

STANDARD DETAILS INDEX

SIDEWALK, DRIVEWAY, AND CURB & GUTTER DETAILS

Drawing Number Drawing Title

- 199 SAMPLE DRAWING OF TYPICAL LOT DRAINAGE PLAN
- 200 STANDARD MONOLITHIC CURB AND GUTTER
- 205 MOUNTABLE CURB
- 210 TYPE 'A' CURB - (ON SPECIAL APPLICATION)
- 215 CONCRETE VALLEY GUTTER
- 220 SIDEWALK DETAILS
- 221 TYPICAL MAILBOX AND SIGNAGE LOCATION
- 225 RESIDENTIAL STREET WHEELCHAIR & BICYCLE RAMPS
- 230 ARTERIAL/COLLECTOR STREET WHEELCHAIR ACCESS RAMPS
- 235 WHEELCHAIR ACCESS RAMP
- 245 COMMERCIAL DRIVEWAY WITH CURBS
- 250 CURB KNOCKOUT FOR DRIVEWAYS
- 252 STANDARD ADA DRIVEWAY APPROACH
- 252-A ADA DRIVEWAY APPROACH WITH MOUNTABLE CURB
- 255 SIDEWALK DETAILS: OBSTRUCTIONS & PROTRUDING OBJECTS

STREET AND PAVEMENT DETAILS

Drawing Number Drawing Title

- 256 STREET UTILITY PATCH
- 260 OFFSET CROWN
- 265 GEODETIC MONUMENT - SOFT SOILS
- 266 CENTERLINE SURVEY MONUMENTS
- 267 MONUMENT BOX
- 284 APPROVED FIRE TURN-AROUND CONFIGURATIONS
- 286 DOUBLE STREET BARRICADE TYPE |||
- 286-A SINGLE STREET BARRICADE TYPE |||

GENERAL UTILITIES AND TRENCH DETAILS

Drawing Number Drawing Title

- 295 STANDARD UTILITY LOCATIONS
- 300 TYPICAL TRENCH DETAIL
- 301 JOINT UTILITY TRENCH
- 305 CONCRETE CRADLE AND CAP DETAIL
- 310 STEEP SCOPE PIPE ANCHOR WALLS

STORM WATER DETAILS

Drawing Number Drawing Title

315 TYPICAL 20" x 24" CATCH BASIN
325 DITCH INLET
330 SUBSURFACE DRAIN
331 FIGURE 3.1 - AVERAGE VELOCITY

SANITARY SEWER DETAILS

Drawing Number Drawing Title

335 SHALLOW TRENCH SERVICE CONNECTION, BLOCKING, & MARKING
336 TYPICAL DEEP TRENCH SERVICE CONNECT DETAIL
340 CLEANOUT DETAIL

MANHOLE DETAILS

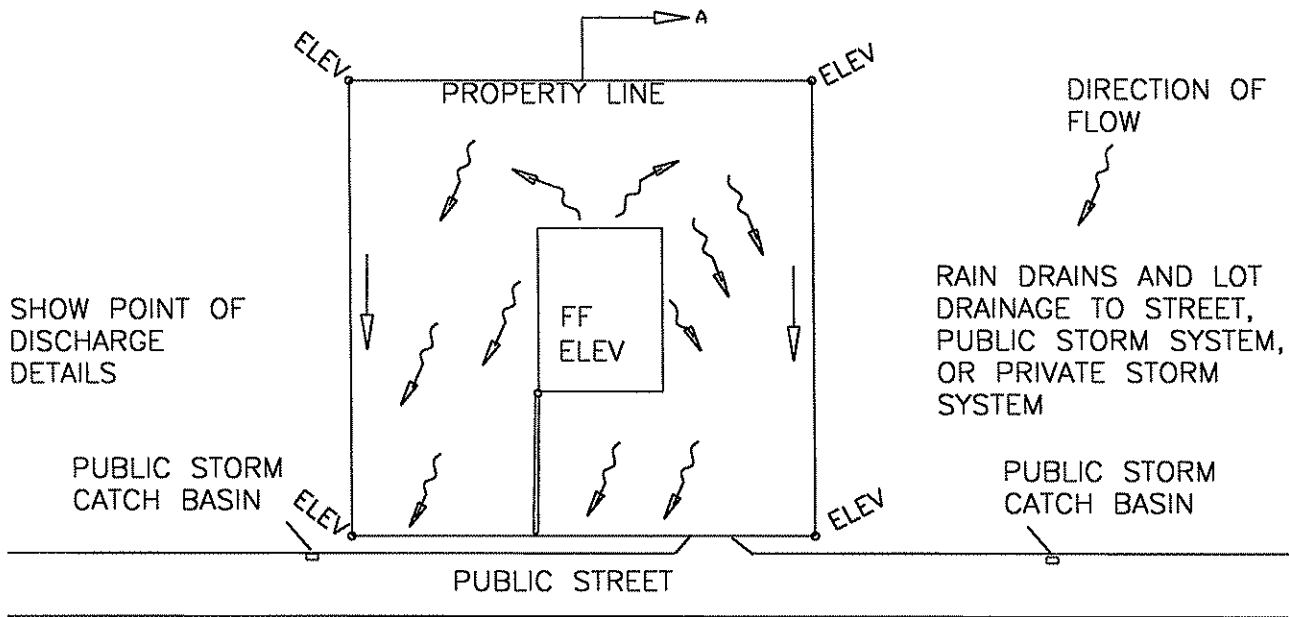
Drawing Number Drawing Title

345 MANHOLE ADJUSTMENT RINGS FOR RESURFACING
346 MANHOLE COVER & FRAME DETAILS
347 CAM-LOCK MANHOLE COVER AND FRAME
350 TYPICAL MANHOLE DETAIL
351 FLAT-TOP MANHOLE
352 BEAVER SLIDE MANHOLE
353 TYPICAL OUTSIDE DROP MANHOLE DETAIL
354 TYPICAL INSIDE DROP MANHOLE
355 POLLUTION CONTROL MANHOLE INSIDE ELBOW
356 POLLUTION CONTROL MANHOLE OUTSIDE ELBOW
360 MANHOLE BASE SECTION
361 LARGE MANHOLE BASE SECTION
362 LARGE CAST-IN-PLACE CONCRETE MANHOLE BASE

WATER DETAILS

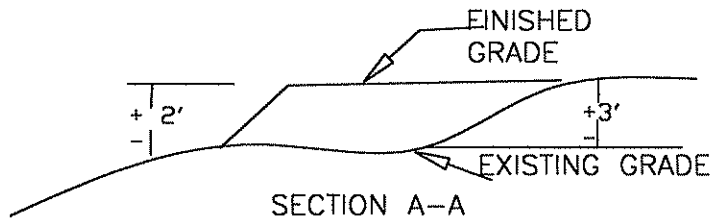
Drawing Number Drawing Title

400 FIRE HYDRANT INSTALLATION
405 SINGLE WATER SERVICE INSTALLATION
406 BROOKS 12" x 20" METER BOX FOR 1" WATER METER
410 GATE VALVE SETTING DETAIL
411 18" FLANGE UP VALVE BOX AND COVER
415 AIR RELEASE VALVE
420 PERMANENT 2" BLOWOFF
421 ELIPSE # 88 SAMPLING STATION
422 TEMPORARY 2" BLOWOFF
425 COLLAR THRUST BLOCK
430 THRUST BLOCKING DETAILS



NOTES:

1. ALL DRAINAGE FROM LOT TO BE CHANNELLED TO PUBLIC OR PRIVATE STORM SYSTEM.
2. A SIMPLE SKETCH DRAWING SHOWING ROOF DRAINS, LOT DRAINAGE, AND A POINT OF DISCHARGE FROM PROPERTY IS REQUIRED FOR BUILDING PERMIT.
3. SECTIONAL VIEWS OF ALL SIDES OF LOTS SHOWING ADJACENT PROPERTIES.
4. PROVIDE STAMPED, ENGINEERED DRAWINGS FOR DRYWELLS. MUST BE PROVIDED BY A PROFESSIONAL ENGINEER AND INCLUDE PERC REST RESULTS.
5. IF DRYWELL IS USED, AN ENGINEERED DETAIL AND PERC TESTS ARE REQUIRED.



NOTES:

1. SHOW EXISTING GRADES ON ADJACENT LOTS.
2. SHOW FINISHED GRADE OF LOT TO BE PERMITTED.
3. EXISTING GRADES ON LOT TO BE PERMITTED.

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DATE:

SCALE:



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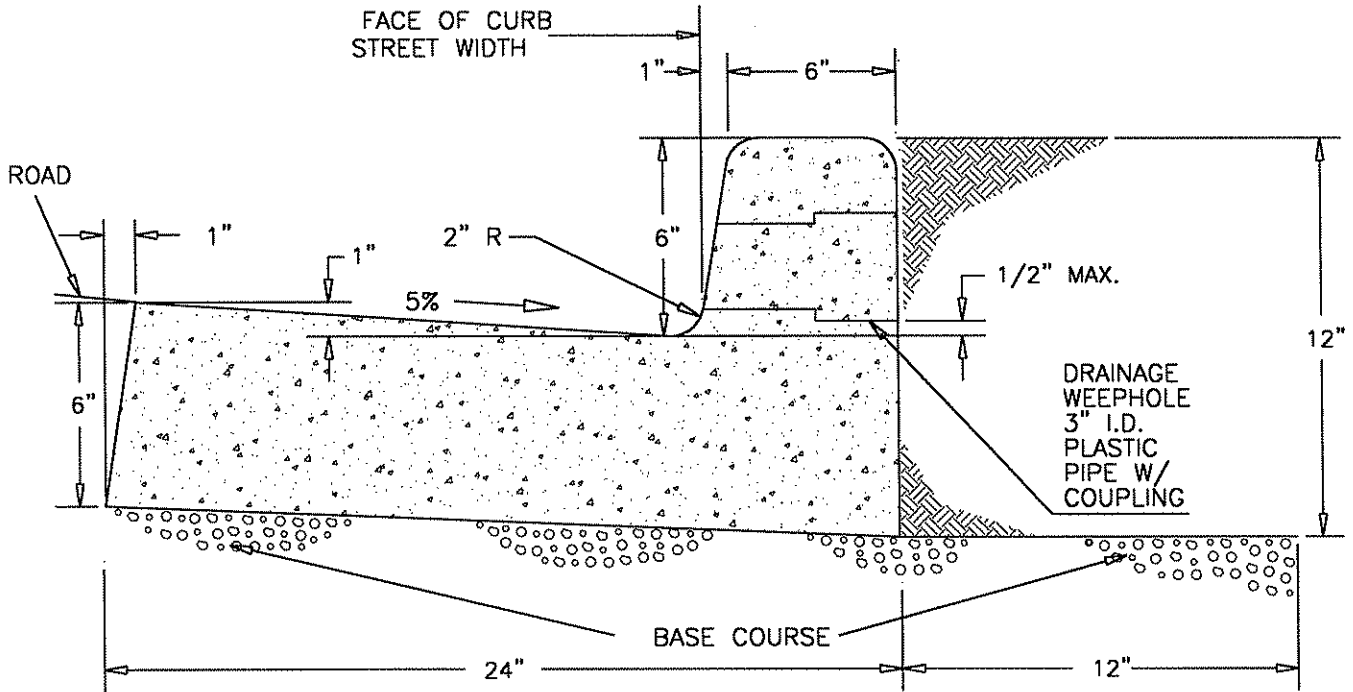
TITLE:

SAMPLE DRAWING OF TYPICAL LOT DRAINAGE PLAN

REVISION:

DRAWING NO:

199



NOTES:

1. FOR USE ALONG MEDIANS, GUTTERS MAY BE REDUCED WITH PRIOR APPROVAL FROM THE CITY ENGINEER.
2. CONCRETE TO HAVE A COMPRESSIVE STRENGTH OF 3300 P.S.I. AT 28 DAYS.
3. CONTRACTION JOINTS
 - A. SPACING TO BE NOT MORE THAN 15 FEET.
 - B. THE DEPTH OF THE JOINT SHALL BE AT LEAST 1-1/2 INCHES.
 - C. WEEPHOLES TO BE CENTERED WITH CONTRACTION JOINTS.
4. BASE ROCK 1 1/2"-0 OR 3/4"-0, 95% (AASHTO T-180) COMPACTION. BASE ROCK SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4 INCHES, WHICHEVER IS GREATER, AND SHALL EXTEND 12" BEHIND THE CURB.
5. DRAINAGE WEEPHOLE -3" DIAMETER PLASTIC PIPE
 - A. I.D. PLASTIC PIPE WITH COUPLING.
 - B. DRAINAGE ACCESS THROUGH EXISTING CURBS SHALL BE CORE DRILLED.
6. ALL RADII SHALL BE 3/4" EXCEPT AS OTHERWISE SHOWN.

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T. KOLLN

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SCALE:



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TITLE:

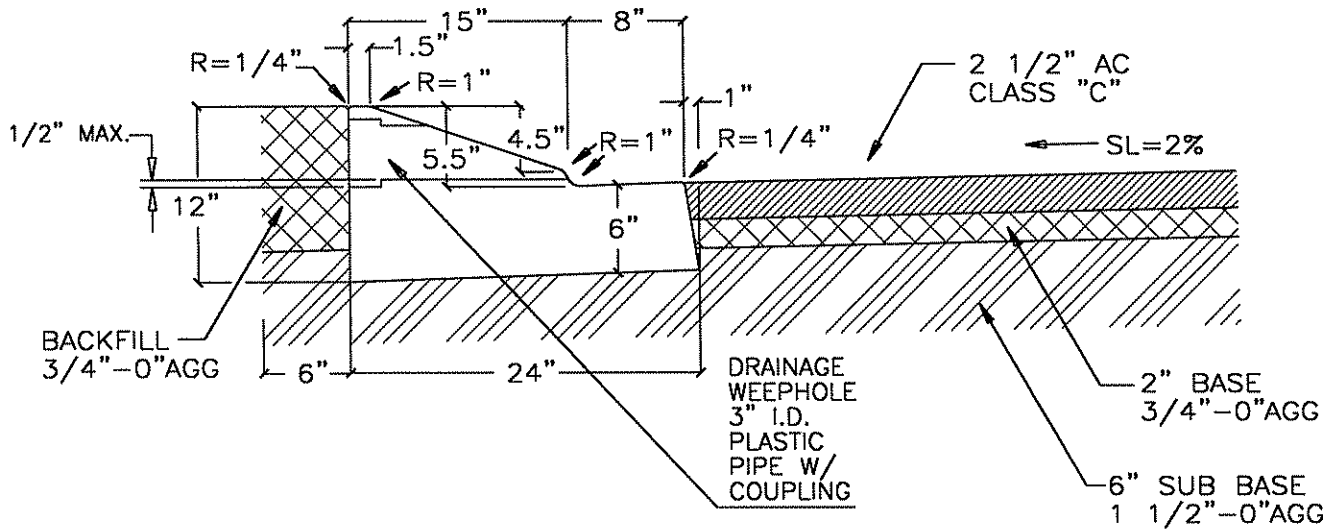
STANDARD MONOLITHIC CURB AND GUTTER

REVISION:

NC

DRAWING NO:

200




MOUNTABLE CURB

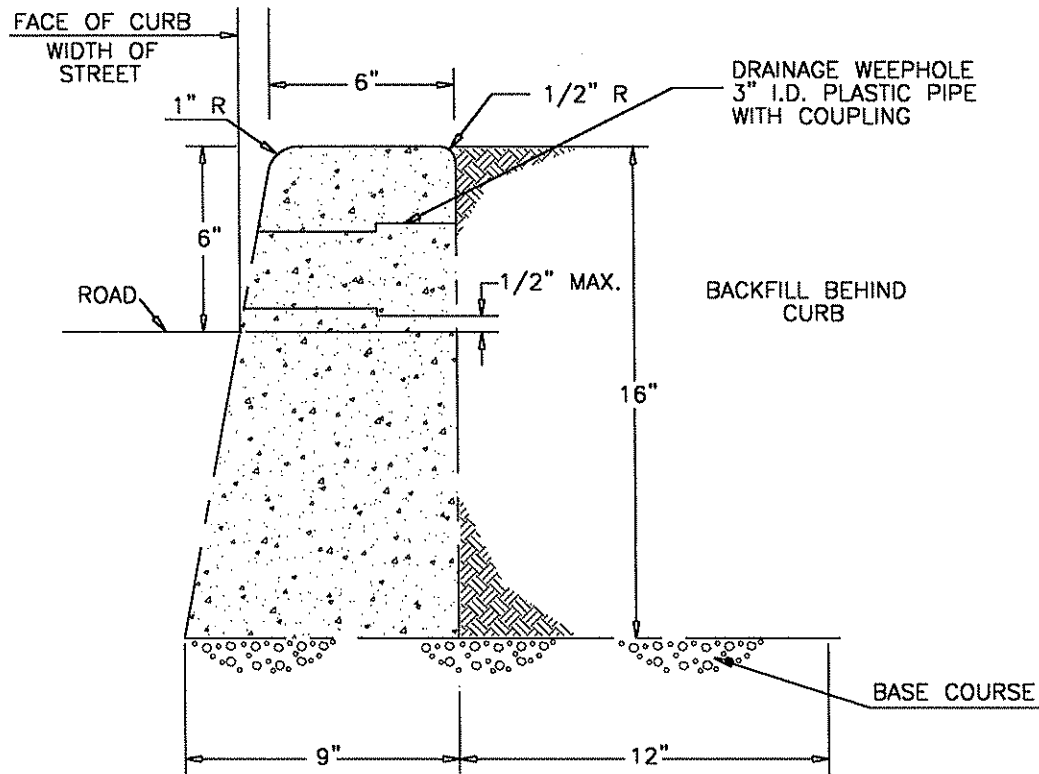
APPROVED FOR
CUL-DE-SACS
MAY BE USED
WITH PREAPPROVAL
IN OTHER LOCATIONS

STANDARD ROAD CROSS SECTION

NOTES

1. CONCRETE TO HAVE A COMPRESSIVE STRENGTH OF 3300 P.S.I. AT 28 DAYS.
2. CONTRACTION JOINTS
 - A. SPACING TO BE NOT MORE THAN 15 FEET.
 - B. THE DEPTH OF THE JOINT SHALL BE AT LEAST 1-1/2 INCHES.
 - C. WEEPHOLES TO BE CENTERED WITH CONTRACTION JOINTS.
3. BASE ROCK 1 1/2"-0 OR 3/4"-0, 95% (AASHTO T-180) COMPACTION. BASE ROCK SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4 INCHES, WHICHEVER IS GREATER, AND SHALL EXTEND 12" BEHIND THE CURB.
4. DRAINAGE WEEPHOLE -3" DIAMETER PLASTIC PIPE
 - A. I.D. PLASTIC PIPE WITH COUPLING.
 - B. DRAINAGE ACCESS THROUGH EXISTING CURBS SHALL BE CORE DRILLED.
5. WHEN USING MOUNTABLE CURB 6" S/W SHALL BE USED.

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CHECKED BY:		NC
DATE:	TITLE: MOUNTABLE CURB	DRAWING NO: 205
SCALE:		



NOTES:

1. THIS DETAIL TO BE USED ONLY WHEN REPLACING LIKE CURB. NOT INTENDED FOR NEW CONSTRUCTION UNLESS SPECIFICALLY APPROVED BY THE CITY ENGINEER.
2. CONCRETE TO HAVE COMPRESSIVE STRENGTH OF 3300 P.S.I. AFTER 28 DAYS.

EXPANSION JOINTS.

A. TO BE PROVIDED:

- 1) AT EACH POINT OF TANGENCY OF THE CURB.
- 2) AT EACH COLD JOINT.
- 3) AT EACH SIDE OF INLET STRUCTURES.
- 4) AT EACH END OF DRIVEWAYS.

B. MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED, NON-EXTRUDING, WITH A THICKNESS OF 1/2 INCH.

3. CONTRACTION JOINTS.

- A. SPACING TO BE NOT MORE THAN 15 FEET.
- B. THE DEPTH OF THE JOINT SHALL BE AT LEAST 1-1/2 INCHES.
- C. WEEPHOLE TO BE CENTERED WITH CONTRACTION JOINTS.

4. BASE ROCK 1 1/2"-0 OR 3/4"-0, 95% (AASHTO T-180) COMPACTION. BASE ROCK SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4" IN DEPTH, WHICHEVER IS GREATER. SUBGRADE ROCK TO EXTEND 12" BEHIND CURB.

5. DRAINAGE WEEPHOLE - 3" DIA. PLASTIC PIPE.

- A. I.D. PLASTIC PIPE WITH COUPLING.
- B. DRAINAGE ACCESS THROUGH EXISTING CURBS SHALL BE CORE DRILLED.

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SCALE:



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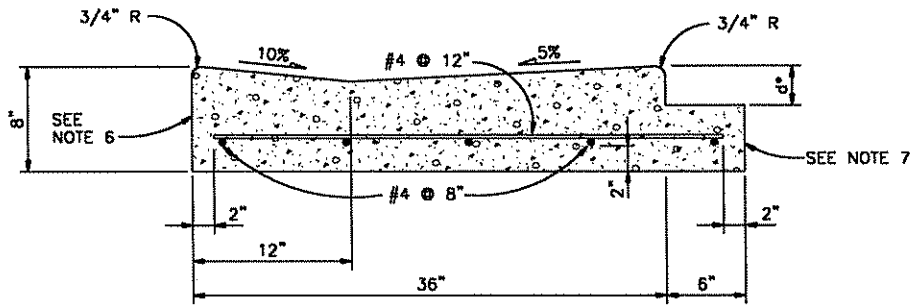
TYPE 'A' CURB - (ON SPECIAL APPLICATION)

REVISION:

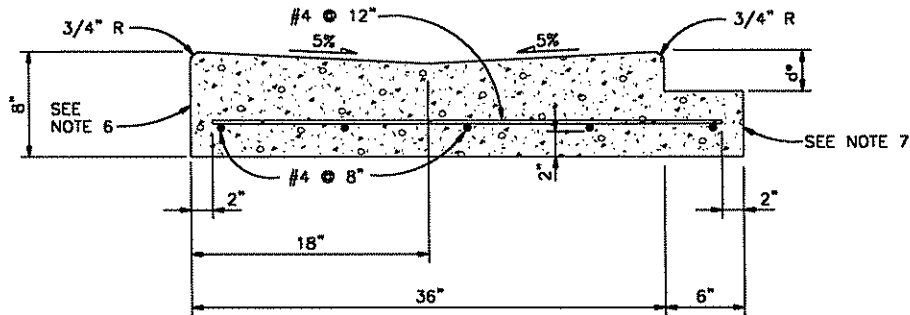
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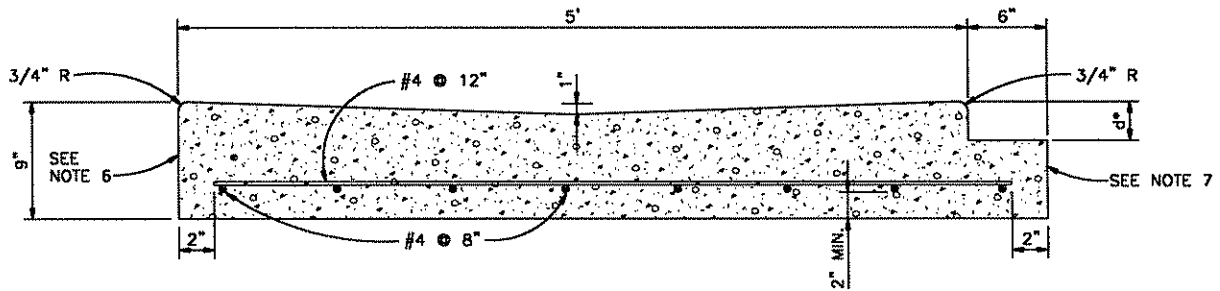
210



NON-SYMMETRICAL "V" GUTTER



SYMMETRICAL "V" TYPE GUTTER



WIDE VALLEY GUTTER

NOTES:

1. d^* = THICKNESS OF ASPHALT PAVING.
2. THE CONCRETE SHALL BE CLASS 3300.
3. THE TOTAL WIDTH OF THE NON-SYMMETRICAL "V" GUTTER MAY BE REDUCED TO 30" WHEN CONSTRUCTION WITH A CURB-EXTRUSION MACHINE.
4. CONSTRUCT 6" BENCH MONOLITHICALLY WITH VALLEY GUTTER TO EXTEND UNDER PAVING FOR PAVEMENT SUPPORT.
5. WHEN BENCH IS NOT REQUIRED, CONSTRUCT 1" BATTER ON VERTICAL FACE.
6. PLACE PREMOLDED FILLER AGAINST VERTICAL FACE WHERE VALLEY GUTTER ABUTS CONCRETE.
7. CONSTRUCT 6" x d DEPRESSED BENCH WHERE VALLEY GUTTER ABUTS ASPHALT PAVEMENT.

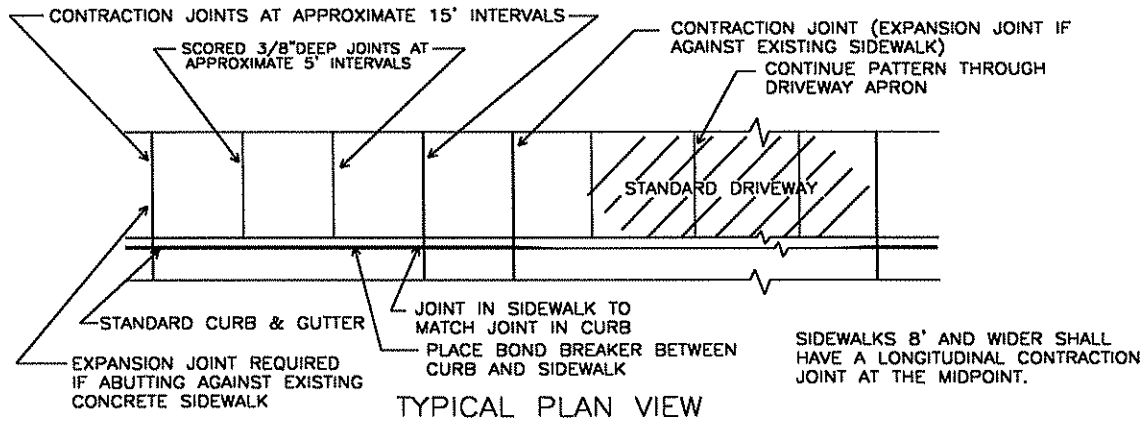
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SCALE:	.



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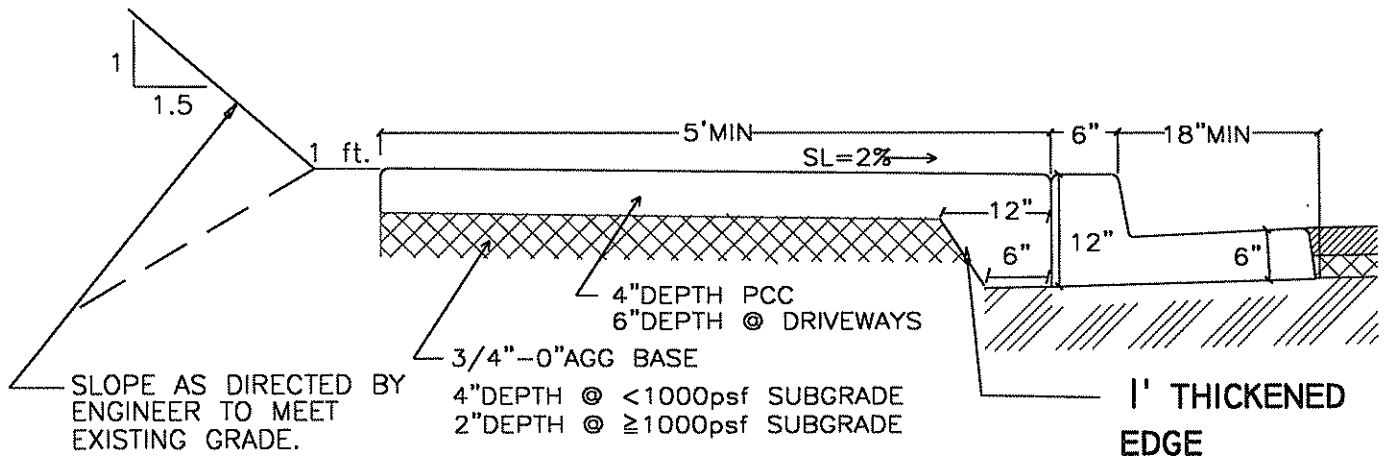
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DRAWING NO:	215

TITLE: CONCRETE VALLEY GUTTER



NOTES:

- 1) STANDARD SIDEWALK CROSS SLOPE SHALL BE 1/4"/FOOT. WHEN THE LOT IS BELOW THE TOP OF THE CURB AND SLOPES DOWN FROM THE CURB A MINUS 1/4"/FOOT SLOPE MAY BE REQUIRED.
- 2) CONCRETE DEPTH FOR STANDARD SIDEWALKS SHALL BE NOMINAL 4" MIN. DRIVEWAY SECTIONS INCLUDING SIDEWALKS THROUGH DRIVEWAYS SHALL BE NOMINAL 6" MIN.
- 3) EXPANSION JOINTS WITH PREMOLDED FILLER SHALL BE INSTALLED BETWEEN DRIVEWAYS AND SIDEWALK AT THE DIRECTION OF THE ENGINEER. (SEE DRIVEWAY DETAILS) CONTRACTION JOINTS SHALL BE INSTALLED AT APPROXIMATE INTERVALS OF 15 FEET BY CUTTING AT LEAST 1/3 OF THE DEPTH OF THE CONCRETE. "DUMMY" JOINTS SHALL BE INSTALLED AT APPROXIMATE INTERVALS OF 5 FEET.
- 4) INSTALL A BOND BREAKER OR ISOLATION JOINT BETWEEN BACK OF CURB AND SIDEWALK, AND AROUND ANY OBSTRUCTION WITHIN SIDEWALK AREA.
- 5) SEE STANDARD WHEEL CHAIR/BICYCLE RAMP DETAILS FOR SIDEWALK PATTERNS AT INTERSECTION CURB RETURNS
- 6) SEE, ALSO, STANDARD DETAILS FOR DRIVEWAYS. NO. 242
- 7) WHEN USED IN CONJUNCTION WITH MOUNTABLE CURB IN CUL-DE-SAC'S LESS THAN 45' IN RADIUS, 6" THICK SIDEWALK IS REQ'D
- 8) SIDE WALK WIDTHS SHALL BE: 6-FT MINIMUM ON COLLECTOR STREETS; 5-FT MINIMUM ON RESIDENTIAL STREETS.



