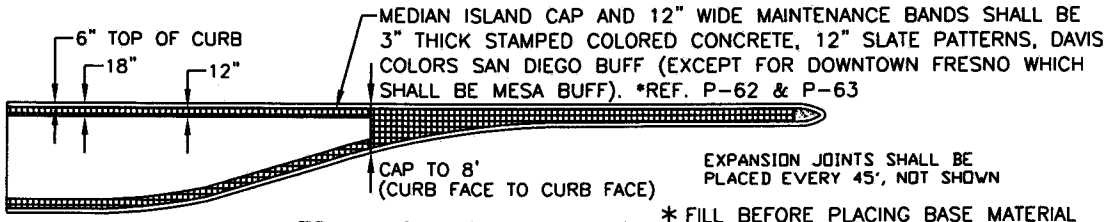
MEDIAN ISLAND CURB DETAIL



WEDGE CURB & GUTTER DETAIL



1/2 RESIDENTIAL STREET WITH WEDGE CURBS



MEDIAN ISLAND PLAN VIEW

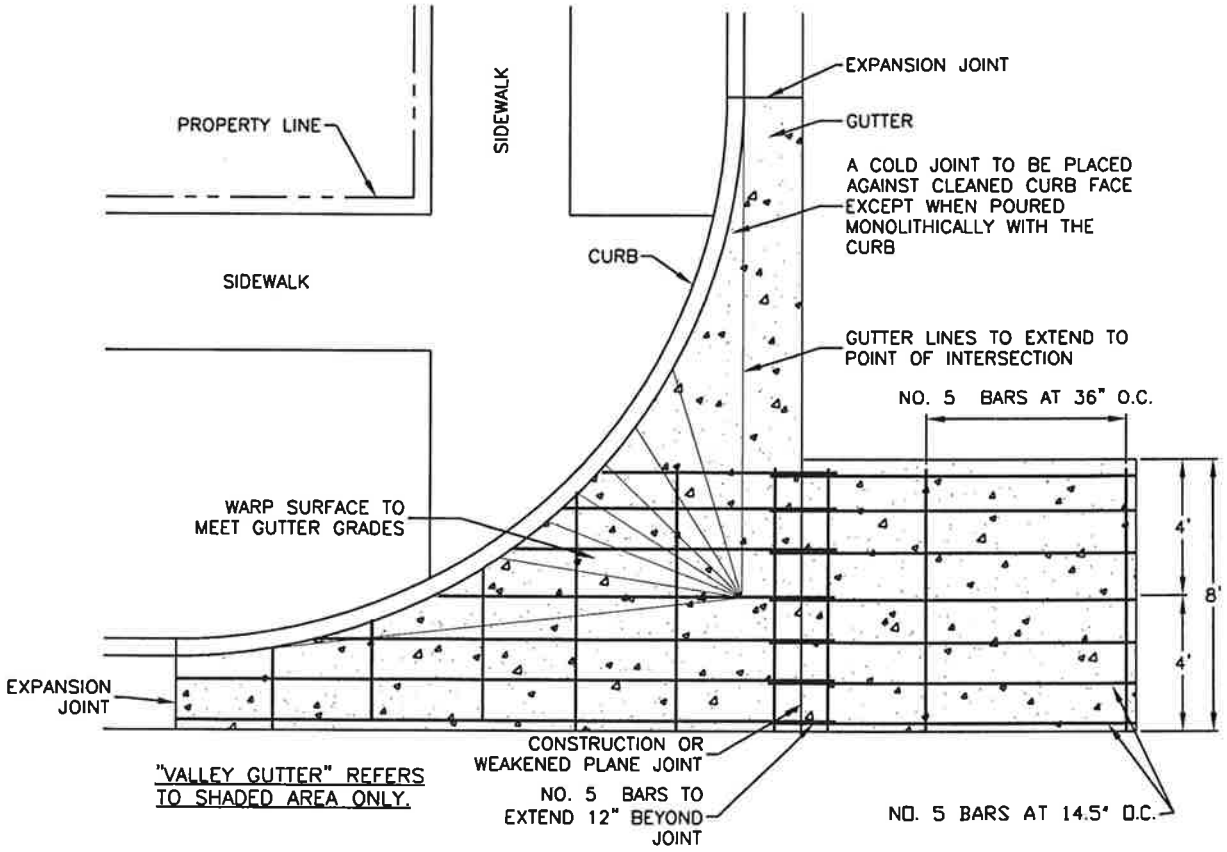
* FILL BEFORE PLACING BASE MATERIAL OR COMPACTING IN THE TRAVELED WAY

CONCRETE CONSTRUCTION DETAILS

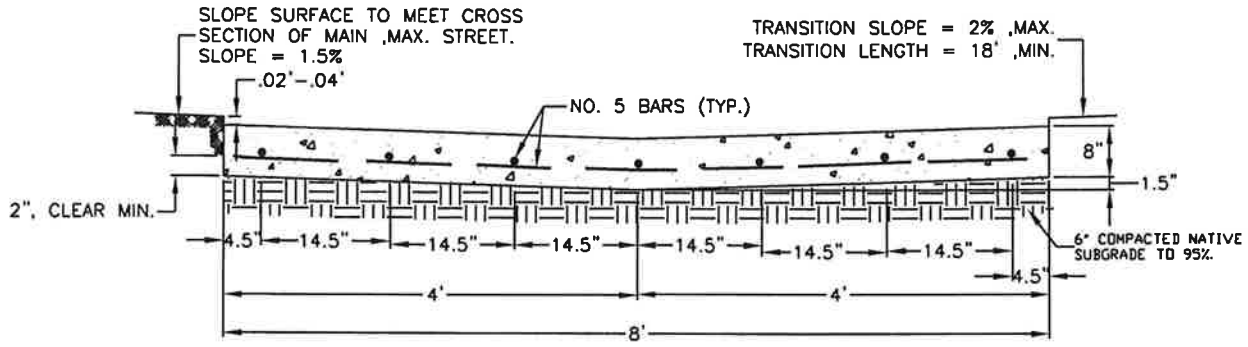
REF. & REV. JUNE 2015

CITY OF FRESNO

P-9



PLAN

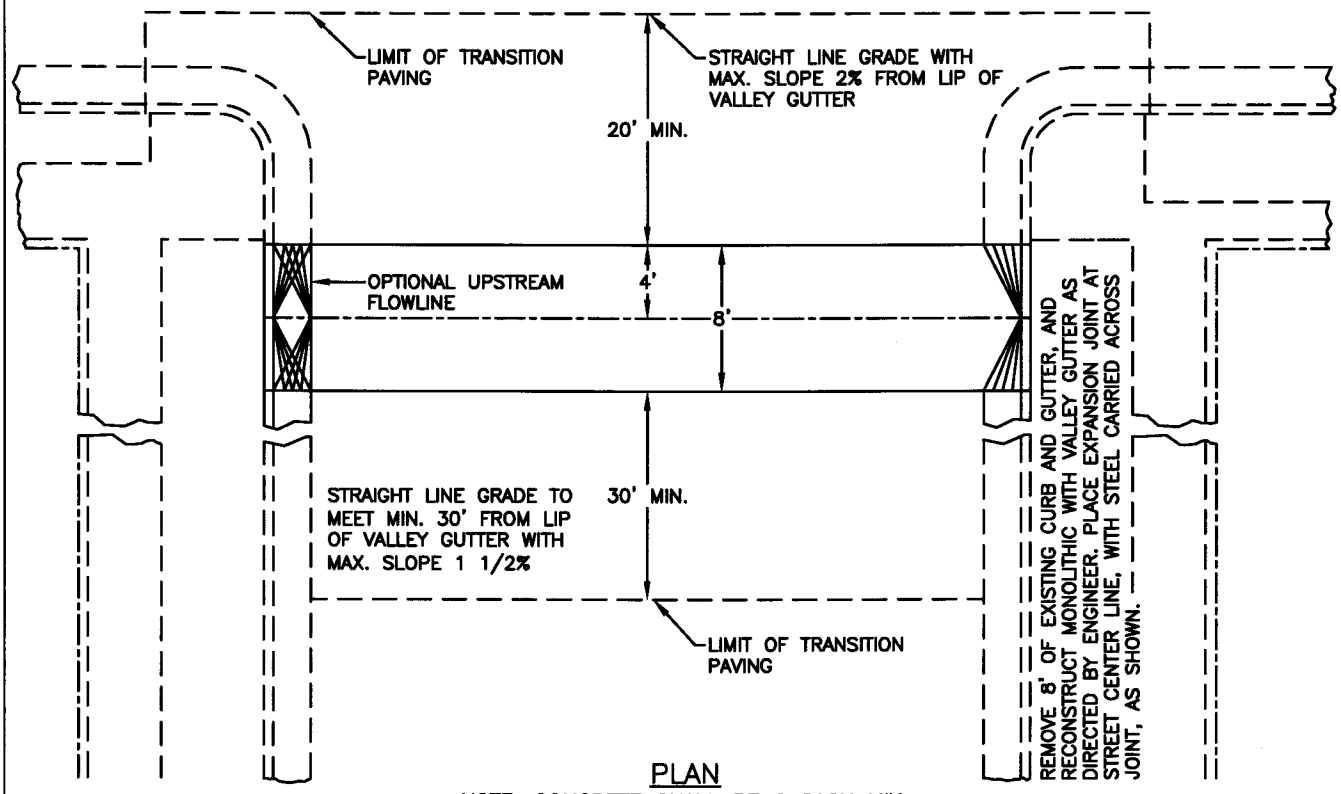


NOTES:

1. IN NEW CONSTRUCTION AREAS, VALLEY GUTTERS SHALL BE DESIGNED TO PROVIDE A MINIMUM DIFFERENCE OF THIRTY-FIVE HUNDREDTHS OF A FOOT (.35') FROM END OF RETURN TO END OF RETURN.
2. ALL VALLEY GUTTERS SHALL BE CONSTRUCTED USING 6 SACK CLASS A CONCRETE PER STD. SPECIFICATIONS 14-2

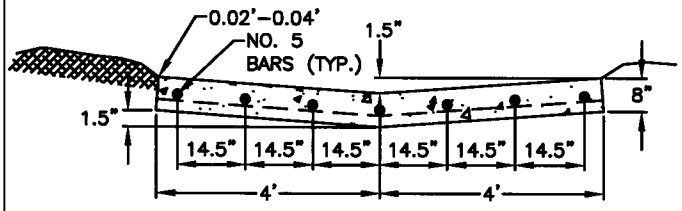
SECTION OF GUTTER

CONCRETE VALLEY GUTTER	REF. & REV. JUNE 2015	CITY OF FRESNO P-10

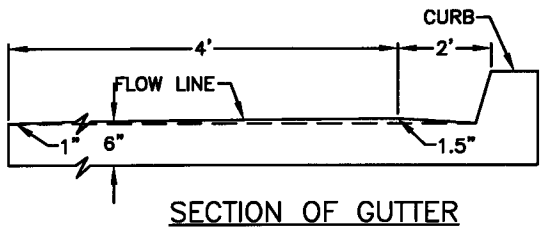


PLAN

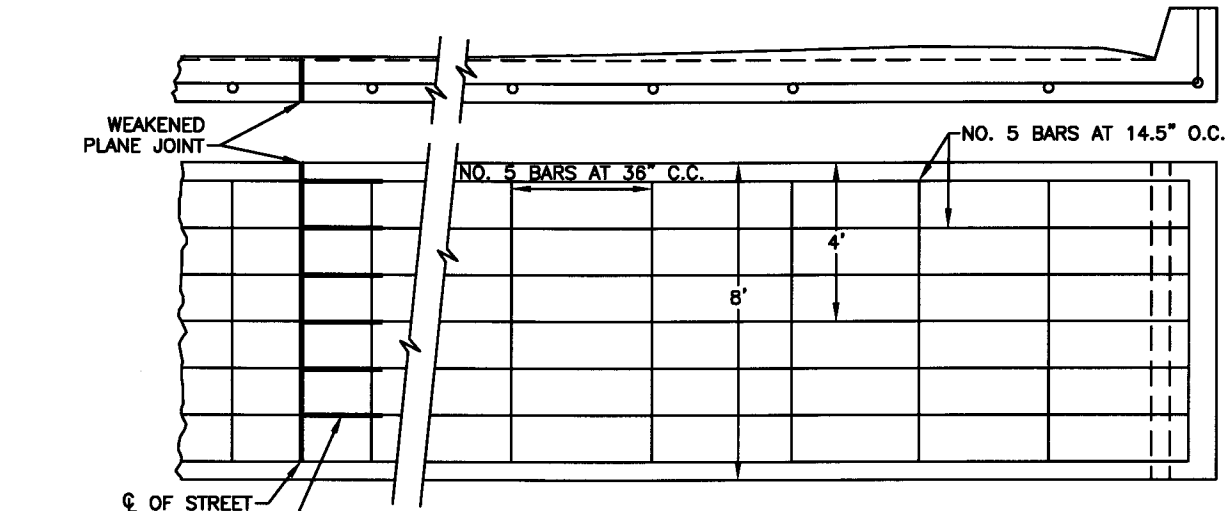
NOTE: CONCRETE SHALL BE 6 SACK MIX.
CLASS A PER STANDARD 14-2 SPECIFICATIONS



SECTION OF GUTTER



SECTION OF GUTTER



PLAN - SECTION

NOTE: TO BE USED WITH CITY ENGINEER'S APPROVAL ONLY

SPECIAL VALLEY GUTTER
(CROSS DRAIN REPLACEMENT)

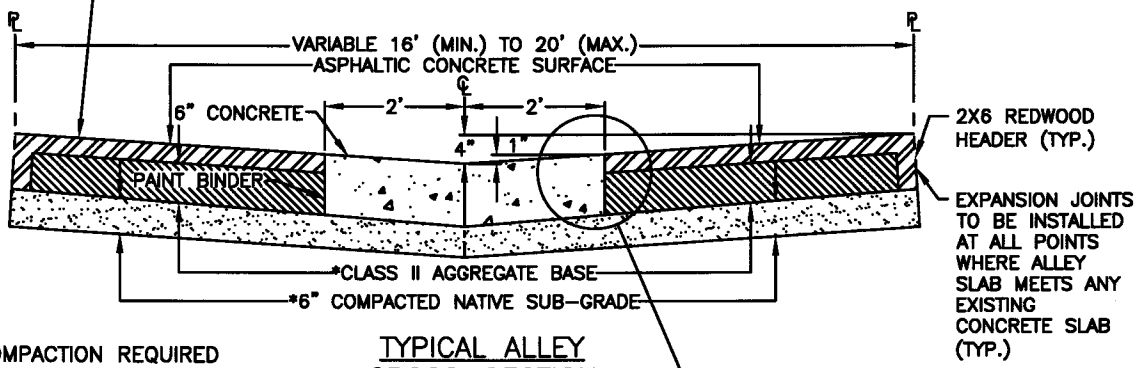
REF. & REV.
AUG., 2010

CITY OF FRESNO

P-11

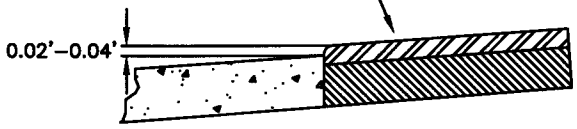
ALTERNATE SECTIONS:

- 2"A.C./4"A.B. W/CONCRETE GUTTER–RESIDENTIAL
- 3"A.C. W/O CONCRETE GUTTER–RESIDENTIAL (LONG. S ≥ 0.0020)
- 4"A.C. W/CONCRETE GUTTER–COMMERCIAL
- 6"A.C. W/O CONCRETE GUTTER–COMMERCIAL (LONG. S ≥ 0.0020)
- 6"P.C.C. COMMERCIAL

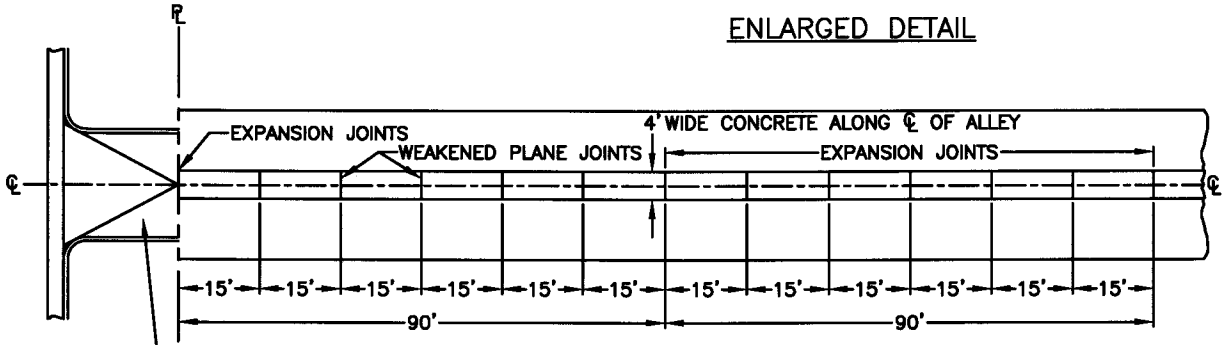


*95% COMPACTION REQUIRED PER CITY STANDARD SPECS.

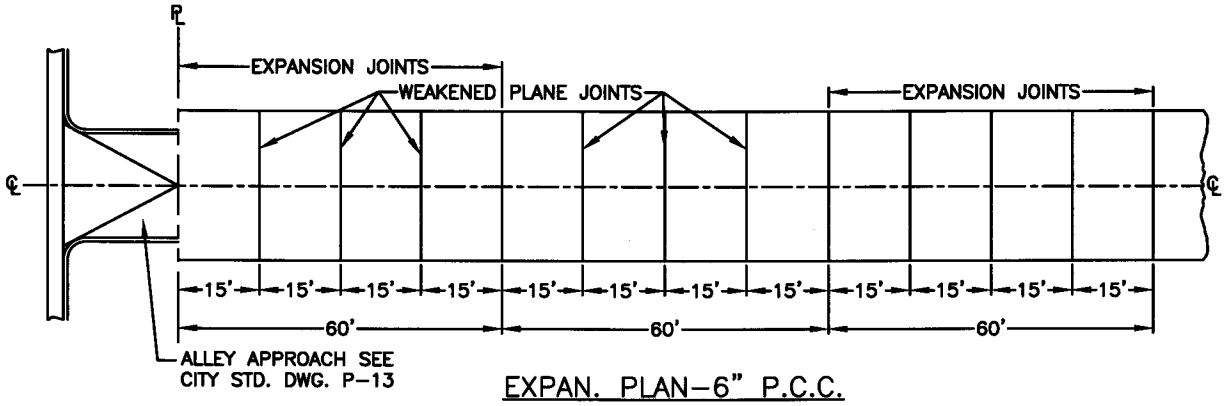
TYPICAL ALLEY CROSS–SECTION



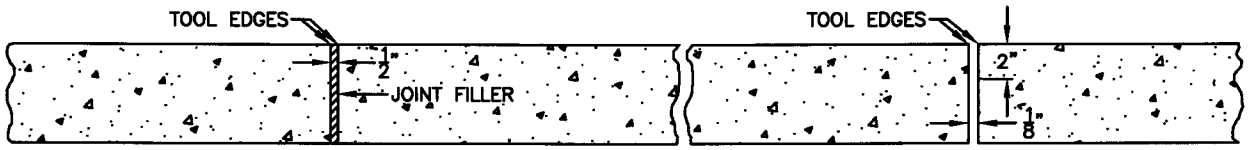
ENLARGED DETAIL



EXPAN. PLAN–CONCRETE GUTTER



EXPAN. PLAN–6" P.C.C.



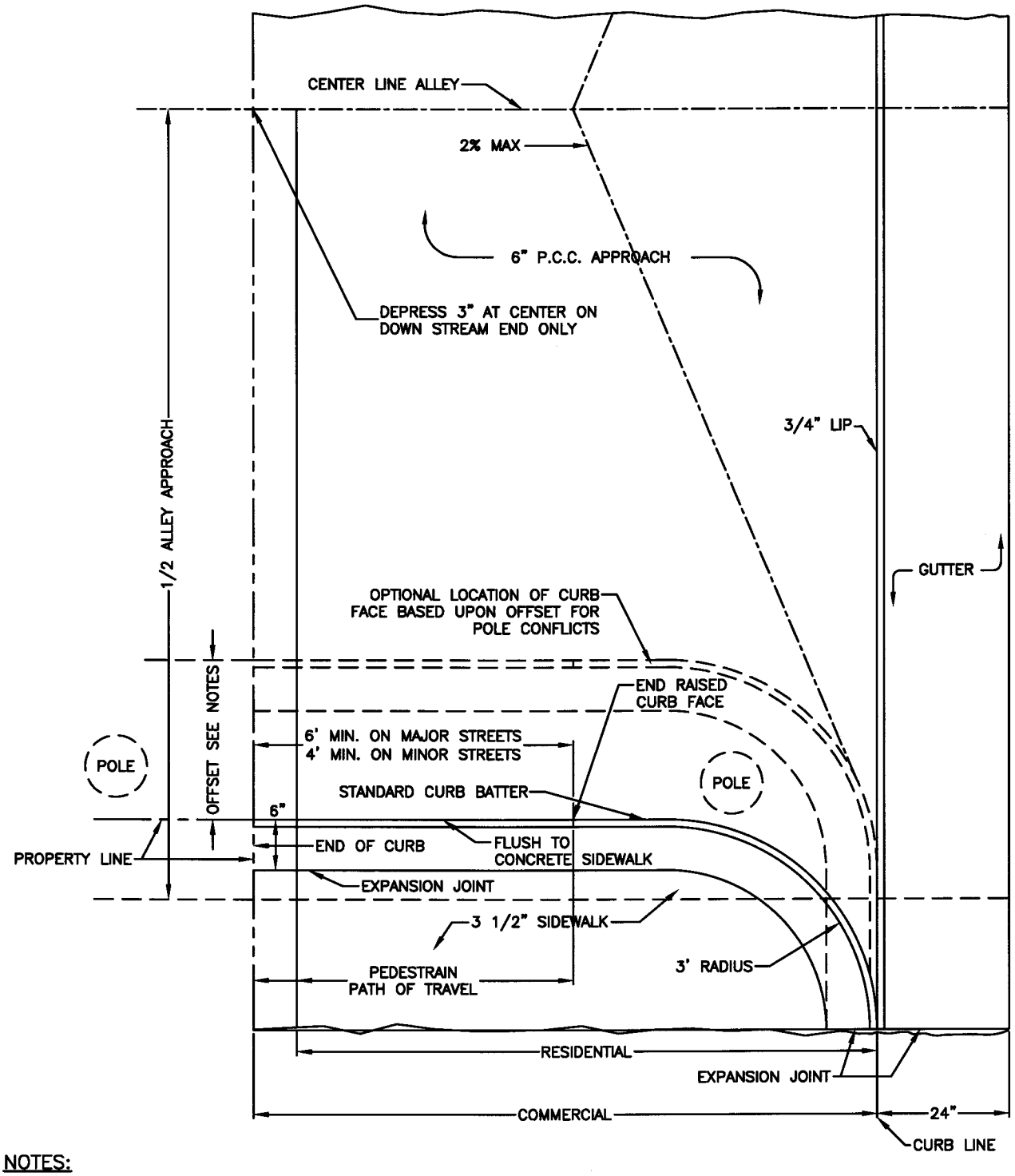
EXPANSION JOINT DETAIL
(REF. STATE STD. SPEC'S SEC. 51–1.12C)

WEAKENED PLANE JOINT DETAIL
(SEE CITY STD. DWG. P–9 FOR ALTERNATE DESIGN)

ALLEY CROSS–SECTION & PLAN
(RESIDENTIAL–COMMERCIAL)

REF. & REV.
AUG., 2010

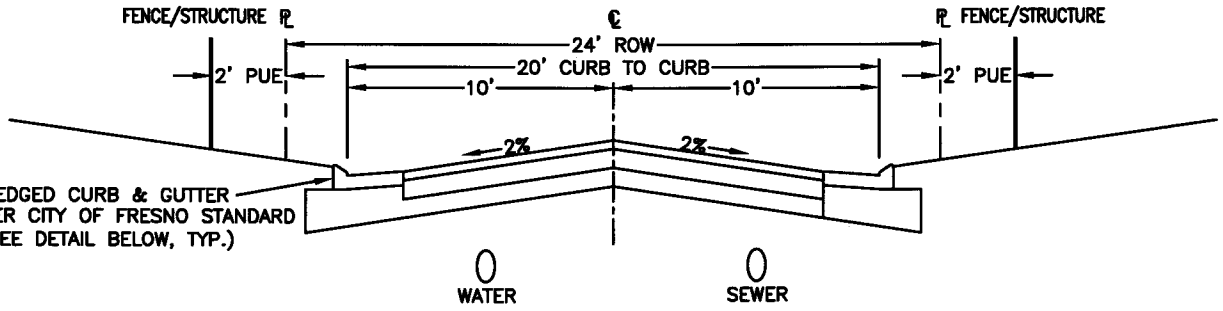
CITY OF FRESNO
P–12



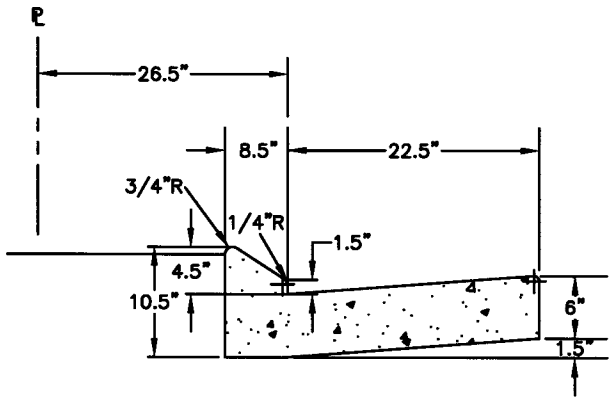
NOTES:

1. A MAXIMUM OFFSET OF 3' SHALL BE ALLOWED ONLY IF POLE EXISTS AT OR NEAR APPROACH IN ALLEY OR CORNER.
2. STANDARD BASED ON 20' ALLEY, ANY OTHER WIDTH TO BE ADJUSTED IN ACCORDANCE WITH ENGINEER.
3. MAXIMUM SLOPE FROM ALLEY TO SIDEWALK SHALL NOT EXCEED 8.33%.
4. THE PEDESTRIAN PATH OF TRAVEL ACROSS THE ALLEY SHALL BE 2% MAXIMUM CROSS SLOPE AND SHALL COMPLY WITH ADA REQUIREMENTS.

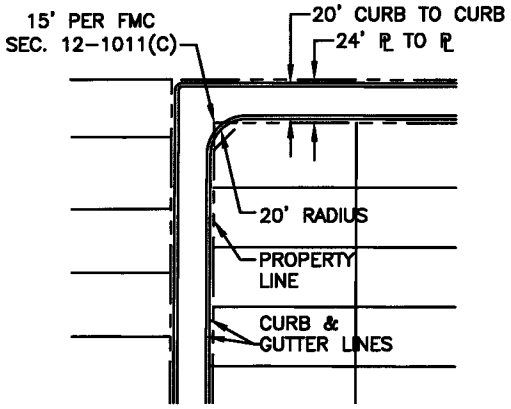
CONCRETE ALLEY APPROACH	REF. & REV. AUG., 2010	CITY OF FRESNO P-13



CROSS SECTION
N.T.S.



WEDGED CURB & GUTTER DETAIL
N.T.S.



PLAN VIEW
N.T.S.

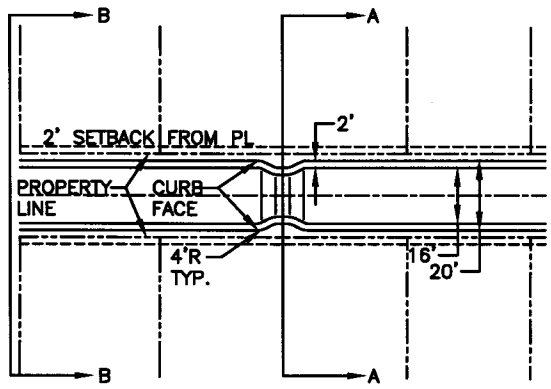
SPECIFICATIONS

1. 20' FROM FACE OF CURB TO FACE OF CURB.
2. A MAXIMUM OFFSET OF 3' FROM FACE OF CURB SHALL BE ALLOWED ONLY IF STREETLIGHT POLE EXISTS AT OR NEAR APPROACH IN ALLEY OR CORNER.
3. STANDARD BASED ON 20' CURB TO CURB; ANY OTHER WIDTH TO BE ADJUSTED TO THE SATISFACTION OF THE CITY ENGINEER.
4. NO PARKING ALLOWED ON EITHER SIDE AND SHALL BE POSTED AT THE ENTRANCE TO ALLEY.
5. ALLEY TO BE MAINTAINED BY CFD, HOA, OR OTHER MAINTENANCE AGREEMENT.
6. CONNECTION TO LOCAL STREETS TO BE "STREET TYPE" APPROACHES. APPROACHES TO ACCOMMODATE CITY OF FRESNO STANDARD P-29 RAMPS AT MINIMUM.
7. NO UTILITY POLES, RISERS OR ABOVE GROUND APPURTENANCES ALLOWED IN CITY ROW, EXCEPT FOR FIRE HYDRANTS.
8. FIRE HYDRANTS SHALL BE PROTECTED WITH 6" CURB AND THE BOLLARD STANDARD.
9. FIRE HYDRANTS LOCATIONS SHALL BE APPROVED BY THE FIRE DEPARTMENT AND SHALL BE LOCATED A MINIMUM OF ONE LOT FROM ALLEY INTERSECTION.
10. GUTTER SLOPE SHALL BE 0.0015 MINIMUM.

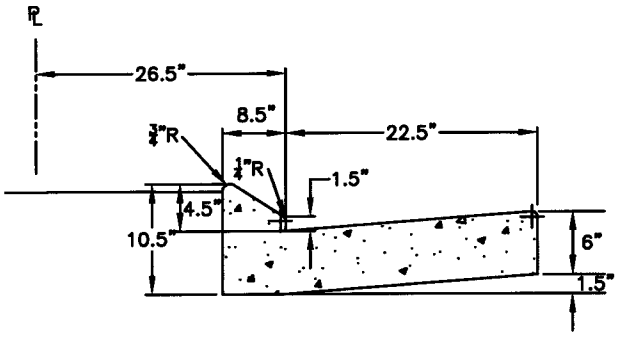
24' ALTERNATIVE ALLEY
WITH WEDGED CURB

REF. & REV.
AUG., 2010

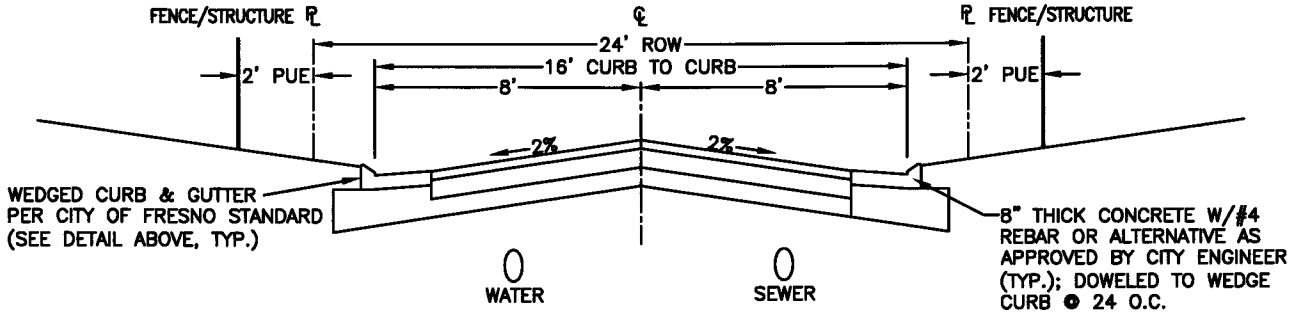
CITY OF FRESNO
P-14



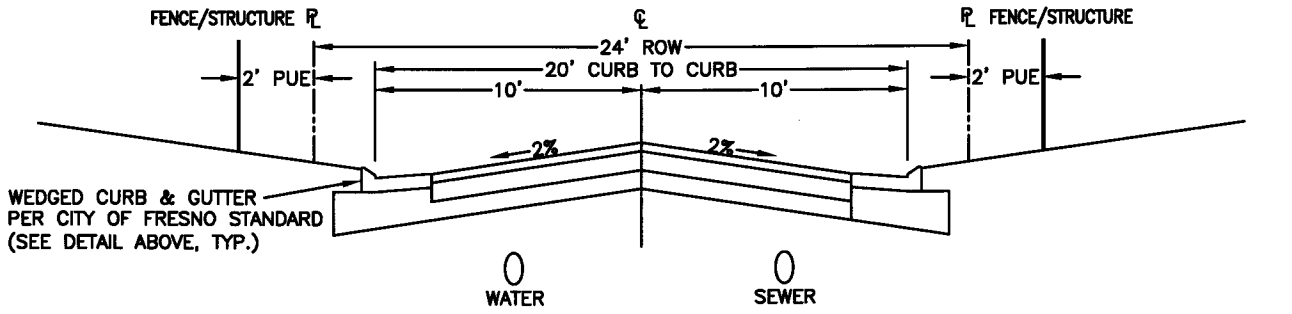
PLAN VIEW
N.T.S.



WEDGED CURB & GUTTER DETAIL
N.T.S.



CROSS SECTION A–A
N.T.S.

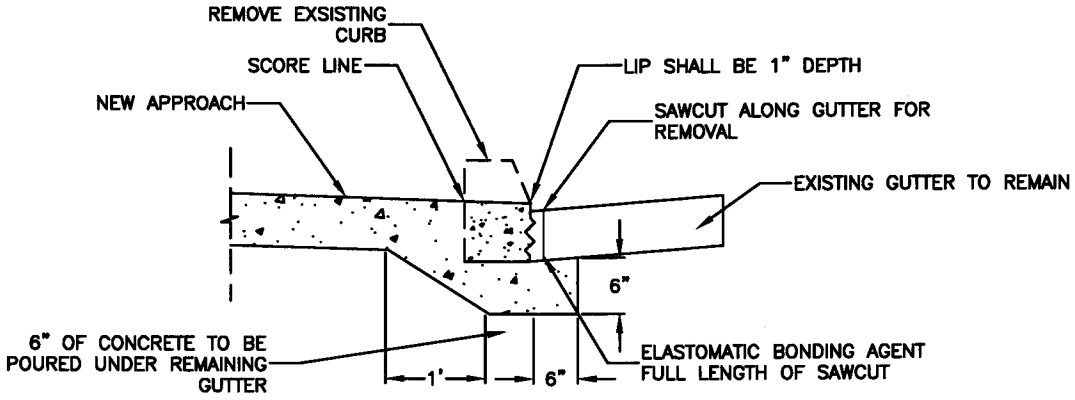


CROSS SECTION B–B
N.T.S.

SPECIFICATIONS

1. 16' FROM FACE OF CURB TO FACE OF CURB AT PINCH POINT; 20' WIDTH IN ALL OTHER LOCATIONS.
2. A MAXIMUM OFFSET OF 3' FROM FACE OF CURB SHALL BE ALLOWED ONLY IF STREETLIGHT POLE EXISTS AT OR NEAR APPROACH IN ALLEY OR CORNER.
3. NO PARKING ALLOWED ON EITHER SIDE AND SHALL BE POSTED AT THE ENTRANCE TO ALLEY.
4. NO UTILITY POLES, RISERS OR ABOVE GROUND APPURTENANCES ALLOWED IN CITY ROW, EXCEPT FOR FIRE HYDRANTS.
5. NO FIRE HYDRANT SHALL BE ALLOWED AT PINCH POINT.
6. GUTTER SLOPE SHALL BE 0.0015 MINIMUM.

ALLEY TRAFFIC CALMING PINCH POINT	REF. & REV. AUG, 2010	CITY OF FRESNO P–15



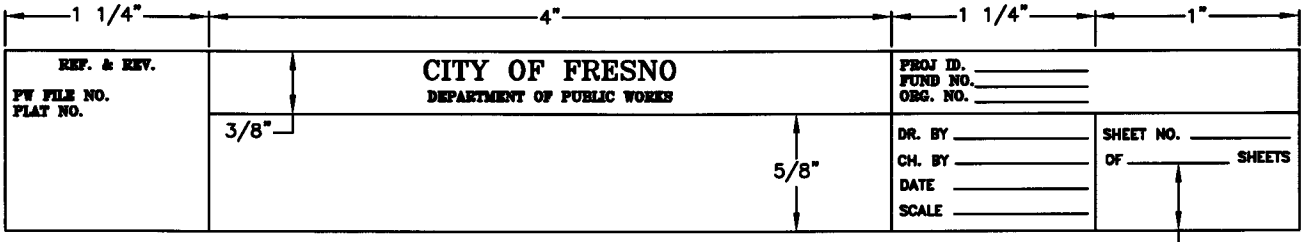
CURB REMOVAL
FOR NEW APPROACHES

REF. & REV.
AUG., 2010

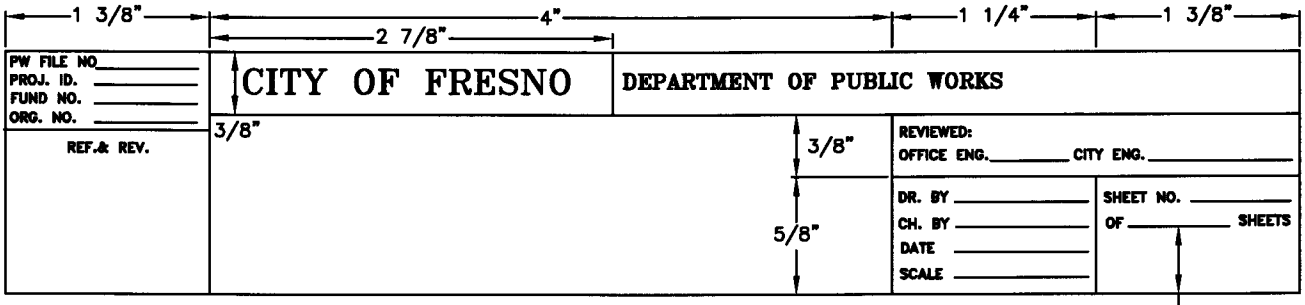
CITY OF FRESNO

P–16

	SHEET SIZE	LEFT BORDER	OTHER BORDERS	TITLE BLOCK
A	11" X 8 1/2"	.5 "	.5 "	A
AA	11" X 17"	.5 "	.5 "	A
B	12" X 25 1/4"	.25 "	.25 "	B
C	12" X 36"	1 "	.25 "	B
D **	24" X 25 1/4"	1 "	.25 "	B
E	24" X 36"	1 "	.25 "	B
F	31" X 36"	1 "	.25 "	B
G **	31" X 25 1/4"	1 "	.25 "	B
*	18" X 26"	1 "	1 "	
*	ASSESSMENT DIAGRAMS, OFFICIAL PLAN LINES, TRACT MAPS AND PARCEL MAPS			
**	NO LONGER USED BY THE CITY OF FRESNO			

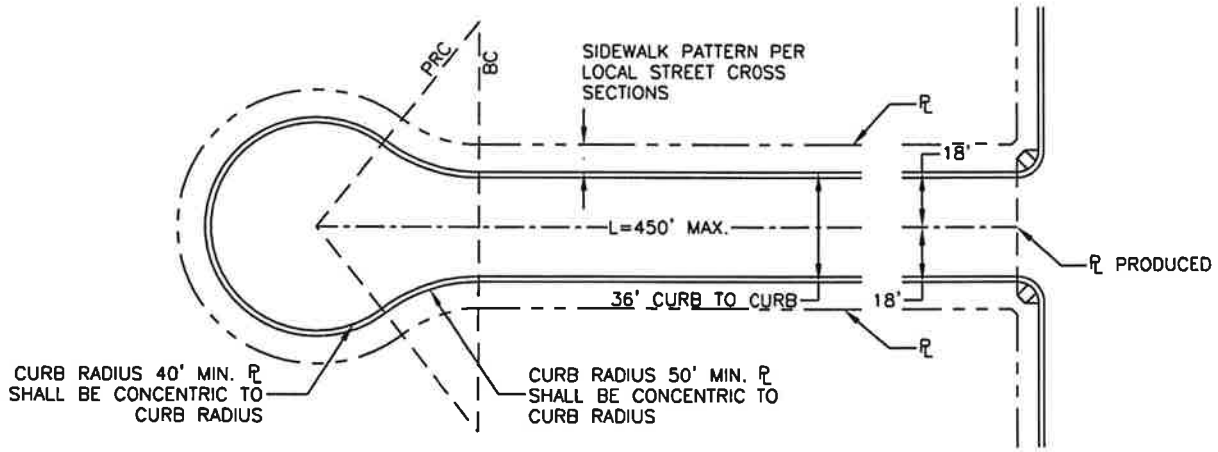


TITLE BLOCK 'A'

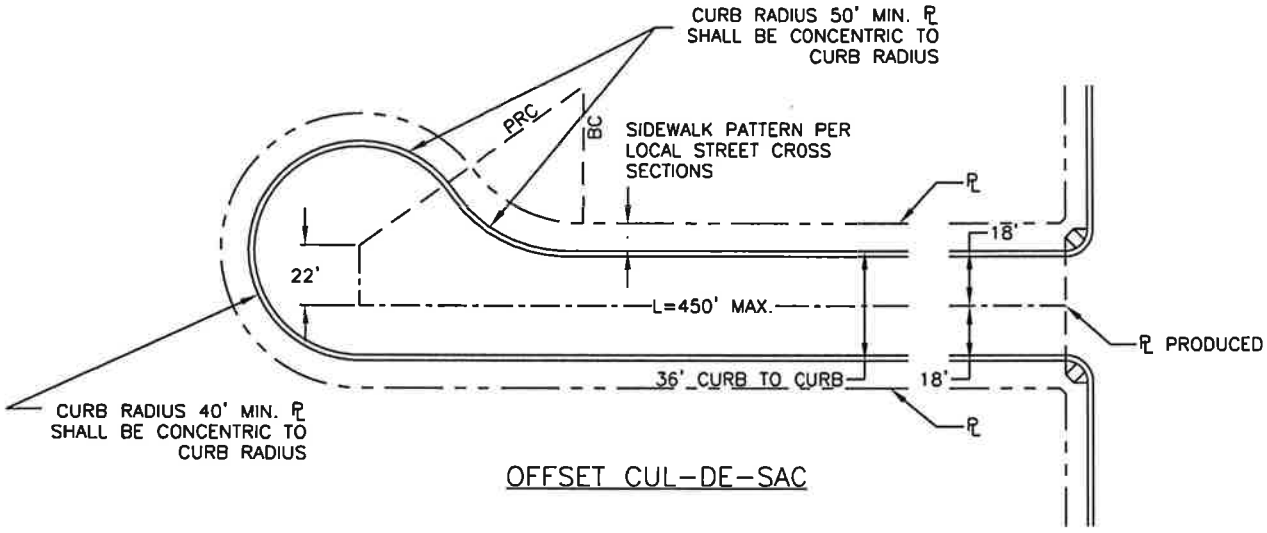


TITLE BLOCK 'B'

STANDARD DRAWING SIZES	REF. & REV. AUG., 2010	CITY OF FRESNO P-17

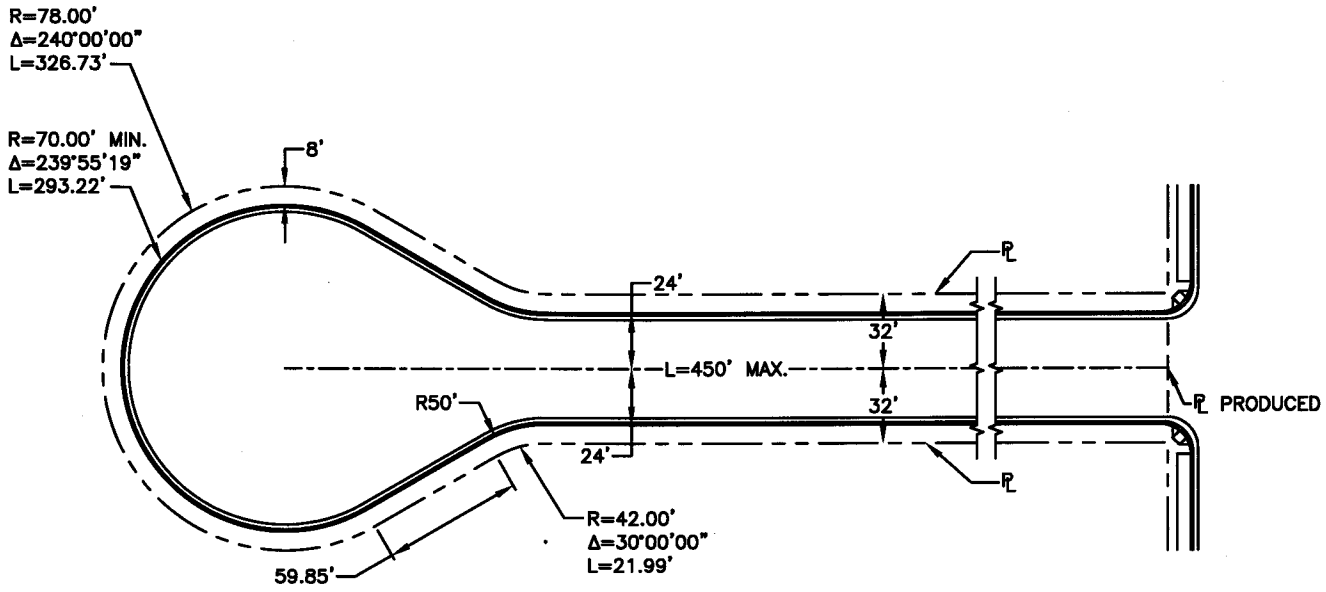


CENTERED CUL-DE-SAC



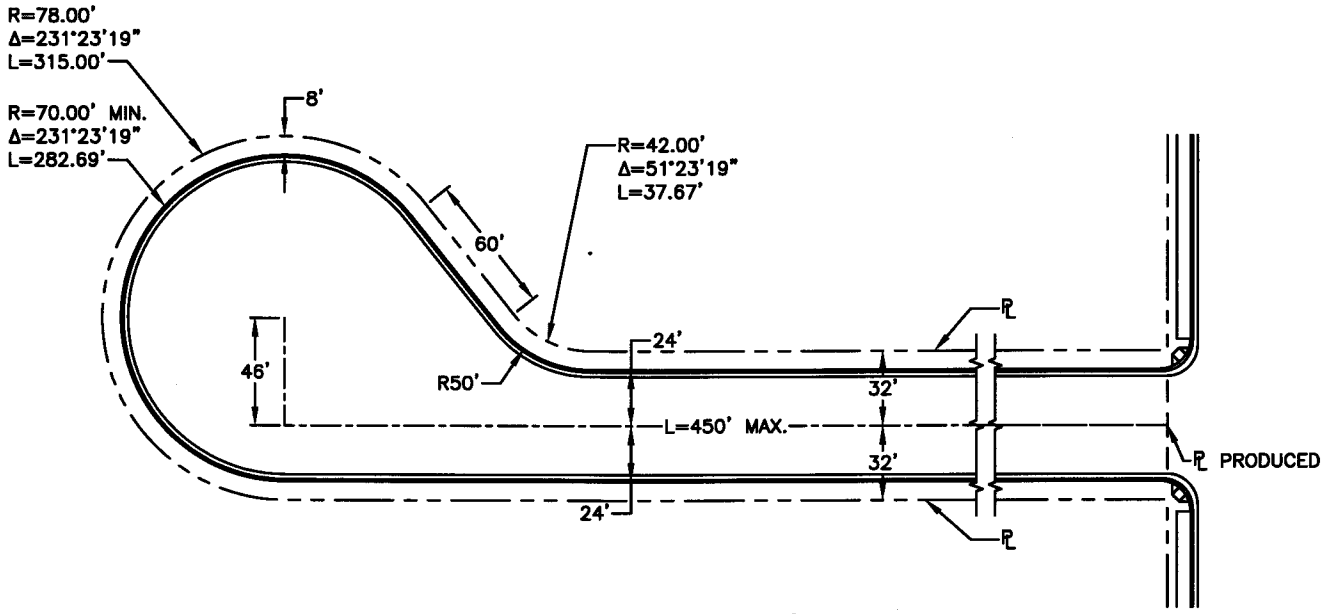
OFFSET CUL-DE-SAC

STANDARD CUL-DE-SAC FOR LOCAL RESIDENTIAL STREETS	REF. & REV. JUNE 2015	CITY OF FRESNO P-18



CENTERED CUL-DE-SAC

PAVED AREA=12,578 SQ. FT.
CURB & GUTTER=379 L.F.
FOR STRUCTURAL SECTION SEE CITY STD. DWG. P-55



OFFSET CUL-DE-SAC

STANDARD CUL-DE-SAC
FOR LOCAL INDUSTRIAL STREETS

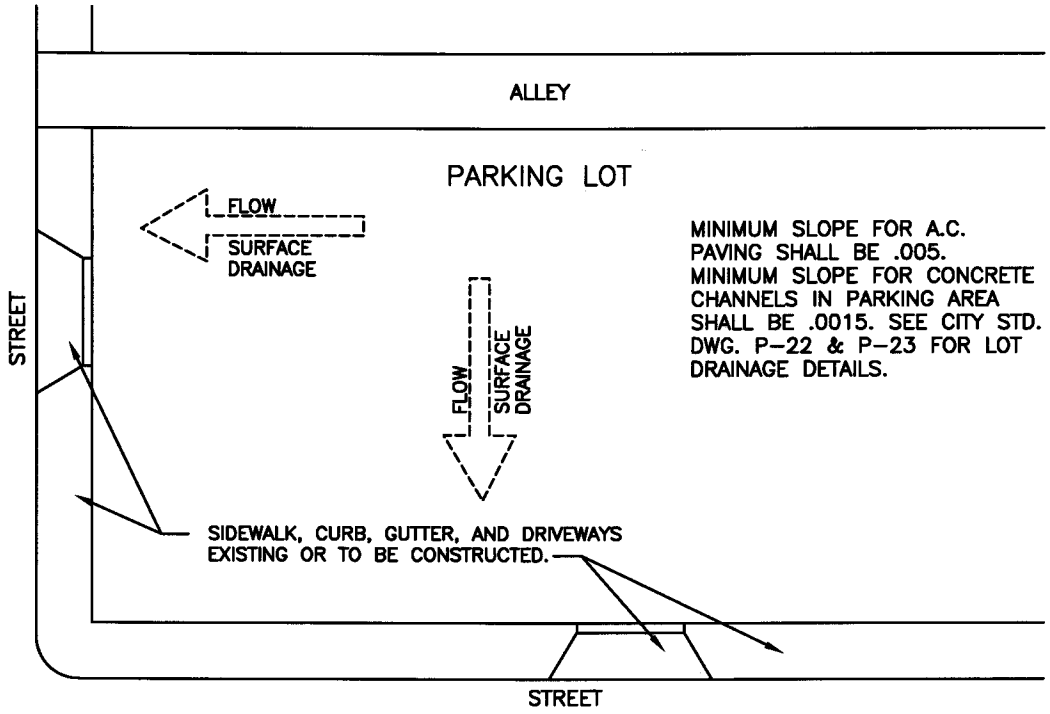
REF. & REV.
AUG., 2010

CITY OF FRESNO

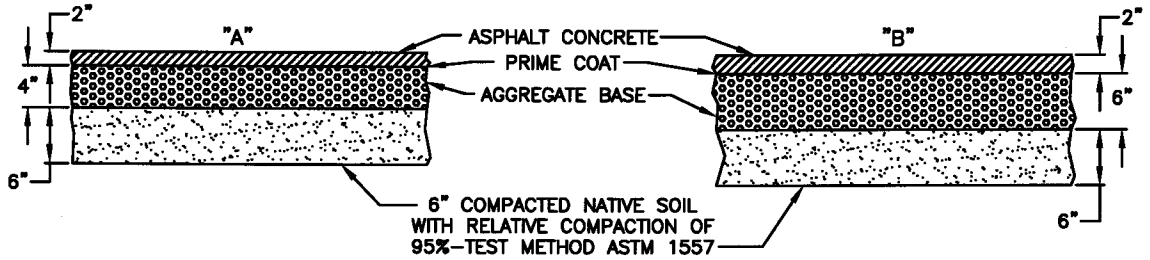
P-19

NOT USED

NO LONGER USED	REF. & REV. AUG., 2010	CITY OF FRESNO P–20

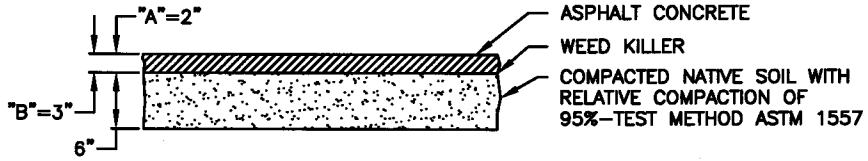


TYPICAL CROSS SECTIONS



PARKING LOTS

INDUSTRIAL PARKING LOTS AND LOADING ZONES

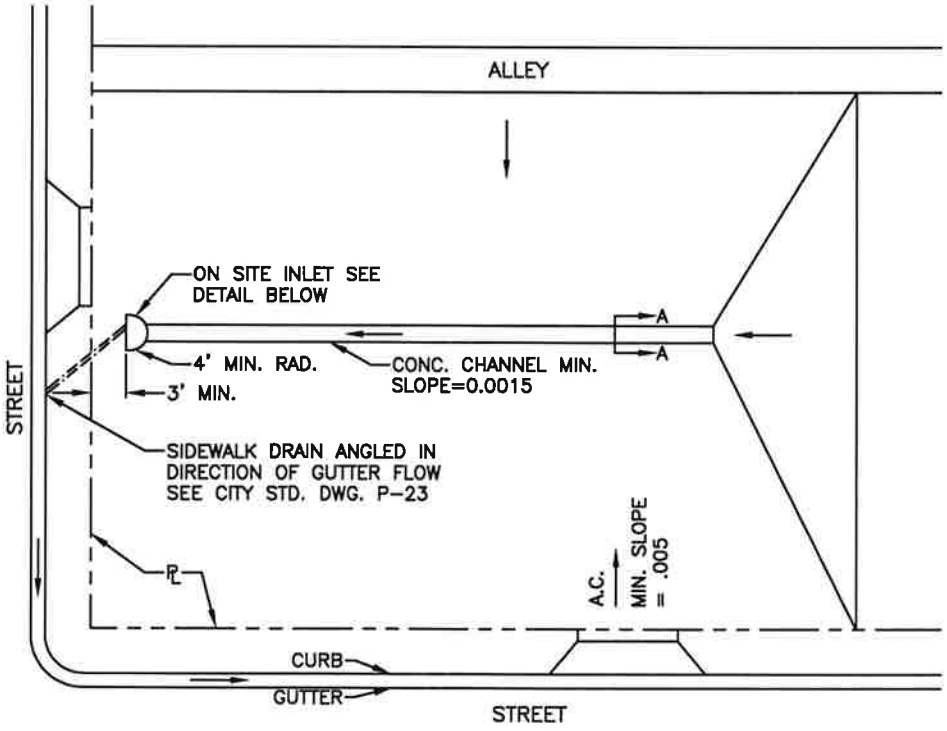


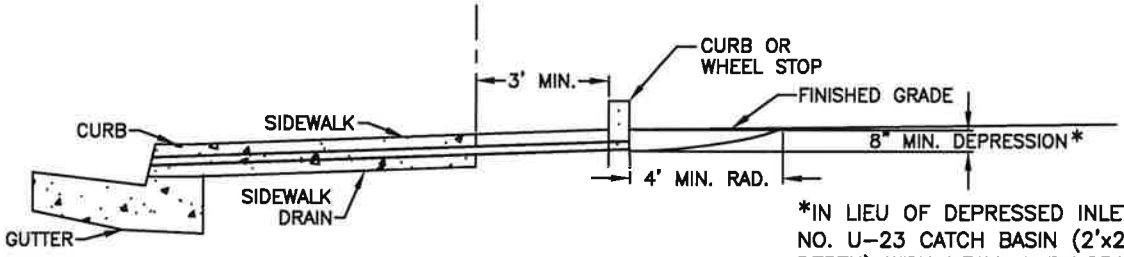
OPTIONAL-WITH APPROVED TEST

NOTES:

1. SURFACE DRAINAGE SHALL BE TO STREET.
2. PARKING BUMPERS TO BE PLACED SO THAT PARKED CARS WILL NOT OVERHANG ON SIDEWALKS OR STREETS.
3. THE OPTIONAL CROSS-SECTION MAY BE USED UPON SUBMISSION OF "R" VALUE TESTS TAKEN BY AN APPROVED LABORATORY SUBSTANTIATING THE USE OF EXISTING SOIL FOR THE BASE. A MINIMUM VALUE OF 65 WILL BE REQUIRED.
4. WHERE ASPHALT CONCRETE IS APPLIED TO THE NATIVE SOIL, SOIL STERILANT AS PER MANUFACTURES SPECIFICATIONS WILL BE REQUIRED BEFORE THE SURFACE MATERIAL IS PLACED. WEED KILLER TO BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION.
5. SURFACE DRAINAGE TO ALLEY ONLY BY WRITTEN APPROVAL OF THE CITY ENGINEER.
6. TEMPORARY PARKING LOTS (USE NOT TO EXCEED 60 DAYS) SHALL BE GRADED AND ROLLED SMOOTH. THE TOP 6" OF NATIVE SOIL SHALL BE COMPACTED TO 85% RELATIVE COMPACTION USING TEST METHOD ASTM 1557. A DUST PALLIATIVE PER STATE STANDARD SPECIFICATIONS AT THE RATE OF 1 GAL./SQ. YD. TO OBTAIN A MINIMUM PENETRATION OF 1". THE MIXING RATIO SHALL BE 4:1 PER STATE STANDARD SPECIFICATIONS. THE DEVELOPER SHALL POST A BOND TO GUARANTEE REMOVAL OF ALL IMPROVEMENTS FOR A TEMPORARY PARKING LOT.

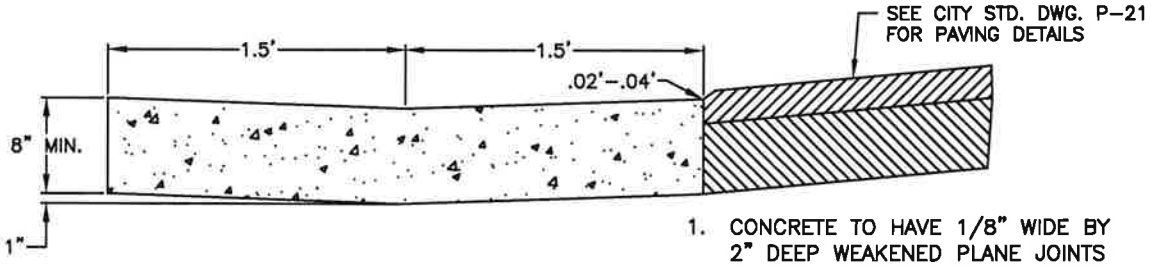
PARKING LOT PAVING DETAILS	REF. & REV. AUG., 2010	CITY OF FRESNO P-21





*IN LIEU OF DEPRESSED INLET A CRISTY NO. U-23 CATCH BASIN (2'x2'x2' MIN. DEPTH) WITH HEAVY DUTY TRAFFIC GRATE TO WITHSTAND MAX. TRAFFIC LOADING OR A BROOKS W-100 SERIES 2'x3' UTILITY BOX NO. 100TG TRAFFIC GRATE OR APPROVED EQUAL MAY BE USED.

ON SITE INLET DETAIL



SECTION A-A

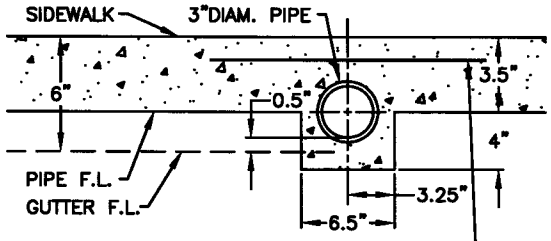
1. CONCRETE TO HAVE 1/8" WIDE BY 2" DEEP WEAKENED PLANE JOINTS AT 15' O.C. AND 1/2" EXPANSION JOINTS AT 90' O.C.
2. SURFACE DRAINAGE TO ALLEY ONLY BY WRITTEN APPROVAL OF THE CITY ENGINEER.
3. SURFACE DRAINAGE OVER DRIVEWAY APPROACHES AND SIDEWALKS IS NOT PERMITTED WHEN THE AREA TO BE DRAINED EXCEEDS 1/4 ACRE.

LOT DRAINAGE DETAILS

REF. & REV. AUG., 2010

CITY OF FRESNO

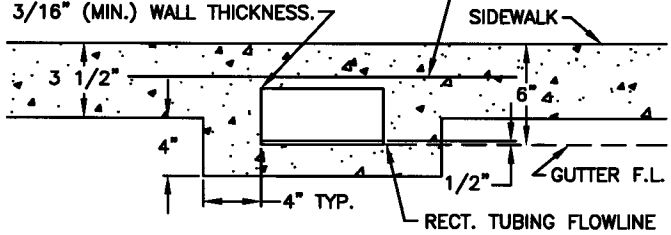
P-22



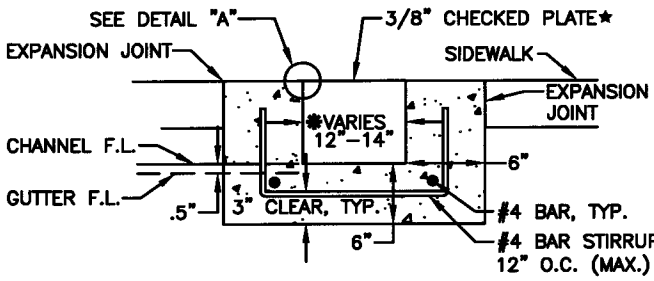
3" DIAMETER PIPE UNDER WALK

PROVIDE TWO LAYERS OF 6" X 6" WELDED WIRE MESH GAGE NO. 10, EXTEND 12" (MIN.) ON EACH SIDE OF TUBE.

3"X5" OR 3"X6" RECT. TUBING WITH 3/16" (MIN.) WALL THICKNESS.



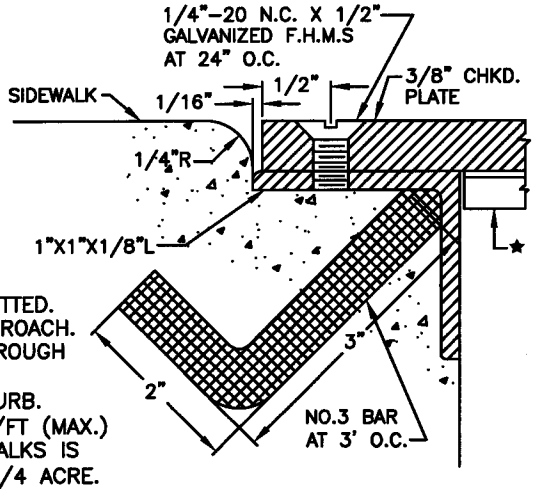
RECTANGULAR STEEL TUBING UNDER WALK



CHANNEL THROUGH WALK

*CHANNELS CAN BE WIDER UPON APPROVAL

★ONE SECTION OF 3/8" CHECKED PLATE SHALL NOT EXCEED 5 FEET IN LENGTH. FOR CHANNELS WIDER THAN 14" AND UP TO 24", PROVIDE 1"X 1"X 3/16" ANGLE IRON AT 12" O.C. WELDED ON THE UNDERSIDE OF THE CHECKED PLATE.



DETAIL "A"

NOTES:

1. FOR 3" OR SMALLER DIAMETER PIPE, SCH. 40 PVC IS PERMITTED.
2. DRAIN SHALL NOT BE CONSTRUCTED UNDER A DRIVEWAY APPROACH.
3. SIDEWALK DRAINS, EXCEPT CHANNELS, SHALL BE ANGLED THROUGH SIDEWALK IN DIRECTION OF GUTTER FLOW.
4. ALL DRAINS AND CHANNELS SHALL BE FLUSH W/FACE OF CURB.
5. DRAIN SLOPES SHALL BE 0.010 FT/FT (MIN.) AND 0.042 FT/FT (MAX.)
6. SURFACE DRAINAGE OVER DRIVEWAY APPROACHES AND SIDEWALKS IS NOT PERMITTED WHEN THE AREA TO BE DRAINED EXCEEDS 1/4 ACRE.

AREAS TO BE DRAINED FROM PRIVATE PROPERTY TO PUBLIC STREETS				
SURFACE AREA	TYPE OF SURFACE	DRAIN AREA REQUIRED	SIZE & NO. OF PIPES OR RECTANGULAR STEEL TUBE	SIZE & NO. OF CHANNELS
2 ACRES 200'X400'	PAVED GRASS	100 SQ. IN. 25 SQ. IN.	2-3"X6" RECT. TUBES	2-4"X14"
1.5 ACRES 200'X300'	PAVED GRASS	75 SQ. IN. 20 SQ. IN.	1-3"PIPE & 1-3"X6" R.T.	2-3"X12"
1 ACRE 200'X200'	PAVED GRASS	50 SQ. IN. 12 SQ. IN.	1-3"X5" RECT. TUBE	1-4"X14"
0.75 ACRE 150'X200'	PAVED GRASS	40 SQ. IN. 10 SQ. IN.	3-3"X6" RECT. TUBE OR 1-3"X5" RECT. TUBE	1-4"X14"
0.5 ACRE 100'X200'	PAVED GRASS	30 SQ. IN. 6 SQ. IN.	2-3"X6" RECT. TUBE OR 1-3"PIPE	1-3"X12"
0.25 ACRE 100'X100'	PAVED GRASS	16 SQ. IN. 3 SQ. IN.	1-3"PIPE & 1-3"X5" R.T. 1-3" PIPE	
USE 1 ACRE = 200'X200' OR 100'X400'				
AREA 3" DIA. PIPE = 7.1 SQ. IN.			AREA 4"X 14" CHANNEL = 56 SQ.IN.	
AREA 3"X 5" RECT. TUBE = 12.3 SQ. IN.			AREA 3"X 12" CHANNEL = 36 SQ.IN.	
AREA 3"X 6" RECT. TUBE = 14.9 SQ. IN.				

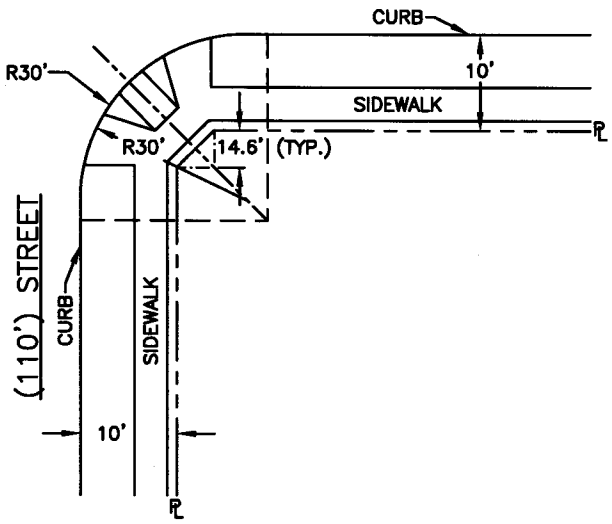
SIDEWALK DRAINS

REF. & REV. AUG., 2010

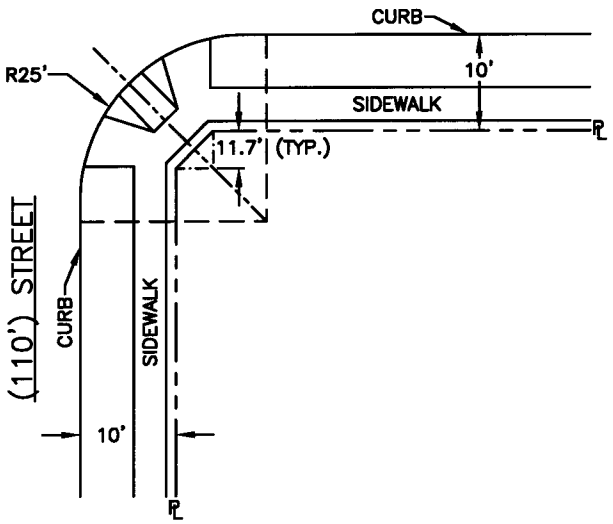
CITY OF FRESNO

P-23

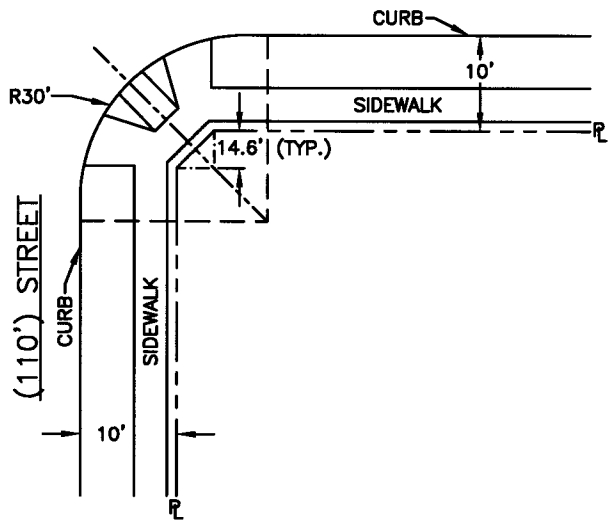
(110') STREET



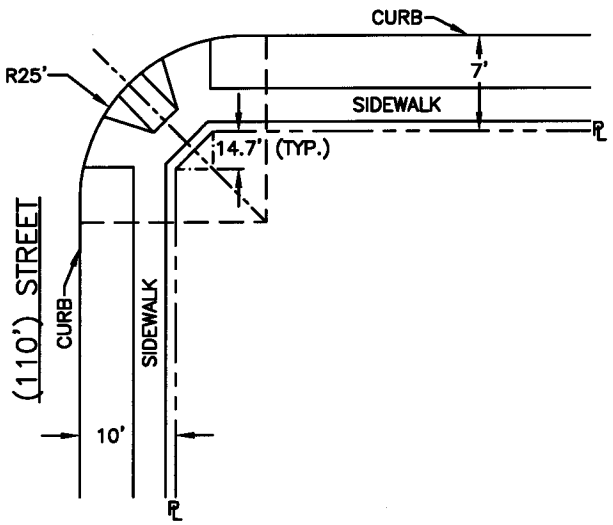
(60') STREET



(80') STREET



(54') STREET



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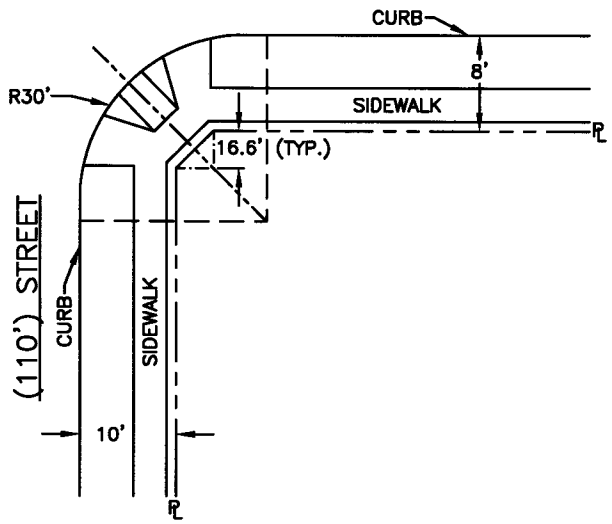
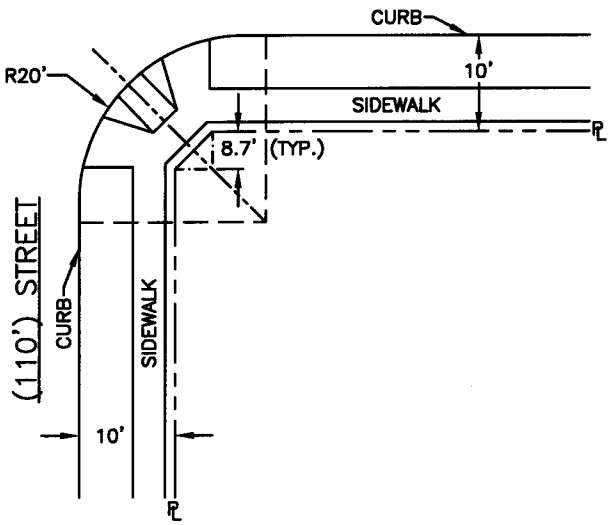


(56') STREET



STREET INTERSECTIONS

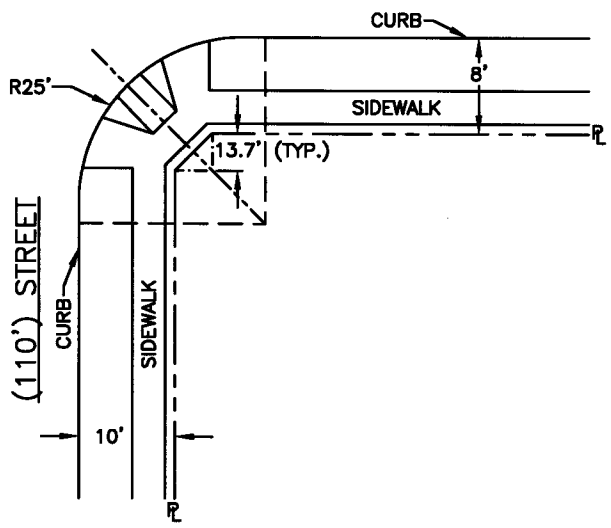
TYPICAL CURB RETURNS, LANDINGS, & R/W

REF. & REV.
AUG., 2010

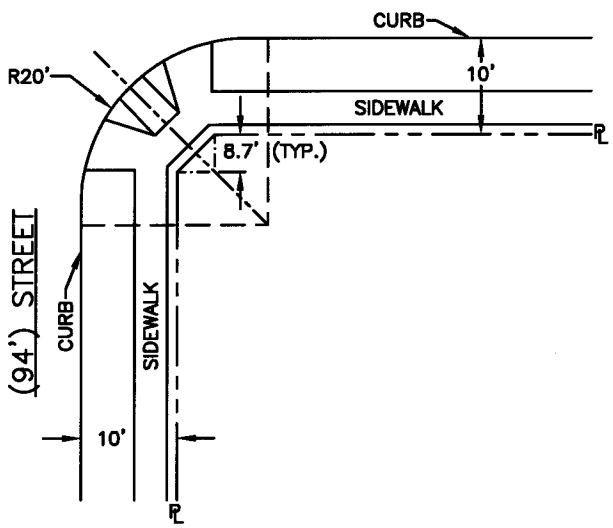
CITY OF FRESNO

P–24

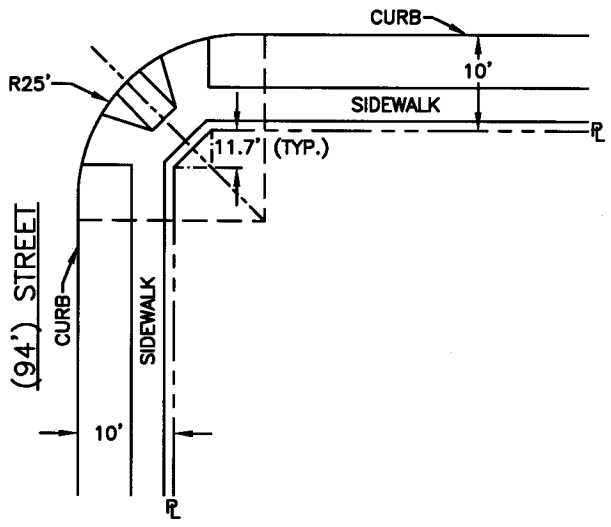
(64') STREET



(56') STREET



(60') STREET



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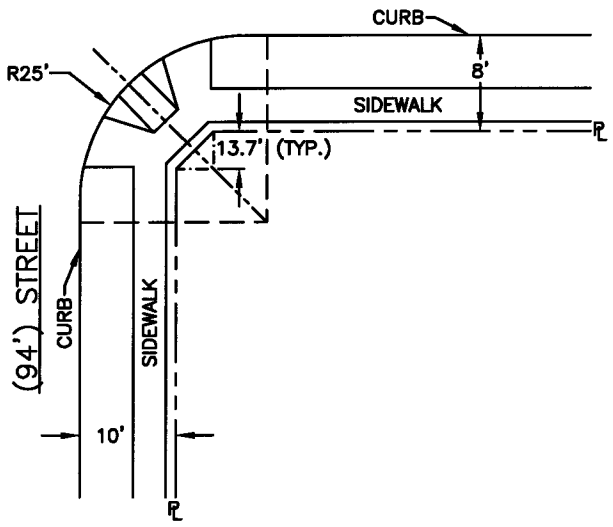
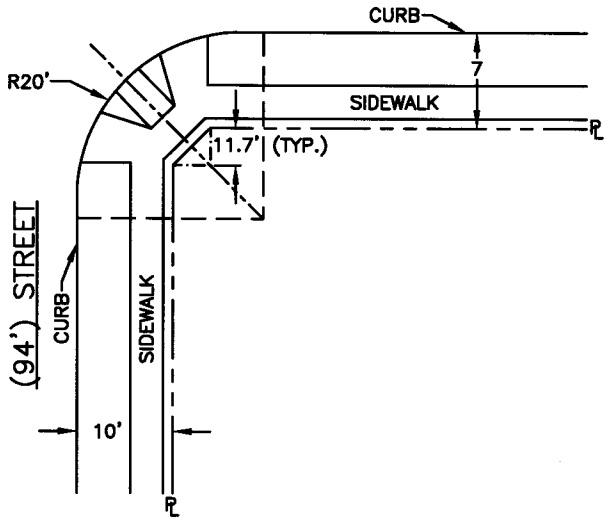


(50'/54') STREET



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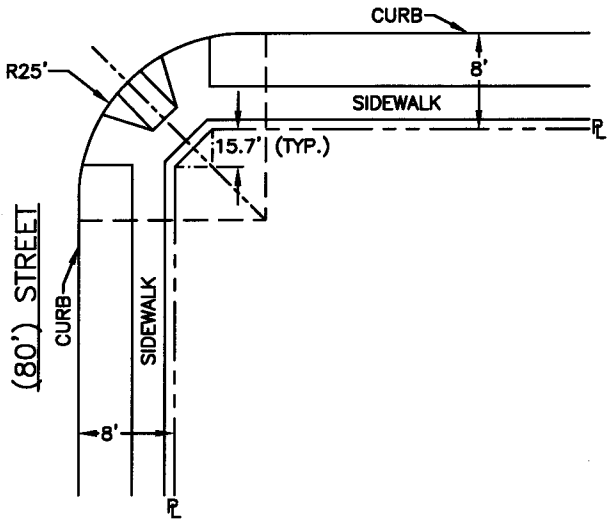


STREET INTERSECTIONS

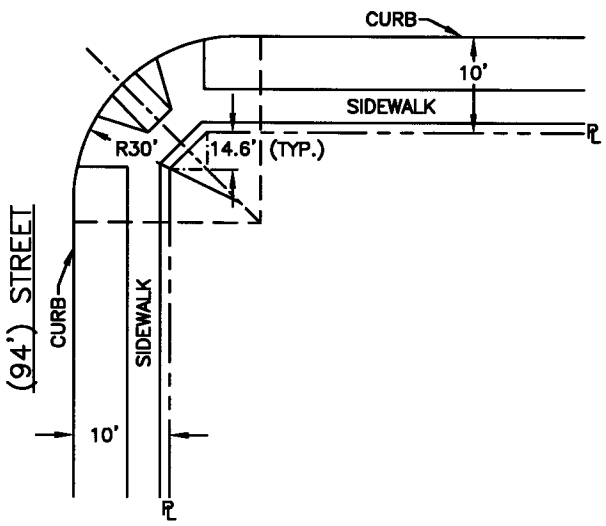
TYPICAL CURB RETURNS, LANDINGS, & R/W

REF. & REV.
AUG., 2010

CITY OF FRESNO

P–25

(94') STREET



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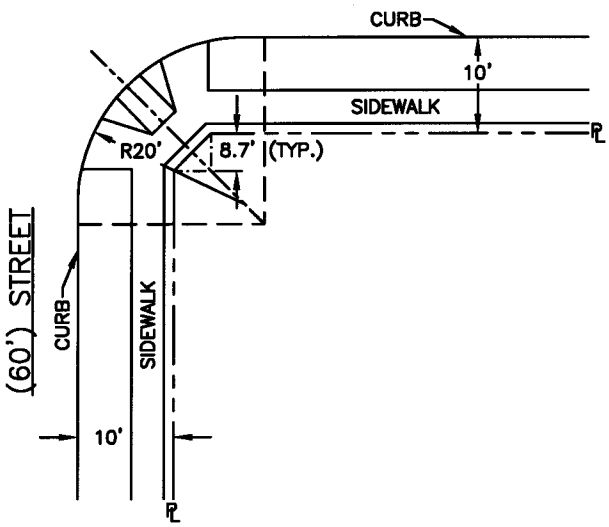
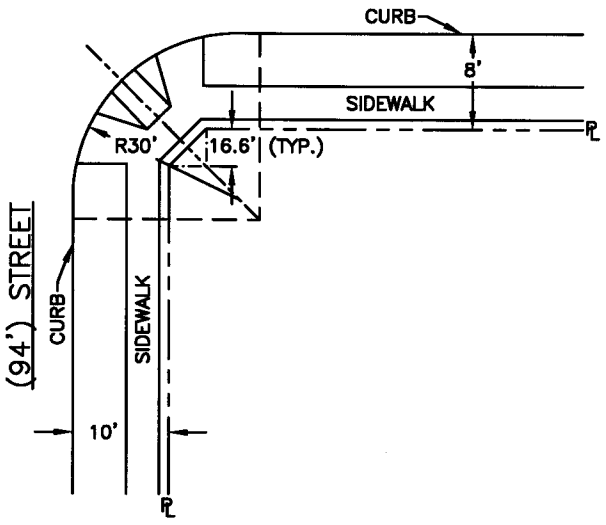
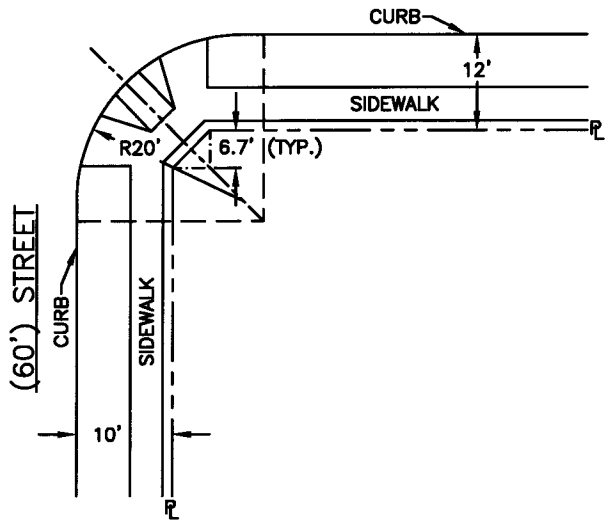


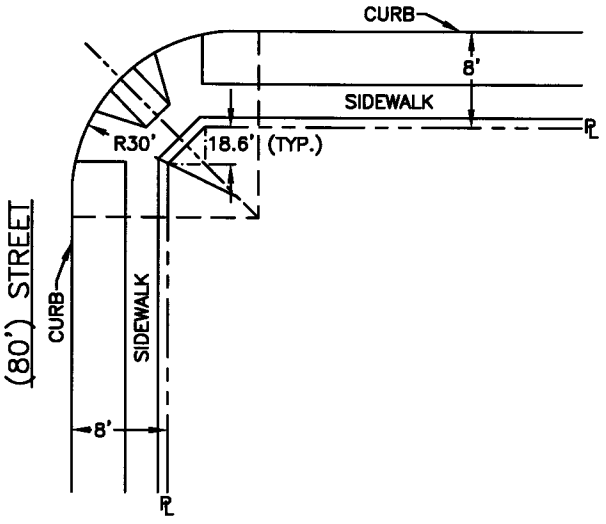
(80') STREET



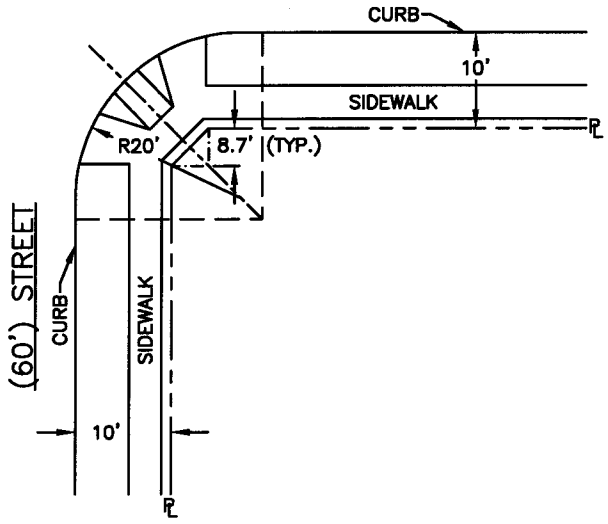
(60') STREET



(80') STREET



(56') STREET



STREET INTERSECTIONS

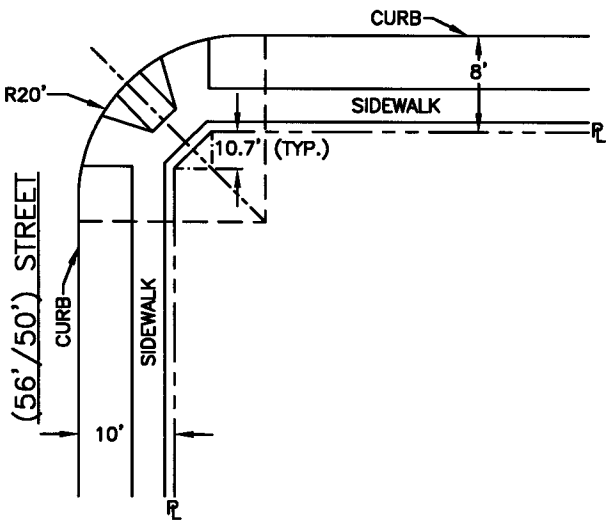
TYPICAL CURB RETURNS, LANDINGS, & R/W

REF. & REV.
AUG., 2002

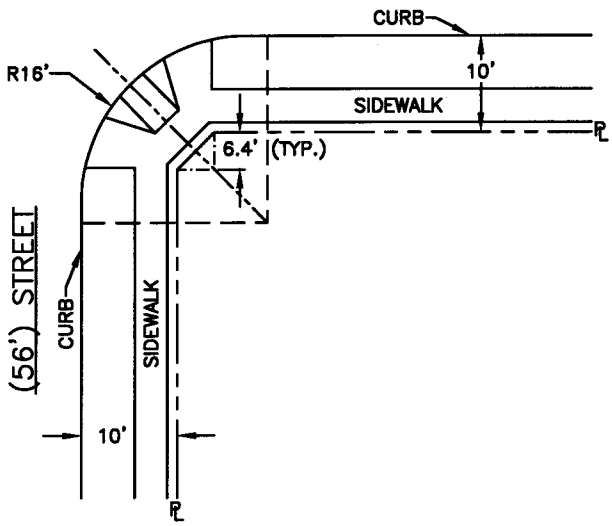
CITY OF FRESNO

P–26

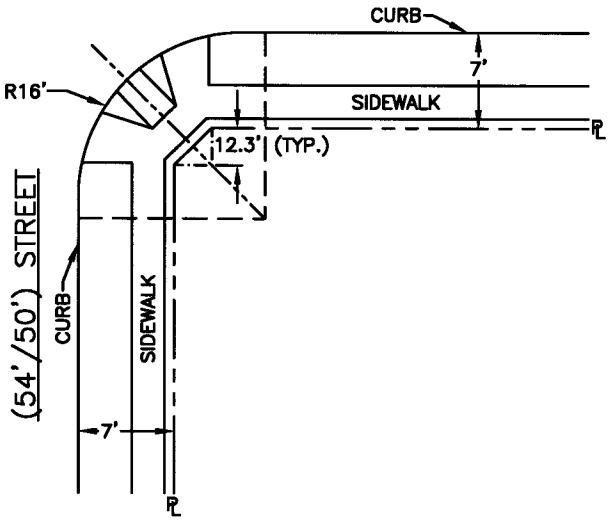
(80')/(64') STREET



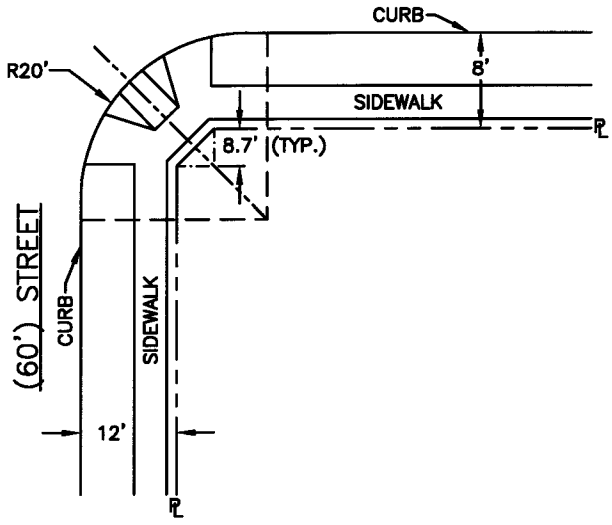
(56') STREET



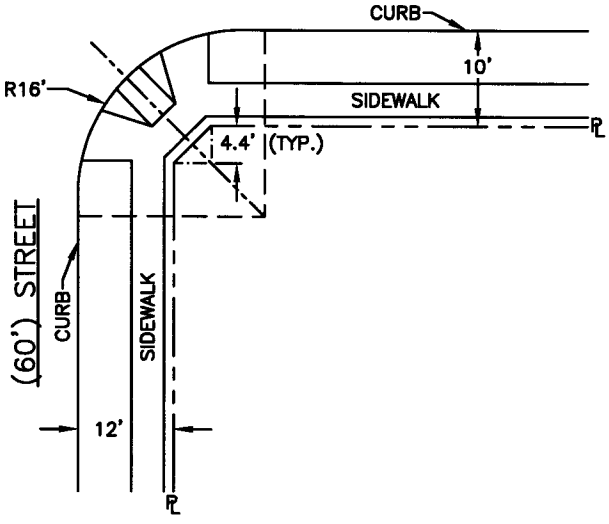
(50'/54') STREET



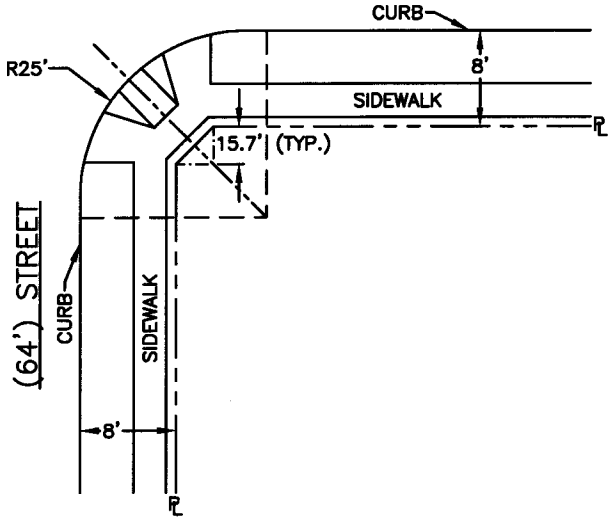
(80')/(64') STREET



(56') STREET



(64') STREET



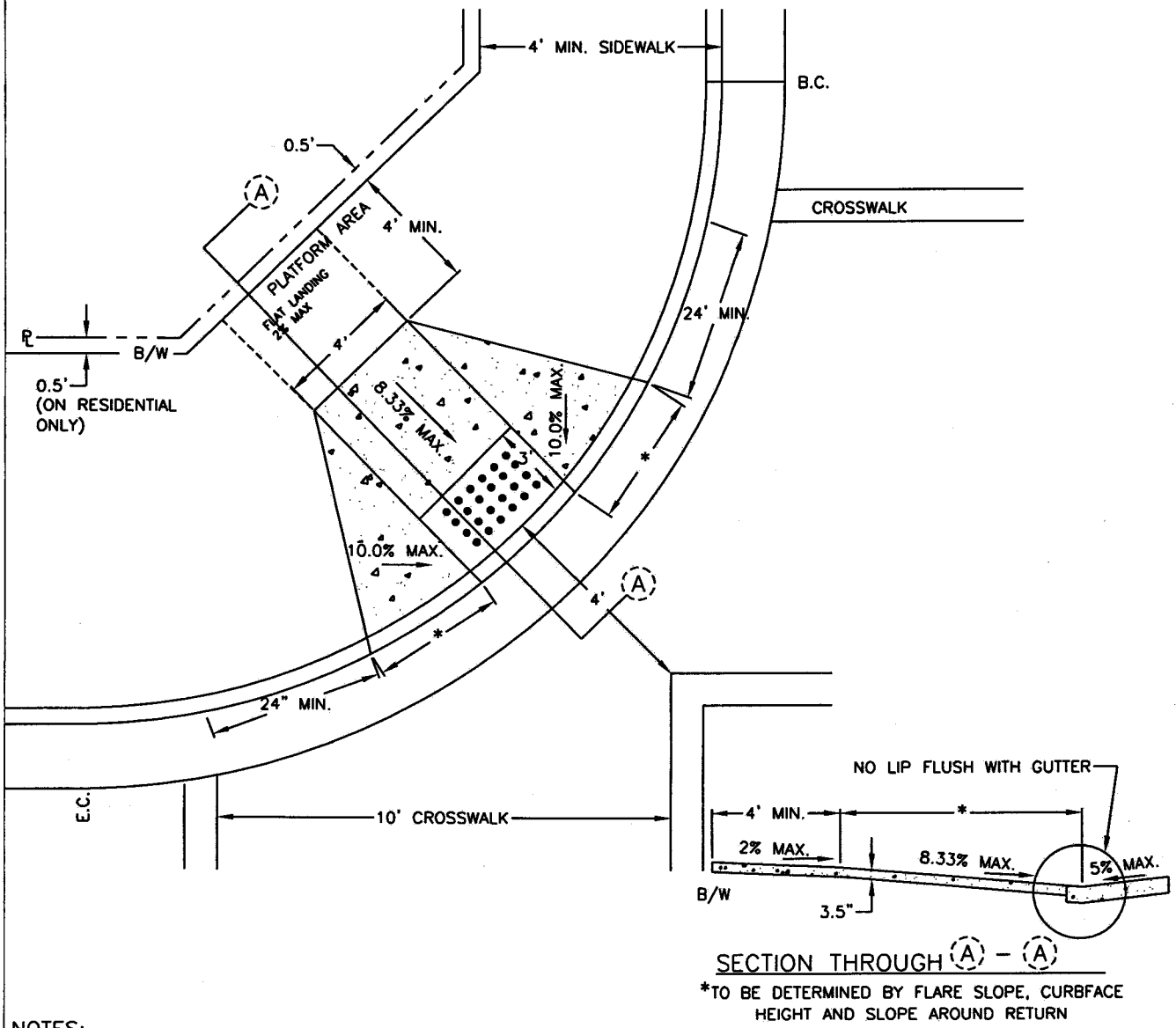
STREET INTERSECTIONS

TYPICAL CURB RETURNS, LANDINGS, & R/W

REF. & REV.
AUG., 2010

CITY OF FRESNO

P-27



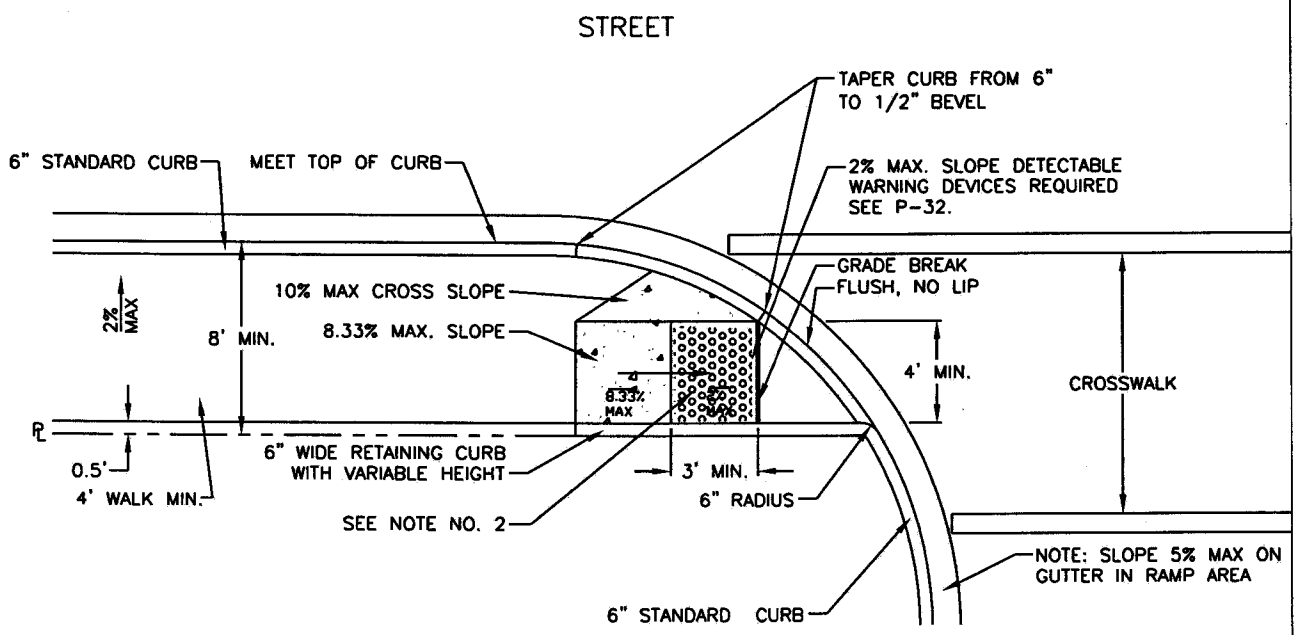
SECTION THROUGH (A) - (A)

*TO BE DETERMINED BY FLARE SLOPE, CURBFACE HEIGHT AND SLOPE AROUND RETURN

NOTES:

1. TRANSITIONS FROM RAMPS AND LANDING TO WALK, GUTTERS OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
2. SURFACE OF CURB RAMP AND FLARED SIDES SHALL HAVE MEDIUM BROOM FINISH TRANSVERSE TO PATH OF TRAVEL AND SHALL BE OF CONTRASTING FINISH TO THAT OF ADJACENT SIDEWALK.
3. RAMP SLOPE SHALL NEVER EXCEED 8.33%.
4. THE SLOPE OF ADJOINING GUTTERS, ROAD SURFACE OR ACCESSIBLE ROUTE WITHIN 4' OF THE BOTTOM OF THE RAMP SHALL NOT EXCEED 5% SLOPE.
5. THERE SHALL BE A SEGMENT OF STRAIGHT CURB, AT LEAST 24" LONG ON EACH SIDE OF THE CURB RAMP. THESE CURBS SHALL ALSO BE WITHIN THE MARKED CROSSWALK.
6. NOT USED.
7. PROVIDE LEVEL LANDING OF AT LEAST 48" ON UPPER END AND OVER FULL WIDTH OF RAMP, 2% MAX LANDING
8. THE 4' CLEAR SPACE AT BOTTOM OF RAMP SHALL BE WITHIN THE MARKED CROSSINGS.
9. RAMP SHALL BE MINIMUM OF 4' WIDE AND SHALL LIE GENERALLY IN A SINGLE SLOPED PLANE WITH A MINIMUM OF SURFACE WARPING AND CROSS SLOPE.
10. THE FLARED SIDE SHALL NOT EXCEED 10% SLOPE.
11. CURB RAMPS SHALL BE LOCATED OR PROTECTED TO PREVENT THEIR OBSTRUCTION BY PARKED CARS.
12. THE DETECTABLE WARNING SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. THE MATERIAL USED SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.

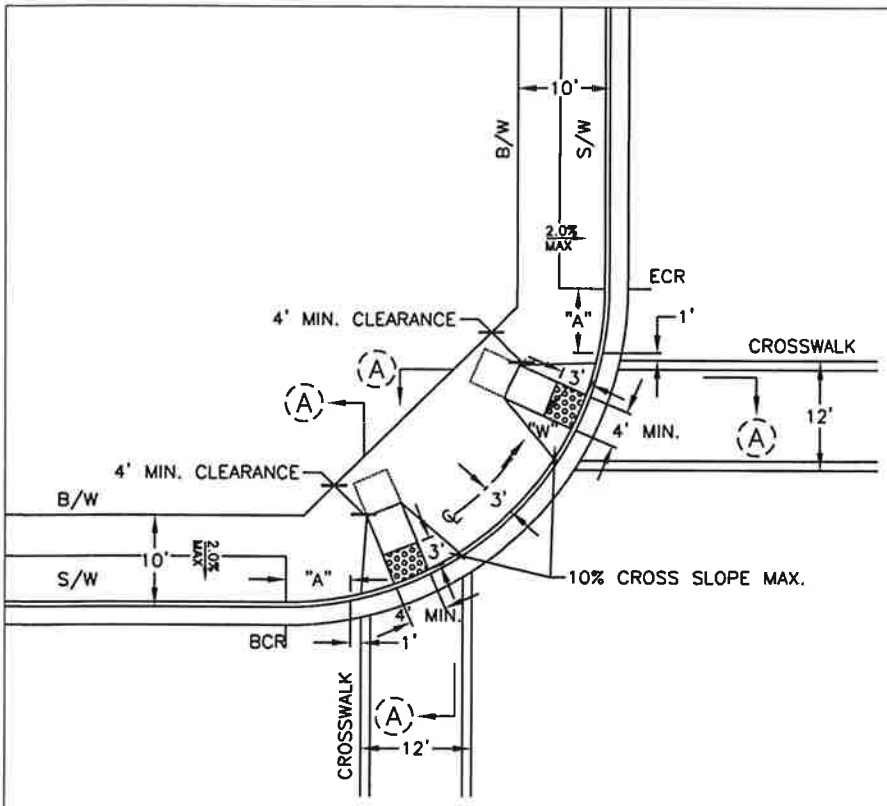
DIAGONAL CURB RAMP (USE ONLY WHEN NECESSARY)	REF. & REV. JUNE 2015	CITY OF FRESNO P-28



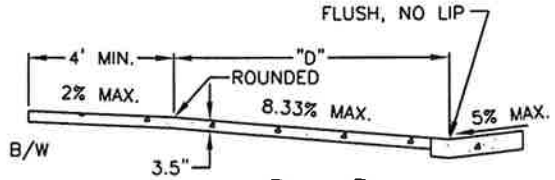
NOTES:

1. SURFACE OF CURB RAMP AND FLARED SIDE SHALL HAVE BROOM FINISH TRANSVERSE WITH THE PATH OF TRAVEL AND SHALL BE OF CONTRASTING FINISH TO THAT OF ADJOINING SIDEWALK.
2. ON THE BOTTOM LANDING WITH A 2% MAX. SLOPE, WHERE WALK ADJOINS A VEHICULAR WAY, USE TRUNCATED DOMES, IN-LINE PATTERN PER P.W. STD. P-32. WHERE BOTH ENDS OF THE BOTTOM GRADE BREAK FOR THE RAMP ARE LESS THAN 5' FROM THE BACK OF THE CURB THE DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE RAMP RUN WITH ONE DOME SPACING OF THE BOTTOM GRADE BREAK.
3. THE SLOPE OF ADJOINING GUTTERS, ROAD SURFACE OR ACCESSIBLE ROUTE WITHIN 4' OF THE BOTTOM OF THE RAMP SHALL NOT EXCEED 5% SLOPE.
4. RAMP SLOPE SHALL NEVER EXCEED 8.33%.
5. NOT USED.
6. PROVIDE LEVEL LANDING OF AT LEAST 48" ON UPPER END OVER FULL WIDTH OF RAMP, 2% MAX LEVEL LANDING.
7. THE LOWER END OF THE CURB RAMP SHALL TERMINATE WITHIN THE MARKED CROSSINGS.
8. RAMP SHALL BE MINIMUM OF 4' WIDE AND SHALL LIE GENERALLY IN A SINGLE SLOPED PLANE WITH A MINIMAL OF SURFACE WARPING AND CROSS SLOPE.
9. CURB RAMPS SHALL BE LOCATED OR PROTECTED TO PREVENT THEIR OBSTRUCTION BY PARKED CARS.

MODIFIED CURB RAMP AT STREET TYPE DRIVEWAY APPROACH	REF. & REV. JUNE 2015	CITY OF FRESNO P-29



CURB RADIUS	"A" DISTANCE
30'	5'
35'	7'
40'	11'
45'	15'
50'	18'



SECTION THROUGH (A) – (A)

DIMENSIONS "D" AND "W" TO BE DETERMINED BY FLARE SLOPE, CURBFACE HEIGHT AND SLOPE AROUND RETURN

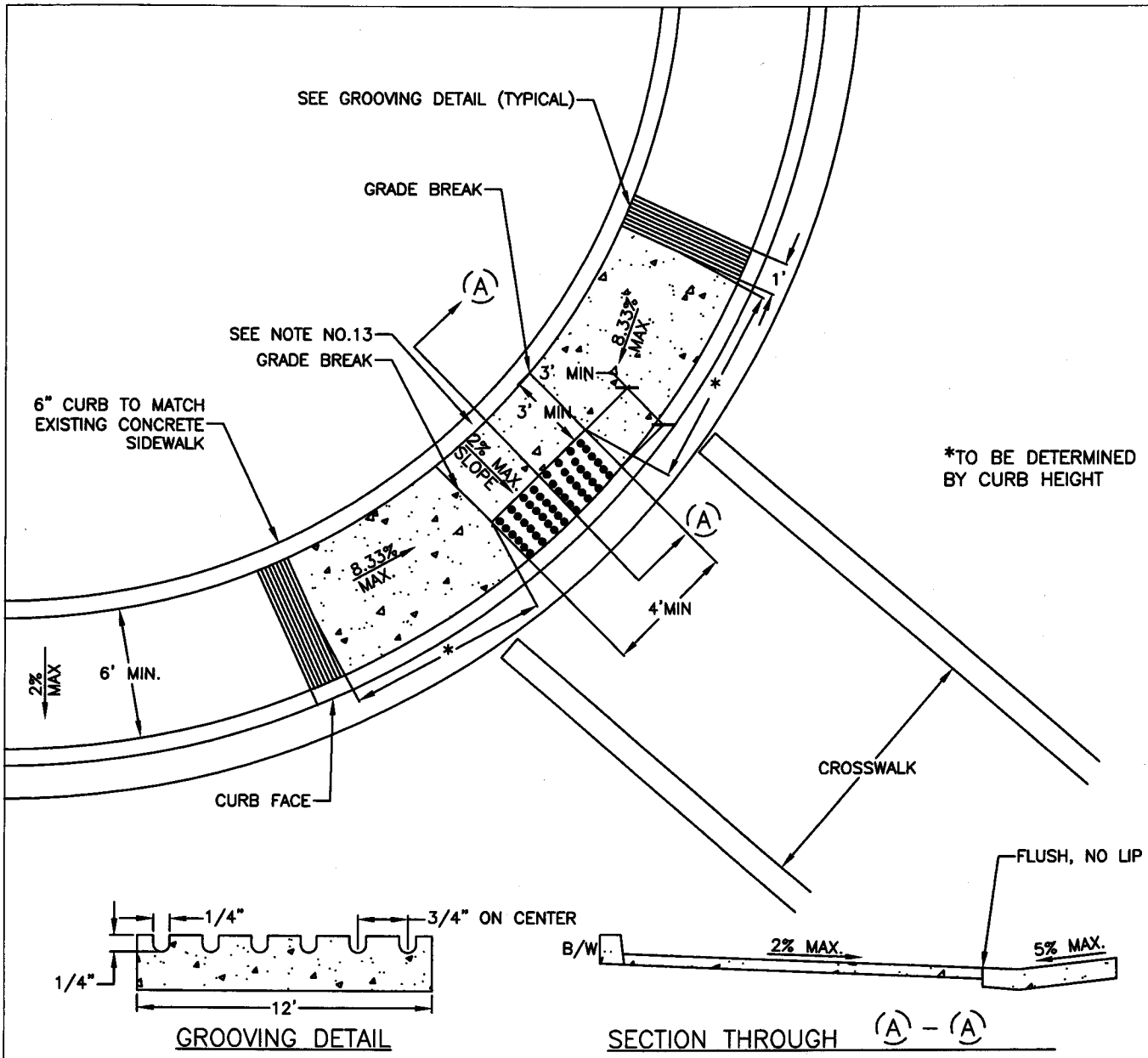
NOTES:

1. TRANSITIONS FROM RAMPS AND LANDING TO WALK, GUTTERS OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
2. SURFACE OF CURB RAMP AND FLARED SIDES SHALL HAVE BROOM FINISH TRANSVERSE TO PATH OF TRAVEL AND SHALL BE OF CONTRASTING FINISH TO THAT OF ADJACENT SIDEWALK.
3. RAMP SLOPE SHALL NEVER EXCEED 8.33%.
4. THE SLOPE OF ADJOINING GUTTERS, ROAD SURFACE OR ACCESSIBLE ROUTE WITHIN 4' OF THE BOTTOM OF THE RAMP SHALL NOT EXCEED 5% SLOPE.
5. NOT USED.
6. PROVIDE LEVEL LANDING OF AT LEAST 48" ON UPPER END AND OVER FULL WIDTH OF RAMP, 2% MAX LEVEL LANDING.
7. THE CLEAR SPACE AT BOTTOM OF RAMP SHALL BE WITHIN THE MARKED CROSSINGS.
8. RAMP SHALL BE MINIMUM OF 4' WIDE AND SHALL LIE GENERALLY IN A SINGLE SLOPED PLANE WITH A MINIMUM OF SURFACE WARPING AND CROSS SLOPE.
9. THE FLARED SIDE SHALL NOT EXCEED 10% SLOPE.
10. CURB RAMPS SHALL BE LOCATED OR PROTECTED TO PREVENT THEIR OBSTRUCTION BY PARKED CARS.
11. THE DETECTABLE WARNING SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. THE MATERIAL USED SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.

DUAL CURB RAMPS
MAJOR STREET INTERSECTION

REF. & REV.
JUNE 2015

CITY OF FRESNO
P-30



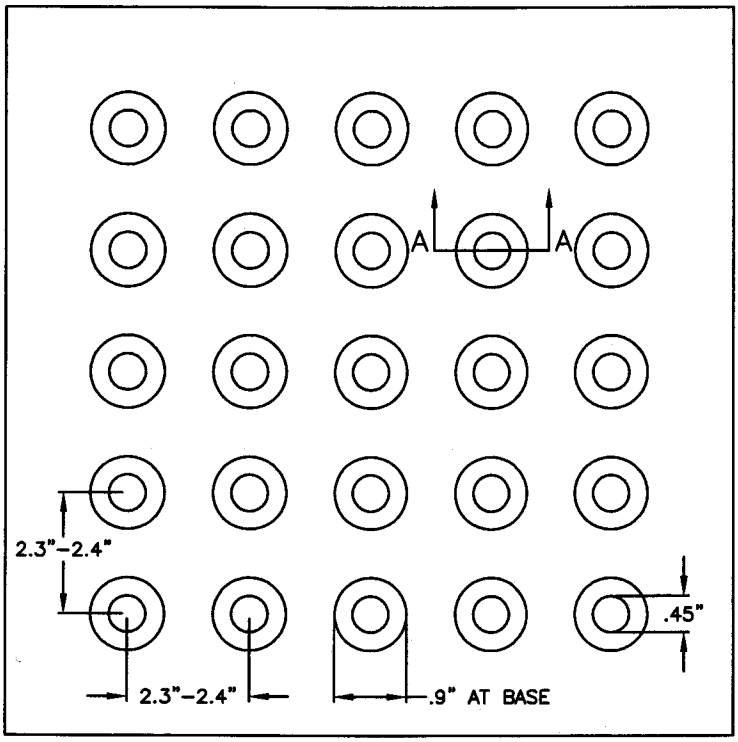
GROOVING DETAIL

SECTION THROUGH (A) - (A)

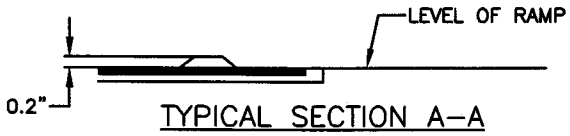
NOTES:

1. TRANSITIONS FROM RAMPS AND LANDING TO WALK, GUTTERS OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
2. SURFACE OF CURB RAMP AND FLARED SIDES SHALL HAVE BROOM FINISH TRANSVERSE TO PATH OF TRAVEL AND SHALL BE OF CONTRASTING FINISH TO THAT OF ADJACENT SIDEWALK.
3. RAMP SLOPE SHALL NEVER EXCEED 8.33%.
4. THE SLOPE OF ADJOINING GUTTERS, ROAD SURFACE OR ACCESSIBLE ROUTE WITHIN 4' OF THE BOTTOM OF THE RAMP SHALL NOT EXCEED 5% SLOPE.
5. PROVIDE GROOVED BORDER 12" WIDE AT THE LEVEL SURFACE OF THE SIDEWALK ALONG THE TOP AND EACH SIDE APPROX. 3/4" ON CENTER, 1/4" DEEP;1/4" WIDE.
6. THE LOWER LANDING AREA LEADING INTO VEHICULAR WAY SHALL TERMINATE WITHIN THE MARKED CROSSING.
7. PROVIDE LEVEL LANDING OF AT LEAST 48" ON UPPER END AND OVER FULL WIDTH OF RAMP.
8. RAMP AND LOWER LANDING SHALL BE MINIMUM OF 4' WIDE AND SHALL LIE GENERALLY IN A SINGLE SLOPED PLANE WITH A MINIMUM OF SURFACE WARPING AND CROSS SLOPE.
9. CURB RAMPS SHALL BE LOCATED OR PROTECTED TO PREVENT THEIR OBSTRUCTION BY PARKED CARS.
10. ON THE BOTTOM LANDING WITH A 2% MAX. SLOPE, WHERE WALK ADJOINS A VEHICULAR WAY, DETECTABLE WARNING DEVICES SHALL BE REQUIRED ON THE FULL WIDTH AND 36" DEPTH, IN-LINE PATTERN PER P.W. STD. P-32.
11. THE DETECTABLE WARNING SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. THE MATERIAL USED SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
12. THIS RAMP TYPE SHALL ONLY BE USED WHEN NECESSARY DUE TO R/W OR PHYSICAL CONSTRAINTS. IT MAY BE UTILIZED FOR DIAGONAL OR DUAL RAMP APPLICATIONS.
13. MODIFIED RAMPS PLACED ON SIGNALIZED INTERSECTIONS SHALL HAVE A PEDESTRIAN POST FOR BUTTON PLACEMENT AT THE LOWER LANDING AREA FOR ADA REQUIREMENTS.

# MODIFIED CURB RAMP	REF. & REV. JUNE 2014	CITY OF FRESNO P-31



IN–LINE PATTERN A–A



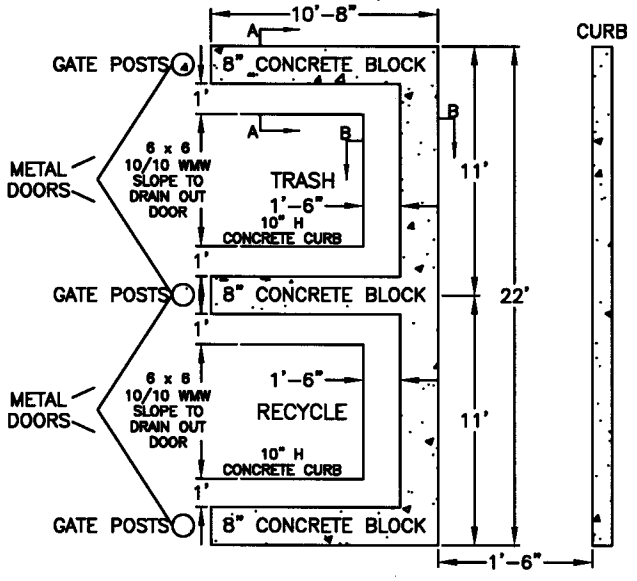
TYPICAL SECTION A–A

NOTES:

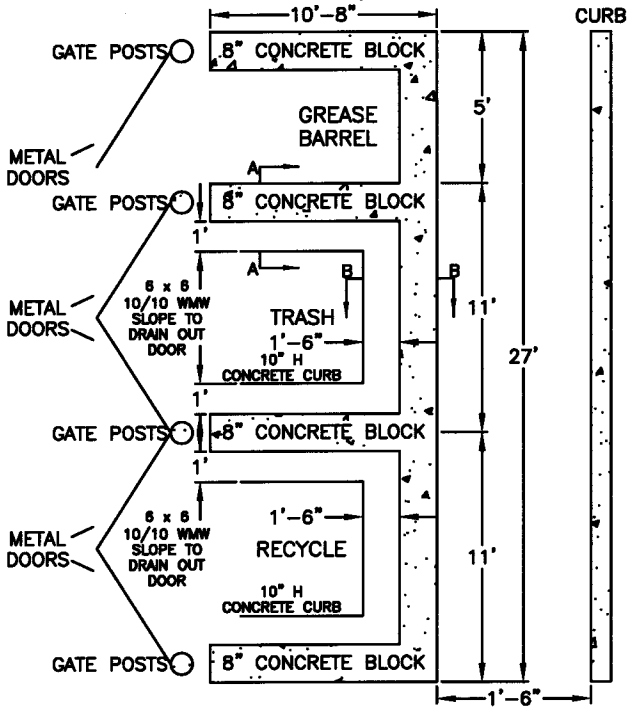
1. THE DETECTABLE WARNING SHALL VISUALLY CONTRAST PER THE 2013 CALIFORNIA BUILDING CODE. THE MATERIAL USED SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE. THE COLOR SHALL BE YELLOW.
2. THE DOMES MAY BE CONSTRUCTED IN A VARIETY OF METHODS, INCLUDING CAST–IN–PLACE OR STAMPED OR IT MAY BE PART OF A PREFABRICATED SURFACE TREATMENT.
3. ONLY APPROVED DSA/AC DETECTABLE WARNING PRODUCTS AND DIRECTIONAL SURFACES SHALL BE INSTALLED AS PROVIDED IN THE CALIFORNIA CODE OF REGULATIONS (CCR), TITLE 24, PART 1, ARTICLES 2, 3 AND 4. REFER TO CCR TITLE 24, PART 12, CHAPTER 12–11A AND B FOR BUILDING FACILITY ACCESS SPECIFICATIONS FOR PRODUCT APPROVAL FOR DETECTABLE WARNING PRODUCTS AND DIRECTIONAL SURFACES.
4. DETECTABLE WARNING PRODUCTS AND DETECTABLE SURFACES SHALL BE EVALUATED BY AN INDEPENDENT ENTITY, SELECTED BY THE DEPARTMENT OF GENERAL SERVICES, DIVISION OF THE STATE ARCHITECT–ACCESS COMPLIANCE FOR ALL OCCUPANCIES, INCLUDING TRANSPORTATION AND OTHER OUTDOOR ENVIRONMENTS. SEE GOVERNMENT CODE SECTION 4460.

DETECTABLE WARNING DEVICES	REF. & REV. JUNE 2014	CITY OF FRESNO P–32

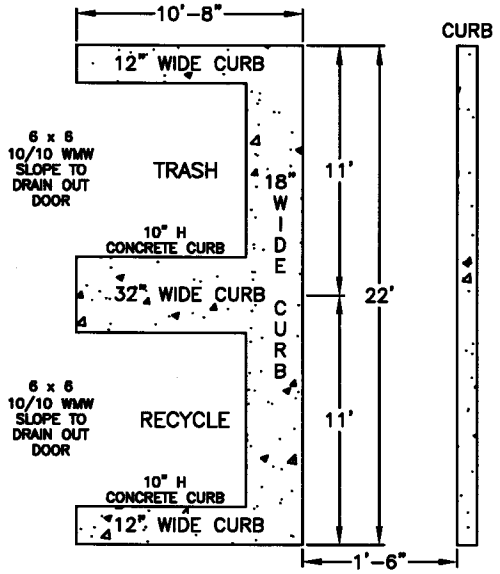
ENCLOSURE SCALE / STANDARD



ENCLOSURE SCALE / RESTAURANT

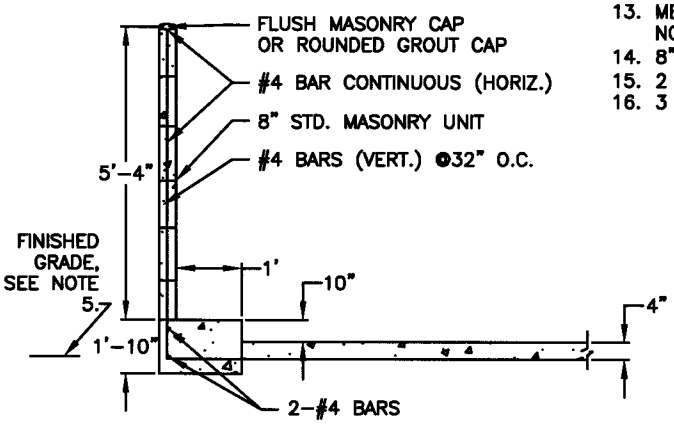


ENCLOSURE SCALE/ CURB ONLY
ZONES–M1,M2,M3, & CM ONLY

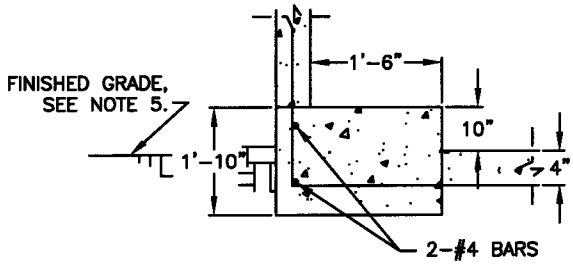


NOTES:

1. ALL CONSTRUCTION SHALL COMPLY WITH THE FRESNO MUNICIPAL CODE.
2. GROUT ALL CELLS.
3. ALL MASONRY UNITS SHALL COMPLY WITH THE LATEST ADOPTED CALIFORNIA BUILDING CODE AND U.B.C. STANDARD 24–4 GRADE N.
4. ALL MASONRY WALLS SHALL BE INSPECTED BY THE CITY OF FRESNO DEVELOPMENT DEPARTMENT.
5. DEPTH OF FOOTINGS ARE INTO NATURAL UNDISTURBED SOIL OR TESTED AND APPROVED COMPACTED FILL.
6. ALL MASONRY UNITS SHALL BE MINIMUM F'M=1500 PSI.
7. REINFORCING STEEL SHALL BE DEFORMED BAR, MIN. GRADE 40.
8. FOOTING CONCRETE SHALL BE A MINIMUM 2000 PSI AT 28 DAYS.
9. MORTAR SHALL BE TYPE–S (MINIMUM 1800 PSI AT 28 DAYS).
   ONE (1) PART CEMENT, TYPE–1
   ONE–HALF (1/2) PART LIME PUTTY OR HYDRATED LIME.
   FOUR AND ONE–HALF (4 1/2) PARTS SAND (MAXIMUM).
10. GROUT SHALL BE A MINIMUM 2000 PSI AT 28 DAYS.
    ONE (1) PART CEMENT.
    THREE (3) PARTS SAND.
    TWO (2) PARTS PEA GRAVEL.
11. FINISH PAD ELEVATION TO BE FLUSH WITH GRADE AT ACCESS PAVEMENT.
12. ANY GATE HINGES SHOULD BE LOCATED ON THE OUTSIDE.
13. METAL DOORS ARE REQUIRED ON ALL ENCLOSURES, CHAIN LINK IS NOT ACCEPTABLE.
14. 8" CONCRETE BLOCK TO BE USED FOR WALLS.
15. 2 CELLS ARE REQUIRED FOR COMMERCIAL/INDUSTRIAL BUILDINGS.
16. 3 CELLS ARE REQUIRED FOR RESTAURANTS.



VIEW "A–A"



VIEW "B–B"

TYPICAL SECTION W/ CONCRETE BLOCK WALL

TYPICAL REFUSE CONTAINER ENCLOSURE DETAILS

REF. & REV.
AUG., 2010

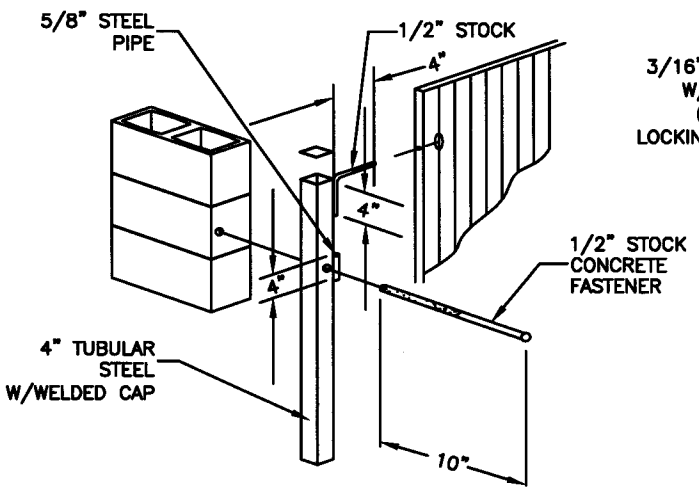
CITY OF FRESNO

P–33

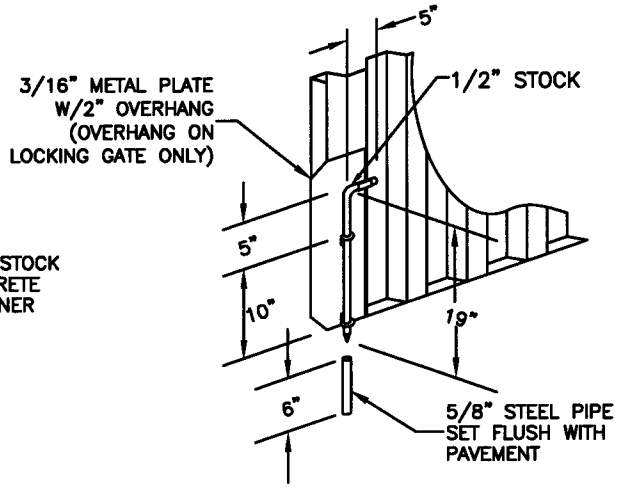
GENERAL NOTES:

1. ALL SITE PLANS SHALL HAVE THE SIGNATURE APPROVAL OF A SOLID WASTE MANAGEMENT DIVISION REPRESENTATIVE.
2. CONTAINERS USED AT ALL PLACES SHALL BE PLACED FOR COLLECTION AT SERVICE LOCATIONS APPROVED BY THE PUBLIC UTILITIES DIRECTOR, OR HIS/HER DESIGNEE, BUT SHALL NOT BE STORED IN THE PUBLIC RIGHT-OF-WAY.
3. THE DESIGN OF ANY NEW, SUBSTANTIALLY REMODELED, OR EXPANDED BUILDING OR OTHER FACILITY SHALL PROVIDE FOR PROPER STORAGE OR HANDLING WHICH WILL ACCOMMODATE THE SOLID WASTE LOADING ANTICIPATED AND WHICH WILL ALLOW FOR SAFE AND EFFICIENT WASTE REMOVAL.
4. THE PUBLIC UTILITIES DIRECTOR, OR HIS/HER DESIGNEE, SHALL PLAN WITH THE PROPERTY OWNER AND/OR THEIR REPRESENTATIVE AS TO PLACEMENT OF STORAGE CONTAINERS TO MINIMIZE TRAFFIC, AESTHETIC AND OTHER PROBLEMS BOTH ON THE PROPERTY, AND FOR THE GENERAL PUBLIC.
5. BELOW IS A CHECKLIST OF REQUIREMENTS REVIEWED FOR A SITE PLAN:
   a. REFUSE, RECYCLABLES, AND GREASE BARRELS SHALL BE STORED FOR LATER REMOVAL FROM THE PREMISES IN AN AREA THAT IS SCREENED FROM VIEW OF THE PUBLIC STREETS BY A CITY OF FRESNO, PUBLIC UTILITIES APPROVED STANDARD ENCLOSURE (REFER TO P-33, P-34, AND P-95 FOR DETAILS). APPROVED STANDARD ENCLOSURES ARE TO BE BUILT USING EIGHT INCH (8") CONCRETE BLOCK AT A HEIGHT OF SIX FEET (6').
   b. ENCLOSURES BUILT IN (INDUSTRIAL ZONES) M-1, M-2, M-3, AND CM ZONES REQUIRING DIRECTOR APPROVAL, OR HIS/HER DESIGNEE, MAY ELIMINATE WALLS AS LONG AS IT IS NOT VISIBLE FROM A MAIN STREET. FOR THIS DESIGN, THE CURBING WILL BE TWELVE INCHES (12") WIDE ON BOTH SIDES, EIGHTEEN INCHES (18") DEEP ALONG THE REAR WITH A THIRTY-TWO INCH (32") WIDE CURB SEPARATING THE TWO CELLS. CURBING MUST BE REINFORCED WITH REBAR AT A HEIGHT OF TEN INCHES (10"). ALL ENCLOSURES SHALL BE A MINIMUM OF EIGHTEEN INCHES (18") FROM THE NEAREST CURB. ALL OTHER PUBLIC WORKS DESIGN REQUIREMENTS SHALL BE MET DURING REVIEW.
   c. THE APPROVED STANDARD ENCLOSURE HAS BEEN DESIGNED TO ACCOMMODATE ALL SIZES OF CONTAINERS TO HANDLE THE ACCUMULATION OF WASTE AND RECYCLABLES GENERATE BETWEEN COLLECTIONS. A STORAGE AREA WITH INNER DIMENSIONS TEN FEET (10') BY TEN FEET (10') IS THE MINIMUM. THERE SHALL BE CURBING TWELVE INCHES (12") FROM SIDE WALLS AND EIGHTEEN INCHES (18") FROM REAR WALL AND AT A HEIGHT OF TEN INCHES (10"). THESE FEATURES ARE INCLUDED IN ORDER TO REDUCE THE POSSIBILITY OF DAMAGE TO THE ENCLOSURE ITSELF.
   d. SERVICE ACCESS TO ENCLOSURE SHALL BE A MINIMUM UNENCUMBERED OPENING OF EIGHT FEET (8'). THE GATE TO BE USED SHALL BE BUILT OF METAL, CHAIN LINK IS NOT ACCEPTABLE, SO THAT BINS CANNOT BE SEEN WHEN GATES ARE CLOSED AND SHALL BE MOUNTED ON THE OUTER SURFACE OF ENCLOSURE AS TO NOT PROTRUDE INTO SERVICE ACCESS OPENING. HARDWARE LATCHES SHOULD BE A HEAVY GAUGE LOCKING GATE LATCH. TWO GATES ARE REQUIRED ON EACH CELL WITH THE EXCEPTION OF THE GREASE BARREL CELL.
   e. THE FLOOR OR BOTTOM SURFACE OF THE COLLECTION AREA SHALL BE MADE OF CONCRETE, (SLOPED) ONE PERCENT (1%) TO THE FRONT, AND THERE SHALL NOT BE ANY DRAINAGE GUTTER IN FRONT OF ENTRANCE. THE UNENCUMBERED OPENING OF EIGHT FEET (8') REFERENCED IN D. ABOVE SHALL BE A LEVEL SURFACE. THE FLOOR SHALL NOT SLOPE TO THE BACK OR SIDES OF THE ENCLOSURE TO ALLOW DRAINAGE TO THE REAR OF THE AREA OR CAUSE ANY STANDING WATER WITHIN THE ENCLOSURE. IT SHALL BE CONSTRUCTED SO THE COLLECTION VEHICLE CAN DRIVE DIRECTLY INTO THE POCKETS OF THE CONTAINERS WITHOUT ANY OBSTRUCTIONS.
   f. INGRESS AND EGRESS SHALL HAVE AN UNOBSTRUCTED OVERHEAD CLEARANCE OF SIXTEEN FEET (16') AND SHALL NOT BE LESS THAN EIGHTEEN FREE (18') WIDE AND CAPABLE OF ACCOMMODATING A TRUCK WITH A TWO HUNDRED FIFTY INCH (250") WHEELBASE, A FORTY-FOUR FOOT (44') (CENTER LINE) TURNING RADIUS AND A SUPPORT WEIGHT OF THIRTY-FIVE (35) TONS. AREA SHALL BE UNOBSTRUCTED AND SO CONFIGURED THAT A TRUCK WILL BE ABLE TO MAKE A ROUND TRIP FROM THE PUBLIC RIGHT-OF-WAY TO THE COLLECTION ARE AND RETURN WITHOUT EXCESSIVE BACKING INTO A TRAFFIC LANE OR A PUBLIC THOROUGHFARE. BACKING AROUND A BUILDING IS NOT ALLOWED. AT NO TIME SHALL A TRUCK BE REQUIRED TO BACK IN EXCESS OF FORTY-FIVE FEET (45').
   g. BIN ENCLOSURE GATES AND SERVICE AREA SHALL NOT OPEN INTO OR BE A PART OF A PARKING STALL OR LOADING ZONE.
   h. GATED ENTRANCE/EXIT SERVICE SITES SHALL BE AT LEAST FORTY FEET (40') AWAY FROM ENTRANCES AND EXITS TO PREVENT TRUCKS FROM STICKING OUT INTO THE ROADWAY WHILE WAITING TO ACCESS ENCLOSURE AND ALLOW TRUCKS ENOUGH SPACE TO CLEAR GATE ON EXITING WHILE WAITING TO MERGE WITH TRAFFIC.
   i. THE ENCLOSURE(S) SHALL ACCOMMODATE REFUSE BINS, RECYCLE BINS, AND GREASE BARRELS WHEN APPLICABLE. NEITHER THE WASTE NOR RECYCLING CONTAINER SHALL BE REQUIRED TO BE MOVED IN ORDER TO SERVICE THE OTHER. GREASE BARRELS SHALL NOT BE PLACED IN THE SAME AREA OF THE ENCLOSURE WITH REFUSE OR RECYCLABLES.
   j. OWNER/OCCUPANTS SHALL NOT USE ENCLOSURES FOR STORAGE OR PLACE ANY MATERIALS AROUND THE TRASH, RECYCLE, OR GREASE CONTAINERS.
   k. SIGNAGE IS REQUIRED TO CLEARLY IDENTIFY ALL RECYCLING, SOLID WASTE COLLECTION, AND LOADING AREAS AND THE MATERIALS ACCEPTED THEREIN. THIS SIGNAGE SHALL BE PLACED AT ALL POINTS OF DIRECT ACCESS TO RECYCLING, SOLID WASTE, AND LOADING AREAS ON, OR ADJACENT TO, THE RECYCLABLE AND SOLID WASTE MATERIAL CONTAINERS.
   l. SITES UTILIZING COMPACTORS AND/OR ROLL-OFFS REQUIRE SIXTY FEET (60') OF CLEARANCE IN FRONT OF THE UNIT, AND A MINIMUM OF THREE FEET (3') ON EACH SIDE, FOR LOADING AND UNLOADING.

TYPICAL REFUSE ENCLOSURE DETAILS	REF. & REV. NOV., 2007	CITY OF FRESNO P-34



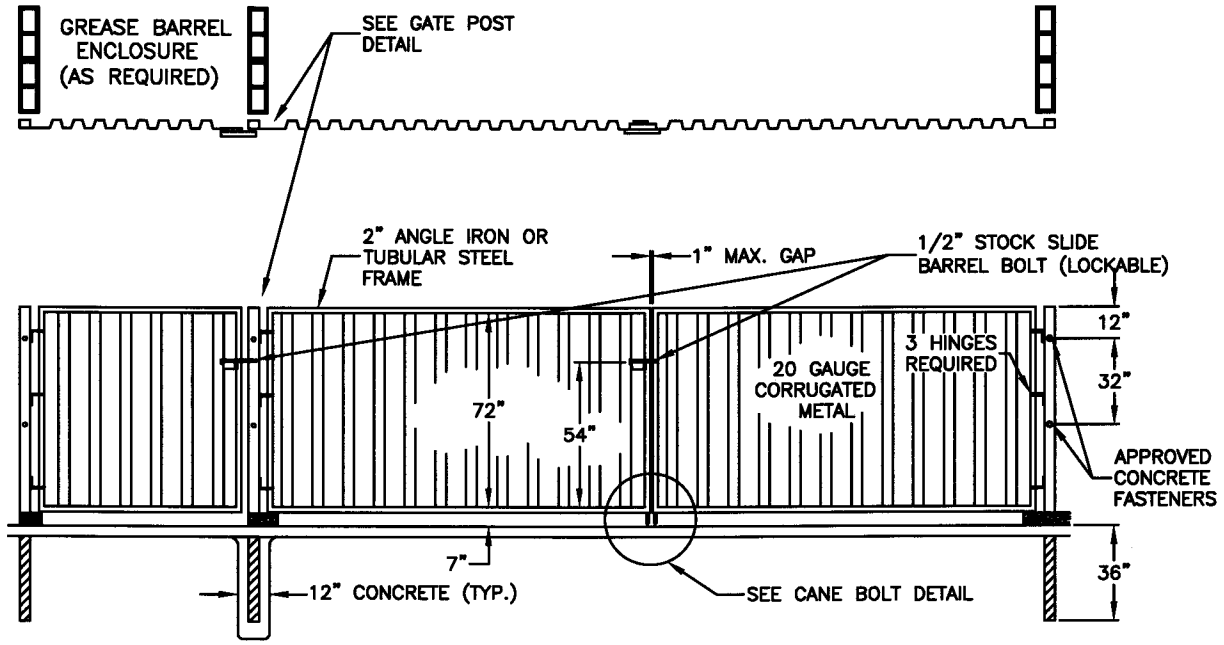
GATE POST DETAIL



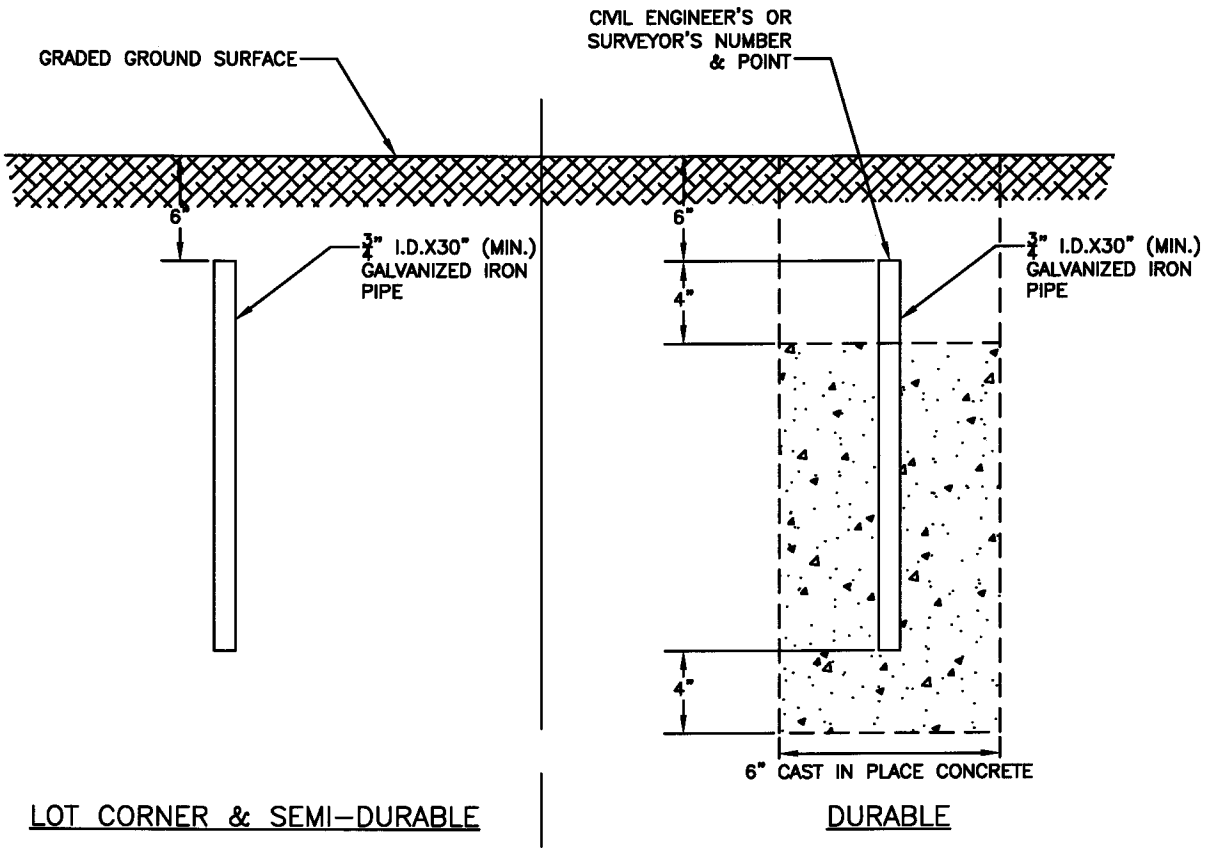
CANE BOLT DETAIL
(BOTH SIDES OF GATE)

NOTES:

1. GATES TO BE PAINTED TO MATCH BUILDING ACCENT FEATURES.
2. DESIGN, ENGINEERING AND CONSTRUCTION NOT SPECIFICALLY NOTED SHALL BE IN ACCORDANCE WITH ACCEPTED INDUSTRY STANDARDS AND OF FIRST QUALITY.
3. SECONDARY CANE BOLT RETAINER TO BE PLACED FOR EACH GATE SUCH THAT GATE IS HELD IN A POSITION 90 DEGREES TO THE CLOSED POSITION.
4. TWO GATES ARE REQUIRED ON EACH CELL WITH THE EXCEPTION OF THE GREASE BARREL CELL.



TRASH ENCLOSURE GATE DETAILS	REF. & REV. AUG., 2010	CITY OF FRESNO P-35



NOTES:

1. STATE LAW REQUIRES ALL CORNERS TO BE TAGGED WITH A REGISTERED SURVEYOR'S OR REGISTERED CIVIL ENGINEER'S NUMBER.

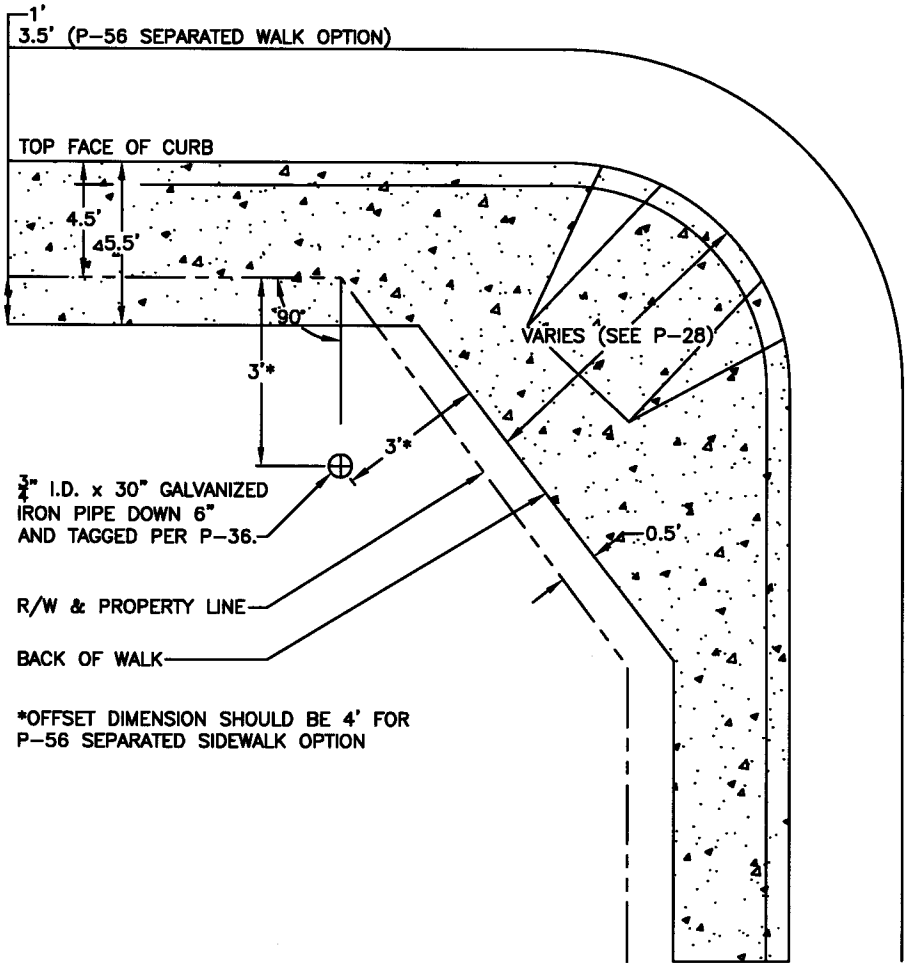
2. REGULAR SHAPED SUBDIVISIONS SHALL HAVE EXTERIOR CORNERS MARKED WITH DURABLE MONUMENTS. IRREGULAR SHAPED SUBDIVISIONS SHALL HAVE ALL EXTERIOR ANGLES AND CURVE POINTS MARKED WITH DURABLE MONUMENTS, OR REFERENCED TO AN ADJACENT BLOCK OR LOT CORNER, WHICH IS ALSO MARKED WITH A DURABLE MONUMENT. CONCRETE FOR THE DURABLE MONUMENT SHALL BE CAST IN PLACE.

3. BLOCK CORNERS, UNLESS OTHERWISE MARKED WITH A DURABLE MONUMENT, SHALL BE MARKED WITH A SEMI-DURABLE MONUMENT.

4. ALL LOT CORNERS, ANGLE POINTS, BEGINNING OF CURVES AND THE END OF CURVES SHALL BE MARKED WITH A SEMI-DURABLE MONUMENT.

5. A DEVIATION FROM SETTING STANDARD SEMI-DURABLE AND DURABLE MONUMENTS WILL BE CONSIDERED UPON A WRITTEN REQUEST CITING THE CIRCUMSTANCES FOR THE DEVIATION.

