STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

2009 Edition

Written And Promulgated By

Public Works Standards, Inc.

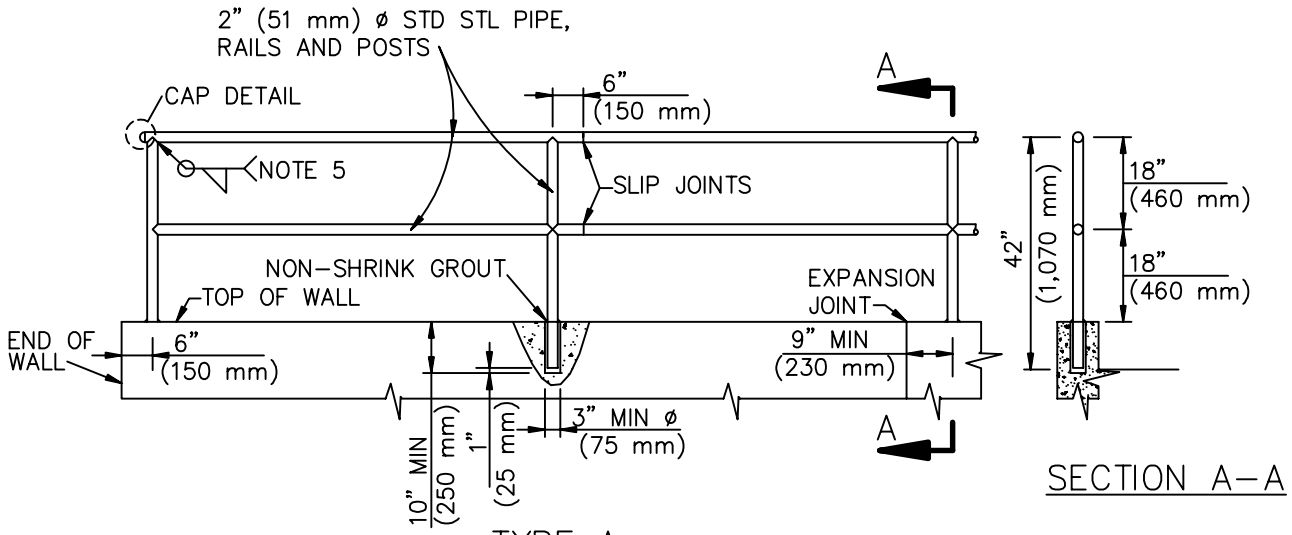
Published By

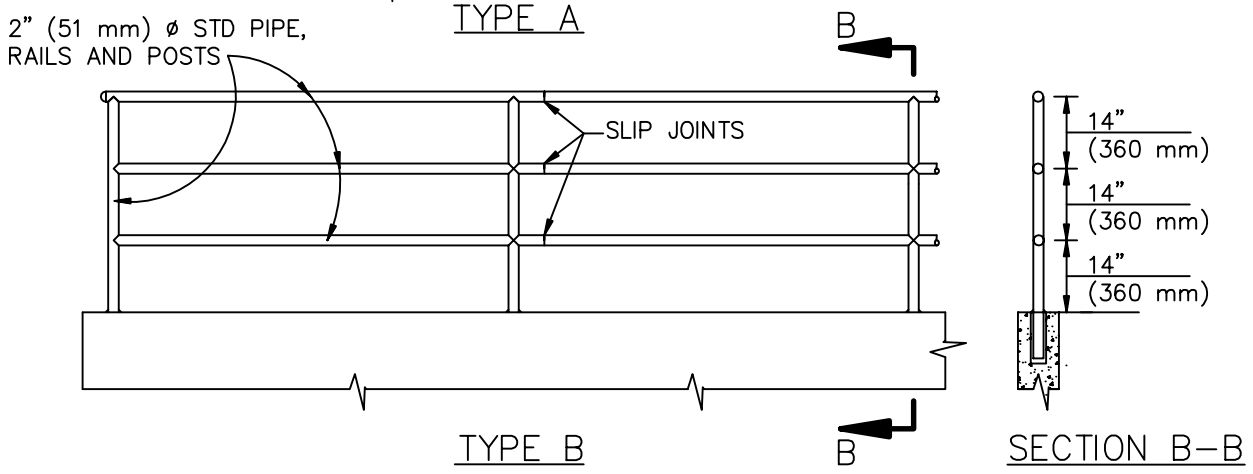
BNi Building News

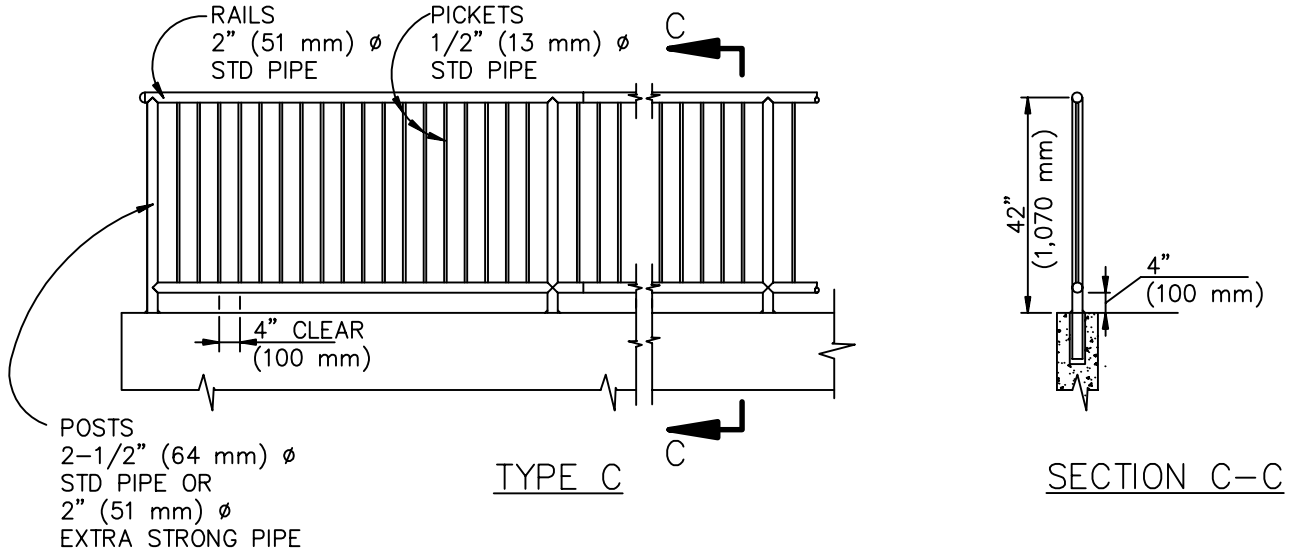
Division of BNi Publications, Inc.