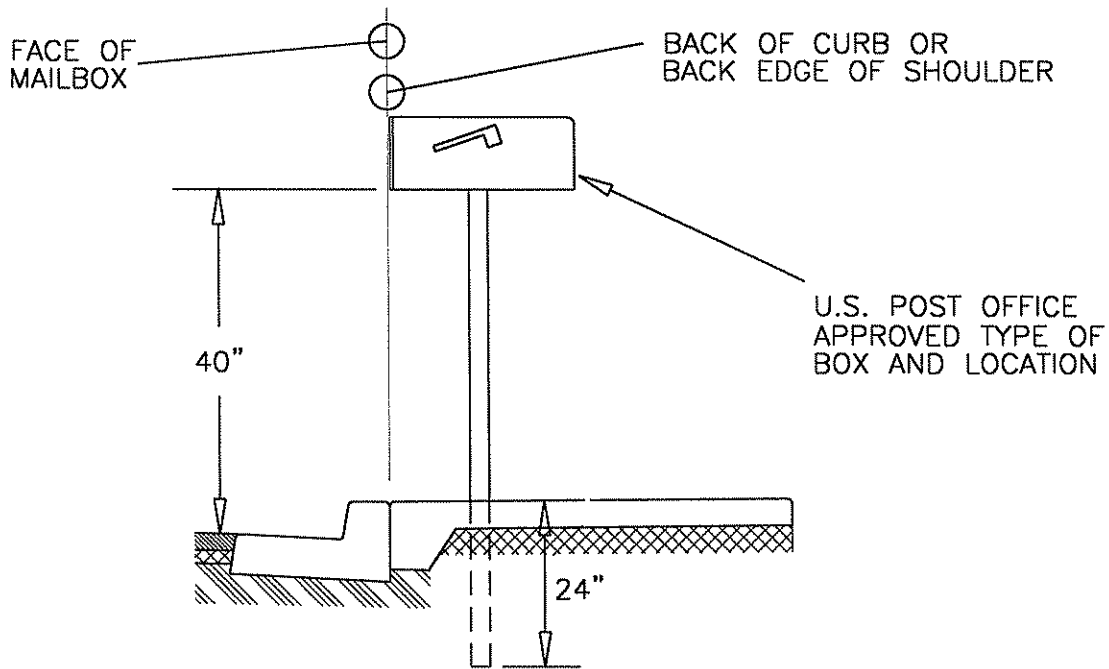
1. CONCRETE TO HAVE A BREAKING STRENGTH OF 3300 PSI AFTER 28 DAYS.
2. PCC CONTRACTION JOINTS
 - A. SPACING TO BE 15 FEET OR LESS.
 - B. DEPTH TO BE AT LEAST 1 1/2".
 - C. TO BE CENTERED OVER ANY WEEPHOLES.
3. PCC EXPANSION JOINTS
 - A. TO BE PROVIDED:
 1. AT EACH POINT OF TANGENCY OF THE CURB.
 2. AT EACH COLD JOINT.
 3. AT EACH SIDE OF INLET STRUCTURES.
 4. AT EACH END OF DRIVEWAYS.
 - B. MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED, NONEXTRUDING, 1/2" THICK.
4. SEE DETAIL FOR CURB & GUTTER

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SCALE:



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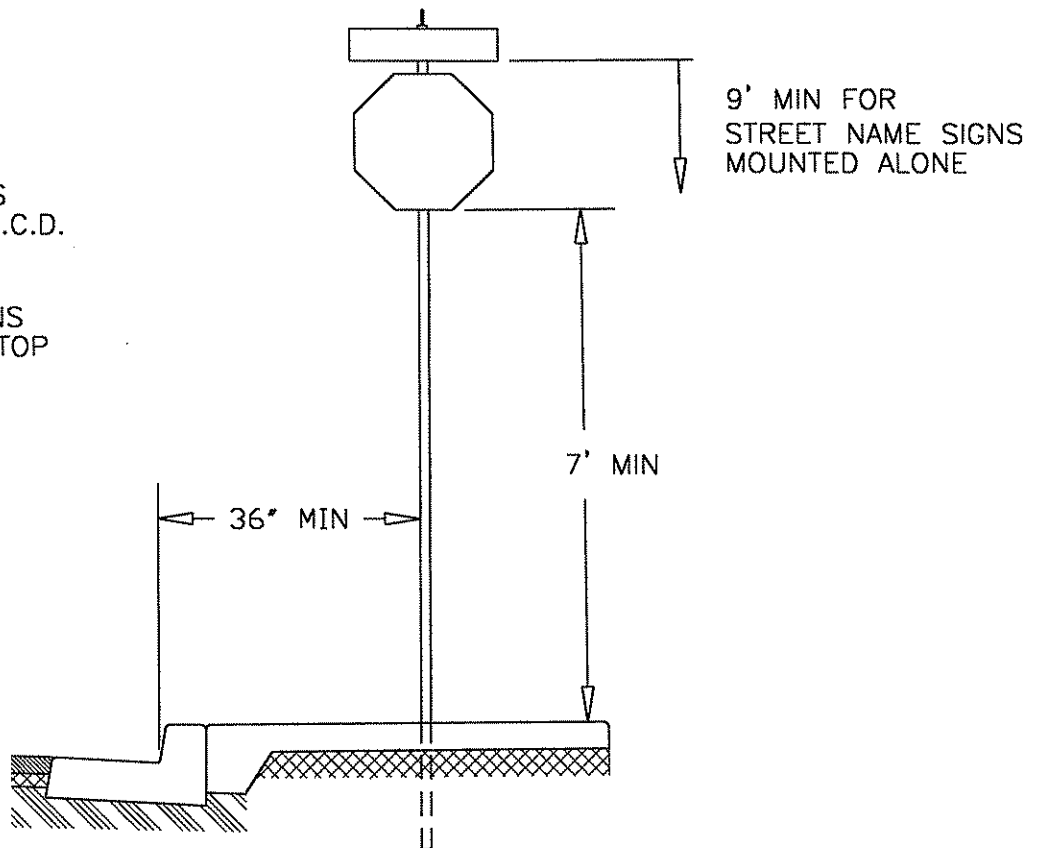
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DRAWING NO:	220



TYPICAL MAILBOX LOCATION

NOTES:

1. THE CITY OF ST. HELENS HAS ADOPTED THE M.U.T.C.D. BY ORDINANCE
2. ONLY STREET NAME SIGNS MAY BE MOUNTED ON STOP SIGN POSTS
3. INSTALLATION BY CITY OF ST. HELENS, COORDINATED BY CONTRACTOR



TYPICAL SIGNAGE LOCATION

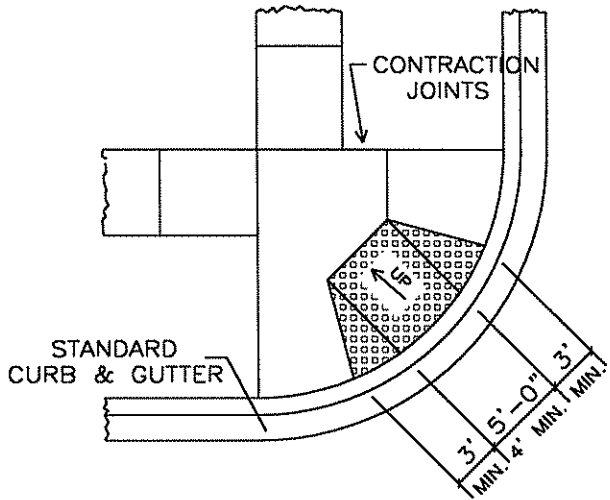
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CHECKED BY:
DATE: 04/2002
SCALE: NONE



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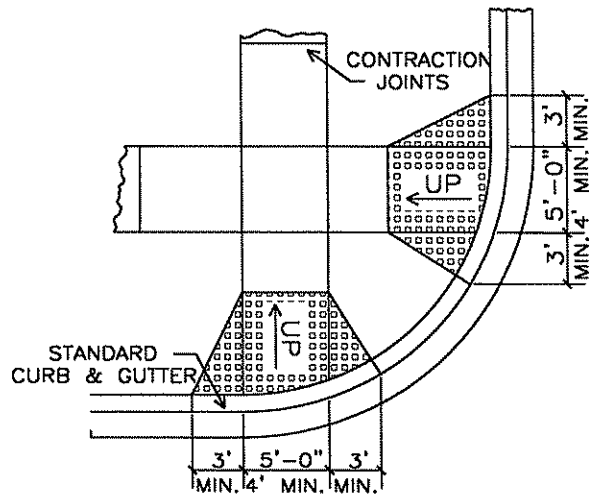
REVISION:
DRAWING NO: 221

TITLE:
TYPICAL MAILBOX AND SIGNAGE LOCATION



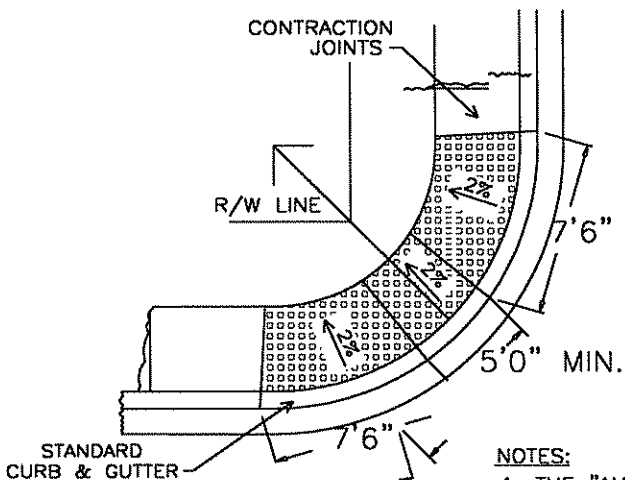
CENTER RAMP

EXTG PROPERTY LINE SIDEWALKS



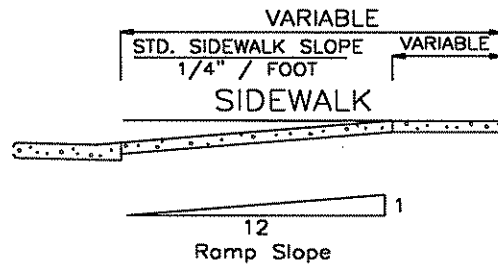
END RAMPs

EXTG PROPERTY LINE SIDEWALKS



CENTER RAMP

FOR CURB LINE SIDEWALKS



SECTION THROUGH RAMPs

NOTES:

1. THE "AMERICANS WITH DISABILITIES ACT" (ADA) REQUIRES THAT ACCESS RAMPs TO SIDEWALKS CONFORM TO ALL FEDERAL GUIDELINES. EXCEPTIONS TO THE REQUIREMENTS IN THIS DRAWING MUST BE APPROVED BY THE ENGINEER AND MUST COMPLY WITH ADA.
2. NO ABOVE GROUND UTILITIES ARE PERMITTED WITHIN RAMP AREA.
3. LANDINGs SHALL BE PLACED AT THE TOP OF EACH RAMP. LANDING SLOPES SHALL NOT EXCEED 50:1 IN ANY DIRECTION. THE SLOPE OF THE SURFACING AT THE BOTTOM OF THE RAMP SHALL NOT EXCEED 20:1 FOR A DISTANCE OF 2' (SEE TYPICAL SECTION ABOVE).
4. MINIMUM LANDING DIMENSIONS SHALL BE 4'x 4'.
5. RAMP SURFACE SHALL BE TEXTURED WITH RAISED DIAMOND TEXTURE. TEXTURING SHALL BE DONE WITH AN EXPANDED METAL GRATE STAMPED INTO THE CONCRETE.
6. CONCRETE STRENGTH SHALL BE 3300 PSI.

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SCALE:

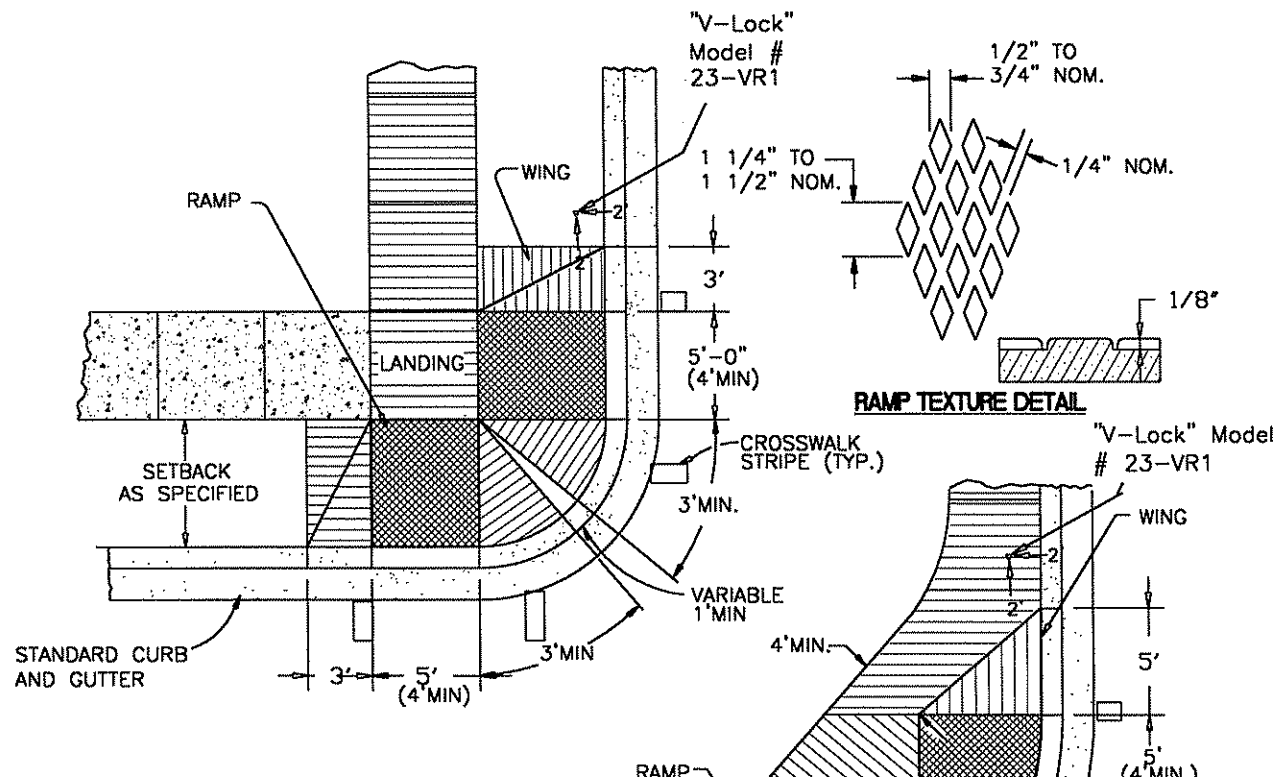


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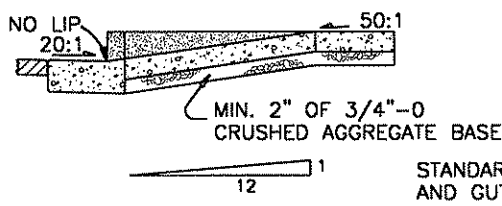
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TITLE:
RESIDENTIAL STREET WHEELCHAIR & BICYCLE RAMPs

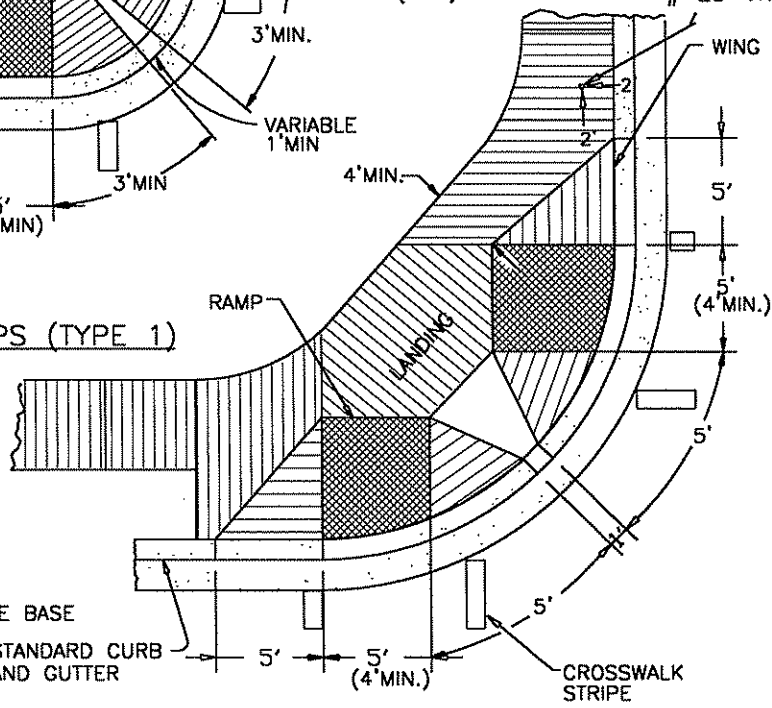
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DRAWING NO:
225



PERPENDICULAR CURB RAMPS (TYPE 1)




TYPICAL SECTION THROUGH RAMP

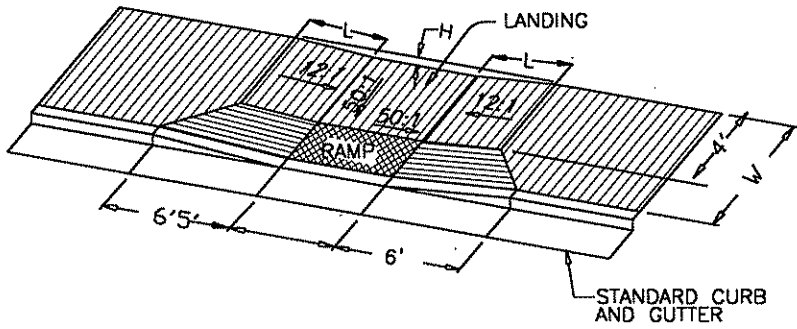


PERPENDICULAR CURB RAMPS (TYPE 2)

NOTES:

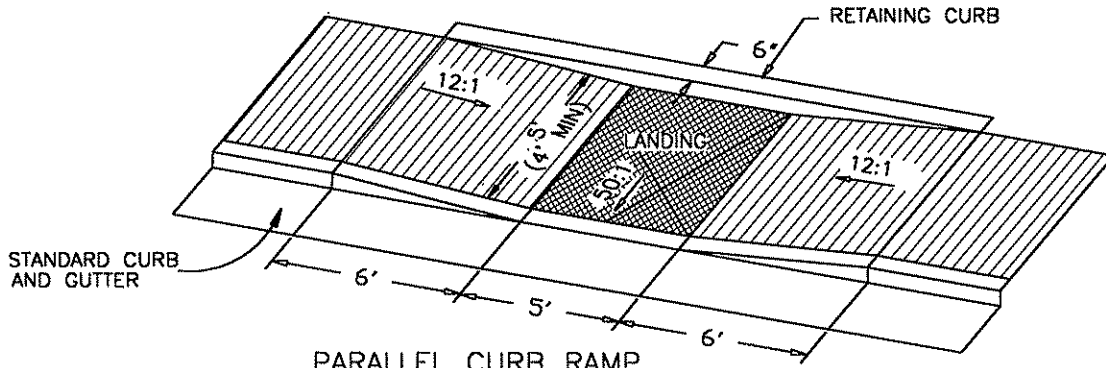
1. THE "AMERICANS WITH DISABILITIES ACT" (ADA) REQUIRES THAT ACCESS RAMPS TO SIDEWALKS CONFORM TO ALL FEDERAL GUIDELINES. EXCEPTIONS TO THE REQUIREMENTS IN THIS DRAWING MUST BE APPROVED BY THE ENGINEER AND MUST COMPLY WITH ADA.
2. NO ABOVE GROUND UTILITIES ARE PERMITTED WITHIN RAMP AREA.
3. LANDINGS SHALL BE PLACED AT THE TOP OF EACH RAMP. LANDING SLOPES SHALL NOT EXCEED 50:1 IN ANY DIRECTION. THE SLOPE OF THE SURFACING AT THE BOTTOM OF THE RAMP SHALL NOT EXCEED 20:1 FOR A DISTANCE OF 2' (SEE TYPICAL SECTION ABOVE).
4. MINIMUM LANDING DIMENSIONS SHALL BE 4' X 4'.
5. RAMP SURFACE SHALL BE TEXTURED WITH RAISED DIAMOND TEXTURE. TEXTURING SHALL BE DONE WITH AN EXPANDED METAL GRATE STAMPED INTO THE CONCRETE.
6. CONCRETE STRENGTH SHALL BE 3300 PSI.
7. INSTALL V-LOCK (MODEL #23-VR1 OR EQUAL) 2-FT FROM FACE OF CURB AND 2-FT BACK FROM CONTRACTION JOINT.
8. V-LOCK TO BE SET PLUMB AND TO BE FLUSH WITH FINISH GRADE. CITY TO INSPECT PRIOR TO CONCRETE PLACEMENT.

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DATE:		DRAWING NO:
SCALE:		230
TITLE: ARTERIAL / COLLECTOR STREET WHEELCHAIR ACCESS RAMPS		

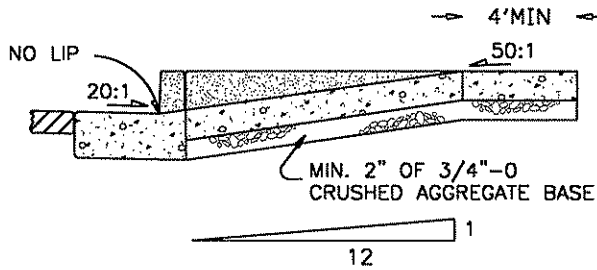


COMBINED CURB RAMP

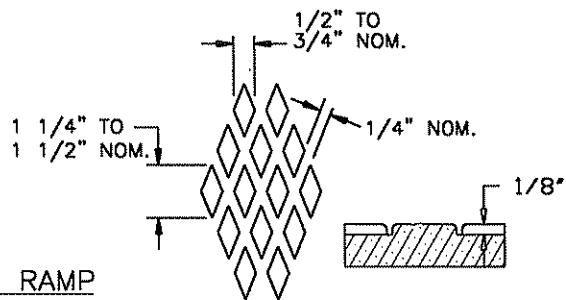
W	L	H
5'	4.36'	7/16"
5.5'	4.05'	13/32"
6'	3.73'	3/8"
6.5'	3.41'	11/32"
7'	3.10'	5/16"
7.5'	2.78'	9/32"
8'	2.46'	1/4"
8.5'	2.15'	7/32"
9'	1.83'	3/16"
9.5'	1.51'	5/32"
10'	1.20'	1/8"
10.5'	0.78'	3/32"



PARALLEL CURB RAMP



TYPICAL SECTION THROUGH COMBINED CURB RAMP



RAMP TEXTURE DETAIL

NOTES:

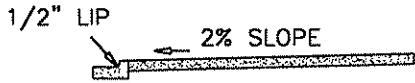
1. THE "AMERICANS WITH DISABILITIES ACT" (ADA) REQUIRES THAT ACCESS RAMPS TO SIDEWALKS CONFORM TO ALL FEDERAL GUIDELINES. EXCEPTIONS TO THE REQUIREMENTS IN THIS DRAWING MUST BE APPROVED BY THE ENGINEER AND MUST COMPLY WITH ADA.
2. NO ABOVE GROUND UTILITIES ARE PERMITTED WITHIN RAMP AREA.
3. LANDINGS SHALL BE PLACED AT THE TOP OF EACH RAMP. LANDING SLOPES SHALL NOT EXCEED 50:1 IN ANY DIRECTION. THE SLOPE OF THE SURFACING AT THE BOTTOM OF THE RAMP SHALL NOT EXCEED 20:1 FOR A DISTANCE OF 2' (SEE TYPICAL SECTION ABOVE).
4. MINIMUM LANDING DIMENSIONS SHALL BE 4'x 4'.
5. RAMP SURFACE SHALL BE TEXTURED WITH RAISED DIAMOND TEXTURE. TEXTURING SHALL BE DONE WITH AN EXPANDED METAL GRATE STAMPED INTO THE CONCRETE.
6. CONCRETE STRENGTH SHALL BE 3300 PSI.

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SCALE:	

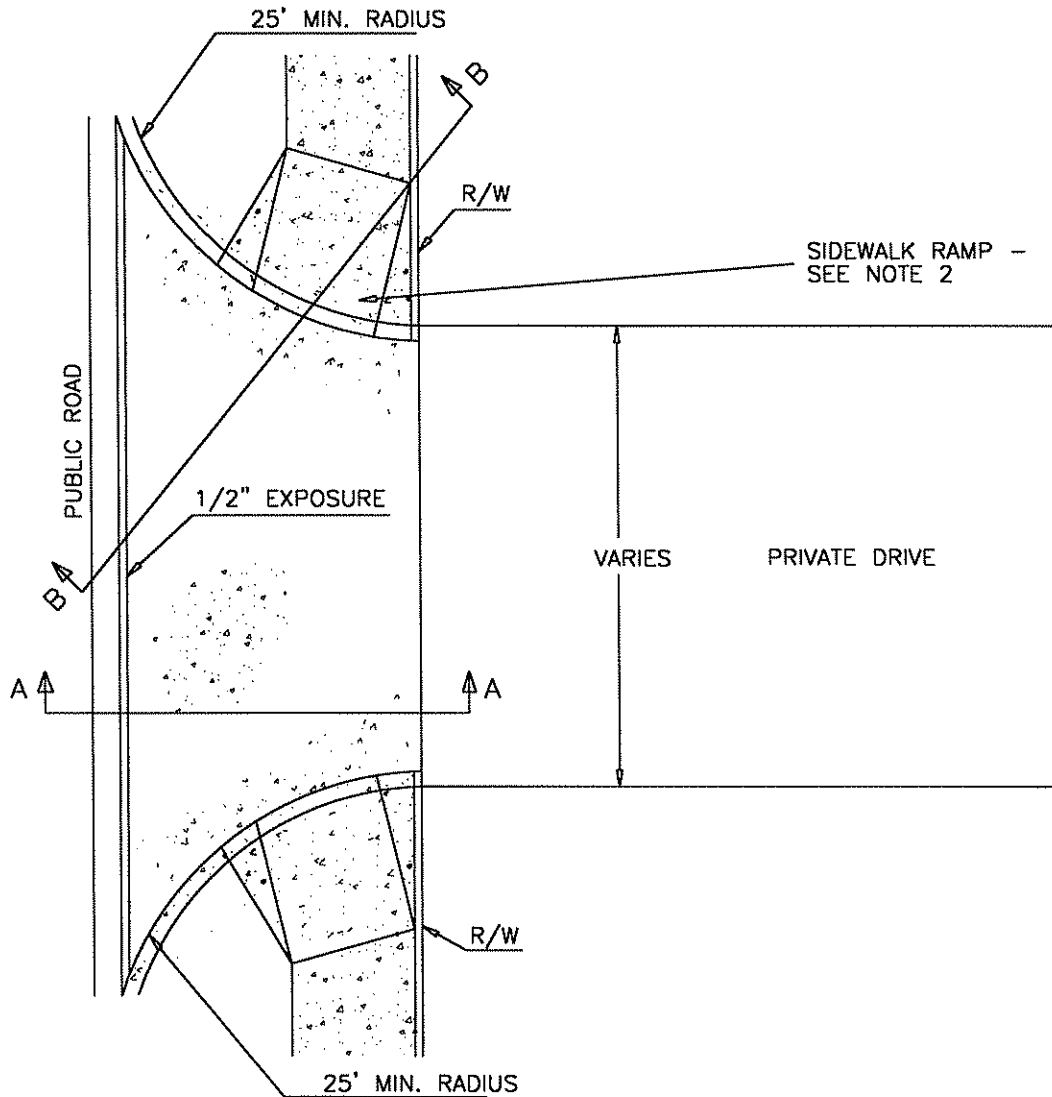


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DRAWING NO:	235



SECTION A-A



NOTES:

1. THIS DETAIL TO BE USED ONLY WHEN DIRECTED BY CITY ENGINEER.

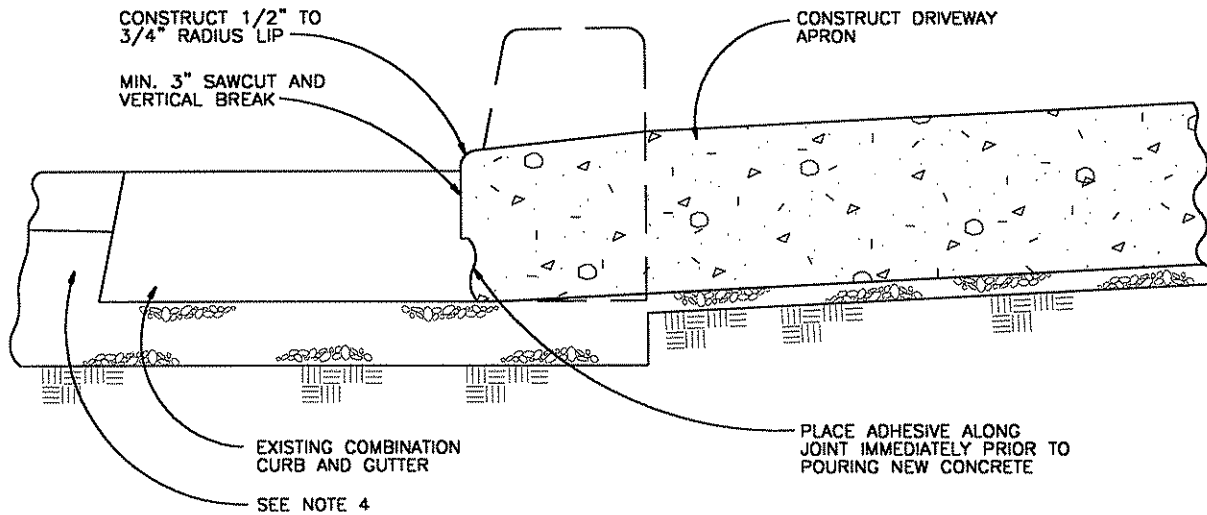
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REVISION: NC
DRAWING NO: 245

TITLE:
COMMERCIAL DRIVEWAY WITH CURBS



NOTES:

1. SAWCUT THROUGH GUTTER PLATE SHALL BE MADE AS CLOSE TO CURB FACE AS POSSIBLE.
2. COMPLETE CURB AND GUTTER SHALL NOT BE REMOVED UNLESS DIRECTED BY THE ENGINEER.
3. WHEN STRAIGHT CURBS ARE REMOVED, A MINIMUM OF 2 FEET OF PAVEMENT FROM THE FACE OF CURB SHOULD BE REMOVED AND REPLACED.
4. WHEN ENTIRE GUTTER PLATE IS REMOVED THE EXISTING PAVEMENT SHALL BE CUT BACK AND A 6" MONOLITHIC CONCRETE BENCH SHALL BE CONSTRUCTED WITH THE NEW GUTTER TO PROVIDE SUPPORT UNDER PAVEMENT. (SEE CONCRETE VALLEY GUTTER DETAIL).