PROPERTY MONUMENT DETAILS	REF. & REV. SEPT., 2009	CITY OF FRESNO P-36

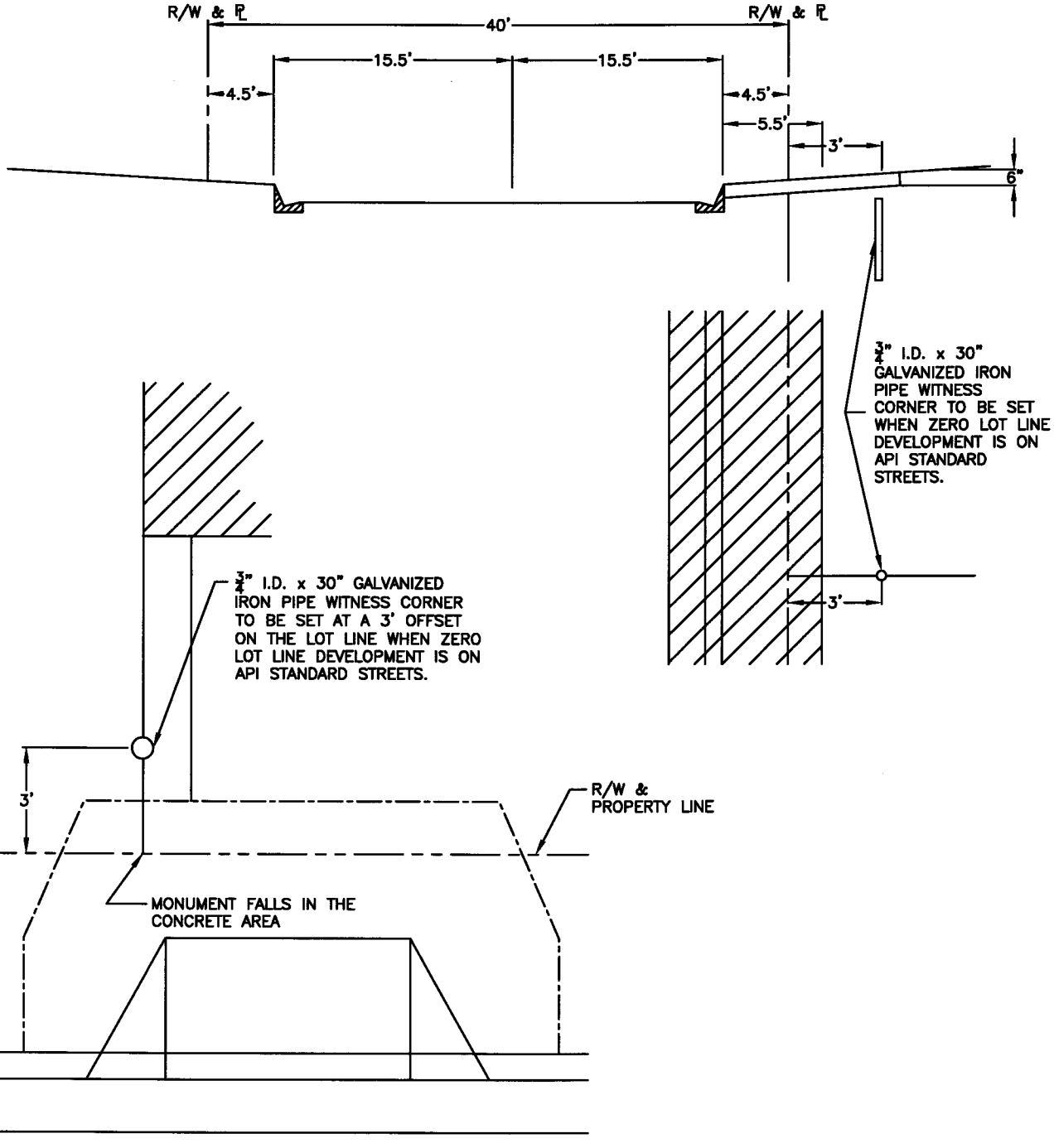


WITNESS CORNER

REF. & REV.
AUG., 2010

CITY OF FRESNO

P-37



WITNESS CORNER DETAILS

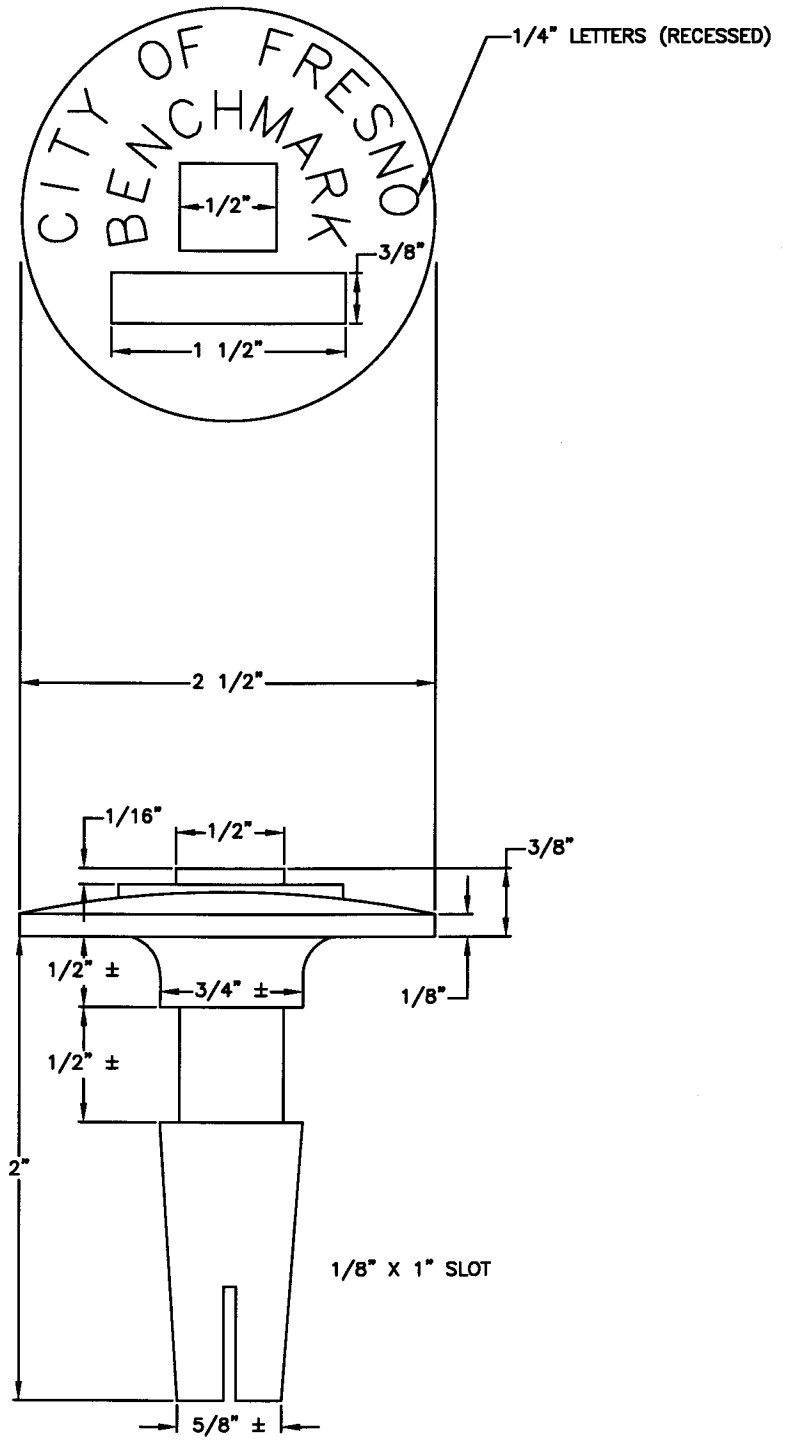
REF. & REV.
AUG., 2010

CITY OF FRESNO

P–38

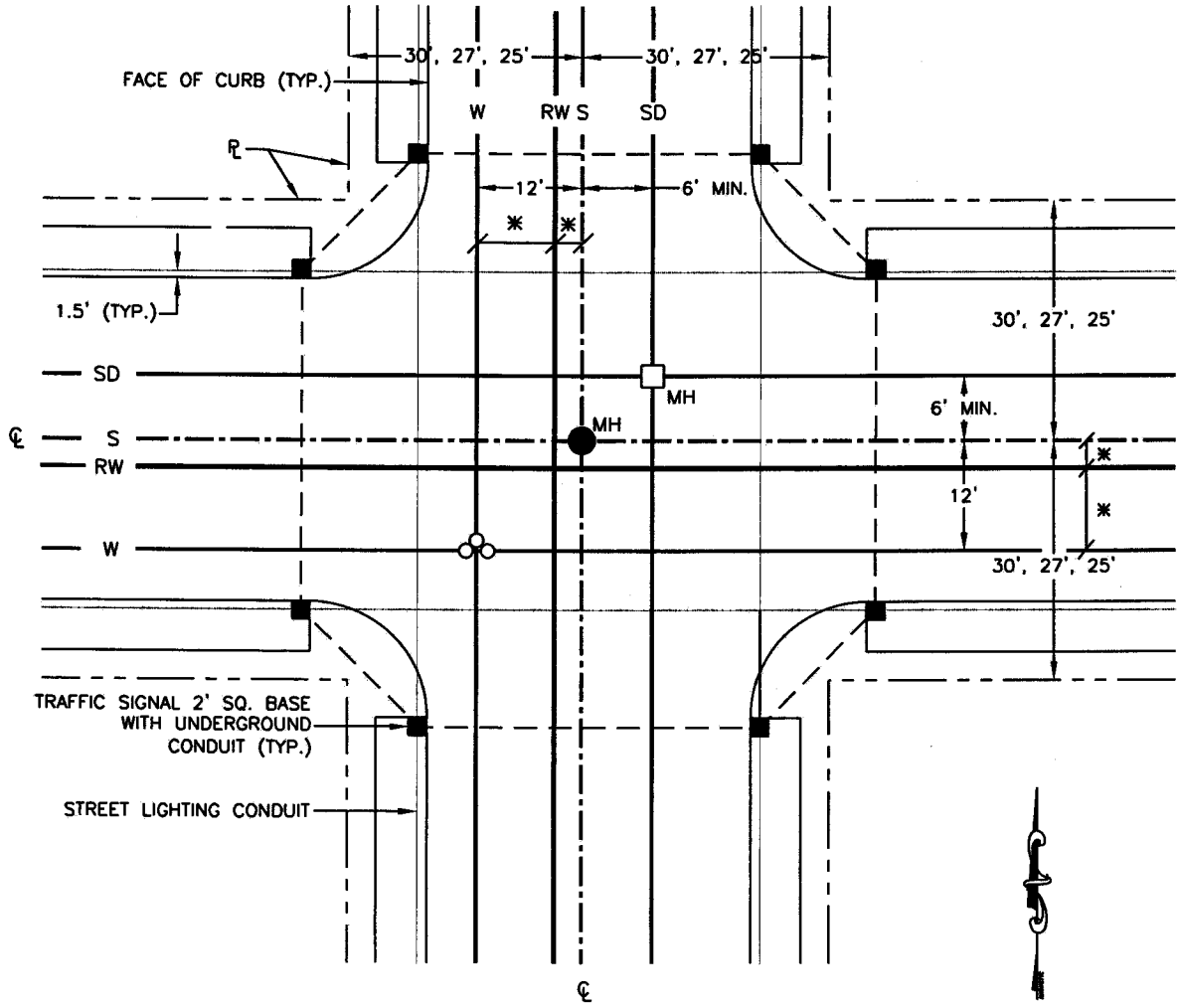
NOT USED

NO LONGER USED	REF. & REV. AUG., 2010	CITY OF FRESNO P–39



BENCHMARK DETAIL	REF. & REV. AUG., 2002	CITY OF FRESNO P-40

LEGEND
- S - SANITARY SEWER
- SD - STORM SEWER
- W - WATER MAIN
- RW - RECYCLED WATER
- MH - MANHOLE
- ℄ - CENTERLINE OF PROPOSED STREET
- ℙ - PROPERTY LINE



NOTES:

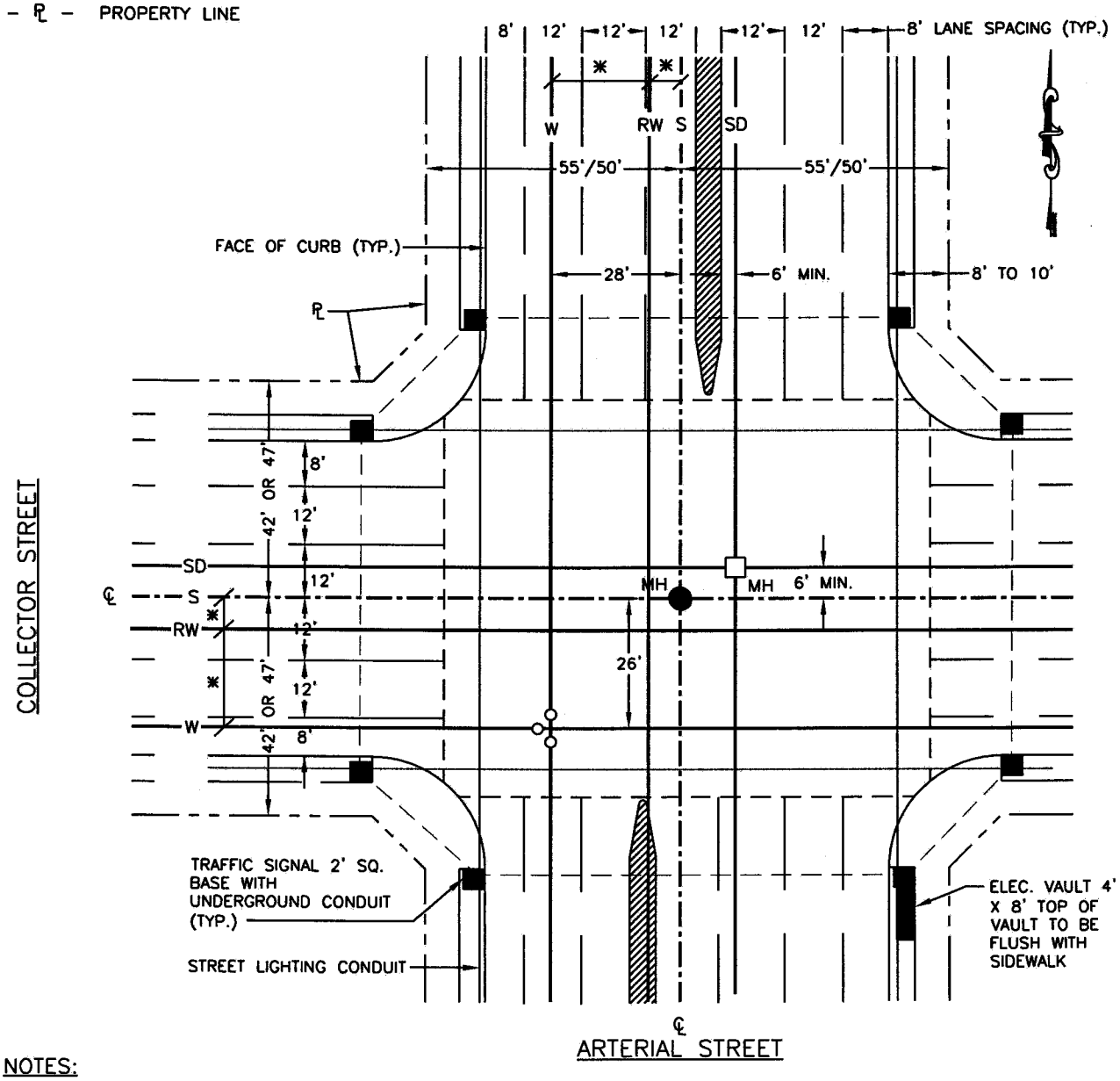
1. THIS "STANDARD" IS A GUIDE ONLY AND DEVIATIONS WILL BE ACCEPTABLE WHERE CONDITIONS DICTATE.
2. DIMENSIONS SHOWN ARE DESIRABLE, BUT DO NOT GOVERN. THE INTENTION IS TO SHOW THE RELATIVE POSITION OF ALL UTILITIES.

APPROVED BY SUBSTRUCTURE COMMITTEE.

* SEE RW-12 DRAWING.

LOCATION OF UNDERGROUND FACILITIES RESIDENTIAL STREETS	REF. & REV. JUNE 2015	CITY OF FRESNO P-41

LEGEND
- S - SANITARY SEWER
- SD - STORM SEWER
- W - WATER MAIN
- RW - RECYCLED WATER
- MH - MANHOLE
- ℄ - CENTERLINE OF PROPOSED OFFICIAL PLAN LINE OR DIRECTOR'S DETERMINATION
- ℙ - PROPERTY LINE



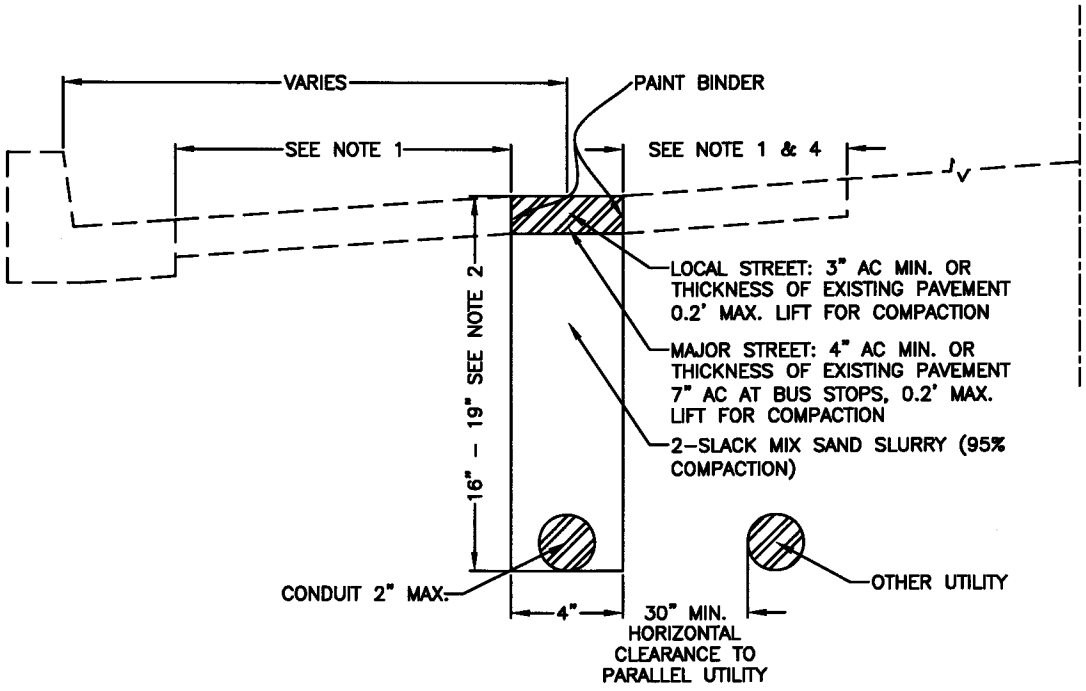
NOTES:

1. THIS "STANDARD" IS A GUIDE ONLY AND DEVIATIONS WILL BE ACCEPTABLE WHERE CONDITIONS DICTATE.
2. DIMENSIONS SHOWN ARE DESIRABLE, BUT DO NOT GOVERN. THE INTENTION IS TO SHOW THE RELATIVE POSITION OF ALL UTILITIES.

APPROVED BY SUBSTRUCTURE COMMITTEE.

* SEE RW-12 DRAWING.

LOCATION OF UNDERGROUND FACILITIES ARTERIAL & COLLECTOR STREETS	REF. & REV. JUNE 2015	CITY OF FRESNO P-42



NOTES:

1. WHEN THE PAVEMENT IS FRACTURED OR SEPARATED, THE CITY ENGINEER MAY DIRECT ITS REPLACEMENT. AJ TO ELIMINATE ANY FLOATING SECTIONS OF AC PAVING.
2. WHERE PERMANENT STREET IMPROVEMENTS ARE NOT COMPLETE, CATV FACILITIES ARE SUBJECT TO RELOCATION DEPENDENT UPON THE DETERMINATION OF FINAL STREET GRADES. INSTALLATION AT A DEPTH GREATER THAN 18" MAY AVOID RELOCATION OF CATV FACILITIES WHEN THE FUTURE STREET GRADE MAY BE LOWER THAN THE EXISTING STREET.
3. STREET CLEANING IS A CONTINUOUS REQUIREMENT OF THE PROJECT.
4. TO PROVIDE A STRAIGHT AND NEAT TRENCH, IN OIL DIRT STREETS, THE ENGINEER MAY REQUIRE ADDITIONAL PAVEMENT REMOVAL AND REPLACEMENT BEYOND THE LIMITS SHOWN IN THIS STANDARD.
5. WHEN STREET PAVING IS LESS THAN ONE YEAR OLD, FOG SEAL IS REQUIRED.
6. STONE GUARDS ARE REQUIRED. GUARDS TO PREVENT FLYING, OR SCATTERING OF DEBRIS BEYOND THE TRENCH SPOIL ARE REQUIRED.
7. CONSTRUCTION MACHINERY IS SUBJECT TO INSPECTION PRIOR TO APPROVAL OF STREET WORK PERMIT.
8. IF FOR ANY REASON THE TRENCH WIDTH EXCEEDS 6 INCHES (E.G. BELL HOLES, BORE PITS, ETC.) THE PAVING SHALL BE REPLACED PER CITY STD. DWG. P-48.

TRENCH DETAIL CATV LOCAL & MAJOR STREETS	REF. & REV. AUG., 2010	CITY OF FRESNO P-43

NOT USED

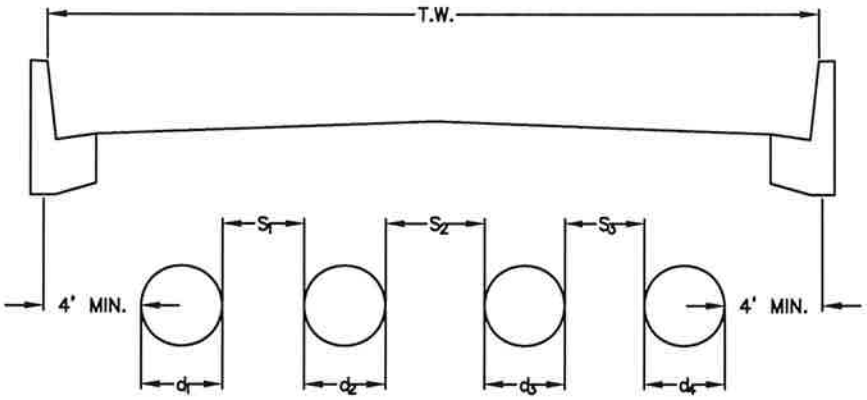
NO LONGER USED	REF. & REV. AUG., 2010	CITY OF FRESNO P–44

NOT USED

NO LONGER USED	REF. & REV. AUG., 2010	CITY OF FRESNO P-45

NOT USED

NO LONGER USED	REF. & REV. AUG., 2010	CITY OF FRESNO P–46



$$T.W. \geq (8) + (S_1 + S_2 + \cdots + S_n) + (d_1 + d_2 + \cdots + d_n) + (2)(L)$$
(IN FEET)

d_n = O.D. OF PROPOSED PIPE.

S_n = CLEAR HORIZONTAL DISTANCE BETWEEN PROPOSED PIPES.

L = NUMBER OF PIPES IN TRAVELED WAY EXCEEDING 10" NOMINAL I.D.

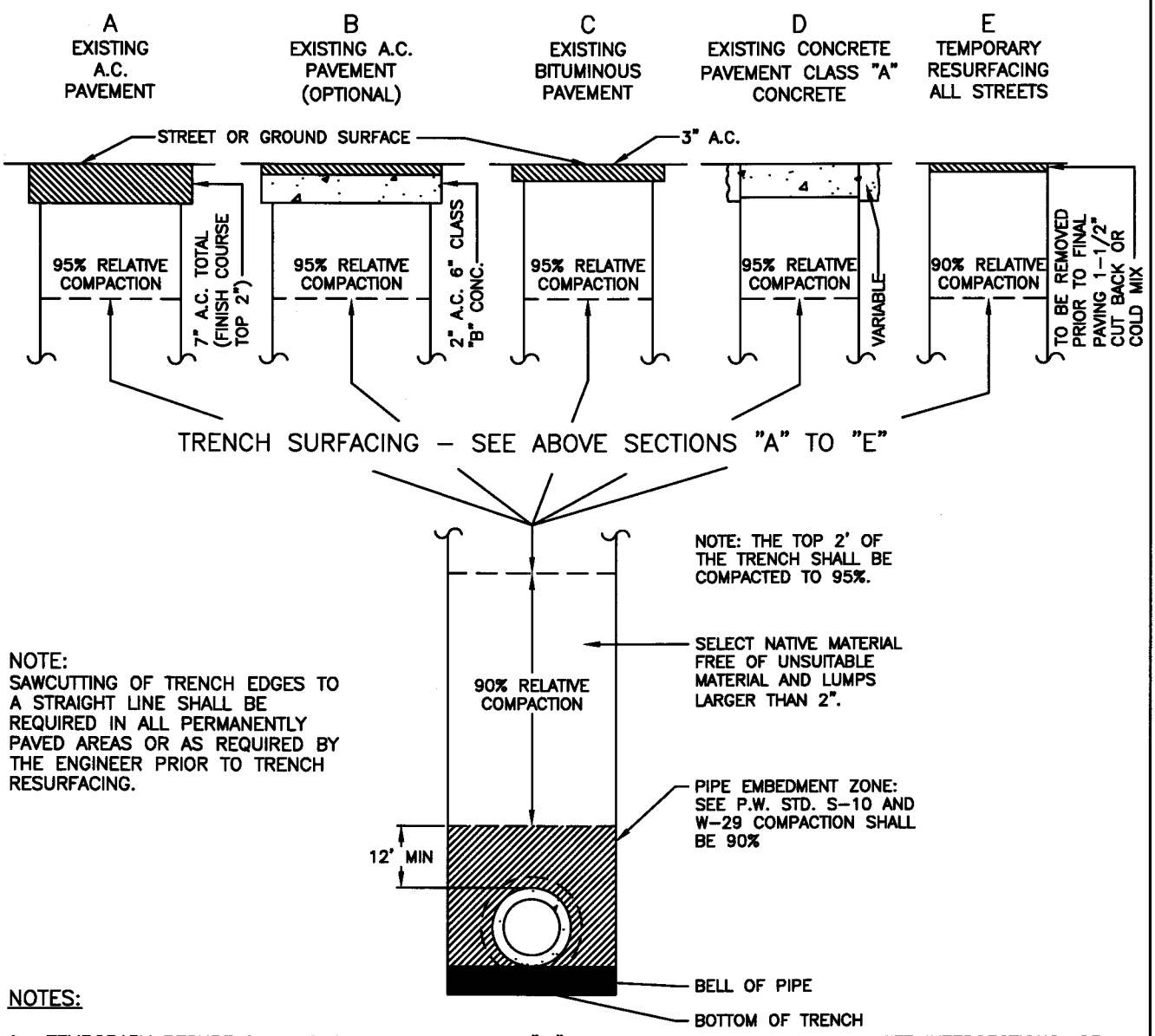
GENERAL:
THE MINIMUM ALLOWABLE TRAVELED WAY MUST BE CALCULATED USING THE FORMULA BELOW. TO DETERMINE THE REQUIRED STANDARD STREET WIDTH CALCULATE T.W. IN THE FORMULA AND ROUND UP TO THE NEAREST TRAVELED WAY SHOWN ON THE ARRAY OF STANDARD STREET SECTIONS.

1. SEWER TO BE MINIMUM 8' FROM CURB FOR CURVILINEAR STREETS.
2. SEWER TO BE WITHIN 2' OF CENTER OF T.W. FOR TANGENTIAL STREETS.
3. WATER TO BE MINIMUM 6' FROM CURB. SPECIAL PIPE CONSTRUCTION MAY ALLOW A REDUCTION WHEN APPROVED BY THE CITY ENGINEER.
4. WATER AND SEWER TO BE SEPARATED BY MINIMUM 10' CLEAR HORIZONTAL DISTANCE.
5. MINIMUM "S" IS 2' OR AS PROVIDED IN CITY STANDARD SPECIFICATIONS.
6. IF THE DEPTH TO FLOWLINE OF A PIPE EXCEEDS 5', THE MINIMUM "S" OF 2' TO ADJACENT PIPES WILL INCREASE BY 6" FOR EACH 1' OF DEPTH GREATER THAN 5'.
7. IF THE ELEVATION OF THE TOP OF A WATER OR SEWER LINE IS WITHIN 6' IN ELEVATION OF THE TOP OF ANOTHER PIPE, (NOT SEWER OR WATER). THE SEPARATION ("S_n") SHALL BE AT LEAST 5'.

MINIMUM TRAVELED WAY FORMULA
FOR PIPELINE INSTALLATION

REF. & REV.
AUG., 2010

CITY OF FRESNO
P-47



NOTE:
SAWCUTTING OF TRENCH EDGES TO A STRAIGHT LINE SHALL BE REQUIRED IN ALL PERMANENTLY PAVED AREAS OR AS REQUIRED BY THE ENGINEER PRIOR TO TRENCH RESURFACING.

NOTES:

1. TEMPORARY RESURFACING AS SHOWN ON SECTION "E," SHALL BE REQUIRED IN ALL STREET INTERSECTIONS, OR AS DIRECTED BY THE ENGINEER.
2. UTILIZE ASTM D1557 TO DETERMINE THE MAXIMUM DRY DENSITY.
3. A.C. = ASPHALT CONCRETE.
4. THE PAVEMENT SECTIONS SHOWN ABOVE ARE MINIMUM, AND IF THE EXISTING STRUCTURAL SECTION IS GREATER, IT SHALL BE MATCHED UNLESS THE ENGINEER APPROVES OTHERWISE.
5. AT THE OPTION OF THE ENGINEER, SAND SLURRY (MIN. 2 SACK MIX) SHALL BE SUBSTITUTED.
6. IF THERE IS LESS THAN 2 FEET BETWEEN THE EDGE OF A TRENCH CUT AND A CONC. IMPROVEMENT, OR EDGE OF PAVING, THEN REMOVE AND REPLACE THE A.C. PAVEMENT FROM THE EDGE OF THE TRENCH CUT TO THE CONCRETE IMPROVEMENT, OR EDGE OF PAVING.
7. MATCH EXISTING STRUCTURAL SECTION WHEN TRENCH WIDTH IS GREATER THAN OR EQUAL TO 4' UNLESS THE ENGINEER APPROVES OTHERWISE.
8. RESURFACING SHALL BE 7 INCHES MINIMUM OF A.C. WHEN TRENCH WIDTH IS LESS THAN 4' UNLESS THE CITY ENGINEER APPROVES OTHERWISE. TRENCHES WIDER THAN 4' SHALL BE CONSTRUCTED WITH BASEROCK STRUCTURAL SECTIONS.

TRENCH BACKFILL & SURFACE REPLACEMENT

REF. & REV.
NOVEMBER
2011

CITY OF FRESNO

P–48

NOT USED

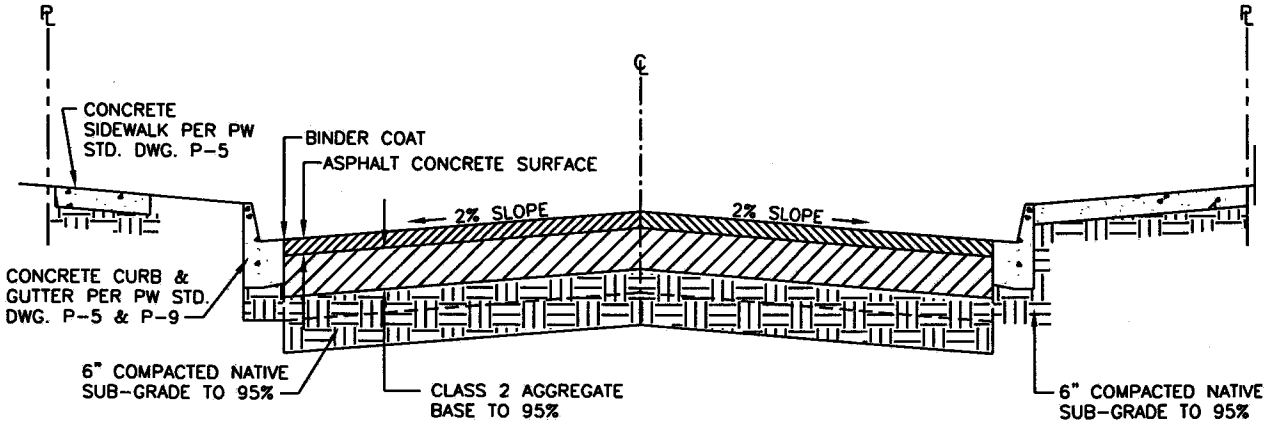
NO LONGER USED

REF. & REV.
AUG., 2010

CITY OF FRESNO

P–49

FOR STREET WIDTHS AND RIGHT-OF-WAY REQUIREMENTS, REFER TO PW STANDARDS FOR MAJOR AND LOCAL STREETS



CROSS SECTION OF PUBLIC STREET

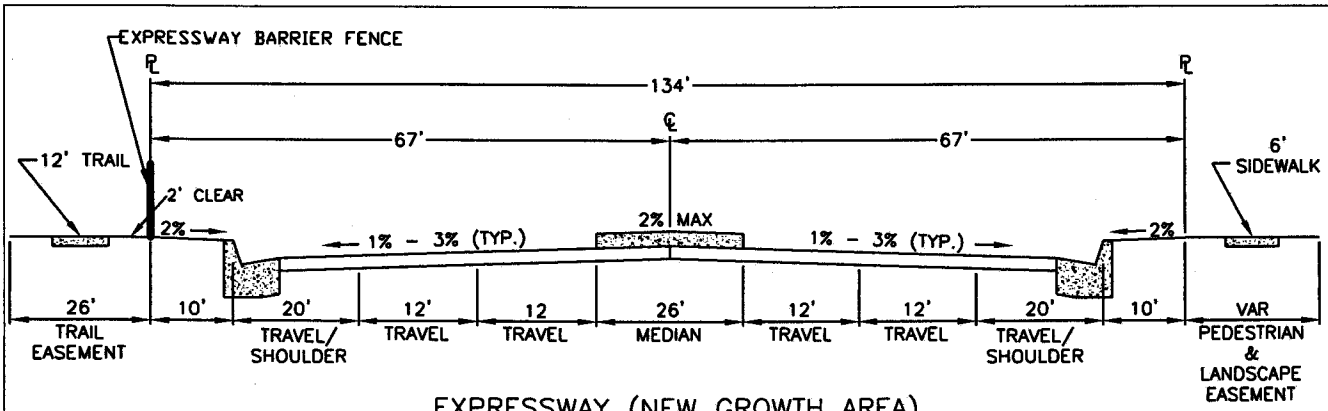
TRAFFIC INDICES AND MINIMUM PAVEMENT SECTIONS

CLASS OF STREET	TRAFFIC INDEX	MIN. AC	MIN. AB
EXPRESSWAY	10.0	6.0"	6"MIN
SUPERARTERIAL	10.0	6.0	6"MIN
INDUSTRIAL ARTERIAL	9.00	5.5"	6"MIN
ARTERIAL	9.00	5.5"	6"MIN
INDUSTRIAL COLLECTOR	8.00	5.0"	6"MIN
COLLECTOR	7.50	4.5"	6"MIN
LOCAL INDUSTRIAL OR COMMERCIAL	6.50	3.0"	6"MIN
LOCAL COLLECTOR/BOULEVARD	6.00	2.5"	6"MIN
LOCAL	5.00	2.5"	4"MIN

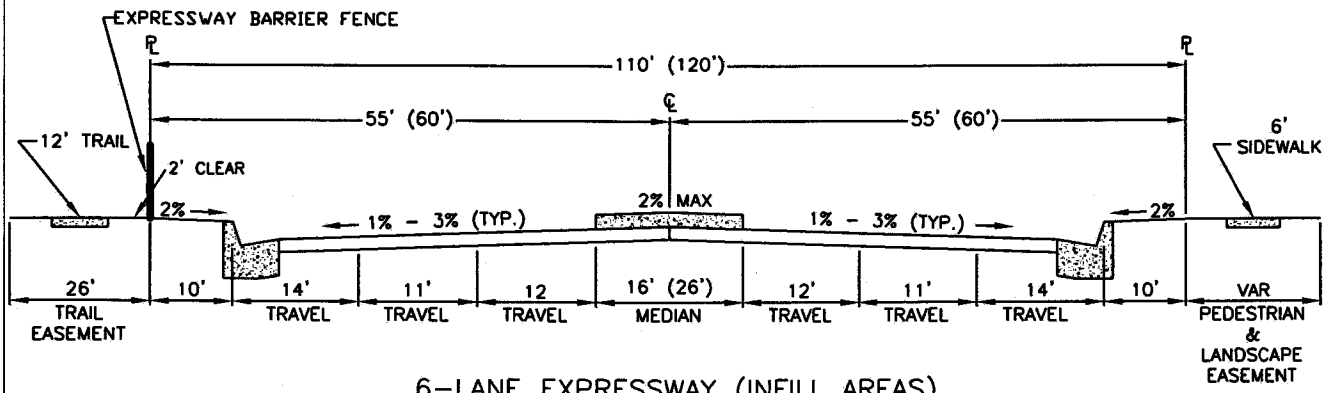
NOTES:

1. TRANSITIONS SHALL BE APPROPRIATE TO THE DESIGN SPEED OF THE STREET BOTH VERTICALLY AND HORIZONTALLY.
2. TRANSITION SLOPE ALONG THE STREET SHALL BE A MAX. 2% GRADE DIFFERENCE. (TEMPORARY)
3. TRANSITION SLOPE ACROSS THE STREET SHALL BE A MAX. SLOPE OF 5%. (TEMPORARY)
4. WHEN SIDEWALK IS NOT REQUIRED, FINISHED GRADE SHALL BE 2% FROM BACK OF CURB TO PROPERTY LINE.
5. THE ASPHALT PAVEMENT SECTION SHALL BE DESIGNED BASED UPON THE CALTRANS METHODOLOGY IN CHAPTER 600 OF THE HIGHWAY DESIGN MANUAL.
6. THE CITY ENGINEER MAY APPROVE A FULL DEPTH A.C. SECTION OR AN A.C./A.B./A.S.B. SECTION WHERE APPROPRIATE.
7. LOCAL INDUSTRIAL STREETS SERVING LAND USES WITH HIGH VOLUMES OF TRUCK TRAFFIC SHALL BE DESIGNED FOR A T.I. OF 7.0 OR 7.5, AS DETERMINED BY THE CITY ENGINEER.
8. "R" VALUE TESTS SHALL BE PROVIDED AT A RATE OF 1 PER 500 FT OF STREET CONSTRUCTION. THE "R" VALUE OF THE SOIL SHALL BE WITHIN 12" BELOW OF THE APPROXIMATE SUBGRADE.
9. STREET FURNITURE SHALL BE LOCATED IN ACCORDANCE WITH STREET FURNITURE LOCATION DIAGRAM.
10. ON CORNER LOTS, THE PLANTING AND UTILITY EASEMENT ALONG THE SIDE YARD MAY BE REDUCED TO EIGHT FEET AND IS MAINTAINED BY PROPERTY OWNER IF NOT IN A CFD.

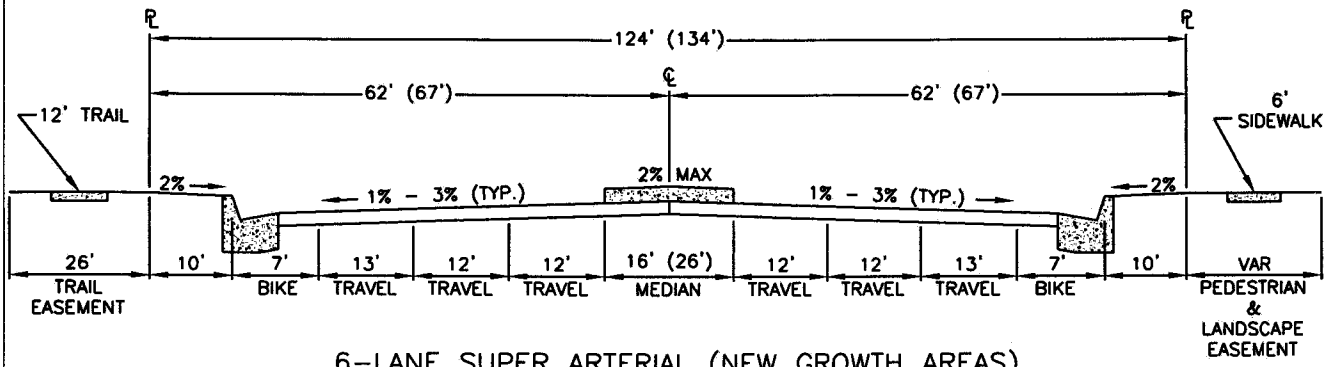
STREET CONSTRUCTION REQUIREMENTS AND TRAFFIC INDICES	REF. & REV. JUNE 2015	CITY OF FRESNO P-50



EXPRESSWAY (NEW GROWTH AREA)



6-LANE EXPRESSWAY (INFILL AREAS)

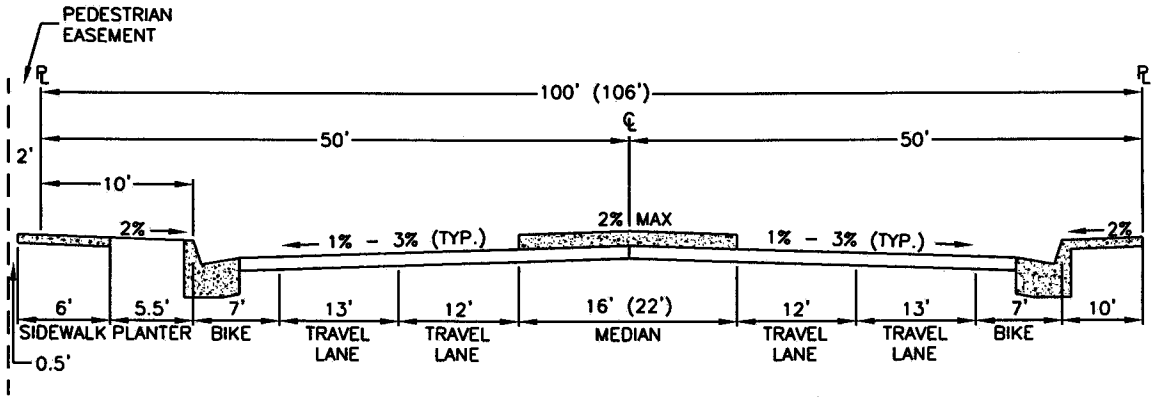


6-LANE SUPER ARTERIAL (NEW GROWTH AREAS)

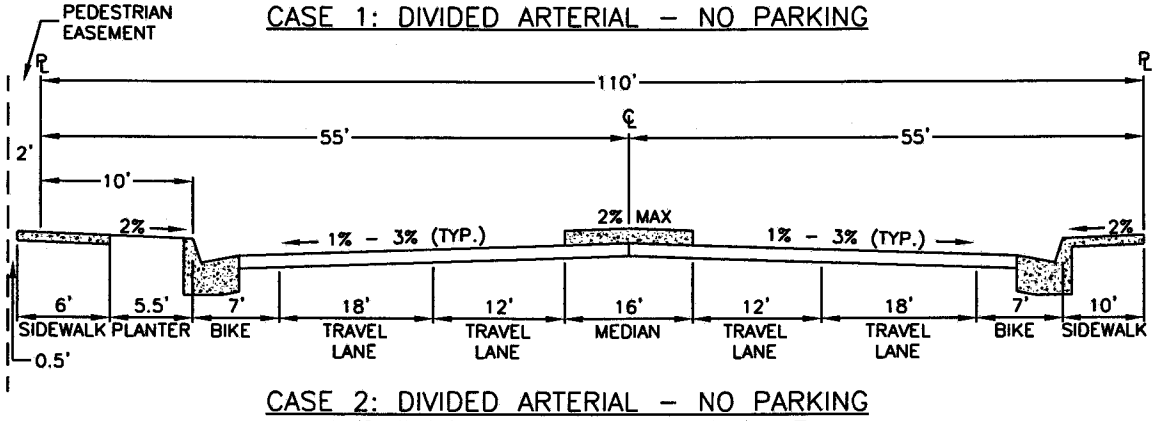
NOTES:

1. FOR DUAL LEFT TURN LANES USE 26' MEDIAN.
2. SEE P-69 AND P-70 FOR ADDITIONAL WIDTH AT MAJOR STREET INTERSECTIONS.
3. OFFSET CROWN REQUIRES APPROVAL OF THE CITY ENGINEER.
4. DEVIATIONS FROM THE STANDARDS REQUIRE APPROVAL OF THE CITY ENGINEER.
5. ( ) PERTAINS TO DIFFERENCE WITH 26' MEDIAN WIDTH WHERE NECESSARY TO ACCOMMODATE DUAL LEFT TURN LANES.
6. SEE P-74 AND P-75 FOR EXPRESSWAY BARRIER FENCE LOCATION AND DETAILS.

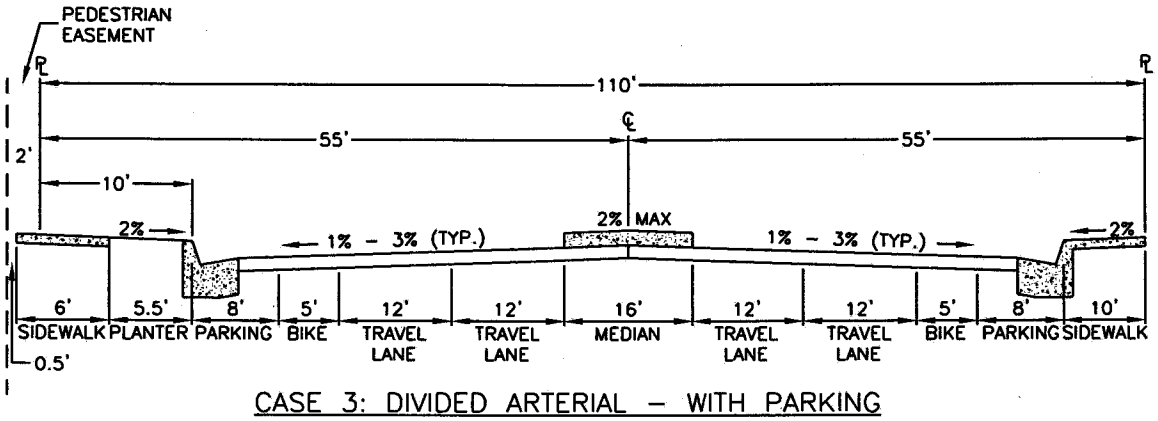
EXPRESSWAY AND SUPER ARTERIAL CROSS-SECTION	REF. & REV. JUNE 2015	CITY OF FRESNO P-51



CASE 1: DIVIDED ARTERIAL – NO PARKING



CASE 2: DIVIDED ARTERIAL – NO PARKING
AND WIDER OUTSIDE TRAVEL LANE

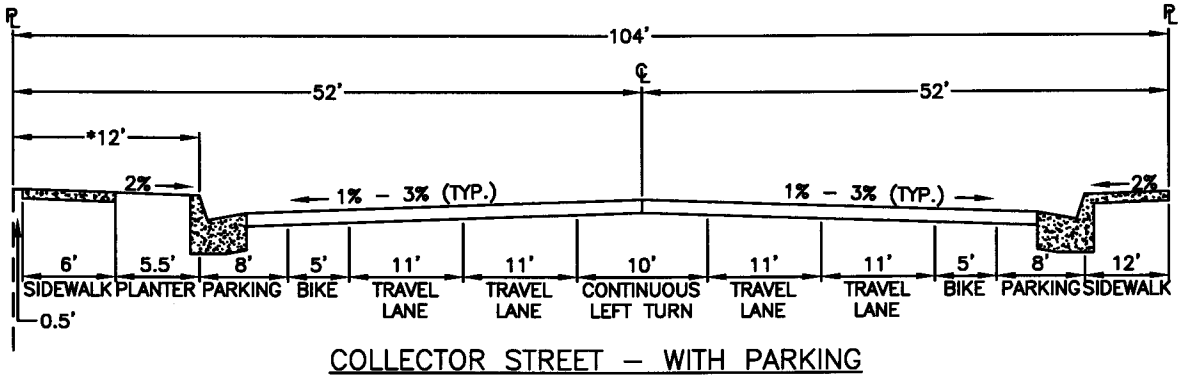


CASE 3: DIVIDED ARTERIAL – WITH PARKING
OR SCHOOL DROP OFF ZONES

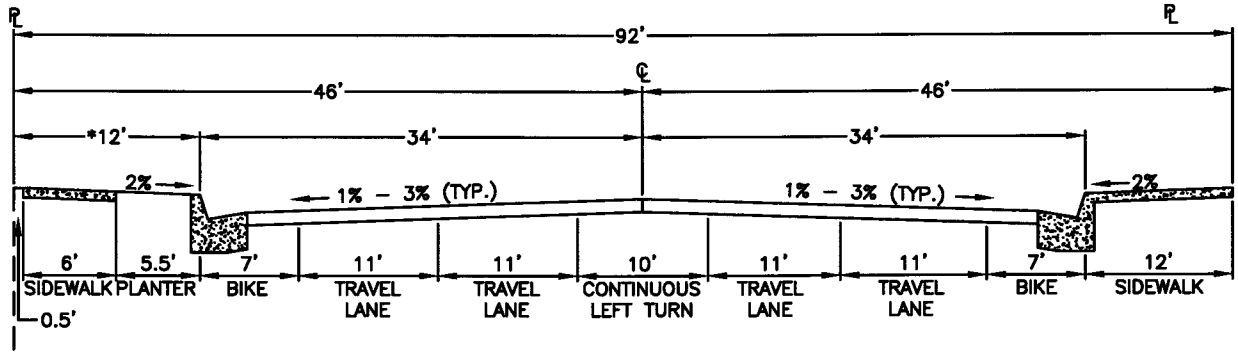
NOTES:

1. USE 26' MEDIAN WHEN DUAL LEFT TURNS ARE REQUIRED.
2. OFFSET CROWN REQUIRES APPROVAL OF THE ENGINEER
   DEVIATIONS FROM STANDARDS REQUIRE APPROVAL OF THE ENGINEER.
3. ( ) INDICATE A 22' MEDIAN WIDTH ONLY WHERE A SPECIFIC ARTERIAL HAS BEEN PLANNED FOR A 22' MEDIAN ISLAND.
4. CASE 2 SHALL ONLY BE USED FOR SHORT GAP FILLING BETWEEN EXISTING CASE 2 ARTERIALS.
5. CASE 3 SHALL NOT BE USED UNLESS APPROVED BY THE CITY TRAFFIC ENGINEER.

ARTERIAL STREET CROSS-SECTION	REF. & REV. JUNE 2015	CITY OF FRESNO P-52



COLLECTOR STREET – WITH PARKING
(4 TRAVEL LANES)



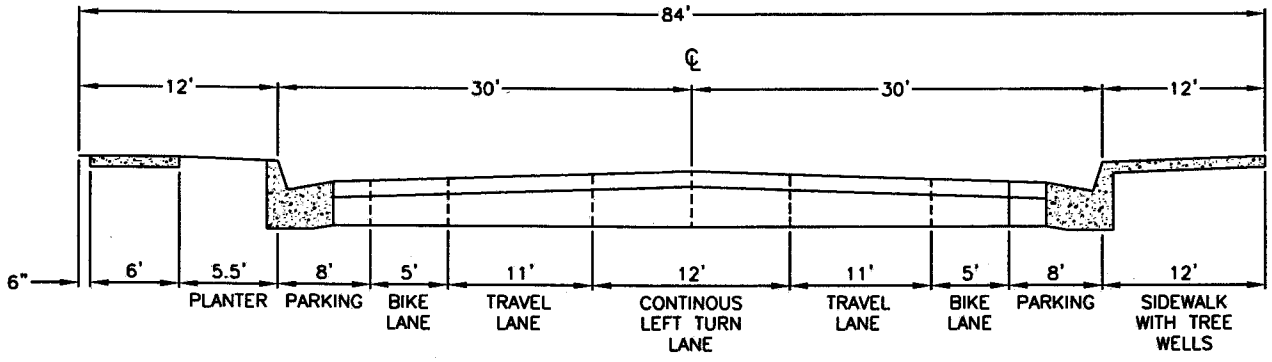
COLLECTOR STREET – NO PARKING
(4 TRAVEL LANES)

NOTES:

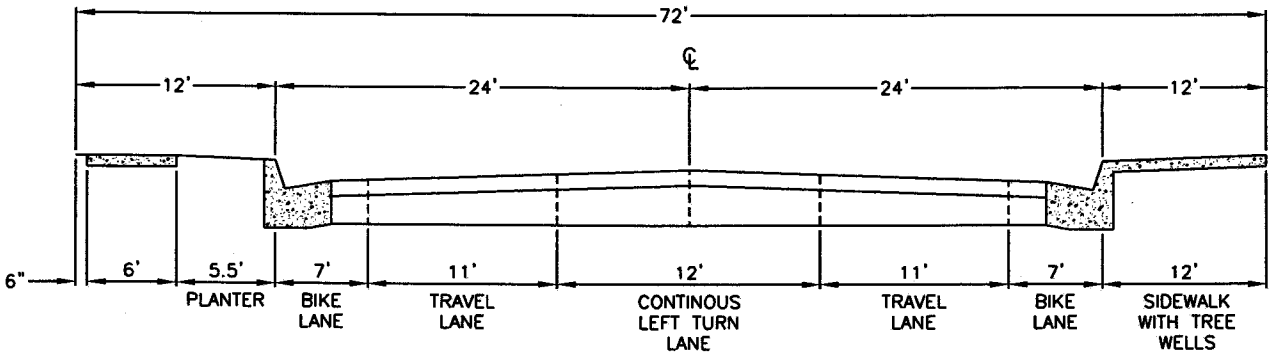
1. OFFSET CROWN REQUIRES APPROVAL OF THE ENGINEER
   DEVIATIONS FROM STANDARDS REQUIRE APPROVAL OF THE ENGINEER.

* OR 10' PATTERN WITH A 2' PEDESTRIAN EASEMENT.

COLLECTOR STREET CROSS–SECTION (4 TRAVEL LANES)	REF. & REV. AUG., 2010	CITY OF FRESNO P–53

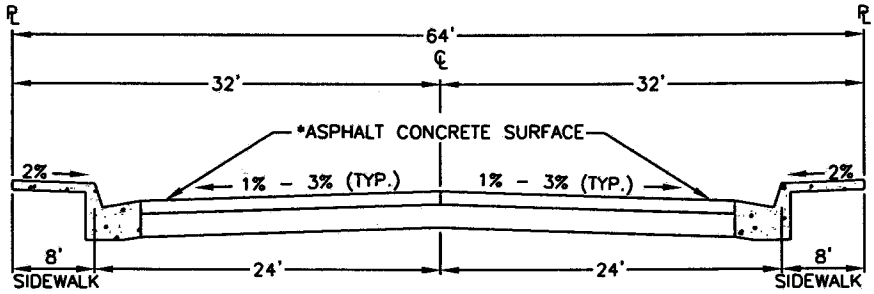


COLLECTOR STREET WITH PARKING
(2 TRAVEL LANES) 84' ROW

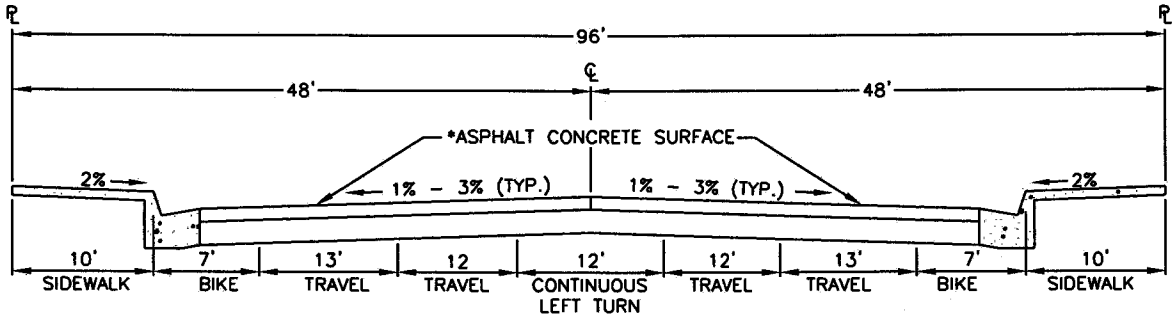


COLLECTOR STREET – NO PARKING
(2 TRAVEL LANES) 72' ROW

COLLECTOR STREET CROSS-SECTION (2 TRAVEL LANES)	REF. & REV. JUNE 2015	CITY OF FRESNO P-54



LOCAL INDUSTRIAL STREET



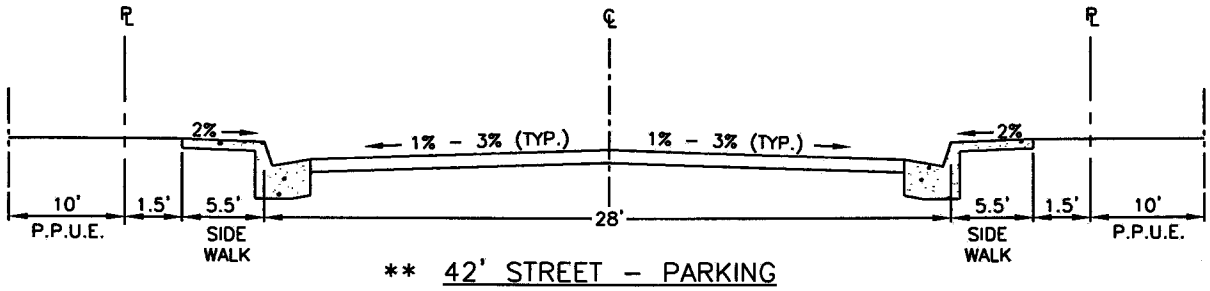
INDUSTRIAL ARTERIAL STREET

* THICKNESS BASED UPON TRAFFIC INDEX FOR SPECIFIC STREET.
BASED UPON CALTRANS METHOD FOR FLEXIBLE PAVEMENT DESIGN, SEE P-50.

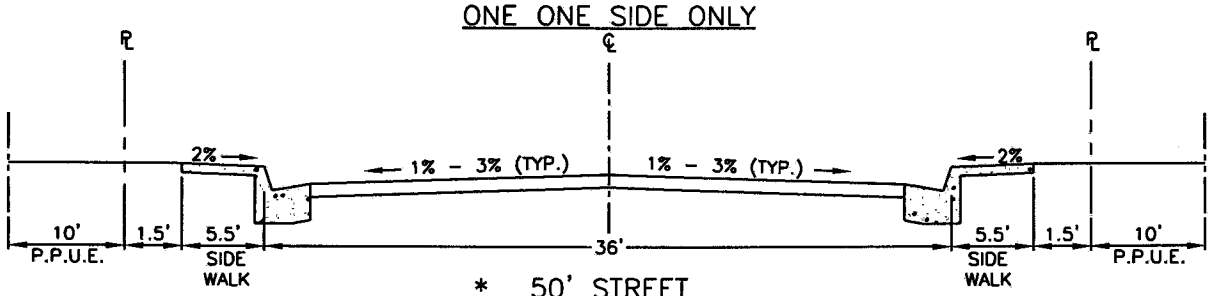
NOTES:

1. ACTUAL SECTION DEPENDS ON TRAFFIC INDEX AND SOIL TESTS.
2. WHERE NO SIDEWALK IS CONSTRUCTED, FINISH GRADE SHALL BE 2% FROM BACK OF CURB TO PROPERTY LINE.

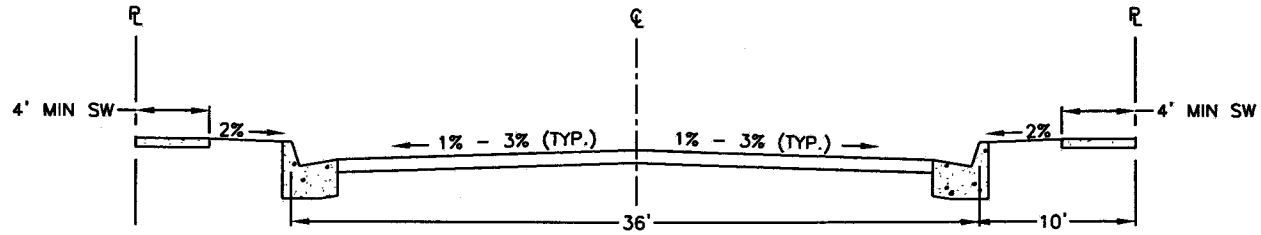
INDUSTRIAL STREET CROSS SECTIONS	REF. & REV. JUNE 2015	CITY OF FRESNO P-55



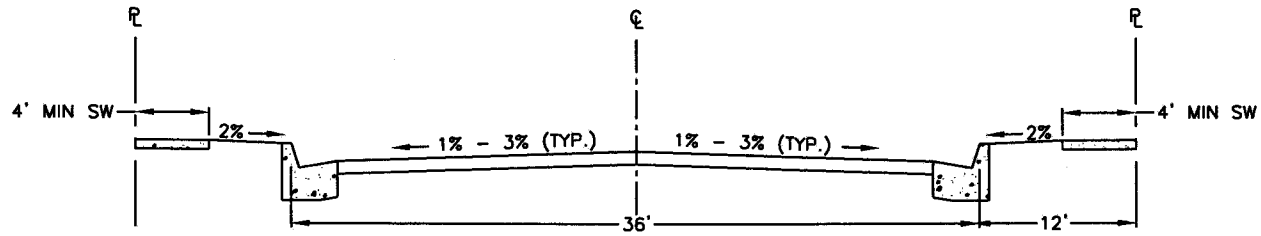
** 42' STREET - PARKING
ONE ONE SIDE ONLY



* 50' STREET
**



56' STREET

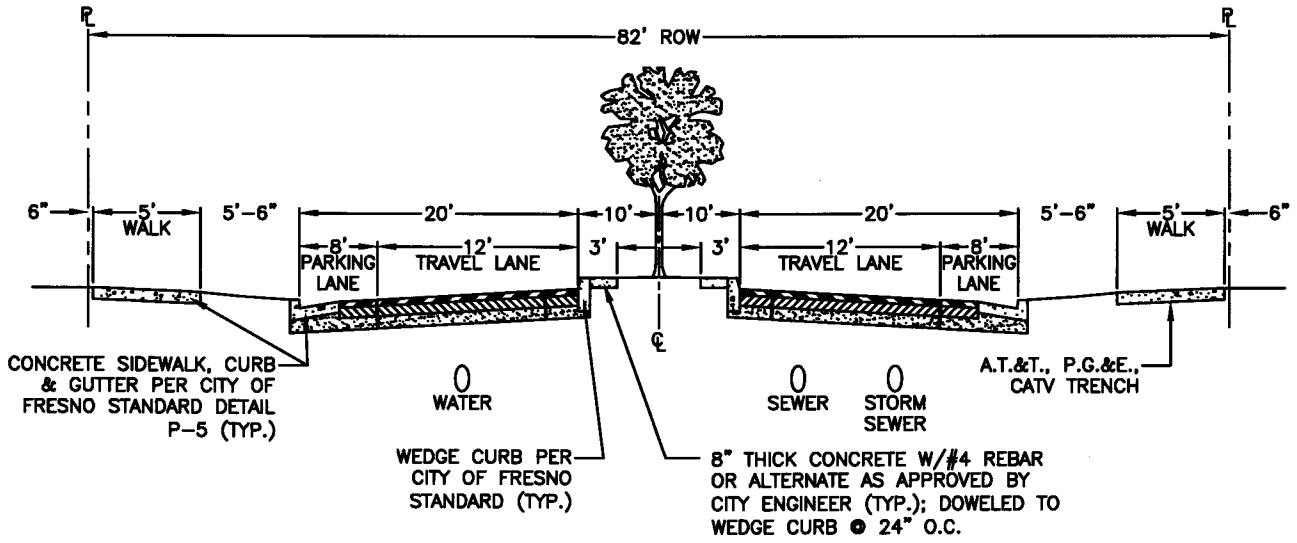


60' STREET

NOTES:

1. FOR DRIVEWAY DETAIL SEE STREET SECTIONS THAT MAY BE USED, SEE P.W. DWGS. P-4.
2. OFFSET CROWN REQUIRES APPROVAL OF THE ENGINEER DEVIATIONS FROM STANDARDS REQUIRE APPROVAL OF THE ENGINEER.
3. ( ) INDICATE AN ALTERNATIVE CROSS-SECTION LAYOUT.
4. SIDEWALKS MAY BE LOCATED PARTIALLY OR FULLY OUTSIDE THE STREET RIGHT-OF-WAY WITH THE DEDICATION OF A PEDESTRIAN EASEMENT, WHEN APPROVED BY THE CITY ENGINEER.
5. * 1,500 FEET MAXIMUM BLOCK LENGTH.
6. ** IN OTHER THAN SINGLE FAMILY AREAS, THIS STREET SECTION CAN ONLY BE USED ON CUL-DE-SACS AND ON BLOCK STREETS NOT EXCEEDING 800 FEET IN LENGTH.
7. ** FRESNO IRRIGATION DISTRICT FACILITIES SHALL BE LOCATED IN A SEPARATE EASEMENT OUT OF THE STREET AREA.

LOCAL STREET CROSS-SECTION	REF. & REV. JUNE 2015	CITY OF FRESNO P-56



CROSS SECTION
NOT TO SCALE

SPECIFICATIONS

1. SIDEWALK SHALL BE INSTALLED ON BOTH SIDES.
2. GREATER RIGHT-OF-WAY MAY BE APPROVED. IN SUCH CASES, 5' SIDEWALK SHALL BE INSTALLED 6" FROM PROPERTY LINE (EXCEPTION MAY BE APPROVED FOR A MEANDERING SIDEWALK).
3. 600' MAXIMUM BLOCK LENGTH BETWEEN OPENINGS IN MEDIAN.
4. AN 18' MINIMUM SETBACK IS REQUIRED FROM BACK OF WALK TO GARAGE WHEN THE GARAGE DOOR FRONTS ON STREET WITH A ROLL-UP DOOR; LIVING SPACE SETBACK TO BE DETERMINED BY CONDITIONAL USE PERMIT OR PLANNING AND DEVELOPMENT DEPARTMENT. THE SETBACK SHALL NOT BE LESS THAN REQUIRED BY THE ZONING ORDINANCE.
5. THIS STANDARD IS SUBJECT TO THE PIPELINE INSTALLATION REQUIREMENTS FORMULA.
6. F.I.D. FACILITIES SHALL BE LOCATED IN A SEPARATE EASEMENT OUT OF THE RIGHT OF WAY.
7. THIS STANDARD CAN BE USED IN CONVENTIONAL DEVELOPMENT, PLANNED UNIT DEVELOPMENTS, OR OTHER RESIDENTIAL DEVELOPMENTS.
8. ON CORNER LOTS, THE PLANTING AND UTILITY EASEMENT ALONG THE SIDE YARD MAY BE REDUCED TO 8'.
9. CROSS SECTIONS SHALL REMAIN CONSISTENT FOR ENTIRE BLOCK.
10. FIRE HYDRANTS SHALL BE PLACED IN MEDIAN AT 600' INTERVALS MAXIMUM. LOCATION APPROVAL REQUIRED BY CITY FIRE DEPARTMENT.

82' ROW LOCAL BOULEVARD	REF. & REV. AUG., 2010	CITY OF FRESNO P-57

NOTES:

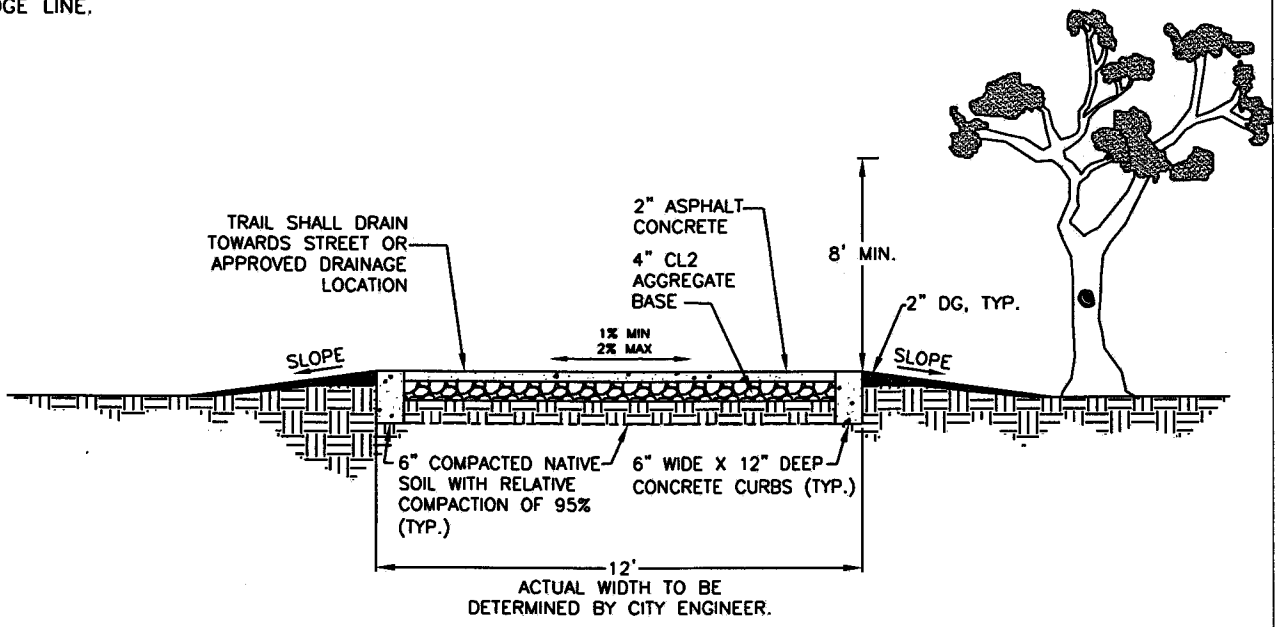
1. THIS STANDARD SHALL BE USED ONLY UPON APPROVAL BY CITY ENGINEER.

2. THIS STANDARD SHALL NOT BE USED IN AREAS OF INUNDATION.

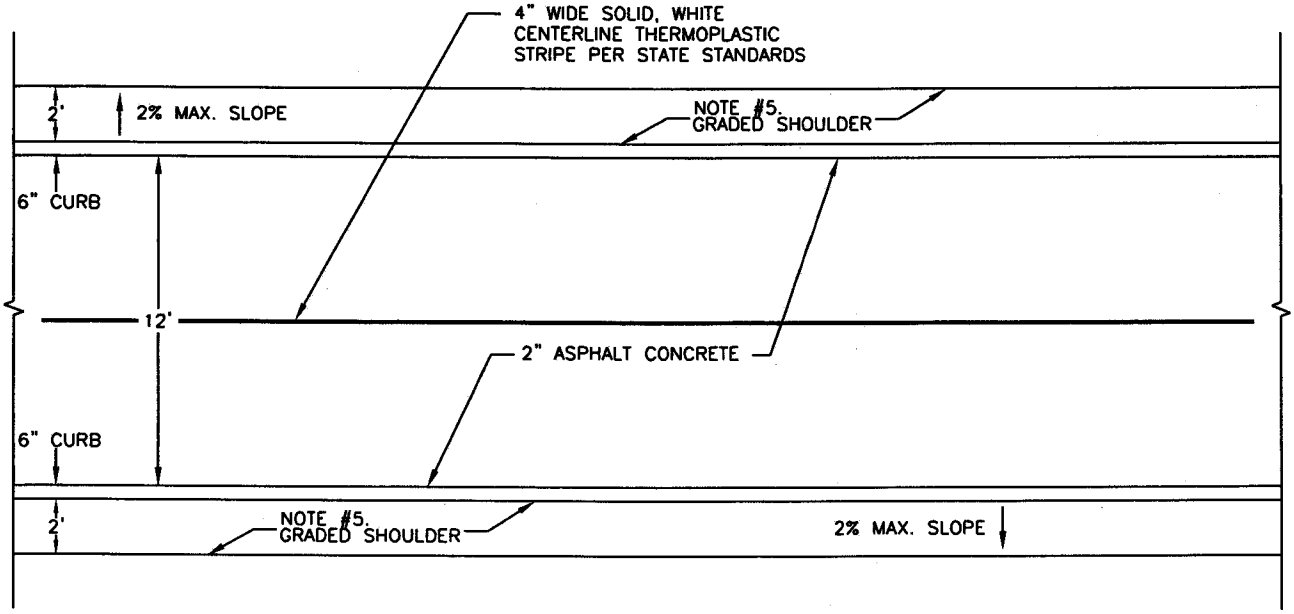
3. CITY ENGINEER MAY PERMIT A CURVILINEAR DESIGN. PRECISE DATA SHALL BE PROVIDED TO STAKE THE ALIGNMENT AND SET APPROPRIATE GRADES. R=160'.

4. TRAIL DESIGN SHALL COMPLY WITH THE LATEST VERSION CHAPTER 1000 OF THE CALTRANS HIGHWAY DESIGN MANUAL AND THE PROWAG FOR SHARED USE PATHS.

5. IF ALL OR PART OF THE SHOULDER IS PAVED WITH THE SAME MATERIAL AS THE PATH, IT IS TO BE DELINEATED FROM THE TRAVELED WAY OF THE PATH WITH AN EDGE LINE.



ELEVATION VIEW



PLAN VIEW

ASPHALT MULTI-PURPOSE TRAIL	REF. & REV. JUNE 2015	CITY OF FRESNO P-58

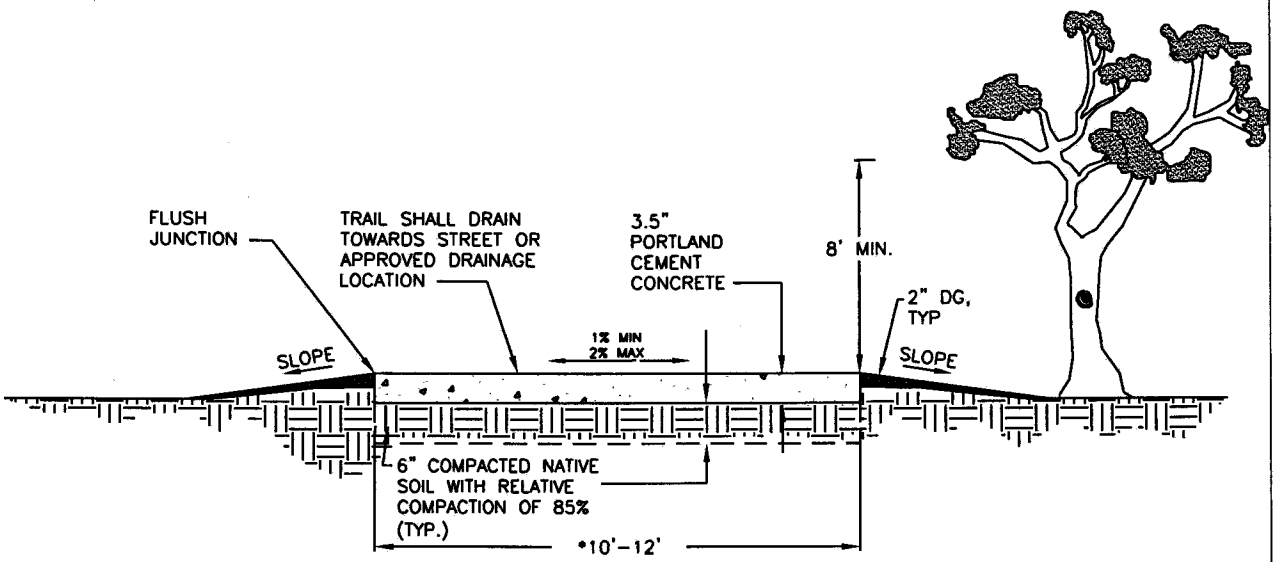
NOTES:

1. *TO BE SPECIFIED BY THE CITY ENGINEER.

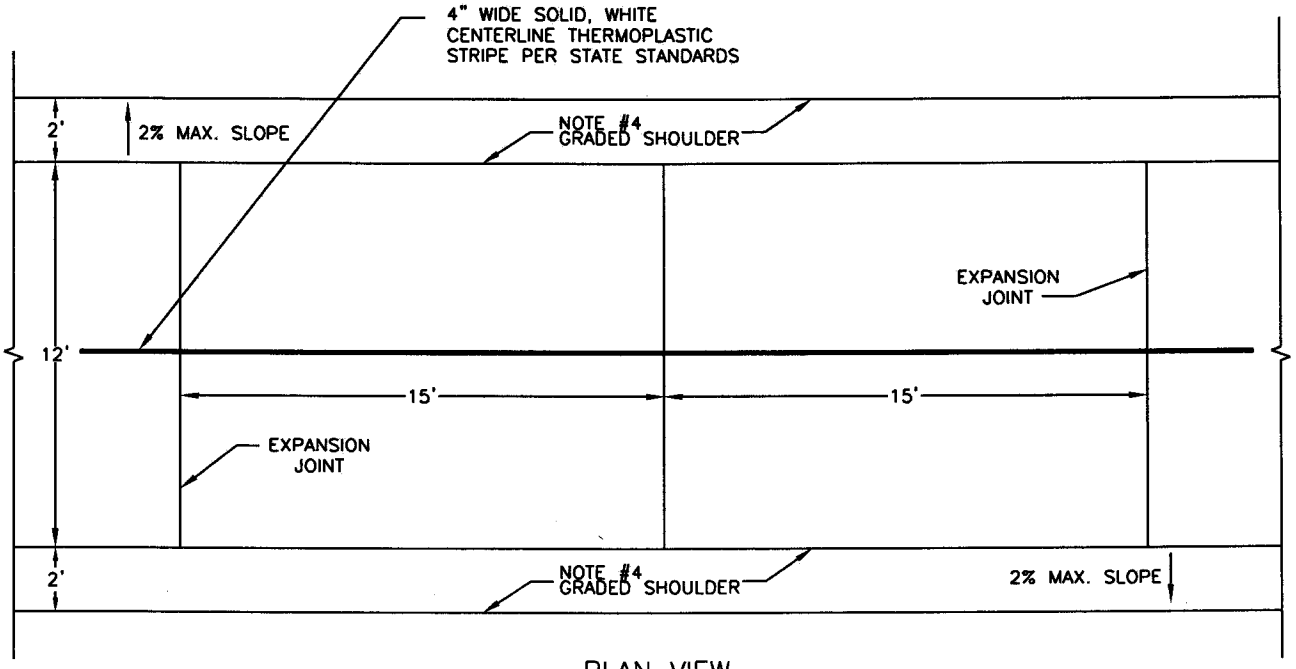
2. CITY ENGINEER MAY PERMIT A CURVILINEAR DESIGN. PRECISE DATA SHALL BE PROVIDED TO STAKE THE ALIGNMENT AND SET APPROPRIATE GRADES. R=160'.

3. TRAIL DESIGN SHALL COMPLY WITH THE LATEST VERSION OF CHAPTER 1000 OF THE CALTRANS HIGHWAY DESIGN MANUAL AND THE PROWAG FOR SHARED USE PATHS.

4. IF ALL OR PART OF THE SHOULDER IS PAVED WITH THE SAME MATERIAL AS THE PATH, IT IS TO BE DELINEATED FROM THE TRAVELED WAY OF THE PATH WITH AN EDGE LINE.

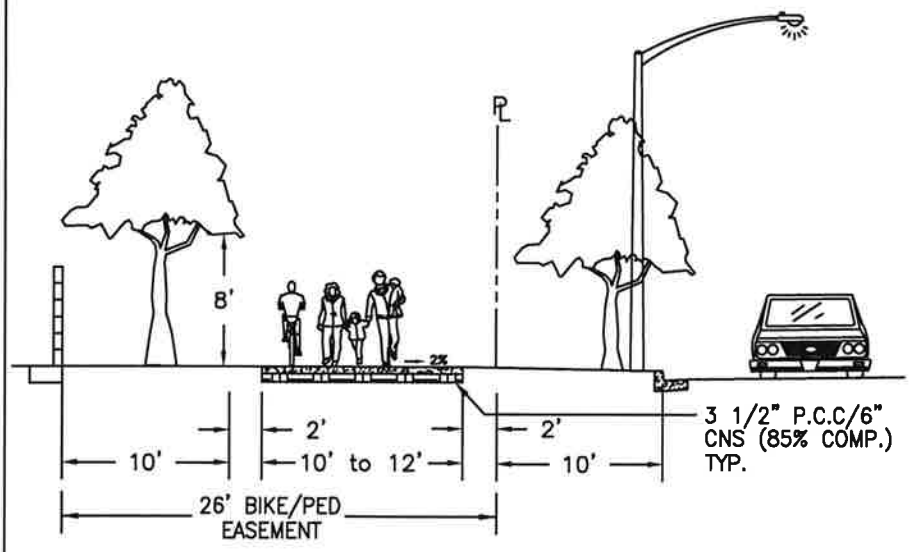


ELEVATION VIEW



PLAN VIEW

CONCRETE MULTI-PURPOSE TRAIL	REF. & REV. JUNE 2015	CITY OF FRESNO P-59



MAJOR STREET TRAIL

GENERAL NOTES:

R=155' MIN (25 mph)
REFERENCE P-60

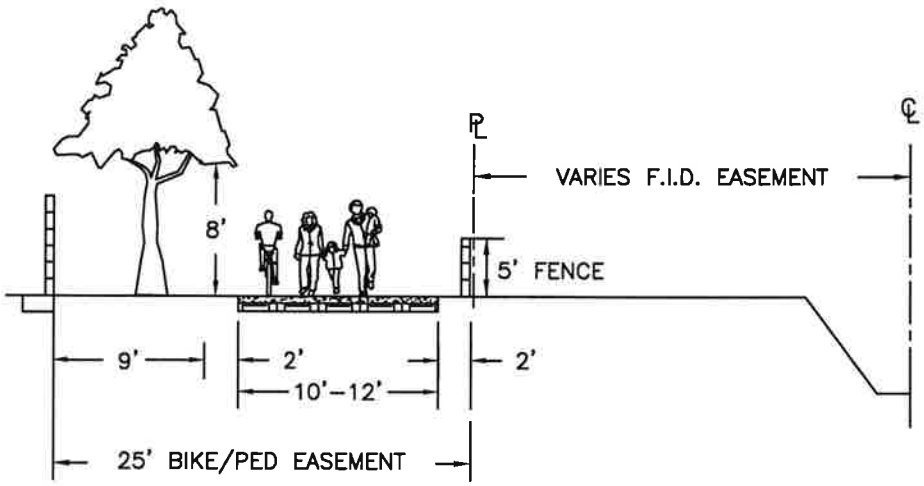
EASEMENTS SHOWN ARE MINIMUMS. ADDITIONAL WIDTHS MAY BE NEEDED FOR GRADING AND DRAINAGE PURPOSES.

CROSS SLOPES=2% FOR TRAIL
2' SHOULDER

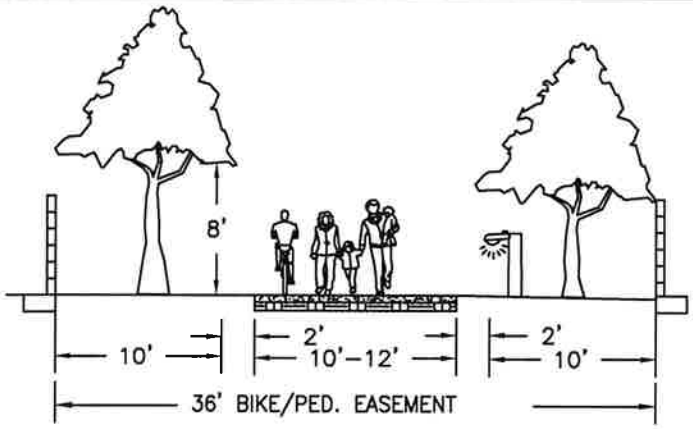
4' FENCE REQUIRED ON EXPRESSWAYS. SEE STANDARD DRAWINGS P-74 AND P-75 FOR REFERENCE.

TRAIL DESIGN SHALL COMPLY WITH CHAPTER 1000 OF THE CALTRANS HIGHWAY DESIGN MANUAL.

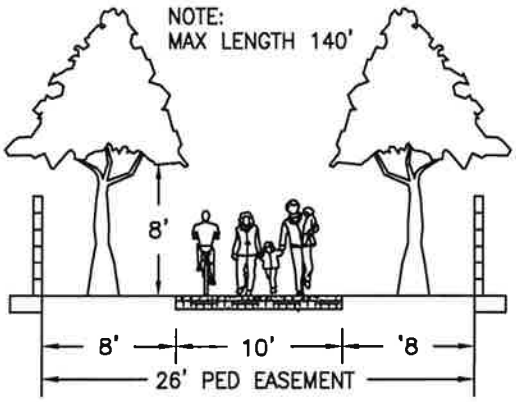
AN ADDITIONAL 12' EASEMENT REQUIRED FOR EQUESTRIAN PURPOSES.



CANAL-SIDE TRAIL



OFF-STREET TRAIL

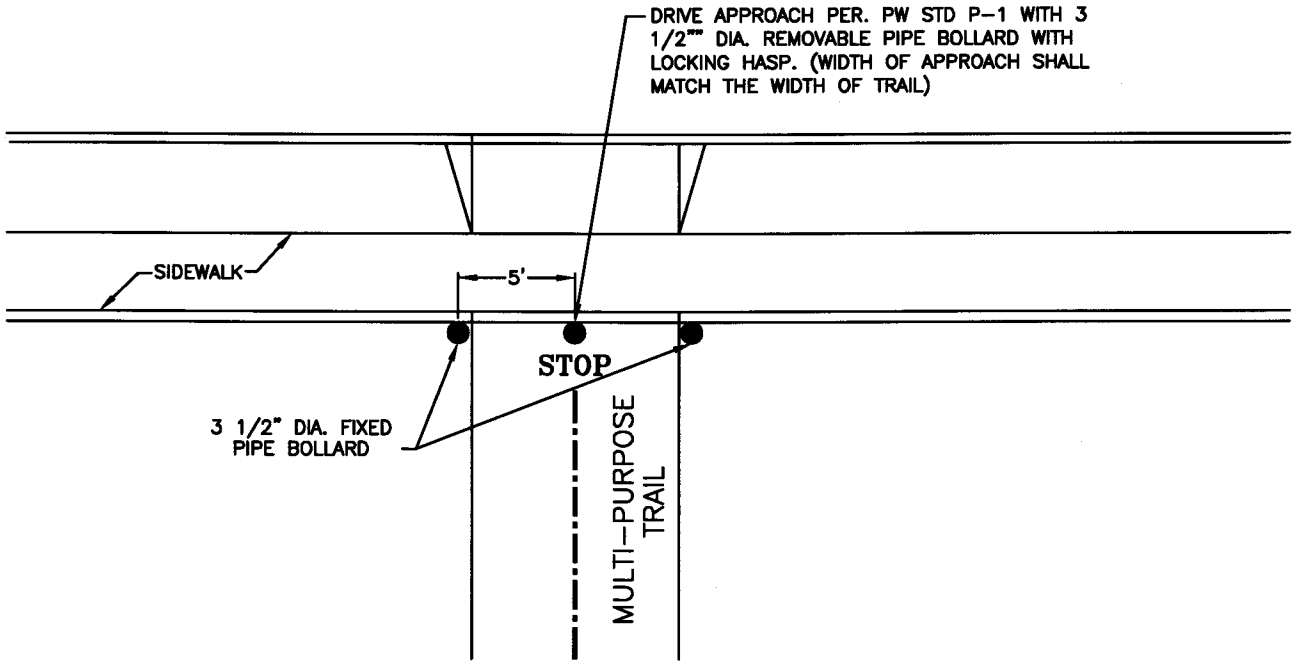


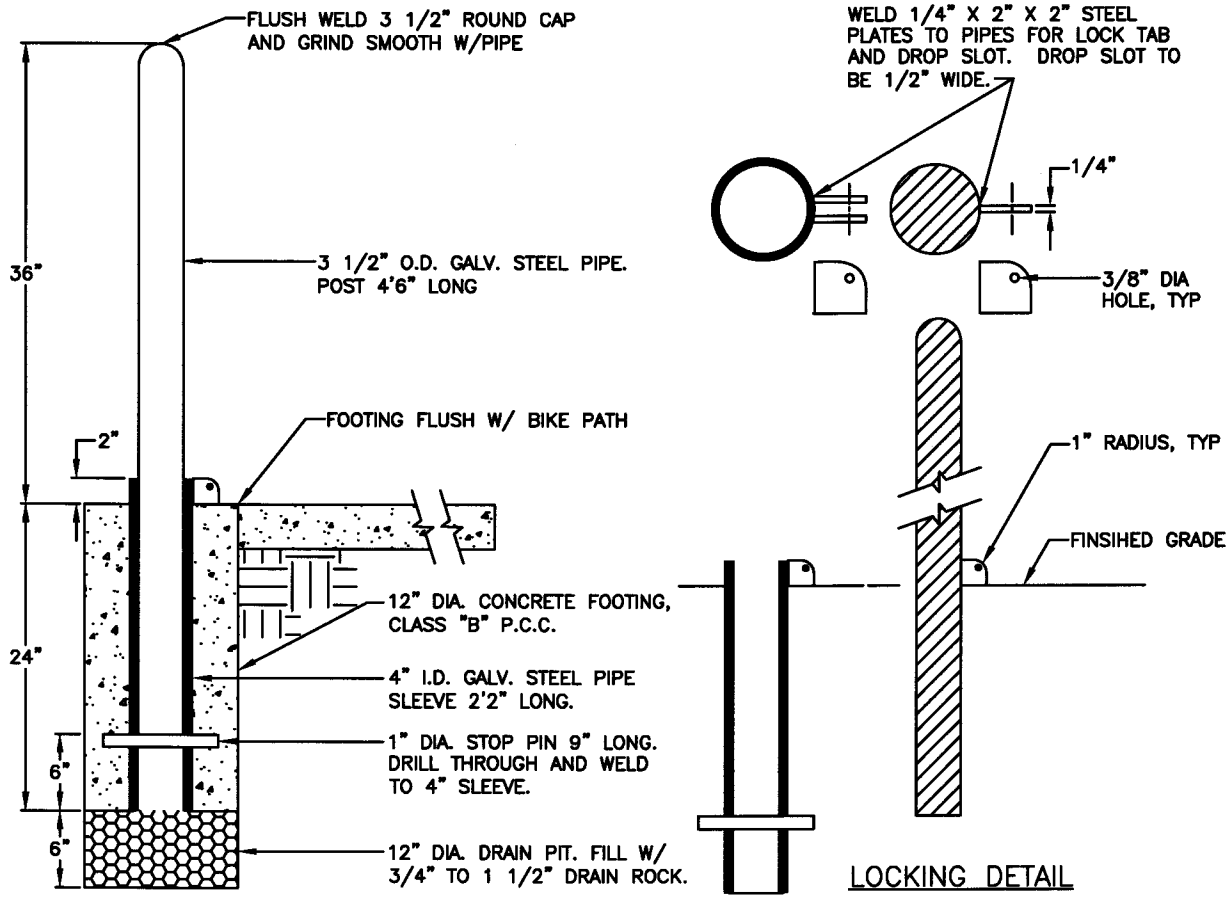
CONNECTOR TRAIL

TRAIL DETAILS

REF. & REV. NOVEMBER 2011

CITY OF FRESNO
P-60



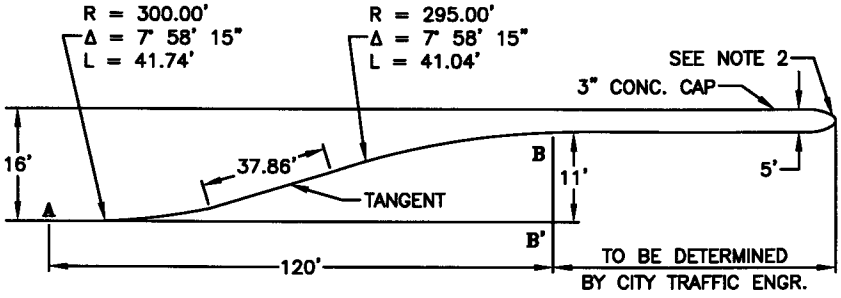


TRAIL-STREET INTERSECTION TYPICAL PLAN

REF. & REV. NOVEMBER 2011

CITY OF FRESNO

P-61

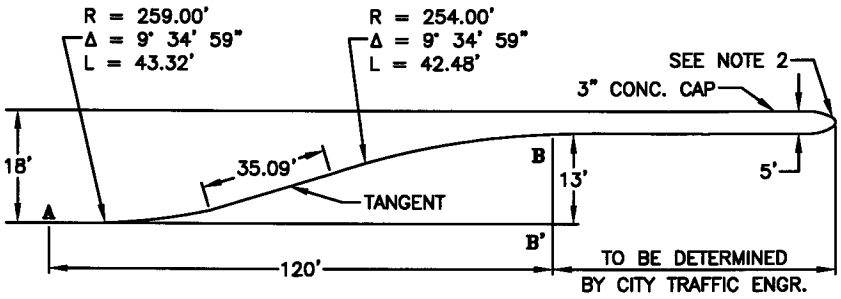


CURVE TABLE	
DIST. FROM POINT "A"	OFFSET B-B' = 11'
0'	0.00'
10'	0.17'
20'	0.67'
30'	1.50'
40'	2.68'
41.60'	2.90'
50'	4.08'
60'	5.48'
70'	6.88'
79.09'	8.15'
80'	8.28'
90'	9.47'
100'	10.32'
110'	10.83'
120'	11.00'

TANGENT

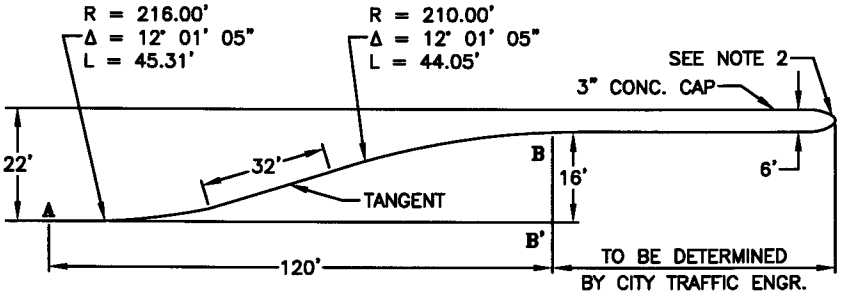
NOTES:

1. END CONCRETE CAP WHERE CURB FACES ARE GREATER THAN 8' APART.
2. NOSE SHALL BE A MINIMUM OF 10' FROM PRODUCTION OF CROSS STREET EXTREME CURB LINE.
3. CONCRETE GUTTER TO BE USED WHERE REQUIRED.



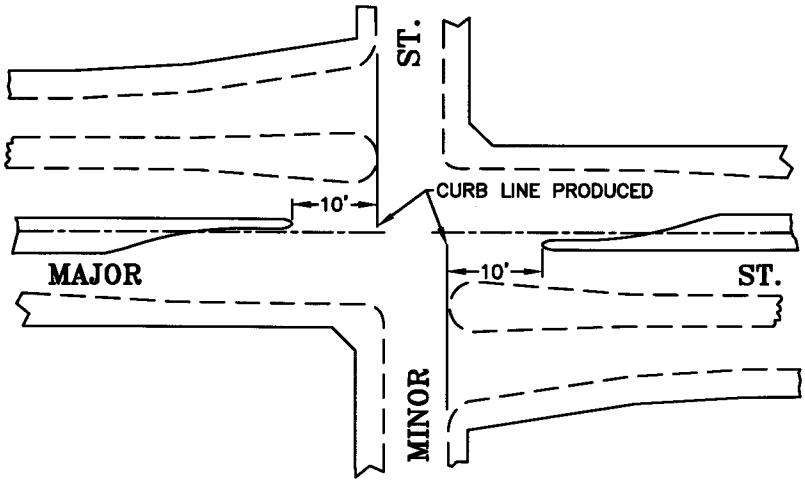
CURVE TABLE	
DIST. FROM POINT "A"	OFFSET B-B' = 13'
0'	0.00'
10'	0.19'
20'	0.77'
30'	1.74'
40'	3.08'
43.12'	3.61'
50'	4.77'
60'	6.46'
70'	8.16'
77.71'	9.46'
80'	9.96'
90'	11.23'
100'	12.21'
110'	12.80'
120'	13.00'

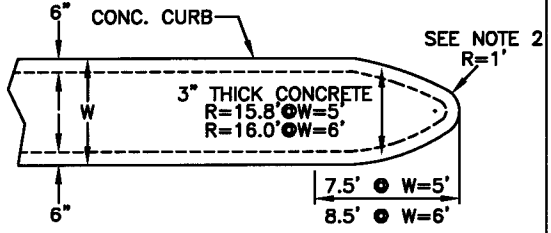
TANGENT



CURVE TABLE	
DIST. FROM POINT "A"	OFFSET B-B' = 16'
0'	0.00'
10'	0.23'
20'	0.93'
30'	2.09'
40'	3.74'
44.97'	4.73'
50'	5.80'
60'	7.93'
70'	10.06'
76.27'	11.40'
80'	12.16'
90'	13.85'
100'	15.05'
110'	15.76'
120'	16.00'

TANGENT





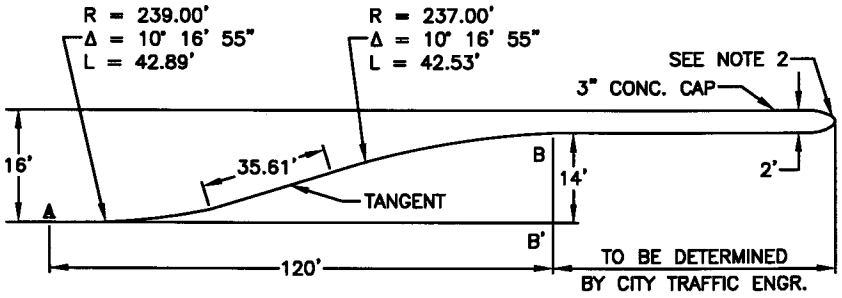
ISLAND NOSE DETAIL

MEDIAN ISLAND LEFT TURN POCKETS
(1 OF 2)

REF. & REV.
AUG., 2010

CITY OF FRESNO

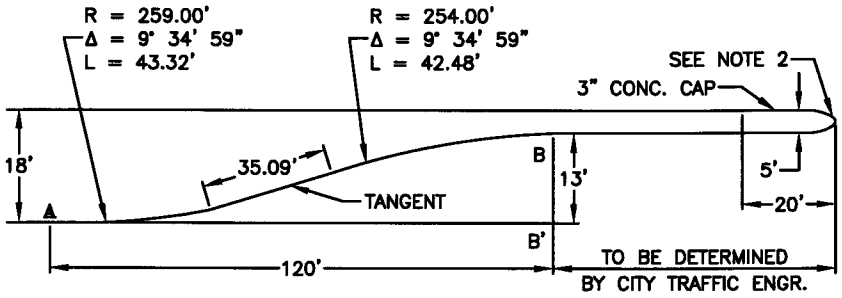
P-62



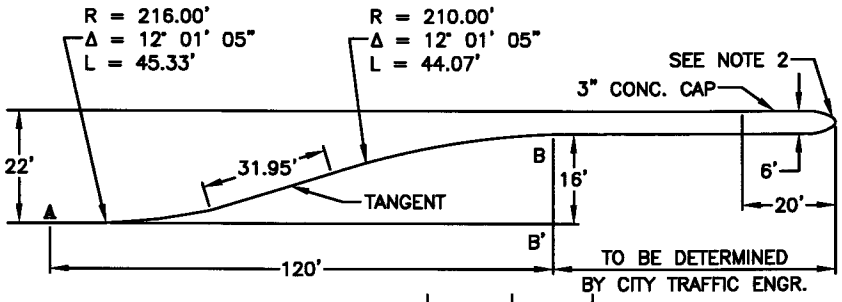
CURVE TABLE	
DIST. FROM POINT "A"	OFFSET B-B' = 14'
0'	0.00'
10'	0.21'
20'	0.84'
30'	1.89'
40'	3.37'
42.66' (TANGENT)	3.84'
50'	5.17'
60'	6.98'
70'	8.80'
77.70'	10.19'
80'	10.60'
90'	12.09'
100'	13.16'
110'	13.79'
120'	14.00'

NOTES:

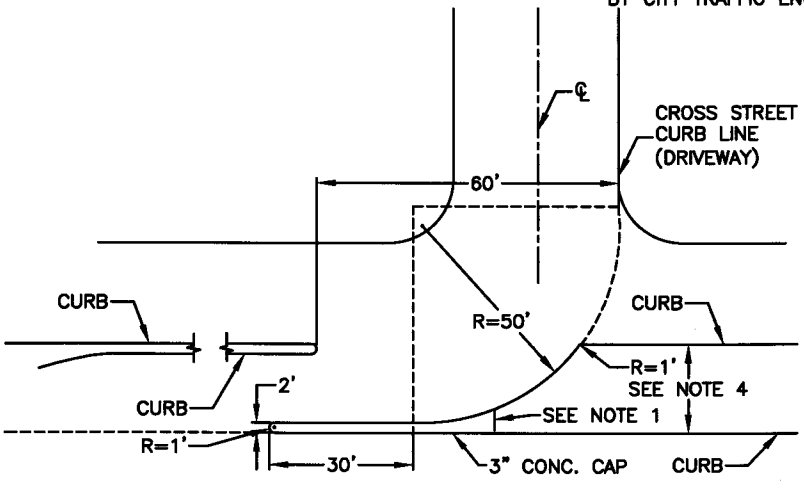
1. END CONCRETE CAP WHERE CURB FACES ARE GREATER THAN 8' APART.
2. NOSE SHALL BE A MINIMUM OF 10' FROM PRODUCTION OF CROSS STREET EXTREME CURB LINE.
3. CONCRETE GUTTER TO BE USED WHERE REQUIRED.

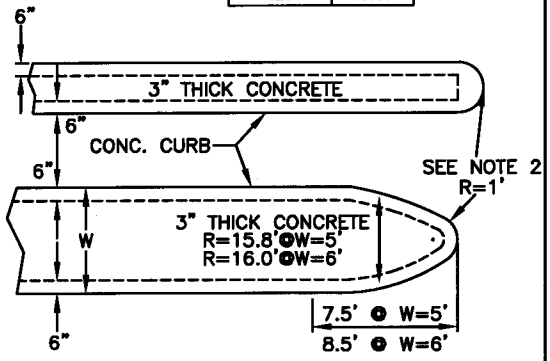


CURVE TABLE	
DIST. FROM POINT "A"	OFFSET B-B' = 13'
0'	0.00'
10'	0.19'
20'	0.77'
30'	1.74'
40'	3.11'
43.12' (TANGENT)	3.61'
50'	4.77'
60'	6.46'
70'	8.16'
77.71'	9.46'
80'	9.83'
90'	11.22'
100'	12.21'
110'	12.80'
120'	13.00'



CURVE TABLE	
DIST. FROM POINT "A"	OFFSET B-B' = 16'
0'	0.00'
10'	0.23'
20'	0.93'
30'	2.09'
40'	3.74'
45.00' (TANGENT)	4.74'
50'	5.80'
60'	7.93'
70'	10.06'
76.25'	11.39'
80'	12.16'
90'	13.85'
100'	15.05'
110'	15.76'
120'	16.00'





ISLAND NOSE DETAIL

MEDIAN ISLAND LEFT TURN POCKETS
(2 OF 2)

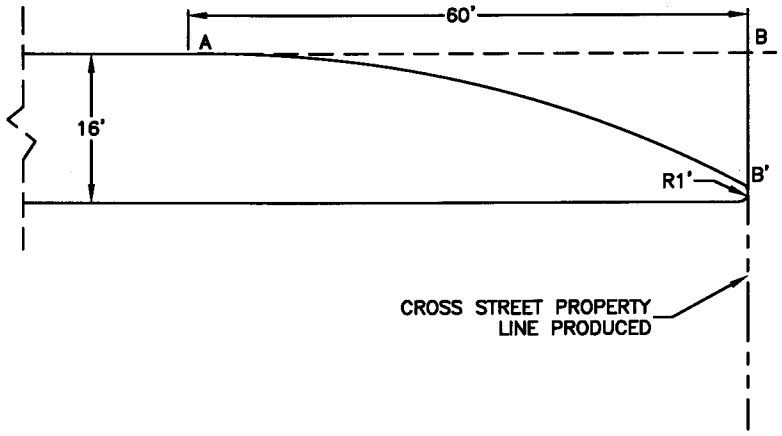
REF. & REV.
JULY 2011

CITY OF FRESNO

P-63

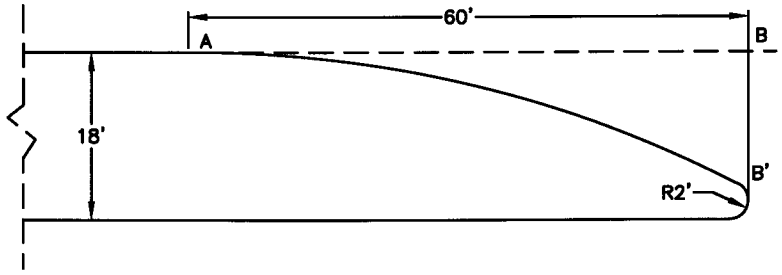
CURVE TABLE	
DIST. FROM POINT "A"	OFFSET B-B'
10'	0.40'
20'	1.58'
30'	3.56'
40'	6.33'
50'	9.99'
55'	11.97'

MEET 1' RAD. AT 60' ±



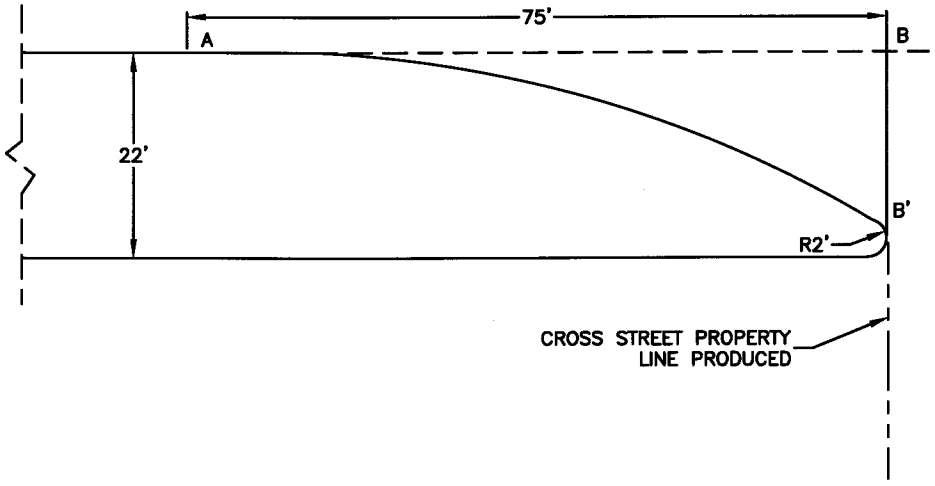
CURVE TABLE	
DIST. FROM POINT "A"	OFFSET B-B'
10'	0.40'
20'	1.58'
30'	3.56'
40'	6.33'
50'	9.99'
55'	11.97'

MEET 2' RAD. AT 60' ±



CURVE TABLE	
DIST. FROM POINT "A"	OFFSET B-B'
10'	0.32'
20'	1.30'
30'	2.92'
40'	5.19'
50'	8.11'
60'	11.68'
70'	15.90'

MEET 2' RAD. AT 75' ±

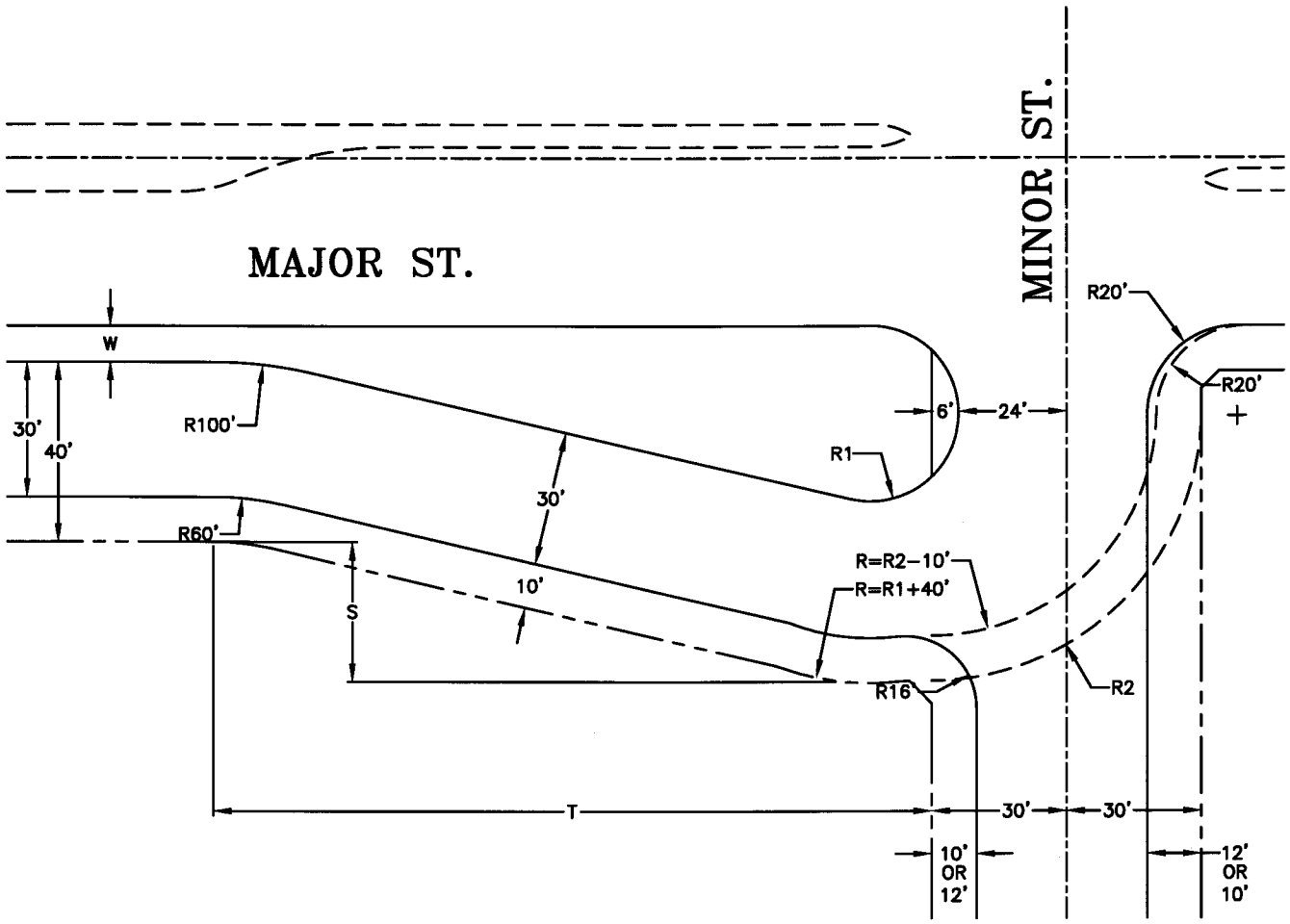


MEDIAN ISLAND PARABOLIC NOSE

REF. & REV. AUG., 2010

CITY OF FRESNO

P-64



	DESIGN TABLE
R1	(W=8') 19.50'
	(W=10') 20.50'
R2	60.00'
T	160' MIN.
S	31.00'

NOTES:

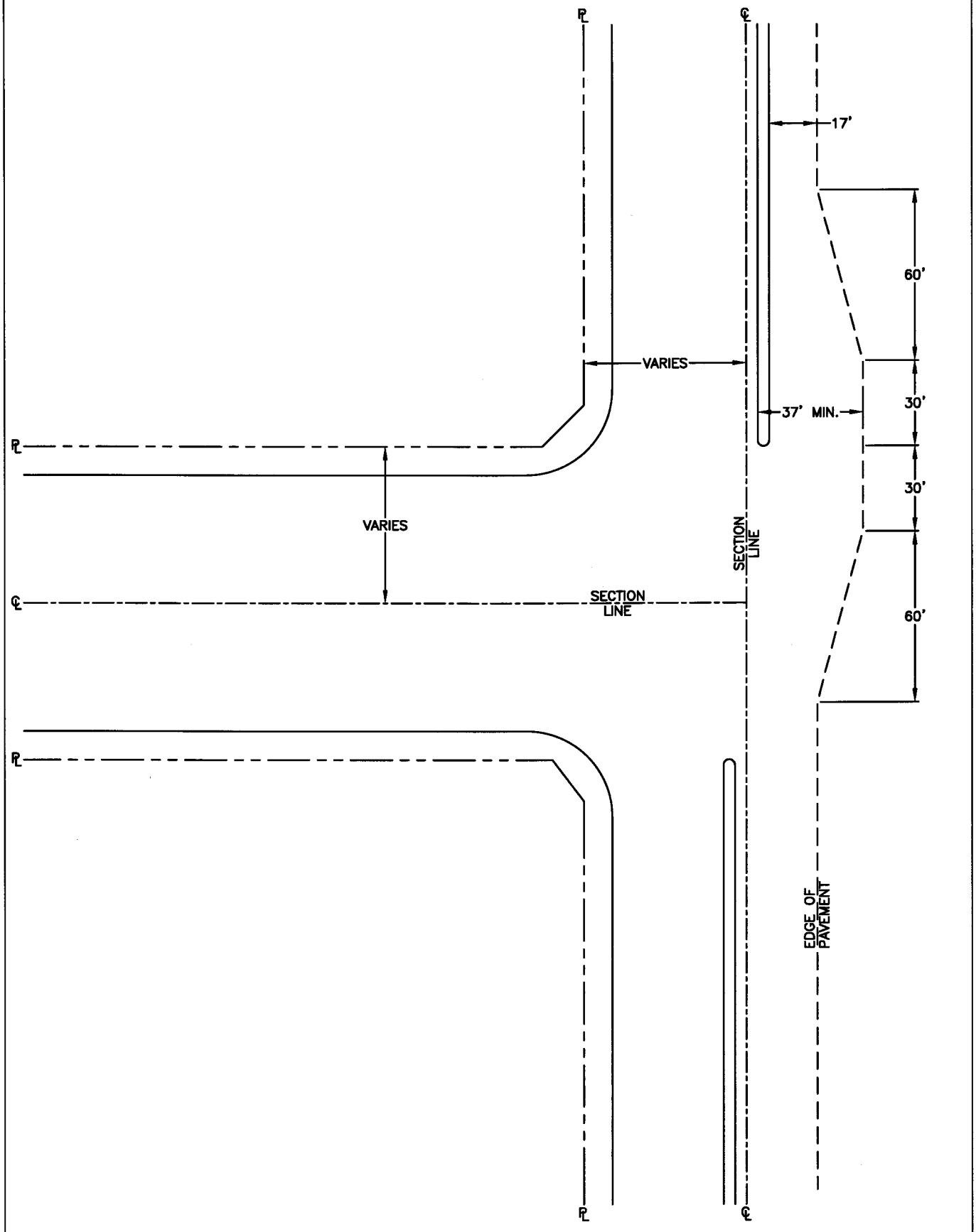
1. SIDEWALK PATTERN SHALL BE IN ACCORDANCE WITH SECTION 14 OF STANDARD SPECIFICATIONS.
2. "W"=8' ON 80' STREETS, 10' ON ALL OTHER MAJOR STREETS.

BULB DESIGN FRONTAGE ROAD TERMINATIONS

REF. & REV.
AUG., 2010

CITY OF FRESNO

P-65

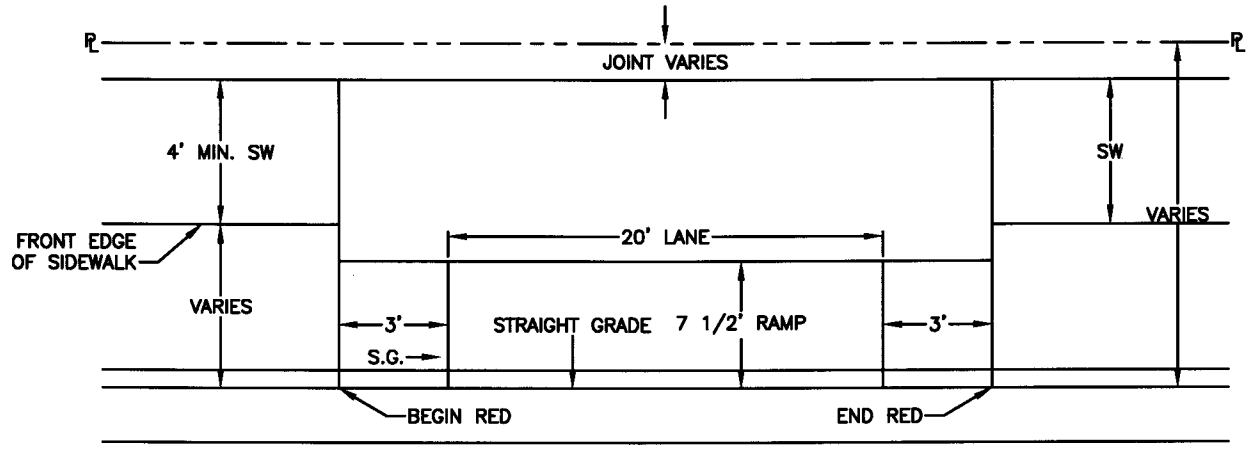


U–TURN MINIMUM CLEARANCE

REF. & REV.
AUG., 2010

CITY OF FRESNO

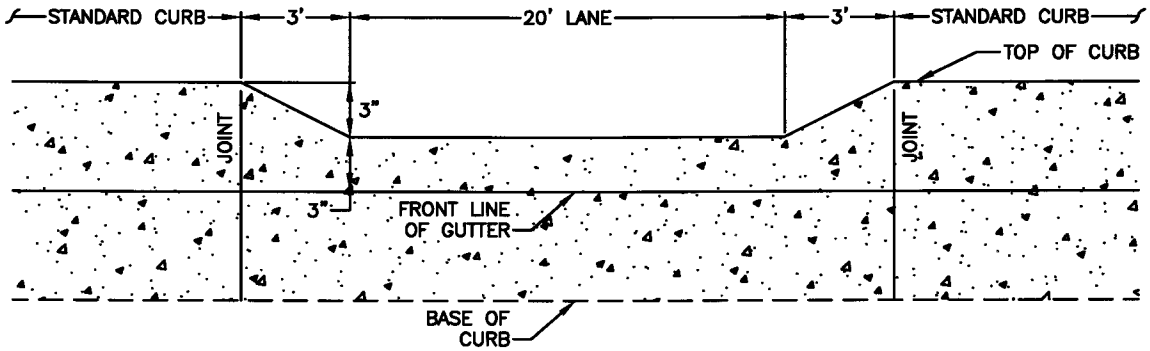
P–66



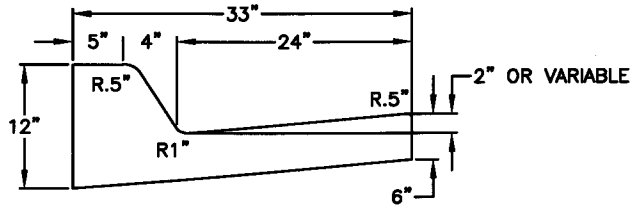
PLAN VIEW

NOTES:

1. RAMP AND SW AREAS SHALL BE 7" PCC/ 6" CNS.
2. A 36" MIN. SIDEWALK AREA BEHIND RAMP SHALL BE MAINTAINED WITH 10' PATTERN OR LESS.
3. CURB TOP AND FACE SHALL BE PAINTED RED.

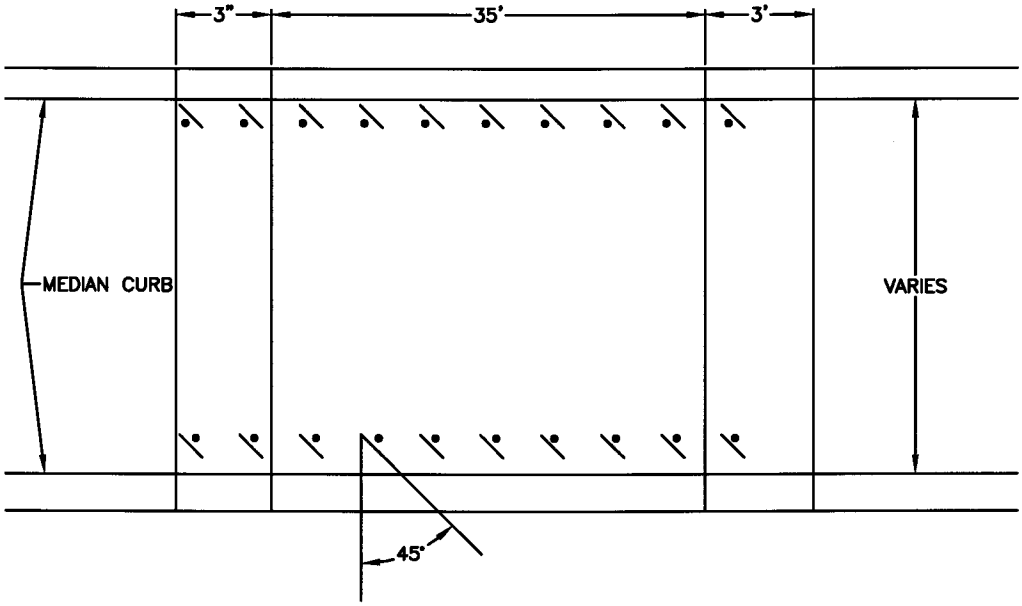


PROFILE VIEW



CURB DETAIL

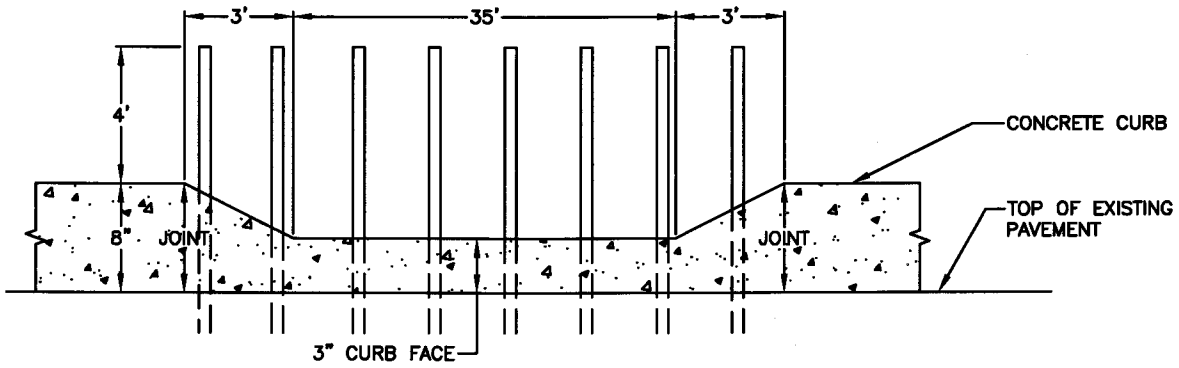
FIRE ACCESS LANE ACROSS PARKWAY	REF. & REV. AUG., 2002	CITY OF FRESNO P-67



PLAN VIEW

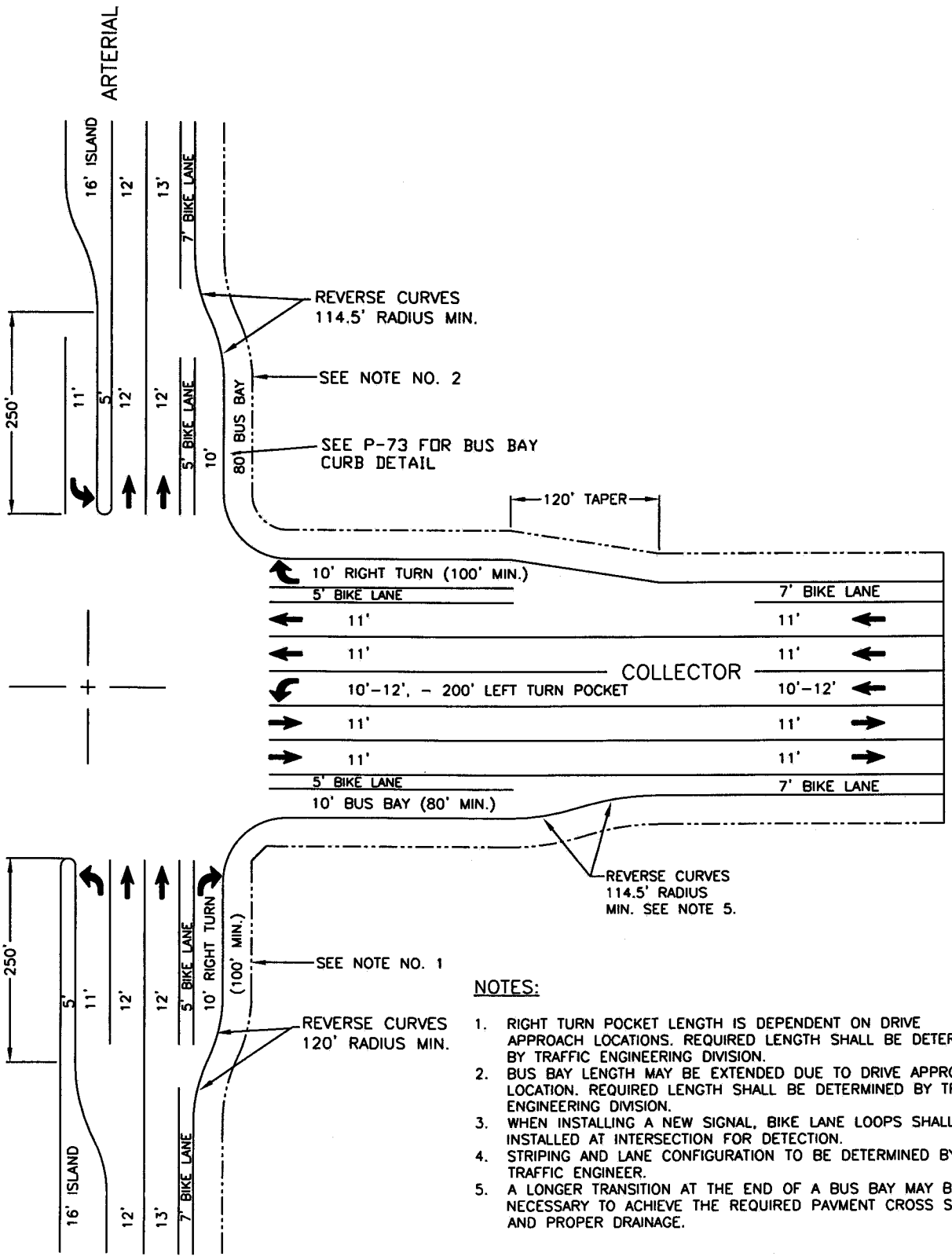
NOTES:

1. MEDIAN CROSSING SHALL BE 7" PCC/6" CNS.
2. FLEXIBLE WHITE REFLECTORIZED PADDLES SHALL BE INSTALLED ON 5' CENTERS. (STATE STD.).



PROFILE VIEW

MEDIAN OPENING FOR EMERGENCY VEHICLES	REF. & REV. AUG., 2010	CITY OF FRESNO P–68



NOTES:

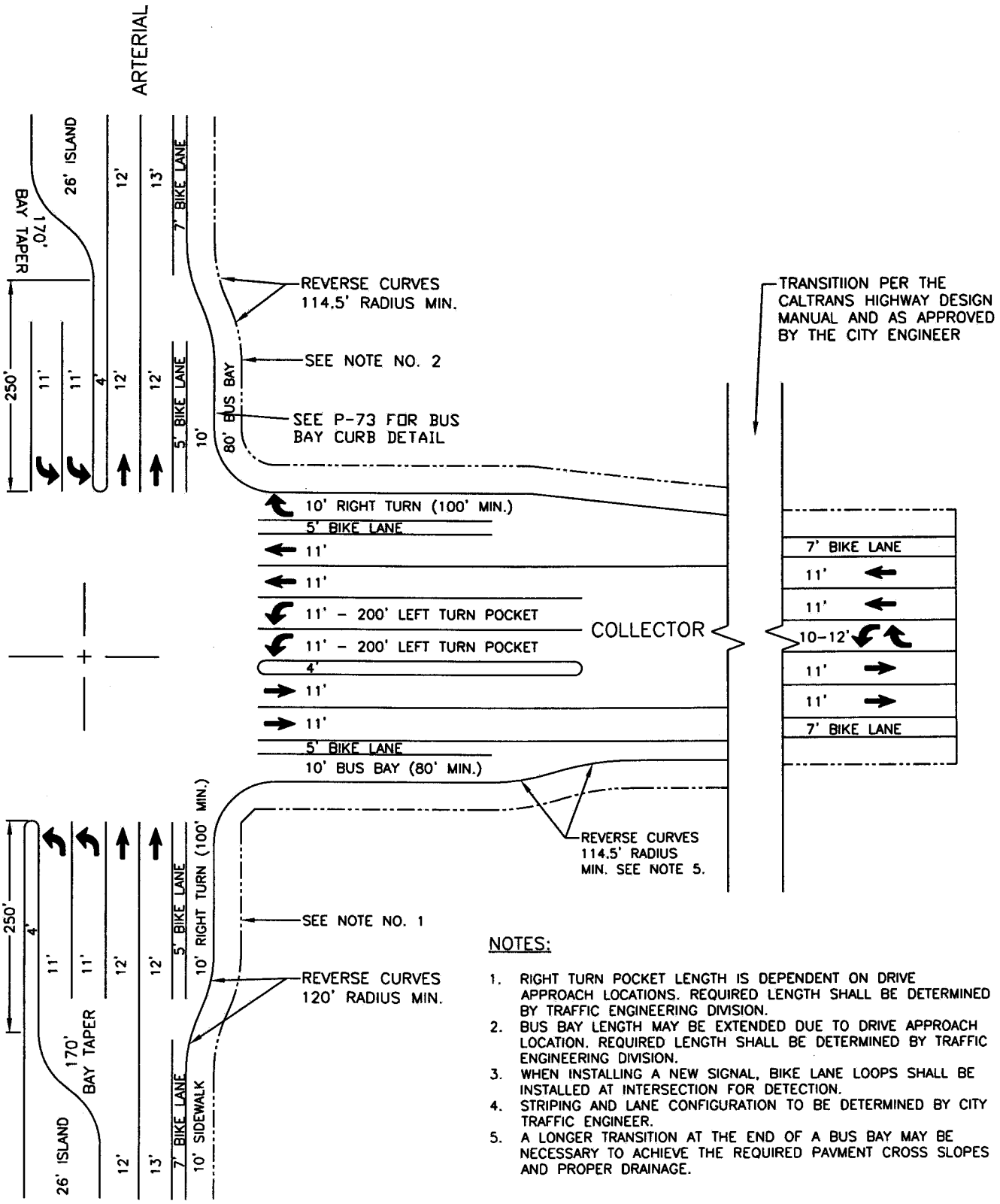
1. RIGHT TURN POCKET LENGTH IS DEPENDENT ON DRIVE APPROACH LOCATIONS. REQUIRED LENGTH SHALL BE DETERMINED BY TRAFFIC ENGINEERING DIVISION.
2. BUS BAY LENGTH MAY BE EXTENDED DUE TO DRIVE APPROACH LOCATION. REQUIRED LENGTH SHALL BE DETERMINED BY TRAFFIC ENGINEERING DIVISION.
3. WHEN INSTALLING A NEW SIGNAL, BIKE LANE LOOPS SHALL BE INSTALLED AT INTERSECTION FOR DETECTION.
4. STRIPING AND LANE CONFIGURATION TO BE DETERMINED BY CITY TRAFFIC ENGINEER.
5. A LONGER TRANSITION AT THE END OF A BUS BAY MAY BE NECESSARY TO ACHIEVE THE REQUIRED PAVMENT CROSS SLOPES AND PROPER DRAINAGE.

STREET INTERSECTION DETAIL

REF. & REV.
JUNE 2015

CITY OF FRESNO

P-69



NOTES:

1. RIGHT TURN POCKET LENGTH IS DEPENDENT ON DRIVE APPROACH LOCATIONS. REQUIRED LENGTH SHALL BE DETERMINED BY TRAFFIC ENGINEERING DIVISION.
2. BUS BAY LENGTH MAY BE EXTENDED DUE TO DRIVE APPROACH LOCATION. REQUIRED LENGTH SHALL BE DETERMINED BY TRAFFIC ENGINEERING DIVISION.
3. WHEN INSTALLING A NEW SIGNAL, BIKE LANE LOOPS SHALL BE INSTALLED AT INTERSECTION FOR DETECTION.
4. STRIPING AND LANE CONFIGURATION TO BE DETERMINED BY CITY TRAFFIC ENGINEER.
5. A LONGER TRANSITION AT THE END OF A BUS BAY MAY BE NECESSARY TO ACHIEVE THE REQUIRED PAVMENT CROSS SLOPES AND PROPER DRAINAGE.

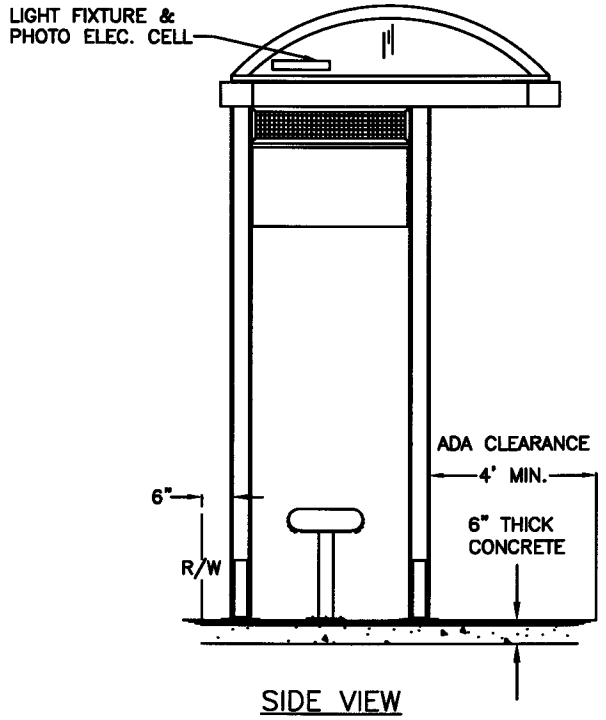
STREET INTERSECTION DETAIL
WITH DUAL LEFT TURN LANES

REF. & REV.
JUNE 2015

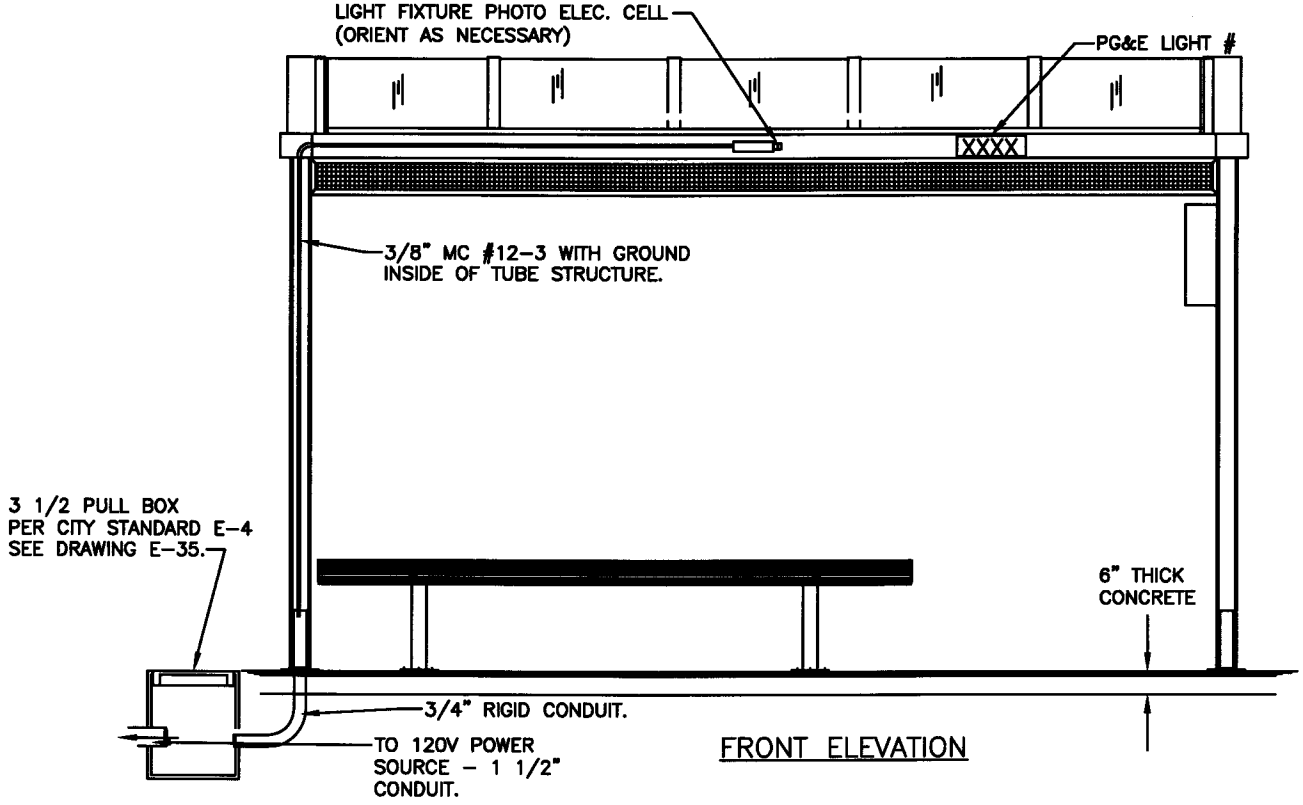
CITY OF FRESNO
P-70

NOT USED

NO LONGER USED	REF. & REV. AUG., 2010	CITY OF FRESNO P-71



SIDE VIEW



FRONT ELEVATION

NOTES:

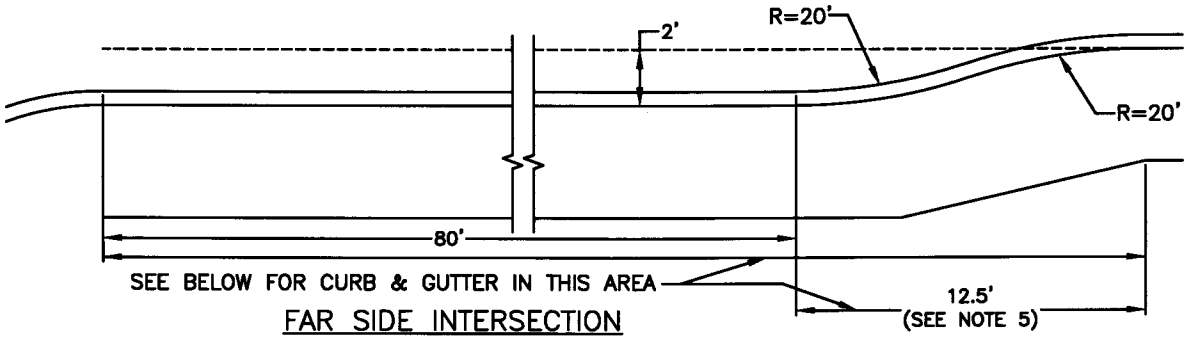
1. BUS SHELTERS SHALL BE PLACED IN CITY OF FRESNO RIGHT OF WAY. CONTACT CITY OF FRESNO TRAFFIC ENGINEERING FOR EASEMENT REQUIREMENTS IF ADA CLEARANCE IS NOT MET.
2. A 6" CONCRETE PAD SHALL BE PLACED UNDER SHELTER. LIMITS OF PAD SHALL ALLOW FOR FUTURE ADDITION TO SHELTER. CONTACT TRAFFIC ENGINEERING FOR REQUIREMENTS.
3. BUS SHELTER LIGHT(S) SHALL BE NUMBERED. NUMERICAL SEQUENCE SHALL BE OBTAINED FROM P.G.&E. NUMBERS TO BE 2 1/2" HIGH AND INSTALLED AS SHOWN ON THIS STANDARD DRAWING.

BUS SHELTER ELECTRICAL LAYOUT

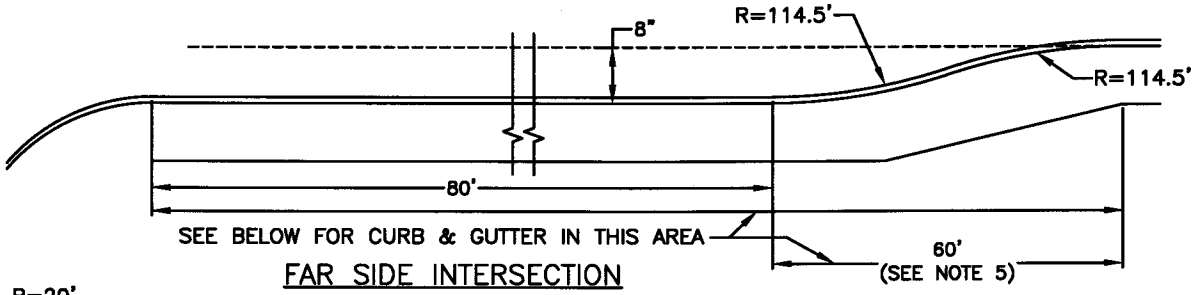
REF. & REV.
JULY 2011

CITY OF FRESNO

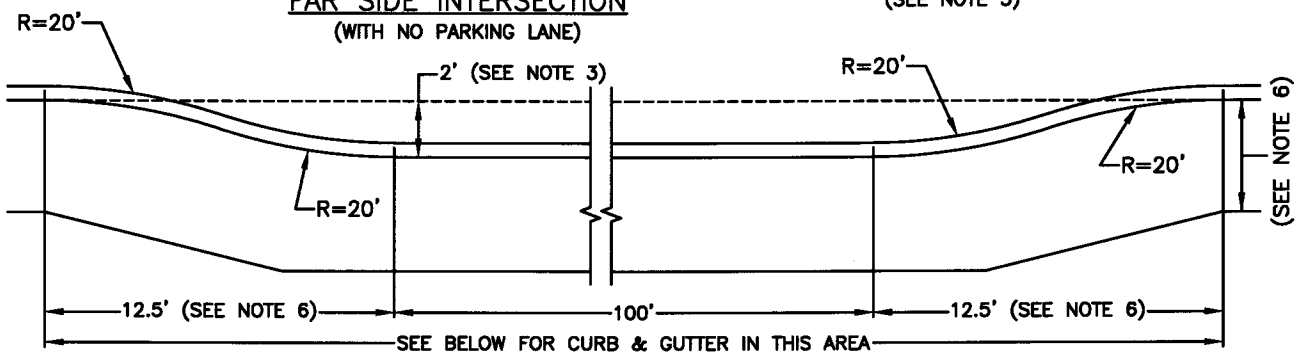
P-72



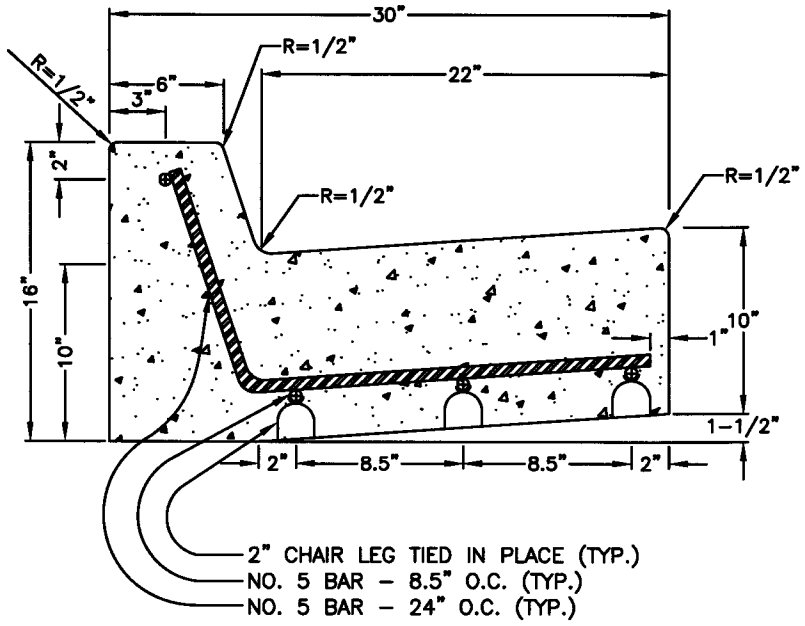
FAR SIDE INTERSECTION
(WITH PARKING LANE)



FAR SIDE INTERSECTION
(WITH NO PARKING LANE)



MID BLOCK



DETAIL

NOTES:

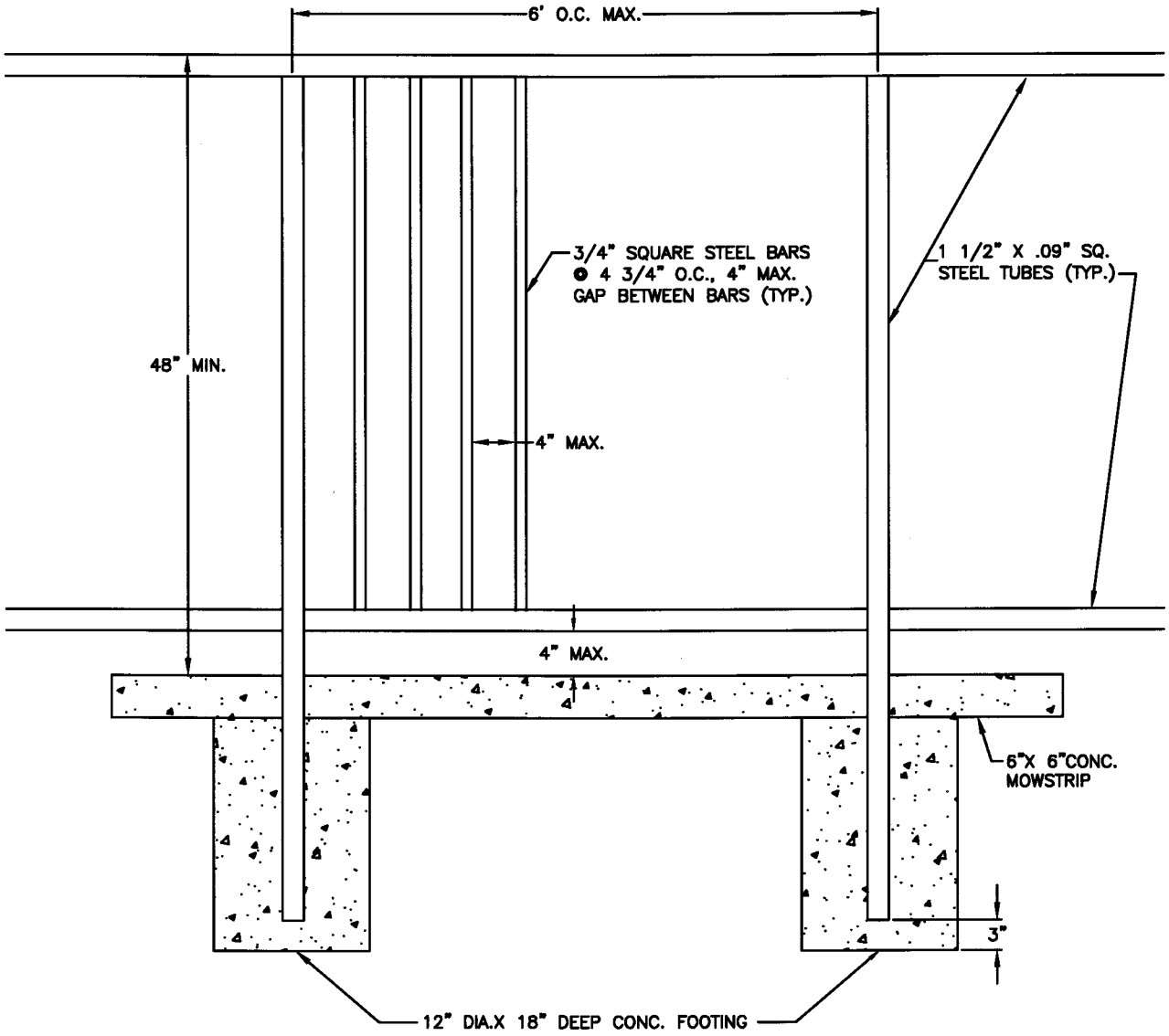
1. 5' MIN. TRANSITION TO STD. CURB & GUTTER.
2. 20" LAP REQ'D ON ALL BAR SPLICES.
3. WHERE PARKING LANE DOES NOT EXIST, 8' BUS BAY WILL BE REQUIRED.
4. USE 6 SACK CONCRETE MIX.
5. ON COLLECTOR STREETS IN NEW GROWTH AREA, USE P-69 CITY STD.
6. IF 8' BUS BAY, USE 114.50' RADIUS AND 60' TRANSITION.

BUS BAYS

REF. & REV.
AUG., 2002

CITY OF FRESNO

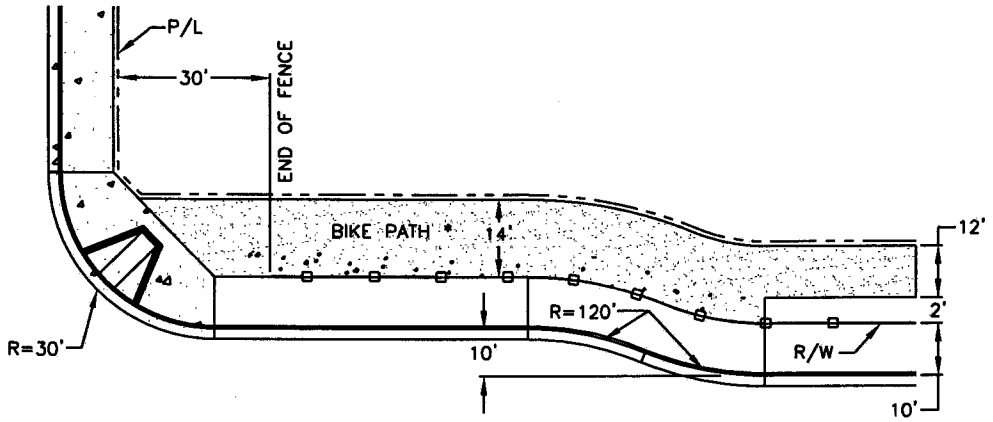
P-73



NOTES:

1. FENCE SHALL BE LOCATED 6" OUTSIDE OF STREET RIGHT-OF-WAY.
2. FENCE SHALL HAVE A BLACK POWDER COATING.
3. SEE PUBLIC WORKS STANDARD P-75 FOR REQUIRED LOCATION OF BARRIER FENCING.
4. ALTERNATE DESIGNS MAY BE APPROVED BY THE CITY ENGINEER, PROVIDED THE 4' MINIMUM HEIGHT IS PROVIDED.
5. ALL CONCRETE WORK SHALL BE 5-SACK MIX.

EXPRESSWAY BARRIER FENCING	REF. & REV. AUG, 2010	CITY OF FRESNO P-74

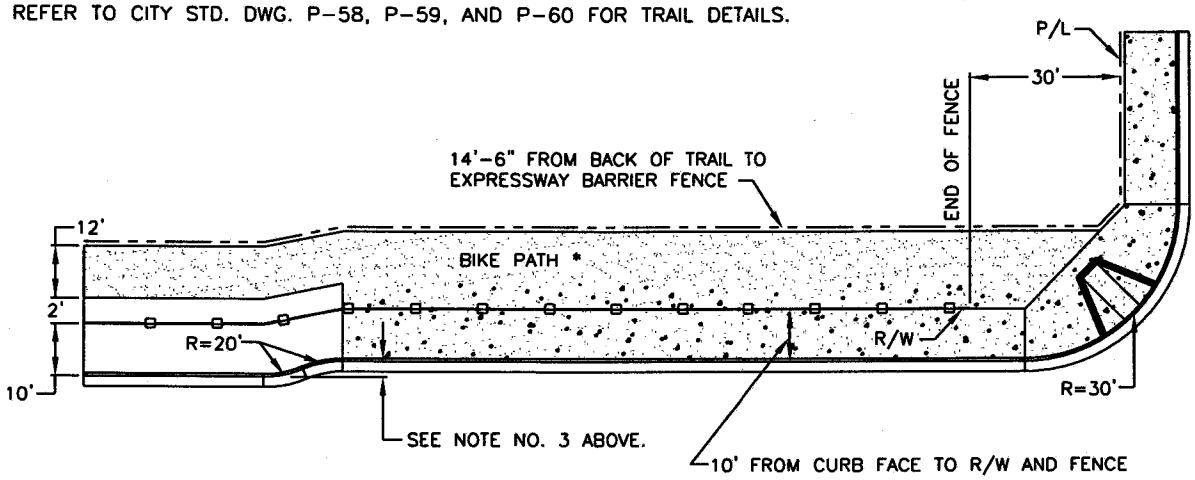


RIGHT TURN LANE LOCATION

*IF BIKE PATH CONSTRUCTION IS REQUIRED.

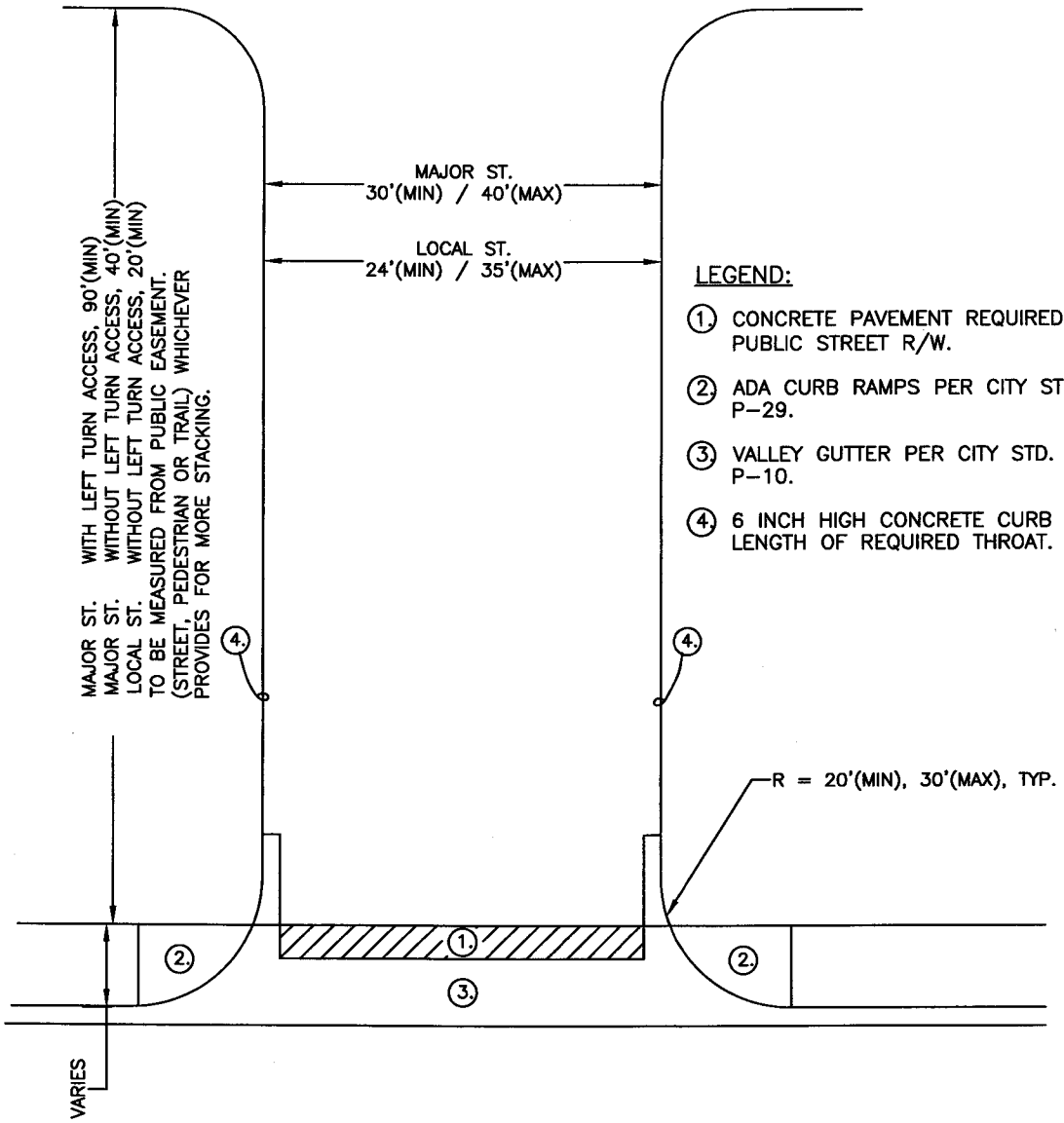
NOTES:

1. EXPRESSWAY BARRIER FENCE SHALL BE ON STREET RIGHT-OF-WAY.
2. BIKE PATH MAY MEANDER OUTSIDE OF RIGHT TURN AND BUS BAY AREA.
3. REFER TO CITY STD. DWG. P-58, P-59, AND P-60 FOR TRAIL DETAILS.



BUS BAY LOCATION

EXPRESSWAY BARRIER FENCE LOCATION	REF. & REV. JUNE 2015	CITY OF FRESNO P-75

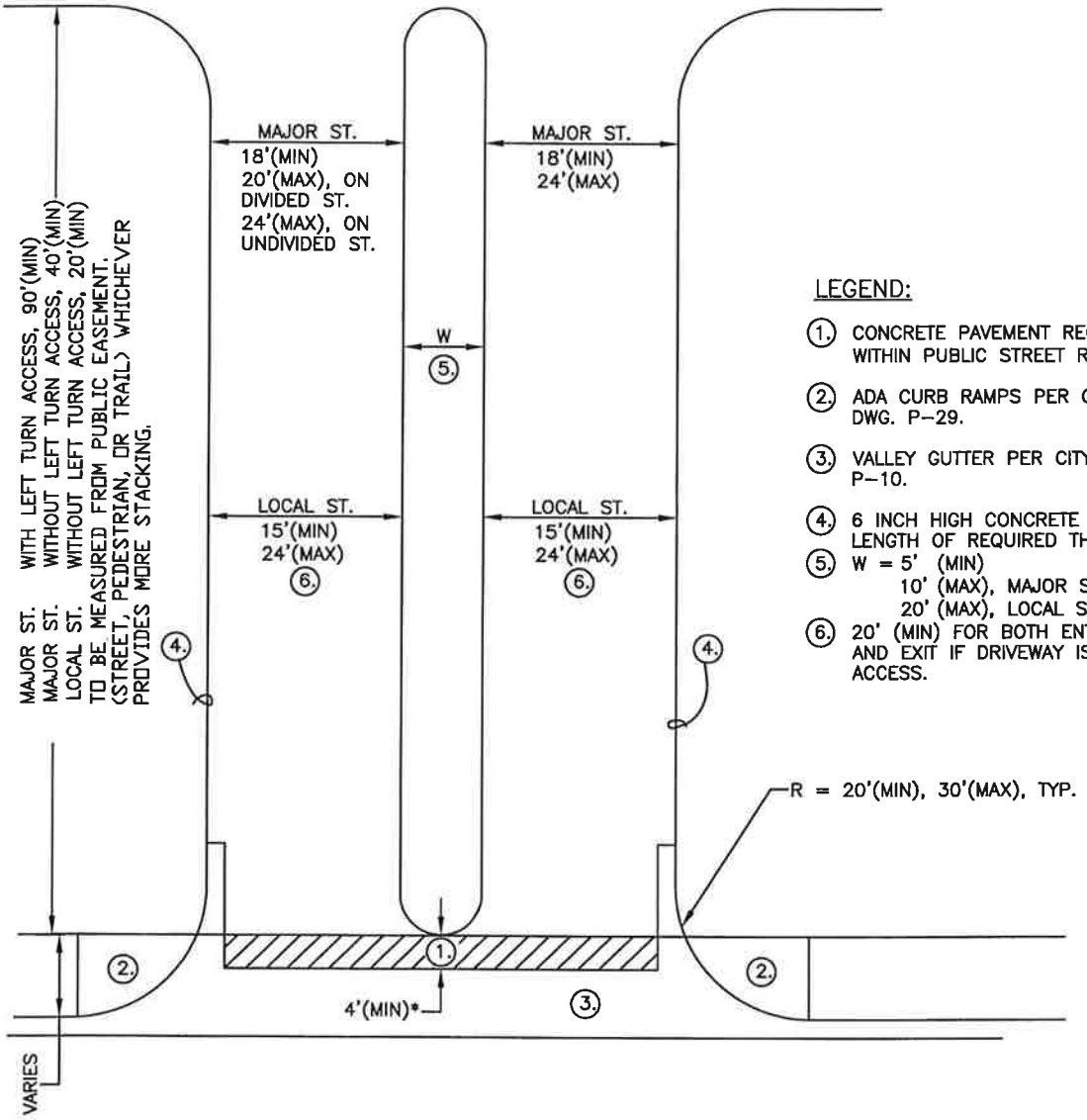


MAJOR ST./LOCAL ST.