990 Park Center Drive, Suite E, Vista, CA 92081

1-760-734-1113







ELEVATION

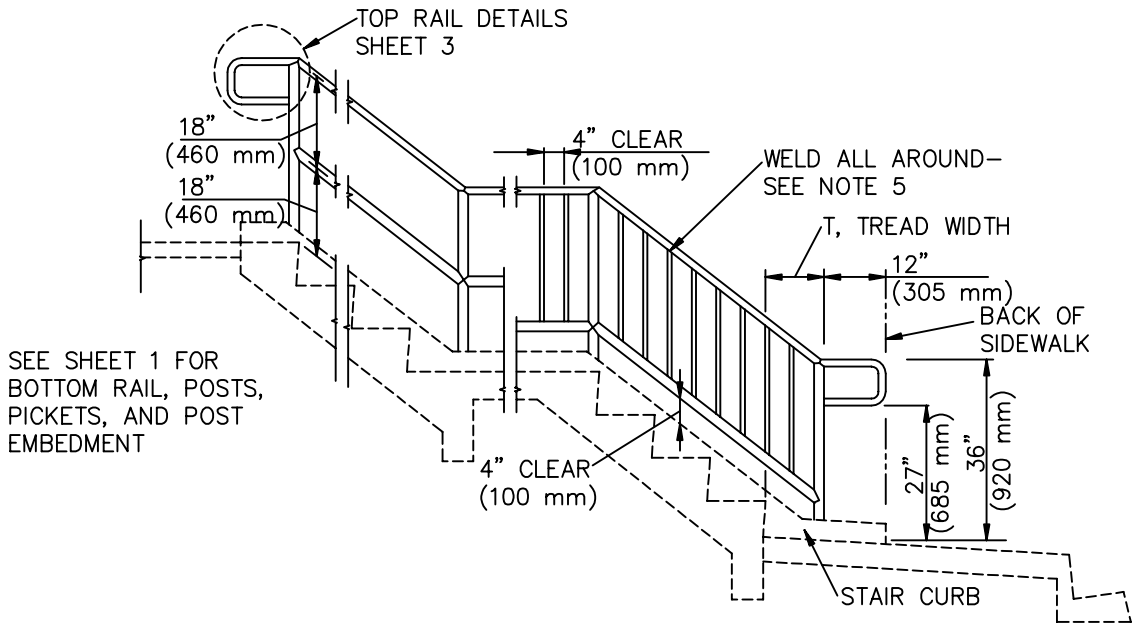
STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE
PUBLIC WORKS STANDARDS INC.
GREENBOOK COMMITTEE
1993
REV. 1996, 2005, 2009

METAL HAND RAILINGS

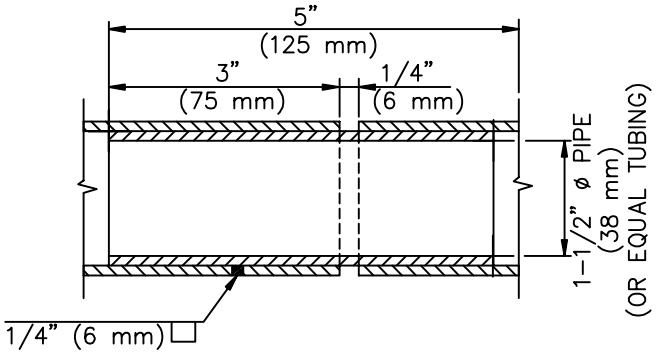
USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN
606-3
SHEET 1 OF 3

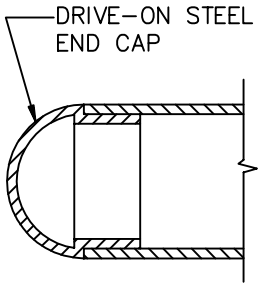


TYPE A TYPE C

HANDRAIL INSTALLATION ON STAIRWAYS



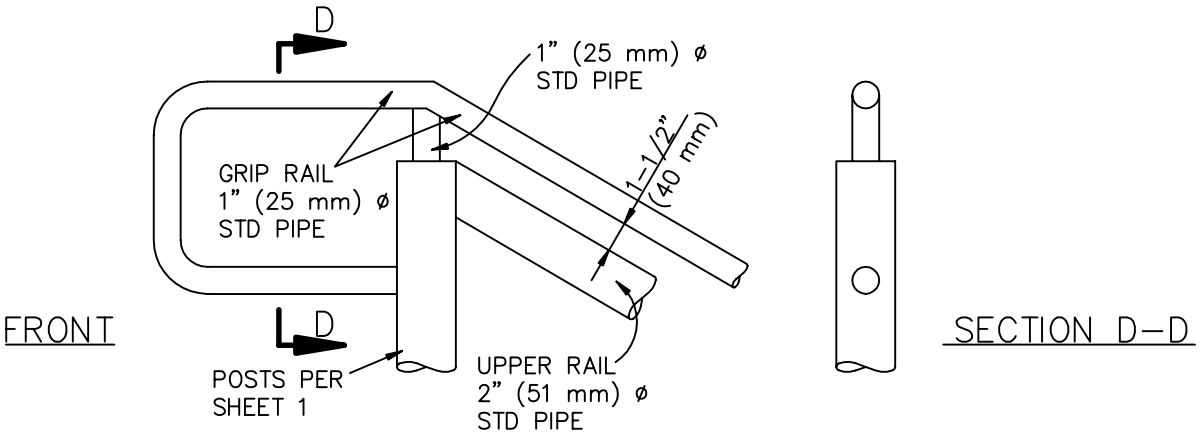
SLIP JOINT DETAIL



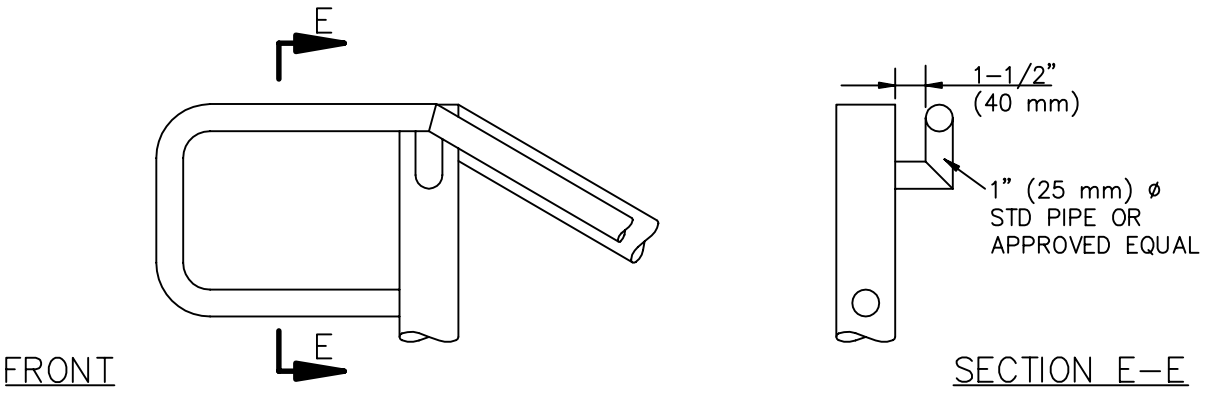
CAP DETAIL FOR RAIL END

NOTES:

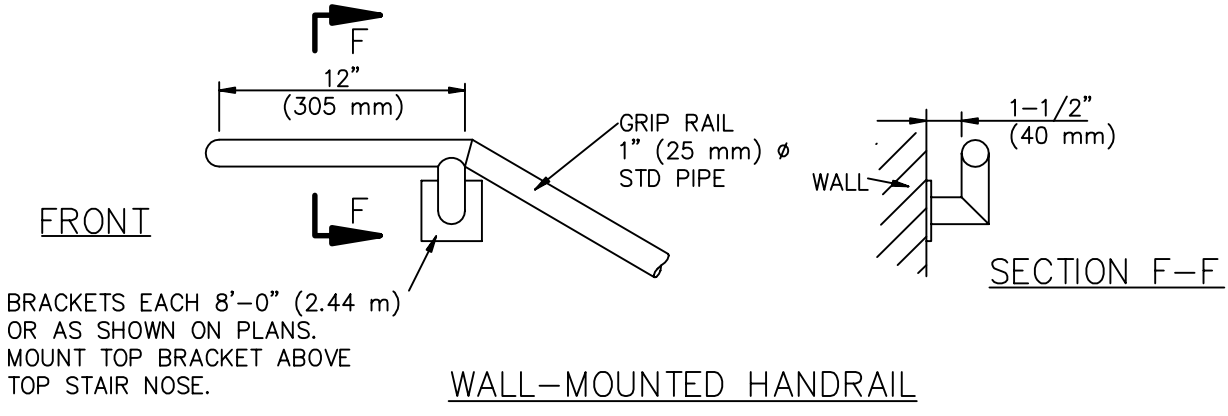
1. USE TYPE C WHERE ADJACENT GRADE IS MORE THAN 2'–6" (760 mm) BELOW LANDING OR SIDEWALK FINISHED SURFACE.
2. RAILS, POSTS, AND PICKETS SHALL BE GALVANIZED STEEL PIPE.
3. PROVIDE SLIP JOINTS AT STAIRWAY EXPANSION JOINTS, 24' (7.3 m) MAXIMUM.
4. MAXIMUM SPACING OF POSTS SHALL BE 8'–0" (2.44 m) ON STRAIGHT ALIGNMENTS, AND 6'–0" (1.83 m) ON CURVED ALIGNMENTS WITH LESS THAN 30' (9.1 m) RADIUS. MAKE SPACING UNIFORM BETWEEN CHANGES IN ALIGNMENT.
5. WELDS SHALL BE SLOT OR FILLET WELDS EQUAL TO THICKNESS OF PIPE. WELD ALL JOINTS ALL AROUND.