DRAWN BY: T. KOLLN

CHECKED BY:

DATE:

SCALE:



CITY OF ST. HELENS

265 THE STRAND, ST. HELENS, OR 97051
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TITLE:

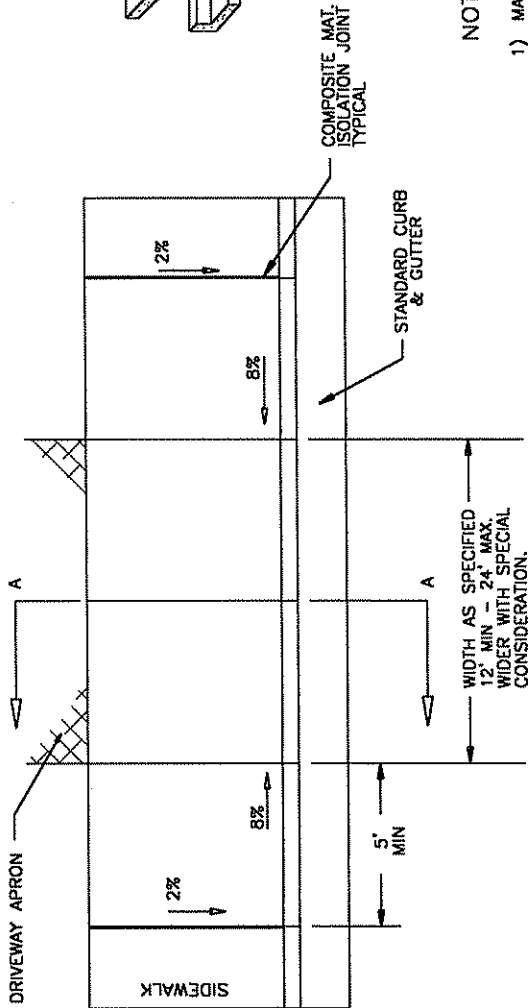
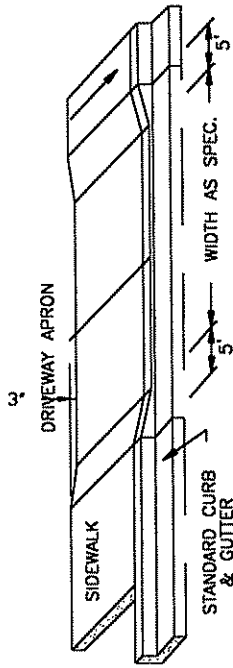
CURB KNOCKOUT FOR DRIVEWAYS

REVISION:

NC

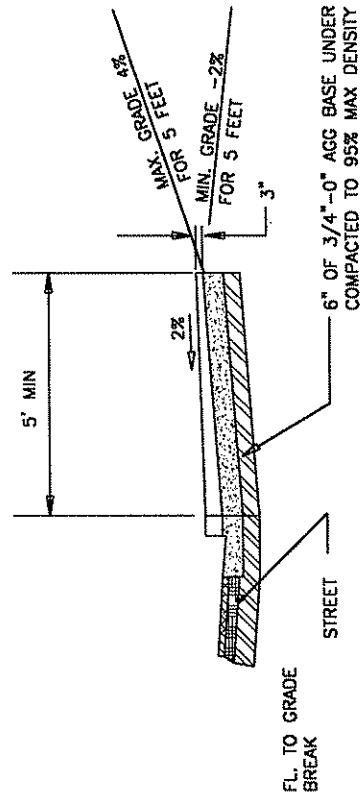
DRAWING NO:

250



NOTES:

- 1) MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE TO APWA STANDARD SPECIFICATIONS.
- 2) ALL DRIVEWAYS AND SIDEWALK SECTIONS THROUGH DRIVEWAYS SHALL HAVE A NOMINAL THICKNESS A SIX INCHES OF CONCRETE.
- 3) TAPERED SECTIONS BETWEEN FULL CURB HEIGHT AND DRIVEWAY SHALL BE FIVE FEET.
- 4) CONCRETE DRIVEWAY APPROACHES SHALL HAVE A 28 DAY ULTIMATE COMPRESSIVE STRENGTH OF 3500 PSI MINIMUM.
- 5) DEPENDING ON THE WIDTH OF THE DRIVEWAY APPROACH, CONSTRUCT ONE OR MORE CONTRACTION JOINTS.



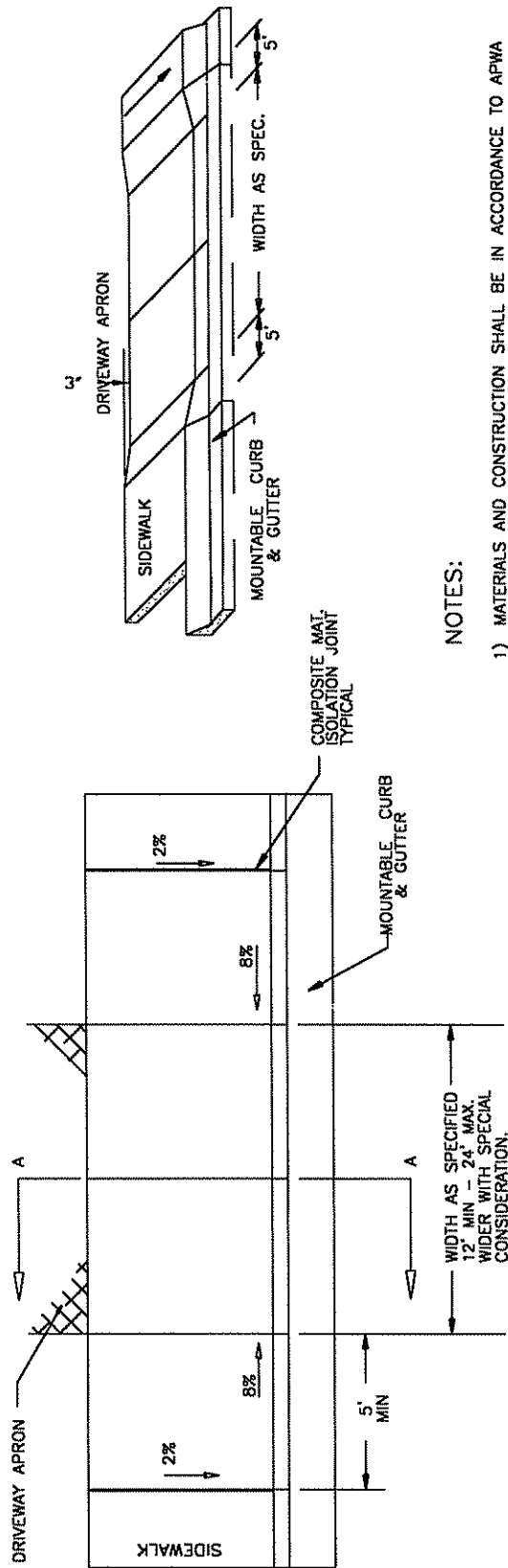
SECTION AA

DRAWN BY:	J. GRAHAM
CHECKED BY:	
DATE:	
SCALE:	



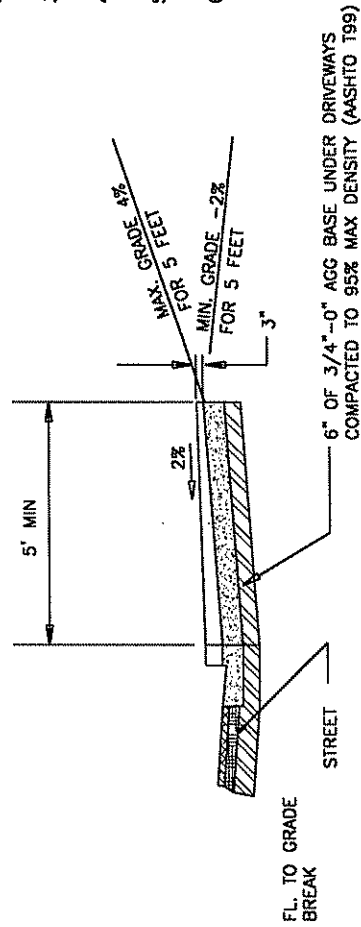
CITY OF ST. HELENS
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REVISION:	NC
DRAWING NO:	252



NOTES:

- 1) MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE TO APWA STANDARD SPECIFICATIONS.
- 2) ALL DRIVEWAYS AND SIDEWALK SECTIONS THROUGH DRIVEWAYS SHALL HAVE A NOMINAL THICKNESS A SIX INCHES OF CONCRETE.
- 3) TAPERED SECTIONS BETWEEN FULL CURB HEIGHT AND DRIVEWAY SHALL BE FIVE FEET.
- 4) CONCRETE DRIVEWAY APPROACHES SHALL HAVE A 28 DAY ULTIMATE COMPRESSIVE STRENGTH OF 3300 PSI MINIMUM.
- 5) DEPENDING ON THE WIDTH OF THE DRIVEWAY APPROACH, CONSTRUCT ONE OR MORE CONTRACTION JOINTS.
- 6) SEE DETAIL FOR MOUNTABLE CURB



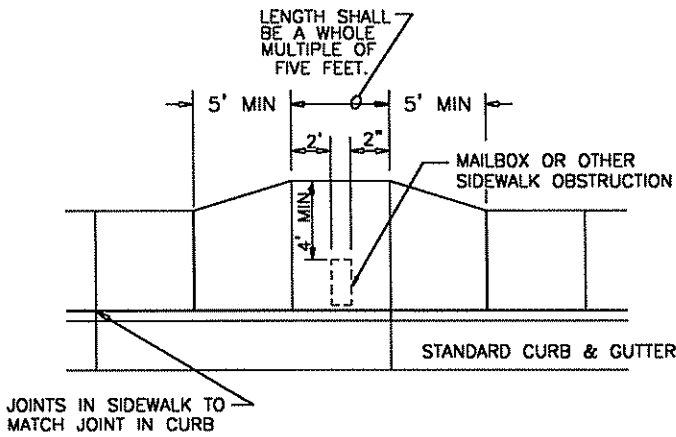
SECTION AA

DRAWN BY: T.L.U
CHECKED BY:
DATE:
SCALE:

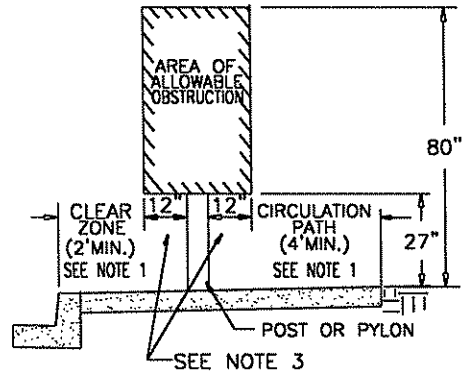


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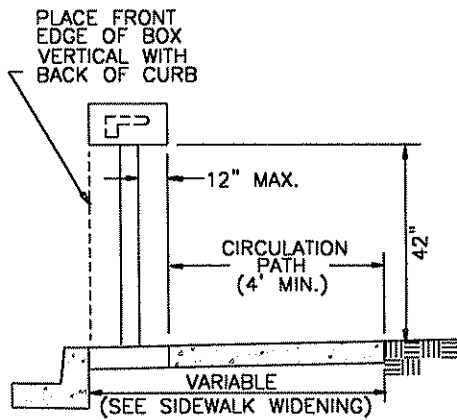
REVISION: NC
DRAWING NO: 252-A



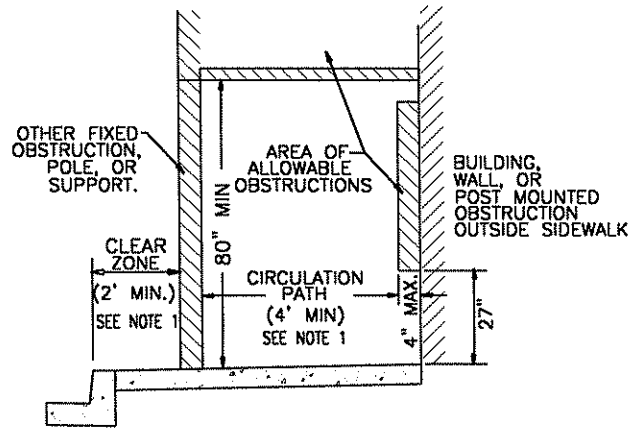
REQUIRED SIDEWALK WIDENING
AROUND OBSTRUCTIONS



POST MOUNTED OBSTRUCTION
WITHIN SIDEWALK




TYPICAL MAILBOX INSTALLATION

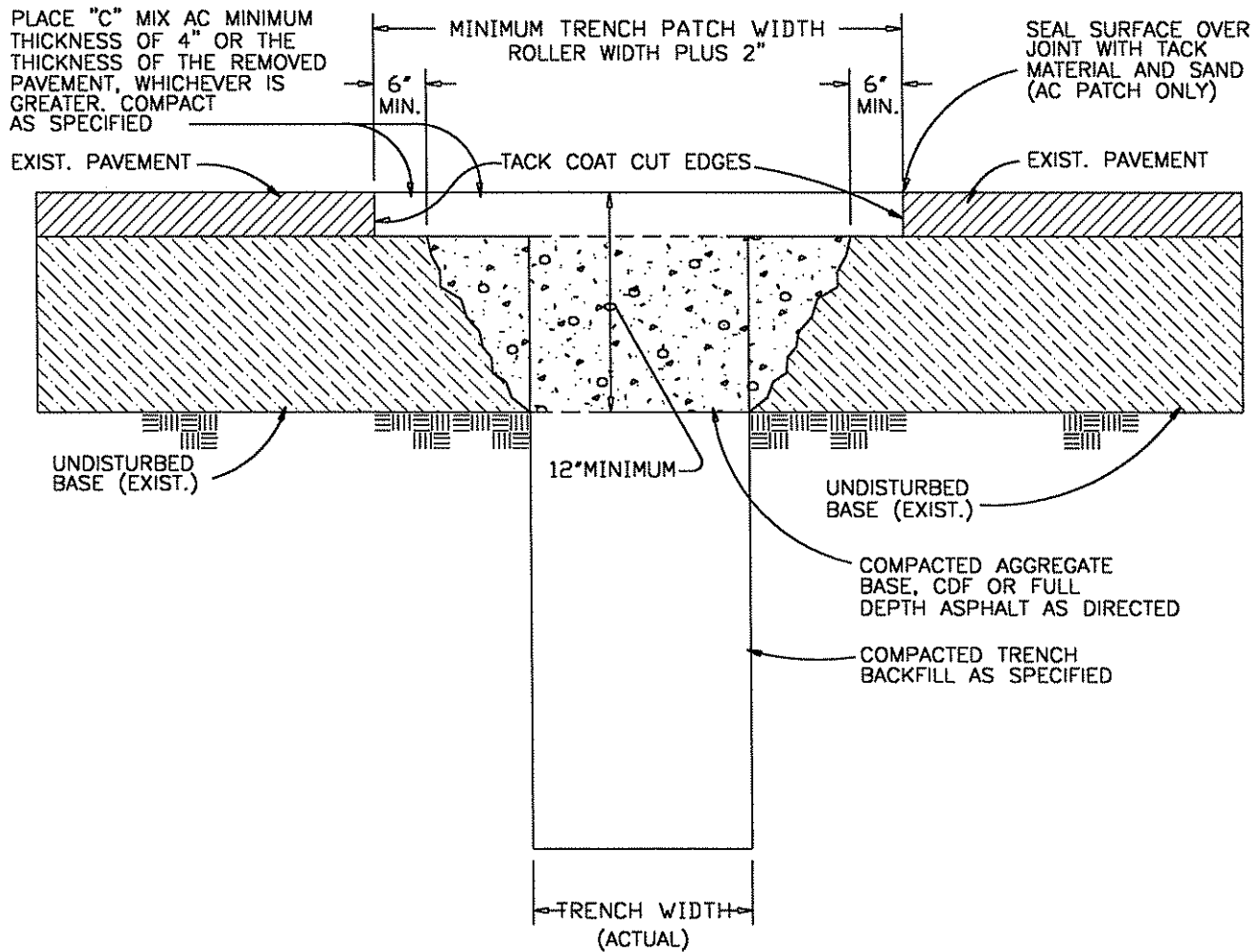


PROTRUDING OBJECTS
AND OTHER OBSTRUCTIONS

NOTES:

- 1) CLEAR ZONE AND THE CIRCULATION PATH MAY BE COMBINED PROVIDING A 5 FOOT MINIMUM SIDEWALK WIDTH IS MAINTAINED.
- 2) DEFLECT SIDEWALK AROUND AREA OF OBSTRUCTION WHEN OVERHANGS EXCEED ALLOWABLE LIMITS.
- 3) WHEN OBSTRUCTIONS ARE LOCATED WITHIN THE SIDEWALK AREA THE DIMENSION APPLIES IN ALL DIRECTIONS.
- 4) INSTALL FULL DEPTH EXPANSION JOINT AROUND ALL OBSTRUCTIONS PENETRATING SIDEWALK SURFACE.
- 5) ON CUL-DE-SACS, PLACE FRONT EDGE OF MAILBOX 6 INCHES BEHIND BACK OF CURB.
- 6) EXCEPTIONS TO THE REQUIREMENTS IN THIS DRAWING MUST BE APPROVED BY THE ENGINEER AND MUST COMPLY WITH AMERICANS WITH DISABILITY ACT.

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DATE:		
SCALE:		
TITLE: SIDEWALK DETAILS: OBSTRUCTIONS & PROTRUDING OBJECTS		DRAWING NO: 255



NOTES:

1. ALL EXISTING AC OR PCC PAVEMENT SHALL BE SAWCUT PRIOR TO REPAVING.
2. CONCRETE PAVEMENT SHALL BE REPLACED WITH CONCRETE TO A MINIMUM THICKNESS OF 6" OR TO THE THICKNESS OF REMOVED PAVEMENT, WHICHEVER IS GREATER.
3. IF EXISTING BASE MATERIAL IS CTB OR ATB, THEN REPLACEMENT BASE MATERIAL SHALL MATCH EXISTING.
4. CONCRETE STRENGTH SHALL BE 3300 PSI AT 28 DAYS.

DRAWN BY: T. KOLLN

CHECKED BY:

DATE:

SCALE:



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TITLE:

STREET UTILITY PATCH

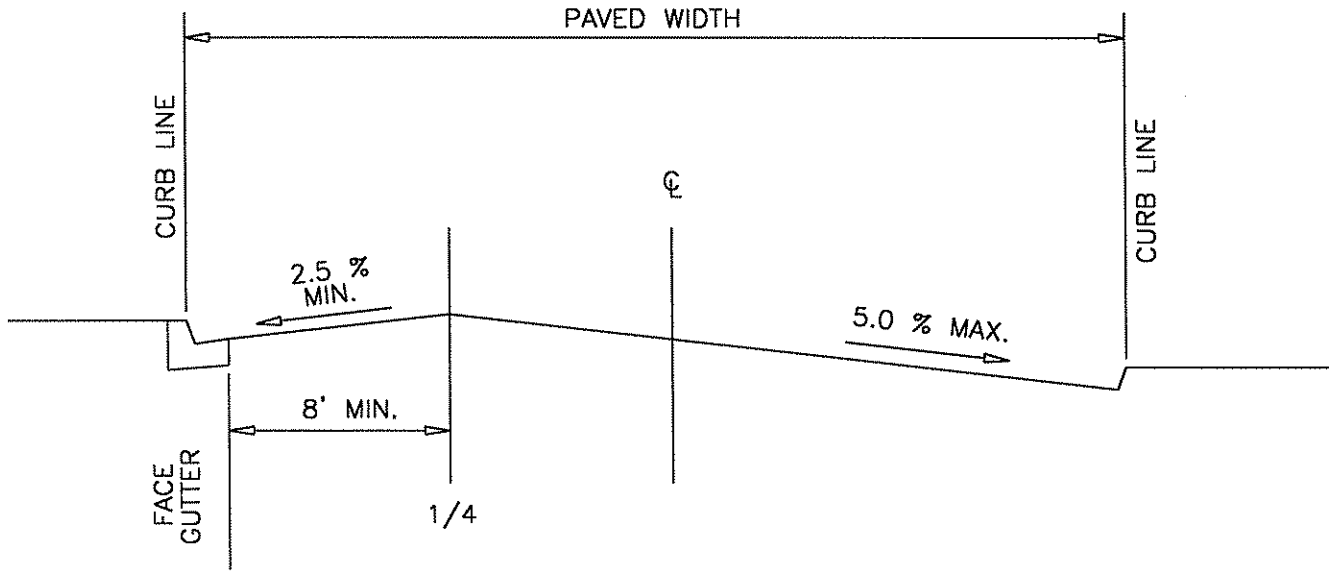
REVISION:

NC

DRAWING NO:

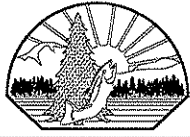
256

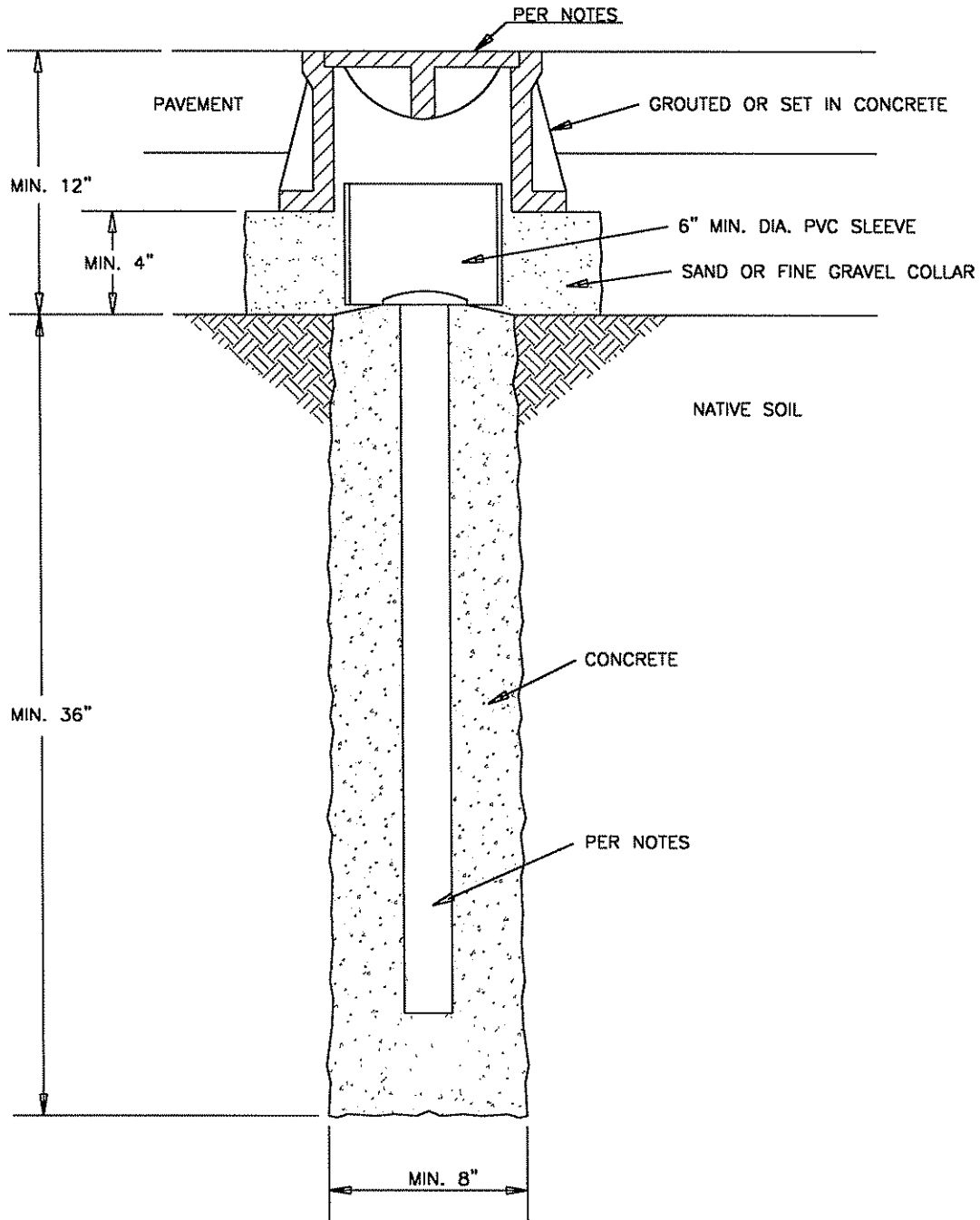
OFFSET CROWN



NOTES:

1. THE CITY ENGINEER MUST GIVE SPECIFIC APPROVAL FOR USE OF AN OFFSET CROWN.
2. OFFSET CROWN CROSS-SECTIONS MAY BE USED IN AREAS OF SUBSTANTIAL CROSS SLOPE.
3. OFFSET CROWN CROSS-SECTIONS SHALL NOT BE USED TO INCREASE DESIGN SPEED IN HORIZONTAL CURVES. SUPERELEVATION SECTIONS SHALL BE USED FOR THAT PURPOSE.
4. MAXIMUM ELEVATION DIFFERENCE OF CURBS (OR EDGE OF PAVEMENT) IS DETERMINED BY CROSS-SLOPES AND

DRAWN BY:	 <p style="font-size: 1.2em; font-weight: bold; margin: 0;">CITY OF ST. HELENS</p> <p style="margin: 0;">265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016</p>	REVISION:
CHECKED BY:		
DATE:		
SCALE:		DRAWING NO: <div style="text-align: center; font-weight: bold; font-size: 1.2em;">260</div>
TITLE: <div style="text-align: center; font-weight: bold; font-size: 1.2em;">OFFSET CROWN</div>		



NOTES:

1. THIS IS INTENDED FOR GPS OR OTHER CONTROL MONUMENTS.
2. 8" x 8" CAST IRON MONUMENT CASTING REQUIRED IN ALL TRAFFIC AREAS (INCLUDING DRIVEWAYS AND PARKING LOTS); IN NONTRAFFIC OR PEDESTRIAN AREAS, A BERNTSEN BMAC-6 OR EQUIVALENT MAY BE SUBSTITUTED.
3. THE MONUMENT SHALL BE A 3"-4" DOMED BRASS CAP AFFIXED TO A FERROUS METAL PIPE AT LEAST 30" IN LENGTH. THE CAP SHALL BE STAMPED OR SCRIBED WITH A CLEARLY DEFINED CENTER MARK AND THE FOLLOWING MINIMUM WORDING: "CITY OF ST. HELENS - DO NOT DISTURB"

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 CHECKED BY:
 DATE:
 SCALE:



CITY OF ST. HELENS
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 PH (503)397-6272 FAX (503)397-4016

REVISION:
 DRAWING NO:
 265

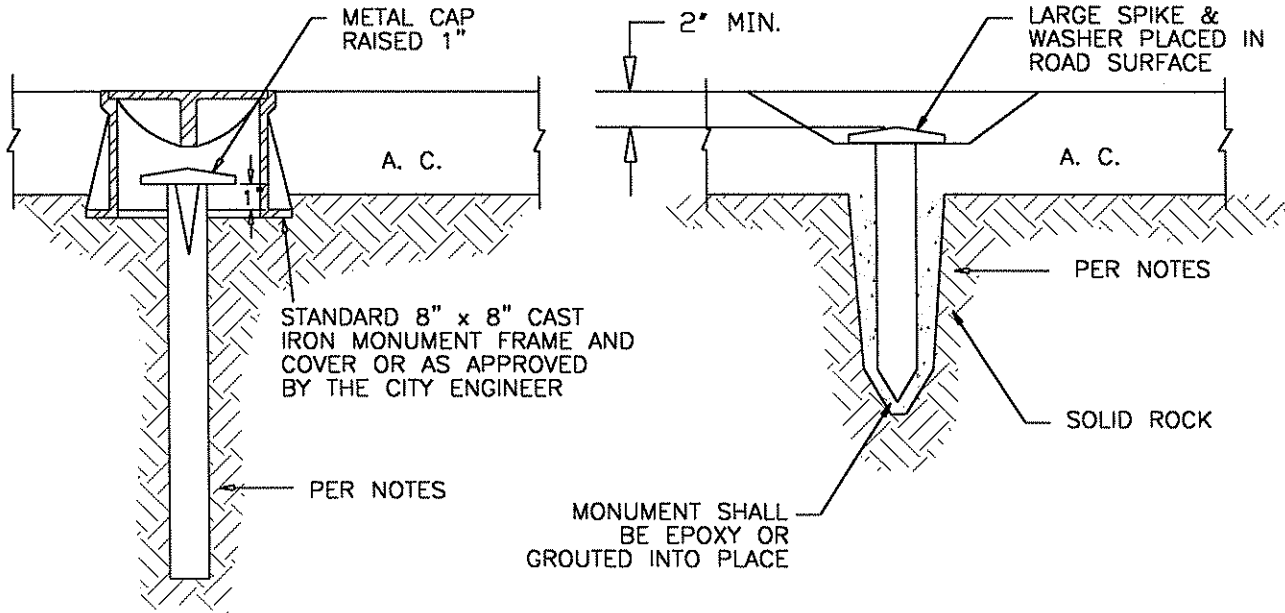
TITLE:
 GEODETIC MONUMENT - SOFT SOILS

TYPE "A"

FOR USE IN INTERSECTIONS,
P.I., P.C., P.T.'S


TYPE "B"

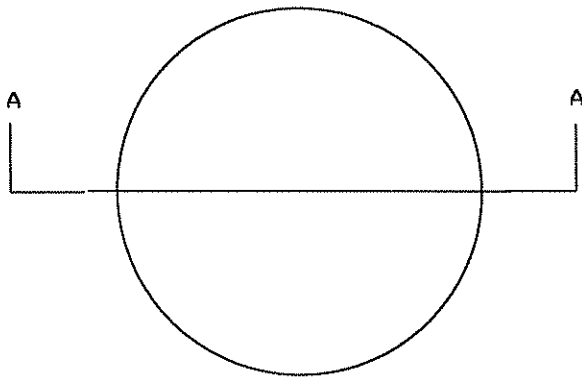
FOR USE AT POINTS
ON SOLID ROCK IN
EXISTING ROADWAYS



NOTES:

1. ALL MONUMENTS SHALL USE EITHER 5/8" DIA. x 30" LONG IRON ROD OR 3/4" DIA. x 30" LONG IRON PIPE, UNLESS APPROVED BY CITY ENGINEER.
2. ALL MONUMENTS SHALL BE IN ACCORDANCE WITH CHAPTER 92 AND 209 OF OREGON REVISED STATUES.
3. TYPE "A" MONUMENT SHALL BE USED AT CENTERLINE INTERSECTIONS & P.I.'S THAT FALL WITHIN PAVED ROADWAYS IN NEW CONSTRUCTION. IF THE P.I. FALLS OUTSIDE OF THE PAVED ROADWAY THE P.C. AND P.T. WILL BE SET IN LIEU OF THE P.I.
4. TYPE "B" MONUMENT WILL BE USED IN SOLID ROCK ONLY.
5. ANY POINT BEING USED AS A GPS POINT SHALL BE SET IN ACCORDANCE WITH THE STANDARD "GEODETIC MONUMENT" DETAIL #265.