NOTES:

ON DIVIDED MAJOR STREET, DESIGN ONE-WAY LEFT TURN POCKET PER CITY STD. DWG. P-63, WHERE APPROVED BY CITY TRAFFIC ENGINEER.

STREET TYPE APPROACH FOR UNDIVIDED DRIVEWAY	REF. & REV. AUG. 2015	CITY OF FRESNO P-76



LEGEND:

1. CONCRETE PAVEMENT REQUIRED WITHIN PUBLIC STREET R/W.
2. ADA CURB RAMPS PER CITY STD. DWG. P-29.
3. VALLEY GUTTER PER CITY STD. DWG. P-10.
4. 6 INCH HIGH CONCRETE CURB FOR LENGTH OF REQUIRED THROAT.
5. W = 5' (MIN)
   10' (MAX), MAJOR ST.
   20' (MAX), LOCAL ST.
6. 20' (MIN) FOR BOTH ENTERANCE AND EXIT IF DRIVEWAY IS SOLE ACCESS.

MAJOR ST./LOCAL ST.

NOTES:

ON DIVIDED MAJOR STREET, DESIGN ONE-WAY LEFT TURN POCKET PER CITY STD. DWG. P-63, WHERE APPROVED BY CITY TRAFFIC ENGINEER.

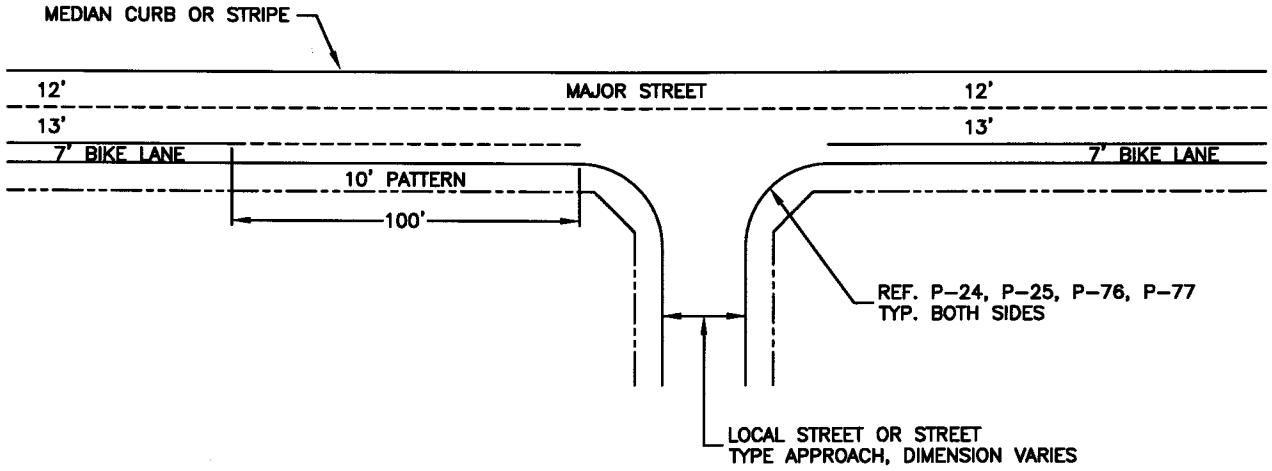
*FOR ADA ACCESSIBILITY ACROSS DRIVEWAY

STREET TYPE APPROACH
FOR DIVIDED DRIVEWAY

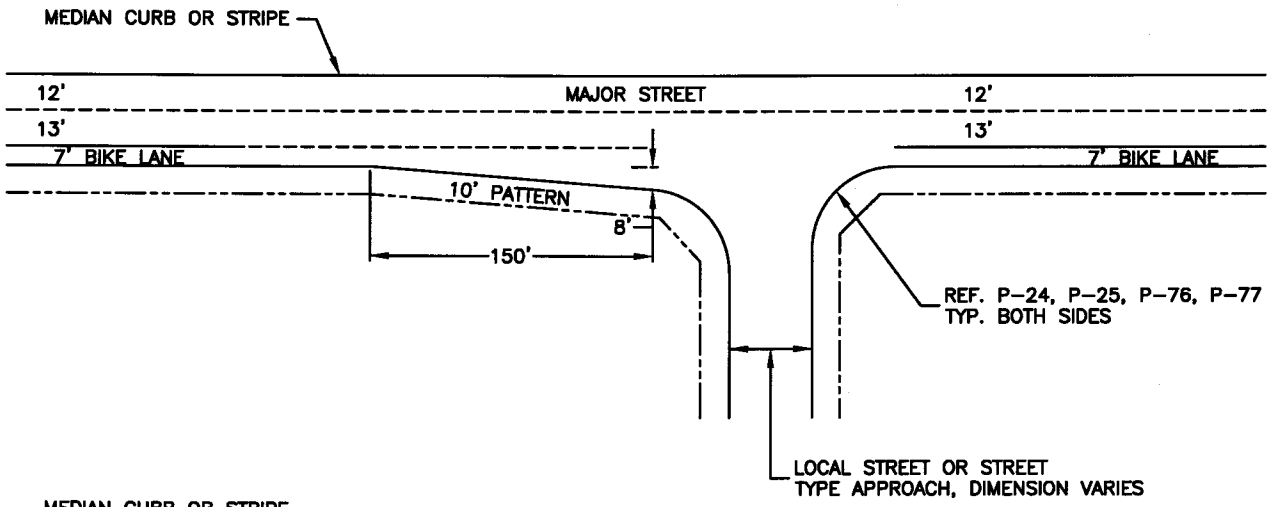
REF. & REV.
AUG. 2015

CITY OF FRESNO

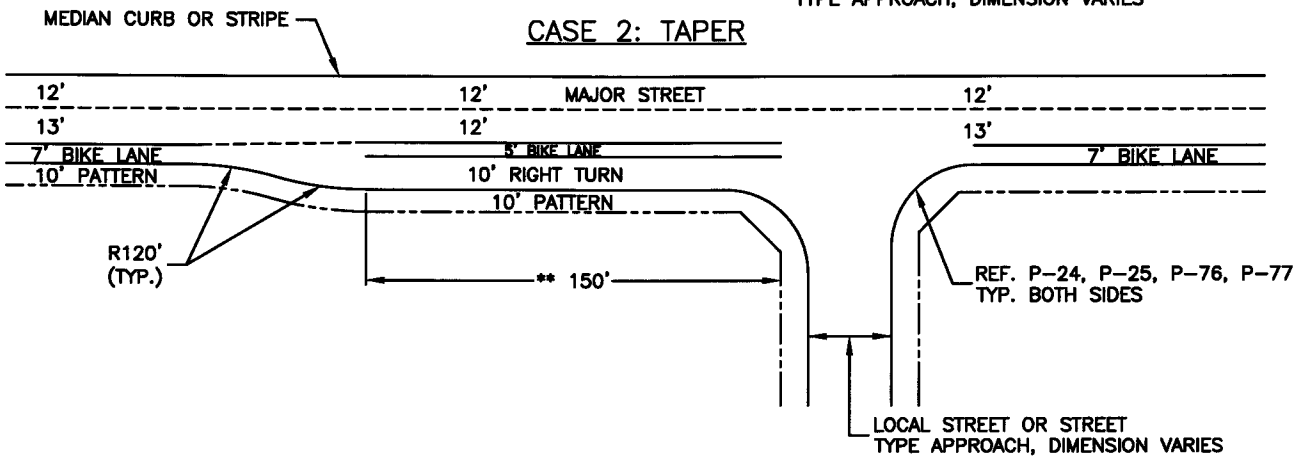
P-77



CASE 1: SHARED LANE



CASE 2: TAPER



CASE 3: RIGHT TURN POCKET

MAJOR STREET: # PEAK HOUR RIGHT TURN VEHICLES

SPEED (MPH)	CASE 1	CASE 2	CASE 3
35	< 50	≥ 50 – <100	≥ 100
40	< 40	≥ 40 – <90	≥ 90
45	< 30	≥ 30 – <80	≥ 80
> 50	< 20	≥ 20 – <75	≥ 75

NOTES:

CASE 2: NOT ALLOWED WHEN AT A SIGNALIZED INTERSECTION

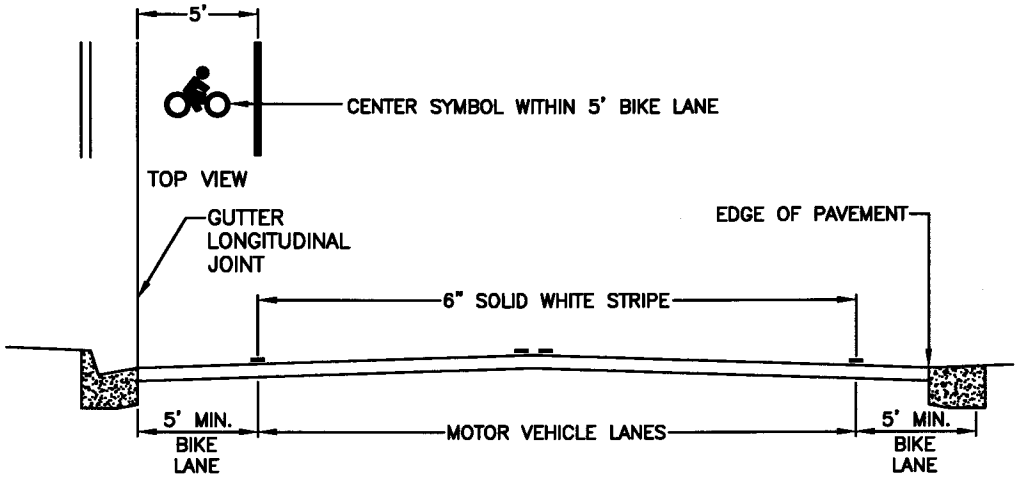
CASE 3: ** EXCEPTIONS NEED TO BE APPROVED BY THE CITY TRAFFIC ENGINEER

MAJOR STREET CONNECTIONS
FOR LOCAL STREETS AND STREET TYPE APPROACHES

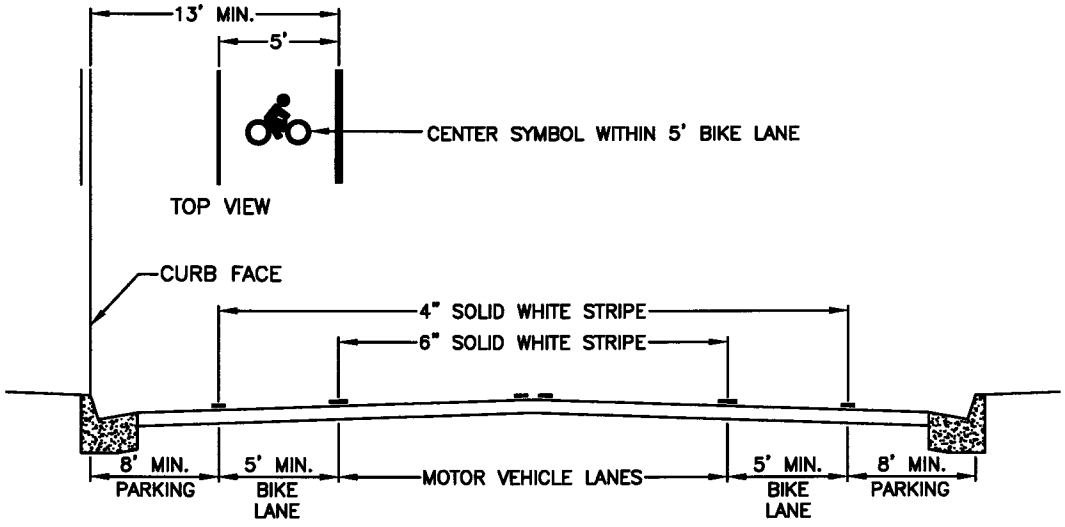
REF. & REV. AUG., 2010

CITY OF FRESNO

P-78



CASE I



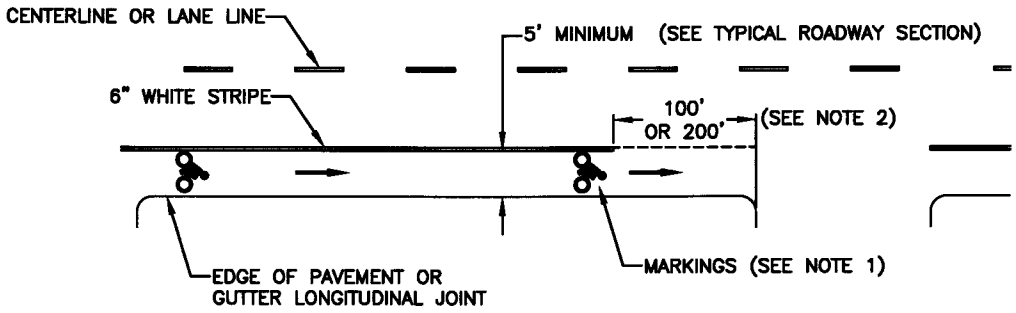
CASE II

NOTES:

TO THE GREATEST EXTENT POSSIBLE, CASE I BIKE LANES WILL BE INSTALLED. CONSIDERATION WILL BE GIVEN TO 5-FOOT BIKE LANES (MEASURED FROM FACE OF CURB), REDUCED LANE WIDTH, AND/OR ELIMINATION OF TRAFFIC LANES. A TRAFFIC STUDY TO INVESTIGATE, BUT NOT LIMITED TO, TRAFFIC SPEED, SPEED LIMITS, TYPE OF CORRIDOR, AND VOLUMES FOR CARS AND TRUCKS, MAY BE DEVELOPED BEFORE TRAVEL LANES ARE ELIMINATED AND/OR REDUCED IN WIDTH.

"NO STOPPING AT ANY TIME" SIGNS WILL BE INSTALLED AT 200 FOOT INTERVALS. (OR AT INTERVALS DETERMINED BY EXISTING STREETLIGHT POLES) WHEN STRIPING A CASE I BIKE LANE.

TYPICAL BIKE LANE CROSS-SECTIONS	REF. & REV. AUG., 2002	CITY OF FRESNO P-79



NOTES:

1. THE BICYCLE SYMBOL PAVEMENT MARKINGS SHALL BE PLACED ON THE FAR SIDE OF EACH INTERSECTION, 25' FROM THE RETURN. 800' MAXIMUM SPACING. THEY MAY BE PLACED AT OTHER LOCATIONS AS DESIRED.

2. WHERE MOTORIST RIGHT TURNS ARE PERMITTED, THE SOLID BIKE LANE LINE SHALL BE DASHED UP TO THE INTERSECTION, AS SHOWN, BEGINNING AT A POINT 100' IN ADVANCE OF THE INTERSECTION. A DISTANCE OF 200' SHALL BE USED ON ARTERIALS AND SUPER ARTERIALS WITH A POSTED SPEED LIMIT OF 45 MPH OR GREATER. WHEN RIGHT TURNS ARE PROHIBITED, THE BIKE LANE LINE SHALL BE SOLID TO THE INTERSECTION.

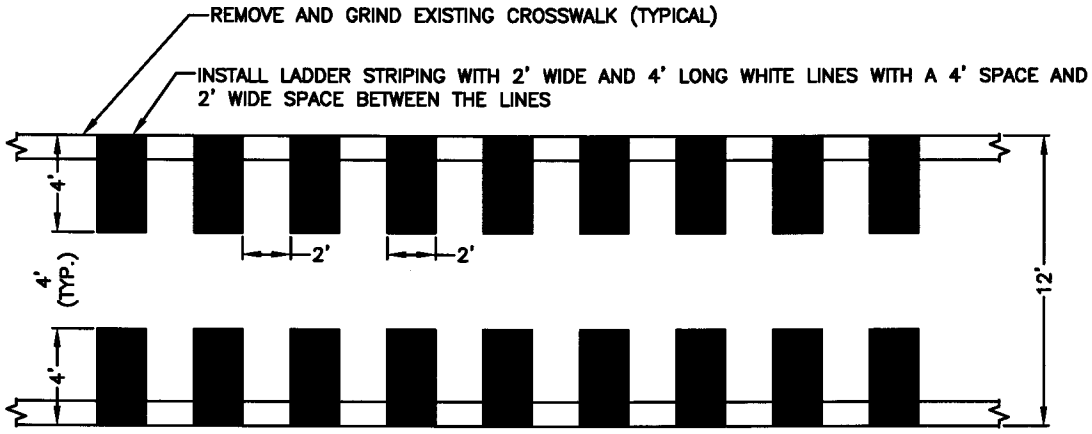
3. THE "BIKE LANE" SIGN (18" X 24") SHALL BE PLACED AT THE BEGINNING OF ALL BIKE LANES, ON THE FAR SIDE OF EVERY MAJOR STREET INTERSECTION, AT ALL MAJOR CHANGES IN DIRECTION, AND AT MAXIMUM 1/2 MI. (0.8 km) INTERVALS.

4. THE ACTUAL LOCATION OF ALL SIGNS WILL BE DETERMINED BY THE CITY TRAFFIC ENGINEER.

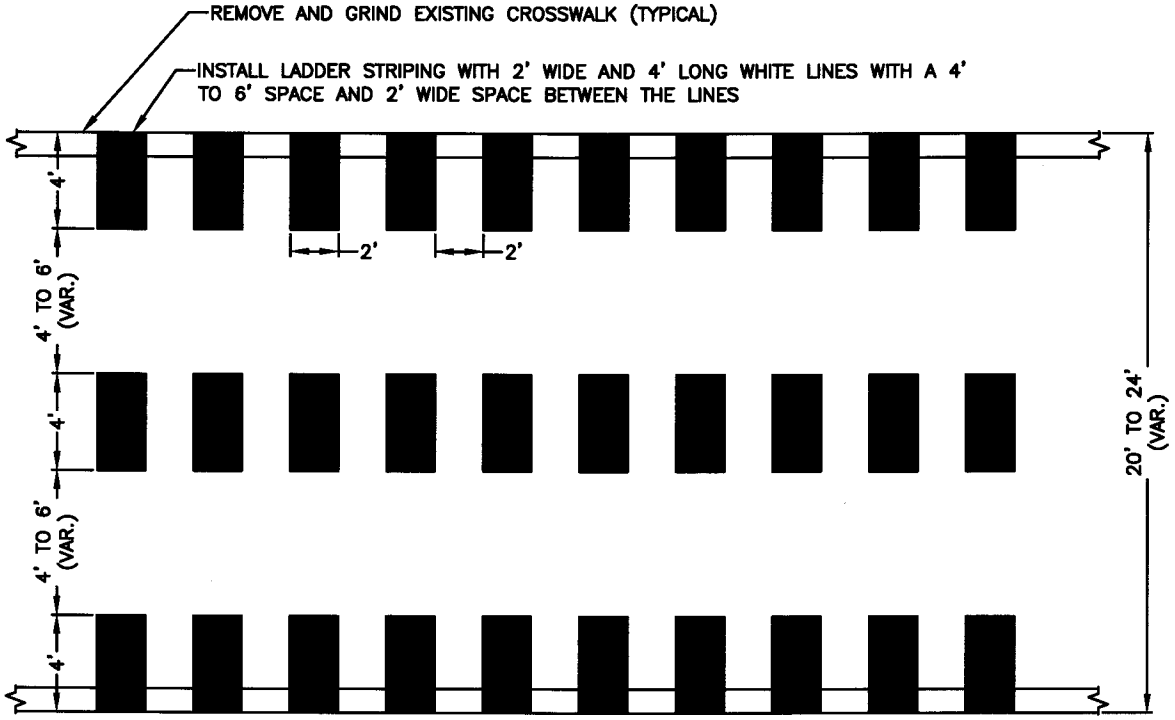
BIKE LANE SIGNS AND MARKINGS	REF. & REV. AUG, 2010	CITY OF FRESNO P–80

NOT USED

NO LONGER USED	REF. & REV. AUG., 2010	CITY OF FRESNO P–81



HIGH VISIBILITY CROSSWALK (TYPICAL 12' LAYOUT)



HIGH VISIBILITY CROSSWALK (ENLARGED LAYOUT)

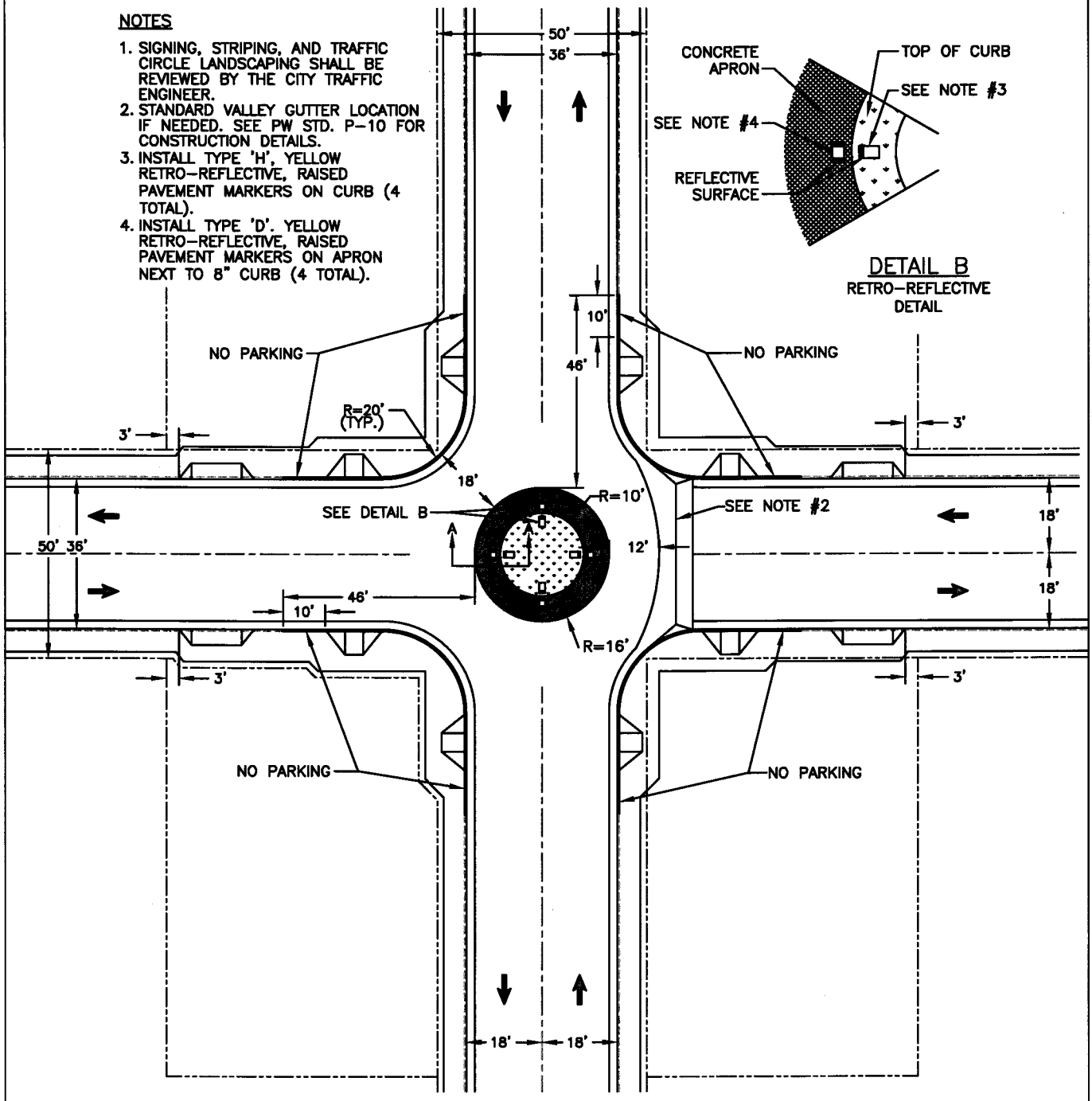
NOTES:

1. INSTALL THREE ROWS OF 2' x 4' LADDER STRIPING WITH VARIABLE SPACING FROM 4' TO 6" ON ENLARGED CROSSWALKS 2.
2. THE VARIABLE SPACING IS TO BE SYMMETRICAL

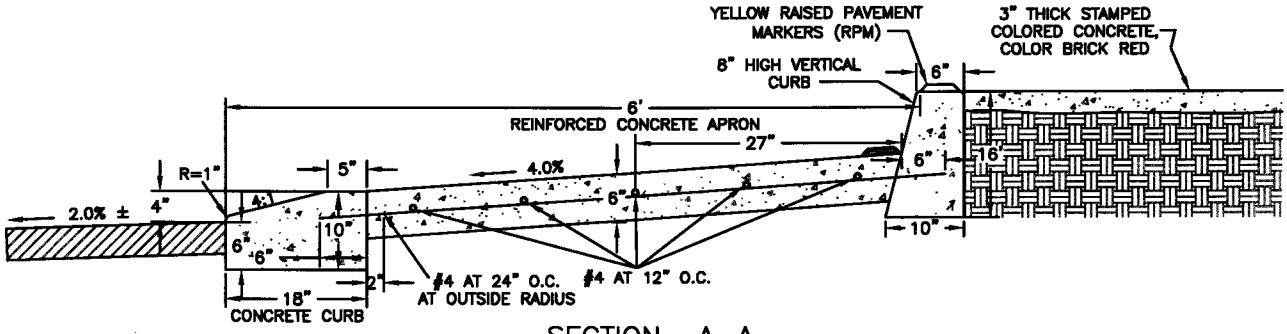
HIGH VISIBILITY CROSSWALK	REF. & REV. AUG., 2010	CITY OF FRESNO P-82

NOTES

1. SIGNING, STRIPING, AND TRAFFIC CIRCLE LANDSCAPING SHALL BE REVIEWED BY THE CITY TRAFFIC ENGINEER.
2. STANDARD VALLEY GUTTER LOCATION IF NEEDED. SEE PW STD. P-10 FOR CONSTRUCTION DETAILS.
3. INSTALL TYPE 'H', YELLOW RETRO-REFLECTIVE, RAISED PAVEMENT MARKERS ON CURB (4 TOTAL).
4. INSTALL TYPE 'D'. YELLOW RETRO-REFLECTIVE, RAISED PAVEMENT MARKERS ON APRON NEXT TO 8" CURB (4 TOTAL).



DETAIL B
RETRO-REFLECTIVE DETAIL



SECTION A-A
CIRCLE CURB DETAIL

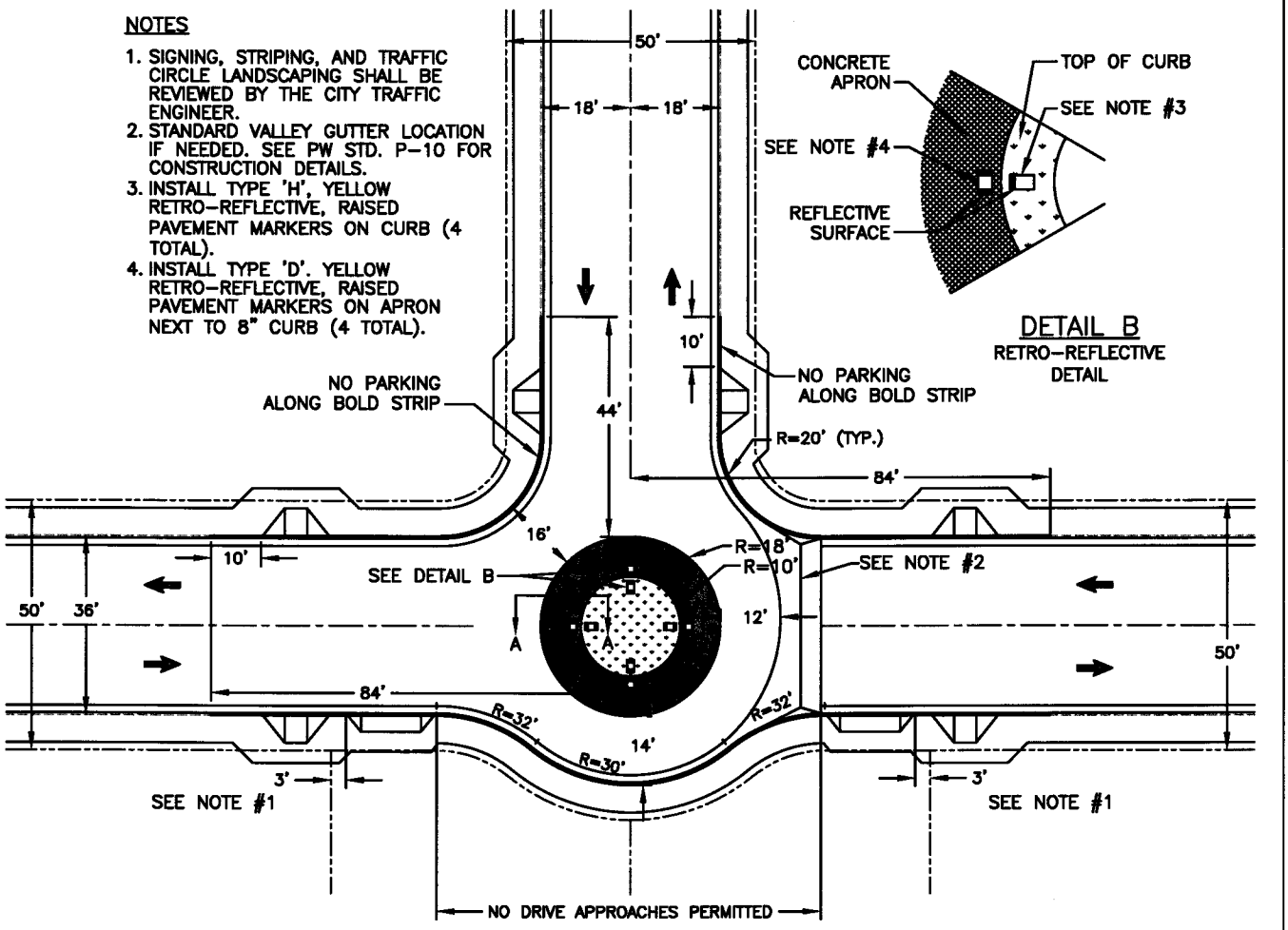
RESIDENTIAL TRAFFIC CIRCLE
FOR FOUR-WAY INTERSECTION

REF. & REV.
AUG., 2010

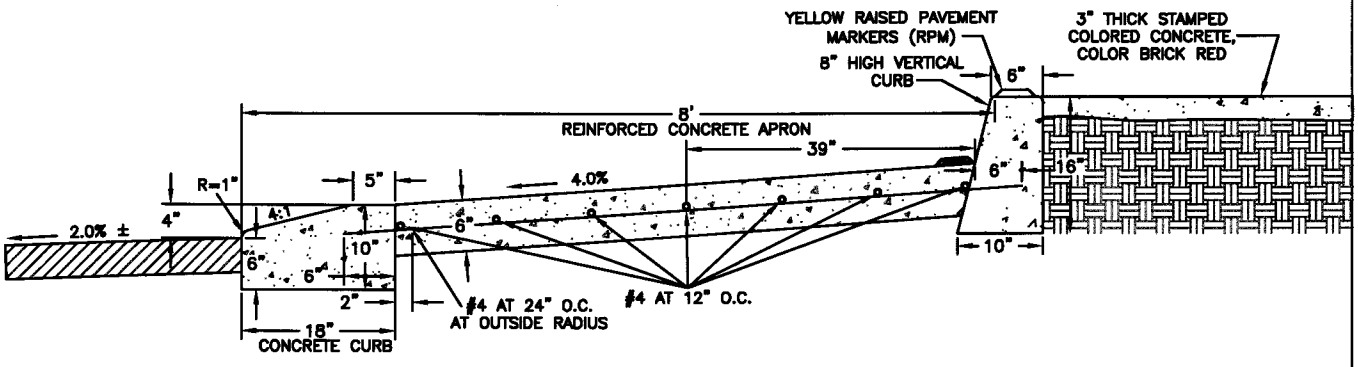
CITY OF FRESNO
P-83

NOTES

1. SIGNING, STRIPING, AND TRAFFIC CIRCLE LANDSCAPING SHALL BE REVIEWED BY THE CITY TRAFFIC ENGINEER.
2. STANDARD VALLEY GUTTER LOCATION IF NEEDED. SEE PW STD. P-10 FOR CONSTRUCTION DETAILS.
3. INSTALL TYPE 'H', YELLOW RETRO-REFLECTIVE, RAISED PAVEMENT MARKERS ON CURB (4 TOTAL).
4. INSTALL TYPE 'D', YELLOW RETRO-REFLECTIVE, RAISED PAVEMENT MARKERS ON APRON NEXT TO 8" CURB (4 TOTAL).



DETAIL B
RETRO-REFLECTIVE DETAIL



SECTION A-A
CIRCLE CURB DETAIL

RESIDENTIAL TRAFFIC CIRCLE

CASE NO.1

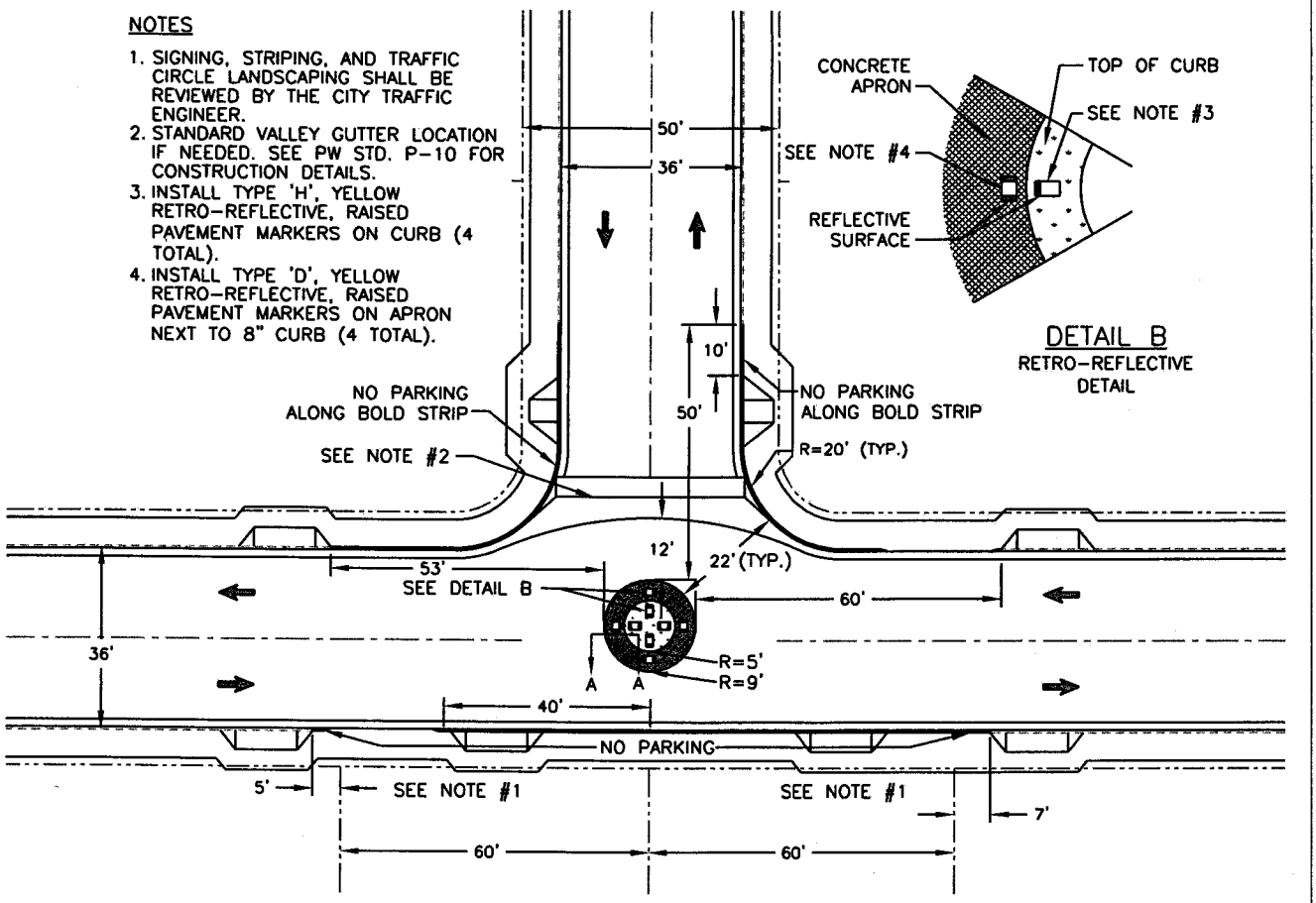
REF. & REV.
AUG., 2010

CITY OF FRESNO

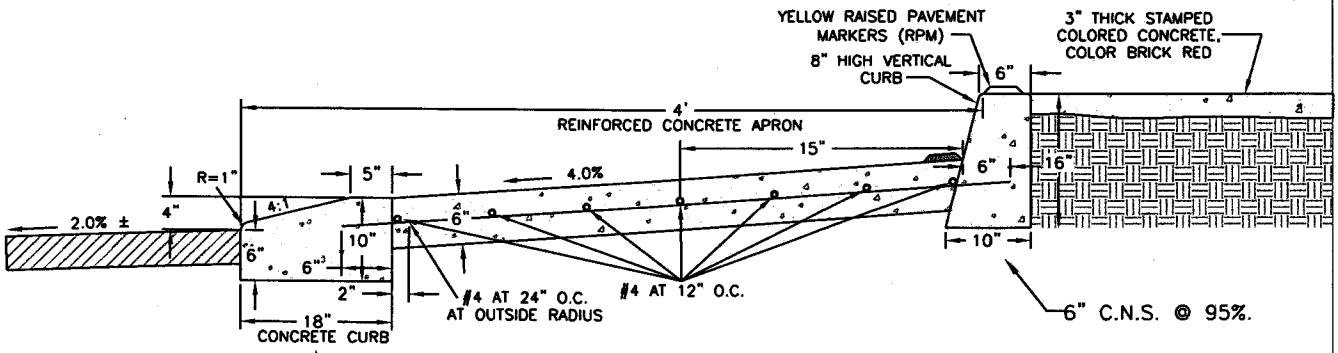
P-84

NOTES

1. SIGNING, STRIPING, AND TRAFFIC CIRCLE LANDSCAPING SHALL BE REVIEWED BY THE CITY TRAFFIC ENGINEER.
2. STANDARD VALLEY GUTTER LOCATION IF NEEDED. SEE PW STD. P-10 FOR CONSTRUCTION DETAILS.
3. INSTALL TYPE 'H', YELLOW RETRO-REFLECTIVE, RAISED PAVEMENT MARKERS ON CURB (4 TOTAL).
4. INSTALL TYPE 'D', YELLOW RETRO-REFLECTIVE, RAISED PAVEMENT MARKERS ON APRON NEXT TO 8" CURB (4 TOTAL).



DETAIL B
RETRO-REFLECTIVE DETAIL



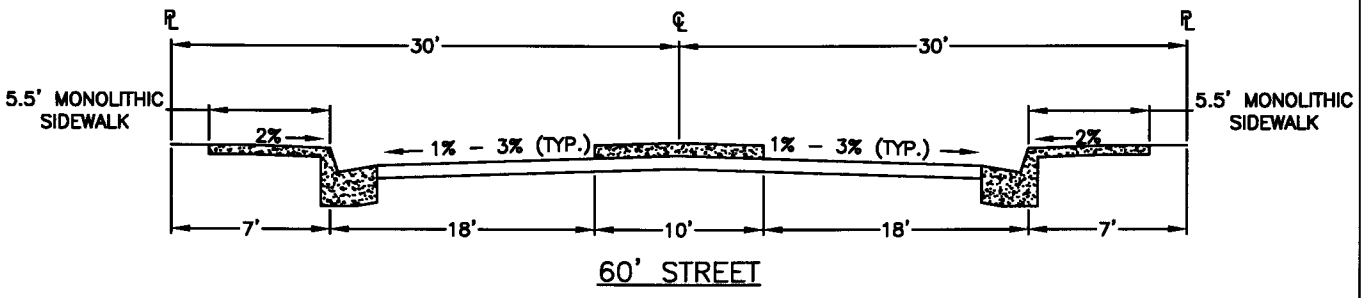
SECTION A-A
CIRCLE CURB DETAIL

RESIDENTIAL TRAFFIC CIRCLE
CASE NO.2

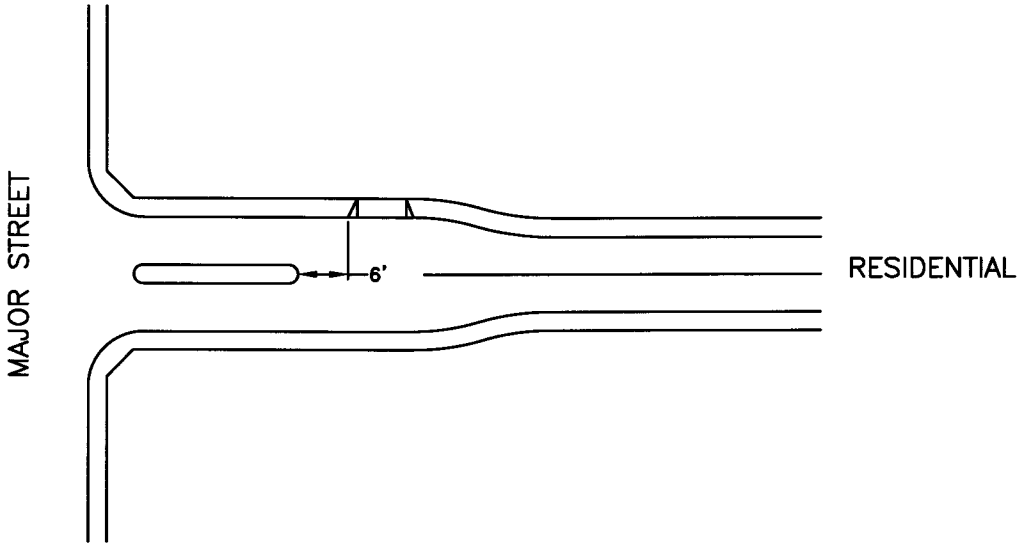
REF. & REV. JUNE 2015

CITY OF FRESNO

P-85



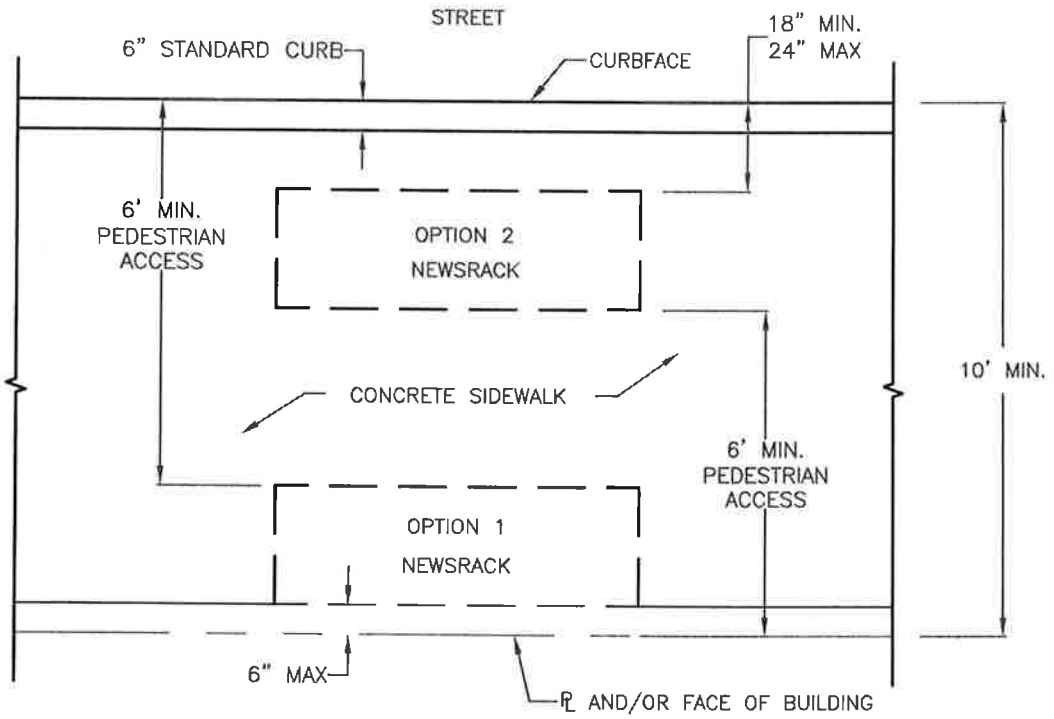
60' STREET



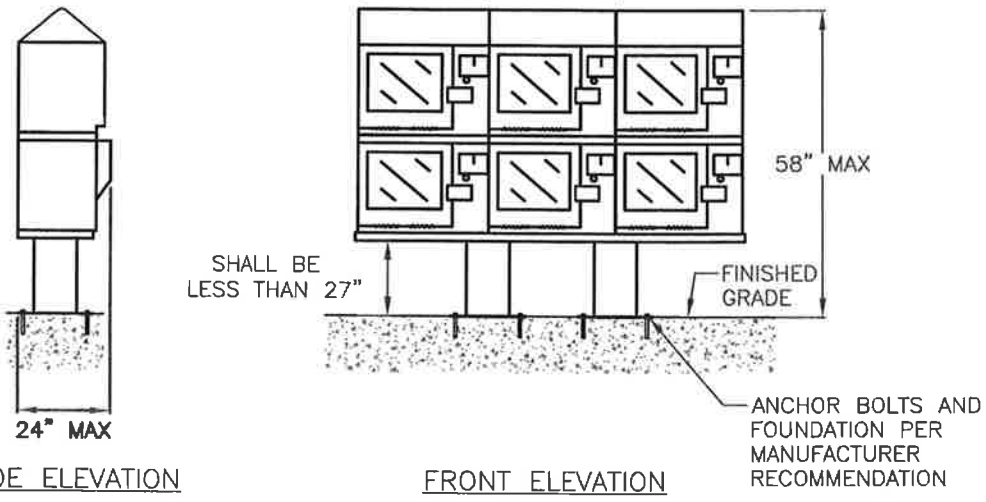
NOTES:

1. GREATER RIGHT-OF-WAY MAY BE APPROVED. IN SUCH CASES, 5' SIDEWALK SHALL BE INSTALLED 6 INCHES FROM PROPERTY LINE (EXCEPTION MAY BE APPROVED FOR A MEANDERING SIDEWALK).
2. USE ALL CONTACT POINTS WITH MAJOR STREETS, EXCEPT WHERE STANDARD CUL-DE-SACS CONTACT MAJOR STREETS, A 50' RIGHT-OF-WAY STANDARD IS ACCEPTABLE. THE MEDIAN ISLAND SHALL EXTEND FROM THE MAJOR STREET UNTILL THE CLOSEST SIDE OF THE OF THE FIRST DRIVEWAY. MAY BE MINIMUM STANDARD WHEN NEEDED FOR TRAFFIC SAFETY. GENERALLY REQUIRED FOR MULTIPLE-FAMILY DEVELOPMENT.
3. A 20' MINIMUM SETBACK FROM BACK OF SIDEWALK TO GARAGE WHEN THE GARAGE DOOR FRONTS ON THE STREET SHALL BE REQUIRED. THE ACTUAL SETBACK WILL DEPEND ON THE DRIVEWAY APPROACH REQUIRED BY P-1. THE SETBACK SHALL NOT BE LESS THAN REQUIRED BY THE ZONING ORDINANCE.
4. ON CORNER LOTS, THE PLANTING AND PUBLIC UTILITY EASEMENT ALONG THE SIDE YARD MAY BE REDUCED TO 8'.

RESIDENTIAL ENTRY TREATMENT	REF. & REV. AUG., 2010	CITY OF FRESNO P-86



PLAN VIEW



SIDE ELEVATION

FRONT ELEVATION

NOTES:

1. REQUIREMENTS FOR NEWSRACKS IN SPECIAL DISTRICTS CAN BE FOUND IN CHAPTER 13 ARTICLE 7 OF THE FRESNO MUNICIPAL CODE.
2. NEWSRACK DIMENSIONS SHALL BE APPROVED BY CITY ENGINEER.
3. NEWSRACK WINDOWS SHALL OPEN TOWARD CENTER OF SIDEWALK.
4. CORNERS SHALL HAVE A MINIMUM RADIUS OF 1/8" PER PROWAG 11B-307.3.1
5. MODULAR NEWSRACK SHALL BE MODEL 100 BY MECHANISM EXCHANGE & REPAIR INC., OR APPROVED EQUAL.
6. NEWSRACK SHALL BE BLACK UNLESS OTHERWISE APPROVED BY CITY ENGINEER.

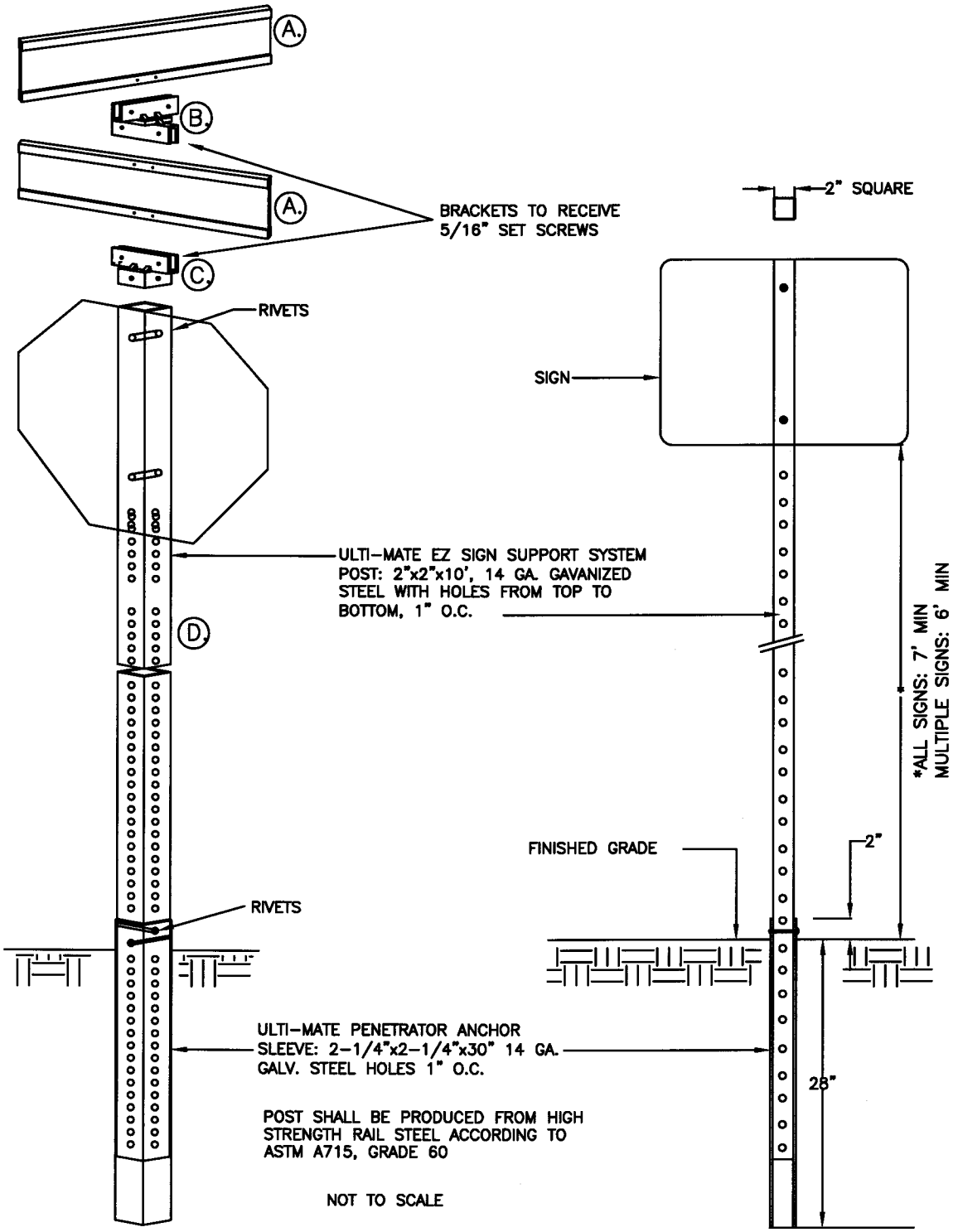
NEWS RACKS IN SPECIAL DISTRICTS	REF. & REV. AUG. 2015	CITY OF FRESNO P-87

(A.) 9"x 30" OR 9"x 36" x 0.100 GAUGE FLAT NON-EXTRUDED SIGN BLADE MADE OF ALUMINUM ALLOY. THEY ARE TO BE SINGLE BLADE DOUBLE FACED FINISH WITH WHITE LETTERS AND BORDER ON A GREEN BACKGROUND USING AVERY DENNISON T6500 HIGH INTENSITY GRADE REFLECTIVE SHEETING. SIGNS TO BE COVERED WITH AVERY DENNISON OL 1000 PREMIUM ANTI-GRAFFITI FILM.

(B.) SIGN-TO-SIGN BRACKET, 850F-90 CROSS PIECE THAT WILL ACCOMODATE THE 0.100 GAUGE SIGN BLADE. BRACKETS TO RECEIVE 5/16" SET SCREWS.

(C.) POST-TO-SIGN BRACKET, 850F- 2"x 2" SQUARE SIGN CAP SLOT TO BE 3-3/4" LONG TO ACCOMODATE THE 0.100 GAUGE SIGN BLADE. BRACKETS TO RECEIVE 5/16" SET SCREWS.

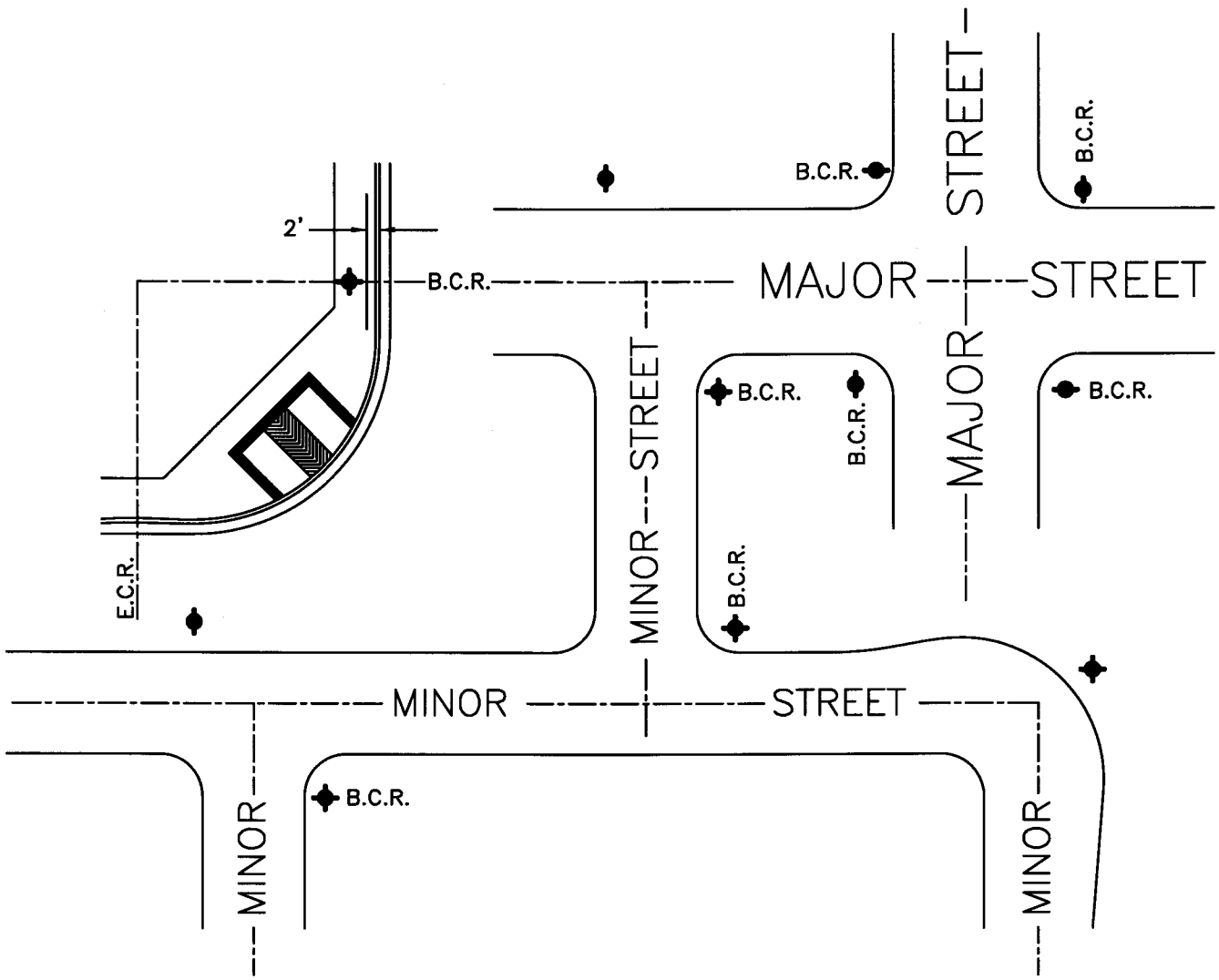
(D.) SIGN POST SYSTEM TO BE THE ULTI-MATE EZ INSTALLATION SIGN POST SYSTEM. USING THE ULTI-MATE 2"x 2"X 10' 14 GA. GALVANIZED STEEL POSTS WITH HOLES DRILLED FROM TOP TO BOTTOM, 1" ON CENTER. ANCHOR THE POLE TO THE GROUND USING A 2-1/4"x 2-1/4"x 24" GALVANIZED STEEL ULTI-MATE PENETRATOR ANCHOR. 5/16" DRIVE RIVETS ARE TO BE USED TO ATTACH THE SIGN POST TO THE ANCHOR.



POST SHALL BE PRODUCED FROM HIGH STRENGTH RAIL STEEL ACCORDING TO ASTM A715, GRADE 60

NOT TO SCALE

SIGN POST DETAIL	REF. & REV. AUG., 2010	CITY OF FRESNO P-88



"T" INTERSECTION "+" INTERSECTION "L" INTERSECTION

LEGEND:

DOUBLE SIGNS WITH OR WITHOUT R-1

SINGLE SIGN WITH OR WITHOUT R-1

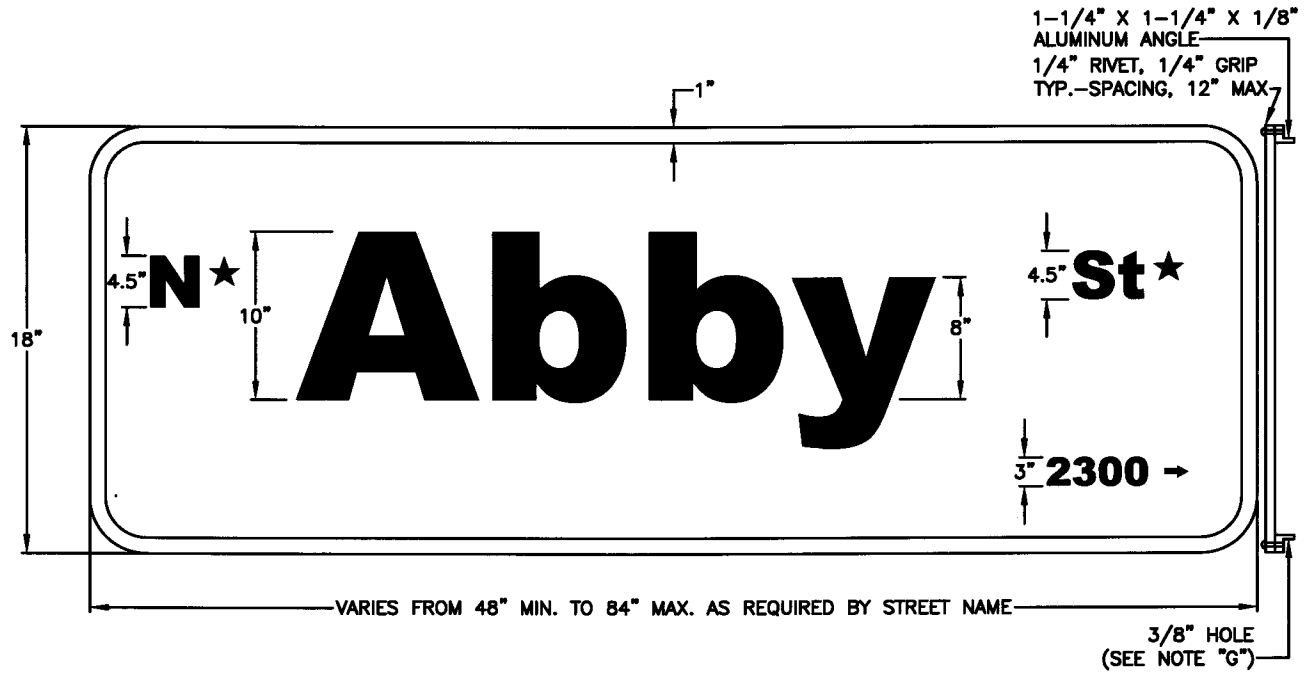
NOTES:

LOCATION OF STREET NAME SIGNS ARE SHOWN IN THEIR APPROXIMATE LOCATIONS. ALTERNATE LOCATIONS TO BE APPROVED BY THE ENGINEER. TYPICAL LOCATIONS: ON B.C.R OF N.E. & S.W. CORNER OF INTERSECTIONS. FOR UNNAMED PRIVATE STREETS, THE WORDS "PRIVATE STREET" SHALL BE 4 1/2" HIGH AND CENTERED WITHIN THE SIGN.

MAJOR STREET = ARTERIALS & COLLECTORS

MINOR STREET = LOCALS

STREET NAME SIGN PLACEMENT	REF. & REV. DEC., 2004	CITY OF FRESNO P-89

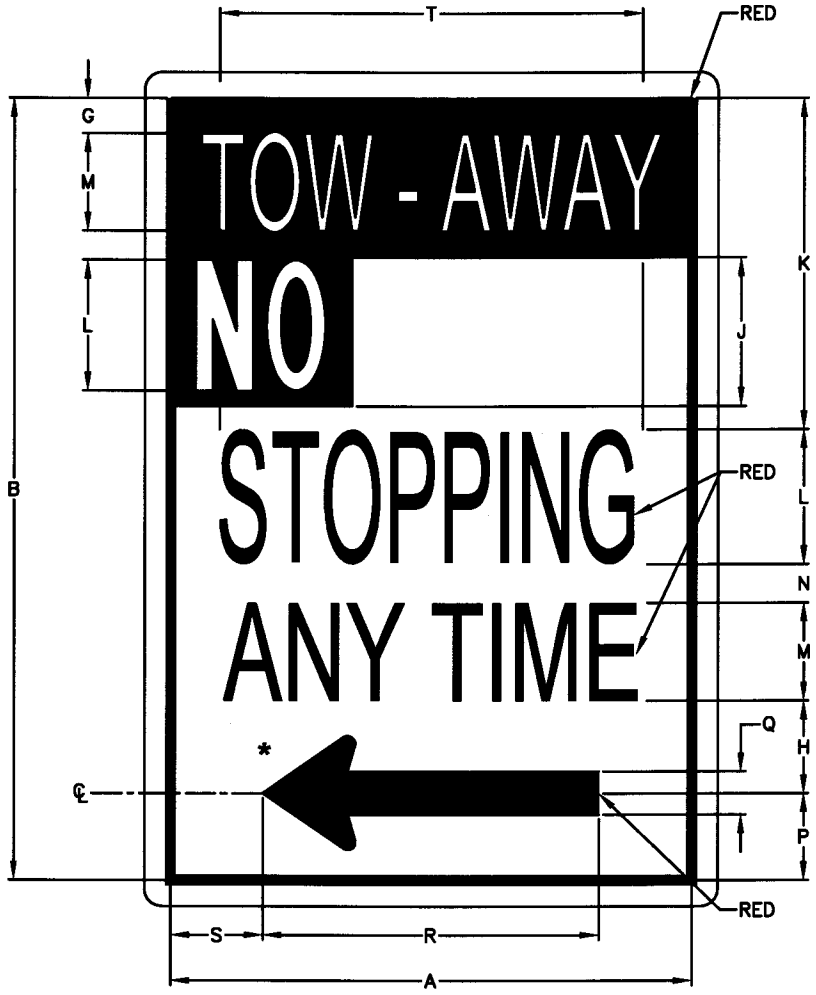


NOTES:

1. 0.080 ALUMINUM PLATE
2. 1" WHITE BOARDER
3. 10" SERIES 'E' MODIFIED UPPER CASE LETTER – 2" STROKE MINIMUM. ON LONGER STREET NAME SIGNS A NARROWER SERIES IS PERMITTED.
4. 8" SERIES 'E' MODIFIED LOWER CASE LETTERS, – 2" STROKE MINIMUM. ON LONGER STREET NAME SIGNS, A NARROWER SERIES IS PERMITTED.
4. ALL LETTERS, NUMBERS, BORDERS AND SHEETING SHALL BE MADE OF 3M-3930HIP TYPE III & IV SERIES REFLECTIVE SHEETING AND BE COVERED WITH 1160A PREMIUM OVERLAY ANTI-GRAFFITI FILM OR AVERY DENNISON T6500 SERIES REFLECTIVE SHEETING AND SHALL BE COVERED WITH AVERY DENNISON OL1000 ANTI-GRAFFITI OVERLAY FILM.
5. ENTIRE SIGN SHALL BE SILK SCREENED – DIE CUT LETTERS AND NUMBERS WILL NOT BE ALLOWED.
6. DRILL TWO 3/8" HOLES ⊙ 4-7/8" O.C., IN THE CENTER OF THE ANGLES STIFFENERS RIVETED TO THE BACK OF THE SIGN, FOR ZUMAR BRACKET.

★ EXACT DESIGNATION SUCH AS STREET, AVENUE, BOULEVARD, LANE, CIRCLE, COURT, DRIVE, PARKWAY, PLACE, ROAD, TERRACE, TRAIL, NORTH, SOUTH, EAST, WEST ETC. WILL BE NOTED ON THE STREET NAME LIST WITH EACH OTHER.

OVERSIZED STREET NAME SIGN	REF. & REV. AUG., 2010	CITY OF FRESNO P-90

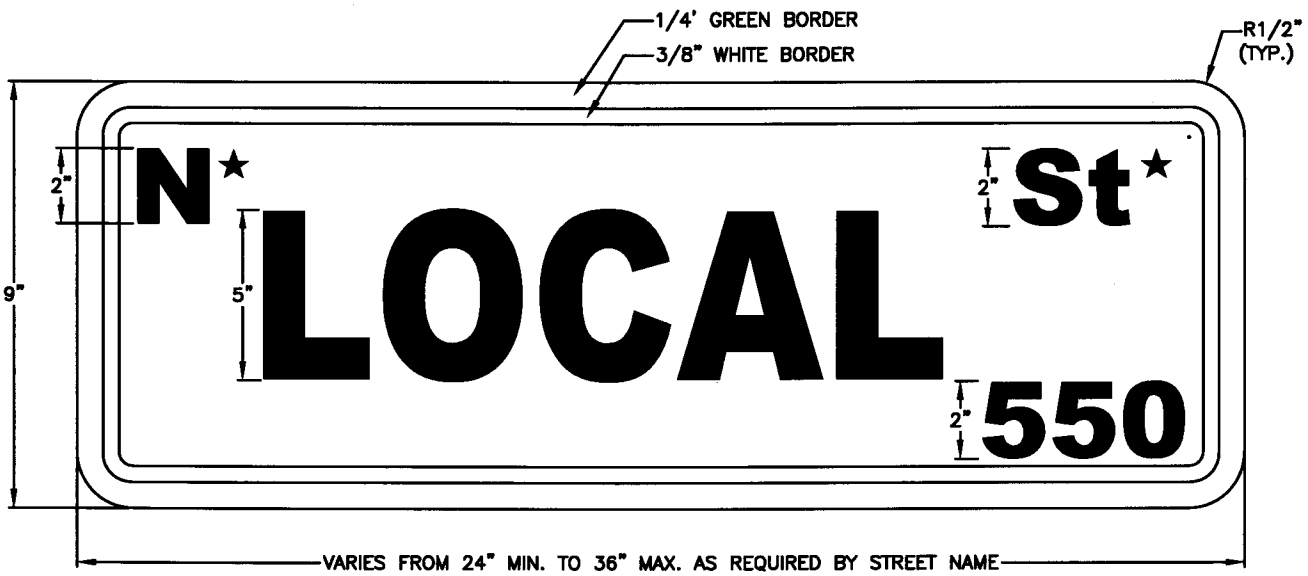


DIMENSIONS (INCHES)																		
SIGN	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
MINIMUM	12	18	1/4	1/4	7/8	3 1/2	4/5	2 5/8	2 1/4	7 5/8	3	2 1/4	2	2	3/4	7 3/4	2 1/8	9 1/2

NOTE:
ALL LETTERS, NUMBERS, BORDERS AND SHEETING SHALL BE MADE OF 3M–3930HIP TYPE III & IV SERIES REFLECTIVE SHEETING AND BE COVERED WITH 1160A PREMIUM OVERLAY ANTI–GRAFFITI FILM OR AVERY DENNISON T6500 SERIES REFLECTIVE SHEETING AND SHALL BE COVERED WITH AVERY DENNISON OL1000 ANTI–GRAFFITI OVERLAY FILM.

* INDICATES DIRECTION OF STOPPING RESTRICTION CAN BE LEFT (←), RIGHT (→) OR DOUBLE (↔)

NO STOPPING ANY TIME SIGN	REF. & REV. AUG., 2010	CITY OF FRESNO P–91



NOTES:

1. ALUMINUM SIGNS SHALL BE SINGLE BLADE DOUBLE SIDED AND SHALL BE MADE OF 0.100 THICKNESS ALUMINUM WITH AN ALLOY HARDNESS OF 5052–H38. THEY SHALL BE 24"x 9", 30"x 9" OR 36"x 9" TO ACCOMMODATE THE STREET NAME.

2. COLORS SHALL BE WHITE LETTERS ON A GREEN BACKGROUND UNLESS OTHERWISE SPECIFIED.

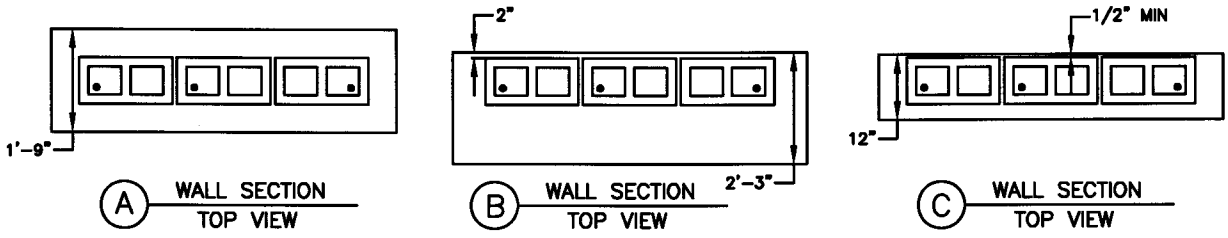
3. LETTERS ON STREET NAME SHALL BE A SERIES B, 5" UPPER CASE. THE SECONDARY DIRECTIONAL INDICATOR, STREET TYPE (AVE., BLVD. ETC) AND BLOCK NUMBERS SHALL BE 2" UPPER CASE. SIGN SHALL HAVE A 1/2" RADIUS CORNER WITH A 1/4" OUTSIDE GREEN BORDER AND A 3/8" INSIDE BORDER.

4. ALL LETTERS, NUMBERS, BORDERS AND SHEETING SHALL BE MADE OF 3M–3930HIP TYPE III & IV SERIES REFLECTIVE SHEETING AND BE COVERED WITH 1160A PREMIUM OVERLAY ANTI–GRAFFITI FILM OR AVERY DENNISON T6500 SERIES REFLECTIVE SHEETING AND SHALL BE COVERED WITH AVERY DENNISON OL1000 ANTI–GRAFFITI OVERLAY FILM.

5. SIGNS MAY BE FABRICATED BY MEANS OF SILK SCREENING USING GRAFFITI INKS, BY THE DIE CUT LETTERS OR BY USING AVERY DENNISON TRANSLUCENT OR TRANSPARENT OVERLAY SHEETING ON TOP OF THE T6500 REFLECTIVE SIGN SHEETING.

★ EXACT DESIGNATION SUCH AS STREET, AVENUE, BOULEVARD, LANE, CIRCLE, COURT, DRIVE, PARKWAY, PLACE, ROAD, TERRACE, TRAIL, NORTH, SOUTH, EAST, WEST ETC. WILL BE NOTED ON THE STREET NAME LIST WITH EACH OTHER.

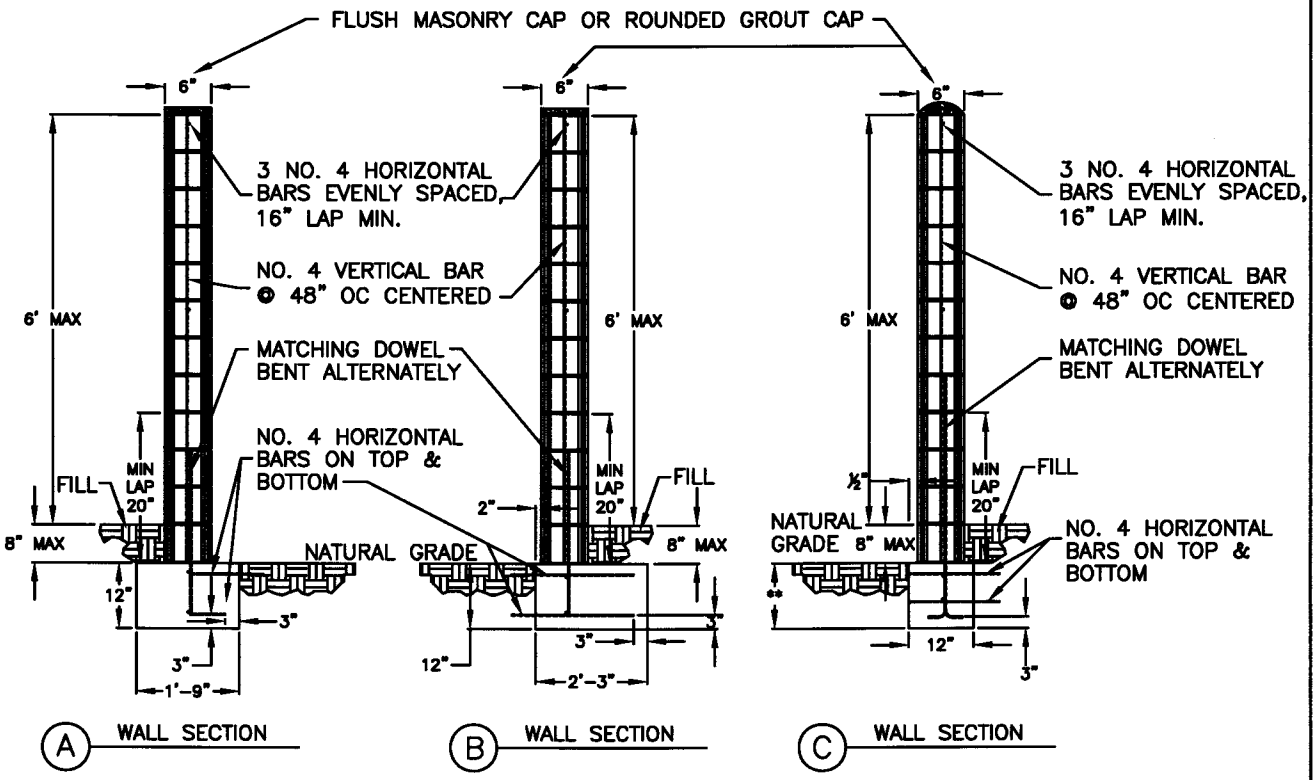
LOCAL STREET NAME SIGN	REF. & REV. AUG., 2010	CITY OF FRESNO P–92



(A) WALL SECTION TOP VIEW

(B) WALL SECTION TOP VIEW

(C) WALL SECTION TOP VIEW



(A) WALL SECTION

(B) WALL SECTION

(C) WALL SECTION

** 3'-2" MIN. AT LANDSCAPED AREA
2'-2" MIN. AT AREA W/PAVEMENT EACH SIDE

GENERAL NOTES AND SPECIFICATIONS:

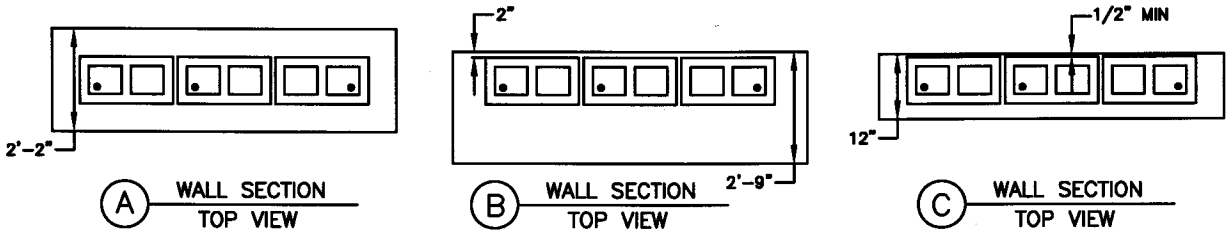
1. ALL CONSTRUCTION SHALL COMPLY WITH THE FRESNO MUNICIPAL CODE.
2. GROUT ALL CELLS CONTAINING REINFORCING STEEL.
3. ALL MASONRY UNITS SHALL COMPLY WITH THE LATEST ADOPTED CALIFORNIA BUILDING CODE.
4. DEPTH OF FOOTINGS ARE INTO NATURAL UNDISTURBED SOIL OR TESTED AND APPROVED COMPACTED FILL.
5. ALL MASONRY UNITS SHALL BE MINIMUM F'm = 1500 PSI.
6. REINFORCING BARS SHALL BE DEFORMED BARS MINIMUM GRADE 40.
7. FOOTING CONCRETE SHALL BE A MINIMUM 2000 PSI AT 28 DAYS.
8. ALL CELLS SHALL BE GROUTED SOLID ON CITY OWNED WALLS.
9. MORTAR SHALL BE TYPE-S (MINIMUM 1800 PSI AT 28 DAYS):
   ONE(1) PART CEMENT , TYPE-1
   ONE-HALF (1/2) PART LIME PUTTY OR HYDRATED LIME
   FOUR AND ONE-HALF (4 1/2) PARTS SAND (MAXIMUM)
10. GROUT SHALL BE A MINIMUM 2000 PSI AT 28 DAYS:
    ONE (1) PART CEMENT
    THREE (3) PARTS SAND
    TWO (2) PARTS PEA GRAVEL.
11. PLEASE CONTACT THE DEVELOPMENT DEPARTMENT ENGINEERING DIVISION REGARDING THE APPLICABILITY AND USE OF THIS STANDARD AND ISSUANCE OF REQUIRED PERMITS.

6" CONCRETE MASONRY WALL
WITH OR WITHOUT 8" SOIL RETENTION

REF. & REV. SEPTEMBER 2011

CITY OF FRESNO

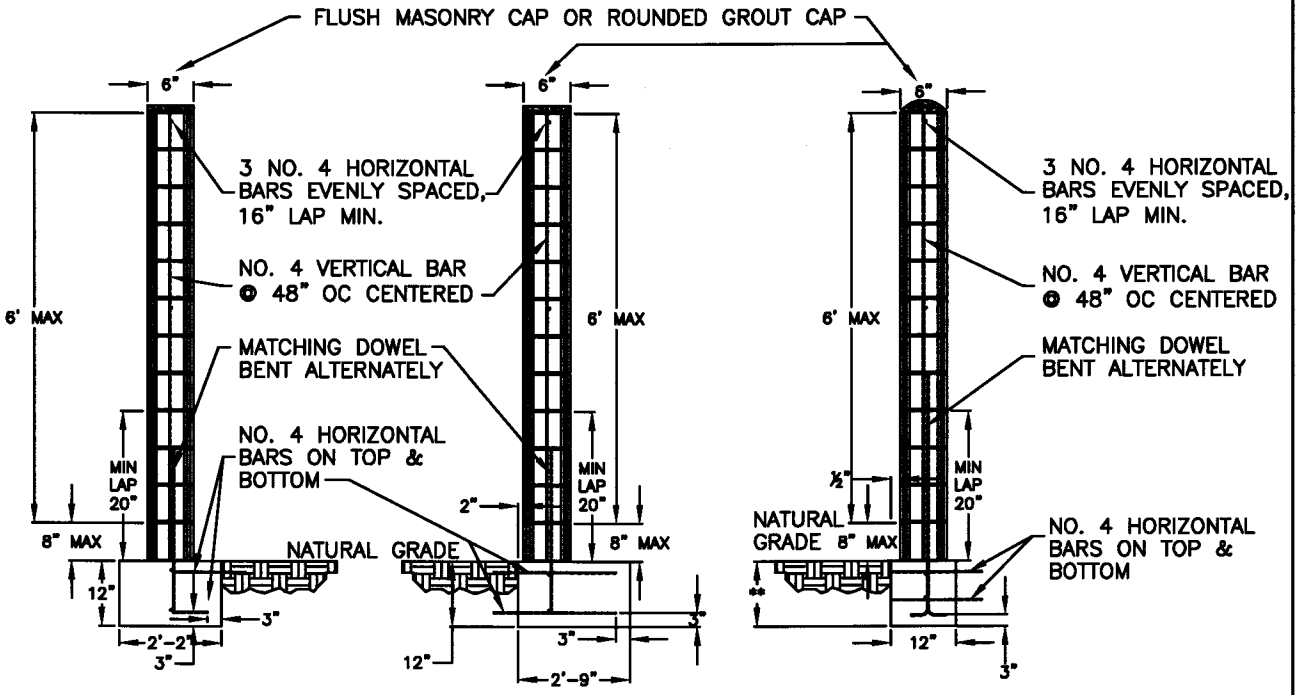
P-93



(A) WALL SECTION TOP VIEW

(B) WALL SECTION TOP VIEW

(C) WALL SECTION TOP VIEW



(A) WALL SECTION

(B) WALL SECTION

(C) WALL SECTION

** 3'-2" MIN. AT LANDSCAPED AREA
2'-2" MIN. AT AREA W/PAVEMENT EACH SIDE

GENERAL NOTES AND SPECIFICATIONS:

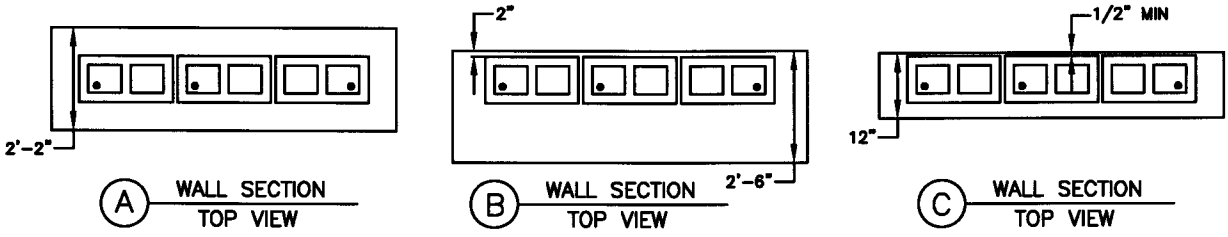
1. ALL CONSTRUCTION SHALL COMPLY WITH THE FRESNO MUNICIPAL CODE.
2. GROUT ALL CELLS CONTAINING REINFORCING STEEL.
3. ALL MASONRY UNITS SHALL COMPLY WITH THE LATEST ADOPTED CALIFORNIA BUILDING CODE.
4. DEPTH OF FOOTINGS ARE INTO NATURAL UNDISTURBED SOIL OR TESTED AND APPROVED COMPACTED FILL.
5. ALL MASONRY UNITS SHALL BE MINIMUM F'm = 1500 PSI.
6. REINFORCING BARS SHALL BE DEFORMED BARS MINIMUM GRADE 40.
7. FOOTING CONCRETE SHALL BE A MINIMUM 2000 PSI AT 28 DAYS.
8. ALL CELLS SHALL BE GROUTED SOLID ON CITY OWNED WALLS.
9. MORTAR SHALL BE TYPE-S (MINIMUM 1800 PSI AT 28 DAYS):
   ONE(1) PART CEMENT , TYPE-1
   ONE-HALF (1/2) PART LIME PUTTY OR HYDRATED LIME
   FOUR AND ONE-HALF (4 1/2) PARTS SAND (MAXIMUM)
10. GROUT SHALL BE A MINIMUM 2000 PSI AT 28 DAYS:
    ONE (1) PART CEMENT
    THREE (3) PARTS SAND
    TWO (2) PARTS PEA GRAVEL.
11. PLEASE CONTACT THE DEVELOPMENT DEPARTMENT ENGINEERING DIVISION REGARDING THE APPLICABILITY AND USE OF THIS STANDARD AND ISSUANCE OF REQUIRED PERMITS.

6" CONCRETE MASONRY WALL
WITHOUT SOIL RETENTION

REF. & REV. SEPTEMBER 2011

CITY OF FRESNO

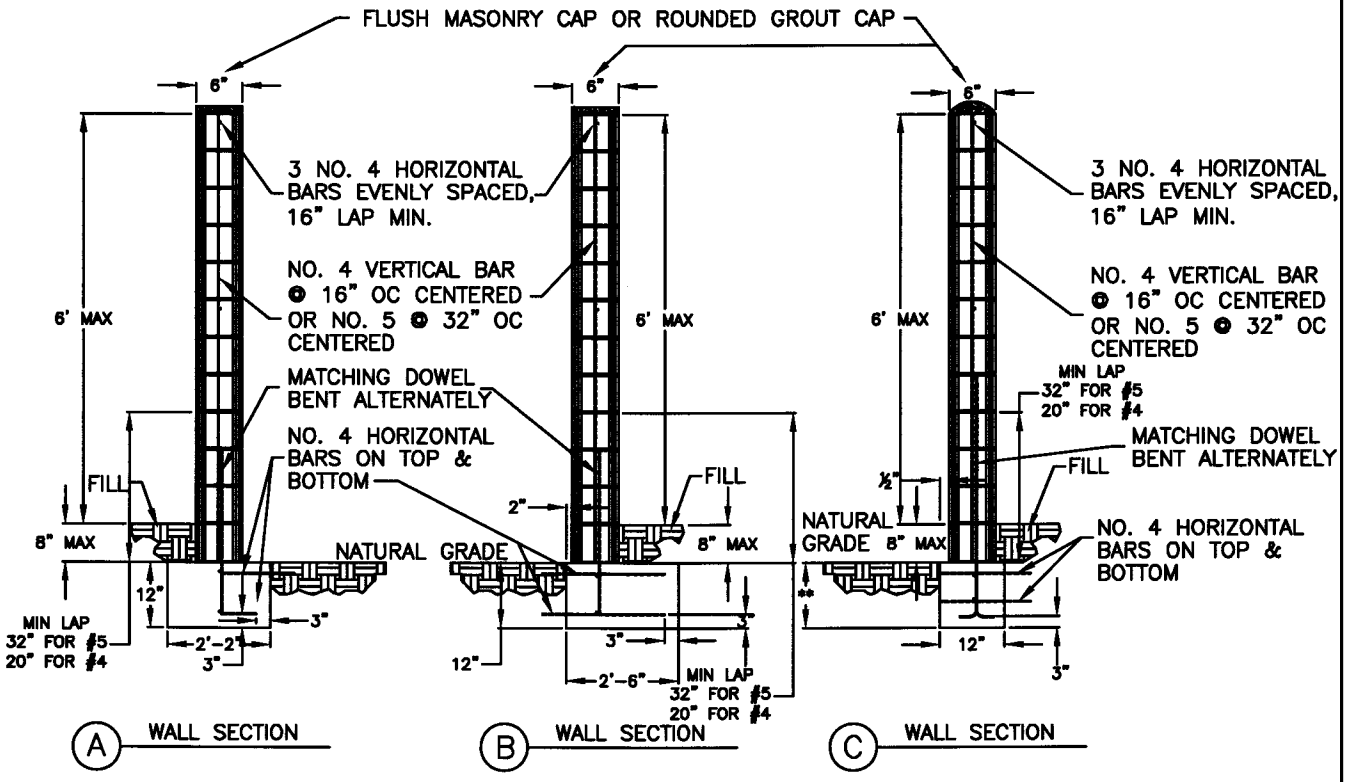
P-94



(A) WALL SECTION TOP VIEW

(B) WALL SECTION TOP VIEW

(C) WALL SECTION TOP VIEW



(A) WALL SECTION

(B) WALL SECTION

(C) WALL SECTION

** 3'-3" MIN. AT LANDSCAPED AREA
2'-3" MIN. AT AREA W/PAVEMENT EACH SIDE

GENERAL NOTES AND SPECIFICATIONS:

1. ALL CONSTRUCTION SHALL COMPLY WITH THE FRESNO MUNICIPAL CODE.
2. GROUT ALL CELLS CONTAINING REINFORCING STEEL.
3. ALL MASONRY UNITS SHALL COMPLY WITH THE LATEST ADOPTED CALIFORNIA BUILDING CODE.
4. DEPTH OF FOOTINGS ARE INTO NATURAL UNDISTURBED SOIL OR TESTED AND APPROVED COMPACTED FILL.
5. ALL MASONRY UNITS SHALL BE MINIMUM F'm = 1500 PSI.
6. REINFORCING BARS SHALL BE DEFORMED BARS MINIMUM GRADE 40.
7. FOOTING CONCRETE SHALL BE A MINIMUM 2000 PSI AT 28 DAYS.
8. ALL CELLS SHALL BE GROUTED SOLID ON CITY OWNED WALLS.
9. MORTAR SHALL BE TYPE-S (MINIMUM 1800 PSI AT 28 DAYS):
   ONE(1) PART CEMENT , TYPE-1
   ONE-HALF (1/2) PART LIME PUTTY OR HYDRATED LIME
   FOUR AND ONE-HALF (4 1/2) PARTS SAND (MAXIMUM)
10. GROUT SHALL BE A MINIMUM 2000 PSI AT 28 DAYS:
    ONE (1) PART CEMENT
    THREE (3) PARTS SAND
    TWO (2) PARTS PEA GRAVEL.
11. PLEASE CONTACT THE DEVELOPMENT DEPARTMENT ENGINEERING DIVISION REGARDING THE APPLICABILITY AND USE OF THIS STANDARD AND ISSUANCE OF REQUIRED PERMITS.

6" CONCRETE MASONRY WALL
WITH 8" MAX SOIL RETENTION

REF. & REV. SEPTEMBER 2011

CITY OF FRESNO

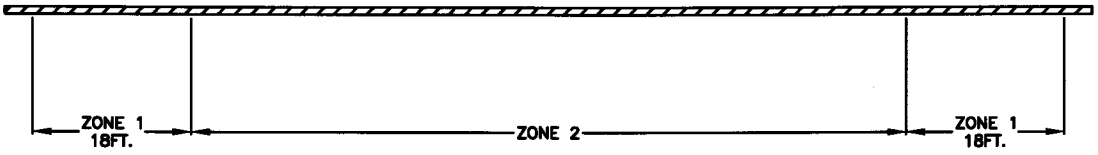
P-95

STANDARD DETAILS FOR 6'–0" CONCRETE MASONRY FENCE:
P–93, P–94, P–95

EXPOSURE B: URBAN AND SUBURBAN AREAS, WOODED AREAS OR OTHER TERRAIN WITH NUMEROUS CLOSELY SPACED OBSTRUCTIONS HAVING THE SIZE OF SINGLE FAMILY DWELLING OR LARGER WITHIN 1500FT.

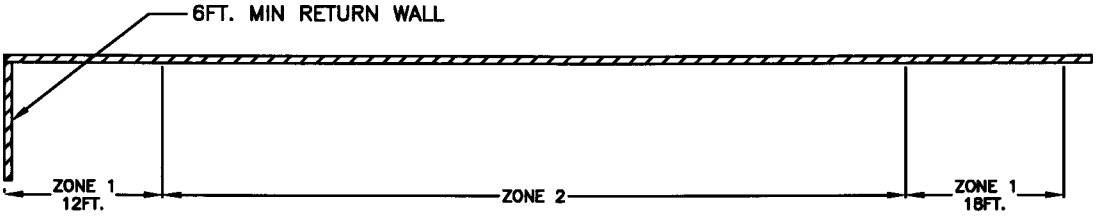
USE WALL TYPE P–93 FOR FULL LENGTH OF WALL

EXPOSURE C: OPEN TERRAIN WITHIN 1500FT.



6 INCHES THICK BY 6 FEET HIGH MASONRY FENCE WITHOUT RETURN WALL

WALL LENGTH FEET / ZONE	0–20	21–60	OVER 60
	WALL AND FOOTING TYPE		
FULL LENGTH OF FENCE	P–93	P–94,95	
ZONE 1			P–94,95
ZONE 2			P–93



6 INCHES THICK BY 6 FEET HIGH MASONRY FENCE WITH RETURN WALL

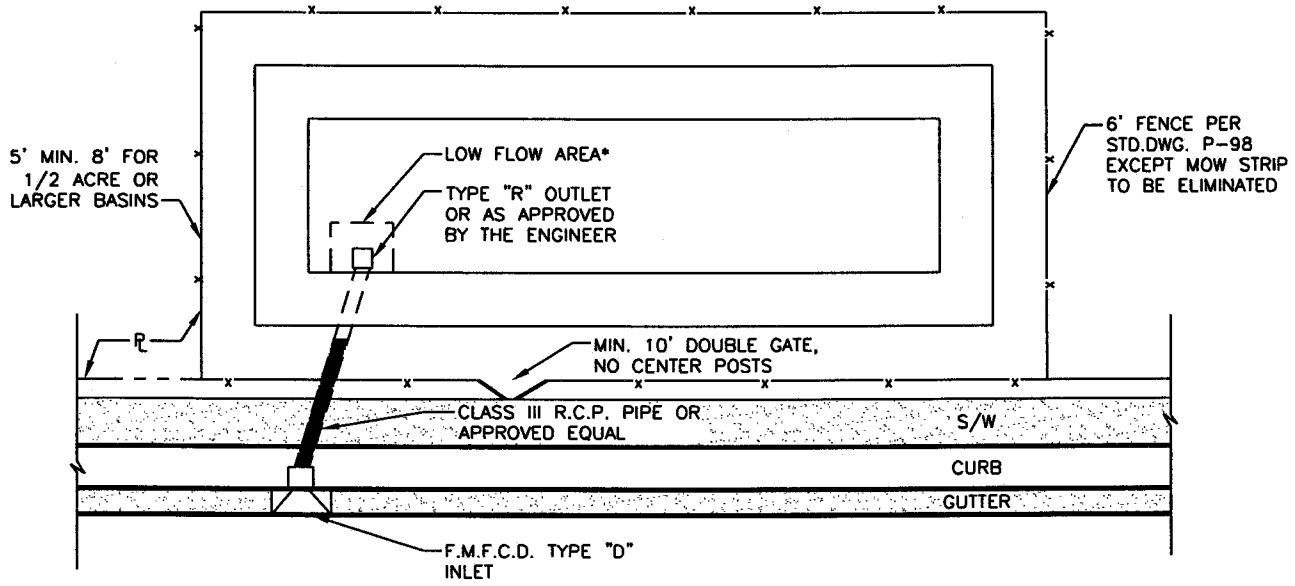
WALL LENGTH FEET / ZONE	0–20	21–60	OVER 60
	WALL AND FOOTING TYPE		
FULL LENGTH OF FENCE	P–93	P–94,95	
ZONE 1			P–94,95
ZONE 2			P–93

6" CONCRETE MASONRY WALL STANDARD DETAILS

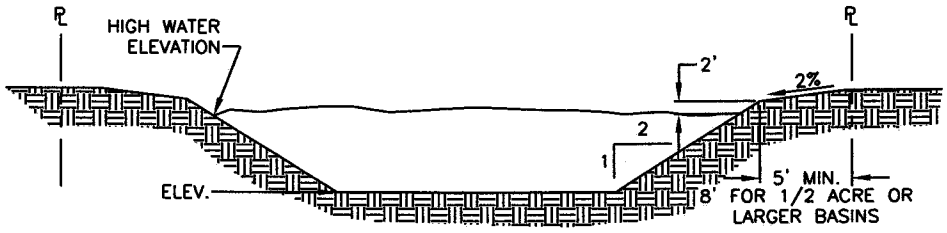
REF. & REV.
SEPTEMBER
2011

CITY OF FRESNO

P–96



PLAN VIEW OF TYPICAL TEMPORARY PONDING BASIN



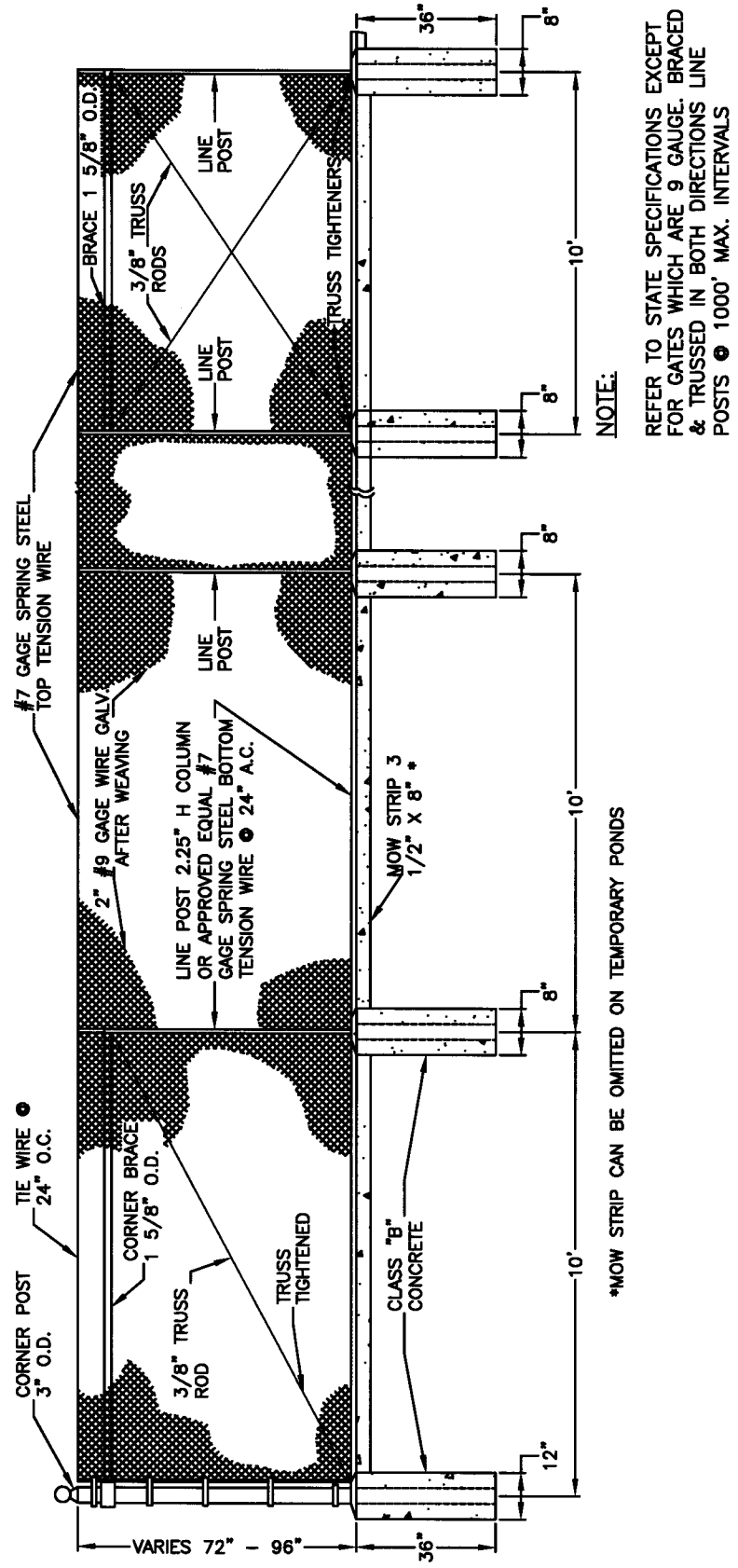
SECTION

NOTES: DESIGN MINIMUMS

1. OVERFLOW MUST BE TO THE STREET.
2. DESIGN WATER SURFACE ELEVATION SHALL BE TWO FEET BELOW THE LOWEST INLET FLOW LINE OR POND PERIPHERAL ELEVATION, WHICHEVER IS LOWER.
3. REQUIRED CAPACITY: V=CIA WHERE V=REQUIRED BASIN CAPACITY IN CUBIC FEET, C=RUNOFF COEFFICIENT, I=RAINFALL FROM A DESIGN STORM (0.35 FEET), AND A=TRIBUTARY AREA IN SQUARE FEET.
4. PROVIDE COMPOSITE "C" CALCULATIONS.
5. THE ENGINEER MAY REQUIRE AN 8' WIDE VEHICLE RAMP WITH A MAX. SLOPE OF 15% IN ½ ACRE OR LARGER BASINS.
6. TEMPORARY PONDING BASINS SHALL BE FENCED WITHIN 7 DAYS TIME AFTER THEY BECOME OPERATIONAL OR WHEN REQUIRED BY THE ENGINEER.
7. THE CITY ENGINEER MAY CONSIDER OTHER BASIN DESIGN ALTERNATIVES, AS A SUBSTITUTE FOR PROVIDING THE 2 FOOT FREEBOARD, WHEN THE BASIN SIZE IMPACTS PROJECT FEASIBILITY.
8. LOCKS FOR THE GATE TO BE #5 MASTER LOCKS, NO. 1C95, 3203 OR 0855.

- SIZE AND DEPTH OF LOW FLOW AREA TO BE DETERMINED BY THE ENGINEER.

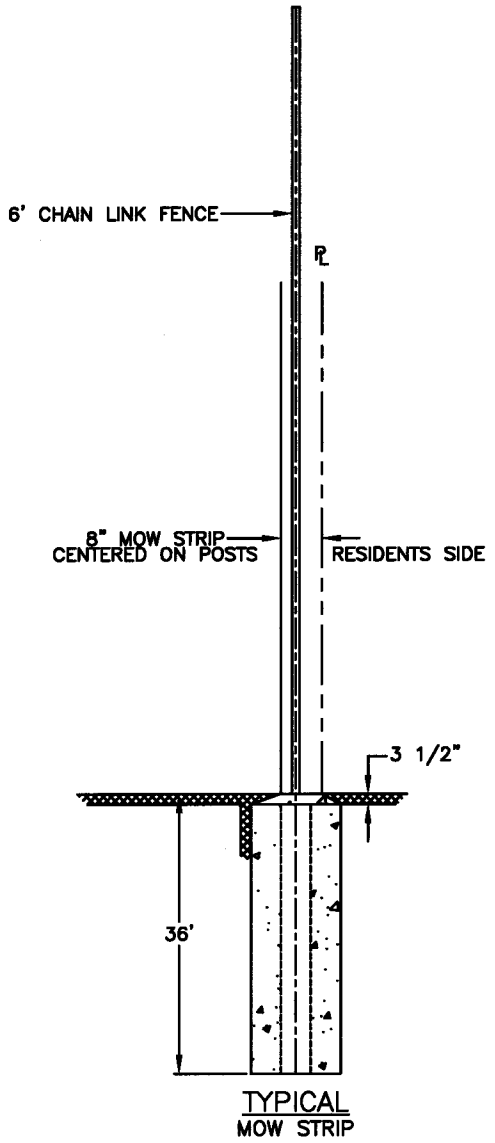
TEMPORARY PONDING BASIN	REF. & REV. JUNE 2015	CITY OF FRESNO P-97



NOTE:

REFER TO STATE SPECIFICATIONS EXCEPT FOR GATES WHICH ARE 9 GAUGE. BRACED & TRUSSED IN BOTH DIRECTIONS LINE POSTS @ 1000' MAX. INTERVALS

*MOW STRIP CAN BE OMITTED ON TEMPORARY PONDS



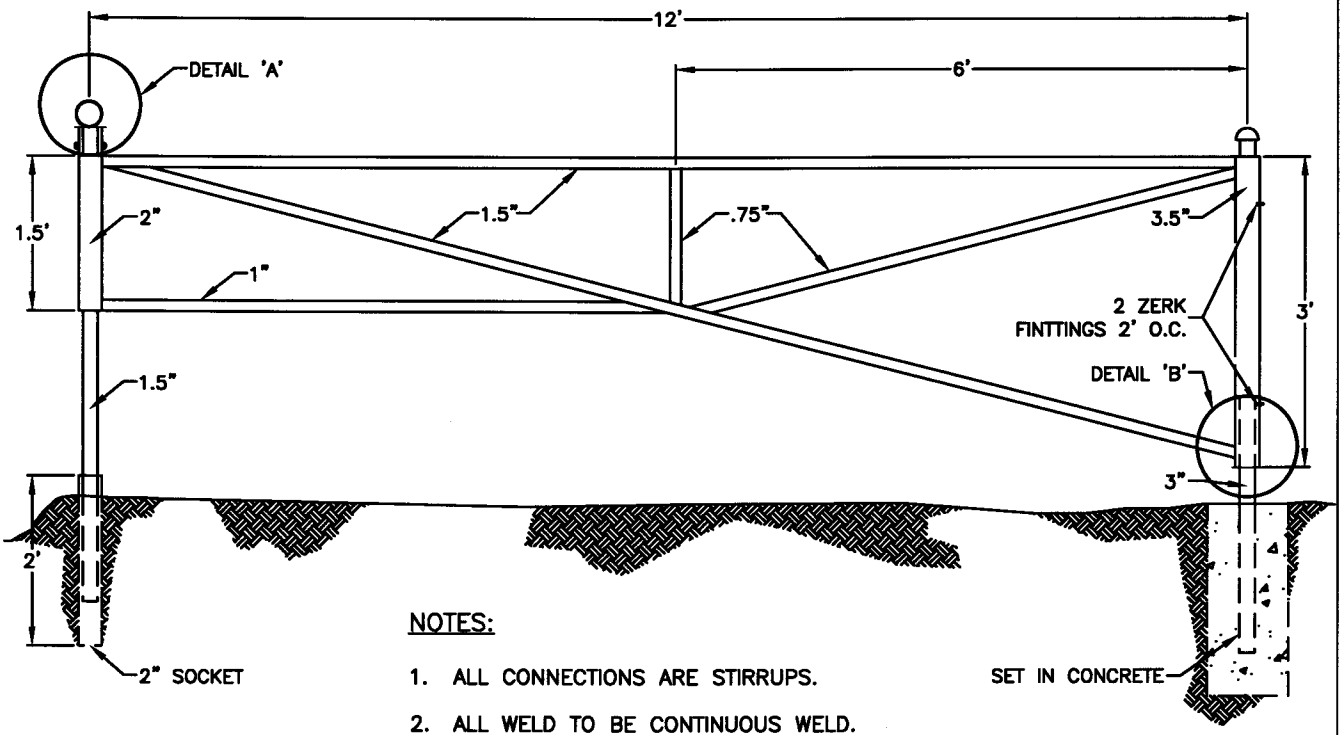
TYPICAL
MOW STRIP

CHAIN LINK FENCE CONSTRUCTION DETAILS

REF. & REV.
AUG., 2010

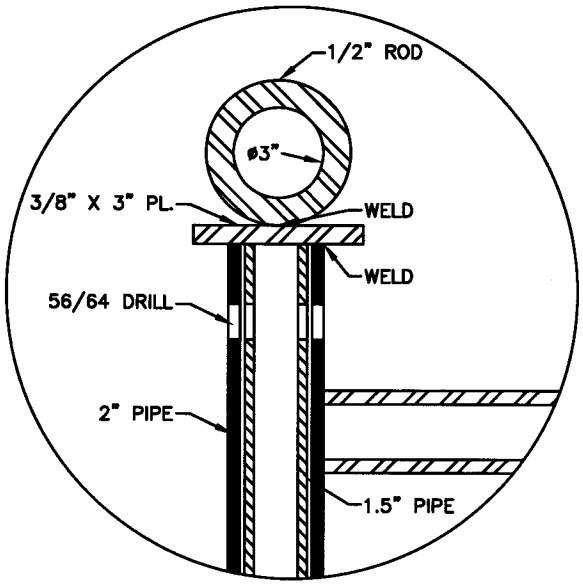
CITY OF FRESNO

P-98

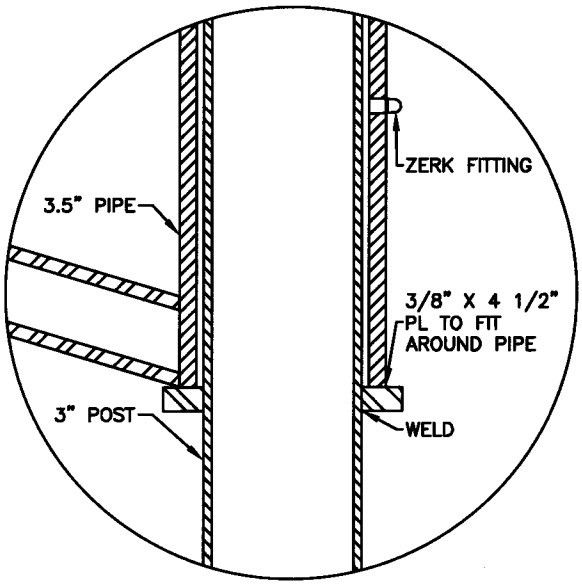


NOTES:

1. ALL CONNECTIONS ARE STIRRUPS.
2. ALL WELD TO BE CONTINUOUS WELD.



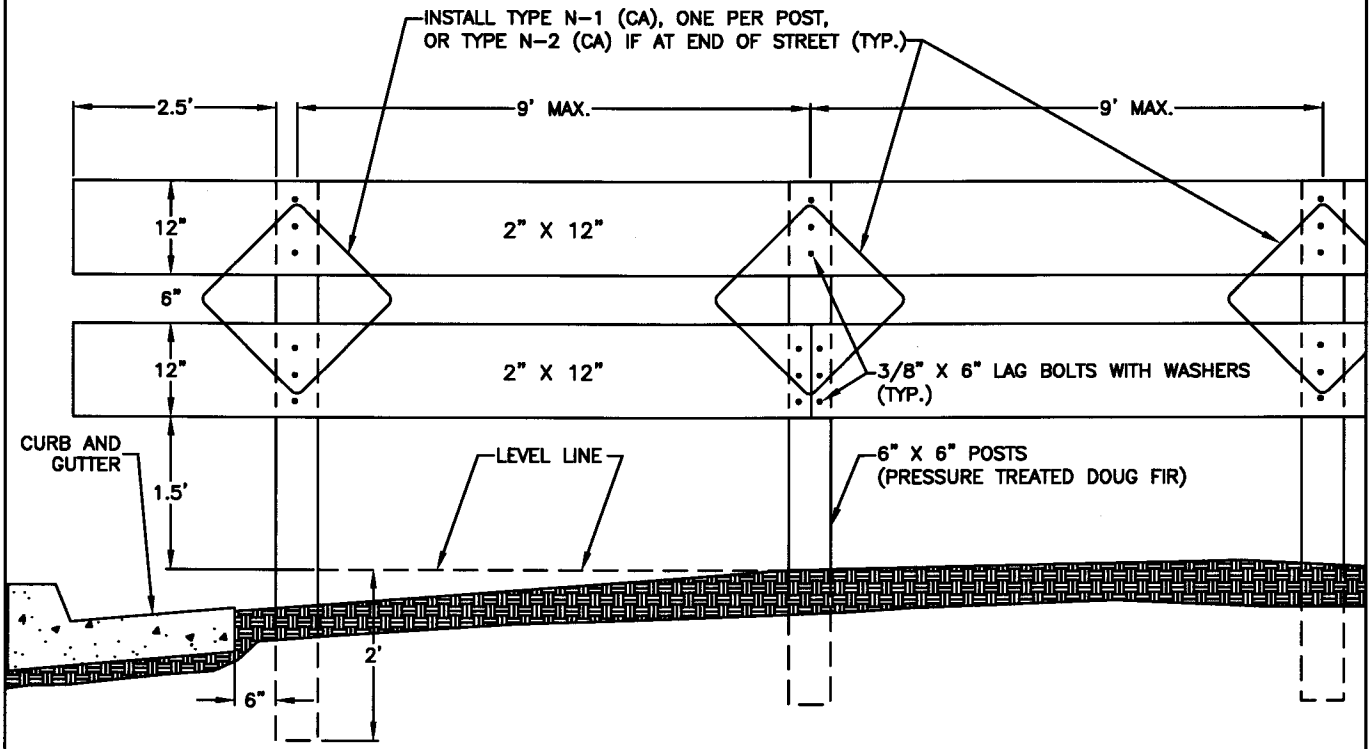
DETAIL 'A'
NOT TO SCALE



DETAIL 'B'
NOT TO SCALE

ACCESS RAMP GATE	REF. & REV. AUG., 2010	CITY OF FRESNO P-99

PAINT: TWO COATS OF EXTERIOR GRADE WHITE PAINT SHALL BE APPLIED TO ALL WOOD SURFACES.



TEMPORARY TIMBER BARRICADE

NOTES:

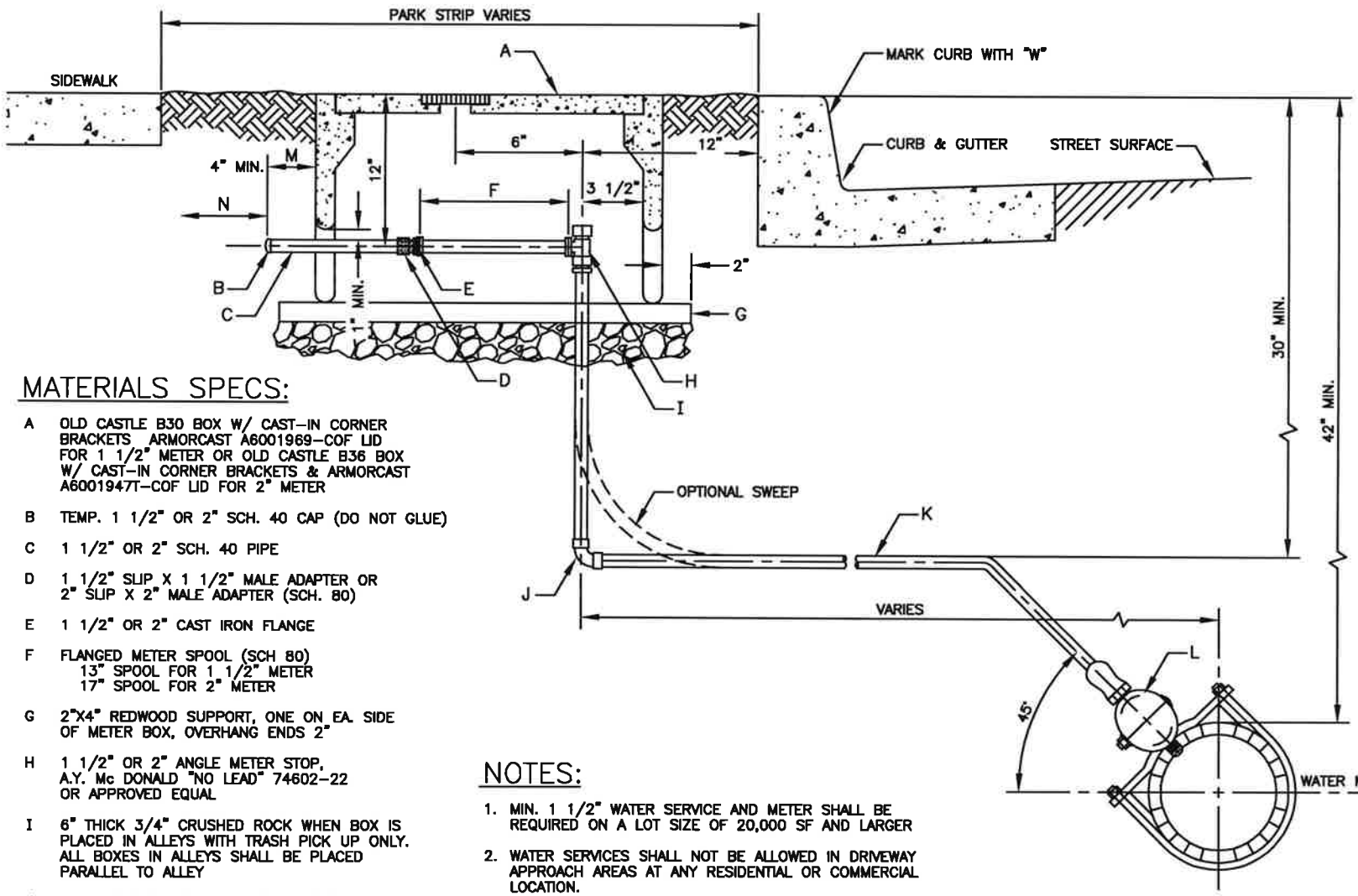
1. BARRICADE MUST BE FULL WIDTH BETWEEN FACES OF CURBS.
2. APPROPRIATE SIGNS AND REFLECTORS TO BE DESIGNATED BY THE DEPT. OF PUBLIC WORKS.
3. BARRICADE TO BE LOCATED INSIDE OF STREET R/W ± 1'.
4. BARRICADE TO BE INSTALLED WITHIN SEVEN DAYS OF COMPLETION OF STREET CONSTRUCTION.

TEMPORARY TIMBER BARRICADE	REF. & REV. NOVEMBER 2011	CITY OF FRESNO P-100

1 1/2" & 2" SERVICE CONNECTION & METER BOX INSTALLATION

REF & REV
JUNE 2011

CITY OF FRESNO
W—1



MATERIALS SPECS:

A OLD CASTLE B30 BOX W/ CAST-IN CORNER BRACKETS ARMORCAST A6001969-COF LID FOR 1 1/2" METER OR OLD CASTLE B36 BOX W/ CAST-IN CORNER BRACKETS & ARMORCAST A6001947T-COF LID FOR 2" METER

B TEMP. 1 1/2" OR 2" SCH. 40 CAP (DO NOT GLUE)

C 1 1/2" OR 2" SCH. 40 PIPE

D 1 1/2" SLIP X 1 1/2" MALE ADAPTER OR 2" SLIP X 2" MALE ADAPTER (SCH. 80)

E 1 1/2" OR 2" CAST IRON FLANGE

F FLANGED METER SPOOL (SCH 80)
13" SPOOL FOR 1 1/2" METER
17" SPOOL FOR 2" METER

G 2"X4" REDWOOD SUPPORT, ONE ON EA. SIDE OF METER BOX, OVERHANG ENDS 2"

H 1 1/2" OR 2" ANGLE METER STOP, A.Y. Mc DONALD "NO LEAD" 74602-22 OR APPROVED EQUAL

I 6" THICK 3/4" CRUSHED ROCK WHEN BOX IS PLACED IN ALLEYS WITH TRASH PICK UP ONLY. ALL BOXES IN ALLEYS SHALL BE PLACED PARALLEL TO ALLEY

J COMP X COMP 90° ELL, A.Y. McDONALD OR APPROVED EQUAL "NO LEAD" 74761-22

K TYPE "K" SOFT DRAWN COPPER TUBING OR POLYETHYLENE CTS SDR-9 PE 3408

L 1 1/2" OR 2" CORPORATION STOP, A.Y. Mc DONALD "NO LEAD" 74701-22 OR APPROVED EQUAL

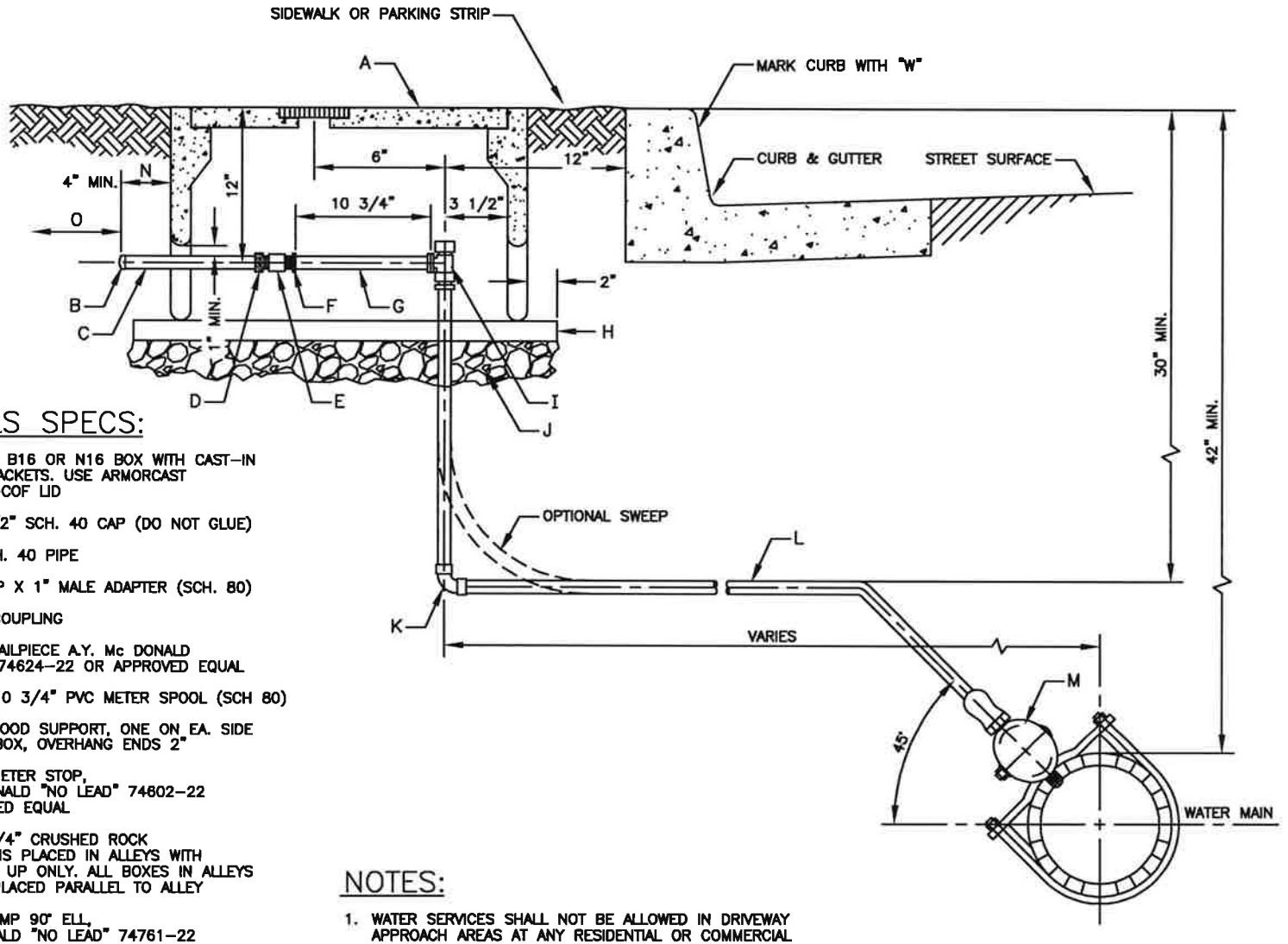
M WATER DIVISION RESPONSIBILITY

N CUSTOMER RESPONSIBILITY

NOTES:

1. MIN. 1 1/2" WATER SERVICE AND METER SHALL BE REQUIRED ON A LOT SIZE OF 20,000 SF AND LARGER
2. WATER SERVICES SHALL NOT BE ALLOWED IN DRIVEWAY APPROACH AREAS AT ANY RESIDENTIAL OR COMMERCIAL LOCATION.
3. ALL COPPER FITTINGS SHALL BE CAMPAK COMPRESSION-TYPE.
4. POLYETHYLENE PIPE SHALL USE CAMPAK COMPRESSION-TYPE JOINTS WITH STAINLESS STEEL INSERT.
5. FOR PVC WATER MAIN TAPS, SERVICE SADDLES WITH CIRCUMFERENTIAL TYPE BANDS SHAPED TO FIT THE ACTUAL O.D. OF THE PIPE, AND HAVING A MINIMUM BEARING WIDTH OF 3" (1 1/2" PER BAND) SHALL BE USED. FOR DUCTILE AND CAST IRON MAINS, USE BRONZE OR DUCTILE IRON SERVICE SADDLES, WITH BRONZE OR STAINLESS DOUBLE STRAPS.

1" SERVICE CONNECTION & METER BOX INSTALLATION



MATERIALS SPECS:

A	OLD CASTLE B16 OR N16 BOX WITH CAST-IN CORNER BRACKETS. USE ARMORCAST A6000489T-COF LID
B	TEMP. 1 1/2" SCH. 40 CAP (DO NOT GLUE)
C	1 1/2" SCH. 40 PIPE
D	1 1/2" SLIP X 1" MALE ADAPTER (SCH. 80)
E	1" BRASS COUPLING
F	1" METER TAILPIECE A.Y. Mc DONALD "NO LEAD" 74624-22 OR APPROVED EQUAL
G	1 1/4" X 10 3/4" PVC METER SPOOL (SCH 80)
H	2"X4" REDWOOD SUPPORT, ONE ON EA. SIDE OF METER BOX, OVERHANG ENDS 2"
I	1" ANGLE METER STOP, A.Y. Mc DONALD "NO LEAD" 74602-22 OR APPROVED EQUAL
J	6" THICK 3/4" CRUSHED ROCK WHEN BOX IS PLACED IN ALLEYS WITH TRASH PICK UP ONLY. ALL BOXES IN ALLEYS SHALL BE PLACED PARALLEL TO ALLEY
K	COMP X COMP 90° ELL, A.Y. McDONALD "NO LEAD" 74761-22 OR APPROVED EQUAL
L	TYPE "K" SOFT DRAWN COPPER TUBING
M	1" CORPORATION STOP A.Y. Mc DONALD "NO LEAD" 74701-22 OR APPROVED EQUAL
N	WATER DIVISION RESPONSIBILITY
O	CUSTOMER RESPONSIBILITY

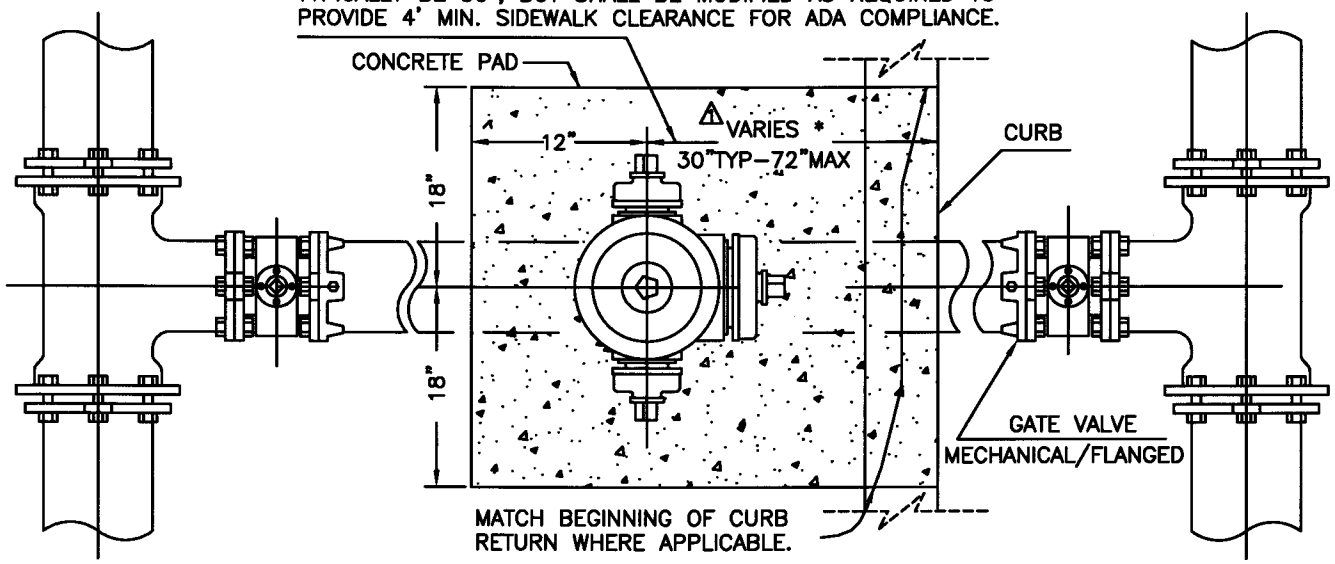
NOTES:

1. WATER SERVICES SHALL NOT BE ALLOWED IN DRIVEWAY APPROACH AREAS AT ANY RESIDENTIAL OR COMMERCIAL LOCATION.
2. ALL COPPER FITTINGS SHALL BE CAMPAK COMPRESSION-TYPE.
3. FOR PVC WATER MAIN TAPS, SERVICE SADDLES WITH CIRCUMFERENTIAL TYPE BANDS SHAPED TO FIT THE ACTUAL O.D. OF THE PIPE, AND HAVING A MINIMUM BEARING WIDTH OF 3" (1 1/2" PER BAND) SHALL BE USED. FOR DUCTILE AND CAST IRON MAINS, USE BRONZE OR DUCTILE IRON SERVICE SADDLES, WITH BRONZE OR STAINLESS DOUBLE STRAPS.

REF & REV
JUNE 2011

CITY OF FRESNO
W-2

FOR ALL FIRE HYDRANTS INSTALLED, THE SETBACK SHALL TYPICALLY BE 30", BUT SHALL BE MODIFIED AS REQUIRED TO PROVIDE 4' MIN. SIDEWALK CLEARANCE FOR ADA COMPLIANCE.

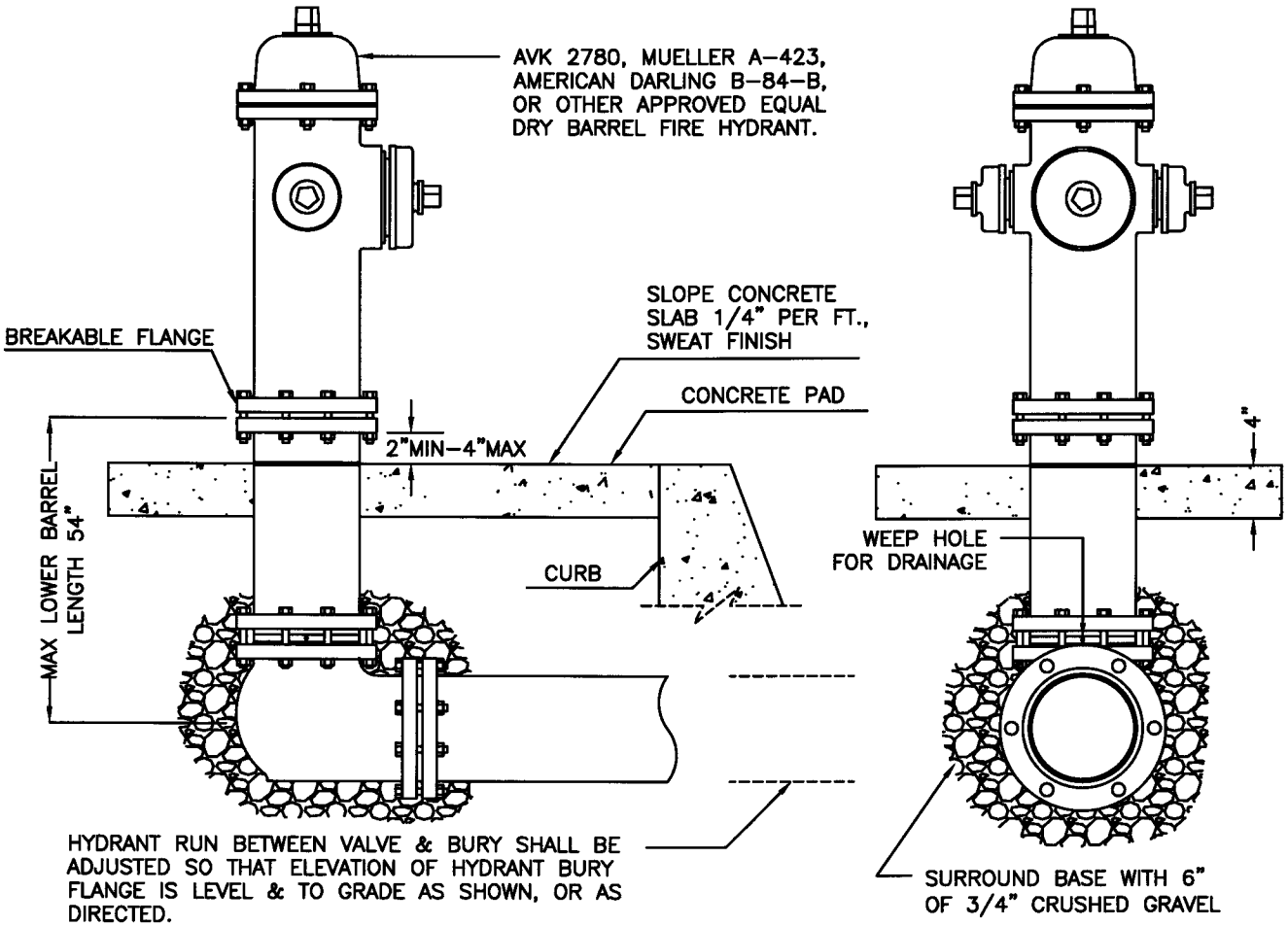


WHERE MAIN LIES BEHIND CURB, PIPE & VALVE DETAILS SHALL BE REVERSED.

⚠ * PROVIDE 4' MIN. SIDEWALK CLEARANCE ADJACENT TO FIRE HYDRANT FOR ADA ACCESSIBILTY REQUIREMENTS.

NOTE: GATE VALVE TO BE TIED TO MAIN PER STD DWG W–37

NOTE: CAP AND OPERATING NUTS ARE 1 1/8" PENTAGON.

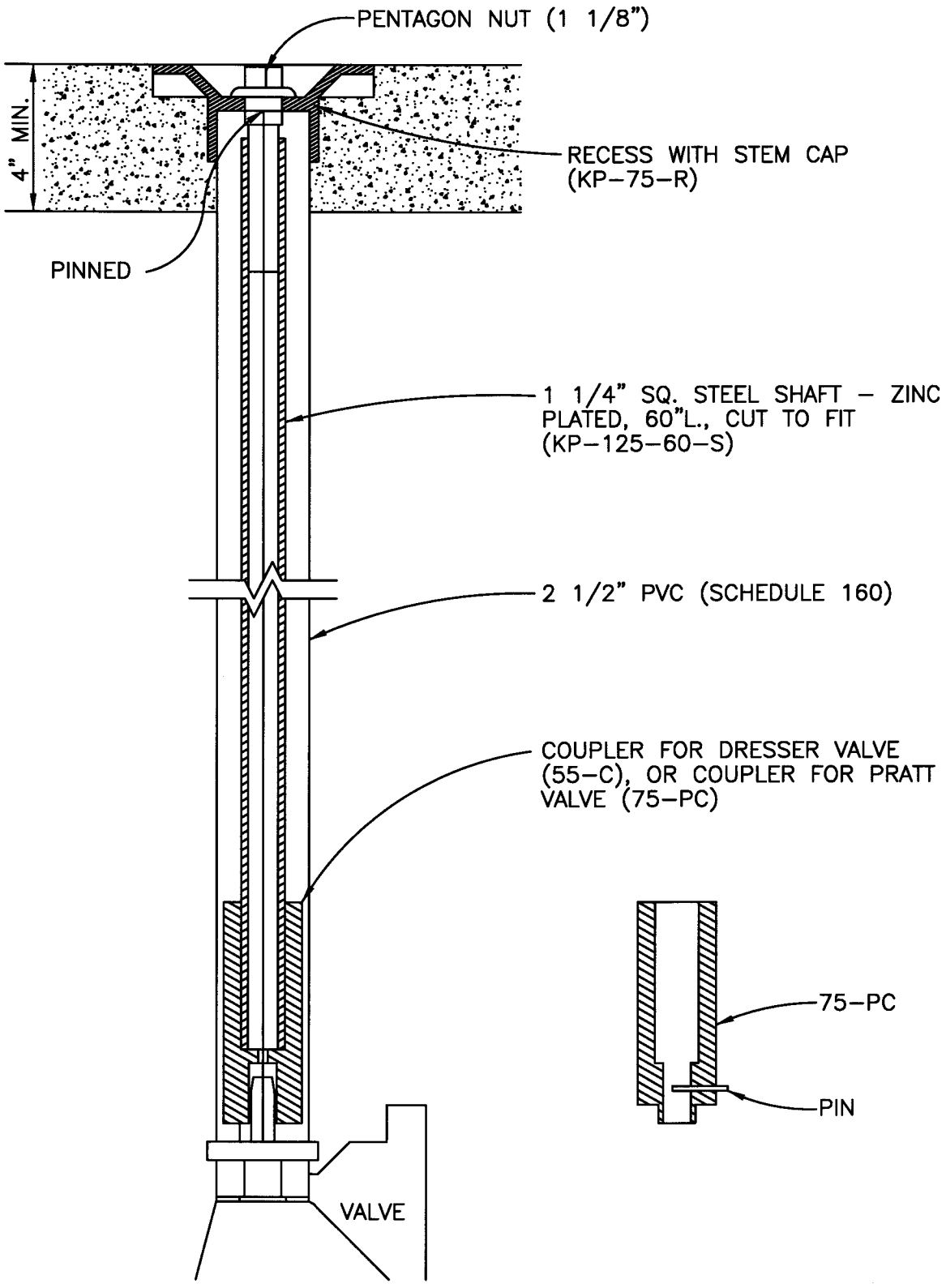


FIRE HYDRANT INSTALLATION

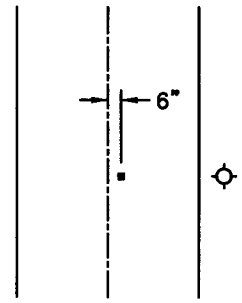
REF. & REV.
DEC., 2003
⚠ JAN., 1997

CITY OF FRESNO

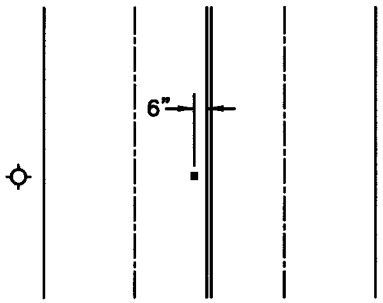
W–3



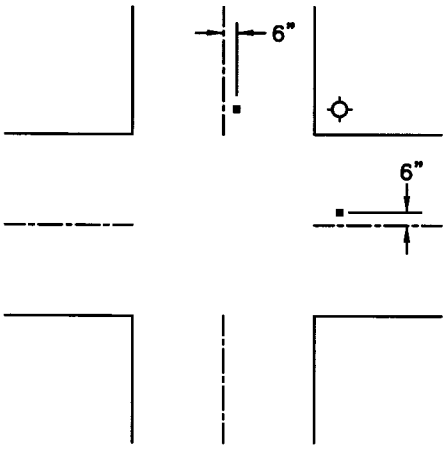
FIRE HYDRANT INSTALLATION VALVE OPERATOR DETAIL	REF. & REV. AUG., 2002	CITY OF FRESNO W-4



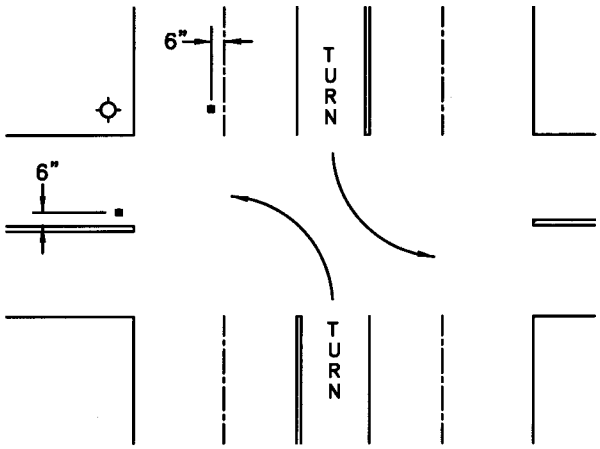
TWO LANE STREET



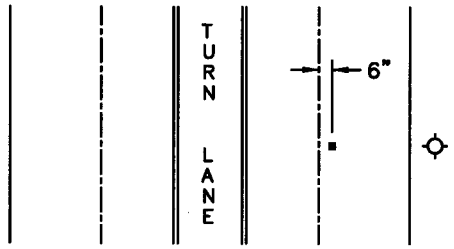
MULTI-LANE STREET



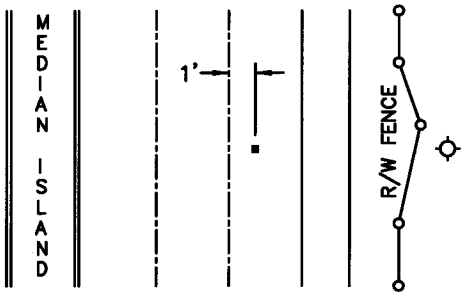
INTERSECTIONS



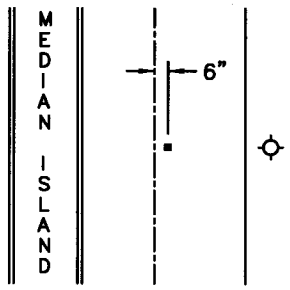
FOUR-LANES W/TURN LANE



FOUR-LANES W/TURN LANE



FREEWAYS AND EXPRESSWAYS



DIVIDED HIGHWAY

FIRE HYDRANT

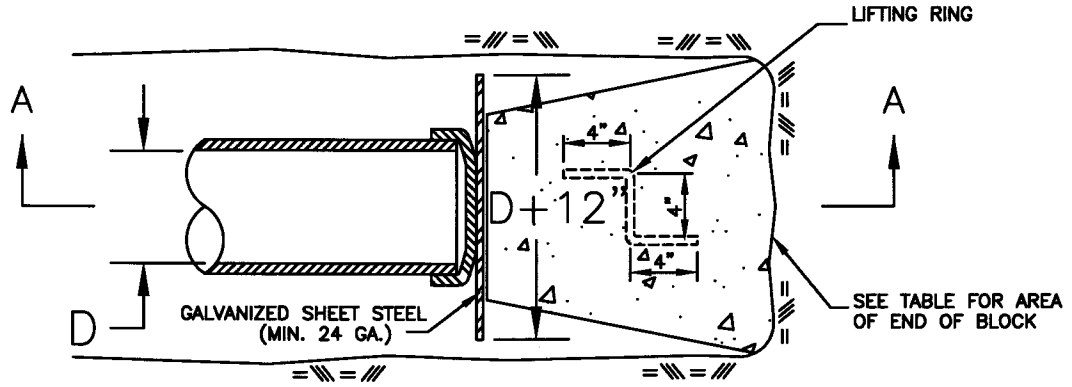
PAVEMENT MARKER EQUAL TO STIMSONITE 810134-88AB "TWO-WAY" BLUE

TYPICAL FIRE HYDRANT MARKER LOCATIONS

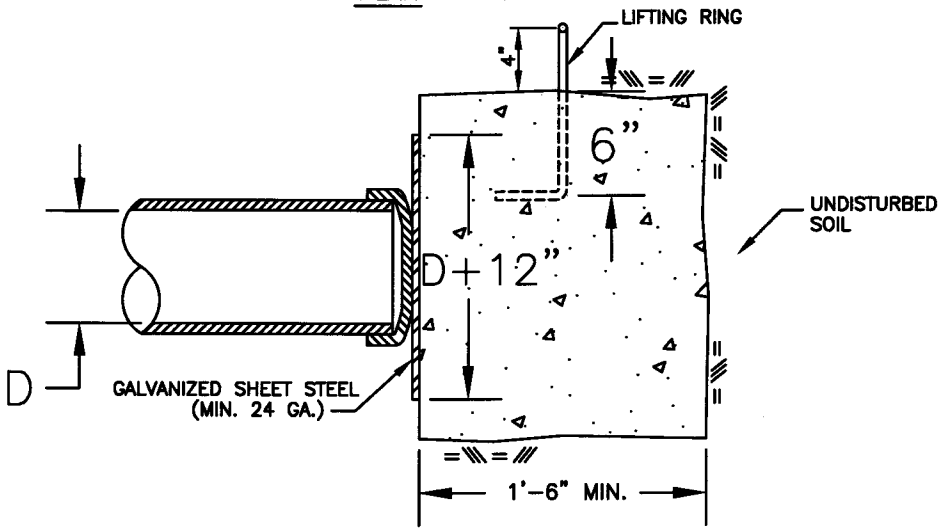
REF. & REV. AUG., 2002

CITY OF FRESNO

W-5



PLAN



SECTION A–A

MINIMUM REQUIRED AREA FOR END OF BLOCK

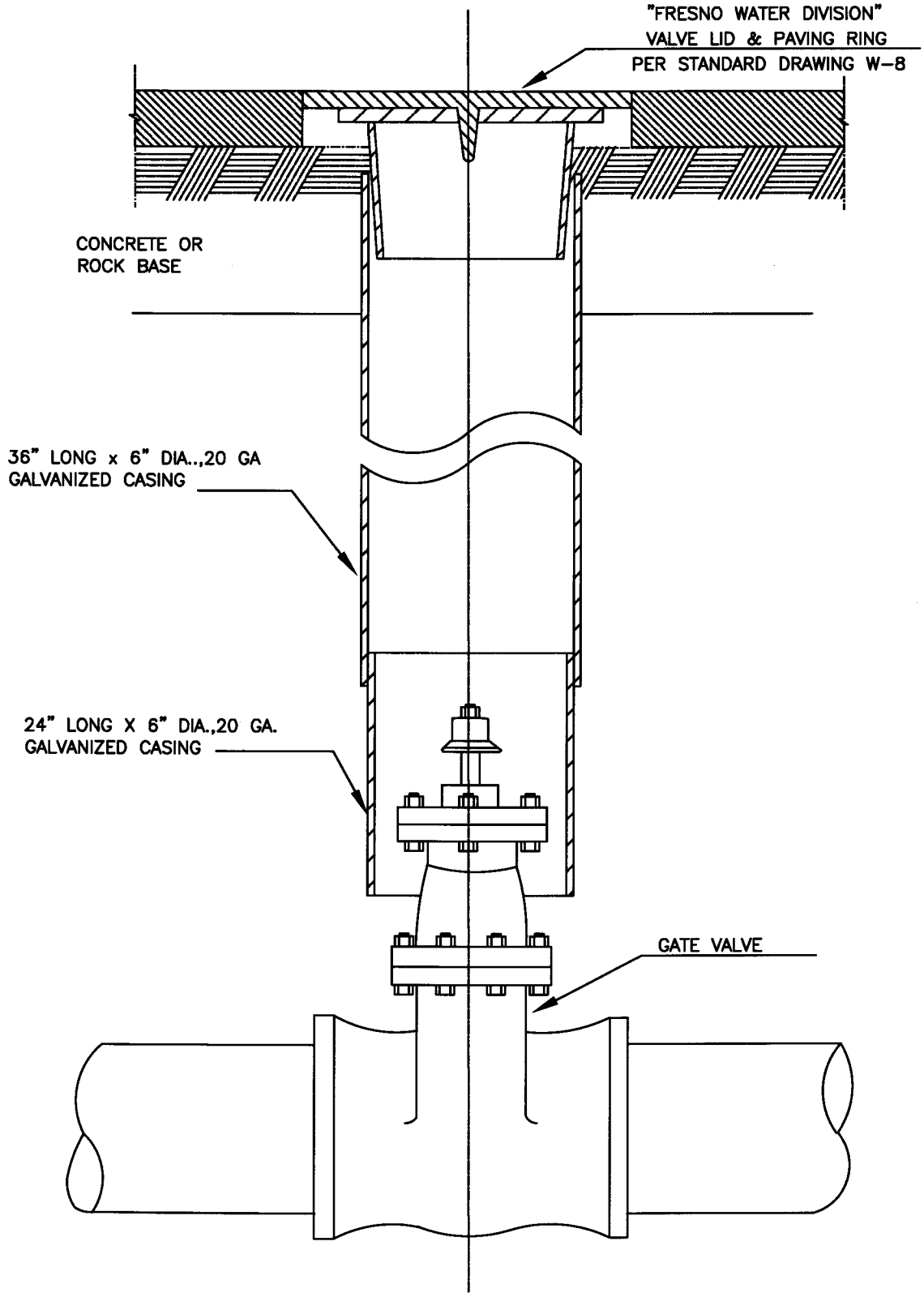
NOMINAL PIPE DIAMETER (INCHES)	4	6	8	10	12	14	16	18	20	24
CONCRETE THRUST BLOCK MIN. AREA (SQ. FT.)	2	4	7	11	15	20	25	31	36	49

BASED ON 200 PSI LINE PRESSURE AND ALLOWABLE SOIL BEARING PRESSURE OF 1500 PSF.

NOTES:

1. THRUST BLOCK SHALL BE USED FOR PIPES WITH 4" DIAMETER OR LARGER.
2. PORTLAND CEMENT CONCRETE USED FOR THRUST BLOCKS SHALL BE MIN. 5 SACK CLASS B CONCRETE WITH A MAX. SLUMP OF 4 INCHES.
3. CONCRETE SHALL BE POURED AGAINST UNDISTURBED EARTH EXCAVATION.
4. BLOCKS SHALL HAVE LIFTING RING. USE NO. 5 BAR REINF. ROD TO FABRICATE RING AT CENTER OF BLOCK. FOR PIPES 16" DIAMETER OR LARGER, NO. 8 BAR REINF. ROD IS REQUIRED.
5. CONCRETE, STEEL SHEET AND END OF PIPE SHALL BE ALL IN FULL CONTACT. NO CONCRETE SHALL BE PLACED IN CONTACT WITH WATER PIPE.
6. TO KEEP THE EXCAVATION WALL SOLID AND UNDISTURBED, OVEREXCAVATION TO ACCOMMODATE THRUST BLOCK SHALL BE HAND EXCAVATED.
7. AREA OF THRUST BLOCK MAY BE INCREASED IF WARRANTED BY SITE CONDITIONS.