TOP RAIL TYPE 1

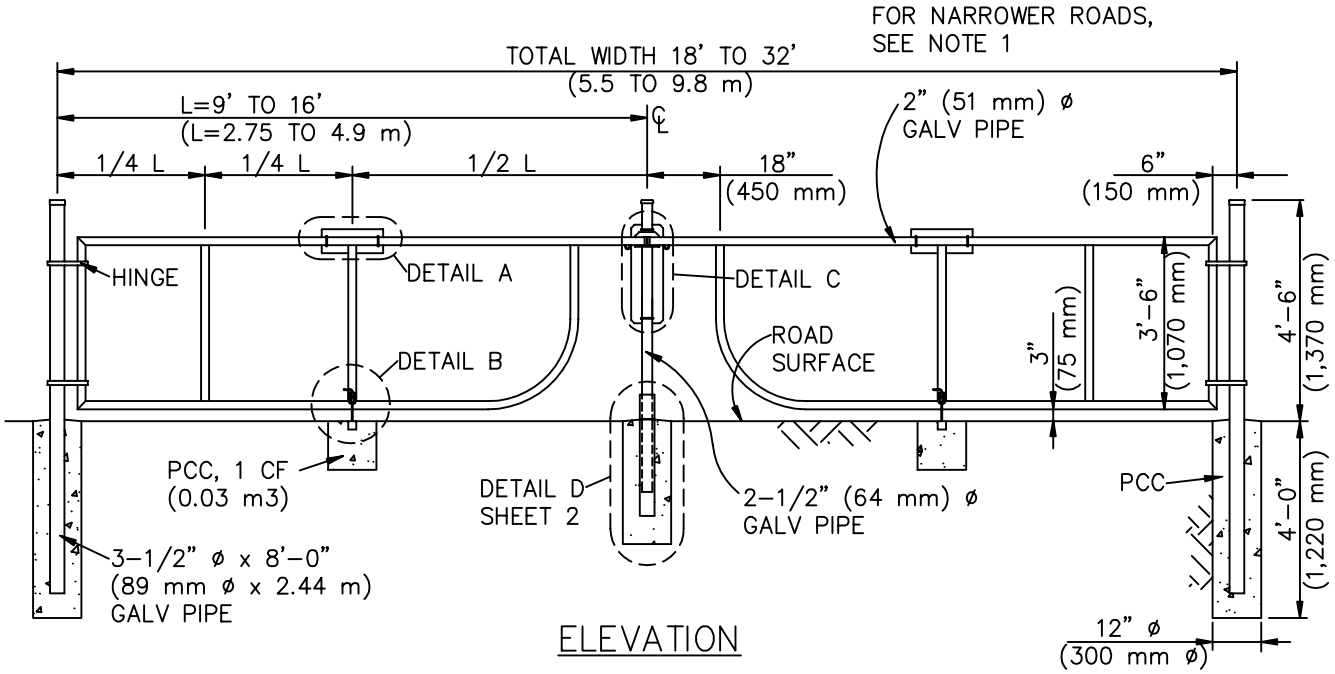


TOP RAIL TYPE 2

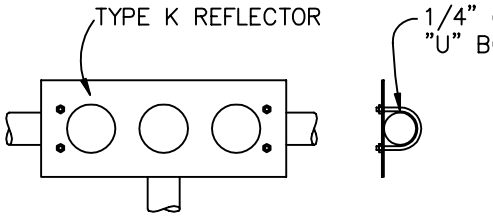


WALL-MOUNTED HANDRAIL

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN
METAL HAND RAILINGS	**606-3**
	SHEET 3 OF 3