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CHECKED BY:			
DATE:		TITLE: CENTERLINE SURVEY MONUMENTS	DRAWING NO: 266
SCALE:			

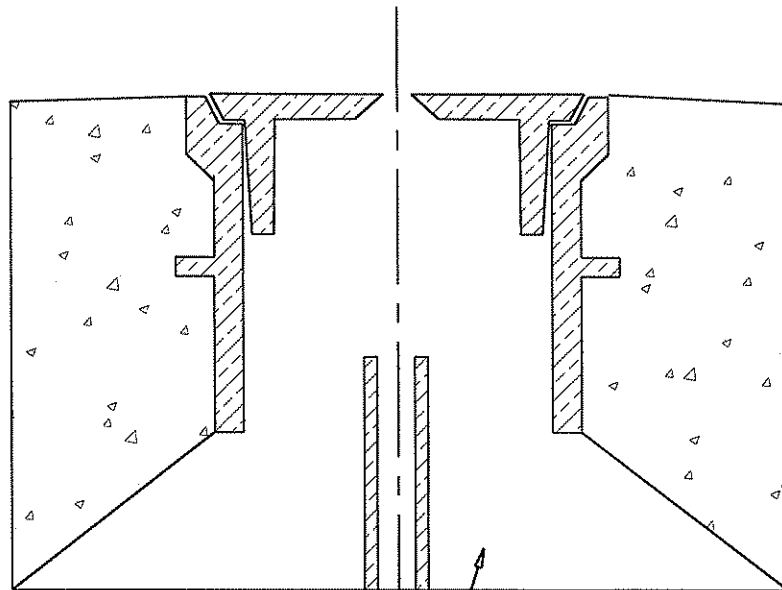
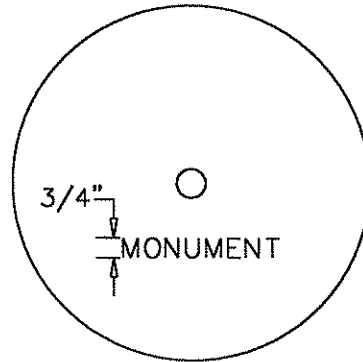


PLAN

RISER RING				
DIM	ADJUSTMENT HEIGHT			
	1 1/2"	2"	2 1/2"	3"
A	1 1/2"	2"	2 1/2"	3"
B	2 1/4"	2 3/4"	3 1/4"	3 3/4"



A - A



AGGREGATE DRAINAGE MATERIAL THICKNESS = 4"

PLACE AGGREGATE AS REQUIRED TO SUPPORT MONUMENT BOX DURING CONCRETE PLACEMENT

MONUMENT AS REQUIRED TO BE SET BY OTHERS

NOTES:

1. USE OLYMPIC FOUNDARY PART NO. M1015 OR CITY APPROVED EQUAL
2. QUICK SET BAGGED CONCRETE MIX. MINOR STRUCTURE CONCRETE OR CITY APPROVED EQUAL.

DRAWN BY:
T.L.U.

CHECKED BY:

DATE:

SCALE:



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TITLE:

MONUMENT BOX

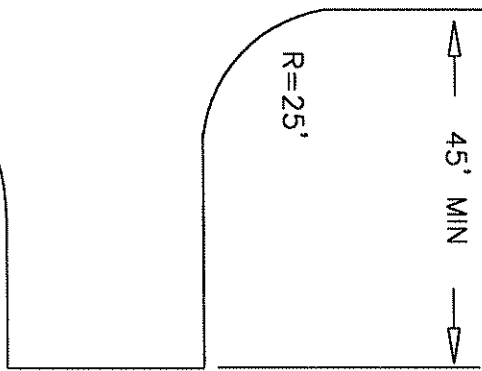
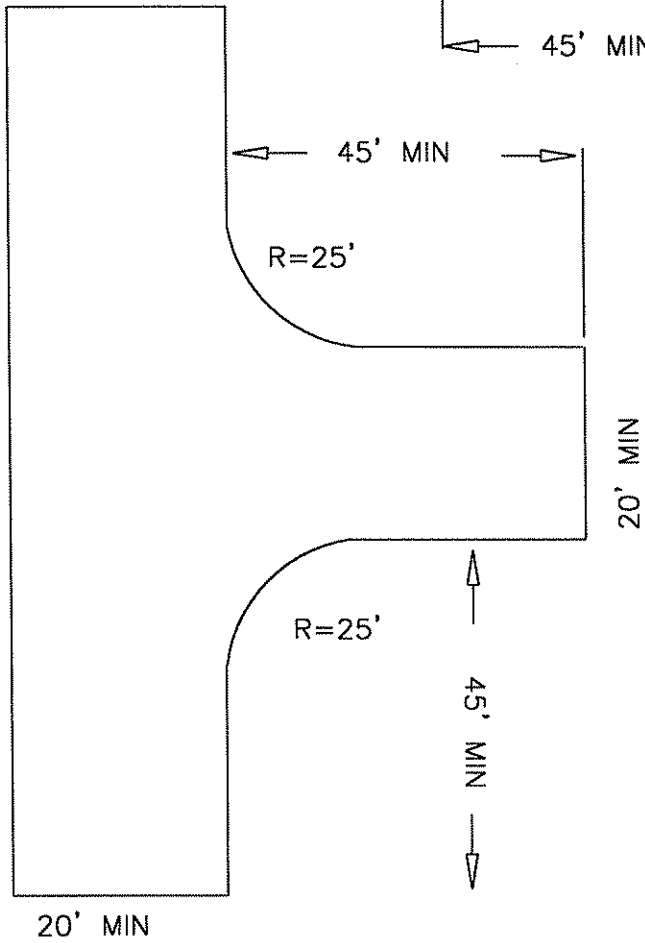
REVISION:

DRAWING NO:

267

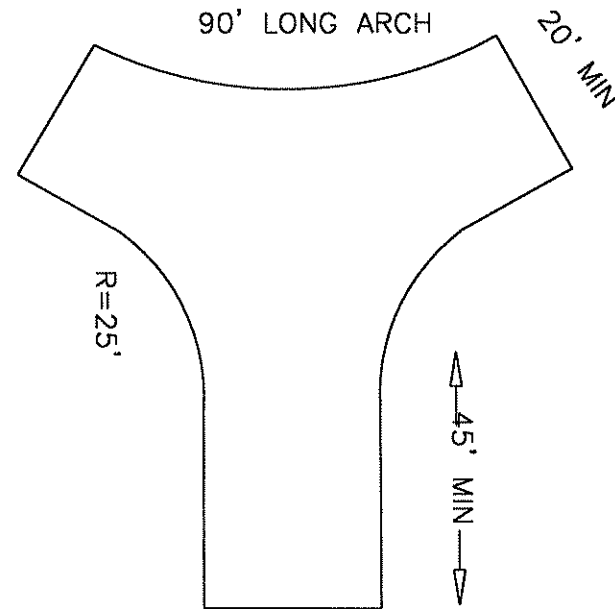
BRANCH
TYPE

20' MIN



20' MIN

T- TYPE



20' MIN

ARCH-TYPE

NOTES:

1. ACCESS WIDTH 20' MIN WITH THE APPROVAL OF THE FIRE MARSHALL AND THE CITY ENGINEER.
2. CURB HEIGHT NOT TO EXCEED 6 INCHES
3. "NO PARKING" SIGNS AS REQUIRED
4. STRUCTURAL SECTION TO BE ENGINEERED TO SUPPORT 50,000 LBS. MINIMUM PER UNIFORM FIRE CODE.

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DATE:

SCALE:



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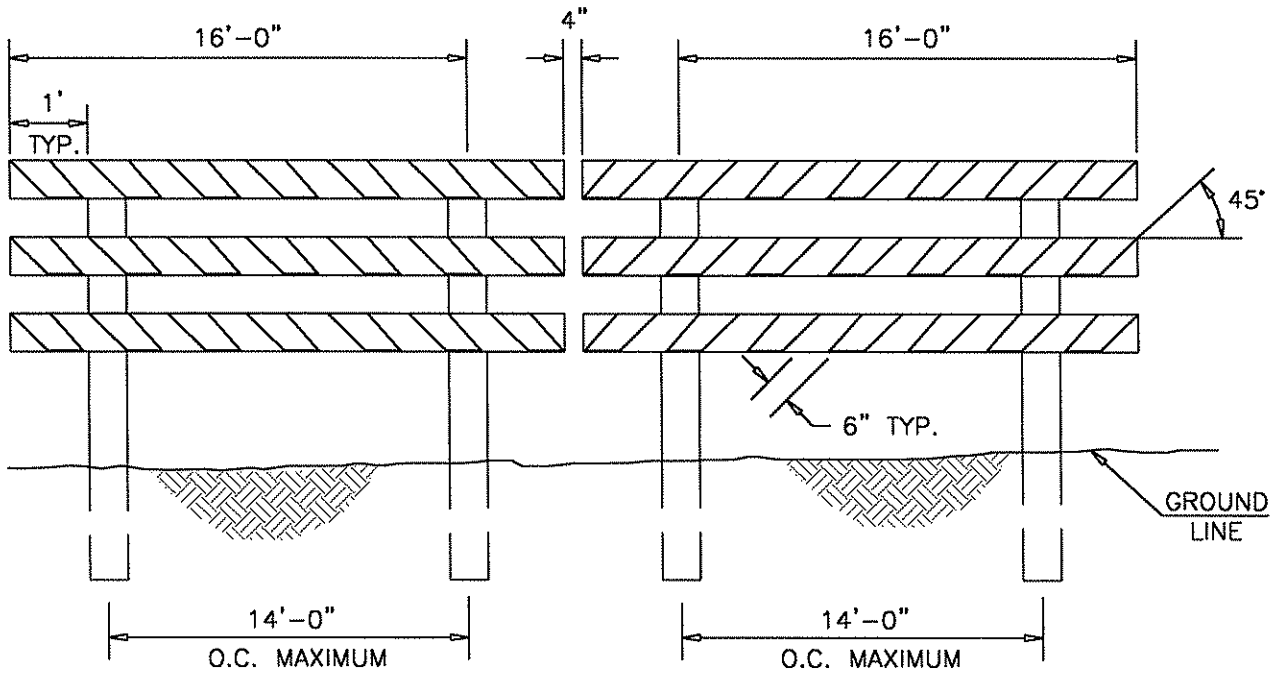
TITLE:

APPROVED FIRE TURN-AROUND CONFIGURATIONS

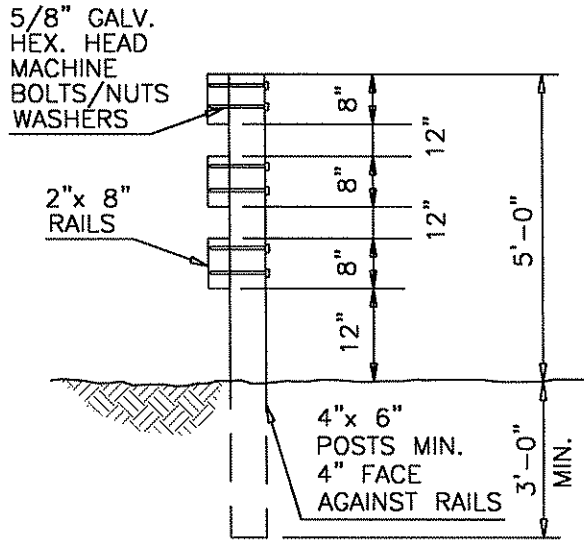
REVISION:

DRAWING NO:

284



ELEVATION



END VIEW

NOTES:

1. RAILS TO BE REFLECTORIZED WHITE AND RED STRIPES. POSTS TO BE PRESSURE TREATED.
2. SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS AND THE OREGON SUPPLEMENT.
 3F-1 BARRICADES
 6C-8 BARRICADE DESIGN
 6C-9 BARRICADE APPLICATION
3. ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT STATE OF OREGON STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
4. FOR WIDER APPLICATIONS, MULTIPLE SECTIONS AS SHOWN SHALL BE USED.

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DATE:
SCALE:



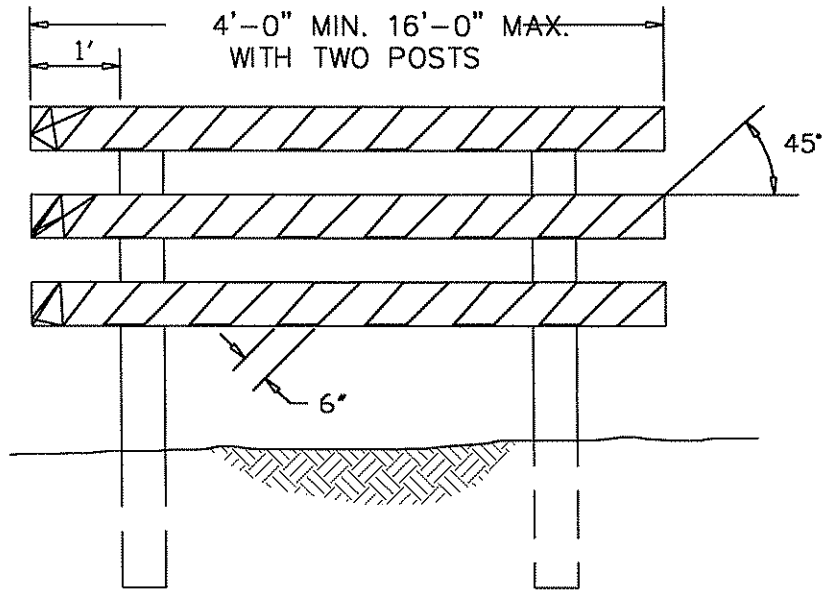
CITY OF ST. HELENS

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TITLE:

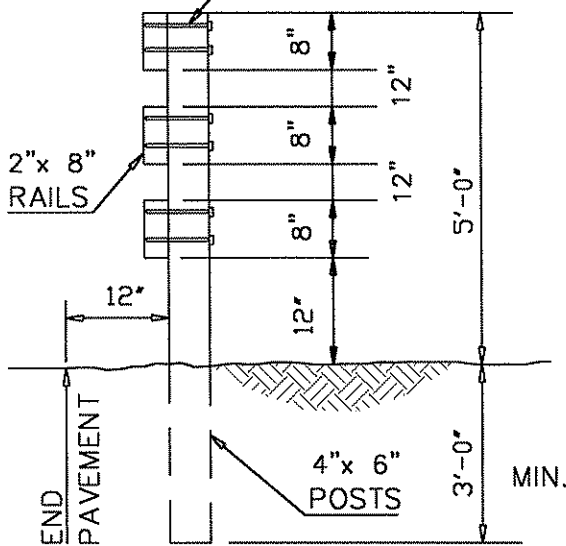
DOUBLE STREET BARRICADE - TYPE III

REVISION:
DRAWING NO: 286



ELEVATION

5/8" GALVANIZED
HEX. HEAD MACHINE
BOLTS/WASHERS



END VIEW

NOTES:

1. RAILS TO BE REFLECTORIZED WHITE AND RED STRIPES. POSTS TO BE PRESSURE TREATED.
2. SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS AND THE OREGON SUPPLEMENT.
3F-1 BARRICADES
6C-8 BARRICADE DESIGN
6C-9 BARRICADE APPLICATION
3. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT STATE OF OREGON STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
4. THE ABOVE BARRICADE INDICATES THAT TRAFFIC PASSES TO THE LEFT OF THE DEVICE. IF TRAFFIC IS TO PASS TO THE RIGHT, THE STRIPES ANGLE MUST REVERSED.
5. FOR WIDER APPLICATIONS, MULTIPLE SECTIONS AS SHOWN SHALL BE USED.

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DATE:
SCALE:



CITY OF ST. HELENS

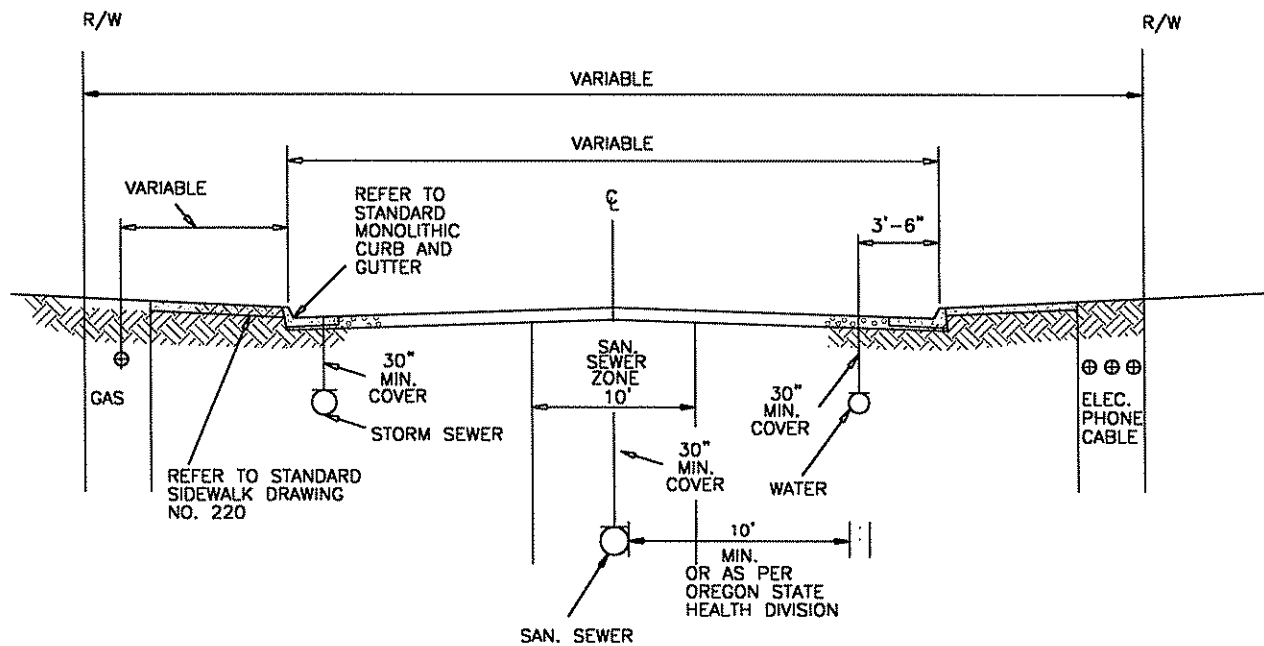
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TITLE:

STREET BARRICADE TYPE III - SINGLE


REVISION:
DRAWING NO: 286-A

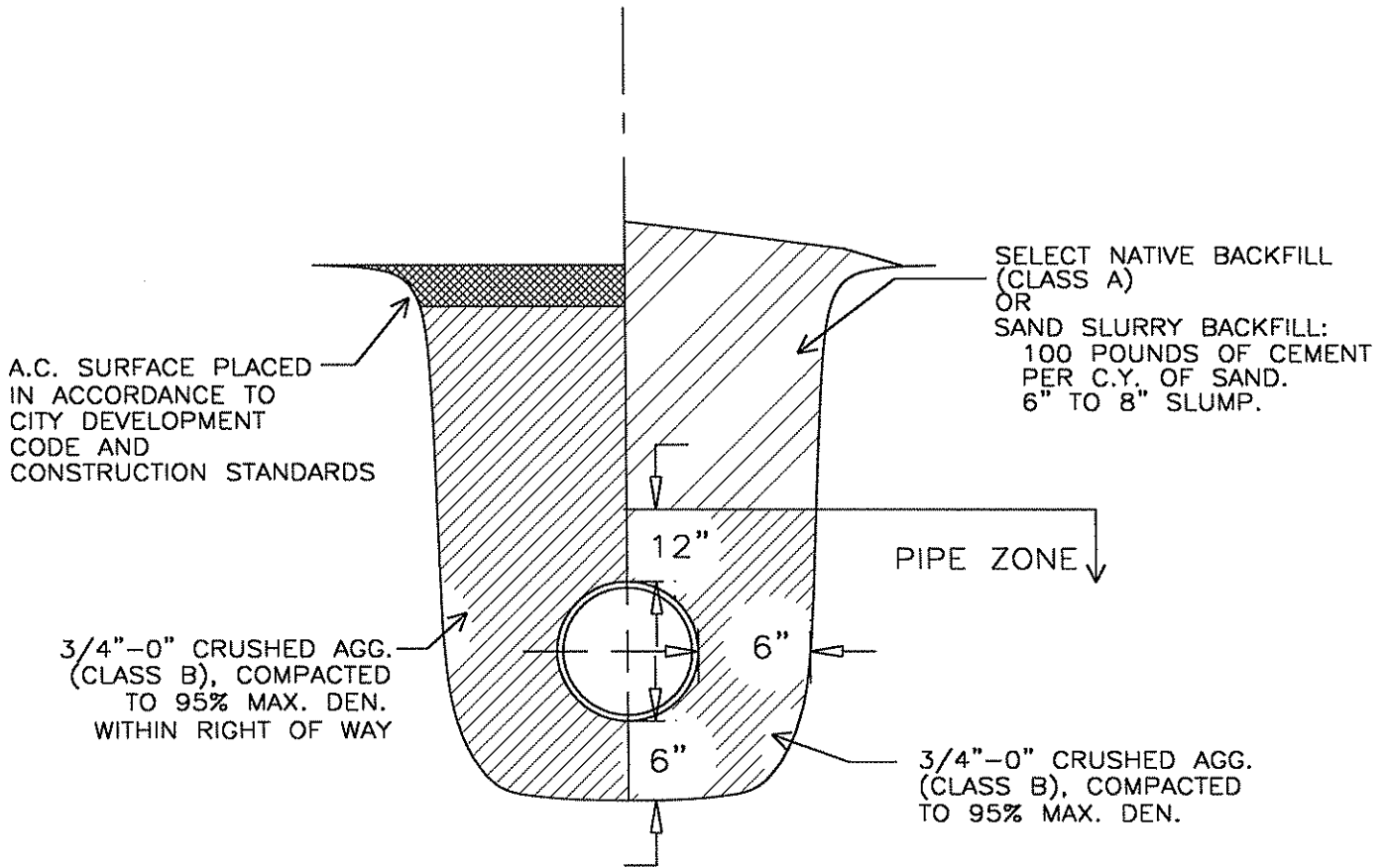
NOTE: A PERMIT MUST BE OBTAINED FOR ALL WORK TO BE DONE WITHIN RIGHT-OF-WAY FROM THE CITY OF ST. HELENS ENGINEERING DEPARTMENT



NOTES:


1. STORM SEWER AND GAS TO BE LOCATED ON SOUTH/WEST SIDE OF STREET, POWER, COMMUNICATIONS, WATER TO BE LOCATED ON NORTH/EAST SIDE OF STREET.
2. ALL UTILITIES SHALL BE INSTALLED AT MINIMUM 30" BELOW ROAD SURFACE TO TOP OF PIPE.
3. ALL CROSSINGS SHALL BE MADE USING JACKING METHOD UNLESS PREAPPROVED.
4. ALL TRENCHES CROSSING STREETS SHALL BE BACKFILLED & MECHANICALLY COMPACTED TO 2 FEET BELOW SURFACE. COMPACTED 6" LIFTS OF 3/4-0 SHALL BE BROUGHT TO THE SURFACE OF AGG. STREETS OR THE BASE OF PAVED STREETS. ALL TRENCHES SHALL BE PATCHED WITH LIKE MATERIALS TO THE ORIGINAL SURFACE.
5. ALL TRENCHES IN SHOULDERS SHALL BE BACKFILLED & MECHANICALLY COMPACTED TO 1 FOOT BELOW SURFACE. COMPACTED LIFTS OF 3/4-0 SHALL BE BROUGHT TO SURFACE.
6. ALL STREET PATCHING & SHOULDER REPAIR SHALL BE WARRANTIED FOR 1 YEAR.

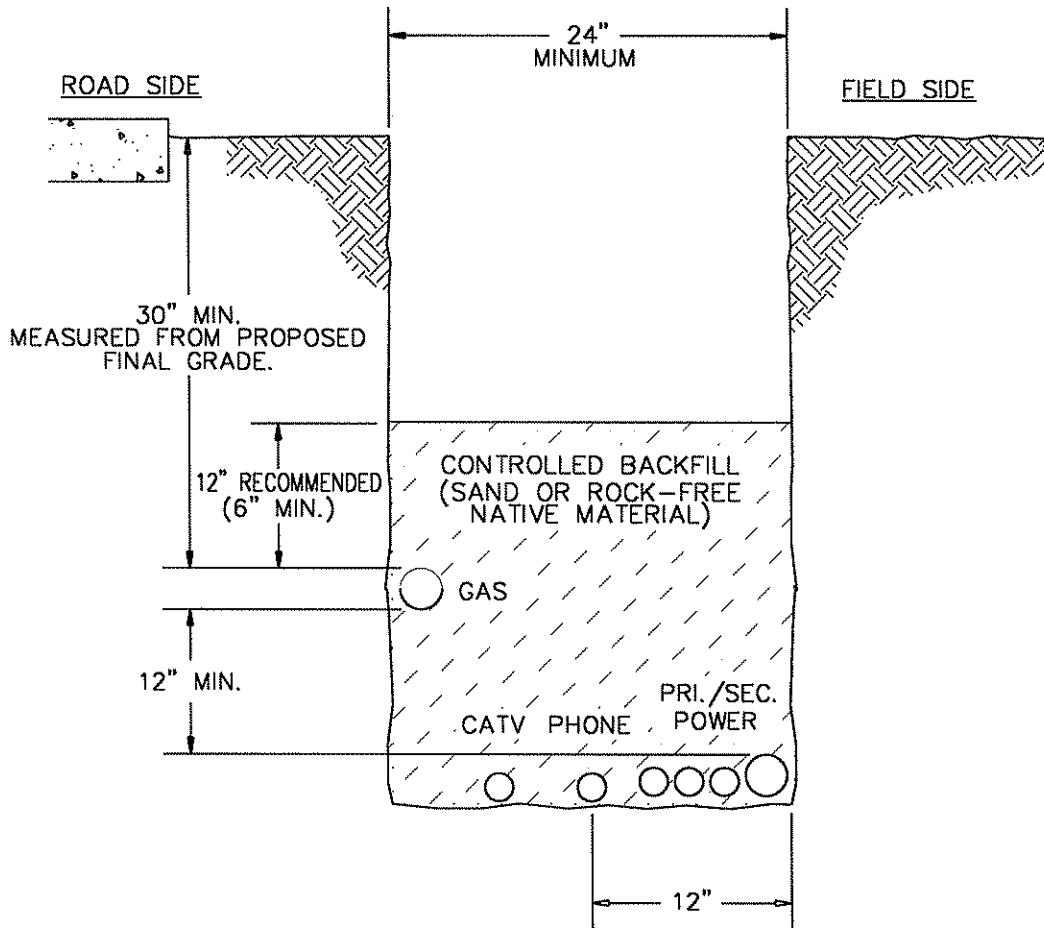
DRAWN BY:	 <h2 style="margin: 0;">CITY OF ST. HELENS</h2> <p style="margin: 0;">265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016</p>	REVISION:
CHECKED BY:		
DATE:		
SCALE:		
TITLE: STANDARD UTILITY LOCATIONS		DRAWING NO: 295




NOTES:

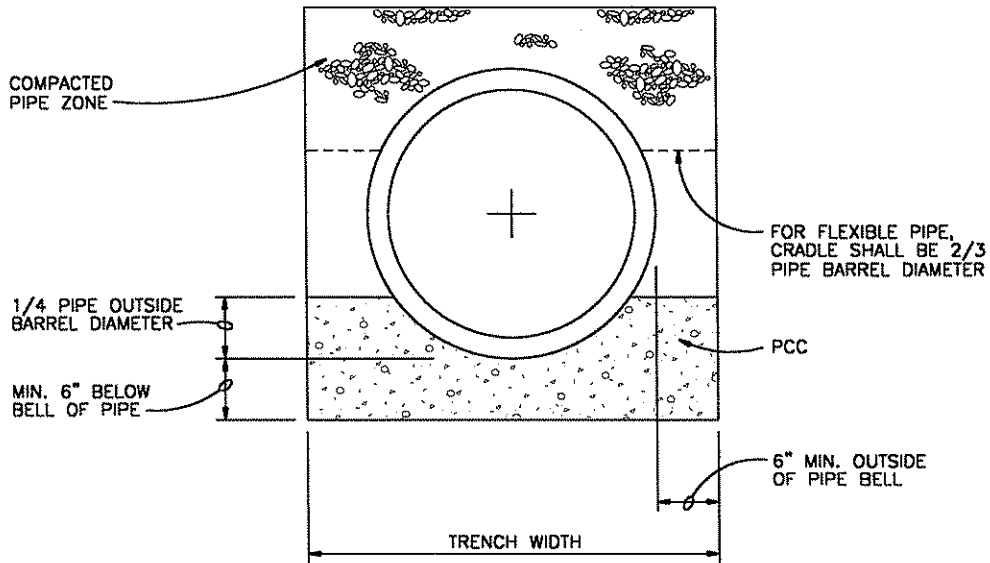
1. MINIMUM TRENCH WIDTH IS 24-INCHES (SEE APWA SEC 301.3)

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CHECKED BY:		
DATE:		
SCALE:		
TITLE:		DRAWING NO:
TYPICAL TRENCH DETAIL		300

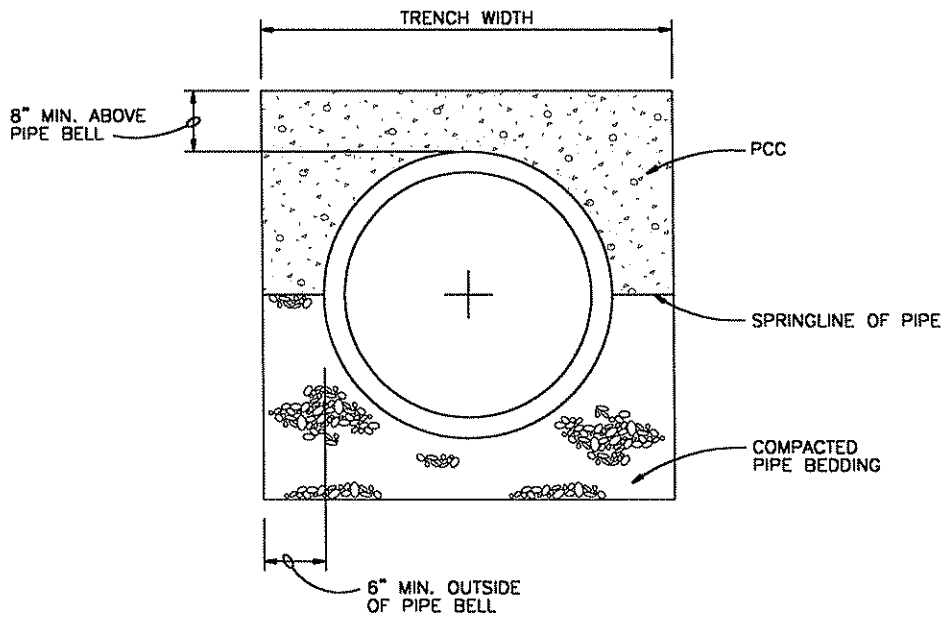


TRENCH REQUIREMENTS FOR JOINT UTILITY USE
 MAIN EXTENSION
 OREGON

DRAWN BY: CHECKED BY: DATE: SCALE:	 <p>CITY OF ST. HELENS 265 THE STRAND, ST. HELENS, OR 97051 PH (503)397-6272 FAX (503)397-4016</p>	REVISION: DRAWING NO: 301
TITLE: JOINT UTILITY TRENCH		



ENCASEMENT DETAIL



CAP DETAIL

NOTE:

THE CONCRETE SHALL BE CLASS 2000 MINIMUM.