THRUST BLOCK FOR DEAD END WATER MAIN	REF. & REV. AUG., 2002	CITY OF FRESNO W–6



VALVE LID & PAVING RING
WITH GALVANIZED CASING

REF. & REV.
AUG., 2002

CITY OF FRESNO

W-7

INSTALLATION PROCEDURE
FOR PAVING RING & LID

REF. & REV.
AUG., 2002

CITY OF FRESNO
W-8

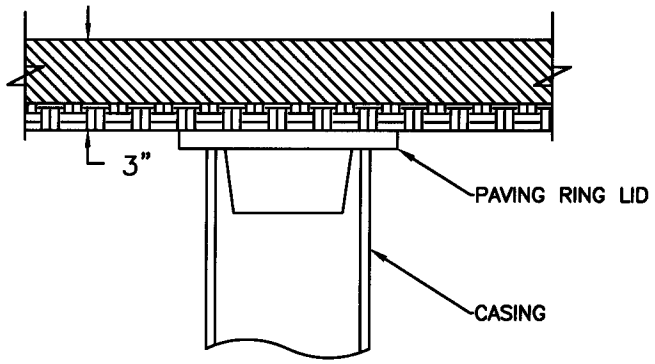


FIG. NO. 1

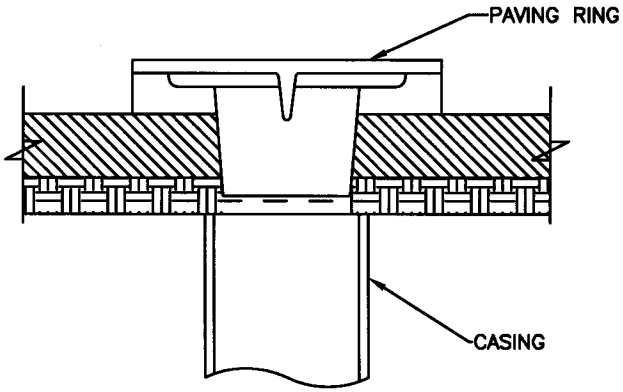


FIG. NO. 2

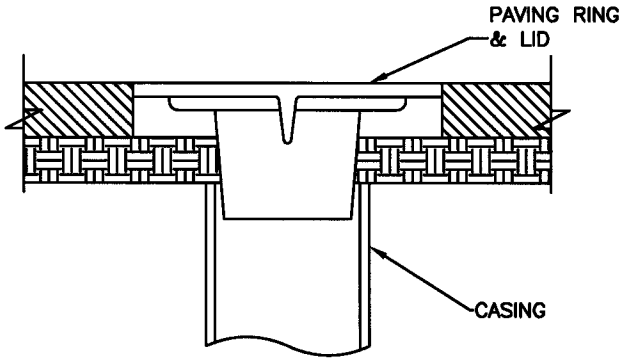
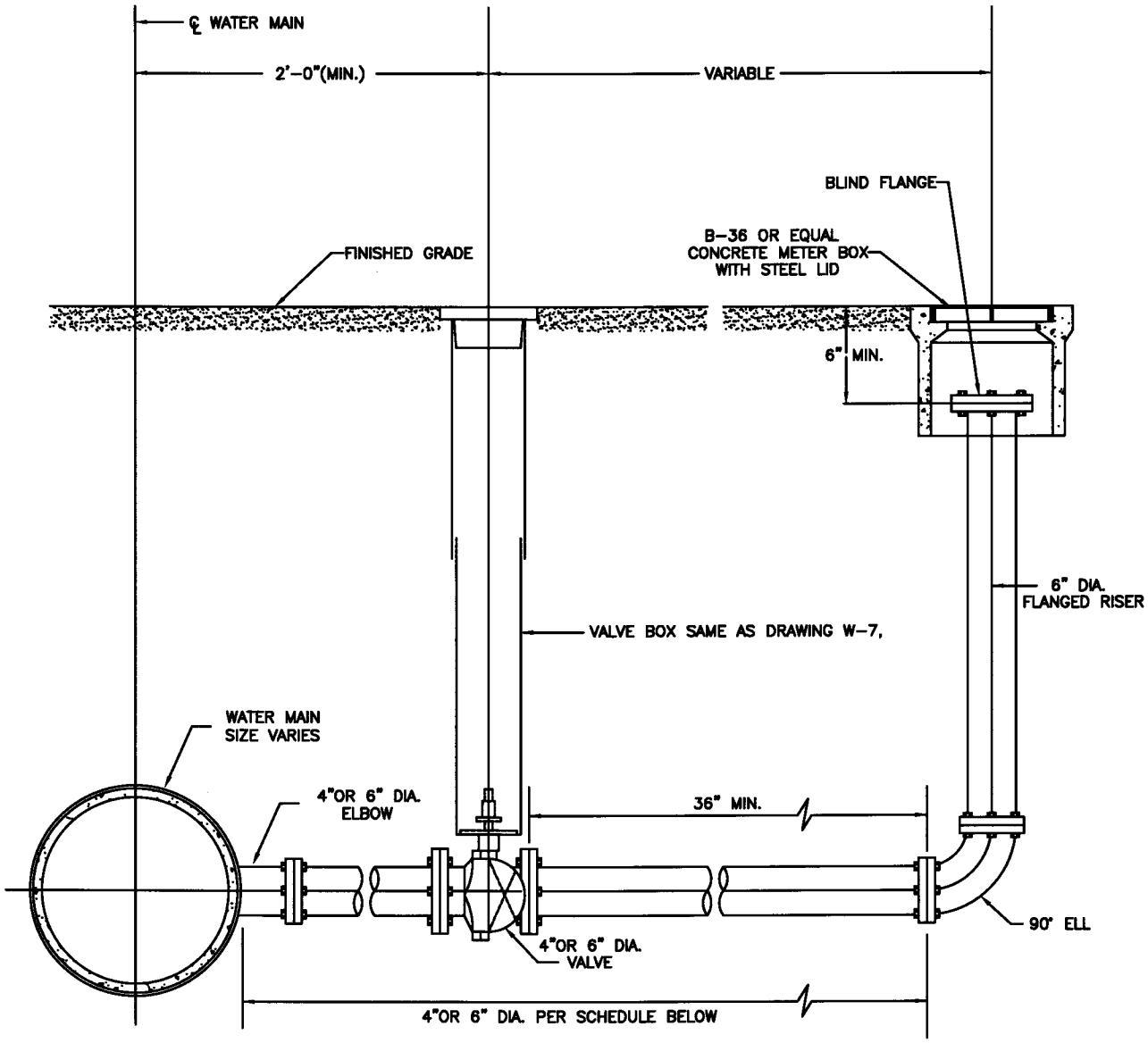


FIG. NO. 3

INSTALLATION PROCEDURE

1. CASING SHALL BE CENTERED OVER VALVE STEM.
2. ADJUST CASING TO 3" BELOW FINISHED GRADE.
3. COVER CASING WITH LID OF THE PAVING RING.
4. PAVE OVER CASING (FIG. NO. 1)
5. IMMEDIATELY AFTER MACHINE HAS PAVED OVER CASING, UNCOVER, AND REMOVE LID, THEN INSET PAVING RING INTO CASING AND PUSH EXCESS A.C. UNDER FLANGES OF PAVING RING. (FIG. NO. 2)
6. PRESS PAVING RING DOWN TO LEVEL WITH TOP OF A.C., INSTALL LID INSIDE PAVING RING AND BRUSH OFF EXCESS PAVING MATERIAL ON TOP OF PAVING RING. (FIG. NO. 3)
7. PAVING RING CAN BE ROLLED IN PLACE AT SAME TIME A.C. IS ROLLED.



NOTE:

1. ALL FITTINGS SHALL BE SECURED WITH RETAINING GLANDS, HARNESSES OR TIE-RODS AS APPLICABLE.
2. PLACE VALVES AND BLOW-OFFS OUTSIDE SIDEWALK AND DRIVEWAY AREAS.
3. ALL PUMP DISCHARGES SHALL BE FLANGED STEEL
4. ALL RISERS SHALL BE FLANGED, 6" DIAMETER.

BLOW-OFF SCHEDULE	
PIPE SIZE	
MAIN	BLOW-OFF
6"	4"
8"	4"
10"	4"
12"	6"
14"	6"
16"	6"

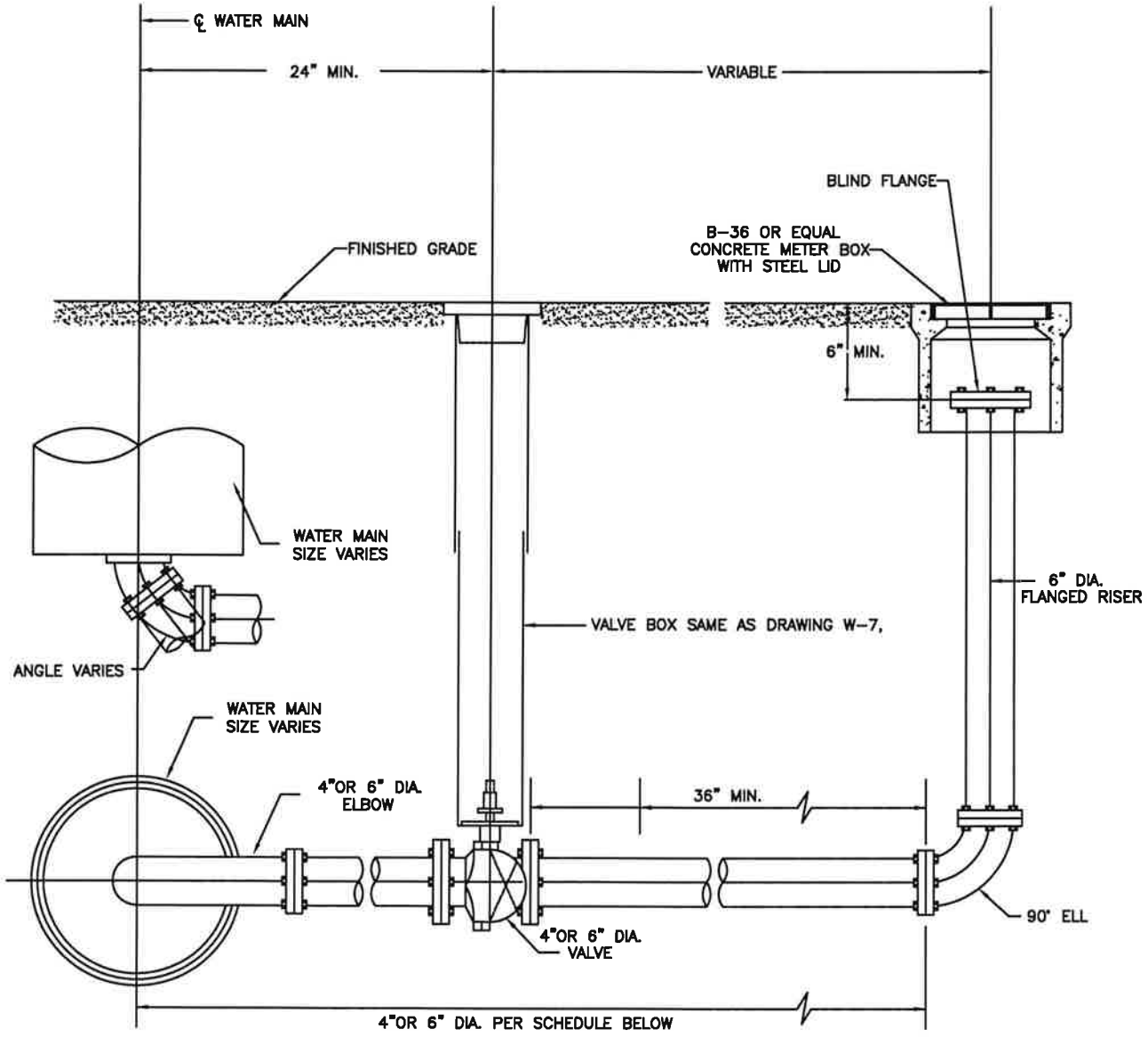
BLOW-OFF ASSEMBLY

TYPE A

REF. & REV.
AUG., 2002

CITY OF FRESNO

W-9



NOTE:

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2. PLACE VALVES AND BLOW-OFFS OUTSIDE SIDEWALK AND DRIVEWAY AREAS.
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BLOW-OFF SCHEDULE	
PIPE SIZE	
MAIN	BLOW-OFF
6"	4"
8"	4"
10"	4"
12"	6"
14"	6"
16"	6"

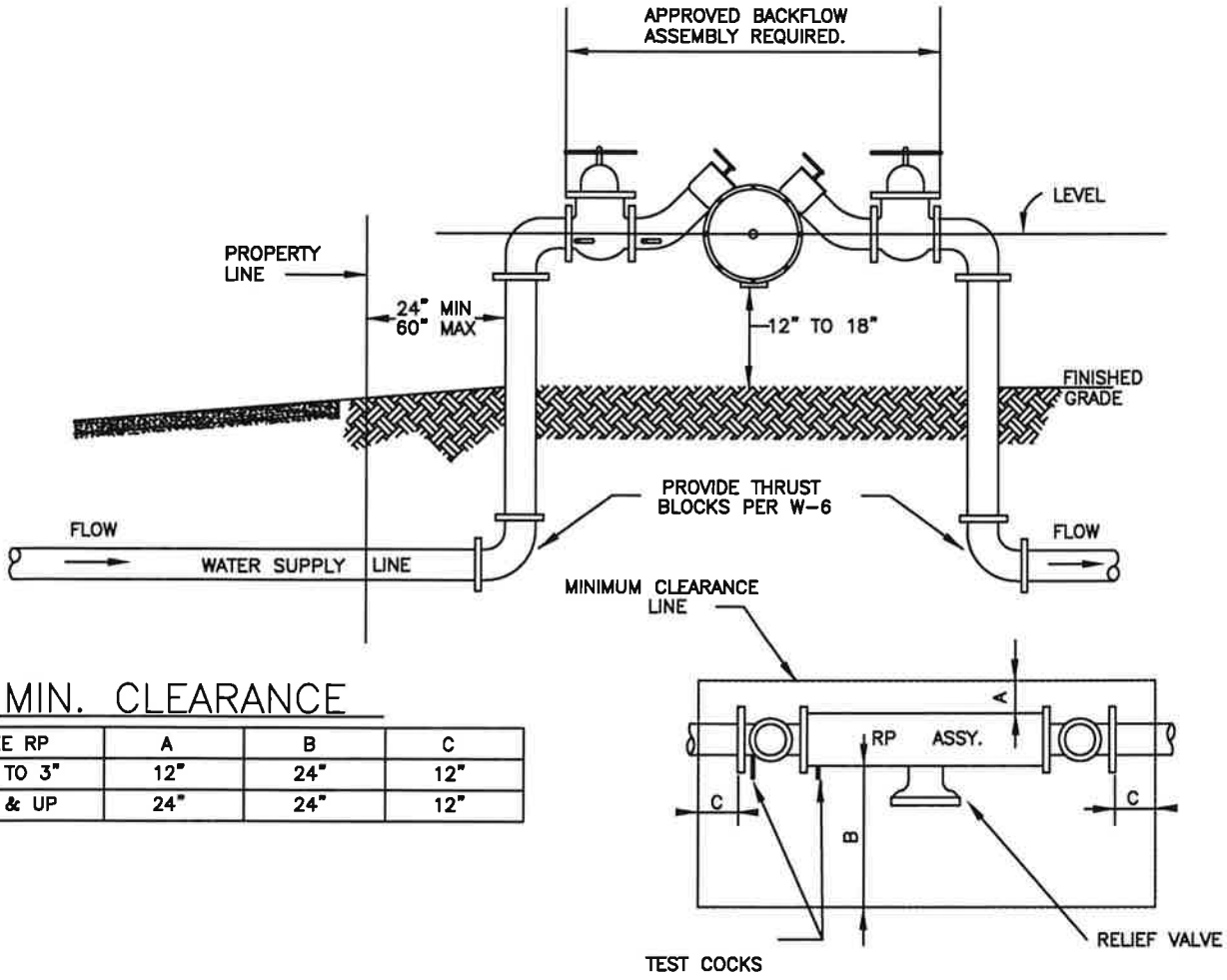
BLOW-OFF ASSEMBLY

TYPE B

REF. & REV.
AUG., 2002

CITY OF FRESNO

W-10



MIN. CLEARANCE

SIZE RP	A	B	C
1" TO 3"	12"	24"	12"
4" & UP	24"	24"	12"

GENERAL NOTES:

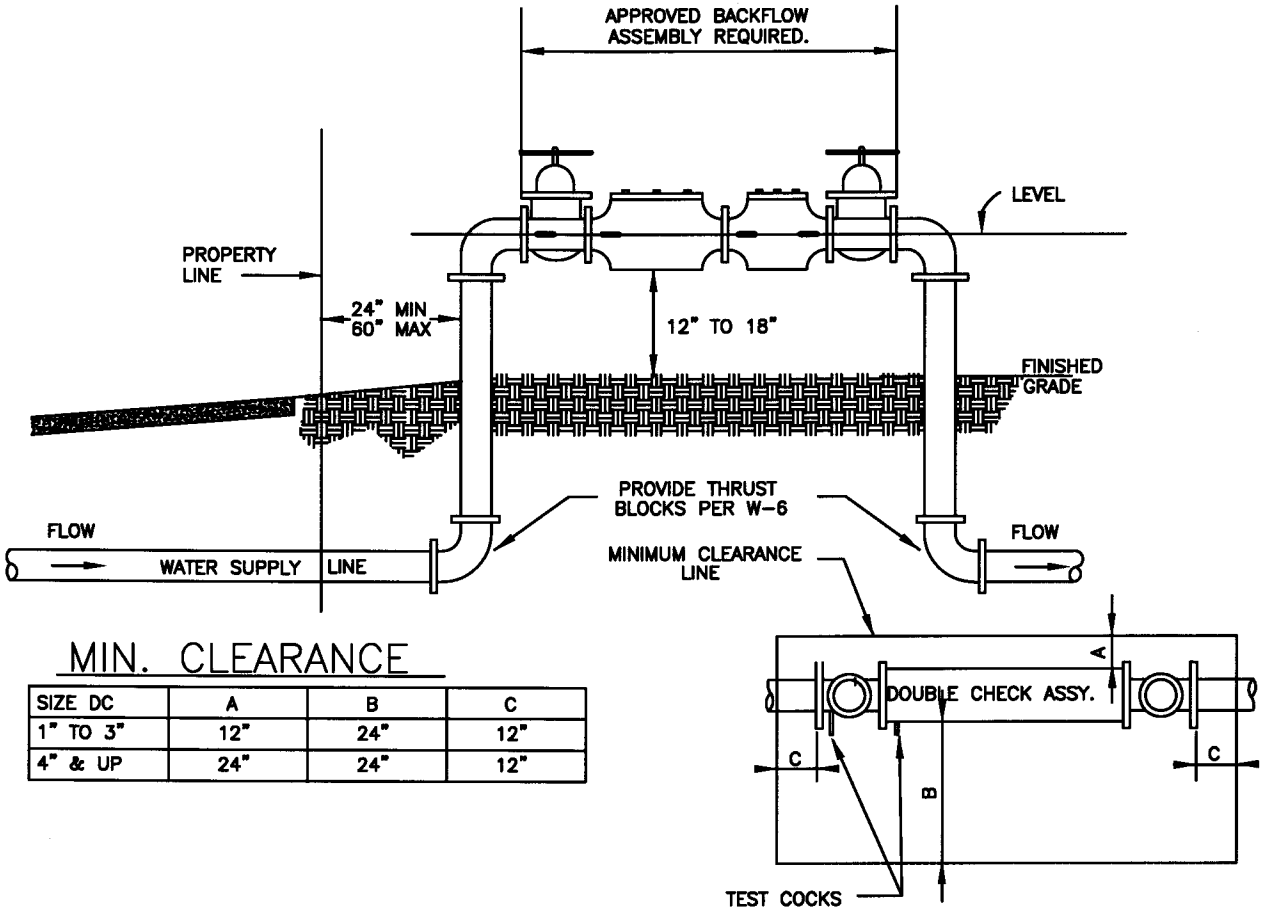
1. RESILIENT SEATED SHUT OFF VALVES AND TEST COCKS ARE REQUIRED.
2. NO TAPS, TEES OR CONNECTIONS OF ANY KIND ARE PERMITTED BETWEEN THE WATER METER AND THE BACKFLOW ASSEMBLY.
3. PROTECTION FROM FREEZE DAMAGE MAY BE REQUIRED IN EXPOSED AREAS.
4. ASSEMBLY MUST BE ACCESSIBLE FOR TESTING AND MAINTENANCE PER FRESNO MUNICIPAL CODE.
5. ASSEMBLY TO BE THE SAME SIZE AS THE WATER SUPPLY LINE PER UNIFORM PLUMBING CODE.
6. PRESSURE LOSS THROUGH RP ASSEMBLY MUST BE INCLUDED IN PRESSURE LOSS CALCULATIONS FOR SIZING OF THE WATER SYSTEM PER UNIFORM PLUMBING CODE.
7. MINIMUM CLEARANCES AROUND ASSEMBLY MUST BE MAINTAINED. REFER TO MINIMUM CLEARANCE CHART ON THIS PAGE.
8. INSTALL A MINIMUM OF ONE UNION IN THE PIPING SYSTEM WITHIN 12 INCHES OF THE ASSEMBLY – 3/4 THRU 2" SIZES.
9. DRAINAGE TO EXTERIOR OF THE BUILDING IS REQUIRED WHEN ASSEMBLY IS INSTALLED INSIDE.
10. ANY DEVIATION FROM THESE REQUIREMENTS SHALL BE APPROVED BY THE WATER SYSTEM MANAGER PRIOR TO INSTALLATION.

REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLY INSTALLATION

REF. & REV.
AUG., 2002

CITY OF FRESNO

W–11



MIN. CLEARANCE

SIZE DC	A	B	C
1" TO 3"	12"	24"	12"
4" & UP	24"	24"	12"

GENERAL NOTES:

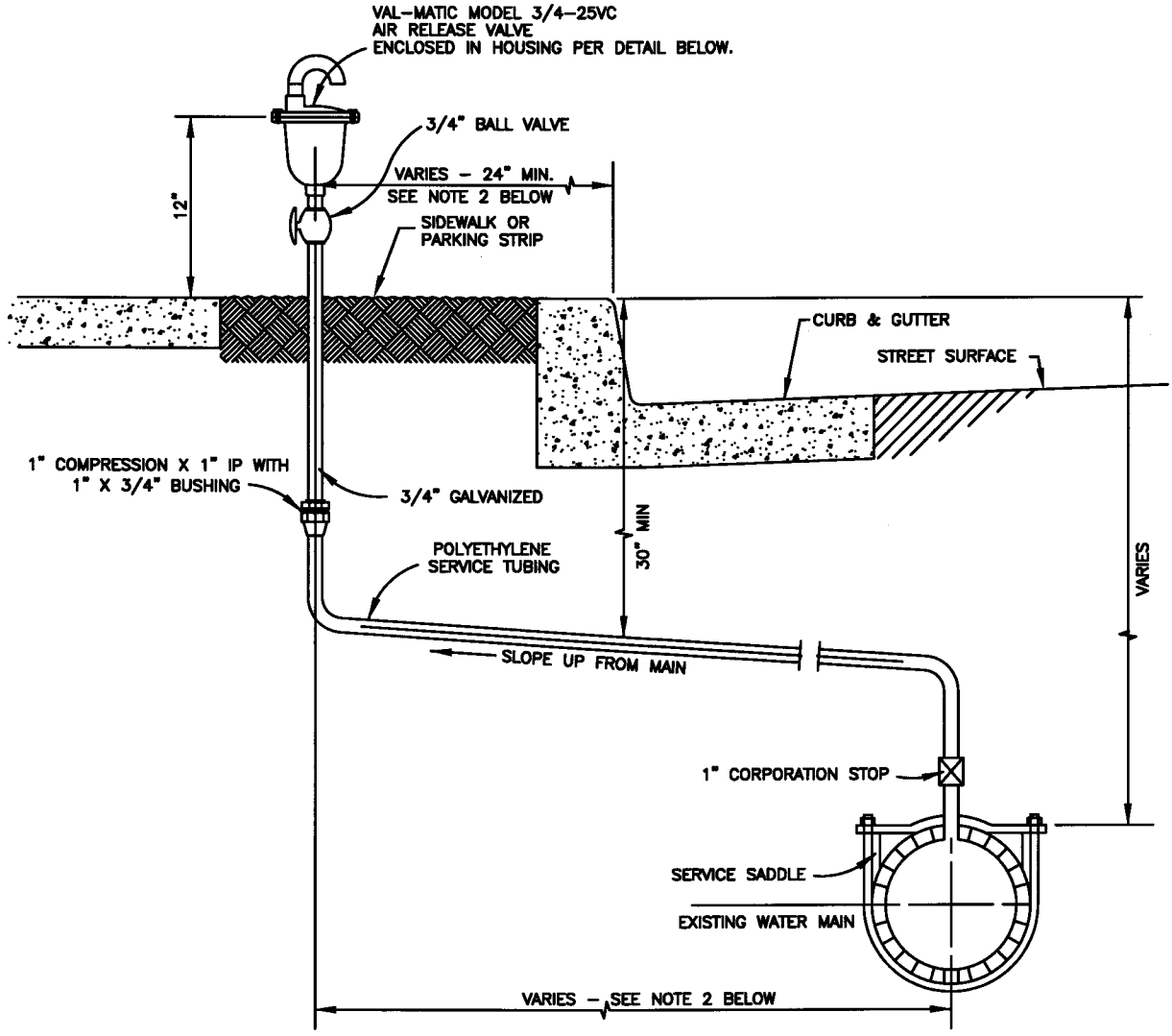
1. RESILIENT SEATED SHUT OFF VALVES AND TEST COCKS ARE REQUIRED.
2. NO TAPS, TEES OR CONNECTIONS OF ANY KIND ARE PERMITTED BETWEEN THE WATER METER AND THE BACKFLOW ASSEMBLY.
3. PROTECTION FROM FREEZE DAMAGE MAY BE REQUIRED IN EXPOSED AREAS.
4. ASSEMBLY MUST BE ACCESSIBLE FOR TESTING AND MAINTENANCE PER FRESNO MUNICIPAL CODE.
5. ASSEMBLY TO BE THE SAME SIZE AS THE WATER SUPPLY LINE PER UNIFORM PLUMBING CODE.
6. PRESSURE LOSS THROUGH ASSEMBLY MUST BE INCLUDED IN PRESSURE LOSS CALCULATIONS FOR SIZING OF THE WATER SYSTEM PER UNIFORM PLUMBING CODE.
7. MINIMUM CLEARANCES AROUND ASSEMBLY MUST BE MAINTAINED. REFER TO MINIMUM CLEARANCE CHART ON THIS PAGE.
8. INSTALL A MINIMUM OF ONE UNION IN THE PIPING SYSTEM WITHIN 12 INCHES OF THE ASSEMBLY – 3/4 THRU 2" SIZES.
9. DRAINAGE TO EXTERIOR OF THE BUILDING IS REQUIRED WHEN ASSEMBLY IS INSTALLED INSIDE.
10. ANY DEVIATION FROM THESE REQUIREMENTS SHALL BE APPROVED BY THE WATER SYSTEM MANAGER PRIOR TO INSTALLATION.

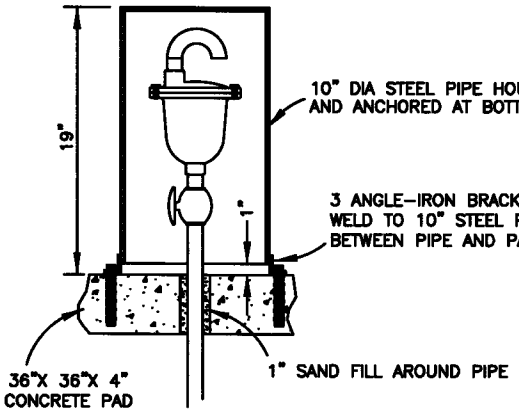
DOUBLE CHECK VALVE INSTALLATION

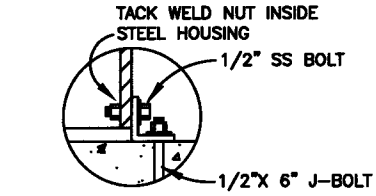
REF. & REV.
AUG., 2002

CITY OF FRESNO

W–12







ANCHOR DETAIL AND
ALTERNATE CLIP CONNECTION

NOTES :

1. METAL HOUSING SHALL BE PRIMED AND PAINTED WITH A LIGHT GREEN, TAN OR GRAY EXTERIOR ENAMEL FINISH.
2. VALVE ASSEMBLY AND METAL HOUSING SHALL BE LOCATED IN MEDIAN ISLANDS, LANDSCAPE AREAS OR OUTSIDE OF SIDEWALK AREA WHERE POSSIBLE.

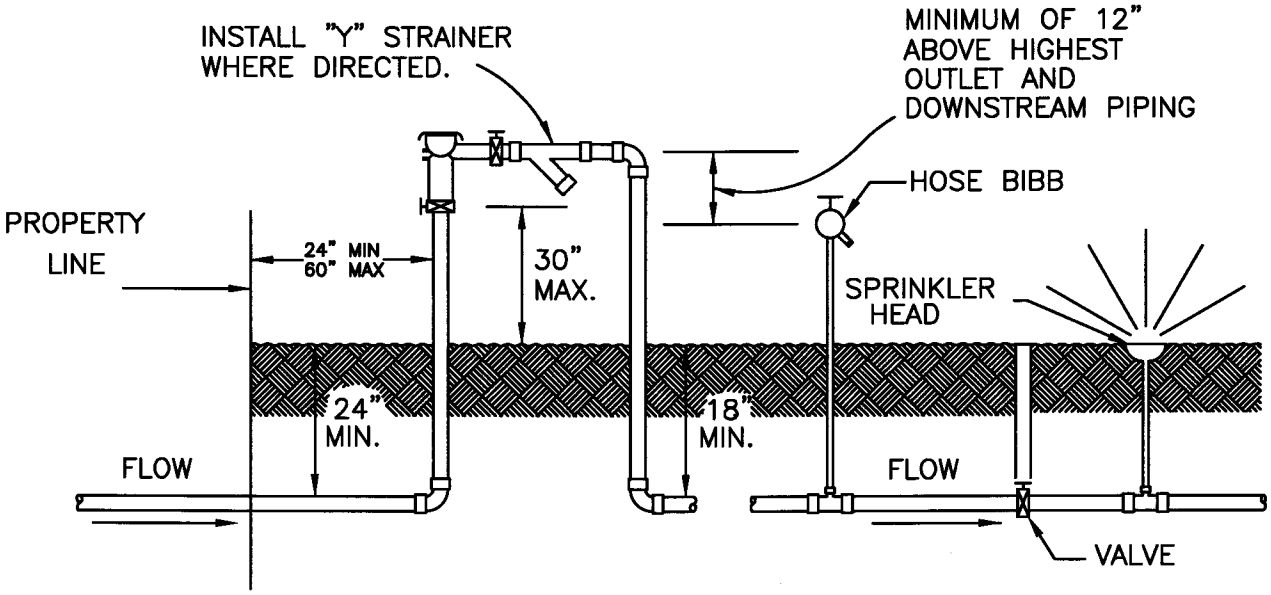
PROVIDE 4' MIN. SIDEWALK CLEARANCE ADJACENT TO AIR-VAC DEVICE FOR ADA ACCESSIBILTY REQUIREMENTS.

AUTOMATIC AIR RELEASE AND VACUUM VALVE

REF. & REV.
DEC., 2003

CITY OF FRESNO

W-13



GENERAL NOTES:

1. RESILIENT SEATED SHUT OFF VALVES AND TEST COCKS ARE REQUIRED.
2. NO TAPS, TEES OR CONNECTIONS OF ANY KIND ARE PERMITTED BETWEEN THE WATER METER AND THE P.V.B. ASSEMBLY.
3. PROTECTION FROM FREEZE DAMAGE MAY BE REQUIRED IN EXPOSED AREAS.
4. ASSEMBLY MUST BE ACCESSIBLE FOR TESTING AND MAINTENANCE PER FRESNO MUNICIPAL CODE.
5. ASSEMBLY TO BE THE SAME SIZE AS THE WATER SUPPLY LINE PER UNIFORM PLUMBING CODE.
6. PRESSURE LOSS THROUGH P.V.B. ASSEMBLY MUST BE INCLUDED IN PRESSURE LOSS CALCULATIONS FOR SIZING OF THE WATER SYSTEM PER UNIFORM PLUMBING CODE.
7. DOWNSTREAM PIPING MAY HAVE VALVES IN SYSTEM.
8. INSTALL ONE UNION IN THE PIPING SYSTEM WITHIN 12 INCHES OF THE ASSEMBLY.
9. ASSEMBLY CAN NOT BE SUBJECT TO BACKPRESSURE FROM PUMPS, ELEVATION OR OTHER SOURCES.
10. MAINTAIN A MINIMUM OF 18 INCHES CLEARANCE AROUND ASSEMBLY.
11. ANY DEVIATION FROM THESE REQUIREMENTS SHALL BE APPROVED BY THE WATER SYSTEM MANAGER PRIOR TO INSTALLATION.

PRESSURE VACUUM BREAKER BACKFLOW PREVENTER INSTALLATION	REF. & REV. AUG., 2002	CITY OF FRESNO W-14

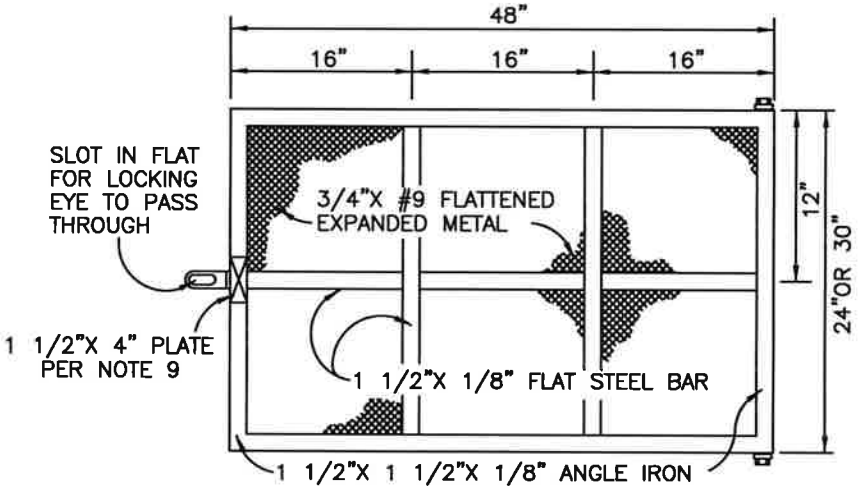
TYPICAL ENCLOSURE

FOR BACKFLOW PREVENTION DEVICES

REF. & REV.
AUG., 2002

CITY OF FRESNO

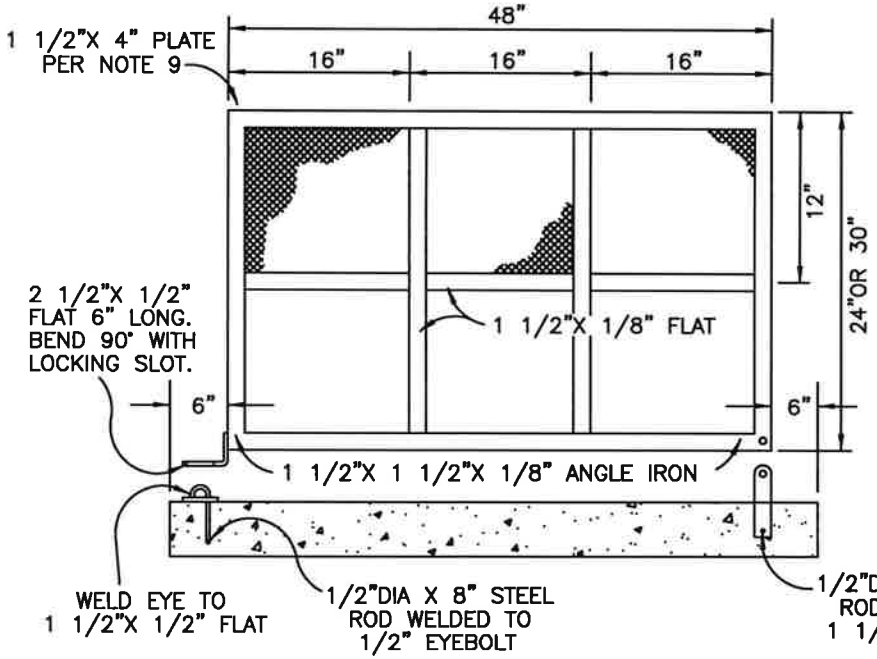
W-15



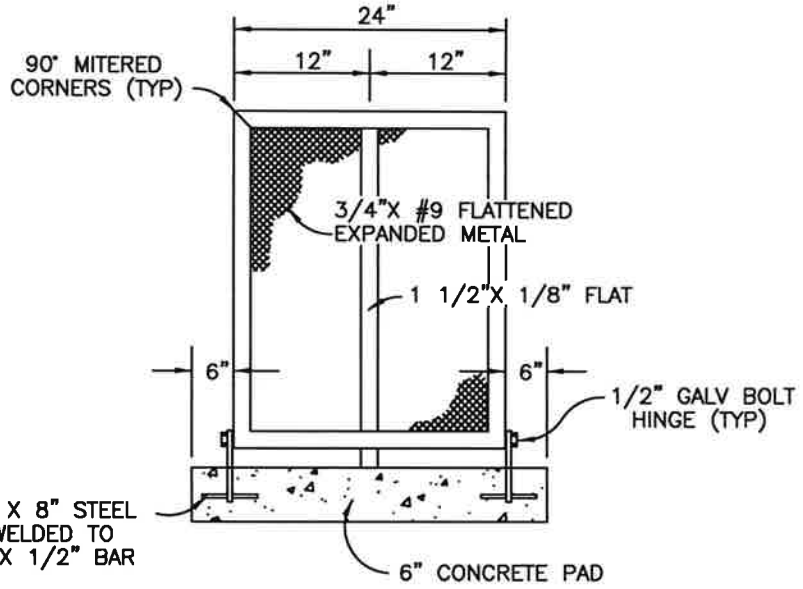
TOP VIEW

GENERAL NOTES

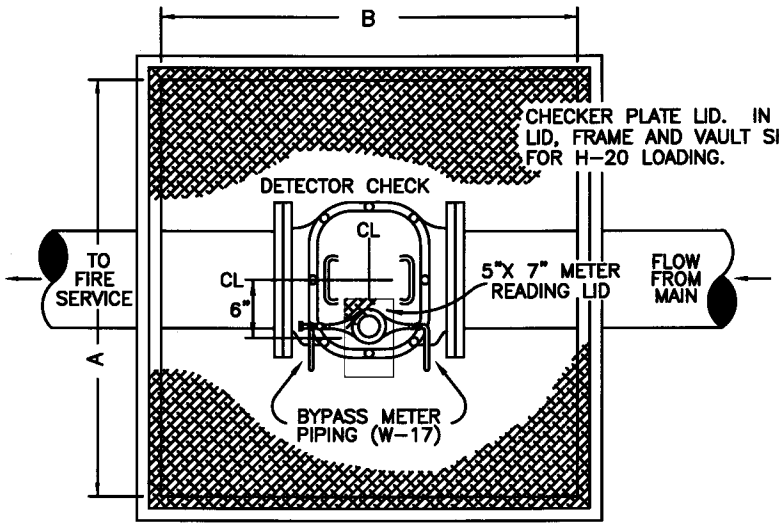
1. EXPANDED METAL GRATING TO BE WELDED INSIDE STRUCTURAL SUPPORTS EVERY 5" MINIMUM.
2. ALL DIAGONAL OR CIRCULAR CUT EXPOSED EDGES SHALL BE BANDED WITH BAR STOCK WELDED AT ALL CONTACT POINTS.
3. FABRICATE HINGE FROM 1/2" GALV. BOLTS WITH GALV. WASHERS & DOUBLE NUTS. BURR THREADS TO PREVENT REMOVAL.
4. WELD ALL 1/2" THICK BAR INTERSECTIONS WITH 3/8" FILLET WELDS.
5. CONCRETE SLAB TO BE CLASS "A" CONCRETE – 6" THICK.
6. ALL PIPING THROUGH CONCRETE SHALL BE DOUBLE WRAPPED WITH 20 MIL PLUMBERS TAPE.
7. ALL EXPOSED METAL TO BE PRIMED AND PAINTED WITH RUST PREVENTIVE PAINT.
8. ENCLOSURE DIMENSIONS MAY VARY TO SUIT EQUIPMENT TYPE.
9. ATTACH 1 1/2"X 4" STEEL PLATE FOR SITE ADDRESS.



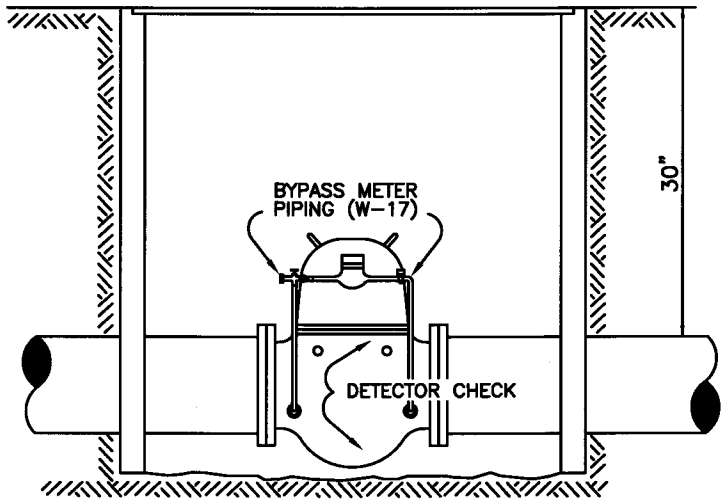
FRONT VIEW



END VIEW



PLAN VIEW



ELEVATION

NOTES:

1. CHECK VALVE TO BE HERSEY MODEL E.D.C. OR D.C., GRINNELL MODEL A-2 OR B-2 OR APPROVED EQUAL.
2. CHECK VALVE TO BE TAPPED AND PLUGGED (FOR INSTALLATION OF BYPASS METER PIPING BY CITY FORCES).
3. VAULT OR BOX TO BE CHRISTY, BROOKS OR APPROVED EQUAL.
4. VAULT OR BOX, DETECTOR CHECK VALVE AND COVER TO BE INSTALLED BY DEVELOPER'S CONTRACTOR PER FRESNO MUNICIPAL CODE, SECTION 14, SUBSECTIONS 131-137 INCL. SEE W-17 FOR DETAILS.
5. VAULT OR BOX COVER TO HAVE 5"X 7" HINGED METER READ LID.

NOMINAL INSIDE DIMENSIONS

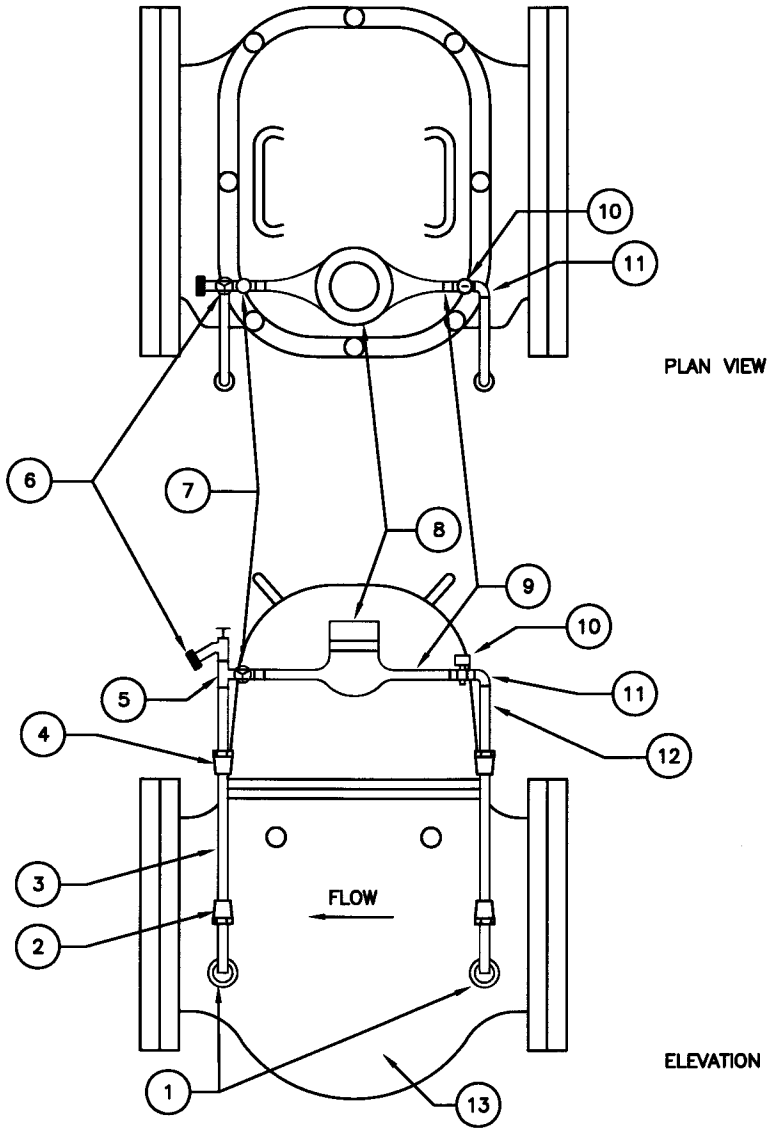
SERVICE	A	B
4" - 8"	30"	48"
10"	48"	48"

FIRE SERVICE DETECTOR CHECK INSTALLATION

REF. & REV.
AUG., 2002

CITY OF FRESNO

W-16



MATERIALS LIST:

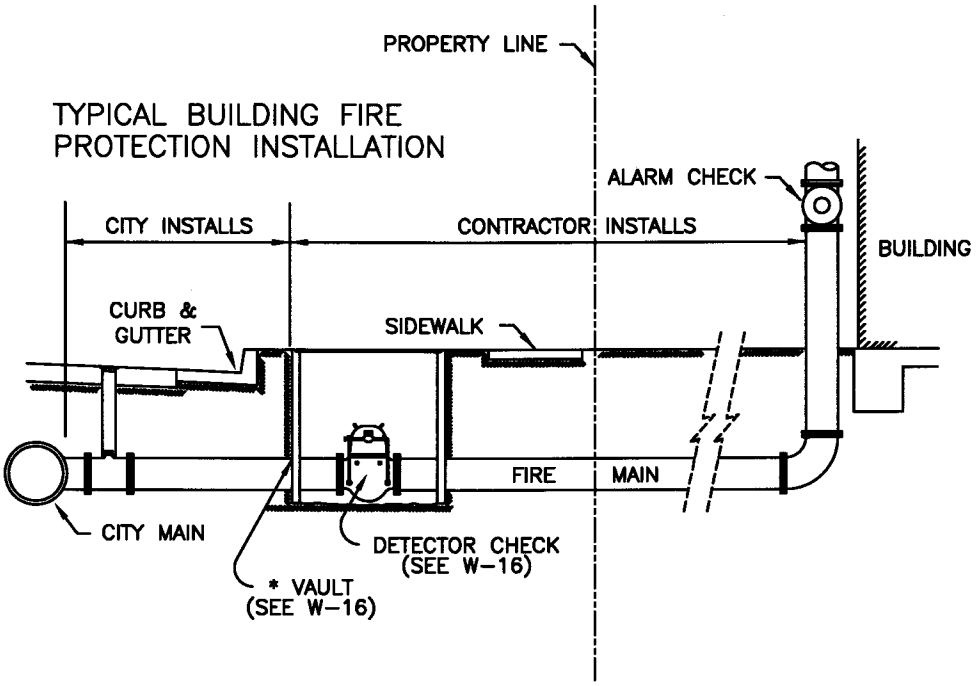
1. 1"X 3/4" BRASS BUSHING – 2 REQ'D.
2. 3/4" J–1550 BRASS COUPLING – 2 REQ'D.
3. 3/4" COPPER TUBING – 2 REQ'D.
4. 3/4" J–1531 BRASS COUPLING – 2 REQ'D.
5. 3/4" BRASS TEE – 1 REQ'D.
6. 3/4" BENT NOSE HOSE BIBB – 1 REQ'D.
7. 3/4" CHECK VALVE – 1 REQ'D.
8. 5/8" METER – 1 REQ'D.
9. 3/4" METER CONNECTION (TAIL PIECE) – 2 REQ'D.
10. 3/4" J–200 CURB STOP – 1 REQ'D.
11. 3/4" BRASS 90° ELL – 1 REQ'D.
12. 3/4" BRASS CLOSE NIPPLE – 4 REQ'D.
13. WEIGHTED DETECTOR CHECK VALVE – 1 REQ'D.
    A. TO BE INSTALLED BY DEVELOPER.
    B. TO BE TAPPED AND PLUGGED FOR DETECTOR METER PIPING. SEE W–16.

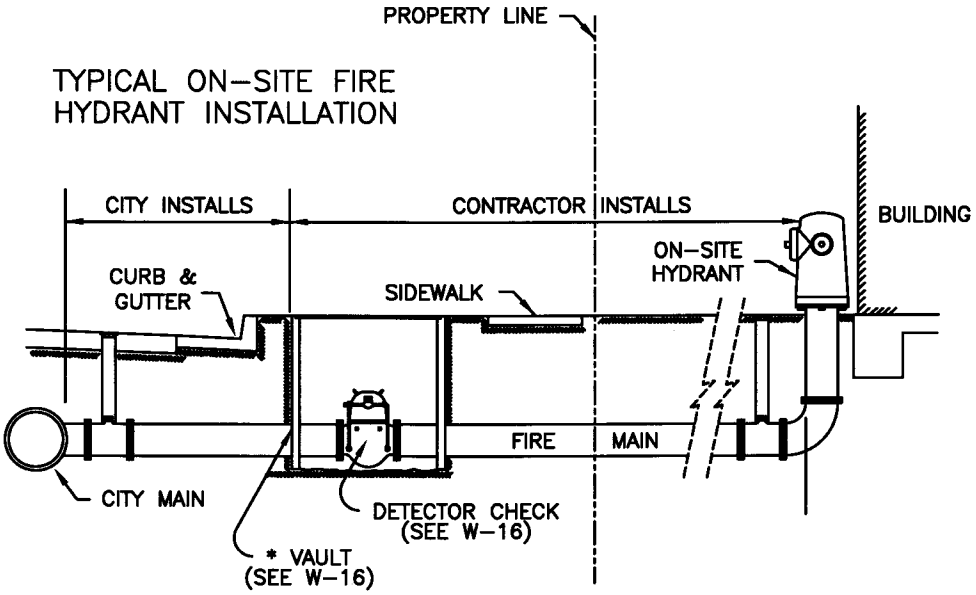
DETECTOR BYPASS METER DETAILS

REF. & REV.
AUG., 2002

CITY OF FRESNO

W–17

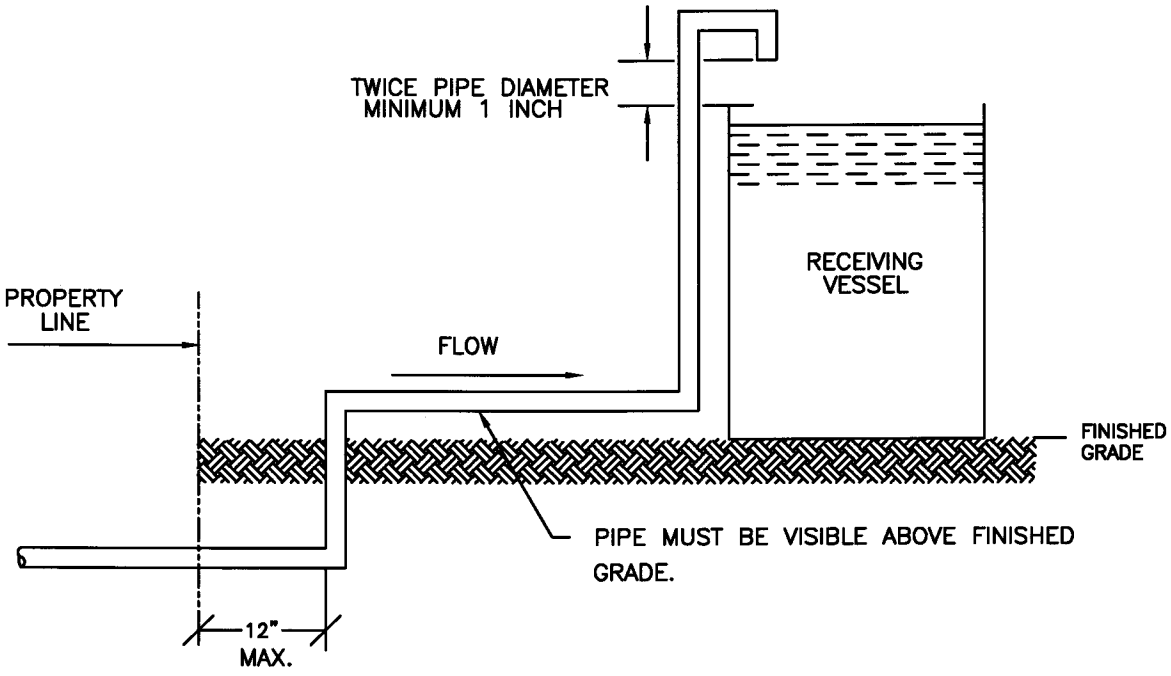




NOTES:
1. THE PERMANENT CONNECTION BETWEEN THE CITY'S INSTALLATION AND THE DEVELOPER'S CONSTRUCTION SHALL BE MADE BY THE DEVELOPER'S CONTRACTOR.
2. CONTRACTOR SHALL INSTALL VAULT AND VAULT COVER AFTER CITY FORCES COMPLETE THEIR WORK.

* VAULT TO BE 1.5' FROM THE CURB FACE OR AS DIRECTED BY THE ENGINEER.

DETECTOR CHECK REQUIREMENTS RELATED TO FIRE SERVICE IMPROVEMENTS GREATER THAN 2"	REF. & REV. AUG., 2002	CITY OF FRESNO W-18



REQUIREMENTS

1. NO TAPS, TEES OR CONNECTIONS OF ANY KIND ARE PERMITTED BETWEEN THE WATER METER AND RECEIVING VESSEL.
2. THE SERVICE PIPE BETWEEN THE WATER METER AND RECEIVING VESSEL MUST BE VISIBLE ABOVE FINISHED GRADE FROM 12 INCHES BEHIND PROPERTY LINE TO THE RECEIVING VESSEL.
3. PROTECTION FROM FREEZE DAMAGE MAY BE NECESSARY IN EXPOSED AREAS.

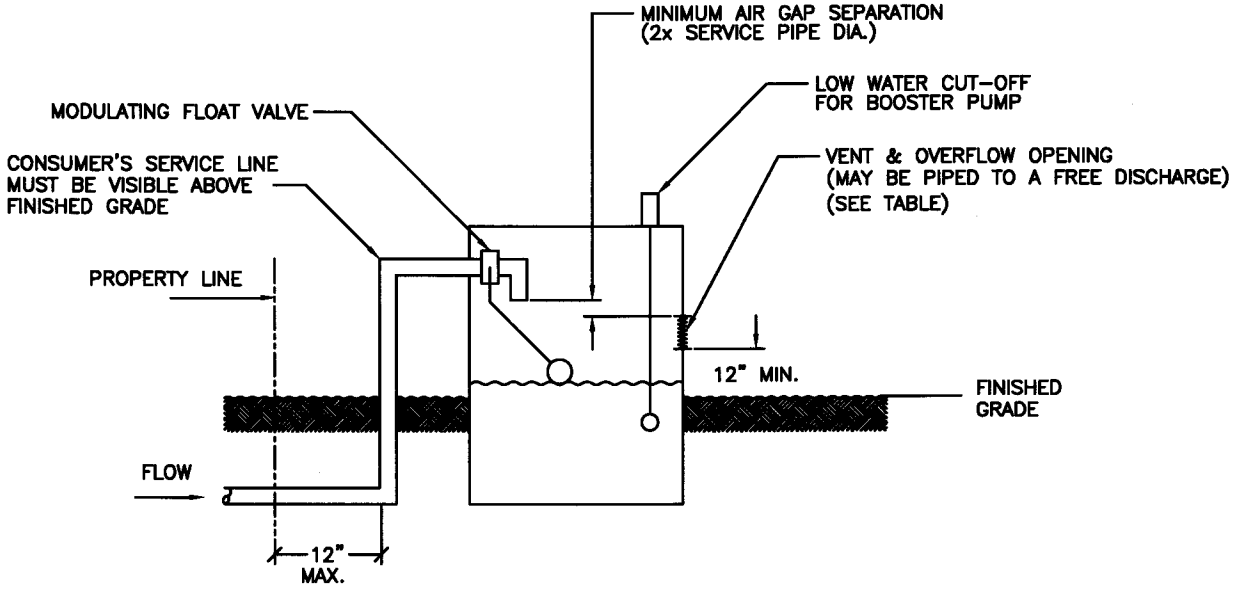
INSTALLATION REQUIREMENTS

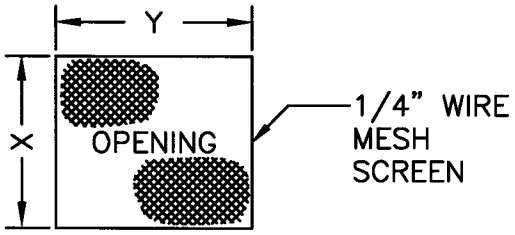
FOR AN APPROVED AIR GAP SEPARATION

REF. & REV.
AUG., 2002

CITY OF FRESNO

W–19





VENT & OVERFLOW

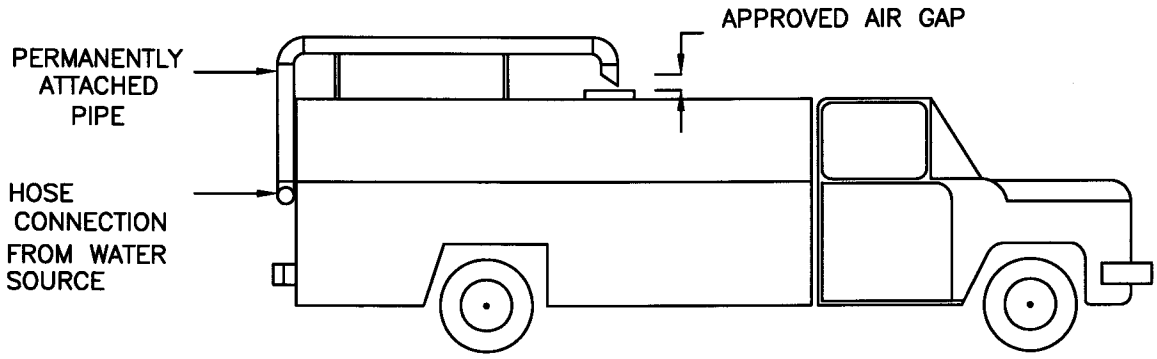
VENT & OVERFLOW TABLE		
SERVICE PIPE SIZE	DIMENSIONS	
	X	Y
3/4"	4"	3"
1"	4"	4 1/2"
1 1/2"	5"	6"
2"	6"	7"
3"	7"	10"
* 4"	7"	10"
* 6"	7"	15"
* 8"	7"	20"

* 2 OPENINGS REQUIRED

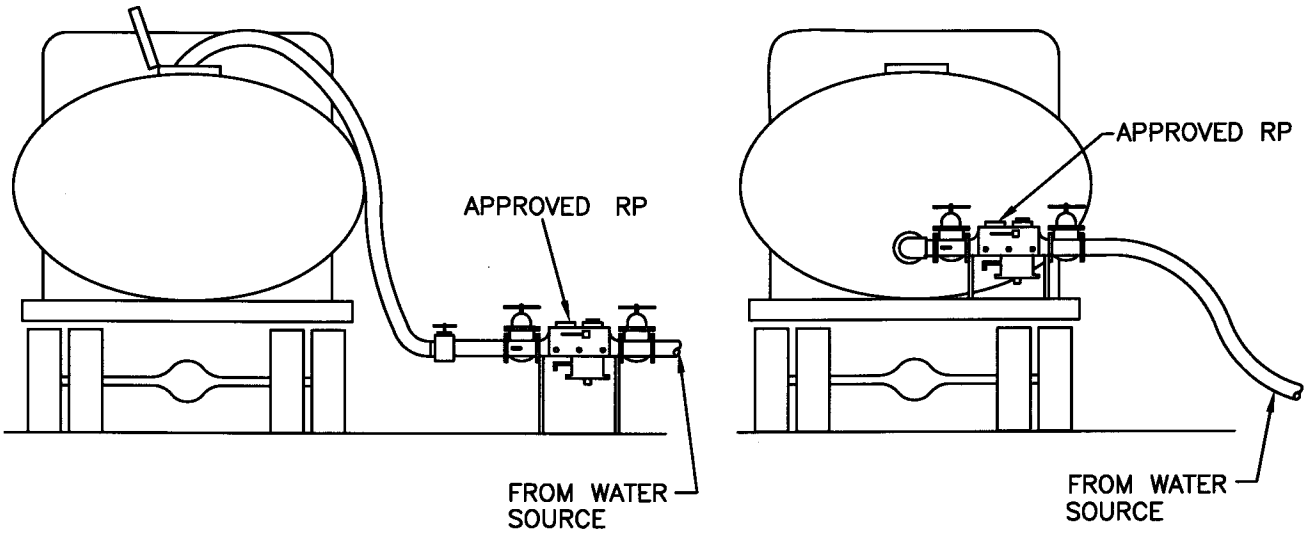
REQUIREMENTS

1. NO TAPS, TEES OR OTHER CONNECTIONS OF ANY KIND ARE PERMITTED BETWEEN THE WATER METER AND RECEIVING VESSEL.
2. THE OVERFLOW OPENING AND SCREEN SIZE SHALL BE AS SHOWN ON THE VENT AND OVERFLOW TABLE OR OF GREATER CAPACITY AS REQUIRED TO MAINTAIN THE SPECIFIED AIR GAP SYSTEM.
3. PROTECTION FROM FREEZE DAMAGE MAY BE NECESSARY IN EXPOSED AREAS.

APPROVED ALTERNATIVE INSTALLATION FOR AN AIR GAP SYSTEM	REF. & REV. AUG., 2002	CITY OF FRESNO W-20



AIR–GAP PROTECTION

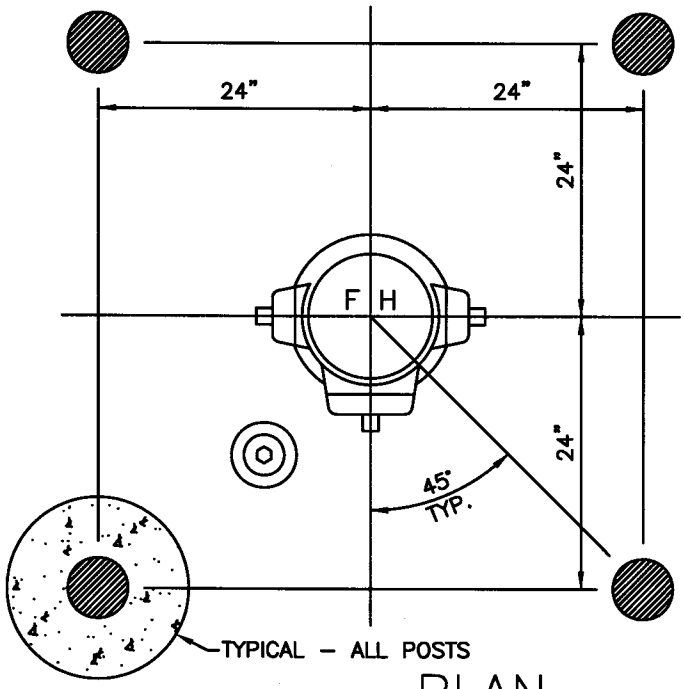


MECHANICAL ASS'Y PROTECTION

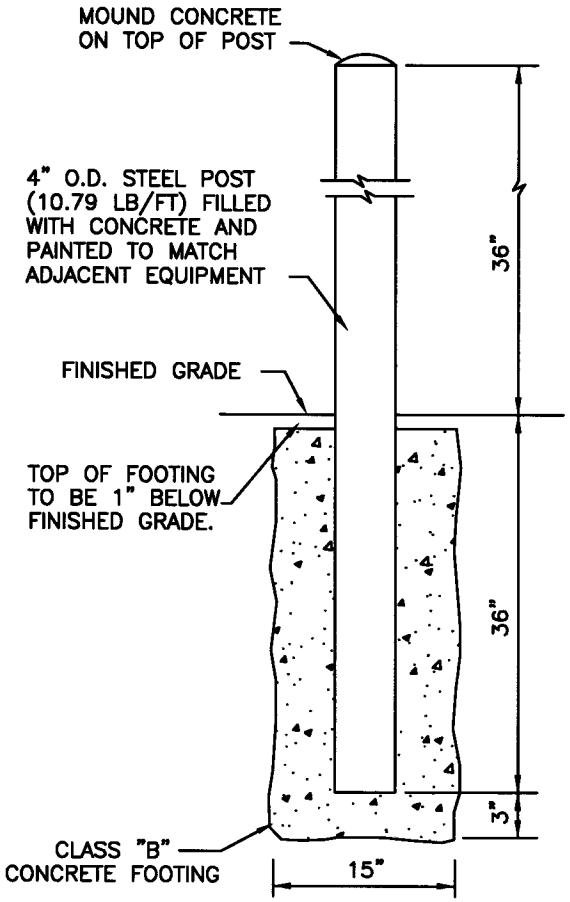
REQUIREMENTS

1. AIR–GAP MUST BE APPROVED "AIR–GAP" SYSTEM.
2. MECHANICAL BACKFLOW PREVENTER MUST BE AN APPROVED REDUCED PRESSURE PRINCIPAL ASSEMBLY.
3. BACKFLOW ASSEMBLY MUST BE TESTED BY A CERTIFIED BACKFLOW PREVENTION DEVICE TESTER, WHO IS REGISTERED WITH THE CITY WATER DIVISION. THE TESTS SHALL BE PERFORMED ONCE A YEAR. THE TEST RESULTS MUST BE PROVIDED TO THE CITY WATER DIVISION.
4. TYPICAL EQUIPMENT: WATER TRUCKS, PEST CONTROL TRUCKS, HYDROSEEDING EQUIPMENT, PORTABLE WASHING AND STEAM CLEANING EQUIPMENT.

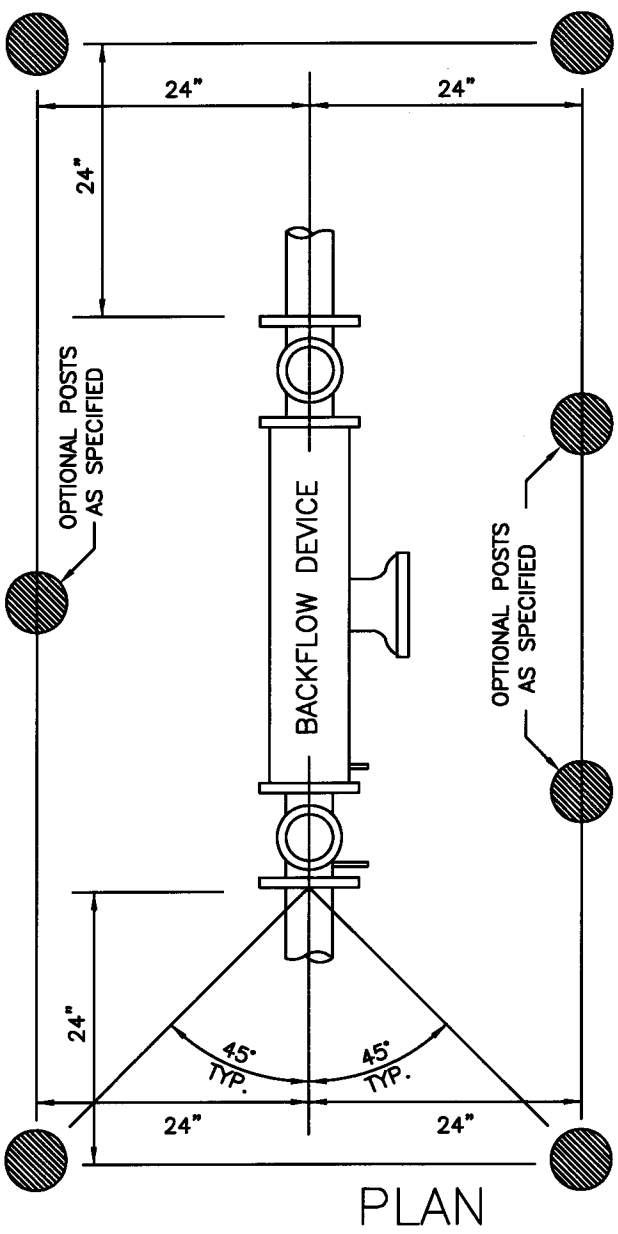
APPROVED PORTABLE WATER TRANSPORT BACKFLOW PROTECTION	REF. & REV. AUG., 2002	CITY OF FRESNO W–21



PLAN



SECTION

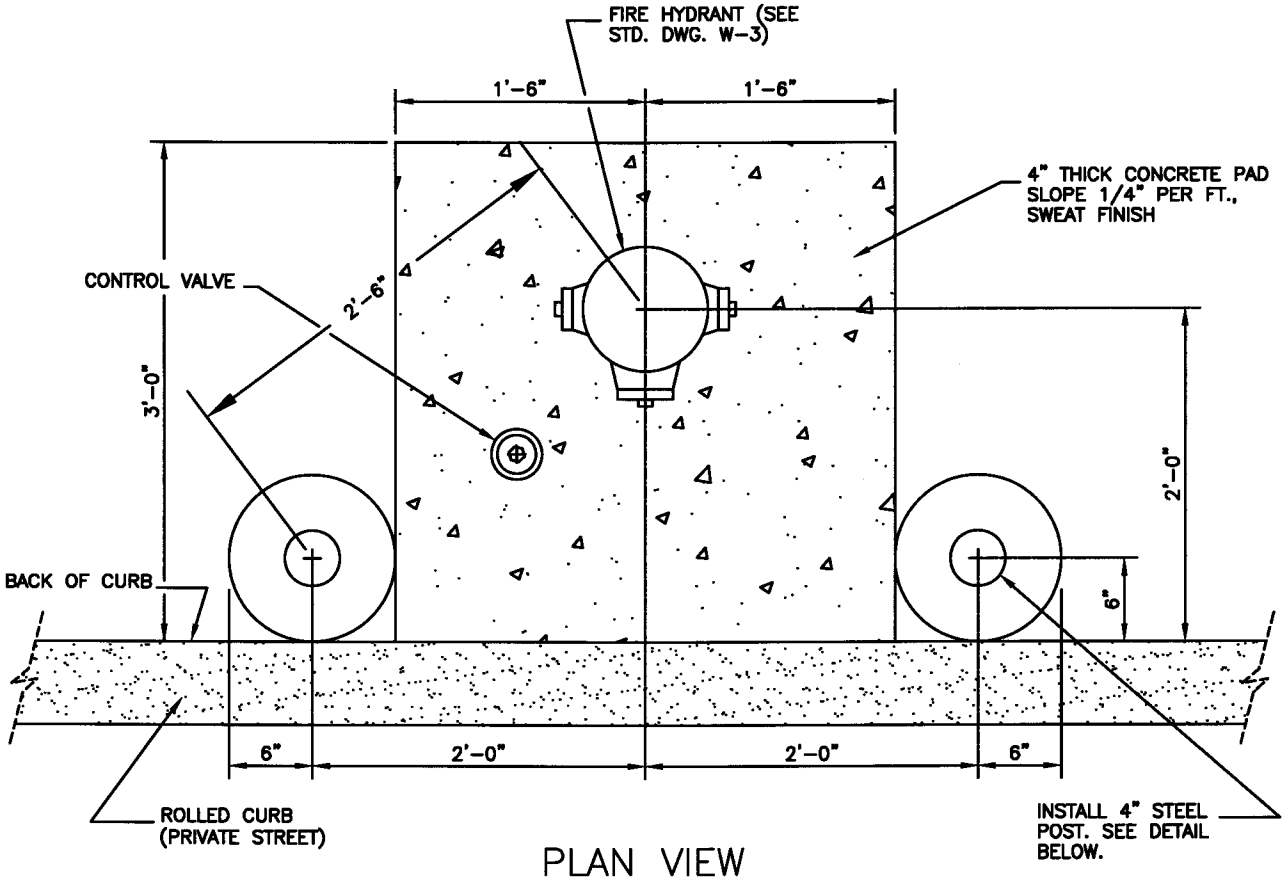


PLAN

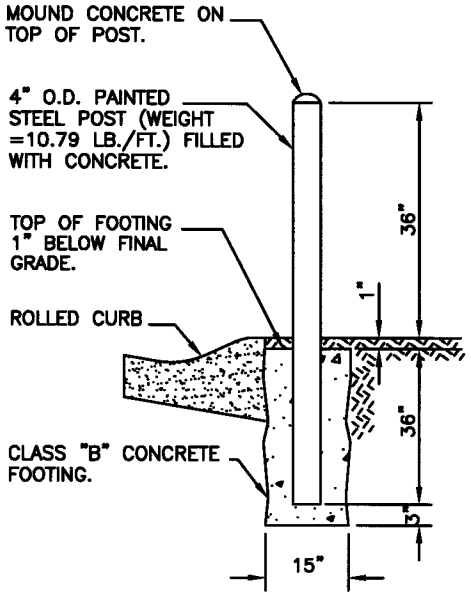
NOTES

1. NUMBER OF POSTS SHALL BE AS SPECIFIED TO FIT VARIOUS FIELD CONDITIONS.
2. POSTS MAY BE USED IN VARIOUS LOCATIONS TO PROTECT FIRE HYDRANTS, BACKFLOW DEVICES AND OTHER ABOVE GROUND EQUIPMENT AS REQUIRED.

GUARD POST DETAILS	REF. & REV. DEC., 2003	CITY OF FRESNO W–22



PLAN VIEW



DETAIL OF STEEL GUARD POST

NOTES:

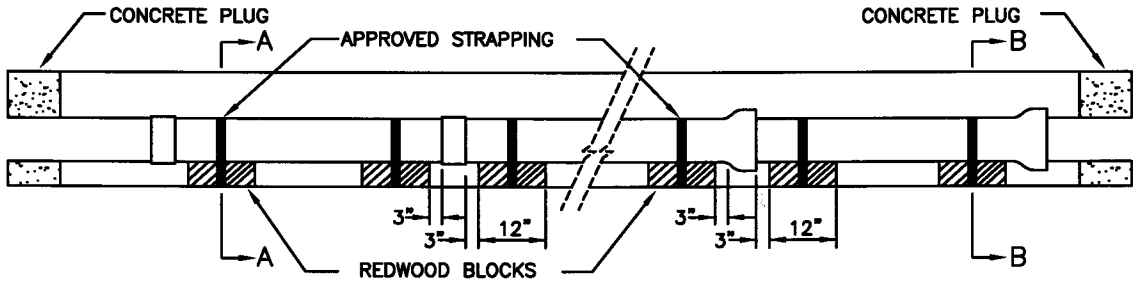
1. THE MAINTENANCE OF THE FIRE HYDRANT PROTECTOR POST SHALL BE THE RESPONSIBILITY OF THE HOMEOWNERS' ASSOCIATION, WITHIN PRIVATE STREETS.
2. IN THE EVENT ANY DAMAGE IS NOTED, THE CITY WILL NOTIFY THE HOMEOWNERS' ASSOCIATION TO PERFORM THE NECESSARY REPAIRS.
3. IF THE DAMAGE IS NOT REPAIRED WITHIN 30 CALENDAR DAYS FROM THE DATE OF THE CITY NOTICE, THE CITY SHALL PERFORM THE NECESSARY REPAIRS AND BILL THE HOMEOWNERS' ASSOCIATION FOR THE ASSOCIATED REPAIR COST.
4. POSTS SHALL BE KEPT IN GOOD REPAIR, AND SHALL BE CLEANED OR REPAINTED AS NECESSARY TO PRESERVE THEIR APPEARANCE.

FIRE HYDRANT INSTALLATION
WITH GUARD POSTS

REF. & REV. DEC., 2003

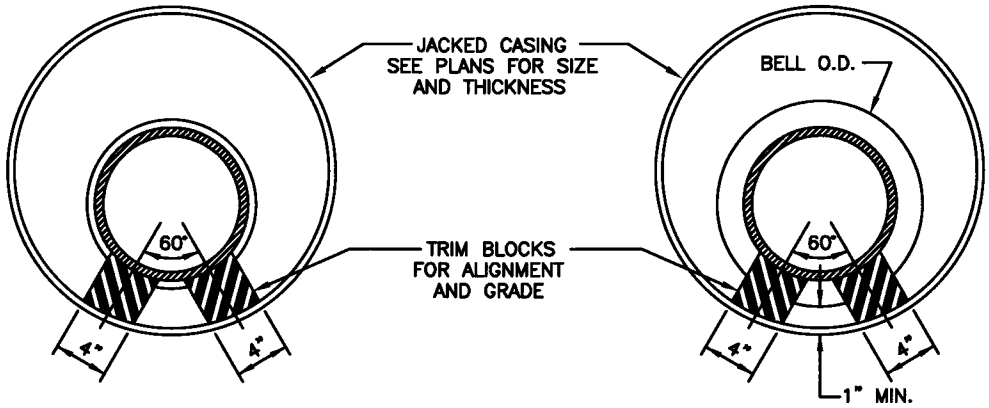
CITY OF FRESNO

W-23



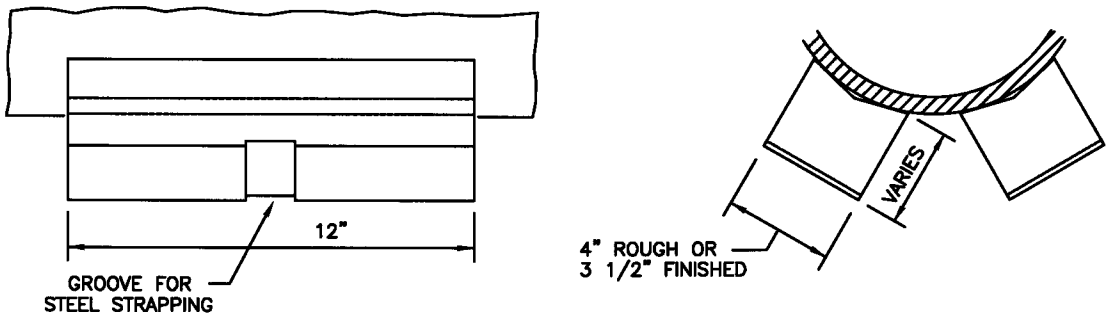
BELL–LESS PIPE

BELL PIPE



SECTION A–A

SECTION B–B

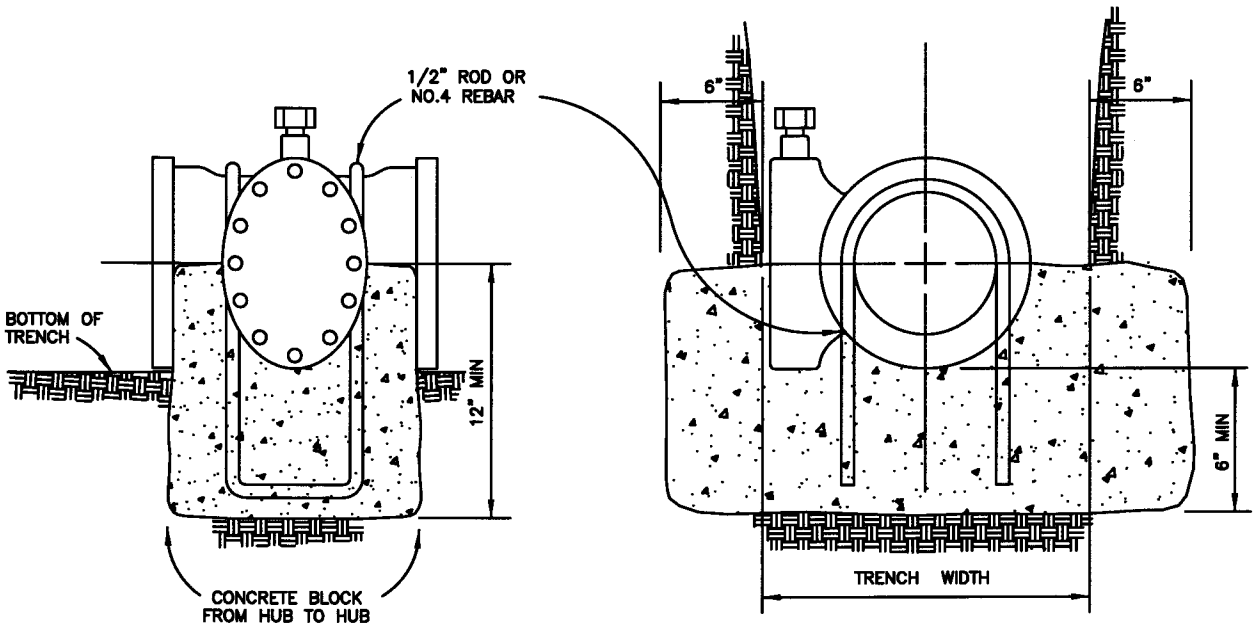


REDWOOD BLOCK DETAIL

NOTES:

1. REDWOOD BLOCKS SHALL BE CONSTRUCTION GRADE.
2. REDWOOD BLOCKS SHALL BE VEED TO FIT CONTOUR OF PIPE.
3. WHEN JACKING CASING, GRADE SHALL BE SET SO CENTERLINE OF CASING SHALL COINCIDE WITH CENTERLINE OF WATER MAIN.
4. REDWOOD BLOCKS SHALL BE STRAPPED TO THE PIPE WITH STEEL STRAPPING OR APPROVED WIRE BANDS.
5. PLUG ENDS OF CASING WITH 12 INCHES MINIMUM OF CONCRETE.
6. CONCRETE SHALL BE CLASS B.

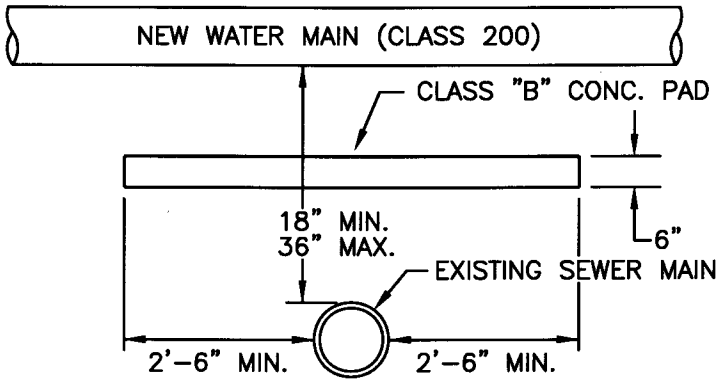
INSTALLATION OF WATER PIPE IN JACKED STEEL CASING	REF. & REV. AUG., 2002	CITY OF FRESNO W–24

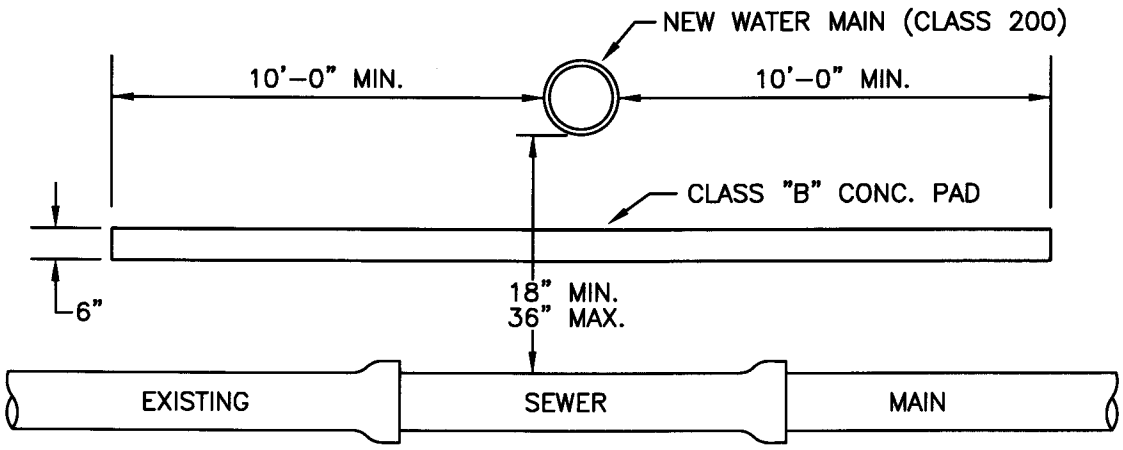


NOTE:

OPERATING NUT OF BUTTERFLY VALVE SHALL BE PLACED ON SOUTH OR WEST SIDE DEPENDING ON LINE LOCATION.

VALVE ANCHOR FOR LINE VALVE	REF. & REV. AUG., 2002	CITY OF FRESNO W–25





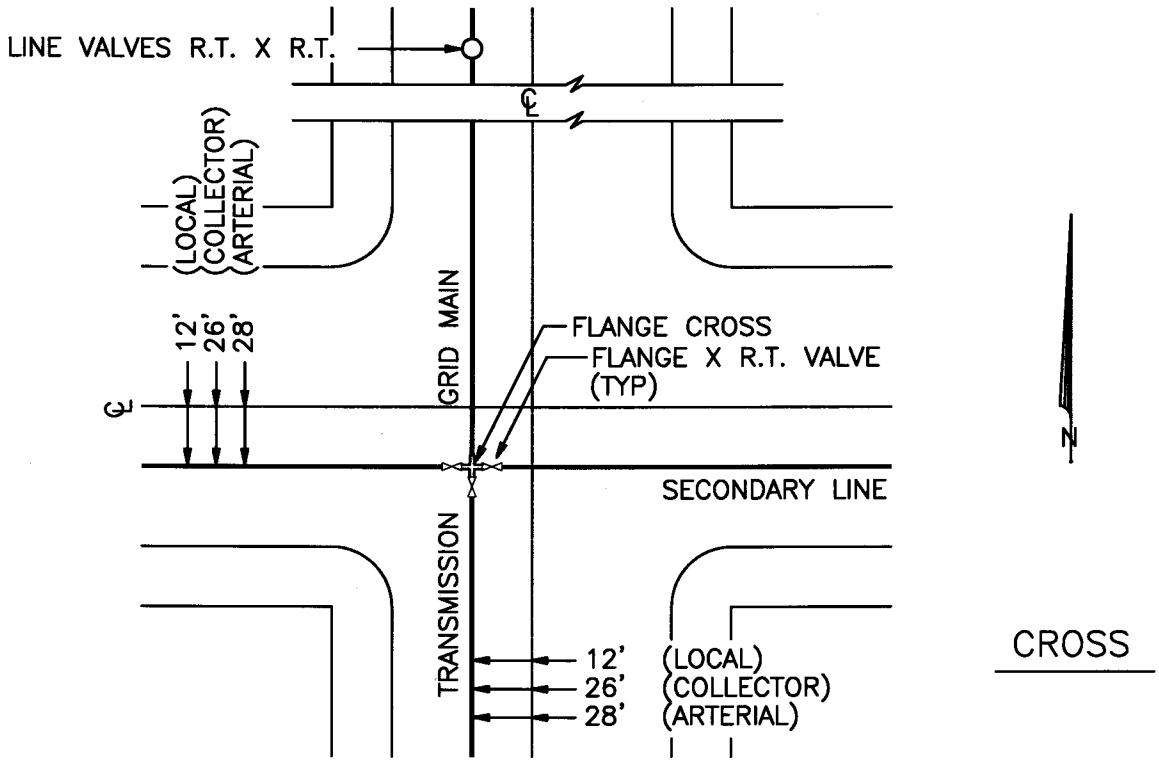
ALTERNATIVE TO FULL CONCRETE ENCASEMENT

(NEW WATER MAIN CROSSING EXISTING SEWER MAIN ZONE D)

REF. & REV.
AUG., 2002

CITY OF FRESNO

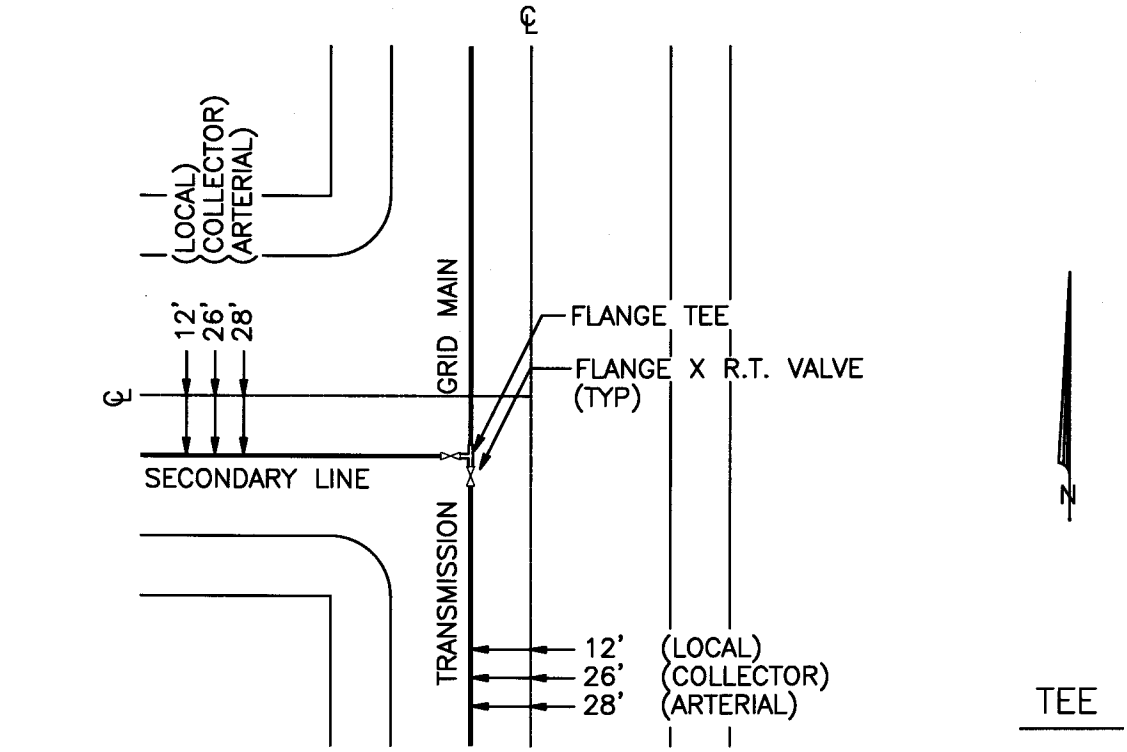
W-26



CROSS

NOTES:

1. DISTANCE BETWEEN VALVES SHALL NOT EXCEED 600' WITHOUT APPROVAL OF ENGINEER.
2. RINGTITE JOINTS SHALL MEAN TYTON JOINT WHERE CAST IRON OR DUCTILE IRON PIPE IS USED.



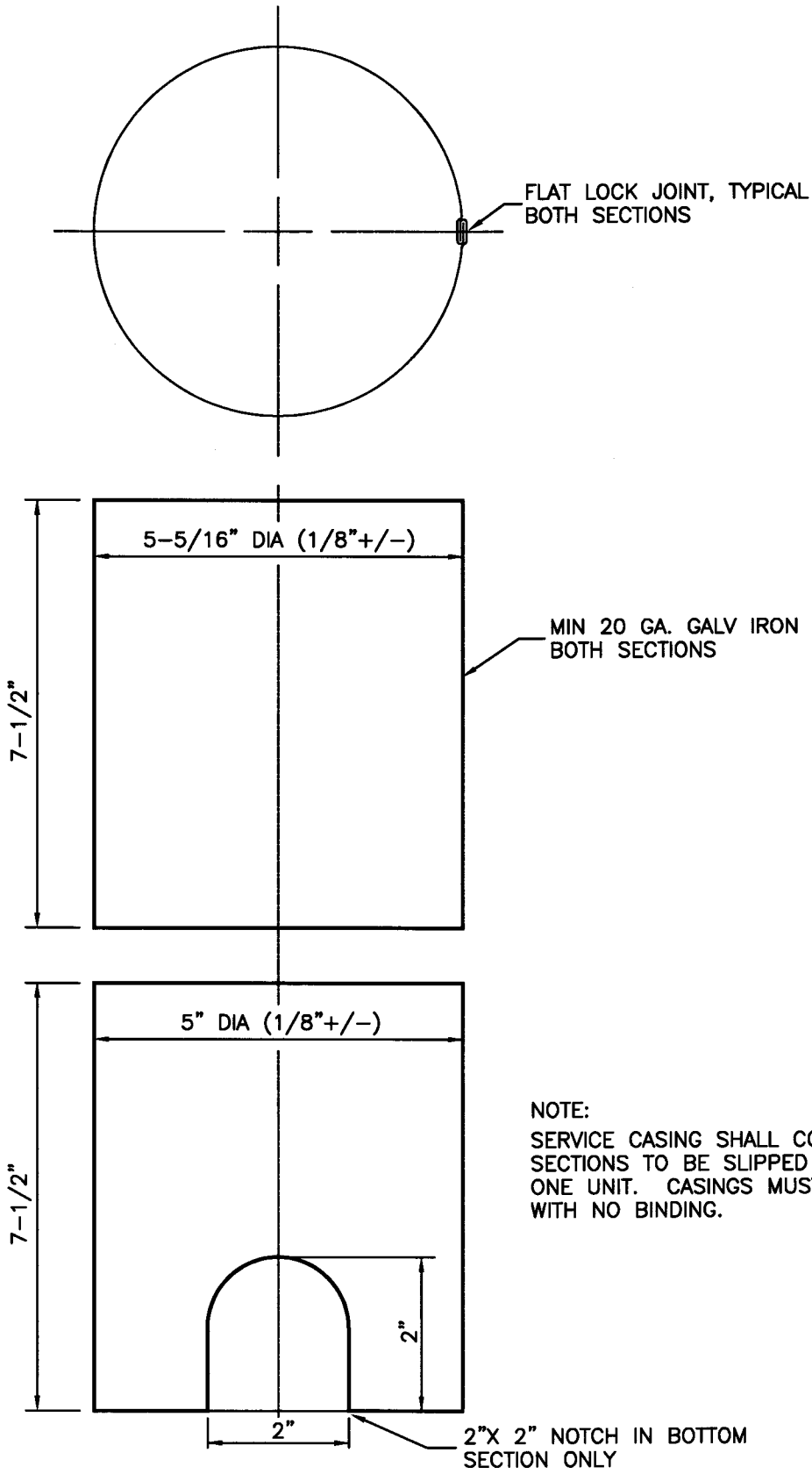
TEE

TYPICAL INTERSECTION CONNECTIONS

REF. & REV.
AUG., 2002

CITY OF FRESNO

W-27



NOTE:

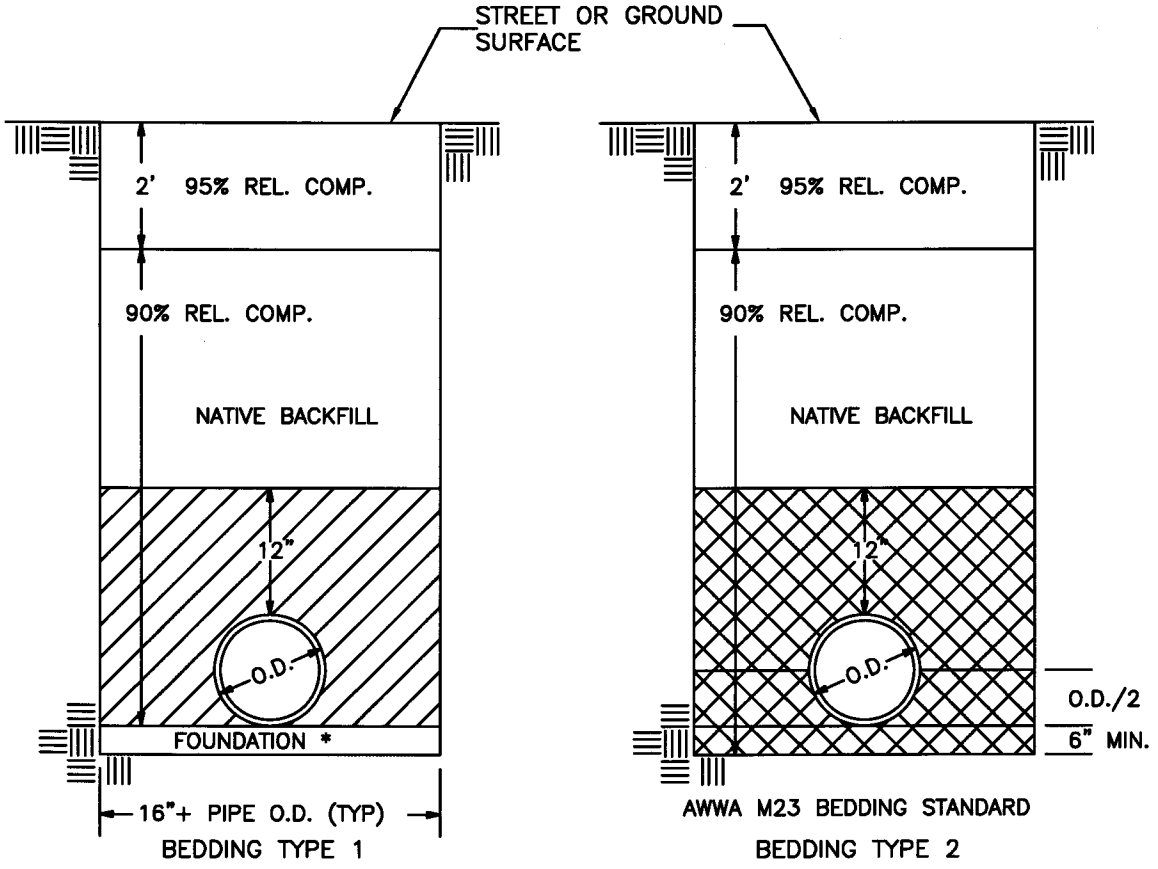
SERVICE CASING SHALL CONSIST OF BOTH SECTIONS TO BE SLIPPED TOGETHER AS ONE UNIT. CASINGS MUST SLIDE FREELY WITH NO BINDING.

SERVICE CASING

REF. & REV.
AUG., 2002

CITY OF FRESNO

W-28



SIZE OF WATER MAIN	PIPE MATERIAL		
	DUCTILE IRON**	PVC CL.150	PVC CL.235
6" – 12"	TYPE 1	TYPE 2	N.A.
14" AND LARGER	TYPE 1	N.A.	TYPE 1

SELECT MATERIAL – 2" DIAMETER OR SMALLER

SELECT MATERIAL – 3/4" DIAMETER OR SMALLER

BELL HOLES ARE REQUIRED FOR PUSH ON AND MECHANICAL JOINT PIPE.

NO JETTING ALLOWED FOR PVC WATER PIPE.

* IF HARDPAN EXISTS, EXCAVATE 4" AND BACKFILL WITH SELECT MATERIAL.

** CLASS 250 (14" TO 20") OR 350 (UP TO AND INC. 12")

WATER MAIN BEDDING DETAILS

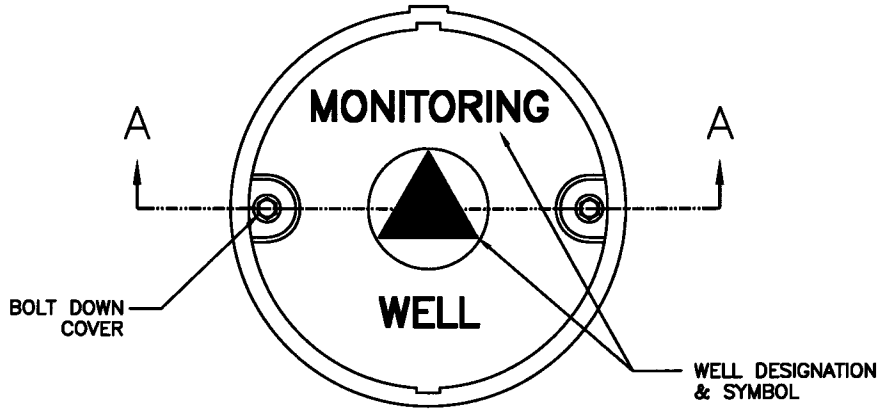
REF. & REV. DEC., 2003

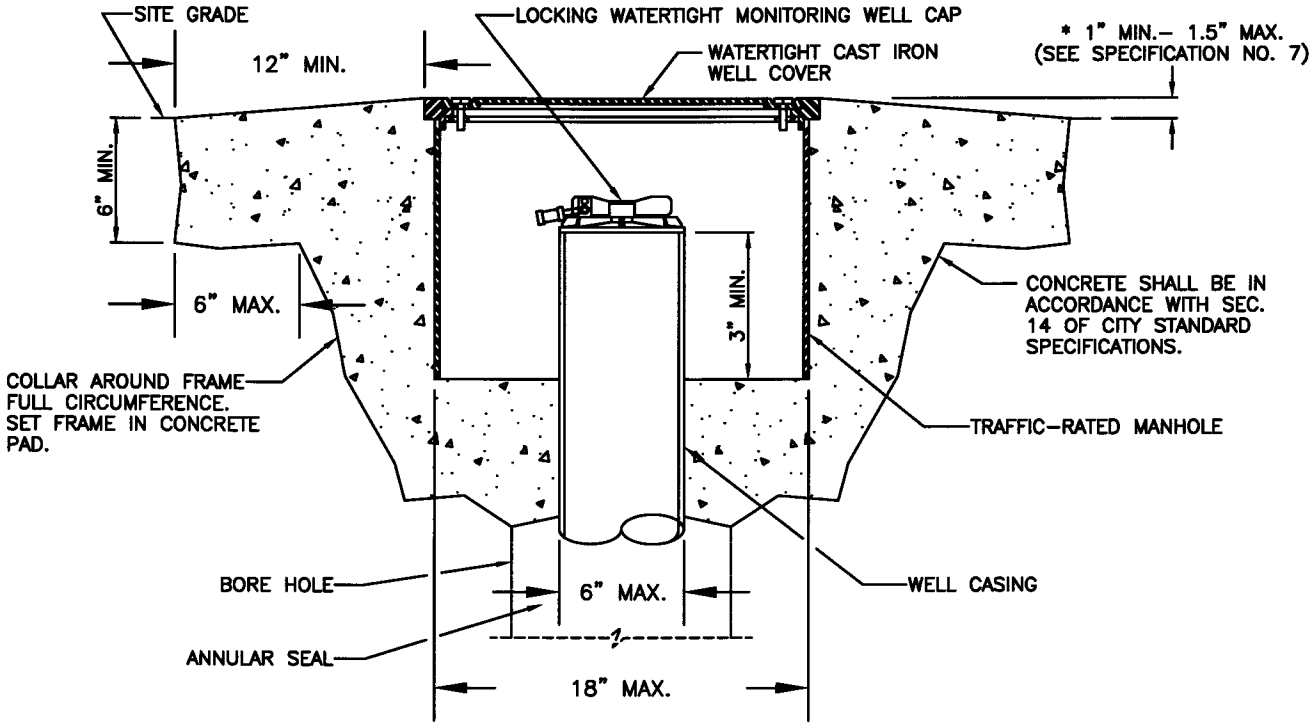
CITY OF FRESNO

W–29

SPECIFICATIONS

1. THIS STANDARD IS NOT ALLOWED WITHIN THE TRAVELED WAY AND ANY PAVED AREAS OF A PUBLIC STREET.
2. NO LESS THAN 12 FEET OF HORIZONTAL SEPARATION SHALL BE MAINTAINED BETWEEN THE MONITORING WELL AND ANY EXISTING UNDERGROUND UTILITY.
3. THE WELL BOX SHALL BE STRUCTURALLY SOUND AND STRONG ENOUGH TO SUPPORT VEHICULAR TRAFFIC. IT SHALL BE TRAFFIC-RATED AS TESTED BY AN OFFICIAL TESTING LABORATORY TO MEET AASHTO STANDARD FOR "H-20" TRUCK LOADINGS.
4. THE TOP OF THE WELL SHALL BE PERMANENTLY MARKED WITH LARGE LETTERS "MONITORING WELL."
5. THE WELL COVER SHALL BE BOLT DOWN OR EQUIVALENT TO PROVIDE PROTECTION AGAINST UNAUTHORIZED ACCESS.
6. THE WELL COVER SHALL BE WATERTIGHT TO PROTECT AGAINST ENTRY OF SURFACE WATER.
7. THE TOP OF THE WELL SHALL BE SET 1.0 TO 1.5 INCHES ABOVE SURROUNDING GRADE TO PROVIDE FOR DRAINAGE AWAY FROM THE COVER, EXCEPT FOR WELLS INSTALLED IN SIDEWALK OR PAVED AREAS WHERE TOP OF THE CONCRETE PAD SHALL BE INSTALLED FLUSH AND MATCH EXISTING CONDITIONS.
8. A CONCRETE PAD WITH A MINIMUM THICKNESS OF 6 INCHES SHALL BE CONSTRUCTED AROUND THE WELL BOX. THE PAD SHALL EXTEND LATERALLY A MINIMUM OF 12 INCHES FROM OUTSIDE OF THE WELL BOX. THE PAD SHALL BE CONSTRUCTED TO BE FREE OF CRACKS OR OTHER DEFECTS LIKELY TO AFFECT WATER TIGHTNESS.
9. A LOCKING WATERTIGHT WELL CAP SHALL BE INSTALLED AT THE TOP OF THE WELL CASING SO THAT SURFACE WATER THAT MAY ENTER THE VAULT WILL NOT ENTER THE WELL.
10. MONITORING WELLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CALIFORNIA WELL STANDARDS.





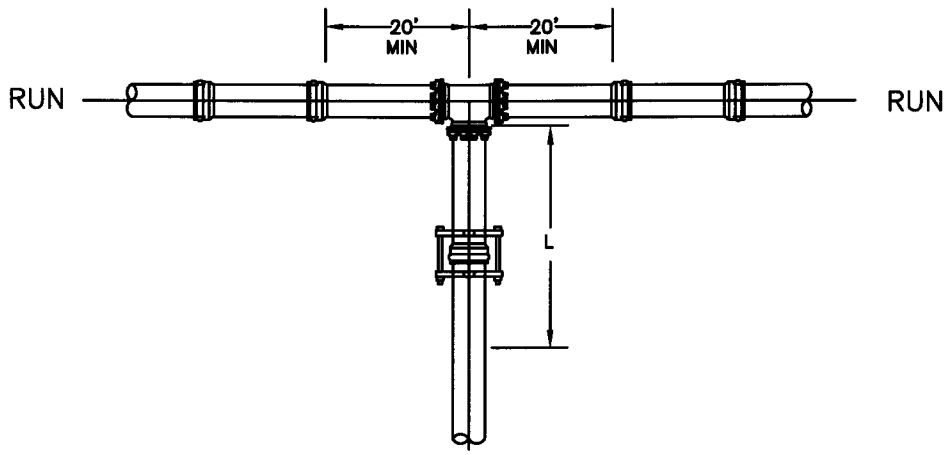
SECTION A–A

MONITORING WELL MANHOLE CONSTRUCTION DETAIL

REF. & REV. AUG., 2002

CITY OF FRESNO

W–30



BRANCH

RUN SIZE

BRANCH SIZE	4	6	8	10	12	14	16	18	20	24
4	*	*	*	*	*	*	*	*	*	*
6		*	*	*	*	*	*	*	*	*
8			*	*	*	*	*	*	*	*
10				*	*	*	*	*	*	*
12					13	*	*	*	*	*
14						24	13	*	*	*
16							36	25	14	*
18								47	37	16
20									58	39
24										79

* –FOR THIS CONDITION NEED ONLY RESTRAIN THE BRANCH OUTLET OF THE TEE.

RESTRAINED LENGTHS, "L" (IN FEET)

1. RESTRAIN THE TWO MECHANICAL JOINTS ON THE RUN SIDES OF THE TEE. WHEN LESS THAN A FULL 20' LENGTH OF PIPE IS INSTALLED ON EACH SIDE OF THE RUN.
2. ALL JOINTS WITHIN THE LENGTH "L" ON THE BRANCH MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS ON PUSH–ON PIPE PER CITY SPECIFICATION.
3. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION 22 OF GENERAL CONDITIONS.

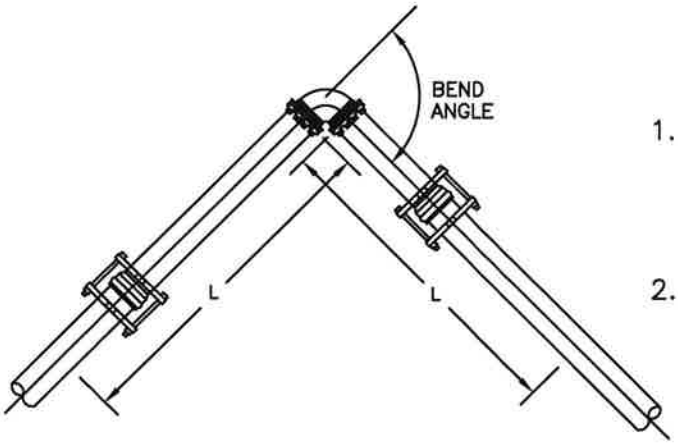
PVC TEE RESTRAINTS

REF. & REV. MAR., 2006

CITY OF FRESNO

W–31

HORIZONTAL BEND

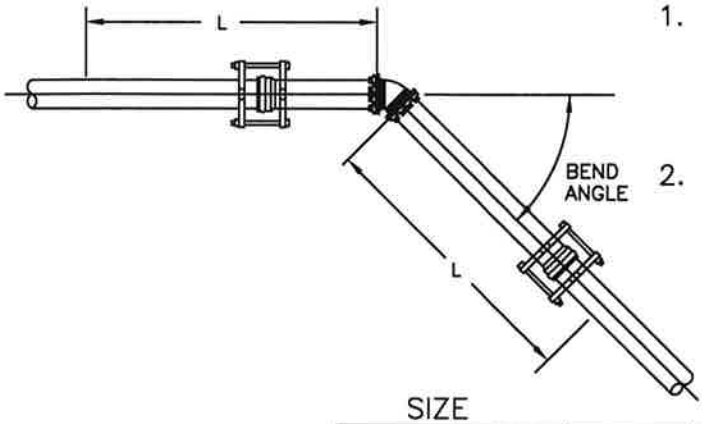


1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER CITY STD. SPECIFICATIONS.
2. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION 22 OF GENERAL CONDITIONS.

BEND ANGLE \ SIZE	4	6	8	10	12	14	16
11.25	3	3	3	4	4	5	5
22.5	3	5	7	7	9	10	11
45	7	11	13	15	18	20	23
90	17	24	31	37	43	49	55

RESTRAINED LENGTHS, "L" (IN FEET)

VERTICAL BEND



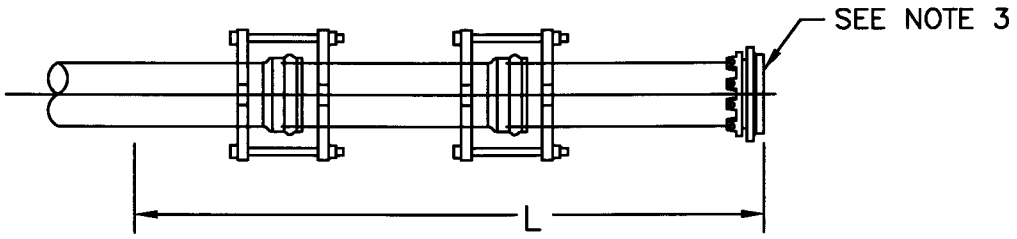
1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER CITY STD. SPECIFICATIONS.
2. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION 22 OF GENERAL CONDITIONS.

BEND ANGLE \ SIZE	4	6	8	10	12	14	16
11.25	5	7	9	11	13	15	17
22.5	11	15	19	23	27	31	35
45	23	31	40	48	56	64	72

RESTRAINED LENGTHS, "L" (IN FEET)

PVC BEND RESTRAINTS	REF. & REV. MAR., 2006	CITY OF FRESNO W-32

DEAD END FOR PVC PIPE



1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER CITY STANDARD SPECIFICATIONS.
2. FOR TEST PRESSURES AND LAYING CONDITIONS, SEE SECTION 22 OF GENERAL CONDITIONS.
3. WHEN APPROVED, CONCRETE THRUST BLOCK MAY BE USED AS SHOWN ON STANDARD DRAWING W-6.

PIPE SIZE						
4	6	8	10	12	14	16
52	73	96	115	136	155	174

RESTRAINED LENGTHS, "L" (IN FEET)

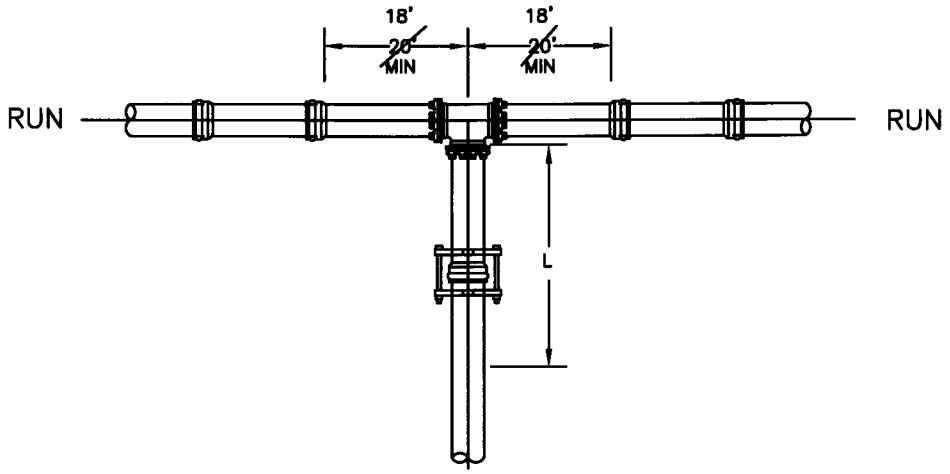
GENERAL NOTES ON USE OF RESTRAINED JOINT LENGTHS

THESE RESTRAINED LENGTH CALCULATIONS ARE BASED ON THE FOLLOWING DESIGN CRITERIA

1. THREE (3) FEET MINIMUM DEPTH OF COVER
2. A SAFETY FACTOR OF 1.5
3. SOIL TYPE OF SM--SILTY GRAVEL AND SILTY SANDS AS DEFINED BY ASTM D-2487
4. TRENCH COMPACTION OF TYPE 5 - PIPE BEDDED IN COMPACTED GRANULAR MATERIAL TO THE CENTER LINE OF PIPE, 4 INCHES MINIMUM UNDER PIPE. COMPACTED GRANULAR MATERIAL OR SELECT MATERIAL TO TOP OF THE PIPE. (APPROXIMATELY 90 PERCENT STANDARD PROCTOR DENSITY, AASHTO T-99)
5. TEST PRESSURES OF 200 PSI FOR THE 4 THROUGH 16 INCH SIZES

IF ACTUAL CONDITIONS DIFFER FROM THOSE LISTED ABOVE OR THE REQUIRED RESTRAINED LENGTH CANNOT BE MET, CONSULT THE DESIGN ENGINEER FOR MODIFICATIONS TO THE RESTRAINED LENGTHS OR DESIGN.

PVC PIPE RESTRAINTS	REF. & REV. MAR., 2006	CITY OF FRESNO W-33



BRANCH

RUN SIZE

BRANCH SIZE	4	6	8	10	12	14	16	18	20	24
4	*	*	*	*	*	*	*	*	*	*
6		*	*	*	*	*	*	*	*	*
8			*	*	*	*	*	*	*	*
10				*	*	*	*	*	*	*
12					13	*	*	*	*	*
14						24	13	*	*	*
16							36	25	14	*
18								47	37	16
20									58	39
24										79

* –FOR THIS CONDITION NEED ONLY RESTRAIN THE BRANCH OUTLET OF THE TEE.

RESTRAINED LENGTHS, "L" (IN FEET)

1. RESTRAIN THE TWO MECHANICAL JOINTS ON THE RUN SIDES OF THE TEE WHEN LESS THAN A FULL 18' LENGTH OF PIPE IS INSTALLED ON EACH SIDE OF THE RUN.
2. ALL JOINTS WITHIN THE LENGTH "L" ON THE BRANCH MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS ON PUSH–ON PIPE PER CITY SPECIFICATION.
3. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION 22 OF GENERAL CONDITIONS.

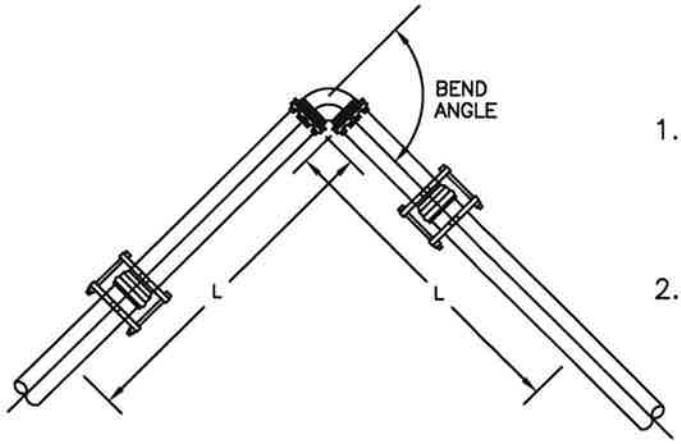
DUCTILE IRON TEE RESTRAINTS

REF. & REV.
MAR., 2006

CITY OF FRESNO

W–34

HORIZONTAL BEND

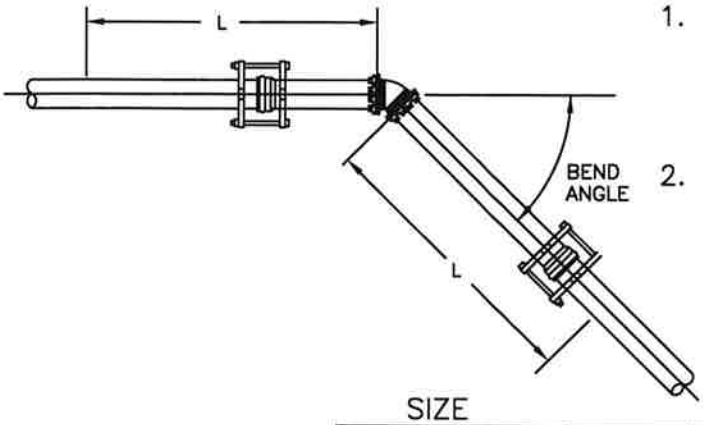


1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER CITY STD. SPECIFICATIONS.
2. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION 22 OF GERNERAL CONDITIONS.

BEND ANGLE \ SIZE	4	6	8	10	12	14	16
11.25	3	3	3	4	4	4	5
22.5	3	4	7	7	8	9	10
45	7	9	12	15	17	19	21
90	16	23	29	35	40	45	51

RESTRAINED LENGTHS, "L" (IN FEET)

VERTICAL BEND



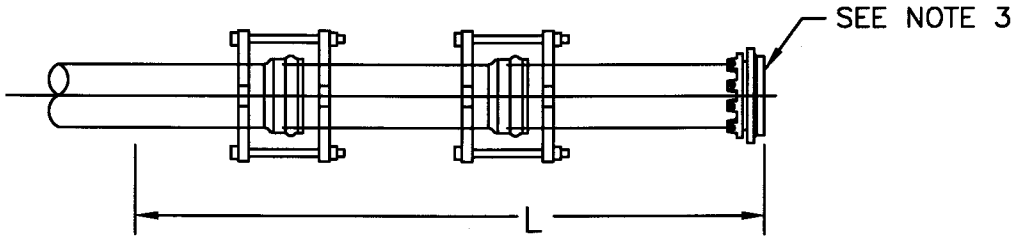
1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER CITY STD. SPECIFICATIONS.
2. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION 22 OF GENERAL CONDITIONS.

BEND ANGLE \ SIZE	4	6	8	10	12	14	16
11.25	3	5	7	8	8	10	11
22.5	7	11	12	15	17	20	22
45	15	19	25	31	36	41	46

RESTRAINED LENGTHS, "L" (IN FEET)

DUCTILE IRON BEND RESTRAINTS	REF. & REV. MAR., 2006	CITY OF FRESNO W-35

DEAD END FOR DUCTILE IRON PIPE



1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER CITY STANDARD SPECIFICATIONS.
2. FOR TEST PRESSURES AND LAYING CONDITIONS, SEE SECTION 22 OF GENERAL CONDITIONS.
3. WHEN APPROVED, CONCRETE THRUST BLOCK MAY BE USED AS SHOWN ON STANDARD DRAWING W-6.

PIPE SIZE						
4	6	8	10	12	14	16
33	47	61	73	86	98	111

RESTRAINED LENGTHS, "L" (IN FEET)

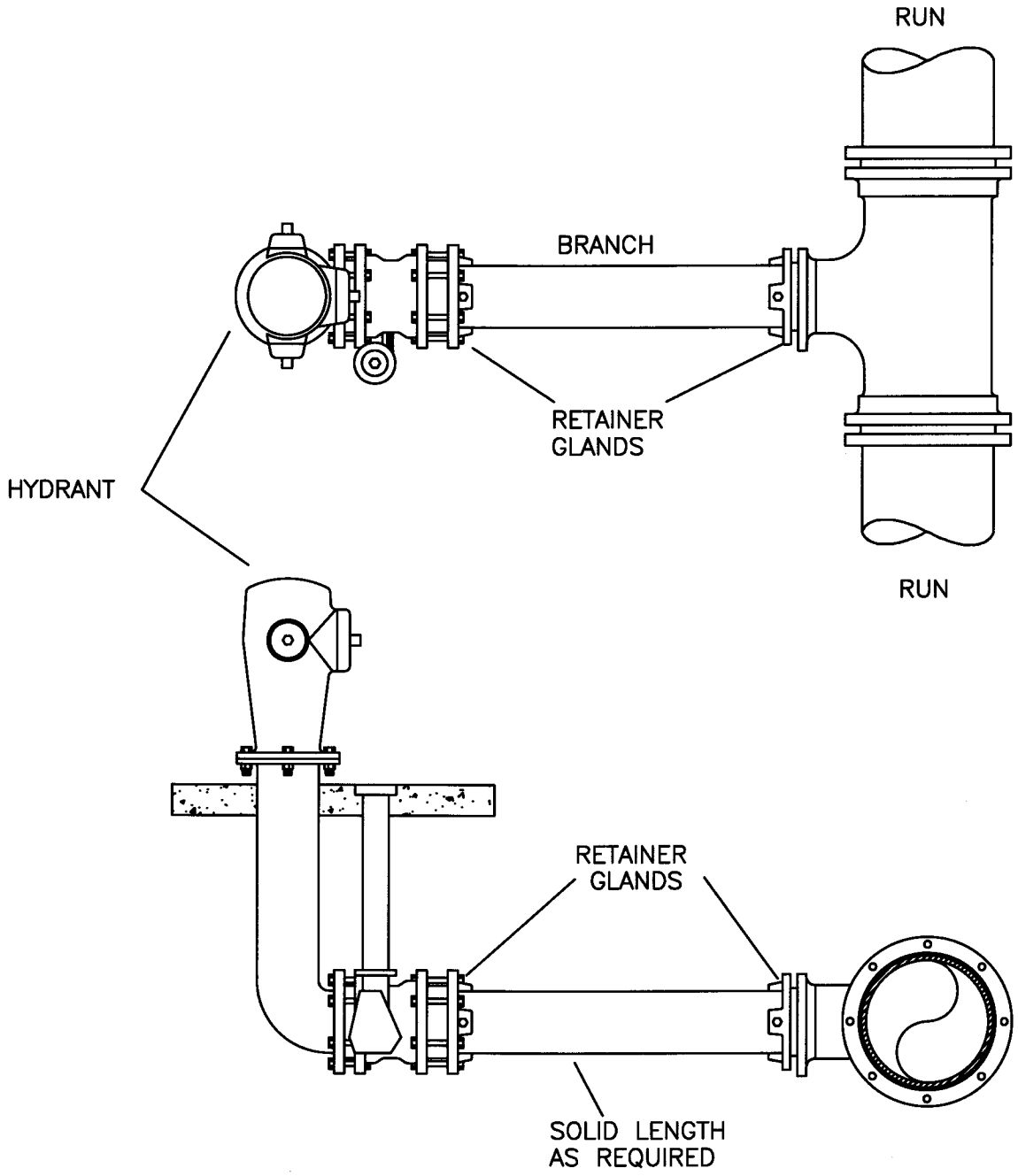
GENERAL NOTES ON USE OF RESTRAINED JOINT LENGTHS

THESE RESTRAINED LENGTH CALCULATIONS ARE BASED ON THE FOLLOWING DESIGN CRITERIA

1. THREE (3) FEET MINIMUM DEPTH OF COVER
2. A SAFETY FACTOR OF 1.5
3. SOIL TYPE OF SM--SILTY GRAVEL AND SILTY SANDS AS DEFINED BY ASTM D-2487
4. TRENCH COMPACTION OF TYPE 5 - PIPE BEDDED IN COMPACTED GRANULAR MATERIAL TO THE CENTER LINE OF PIPE, 4 INCHES MINIMUM UNDER PIPE. COMPACTED GRANULAR MATERIAL OR SELECT MATERIAL TO TOP OF THE PIPE. (APPROXIMATELY 90 PERCENT STANDARD PROCTOR DENSITY, AASHTO T-99)
5. TEST PRESSURES OF 200 PSI FOR THE 4 THROUGH 16 INCH SIZES

IF ACTUAL CONDITIONS DIFFER FROM THOSE LISTED ABOVE OR THE REQUIRED RESTRAINED LENGTH CANNOT BE MET, CONSULT THE DESIGN ENGINEER FOR MODIFICATIONS TO THE RESTRAINED LENGTHS OR DESIGN.

DUCTILE IRON PIPE RESTRAINTS	REF. & REV. MAR., 2006	CITY OF FRESNO W-36



1. HYDRANT MUST BE FULLY RESTRAINED FROM TEE TO HYDRANT. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS ON PUSH ON PIPE PER CITY SPECIFICATION.
2. JOINT RESTRAINT IS NOT REQUIRED ON THE RUN OF THE TEE UNLESS THE TEE FALLS WITHIN THE RESTRAINED LENGTH REQUIREMENT OF ANOTHER FITTING.
3. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION ON GENERAL NOTES FOR USE OF RESTRAINED JOINT LENGTHS.

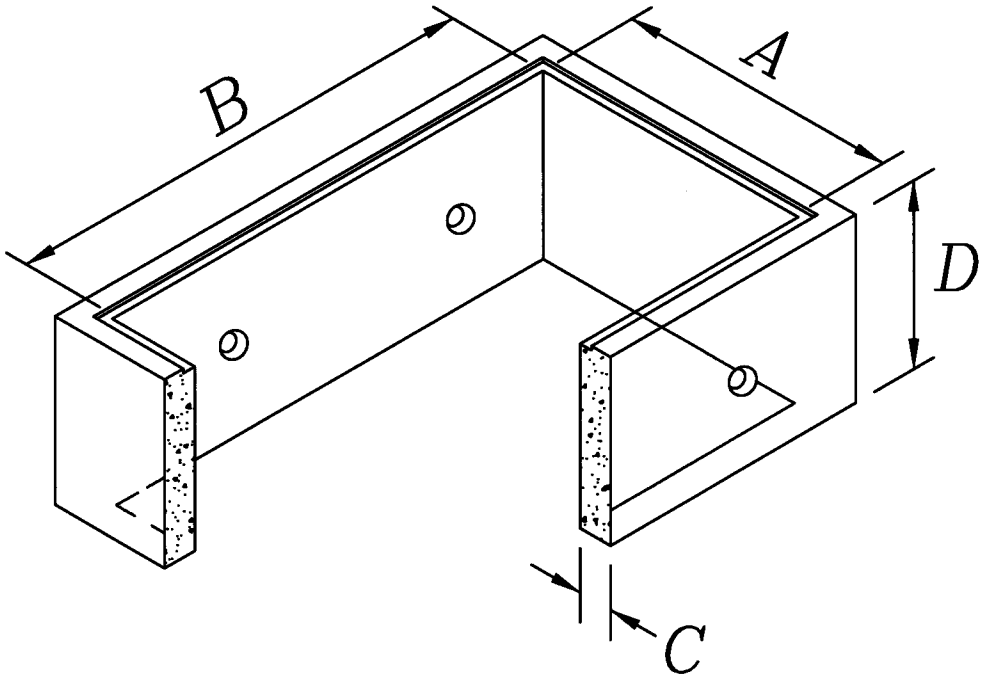
HYDRANT RUN TEE RESTRAINT

FOR PVC OR DUCTILE IRON PIPE

REF. & REV.
DEC., 2003

CITY OF FRESNO

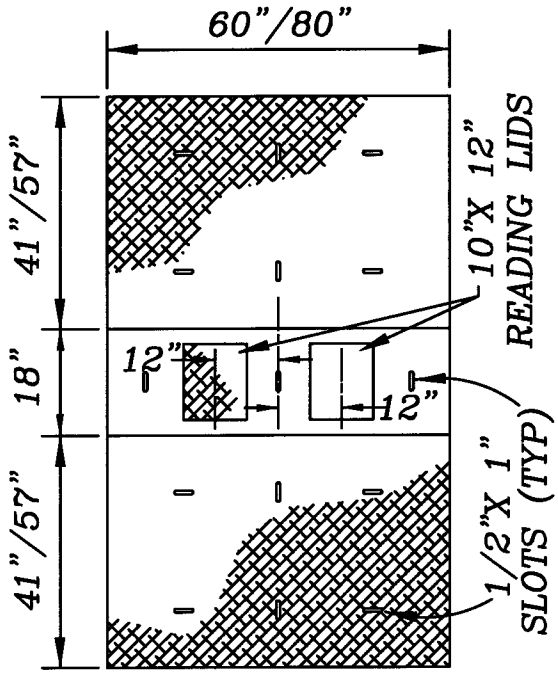
W–37



VAULT	A	B	C	D
TYPE I	60"	100"	6"	42"
TYPE II	80"	132"	6"	42"

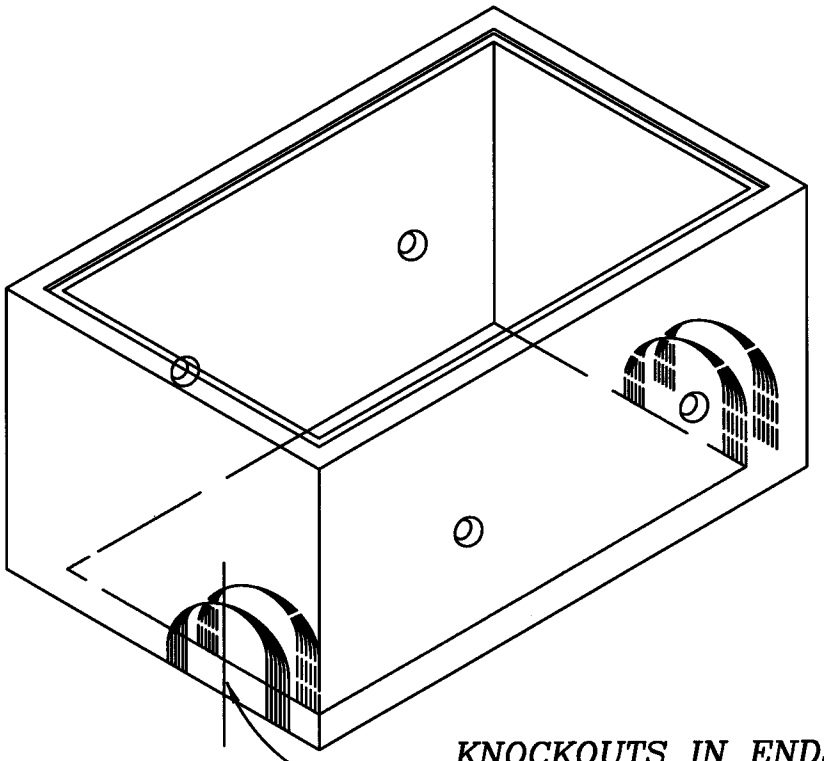
MANUFACTURER SHALL PROVIDE:

1. *SHOP DRAWINGS OF VAULTS WITH WEIGHTS AND PROPOSED LIFTING LUG DETAILS.*
2. *SHOP DRAWINGS OF DIAMOND PLATE PARKWAY COVERS WITH REQUIRED REINFORCEMENT DETAILS.*
3. *SHOP DRAWINGS OF READING LIDS INDICATING METHOD OF HINGING OR RETAINING LID IN THE HOLE.*

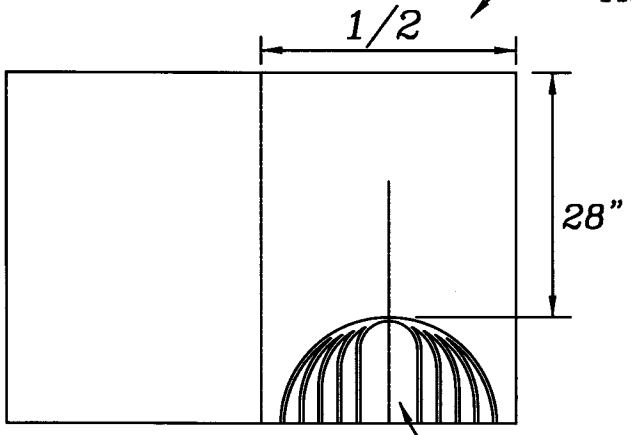


THREE PIECE DIAMOND PLATE COVER WITH READING LID

CONCRETE VAULT AND COVER DETAILS	REF. & REV. AUG., 2002	CITY OF FRESNO W-38



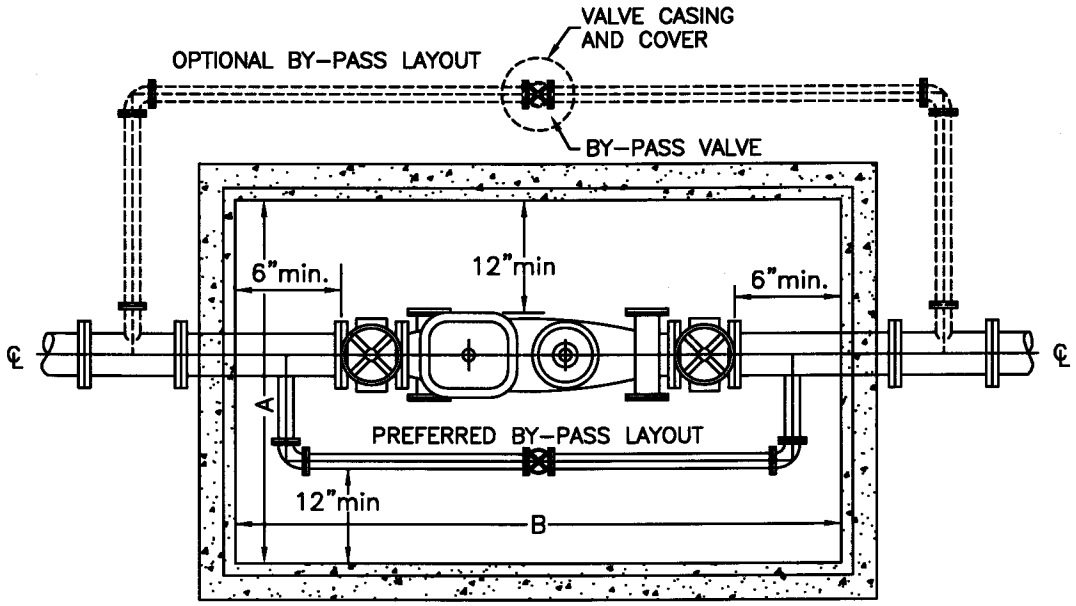
KNOCKOUTS IN ENDS OF VAULT SHALL BE CENTERED IN ONE–HALF THE WIDTH.



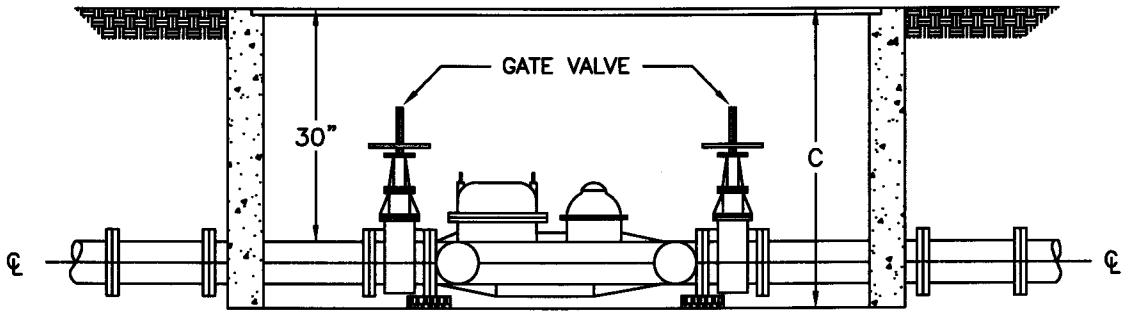
END VIEW

SLEDGE HAMMER KNOCKOUTS

CONCRETE VAULT KNOCKOUT DETAILS	REF. & REV. AUG., 2002	CITY OF FRESNO W–39



PLAN VIEW



ELEVATION

NOTES:

1. BY-PASS MAY BE INSIDE METER BOX OR OUTSIDE METER BOX. IF INSTALLED OUTSIDE METER BOX A CASING AND COVER WILL BE REQUIRED OVER BY-PASS VALVE.
2. 1-1/2 INCH AND 2 INCH BY-PASS VALVES MUST BE BALL VALVES. THREE INCH AND LARGER TO BE RESILIENT SEATING SHUT-OFF VALVES.
3. METERS DEEPER THAN 30 INCHES TO TOP OF PIPE MUST BE RAISED TO 30 INCHES.
4. INLET AND OUTLET VALVES TO BE INSTALLED AT EACH END OF METER.

MINIMUM VAULT SIZE

	A	B	C
3",4"&6"	40"	72"	42"

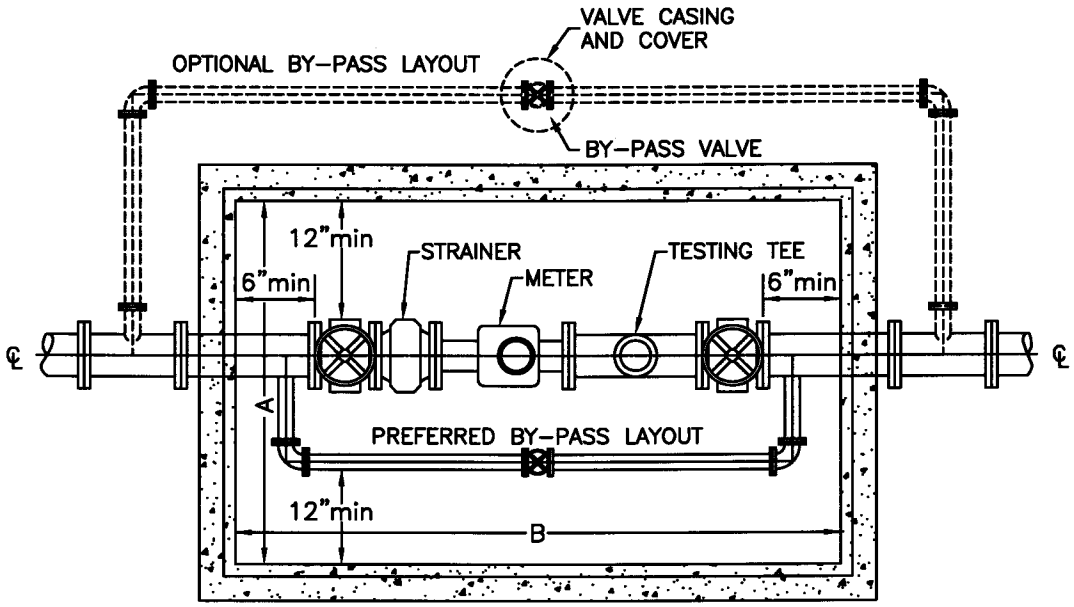
COMPOUND METER SETTING

WITH BY-PASS

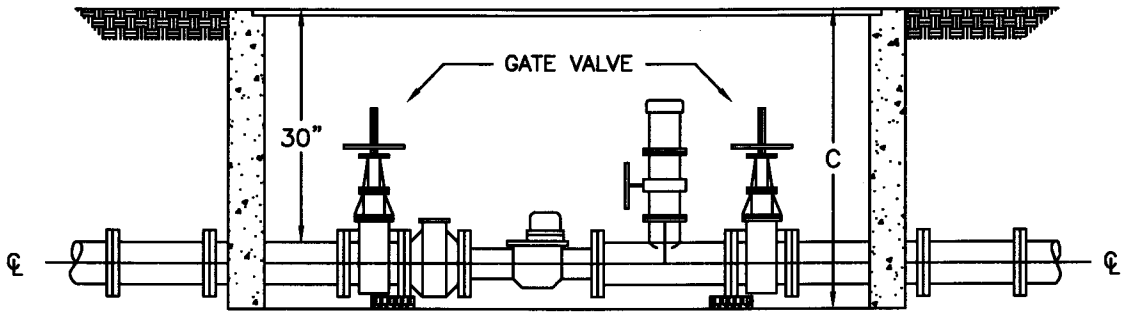
REF. & REV.
AUG., 2002

CITY OF FRESNO

W-40



PLAN VIEW



ELEVATION

NOTES:

1. BY-PASS MAY BE INSIDE METER BOX OR OUTSIDE METER BOX. IF INSTALLED OUTSIDE METER BOX A CASING AND COVER WILL BE REQUIRED OVER BY-PASS VALVE.
2. 1-1/2 INCH AND 2 INCH BY-PASS VALVES MUST BE BALL VALVES. THREE INCH AND LARGER TO BE RESILIENT SEATING SHUT-OFF VALVES.
3. METERS DEEPER THAN 30 INCHES TO TOP OF PIPE MUST BE RAISED TO 30 INCHES.
4. INLET AND OUTLET VALVES TO BE INSTALLED AT EACH END OF METER.
5. TEST TEE TO BE 3 PIPE DIAMETERS DOWNSTREAM OF METER.
6. WHEN CHARGING METER WITH WATER - OPEN INLET VALVE VERY SLOWLY, THEN SLOWLY OPEN OUTLET VALVE.

MINIMUM
VAULT SIZE

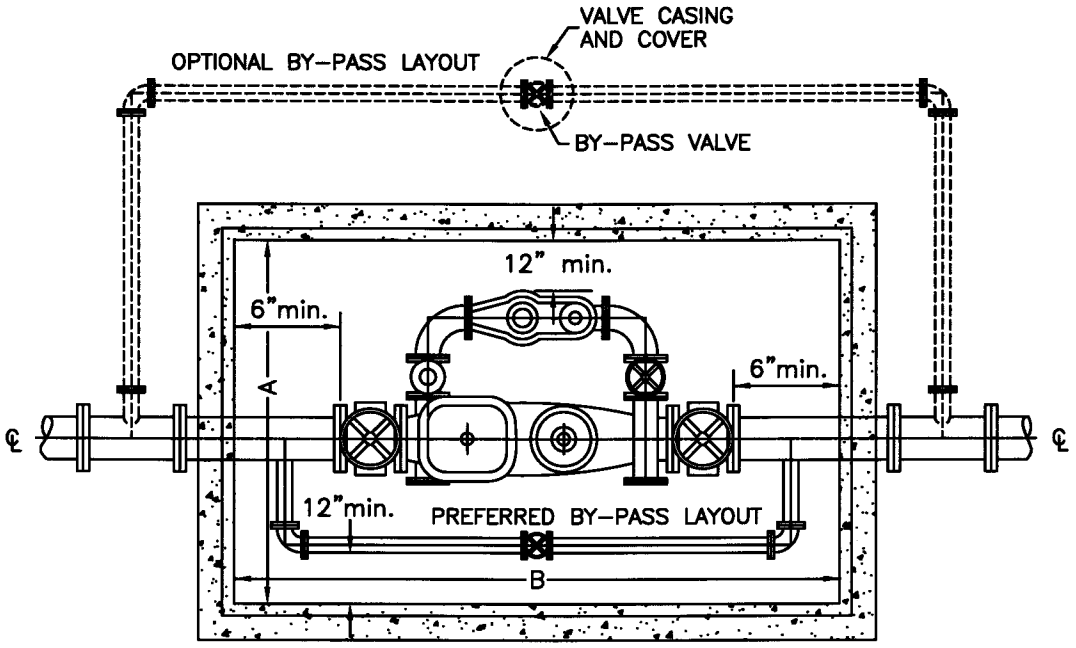
	A	B	C
2",3"&4"	20"	48"	42"
4",6"&8"	40"	72"	42"
10"	60"	100"	42"

TURBINE METER SETTING
WITH BY-PASS

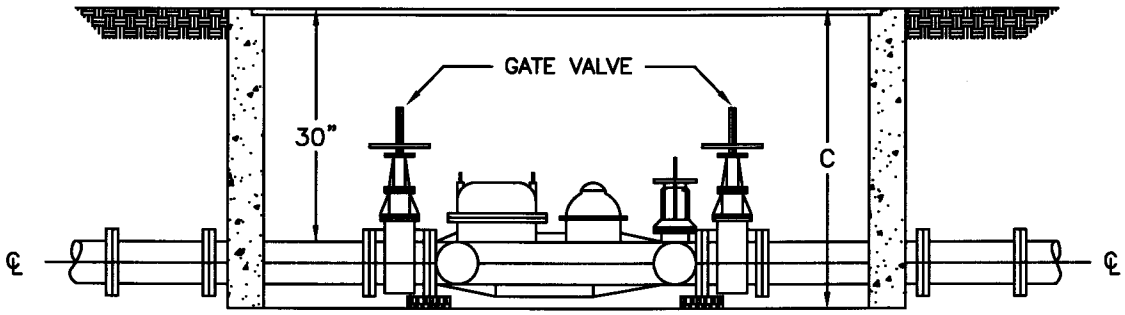
REF. & REV.
AUG., 2002

CITY OF FRESNO

W-41



PLAN VIEW



ELEVATION

NOTES:

1. BY-PASS MAY BE INSIDE METER BOX OR OUTSIDE METER BOX. IF INSTALLED OUTSIDE METER BOX A CASING AND COVER WILL BE REQUIRED OVER BY-PASS VALVE.
2. 1-1/2 INCH AND 2 INCH BY-PASS VALVES MUST BE BALL VALVES. THREE INCH AND LARGER TO BE RESILIENT SEATING SHUT-OFF VALVES.
3. METERS DEEPER THAN 30 INCHES TO TOP OF PIPE MUST BE RAISED TO 30 INCHES.
4. INLET AND OUTLET VALVES TO BE INSTALLED AT EACH END OF METER.

MINIMUM
VAULT SIZE

	A	B	C
4"& 6"	60"	100"	42"
8"& 10"	80"	132"	42"

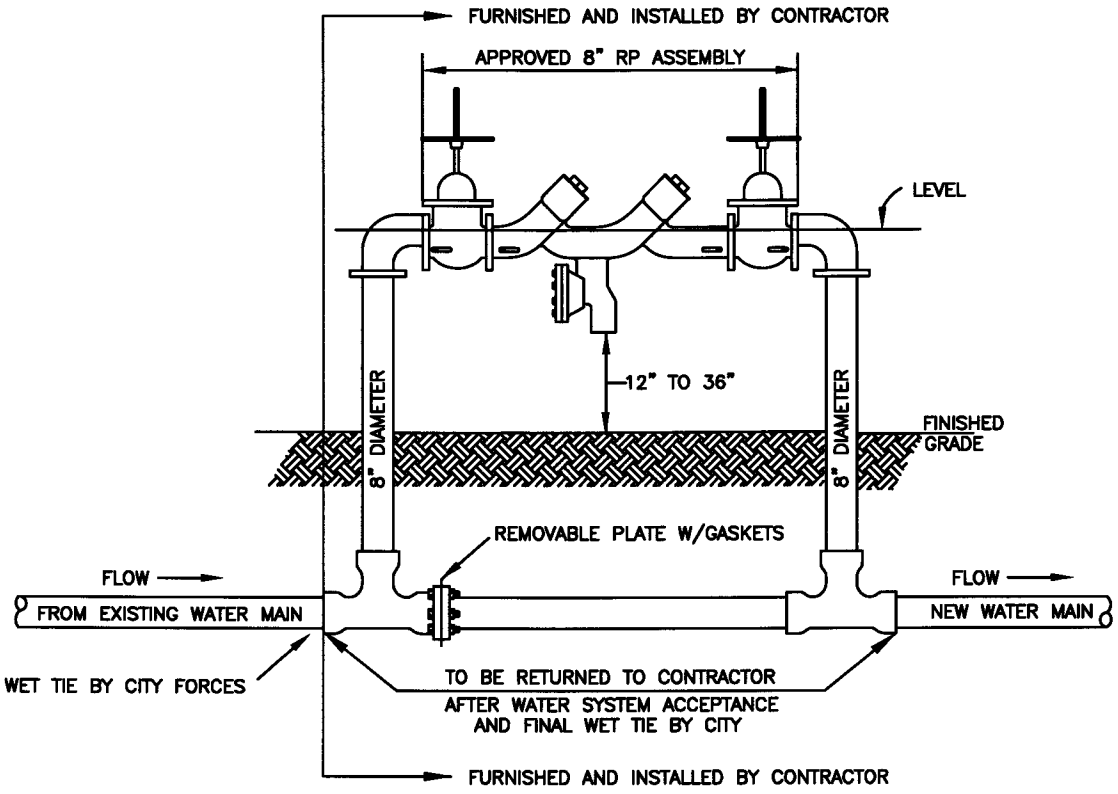
FIRE SERVICE METER SETTING

WITH BY-PASS

REF. & REV.
AUG., 2002

CITY OF FRESNO

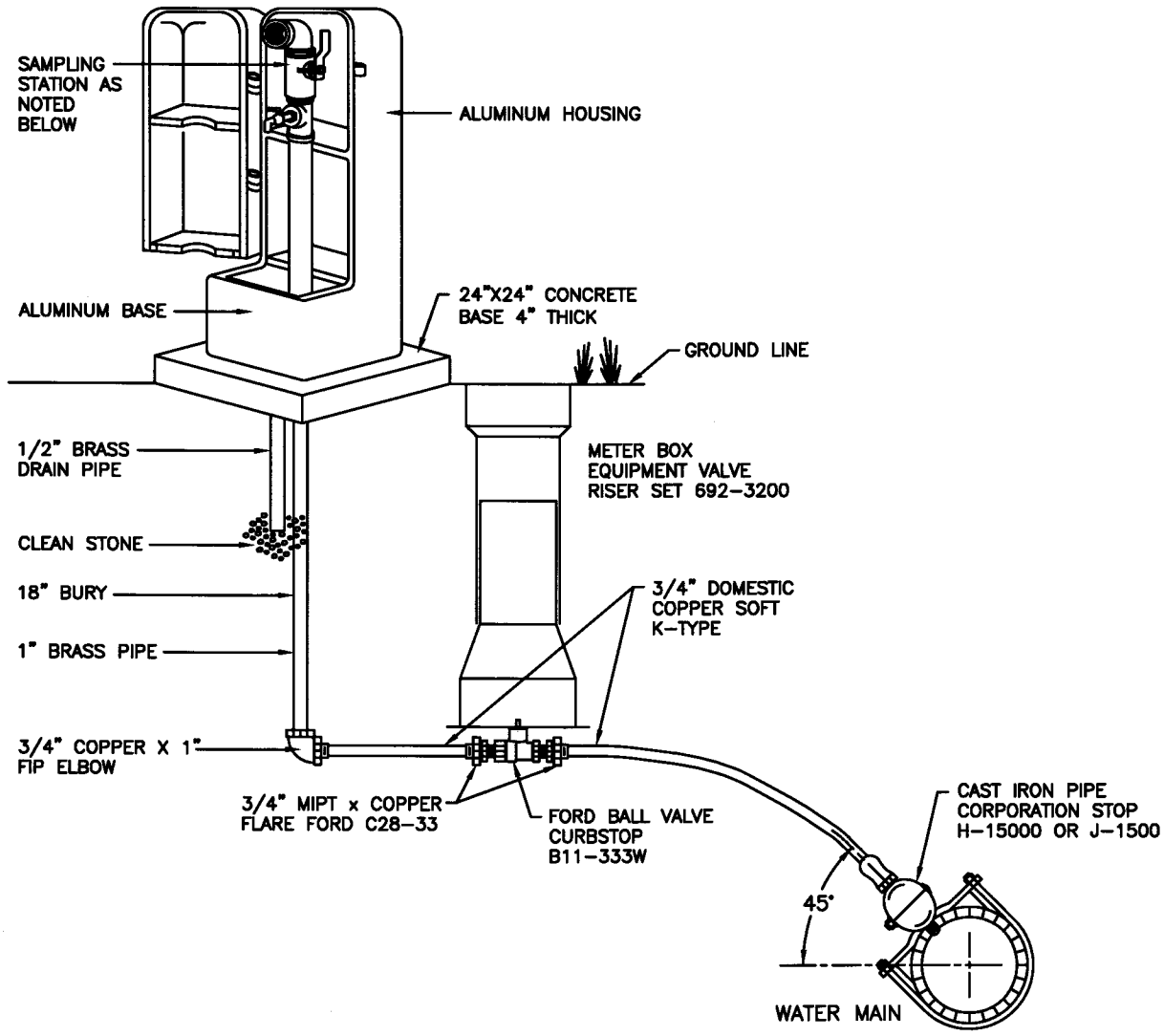
W-42



GENERAL NOTES:

- VALVES SHALL BE "ULFM INDICATING OS&Y" TYPE.
- CURRENTLY APPROVED RP DEVICES ARE:
  AMES MAXIM 400
  WILKINS 375OSY
  FEBCO 860
- RESILIENT SEATED SHUT OFF VALVES AND TEST COCKS ARE REQUIRED.
- ASSEMBLY MUST BE ACCESSIBLE FOR TESTING AND MAINTENANCE BY FRESNO CITY WATER DIVISION.
- ANY DEVIATION FROM THESE REQUIREMENTS SHALL BE APPROVED BY THE WATER SYSTEM MANAGER PRIOR TO INSTALLATION.
- RP DEVICE WITH ASSOCIATED PIPING, VALVES, TEES AND FITTINGS SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR.
- NEW SYSTEM OF MAINS, HYDRANTS AND SERVICES SHALL BE PRESSURE TESTED AND SHALL PASS STANDARD BACTERIAL TESTING PRIOR TO CONNECTION TO EXISTING CITY WATER SYSTEM.
- WET TIE TO EXISTING SYSTEM WILL BE PERFORMED BY CITY FORCES.
- AFTER INSTALLATION AND PRIOR TO PLACING IN SERVICE, THE RP DEVICE SHALL BE TESTED BY THE CITY.
- PRIOR TO FINAL ACCEPTANCE OF THE WATER SYSTEM, A FINAL SET OF PRESSURE TESTS AND BACTERIAL TESTS SHALL BE PERFORMED.
- UPON PUBLIC WORKS ACCEPTANCE OF THE COMPLETE WATER SYSTEM, CITY FORCES WILL REMOVE THE RP DEVICE AND ASSOCIATED PIPING, VALVES, TEES AND FITTINGS, AND WILL CALL FOR PICKUP BY THE CONTRACTOR.