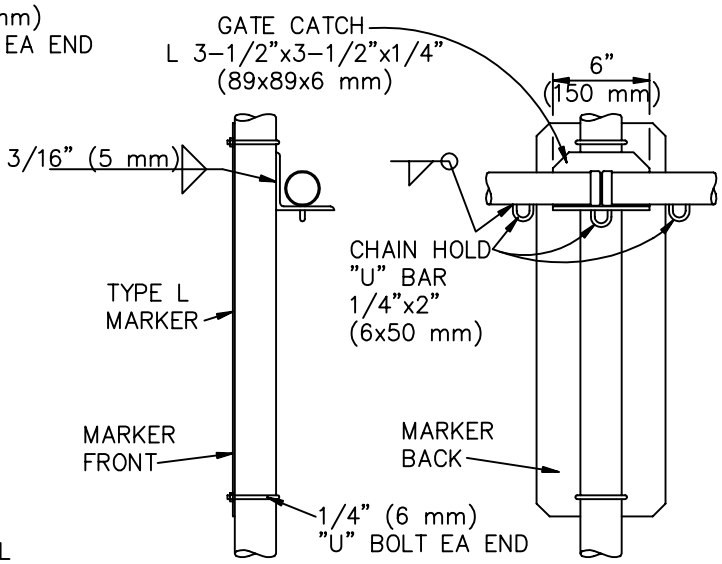


ELEVATION



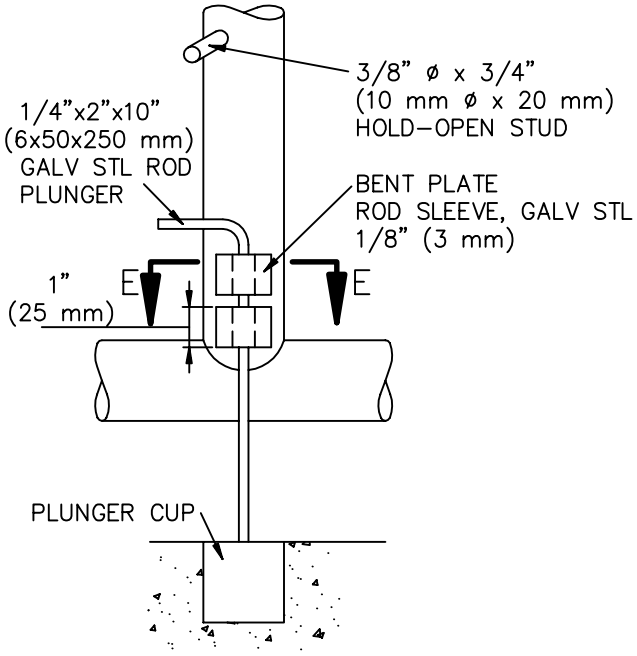
FRONT VIEW SIDE VIEW

DETAIL A

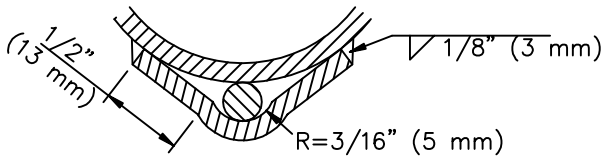


SIDE VIEW

DETAIL C



DETAIL B



SECTION E-E

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1993 REV. 1996, 2005, 2009

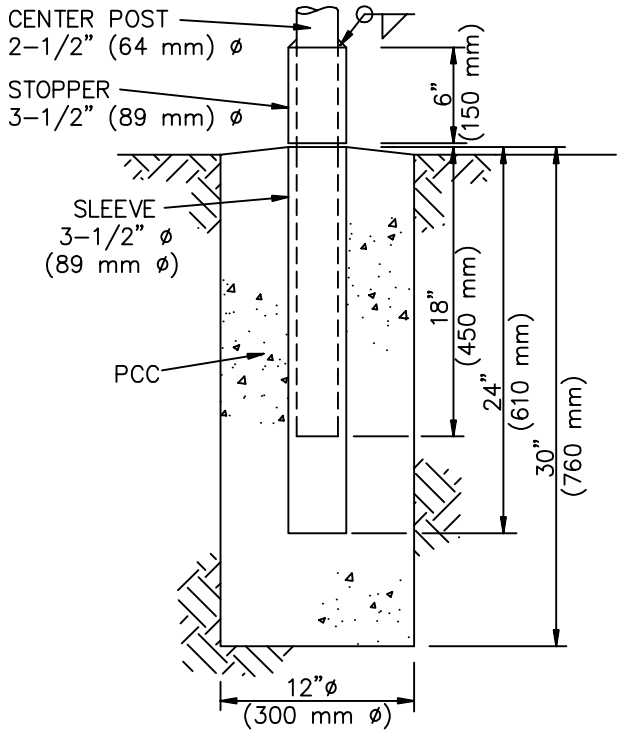
STANDARD PIPE GATE FOR ACCESS ROADS

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

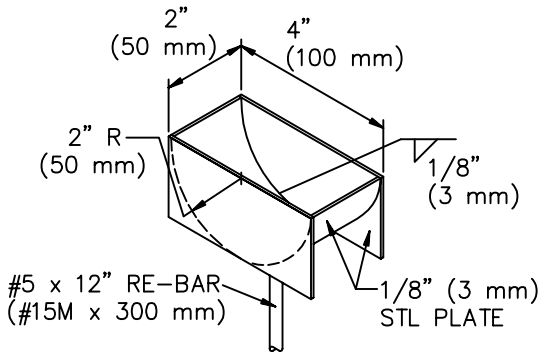
STANDARD PLAN 602-3

NOTES:

1. FOR ROADWAYS 16'–0" (4.8 m) WIDE OR LESS, USE A SINGLE GATE. PLACE THE ANGLE CATCH ON A PERMANENT END POST.
2. PIPE SHALL BE STANDARD WEIGHT, PER AISC STANDARDS.
3. CUT THE PIPE TO PROVIDE A CLOSE FIT–UP OF THE JOINTS.
4. USE 100% PENETRATION WELDS FOR PIPE CONNECTIONS.
5. PAINT GATE WITH ONE COAT OF ALUMINUM PAINT AFTER FABRICATION.
6. GATE HINGES SHALL BE HEAVY DUTY, MALLEABLE IRON OR STEEL, INDUSTRIAL SERVICE TYPE, WITH 270° SWING.
7. TYPE K AND TYPE L MARKERS SHALL CONFORM TO STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION ("CALTRANS") STANDARDS. THE REFLECTORS SHALL BE FILM–TYPE.
8. SECURE NUTS AT U BOLT ENDS FROM REMOVAL BY WELDING OR PEENING AFTER INSTALLING MARKERS.