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T. KOLLN

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DATE:

SCALE:



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TITLE:

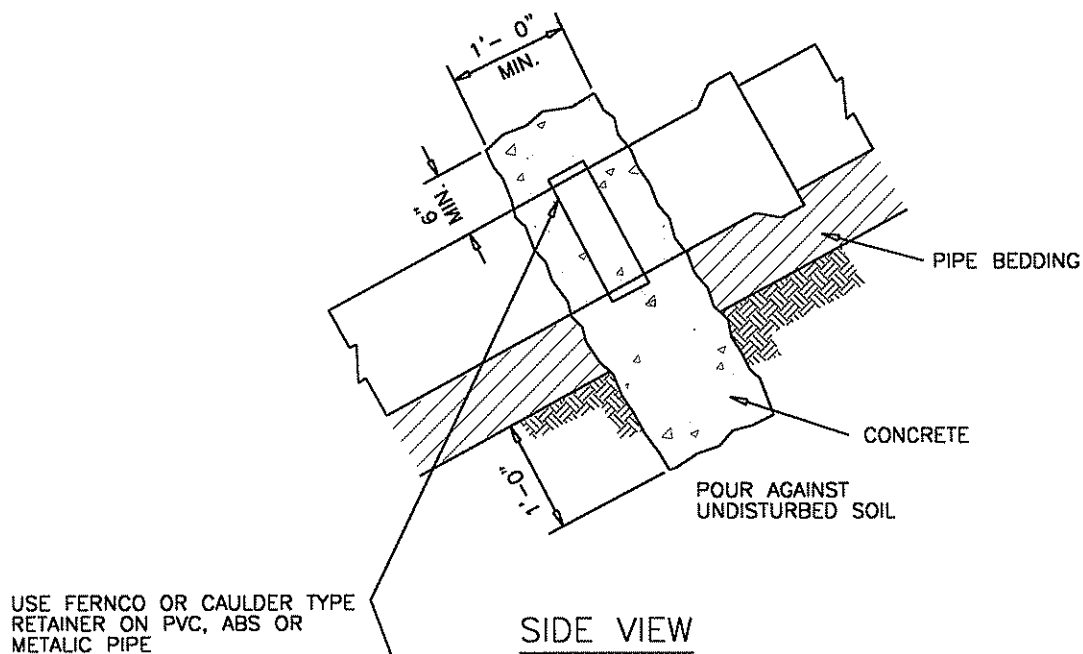
CONCRETE CRADLE AND CAP DETAIL

REVISION:

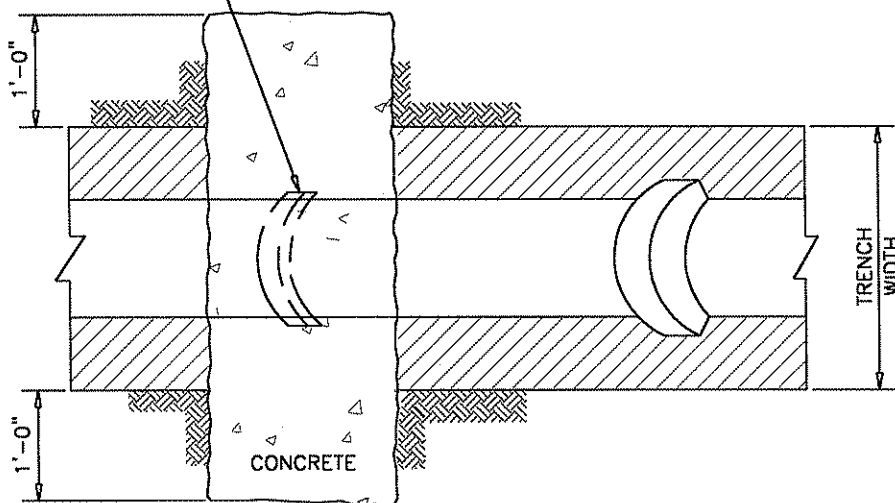
NC

DRAWING NO:

305



USE FERNCO OR CAULDER TYPE
RETAINER ON PVC, ABS OR
METALIC PIPE



SLOPE	MIN. ANCHOR SPACING, CENTER TO CENTER
0.20-0.34	35'
0.35-0.50	25'
0.51+	15' OR CONC. ENCASEMENT

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DATE:

SCALE:



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TITLE:

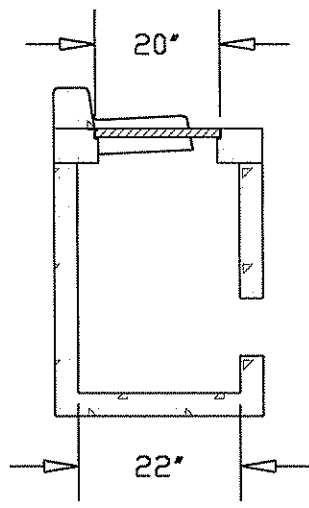
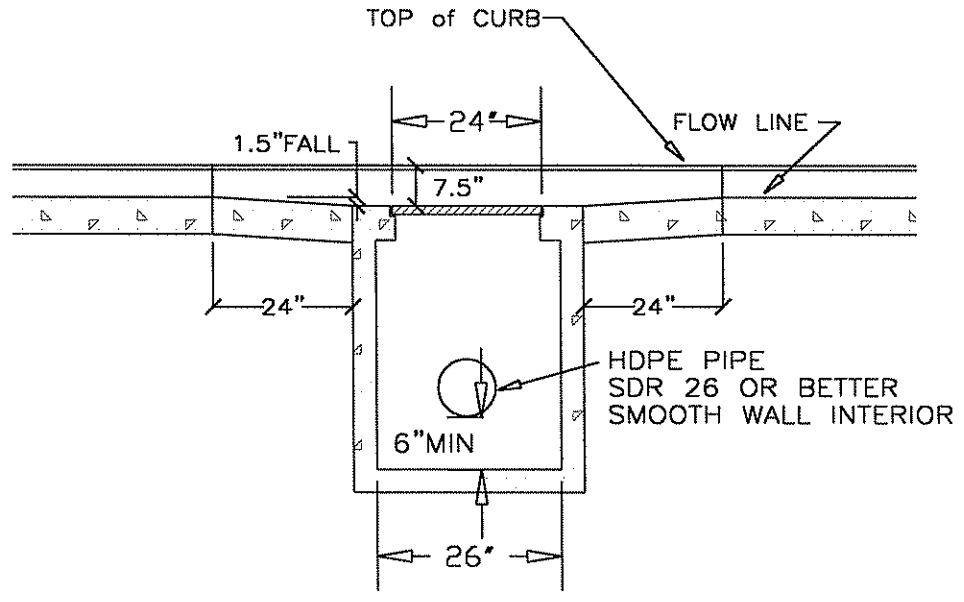
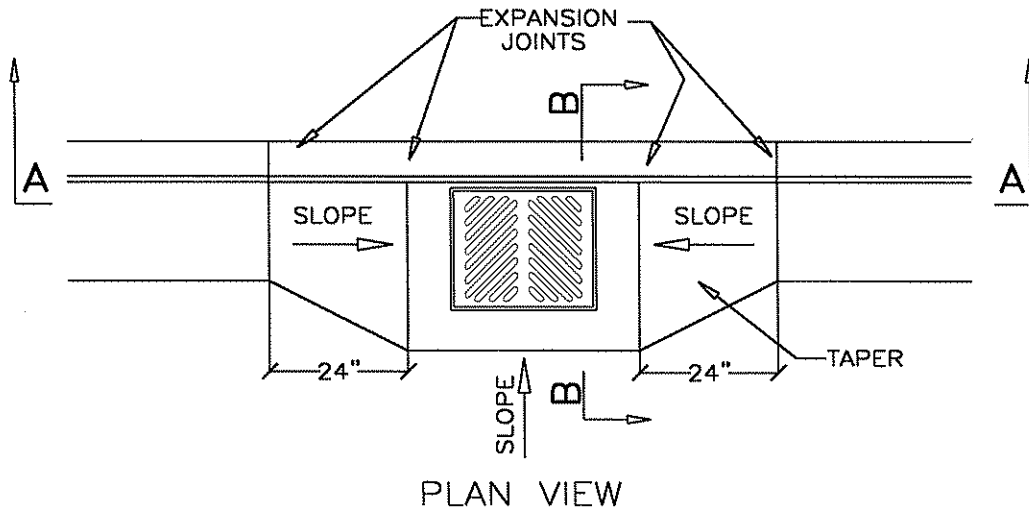
STEEP SLOPE PIPE ANCHOR WALLS

REVISION:

NC

DRAWING NO:

310



NOTE:
USES WSDOT STD STYLE "C-2" GRATE

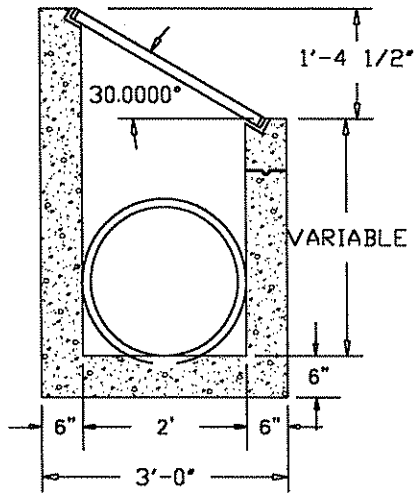
DRAWN BY:	T. KOLLN
CHECKED BY:	.
DATE:	.
SCALE:	.



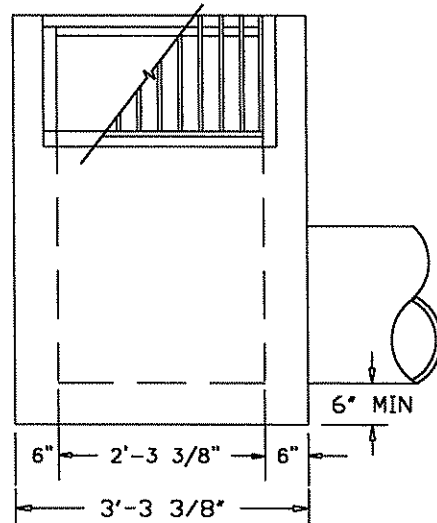
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REVISION:	NC
DRAWING NO:	315

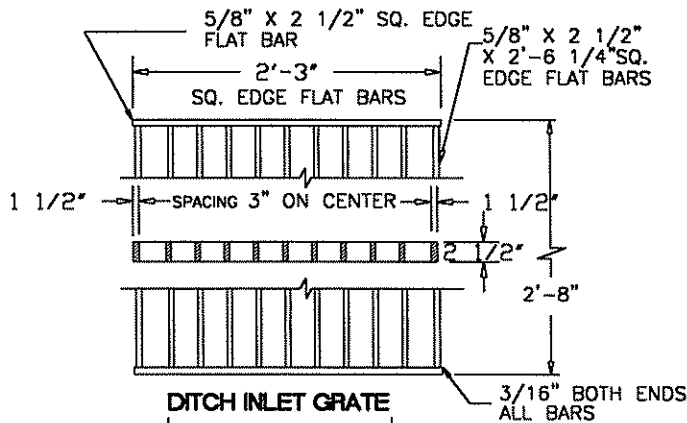
TITLE: TYPICAL 20"X24" CATCH BASIN



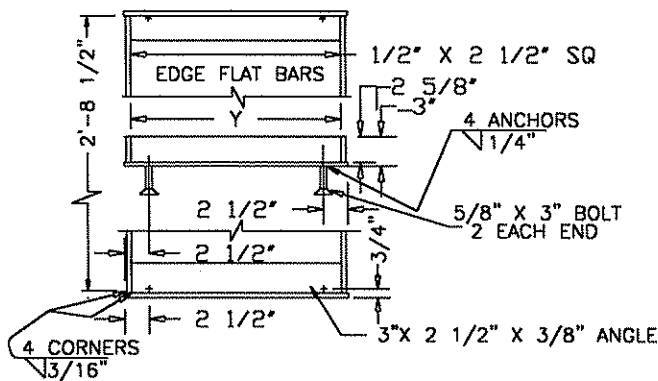
SECTION A - A



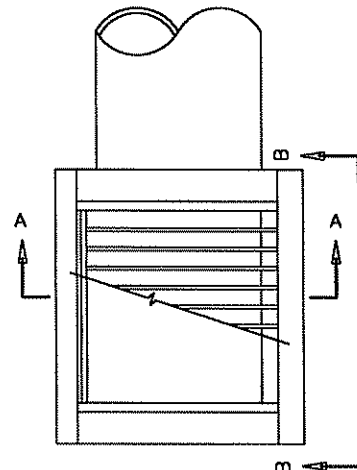
SECTION B - B



DITCH INLET GRATE



DITCH INLET FRAME



PLAN

NOTES:

1. CONCRETE STRENGTH SHALL BE 3000 PSI.
2. G-2 GRATES MAY BE USED IF APPROVED BY THE ENGINEER.
3. CATCH BASIN, FRAME, AND GRATES SHALL MEET H2O LOADING.
4. INSIDE FRAME DIMENSIONS: 2'-3 3/8", 2'-8 1/2".

NOTE:

3/8" CROSS BARS SHALL BE FLUSH WITH THE GRATE SURFACE AND MAY BE FILLET WELDED, RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS.

DITCH INLET FRAME

INLET TYPE	V	Y	Y ₁	NO. OF BARS	TYPE
D	2'-4 3/4"	2'-3 3/8"	2'-3"	9	1

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DATE:

SCALE:



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TITLE:

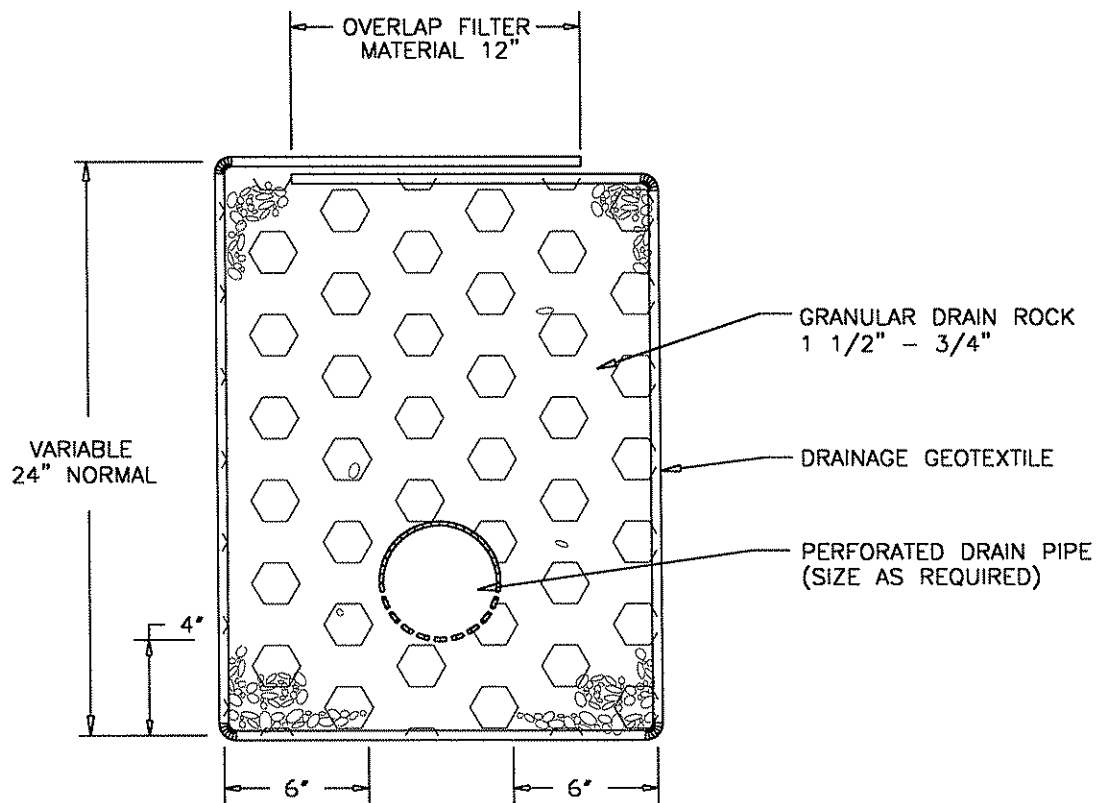
DITCH INLET

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325



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TITLE:

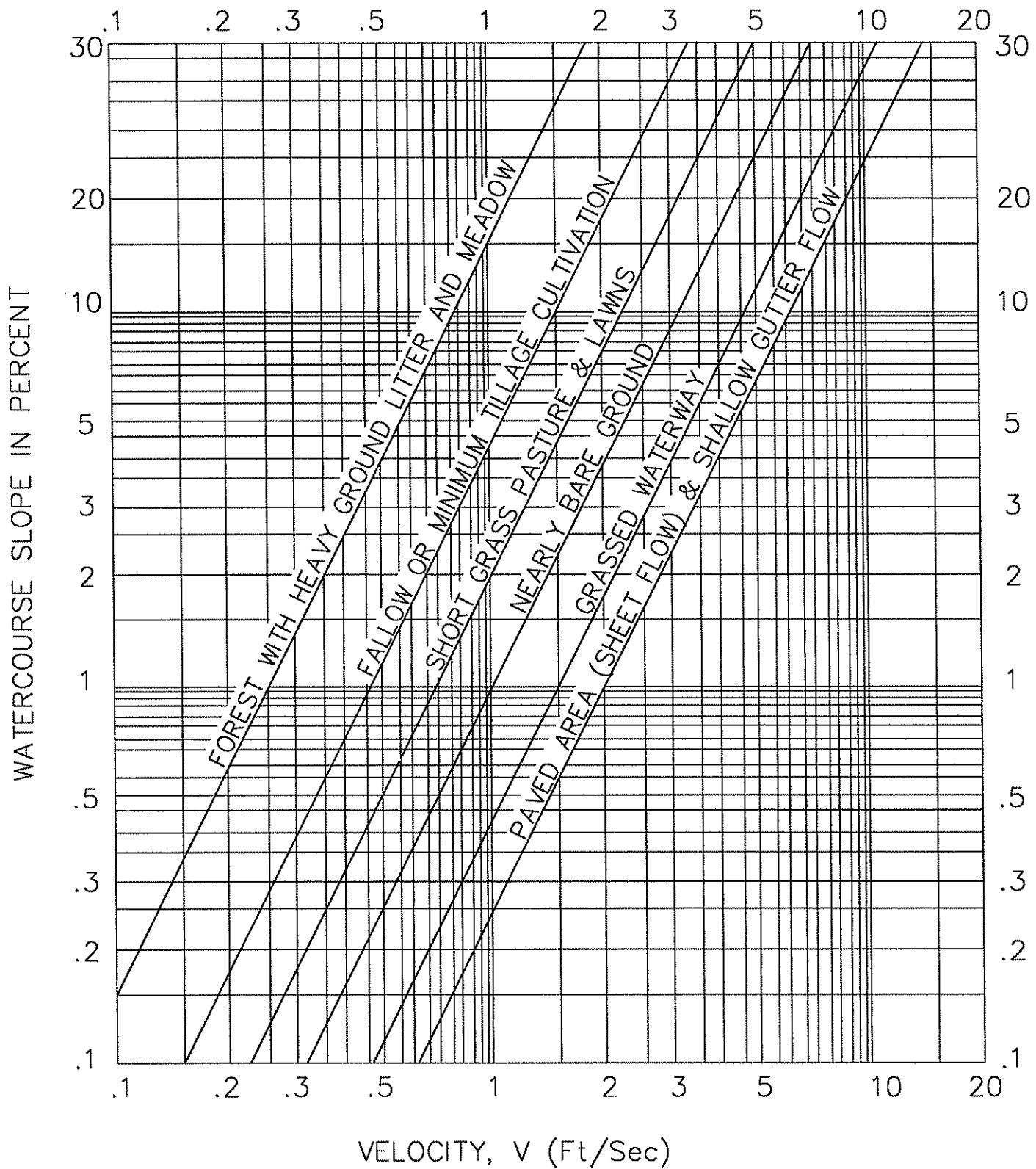
SUBSURFACE DRAIN

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330



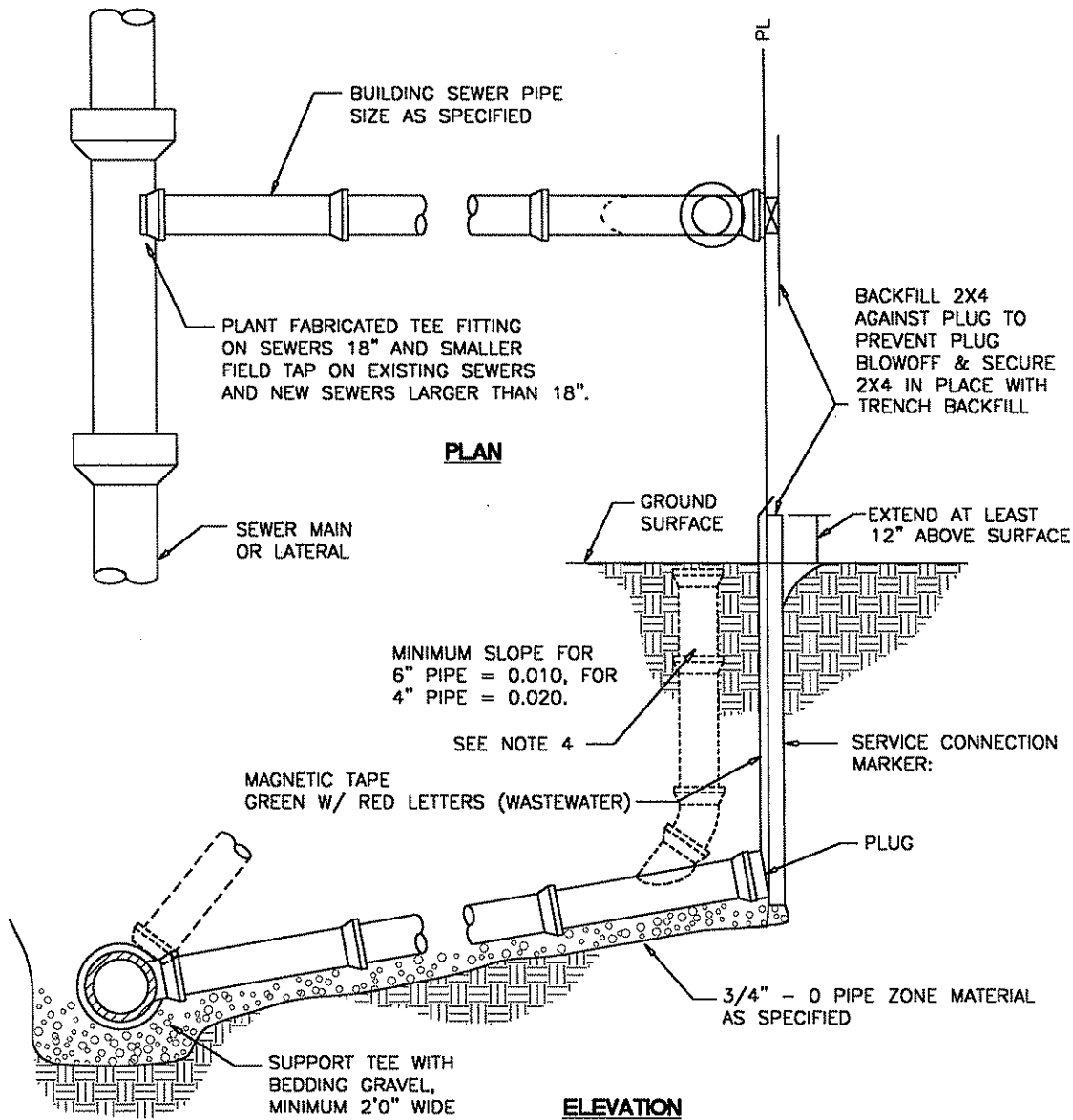
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REVISION:
 DRAWING NO: 331

TITLE: **FIGURE 3.1**



NOTES:

1. PIPE AND FITTINGS SHALL BE COMPATIBLE. ONLY MANUFACTURED FITTINGS SHALL BE USED.
2. MINIMUM DEPTH AT RIGHT OF WAY OR EASEMENT LINE SHALL BE 4 FEET.
3. MARKER POSTS AND BLOCKING SHALL BE TREATED WOOD. POST SHALL BE 2" x 4" FIR. POST TO EXTEND 12" MINIMUM ABOVE FINISH GRADE AND EXPOSED AREA SHALL BE PAINTED WHITE.
4. WHEN REQUIRED, A CLEANOUT SHALL BE INSTALLED.
5. LAY BUILDING SEWER AT MAX. 45° FROM HORIZONTAL TO ACHIEVE REQUIRED DEPTH AT PROPERTY LINE WHEN MINIMUM SLOPE RESULTS IN EXCESSIVE DEPTH.

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TITLE:

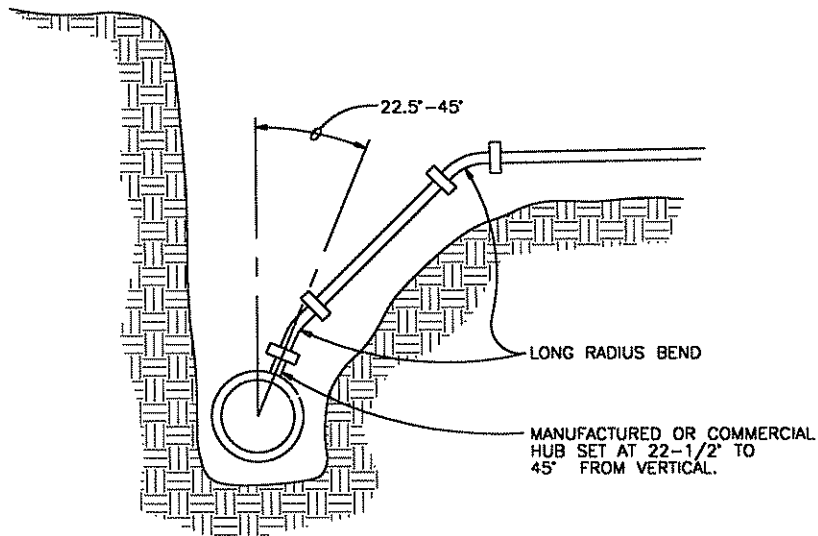
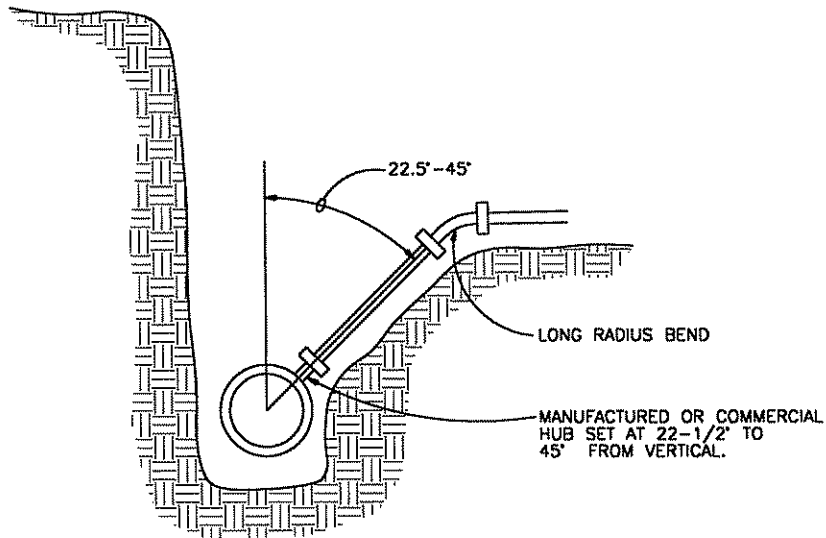
SHALLOW TRENCH SERVICE
CONNECTION, BLOCKING, & MARKING

REVISION:

NC

DRAWING NO:

335



NOTES:

1. PIPE AND FITTINGS SHALL BE COMPATIBLE. ONLY MANUFACTURED FITTINGS SHALL BE USED.
2. MINIMUM DEPTH AT RIGHT OF WAY OR EASEMENT LINE SHALL BE 4 FEET.
3. PLUGGING, BLOCKING, AND MARKING OF UNCONNECTED SERVICES SHALL CONFORM TO SHALLOW TRENCH SERVICE CONNECTION DRAWING.
4. VERTICAL TRENCH WALLS ARE REQUIRED. IF IT IS NOT POSSIBLE TO MAINTAIN VERTICAL TRENCH WALLS, USE ALTERNATE CONNECTION METHOD TO MAINTAIN 6" MAXIMUM DISTANCE BETWEEN RISER PIPE AND TRENCH WALLS. REPLACE ALL EXCAVATED OR DISTURBED MATERIAL WITH FULL DEPTH GRANULAR BACKFILL COMPACTED TO 95% RELATIVE DENSITY.
5. WHERE DEEP CONNECTION IS AT AN ANGLE LESS THAN 45° FROM VERTICAL, DUCTILE IRON PIPE AND FITTINGS SHOULD BE USED.