TEMPORARY RP PRINCIPLE BACKFLOW ASSEMBLY INSTALLATION	REF. & REV. MAR., 2006	CITY OF FRESNO W-43



NOTES:

1. SAMPLING STATIONS SHALL BE ECLIPSE 88WC OR SAFETY GUARD BSS02 OR EQUAL AS APPROVED BY THE WATER DIVISION.
2. SAMPLING STATIONS SHALL BE 18" BURY, WITH A 1" MIP INLET AND A 1" FIP DISCHARGE. A 1/4" BENT-NOSE SAMPLING BIBB SHALL BE LOCATED BEFORE THE DISCHARGE.
3. ALL STATIONS SHALL BE ENCLOSED IN A LOCKABLE, NONREMOVABLE, ALUMINUM-CAST HOUSING.
4. WHEN OPENED, THE STATION SHALL REQUIRE NO KEY FOR OPERATION AND THE WATER WILL FLOW IN ALL BRASS WATERWAY.
5. ALL WORKING PARTS SHALL BE OF BRASS AND SERVICEABLE FROM ABOVE GROUND WITH NO DIGGING. (OPTIONAL: IF DESIRED, PROVIDE A DRAINAGE HOLE WITHIN THE LOCKING COVER TO PREVENT WATER FROM ACCUMULATING INSIDE THE UNIT.)
6. A 1" BALL VALVE SHALL CONTROL THE WATER FLOW, AND SHALL BE LOCATED BEFORE (OR AFTER) THE SAMPLING BIBB, AS MANUFACTURED BY KUPFERLE FOUNDRY, ST. LOUIS, MO 63102.

SAMPLE STATION INSTALLATION	REF. & REV. SEPT., 2009 MAR., 2007 AUG., 1994	CITY OF FRESNO W-44

LEGEND:

1 REMOVE ALL PUMPING EQUIPMENT AND DEBRIS FROM THE WELL PRIOR TO THE PLACEMENT OF ANY SEALING MATERIAL INTO THE WELL.

2 A VIDEO OF THE ENTIRE DEPTH OF THE WELL SHALL BE SUBMITTED TO THE WATER DIVISION FOR REVIEW.

3 A TREMIE PIPE SHALL BE USED FOR THE PLACEMENT OF SEALING IN WELLS, WHEN ONE OR MORE OF THE FOLLOWING CONDITIONS EXIST:

- THE TOTAL WELL DEPTH IS GREATER THAN 30'
- THE STATIC WATER LEVEL IS MORE THAN 5'
- THE WELL'S DIAMETER IS 4" OR LESS

4 WHEN THE EXISTING WELL CASING IS FOUND TO BE PERFORATED, SLOTTED, CRACKED, SEPARATED, OR TO HAVE HOLES. THE WELL SHALL BE FILLED TO THE TOP WITH A SEALING MATERIAL APPROVED BY THE CITY OF FRESNO WATER DIVISION AND PRESSURIZED PER DWR BULLETIN 74–81 AND 74–90.

5 THE TOTAL DEPTH OF THE WELL SHALL BE FILLED WITH AN IMPERVIOUS MATERIAL, CEMENT GROUT OR PER SECTION 33 OF CITY OF FRESNO'S WELL DESTRUCTION STANDARDS.

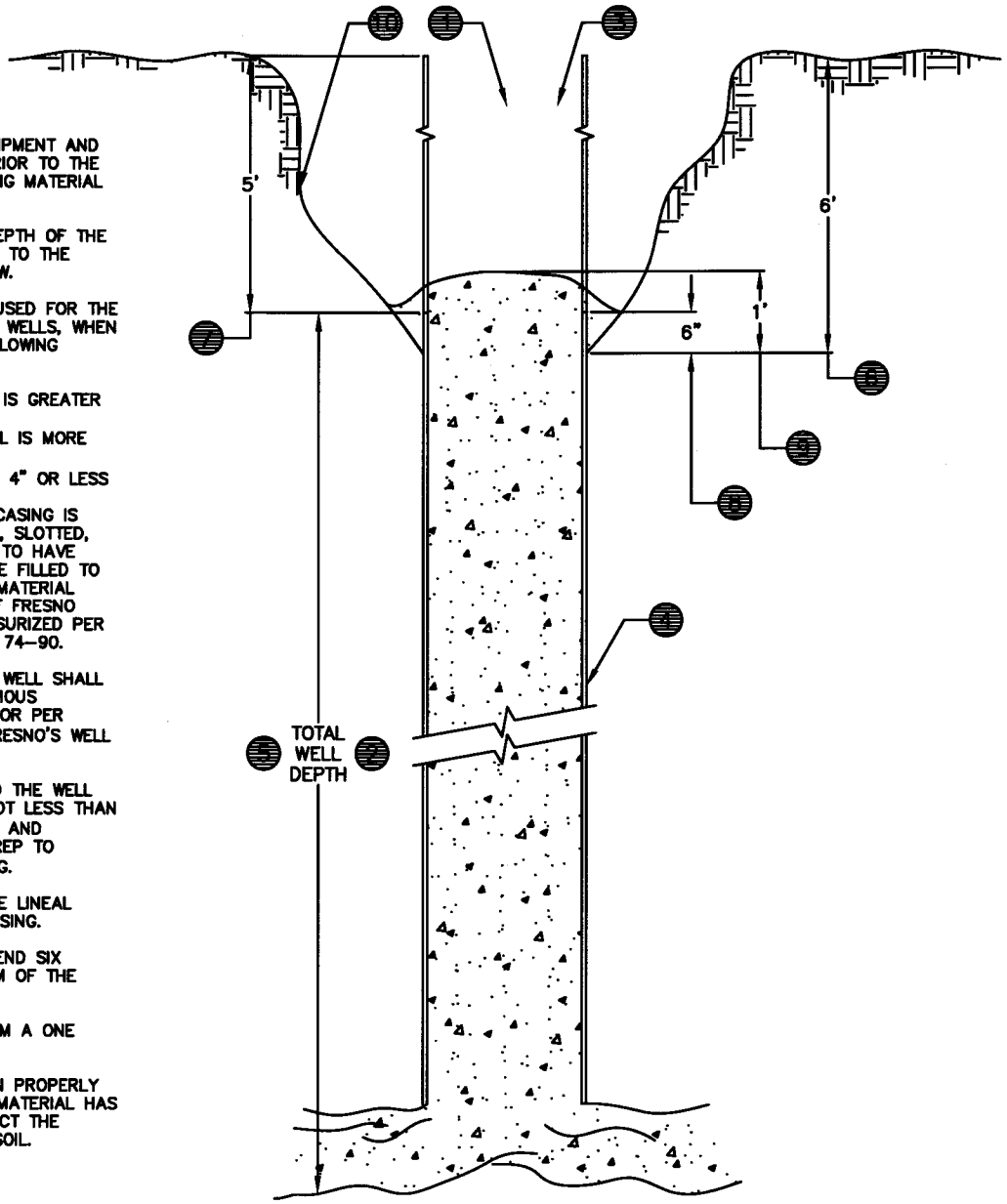
6 EXCAVATE A HOLE AROUND THE WELL CASING TO A DEPTH OF NOT LESS THAN 6', OR SUBMIT FOR REVIEW AND APPROVAL METHODS OF PREP TO REMOVE 5' OF WELL CASING.

7 REMOVE A MINIMUM OF FIVE LINEAL FEET OF EXISTING WELL CASING.

8 REMAINING CASING TO EXTEND SIX INCHES ABOVE THE BOTTOM OF THE EXCAVATED HOLE.

9 ALLOW SPILL OVER TO FORM A ONE FOOT THICK CAP.

10 AFTER THE WELL HAS BEEN PROPERLY FILLED, AND THE SEALING MATERIAL HAS SET, BACKFILL AND COMPACT THE EXCAVATION WITH NATIVE SOIL.



NOTES:

A THE DESTRUCTION OF ALL WATER WELLS WITHIN THE JURISDICTION OF THE CITY OF FRESNO SHALL CONFORM TO THE STATE OF CALIFORNIA DEPARTMENT OF WATER RESOURCES STANDARDS: BULLETINS 74–81 & 74–90, AND AS DIRECTED BY THE CITY OF FRESNO WATER DIVISION.

B AUTHORIZATION FROM THE CAL EPA DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC) OR CALIFORNIA DEPARTMENT OF WATER RESOURCES (DWR) IS REQUIRED TO DESTROY DECOMMISSIONED MONITORING WELLS, SUBMIT A COPY OF THE AUTHORIZATION DOCUMENTATION WITH WELL DESTRUCTION PERMIT APPLICATION.

C THERE ARE THREE TYPES OF SEALING GROUT MIXTURES USED IN DESTROYING WELLS WITHIN THE CITY OF FRESNO (SEE TABLE FOR BATCH SPECIFICATIONS)

BATCH TABLE

			water	cement	sand	bentonite
			gal	sack	lbs	lbs
1	CEMENT AND SAND GROUT	=	6	1	85	n/a
2	NEAT CEMENT GROUT	=	6	1	n/a	n/a
3	BENTONITE CEMENT GROUT	=	8	1	n/a	1.88

D BEFORE WELL DESTRUCTION OPERATIONS BEGIN, A COMPLETE WELL PERMIT APPLICATION PACKAGE FOR DESTRUCTION INCLUDING THE FOLLOWING CALCULATIONS ARE TO BE SUBMITTED FOR APPROVAL:

- A MIX DESIGN OF THE SEALING MATERIAL PREPARED BY THE GROUT SUPPLIER.
- A MIX DESIGN OF THE SEALING MATERIAL PREPARED BY THE PROJECT ENGINEER, OUTLINING FIELD MIXING PROCESS.
- A VOLUME CALCULATION OF THE SEALING MATERIAL, PREPARED BY THE PROJECT ENGINEER.
- A VOLUME CALCULATION FOR THE WELL PREPARED BY A PROJECT ENGINEER SHOWING THE FOLLOWING:
  - a VOLUME OF THE WELL CASING & VOLUME OF THE FILTER PACK TO BE FILLED (FOR GRAVEL PACKED WELLS)
  - b VOLUME OF THE WELL (FOR OPEN BOTTOM WELLS)

E ONLY COMPLETE PERMIT APPLICATION PACKAGES WILL BE PROCESSED

F ONLY CALIFORNIA C57 LICENSED CONTRACTORS ARE AUTHORIZED TO DESTROY ANY WELLS WITHIN THE CITY OF FRESNO.

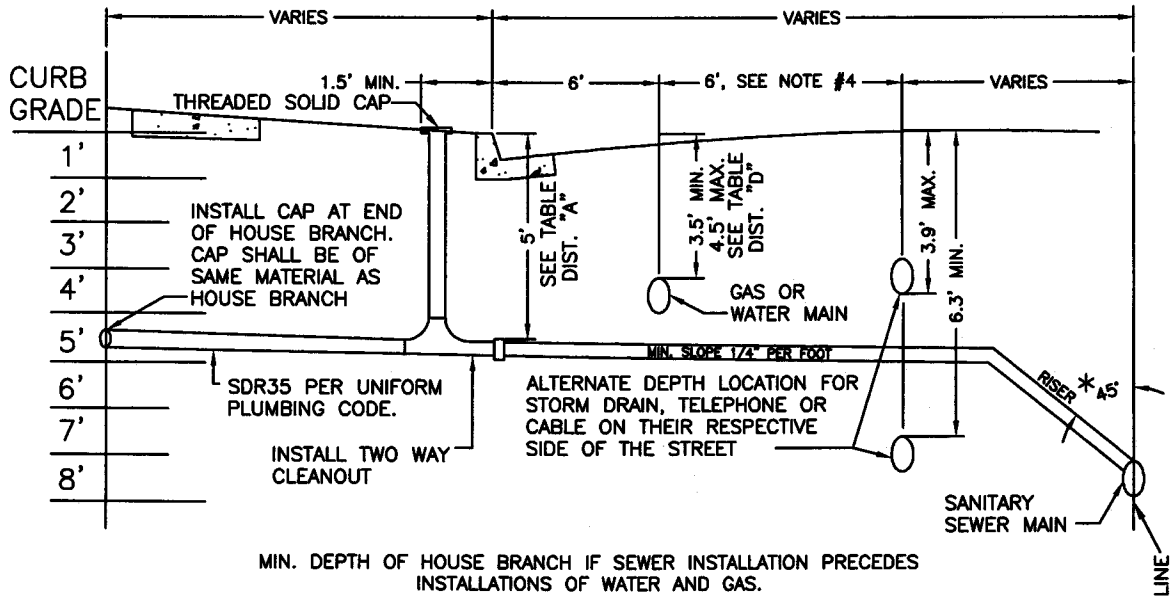
CITY OF FRESNO – WATER DIVISION

WELL DESTRUCTION REQUIREMENTS

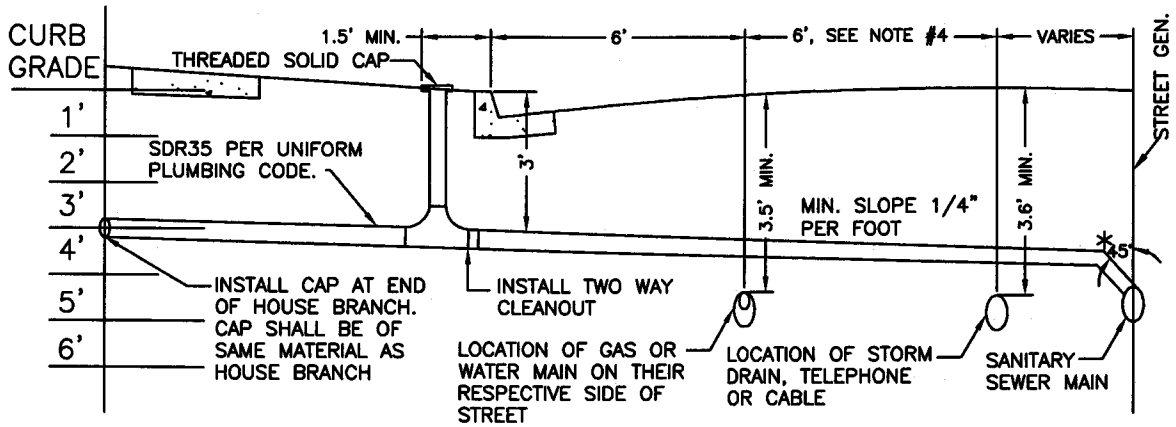
REF. & REV.
SEPT., 2009
JUN., 2008
NOV., 2006
AUG., 1992
SEP., 1991

CITY OF FRESNO

W–45



MIN. DEPTH OF HOUSE BRANCH IF SEWER INSTALLATION PRECEDES INSTALLATIONS OF WATER AND GAS.



MIN. DEPTH OF WATER OR GAS MAINS IF INSTALLATION OF WATER OR GAS MAINS PRECEDES INSTALLATION OF SEWERS ONLY IF APPROVED BY THE ENGINEER.

DEPTH SCHEDULE		
DISTANCE	"A"	"D"
6" WATER OR GAS MAIN	4.5'	3.5'
8" WATER OR GAS MAIN	4.8'	3.8'
10" WATER OR GAS MAIN	5.2'	4.2'
12" WATER OR GAS MAIN	5.5'	4.5'

"A" & "D" DIMENSIONS ARE SET TO ALLOW 1.0' CLEARANCE BETWEEN SEWER AND GAS OR WATER LINES.

*SPECIAL APPROVAL REQUIRED FOR DEVIATION FROM 45 DEGREE STANDARD ANGLE.

NOTES:

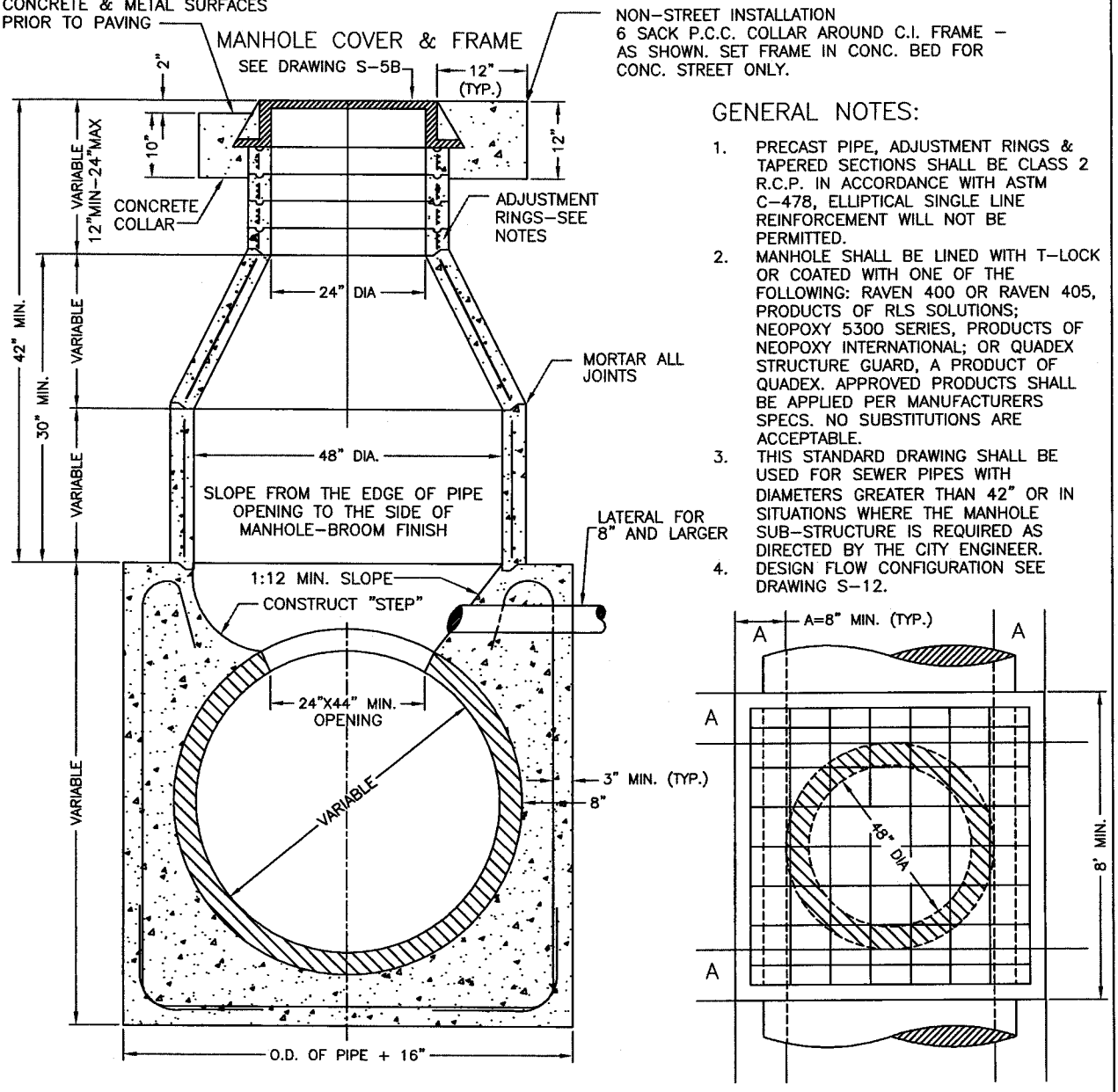
1. WATER MAINS AND TELEPHONE DUCTS SHALL OCCUPY ONE SIDE OF STREET; GAS MAINS AND STORM SEWERS TO OCCUPY OTHER SIDE.
2. IN NEW SUBDIVISIONS, EXTEND HOUSE BRANCHES ABOUT 1' BEYOND PROPERTY LINE.
3. IN ALL OTHER CASES, EXTEND HOUSE BRANCHES ABOUT 1' BEYOND PROPERTY LINE OR AS DIRECTED BY CITY ENGINEER.
4. REFER TO DWG. P-47 FOR LOCATION OF UNDERGROUND FACILITIES IN ARTERIAL AND COLLECTOR STREETS.
5. MINIMUM VERTICAL CLEARANCE BETWEEN THE HOUSE BRANCH AND WATER MAIN SHALL BE 1'.
6. FOR TRENCH BACKFILL SEE DWG. P-48, S-10, W-29 AND SECTION 17-5 OF CITY STANDARD SPECIFICATIONS
7. SEWER WYE'S MUST JOIN THE SEWER MAIN WITH FLOW IN THE SAME DIRECTION.

HOUSE BRANCH & UTILITIES LOCATIONS IN STREETS

REF. & REV. JUNE 2014

CITY OF FRESNO

S-1



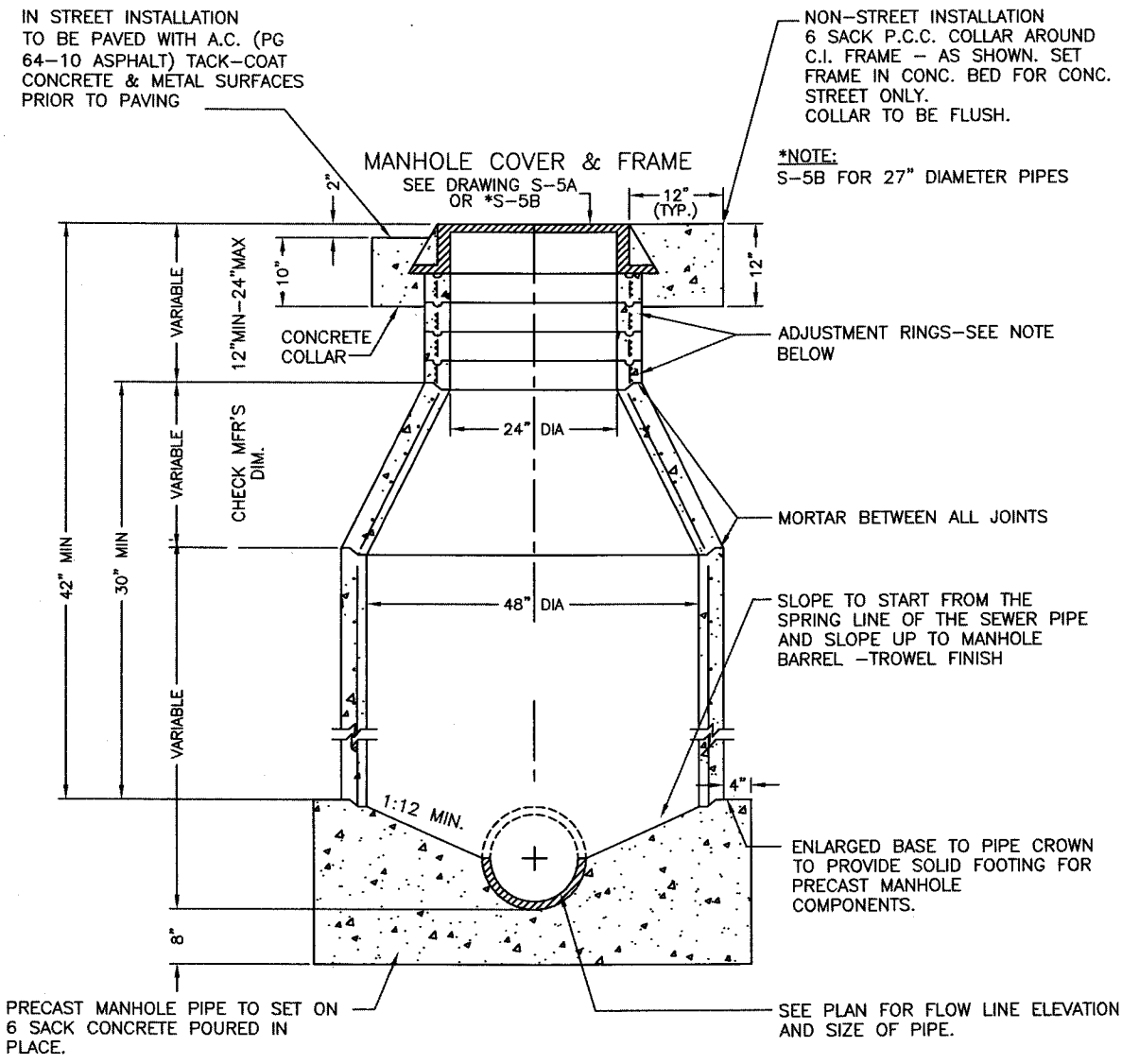
GENERAL NOTES:

1. PRECAST PIPE, ADJUSTMENT RINGS & TAPERED SECTIONS SHALL BE CLASS 2 R.C.P. IN ACCORDANCE WITH ASTM C-478, ELLIPTICAL SINGLE LINE REINFORCEMENT WILL NOT BE PERMITTED.
2. MANHOLE SHALL BE LINED WITH T-LOCK OR COATED WITH ONE OF THE FOLLOWING: RAVEN 400 OR RAVEN 405, PRODUCTS OF RLS SOLUTIONS; NEOPOXY 5300 SERIES, PRODUCTS OF NEOPOXY INTERNATIONAL; OR QUADEX STRUCTURE GUARD, A PRODUCT OF QUADEX. APPROVED PRODUCTS SHALL BE APPLIED PER MANUFACTURERS SPECS. NO SUBSTITUTIONS ARE ACCEPTABLE.
3. THIS STANDARD DRAWING SHALL BE USED FOR SEWER PIPES WITH DIAMETERS GREATER THAN 42" OR IN SITUATIONS WHERE THE MANHOLE SUB-STRUCTURE IS REQUIRED AS DIRECTED BY THE CITY ENGINEER.
4. DESIGN FLOW CONFIGURATION SEE DRAWING S-12.

NOTES FOR MANHOLE SUB-STRUCTURE:

1. ALL CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3000 P.S.I AT 28 DAYS.
2. ALL REINFORCING STEEL TO BE NO. 4 BARS GRADE 60 STEEL, SPACED 12" O.C. BOTH WAYS IN TOP, BOTTOM & WALLS.
3. MINIMUM WALL THICKNESS IS 8".
4. SEE PLAN FOR FLOW LINE ELEVATION & PIPE SIZE.

SPECIAL SEWER MANHOLE FOR SEWER PIPES WITH DIAMETER GREATER THAN 42"	REF. & REV. AUGUST 2015	CITY OF FRESNO S-2

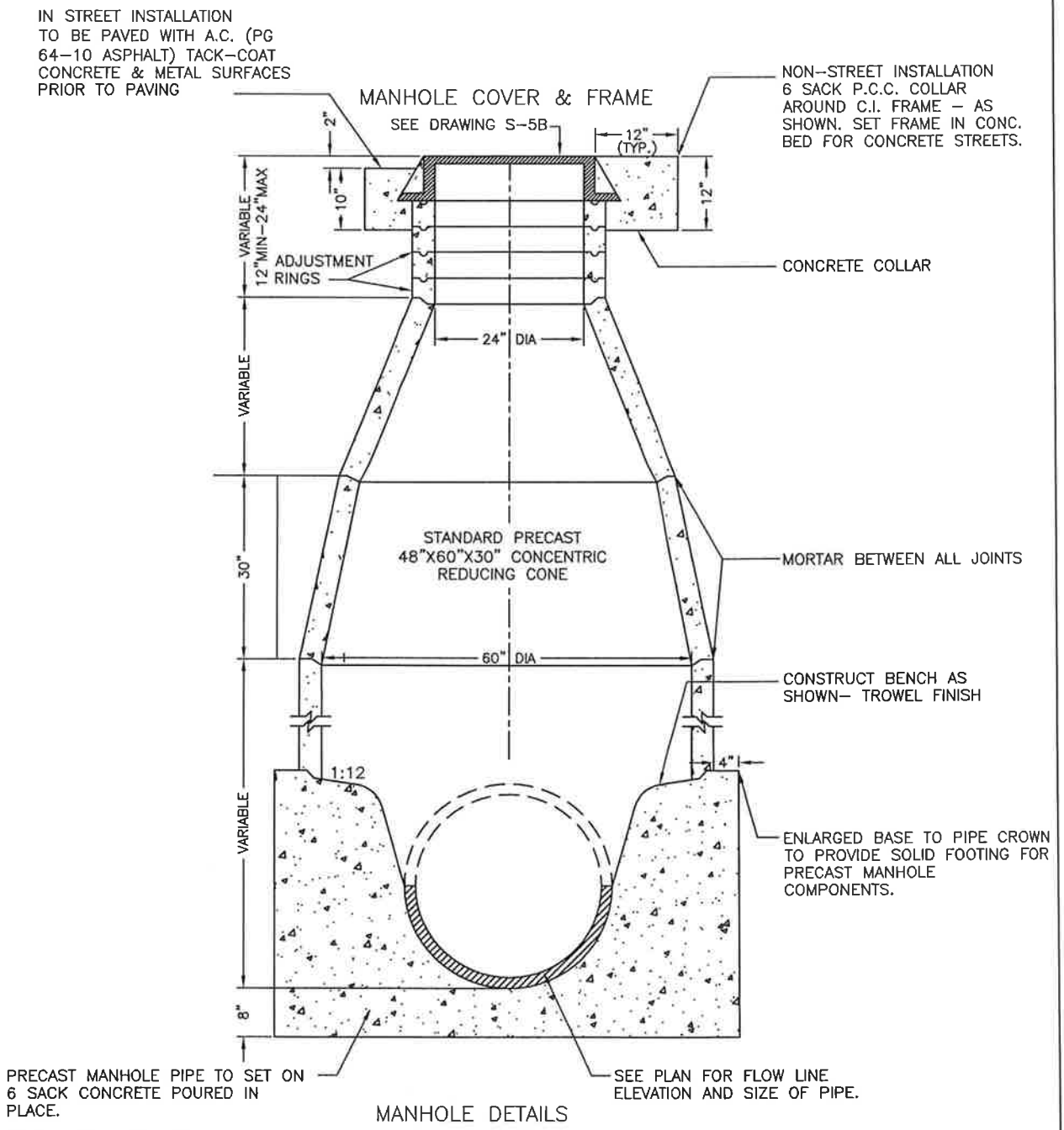


MANHOLE DETAILS

NOTES:

1. PRECAST RISER SECTIONS, ADJUSTMENT RINGS AND TAPERED SECTIONS SHALL BE IN ACCORDANCE WITH ASTM C-478. ELLIPTICAL SINGLE LINE REINFORCEMENT WILL NOT BE PERMITTED.
2. THIS STANDARD DRAWING SHALL BE USED FOR SEWER PIPES WITH DIAMETERS OF UP TO 27".
3. DESIGN FLOW CONFIGURATION SEE DRAWING S-12.
4. MANHOLES ON SEWER LINES EQUAL TO OR GREATER THAN 12", OR ON ANY SIZE SEWER WITHIN 600' OF A 30" OR LARGER SEWER LINE SHALL BE LINED WITH T-LOCK OR COATED WITH ONE OF THE FOLLOWING: RAVEN 400 OR 405, PRODUCTS OF RLS SOLUTIONS; NEOPOXY 5300 SERIES, PRODUCTS OF NEOPOXY INTERNATIONAL; OR QUADEX STRUCTURE GUARD, A PRODUCT OF QUADEX. APPROVED PRODUCTS SHALL BE APPLIED PER MANUFACTURER'S SPECS. NO SUBSTITUTIONS ARE ACCEPTABLE.

48" SEWER MANHOLE SEWER PIPES W/DIA. UP TO AND INCLUDING 27" WITH PRECAST SECTIONS & CAST IRON FRAME & COVER	REF. & REV. AUGUST 2015	CITY OF FRESNO S-3

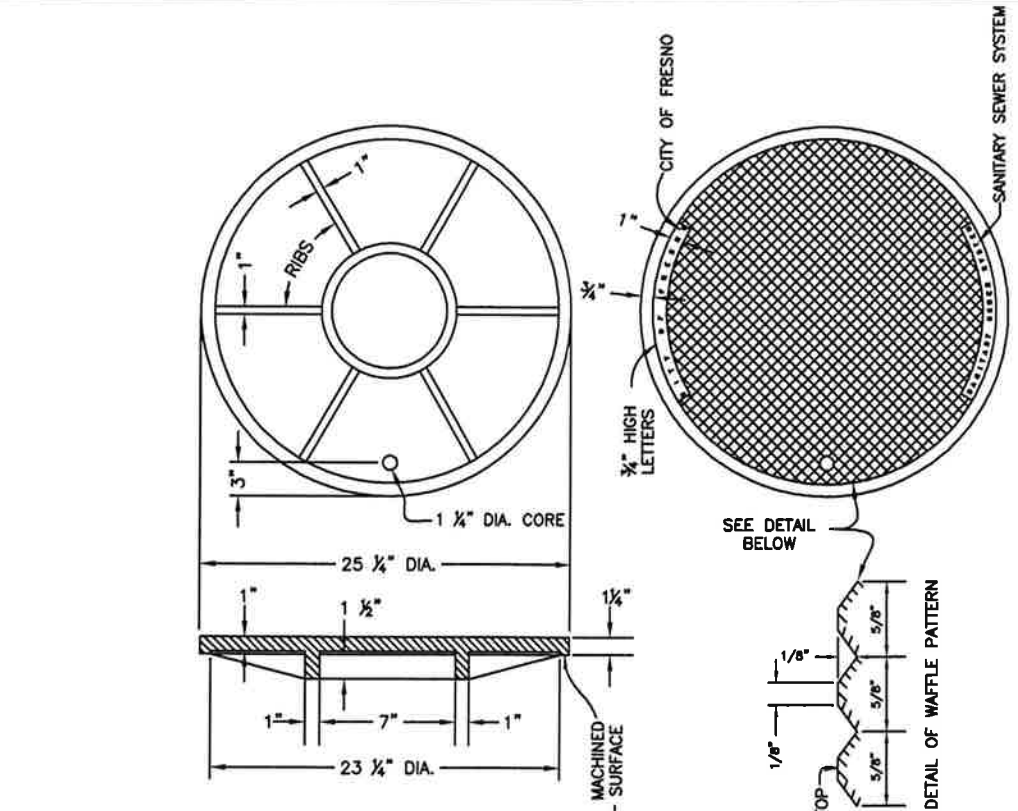


MANHOLE DETAILS

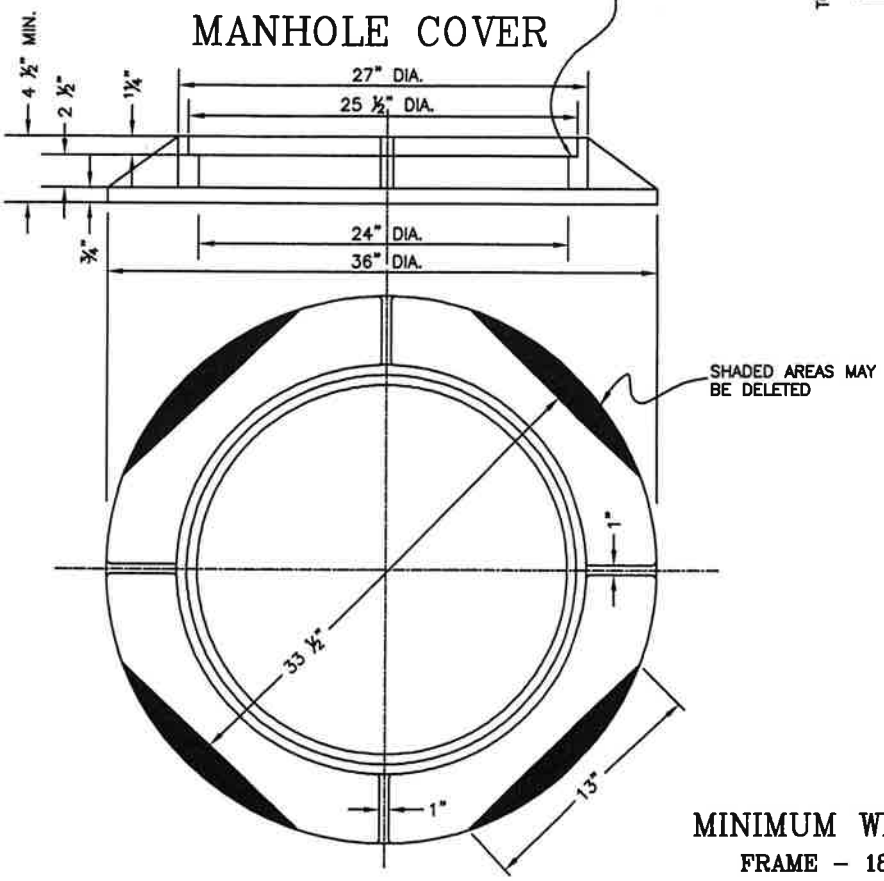
GENERAL NOTES:

1. PRECAST RISER SECTIONS, ADJUSTMENT RINGS AND TAPERED SECTIONS SHALL BE IN ACCORDANCE WITH ASTM C-478.
2. THIS STANDARD DRAWING SHALL BE USED FOR SEWER PIPES WITH DIAMETERS OF 30" THROUGH 42".
3. MANHOLE SHALL BE LINED WITH T-LOCK OR COATED WITH ONE OF THE FOLLOWING: RAVEN 400 OR 405, PRODUCTS OF RLS SOLUTIONS; NEOPOXY 5300 SERIES, PRODUCTS OF NEOPOXY INTERNATIONAL; OR QUADEX STRUCTURE GUARD, A PRODUCT OF QUADEX. APPROVED PRODUCTS SHALL BE APPLIED PER MANUFACTURER SPECS. NO SUBSTITUTIONS ARE ACCEPTABLE.
4. WHEN PIPE IS CUT, ALL EXPOSED REINFORCING STEEL TO BE COATED WITH 2" OF CONCRETE.
5. DESIGN FLOW CONFIGURATION SEE DRAWING S-12.

60" SEWER MANHOLE SEWER PIPES W/DIA. OF 30" THRU & INCLUDING 42" WITH PRECAST SECTIONS & CAST IRON FRAME & COVER	REF. & REV. AUGUST 2015	CITY OF FRESNO S-4



MANHOLE COVER



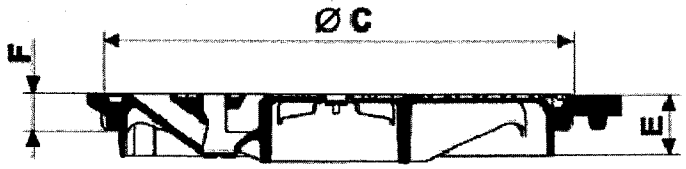
MANHOLE FRAME

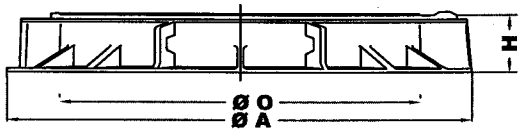
MINIMUM WEIGHTS

FRAME – 180 lbs.

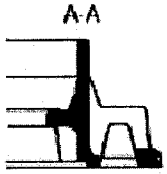
COVER – 147 lbs.

CAST IRON MANHOLE FRAME AND COVER	REF. & REV. JUNE 2014	CITY OF FRESNO S–5A

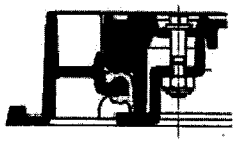


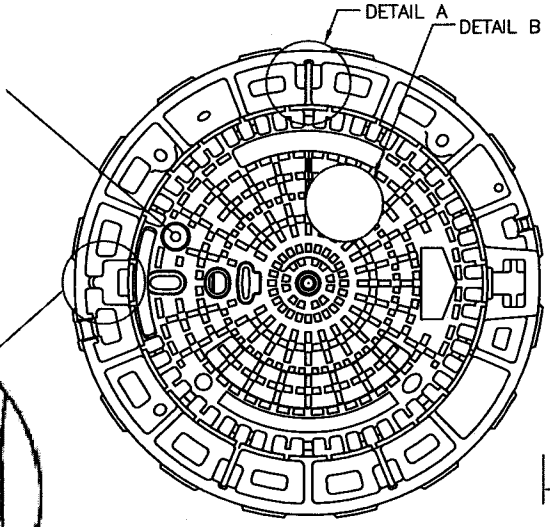


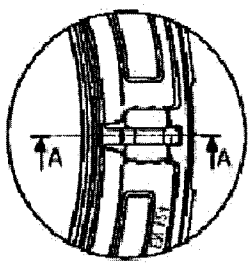
Detail A : Lifting Holes

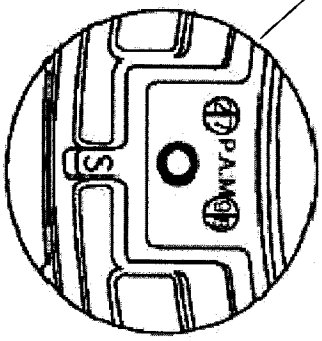


Locking Mechanism



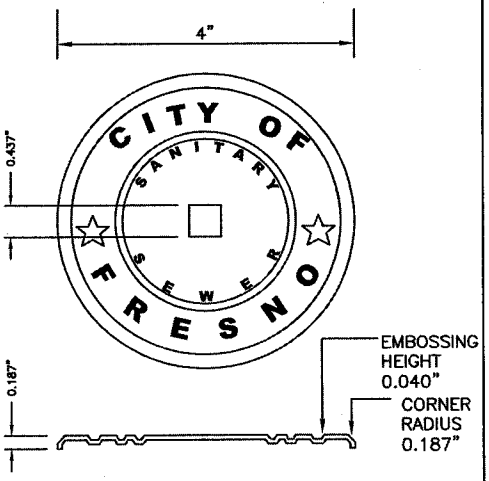






Frame Marking

Detail B



DIMENSIONS (INCHES)					
A	C	E	F	H	O
33 1/2	26 1/2	3 1/2	2	4	24

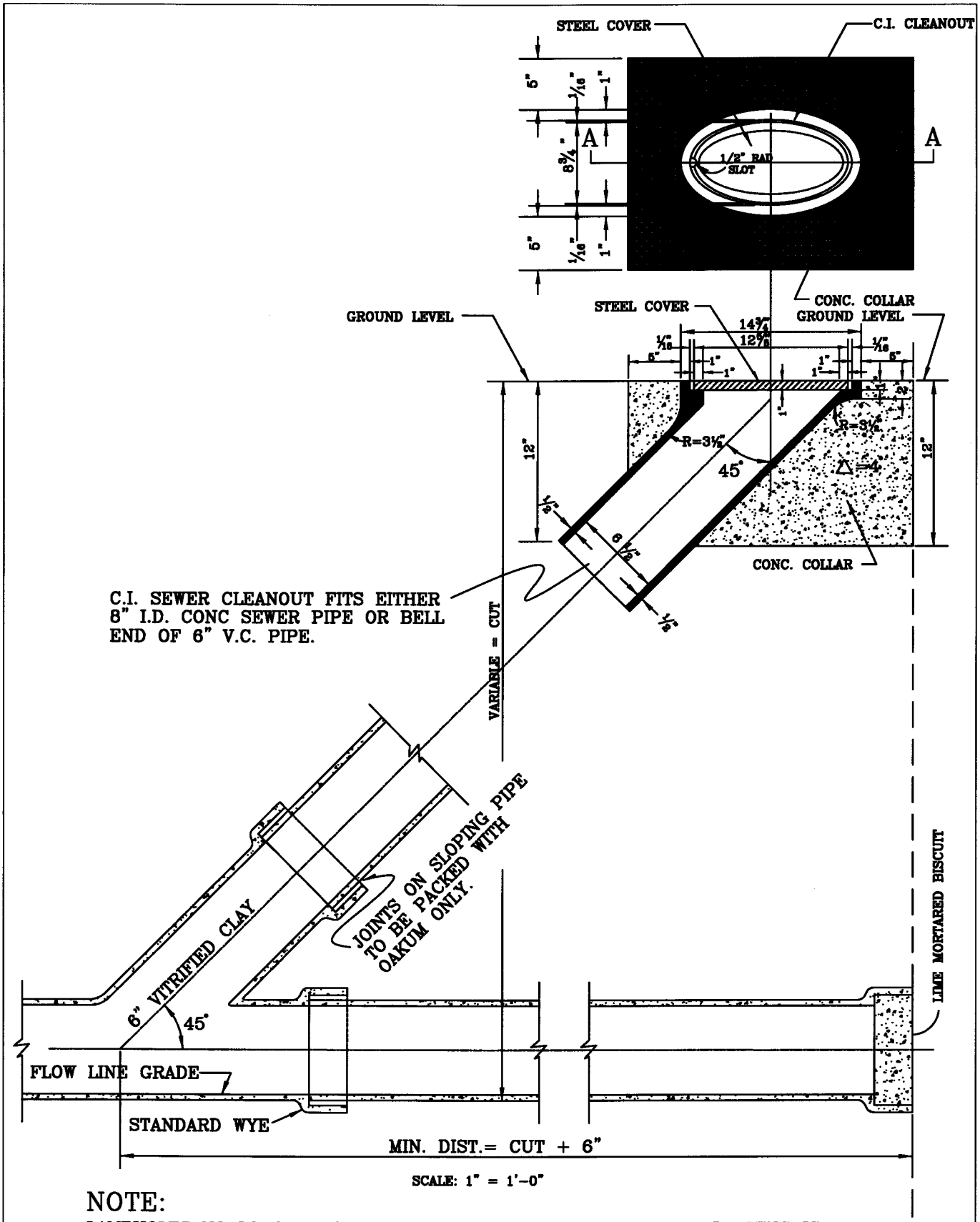
1. MANHOLE COVER AND FRAME SHALL BE CALLED PAMREX OR APPROVED EQUAL.
2. COVER AND FRAME SHALL BE MANUFACTURED FROM DUCTILE IRON.
3. COVERS SHALL BE HINGED AND INCORPORATE A 90 DEGREE BLOCKING SYSTEM TO PREVENT ACCIDENTAL CLOSURE.
4. COVERS SHALL BE ONE MAN OPERABLE USING STANDARD TOOLS AND SHALL BE CAPABLE OF WITHSTANDING A TEST LOAD OF 120,000 LBS.
5. FRAMES SHALL BE CIRCULAR, INCORPORATE A SEATING RING AND A FITTED PLUG IN THE HINGE HOUSING, AND BE AVAILABLE IN A 24 INCH CLEAR OPENING.
6. THE FRAME DEPTH SHALL NOT EXCEED 4 INCHES, AND THE FLANGE SHALL INCORPORATE BEDDING SLOTS, BOLT HOLES, AND LIFTING EYES.
7. ALL COMPONENTS SHALL BE BLACK COATED.
   FRAME WEIGHT: 73 LBS.
   COVER WEIGHT: 122 LBS.
   TOTAL WEIGHT: 195 LBS.
8. HINGE SHOULD BE PLACED 90° TO THE ROAD TOWARD THE UPSTREAM FLOW OF THE DOMINATE LINE.

PAMREX DUCTILE IRON
FRAME AND COVER
FOR SEWER PIPE 27" OR LARGER

REF. & REV.
AUGUST 2015

CITY OF FRESNO

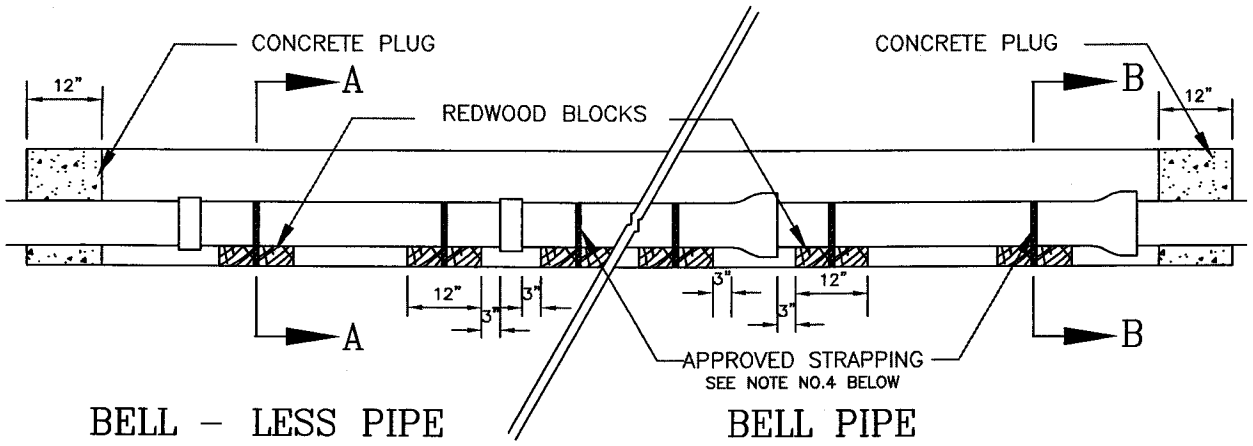
S-5B



NOTE:

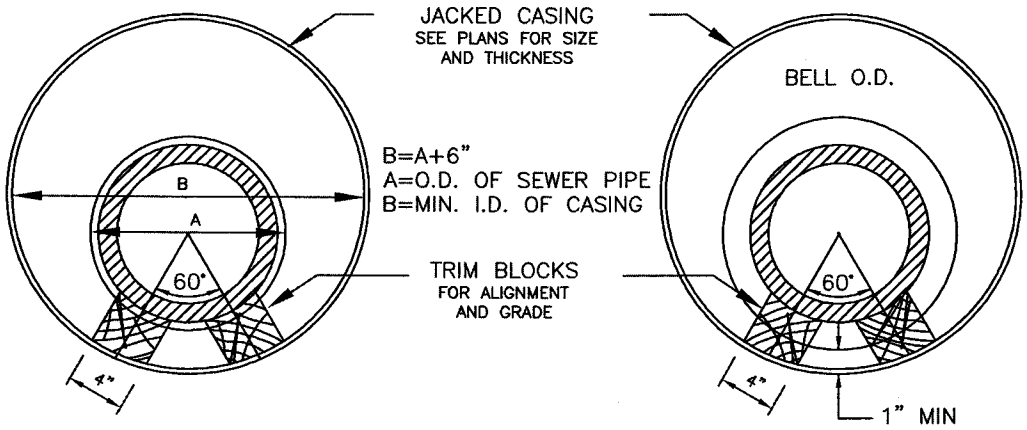
LAMPHOLES NO LONGER CONSTRUCTED IN CITY OF FRESNO. THIS DRAWING IS RETAINED FOR INFORMATIONAL PURPOSES TO SHOW CONSTRUCTION OF EXISTING LAMPHOLES.

SLOPING LAMPHOLE WITH C.I. CLEANOUT & COVER	REF. & REV. AUG., 2002	CITY OF FRESNO S–6



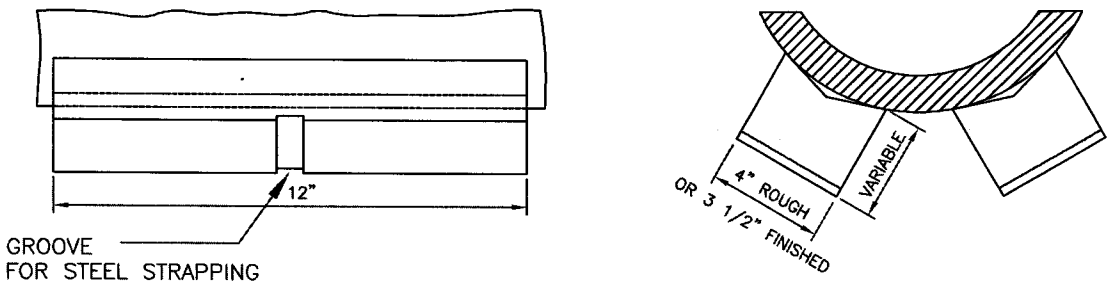
BELL – LESS PIPE

BELL PIPE



SECTION A–A

SECTION B–B



REDWOOD BLOCK DETAIL

NOTES:

1. REDWOOD BLOCKS SHALL BE CONSTRUCTION GRADE.
2. REDWOOD BLOCKS SHALL BE VEED TO FIT CONTOUR OF PIPE.
3. WHEN JACKING, CASING GRADE SHALL BE SET SO CENTER LINE OF CASING SHALL COINCIDE WITH CENTER LINE OF SEWER PIPE.
4. REDWOOD BLOCKS SHALL BE STRAPPED TO THE PIPE WITH STEEL STRAPPING OR APPROVED WIRE BANDS.
5. PLUG ENDS OF CASING WITH 12 INCHES MINIMUM OF CONCRETE.
6. CONCRETE SHALL BE CLASS "B" P.C.C.
7. APPROVED CASING SPACERS AND END SEALS MAY BE USED IN LIEU OF REDWOOD BLOCKS AND CONCRETE PLUGS.
8. STEEL CASING WALL THICKNESS CHART, SEE DETAIL S–7B.

INSTALLATION OF SEWER PIPE IN JACKED STEEL AND NON JACKED STEEL CASING	REF. & REV. AUGUST 2015	CITY OF FRESNO S–7A

NOMINAL DIAMETER (INCHES)	WHEN COATED OR CATHODICALLY PROTECTED NOMINAL THICKNESS (INCHES)	WHEN NOT COATED OR CATHODICALLY PROTECTED NOMINAL THICKNESS (INCHES)
12–3/4 and under	0.188	0.188
14	0.188	0.250
16	0.219	0.281
18	0.250	0.312
20 and 22	0.281	0.344
24	0.312	0.375
26	0.344	0.406
28	0.375	0.438
30	0.406	0.469
32	0.438	0.500
34 and 36	0.469	0.531
38	0.500	0.562
40	0.531	0.594
42	0.562	0.625
44 and 46	0.594	0.656
48	0.625	0.688
50	0.656	0.719
52	0.688	0.750
54	0.719	0.781
56 and 58	0.750	0.812
60	0.781	0.844
62	0.812	0.875
64	0.844	0.906
66 and 68	0.875	0.938
70	0.906	0.969
72	0.938	1.000

NOTES:

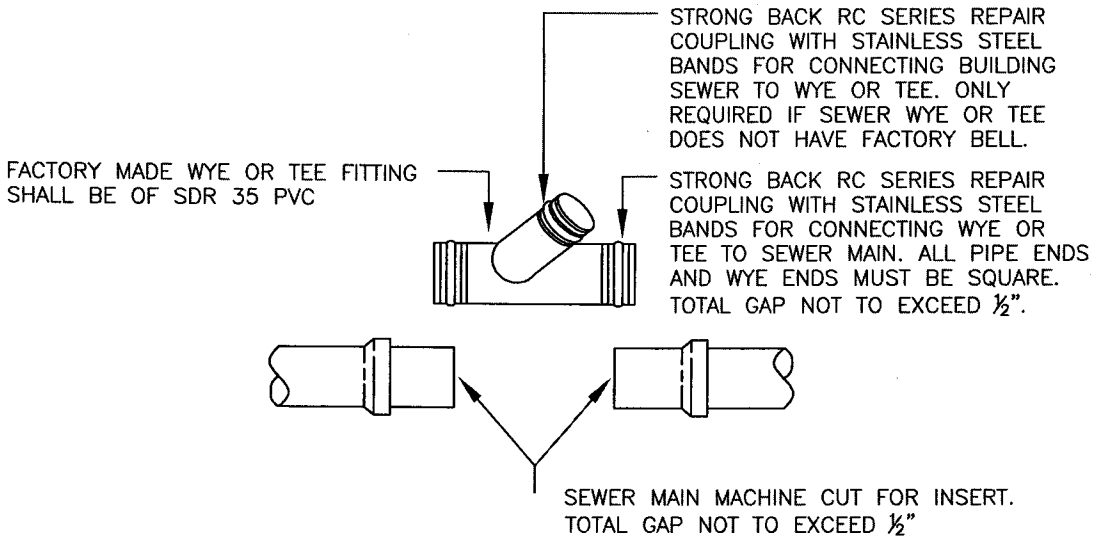
1. THIS TABLE WAS REFERENCED FROM AREMA MANUAL FOR RAILWAY ENGINEERING

MINIMUM WALL THICKNESS FOR STEEL CASING PIPE

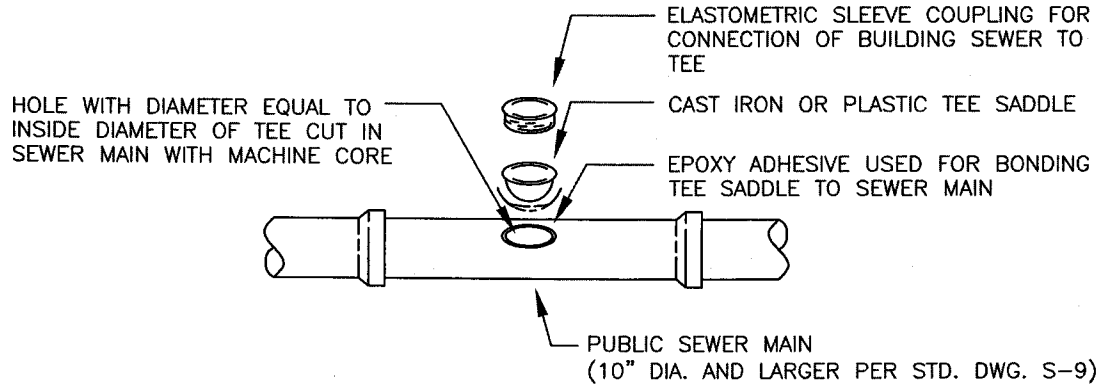
REF. & REV.
AUGUST 2015

CITY OF FRESNO

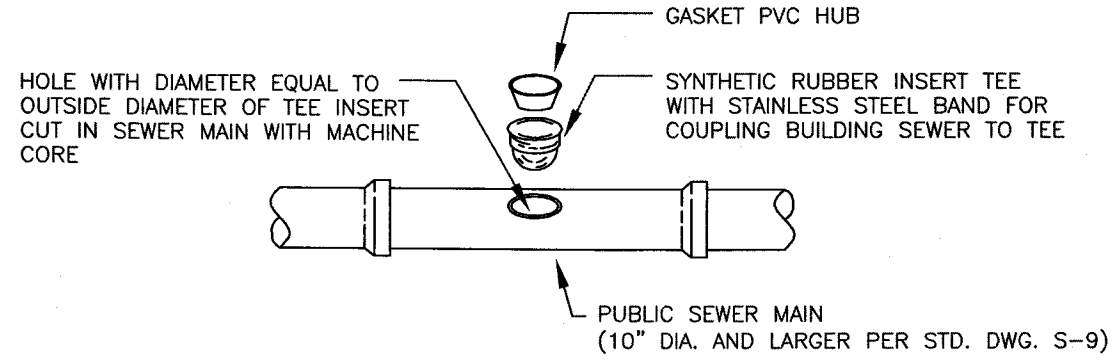
S–7B



METHOD 1: INSERTION OF FACTORY MADE WYE OR TEE



METHOD 2: EPOXY BONDED SADDLE TEE



METHOD 3: COMPRESSION TEE

HOUSE BRANCH CONNECTIONS	REF. & REV. AUGUST 2015	CITY OF FRESNO S-8

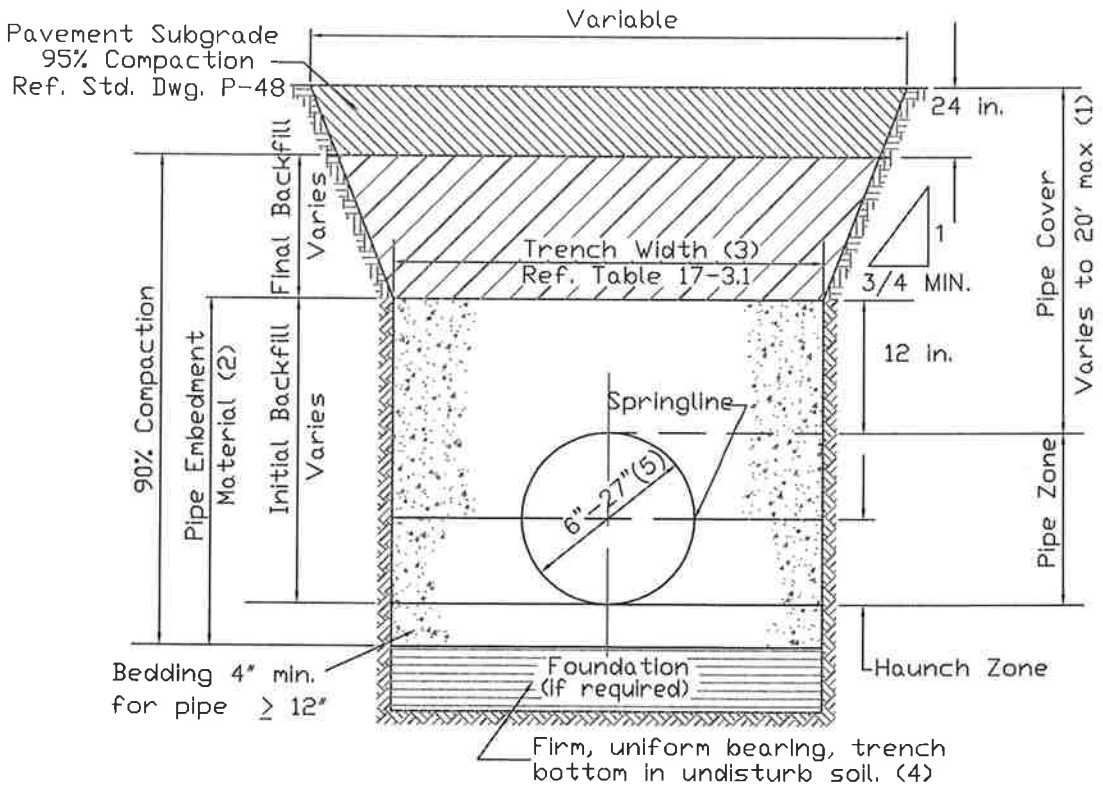
HOUSE BRANCH SIZE–APPROVED CONNECTION METHOD

SEWER MAIN SIZE

H.B.SIZE	6"	8"	10"	12"	15"
4"	MTHD.1	MTHD.1	MTHD.1,2,3	MTHD.1,2,3	MTHD.1,2,3
6"	MTHD.1	MTHD.1	MTHD.1,2,3	MTHD.1,2,3	MTHD.1,2,3

1. ALL WYES AND TEES SHALL BE OF SAME MATERIALS AS THAT OF THE SEWER MAIN OR APPROVED EQUAL.
2. 8 INCH DIAMETER AND LARGER HOUSE BRANCHES REQUIRE A MANHOLE AT POINT OF CONNECTION.
3. HOUSE BRANCH CONNECTIONS WITH AN APPROVED SADDLE TO EXISTING SEWER MAINS 10 INCHES AND LARGER BY OTHER THAN A MACHINE CORE SHALL NOT BE ALLOWED.
4. SADDLES SHALL BE OF SAME MATERIAL AS SEWER MAIN OR APPROVED EQUAL AND SHALL NOT EXTEND BEYOND 1/4" INTO THE MAIN SEWER.
5. SEWER HOUSE BRANCHES SHALL BE INSTALLED IN CONFORMANCE WITH DRAWING S–1 OF THE CITY STANDARD SPECIFICATIONS AND THE UNIFORM PLUMBING CODE.

ADDITIONAL LIMITATIONS ON HOUSE BRANCH CONNECTIONS	REF. & REV. AUGUST 2015	CITY OF FRESNO S–9



(1) Pipe installations where cover over pipe exceeds 20' shall be designed by a Civil Engineer and specified in the Project Plans and Special Provisions.

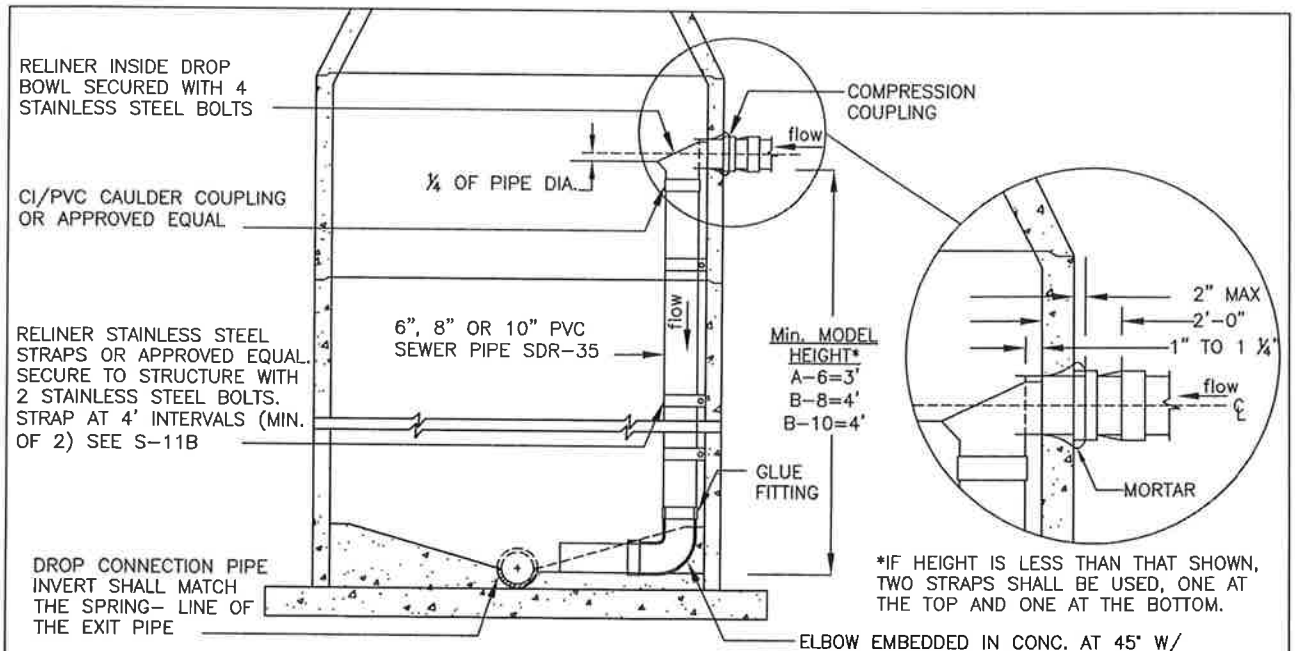
(2) Pipe Embedment material shall consist of Class II or Class III select natural material or processed product as defined in Subsection 17–5.2, "Pipe Embedment Zone" of Standard Specifications and inital backfill placed in accordance with Subsection 17–5.3, "Inital Backfill", of the Standard Specifications.

(3) Minium and maximum trench width allowed shall be maintained as specified in TABLE 17–3.1, Subsection 17–3.2.1, "Trench Widths", of the Standard Specifications.

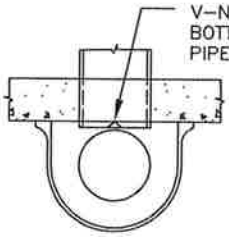
(4) Bottom of trench shall be in firm, uniform–bearing soil surfaces. When unsuitable or disturbed, the contractor shall remove and refill with suitable material as specified in Subsection 17–5.1, "Foundation and Bedding", of the Standard Specifications.

(5) Standard detail S–10 shall be applicable to all sewer pipe installations with diameters of 6 to 27 inches. Construction procedures for pipes larger than 30 inches shall be provided by the City Engineer.

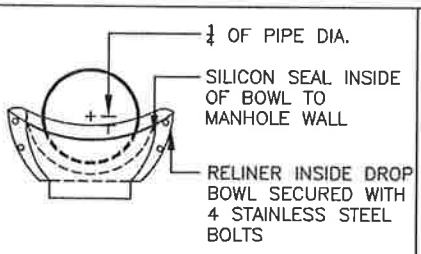
SEWER MAIN TRENCH, BEDDING, & BACKFILL DETAIL	REF. & REV. AUGUST 2015	CITY OF FRESNO S–10



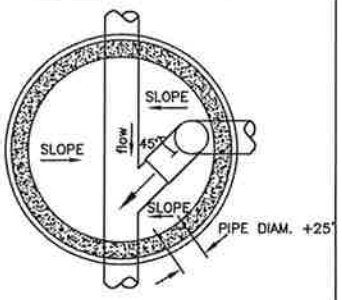
INSIDE DROP CONNECTION



DROP BOWL MOUNTING POSITION TOP VIEW



DROP BOWL MOUNTING POSITION FRONT VIEW



INSIDE DROP -PLAN

NOTES:

1. ALL INSIDE DROP CONNECTIONS FOR SERVICES AND COLLECTOR SEWER SHALL USE THE DROP BOWL AS PRODUCED BY:
   RELINER-DURAN, INC.
   53 MT. ARCHER RD.
   LYME, CT 06371
   (860)434-0277 FAX: (860)434-3195 OR APPROVAL EQUAL

2. DROP BOWL MODEL "A-6" SHALL BE USED FOR ALL LINES UP THROUGH FULL 6" INLETS. DROP BOWLS MODEL "B-8" SHALL BE USED FOR ALL 8" INLETS. DROP BOWLS MODEL "B-10" SHALL BE USED FOR ALL 10" INLETS.
   6" ONLY ALLOWABLE FOR REPLACING EXISTING 6" DROP. LINES LARGER THAN 10" SHALL BE AS DIRECTED BY THE ENGINEER.

3. SECURE DROP PIPE TO MANHOLE WALL WITH RELINER-DURAN, INC STAINLESS STEEL ADJUSTABLE CLAMPING BRACKETS OR APPROVED EQUAL (SEE DETAIL S-11B).

4. ATTACH THE DROP BOWL & EACH CLAMPING BRACKET TO THE MANHOLE WALL WITH ⅜" X 3 ¾" RAMSET/RED HEAD BOLTS. PRE-ROTO DRILL AND SET BOLTS IN PLACE WITH EPOXY PASTE. EPOXY SHALL MEET THE FOLLOWING REQUIREMENTS:

   A. EPOXY PASTE SHALL BE A TWO COMPONENT, 100% SOLID SYSTEM. EPOXY SHALL BE SIKADUR 31 HI-MOD GEL BY SIKA CORPORATION (PHONE 592/941-0231) OR EQUAL.

   B. THE EPOXY PASTE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI IN 28 DAYS WHEN TESTED IN ACCORDANCE WITH ASTM D695 AT 73 DEGREES.

   C. THE EPOXY PASTE SHALL DEVELOP A MINIMUM TENSILE STRENGTH OF 3,000 PSI IN 14 DAYS WHEN TESTED IN ACCORDANCE WITH ASTM D638.

   D. THE EPOXY PASTE SHALL DEVELOP A MINIMUM BOND STRENGTH OF 2,000 PSI IN 2 DAYS WHEN TESTED IN ACCORDANCE WITH ASTM C882 (HARDENED CONCRETE TO HARDENED CONCRETE).

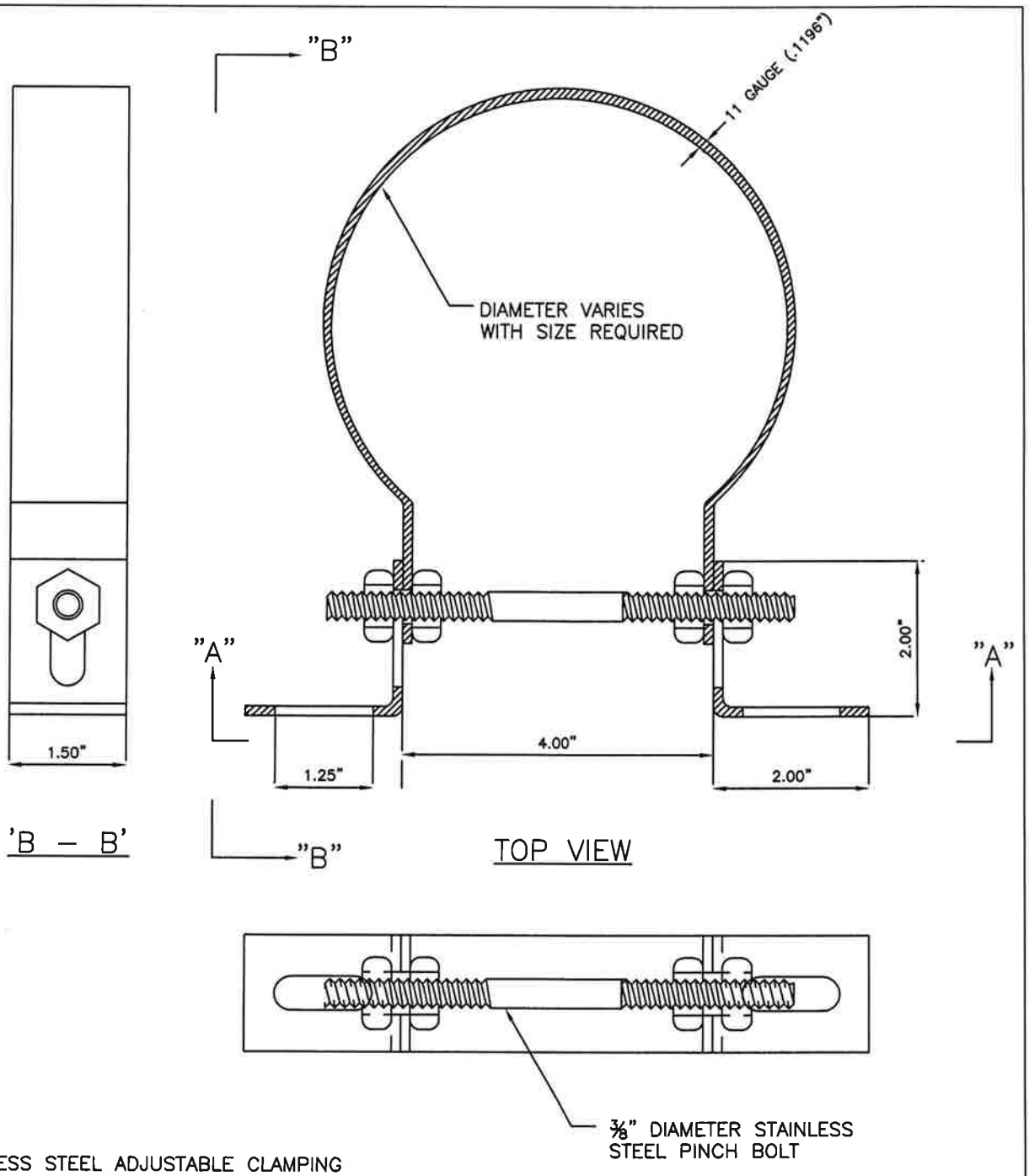
DROP CONNECTIONS

REF. & REV.
AUGUST 2015

CITY OF FRESNO

S-11A

1 OF 2



STAINLESS STEEL ADJUSTABLE CLAMPING BRACKED AS MANUFACTURED BY:

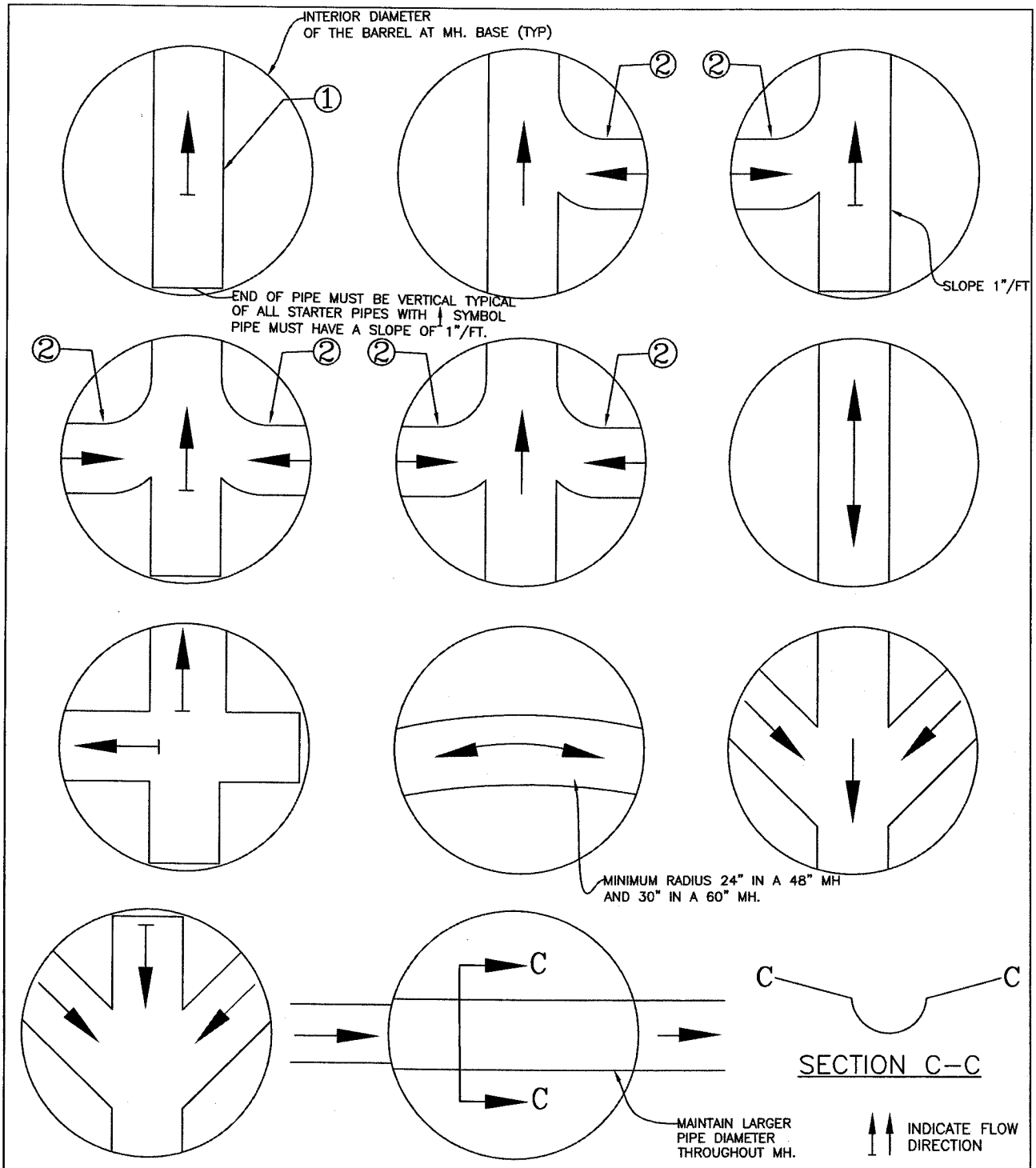
RELINER–DURAN, INC.
53 MT. ARCHER RD.
LYME, CT 06371
(860)434–0277 FAX: (860)434–3195
OR APPROVAL EQUAL

SPECIFICATIONS:

1) CLAMP AND BRACKETS IS TYPE 304 STAINLESS STEEL, 11 GAUGE (.1196").

2) 3/8" ø PINCH BOLT AND NUTS IS TYPE 18–8 STAINLESS STEEL.

STAINLESS STEEL ADJUSTABLE CLAMPING BRACKETS	REF. & REV. JUNE 2014	CITY OF FRESNO S–11B 2 OF 2



① ALL STRAIGHT PIPE TO BE LAID THROUGH MANHOLES WITH TOP HALF REMOVED TO PROVIDE AT LEAST A 44" OR 56" LONG OPENING. ROUGH BROKEN EDGES SHALL BE MORTARED SMOOTH. THIS INCLUDES UPPER ENDS OF LINE MANHOLE.

② ALL TURNS MUST BE MADE SUCH THAT THE CENTER LINE OF THE FLOW CHANNEL BEND RADIUS IS MINIMUM 24" IN A 48" MANHOLE AND MINIMUM 30" IN A 60" MANHOLE. TURNS TO BE CONSTRUCTED TO FORM A SMOOTH FLOW LINE OF SAME SHAPE AND PATTERN AS BOTTOM WALL PIPE.

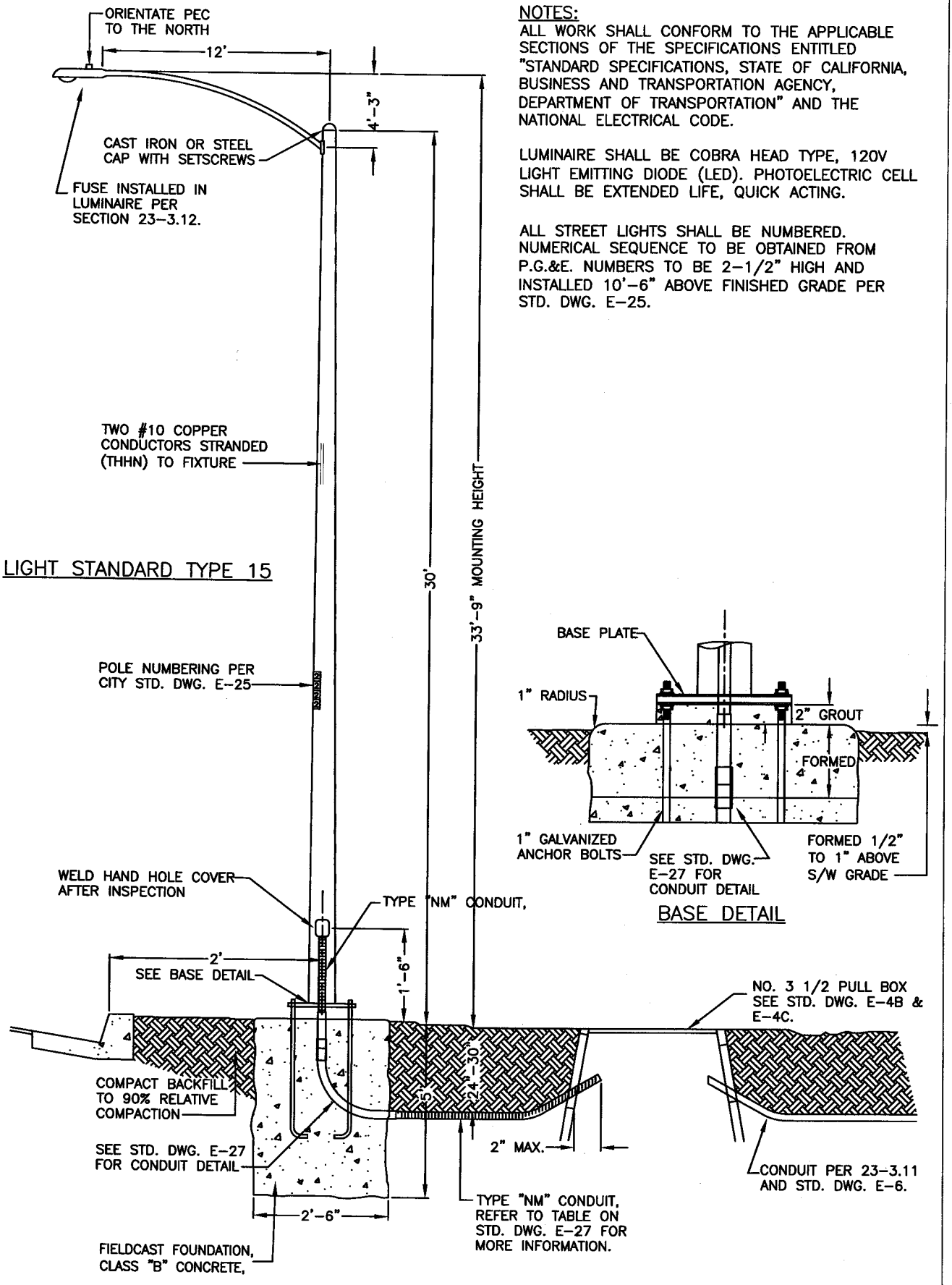
NOTE:
WHEN PIPE IS CUT, ALL EXPOSED REINFORCING STEEL TO BE COATED WITH 2" OF CONCRETE.

MANHOLE BASE DESIGN FLOW CONFIGURATION SUPPLEMENT TO S-3 & S-4	REF. & REV. AUGUST 2015	CITY OF FRESNO S-12

NOTES:
ALL WORK SHALL CONFORM TO THE APPLICABLE SECTIONS OF THE SPECIFICATIONS ENTITLED "STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, BUSINESS AND TRANSPORTATION AGENCY, DEPARTMENT OF TRANSPORTATION" AND THE NATIONAL ELECTRICAL CODE.

LUMINAIRE SHALL BE COBRA HEAD TYPE, 120V LIGHT EMITTING DIODE (LED). PHOTOELECTRIC CELL SHALL BE EXTENDED LIFE, QUICK ACTING.

ALL STREET LIGHTS SHALL BE NUMBERED. NUMERICAL SEQUENCE TO BE OBTAINED FROM P.G.&E. NUMBERS TO BE 2-1/2" HIGH AND INSTALLED 10'-6" ABOVE FINISHED GRADE PER STD. DWG. E-25.



LIGHT STANDARD TYPE 15

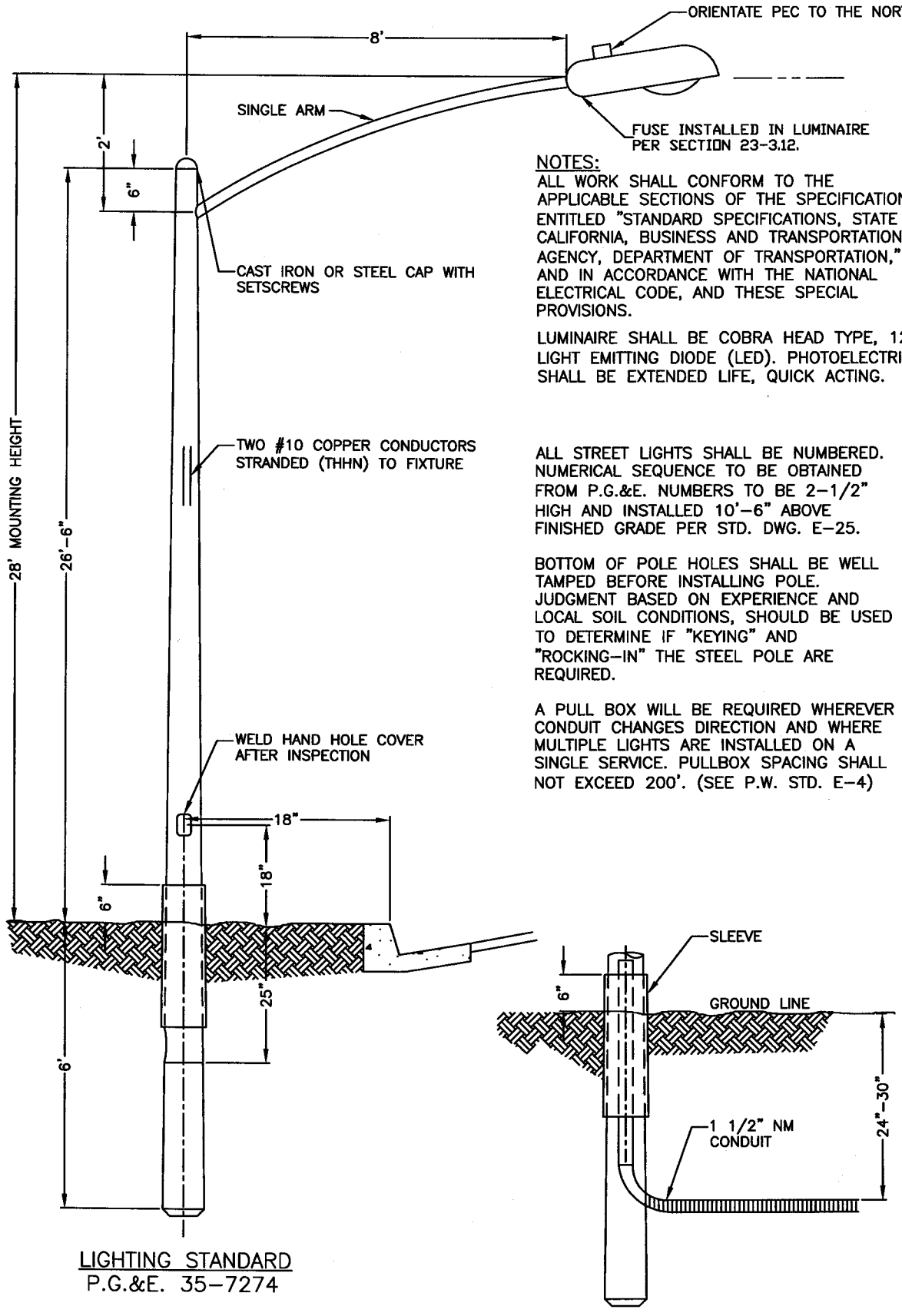
BASE DETAIL

STREETLIGHT-MAJOR STREET
WITH BASE, PULL BOX & PVC CONDUIT

REF. & REV.
AUG. 2015

CITY OF FRESNO

E-1



LIGHTING STANDARD
P.G.&E. 35-7274

NOTES:

ALL WORK SHALL CONFORM TO THE APPLICABLE SECTIONS OF THE SPECIFICATIONS ENTITLED "STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, BUSINESS AND TRANSPORTATION AGENCY, DEPARTMENT OF TRANSPORTATION," AND IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, AND THESE SPECIAL PROVISIONS.

LUMINAIRE SHALL BE COBRA HEAD TYPE, 120V LIGHT EMITTING DIODE (LED). PHOTOELECTRIC CELL SHALL BE EXTENDED LIFE, QUICK ACTING.

ALL STREET LIGHTS SHALL BE NUMBERED. NUMERICAL SEQUENCE TO BE OBTAINED FROM P.G.&E. NUMBERS TO BE 2-1/2" HIGH AND INSTALLED 10'-6" ABOVE FINISHED GRADE PER STD. DWG. E-25.

BOTTOM OF POLE HOLES SHALL BE WELL TAMPED BEFORE INSTALLING POLE. JUDGMENT BASED ON EXPERIENCE AND LOCAL SOIL CONDITIONS, SHOULD BE USED TO DETERMINE IF "KEYING" AND "ROCKING-IN" THE STEEL POLE ARE REQUIRED.

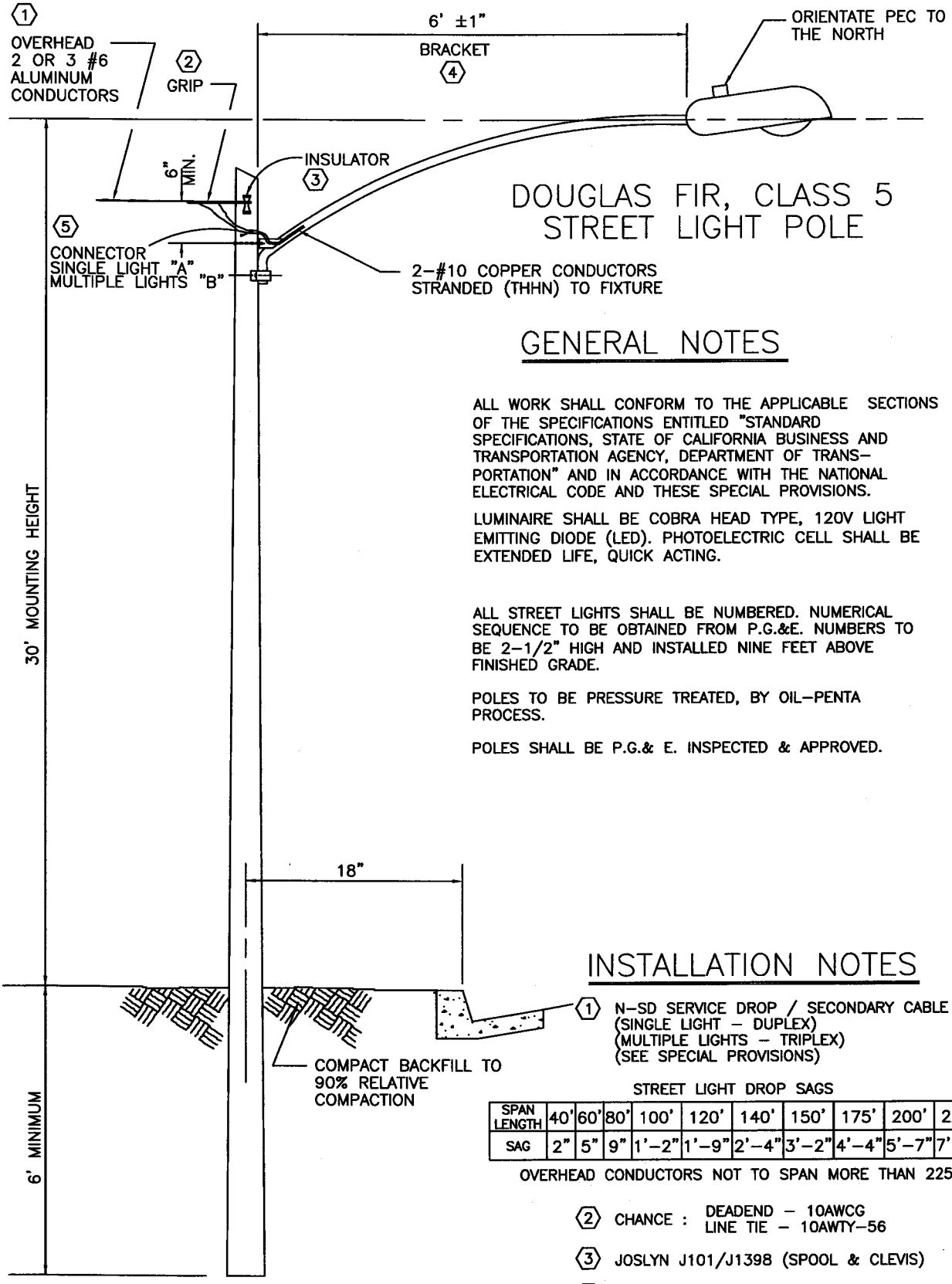
A PULL BOX WILL BE REQUIRED WHEREVER CONDUIT CHANGES DIRECTION AND WHERE MULTIPLE LIGHTS ARE INSTALLED ON A SINGLE SERVICE. PULLBOX SPACING SHALL NOT EXCEED 200'. (SEE P.W. STD. E-4)

STREETLIGHT-LOCAL STREET
DIRECT BURY WITH NO BASE

REF. & REV.
AUG. 2015

CITY OF FRESNO

E-2



DOUGLAS FIR, CLASS 5 STREET LIGHT POLE

GENERAL NOTES

ALL WORK SHALL CONFORM TO THE APPLICABLE SECTIONS OF THE SPECIFICATIONS ENTITLED "STANDARD SPECIFICATIONS, STATE OF CALIFORNIA BUSINESS AND TRANSPORTATION AGENCY, DEPARTMENT OF TRANS-PORTATION" AND IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND THESE SPECIAL PROVISIONS.

LUMINAIRE SHALL BE COBRA HEAD TYPE, 120V LIGHT EMITTING DIODE (LED). PHOTOELECTRIC CELL SHALL BE EXTENDED LIFE, QUICK ACTING.

ALL STREET LIGHTS SHALL BE NUMBERED. NUMERICAL SEQUENCE TO BE OBTAINED FROM P.G.&E. NUMBERS TO BE 2-1/2" HIGH AND INSTALLED NINE FEET ABOVE FINISHED GRADE.

POLES TO BE PRESSURE TREATED, BY OIL-PENTA PROCESS.

POLES SHALL BE P.G.& E. INSPECTED & APPROVED.

INSTALLATION NOTES

1 N-SD SERVICE DROP / SECONDARY CABLE
(SINGLE LIGHT - DUPLEX)
(MULTIPLE LIGHTS - TRIPLEX)
(SEE SPECIAL PROVISIONS)

STREET LIGHT DROP SAGS

SPAN LENGTH	40'	60'	80'	100'	120'	140'	150'	175'	200'	225'
SAG	2"	5"	9"	1'-2"	1'-9"	2'-4"	3'-2"	4'-4"	5'-7"	7'-1"

OVERHEAD CONDUCTORS NOT TO SPAN MORE THAN 225'

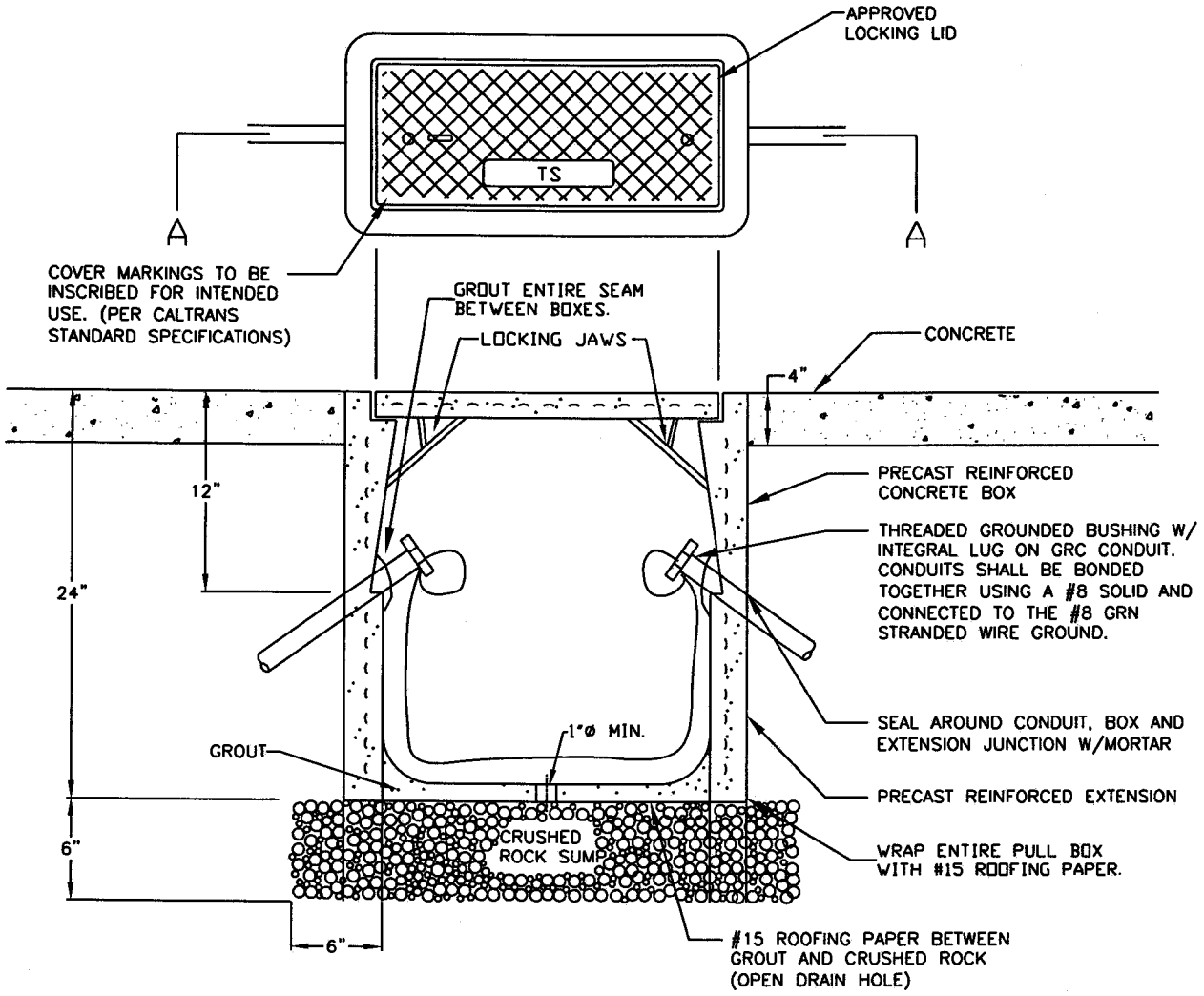
2 CHANCE : DEADEND - 10AWCG
LINE TIE - 10AWTY-56

3 JOSLYN J101/J1398 (SPOOL & CLEVIS)

4 JOSLYN JP40482 (BRACKET)

5 CONNECTOR (SEE SPECIAL PROVISIONS)

STREETLIGHT-LOCAL STREET OVERHEAD SERVICE - WOOD POLE	REF. & REV. AUG. 2015	CITY OF FRESNO E-3

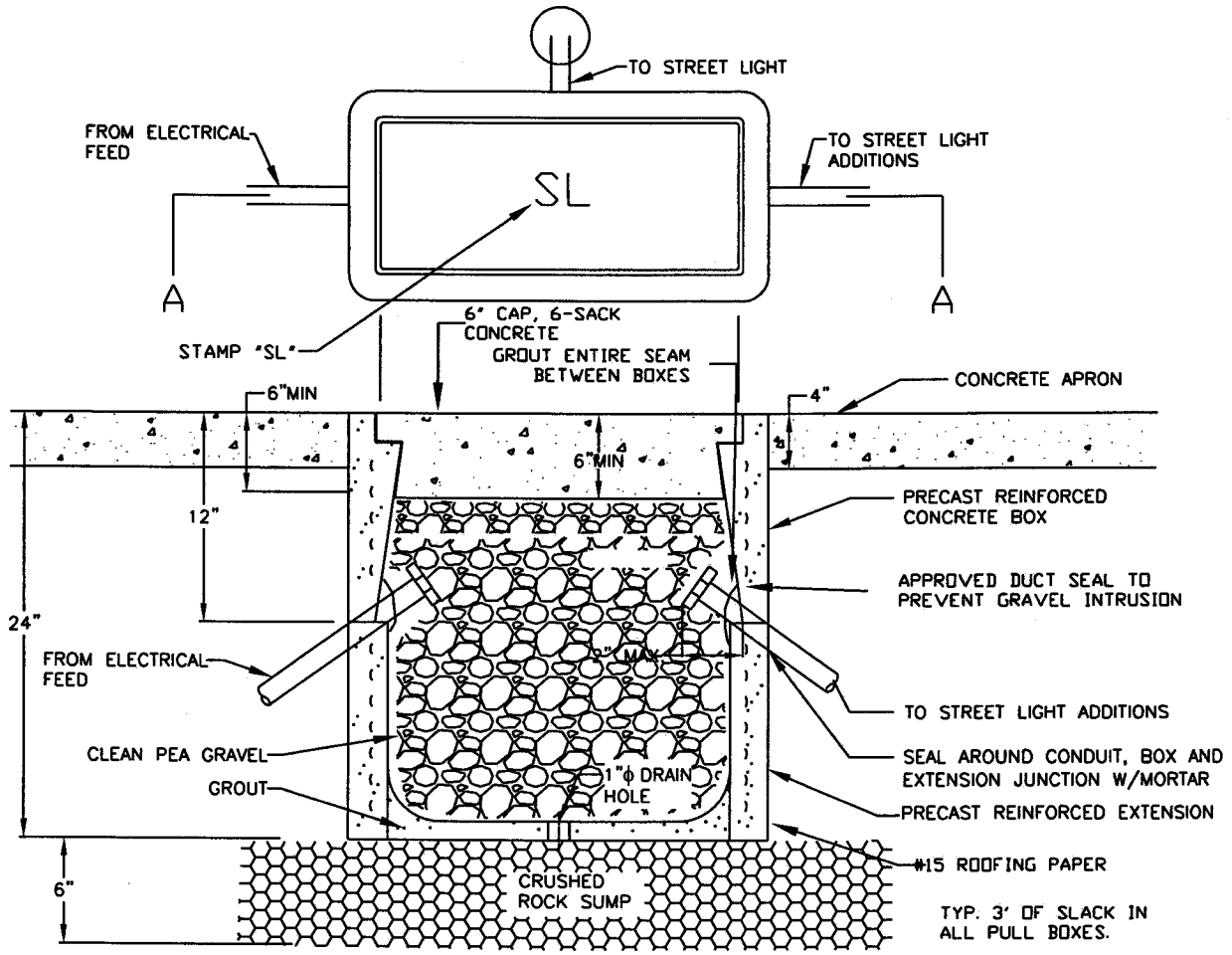


Section A–A

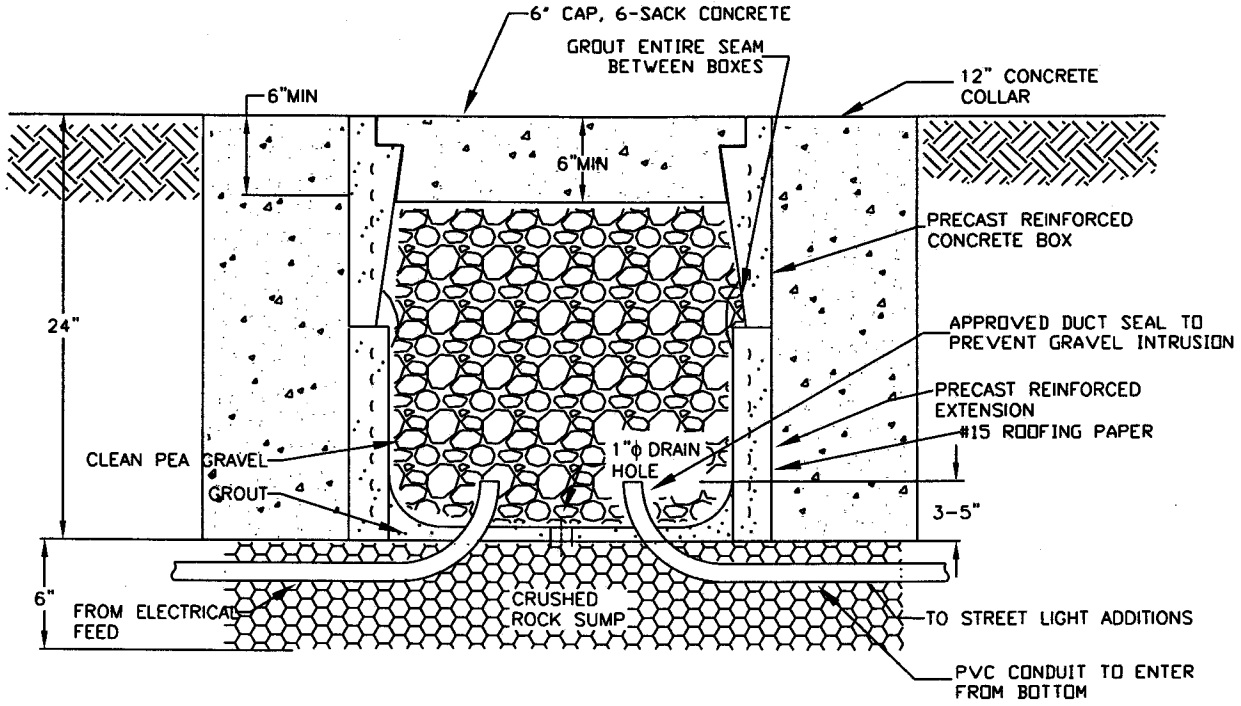
NOTES:

1. PULL BOXES SHALL BE #5 UNLESS OTHERWISE NOTED ON PLANS.
2. WRAP PULL BOX WITH ROOFING PAPER BEFORE BACKFILLING.
3. INSTALL A ONE–FOOT RING OF CONCRETE, 24" DEEP, AROUND THE WRAPPED PULL BOXES INSTALLED IN NON–CONCRETE AREAS, SLOPED TO DRAIN AWAY FROM THE PULL BOX. PULL BOXES IN SIDEWALKS MUST BE SET AT FINISHED GRADE WITH TEMPORARY CONCRETE APRON OR SECTION OF SIDEWALK POURED.
4. PULL BOXES SHALL BE GROUTED PRIOR TO INSTALLATION OF CONDUCTORS, SLOPED TOWARD THE DRAIN HOLE. PLACE A LAYER OF ROOFING PAPER BETWEEN THE CRUSHED ROCK AND THE GROUT, OPEN AT THE DRAIN HOLE.
5. AN APPROVED LOCKING LID SHALL BE INSTALLED ON ALL TRAFFIC SIGNAL PULL BOXES.
6. TYPICAL, 3' OF SLACK IN ALL PULL BOXES.

TRAFFIC SIGNALS CONCRETE PULL BOXES	REF. & REV. JUNE 2015	CITY OF FRESNO E–4A

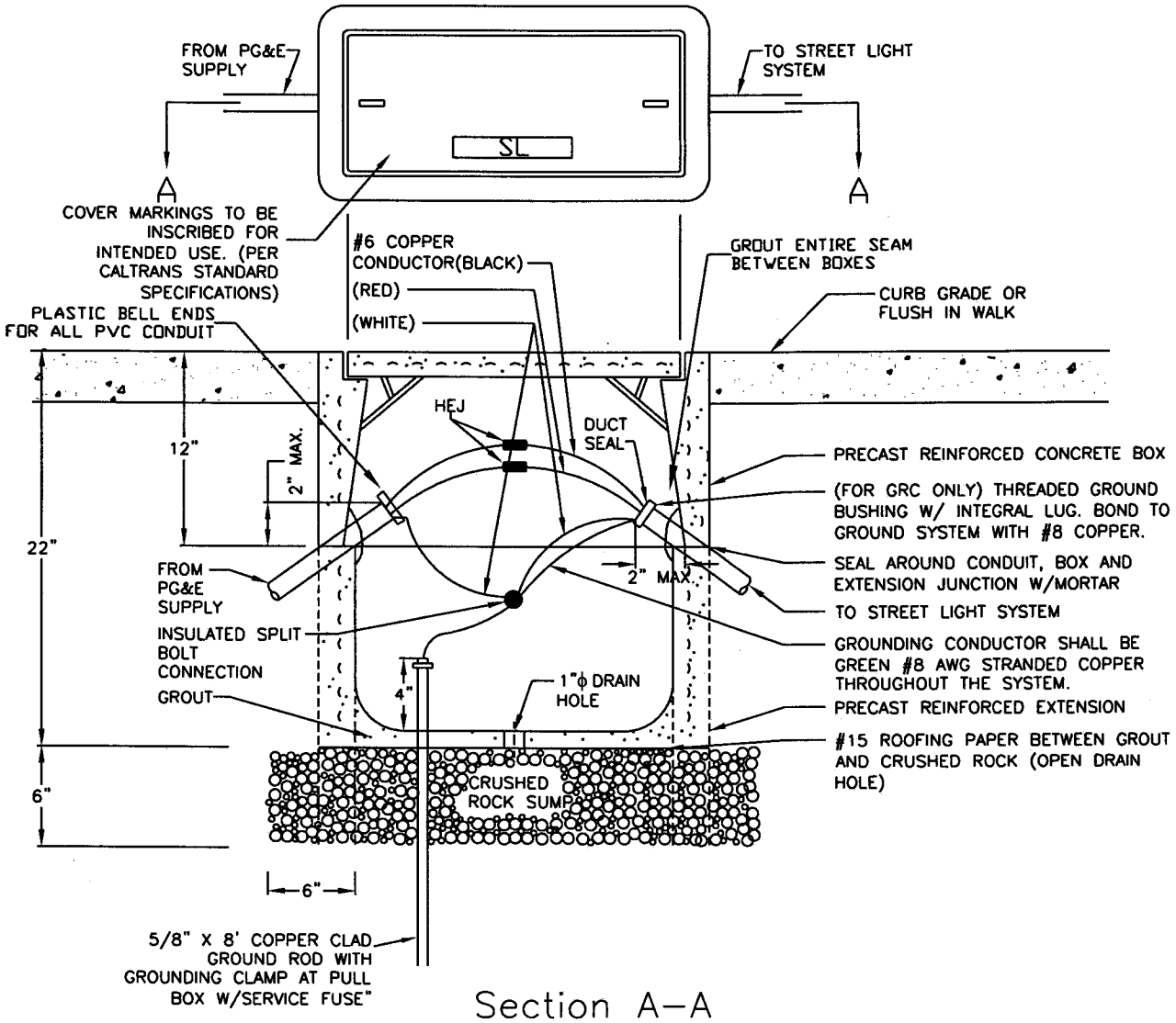


STREET LIGHT PULL BOX IN CONCRETE AREA



STREET LIGHT PULL BOX IN DIRT AREA

STREETLIGHTS CONCRETE PULL BOXES DETERRENT DETAIL	REF. & REV. JUNE 2015	CITY OF FRESNO E–4B

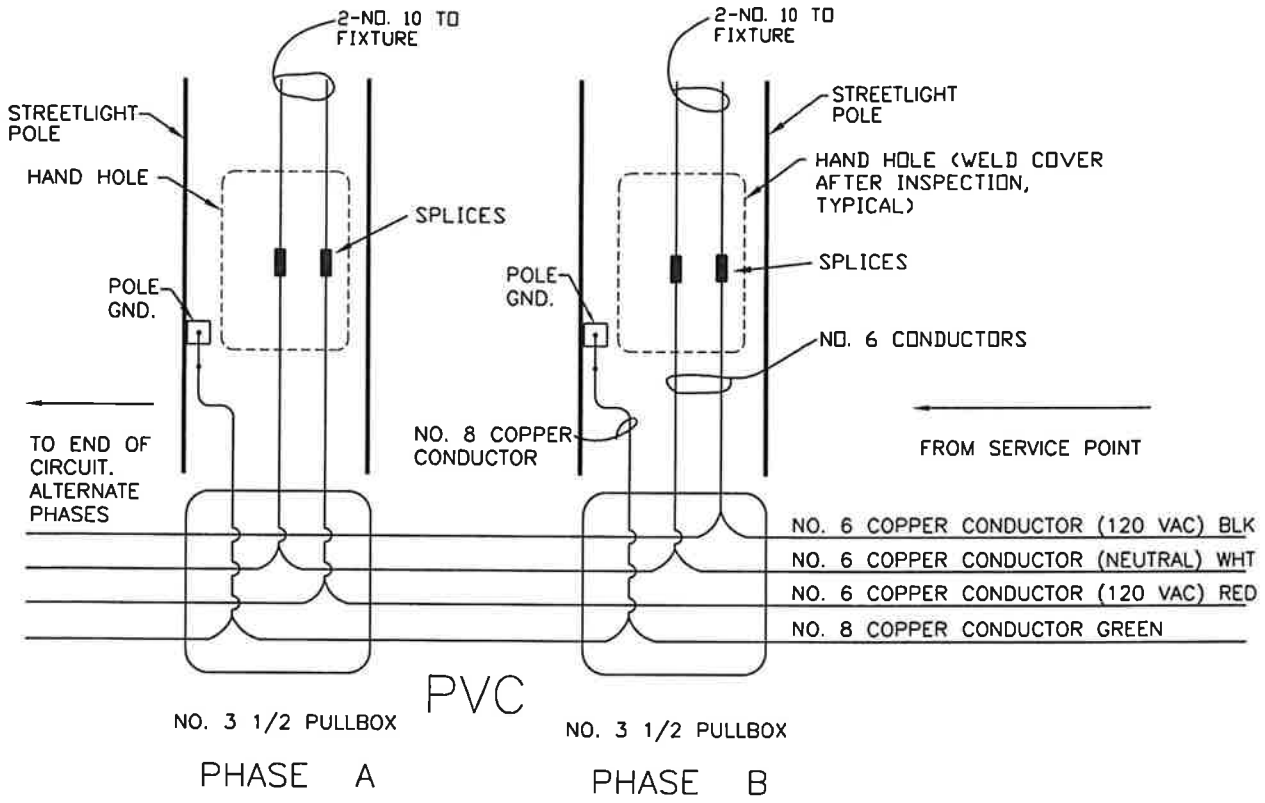


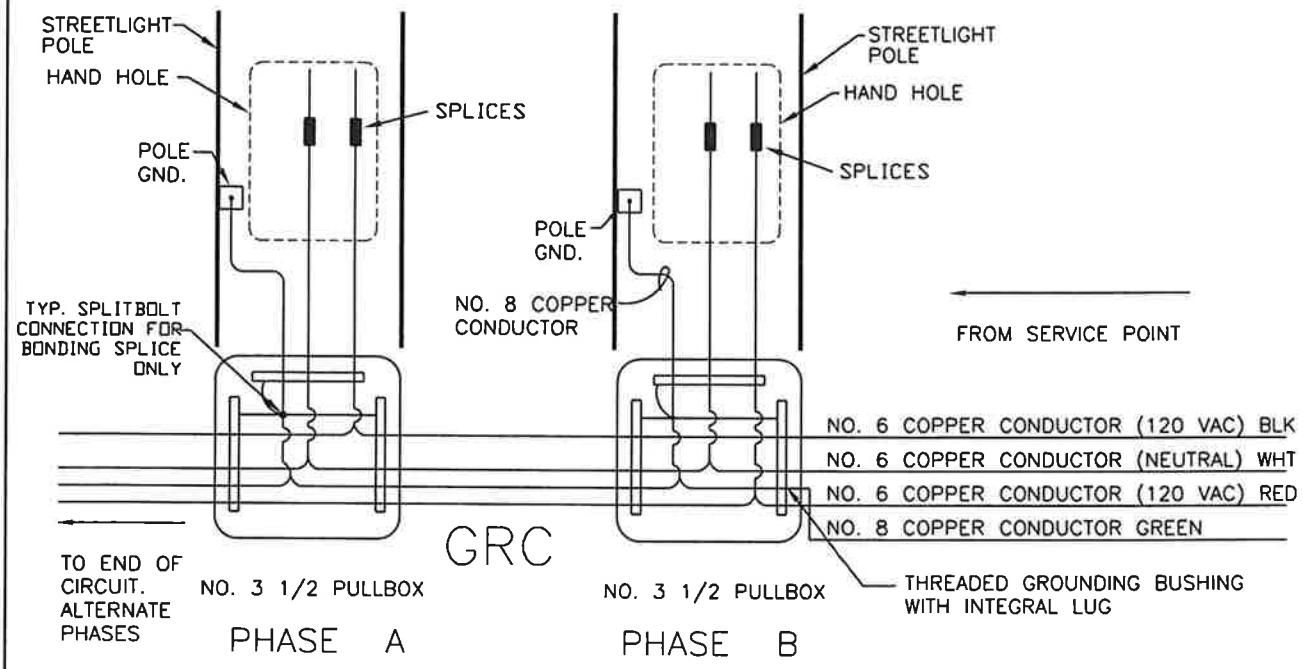
Section A–A

NOTES:

1. PULL BOXES SHALL BE #3 1/2 UNLESS OTHERWISE NOTED ON PLANS.
2. SERVICE PULL BOX SHALL BE WITHIN THE STREET R.O.W. AND NOT PRIVATE PROPERTY.
3. WRAP PULL BOX WITH ROOFING PAPER BEFORE BACKFILLING.
4. INSTALL A ONE–FOOT CONCRETE COLLAR, 24" DEEP, AROUND THE WRAPPED PULL BOXES WHEN INSTALLED IN DIRT OR TURF AREAS, SLOPED TO DRAIN AWAY FROM THE PULL BOX. PULL BOXES IN SIDEWALKS MUST BE SET AT FINISHED GRADE WITH A TEMPORARY CONCRETE APRON OR SECTION OF SIDEWALK POURED.
5. PULL BOXES SHALL BE GROUTED PRIOR TO INSTALLTION OF CONDUCTORS, SLOPED TOWARD THE DRAIN HOLE. PLACE A LAYER OF ROOFING PAPER BETWEEN THE CRUSHED ROCK AND THE GROUT, OPEN AT THE DRAIN HOLE.
6. FUSE AT POINT OF SERVICE SHALL BE 60A IF #6 CONDUCTOR AND 40A IF #8 CONDUCTOR AND SHALL HAVE A TRON HEJ TYPE FUSE HOLDER (SINGLE POLE). INSULATE WIRE CONNECTION SAME AS SPLICES (23–3.13).
7. AN APPROVED LOCKING LID SHALL BE INSTALLED AT THE "POINT OF SERVICE" PULL BOX.

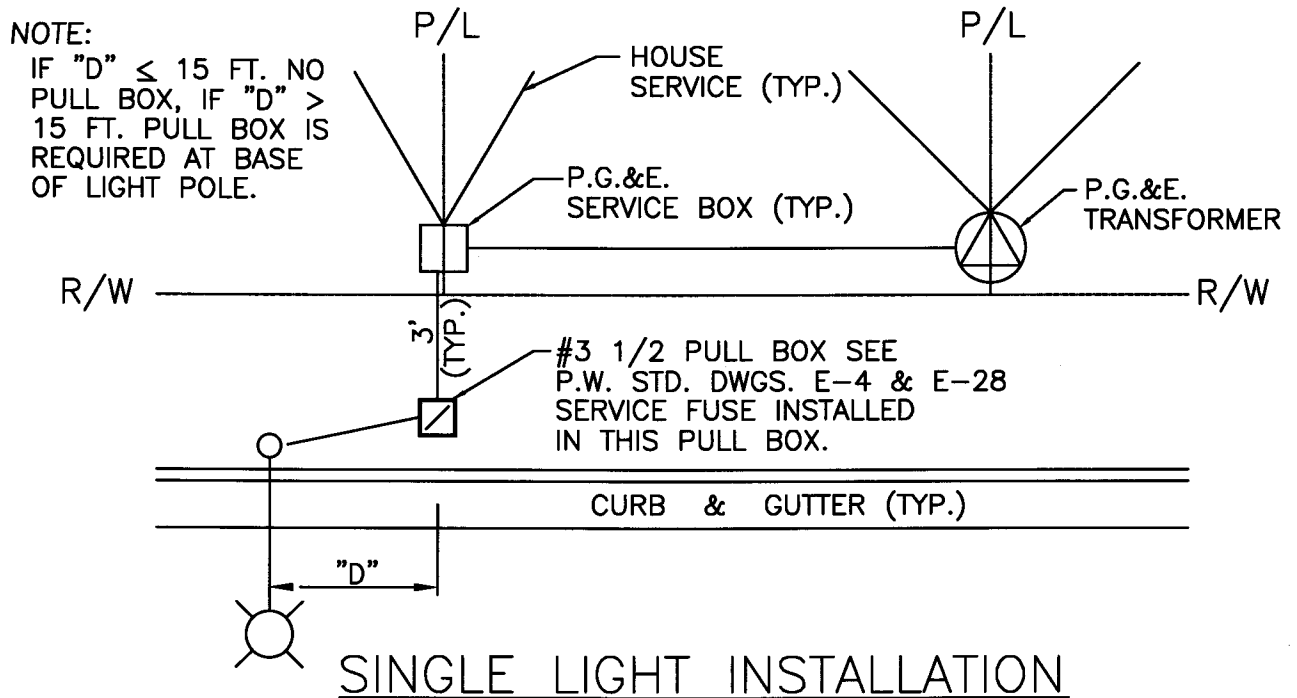
STREETLIGHT POINT OF SERVICE CONCRETE PULL BOX	REF. & REV. JUNE 2015	CITY OF FRESNO E–4C



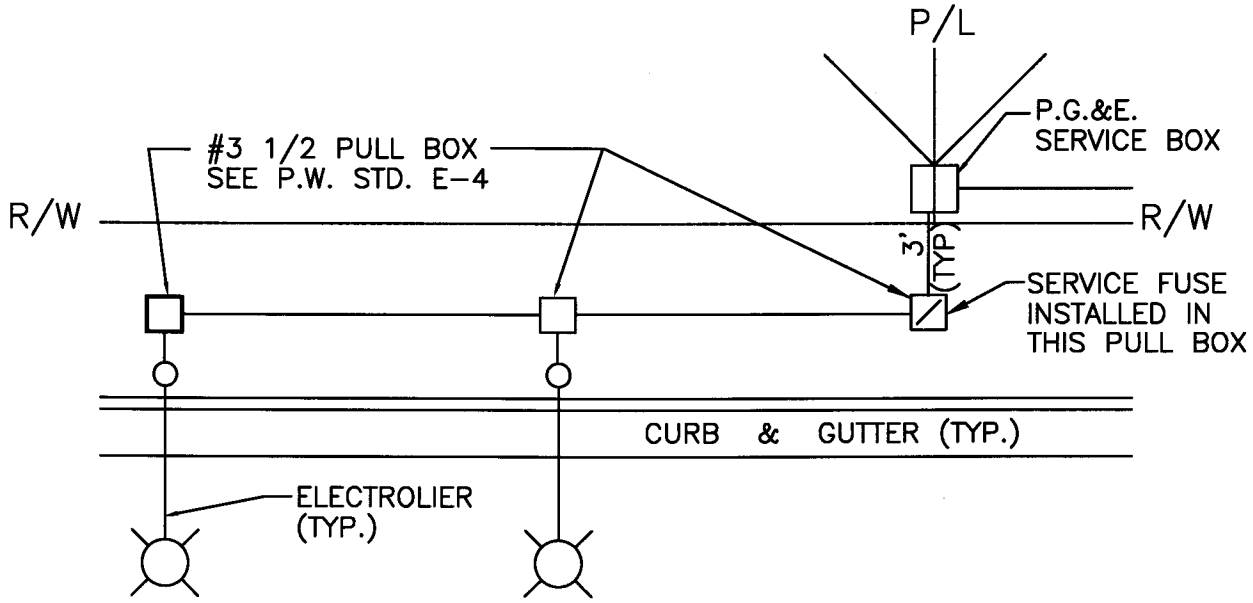


NOTES:
WITH EXCEPTION OF BONDING JUMPERS, NO SPLICES WILL BE ALLOWED IN PULL BOXES.

STREETLIGHT–CONNECTION DIAGRAM	REF. & REV. JUNE 2015	CITY OF FRESNO E–5



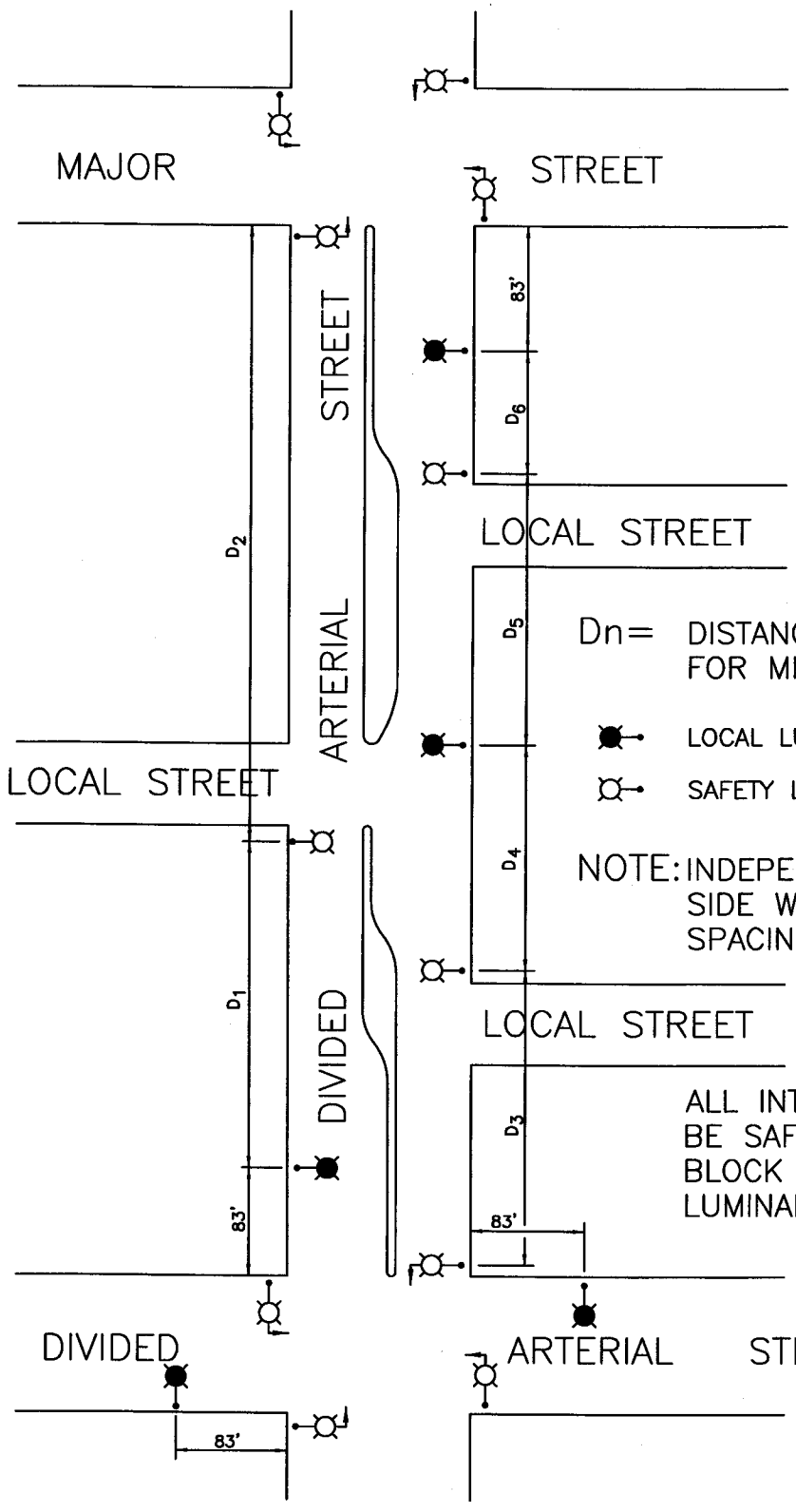
SINGLE LIGHT INSTALLATION



MULTIPLE LIGHT INSTALLATION

1. CONDUIT SHALL BE SCHEDULE 40 PVC ON LOCAL STREETS AND SCHEDULE 80 PVC ON MAJOR STREETS. LOCAL STREET CROSSINGS SHALL BE SCHEDULE 80 PVC, AND MAJOR STREETS CROSSINGS SHALL BE GALVANIZED RIGID CONDUIT.
2. LOCATE STREET LIGHTS ON THE SAME SIDE OF THE STREET AS THE P.G.&E. SERVICE WHEN POSSIBLE.
3. DO NOT LOCATE THE PULL BOXES ABOVE THE JOINT TRENCH.
4. PULL BOX SPACING SHALL NOT EXCEED 200' AND SHALL BE REQUIRED IN ALL CONDUIT CHANGE OF DIRECTION.

STREETLIGHT LAYOUT	REF. & REV. NOV., 2007	CITY OF FRESNO E-6



Dn= DISTANCE TO BE DIVIDED FOR MID BLOCK LIGHTING.

LOCAL LUMINAIRE PER SECTION 23–3.16

SAFETY LUMINAIRE PER SECTION 23–3.16

NOTE: INDEPENDENT SYSTEMS ON EACH SIDE WITH 165 FT. MAX. SPACING ON EACH SIDE.

ALL INTERSECTION LIGHTS SHALL BE SAFETY LUMINAURES, MID BLOCK LIGHTS SHALL BE LOCAL LUMINAIRES.

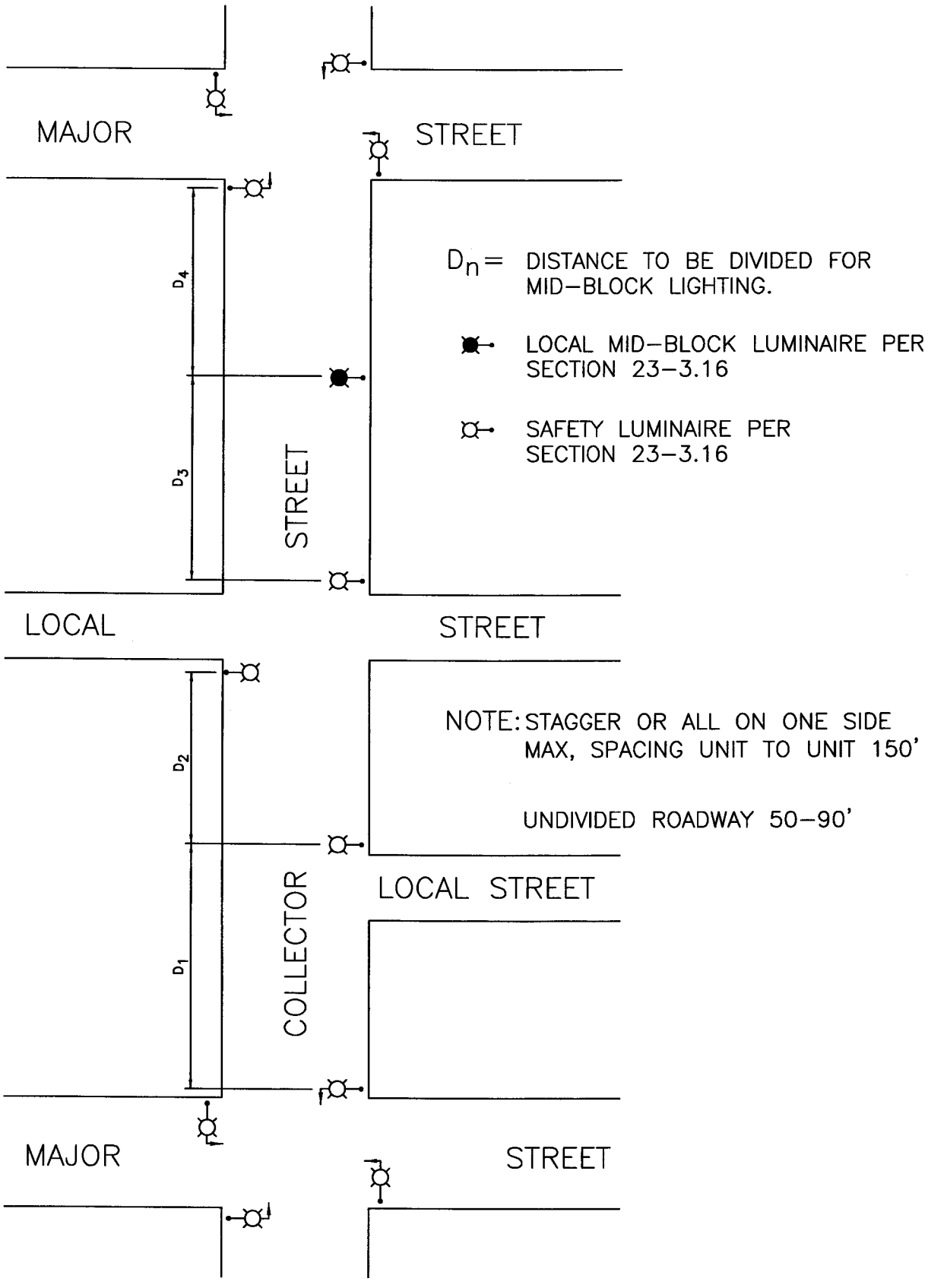
STREETLIGHT–PLACEMENT

DIVIDED ARTERIAL STREETS

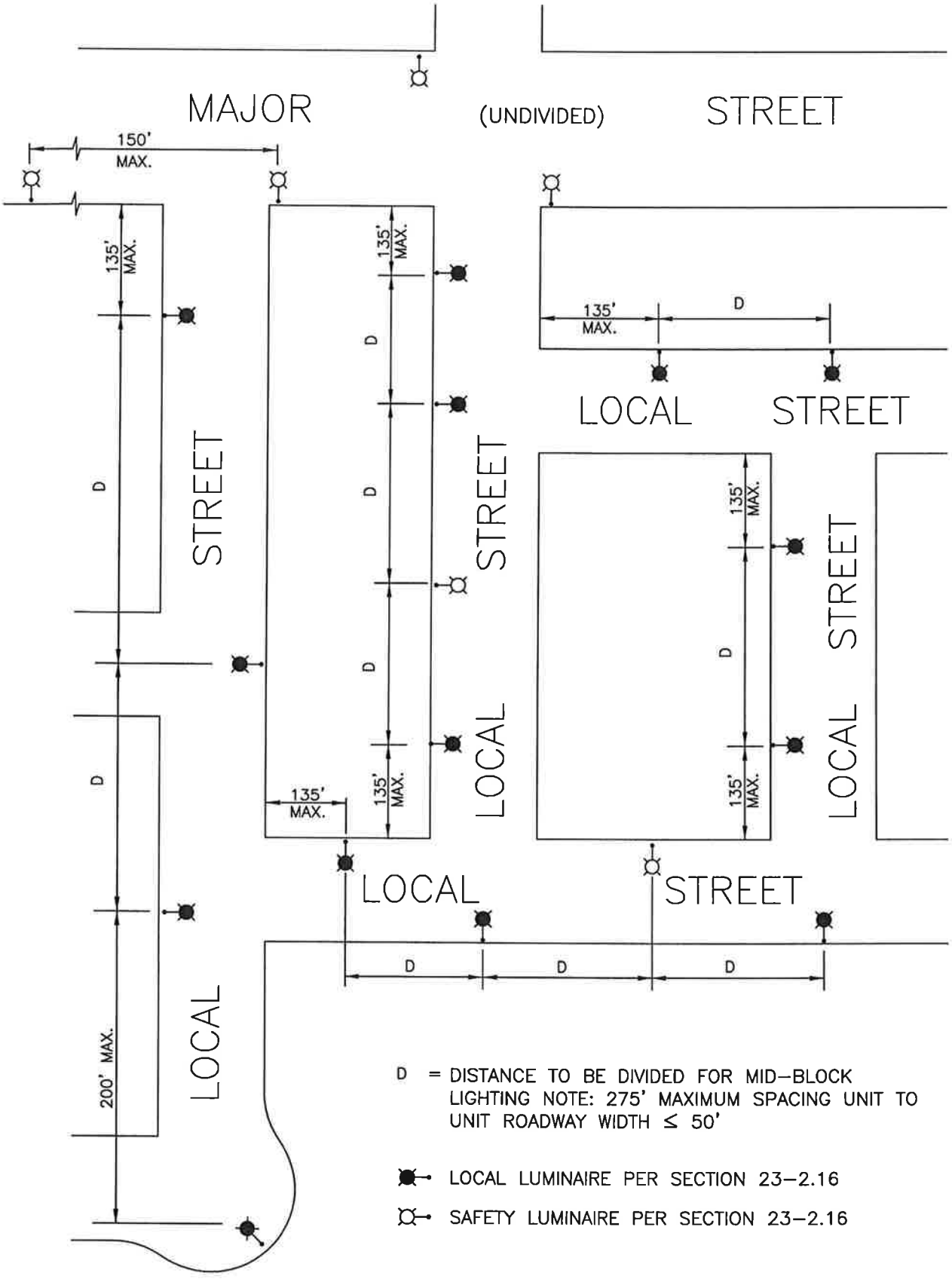
REF. & REV.
AUG. 2015

CITY OF FRESNO

E–7



STREETLIGHT-PLACEMENT COLLECTOR STREET	REF. & REV. AUG. 2015	CITY OF FRESNO E-8



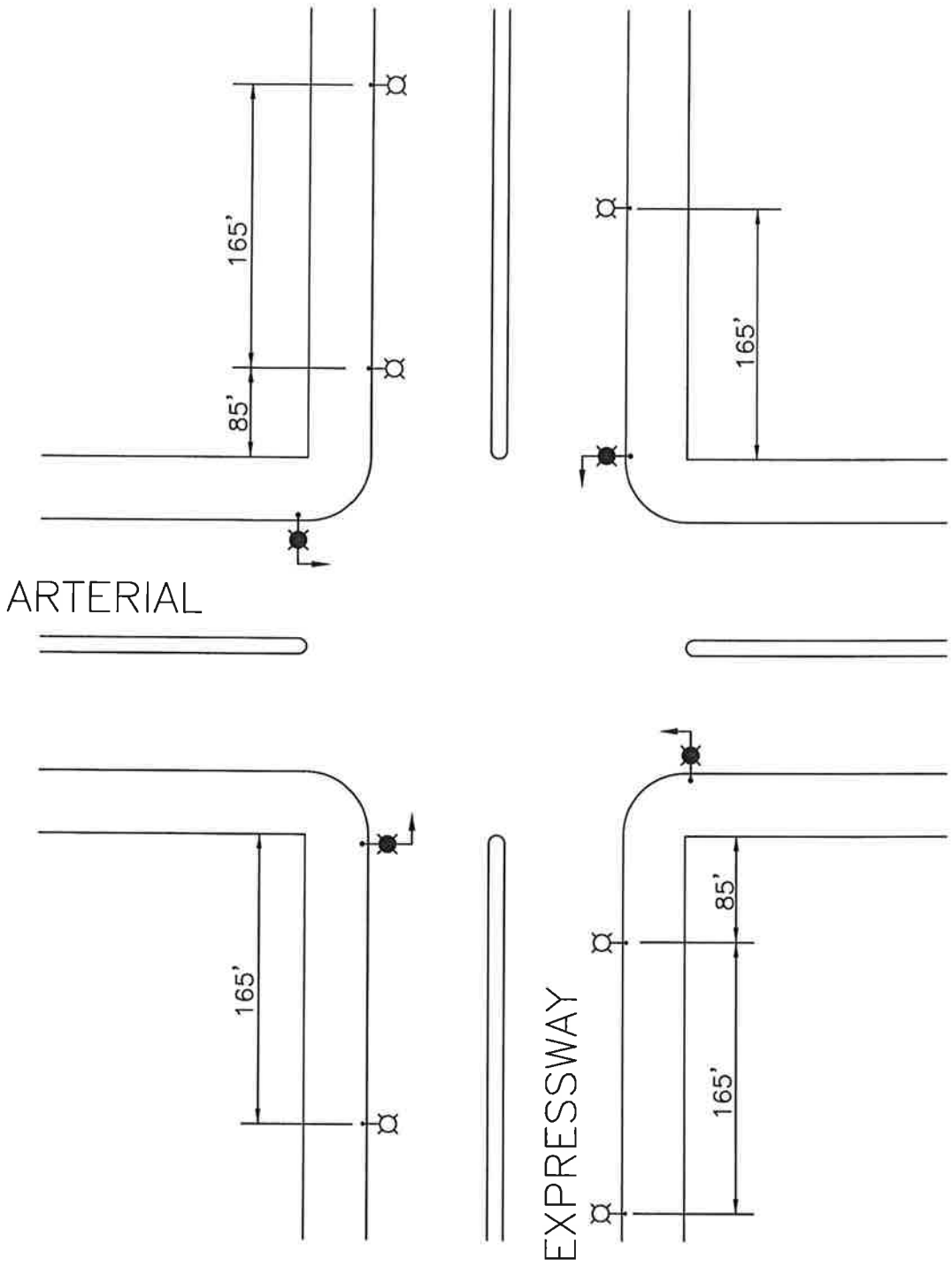
STREETLIGHT–PLACEMENT

LOCAL STREETS

REF. & REV.
AUG. 2015

CITY OF FRESNO

E–9

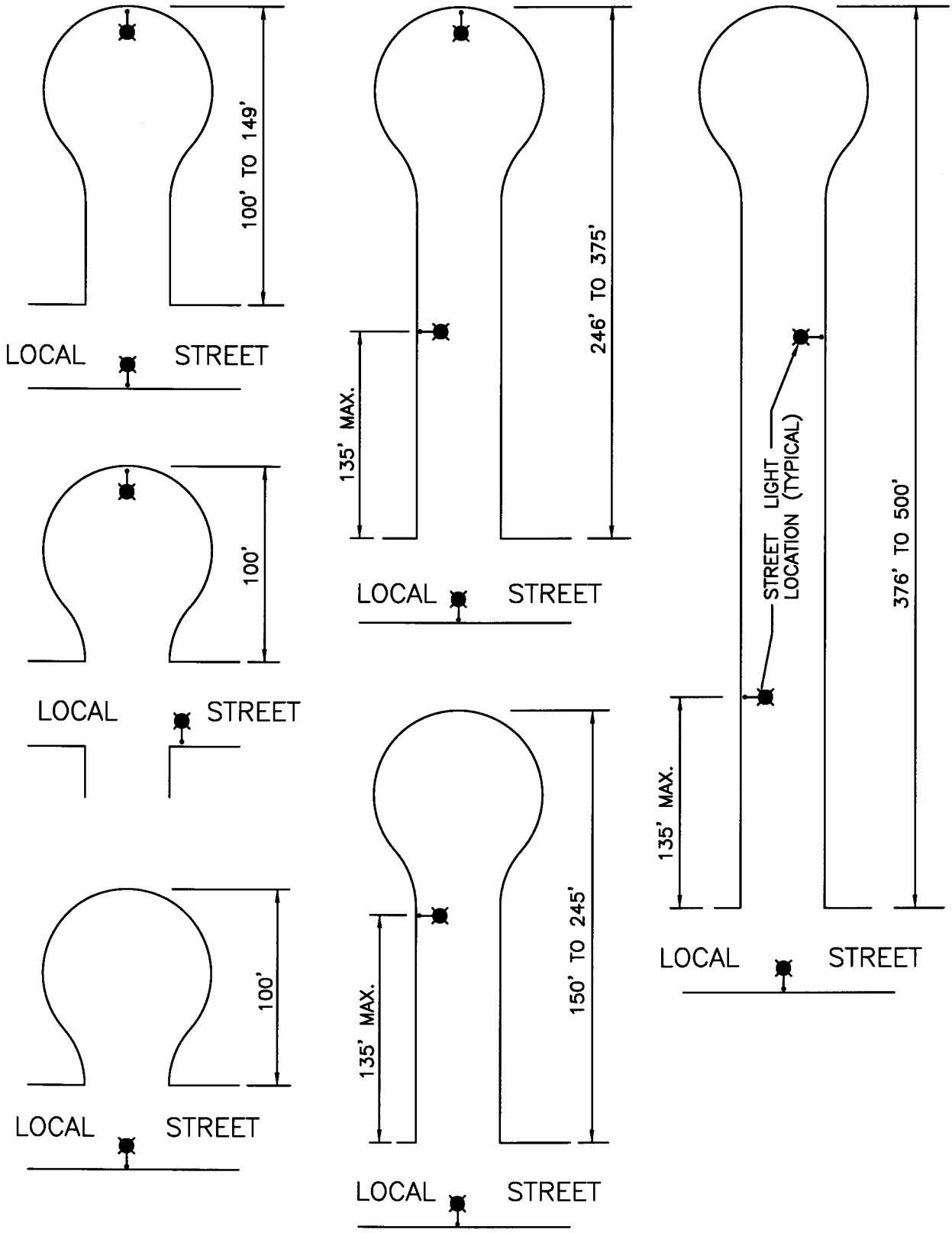


■ = SAFETY EXPRESSWAY LUMINAIRE PER SECTION 23–2.16

¤ = LOCAL LUMINAIRE PER SECTION 23–2.16

NOTE: SAFETY LIGHTS & APPROACH LIGHTS (ENTRANCE & EXIT) TO BE ON SEPARATE BREAKERS OF SAME CONTACTOR.

STREETLIGHT–PLACEMENT EXPRESSWAY	REF. & REV. AUG. 2015	CITY OF FRESNO E–10



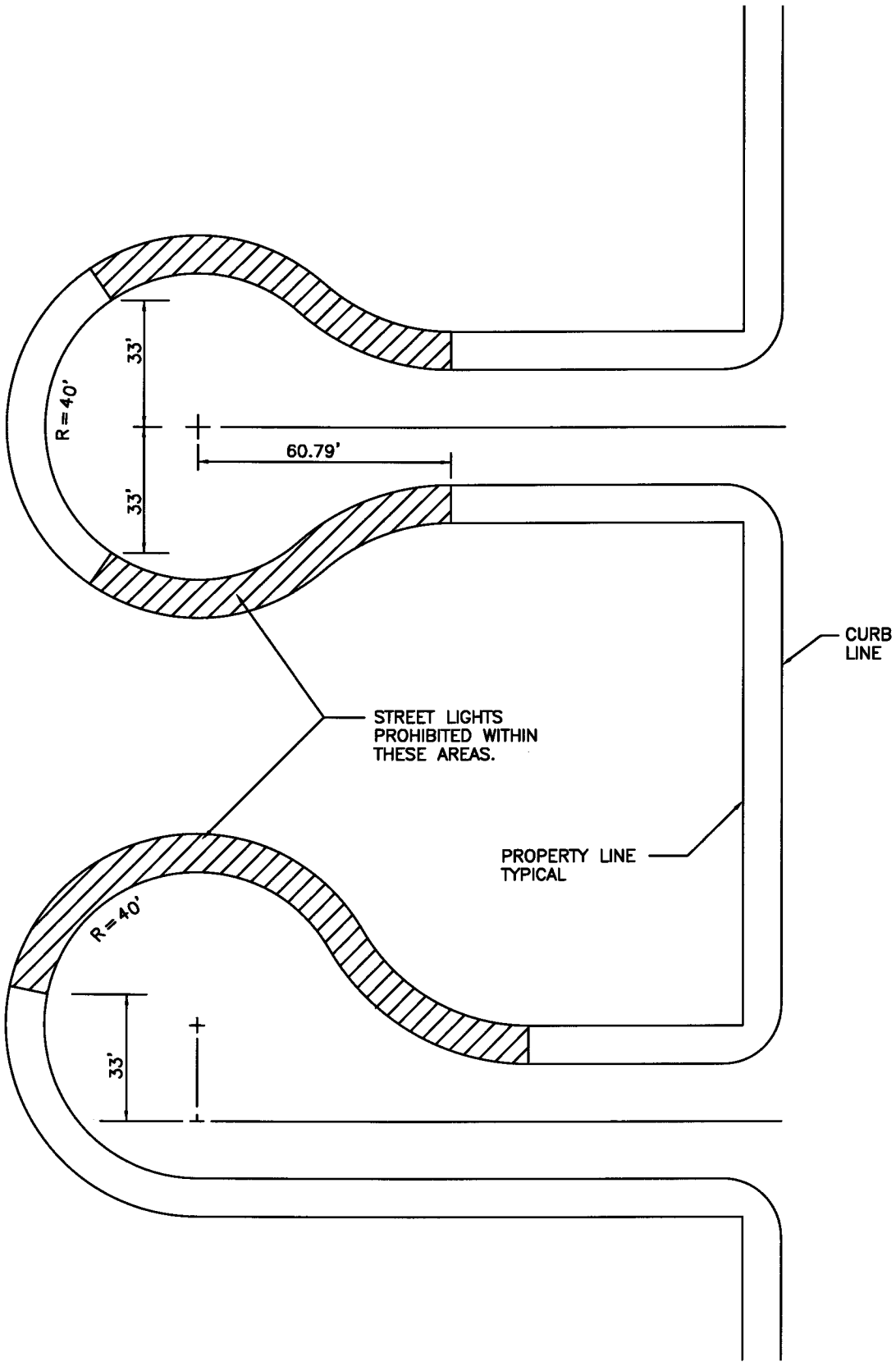
STREETLIGHT–PLACEMENT

CUL–DE–SAC STREETS

REF. & REV.
AUG., 2002

CITY OF FRESNO

E–11



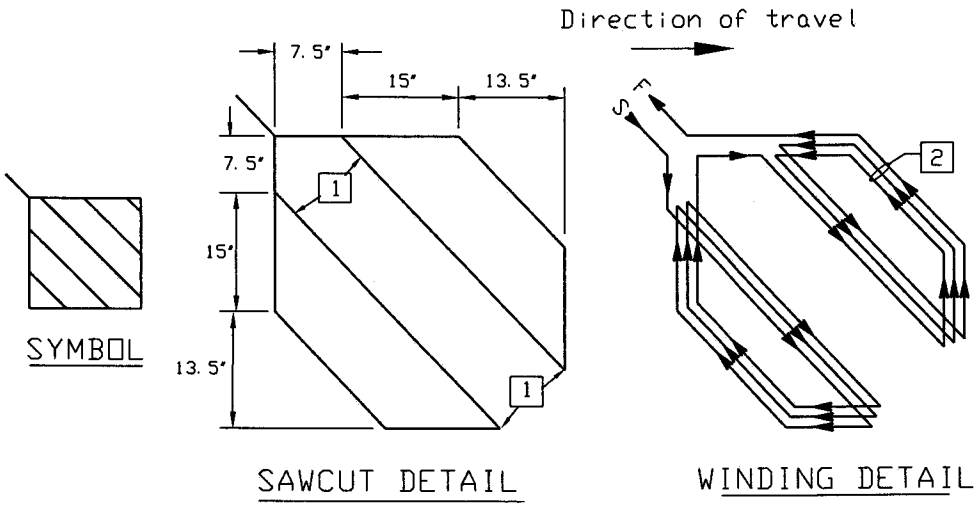
STREETLIGHT–RESTRICTIONS

CUL–DE–SAC DESIGNS

REF. & REV.
AUG., 2002

CITY OF FRESNO

E–12

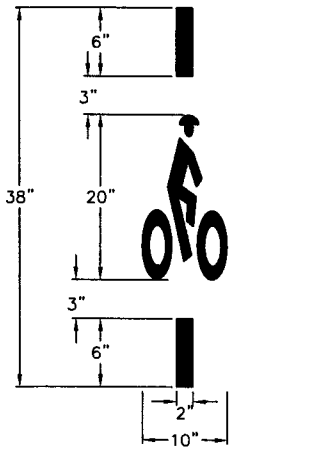


BIKE LOOP (3' X3')
DETECTOR CONFIGURATION

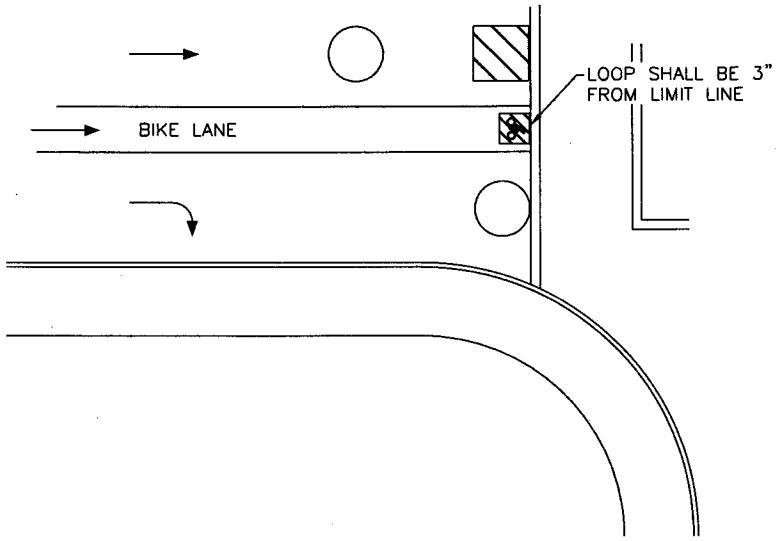
[1] Round corners of acute angle sawcuts to prevent damage to conductors.

[2] Install 3 turns when only one BIKE loop is on a sensor unit channel. Install 5 turns when one BIKE loop is connected in series with 3 additional 6' x6' loops on a sensor unit channel.

CITY OF FRESNO BIKE LOOP WITH BIKE LOOP DETECTOR SYMBOL 9C-7 OF THE CA-MUTCD, CENTERED ON LOOP.