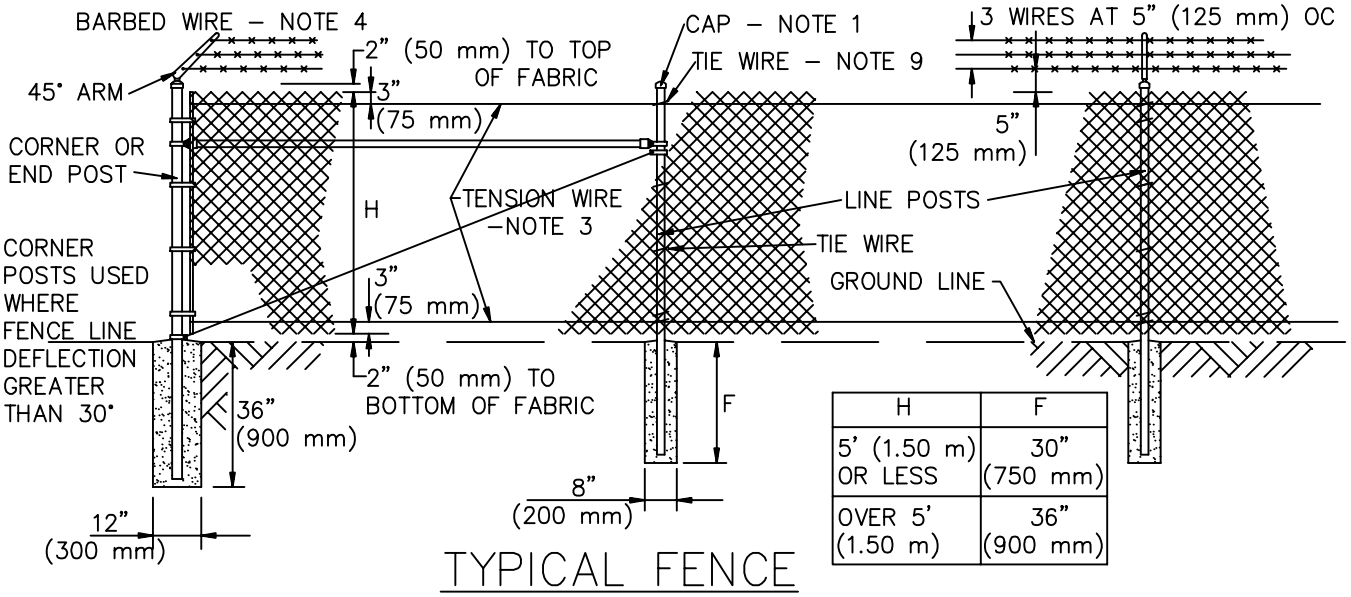


DETAIL D



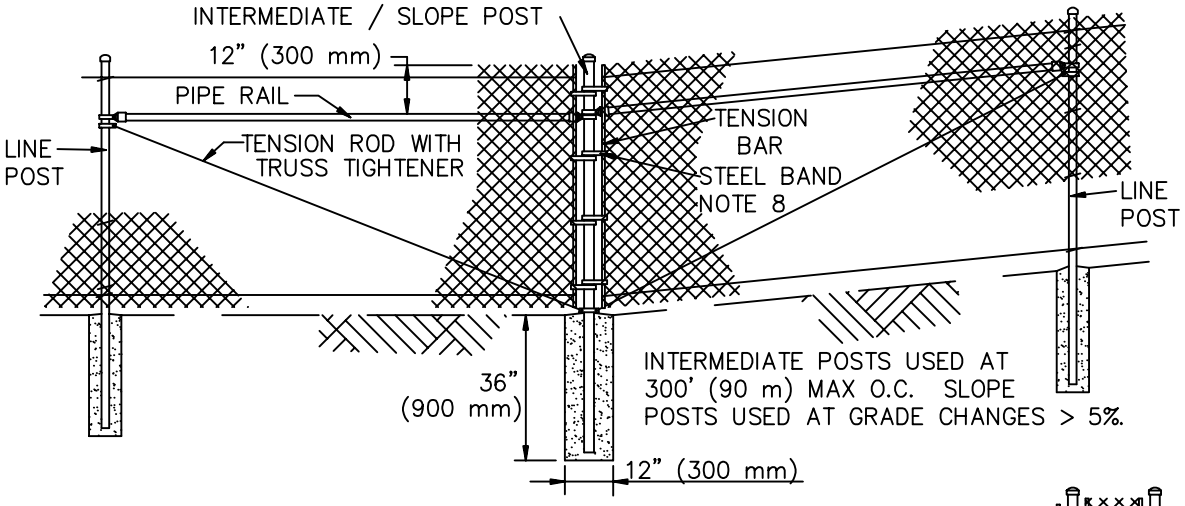
PLUNGER CUP
ISOMETRIC

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN
STANDARD PIPE GATE FOR ACCESS ROADS	**602–3**
	SHEET 2 OF 2

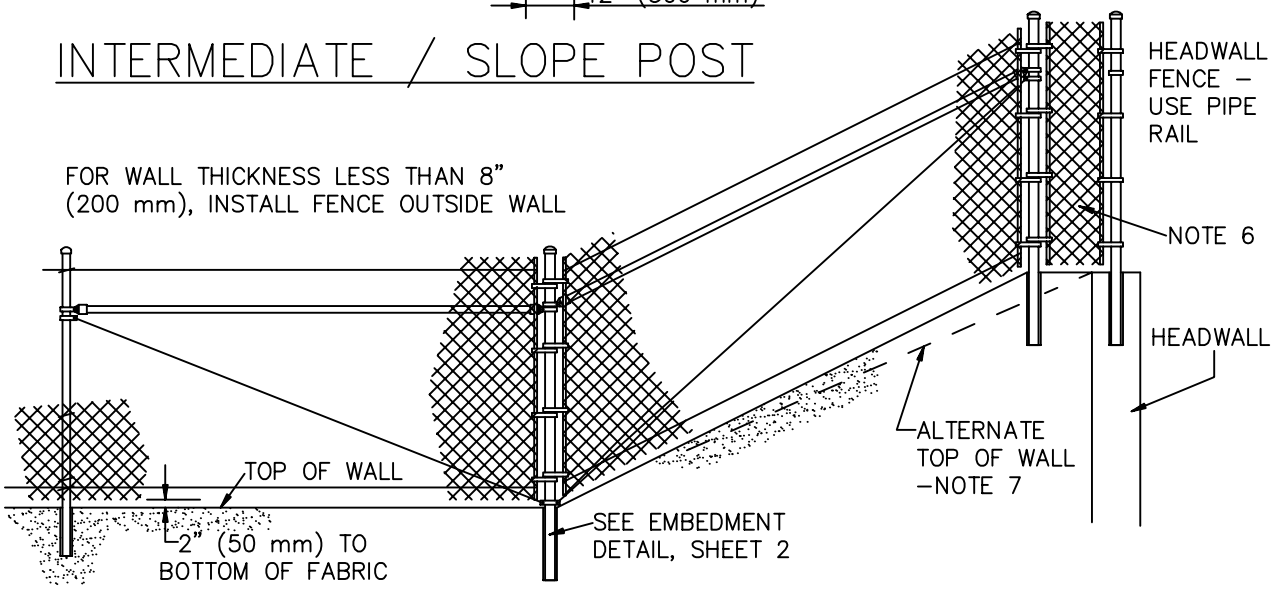


H	F
5' (1.50 m) OR LESS	30" (750 mm)
OVER 5' (1.50 m)	36" (900 mm)

TYPICAL FENCE



INTERMEDIATE / SLOPE POST



CHANNEL WALL AND WINGWALL AT HEADWALL

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

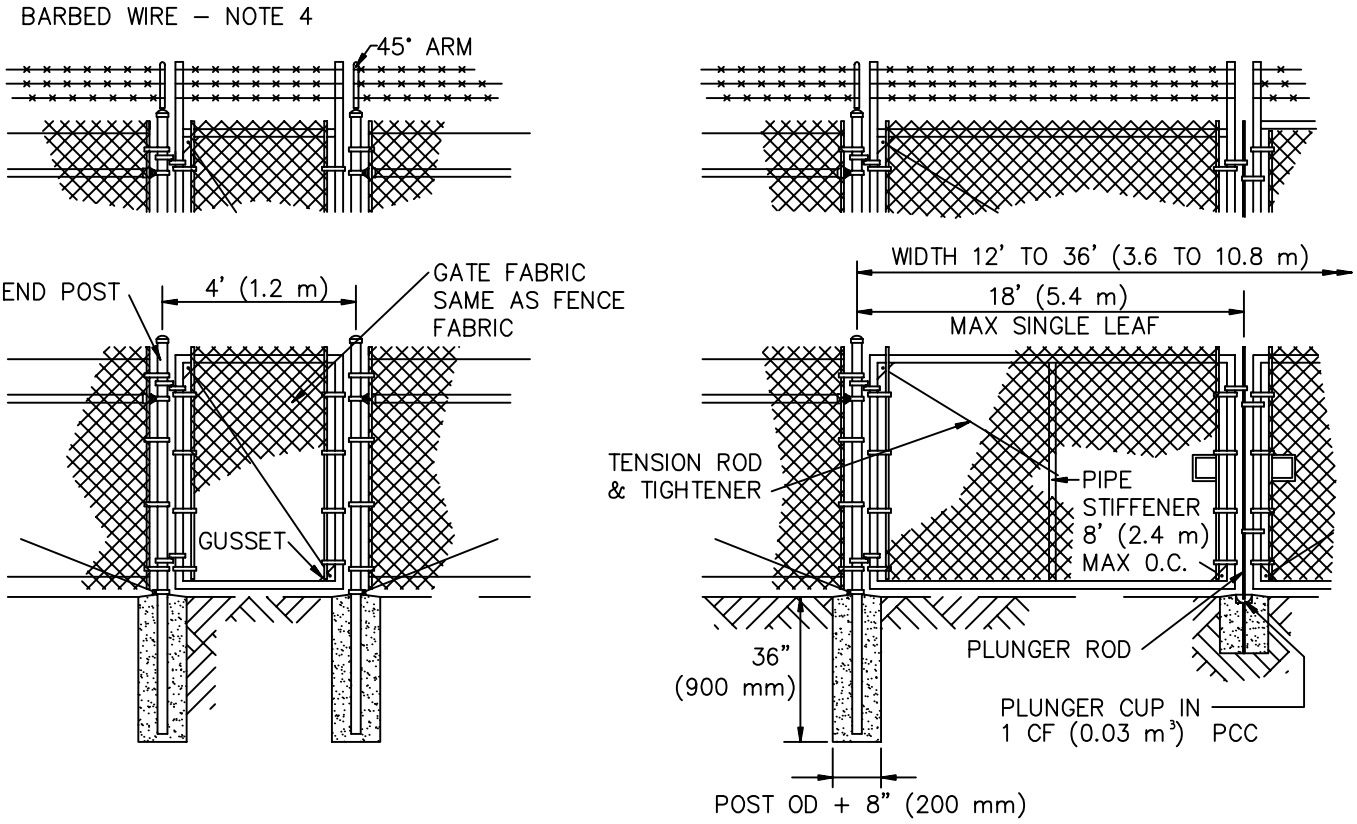
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 2005