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TITLE:

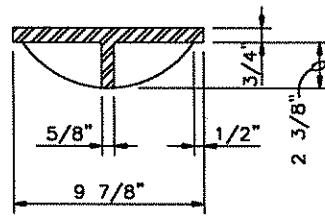
TYPICAL DEEP TRENCH SERVICE CONNECT DETAIL

REVISION:

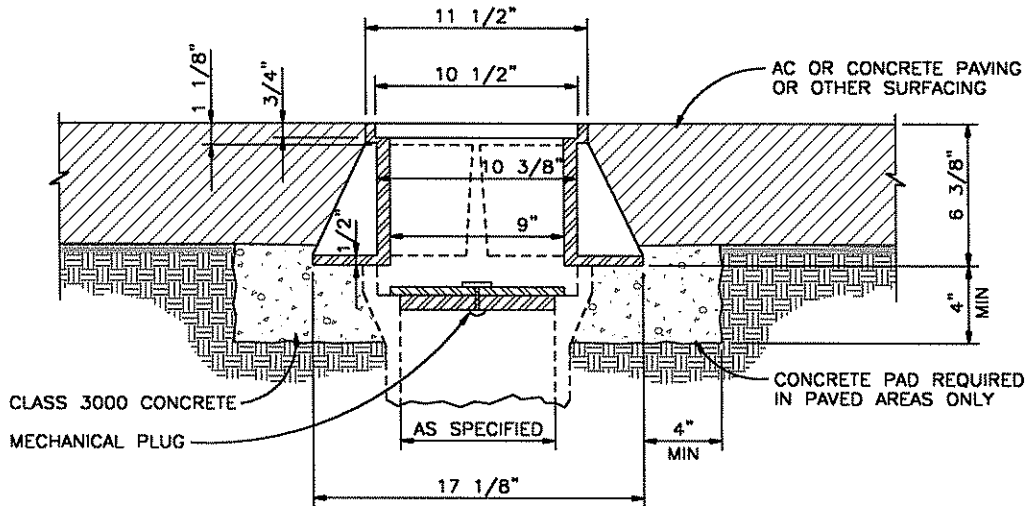
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DRAWING NO:

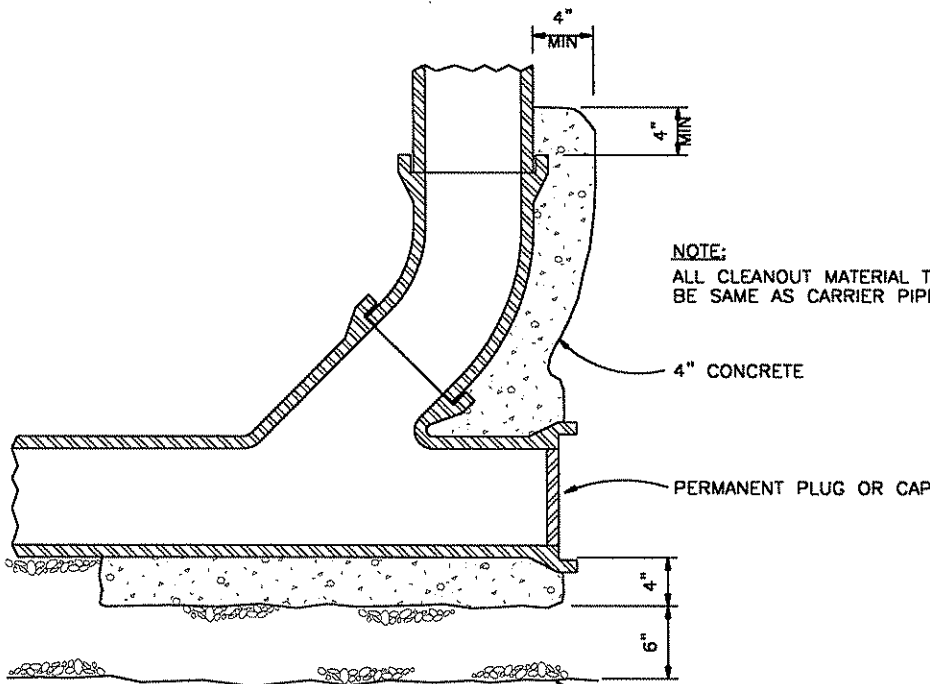
336



CAST IRON COVER



CAST IRON FRAME



NOTE:
ALL CLEANOUT MATERIAL TO
BE SAME AS CARRIER PIPE.

CLEANOUT

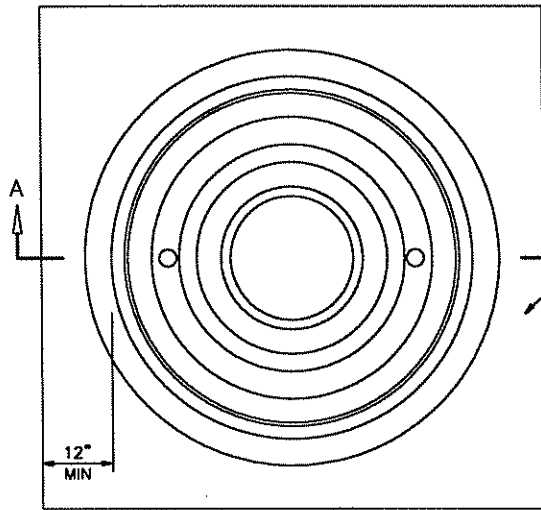
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DRAWING NO:	340

TITLE: CLEANOUT DETAIL

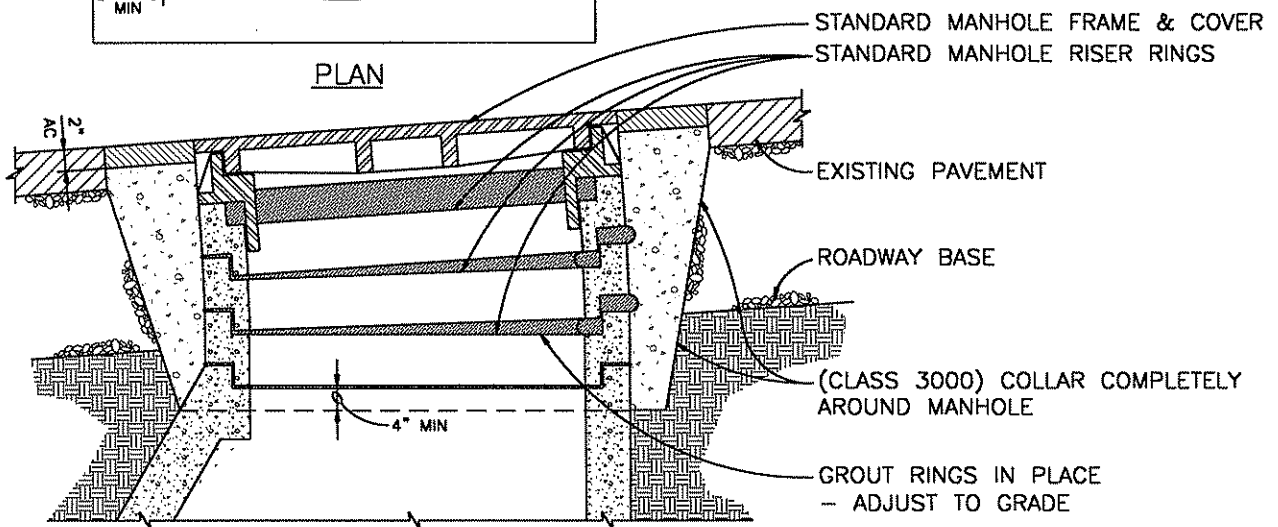


SAW CUT SQUARE AND REMOVE PAVEMENT
2-FOOT MINIMUM LARGER THAN MANHOLE
FRAME DIMENSION

REPLACE WITH 2-INCH THICK AC. PAVING

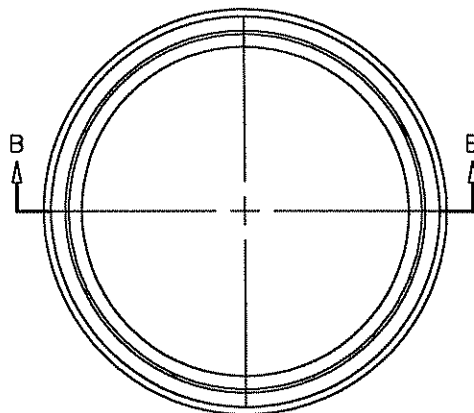
APPLY TACK COAT TO EDGES OF EXISTING
PAVEMENT BEFORE INSTALLING PATCH.
FINISH JOINT WITH ASPHALTIC SEAL
AND SAND.

PLAN

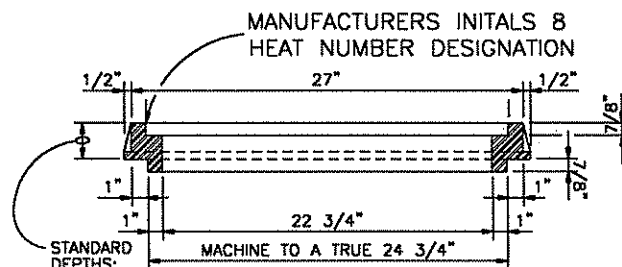


SECTION A-A

TYPICAL MANHOLE GRADE ADJUSTMENT IN STREET



MATERIAL SHALL BE
CAST IRON



SECTION B-B

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TITLE:

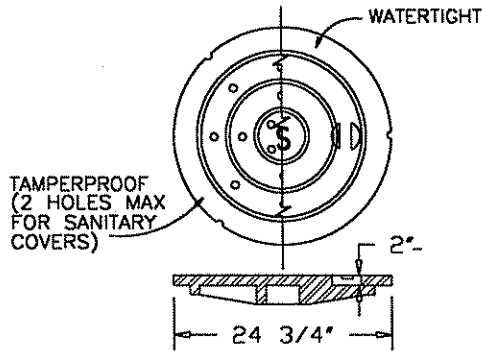
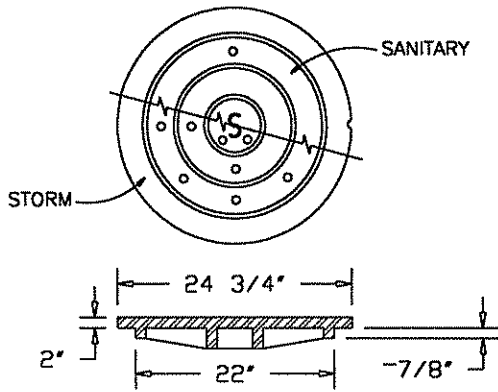
MANHOLE ADJUSTMENT RINGS FOR RESURFACING

REVISION:

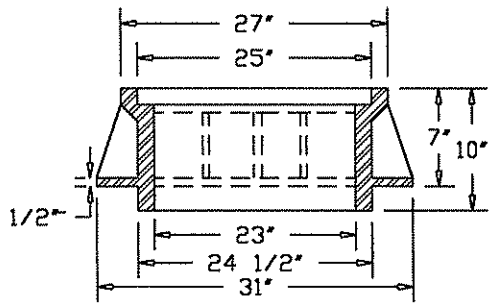
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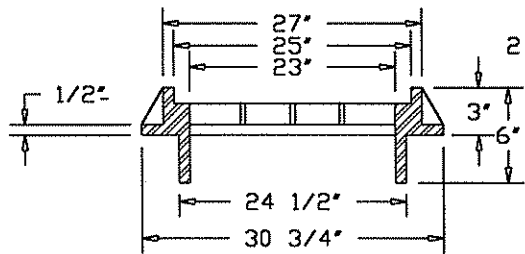
345



CAST IRON TAMPERPROOF & WATERTIGHT
(FRAMES AVAILABLE IN STANDARD OR SUBURBAN PATTERN)

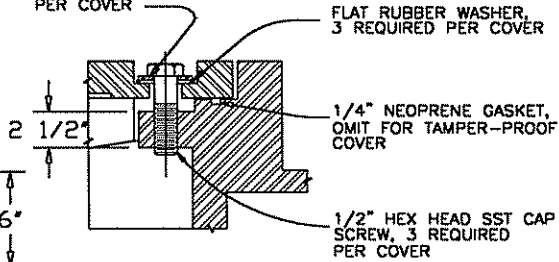


CAST IRON STANDARD
(APPROX. WT. - 387 LBS.)



CAST IRON SUBURBAN
(APPROX. WT. - 305 LBS.)

1 1/4" O.D. SST WASHER,
3/32" THICK, 3 REQUIRED
PER COVER



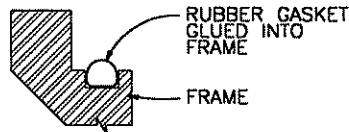
FLAT RUBBER WASHER,
3 REQUIRED PER COVER

1/4" NEOPRENE GASKET,
OMIT FOR TAMPER-PROOF
COVER

1/2" HEX HEAD SST CAP
SCREW, 3 REQUIRED
PER COVER

NOTE:

3 REQUIRED, 1/2" x 1 1/4" PENTAGONAL
OR HEXAGONAL HEAD, BRONZE OR CAD. PLATED.
INSTALL FRAME SO THAT ONE BOLT BOSS IS LOCATED
OVER THE MANHOLE LADDER.



RUBBER GASKET
GLUED INTO
FRAME

FRAME

BOLT-DOWN DETAIL
(FOR TAMPERPROOF AND WATERTIGHT)

WATERTIGHT GASKET DETAIL

NOTES:

1. TAMPERPROOF COVERS REQ'D ON SANITARY OR STORM DRAIN MANHOLE WHERE LOCATED IN PEDESTRIAN WAYS OR EASMENT AREAS. TAMPERPROOF COVERS FOR SANITARY MANHOLES SHALL HAVE 2 HOLES MAXIMUM.
2. WATERTIGHT COVERS REQUIRED IF LOCATED WHERE COVER MAY BE SUBMERGED.
3. FRAMES AND COVERS SHALL BE STAMPED WITH MANUFACTURER'S INITIALS, HEAT NUMBER AND POINT OF ORIGIN.

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TITLE:

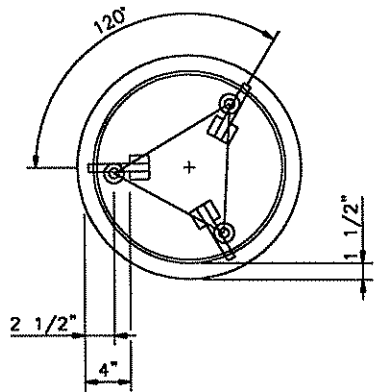
MANHOLE COVER & FRAME DETAILS

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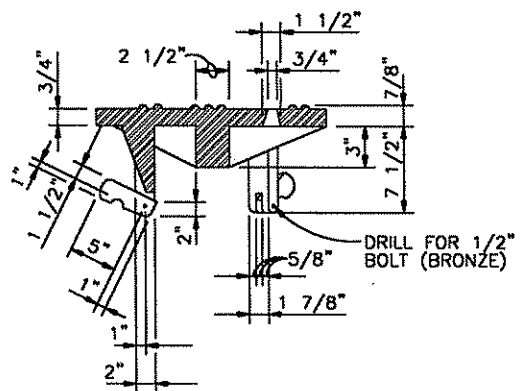
DRAWING NO:

346

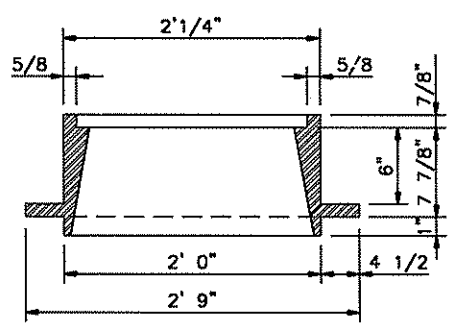


NOTE:
 BOLTS TO BE FURNISHED WITH STANDARD
 HEX-HEAD NUTS & COTTER KEYS. COVER
 AND RING TO BE MACHINED TO A TRUE
 BEARING AT CONTACT POINTS.

PLAN



COVER SECTION



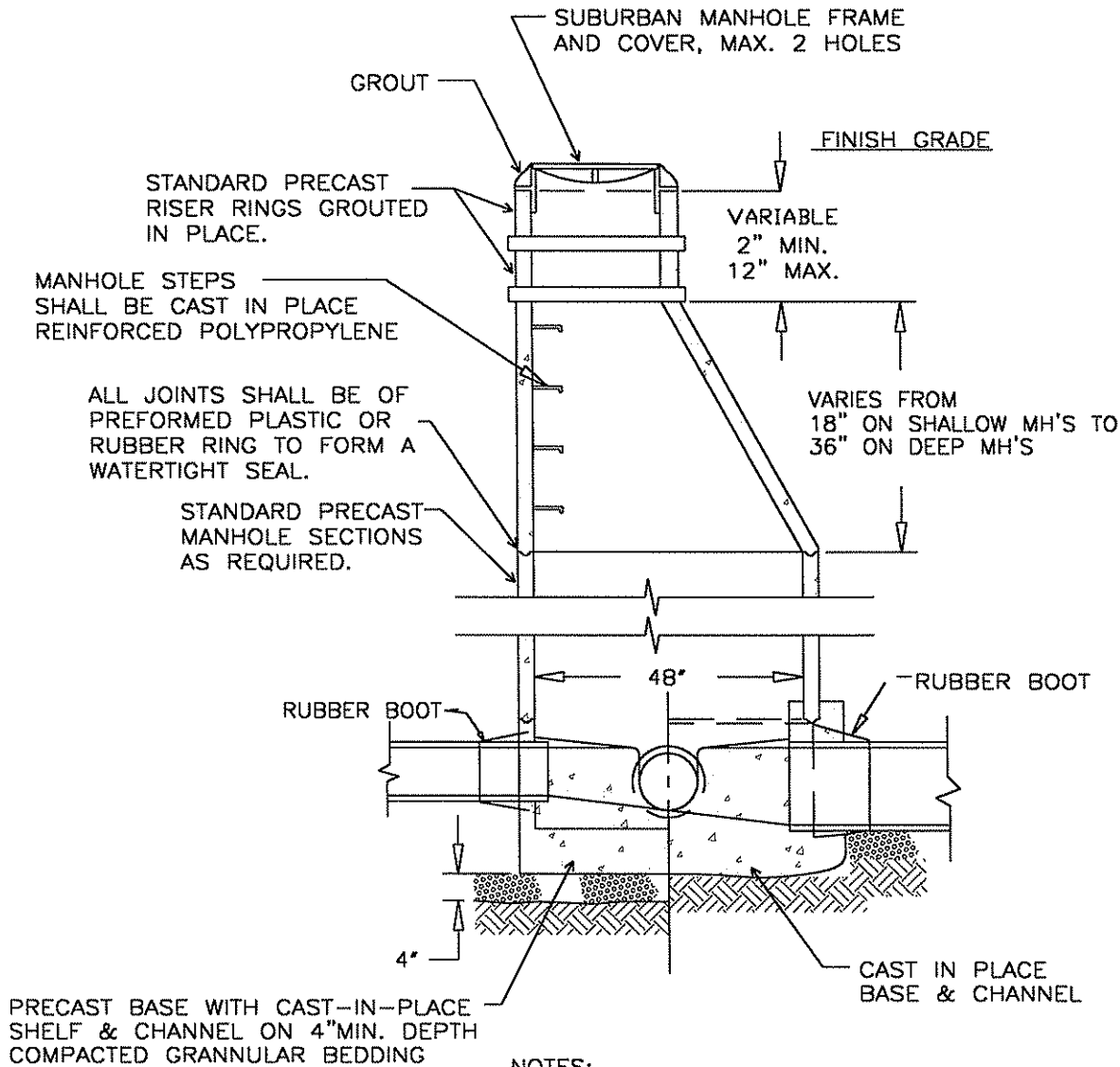
FRAME SECTION

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NOTES:

- 1) STANDARD PRECAST MANHOLE SECTIONS - ASTM C478
 USE 48" MINIMUM FOR PIPE SIZES TO 30" MAXIMUM
 USE 60" MINIMUM FOR PIPE SIZES TO 42" MAXIMUM
 USE 72", 84", OR 102" WHEN SPECIFIED.
- 2) USE ECCENTRIC PRECAST CONE FOR ALL MANHOLES
 OVER FOUR FEET DEEP.
- 3) PIPE CONNECTIONS SHALL CONFORM WITH DIVISION 3
 OF THE APWA STANDARDS
- 4) FRAME AND RISER RINGS SHALL BE SEALED WITH
 PREFORMED PLASTIC OR RUBBER TO FORM A
 WATERTIGHT SEAL. GROUT MAY BE USED FOR STORM SYSTEMS.

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TITLE:

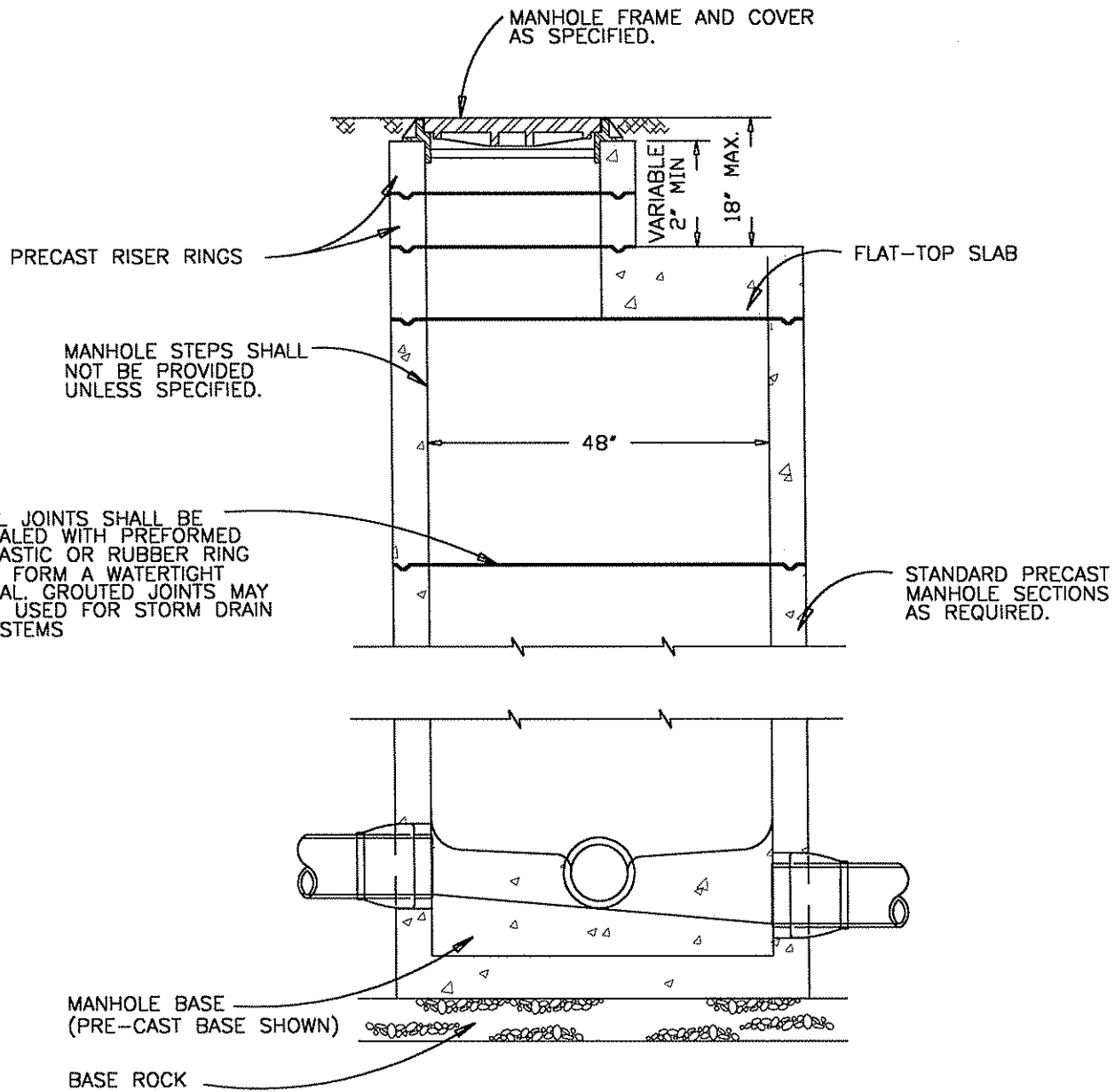
TYPICAL MANHOLE DETAIL

REVISION:

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DRAWING NO:

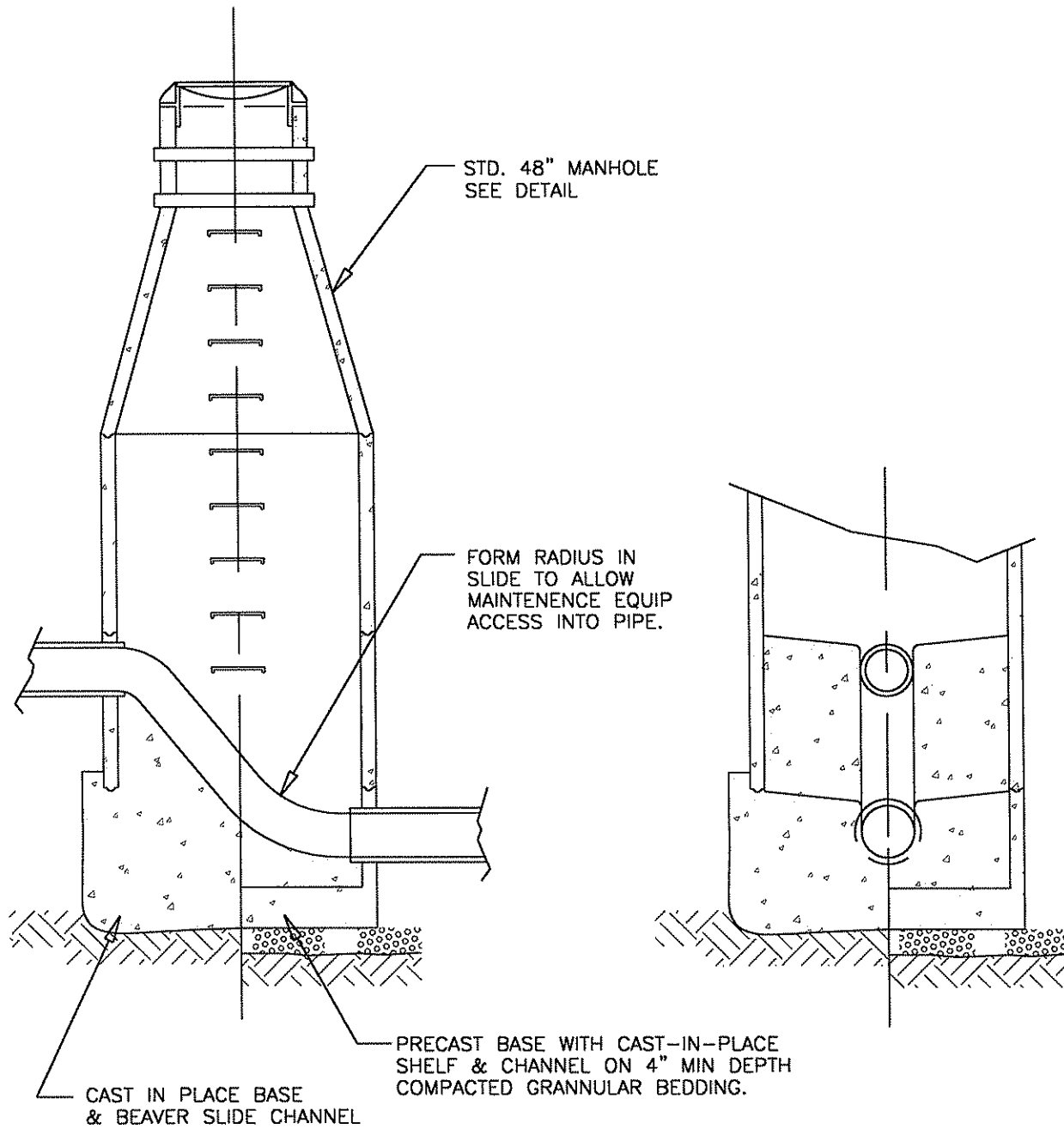
350



NOTE:S

1. SEE MANHOLE BASE SECTION DRAWING FOR BASE DETAILS
2. MANHOLE MAY BE 42" DIAMETER IF DIRECTED BY ENGINEER.
3. REFER TO STANDARD MANHOLE DETAIL.
4. FRAME AND RISER RINGS SHALL BE SEALED WITH PREFORMED PLASTIC OR RUBBER TO FORM A WATERTIGHT SEAL. GROUT MAY BE USED FOR STORM SYSTEMS.

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DATE: .		
SCALE: .		
TITLE: FLAT-TOP MANHOLE		



REFER TO TYP. MANHOLE DETAIL NO. 350

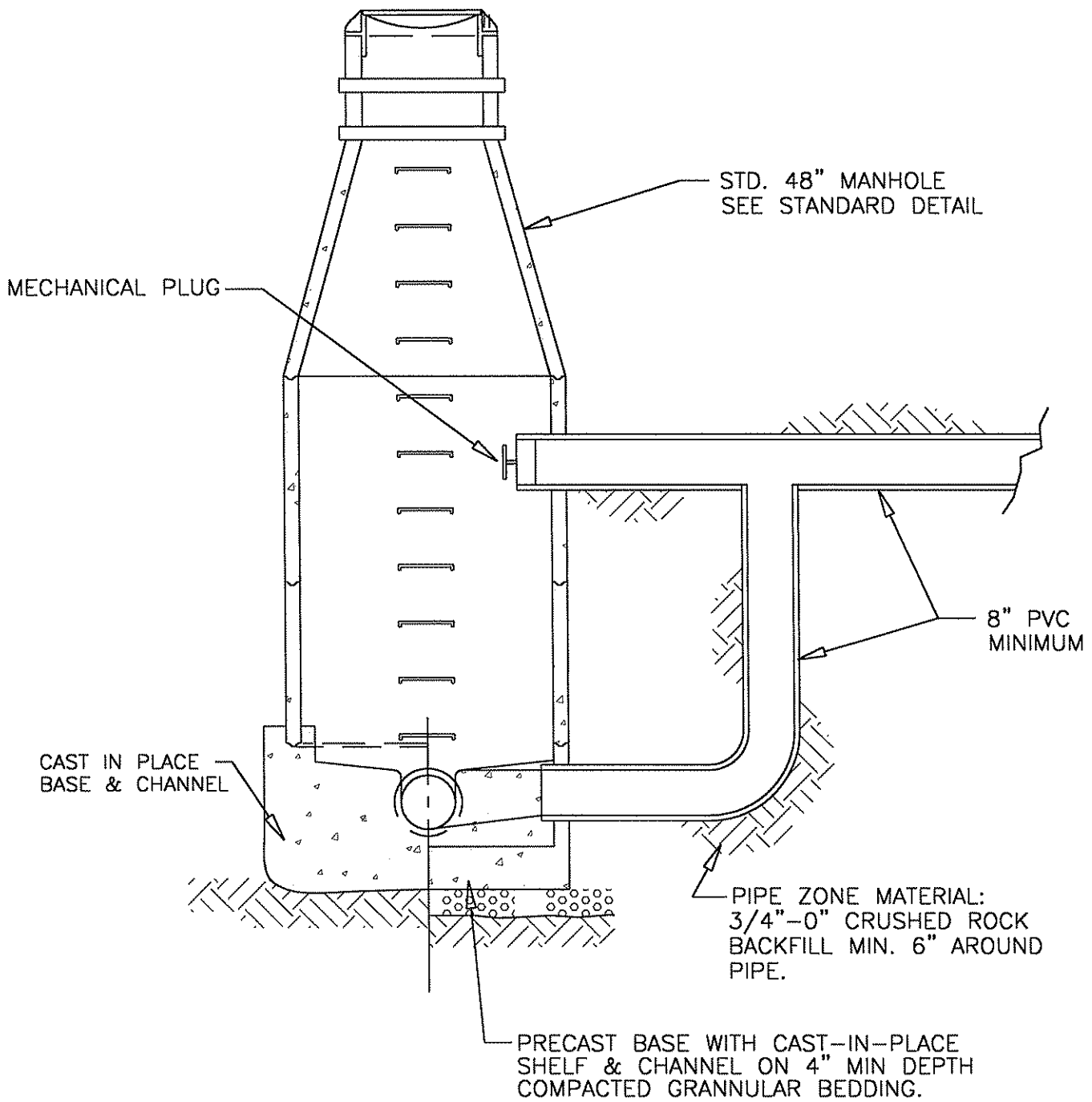
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SCALE:	.