BICYCLE LOOP DETECTOR SYMBOL FOR 3'X3' LOOP



NOTES:

1. LOOP SEALANT SHALL BE CALTRANS APPROVED ELASTOMERIC SEALANT OR HOT MELT RUBBERIZED ASPHALT SEALANT.
2. ALL NEW LOOPS SHALL BE TESTED AND DOCUMENTED ON SHEET PROVIDED IN THE SECTION 23-2, TESTING SHALL BE TO CALTRANS STATE STANDARD PLANS.
3. REFER TO STD. DWG. E-14 FOR LOOP PLACEMENT.

SIGNAL LIGHTS **BIKE LOOP DETECTOR DETAIL (3'X3')**	REF. & REV. JUNE 2015	CITY OF FRESNO E-13

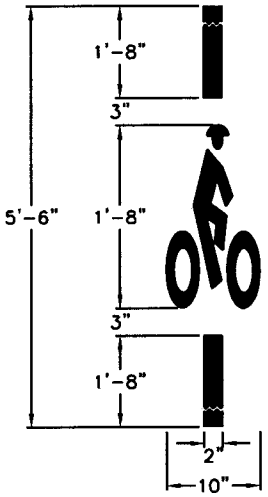
LEGEND:

CALTRANS TYPE 'E' – SAWCUT CIRCULAR LOOP DETECTOR – "TYPE 2" LOOP WIRE (ES-5B).

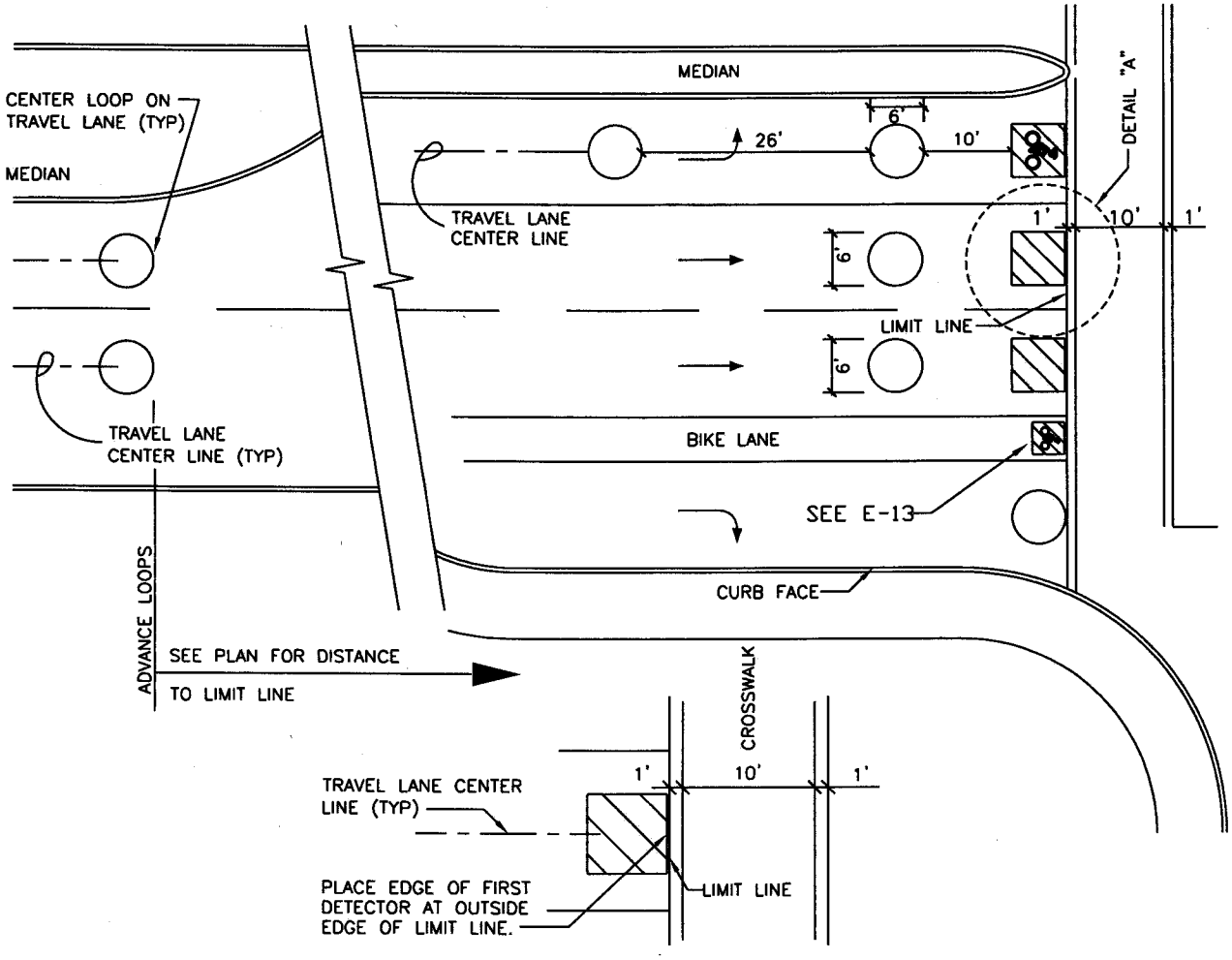
CALTRANS TYPE 'D' – SAW CUT DIAGONAL LOOP DETECTOR "TYPE 2" LOOP WIRE (ES-5B).

CALTRANS TYPE 'D' W/BIKE DETECTOR SYMBOL (ON STATE STD. PLANS A24C & FIG. 9C-7 (CA) CA-MUTCD) CENTERED ON LOOP.

CITY OF FRESNO STD. DWG. E-13 BIKE LOOP (3'x3') WITH BIKE DETECTOR SYMBOL CENTERED ON LOOP.



BICYCLE LOOP DETECTOR SYMBOL FOR CALTRANS TYPE 'D'



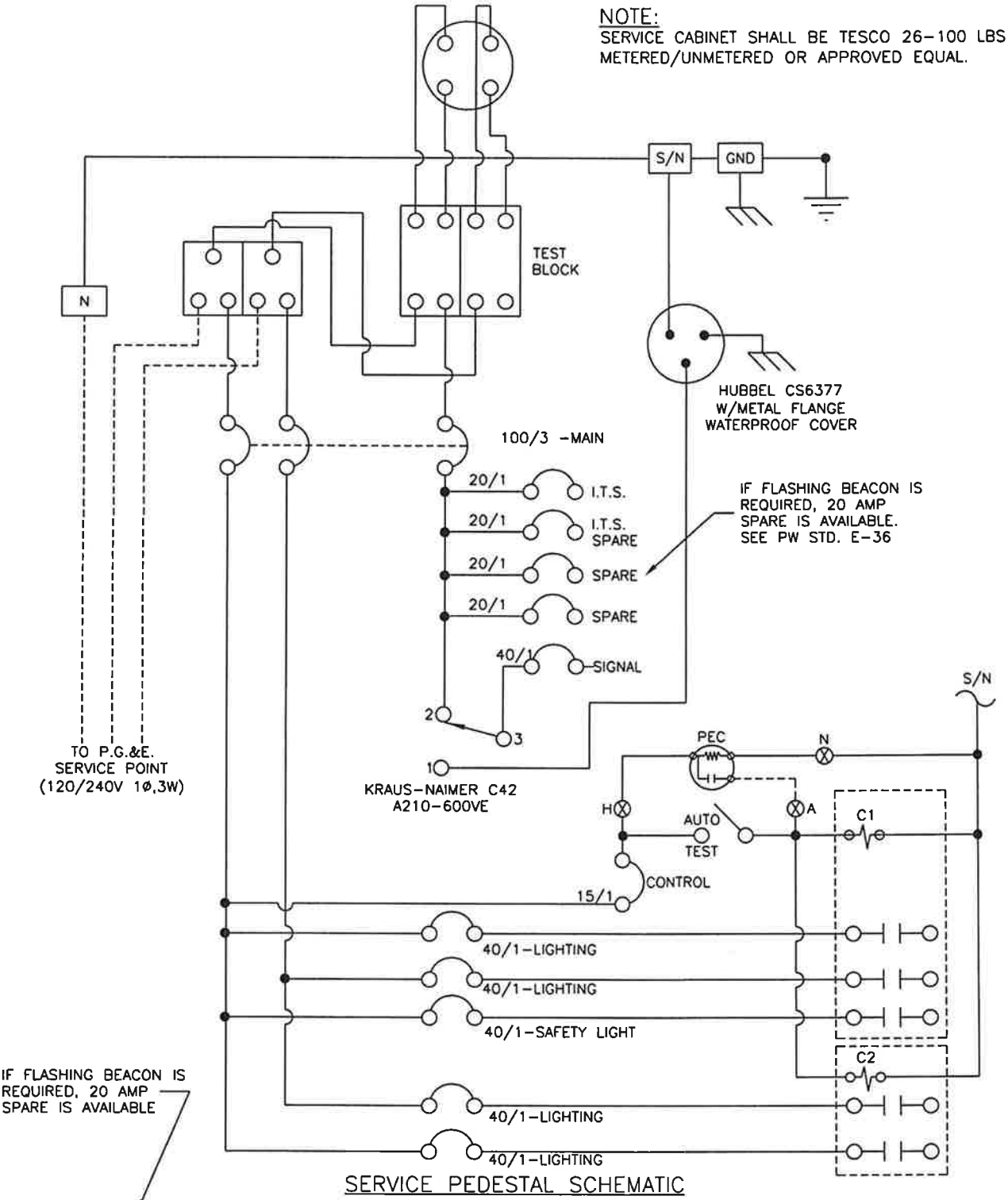
DETAIL "A"

NOTES:

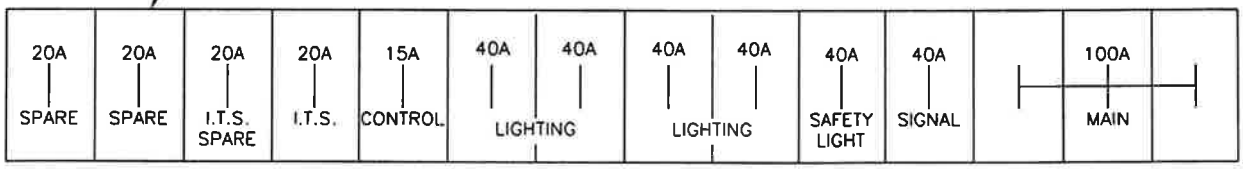
1. CIRCULAR DETECTION SHALL BE DETERMINED BY THE CONDITION OF EXISTING PAVEMENT AND SHALL HAVE THE APPROVAL OF THE CITY TRAFFIC ENGINEER. CIRCULAR LOOP SAWCUTS SHALL BE PER CALTRANS ES-5B, LOOP SEALANT SHALL BE CALTRANS APPROVED ELASTOMERIC SEALANT OR HOT MELT RUBBERIZED ASPHALT SEALANT.
2. ALL NEW LOOPS SHALL BE TESTED AND DOCUMENTED ON SHEET PROVIDED IN THE SECTION 23-2, TESTING SHALL BE TO CALTRANS STATE STANDARD PLANS.

SIGNAL LIGHTS LOOP DETECTOR PLACEMENT	REF. & REV. JUNE 2015	CITY OF FRESNO E-14

NOTE:
SERVICE CABINET SHALL BE TESCO 26-100 LBS METERED/UNMETERED OR APPROVED EQUAL.

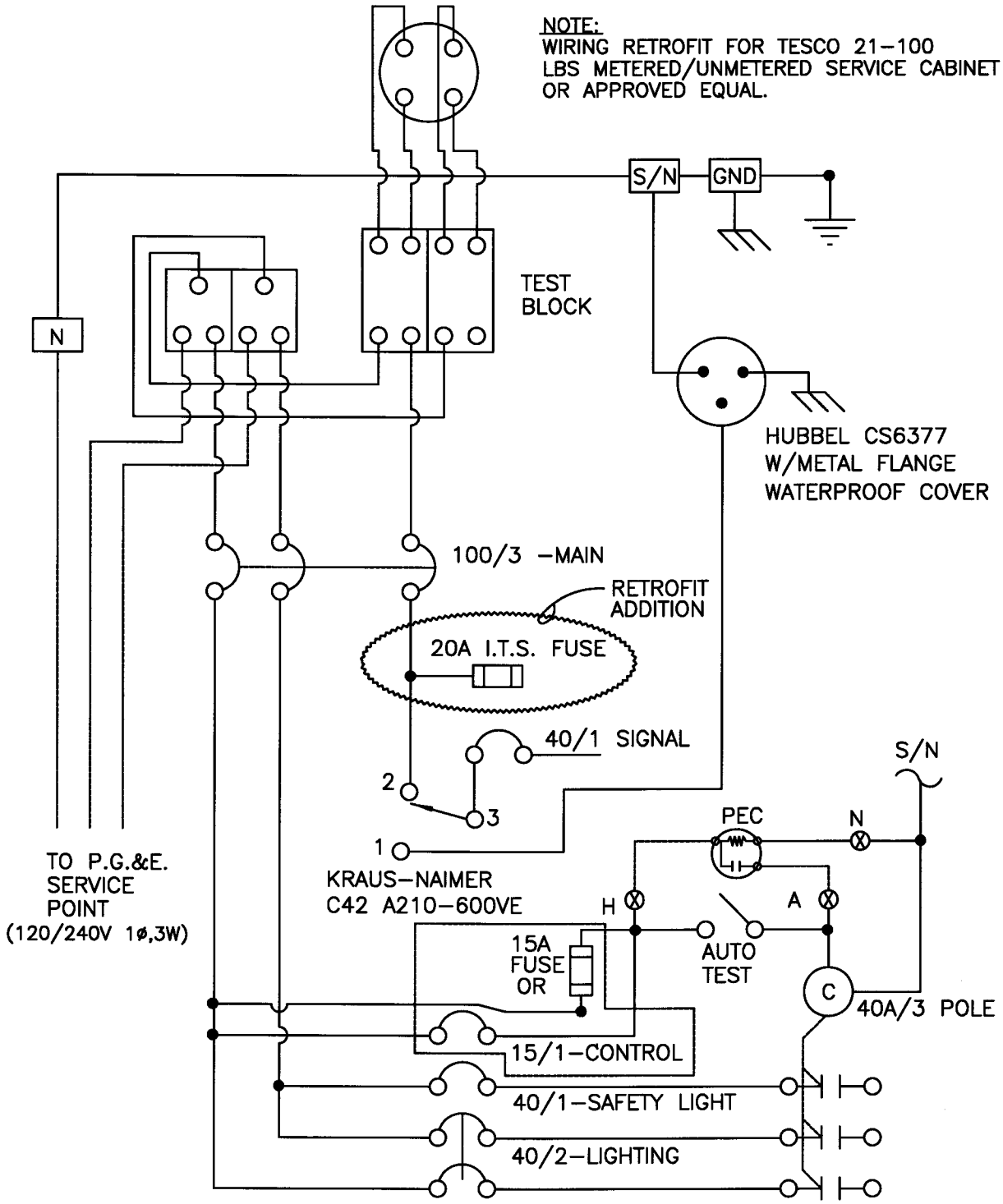


SERVICE PEDESTAL SCHEMATIC

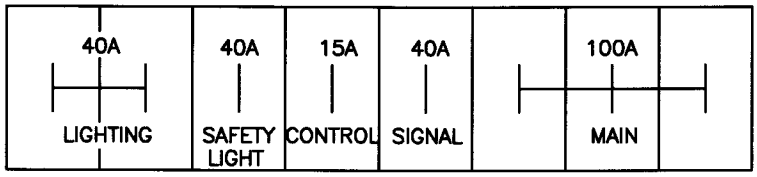


SWITCH LOCATION

SIGNAL LIGHT WIRING NEW INSTALLATIONS 26-100 CABINETS	REF. & REV. JUNE 2015	CITY OF FRESNO E-15

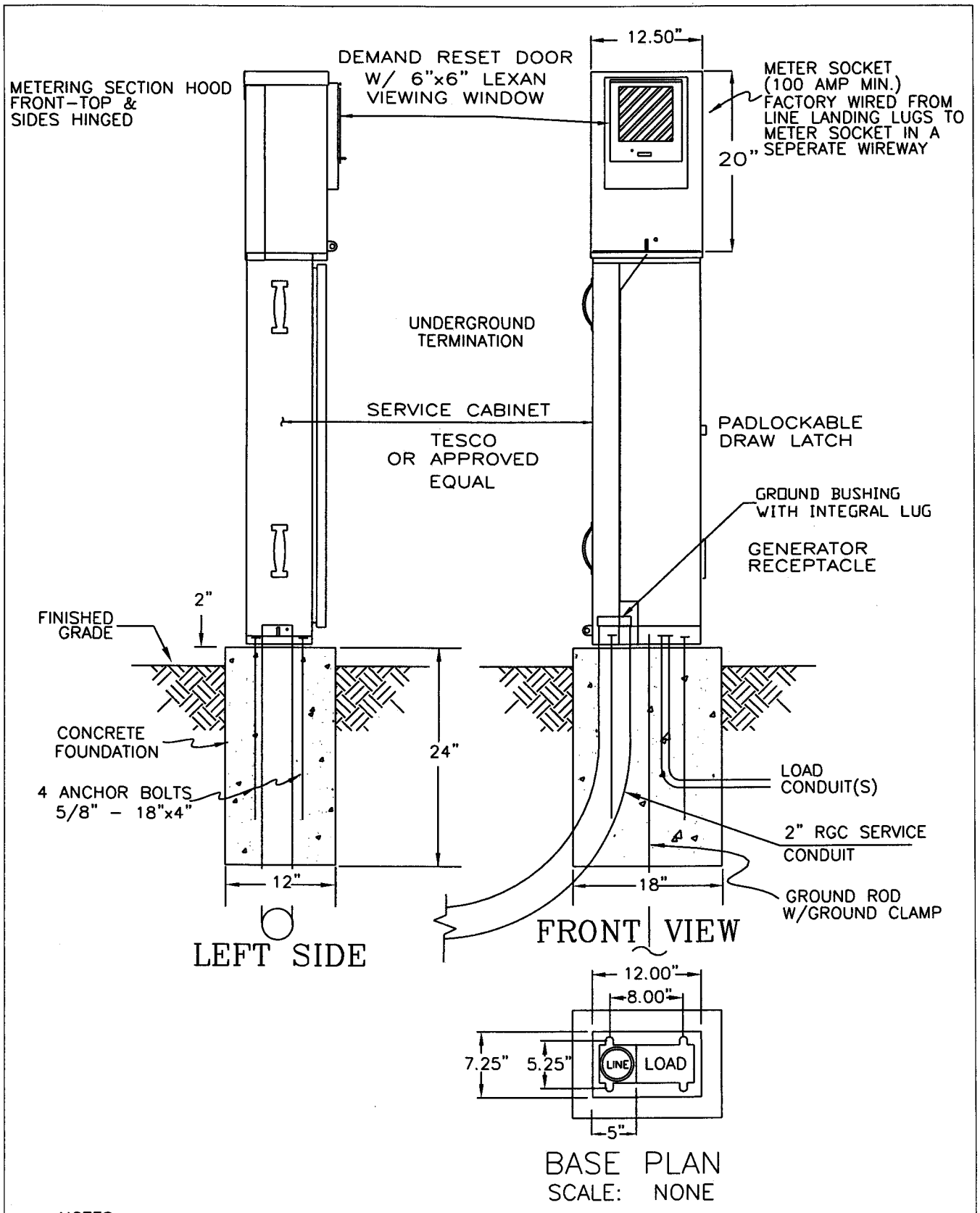


SERVICE PEDESTAL SCHEMATIC



SWITCH LOCATION

SIGNAL LIGHT WIRING RETROFIT OF EXISTING 21-100 CABINETS	REF. & REV. NOV., 2007	CITY OF FRESNO E-16

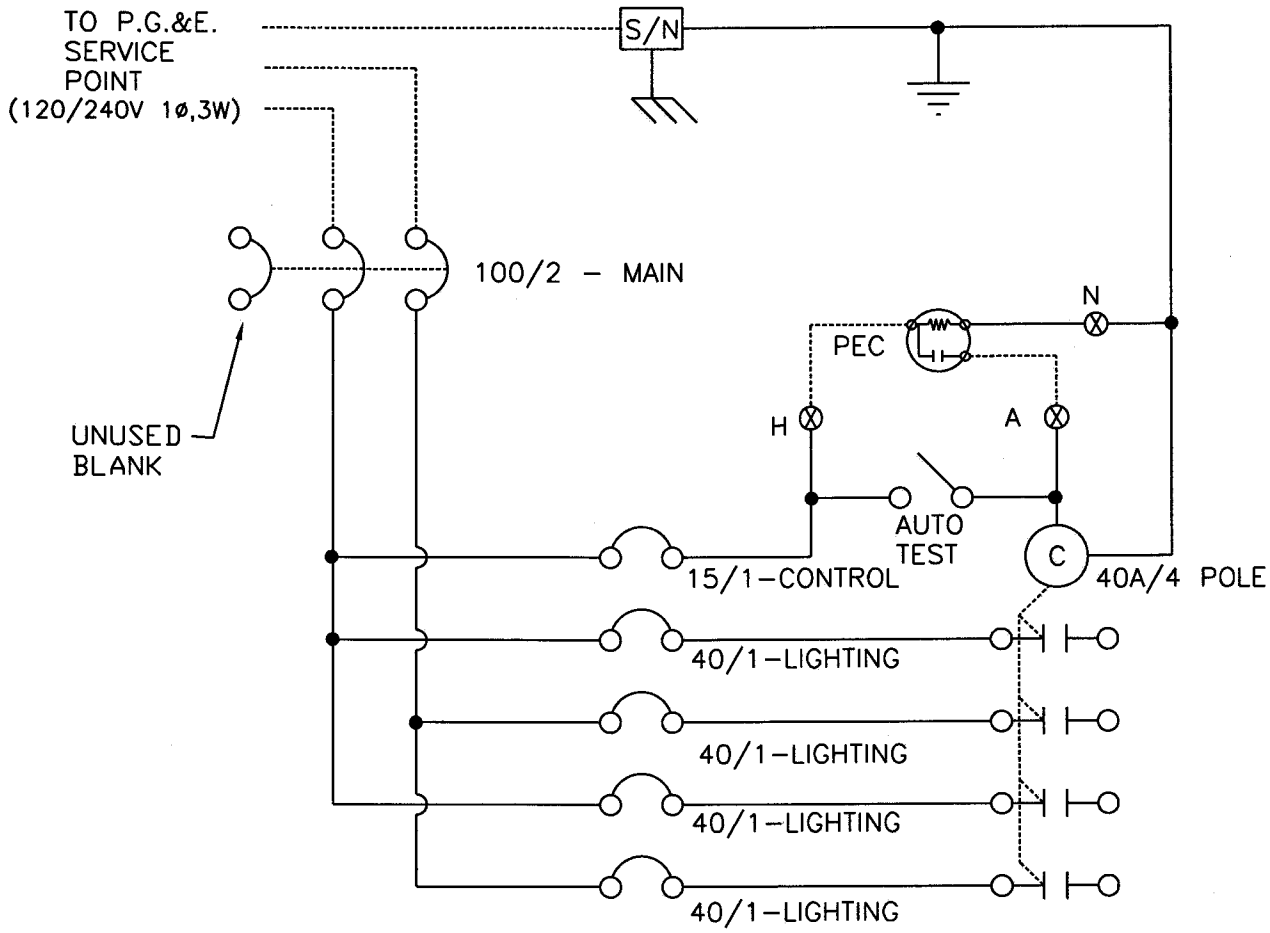


NOTES

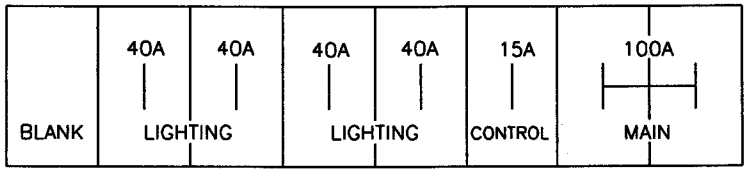
1. IN ORDER FOR CONFORMITY AND REPLACEMENT PURPOSES ALL SERVICE PEDESTAL FOUNDATIONS TO BE CONSTRUCTED TO THESE SPECIFICATIONS. ANY DEVIATIONS FROM THESE REQUIREMENTS SHALL HAVE THE APPROVAL OF THE ELECTRICAL SUPERINTENDANT.
2. FRONT OF CABINET SHALL FACE ACCESSIBLE RIGHT OF WAY.

SIGNAL LIGHT SERVICE FOUNDATION DETAIL	REF. & REV. JUNE 2015	CITY OF FRESNO E-17

NOTE:
SERVICE CABINET SHALL BE TESCO 26-000 NM UNMETERED OR APPROVED EQUIVALENT.

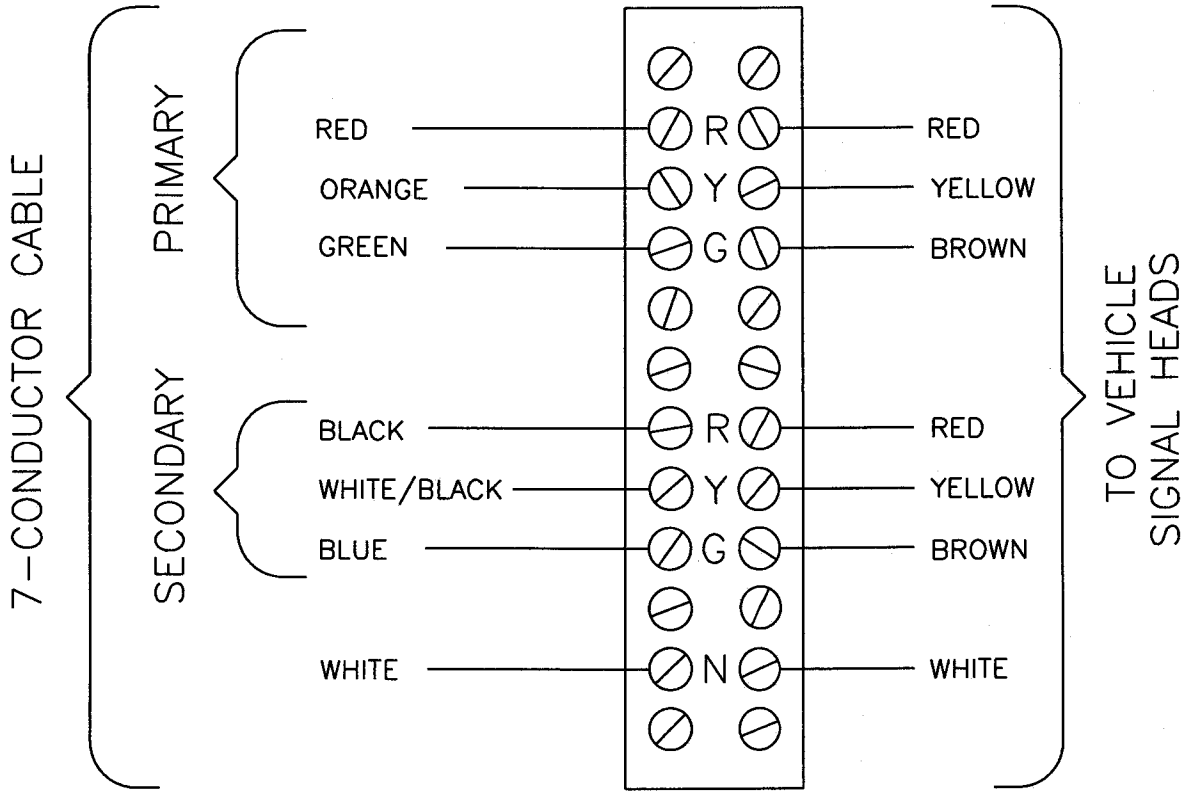


SERVICE PEDESTAL SCHEMATIC



SWITCH LOCATION

STREETLIGHT WIRING	REF. & REV. JUNE 2015	CITY OF FRESNO E–18



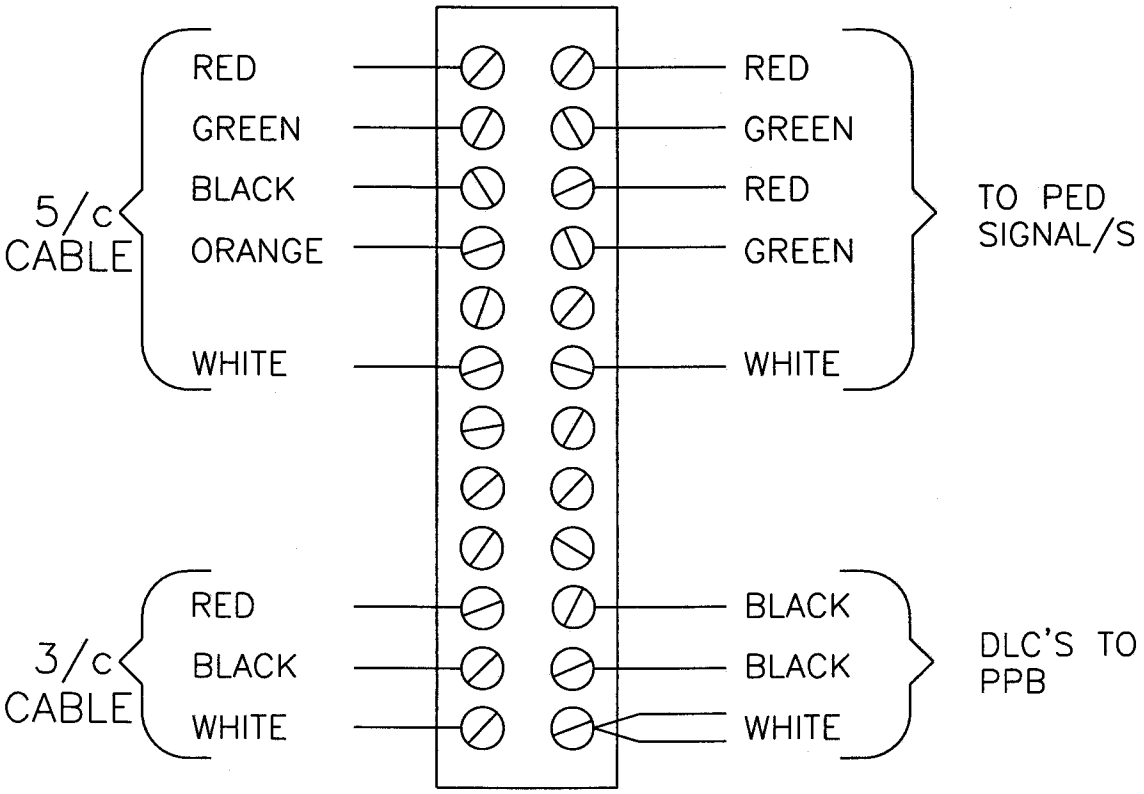
VEHICLE TERMINAL COMPARTMENT

NOTES:

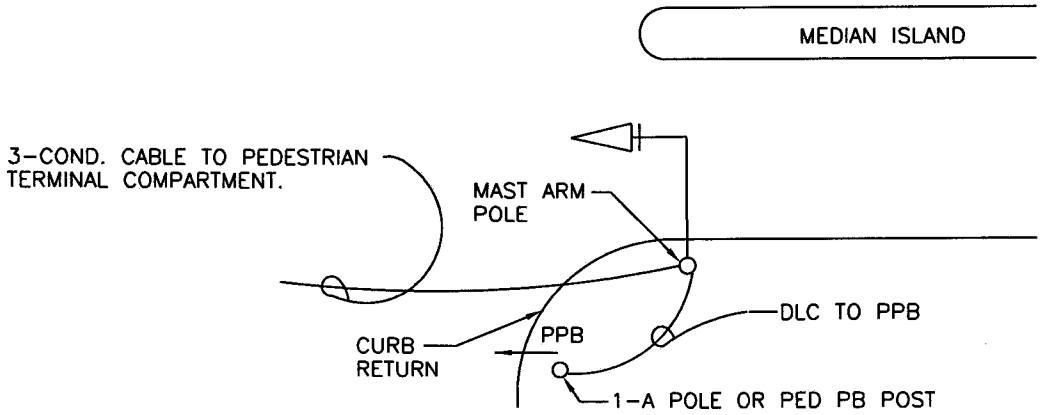
1. INSTALL SINGLE CONDUCTOR COLOR CODED #14 THWN COPPER WIRE BETWEEN TERMINAL STRIP AND EACH SIGNAL ASSEMBLY AND CONNECT.
2. ALL STRANDED CONDUCTORS SHALL HAVE ALL LOOSE STRANDS TIGHTLY TWISTED TOGETHER AND INDIVIDUAL CONDUCTORS TINNED WITH SOLDER.
3. WITHIN INDIVIDUAL CABLES THE ASSIGNMENTS OF PRIMARY OR SECONDARY COLORS ARE BASED UPON THE TABLE BELOW:

PRI	SEC
NB	EB or SB or WB
EB	SB or WB
SB	WB
THRU	TURN

VEHICLE SIGNAL TERMINAL LOCATION	REF. & REV. JUNE 2015	CITY OF FRESNO E-19



TERMINAL STRIP



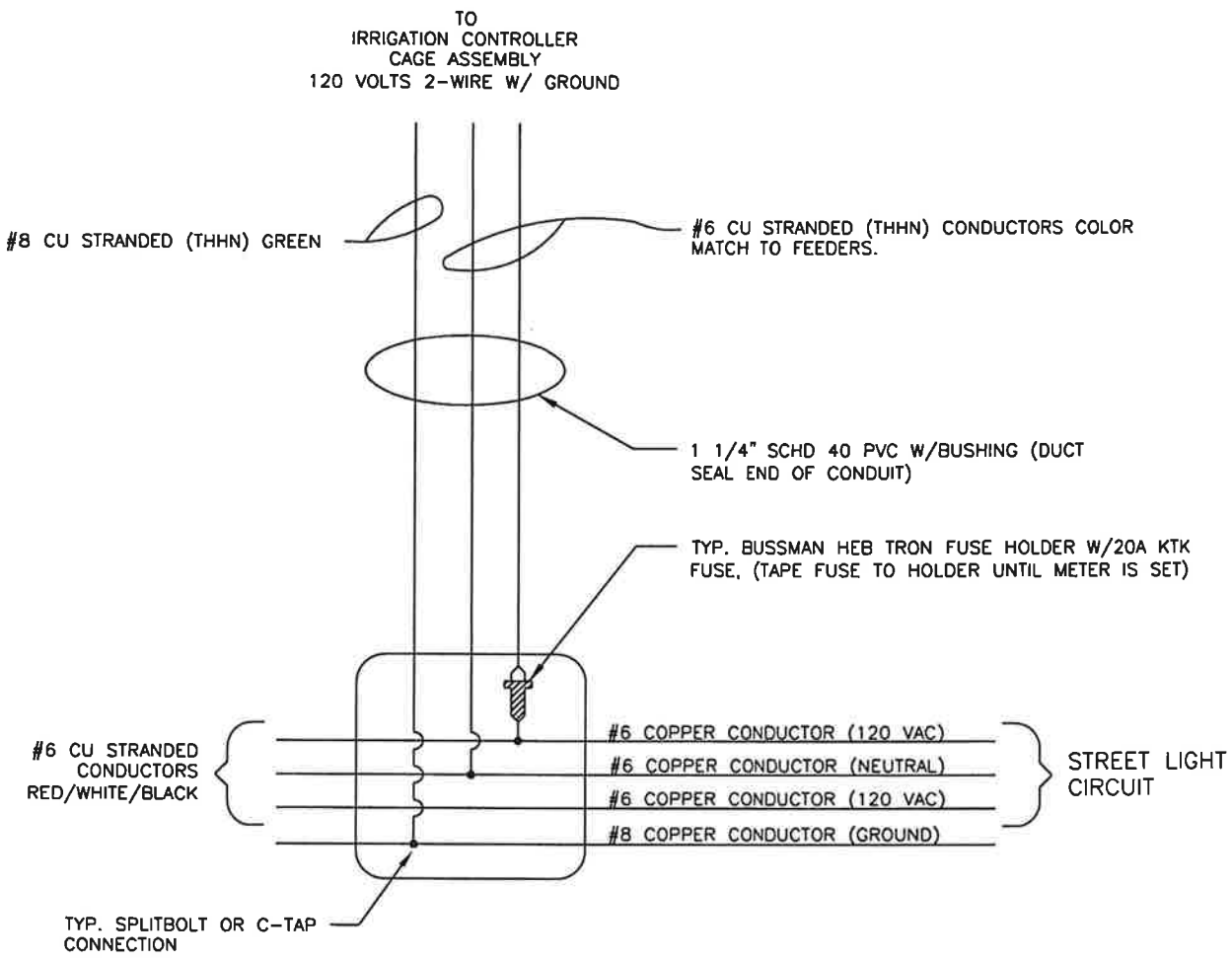
TYPICAL CORNER CONNECTIONS

NOTES:

1. INSTALL SINGLE CONDUCTOR COLOR CODED #14 THWN COPPER WIRE BETWEEN TERMINAL STRIP AND EACH SIGNAL ASSEMBLY AND CONNECT.

2. ALL STRANDED CONDUCTORS SHALL HAVE ALL LOOSE STRANDS TIGHTLY TWISTED TOGETHER AND INDIVIDUAL CONDUCTORS TINNED WITH SOLDER.

PEDESTRIAN SIGNAL, & PPB TERMINAL LOCATIONS	REF. & REV. JUNE 2015	CITY OF FRESNO E-20

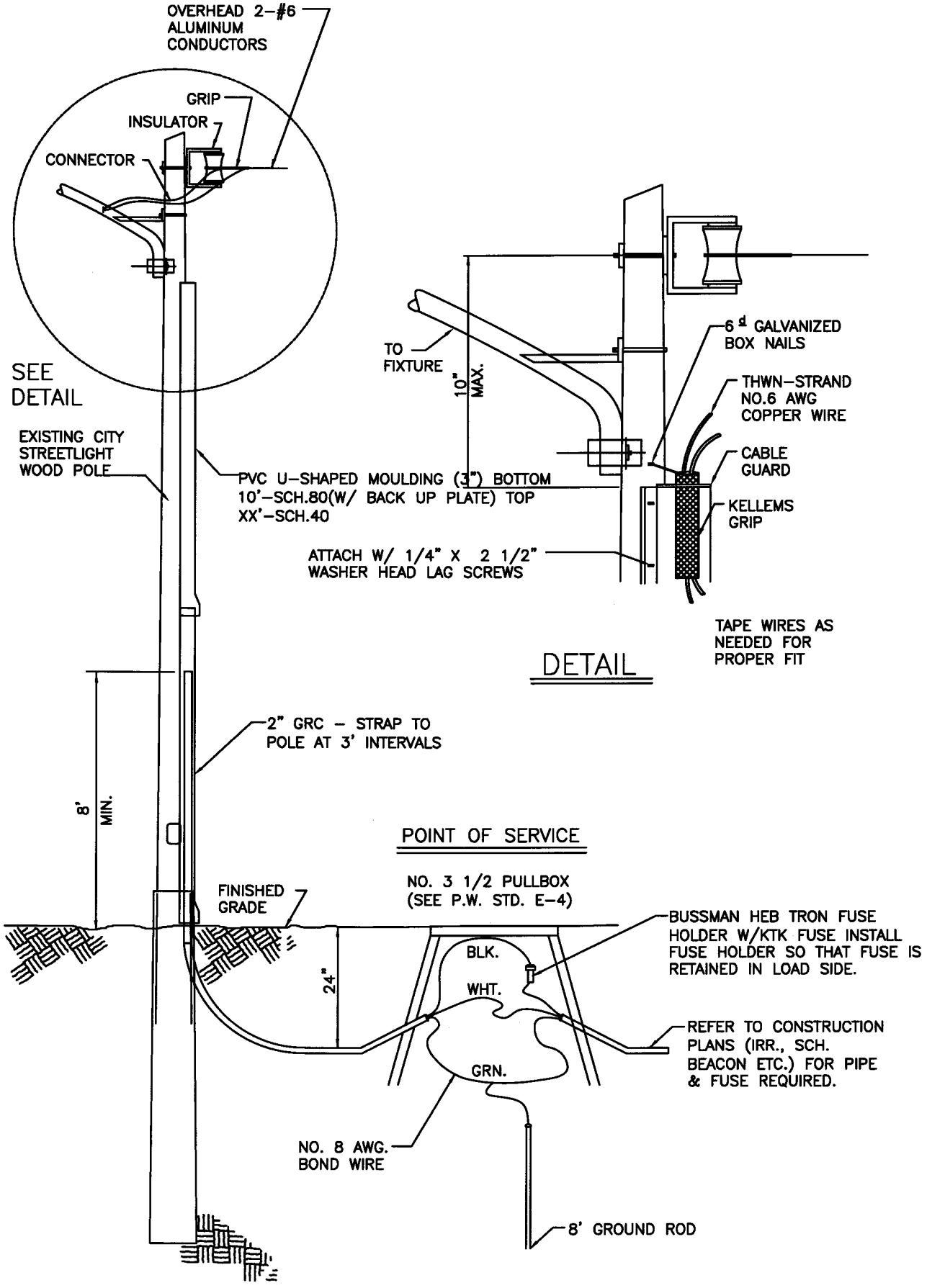


TYPICAL NO. 3 1/2 PULLBOX

NOTES:

1. GROUT BOX AT CONDUIT ENTRANCE. RESTORE ANY GROUT DAMAGED BY INSTALLATION.
2. INSULATE HOT/NEUTRAL SPLICES AS FOLLOWS:
   COVER WITH 2-LAYERS RUBBER TAPE-FILLING VOIDS.
   APPLY 1-LAYER 1/2 LAPPED PVC TAPE.
   APPLY 1-LAYER FRICTION TAPE & COAT WITH AN APPROVED ELECTRICAL SEALING COMPOUND.
3. PULL BOX LID SHALL BE A "LOCK JAW LOCKING LID" OR EQUIVALENT.

STREETLIGHT IRRIGATION SERVICE INSTALLATION	REF. & REV. JUNE 2015	CITY OF FRESNO E-21



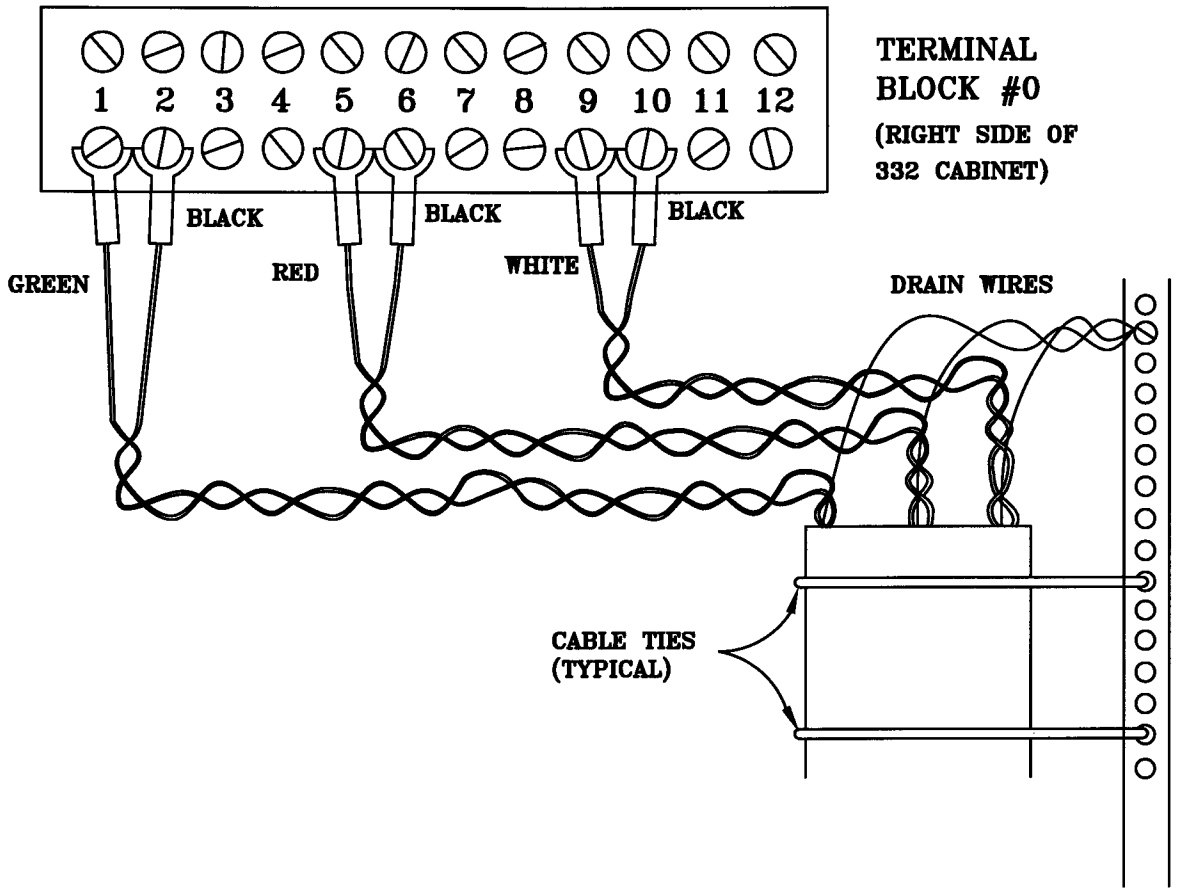
SERVICE RISER DETAIL
FROM EXISTING STREETLIGHT

REF. & REV.
AUG., 2002

CITY OF FRESNO

E-22

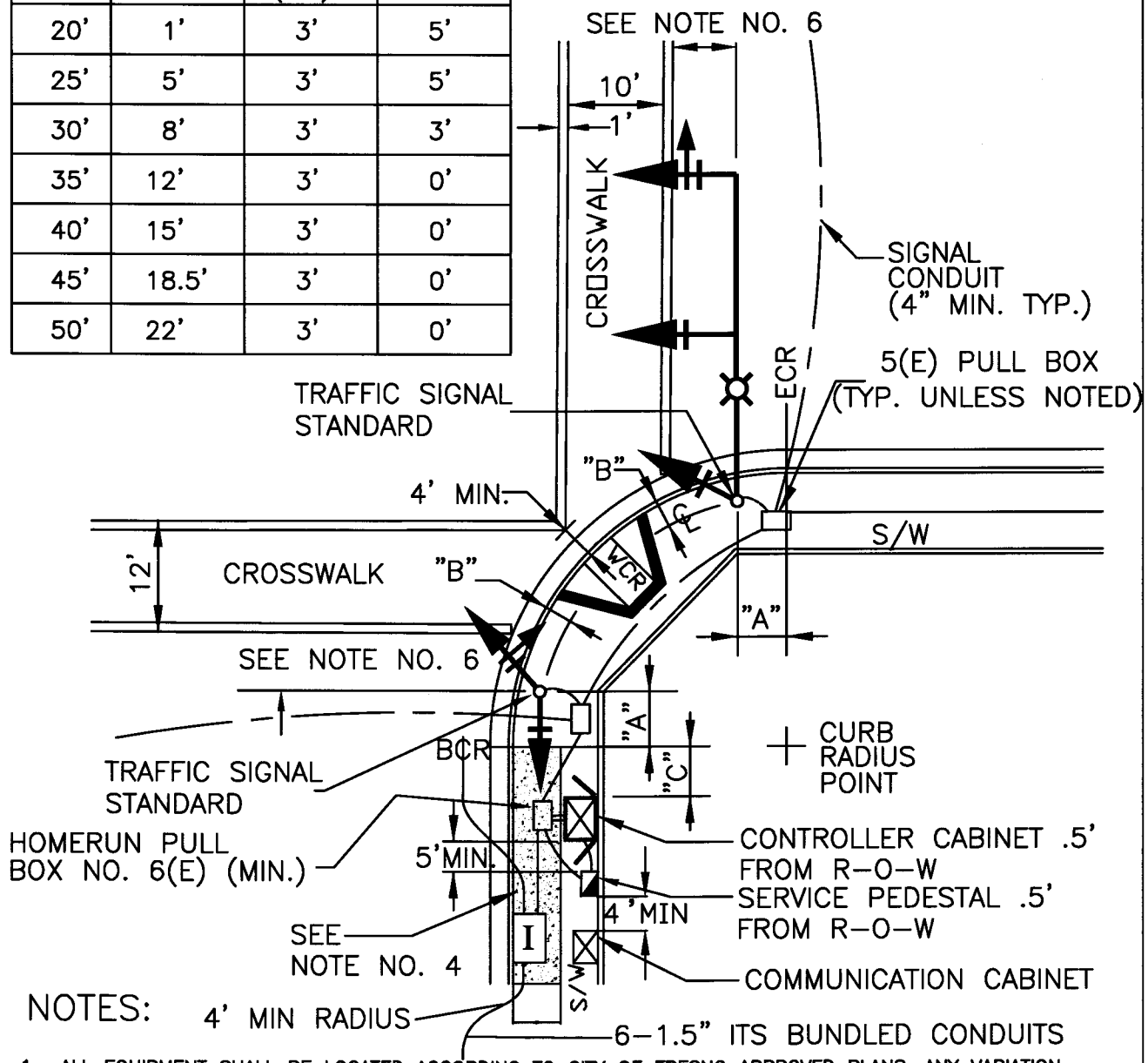
COORDINATION CABLE TERMINATION
(ONE OR MORE CABLES AS APPROPRIATE)



1. TERMINATE TWISTED PAIRS AS SHOWN USING APPROPRIATE SOLDERLESS INSULATED FORK TERMINALS.
2. TERMINATE DRAIN WIRES WITH A SINGLE INSULATED RING TERMINAL TO RACK SIDE FRAME (GROUND) USING 10–32 MACHINE SCREW ON ONE END ONLY OF EACH CABLE. FOR STANDARDIZATION. ONLY CABLE ENDS FROM SOUTH OR EAST OF INTERSECTION ARE GROUNDED. UNUSED DRAIN WIRES ARE FOLDED BACK ALONG JACKET MINIMUM 1" & TAPED.
3. UNDERGROUND INLINE SPLICES ARE NOT PERMITTED. CONDUCTORS & DRAIN WIRES SHALL BE SPLICED USING UNINSULATED CRIMP CONNECTORS. THE CONNECTION SHALL BE STAGGERED AND SOLDERED (FLAMELESS METHOD) EACH INDIVIDUAL CONDUCTOR SPLICE SHALL HAVE HEAT SHRINK TUBING APPLIED. THE ENTIRE SPLICE ASSY. SHALL HAVE TWO (2) LAYERS OF HEAT SHRINK TUBING APPLIED. TUBING SHALL BE 3M I.T.C.S.N. OR APPROVED EQUAL. ALL HEAT SHRINK TUBING SHALL BE APPLIED USING A FLAMELESS METHOD.

SIGNAL LIGHT COORDINATION CABLE TERMINATION	REF. & REV. JULY 2011	CITY OF FRESNO E–23

CURB RADIUS	"A" DISTANCE	"B" DISTANCE (MIN.)	"C" DISTANCE
20'	1'	3'	5'
25'	5'	3'	5'
30'	8'	3'	3'
35'	12'	3'	0'
40'	15'	3'	0'
45'	18.5'	3'	0'
50'	22'	3'	0'



1. ALL EQUIPMENT SHALL BE LOCATED ACCORDING TO CITY OF FRESNO APPROVED PLANS. ANY VARIATION TO THE PLANS SHALL HAVE THE APPROVAL OF THE CITY TRAFFIC ENGINEER.
2. ALL EQUIPMENT SHALL BE LOCATED ACCORDING TO THE ULTIMATE STREET WIDTH AND CURB RETURNS.
3. ULTIMATE AND EXISTING CURB RETURN ARE/SHALL BE SHOWN ON CONSTRUCTION PLANS.
4. ADDITIONAL SIDEWALK TO BE INSTALLED PER CITY STANDARDS AS APPLICABLE TO MAINTAIN A 4' MINIMUM ADA CLEAR PATH ADJACENT TO EQUIPMENT.
5. DISTANCE "C" SHALL BE ADJUSTED AS NECESSARY FOR THE 4' ADA CLEARANCE REQUIREMENT.
6. DISTANCE "A" HAS BEEN CALCULATED TO PLACE A PEDESTRIAN PUSH BUTTON APPROXIMATELY 5' FROM CROSSWALK. IF UNFORESEEN CONDITIONS DO NOT ALLOW SIGNAL STANDARD OR CROSSWALK PLACEMENT AS SHOWN, A PEDESTRIAN PUSH BUTTON POST SHALL BE INSTALLED TO MEET ADA GUIDELINES.
7. LOCATE PULLBOXES FOR TESCO & TS COMBINED 3' FROM FACE OF CURB TO EDGE OF PULLBOX

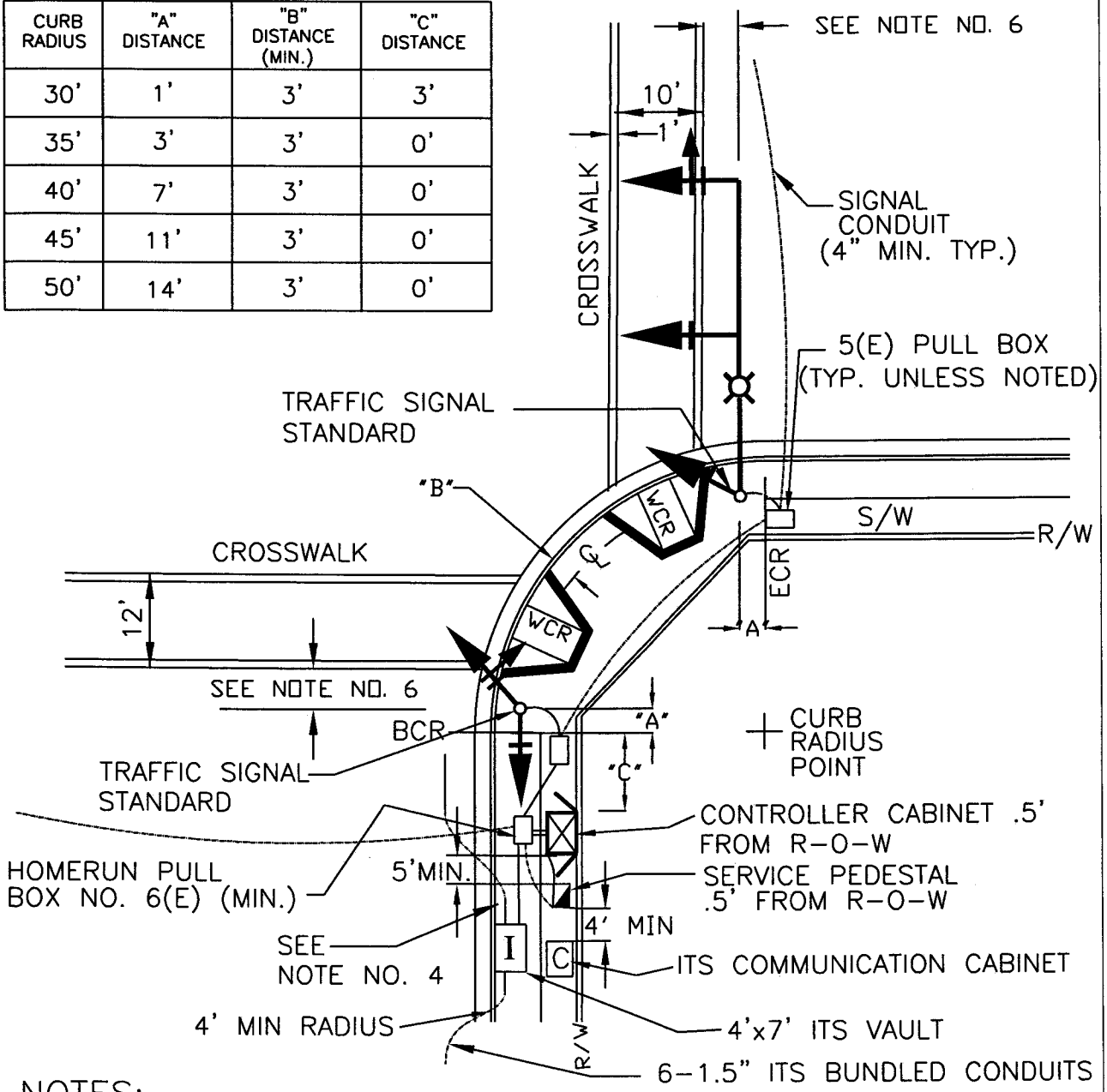
SIGNAL LIGHT
EQUIPMENT PLACEMENT GUIDELINE

REF. & REV.
NOV., 2007

CITY OF FRESNO

E-24

CURB RADIUS	"A" DISTANCE	"B" DISTANCE (MIN.)	"C" DISTANCE
30'	1'	3'	3'
35'	3'	3'	0'
40'	7'	3'	0'
45'	11'	3'	0'
50'	14'	3'	0'



NOTES:

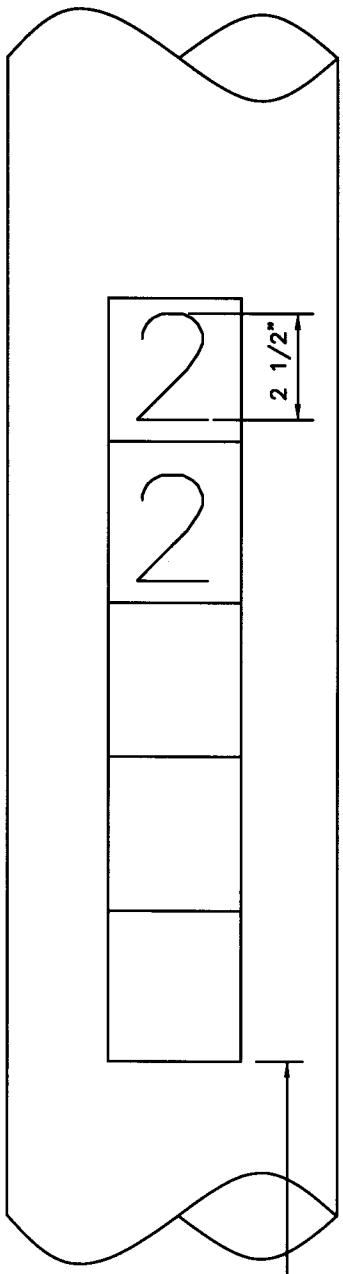
1. ALL EQUIPMENT SHALL BE LOCATED ACCORDING TO CITY OF FRESNO APPROVED PLANS. ANY VARIATION TO THE PLANS SHALL HAVE THE APPROVAL OF THE CITY TRAFFIC ENGINEER.
2. ALL EQUIPMENT SHALL BE LOCATED ACCORDING TO THE ULTIMATE STREET WIDTH AND CURB RETURNS.
3. ULTIMATE AND EXISTING CURB RETURN ARE/SHALL BE SHOWN ON CONSTRUCTION PLANS.
4. ADDITIONAL SIDEWALK TO BE INSTALLED PER CITY STANDARDS AS APPLICABLE TO MAINTAIN A 4' MINIMUM ADA CLEAR PATH ADJACENT TO EQUIPMENT.
5. DISTANCE "C" SHALL BE ADJUSTED AS NECESSARY FOR THE 4' ADA CLEARANCE REQUIREMENT.
6. DISTANCE "A" HAS BEEN CALCULATED TO PLACE A PEDESTRIAN PUSH BUTTON APPROXIMATELY 5' FROM CROSSWALK. IF UNFORESEEN CONDITIONS DO NOT ALLOW SIGNAL STANDARD OR CROSSWALK PLACEMENT AS SHOWN, A PEDESTRIAN PUSH BUTTON POST SHALL BE INSTALLED TO MEET ADA GUIDELINES.

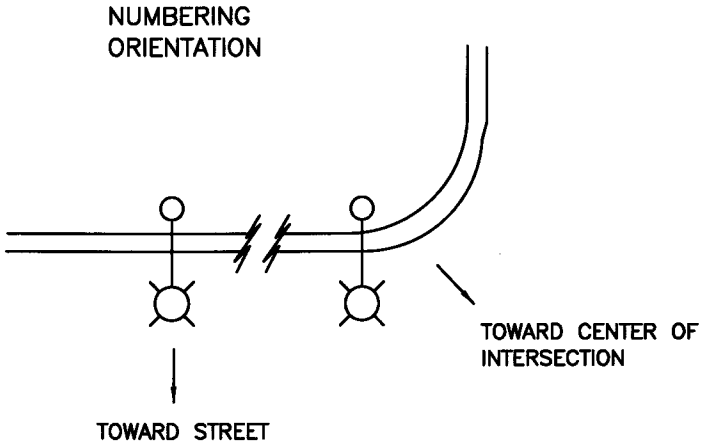
SIGNAL LIGHTS/DUAL RAMPS
EQUIPMENT PLACEMENT GUIDELINE

REF. & REV. JUNE 2015

CITY OF FRESNO

E-24A





NOTES:

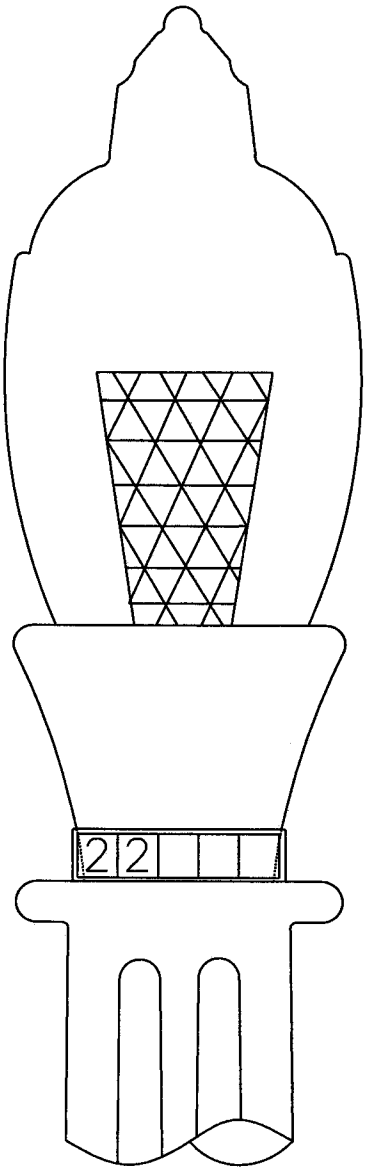
1. NUMERALS SHALL BE ALMETEK PS–2.5 SERIES, OR APPROVED EQUAL, BLACK ON WHITE PRESSURE SENSITIVE MARKERS OF REFLECTIVE SCOTCHLITE.
2. FOR METAL POLES, APPLY TO CLEAN SURFACE.
3. FOR WOOD POLES, USE EMBOSSED ALUMINUM BACKING PLATE SECURED WITH 1–1/2" ALUMINUM ROOFING NAILS. BACKING PLATE SHALL BE ALMETEK PS–2.5V5 OR APPROVED EQUAL.

10'6" FROM GRADE/SIDEWALK ELEVATION, ADJUST AS NEEDED TO CLEAR HARDWARE OR APPURTENANCES.

STREETLIGHT/SAFETY LIGHT POLE NUMBERING	REF. & REV. NOV., 2007	CITY OF FRESNO E–25

NOTES:

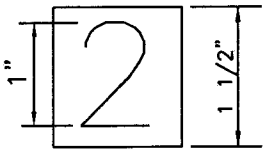
INSERT #'S AS NEEDED INTO HOLDER. FORM TO BASE OF CAPITAL & SECURE WITH STAINLESS STEEL STRAP.



GLOBE

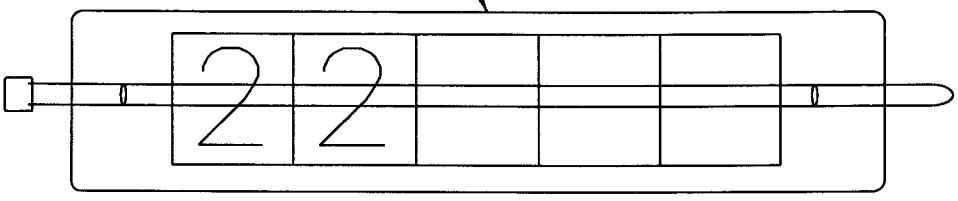
CAPITAL

POLE



UV RESISTANT POLY NUMERAL TAGS ALMETEK H900 SERIES BLACK ON YELLOW.

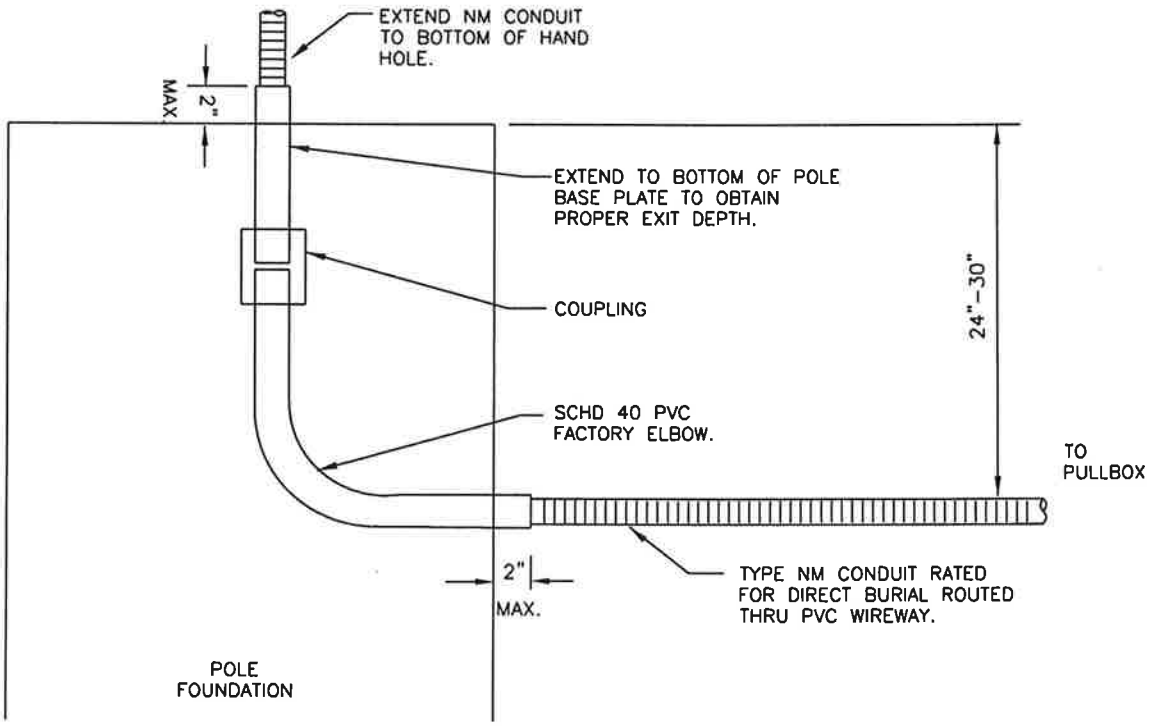
UV RESISTANT POLY TAG HOLDER ALMETEK TH-6P



STAINLESS STEEL STRAP PANDUIT MLT8H-LP OR APPROVED EQUAL.

NUMERAL HOLDER DETAIL

STREETLIGHT ORNAMENTAL POLE NUMBERING	REF. & REV. JUNE 2015	CITY OF FRESNO E-26

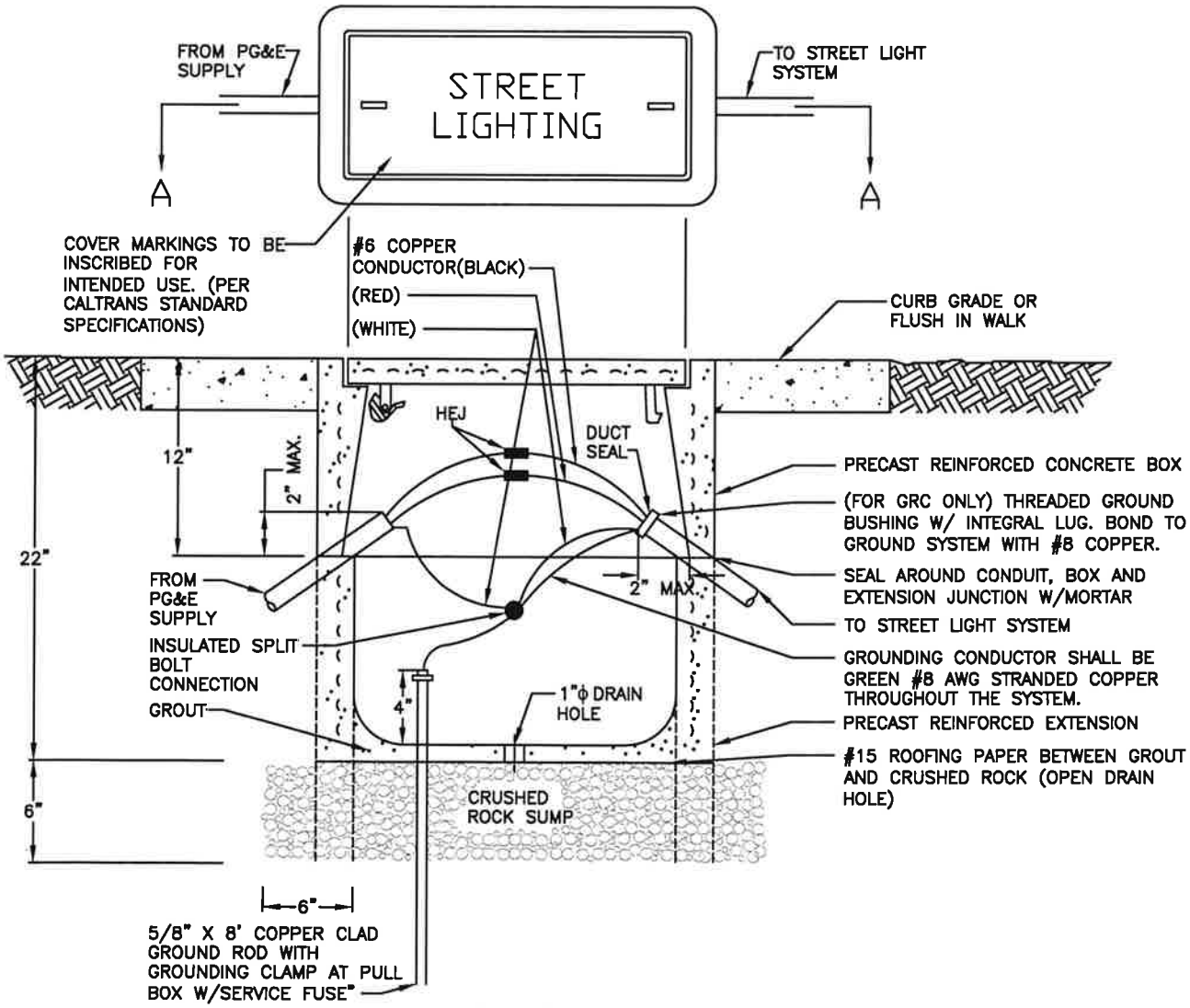


POLE TYPE	PVC	NM	GRC
PPBP	--	--	1"
POLE TYPE 1A	2.5"	1.5"	--
POLE TYPE 15	2.5"	1.5"	--
POLE TYPES 16-61	3"	2"	--

SIGNAL LIGHT
FOUNDATION WIRE-WAY DETAIL

REF. & REV.
JUNE 2015

CITY OF FRESNO
E-27



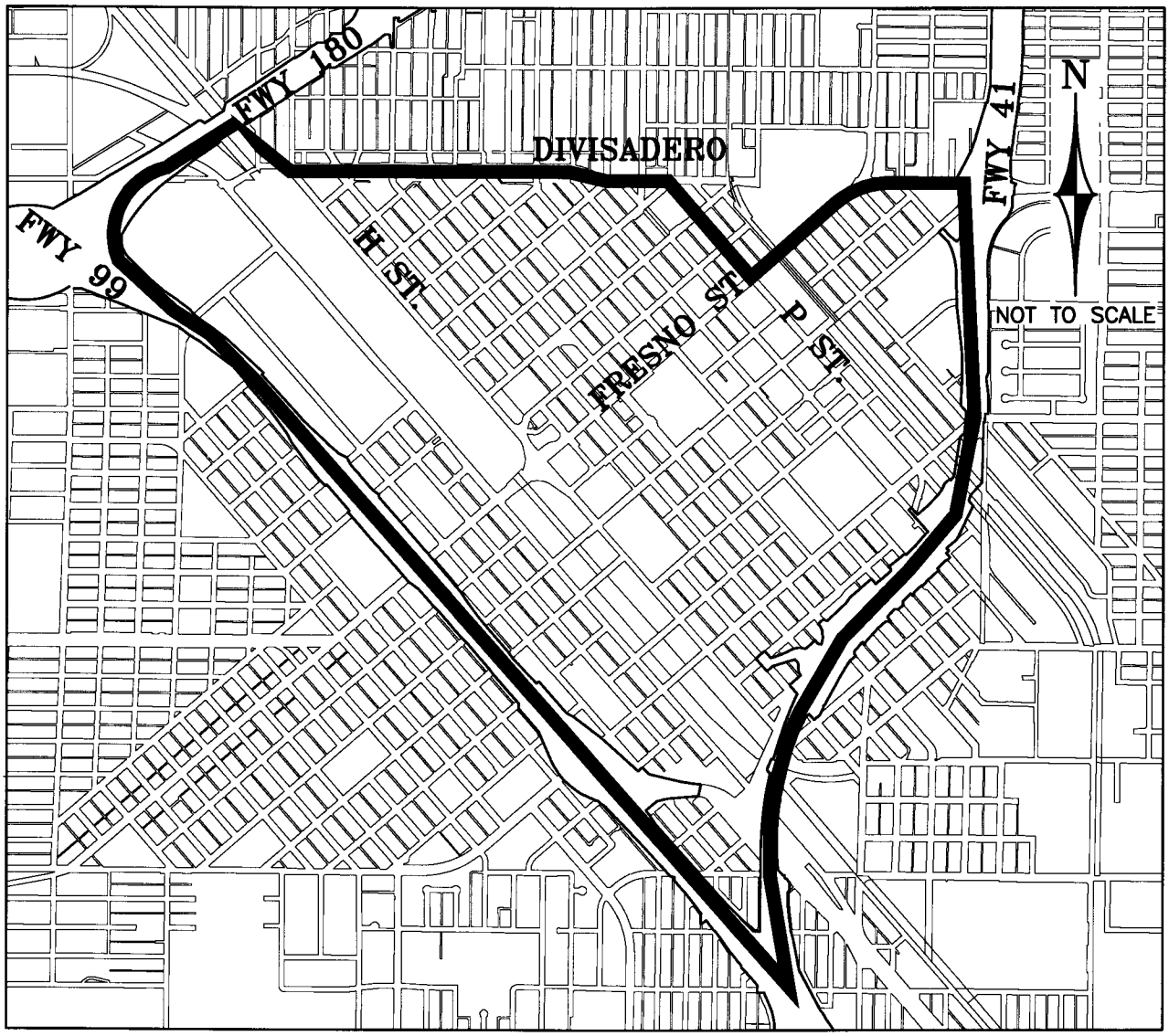
Section A–A

NOTES:

1. PULL BOXES SHALL BE PER CALTRANS STANDARD SPECIFICATIONS.
2. PULL BOXES SHALL BE GROUTED PRIOR TO INSTALLATION OF CONDUCTORS, SLOPED TOWARD THE DRAIN HOLE. PLACE A LAYER OF ROOFING PAPER BETWEEN THE CRUSHED ROCK AND THE GROUT (OPEN DRAIN HOLE).
3. PULL LIDS BEFORE POURING CONCRETE AROUND PULL BOXES.
4. WRAP PULL BOX WITH ROOFING PAPER BEFORE BACKFILLING.
5. FUSE AT POINT OF SERVICE SHALL BE 60A IF #6 CONDUCTOR AND 40A IF #8 CONDUCTOR AND SHALL HAVE A TRON HEJ TYPE FUSE HOLDER (SINGLE POLE). INSULATE WIRE CONNECTION SAME AS SPLICES (23–3.13).
6. INSTALL A ONE–FOOT RING OF CONCRETE, FOUR INCHES DEEP, AROUND THE WRAPPED PULL BOXES INSTALLED IN DIRT AND TURF AREAS, SLOPED TO DRAIN AWAY FROM THE PULL BOX.
7. SERVICE PULL BOX SHALL BE WITHIN STREET ROW AND NOT PRIVATE PROPERTY.
8. STREETLIGHTING PULLBOX LIDS SHALL BE A "CHRISTY B90TL LOCKING LID" OR EQUIVALENT AT POINT OF SERVICE ONLY.
9. STREET LIGHT CONDUCTORS SHALL BE INSTALLED CONTINUOUS. SPLICES SHALL ONLY BE PERMITTED AT THE HAND HOLE LOCATIONS OF THE STREET LIGHT STANDARD.

STREETLIGHT POINT OF SERVICE CONCRETE PULL BOX	REF. & REV. SEPT., 2009	CITY OF FRESNO E–28

DOWNTOWN VICINITY MAP

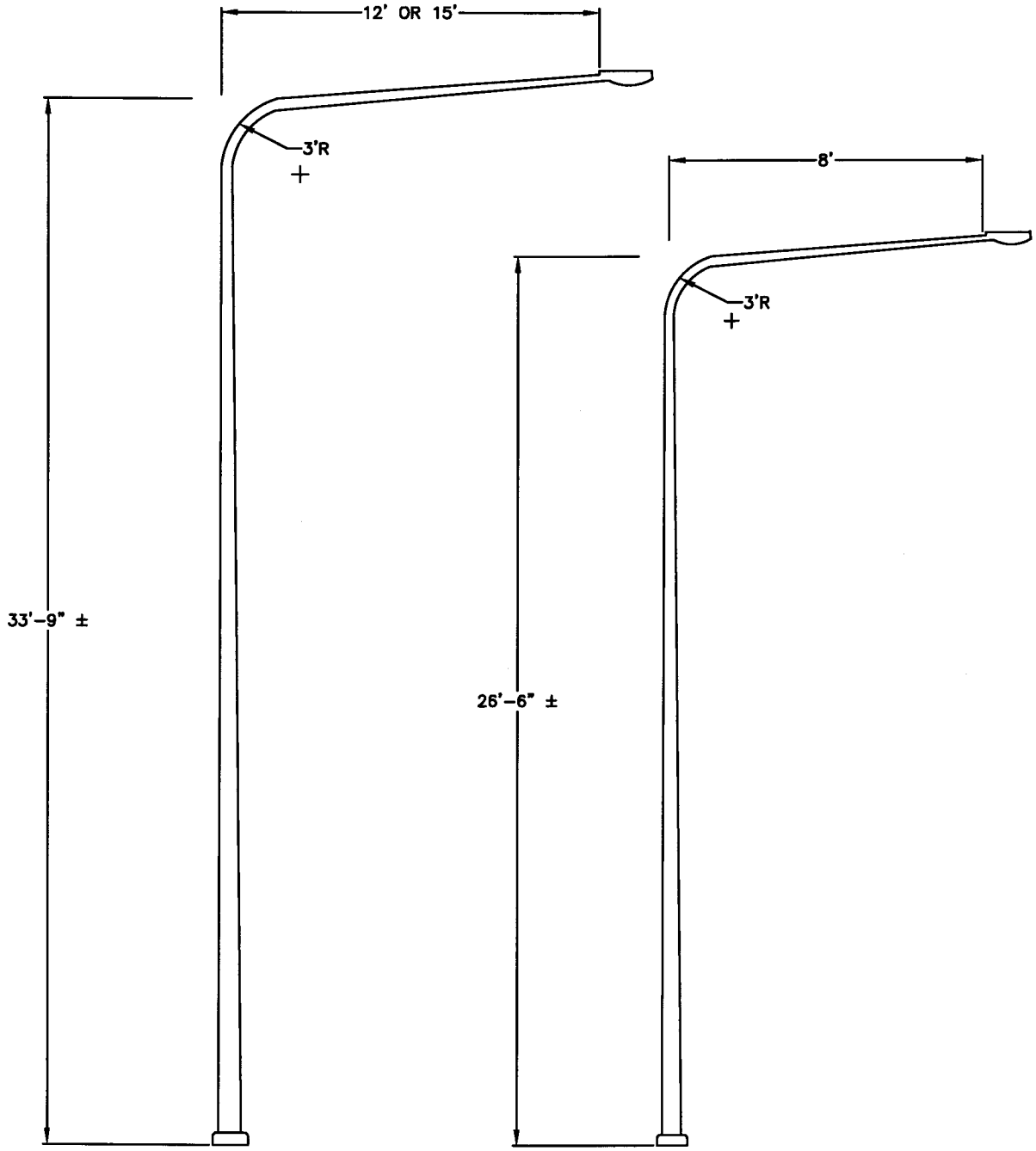


NOTES:

1. ALL STREET LIGHTS AND TRAFFIC SIGNAL POLES INSTALLED WITHIN THE "DOWNTOWN FRESNO AREA" SHALL BE IN ACCORDANCE WITH THE DECORATIVE POLE STANDARDS INCLUDED HEREIN.

2. THE "DOWNTOWN FRESNO AREA" IS BOUNDED BY THE FOLLOWING ROADWAYS: DIVISADERO (41 TO FRESNO ST), FRESNO ST (DIVISADERO TO P ST), P ST (FRESNO ST TO DIVISADERO), DIVISADERO (P ST TO H ST), H ST (DIVISADERO TO 180), 180 (H ST TO 99), 99 (180 TO 41), 41 (99 TO DIVISADERO). BOTH SIDES OF THE BOUNDRY STREETS SHALL UTILIZE DECORATIVE POLES.

DOWNTOWN SIGNAL & STREETLIGHT POLES **DECORATIVE POLE BOUNDARY**	REF. & REV. SEPT., 2009	**CITY OF FRESNO** E–29



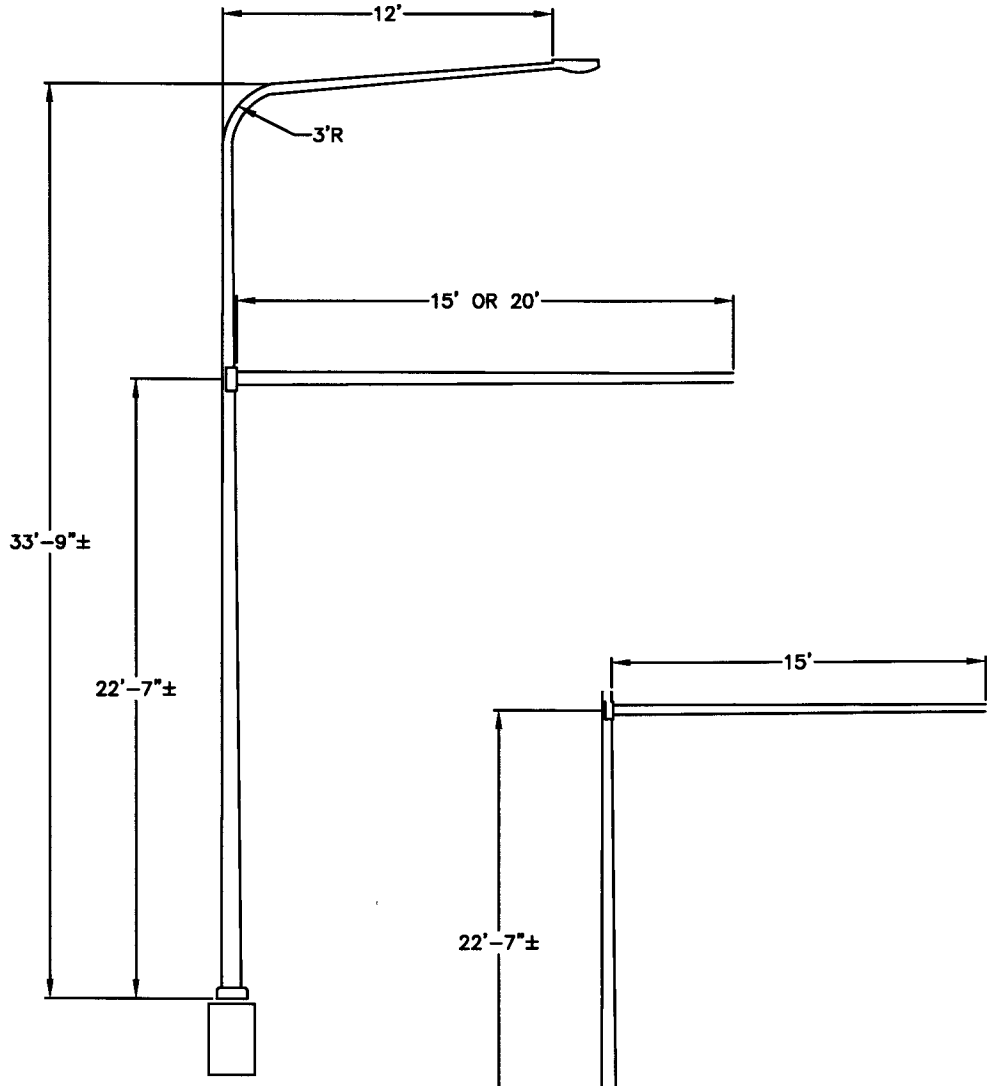
MAJOR STREET STANDARD

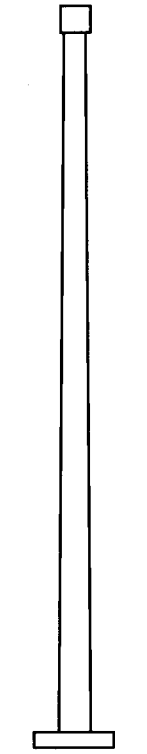
LOCAL STREET STANDARD

GENERAL NOTES:

1. THE DECORATIVE POLE STANDARDS SHALL APPLY TO THE "DOWNTOWN FRESNO AREA" AS DEFINED BY PW STD E-29.
2. ALL NOTES AND REQUIREMENTS PER PW STD E-1 AND E-2 SHALL STILL APPLY, OTHER THAN POLE DIMENSIONS AND COLORS.
3. POLE FINISH: BASE COAT – HOT DIP GALVANIZE TO ASTM A123
   FINISH COAT – TGIC OR URETHANE POLYESTER POWDER
   COLOR – BRONZE TO MATCH ADJACENT DECORATIVE POLES

DOWNTOWN STREETLIGHT DECORATIVE POLE DETAILS	REF. & REV. SEPT., 2009	CITY OF FRESNO E-30



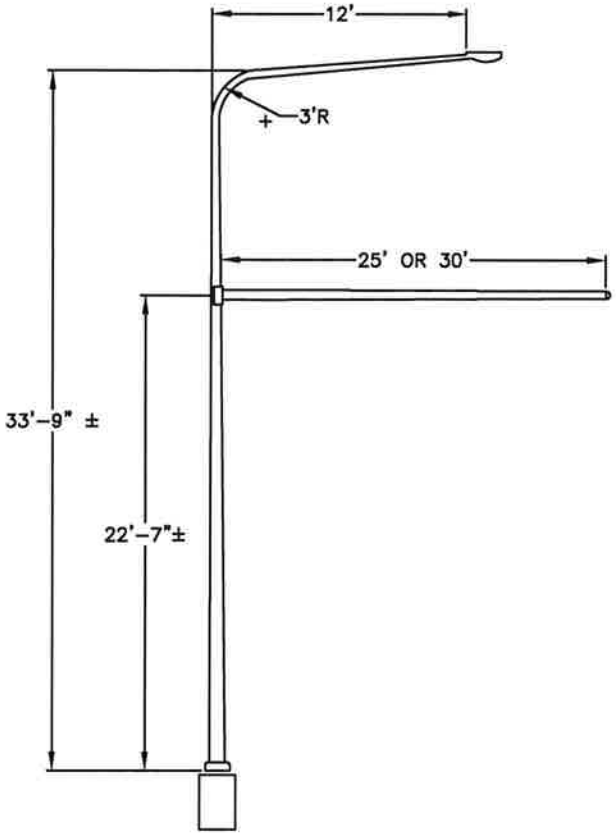


TYPE 1-A

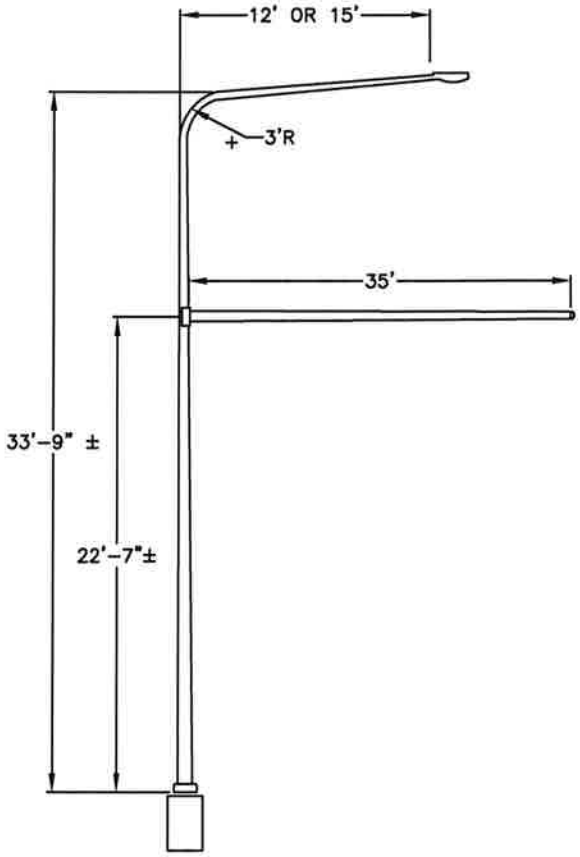
GENERAL NOTES:

1. THE DECORATIVE POLE STANDARDS SHALL APPLY TO THE "DOWNTOWN FRESNO AREA" AS DEFINED BY PW STD E-29.
2. ALL NOTES AND REQUIREMENTS PER PW STD E-1 AND E-2 SHALL STILL APPLY, OTHER THAN POLE DIMENSIONS AND COLORS.
3. POLE FINISH: BASE COAT - HOT DIP GALVANIZE TO ASTM A123
   FINISH COAT - TGIC OR URETHANE POLYESTER POWDER
   COLOR - BRONZE TO MATCH ADJACENT DECORATIVE POLES
4. POLES MUST MEET CALTRANS 1997 STANDARD SPECIFICATIONS FOR TYPE 1-A, 16-1-113, AND 17B-1-113.

DOWNTOWN SIGNAL POLES DECORATIVE POLE DETAILS - TYPE 1-A, 16, 17B	REF. & REV. SEPT., 2009	CITY OF FRESNO E-31



19-3-113

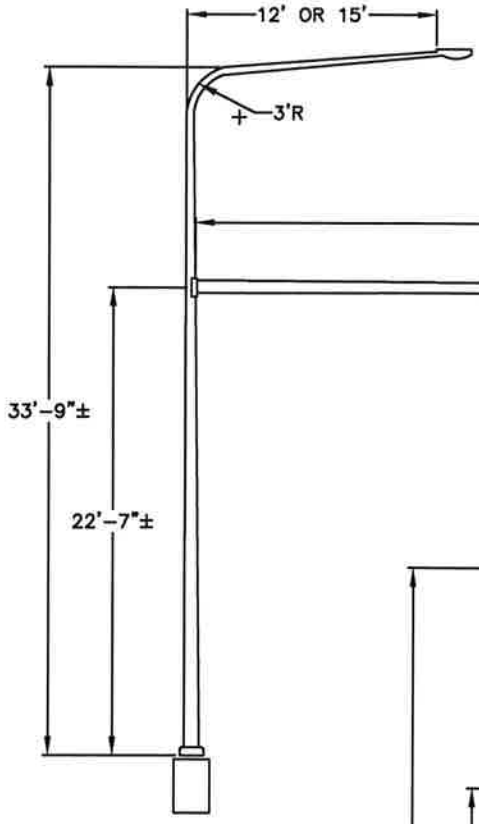


24-3-113

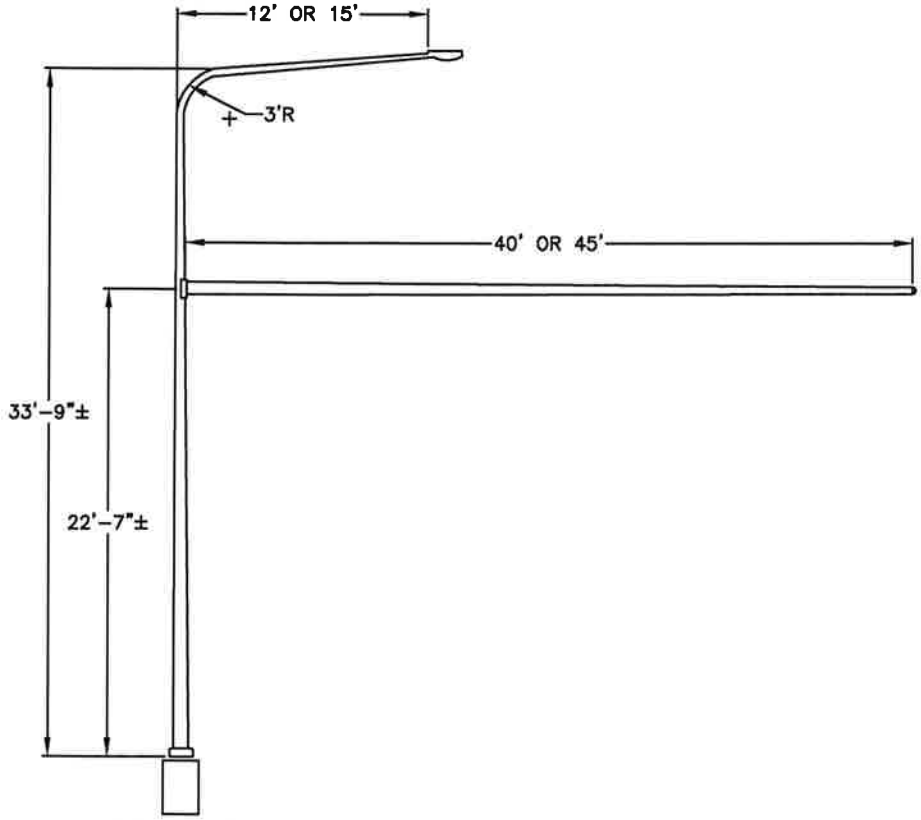
GENERAL NOTES:

1. THE DECORATIVE POLE STANDARDS SHALL APPLY TO THE "DOWNTOWN FRESNO AREA" AS DEFINED BY PW STD E-29.
2. ALL NOTES AND REQUIREMENTS PER PW STD E-1 AND E-2 SHALL STILL APPLY, OTHER THAN POLE DIMENSIONS AND COLORS.
3. POLE FINISH: BASE COAT - HOT DIP GALVANIZE TO ASTM A123
   FINISH COAT - TGIC OR URETHANE POLYESTER POWDER
   COLOR - BRONZE TO MATCH ADJACENT DECORATIVE POLES
4. POLES MUST MEET CALTRANS 1997 STANDARD SPECIFICATIONS FOR TYPE 19-3-113 AND 24-3-113.

DOWNTOWN SIGNAL POLES DECORATIVE POLE DETAILS - TYPE 19, 24	REF. & REV. SEPT., 2009	CITY OF FRESNO E-32



29-5-113



26-3-113

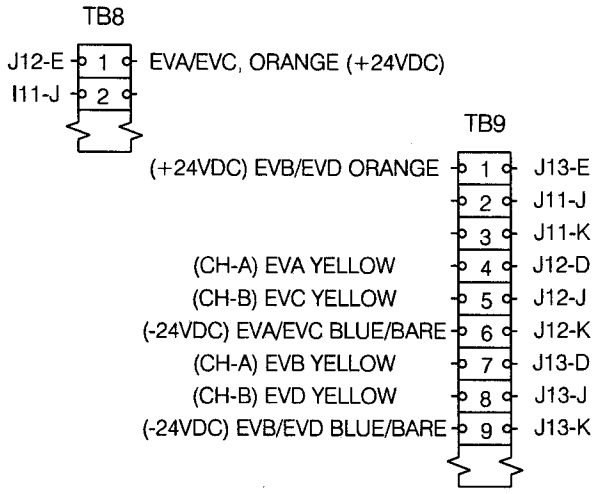
GENERAL NOTES:

1. THE DECORATIVE POLE STANDARDS SHALL APPLY TO THE "DOWNTOWN FRESNO AREA" AS DEFINED BY PW STD E-29.
2. ALL NOTES AND REQUIREMENTS PER PW STD E-1 AND E-2 SHALL STILL APPLY, OTHER THAN POLE DIMENSIONS AND COLORS.
3. POLE FINISH: BASE COAT - HOT DIP GALVANIZE TO ASTM A123
   FINISH COAT - TGIC OR URETHANE POLYESTER POWDER
   COLOR - BRONZE TO MATCH ADJACENT DECORATIVE POLES
4. POLES MUST MEET CALTRANS 1997 STANDARD SPECIFICATIONS FOR TYPE 26-3-113 AND 29-5-113.

DOWNTOWN SIGNAL POLES DECORATIVE POLE DETAILS - TYPE 26, 29	REF. & REV. SEPT., 2009	CITY OF FRESNO E-33

OPTICOM FIELD WIRE DETAIL

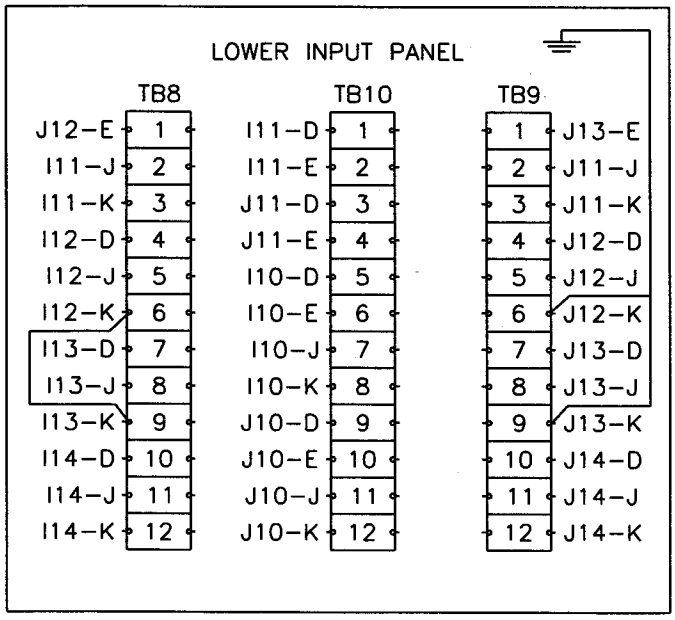
(FOR STANDARD MODEL 721/752 INSTALLATIONS)



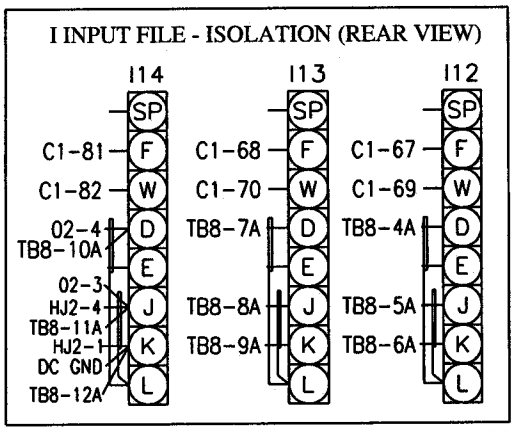
NOTES: 332 CABINET MODIFICATIONS FOR OPTICOM MODEL 762 DISCRIMINATORS (TWO-CHANNEL, DUAL PRIORITY, ENCODED) AND MODEL 721 DETECTORS (TWO DIRECTION, SINGLE CHANNEL).

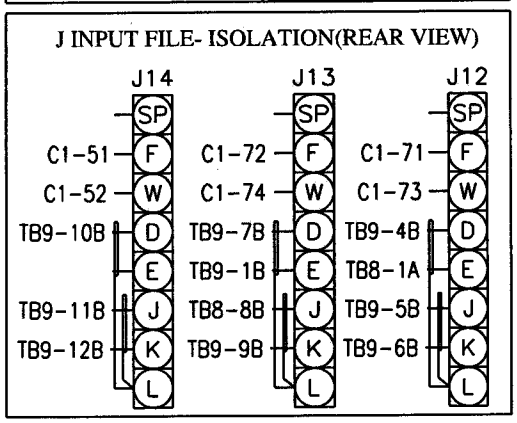
CAUTION

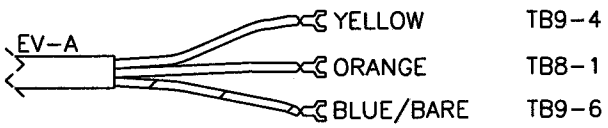
CONNECT TERMINAL K OF THE INPUT FILE SLOTS J12&J13 TO THE EARTH GROUND TO ALLOW DISSIPATION OF STATIC CHARGES ON THE DETECTOR CABLE. FAILURE TO CONNECT TERMINAL K TO THE EARTH GROUND MAY DAMAGE THE EQUIPMENT. IF DETECTORS HAVE BEEN MOUNTED BUT NOT CONNECTED TO THE PHASE SELECTOR, STRIP INSULATION FROM EACH DETECTOR CABLE AND CONNECT ALL THE WIRES TO EARTH GROUND UNTIL THE INSTALLATION CAN BE COMPLETED.

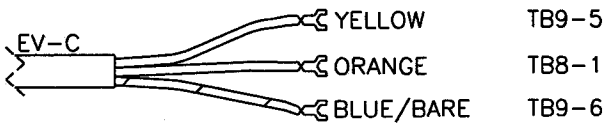


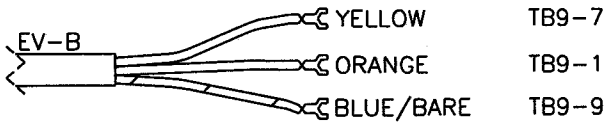
TB10 HD30A SERIES TERMINAL BLOCK OR EQUAL.

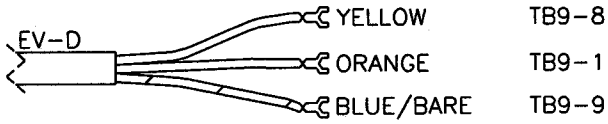












EMERGENCY VEHICLE PREEMPTION OPTICOM CONNECTIONS

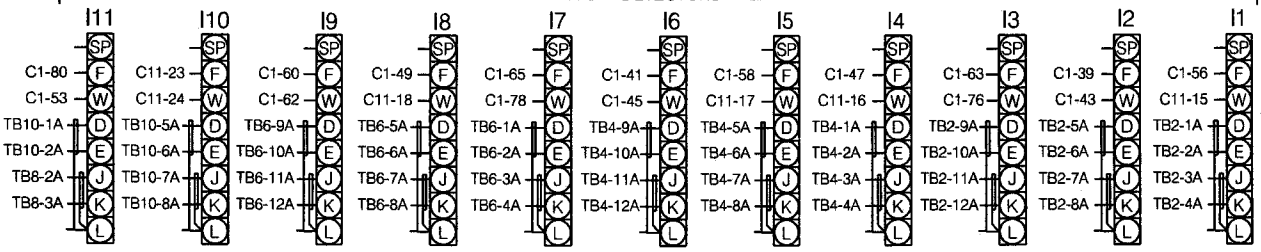
721 DETECTOR AND TERMINAL BLOCK CONNECTIONS

REF. & REV. JUNE 2015

CITY OF FRESNO

E-34A

I INPUT FILE (REAR VIEW)

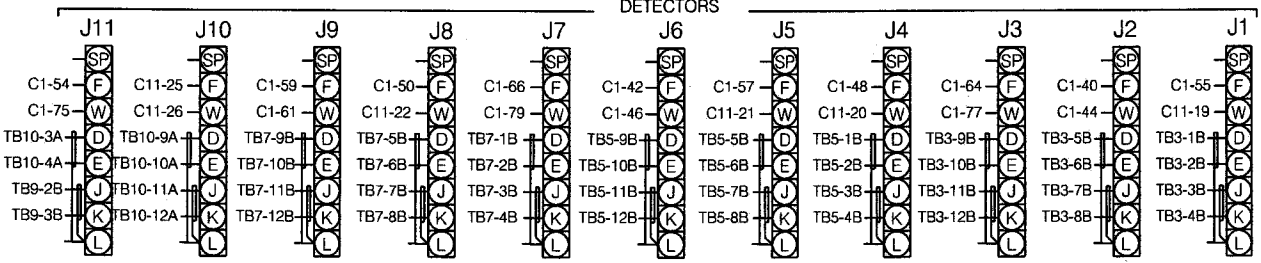


NOTE:
SEE CITY STANDARD DRAWING E-34 WIRING DETAILS FOR INPUT FILE I12, I13, I14, J12, J13 & J14.

INPUT FILE FRONT VIEW

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	1I1U (1)	2I2U (2)	2I3U (4)	2I4U (6)	3I5U (7)	4I6U (8)	4I7U (10)	4I8U (12)	1I9U (13)	SPI10U (41)	2I11U (29)	Ø2P	Ø6P	FS
L	1I1L (33)	2I2L (3)	2I3L (5)	2I4L (34)	3I5L (35)	4I6L (9)	4I7L (11)	4I8L (36)	3I9L (14)	SPI10L (42)	4I11L (30)	Ø4P	Ø8P	ST

J INPUT FILE (REAR VIEW)

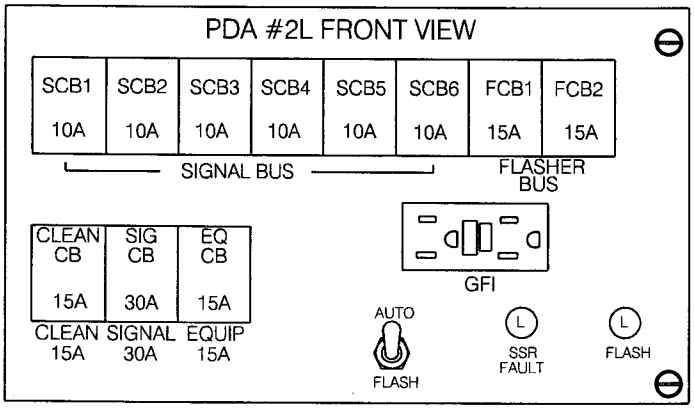


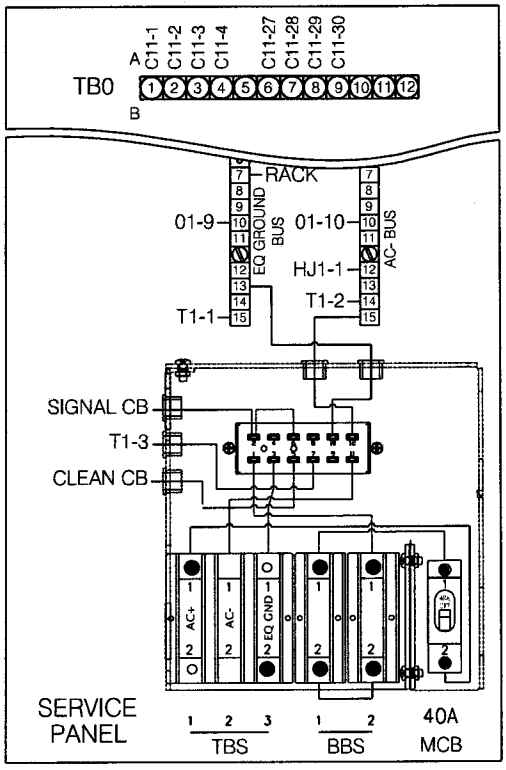
INPUT FILE FRONT VIEW

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	5J1U (15)	6J2U (16)	6J3U (18)	6J4U (20)	7J5U (21)	8J6U (22)	8J7U (24)	8J8U (26)	5J9U (27)	SPJ10U (43)	6J11U (31)	EVA	EVB	RR1
L	5J1L (37)	6J2L (17)	6J3L (19)	6J4L (38)	7J5L (39)	8J6L (23)	8J7L (25)	8J8L (40)	7J9L (28)	SPJ10L (44)	8J11L (32)	EVC	EVD	RR2

CABLE C11S		
PIN NO.	UNIVERSAL FUNCTION	CONN. TO
1	SPECIAL-OUTPUT	TB0-1A
2	SPECIAL-OUTPUT	TB0-2A
3	SPECIAL-OUTPUT	TB0-3A
4	SPECIAL-OUTPUT	TB0-4A
5-14	NOT USED	NOT USED
15	1 CALL, EXT	I1-W
16	2 CALL, QUEUE	I4-W
17	3 CALL, EXT	I5-W
18	4 CALL, QUEUE	I8-W
19	5 CALL, EXT	J1-W
20	6 CALL, QUEUE	J4-W
21	7 CALL, EXT	J5-W
22	8 CALL, QUEUE	J8-W
23	SPECIAL-INPUT	I10-F
24	SPECIAL-INPUT	I10-W
25	SPECIAL-INPUT	J10-F
26	SPECIAL-INPUT	J10-W
27	SPECIAL-INPUT	TB0-6A
28	SPECIAL-INPUT	TB0-7A
29	SPECIAL-INPUT	TB0-8A
30	SPECIAL-INPUT	TB0-9A
21-34	NOT USED	NOT USED

NOTES: 332L CONTROLLER CABINETS MASTER CIRCUIT BREAKER SHALL BE 40A AND THE SIGNAL CIRCUIT BREAKER SHALL BE 30A AND THE FLASHER BUS SHALL BE 2P-15A . C11S CABLE SHALL BE PROVIDED WITH CABINET.





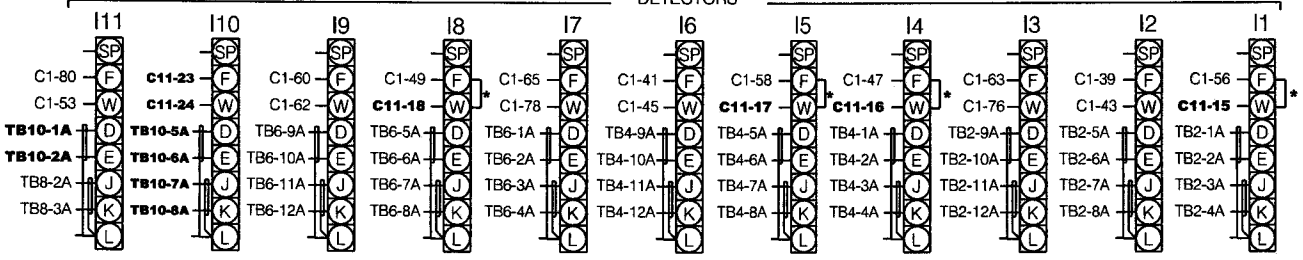
332L CABINET/2070L DETECTION
C11S CABLE CONNECTIONS AND MASTER/SIGNAL CB

REF. & REV.
JUNE 2015

CITY OF FRESNO

E-34B

I INPUT FILE (REAR VIEW)

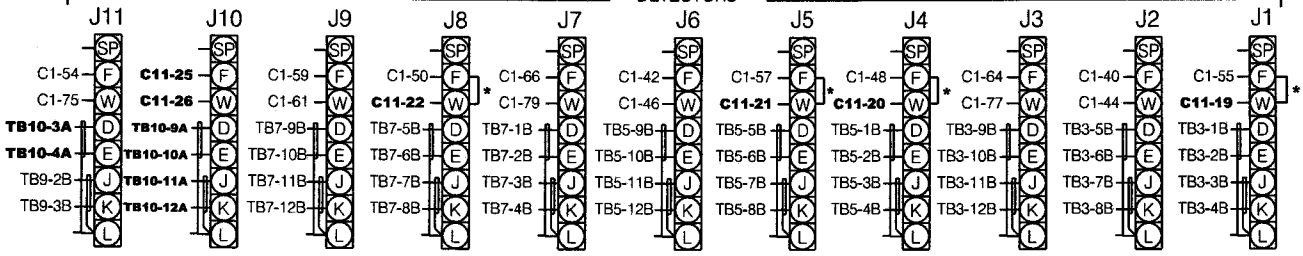


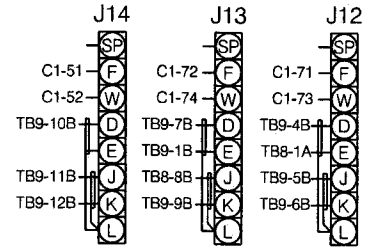
NOTE:
SEE CITY STANDARD DRAWING E-34 WIRING DETAILS FOR INPUT FILE I12, I13, I14, J12, J13 & J14.

INPUT FILE FRONT VIEW

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	1I1U (1)	2I2U (2)	2I3U (4)	2I4U (6)	3I5U (7)	4I6U (8)	4I7U (10)	4I8U (12)	1I9U (13)	SPI10U (41)	2I11U (29)	Ø2P	Ø6P	FS
L	1I1L (33)	2I2L (3)	2I3L (5)	2I4L (34)	3I5L (35)	4I6L (9)	4I7L (11)	4I8L (36)	3I9L (14)	SPI10L (42)	4I11L (30)	Ø4P	Ø8P	ST

J INPUT FILE (REAR VIEW)





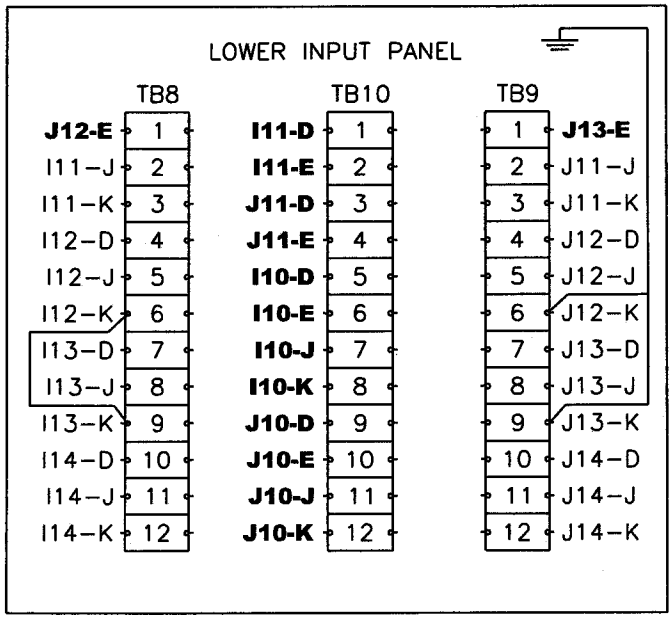
INPUT FILE FRONT VIEW

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	5J1U (15)	6J2U (16)	6J3U (18)	6J4U (20)	7J5U (21)	8J6U (22)	8J7U (24)	8J8U (26)	5J9U (27)	SPJ10U (43)	6J11U (31)	EVA	EVB	RR1
L	5J1L (37)	6J2L (17)	6J3L (19)	6J4L (38)	7J5L (39)	8J6L (23)	8J7L (25)	8J8L (40)	7J9L (28)	SPJ10L (44)	8J11L (32)	EVC	EVD	RR2

* REMOVE EXISTING JUMPERS FROM I AND J FILES

INSTALL TERMINAL BLOCK TB10, REWIRE TERMINAL BLOCKS TB8-1 AND TB9-1.

CABLE C11S		
PIN NO.	UNIVERSAL FUNCTION	CONN. TO
1	SPECIAL-OUTPUT	TB0-1A
2	SPECIAL-OUTPUT	TB0-2A
3	SPECIAL-OUTPUT	TB0-3A
4	SPECIAL-OUTPUT	TB0-4A
5-14	NOT USED	NOT USED
15	1 CALL, EXT	I1-W
16	2 CALL, QUEUE	I4-W
17	3 CALL, EXT	I5-W
18	4 CALL, QUEUE	I8-W
19	5 CALL, EXT	J1-W
20	6 CALL, QUEUE	J4-W
21	7 CALL, EXT	J5-W
22	8 CALL, QUEUE	J8-W
23	SPECIAL-INPUT	I10-F
24	SPECIAL-INPUT	I10-W
25	SPECIAL-INPUT	J10-F
26	SPECIAL-INPUT	J10-W
27	SPECIAL-INPUT	TB0-6A
28	SPECIAL-INPUT	TB0-7A
29	SPECIAL-INPUT	TB0-8A
30	SPECIAL-INPUT	TB0-9A
21-34	NOT USED	NOT USED



TB10 HD30A SERIES TERMINAL BLOCK OR EQUAL.

332 CABINET C11 RETRO-FIT
C11S CABLE CONNECTIONS

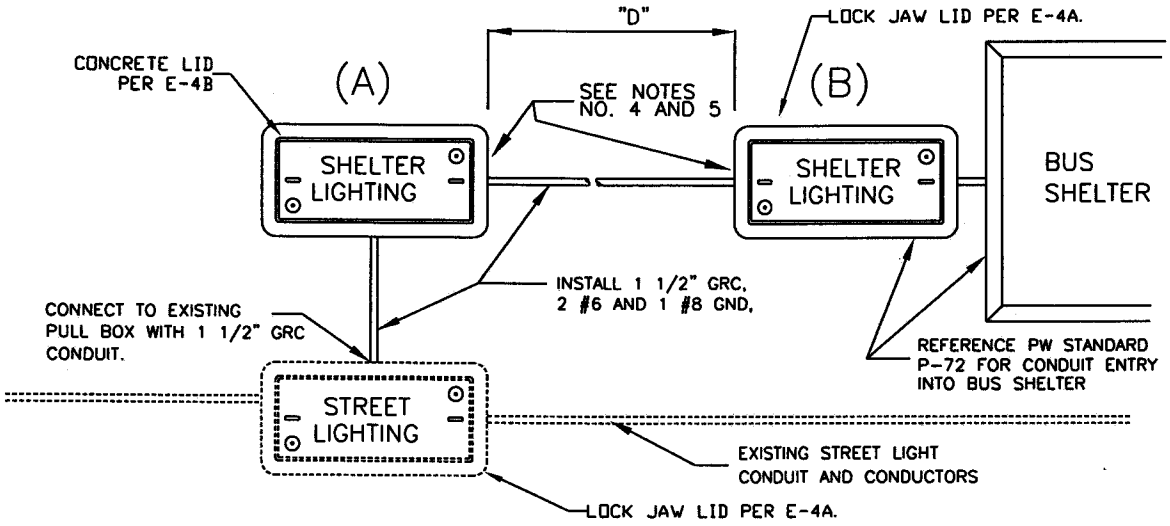
REF. & REV.
JUNE 2015

CITY OF FRESNO

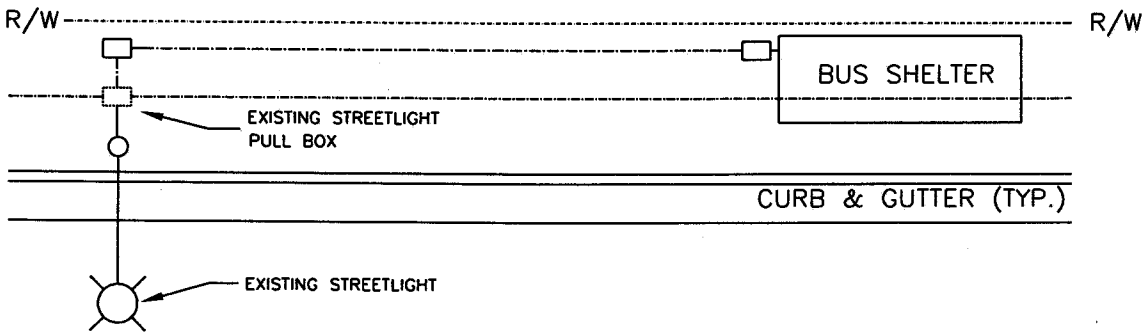
E-34C

INSTALLATIONS TO BE APPROVED AND MAINTAINED BY CITY OF FRESNO, FACILITIES MANAGEMENT DIVISION

PHONE: 621-1487 OR CHIEF OF FACILITIES (ELECTRICAL) 621-1230



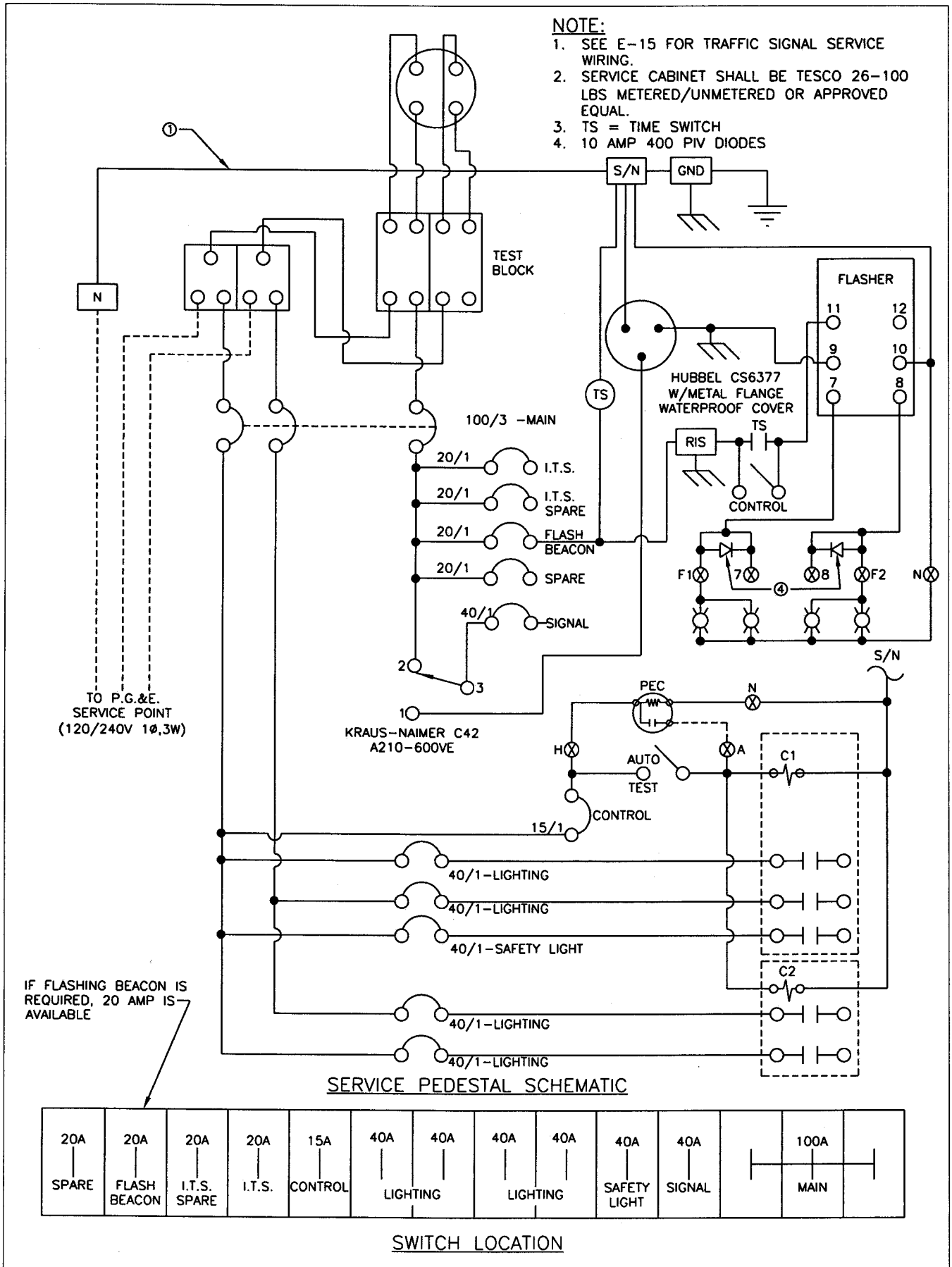
BUS SHELTER LIGHTING CONNECTION



GENERAL NOTES

1. PULL BOXES SHALL BE INSTALLED PER CITY STANDARD E-4. PULL BOXES SHALL UTILIZE LOCKING LIDS PER E-4.
2. DO NOT LOCATE THE PULL BOXES ABOVE THE JOINT TRENCH.
3. PULL BOX COVER SHALL BE AN APPROVED LOCKING TYPE AND SHALL BE INSCRIBED "SHELTER LIGHTING".
4. IF DISTANCE "D" EXCEEDS 20 FT. PULL BOX "A" IS REQUIRED ADJACENT TO EXISTING STREET LIGHT PULL BOX. IF DISTANCE "D" IS LESS THAN 20', PULL BOX " A" IS NOT REQUIRED.
5. A TRON TYPE FUSE HOLDER WITH 5A FUSE TO BE INSTALLED IN NEAREST PULL BOX. INSCRIBED "SHELTER LIGHTING" ADJACENT TO EXISTING STREET LIGHT PULL BOX.
6. ALL BUS SHELTER LIGHTING CONDUCTOR SPLICES SHALL BE TO APPLICABLE ELECTRICAL, STATE AND CITY STANDARDS.
7. ALL SHELTER LIGHTING SHALL BE NUMBERED. NUMERICAL SEQUENCE TO BE OBTAINED FROM PG&E. NUMBERS TO BE 2 1/2" HIGH AND INSTALLED ON SHELTER STRUCTURE.
8. ELECTRICAL FEED FROM EXISTING STREET LIGHTING SYSTEM TO SHELTER LIGHTING SHALL BE CONTINUOUS AND NOT BE IMPACTED BY A MASTER PHOTO CELL (PEC). INSTALL PEC'S ON STREET LIGHT LUMINAIRES AFFECTED BY SHELTER LIGHTING INSTALLATION REQUIREMENTS.

BUS SHELTER LIGHTING CONNECTION DETAIL	REF. & REV. JUNE 2015	CITY OF FRESNO E-35



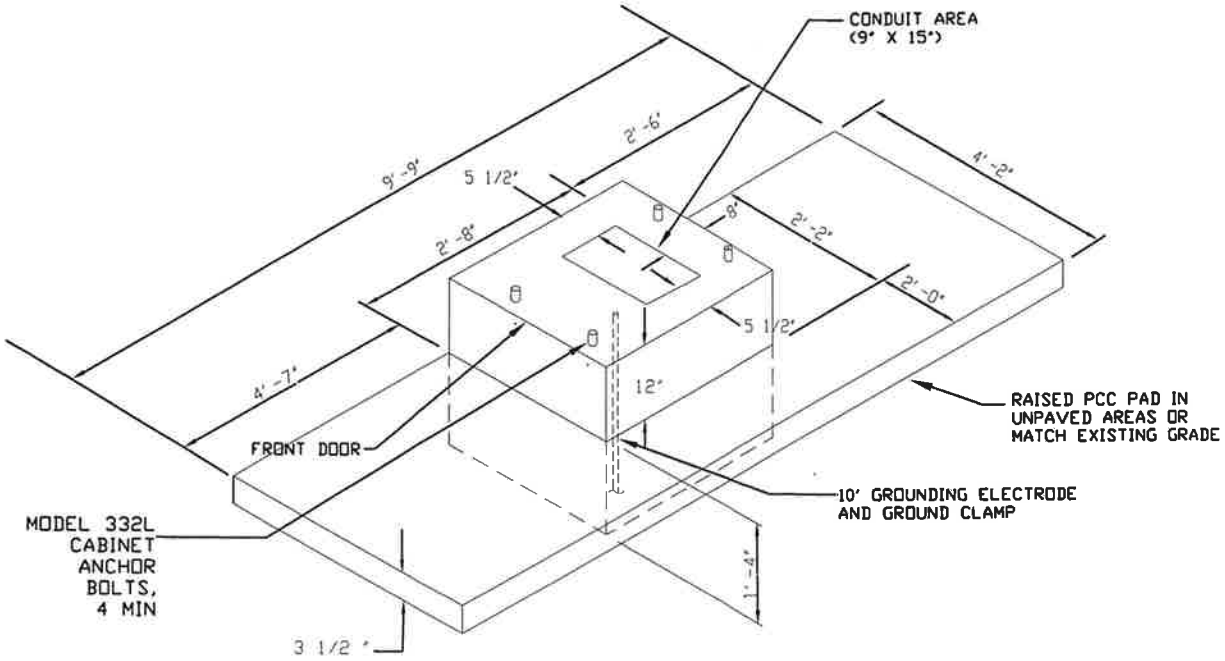
FLASHING BEACON

WIRING NEW INSTALLATIONS 26-100 CABINETS

REF. & REV. JUNE 2015

CITY OF FRESNO

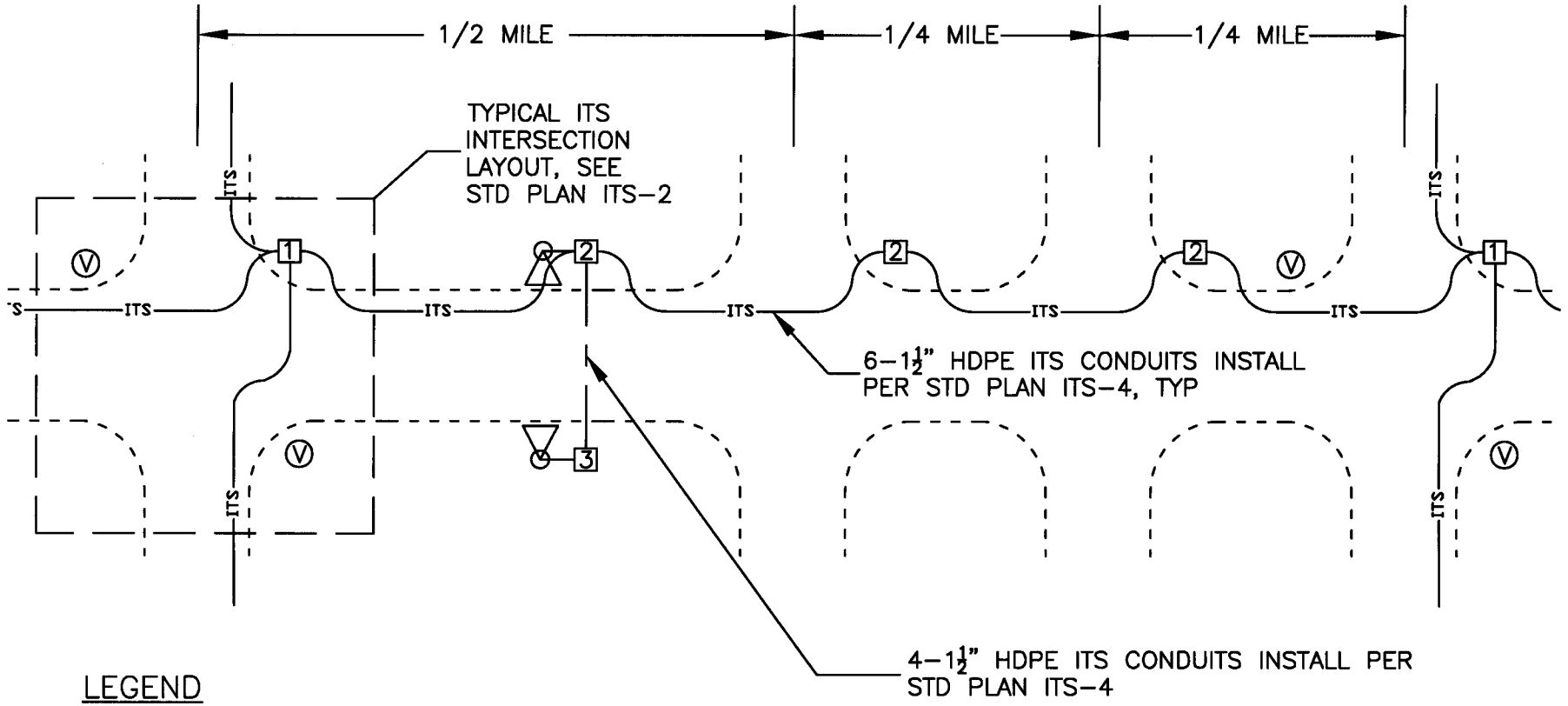
E-36



332L FOUNDATION DETAILS

332L CABINET FOUNDATION	REF. & REV. JUNE 2015	CITY OF FRESNO E-37

TYPICAL ITS CORRIDOR LAYOUT



REF. & REV. JULY 2011

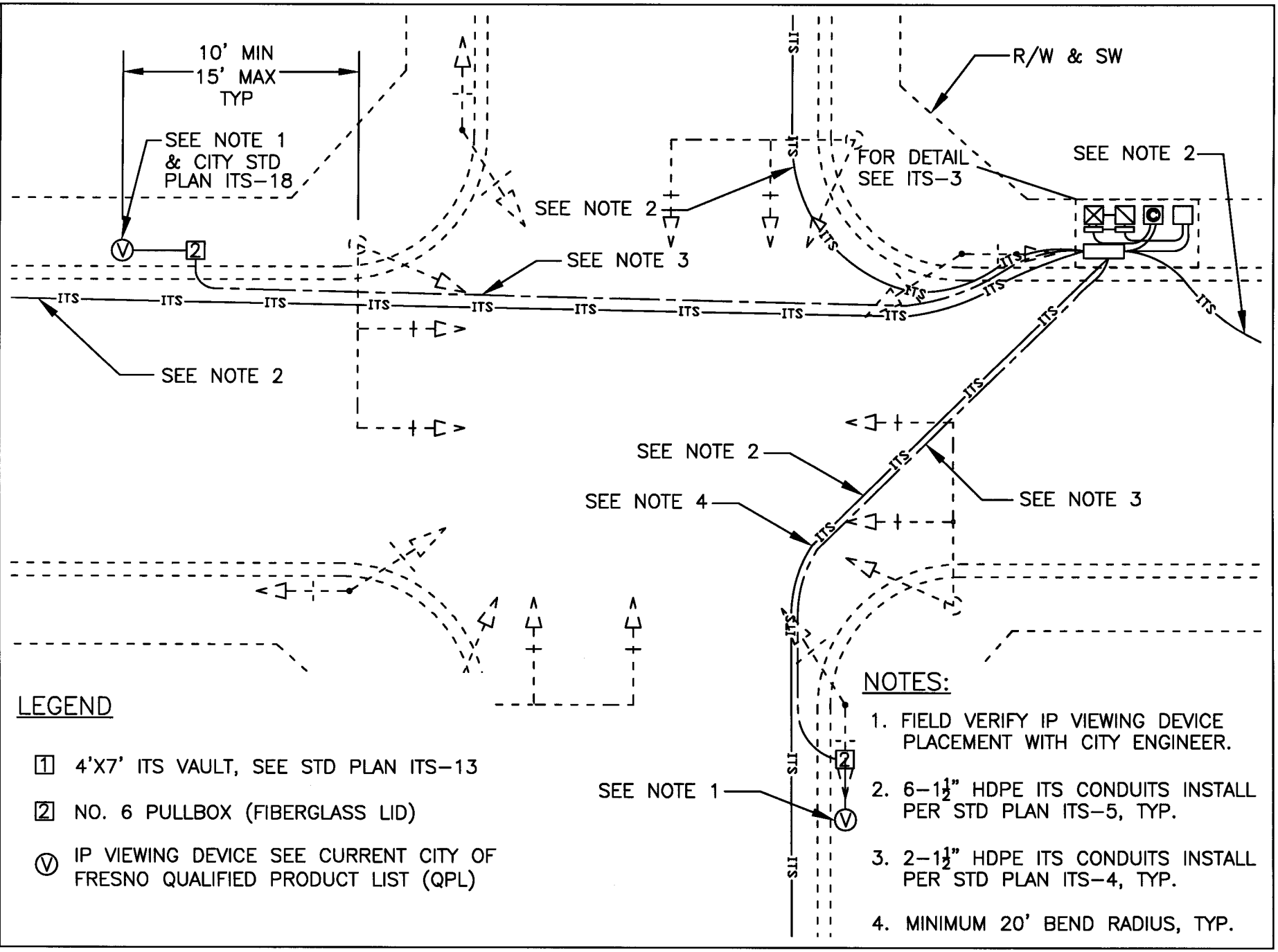
CITY OF FRESNO

ITS-1

LEGEND

- RADAR DETECTOR, INSTALL MID BLOCK PER STD PLAN ITS-15, ITS-16, OR ITS-17
- [1] 4'X7' ITS VAULT, SEE STD PLAN ITS-13 AND ITS-14.
- [2] 3'X5' ITS VAULT, SEE STD PLAN ITS-11 AND ITS-12.
- [3] NO. 6 PULL BOX (FIBERLYTE LID)
- (V) IP VIEWING DEVICE PER CURRENT CITY OF FRESNO QUALIFIED PRODUCT LIST (QPL)

TYPICAL ITS INTERSECTION LAYOUT



REF. & REV. JULY 2011

CITY OF FRESNO

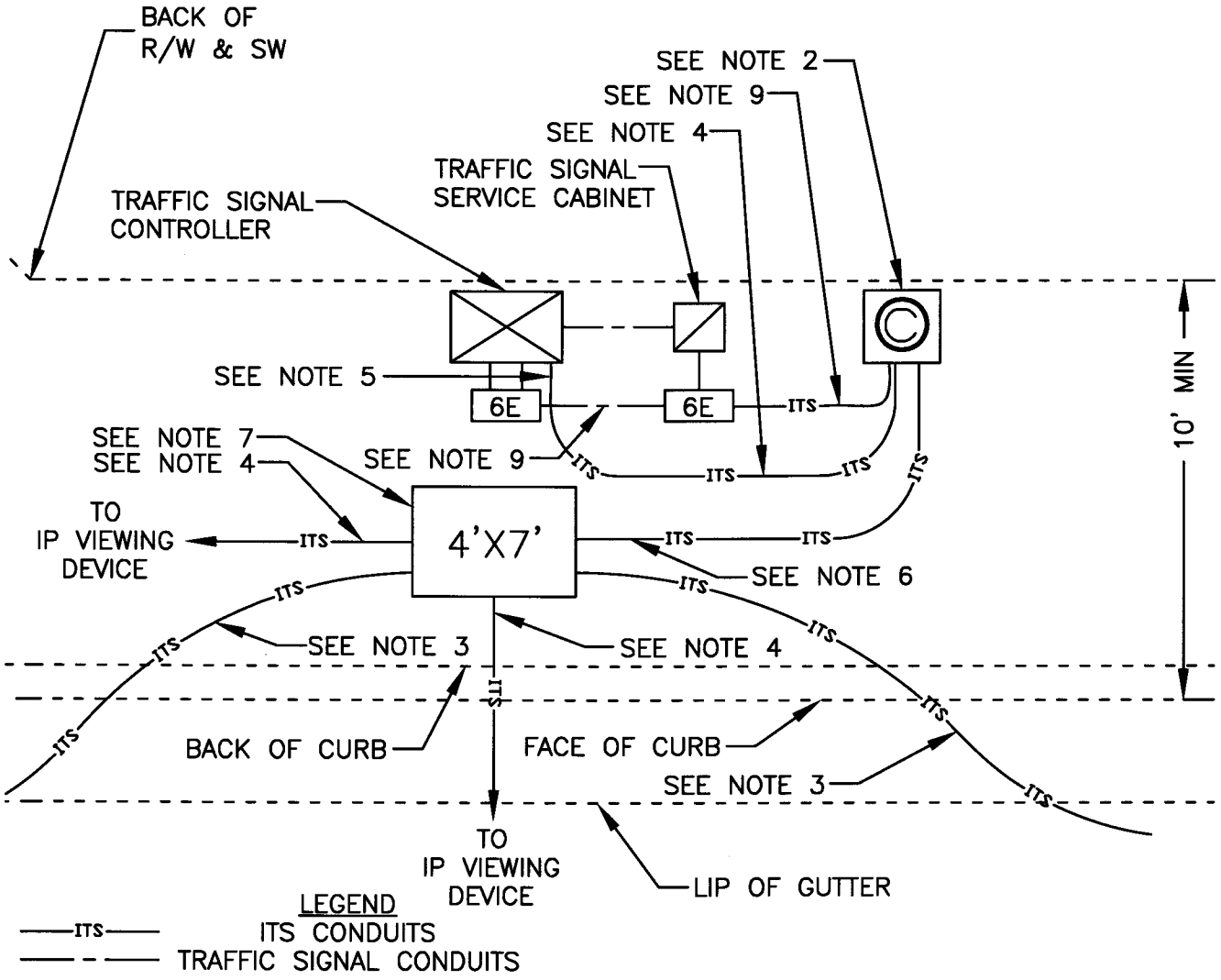
ITS-2

LEGEND

- [1] 4'X7' ITS VAULT, SEE STD PLAN ITS-13
- [2] NO. 6 PULLBOX (FIBERGLASS LID)
- (V) IP VIEWING DEVICE SEE CURRENT CITY OF FRESNO QUALIFIED PRODUCT LIST (QPL)

NOTES:

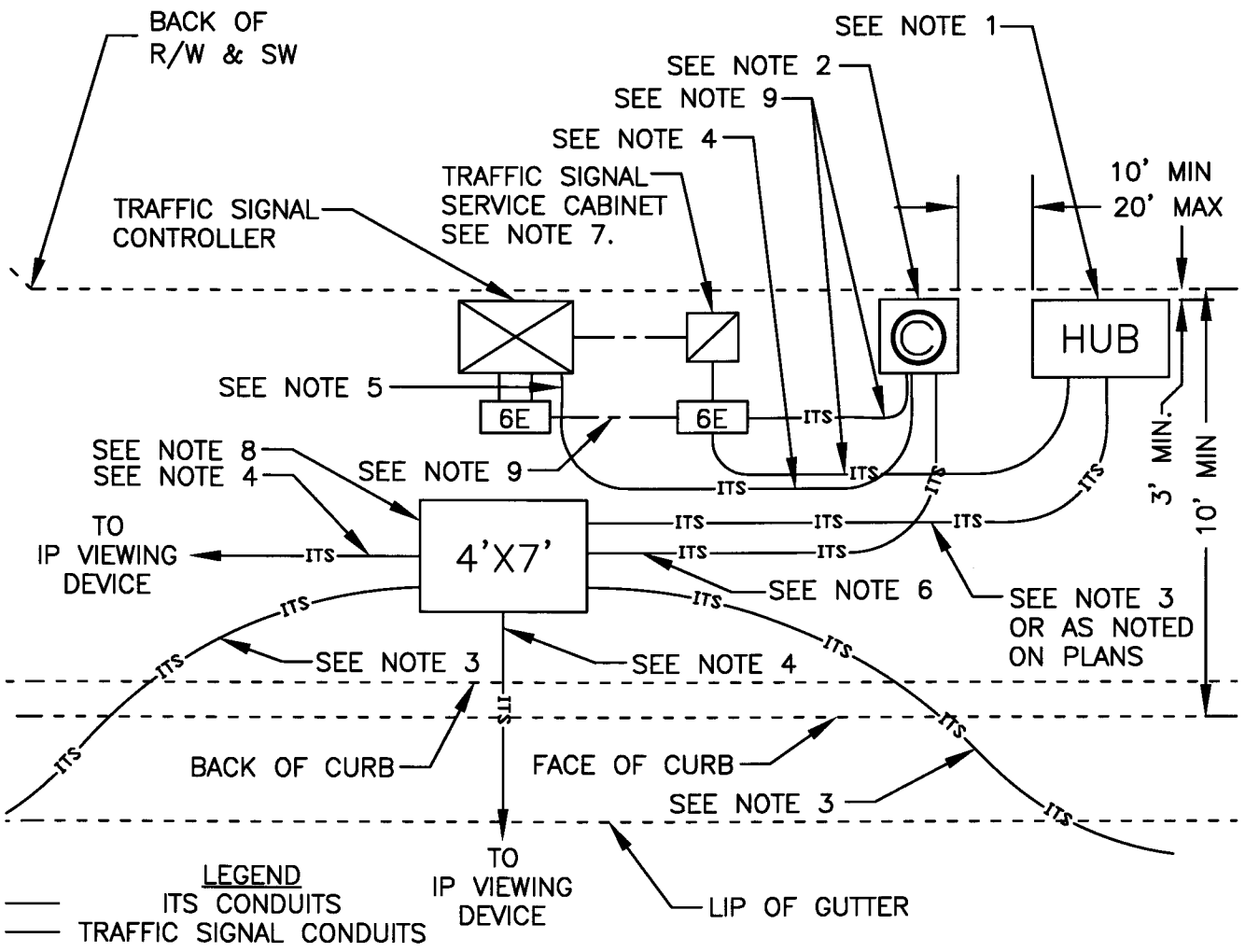
1. FIELD VERIFY IP VIEWING DEVICE PLACEMENT WITH CITY ENGINEER.
2. 6-1½" HDPE ITS CONDUITS INSTALL PER STD PLAN ITS-5, TYP.
3. 2-1½" HDPE ITS CONDUITS INSTALL PER STD PLAN ITS-4, TYP.
4. MINIMUM 20' BEND RADIUS, TYP.



NOTES:

1. FOR LAYOUT WITH ITS HUB CABINET, SEE ITS–3A
2. ITS INTERSECTION COMMUNICATIONS CABINET PER CURRENT CITY OF FRESNO QUALIFIED PRODUCT LIST. (QPL)
3. 6–1½" ITS CONDUITS INSTALL PER STD PLAN ITS–5, TYP.
4. 2–1½" ITS CONDUITS INSTALL PER STD PLAN ITS–4, TYP.
5. FOR EXISTING TRAFFIC SIGNAL CONTROLLER, INSTALL 2–1½" CONDUITS INTO HOMERUN 6E PULLBOX.
6. 4–1½" ITS CONDUITS INSTALL PER STD PLAN ITS–4, TYP.
7. 4'x7' ITS VAULT, SEE STD PLAN ITS–13 AND ITS–14.
8. FOR TRAFFIC SIGNAL EQUIPMENT LAYOUT, SEE STD PLAN E–24.
9. INSTALL 2" RIGID CONDUIT.
10. ANY VARIATION FROM THIS STANDARD SHALL HAVE THE APPROVAL OF THE CITY ENGINEER.

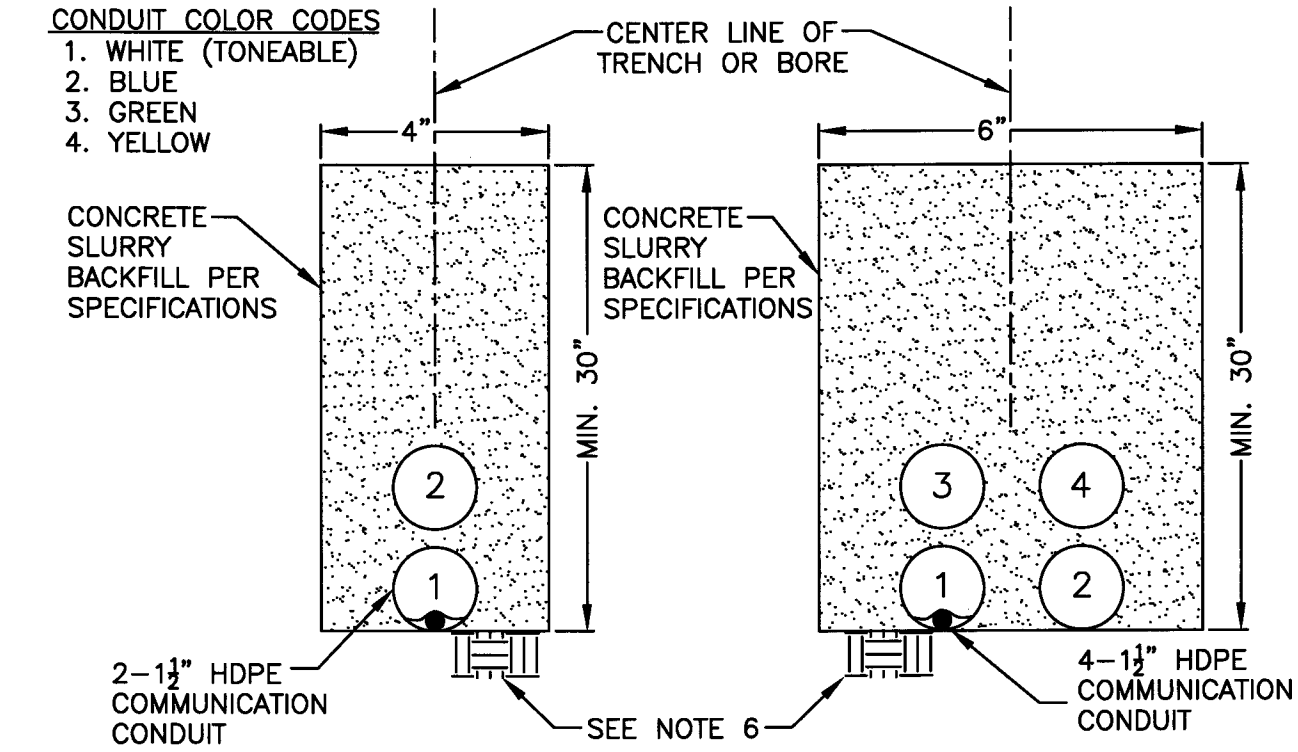
TYPICAL ITS INTERSECTION CONDUIT RUN LAYOUT	REF. & REV. JULY 2011	CITY OF FRESNO ITS–3



NOTES:

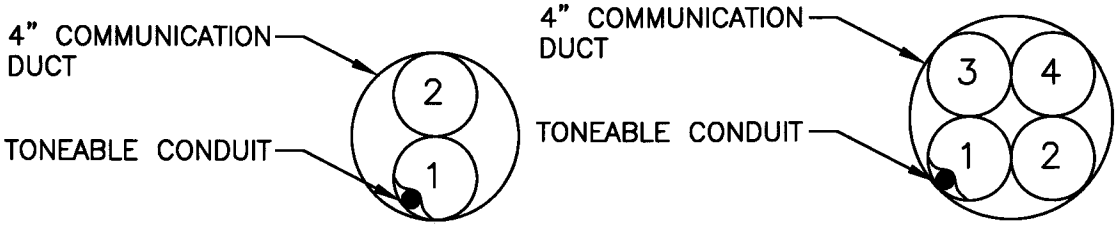
1. ITS CABINET HUB SHALL BE INSTALLED IN A LOCATION APPROVED BY CITY ENGINEER.
2. ITS INTERSECTION COMMUNICATIONS CABINET PER CURRENT CITY OF FRESNO QUALIFIED PRODUCT LIST. (QPL)
3. 6–1½" ITS CONDUITS INSTALL PER STD PLAN ITS–5, TYP.
4. 2–1½" ITS CONDUITS INSTALL PER STD PLAN ITS–4, TYP.
5. FOR EXISTING TRAFFIC SIGNAL CONTROLLER, INSTALL 2–1½" CONDUITS INTO HOMERUN 6E PULLBOX.
6. 4–1½" ITS CONDUITS INSTALL PER STD PLAN ITS–4, TYP.
7. UPGRADE TRAFFIC SIGNAL SERVICE CABINET TO TESCO 27–000 AT LOCATIONS REQUIRING A HUB CABINET.
8. 4'x7' ITS VAULT, SEE STD PLAN ITS–13.
9. INSTALL 2" RIGID CONDUIT.
10. FOR TRAFFIC SIGNAL EQUIPMENT LAYOUT, SEE STD PLAN E–24.
11. ANY VARIATION FROM THIS STANDARD SHALL HAVE THE APPROVAL OF THE CITY ENGINEER.