CHAIN LINK FENCE AND GATES

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

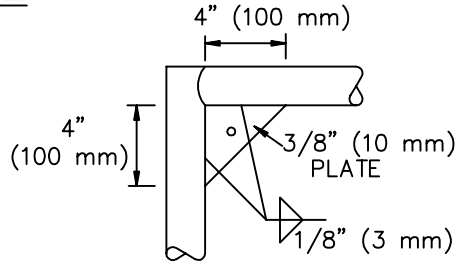
STANDARD PLAN 600–3

SHEET 1 OF 3

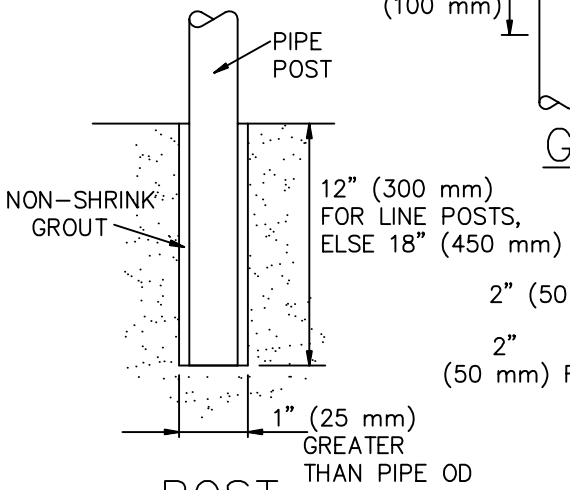


WALK GATE

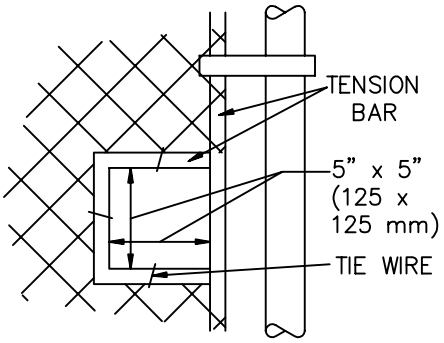
DRIVE GATE



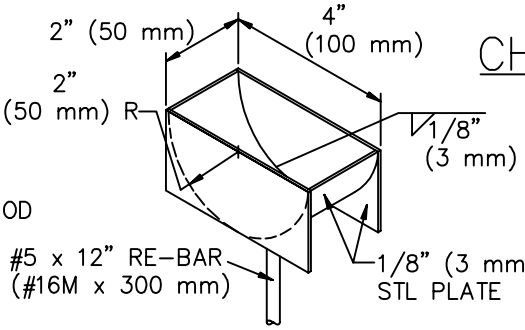
GUSSET



POST EMBEDMENT



CHAIN AND LOCK CUT–OUT



PLUNGER CUP ISOMETRIC

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN
CHAIN LINK FENCE AND GATES	**600–3**
	SHEET 2 OF 3

NOTES:

1. SECURE DRIVE–FIT GALVANIZED CAP TO POST WITH 1/4" (6 mm) ROUND–HEAD RIVET.

2. H DENOTES FABRIC WIDTH AND NOMINAL FENCE HEIGHT. H = 5' (1.5 m) UNLESS OTHERWISE NOTED.

3. IF FENCE WITH TOP RAIL IS SPECIFIED, DELETE STEEL TENSION WIRE AT TOP, AND PIPE RAILS AT INTERMEDIATE, SLOPE, END AND CORNER POSTS. EXTEND TENSION ROD TO TOP RAIL.

4. BARBED WIRE SHALL BE USED ONLY WHEN SPECIFIED.

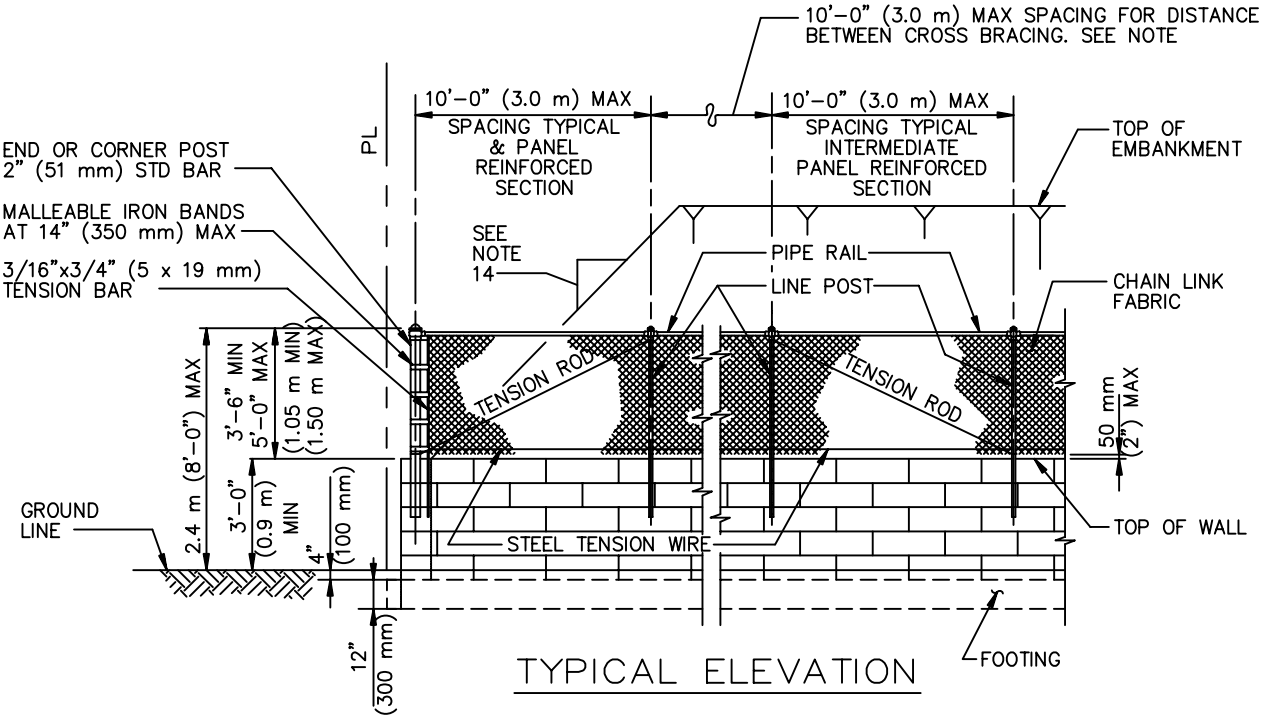
5. POST SPACING IS MAXIMUM 10' (3.0 m).

6. FILL CLEAR OPENINGS GREATER THAN 3" (75 mm) WITH FABRIC. FOR OPENINGS LESS THAN 18" (450 mm), TIE FABRIC TO POSTS.

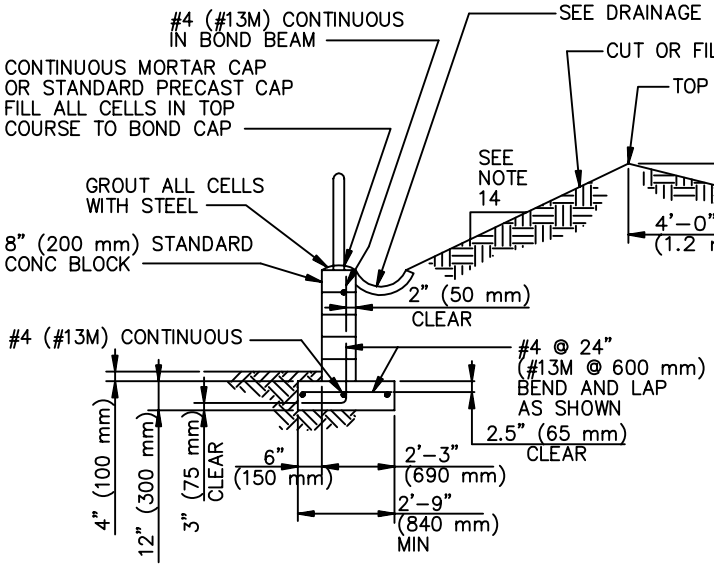
7. USE ONE POST FOR COMBINED SLOPE AND CORNER POST IF TOP OF CHANNEL WALL IS CONSTRUCTED AS SHOWN FOR "ALTERNATE".

8. STEEL BANDS AT TENSION BARS SHALL BE 1/8" x 1" (3 x 25 mm), MINIMUM, SPACED AT MAXIMUM 16" (400 mm).

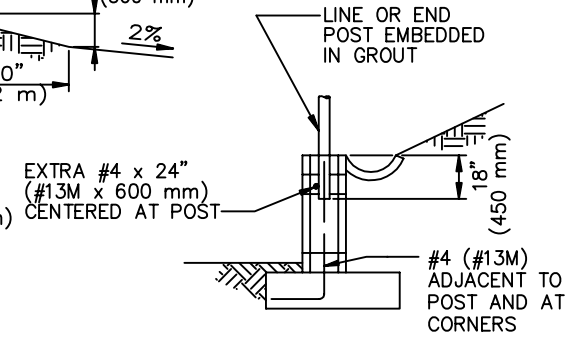
9. SECURE TENSION WIRES TO EACH LINE POST WITH TIE WIRES.



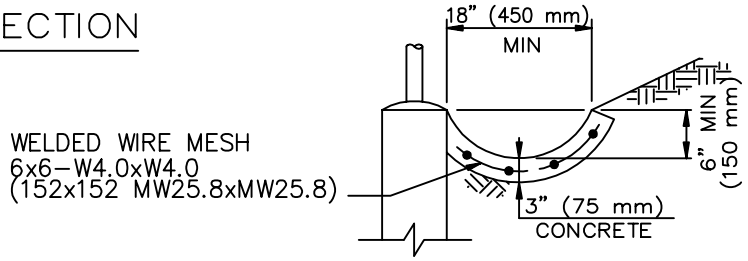
TYPICAL ELEVATION



TYPICAL WALL SECTION



WALL SECTION AT POST



DRAINAGE SWALE DETAIL

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1993 REV. 1996, 2009

REINFORCED CONCRETE BLOCK WALL AND CHAIN LINK FENCE COMBINATION

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 621-2

NOTES:

1. THE BLOCK WALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH SSPWC 303–4.1.
2. USE STANDARD 8" (200 mm) WIDE NORMAL WEIGHT CONCRETE BLOCK PER SSPWC 202–2.
3. USE CONCRETE BOND BEAM BLOCK WHERE HORIZONTAL STEEL IS CALLED FOR.
4. MORTAR, GROUT AND WATER SHALL BE IN ACCORDANCE WITH SSPWC 202–2.
5. REINFORCING STEEL SHALL BE GRADE 40 (GRADE 300) PER SSPWC 201–2.
6. ALL BLOCKS SHALL BE LAID UP IN MORTAR HEAD AND BED JOINTS FOR FULL THICKNESS OF FACE SHELLS. WEBS OF EACH COURSE SHALL CENTER ON WEBS OF COURSES BELOW. OMIT HEAD JOINT IN GRADE COURSE.
7. PLACE A MINIMUM 4" (100 mm) LAYER OF NO. 4 CONCRETE AGGREGATE BETWEEN THE SOIL BACKFILL AND THE OPEN HEAD JOINT.
8. ALL CELLS IN WHICH STEEL IS PLACED SHALL BE FILLED WITH GROUT.
9. CONCRETE SHALL BE 500–A–2500 (310–A–17) PER SSPWC 201–2.
10. POUR FOOTING AGAINST UNDISTURBED NATURAL SOIL OR SOIL THAT HAS BEEN COMPACTED TO 90% OPTIMUM DENSITY PER ASTM D1557–78.
11. CHAIN LINK FENCING SHALL BE CONSTRUCTED IN ACCORDANCE WITH SSPWC 304–3. MATERIAL SHALL BE IN ACCORDANCE WITH SSPWC 206–6.
12. PROVIDE OPEN HEAD JOINTS AT INTERVALS NO GREATER THAN 48" (1.2 m). WHERE WALL IS LOCATED ADJACENT TO A SIDEWALK, PROVIDE 2" ø (50 mm ø) WEEP HOLES UNDER SIDEWALK.
13. FOR PRIVATE PROPERTY, USE 1V:2H SLOPE. FOR PUBLIC PROPERTY, USE ENGINEER'S DESIGNATION.
14. WELDED WIRE MESH SHALL BE PER SSPWC 201–2.4.

TABLE OF CONTENTS

SECTION 1
Street Improvements

GENERAL

100-1 TOPOGRAPHY SYMBOLS
101-2 ABOVE-GROUND UTILITIES LOCATION IN PARKWAY

SIDEWALKS, DRIVEWAYS, AND RAMPS

110-2 DRIVEWAY APPROACHES
111-4 CURB RAMP
112-2 CURB AND SIDEWALK JOINTS
113-2 SIDEWALK AND DRIVEWAY REPLACEMENT

CURB AND GUTTER

120-2 CURB AND GUTTER BARRIER
121-2 CURB AND GUTTER-MOUNTABLE
112-2 CROSS AND LOGITUNDINAL GUTTERS
123-2 CROSS GUTTER AT T INTERSECTIONS

PAVEMENT

130-2 ALLEY INTERSECTION
131-2 CONCRETE BUS PAD
132-3 CONCRETE PAVEMENT REPLACEMENT
133-3 ASPHALT CONCRETE PAVEMENT REPLACEMENT
134-2 CONCRETE PAVEMENT JOINT DETAILS

MEDIAN

140-3 MEDIAN TAPER
141-2 MEDIAN FLARE
150-3 CURB DRAIN
151-2 PARKWAY DRAIN
152-2 RECTANGULAR FRAME AND COVER

SECTION 2
Sewers and Sanitation

MANHOLES AND STRUCTURES

200-3 PRECAST CONCRETE SEWER MANHOLE
201-2 PRECAST CONCRETE SHALLOW MANHOLE
202-2 DROP SEWER MANHOLE
203-2 BRICK SEWER MANHOLE
204-2 TERMINAL CLEANOUT STRUCTURE
205-2 SEWER MANHOLE ADJUSTMENT
206-2 MANHOLE RAISING RINGS
207-2 PRECAST REINFORCED CONCRETE MANHOLE BASE
208-2 BREAKING INTO EXISTING MANHOLES
210-3 24" (610mm) MANHOLE FRAME AND COVER – LOCKING TYPE
211-2 MANHOLE FRAME AND COVER – PRESSURE TYPE
212-2 ANCHOR SYSTEM FOR PRESSURE COVER
FOR OTHER MANHOLES, SEE SECTION 6 – GENERAL FACILITIES

PIPE APPURTENANCES

220-3 CHIMNEYS
221-2 PIPE ANCHORS AND BACKFILL STABILIZIERS
222-2 HOUSE CONNECTION SEWER
223-2 HOUSE CONNECTION REMODELING
224-2 SUPPORTS FOR CONDUITS ACROSS TRENCHES
225-2 BLANKET PROTECTION FOR PIPES