TYPICAL ITS INTERSECTION CONDUIT RUN LAYOUT WITH HUB	REF. & REV. JULY 2011	CITY OF FRESNO ITS–3A



TYPE 2–1 1/2"
TRENCHING DETAIL
SEE NOTE 5

TYPE 4–1 1/2"
TRENCHING DETAIL
SEE NOTE 5



TYPE 2 CONDUIT
INNERDUCT DETAIL

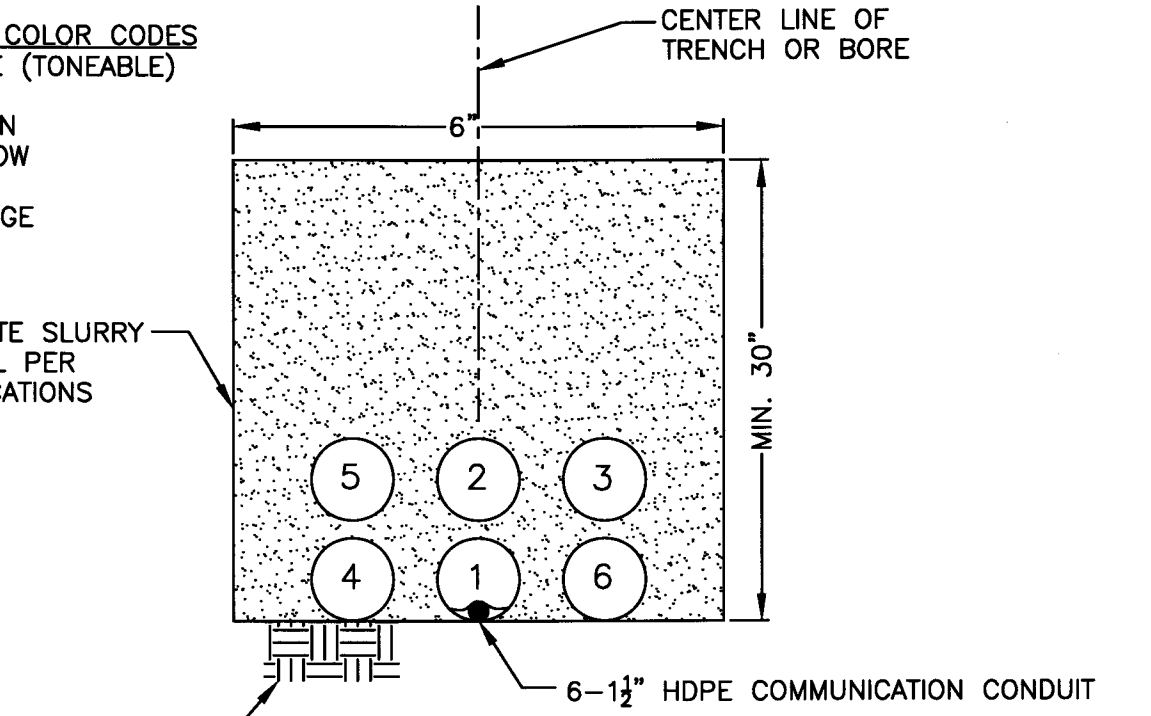
TYPE 4 CONDUIT
INNERDUCT DETAIL

NOTES:

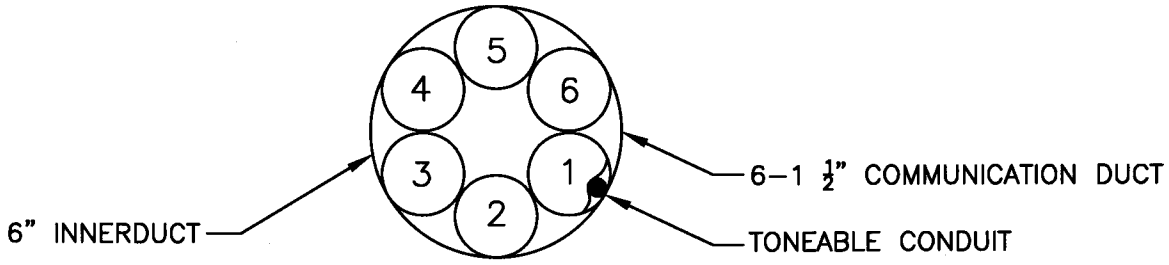
1. ALL CONDUIT SHALL BE SDR–11 HDPE COMMUNICATION.
2. ALL CONDUIT PLACEMENT SHALL BE PLACED PER CALIFORNIA GENERAL ORDER 128 (G.O.128).
3. ALL TRENCH OR BORING OF ITS CONDUIT SHALL HAVE ONE TONEABLE CONDUIT USED FOR TRACER.
4. CONDUITS SHALL BE WHITE, BLUE, GREEN AND YELLOW AS NUMBERED ABOVE.
5. DIRECTIONAL BORING OPTIONAL.
6. REMOVE TRENCH SPOIL MATERIALS TO UNDISTURBED GROUND.
7. ALL CONDUITS SHALL CONTAIN CITY APPROVED PULL TAPE.

ITS CONDUIT TRENCH DETAIL NO. 1	REF. & REV. FEB., 2008	CITY OF FRESNO ITS–4

CONDUIT COLOR CODES
1. WHITE (TONEABLE)
2. BLUE
3. GREEN
4. YELLOW
5. RED
6. ORANGE



TYPE 6-1 1/2"
TRENCHING DETAIL
SEE NOTE 5

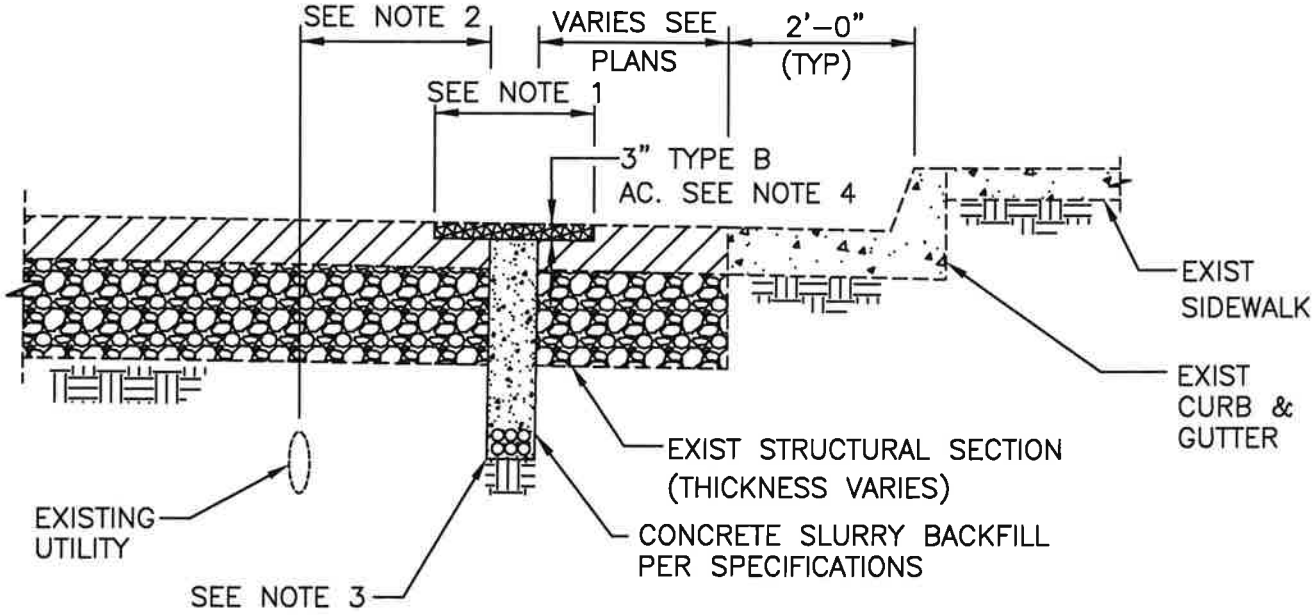


TYPE 6 CONDUIT
INNERDUCT DETAIL

NOTES:

1. ALL CONDUIT SHALL BE SDR-11 HDPE COMMUNICATION.
2. ALL CONDUIT PLACEMENT SHALL BE PLACED PER CALIFORNIA GENERAL ORDER 128 (G.O.128).
3. ALL TRENCH OR BORING OF ITS CONDUIT SHALL HAVE ONE TONEABLE CONDUIT USED FOR TRACER.
4. CONDUITS SHALL BE WHITE, BLUE, GREEN, YELLOW, RED AND ORANGE AS NUMBERED ABOVE.
5. DIRECTIONAL BORING OPTIONAL.
6. REMOVE TRENCH SPOIL MATERIALS TO UNDISTURBED GROUND.
7. ALL CONDUITS SHALL CONTAIN PULL CITY APPROVED PULL TAPE.

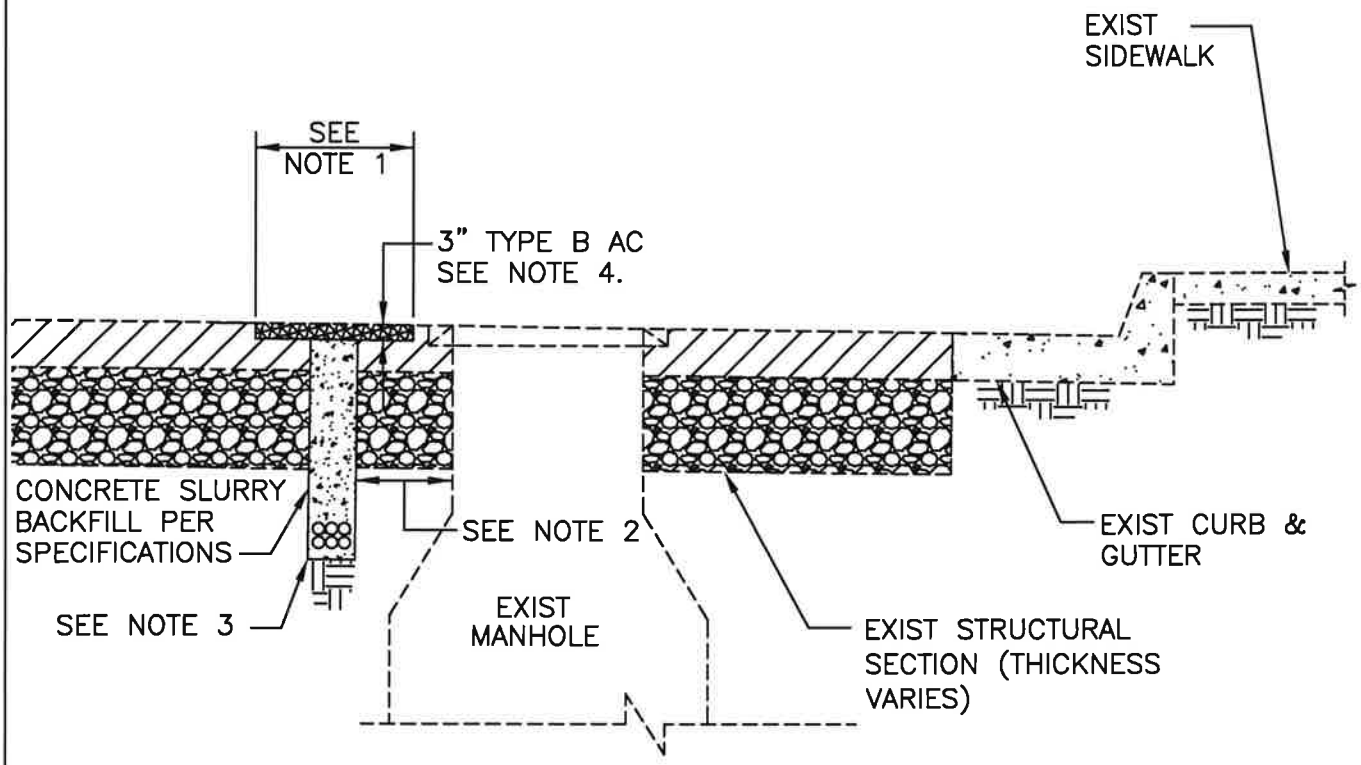
ITS CONDUIT TRENCH DETAIL NO. 2	REF. & REV. FEB., 2008	CITY OF FRESNO ITS-5



NOTES:

1. GRIND EXISTING PAVEMENT TO NEAT EDGE MINIMUM 20" WIDE.
2. CONTRACTOR SHALL ADJUST HORIZONTAL TRENCH ALIGNMENT TO AVOID EXISTING UTILITIES AS NECESSARY. VERIFY ALIGNMENT ADJUSTMENTS WITH CITY REPRESENTATIVE. MAINTAIN MIN 12" CLEARANCE FROM EXISTING UTILITIES AND OBSTRUCTIONS.
3. FOR ITS CONDUIT TRENCH DETAIL, SEE STD DWG ITS-4 AND ITS-5.
4. REPAVING OPERATIONS SHALL BE TO CITY STD SPECS AND DRAWINGS.

ITS CONDUIT TRENCH LAYOUT NO. 1	REF. & REV. FEB., 2008	CITY OF FRESNO ITS-6



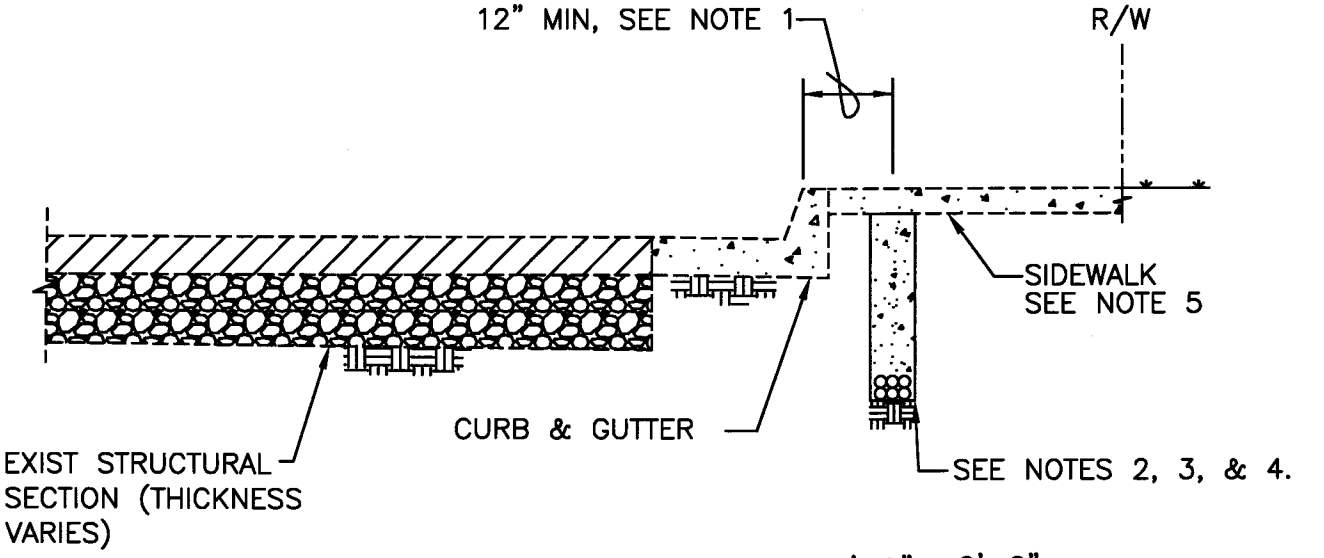
NOTES:

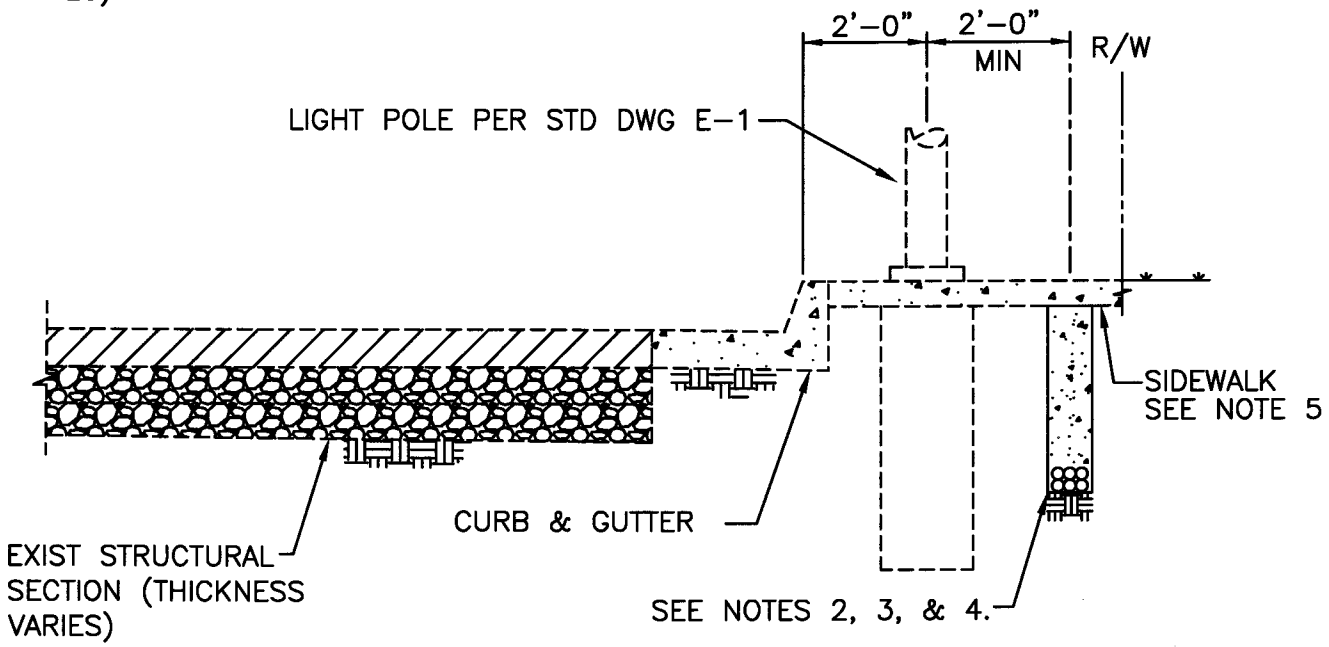
1. GRIND EXISTING ASPHALT PAVEMENT TO NEAT EDGE MINIMUM 20" WIDE.
2. CONTRACTOR SHALL ADJUST HORIZONTAL TRENCH ALIGNMENT TO AVOID EXISTING UTILITIES AS NECESSARY. VERIFY ALIGNMENT ADJUSTMENTS WITH CITY REPRESENTATIVE. MAINTAIN MIN 12" CLEARANCE FROM EXISTING UTILITIES AND OBSTRUCTIONS.
3. FOR ITS CONDUIT TRENCH DETAIL, SEE STD DWG ITS–4 AND ITS–5.
4. REPAVING OPERATIONS SHALL BE TO CITY STD SPECS AND DRAWINGS.

ITS CONDUIT TRENCH LAYOUT NO. 2	REF. & REV. FEB., 2008	CITY OF FRESNO ITS–7

NOTES:

1. LOCATE ITS TRENCH UNDER SIDEWALK TO AVOID EXISTING & PROPOSED UTILITIES.
2. TRENCH BEFORE INSTALLATION OF NEW SIDEWALK.
3. CONTRACTOR SHALL ADJUST HORIZONTAL TRENCH ALIGNMENT TO AVOID EXISTING UTILITIES AS NECESSARY. VERIFY ALIGNMENT ADJUSTMENTS WITH CITY REPRESENTATIVE.
4. FOR ITS CONDUIT TRENCH DETAIL, SEE STD DWG ITS–4 AND ITS–5.
5. DIRECTIONAL BORE OR REMOVE & REPLACE SIDEWALK (BETWEEN EXISITING JOINT) & TRENCH.
6. INSTALLATION OF ITS CONDUITS UNDER SIDEWALK SHALL ONLY BE ALLOWED WITH WRITTEN PERMISSION FROM THE CITY ENGINEER.

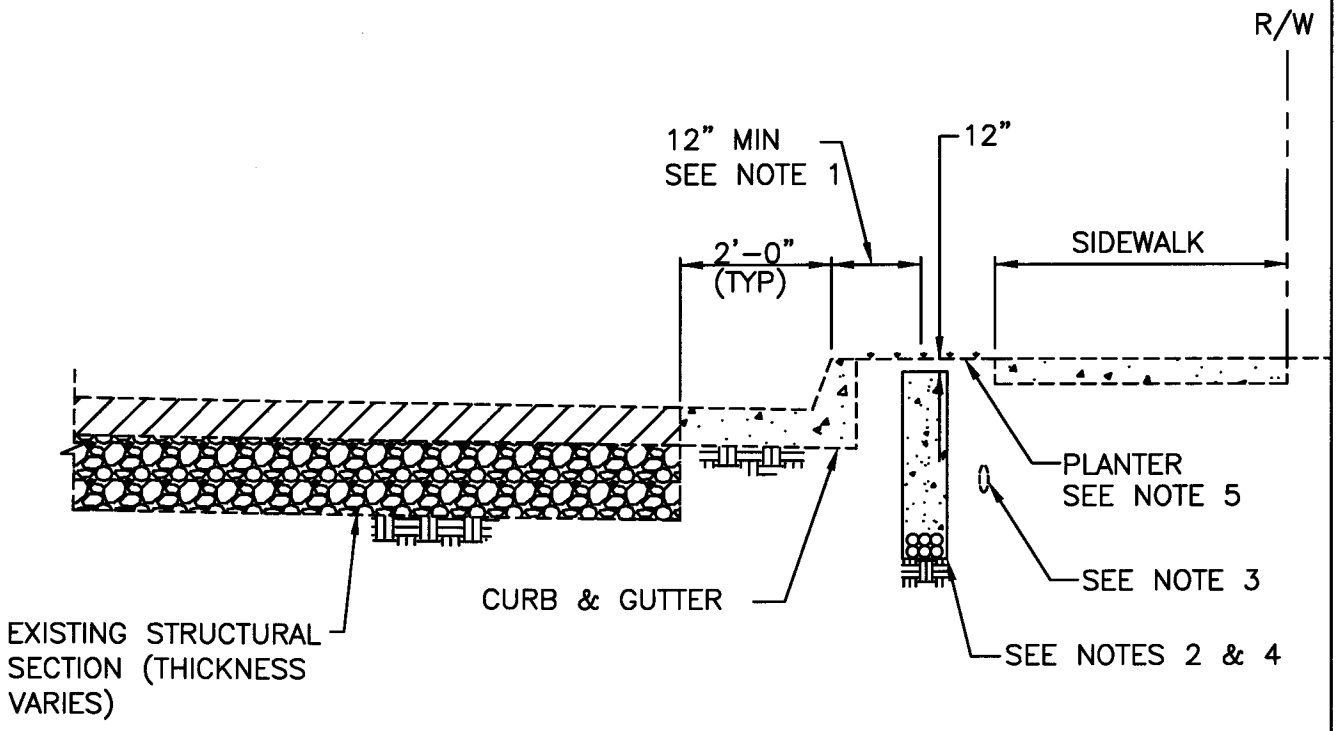




ITS CONDUIT TRENCH LAYOUT NO. 3	REF. & REV. FEB., 2008	CITY OF FRESNO ITS–8

NOTES:

1. LOCATE ITS TRENCH UNDER PLANTER TO AVOID EXISTING & PROPOSED UTILITIES.
2. TRENCH BEFORE INSTALLATION OF LANDSCAPING IN NEW CONSTRUCTION.
3. CONTRACTOR SHALL ADJUST HORIZONTAL TRENCH ALIGNMENT TO AVOID EXISTING UTILITIES AS NECESSARY. VERIFY ALIGNMENT ADJUSTMENTS WITH CITY REPRESENTATIVE.
4. FOR ITS CONDUIT TRENCH DETAIL, SEE STD DWG ITS–4 AND ITS–5.
5. DIRECTIONAL BORE OR REMOVE & REPLACE IRRIGATION AND LANDSCAPING IN KIND.
6. INSTALLATION OF ITS CONDUITS IN PLANTER AREAS SHALL ONLY BE ALLOWED WITH WRITTEN PERMISSION FROM THE CITY ENGINEER.

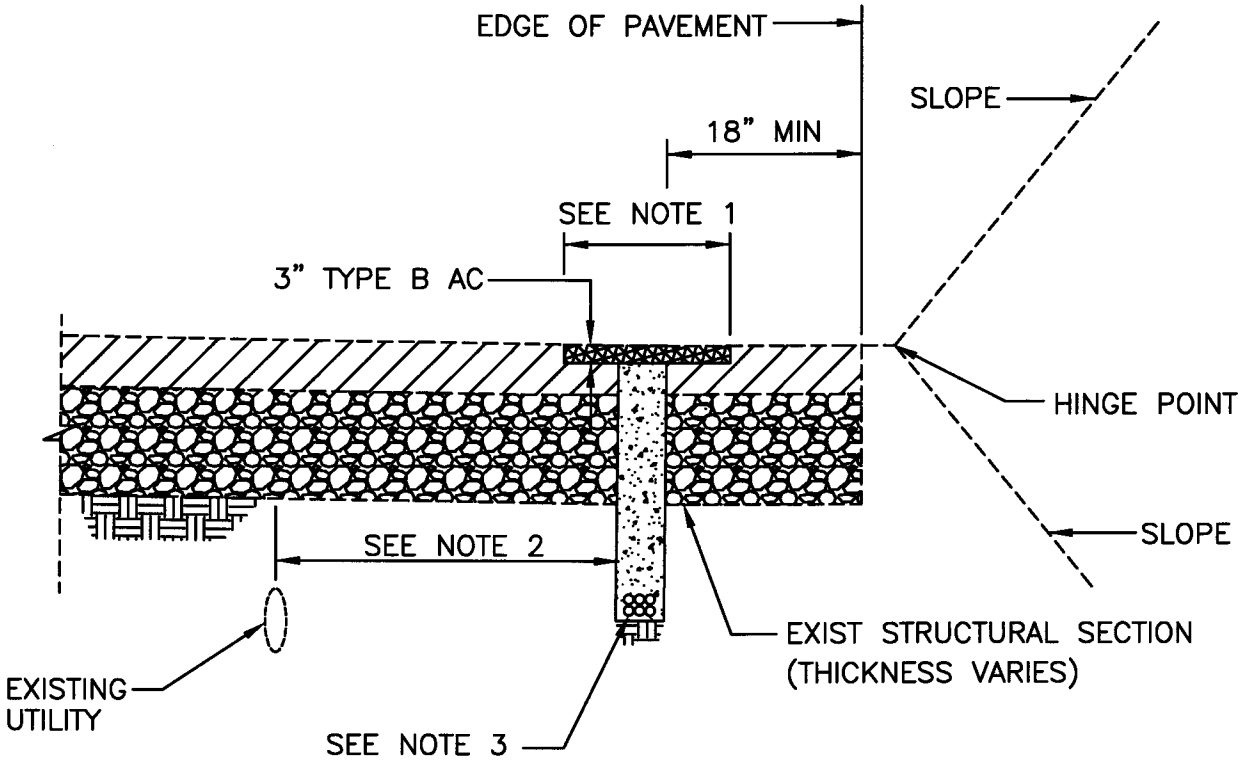


ITS CONDUIT TRENCH LAYOUT NO. 4

REF. & REV.
FEB., 2008

CITY OF FRESNO

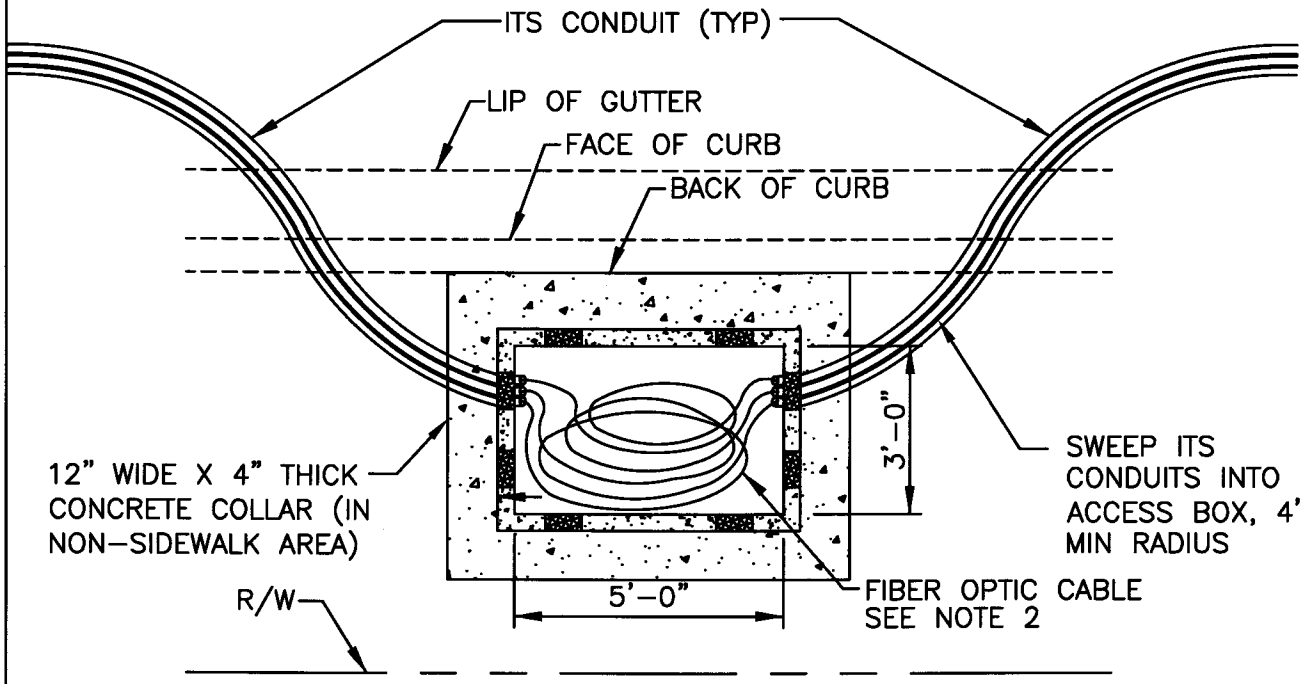
ITS–9



NOTES:

1. GRIND EXISTING ASPHALT PAVEMENT TO NEAT EDGE MINIMUM 20" WIDE.
2. CONTRACTOR SHALL ADJUST HORIZONTAL TRENCH ALIGNMENT TO AVOID EXISTING UTILITIES AS NECESSARY. VERIFY ALIGNMENT ADJUSTMENTS WITH CITY REPRESENTATIVE. MAINTAIN MIN 12" CLEARANCE FROM EXISTING UTILITIES AND OBSTRUCTIONS.
3. FOR ITS CONDUIT TRENCH DETAIL, SEE STD DWG ITS–4 AND ITS–5.
4. REPAVING OPERATIONS SHALL BE TO CITY STD SPECS AND DRAWINGS.

ITS CONDUIT TRENCH LAYOUT NO. 5	REF. & REV. FEB., 2008	CITY OF FRESNO ITS–10

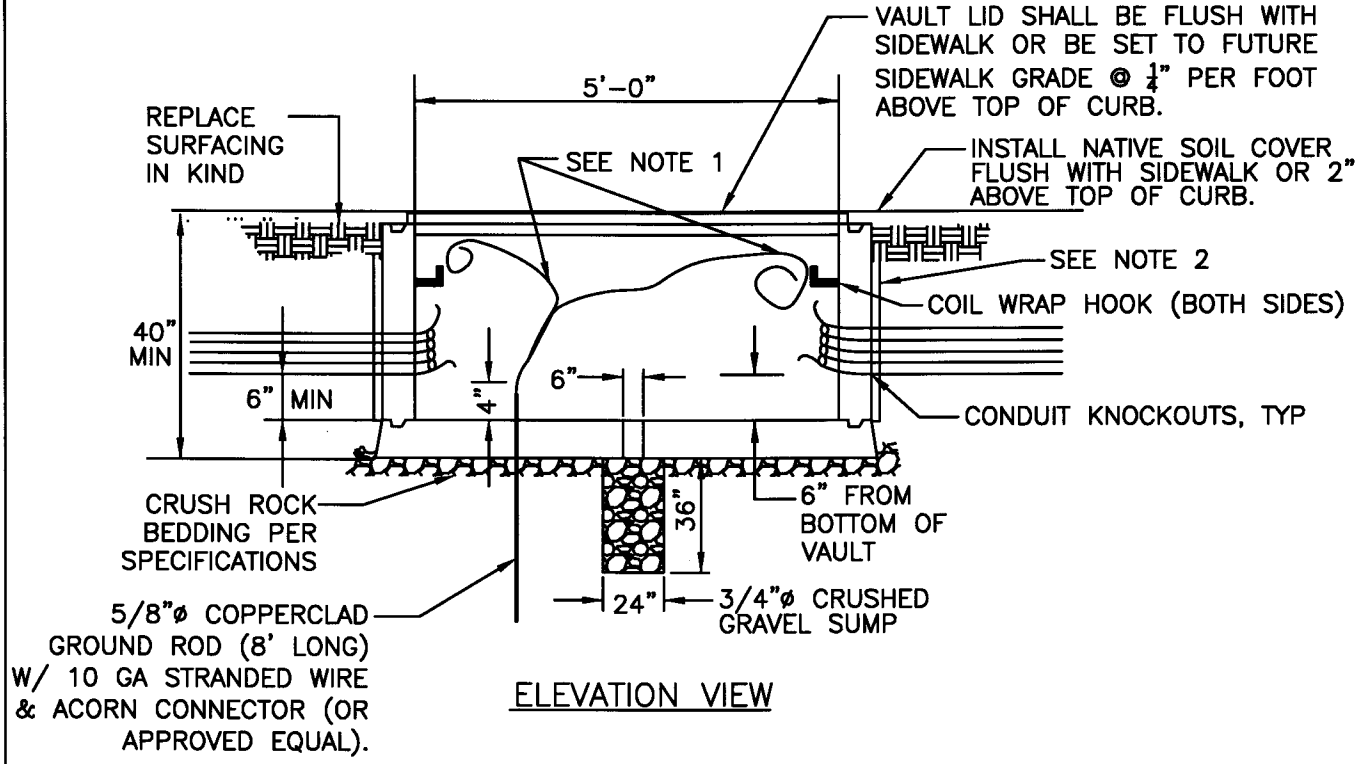


PLAN VIEW

NOTES:

1. TOP THREE CONDUITS NOT SHOWN FOR CLARITY.
2. COIL APPROXIMATELY 150 FEET (OR AS NOTED ON PLANS) OF FIBER OPTIC CABLE AROUND INSIDE BASE OF COMMUNICATIONS VAULT VERTICALLY WITH A MINIMUM RADIUS OF 32". (ATTACH TO HOLD DOWNS WITH METAL TIE WRAPS) PER SPECIFICATIONS.
3. 90° CONDUIT ENTRIES ARE NOT ALLOWED. CONDUIT SHALL BE DIRECTLY ACROSS FROM ADJACENT CONDUITS.
4. LABEL ALL CABLE IN PULL BOX & SERVICE BOX.
5. VAULT SHALL HAVE A TORSION SUSPENDED & SPRING LOADED LID WITH TWO HOLDUP BRACING BARS.
6. VAULTS SHALL INCLUDE BOLT DOWN LIDS.
7. LABELING ON LID SHALL READ "ITS COMMUNICATIONS".
8. VAULTS SHALL BE PER CURRENT CITY OF FRESNO QUALIFIED PRODUCTS LIST (QPL).
9. FOR ADDITIONAL 3' X 5' VAULT DETAILS, SEE STD PLAN ITS-12.

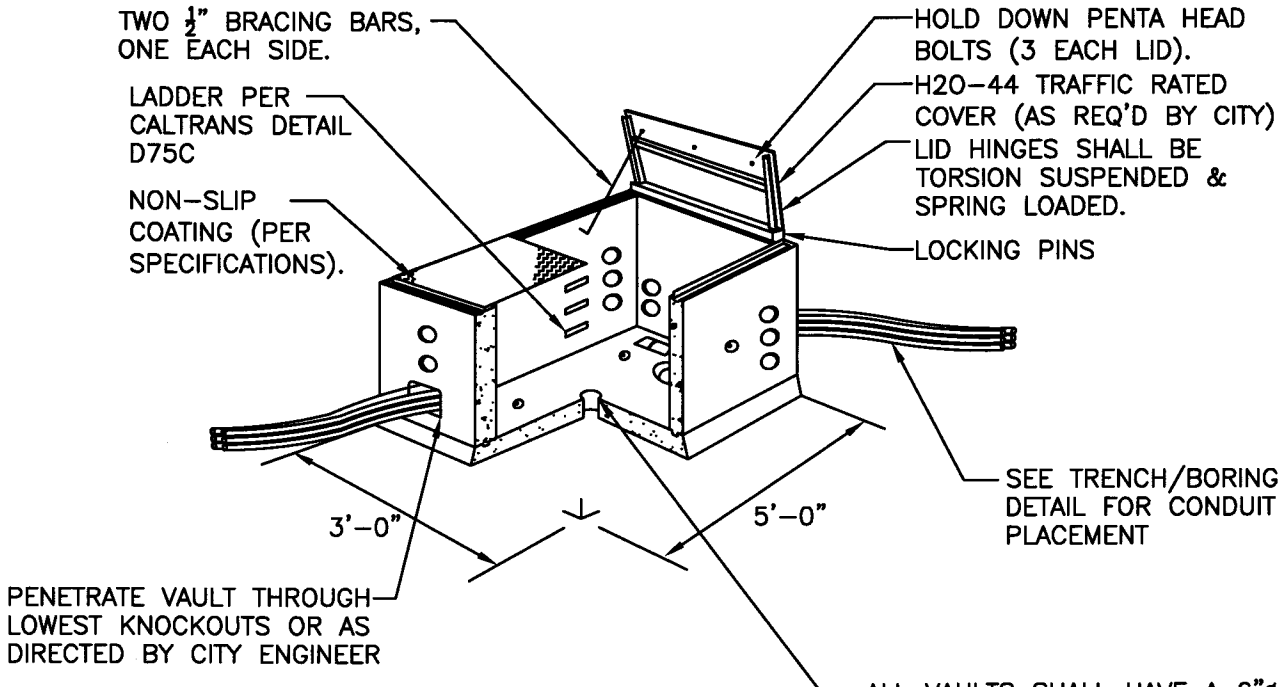
ITS 3' X 5' VAULT DETAILS NO. 1	REF. & REV. JULY 2011	CITY OF FRESNO ITS-11



ELEVATION VIEW

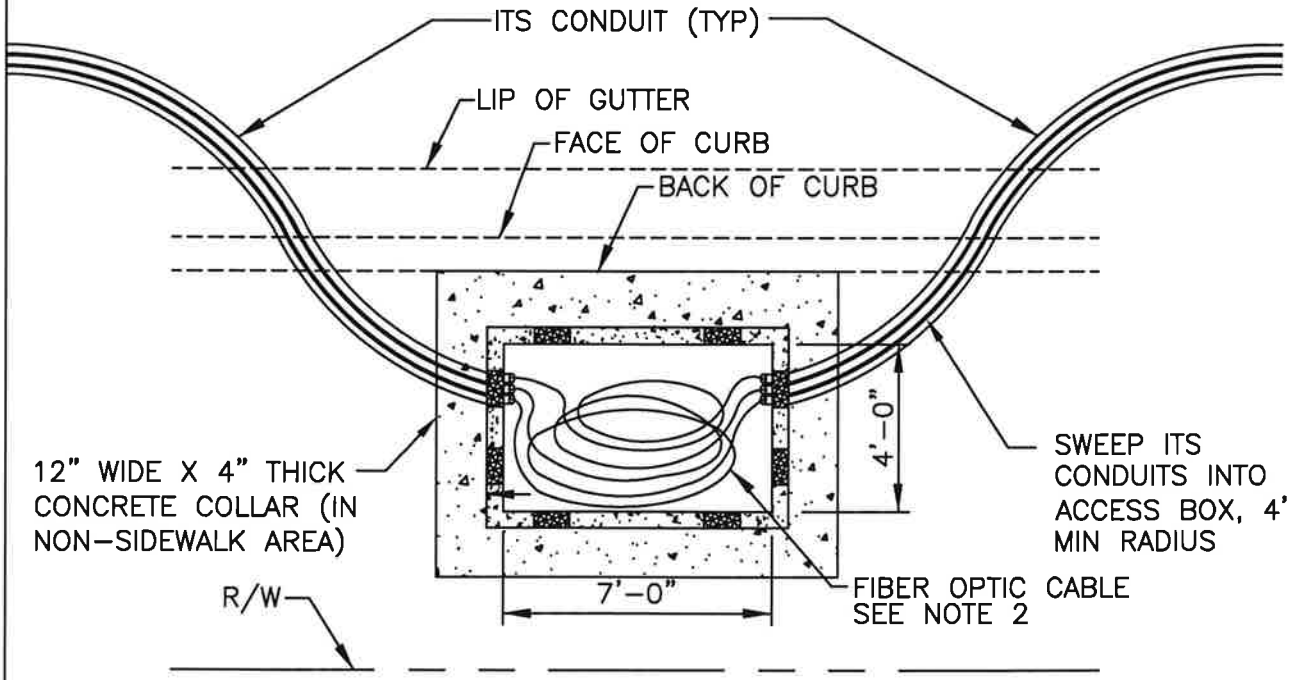
NOTES:

1. INSTALL COMMUNICATIONS BELLS ON CONDUIT ENDS & CONNECT TONEABLE CONDUIT TO GROUNDING ROD.
2. WRAP VAULT WITH BUILDING PAPER PER SPECIFICATIONS BEFORE BACKFILLING.



3-D VIEW

ITS 3' X 5' VAULT DETAILS NO. 2	REF. & REV. FEB., 2008	CITY OF FRESNO ITS-12

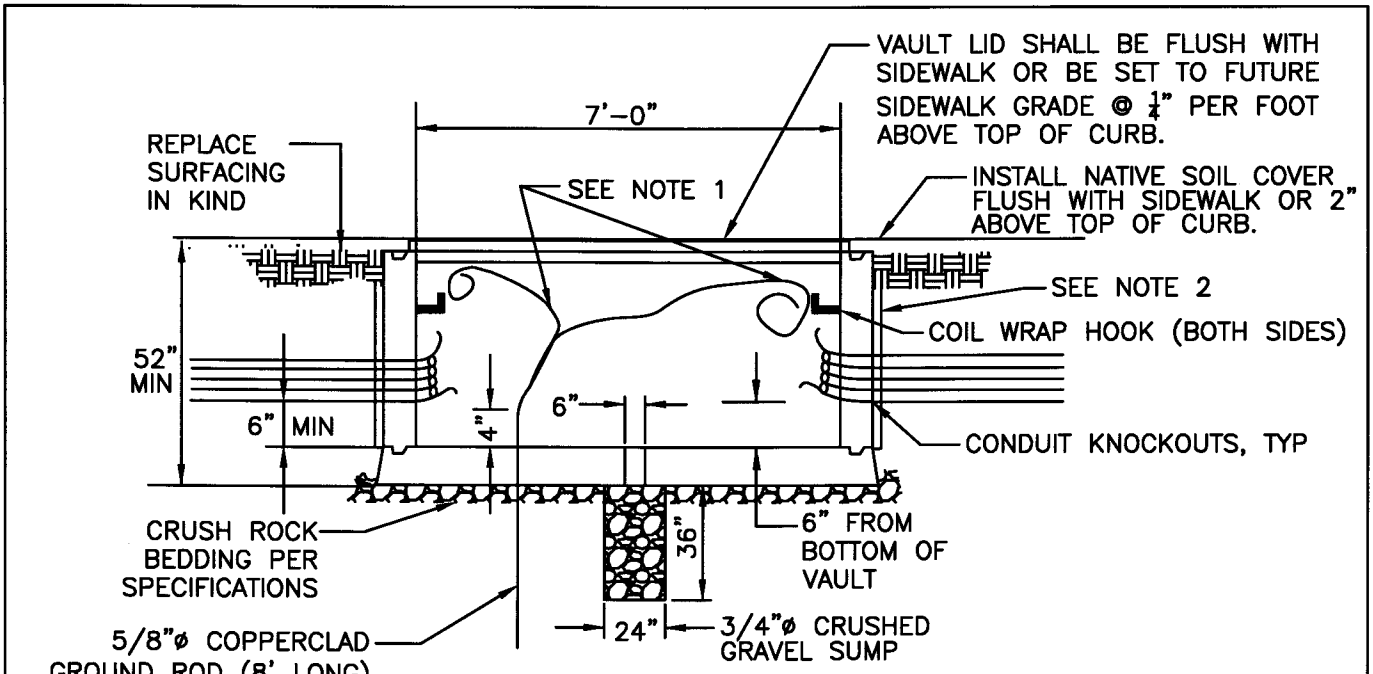


PLAN VIEW

NOTES:

1. TOP THREE CONDUITS NOT SHOWN FOR CLARITY.
2. COIL APPROXIMATELY 300 FEET (OR AS NOTED ON PLANS) OF FIBER OPTIC CABLE AROUND INSIDE BASE OF COMMUNICATIONS VAULT VERTICALLY WITH A MINIMUM RADIUS OF 32". (ATTACH TO HOLD DOWNS WITH METAL TIE WRAPS) PER SPECIFICATIONS.
3. 90° CONDUIT ENTRIES ARE NOT ALLOWED. CONDUIT SHALL BE DIRECTLY ACROSS FROM ADJACENT CONDUITS.
4. LABEL ALL CABLE IN PULL BOX & SERVICE BOX.
5. VAULT SHALL HAVE A TORSION SUSPENDED & SPRING LOADED LID WITH TWO HOLDUP BRACING BARS.
6. VAULTS SHALL INCLUDE BOLT DOWN LIDS.
7. LABELING ON LID SHALL READ "ITS COMMUNICATIONS".
8. VAULTS SHALL BE PER CURRENT CITY OF FRESNO QUALIFIED PRODUCTS LIST (QPL).
9. FOR ADDITIONAL 4' X 7' VAULT DETAILS, SEE STD PLAN ITS-14.

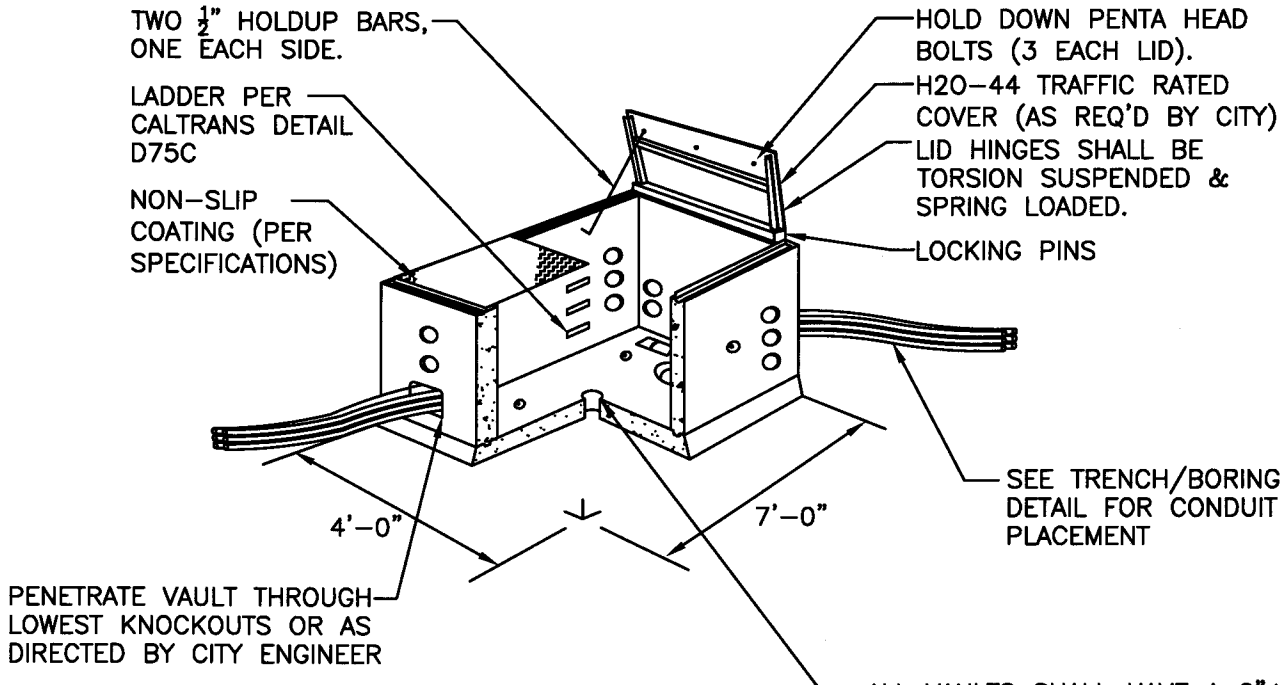
ITS 4' X 7' VAULT DETAILS NO. 1	REF. & REV. JULY 2011	CITY OF FRESNO ITS-13



ELEVATION VIEW

NOTES:

1. INSTALL COMMUNICATIONS BELLS ON CONDUIT ENDS & CONNECT TONEABLE CONDUIT TO GROUNDING ROD.
2. WRAP VAULT WITH BUILDING PAPER PER SPECIFICATIONS BEFORE BACKFILLING.

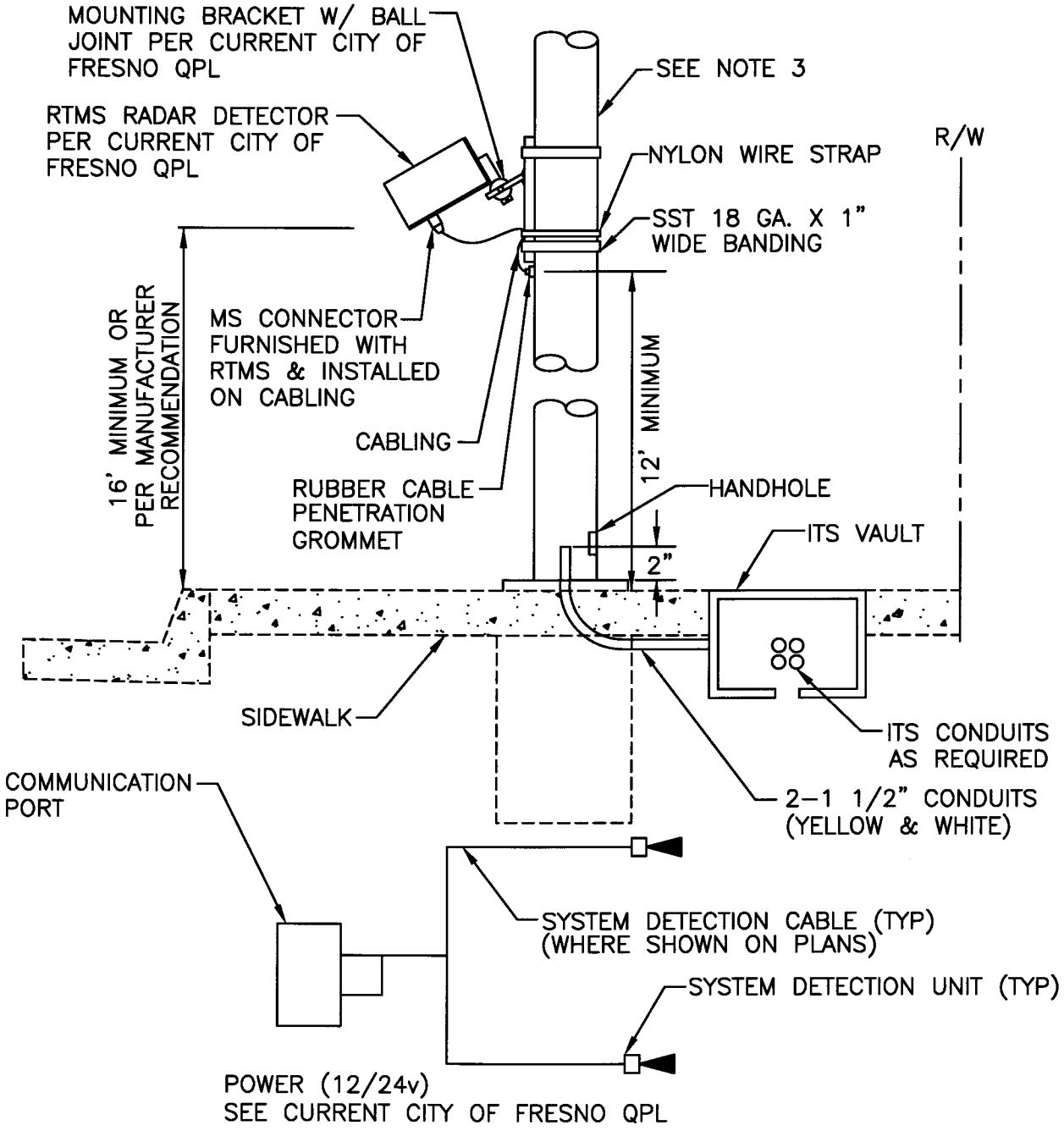


3-D VIEW

ITS 4' X 7' VAULT DETAILS NO. 2	REF. & REV. FEB., 2008	CITY OF FRESNO ITS-14

NOTES:

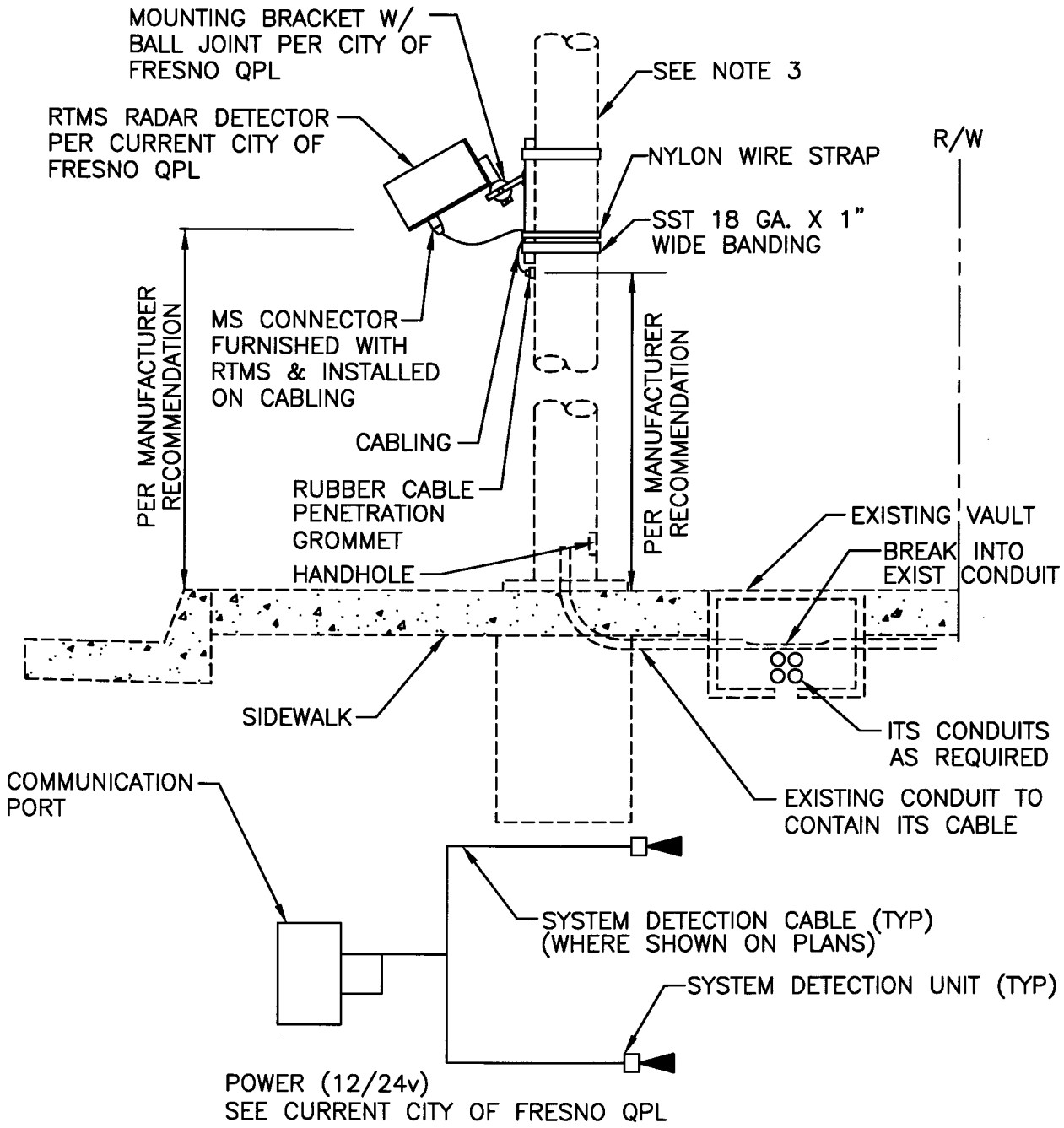
1. MOUNTING HEIGHT TO BE DETERMINED BY CITY ENGINEER.
2. MANUFACTURER'S REPRESENTATIVE SHALL ALIGN THE RADAR DETECTION UNIT IN THE FIELD PRIOR TO START-UP.
3. INSTALL NEW E-1 POLE WITHOUT MASTARM & LUMINAIRE.
4. INSTALL PER CURRENT MANUFACTURERS STANDARDS.



RADAR DETECTION STATION DETAIL NO. 1	REF. & REV. FEB., 2008	CITY OF FRESNO ITS-15

NOTES:

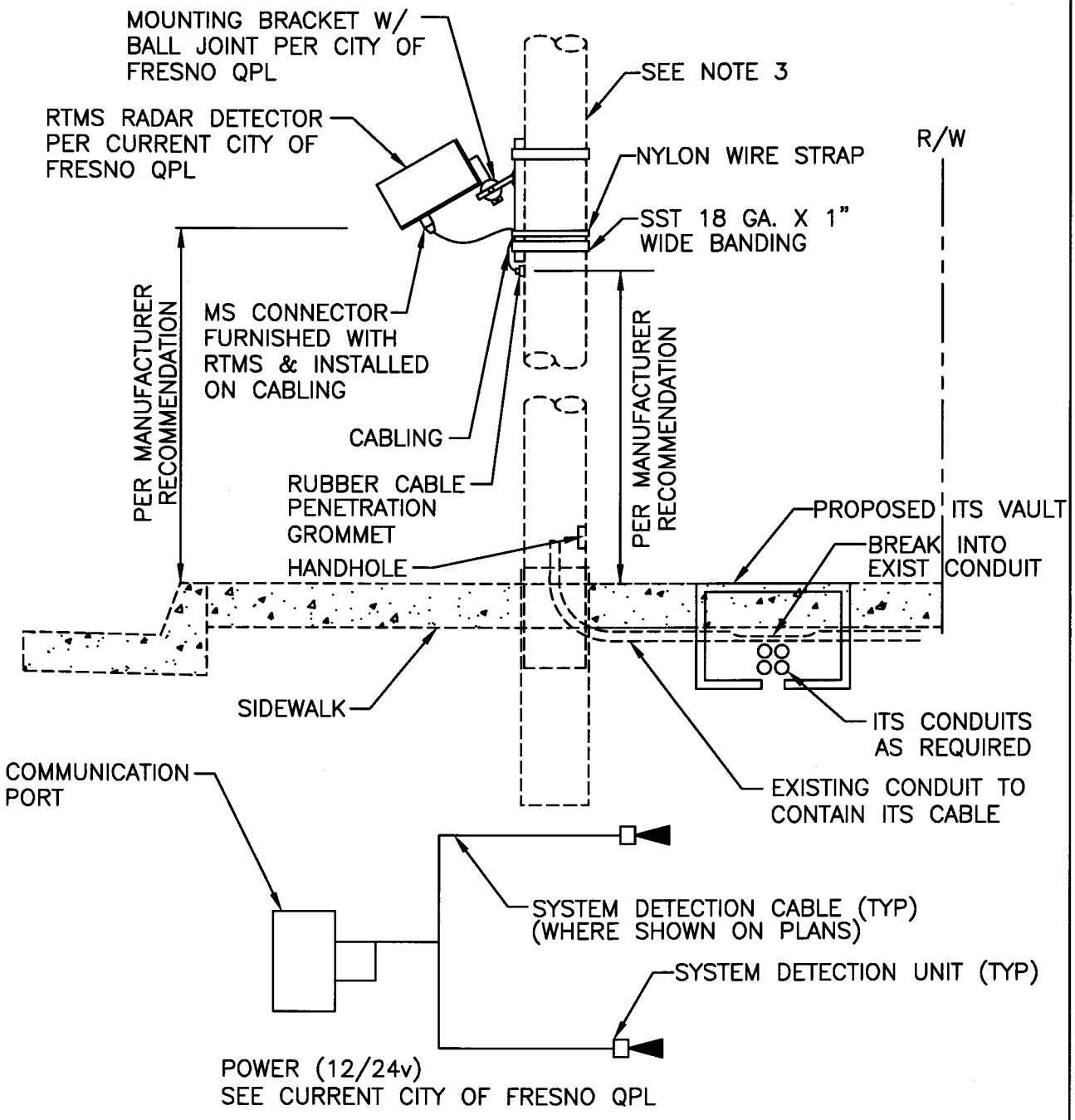
1. MOUNTING HEIGHT TO BE DETERMINED BY CITY ENGINEER.
2. MANUFACTURER'S REPRESENTATIVE SHALL ALIGN THE RADAR DETECTION UNIT IN THE FIELD PRIOR TO START-UP.
3. MOUNT ON EXISTING CITY STD PLAN E-1 POLE.
4. INSTALL PER CURRENT MANUFACTURERS STANDARDS.



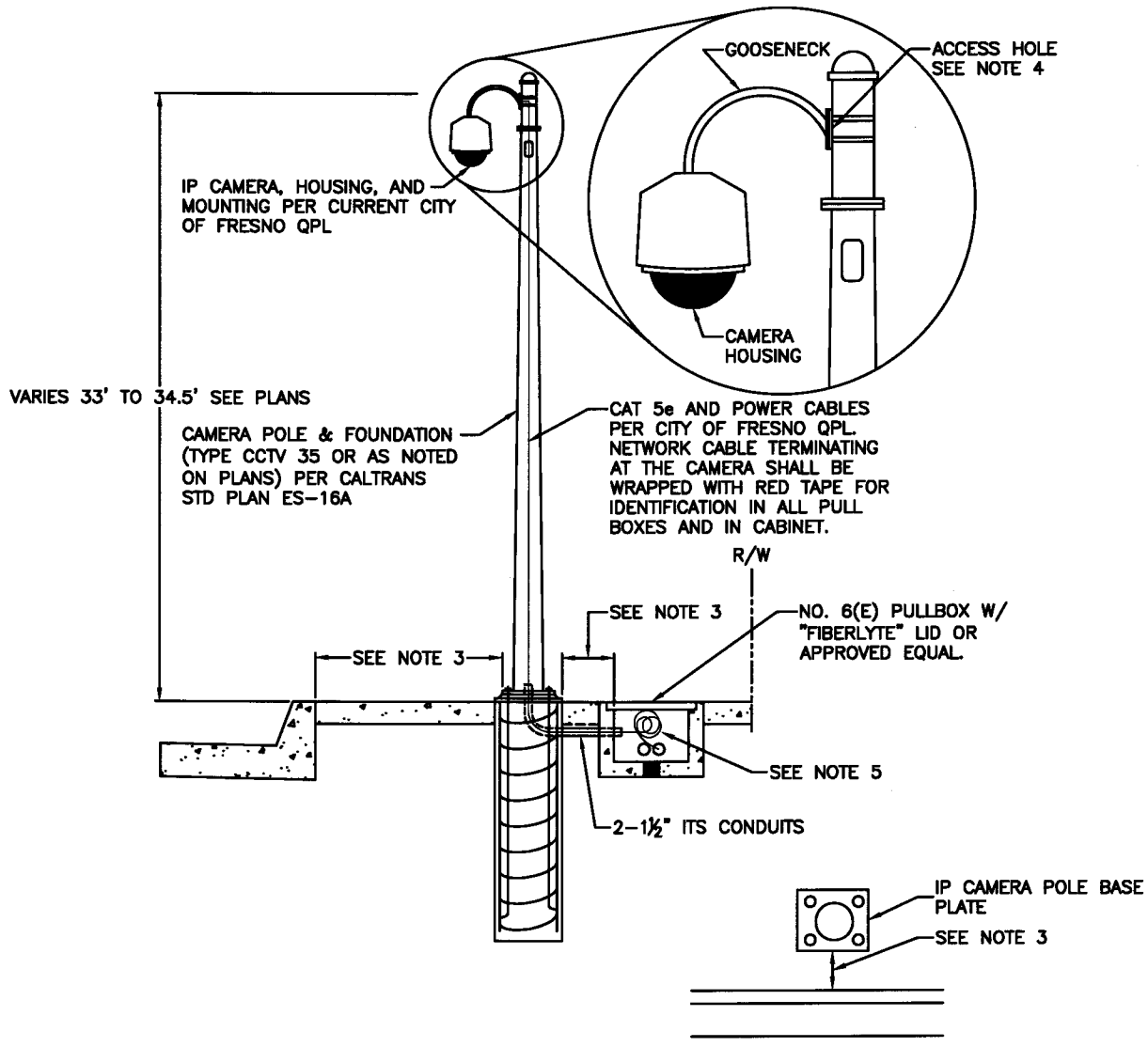
RADAR DETECTION STATION DETAIL NO. 2	REF. & REV. FEB., 2008	CITY OF FRESNO ITS-16

NOTES:

1. MOUNTING HEIGHT TO BE DETERMINED BY CITY ENGINEER.
2. MANUFACTURER'S REPRESENTATIVE SHALL ALIGN THE RADAR DETECTION UNIT IN THE FIELD PRIOR TO START–UP.
3. MOUNT ON EXISTING CITY STD PLAN E–2 POLE.
4. INSTALL PER CURRENT MANUFACTURERS STANDARDS.



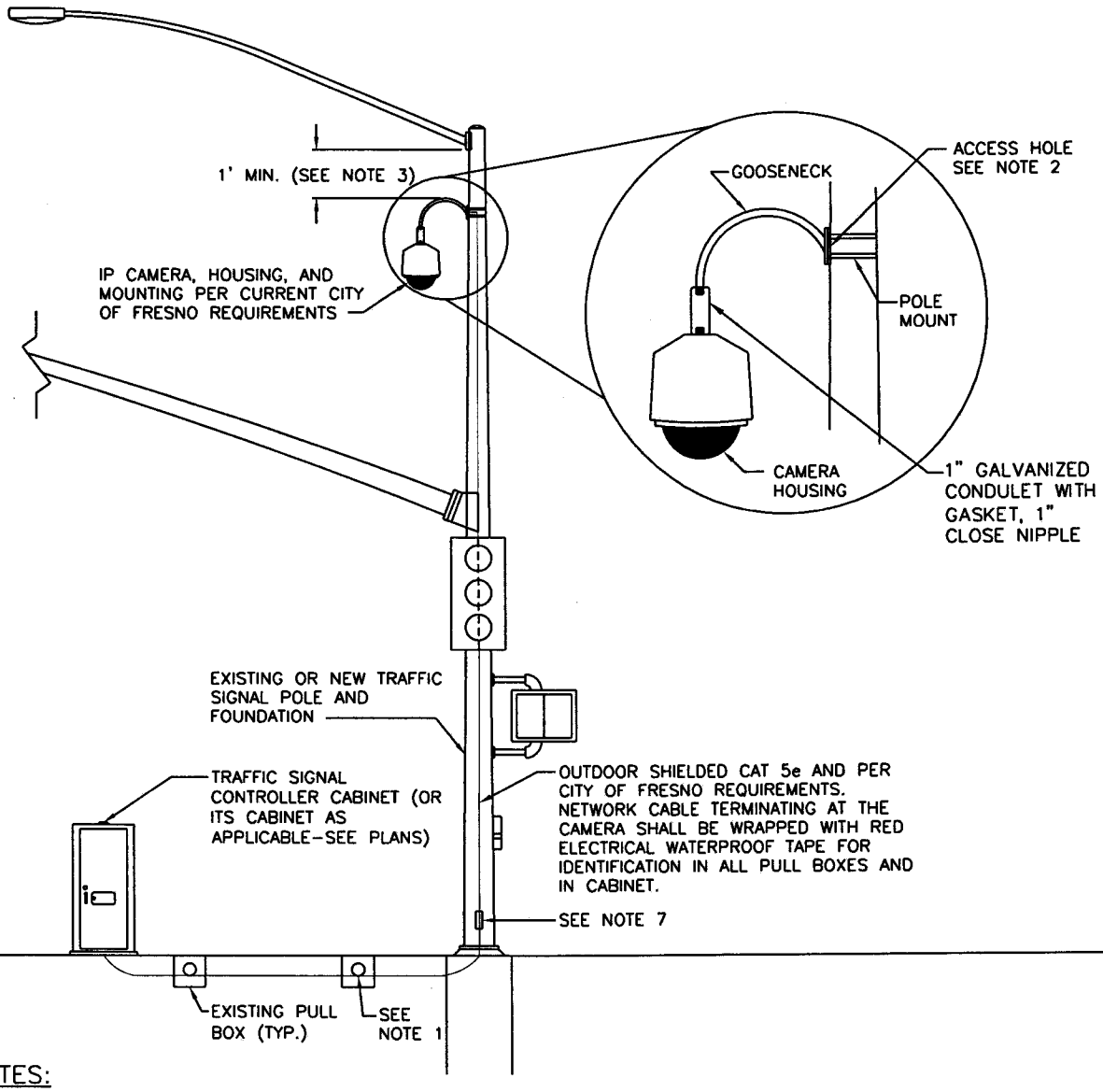
RADAR DETECTION STATION DETAIL NO. 3	REF. & REV. FEB., 2008	CITY OF FRESNO ITS–17



NOTES:

1. THE CONTRACTOR SHALL VERIFY EXISTING UTILITY LOCATIONS, IDENTIFYING POTENTIAL CONFLICTS BEFORE ORDERING OR FABRICATING ANY MATERIAL.
2. DURING POLE ERECTION, THE POST SHALL BE RAKED AS NECESSARY WITH THE USE OF LEVELING NUTS TO PROVIDE A PLUMB POLE AXIS.
3. ALIGN SIDE OF POLE BASE PLATE PARALLEL WITH CURB FACE. 1' MINIMUM & 3' MAXIMUM SETBACK. IF CURB & GUTTER DOESN'T EXIST, ALIGN BASE PLATE PER CITY ENGINEER. MAINTAIN MINIMUM 4' ADA CLEARANCES.
4. DRILL MAX ¾" BEVELED HOLE. GROMMET SHALL FORM A TIGHT SEAL BETWEEN POLE AND CABLE.
5. COIL APPROXIMATELY 2' MAXIMUM OF CAT 5e AND POWER CABLES INSIDE BASE OF PULLBOX.

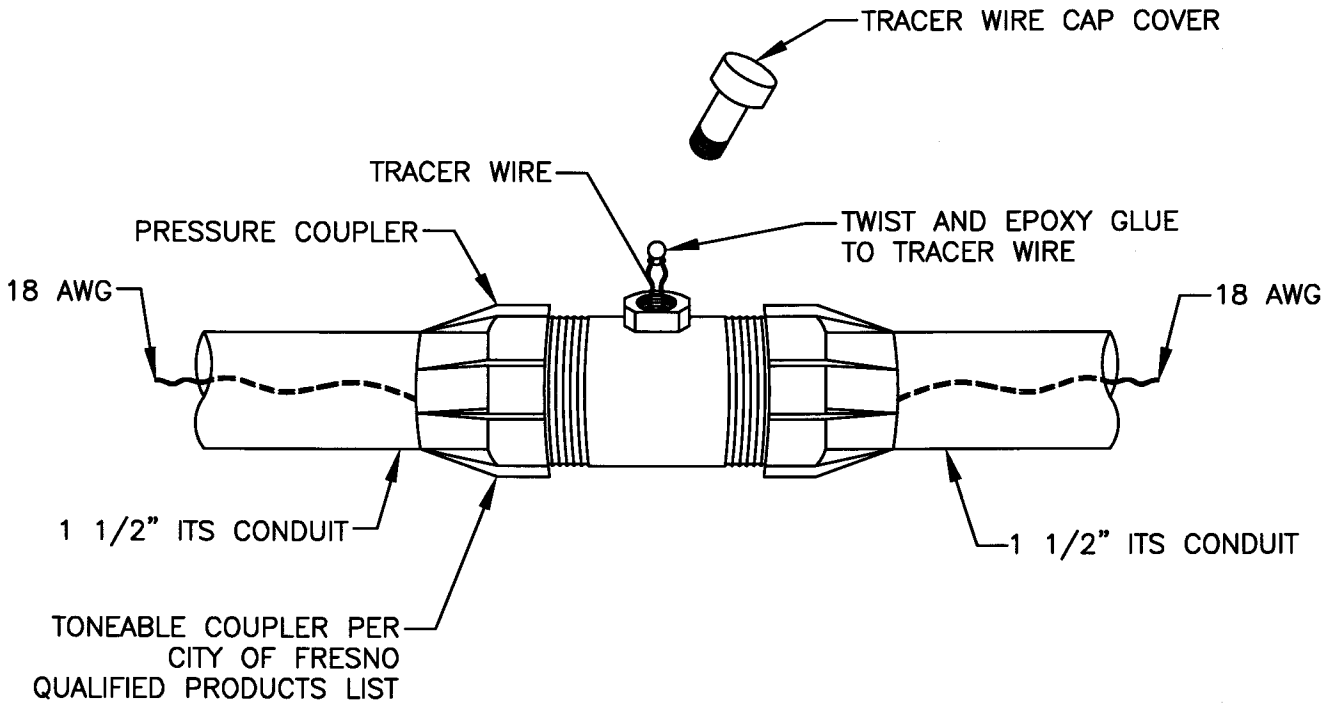
IP CAMERA	REF. & REV. JULY 2011	CITY OF FRESNO ITS-18



NOTES:

1. EXTEND CABLES THROUGH TRAFFIC SIGNAL CONDUIT AND PULL BOXES. COIL MAX. 2' OF SLACK IN EACH PULL BOX. NETWORK CABLE TERMINATING AT THE CAMERA SHALL BE WRAPPED WITH RED ELECTRICAL WATERPROOF TAPE FOR IDENTIFICATION IN ALL PULL BOXES AND IN CABINET.
2. DRILL MAX ¾" BEVELED HOLE. USE RUBBER GROMMET TO SEAL.
3. CAMERA SHALL BE MOUNTED TO ATTAIN MAXIMUM HEIGHT UNLESS OTHERWISE NOTED ON PLANS, OR DIRECTED BY ENGINEER.
4. CAMERA SHALL BE MOUNTED WITH BRACKET AND CAMERA HOUSING FACING CENTER OF INTERSECTION OR AS DIRECTED BY ENGINEER.
5. BOND ALL CONNECTIONS PER CURRENT NEC STANDARD.
6. SHIELDED AND APPROVED RJ-45 CONNECTOR SHALL BE USED FOR GROUNDING TO OUTDOOR SHIELDED CAT5e CABLE.
7. POLE HAND HOLE SHALL BE WELDED IN PLACE AFTER ALL PROPOSED WORK ON EXISTING POLE IS COMPLETED AND INSPECTED. CONTRACTOR SHALL PROTECT CONDUCTORS FROM DAMAGE DURING WELDING.

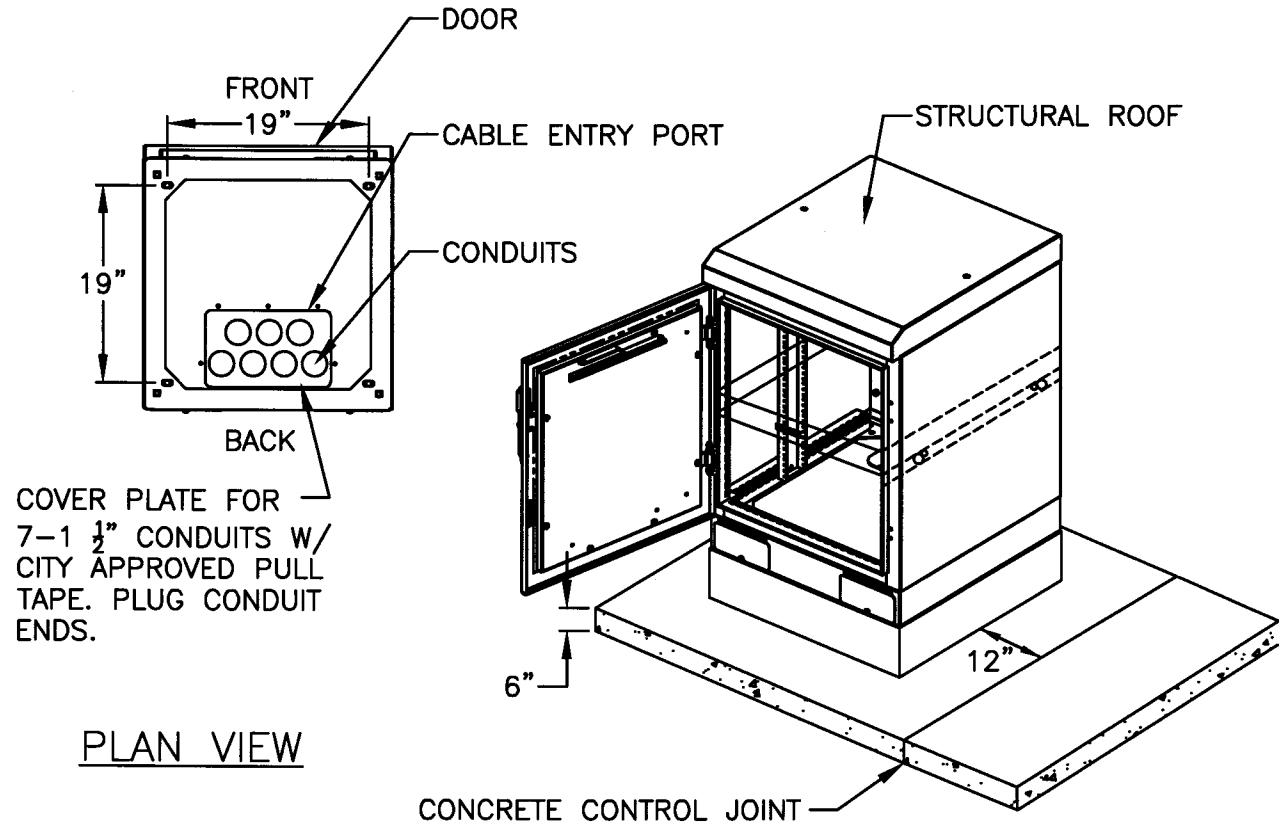
TRAFFIC SIGNAL MOUNTED IP CAMERA (GOOSENECK)	REF. & REV. JUNE 2015	CITY OF FRESNO ITS-18A



NOTES:

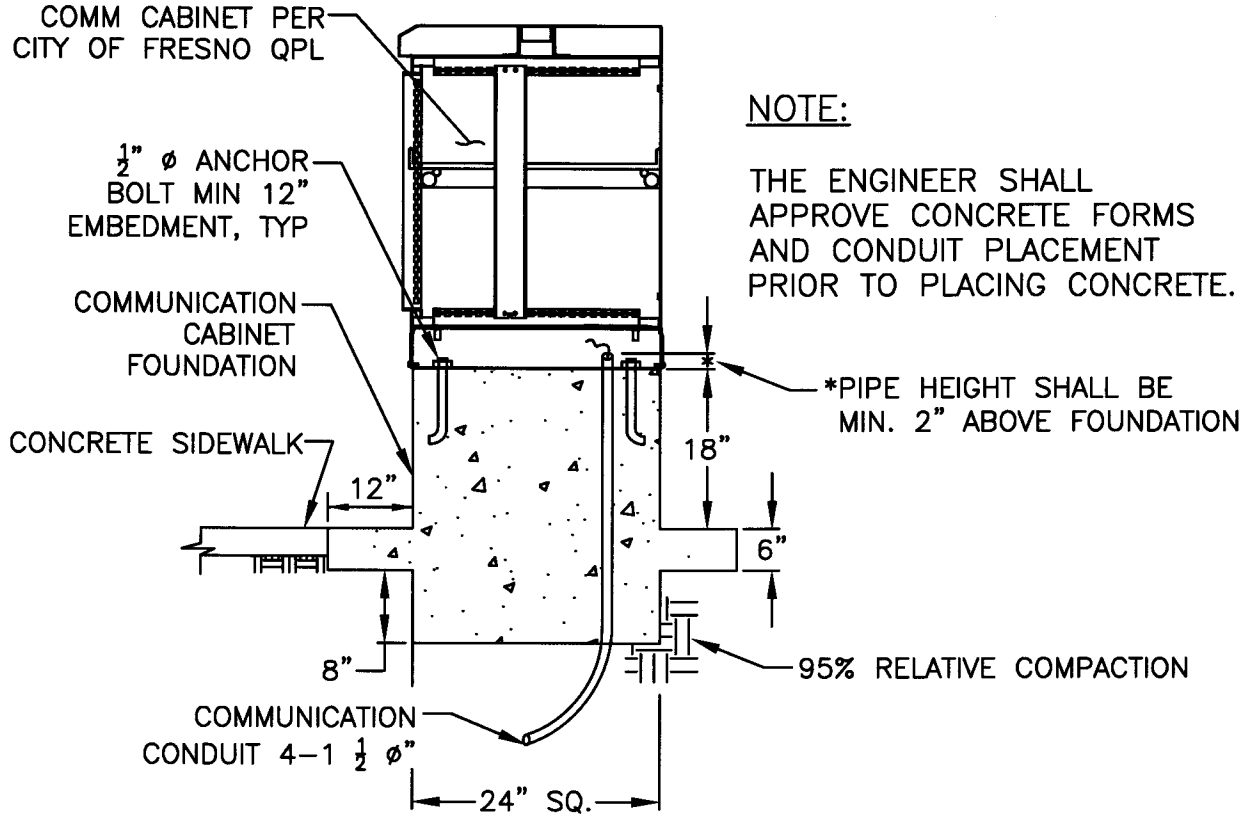
1. ALL COUPLER TRACER CAPS SHALL BE SEALED W/ WATER PROOF SEALER (SCOTCHCOAT) OR APPROVED EQUAL.

TONEABLE T-LOC COUPLING	REF. & REV. JULY 2011	CITY OF FRESNO ITS-19



PLAN VIEW

3D VIEW



NOTE:

THE ENGINEER SHALL APPROVE CONCRETE FORMS AND CONDUIT PLACEMENT PRIOR TO PLACING CONCRETE.

SIDE VIEW

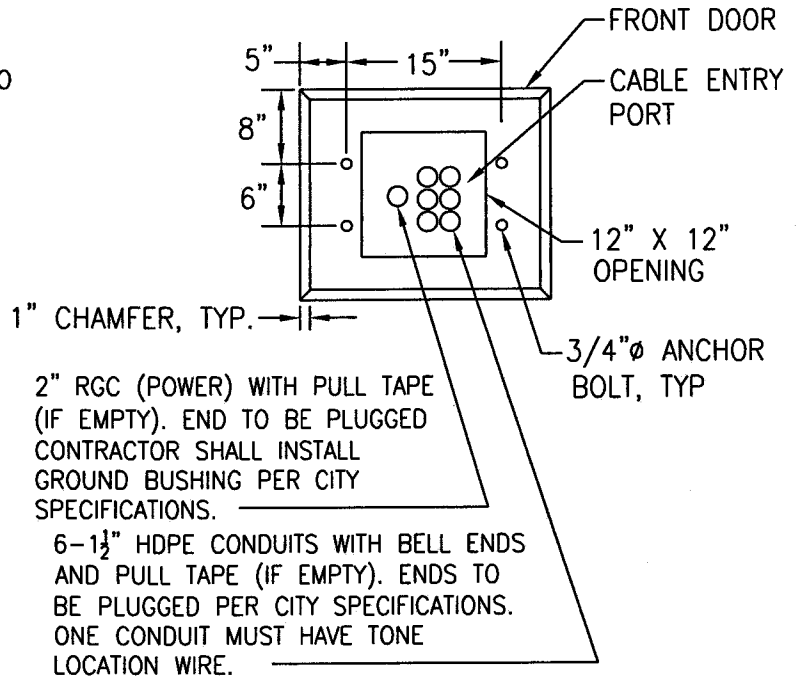
COMMUNICATION CABINET DETAILS

REF. & REV.
JULY 2011

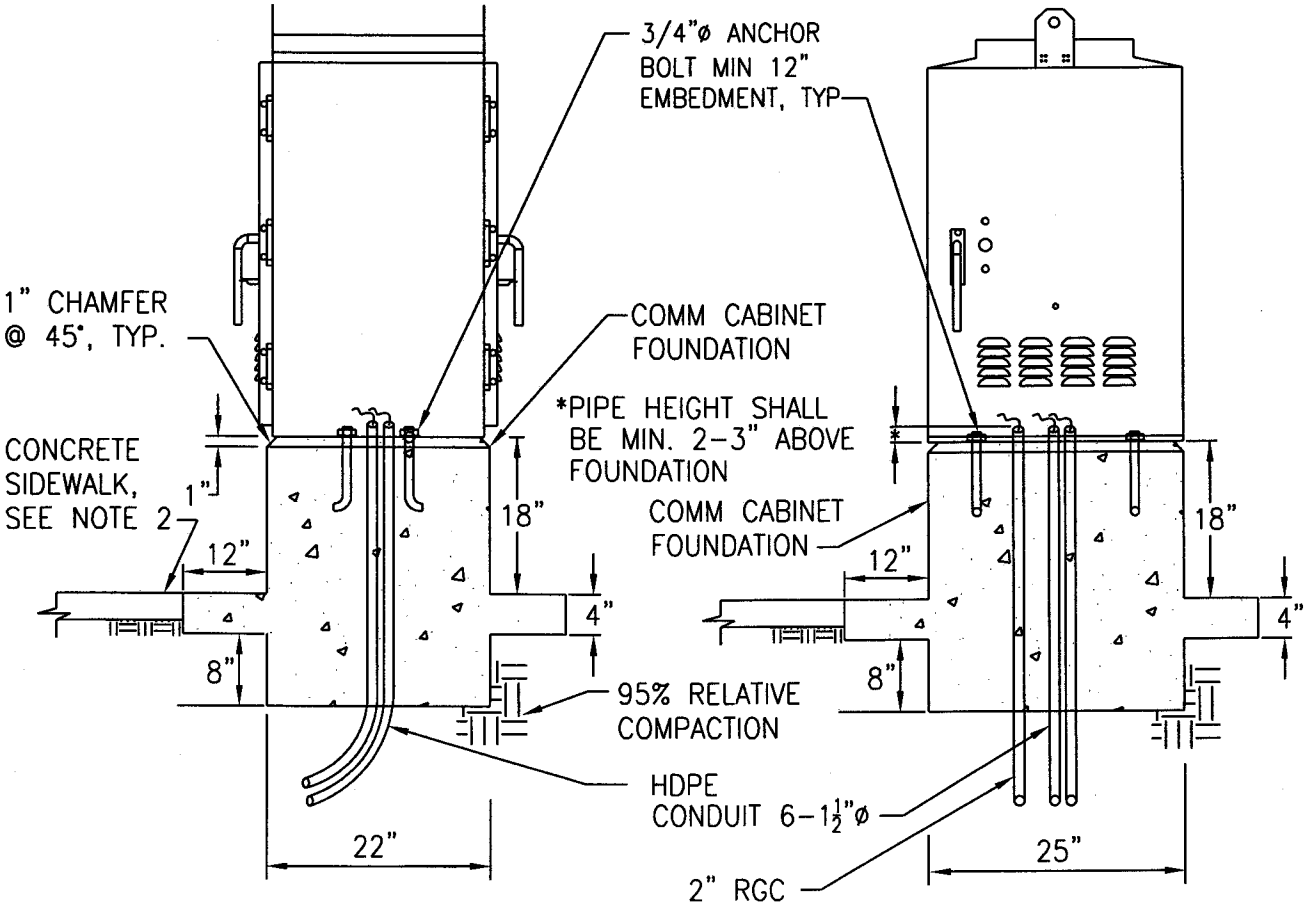
CITY OF FRESNO
ITS–20

NOTES:

1. INSPECTOR SHALL APPROVE FORMS AND CONDUIT PLACEMENT PRIOR TO PLACING CONCRETE.
2. CONSTRUCT MINIMUM 36"X36"X4" CONCRETE MAINTENANCE PAD AT FRONT AND BACK DOORS IF NO SIDEWALK EXISTS.
3. MAINTAIN WORKING CLEARANCES PER NEC.
4. BOND PER CURRENT NEC STANDARD. .
5. BOND ALL CONDUIT PER NEC STANDARDS USE #6 SOLID BARE COPPER FOR BONDING.
6. DOORS SHALL HAVE 4' WORKING CLEARANCE.
7. FINISH SHALL BE ANODIZED PER CITY OF FRESNO REQUIREMENTS.
8. CABINET BASE SHALL NOT BE MODIFIED FOR INSTALLATION.



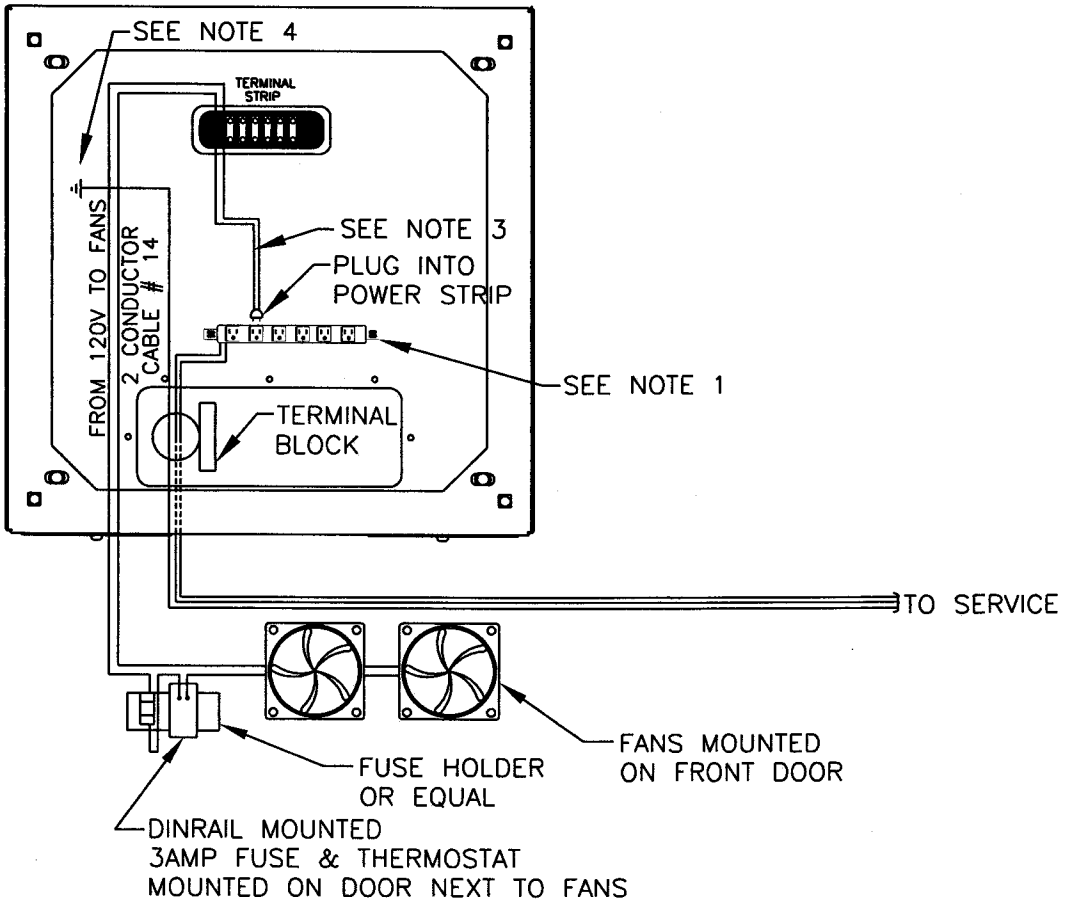
PLAN VIEW



SIDE VIEW

FRONT VIEW

MODEL 336 COMMUNICATION CABINET DETAILS	REF. & REV. JUNE 2015	CITY OF FRESNO ITS-20A



PLAN VIEW

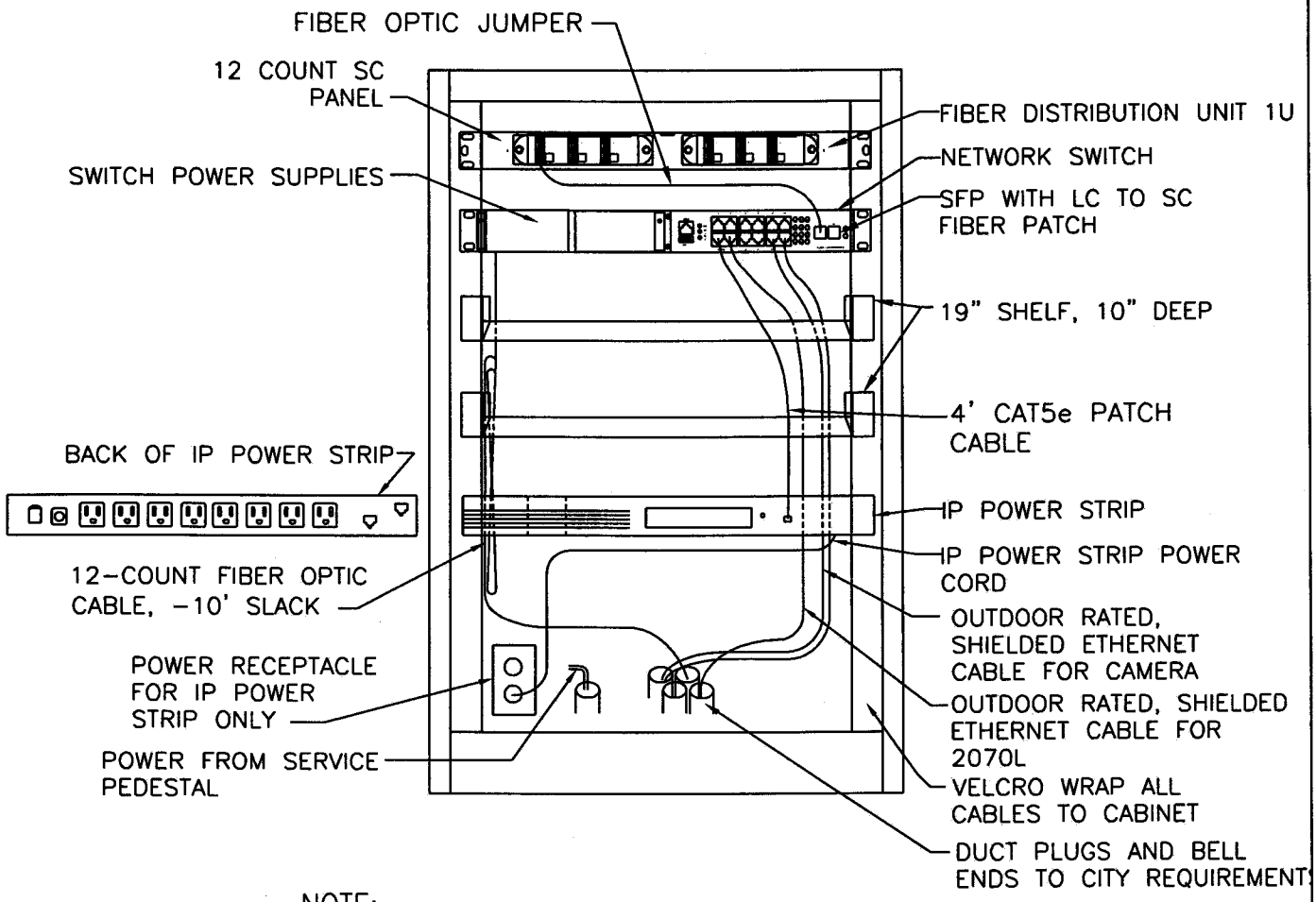
NOTES:

1. PROVIDE AND SECURE RACK MOUNTED POWER STRIP. POWER STRIP TO HAVE ON/OFF SWITCH AND OVER-CURRENT PROTECTION AND SIX RECEPTACLES. CORD CAP ON POWER MUST HAVE RIGHT ANGLE.
2. ALL WIRING BETWEEN COMPONENTS SHALL BE SJO CORD SECURED BY AN APPROVED METHOD.
3. PROVIDE POWER FROM TERMINAL STRIP TO FANS WITH 14/2 SJO CORD. SECURE CORD USING APPROVED METHOD AS NOT TO DAMAGE CORD DURING OPENING AND CLOSING CABINET DOOR (AVOID PINCHING AND AS NOT TO TRANSMIT STRAIN TO TERMINATIONS (STRESS RELIEF). POWER TO FAN WILL BE PROTECTED VIA A 3 AMP FUSE AND THERMOSTAT.
4. BOND TO CABINET PER CURRENT NEC STANDARDS.

COMMUNICATION CABINET WIRING DIAGRAM	REF. & REV. JUNE 2015	CITY OF FRESNO ITS-21

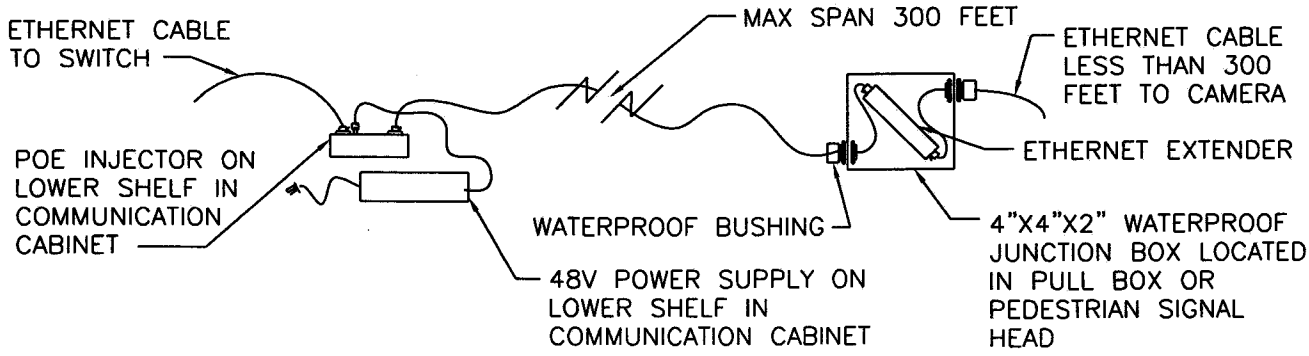
NOT USED

MODEL 336 COMMUNICATION CABINET WIRING DIAGRAM	REF. & REV. JUNE 2015	CITY OF FRESNO ITS-21A



NOTE:
MINIMUM 4" VERTICAL SPACING BETWEEN EQUIPMENT.

(ONLY FOR ETHERNET RUNS LONGER THAN 300')
ETHERNET EXTENDER FOR CAMERA



MODEL 336 COMMUNICATION CABINET EQUIPMENT ASSEMBLIES

REF. & REV. JUNE 2015

CITY OF FRESNO

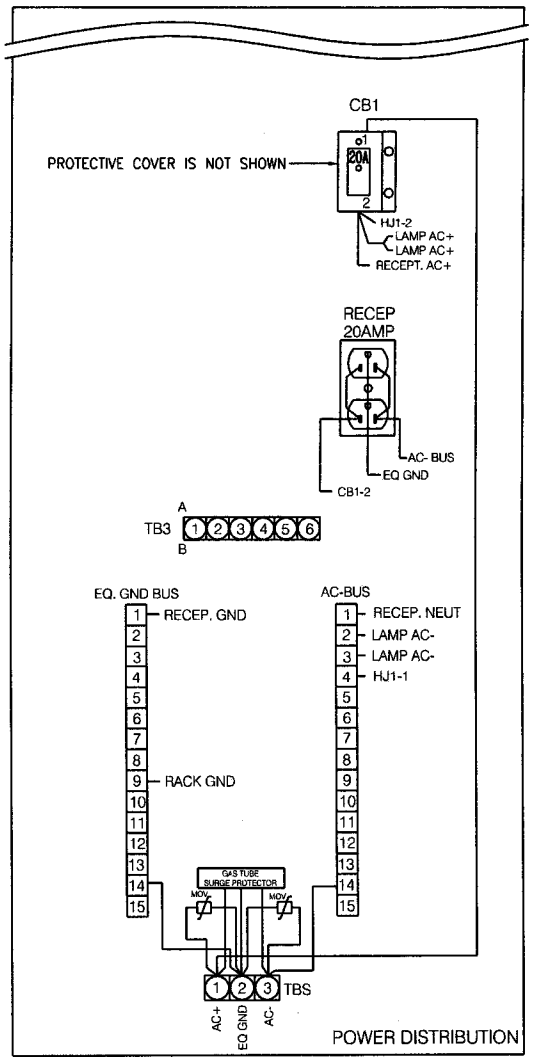
ITS-21B

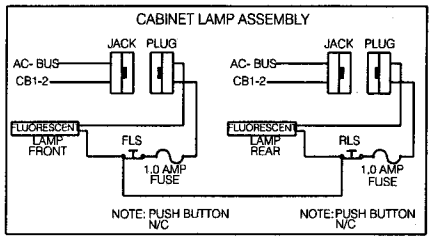
336 COMMUNICATION CABINET WIRING DIAGRAM, 1 OF 2

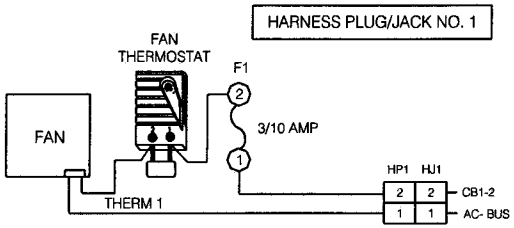
REF. & REV. JUNE 2015

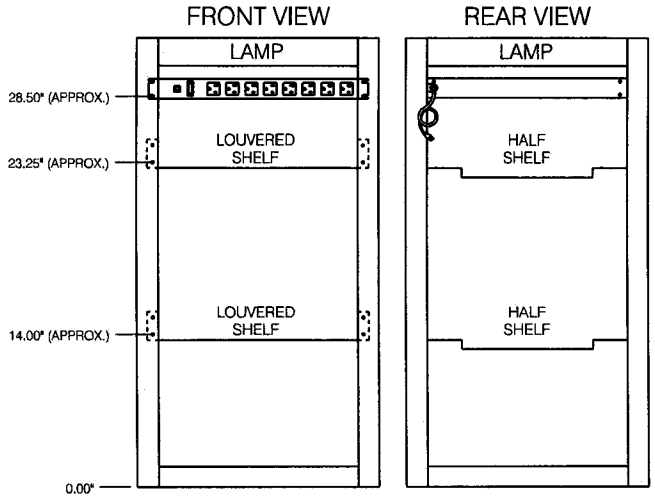
CITY OF FRESNO

ITS-21C







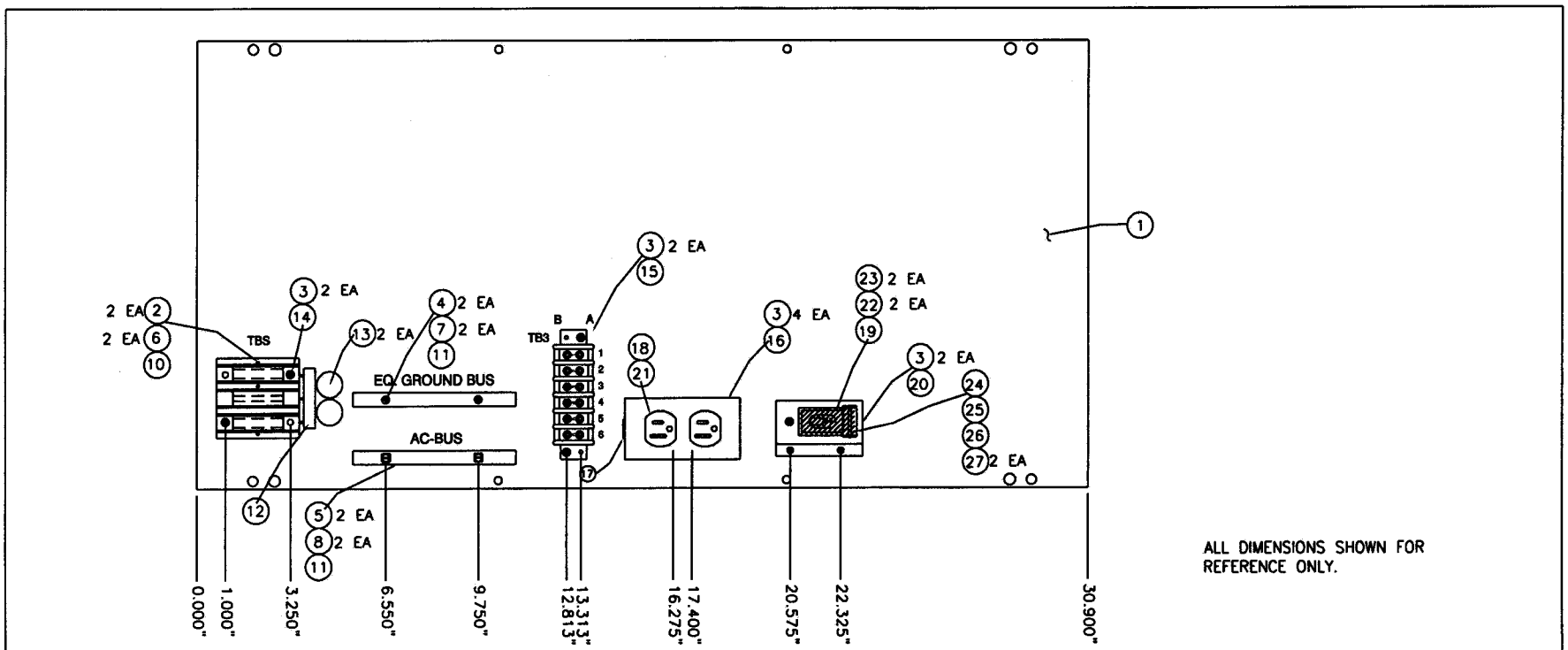


MODEL 336 COMMUNICATION CABINET POWER DISTRIBUTION, 2 OF 2

REF. & REV. JUNE 2015

CITY OF FRESNO

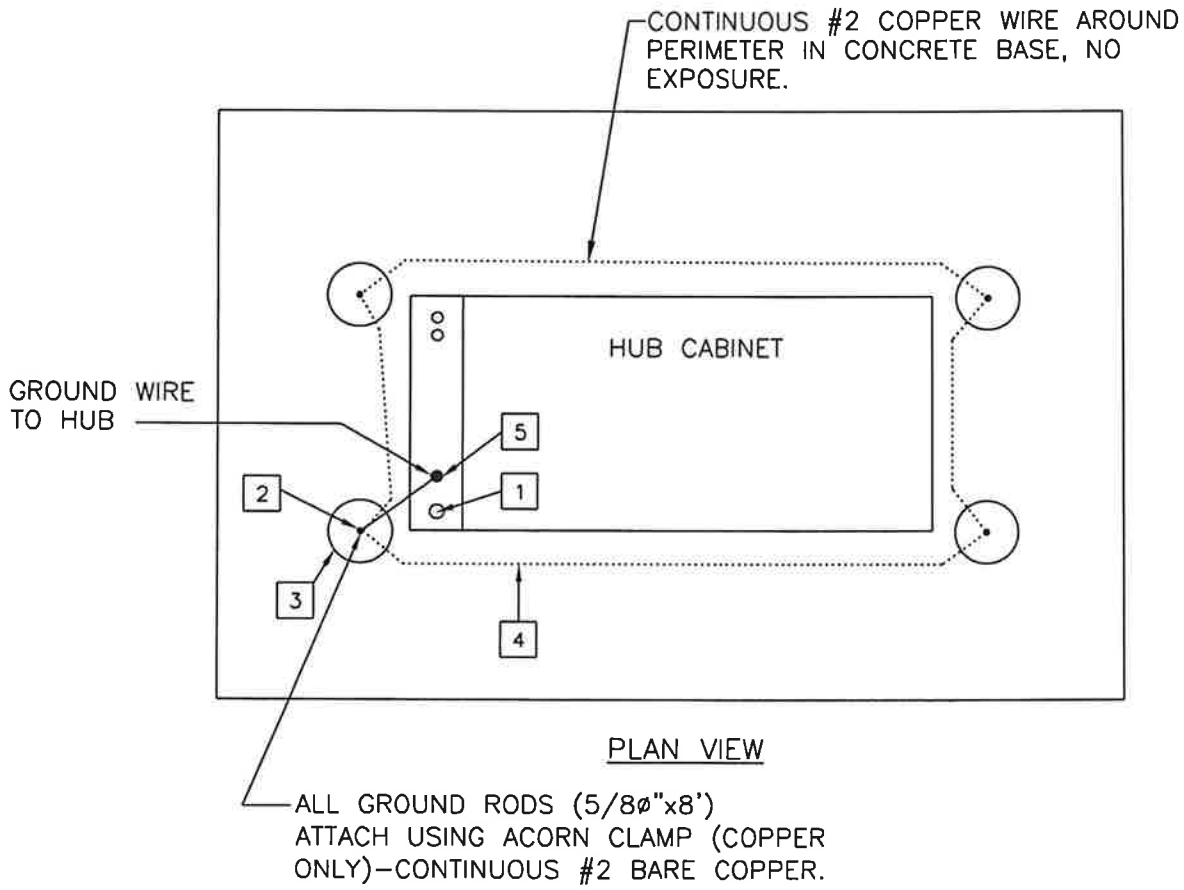
ITS-21D



ALL DIMENSIONS SHOWN FOR REFERENCE ONLY.

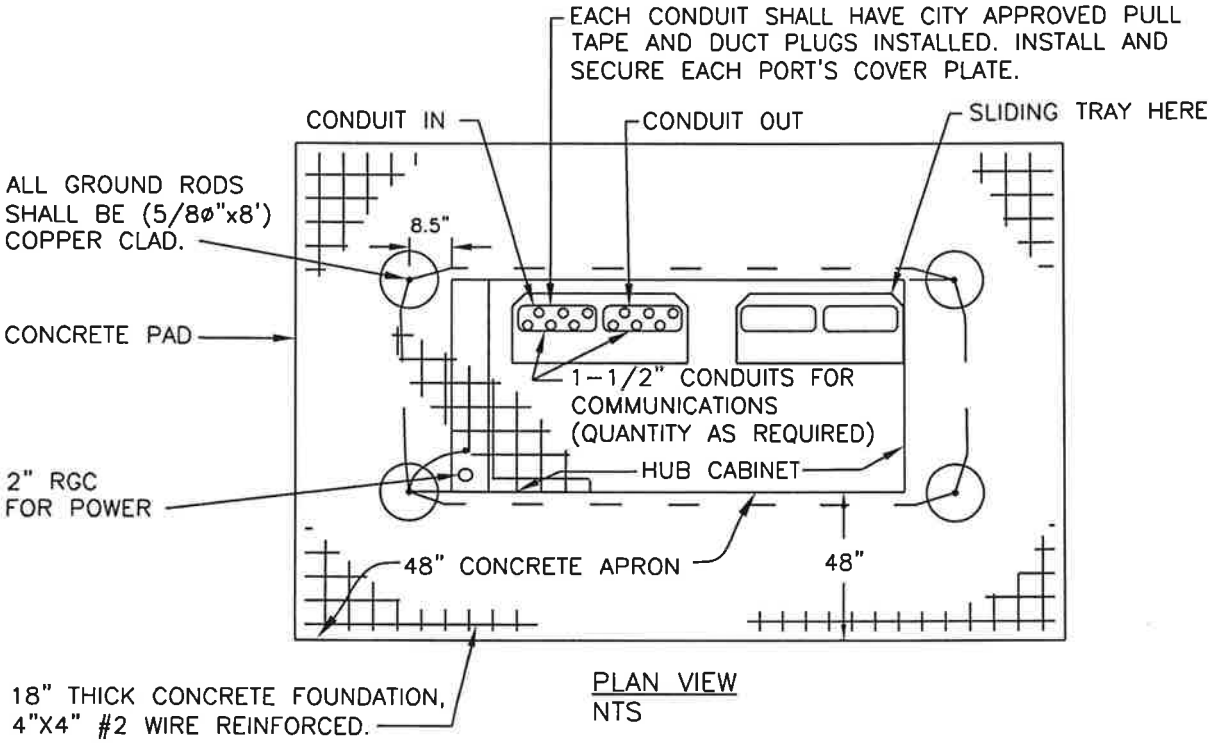
ITEM	QTY.	NOMENCLATURE OR DESCRIPTION
27	2	SCREW, 2-56 X 3/16, PH, PN, SS
26	1	STANDOFF, 2-56 X 1, FEM-FEM, RN, AL
25	1	COVER, CB, LEXAN
24	1	BRACKET, SUPPORT COVER
23	2	WASHER #6 INT. TOOTH SS
22	2	SCREW 6-32 X 1/4,PH,PN
21	1	RECEPTACLE, 5-20R,20A DUPLEX
20	1	BRKT, ENCLOSED, 334Z, CKT
19	1	CKT BKR,20A,1P W/O AUX
18	1	HANDY BOX COVER, METAL DUPLEX
17	1	GROMMET PLASTIC SB-875-11
16	1	HANDY BOX, 4 X 2-1/8,METAL
15	1	TERM BLK, 6POS, 2R, COMB
14	1	TERM BLK, 3POS, 6-32 SCREWS
13	2	ASSY, VARISTOR, M.O.

ITEM	QTY.	NOMENCLATURE OR DESCRIPTION
12	1	SURGE ARRESTOR, GAS TUBE
11	2	BUS BAR ASSY, 15POS, COPPER
10	1	COVER, POWER BLOCK, LEXAN
9	1	HARN, SVC PNL, 336S,
8	2	NUT, SQ HD GROMMET
7	2	WASHER, #8, EXT. TOOTH, SS
6	2	WASHER, #4, SPLIT LOCK, SS
5	2	SCREW, 10-24 X 1, PH, SL, NYLON
4	2	SCREW, #8 X 3/4, PH, PN, SS
3	10	SCREW, #8 X 5/8, PH, PN, SS,
2	2	SCREW, 4-40 X 3/8, SL, FIL
1	1	SVC PANEL, 336S

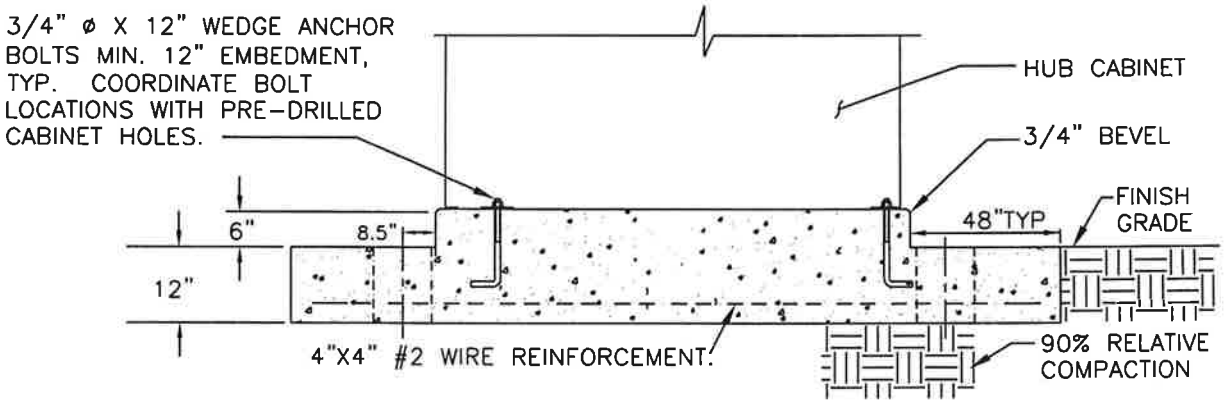


1. FURNISH AND INSTALL 1 – 8' GROUND ROD FOR POWER.
2. FURNISH AND INSTALL 4 – 8' GROUND RODS FOR GROUND CORNERS.
3. FURNISH AND INSTALL 4 – 9" FLOWER ROUND HAND HOLES, LID INSCRIBED "GROUND".
4. #2 AWG BARE TINNED WIRE.
5. GROUND #2 AWG BARE COPPER WIRE TO HUB POWER GROUND ROD. USE ACORN CLAMP FOR BONDING.

HUB FOUNDATION GROUNDING DETAILS	REF. & REV. JUNE 2015	CITY OF FRESNO ITS–22



PLAN VIEW
NTS



FRONT VIEW
NTS

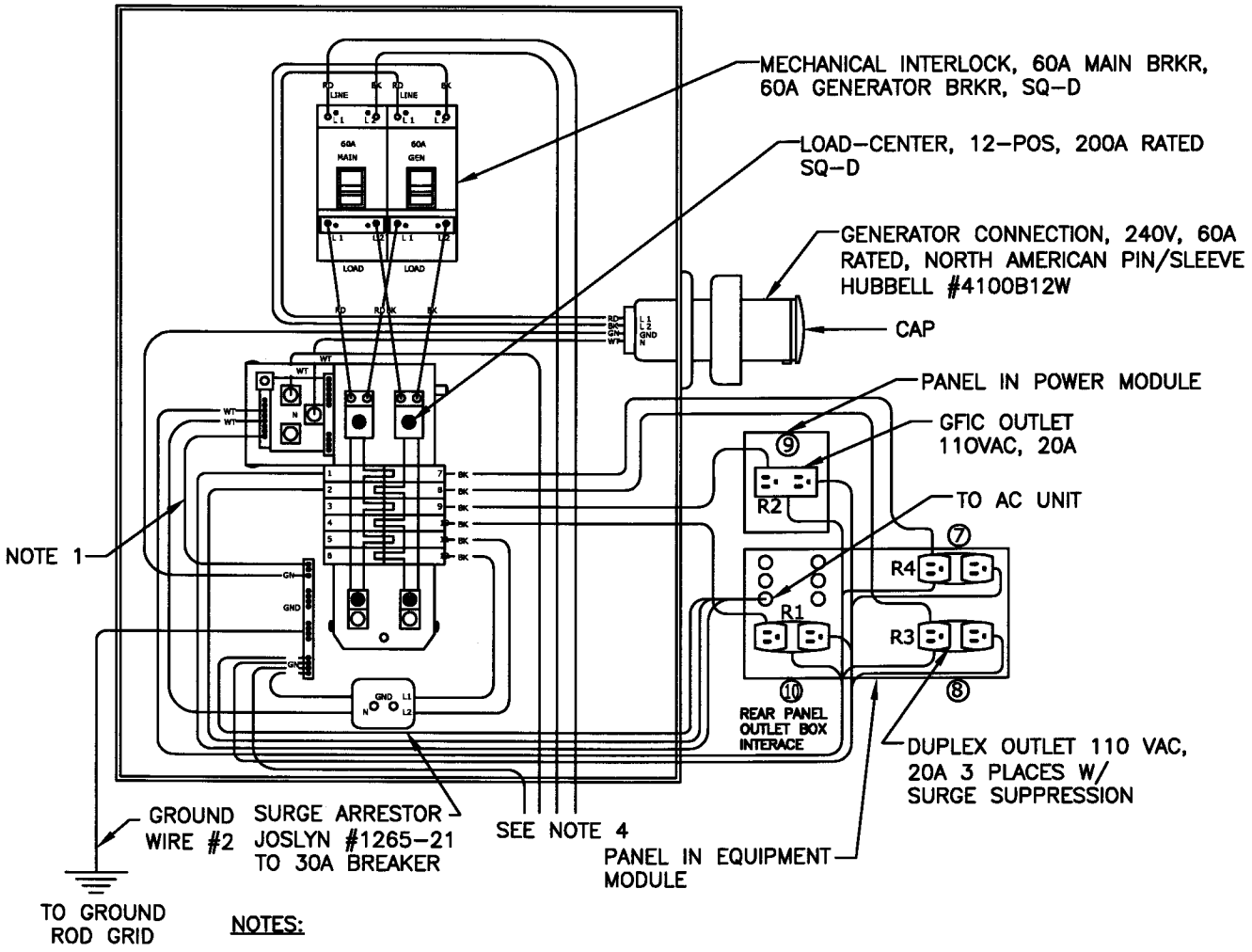
NOTES:

CABINET'S MANUFACTURERS TEMPLATE SHALL BE USED AND APPROVED BY CITY ENGINEER.

SEE ITS-22 FOR GROUNDING.

HUB CABINET FOUNDATION DETAIL	REF. & REV. JUNE 2015	CITY OF FRESNO ITS-23

AMPS	VOLTS	DESCRIPTION	DESIG	COLOR	POS	POS	COLOR	DESIG	DESCRIPTION	VOLTS	AMPS
15	240	AIR CONDITIONER	L1		1	7	BK	L1	R4 DUPLEX RECEPTACLE	110	20
			L2		2	8	BK	L2	R3 DUPLEX RECEPTACLE	110	20
			L1		3	9	BK	L1	R2 GFIC RECEPTACLE	110	20
			L2		4	10	BK	L2	R1 DUPLEX RECEPTACLE	110	20
			L1		5	11	BK	L1	SURGE ARRESTOR	220	30
			L2		6	12	BK	L2			



NOTES:

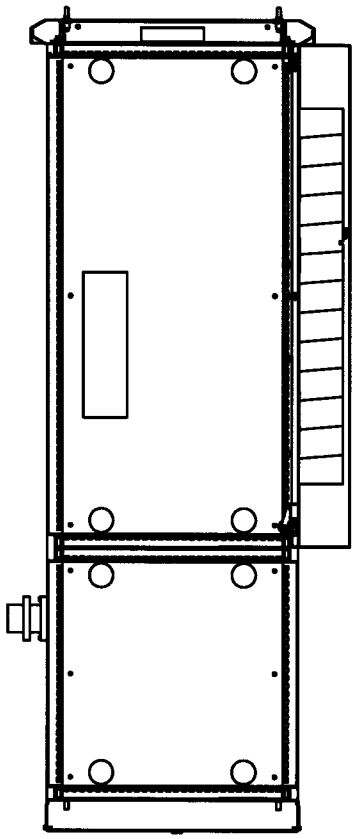
1. BONDED GROUND BETWEEN NEUTRAL & GROUND SHIPPED LOOSE. INSTALL PER LOCAL CODE REQUIREMENTS.
2. CONTACT TSSL SUPERINTENDENT 48 HOURS PRIOR TO ENERGIZING CABINET.
3. ALL WIRING SHALL COMPLY WITH APPLICABLE ELECTRICAL CODES AND SHALL BE APPROVED BY THE CITY ENGINEER.
4. 230 V, 60A SERVICE (3-#6 POWER, 1-#8 GROUND). LAND ON 60A ITS BREAKER IN SERVICE PEDESTAL, SEE ITS-26.

HUB CABINET WIRING DIAGRAM

REF. & REV. JULY 2011

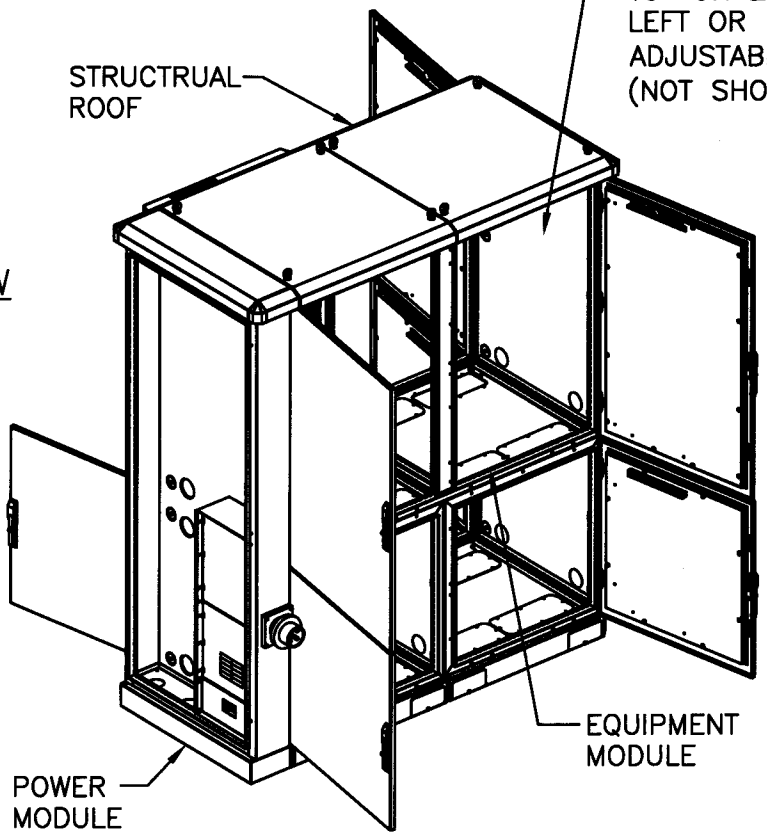
CITY OF FRESNO

ITS-24



RIGHT SIDE VIEW

3-D VIEW



ITS HUB CABINET DETAILS NO. 2

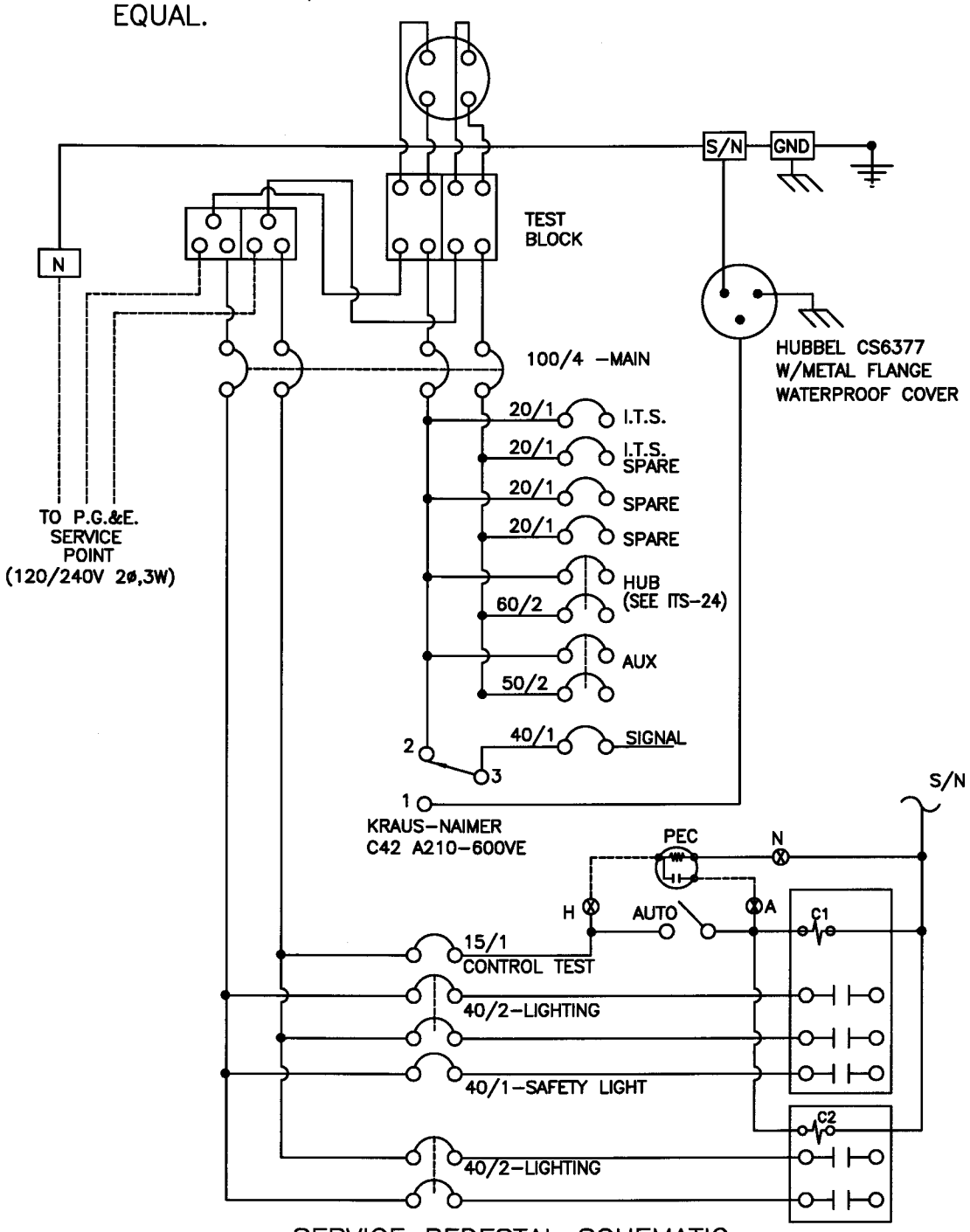
REF. & REV.
FEB., 2008

CITY OF FRESNO

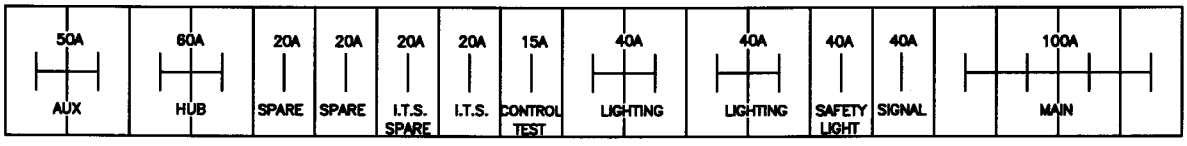
ITS-25

NOTE:

SERVICE CABINET SHALL BE TESCO 27-000 LBS METERED/UNMETERED OR APPROVED EQUAL.

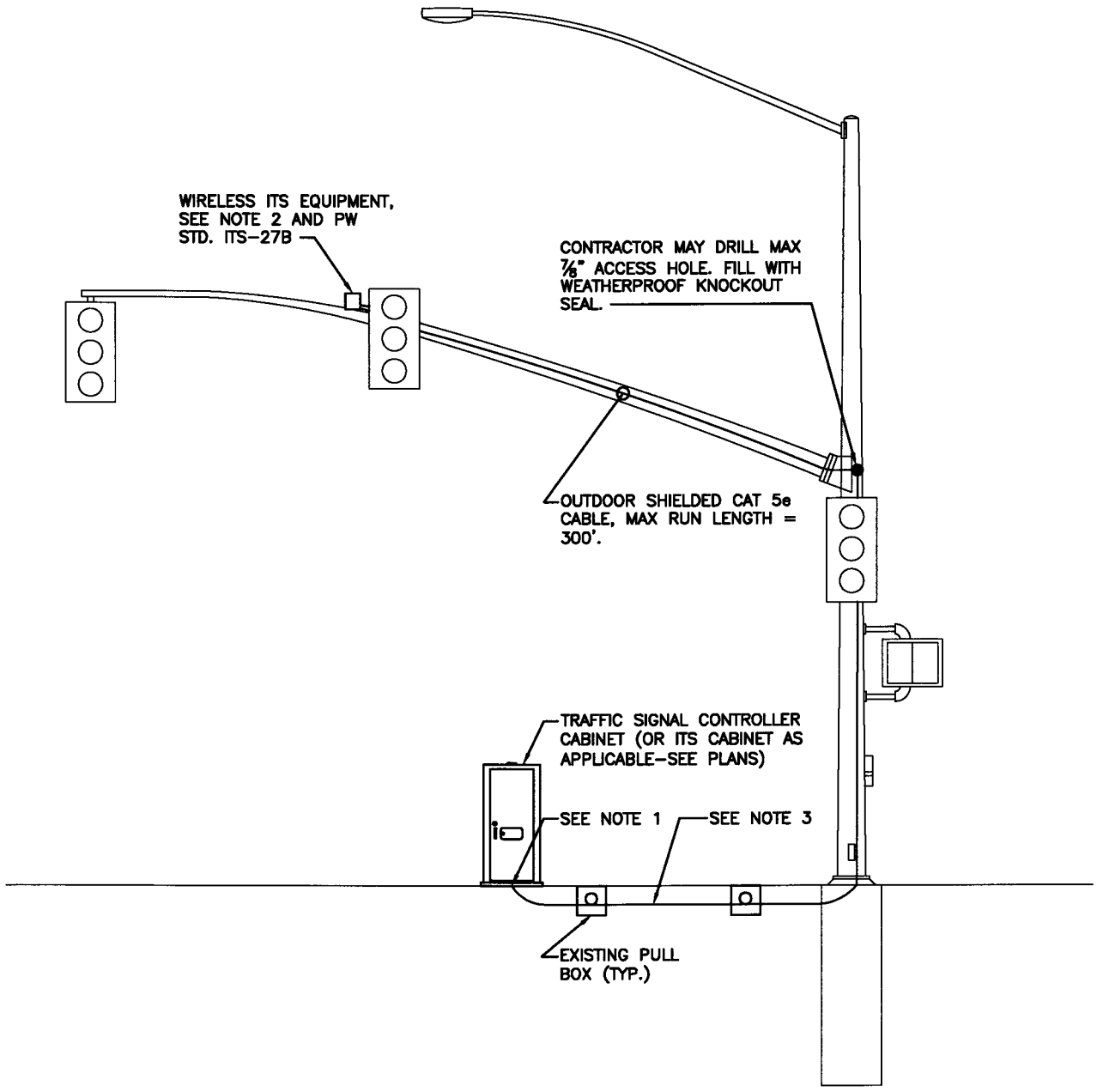


SERVICE PEDESTAL SCHEMATIC



SWITCH LOCATION

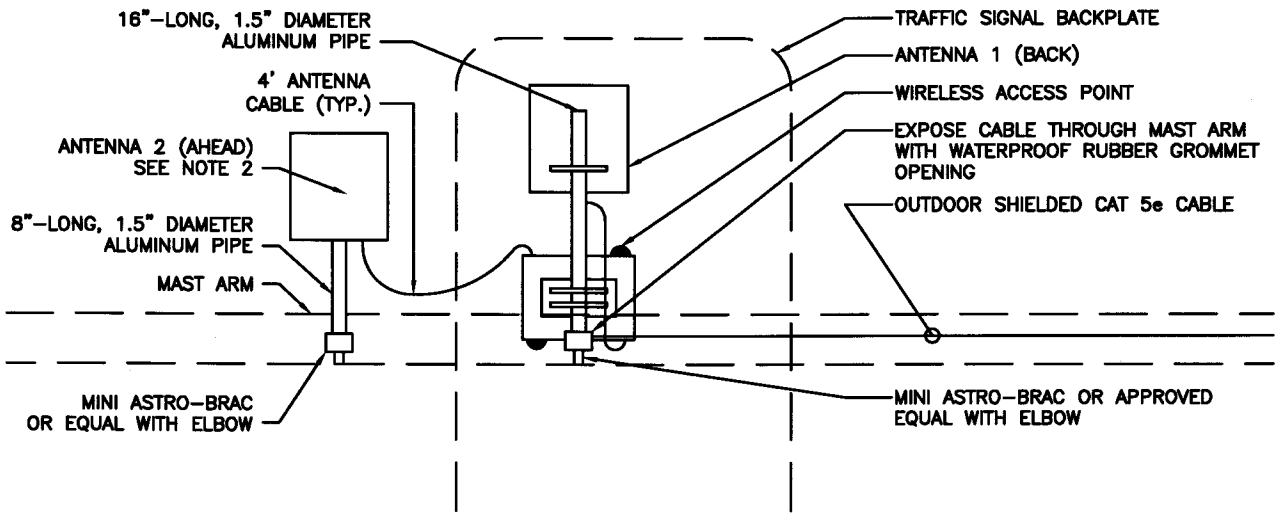
ITS HUB CABINET SERVICE PEDESTAL SCHEMATIC	REF. & REV. JULY 2011	CITY OF FRESNO ITS-26



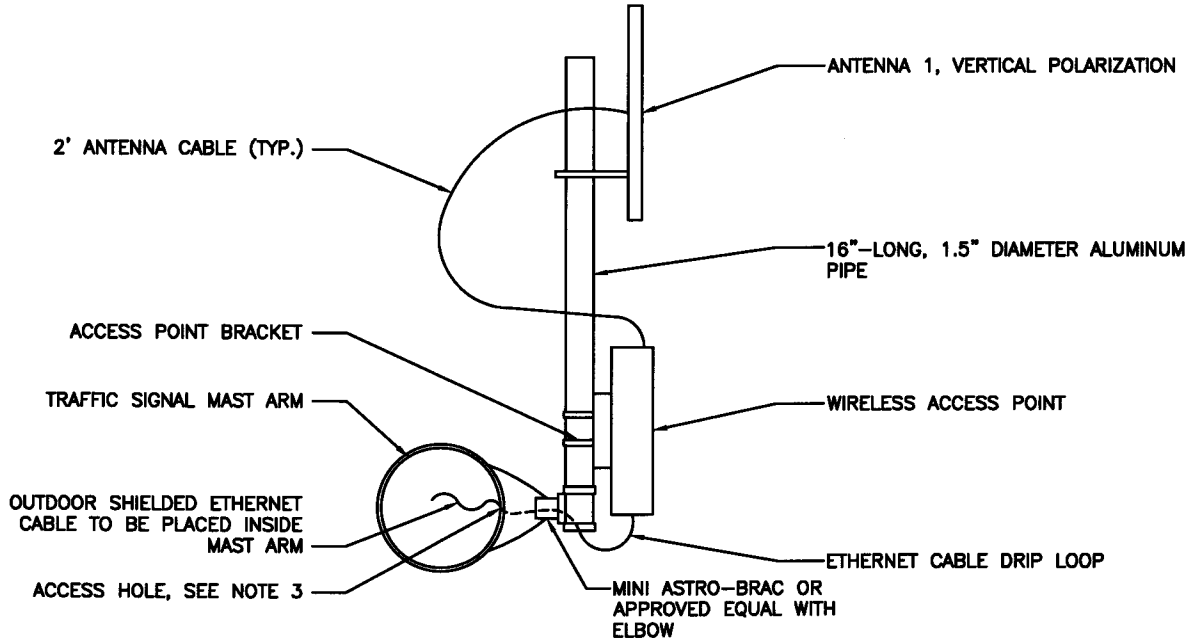
NOTES:

1. FOR NETWORKING CONNECTIONS, SEE SPECIFICATIONS. NETWORK CABLE TERMINATING AT ACCESS POINT SHALL BE WRAPPED WITH BLUE TAPE FOR IDENTIFICATION IN ALL PULL BOXES AND IN CABINET. NETWORK CABLE SHIELDING SHALL BE GROUNDED IN CONTROLLER CABINET.
2. CONTRACTOR SHALL PERFORM A FIELD SURVEY WITH A BUCKET TRUCK TO LOCATE OPTIMAL POSITION OF EQUIPMENT ON MAST ARM IN THE PRESENCE OF THE CITY ENGINEER PRIOR TO INSTALLATION.
3. EXTEND CABLES THROUGH TRAFFIC SIGNAL CONDUIT AND PULL BOXES. COIL MIN. 6' OF SLACK IN EACH PULL BOX.
4. CABLE SHALL BE INSTALLED INSIDE SIGNAL MAST ARM FOR TRAFFIC SIGNAL POLES CONFORMING TO CALTRANS STANDARDS DATED 1977 OR NEWER. FOR TRAFFIC SIGNAL POLES CONFORMING TO OLDER STANDARDS – SEE PLANS.

WIRELESS ITS INSTALLATION	REF. & REV. JULY 2011	CITY OF FRESNO ITS-27A



PROFILE



CROSS SECTION

NOTES:

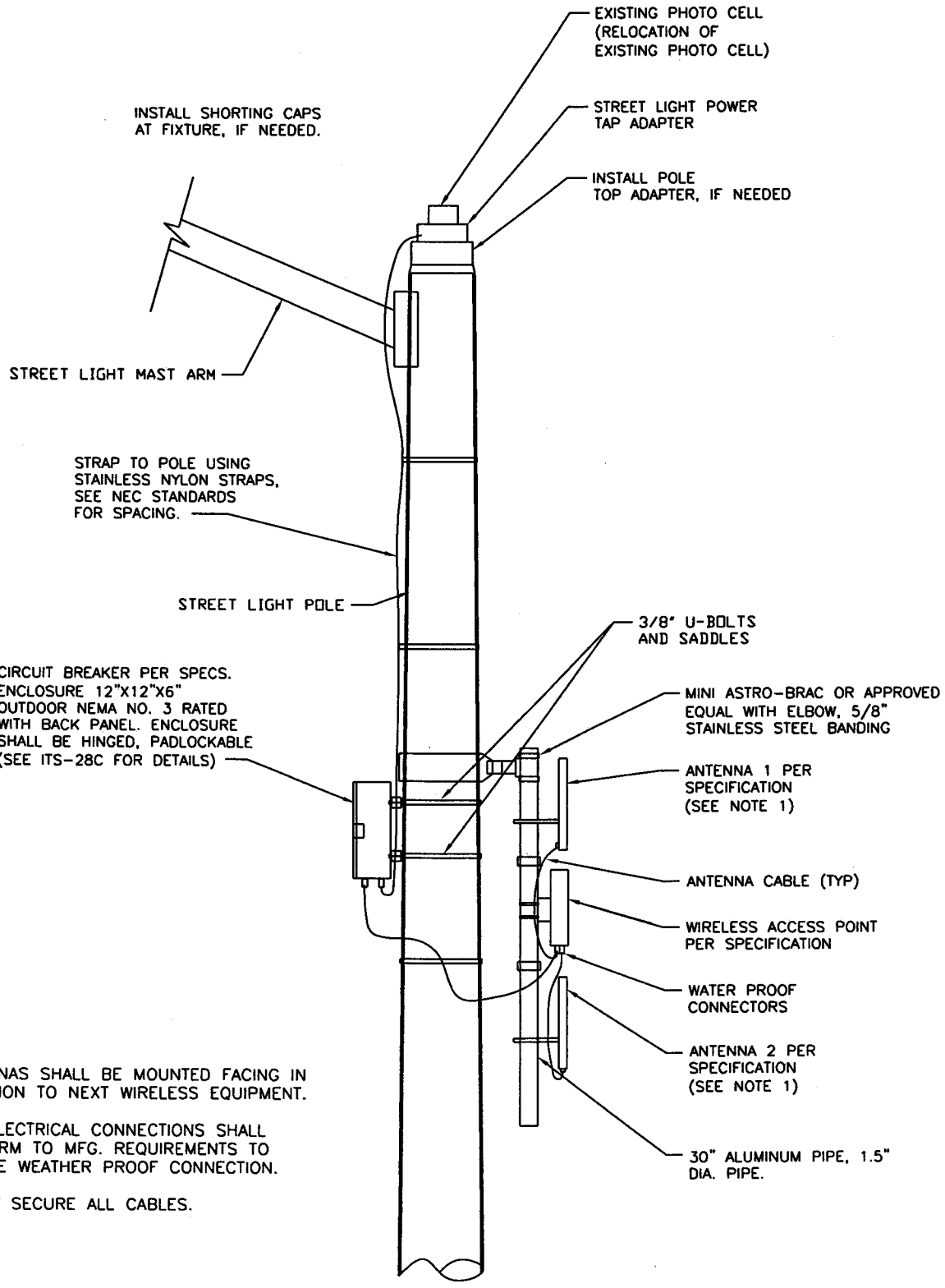
1. ANTENNA 2 WILL BE REQUIRED FOR ALL INTERSECTIONS FOR EXTENSION OF WIRELESS CORRIDOR, SEE PLANS.

2. ANTENNA 2 MOUNTING IS SIMILAR TO THAT SHOWN IN THE CROSS SECTION ABOVE, BUT NO HOLES ARE DRILLED IN THE MAST ARM, AN 8"–LONG ALUMINUM PIPE IS USED, AN ACCESS POINT IS NOT INSTALLED, AND THE MINI ASTRO–BRAC IS INSTALLED ON TOP OF THE MAST ARM WITH NO ELBOW.

3. DRILL MAX ¾" BEVELED HOLE. GROMMET SHALL FORM A TIGHT SEAL BETWEEN POLE AND CABLE.

4. ANTENNA 2 WILL BE MOUNTED IN THE SAME DIRECTION AS ANTENNA 1 WHEN IT IS THE LAST ACCESS POINT IN RUN.

WIRELESS ITS INSTALLATION DETAILS	REF. & REV. JULY 2011	CITY OF FRESNO ITS–27B

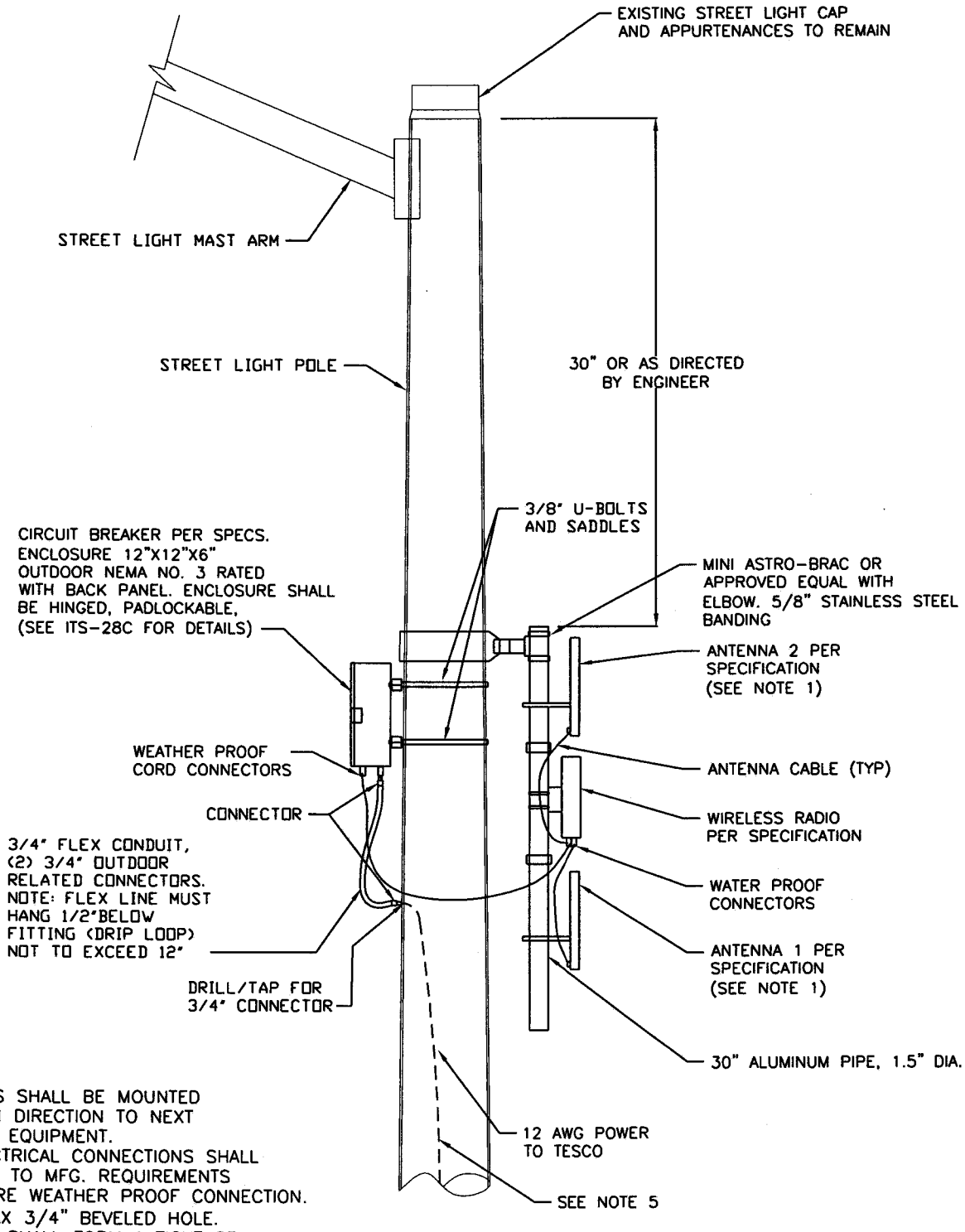


NOTES:

1. ANTENNAS SHALL BE MOUNTED FACING IN DIRECTION TO NEXT WIRELESS EQUIPMENT.
2. ALL ELECTRICAL CONNECTIONS SHALL CONFORM TO MFG. REQUIREMENTS TO ENSURE WEATHER PROOF CONNECTION.
3. NEATLY SECURE ALL CABLES.

FOR POLES WITH MASTER PHOTOCELL

ITS WIRELESS POLE REPEATER INSTALLATION (POWERED THROUGH STREET LIGHT)	REF. & REV. JUNE 2015	CITY OF FRESNO ITS-28A



NOTES:

1. ANTENNAS SHALL BE MOUNTED FACING IN DIRECTION TO NEXT WIRELESS EQUIPMENT.
2. ALL ELECTRICAL CONNECTIONS SHALL CONFORM TO MFG. REQUIREMENTS TO ENSURE WEATHER PROOF CONNECTION.
3. DRILL MAX 3/4" BEVELED HOLE. GROMMET SHALL FORM A TIGHT SEAL BETWEEN POLE AND CABLE.
4. SECURELY STRAP ANTENNA CABLE TO POLE WITH STAINLESS STEEL NYLON COATED STRAPS (FOLLOW NEC STANDARDS FOR SPACING.)
5. CONTRACTOR SHALL CONNECT THE 120VAC POWER TO THE NEAREST EXISTING TESCO PEDESTAL WITH REQUIRED ADDITIONAL CIRCUIT BREAKER (20 AMP) AND NECESSARY CONDUCTORS (2 SOOW CONDUCTOR, 12 AWG). EXISTING PULLBOX ADJACENT TO EXISTING STREET LIGHT POLE WITH CONCRETE FILLED TO BE BROKE-OUT AND WELDS ON POLE. HAND HOLE COVER TO BE GROUND OFF, IN ORDER TO ACCESS AND INSTALL THE NECESSARY CONDUCTORS. POLE HAND HOLE SHALL BE WELDED BACK AND CONCRETE SHALL BE REPLACED BACK TO EXISTING PULLBOX AFTER ALL PROPOSED WORK IS COMPLETED AND INSPECTED.
6. THE CONTRACTOR SHALL CONNECT EARTH GROUND FROM A LOCAL GROUND ROD TO THE BUSSED TERMINALS MARKED "GROUND".

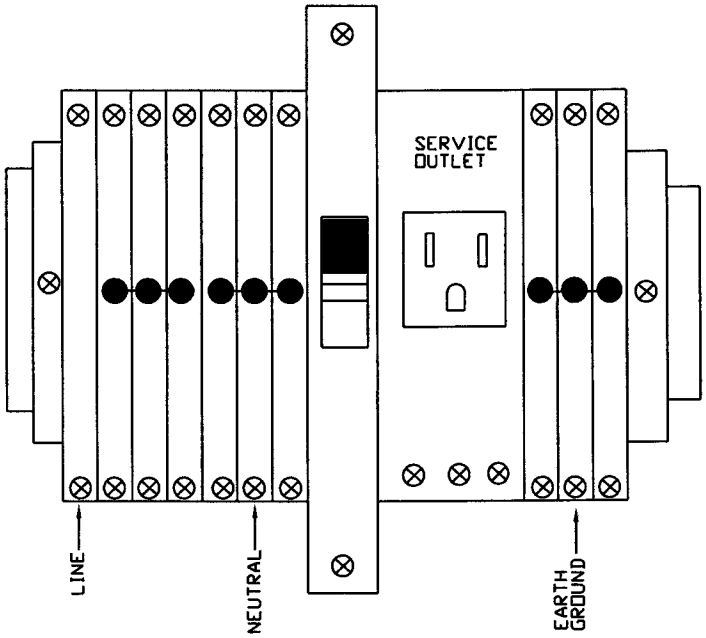
ITS WIRELESS POLE REPEATER INSTALLATION

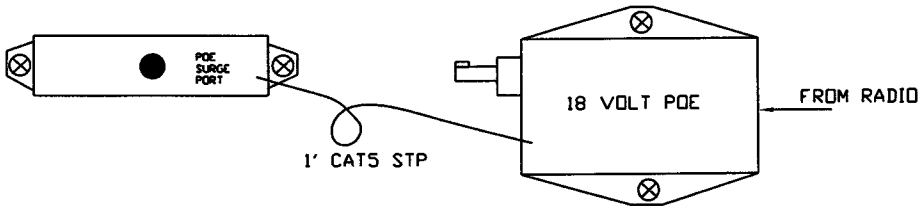
(POWERED THROUGH SERVICE PEDESTAL)

REF. & REV.
JUNE 2015

CITY OF FRESNO

ITS-28B





NOTES:

1. POWER DISTRIBUTION BOX TO BE POLE MOUNTED AT SELECT LOCATIONS TO SUPPORT MESH BROADBAND RADIO REPEATER CO-LOCATED ON POLE.
2. BOX WILL BE MOUNTED ON THE SIDE OF POLE AWAY FROM TRAFFIC AT A HEIGHT SPECIFIED IN THE PLANS OR BY THE ENGINEER ON SITE.
3. THE CONTRACTOR WILL CONNECT THE 120VAC POWER TAPPED FROM THE STREET LIGHT CIRCUIT TO THE BUSSED TERMINALS MARKED 'LINE' & 'NEUTRAL'
4. THE CONTRACTOR WILL CONNECT EARTH GROUND FROM A LOCAL GROUND ROD TO THE BUSSED TERMINALS MARKED 'GROUND'.
5. PADLOCK TO BE PROVIDED BY THE CITY.