SECTION 3
Flood Control And Storm Drain Facilities

GENERAL

300-3 CURB OPENING CATCH BASIN
301-3 CURB OPENING CATCH BASIN WITH GRATING(S) AND DEBRIS SKIMMER
302-3 CURB OPENING CATCH BASIN WITH GRATING(S)
303-3 CURBSIDE GRATING CATCH BASIN
304-3 GRATING CATCH BASIN – ALLEY (LONGITUDINAL)
305-3 GRATING CATCH BASIN – ALLEY (TRANSVERSE)
306-3 CURB OPENING CATCH BASIN AT DRIVEWAY
307-3 CURB OPENING AT CATCH BASIN WITH MANHOLE IN STREET
308-2 MONOLITHIC CATCH BASIN CONNECTION
309-2 CATCH BASIN REINFORCEMENT
310-3 CATCH BASIN FACE PLATE ASSEMBLY AND PROTECTION BAR
311-3 FRAME AND GRATING FOR CATCH BASINS
312-3 CATCH BASIN MANHOLE FRAME AND COVER
313-3 LOCAL DEPRESSIONS AT CATCH BASINS
314-3 MODIFICATIONS FOR SIDE OPENING CATCH BASINS

MANHOLES AND JUNCTION STRUCTURES

320-2 MANHOLE - PIPE TO PIPE [MAIN LINE ID = 36" (900 mm) OR LARGER]
321-2 MANHOLE - PIPE TO PIPE [ONE OR BOTH MAINLINE IDS 33" (825mm) OR SMALLER]
322-2 MANHOLE - PIPE TO PIPE (LARGE SIDE INLET)
323-2 MANHOLE - CONCRETE BOX STORM DRAIN
324-2 MANHOLE SHAFT - WITH ECCENTRIC REDUCER
326-2 MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER
327-2 MANHOLE FOR EXISTING RCB
328-2 PRESSURE MANHOLE SHAFT - WITH ECCENTRIC REDUCER
329-2 PRESSURE MANHOLE SHAFT AND PRESSURE PLATE DETAILS 36" (914 mm) WITHOUT REDUCER
330-2 MANHOLE SHAFT SAFETY LEDGE
331-3 JUNCTION STRUCTURE - PIPE TO PIPE [INLET ID ≥ 24" (600 mm) OR OD > ½ MAIN LINE ID]
332-2 JUNCTION STRUCTURE - PIPE TO PIPE [ID ≤ 24" (600 mm)]
333-2 JUNCTION STRUCTURE - PIPE TO RCB
334-2 JUNCTION STRUCTURE - PIPE TO PIPE [INLET ID < 30" (750 mm)]
335-2 PIPE CONNECTIONS TO EXISTING STORM DRAINS

TRANSITION STRUCTURES

340-2 TRANSITION STRUCTURE PIPE TO PIPE
341-2 TRANSITION STRUCTURE SINGLE RCP TO SINGLE RCB
342-2 TRANSITION STRUCTURE RCB TO PIPE
343-2 TRANSITION STRUCTURE SINGLE RCB TO DOUBLE RCB
344-2 TRANSITION STRUCTURE DOUBLE RCB TO DOUBLE RCB
345-2 TRANSITION STRUCTURE DOUBLE RCB TO TRIPLE RCB
346-2 TRANSITION STRUCTURE TRIPLE RCB TO TRIPLE RCB INLETS
350-2 YARD INLET
351-2 CSP FLARED INLET
360-2 SLOPED PROTECTION BARRIER
361-2 TRASH RACK (INCLINED)
380-4 CONCRETE COLLAR FOR RCP 12" (300 mm) THROUGH 72" (1800 mm)
381-2 ABANDONMENT SEALS FOR MANHOLES AND INLETS
382-2 WINDOW DETAILS FOR MULTIPLE RCB STRUCTURES
383-2 VELOCITY CONTROL RING PRECAST RCP SECTION
384-3 ENERGY DISSIPATOR - IMPACT BASIN WITH VERTICAL BAFFLE WALL
390-0 PRECAST REINFORCED CONCRETE BOX

TABLE OF CONTENTS – *(Continued)*

SECTION 4
Street Lighting and Traffic Signals

SERVICE

401-1 ELECTRICAL SERVICE
403-1 SERVICE CABINET
405-1 PULL BOXES
408-1 WIRING SERVICE DETAILS

CONTROLLER CABINETS

429-1 STEEL LIGHTING STANDARD TYPE 10
430-1 CONCRETE LIGHTING STANDARD TYPE C-1
431-1 CONCRETE LIGHTING STANDARD TYPE C-2
432-1 CONCRETE LIGHTING STANDARD TYPE C-4
433-1 CONCRETE LIGHTING STANDARD TYPE C-6
434-1 STREET LIGHTING DETAILS
452-1 CONTROLLER CABINET TYPE 170
453-1 SIGNAL STANDARDS
454-1 SIGNAL HEADS AND FIXTURES
455-1 SIGNAL FITTINGS
456-1 PEDESTRIAN PUSH BUTTON STAND
457-1 LOOP DETECTORS
458-1 TEMPORARY SIGNALS

SECTION 5
Landscaping and Irrigation Systems

500-2 LANDSCAPE IRRIGATION SYMBOLS
501-3 ELECTRICAL SERVICE
502-3 ANGLE VALVE
503-3 GATE VALVE
504-3 QUICK COUPLER VALVE
505-3 HOSE BIBB VALVE
506-3 REMOTE CONTROL VALVE
507-3 REMOTE CONTROL VALVE WITH QUICK COUPLER
508-3 THRUST BLOCKS FOR PLASTIC PIPE
509-3 IRRIGATION SPRINKLER HEAD
510-3 VACUUM BREAKER ASSEMBLY
511-3 BACKFLOW PREVENTER ASSEMBLY DOUBLE CHECK TYPE
512-3 BACKFLOW PREVENTER ASSEMBLY REDUCED PRESSURE TYPE
513-3 ELECTRICAL PULL BOX
514-3 IRRIGATION CONTROLLER ENCLOSURE
515-3 PIPE PINNING
517-3 SWING JOINT ASSEMBLY
518-3 TREE STAKING
519-3 TREE WELLS
520-4 TREE PLANTING
521-3 PRESSURE REGULATOR INSTALLATION
523-2 ROOT PRUNING
524-2 TEMPORARY TREE WELL COVER

SECTION 6
General Facilities

PROTECTIVE FACILITIES

600-3 CHAIN LINK FENCE AND GATES
601-3 REINFORCED CONCRETE BLOCK WALL
602-3 STANDARD PIPE GATE FOR ACCESS ROADS
606-3 METAL HAND RAILINGS

RETAINING STRUCTURES

610-3 REINFORCED CONCRETE RETAINING WALL TYPE 1
611-3 REINFORCED CONCRETE RETAINING WALL TYPE 2
612-3 REINFORCED CONCRETE RETAINING WALL TYPE 3
613-3 REINFORCED CONCRETE RETAINING WALL TYPE 4
614-3 REINFORCED CONCRETE RETAINING WALL TYPE 5
615-4 REINFORCED CONCRETE RETAINING WALL TYPE 6
616-3 REINFORCED CONCRETE RETAINING WALL TYPE 7
617-3 REINFORCED CONCRETE RETAINING WALL DETAILS
618-3 MASONRY RETAINING WALL
619-2 REINFORCED CONCRETE CRIB WALL
620-2 STEEL CRIB WALL
621-2 REINFORCED CONCRETE BLOCK WALL AND CHAIN LINK FENCE COMBINATION
622-3 CONCRETE BLOCK SLOUGH WALL

SUBSURFACE ACCESS

630-3 24" (600 mm) MANHOLE FRAME AND COVER
631-3 27" (686 mm) MANHOLE FRAME AND COVER
632-3 30" (762 mm) MANHOLE FRAME AND COVER
633-3 36" (914 mm) MANHOLE FRAME AND COVER
635-3 STEEL STEP
636-2 POLYPROPYLENE - PLASTIC STEP
640-3 REINFORCED CONCRETE STAIRWAY