DESCRIPTION	QTY
12"X12"X6" OUTDOOR RATED, NEMA 3 WITH BACK PANEL, HINGED, PADLOCK ENCLOSURE	1
ALUMINUM PANEL	1
SWEEP ELBOW	2
SS BANDING 5/8" W/ BUCKLE	4
ALUM DIN RAIL	A/R
END STOP	2
DIN MOUNT TERM BLOCK-GRAY	7
DIN MOUNT TERM BLOCK-GREEN	3
DIN MOUNT CIRCUIT BREAKER-4A	1
DIN MOUNT DUPLEX OUTLET	1
POE SURGE SUPPRESSOR	1
CAT5 JUMPER-12" SHIELDED	1

REPEATER CIRCUIT BREAKER

REF. & REV.
JUNE 2015

CITY OF FRESNO

ITS-28C

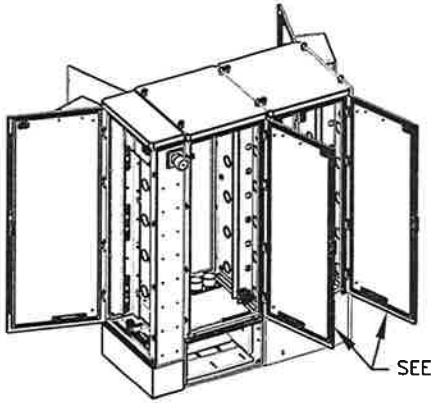
ITS HUB CABINET

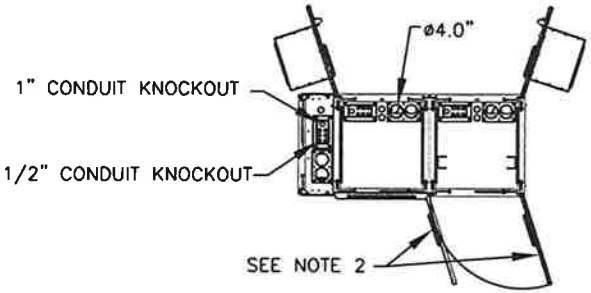
1 OF 2

REF. & REV. JUNE 2015

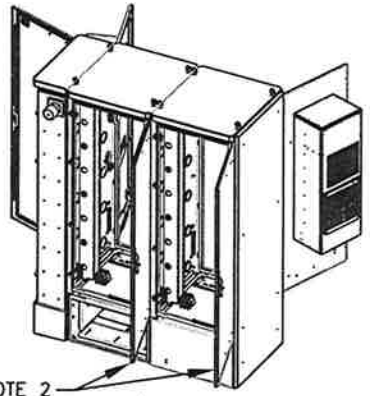
CITY OF FRESNO

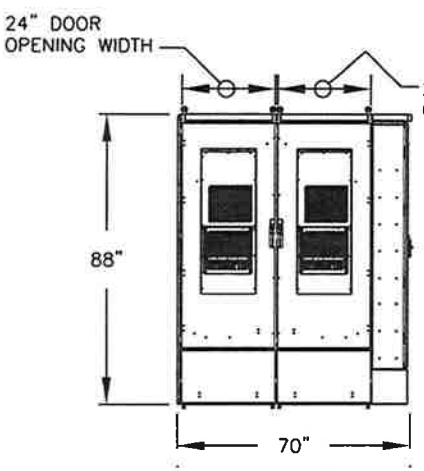
ITS-29A



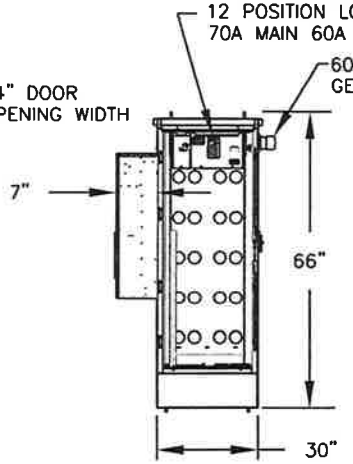


TOP VIEW LOOKING DOWN
(TOP REMOVED FOR CLARITY)

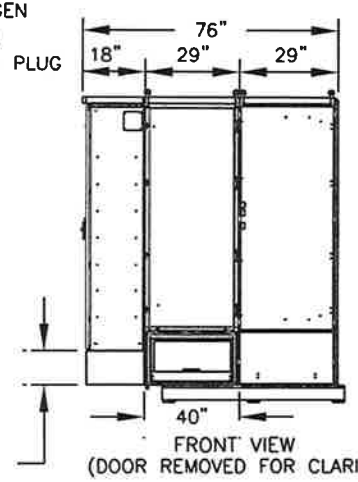




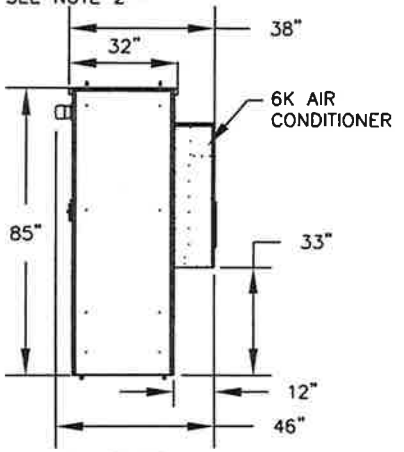
REAR VIEW



LEFT VIEW



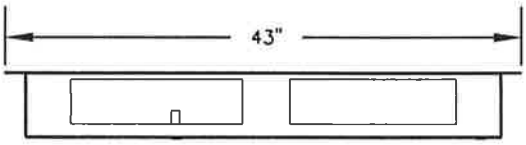
FRONT VIEW
(DOOR REMOVED FOR CLARITY)



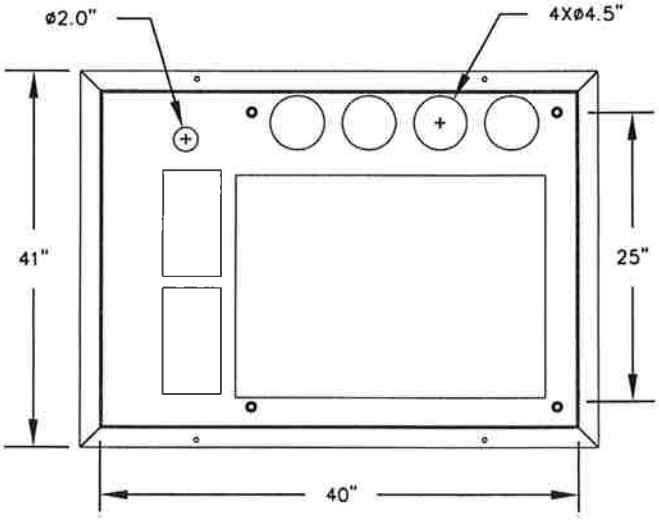
RIGHT VIEW

NOTES:

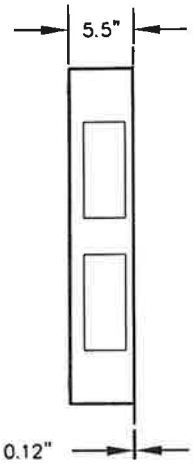
1. REFER TO ITS-23 FOR HUB CABINET FOUNDATION DETAIL.
2. BOTH DOORS HINGES SHALL BE INSTALLED AT OPPOSITE ENDS.
3. REFER TO ITS-29B FOR REQUIRED HUB CABINET PLATE ANCHOR.
4. ALL DOORS SHALL REQUIRE A CITY APPROVED LOCKING FEATURES AND KEYS SHALL BE PROVIDED TO CITY. ALL LOCKS TO BE KEYED TO CITY REQUIREMENTS.
5. ALL DIMENSION SHOWN ARE APPROXIMATE WITH ±3% TOLERANCE.



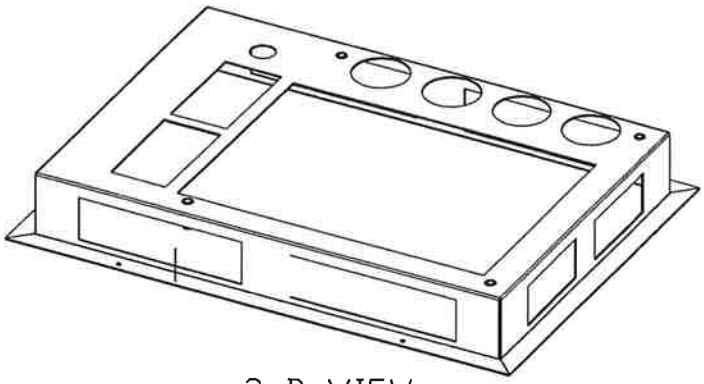
FRONT VIEW



TOP VIEW



SIDE VIEW



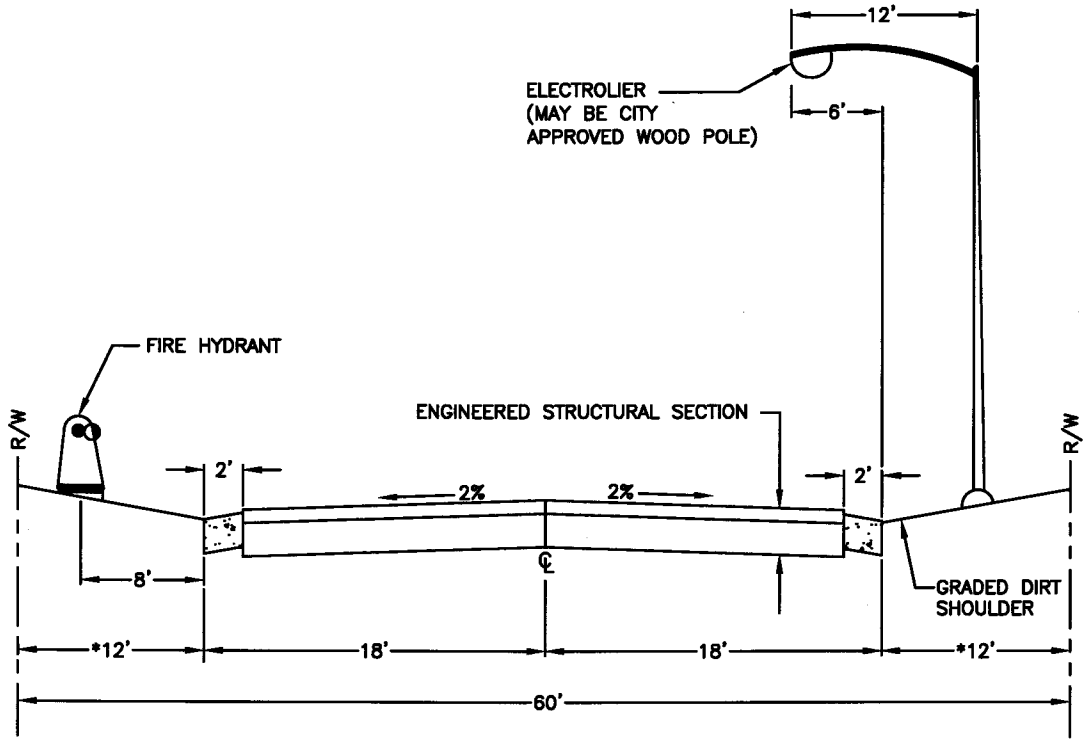
3-D VIEW

NOTES:

1. MATERIAL: STEEL ALLOY OPTIONAL, 0.120" THICKNESS UNLESS OTHERWISE SPECIFIED.

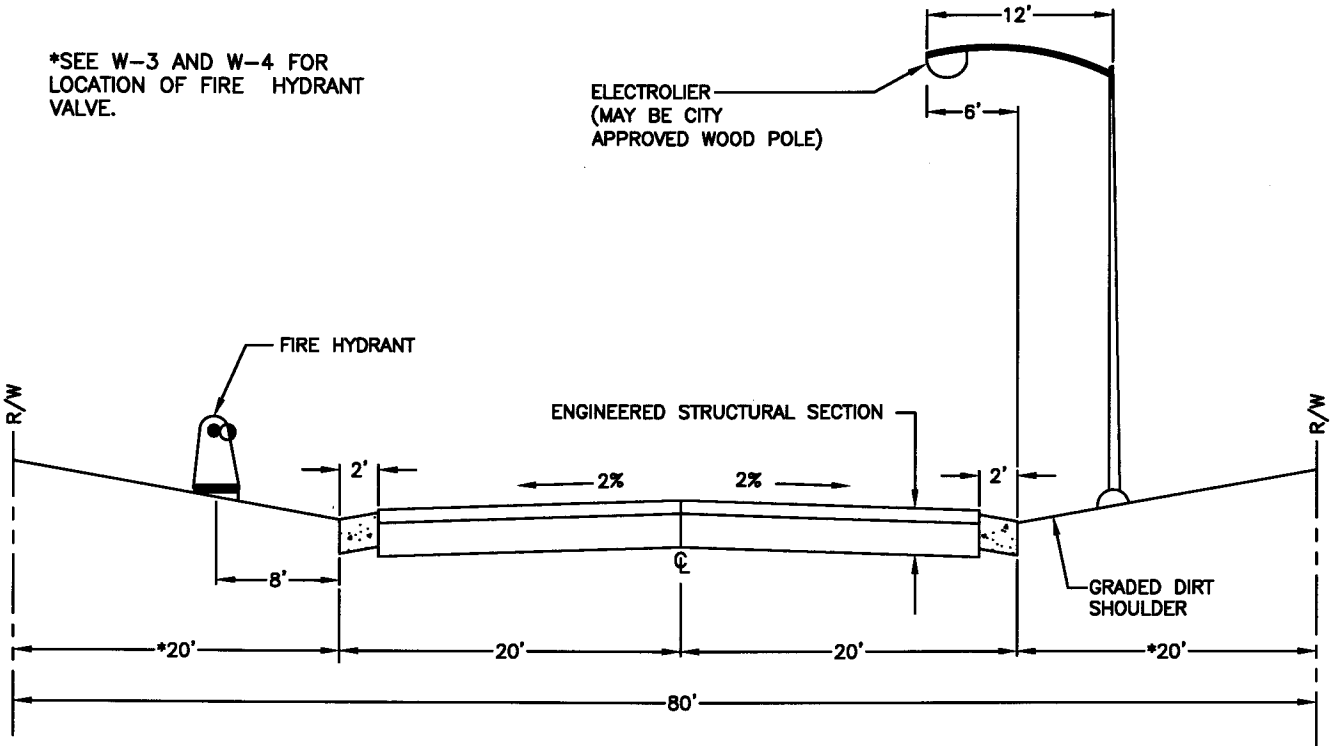
2. ALL DIMENSION SHOWN ARE APPROXIMATE WITH ±3% TOLERANCE.

ITS HUB CABINET, PLATE ANCHOR 2 OF 2	REF. & REV. JUNE 2015	CITY OF FRESNO ITS–29B



LOCAL STREET

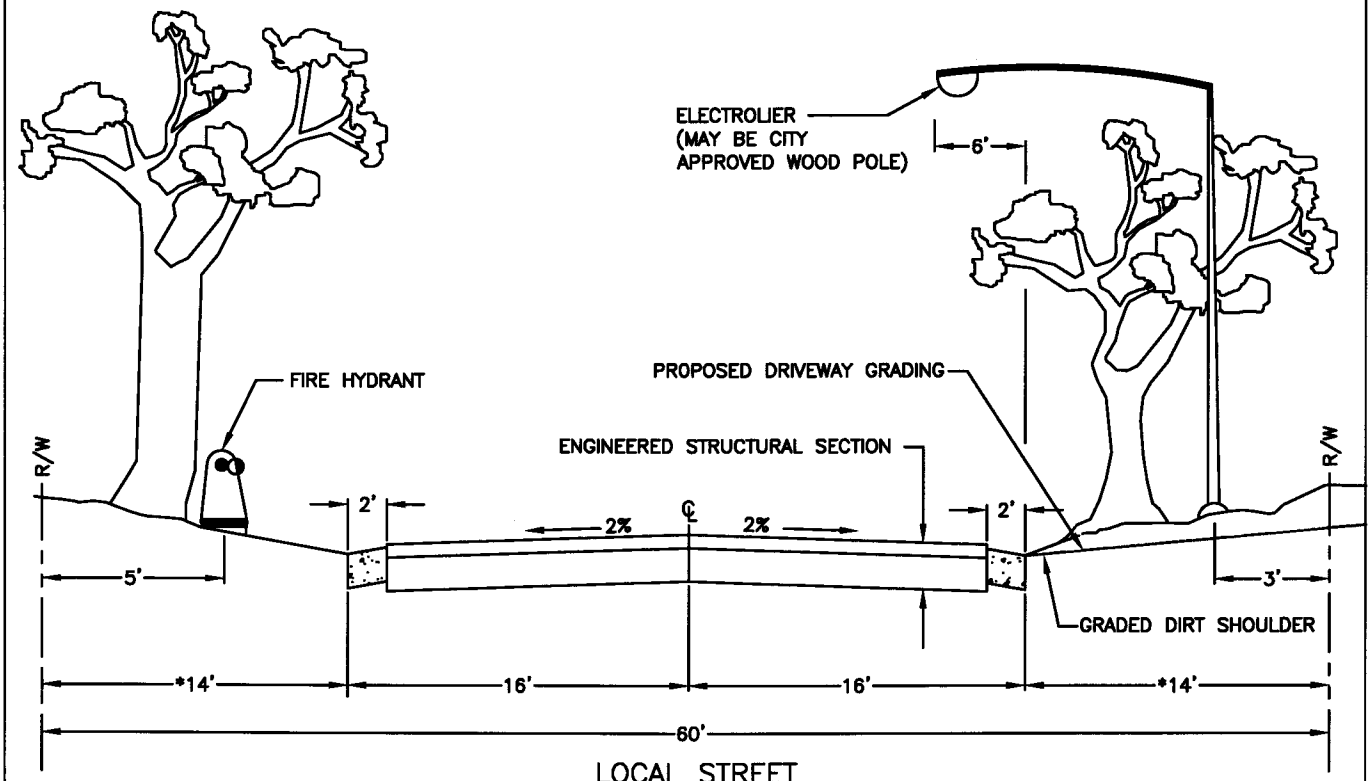
*SEE W-3 AND W-4 FOR LOCATION OF FIRE HYDRANT VALVE.



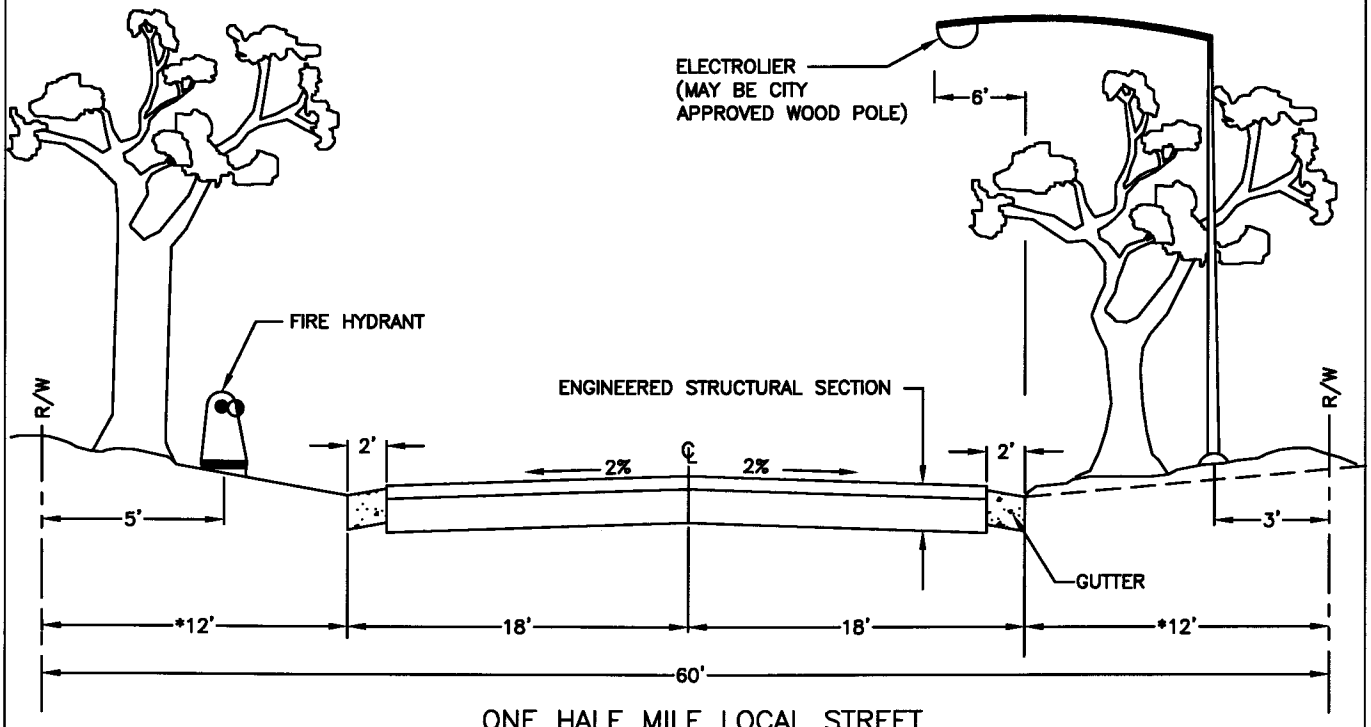
ONE HALF MILE LOCAL STREET

*NO PAVEMENT OR BASE INSTALLATION (GRAVEL, SUBBASE, ETC.) EXCEPT FOR DRIVEWAY APPROACHES IN THIS AREA.

MODIFIED STREETS	REF. & REV. AUG., 2010	CITY OF FRESNO API-1



LOCAL STREET



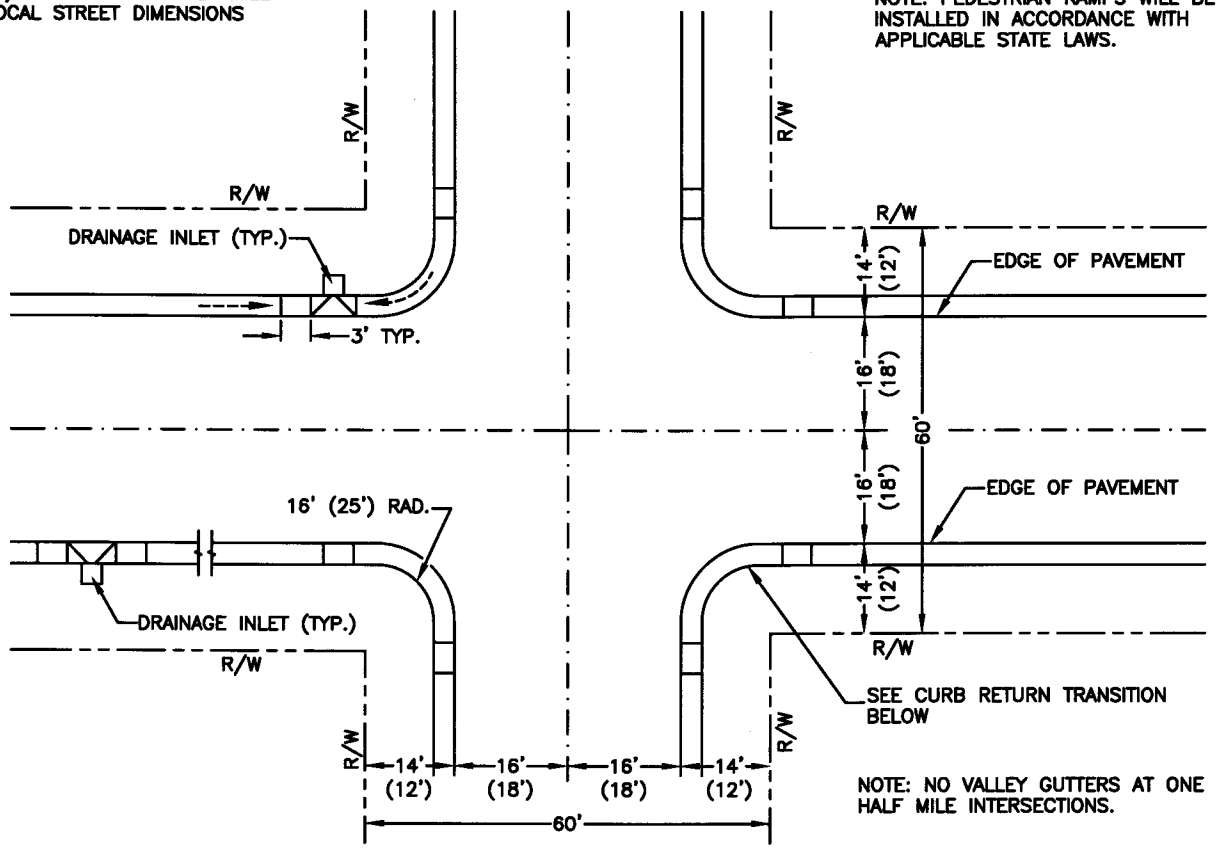
ONE HALF MILE LOCAL STREET

*NO PAVEMENT OR BASE INSTALLATION (GRAVEL, SUBBASE, ETC.) EXCEPT FOR DRIVEWAY APPROACHES IN THIS AREA.

MODIFIED STREET IMPROVEMENT STANDARDS	REF. & REV. AUG., 2010	CITY OF FRESNO API-2

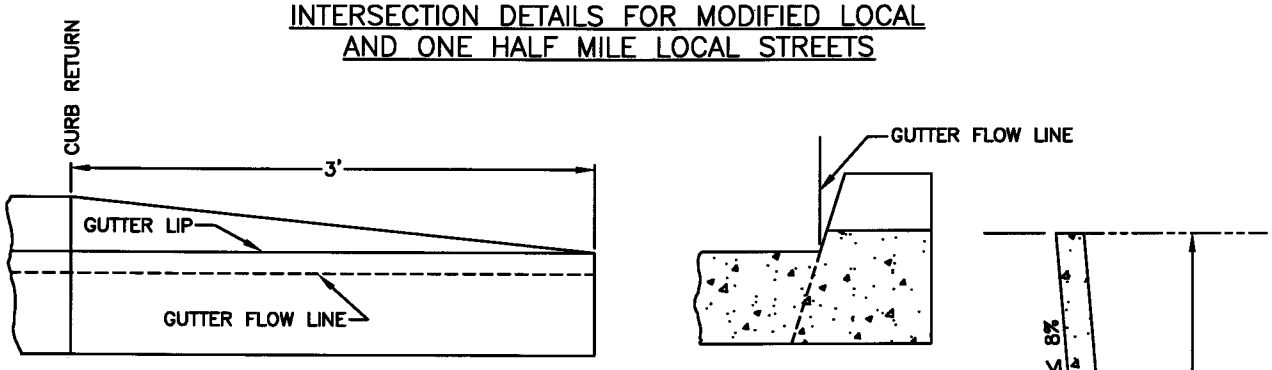
( ) DENOTES ONE HALF MILE LOCAL STREET DIMENSIONS

NOTE: PEDESTRIAN RAMPS WILL BE INSTALLED IN ACCORDANCE WITH APPLICABLE STATE LAWS.

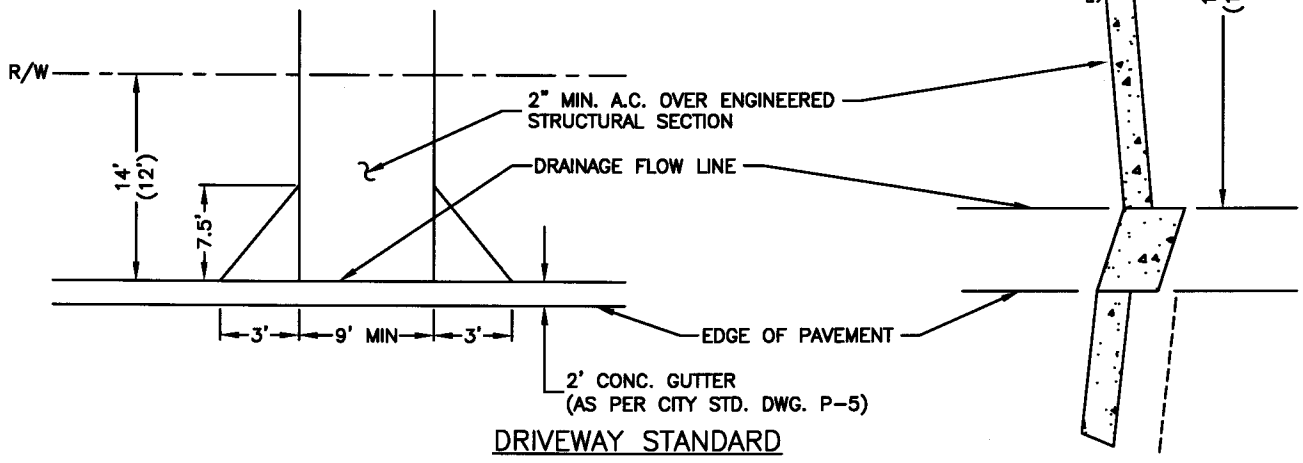


NOTE: NO VALLEY GUTTERS AT ONE HALF MILE INTERSECTIONS.

INTERSECTION DETAILS FOR MODIFIED LOCAL AND ONE HALF MILE LOCAL STREETS



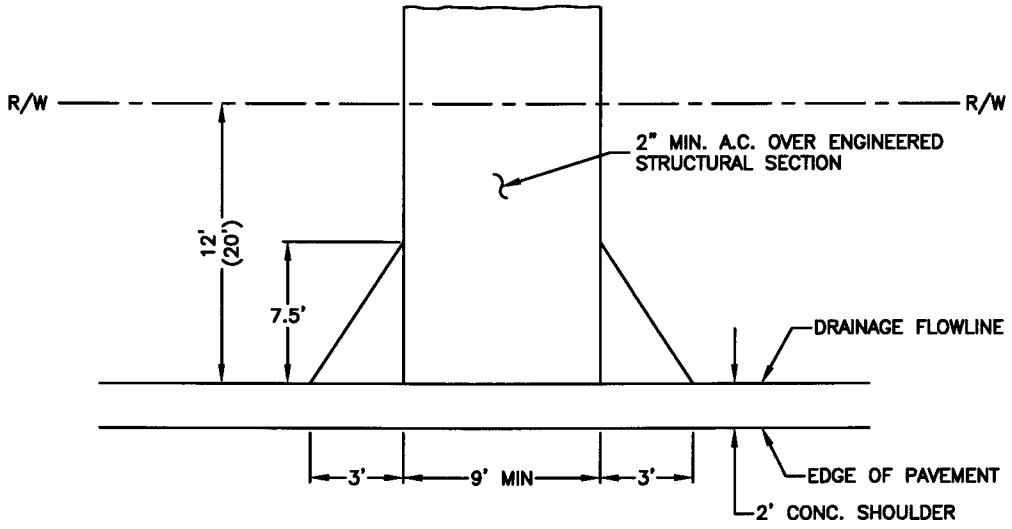
CURB RETURN TRANSITION



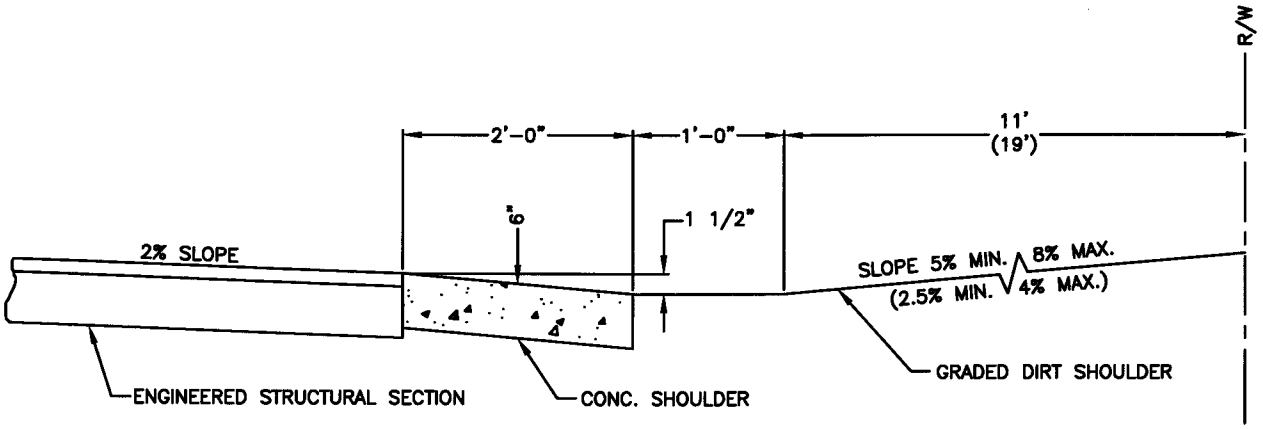
DRIVEWAY STANDARD

MODIFIED STREET IMPROVEMENT STANDARDS	REF. & REV. AUG., 2010	CITY OF FRESNO API-3

( ) DENOTES ONE HALF MILE LOCAL STREET DIMENSIONS.

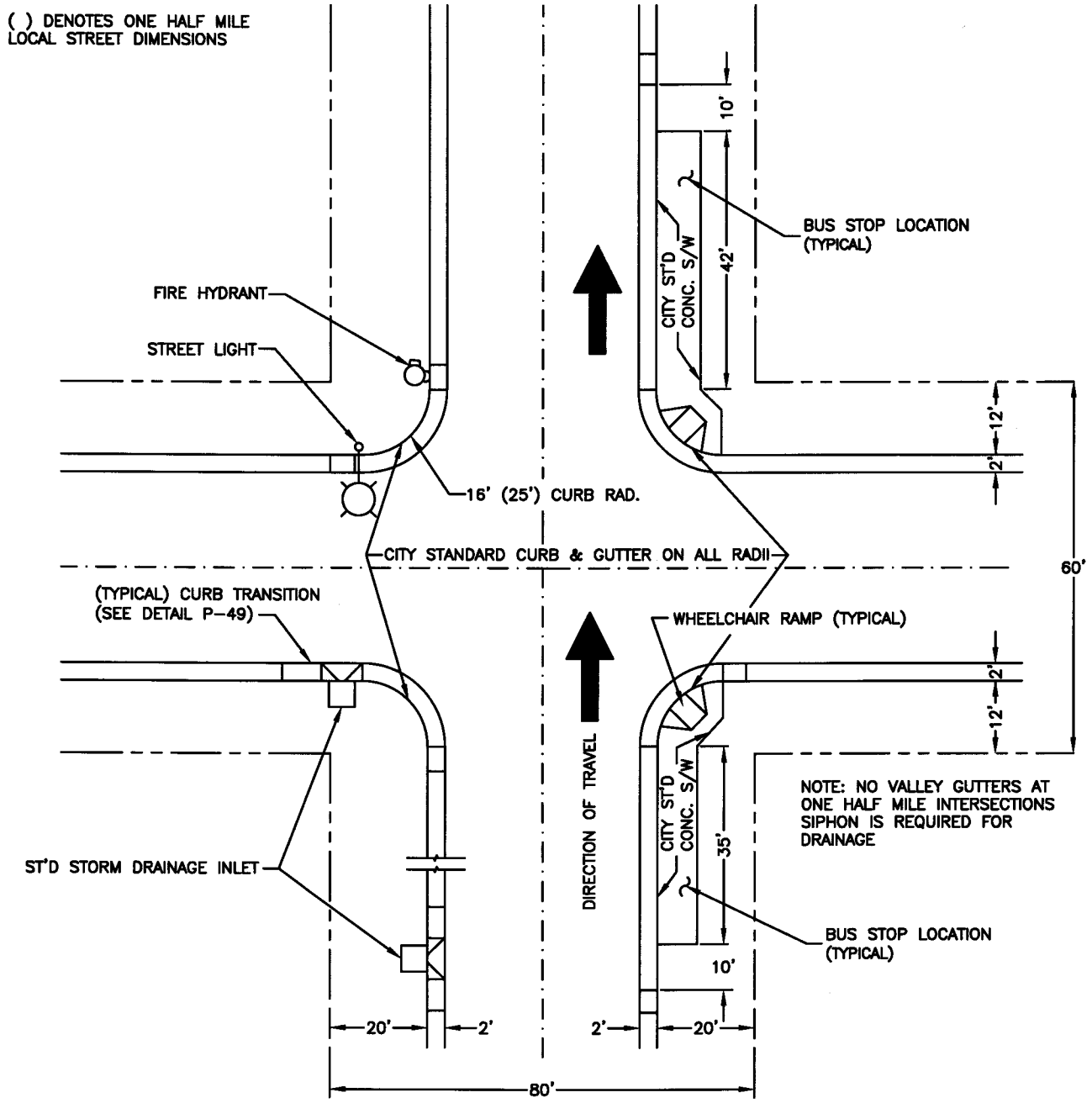


DRIVEWAY STANDARD

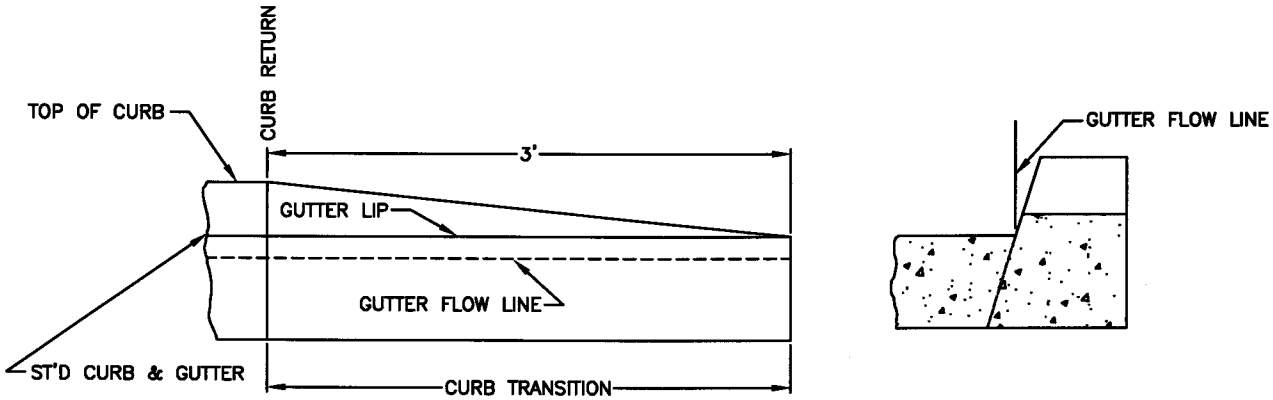


SHOULDER GRADING DETAIL

DETAILS FOR MODIFIED STREETS	REF. & REV. AUG., 2010	CITY OF FRESNO API-4



NOTE: MAJOR STREETS REQUIRE FULL STREET IMPROVEMENTS TO CURRENT URBAN STANDARDS.

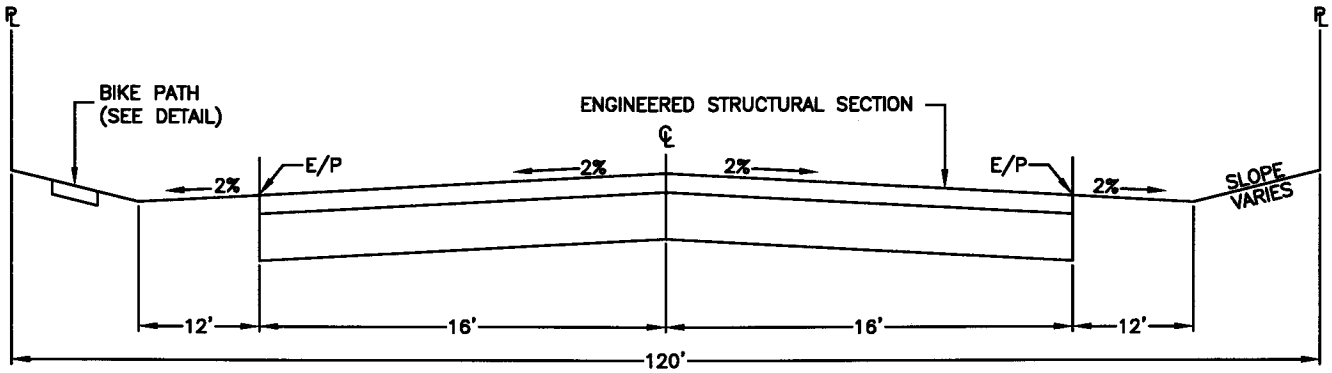


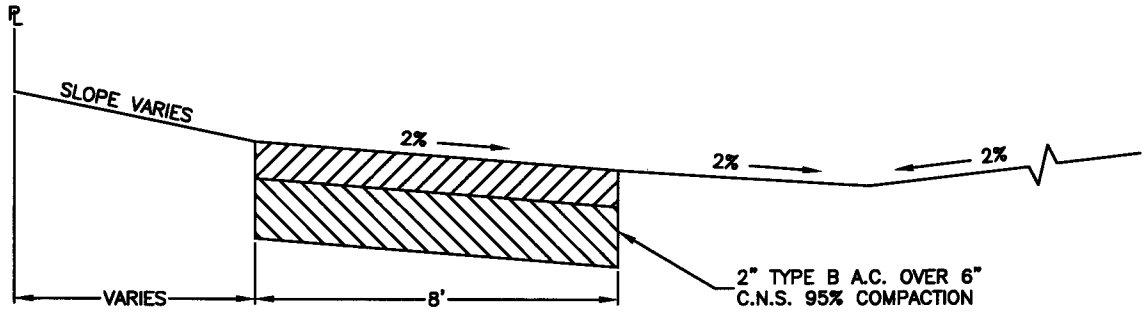
INTERSECTION DETAILS
FOR MODIFIED STREETS
(LOCAL & ½ MILE LOCAL)

REF. & REV.
AUG., 2010

CITY OF FRESNO

API-5



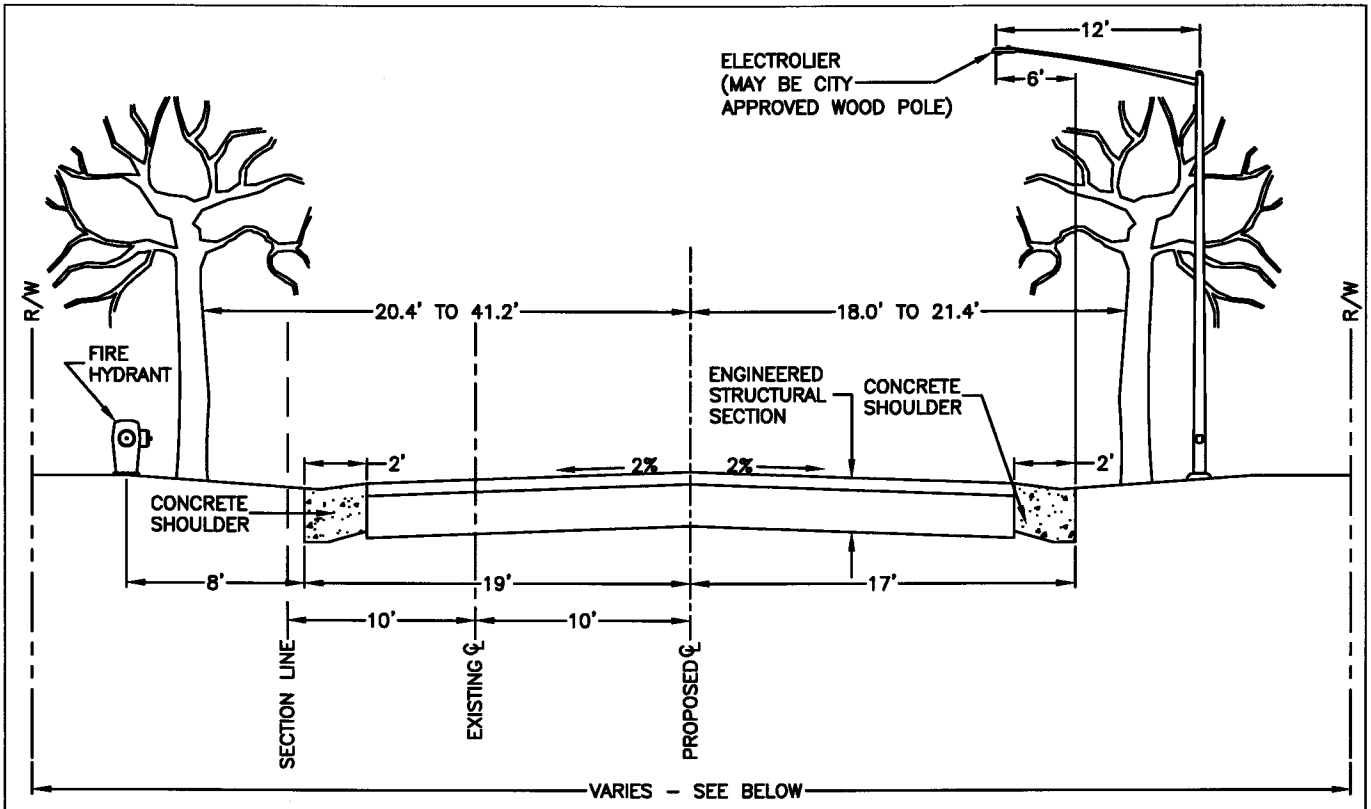


BIKE PATH DETAIL

NOTES:

1. CURB AND GUTTER IS PROHIBITED.
2. DRIVEWAY APPROACHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DRAWING P–4.
3. ASPHALT CONCRETE PAVEMENT SHALL CONFORM TO CITY STANDARDS.
4. SEE STANDARD DRAWINGS W–3 AND W–4 FOR LOCATION OF FIRE HYDRANT VALVES.
5. PROPERTY OWNER MAY PLACE ASPHALT CONCRETE PAVEMENT (2" A.C. OVER 6" C.N.S.) BETWEEN EDGE OF PAVEMENT (EP) AND PROPERTY LINE (PL) BY OBTAINING AN ENCROACHMENT PERMIT FROM THE PUBLIC WORKS DEPARTMENT. PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTAINING PAVEMENT BETWEEN EP AND PL.
6. ANY ENCROACHMENT INTO THE PUBLIC RIGHT OF WAY SHALL HAVE AN ENCROACHMENT PERMIT AND FEES SHALL BE PAID IN ACCORDANCE WITH THE MASTER FEE SCHEDULE.
7. IF SHOULDER IS PAVED, FLOW LINE OF GUTTER MUST BE ESTABLISHED OR APPROVED BY THE PUBLIC WORKS DEPARTMENT.

VAN NESS EXTENSION HERNDON AVE. TO SAN JOAQUIN RIVER BLUFF	REF. & REV. AUG., 2010	CITY OF FRESNO API–6



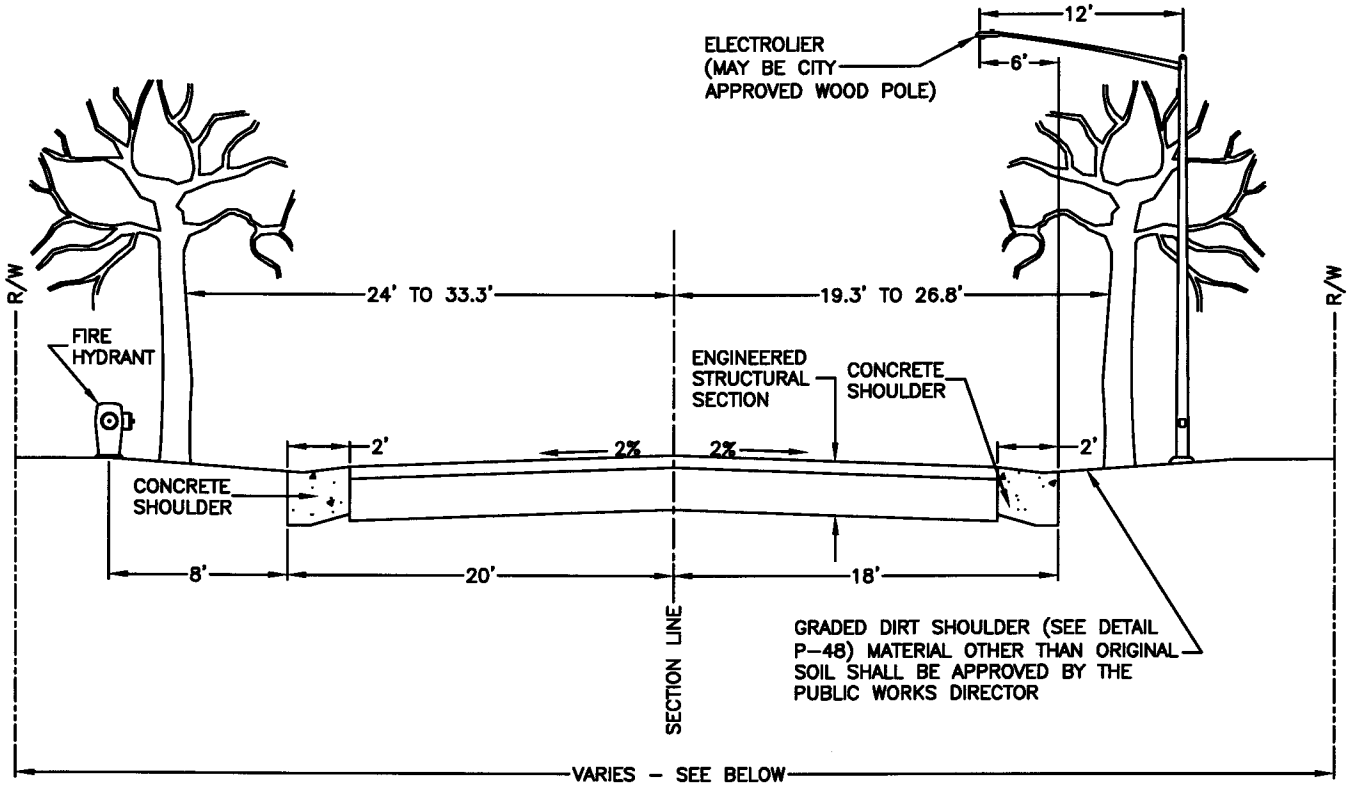
EXISTING RIGHT-OF-WAY WIDTHS

40' FANCHER CREEK TO 25' S/O FLORENCE
60' 25' S/O FLORENCE TO 70' S/O PITT
40' 70' S/O PITT TO 30' S/O GEARY
60' 30' S/O GEARY TO 110' N/O GEARY
40' 110' N/O GEARY TO 90' S/O ATCHISON
60' 90' S/O ATCHISON TO CALIFORNIA

NOTES:

1. A TWO FOOT CONCRETE SHOULDER IS REQUIRED IN AN R-M OVERLAY DISTRICT.
2. ASPHALT CONCRETE PAVING BETWEEN THE EDGE OF PAVEMENT OR CONCRETE SHOULDER AND THE PROPERTY LINE IS PROHIBITED EXCEPT FOR DRIVEWAY APPROACHES.
3. DRIVEWAY APPROACHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DRAWING P-4.
4. ASPHALT CONCRETE PAVEMENT SHALL CONFORM TO CITY STANDARDS.
5. SEE STANDARD DRAWING W-3 AND W-4 FOR LOCATION OF FIRE HYDRANT VALVES.

MINNEWAWA AVENUE FANCHER CREEK TO CALIFORNIA AVENUE	REF. & REV. AUG., 2010	CITY OF FRESNO API-7



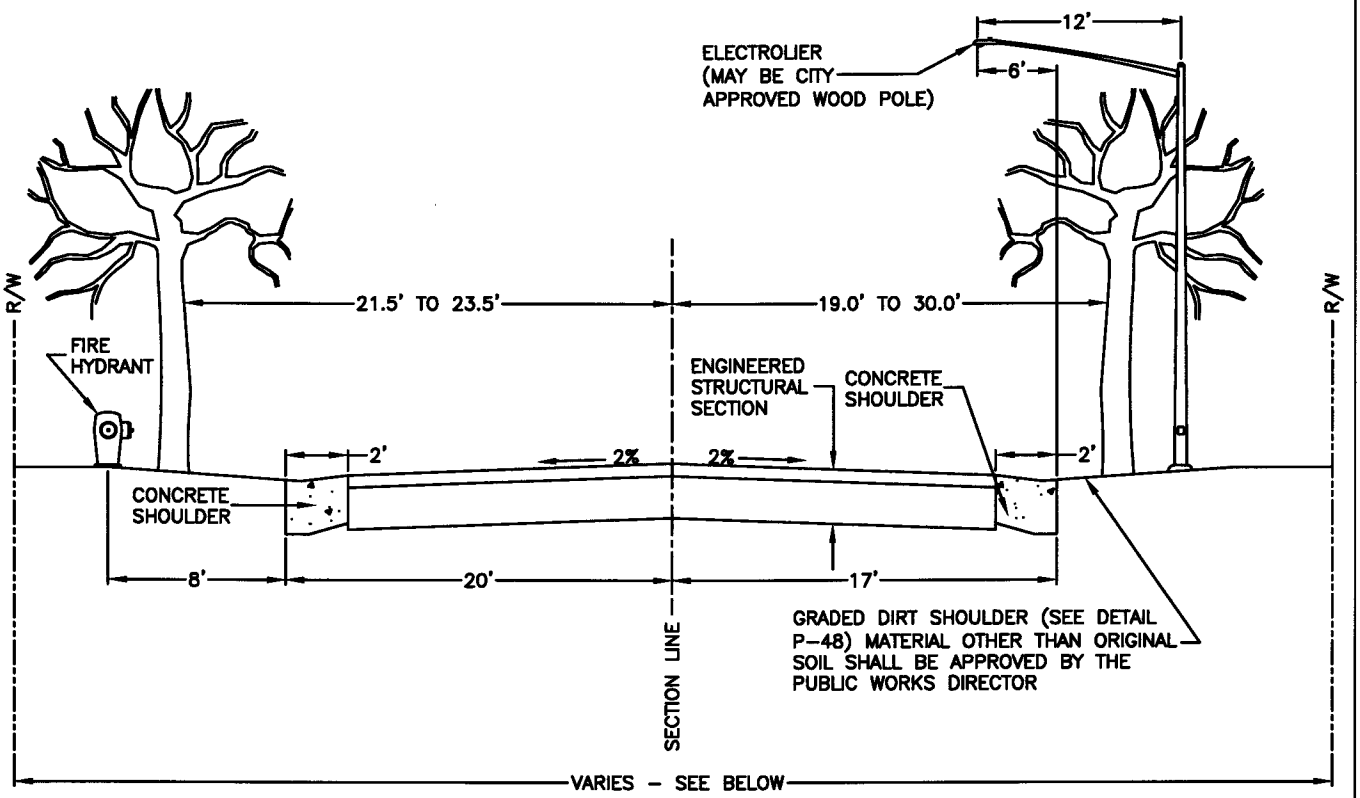
EXISTING RIGHT-OF-WAY WIDTHS

50' CALIFORNIA TO COLUMBIA
40' COLUMBIA TO 145' N/O COLUMBIA
50' 145' N/O COLUMBIA TO 535' N/O COLUMBIA
40' 535' N/O COLUMBIA TO 210' S/O HEATON
50' 210' S/O HEATON TO 205' N/O HEATON
40' 205' N/O HEATON TO BUTLER

NOTES:

1. A TWO FOOT CONCRETE SHOULDER IS REQUIRED IN AN R-M OVERLAY DISTRICT. SEE STANDARD DRAWING P-48.
2. ASPHALT CONCRETE PAVING BETWEEN THE EDGE OF PAVEMENT OR CONCRETE SHOULDER AND THE PROPERTY LINE IS PROHIBITED EXCEPT FOR DRIVEWAY APPROACHES.
3. DRIVEWAY APPROACHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DRAWING P-48.
4. ASPHALT CONCRETE PAVEMENT SHALL CONFORM TO CITY STANDARDS.
5. SEE STANDARD DRAWING W-3 AND W-4 FOR LOCATION OF FIRE HYDRANT VALVES.
6. CURB AND GUTTER EXISTS ON THE EAST SIDE FOR APPROXIMATELY 255' NORTH AND SOUTH OF HEATON.

MINNEWAWA AVENUE CALIFORNIA AVENUE TO BUTLER AVENUE	REF. & REV. AUG., 2010	CITY OF FRESNO API-8



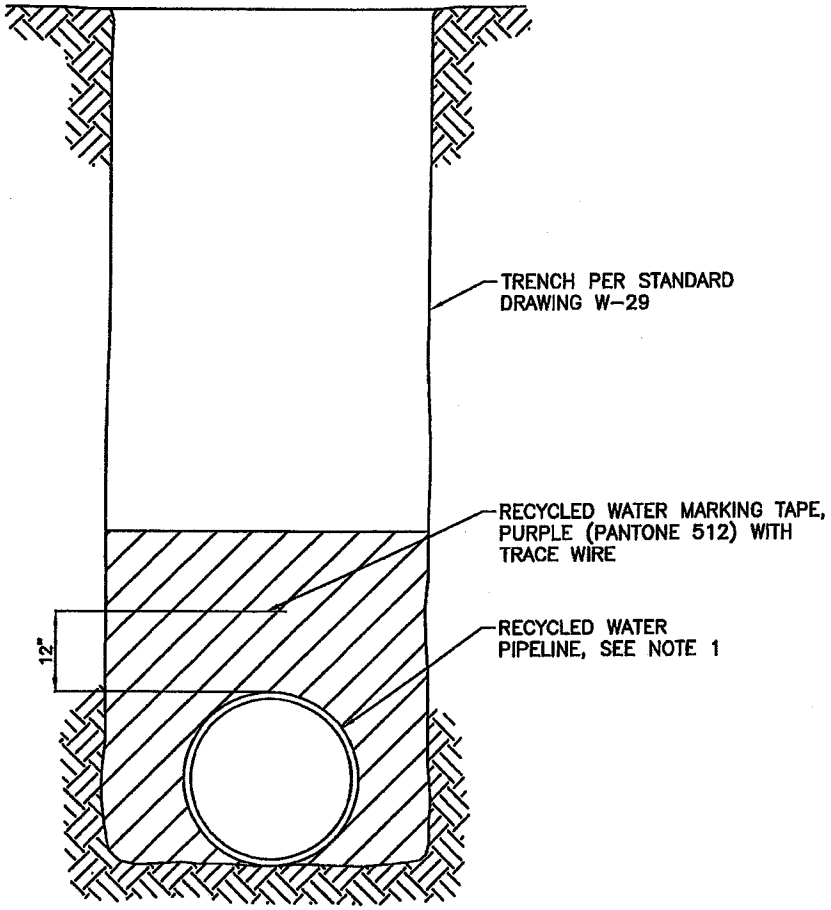
EXISTING RIGHT-OF-WAY WIDTHS

50'	BUTLER TO 240' N/O LIBERTY
60'	240' N/O LIBERTY TO LANE
50'	LANE TO KINGS CANYON
60'	KINGS CANYON TO HUNTINGTON
40'	HUNTINGTON TO PALM DRIVE
40'-50'	PALM DRIVE TO TULARE

NOTES:

1. A TWO FOOT CONCRETE SHOULDER IS REQUIRED IN AN R-M OVERLAY DISTRICT.
2. ASPHALT CONCRETE PAVING BETWEEN THE EDGE OF PAVEMENT OR CONCRETE SHOULDER AND THE PROPERTY LINE IS PROHIBITED EXCEPT FOR DRIVEWAY APPROACHES.
3. DRIVEWAY APPROACHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DRAWING P-4.
4. ASPHALT CONCRETE PAVEMENT SHALL CONFORM TO CITY STANDARDS.
5. SEE STANDARD DRAWING W-3 AND W-4 FOR LOCATION OF FIRE HYDRANT VALVES.
6. CURB AND GUTTER EXISTS ON THE EAST SIDE FOR APPROXIMATELY 255' NORTH AND SOUTH OF HEATON, ON THE EAST SIDE FROM TULARE TO APPROXIMATELY 570' SOUTH OF TULARE, AND ON THE WEST SIDE FROM KINGS CANYON TO APPROXIMATELY 200' NORTH OF KINGS CANYON.

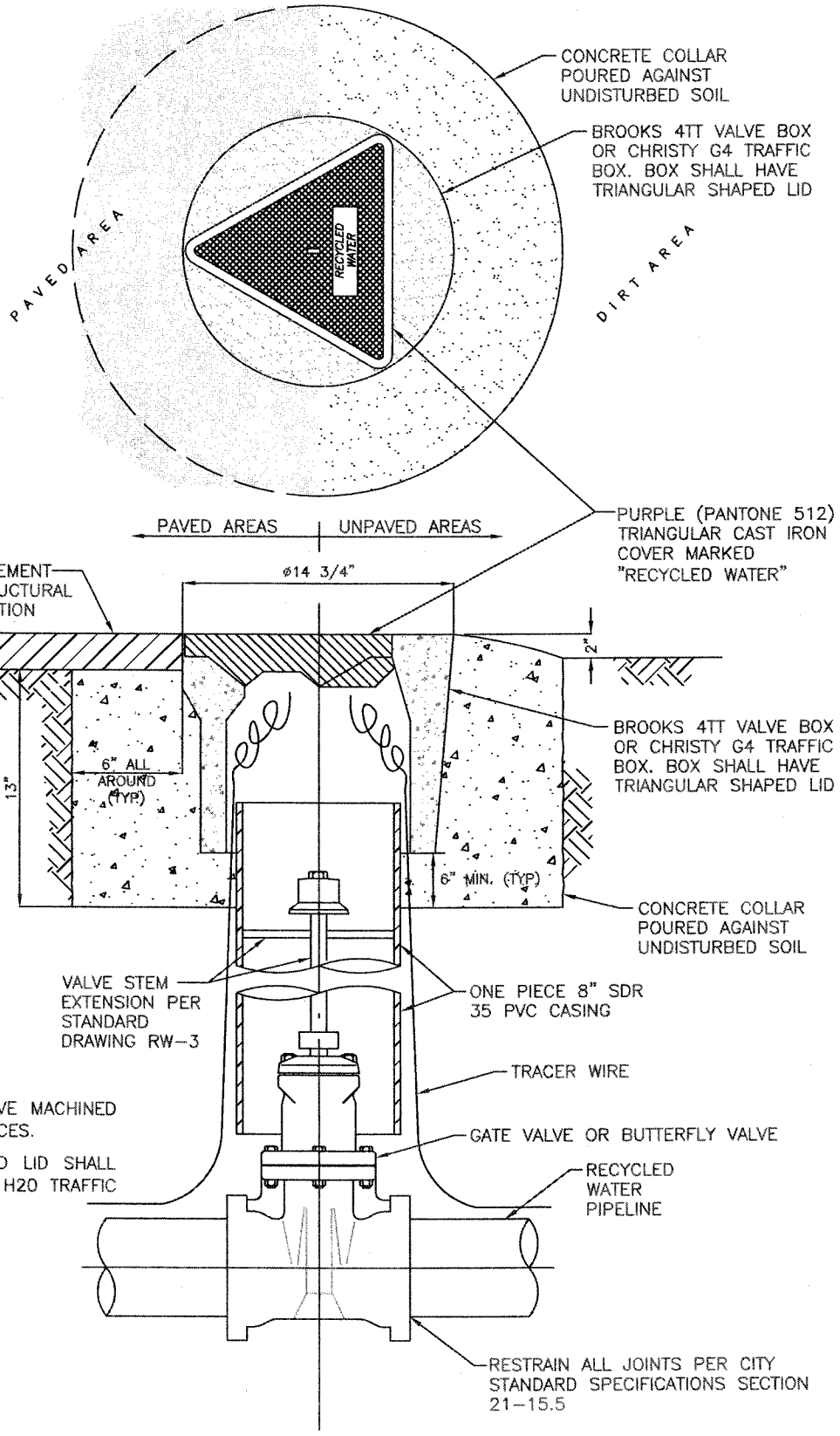
MINNEWAWA AVENUE BUTLER AVENUE TO TULARE AVENUE	REF. & REV. AUG., 2010	CITY OF FRESNO API-9



NOTE:

1. RECYCLED WATER PIPELINES SHALL BE COLORED PURPLE (PANTONE 512) AND INTEGRALLY STAMPED "RECYCLED WATER – DO NOT DRINK" ON OPPOSITE SIDES OF THE PIPE. ALTERNATIVELY, NON–PVC RECYCLED WATER PIPELINES MAY BE MARKED WITH LETTERING ON PURPLE MARKING TAPE BEARING THE CONTINUOUS WORDING "RECYCLED WATER–DO NOT DRINK". THE MARKING TAPE SHALL BE A MINIMUM OF SIX INCHES WIDE AND SHALL BE SECURELY ATTACHED DIRECTLY TO THE TOP OF THE PIPELINE EVERY FIVE FEET.

RECYCLED WATER MAIN IDENTIFICATION	REF. & REV. JUNE 2014	CITY OF FRESNO RW–1



NOTES:

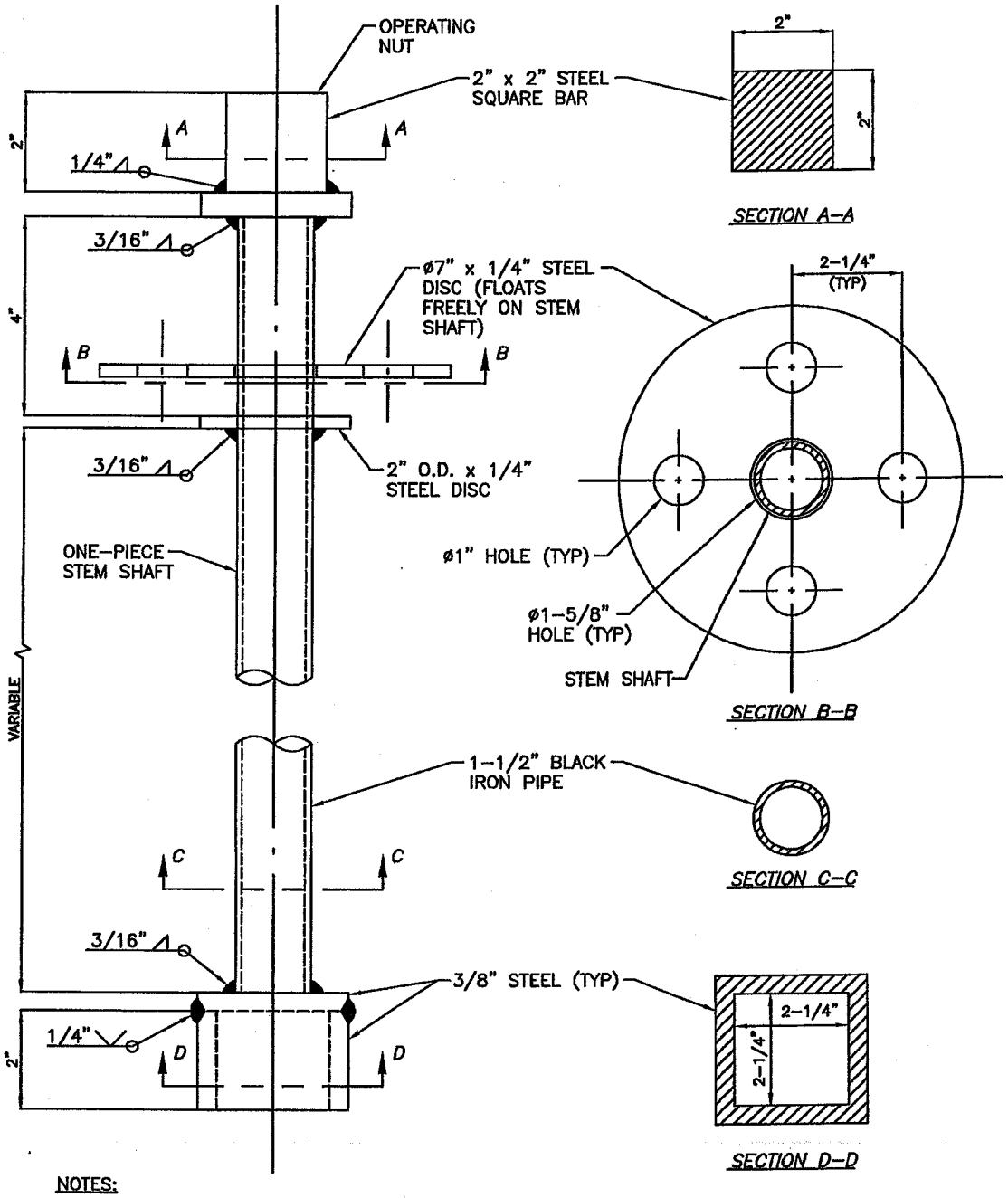
1. LIDS SHALL HAVE MACHINED COATING SURFACES.
2. VALVE BOX AND LID SHALL BE RATED FOR H20 TRAFFIC LOADING.

RECYCLED WATER VALVE AND VALVE BOX

REF. & REV. AUGUST 2015

CITY OF FRESNO

RW-2



NOTES:

1. EXTENSION STEM SHAFT SHALL BE ROUND OR SQUARE STEEL TUBING OF ONE–PIECE DESIGN (NO PINNED CONNECTIONS OR COUPLINGS PERMITTED).
2. VALVES DEEPER THAN 5' REQUIRE A VALVE STEM EXTENSION.
3. EXTENSION STEMS SHALL NOT BE ATTACHED/BOLTED TO OPERATING NUT OF THE VALVE.
4. VALVE STEM EXTENSION SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IS COMPLETE.

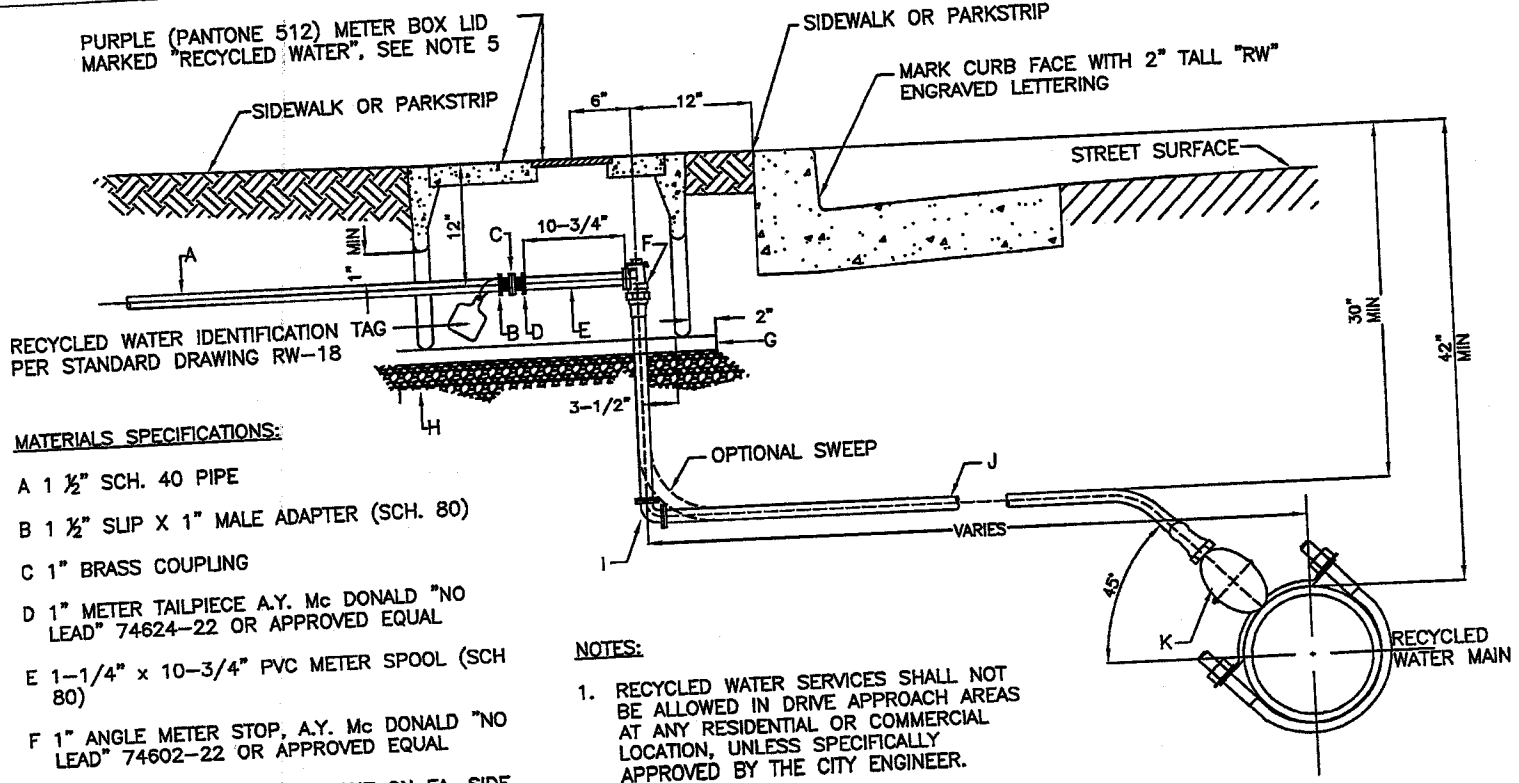
RECYCLED WATER VALVE STEM EXTENSION	REF. & REV. JUNE 2014	CITY OF FRESNO RW–3

1" SERVICE CONNECTION & METER BOX INSTALLATION

REF. & REV. JUNE 2014

CITY OF FRESNO

RW-4



MATERIALS SPECIFICATIONS:

A 1 ½" SCH. 40 PIPE

B 1 ½" SLIP X 1" MALE ADAPTER (SCH. 80)

C 1" BRASS COUPLING

D 1" METER TAILPIECE A.Y. Mc DONALD "NO LEAD" 74624-22 OR APPROVED EQUAL

E 1-1/4" x 10-3/4" PVC METER SPOOL (SCH 80)

F 1" ANGLE METER STOP, A.Y. Mc DONALD "NO LEAD" 74602-22 OR APPROVED EQUAL

G 2"X4" REDWOOD SUPPORT, ONE ON EA. SIDE OF METER BOX, OVERHANG ENDS 2"

H 6" THICK ¾" CRUSHED ROCK WHEN BOX IS PLACED IN ALLEYS WITH TRASH PICK UP ONLY. ALL BOXES IN ALLEYS SHALL BE PLACED PARALLEL TO ALLEY

I COMP X COMP 90° ELL, A.Y. Mc DONALD "NO LEAD" 74761-22 OR APPROVED EQUAL

J TYPE "K" SOFT DRAWN COPPER TUBING CONTINUOUSLY WRAPPED IN PURPLE MARKING TAPE OR PURPLE (PANTONE 512) POLYETHYLENE CTS SDR-9 PE 3408, USE COMPRESSION JOINTS WITH STAILESS STEEL INSERT

K 1" CORPORATION STOP A.Y. Mc DONALD "NO LEAD" 74701-22 OR APPROVED EQUAL

NOTES:

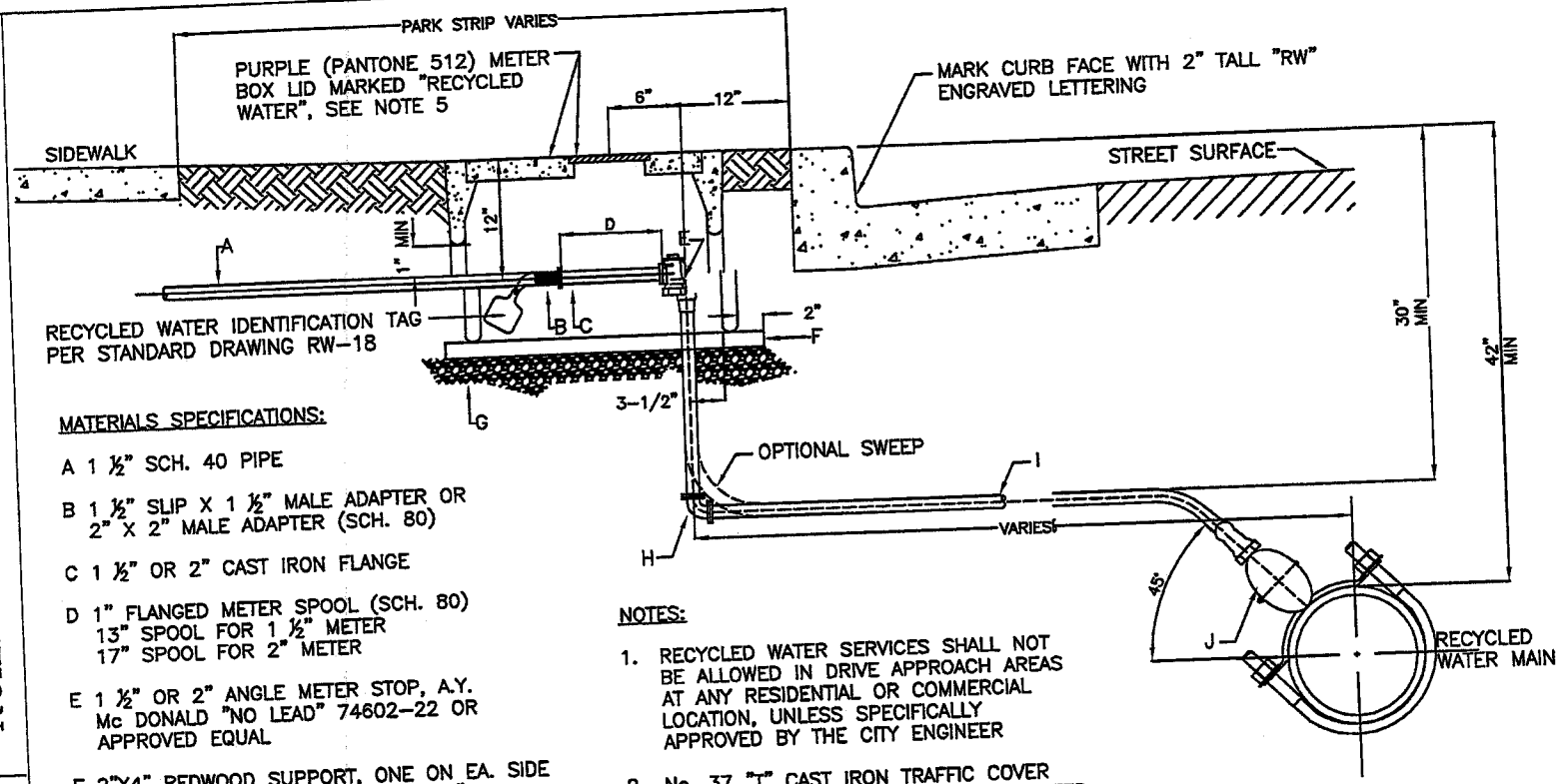
1. RECYCLED WATER SERVICES SHALL NOT BE ALLOWED IN DRIVE APPROACH AREAS AT ANY RESIDENTIAL OR COMMERCIAL LOCATION, UNLESS SPECIFICALLY APPROVED BY THE CITY ENGINEER.
2. No. 37 "T" CAST IRON TRAFFIC COVER SHALL BE USED WHEN METER IS LOCATED IN ALLEYS OR DRIVE APPROACH AREAS, OR BEHIND ROLLED CURBS.
3. ALL COPPER FITTINGS SHALL BE CAMPAK COMPRESSION-TYPE.
4. FOR PVC RECYCLED WATER MAIN TAPS, SERVICE SADDLES WITH CIRCUMFERENTIAL TYPE BANDS SHAPED TO FIT THE ACTUAL O.D. OF THE PIPE AND HAVING A MINIMUM BEARING WIDTH OF 3" (1-1/2" PER BAND) SHALL BE USED. FOR DUCTILE AND CAST IRON MAINS USE BRONZE OR DUCTILE IRON SERVICE SADDLES, WITH BRONZE OR STAINLESS DOUBLE STRAPS.
5. METER BOX SHALL BE OLD CASTLE B16 OR N16 BOX WITH CAST-IN CORNER BRACKETS. USE ARMORCAST A6000489T-COF LID
6. RECYCLED WATER SERVICES SHALL BE LOCATED A MINIMUM OF 4' CLEAR OF POTABLE WATER SERVICES.

1-1/2" & 2" SERVICE CONNECTION & METER BOX INSTALLATION

REF. & REV. JUNE 2014

CITY OF FRESNO

RW-5



MATERIALS SPECIFICATIONS:

A 1 ½" SCH. 40 PIPE

B 1 ½" SLIP X 1 ½" MALE ADAPTER OR 2" X 2" MALE ADAPTER (SCH. 80)

C 1 ½" OR 2" CAST IRON FLANGE

D 1" FLANGED METER SPOOL (SCH. 80)
13" SPOOL FOR 1 ½" METER
17" SPOOL FOR 2" METER

E 1 ½" OR 2" ANGLE METER STOP, A.Y. Mc DONALD "NO LEAD" 74602-22 OR APPROVED EQUAL

F 2"X4" REDWOOD SUPPORT, ONE ON EA. SIDE OF METER BOX, OVERHANG ENDS 2"

G 6" THICK ¾" CRUSHED ROCK WHEN BOX IS PLACED IN ALLEYS WITH TRASH PICK UP ONLY. ALL BOXES IN ALLEYS SHALL BE PLACED PARALLEL TO ALLEY

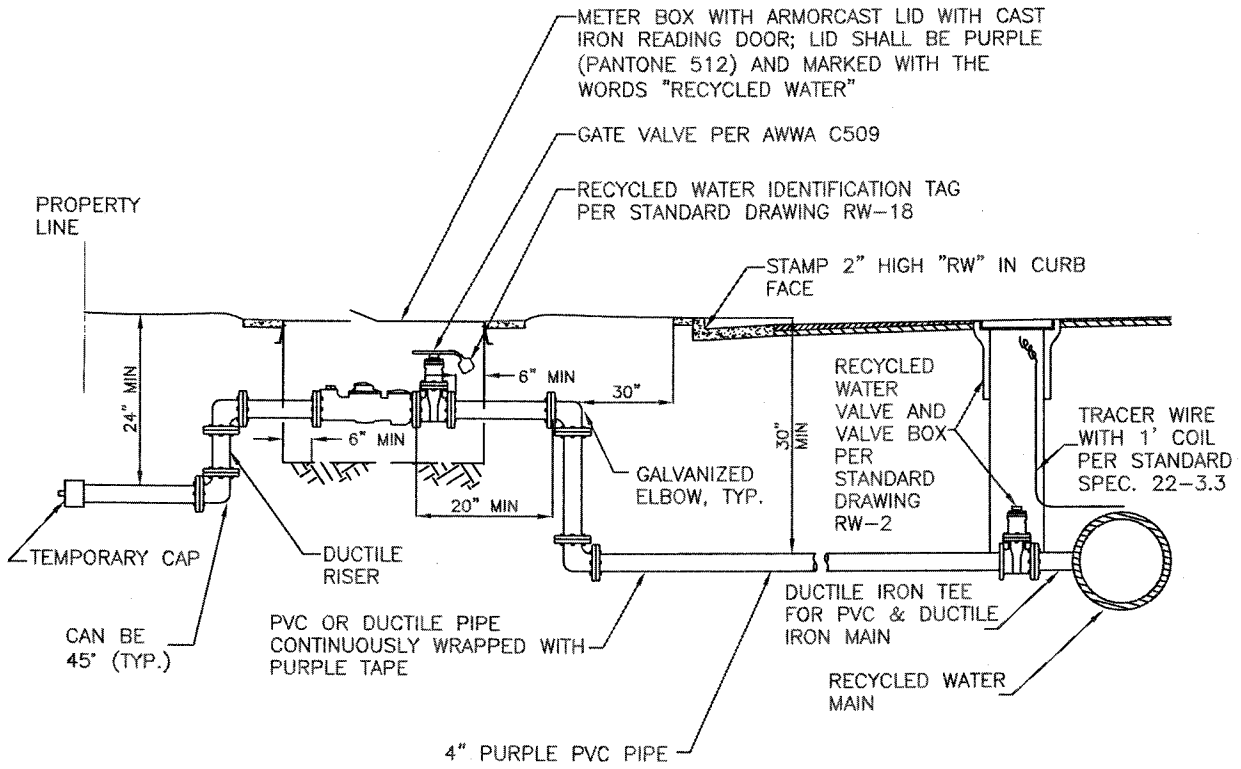
H COMP X COMP 90° ELL, A.Y. Mc DONALD "NO LEAD" 74761-22 OR APPROVED EQUAL

I TYPE "K" SOFT DRAWN COPPER TUBING CONTINUOUSLY WRAPPED IN PURPLE MARKING TAPE OR PURPLE (PANTONE 512) POLYETHYLENE CTS SDR-9 PE 3408, USE COMPRESSION JOINTS WITH STAINLESS STEEL INSERT

J 1" CORPORATION STOP A.Y. Mc DONALD "NO LEAD" 74701-22 OR APPROVED EQUAL

NOTES:

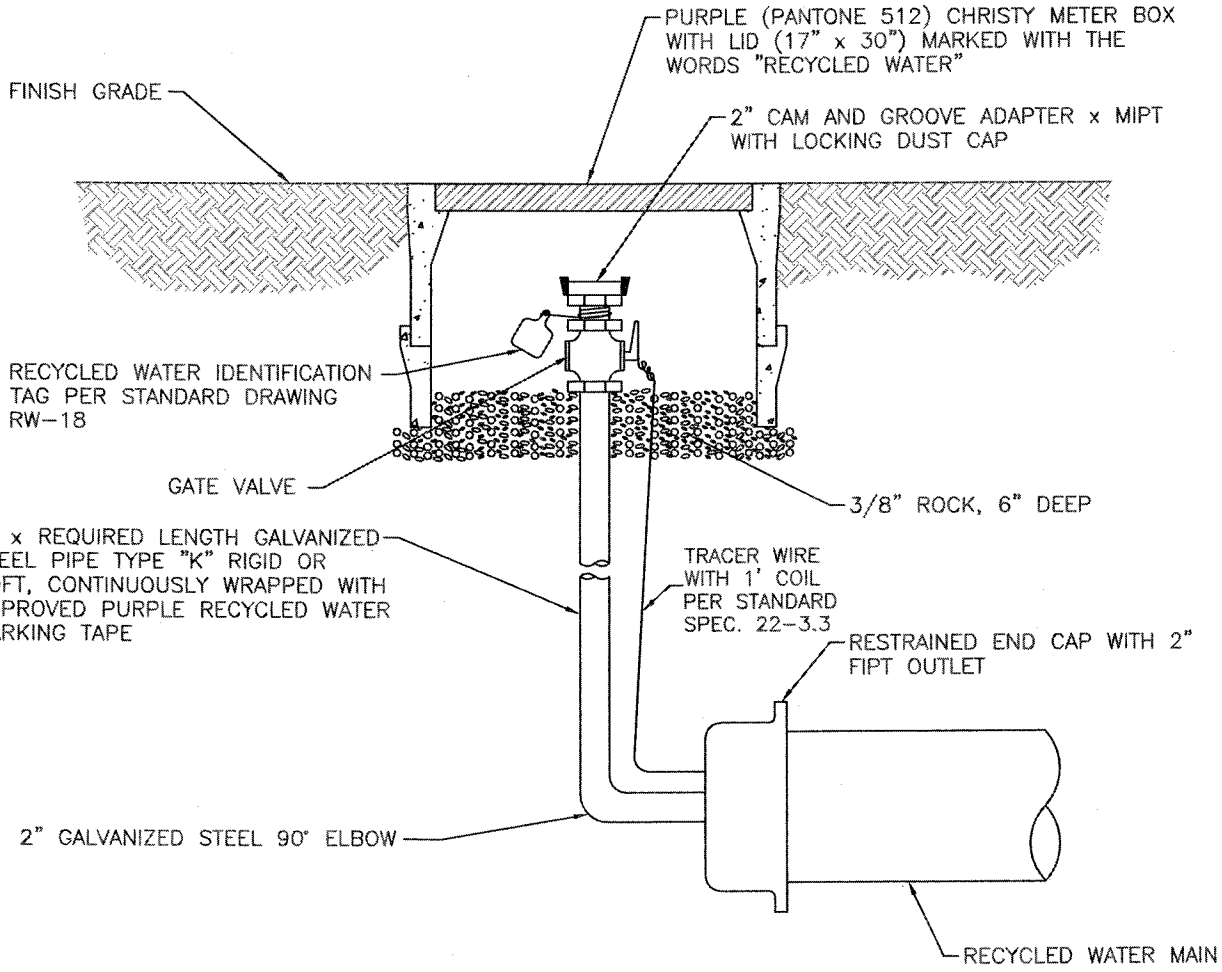
1. RECYCLED WATER SERVICES SHALL NOT BE ALLOWED IN DRIVE APPROACH AREAS AT ANY RESIDENTIAL OR COMMERCIAL LOCATION, UNLESS SPECIFICALLY APPROVED BY THE CITY ENGINEER
2. No. 37 "T" CAST IRON TRAFFIC COVER SHALL BE USED WHEN METER IS LOCATED IN ALLEYS OR DRIVE APPROACH AREAS, OR BEHIND ROLLED CURBS.
3. ALL COPPER FITTINGS SHALL BE CAMPAK COMPRESSION-TYPE.
4. POLYETHYLENE PIPE SHALL USE CAMPAK COMPRESSION-TYPE JOINTS WITH STAINLESS STEEL INSERT.
5. FOR 1½" SERVICE, METER BOX SHALL BE ARMORCAST OR APPROVED EQUAL. OLD CASTLE B30 BOX W/ CAST-IN CORNER BRACKETS ARMORCAST A6001969-COF LID FOR 1 ½" METER OR OLD CASTLE B36 BOX W/ CAST-IN CORNER BRACKETS & ARMORCAST A6001947T-COF LID FOR 2" METER.
6. FOR PVC RECYCLED WATER MAIN TAPS, SERVICE SADDLES WITH CIRCUMFERENTIAL TYPE BANDS SHAPED TO FIT THE ACTUAL O.D. OF THE PIPE AND HAVING A MINIMUM BEARING WIDTH OF 3" (1-1/2" PER BAND) SHALL BE USED. FOR DUCTILE AND CAST IRON MAINS USE BRONZE OR DUCTILE IRON SERVICE SADDLES, WITH BRONZE OR STAINLESS DOUBLE STRAPS.
7. RECYCLED WATER SERVICES SHALL BE LOCATED A MINIMUM OF 4' CLEAR OF POTABLE WATER SERVICES.



NOTES:

1. RECYCLED WATER SERVICE AND METER BOX INSTALLATION SHALL BE INSPECTED AND APPROVED BY CITY PRIOR TO SIDEWALK INSTALLATION.
2. RECYCLED WATER SERVICES SHALL BE LOCATED A MINIMUM OF 4' CLEAR OF POTABLE WATER SERVICES.
3. ALL MATERIALS SHALL BE AS NOTED OR CITY-APPROVED EQUAL.
4. ALL METER BOXES IN DIRT OR LANDSCAPE AREAS SHALL BE SET IN A 6" CONCRETE SLAB MEASURING AT LEAST 1' BEYOND METER BOX ON ALL SIDES.
5. RESTRAIN ALL JOINTS PER CITY STANDARD SPECIFICATIONS SECTION 21-15.5
6. RECYCLED WATER SERVICES SHALL NOT BE ALLOWED IN DRIVEWAY APPROACH AREAS AT ANY RESIDENTIAL OR COMMERCIAL LOCATION.

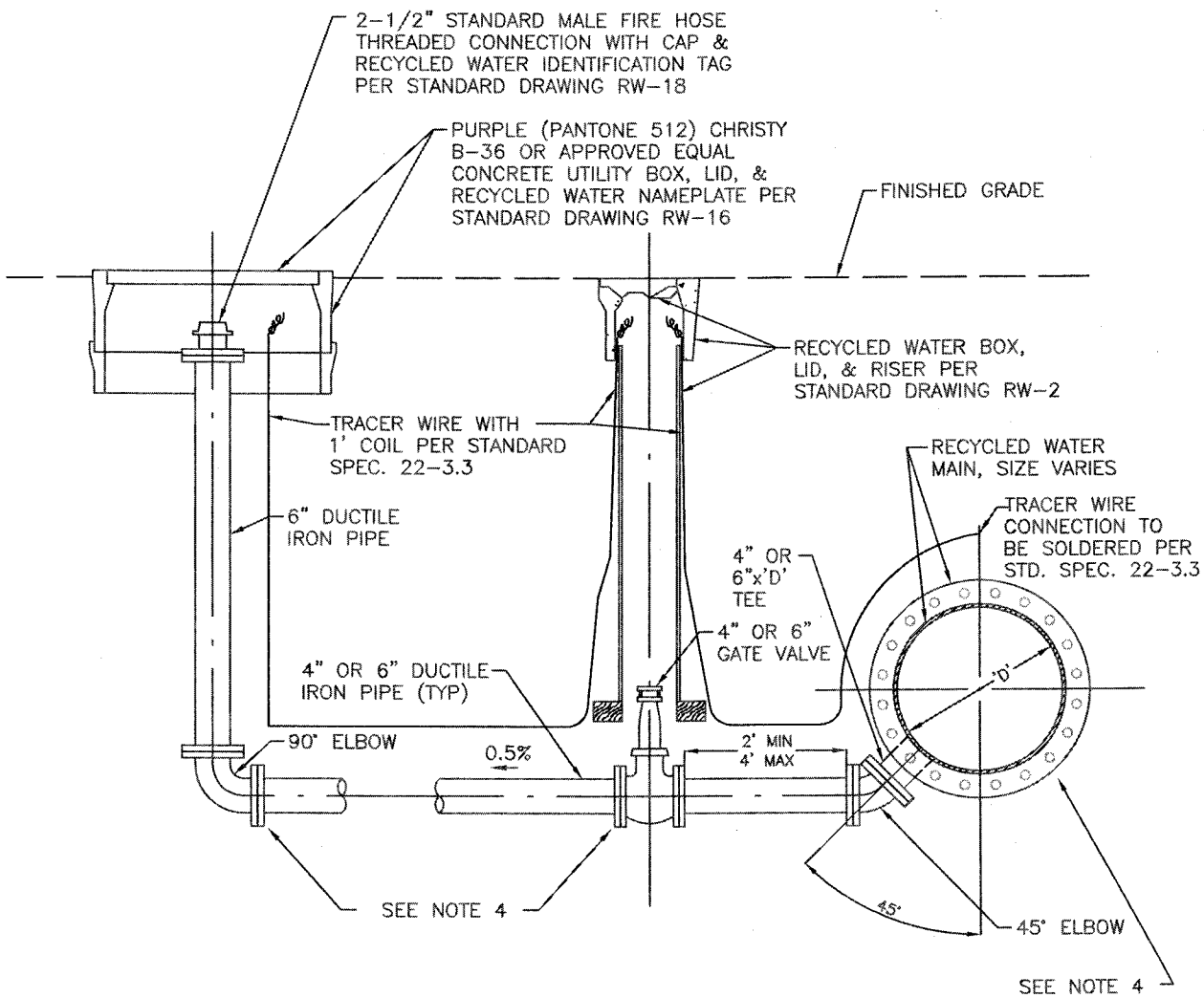
4" RECYCLED WATER SERVICE	REF. & REV. AUGUST 2015	CITY OF FRESNO RW-6



NOTES:

1. SET TOP OF METER BOX FLUSH WITH FINISH GRADE FOR ANY INSTALLATION IN THE CITY RIGHT OF WAY.
2. THE CONSTRUCTION OF A TEMPORARY BLOW-OFF FOR THE USE OF TESTING AND FLUSHING OF NEW RECYCLED WATER MAINS ONLY.
3. RESTRAIN ALL JOINTS PER CITY STANDARD SPECIFICATIONS SECTION 21-15.5

TEMPORARY 2" RECYCLED WATER BLOW-OFF	REF. & REV. AUGUST 2015	CITY OF FRESNO RW-7



NOTES:

1. ALL FITTINGS SHALL BE SECURED WITH FLANGE CONNECTION, HARNESSES OR TIE-RODS AS APPLICABLE.
2. PLACE VALVES AND BLOW-OFFS OUTSIDE SIDEWALK AND DRIVEWAY AREAS.
3. ALL RISERS SHALL BE FLANGED, 6" DIAMETER.
4. RESTRAIN ALL JOINTS PER CITY STANDARD SPECIFICATIONS SECTION 21-15.5

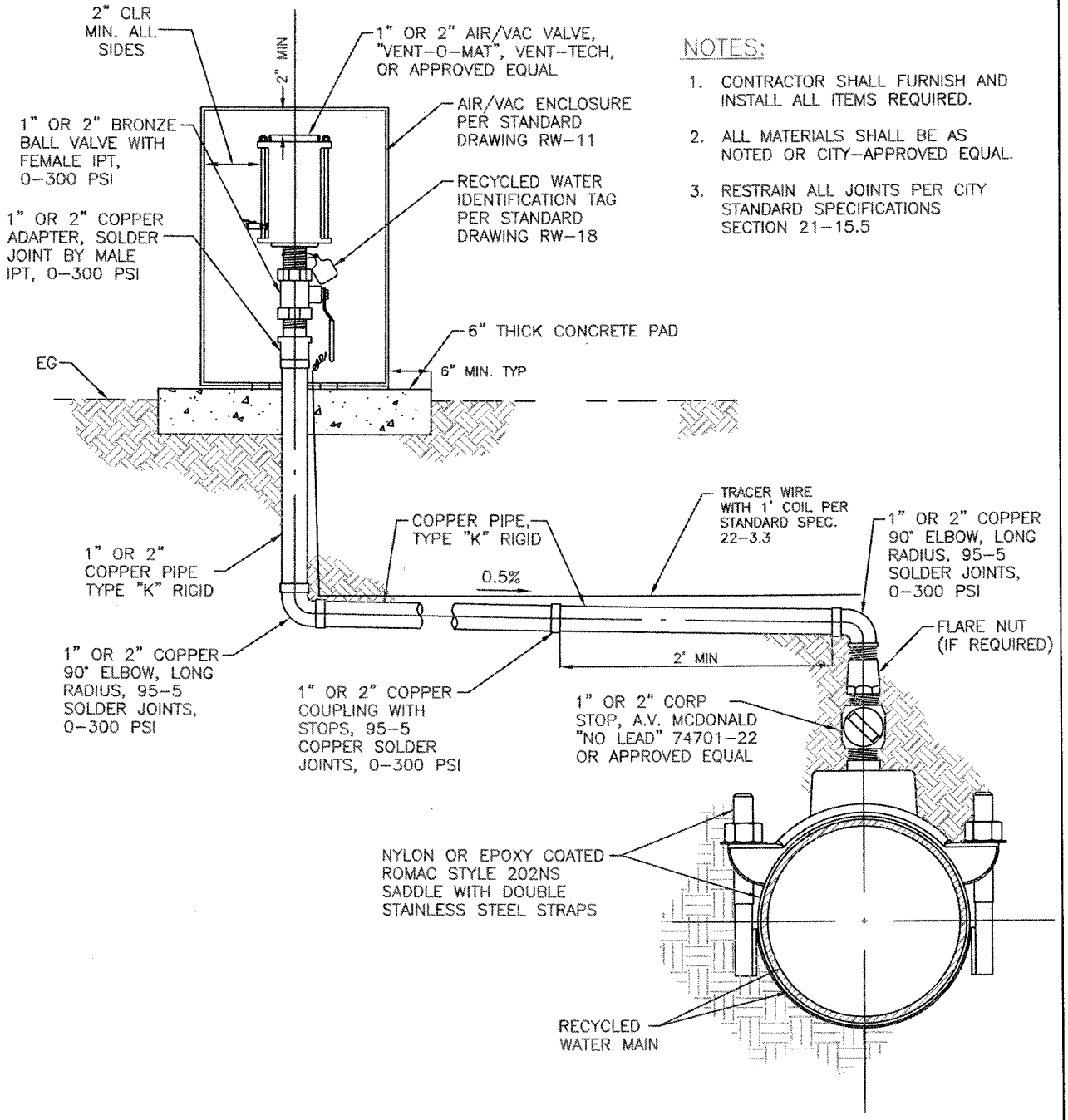
BLOW-OFF PIPE SIZE SCHEDULE	
MAIN	BLOW-OFF
6"	4"
8"	4"
10"	4"
12"	6"
14"	6"
16"	6"
18"	6"
24"	6"
30"	6"

RECYCLED WATER BLOW-OFF ASSEMBLY

REF. & REV. AUGUST 2015

CITY OF FRESNO

RW-8



NOTES:

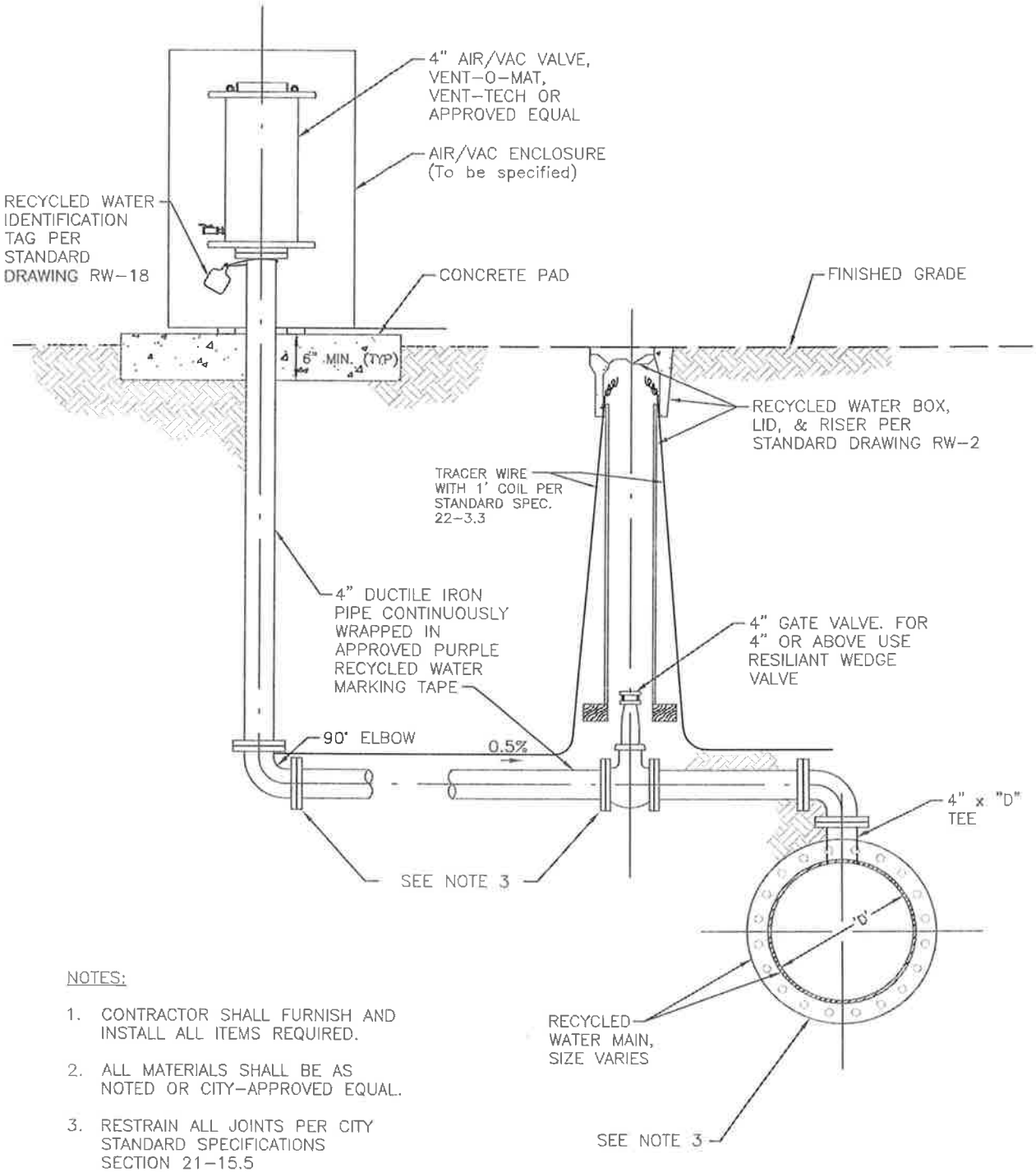
1. CONTRACTOR SHALL FURNISH AND INSTALL ALL ITEMS REQUIRED.
2. ALL MATERIALS SHALL BE AS NOTED OR CITY-APPROVED EQUAL.
3. RESTRAIN ALL JOINTS PER CITY STANDARD SPECIFICATIONS SECTION 21-15.5

RECYCLED WATER 1" OR 2" AIR RELEASE/VACUUM BREAKER STATION

REF. & REV. AUGUST 2015

CITY OF FRESNO

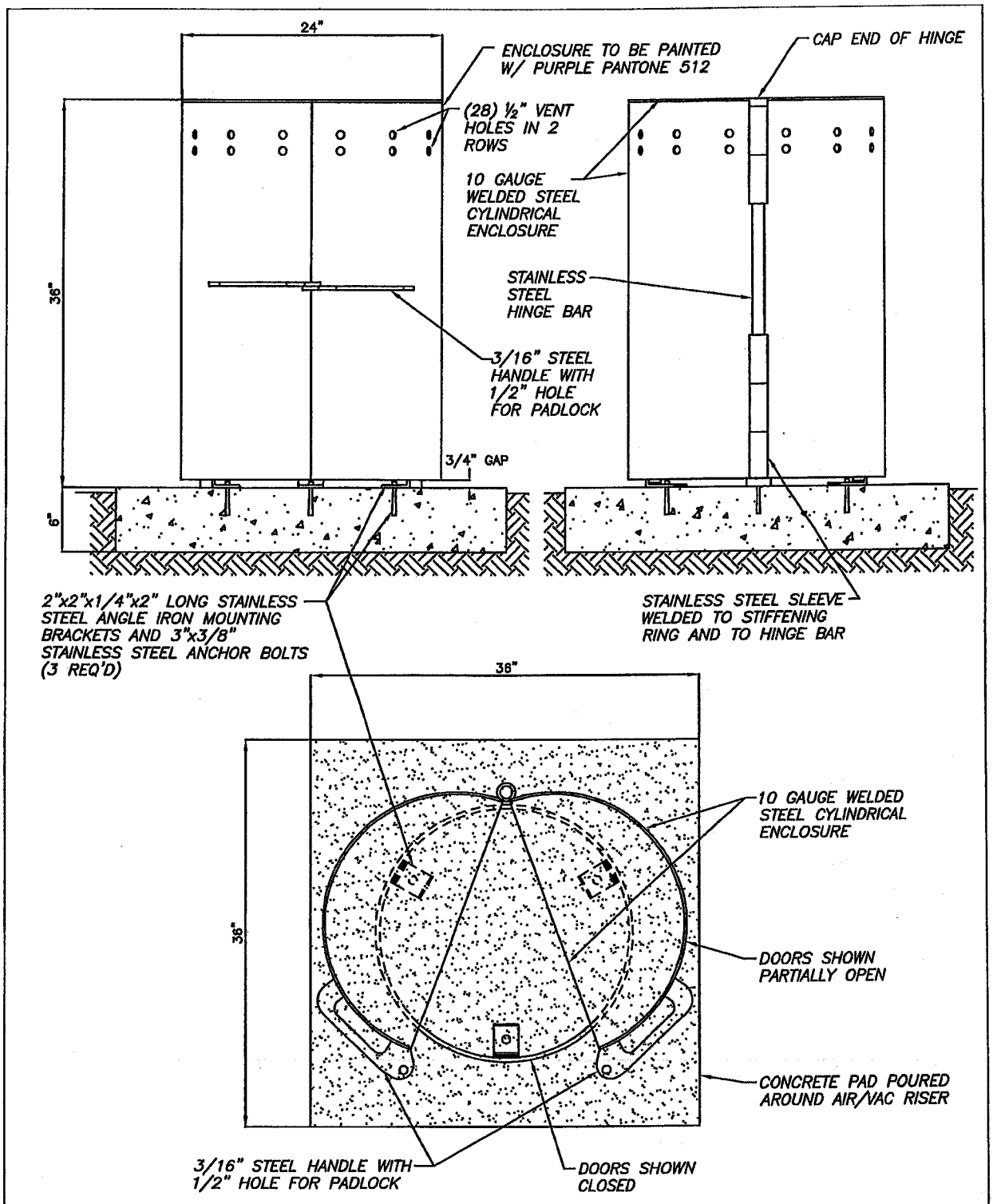
RW-9



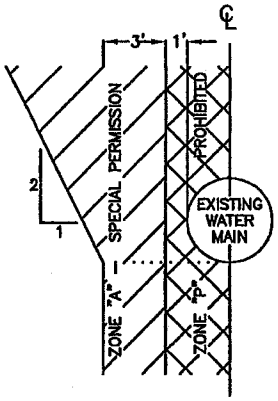
NOTES:

1. CONTRACTOR SHALL FURNISH AND INSTALL ALL ITEMS REQUIRED.
2. ALL MATERIALS SHALL BE AS NOTED OR CITY-APPROVED EQUAL.
3. RESTRAIN ALL JOINTS PER CITY STANDARD SPECIFICATIONS SECTION 21-15.5

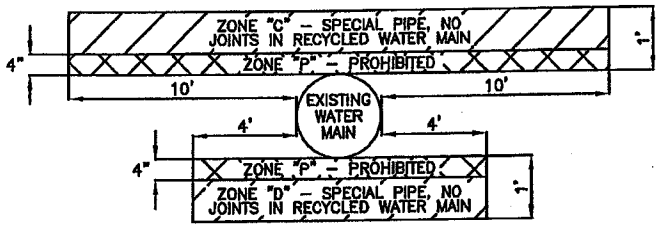
RECYCLED WATER 4" AIR RELEASE/ VACUUM BREAKER STATION	REF. & REV. AUGUST 2015	CITY OF FRESNO RW-10



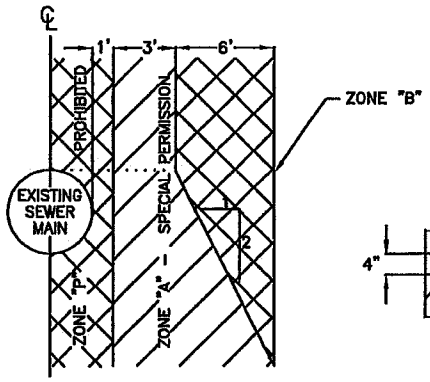
1" OR 2" AIR RELEASE/ VACUUM BREAKER VALVE ENCLOSURE	REF. & REV. JUNE 2014	CITY OF FRESNO RW-11



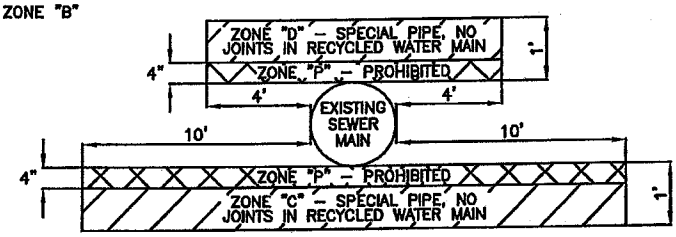
RECYCLED WATER MAIN PARALLEL TO POTABLE WATER MAINS



RECYCLED WATER MAIN CROSSING POTABLE WATER MAINS



RECYCLED WATER MAIN PARALLEL TO SEWER MAINS



RECYCLED WATER MAIN CROSSING SEWER MAINS

SPECIAL CONSTRUCTION REQUIRED FOR RECYCLED WATER

ZONE:

"A" NO RECYCLED WATER LINES PARALLEL TO WATER MAINS SHALL BE PERMITTED IN THIS ZONE WITHOUT PRIOR WRITTEN APPROVAL FROM COUNTY, CALIFORNIA DEPARTMENT OF PUBLIC HEALTH AND THE CITY.

"B" RECYCLED WATER MAIN SHALL BE CONSTRUCTED OF:
1. DUCTILE IRON PIPE WITH HOT DIP BITUMINOUS COATING.
2. DIPPED AND WRAPPED 1/4" THICK WELDED STEEL PIPE.
3. CLASS 305 PRESSURE RATED PLASTIC WATER PIPE (DR 14 PER AWWA C900) OR EQUIVALENT.
4. REINFORCED CONCRETE PRESSURE PIPE, STEEL CYLINDER TYPE, PER AWWA (C300 OR C302 OR C303).

"C" A RECYCLED WATER MAIN SHALL BE CONSTRUCTED OF:
1. DUCTILE IRON PIPE WITH HOT DIP BITUMINOUS COATING.
2. DIPPED AND WRAPPED 1/4" THICK WELDED STEEL PIPE.
3. CLASS 305 PRESSURE RATED PLASTIC WATER PIPE (DR 14 PER AWWA C900) OR EQUIVALENT.
4. REINFORCED CONCRETE PRESSURE PIPE, STEEL CYLINDER TYPE PER AWWA (C300 OR C302 OR C303).

"D" A RECYCLED WATER MAIN SHALL BE CONSTRUCTED OF:
1. DUCTILE IRON PIPE WITH HOT DIP BITUMINOUS COATING.
2. DIPPED AND WRAPPED 1/4" WELDED STEEL PIPE.
3. CLASS 200 PRESSURE RATED PLASTIC WATER PIPE (DR 14 PER AWWA C900) OR EQUIVALENT.
4. REINFORCED CONCRETE PRESSURE PIPE STEEL CYLINDER TYPE, PER AWWA (C300 OR C302 OR C303).

"P" NO RECYCLED WATER MAIN SHALL BE CONSTRUCTED

BASIC SEPARATION STANDARDS

1. SEPARATION DISTANCE SHALL BE MEASURED FROM THE NEAREST OUTSIDE EDGE OF PIPE.

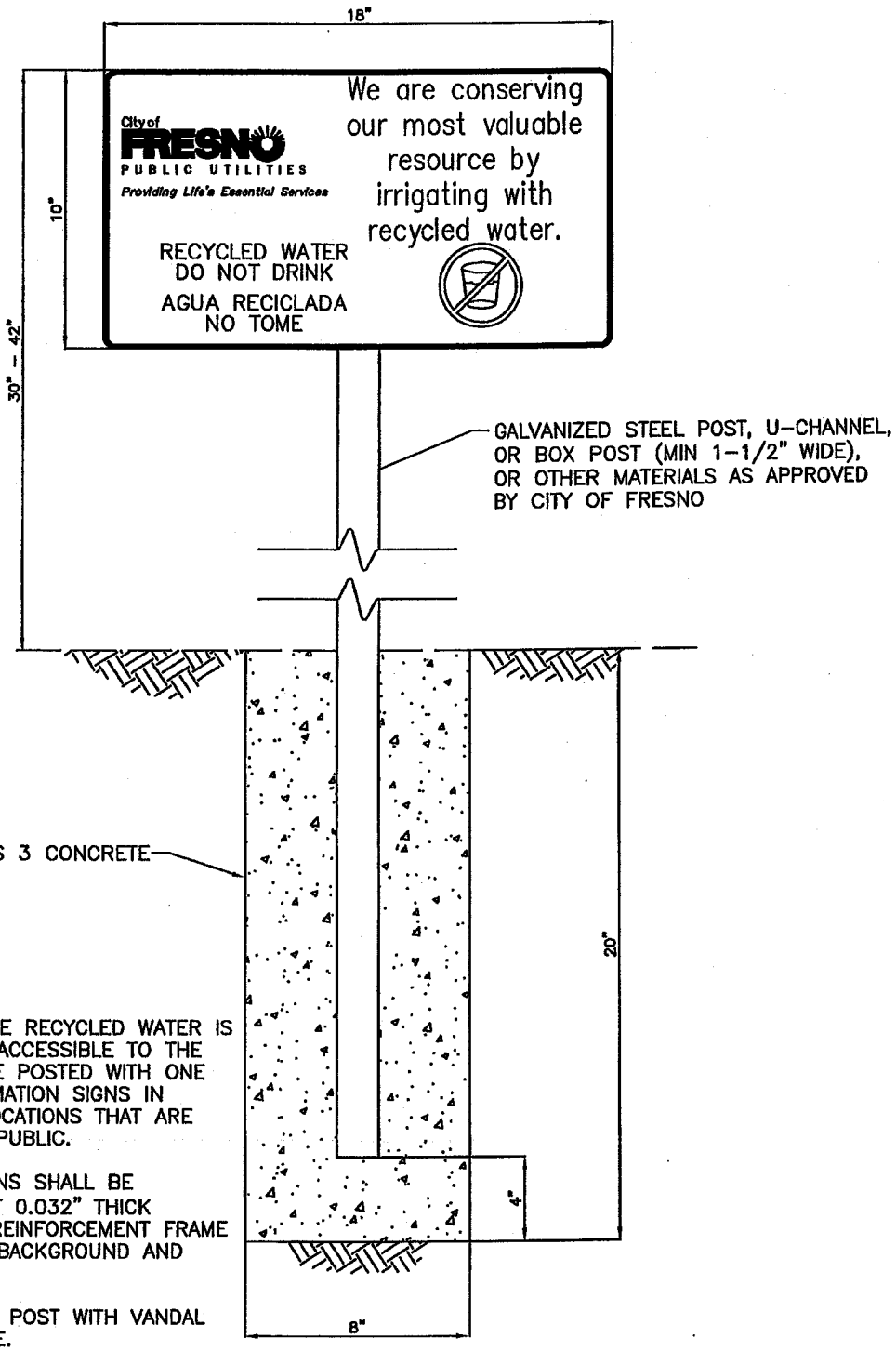
2. WATER MAINS AND SUPPLY LINES OF 24" DIAMETER OR GREATER MAY CREATE SPECIAL HAZARDS BECAUSE OF THE LARGE VOLUMES OF FLOW. INSTALLATIONS OF WATER MAINS AND SUPPLY LINES 24" DIAMETER OR LARGER MUST BE REVIEWED AND APPROVED BY THE HEALTH AGENCY AND CITY ENGINEER PRIOR TO CONSTRUCTION.

RECYCLED WATER MAIN SEPARATION REQUIREMENTS

REF. & REV. JUNE 2014

CITY OF FRESNO

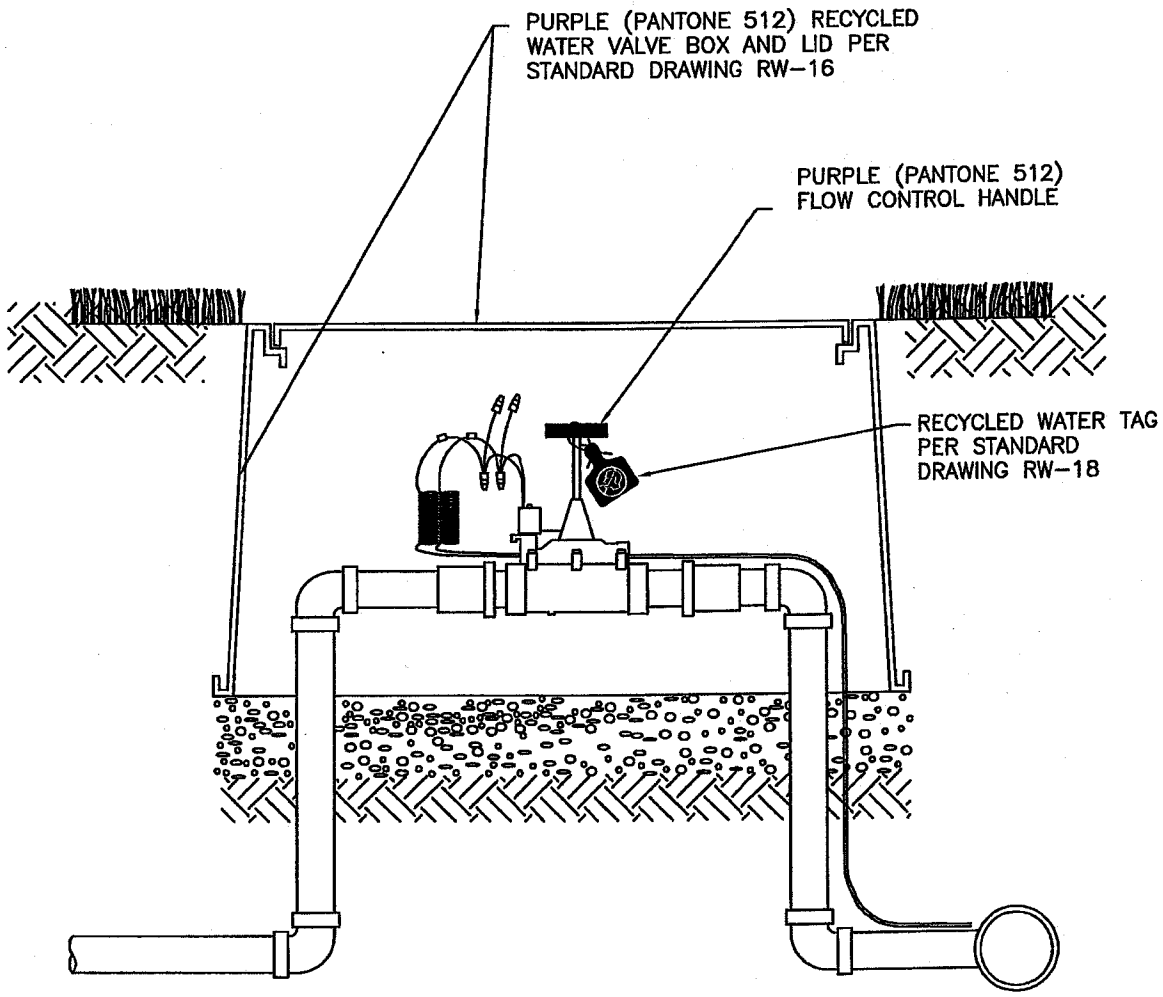
RW–12



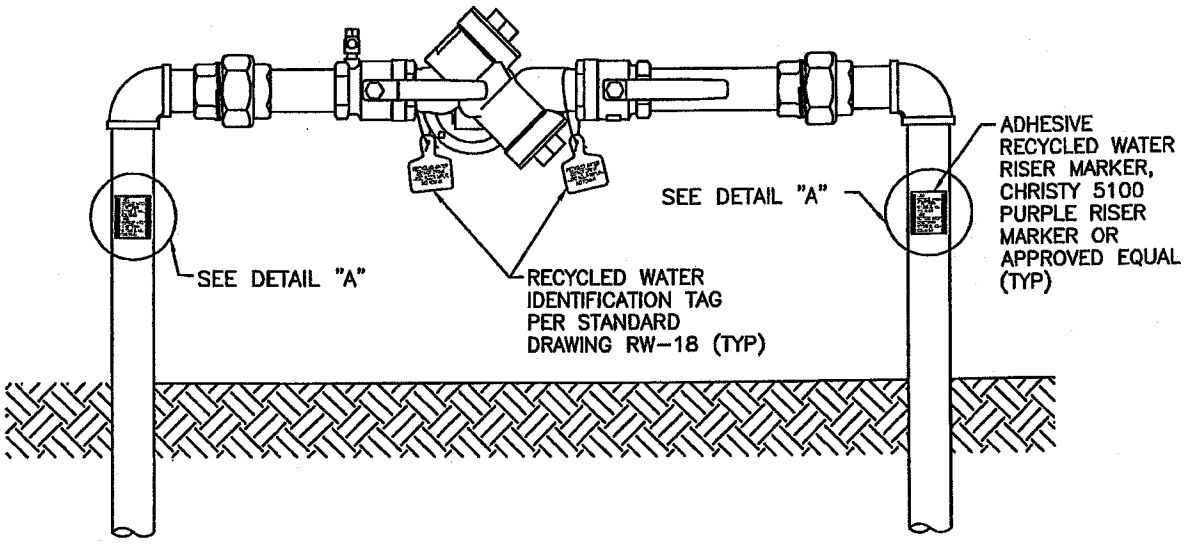
NOTES:

1. ALL AREAS WHERE RECYCLED WATER IS USED THAT ARE ACCESSIBLE TO THE PUBLIC SHALL BE POSTED WITH ONE OR MORE INFORMATION SIGNS IN CONSPICUOUS LOCATIONS THAT ARE VISIBLE TO THE PUBLIC.
2. INFORMATION SIGNS SHALL BE CONSTRUCTED OF 0.032" THICK ALUMINUM AND REINFORCEMENT FRAME WITH A PURPLE BACKGROUND AND WHITE LETTERING.
3. SECURE SIGN TO POST WITH VANDAL PROOF HARDWARE.

RECYCLED WATER IRRIGATION INFORMATION SIGN	REF. & REV. JUNE 2014	CITY OF FRESNO RW-13



RECYCLED WATER REMOTE CONTROL IRRIGATION VALVE IDENTIFICATION	REF. & REV. JUNE 2014	CITY OF FRESNO RW-14



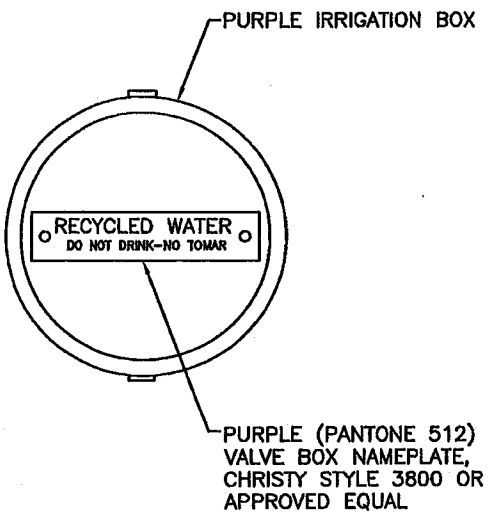
DETAIL "A"

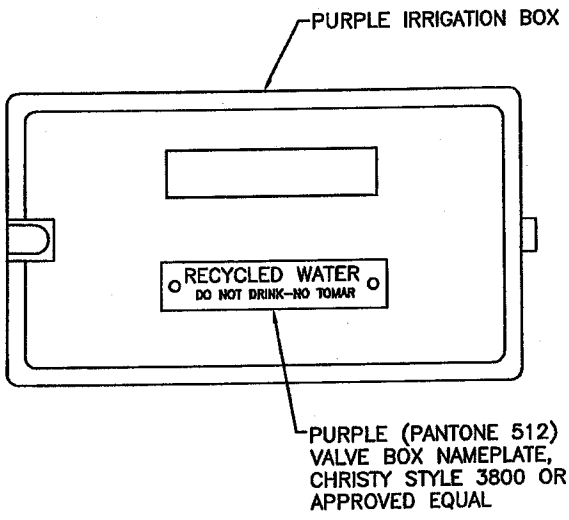
RECYCLED WATER BACKFLOW PREVENTER IDENTIFICATION

REF. & REV.
JUNE 2014

CITY OF FRESNO

RW-15

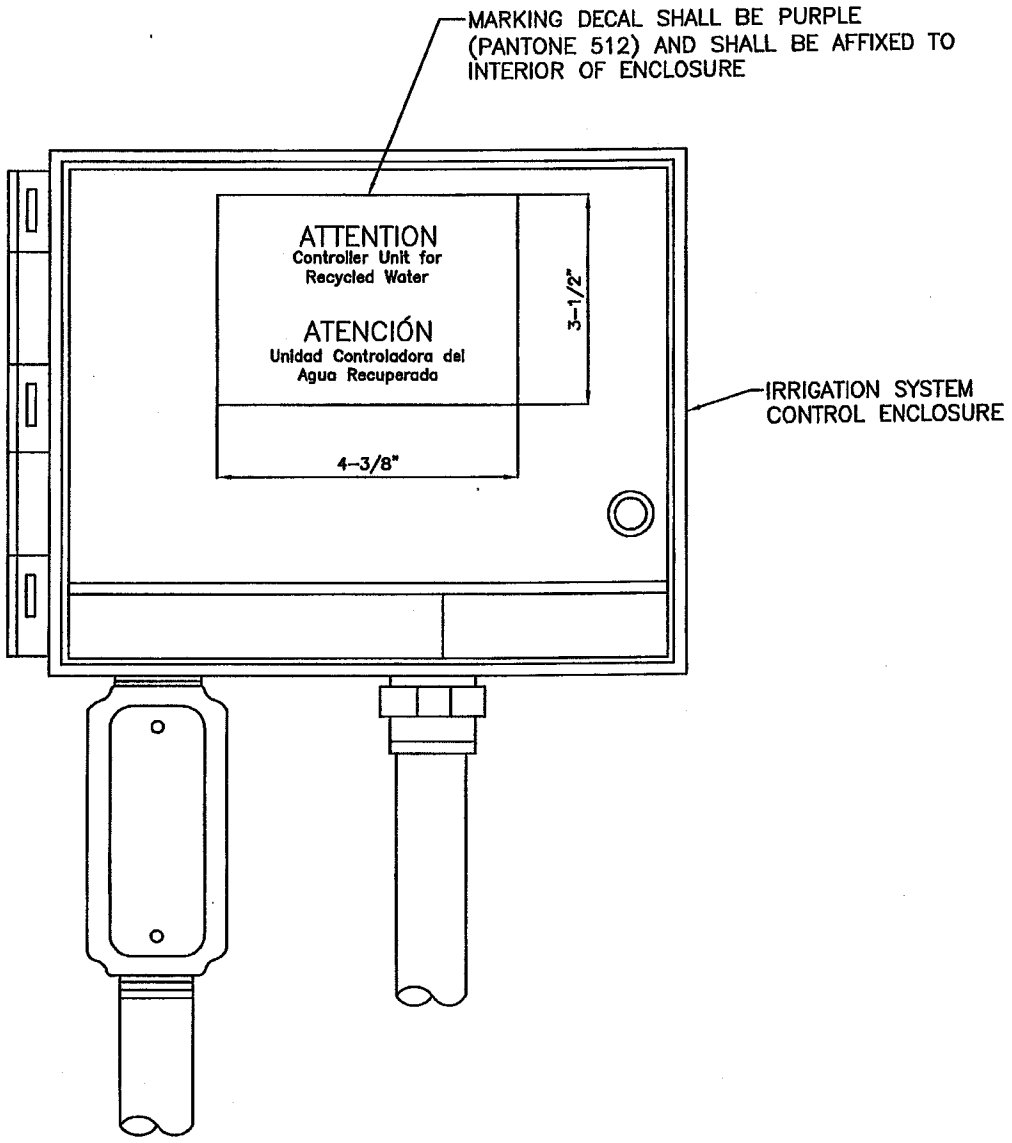




NOTES:

1. ALL RECYCLED WATER IRRIGATION BOXES AND LIDS SHALL BE COLORED PURPLE (PANTONE 512).
2. NAMEPLATE SHALL BE 5.75" LONG AND 1.25" WIDE AND SHALL BE MANUFACTURED IN PURPLE, WITH A UV RESISTANT CO–POLYMER PLASTIC.
3. NAMEPLATE SHALL BE ATTACHED TO VALVE BOX WITH TWO TAMPER–PROOF RIVETS.

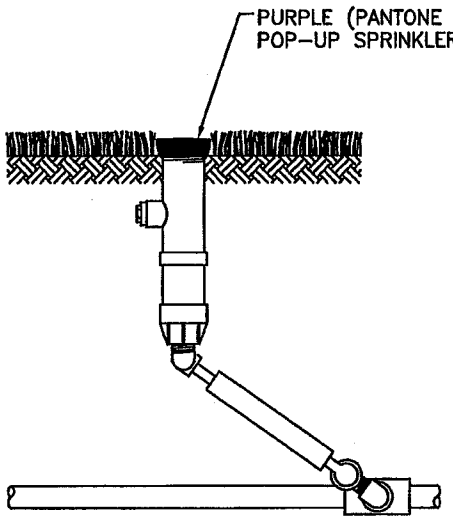
RECYCLED WATER IRRIGATION BOX COVER MARKINGS	REF. & REV. JUNE 2014	CITY OF FRESNO RW–16



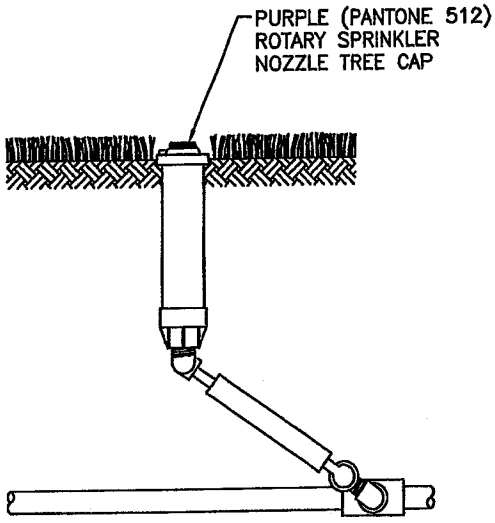
NOTES:

1. ALL RECYCLED WATER IRRIGATION CONTROL ENCLOSURES SHALL BE IDENTIFIED WITH A MARKING DECAL.
2. MARKING DECAL SHALL BE BACKED WITH A PERMANENT ACRYLIC ADHESIVE.
3. MARKING DECAL SHALL BE CHRISTY STYLE 4100, OR APPROVED EQUAL.

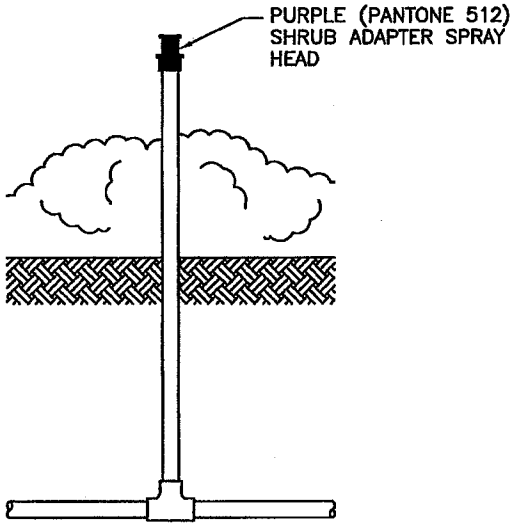
RECYCLED WATER IRRIGATION SYSTEM CLOCK MARKING	REF. & REV. JUNE 2014	CITY OF FRESNO RW-17



POP-UP SPRINKLER



ROTARY SPRINKLER



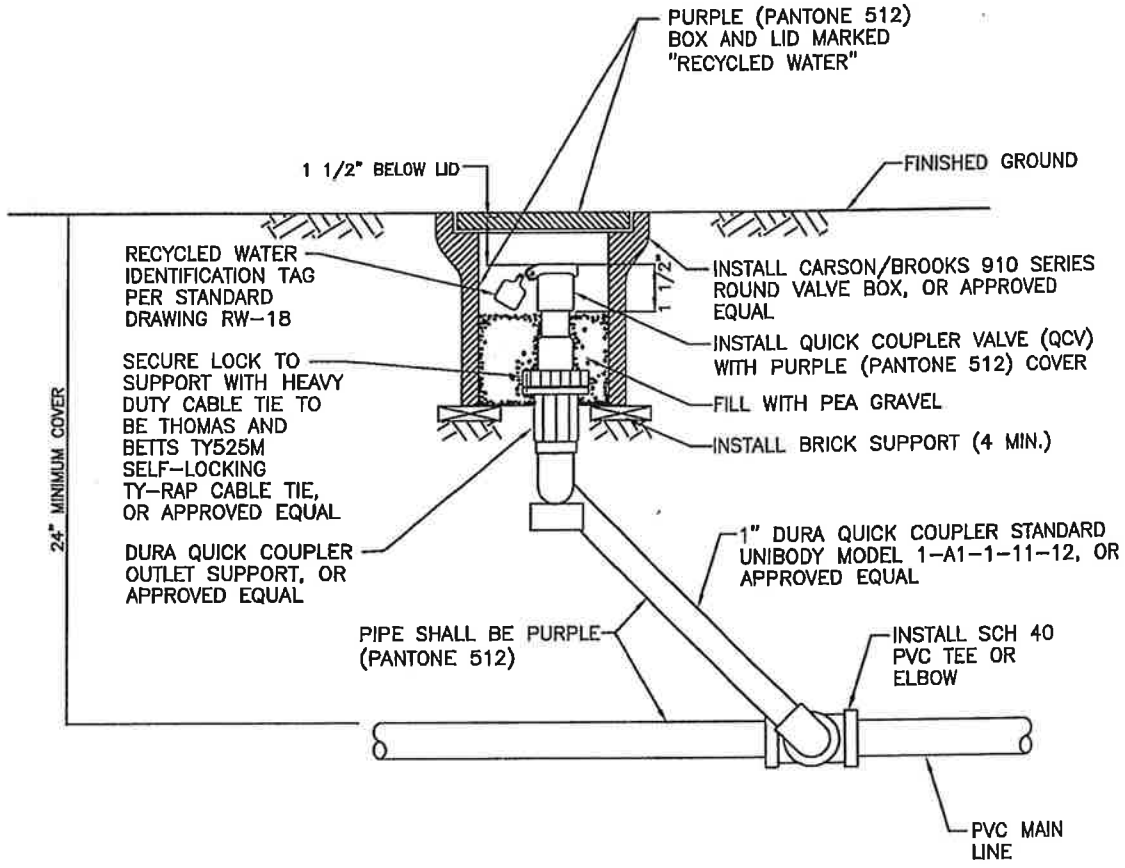
SHRUB RISER SPRINKLER

RECYCLED WATER LANDSCAPE IRRIGATION HEAD IDENTIFICATION

REF. & REV.
JUNE 2014

CITY OF FRESNO

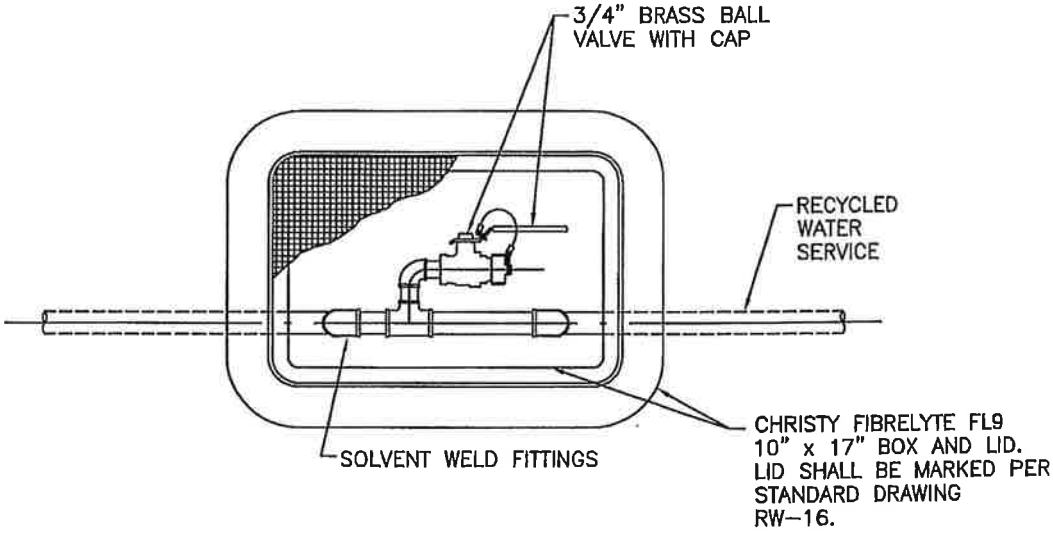
RW-19

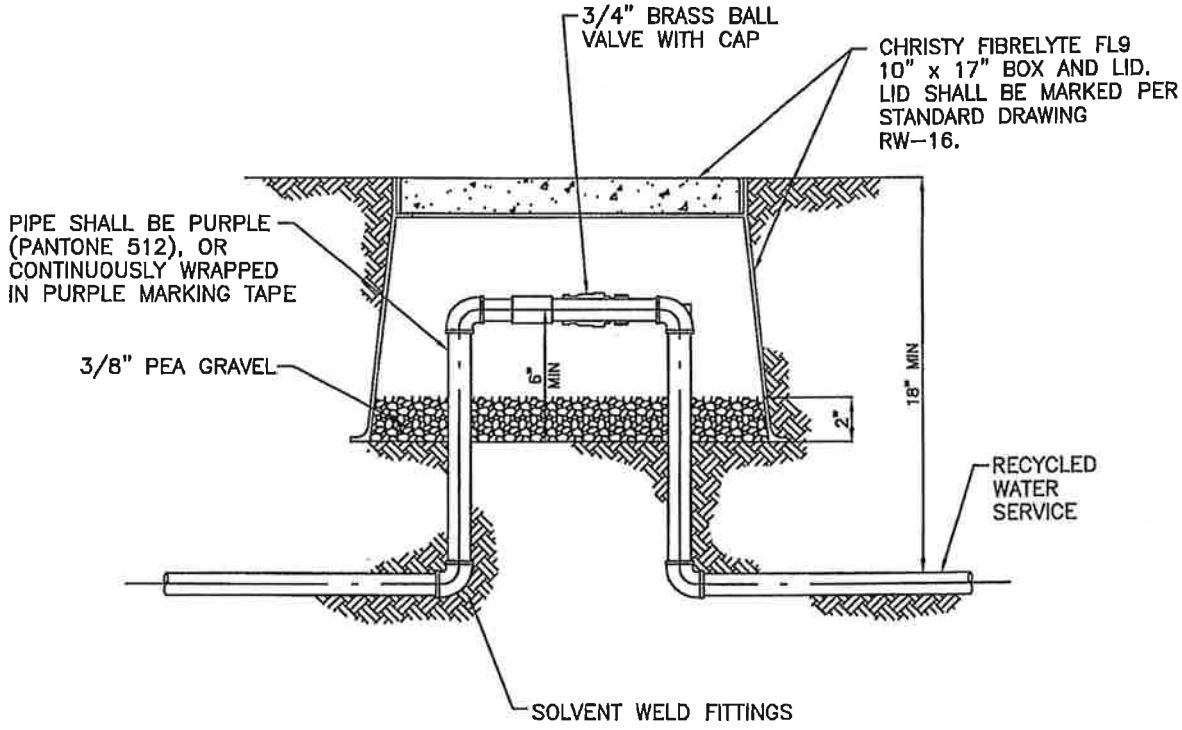


NOTES:

1. NEW-CONSTRUCTION – ALL QUICK COUPLING VALVES MUST HAVE NON-POTABLE LOCKING PURPLE THERMOPLASTIC RUBBER COVERS.
2. RETROFITS – REPLACE ALL EXISTING QUICK COUPLING VALVES WITH NON-POTABLE LOCKING PURPLE THERMOPLASTIC RUBBER COVERS.

QUICK COUPLING VALVE	REF. & REV. JUNE 2014	CITY OF FRESNO RW-20



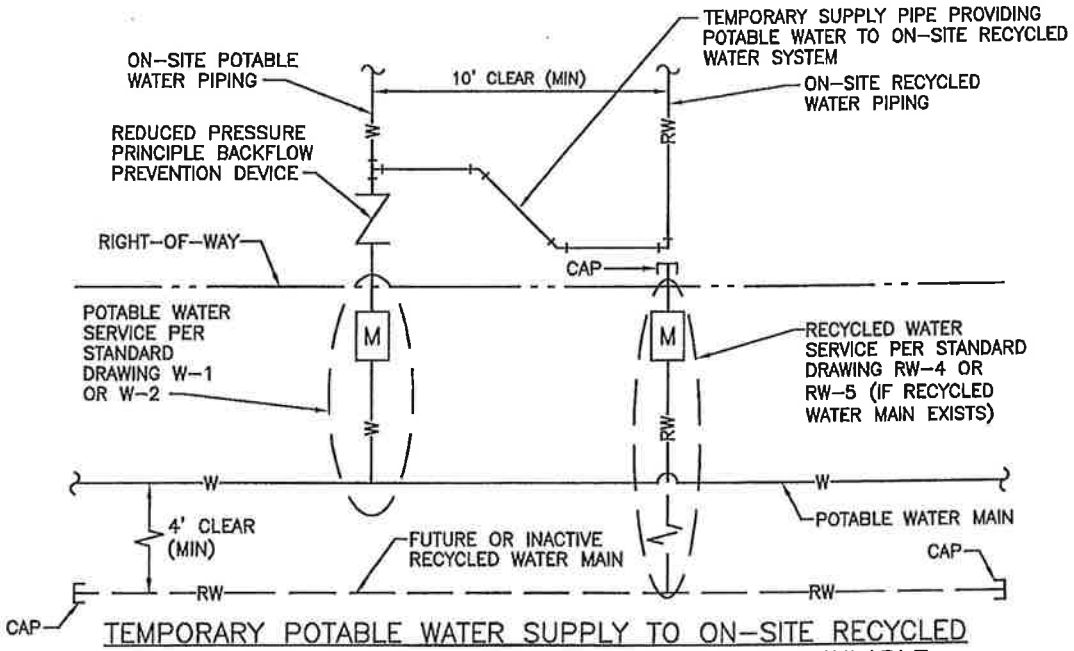


CROSS CONNECTION CONTROL TEST STATION

REF. & REV. JUNE 2014

CITY OF FRESNO

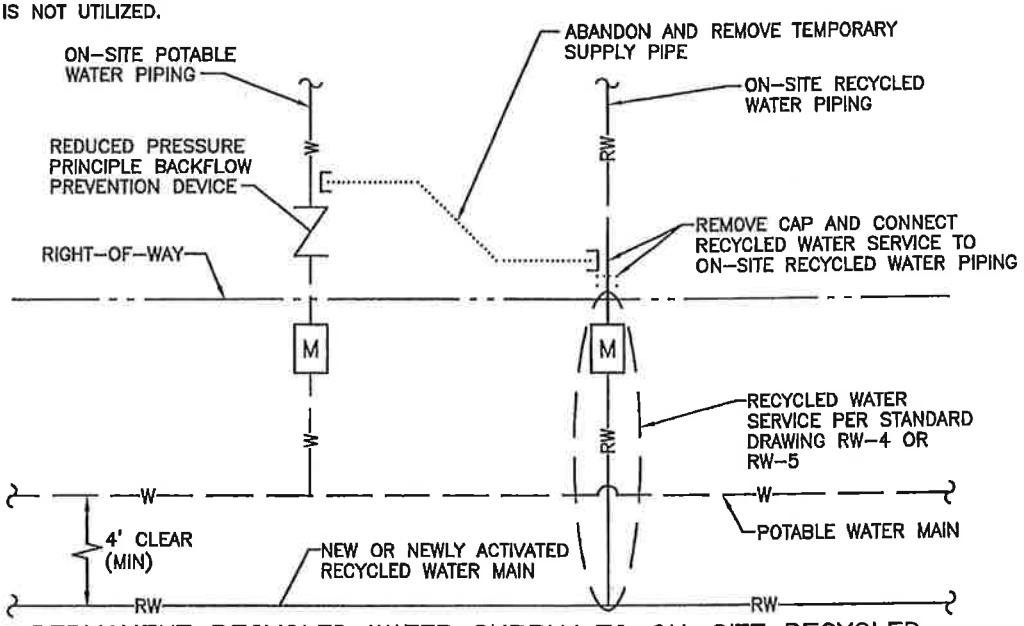
RW-21



TEMPORARY POTABLE WATER SUPPLY TO ON-SITE RECYCLED WATER SYSTEM BEFORE RECYCLED WATER IS AVAILABLE

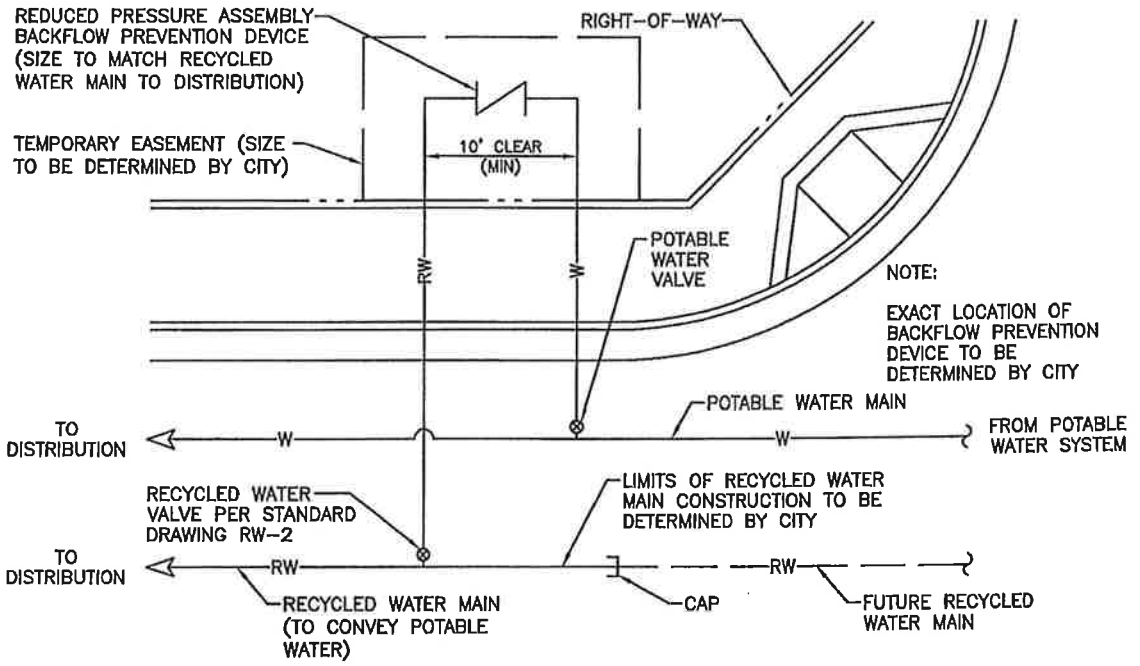
NOTE:

THIS STANDARD DRAWING IS ONLY USED WHEN STANDARD DRAWING RW-23 IS NOT UTILIZED.

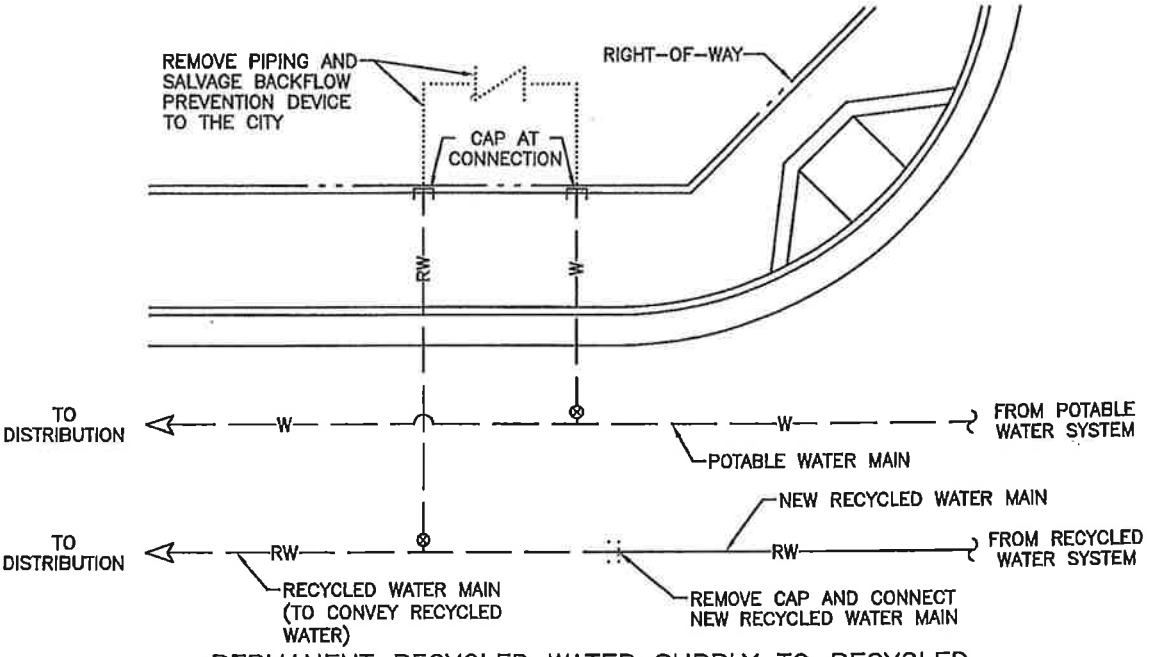


PERMANENT RECYCLED WATER SUPPLY TO ON-SITE RECYCLED WATER SYSTEM AFTER RECYCLED WATER IS AVAILABLE

TEMPORARY POTABLE WATER SUPPLY TO ON-SITE RECYCLED WATER SYSTEM	REF. & REV. JUNE 2014	CITY OF FRESNO RW-22



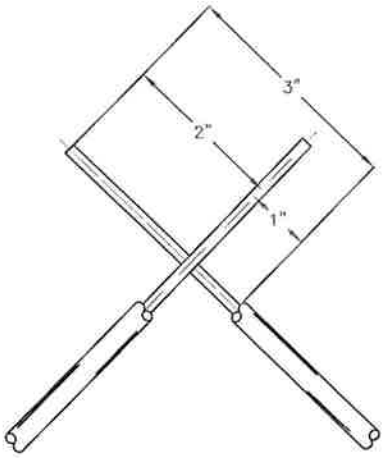
TEMPORARY POTABLE WATER SUPPLY TO RECYCLED WATER SYSTEM BEFORE RECYCLED WATER IS AVAILABLE

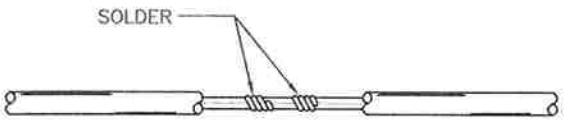


PERMANENT RECYCLED WATER SUPPLY TO RECYCLED WATER SYSTEM AFTER RECYCLED WATER IS AVAILABLE

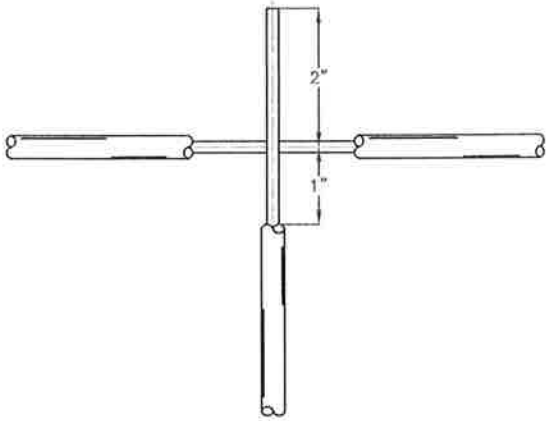
TEMPORARY POTABLE WATER SUPPLY TO RECYCLED WATER SYSTEM	REF. & REV. JUNE 2014	CITY OF FRESNO RW-23

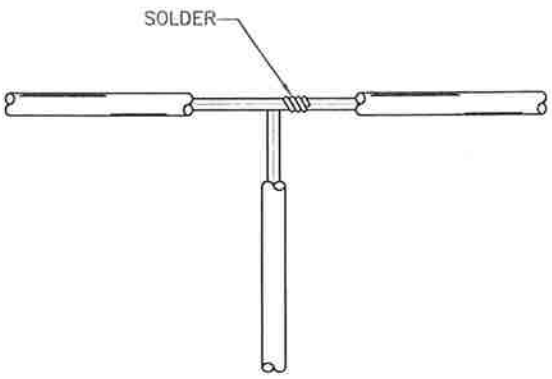
IN–LINE CONNECTION





BRANCH CONNECTION





NOTES:

1. STRIP THE INSULATION FROM THE WIRE AS SHOWN IN THE DRAWING, BUT DO NOT CUT THE COPPER WIRE.
2. LOOP THE WIRE ENDS A MINIMUM OF (4) TIMES FOR EACH WIRE OF THE CONNECTION.
3. USING A PROPANE TORCH, APPLY THE FLAME DIRECTLY TO THE JOINT (LOOPS) TO BE SOLDERED.
4. APPLY 62SN OR EQUIVALENT ROSIN CORE SOLDER TO THE SPLICE. SOLDER SHOULD FLOW INTO THE JOINT.
5. COVER ALL BARE COPPER WIRE WITH A WATERPROOF WRAP THAT IS APPROVED FOR UNDERGROUND CONNECTIONS. THE WRAP MUST EXTEND A MINIMUM OF TWO INCHES (2") BEYOND THE END OF THE STRIPPED WIRE.
6. ALL WIRE MUST BE 12 GAUGE COPPER WIRE.

TRACER WIRE SPLICE CONNECTION DETAIL

REF. & REV.
AUGUST 2015

CITY OF FRESNO

RW–24