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REVISION:	NC
DRAWING NO:	352

TITLE: BEAVER SLIDE MANHOLE



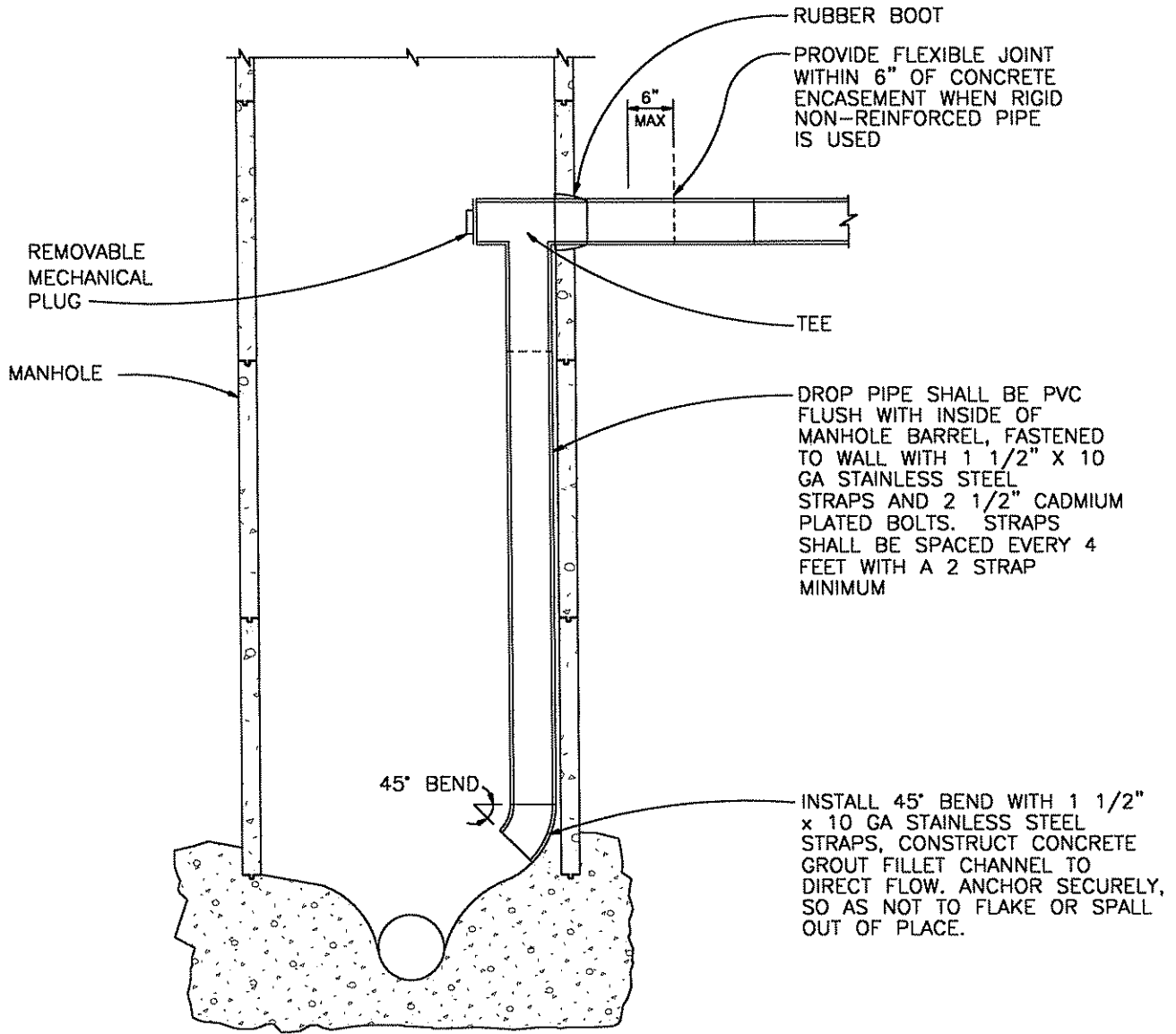
DRAWN BY: T. KOLLN
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SCALE:



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DRAWING NO: 353

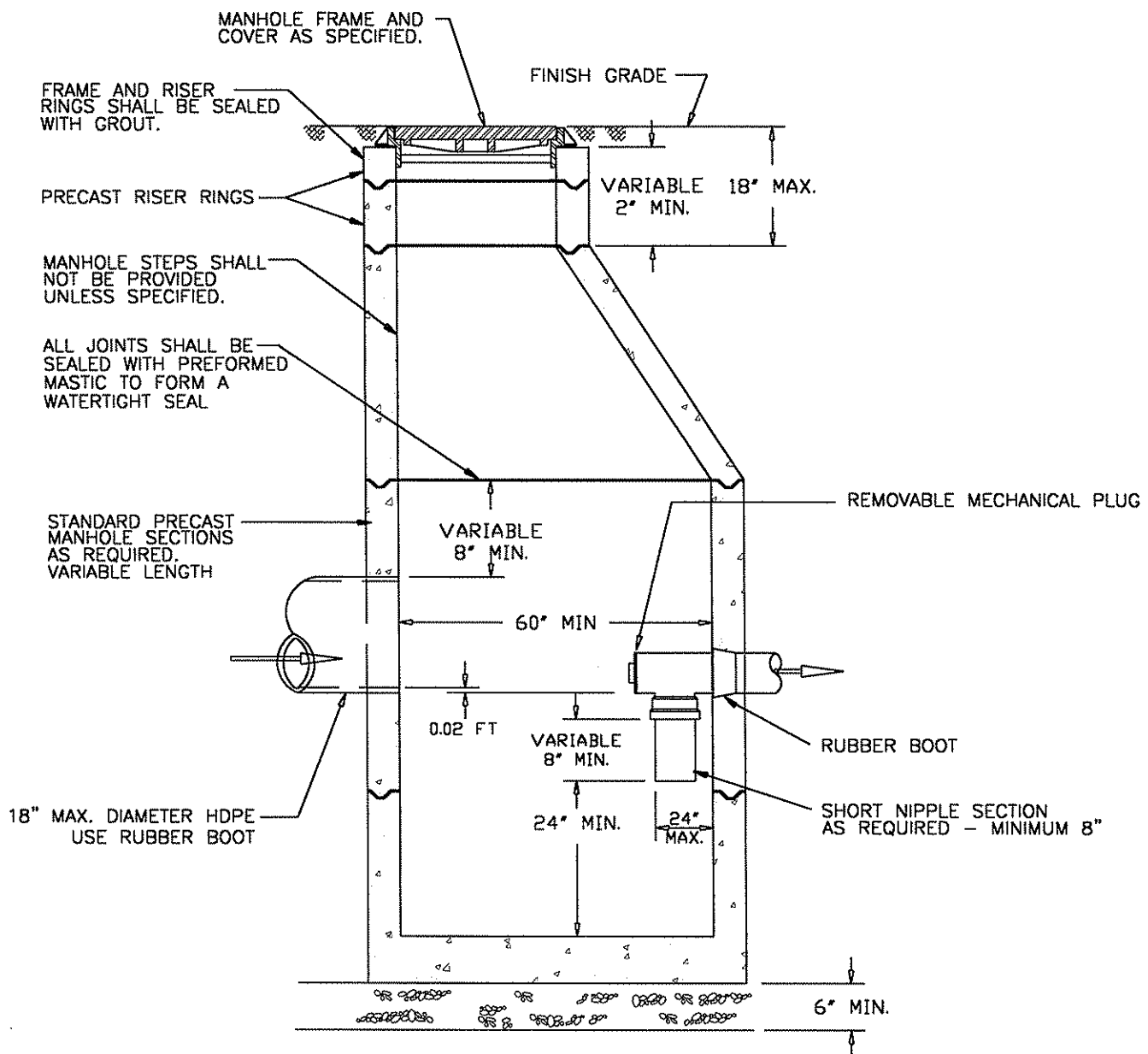
TITLE: TYPICAL OUTSIDE DROP MANHOLE DETAIL



NOTES:

1. ONLY ONE INSIDE DROP CONNECTION ALLOWED PER MANHOLE.
2. MINIMUM MANHOLE DIAMETER WITH DROP CONNECTION SHALL BE 48-INCHES.
3. MAXIMUM DROP PIPE DIAMETER SHALL BE 8-INCHES.
4. REFER TO TYPICAL MANHOLE DETAIL

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CHECKED BY:		NC
DATE:		DRAWING NO:
SCALE:		354
TITLE: INSIDE DROP MANHOLE		



NOTES:

1. ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C 478.
2. ALL CONNECTING PIPE SHALL HAVE A FLEXIBLE JOINT WITHIN 18" OF MANHOLE WALL.

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DATE:	.
SCALE:	.

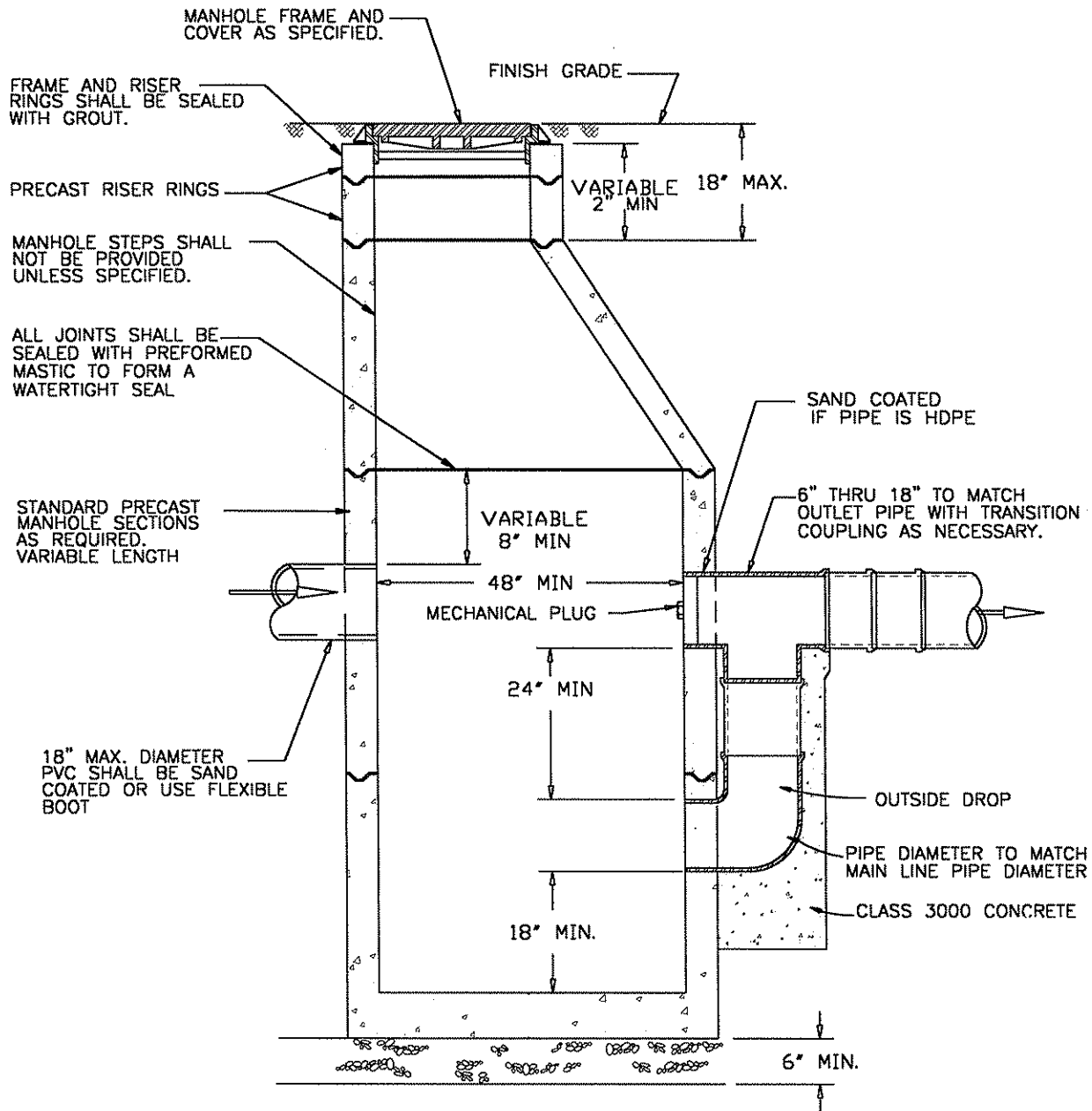


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TITLE: POLLUTION CONTROL MANHOLE INSIDE ELBOW

REVISION:	NC
DRAWING NO:	355



NOTE:

1. ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C 478.
2. ALL CONNECTING PIPE SHALL HAVE A FLEXIBLE JOINT WITHIN 18" OF MANHOLE WALL. IF THE PIPE IS HDPE, IT SHALL BE EPOXY-SAND COATED WHERE IT IS GROUTED INTO THE MANHOLE.
3. CONSTRUCT OUTSIDE DROP PER THE DETAIL FOR "TYPICAL OUTSIDE DROP MANHOLE".

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TITLE:

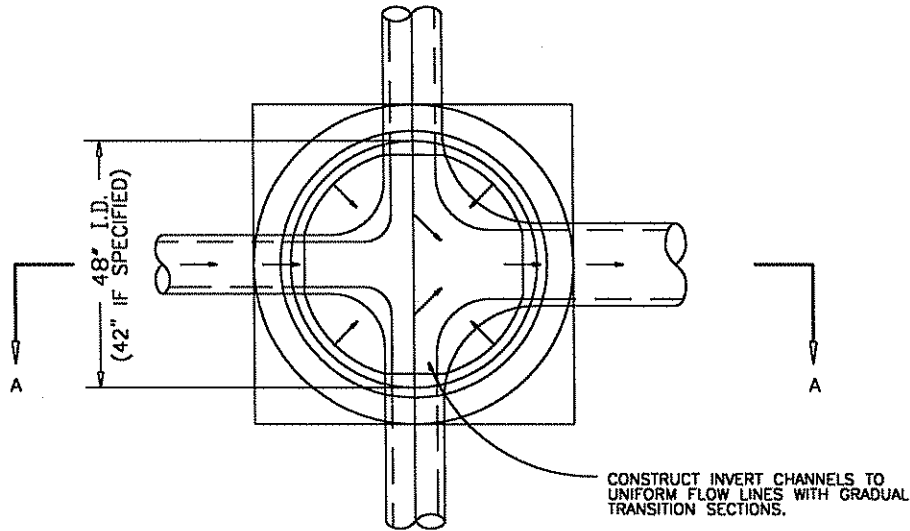
POLLUTION CONTROL MANHOLE OUTSIDE ELBOW

REVISION:

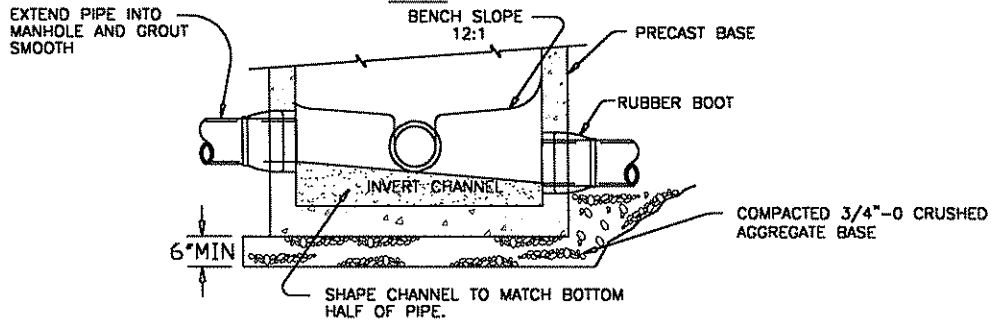
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DRAWING NO:

356

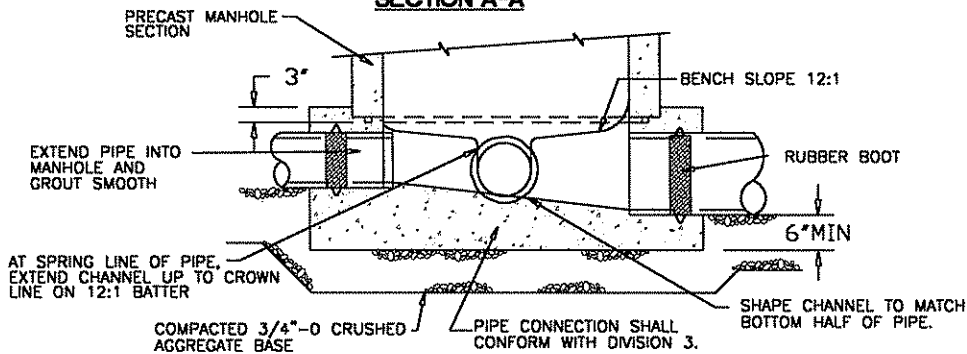


PLAN



PRECAST MANHOLE BASE

SECTION A-A



CAST -IN-PLACE MANHOLE BASE

SECTION A-A

NOTES:

1. CONCRETE SHALL BE 3300 PSI AT 28 DAYS.
2. CHANNELS SHALL BE CONSTRUCTED TO PROVIDE SMOOTH SLOPES AND RADII TO OUTLET PIPE.
3. BASES MAY BE PRECAST OR POURED IN PLACE.
4. THIS MANHOLE BASE SECTION SHALL BE USED FOR PIPE SIZES UP TO 24".
5. USE RUBBER BOOTS IF PIPE IS FLEXIBLE. BOOTS MAY BE KOR-N-SEAL OR EQUIVALENT.

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TITLE:

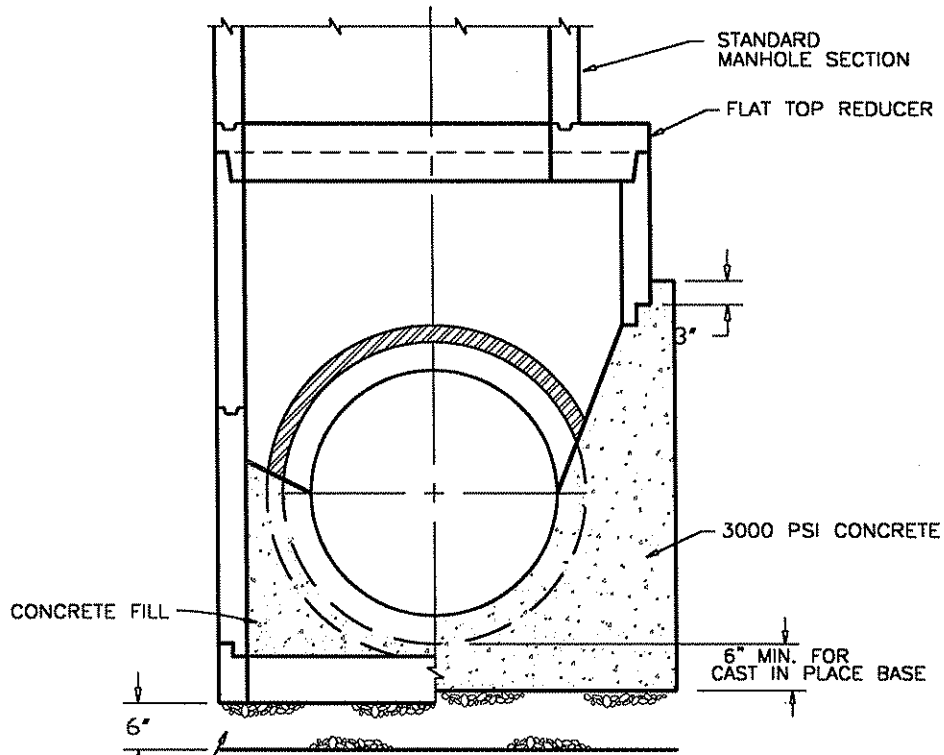
MANHOLE BASE SECTION

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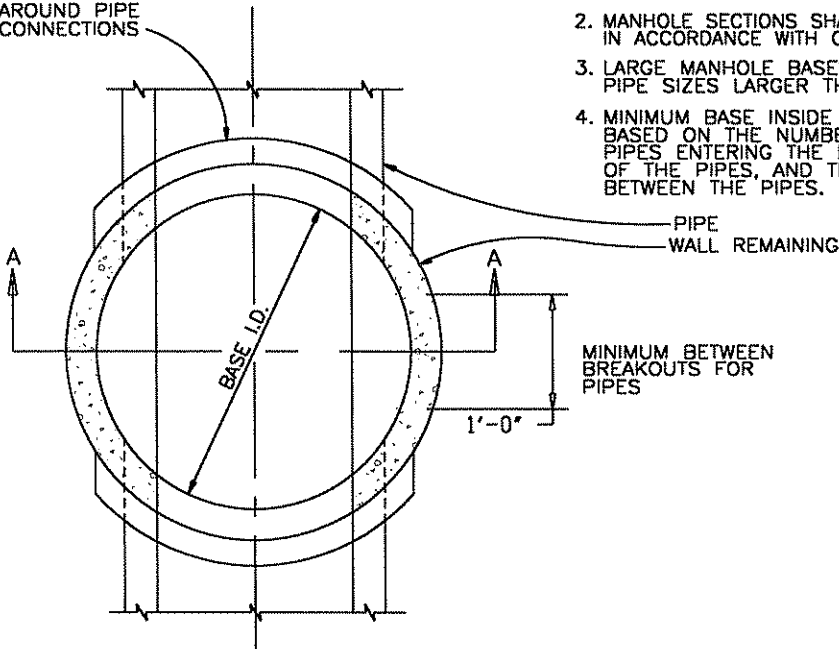
DRAWING NO:

360



COMPACTED 3/4"-0
CRUSHED AGGREGATE
BASE ROCK

CONCRETE COLLAR
AROUND PIPE
CONNECTIONS



PLAN

**PRECAST BASE CAST-IN-PLACE
SECTION A-A BASE**

NOTES:

1. MANHOLES MAY HAVE EITHER PRECAST OR CAST-IN-PLACE BASES.
2. MANHOLE SECTIONS SHALL BE MANUFACTURED IN ACCORDANCE WITH C478.
3. LARGE MANHOLE BASES SHALL BE USED FOR PIPE SIZES LARGER THAN 24".
4. MINIMUM BASE INSIDE DIAMETER SHALL BE BASED ON THE NUMBER AND SIZE OF THE PIPES ENTERING THE MANHOLE, THE ELEVATION OF THE PIPES, AND THE MINIMUM SPACING BETWEEN THE PIPES.

PIPE
WALL REMAINING

MINIMUM BETWEEN
BREAKOUTS FOR
PIPES

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TITLE:

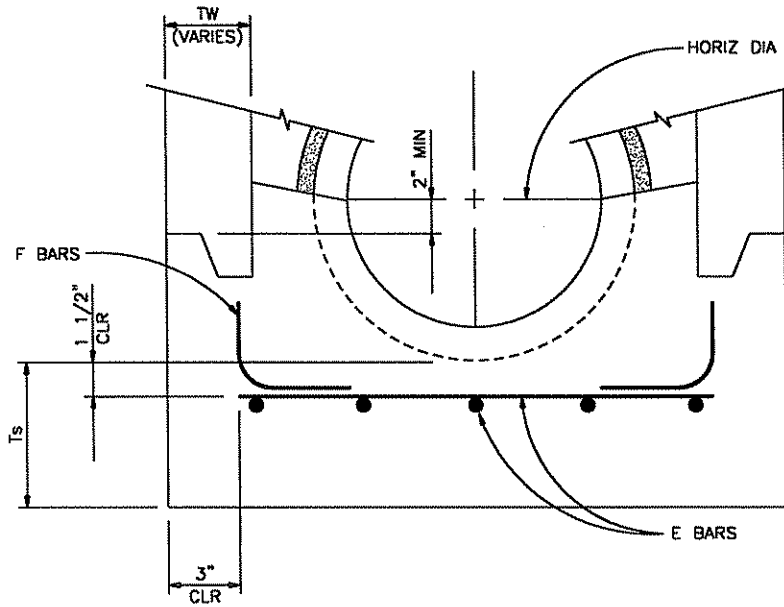
LARGE MANHOLE BASE SECTION

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361



CAST-IN-PLACE BASE

BASE I.D.		60"		72"		84"		96"	
TYPE	DEPTH*	0'-15'	15'-30'	0'-15'	15'-30'	0'-15'	15'-30'	0'-15'	15'-30'
CAST IN PLACE	Ts	7.0"	9.0"	7.0"	9.0"	8.0"	10.0"	9.0"	11.0"
	E BARS	#4 @ 12"	#4 @ 9"	#4 @ 9"	#4 @ 6"	#4 @ 8"	#5 @ 9"	#4 @ 7"	#5 @ 8"
	F BARS	#4 @ 12"	#4 @ 9"	#4 @ 9"	#4 @ 6"	#4 @ 8"	#5 @ 9"	#4 @ 7"	#5 @ 8"

*INVERT TO STREET GRADE

NOTE:
CONCRETE SHALL BE CLASS 3000. STEEL fg = GRADE 60.

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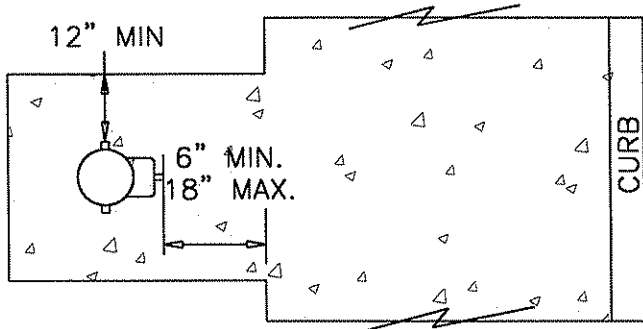
LARGE CAST-IN-PLACE CONCRETE MANHOLE BASE

REVISION:

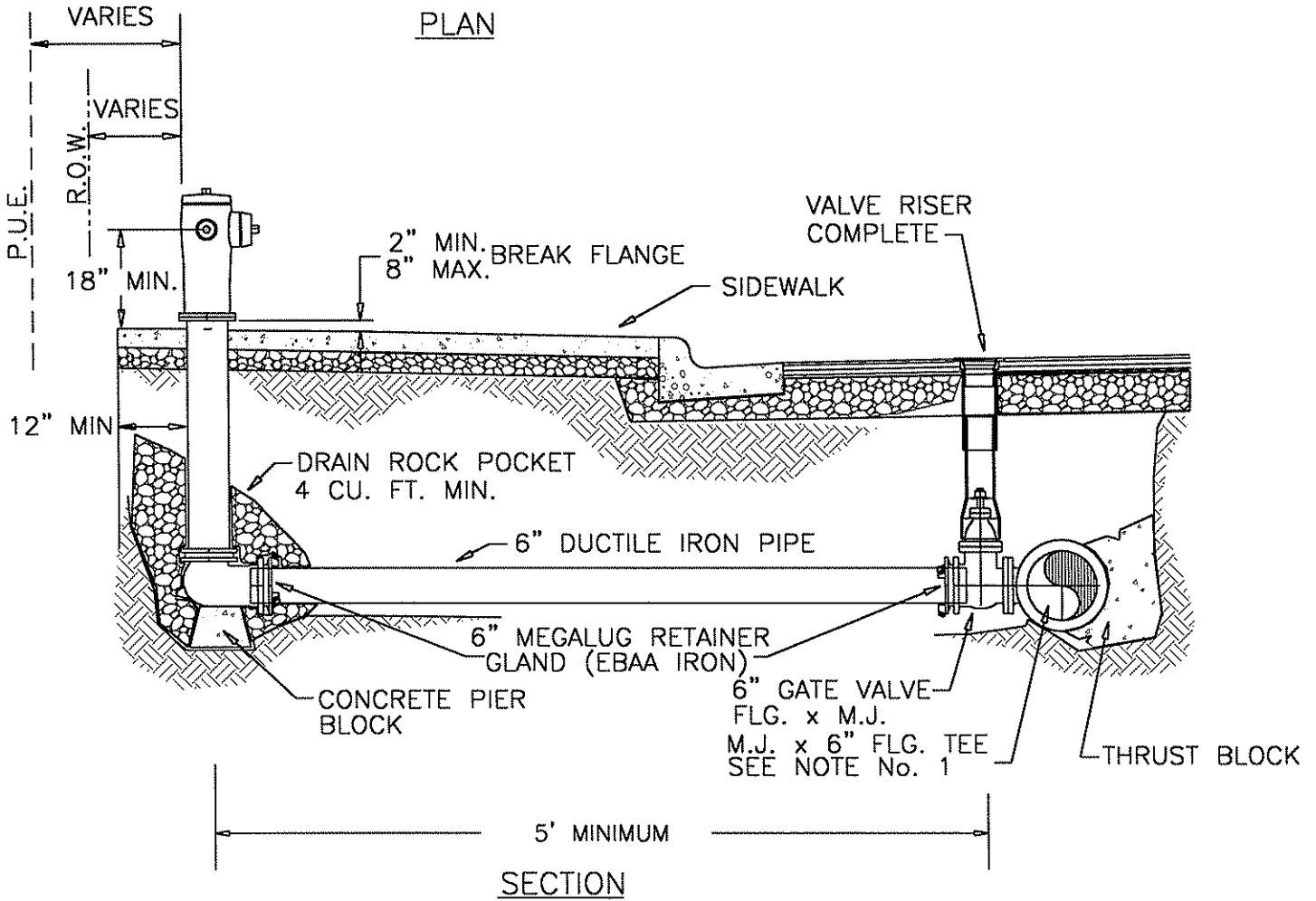
NC

DRAWING NO:

362



PLAN



SECTION

NOTES:

1. KENNEDY GUARDIAN OR OTHER APPROVED CITY HYDRANT.
(VERIFY APPROVED HYDRANTS WITH CITY OF ST. HELENS
MAINTENANCE DEPT. @ 503-397-3532)
2. NO OBSTRUCTIONS WITHIN 3 FT. OF FIRE HYDRANT
3. SIDEWALK SHALL BE WIDENED AROUND FIRE HYDRANT
4. INSTALL 3-FT X 3-FT X 8-IN PCC RESTRAINT
COLLAR WHEN NOT WITHIN PCC SIDEWALK

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TITLE:

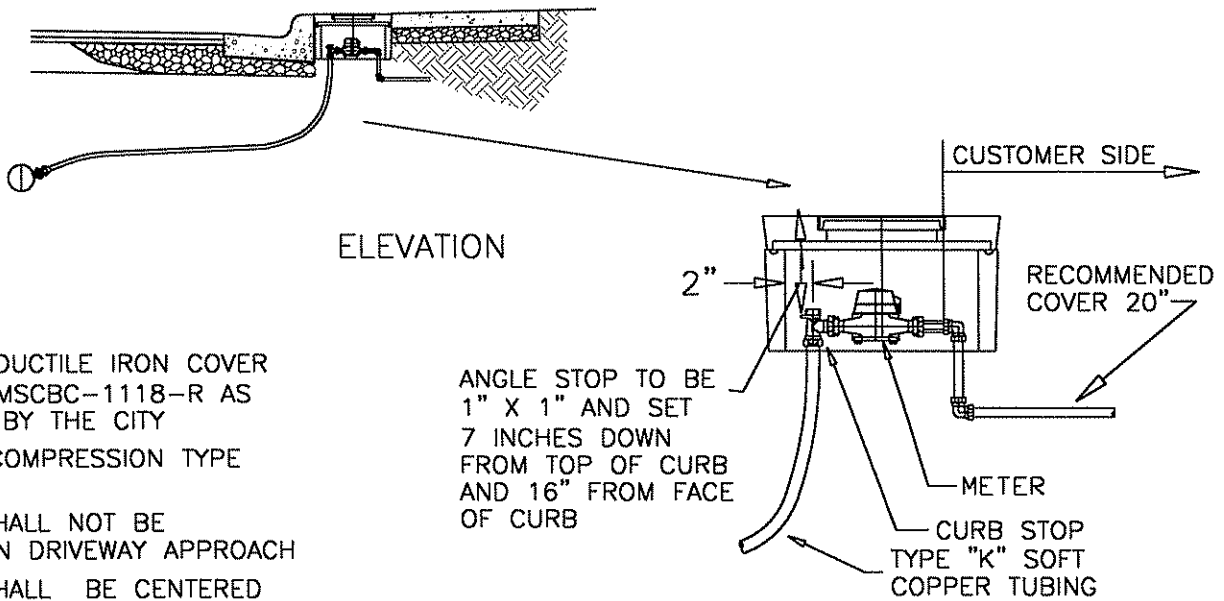
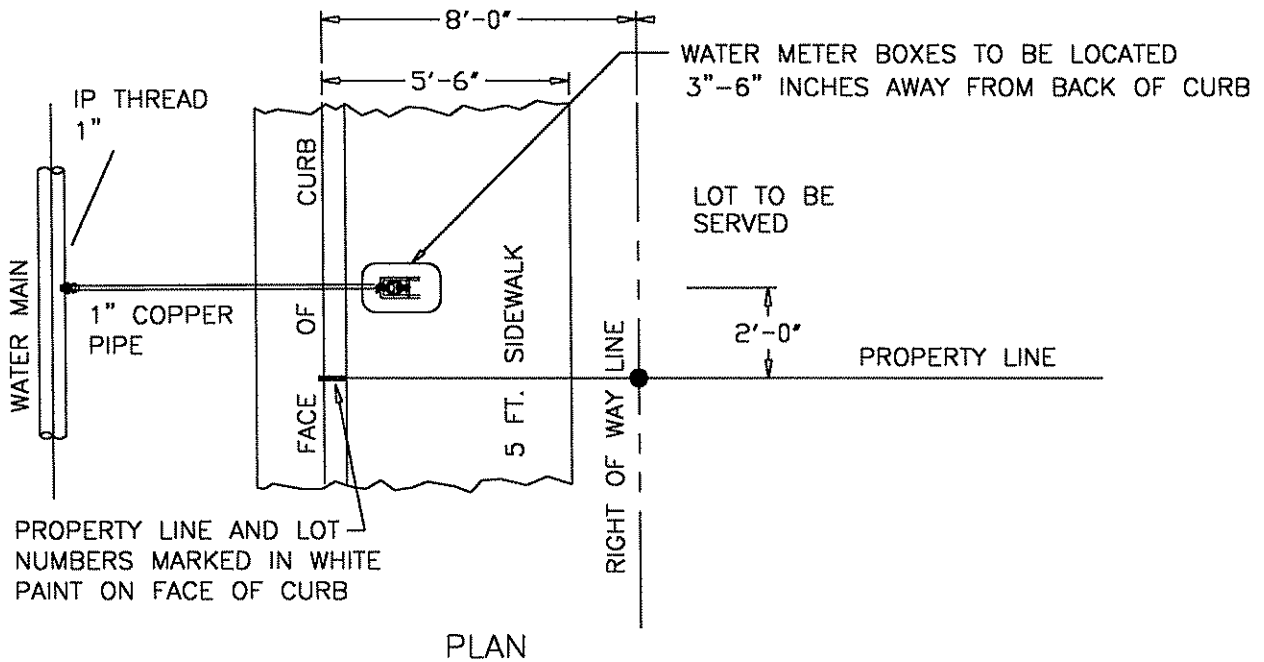
FIRE HYDRANT INSTALLATION

REVISION:

NC

DRAWING NO:


400

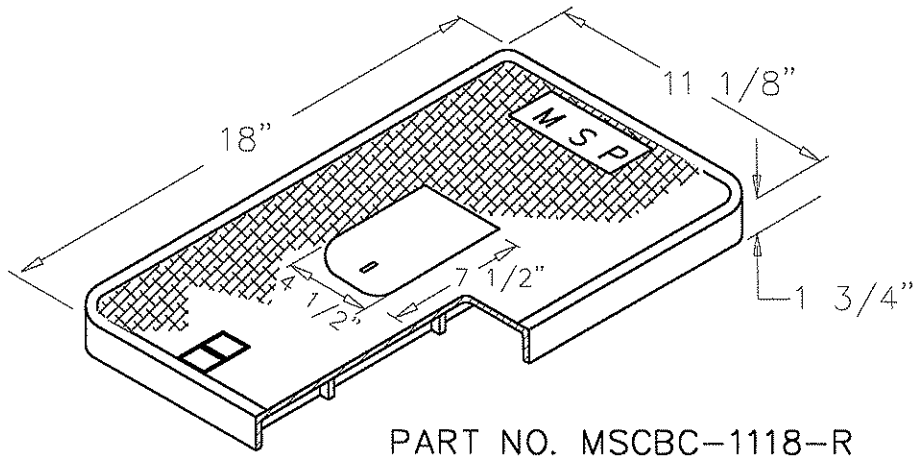


NOTES:

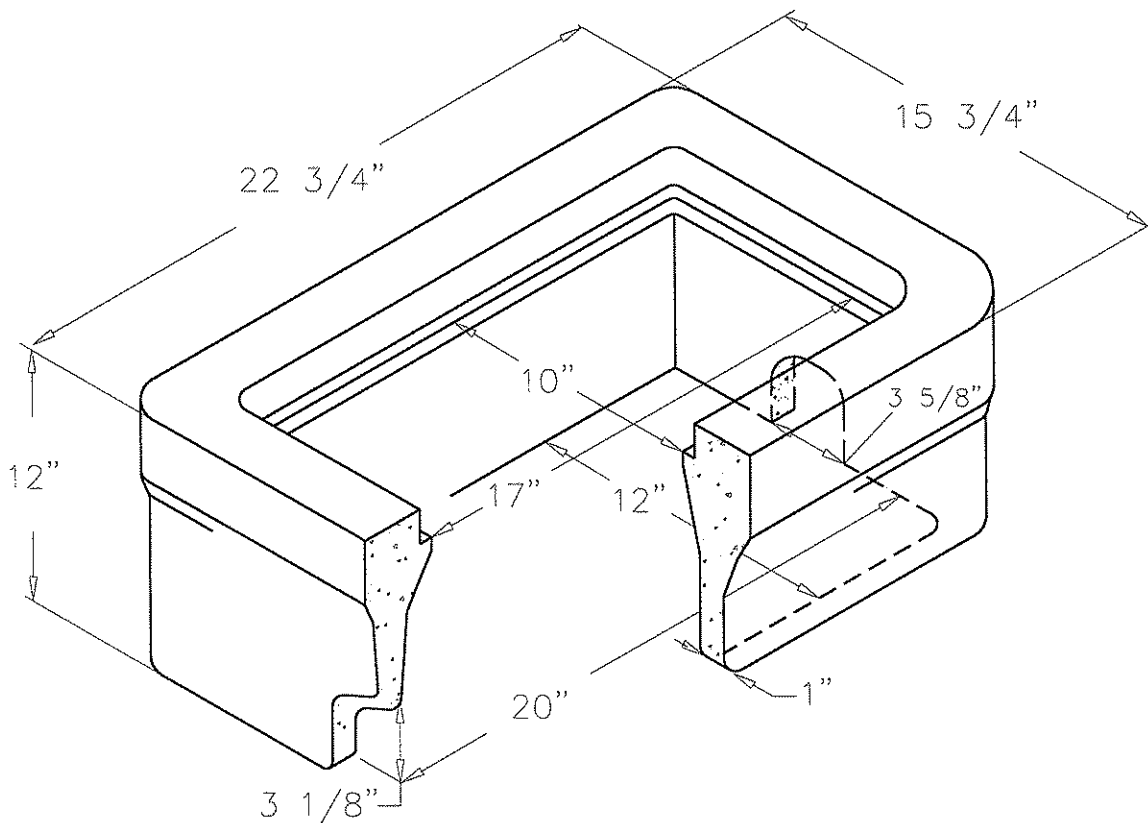
1. USE MSP DUCTILE IRON COVER PART NO. MSCBC-1118-R AS APPROVED BY THE CITY
2. USE ALL COMPRESSION TYPE FITTINGS
3. METERS SHALL NOT BE LOCATED IN DRIVEWAY APPROACH
4. METERS SHALL BE CENTERED IN METER BOX
5. IF COPPER PIPE IS DENTED, BENT, OR CRIMPED, THE DAMAGED SECTION SHALL BE REMOVED

ANGLE STOP TO BE 1" X 1" AND SET 7 INCHES DOWN FROM TOP OF CURB AND 16" FROM FACE OF CURB

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CHECKED BY:		DRAWING NO: 405
DATE:	TITLE: SINGLE WATER SERVICE INSTALLATION	
SCALE:		



PART NO. MSCBC-1118-R
DUCTILE IRON COVER



NOTES:

1. NO. 37 BODY WITH DUCTILE IRON COVER
2. LIGHTWEIGHT (LR) BOXES NOT ACCEPTABLE

DRAWN BY:
SJNM

CHECKED BY:

DATE:

SCALE:
NOT TO SCALE



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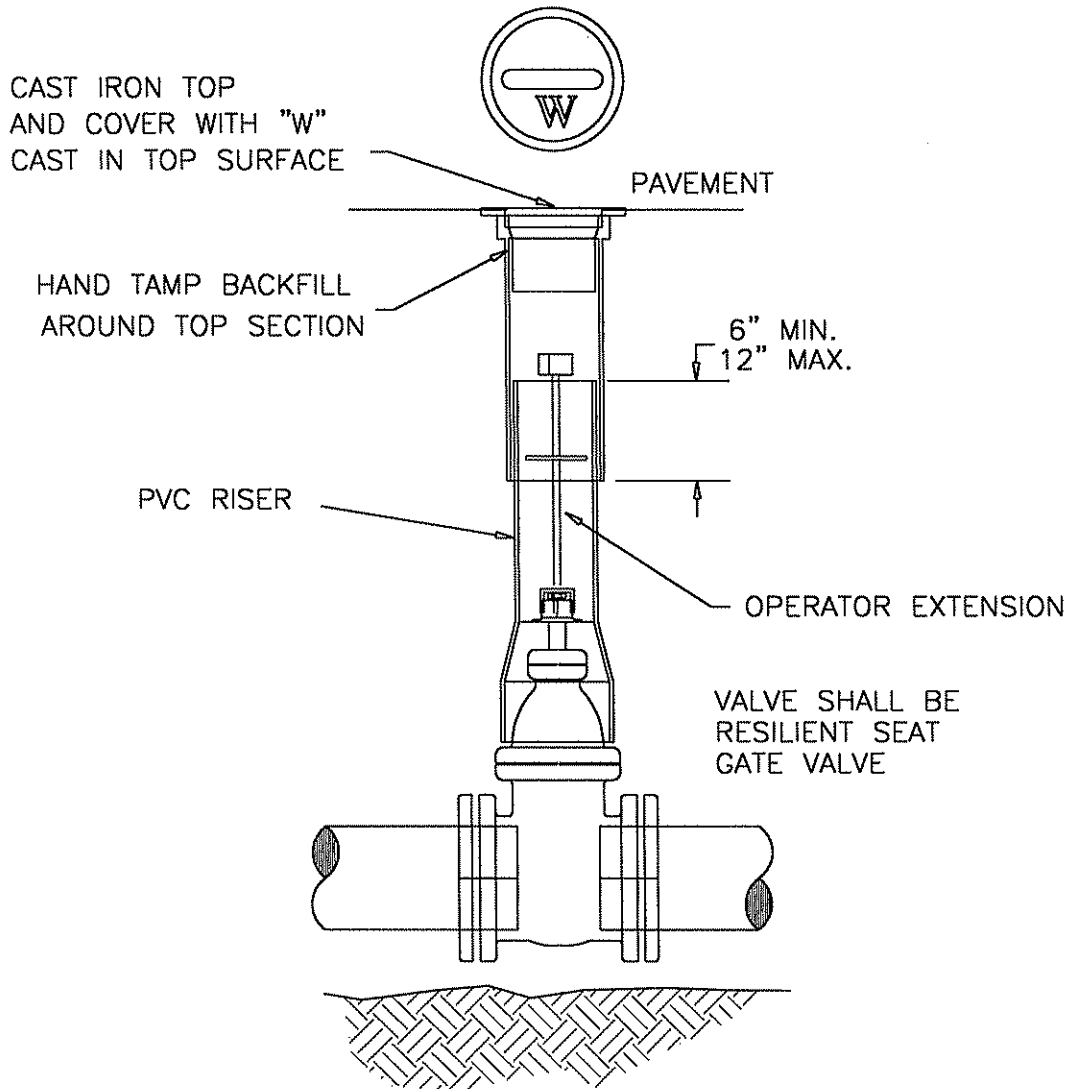
TITLE:

BROOKS 12" X 20" METER BOX FOR 1" WATER METER

REVISION:


DRAWING NO:

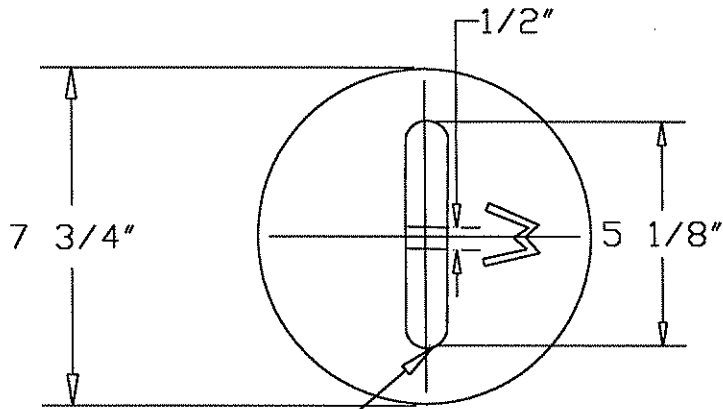
406



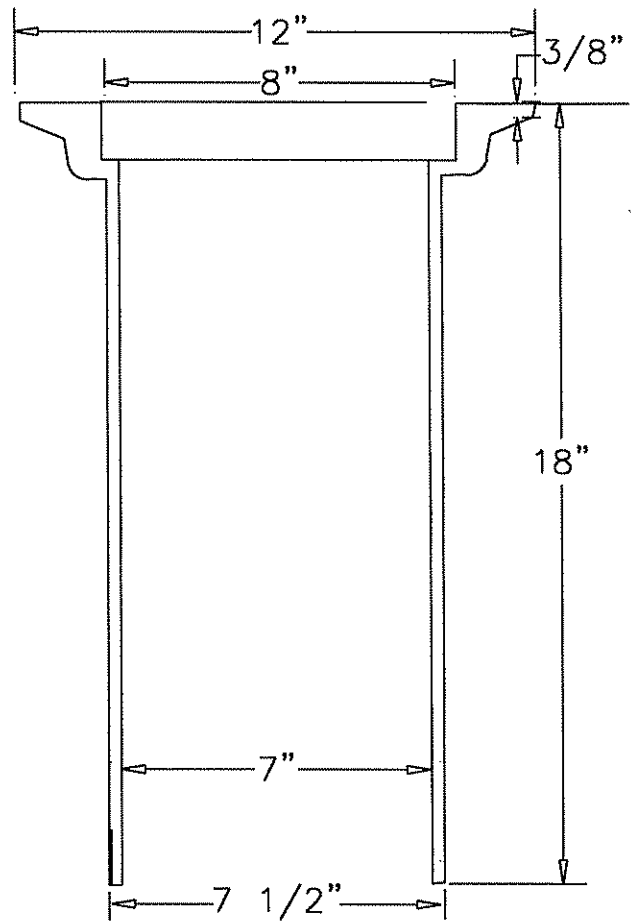
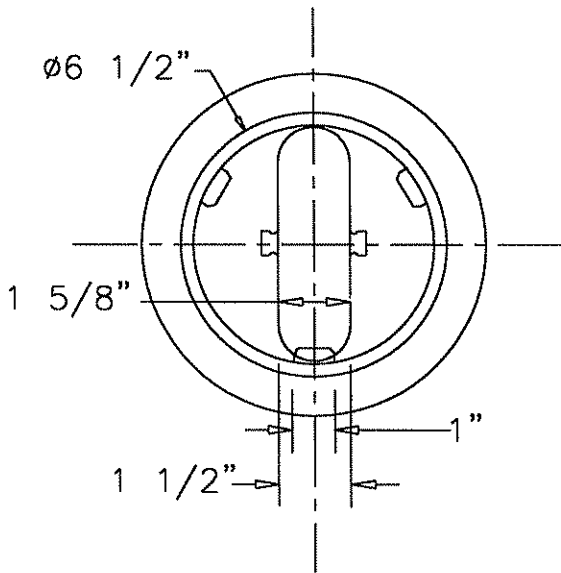
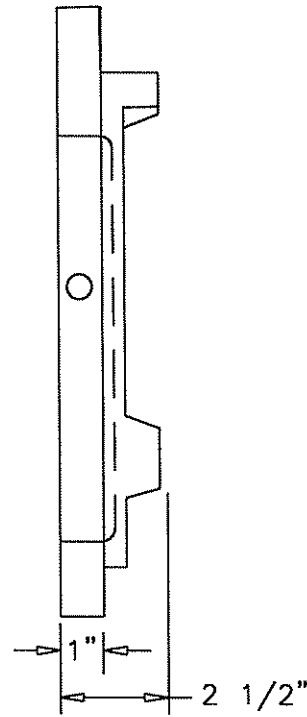
NOTES:

- 1) VALVE BOX NOT TO REST ON OPERATING ASSEMBLY.
- 2) OPERATOR EXTENSION REQUIRED WHEN VALVE NUT IS DEEPER THAN 3 FEET FROM FINISHED GRADE.
- 3) CENTER VALVE BOX ON AXIS OF OPERATOR NUT.
- 4) PROVIDE 24" SQUARE BY 4" THICK CONCRETE PAD AROUND VALVE BOX OUTSIDE OF PAVED AREAS.
- 5) ALL VALVES AND FITTINGS SHALL BE MECHANICAL JOINT.
- 6) SEE STANDARD DETAIL FOR FLANGE UP VALVE BOX AND COVER.

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DATE:		DRAWING NO:
SCALE:		410
TITLE: GATE VALVE SETTING DETAIL		



LIFT POCKET 1" WIDE X 1 1/4" DEEP



NOTES:

1. OLYMPIC FOUNDRIES PART NO. V9910 OR APPROVED EQUAL.
2. MATERIAL: CAST IRON, ASTM A-46, CL 30
APPROXIMATE WEIGHT:
VALVE BOX - 42 LBS.
COVER - 14 LBS.

DRAWN BY: TU
CHECKED BY:
DATE:
SCALE:

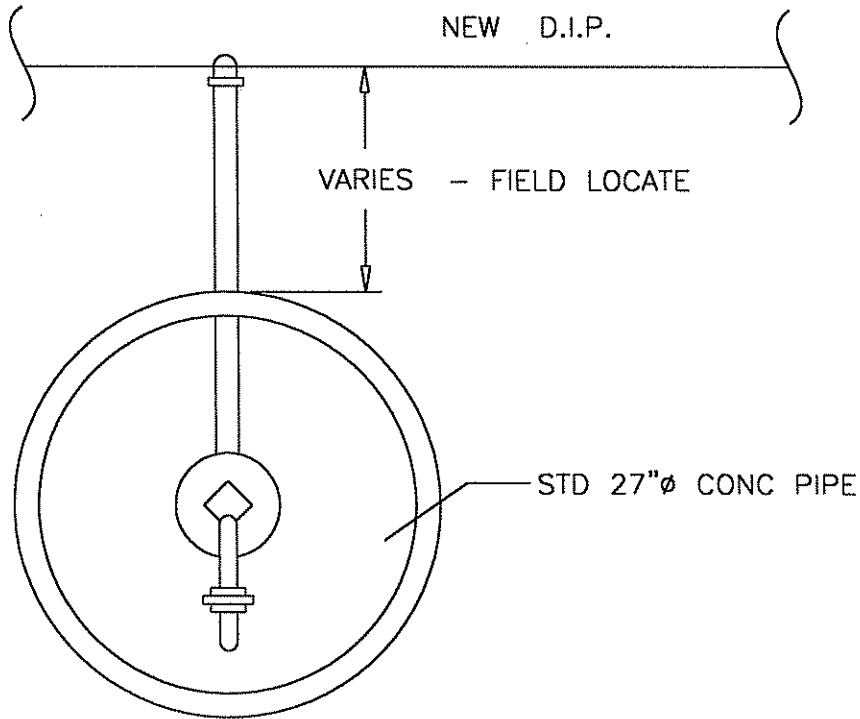


CITY OF ST. HELENS

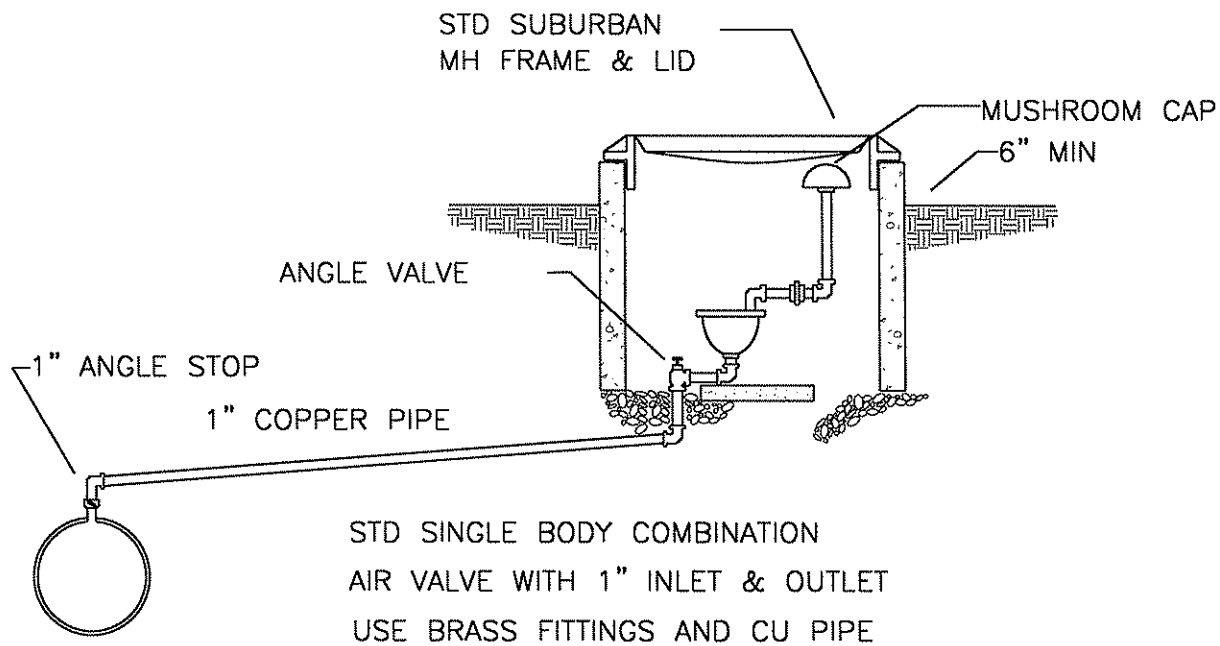
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TITLE:
18" FLANGE UP VALVE BOX AND COVER

REVISION:
DRAWING NO: 411

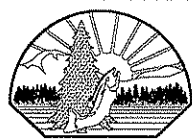


PLAN



CROSS SECTION

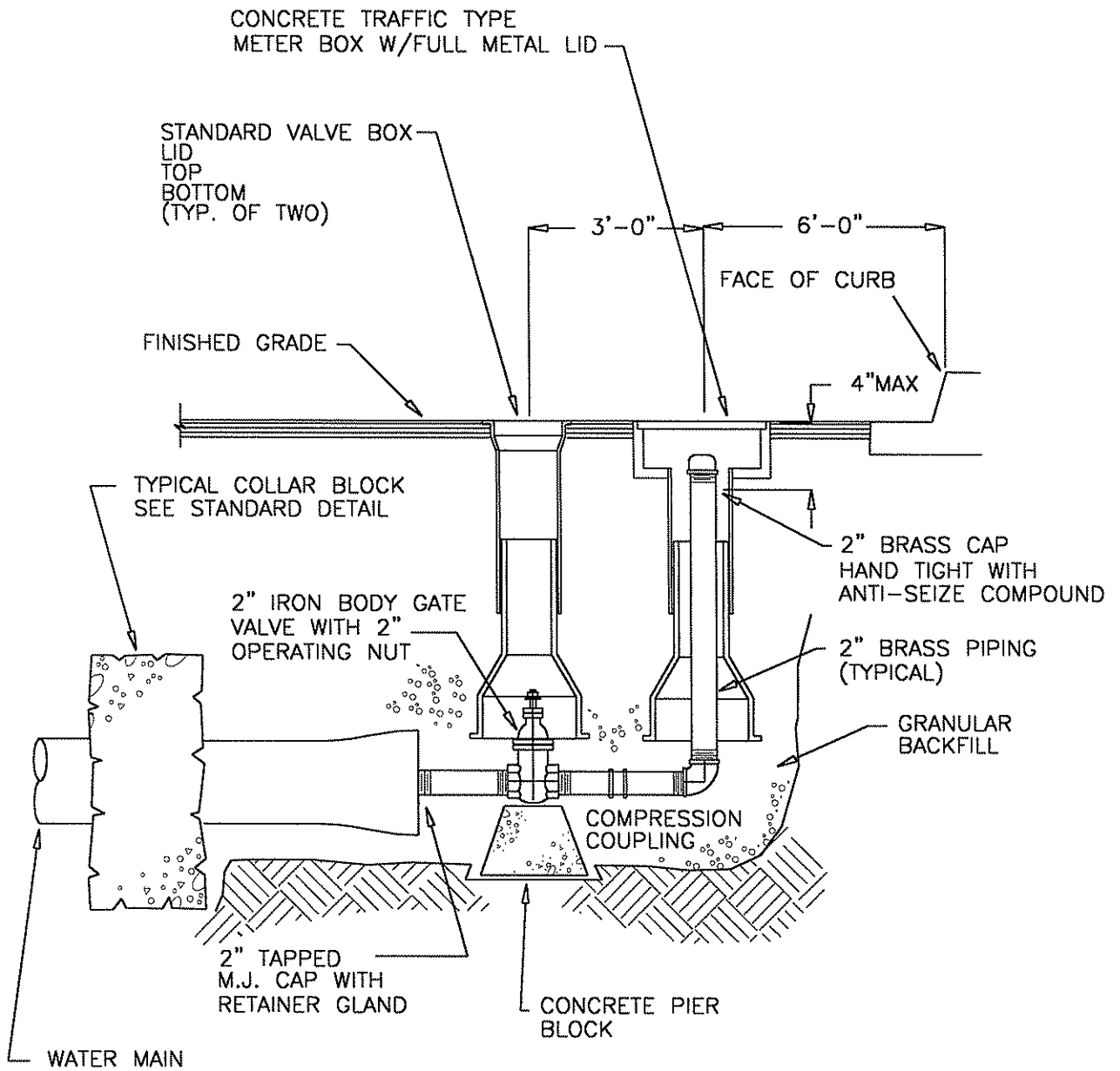
DRAWN BY:	T. KOLLN
CHECKED BY:	.
DATE:	.
SCALE:	.



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REVISION:	NC
DRAWING NO:	415

TITLE: AIR RELEASE VALVE



DRAWN BY: T. KOLLN
 CHECKED BY:
 DATE:
 SCALE:

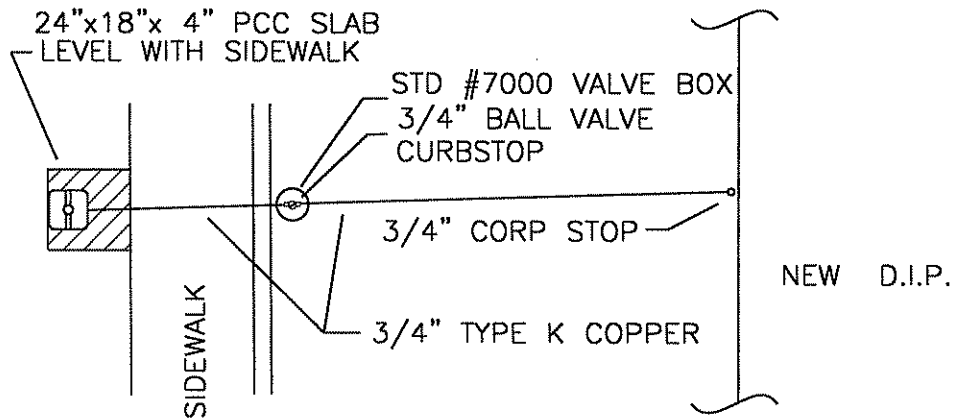


CITY OF ST. HELENS

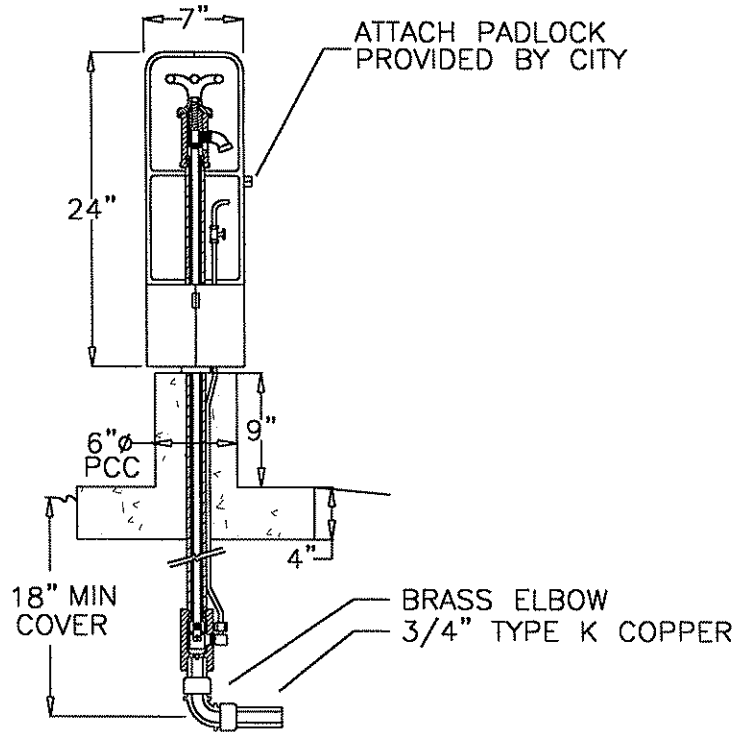
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TITLE: PERMANENT 2" BLOWOFF

REVISION: NC
 DRAWING NO: 420



PLAN



CROSS SECTION

KUPFERLE FOUNDRY OR PRE-APPROVED EQUAL ONLY

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DATE:

SCALE:



TITLE:

CITY OF ST. HELENS

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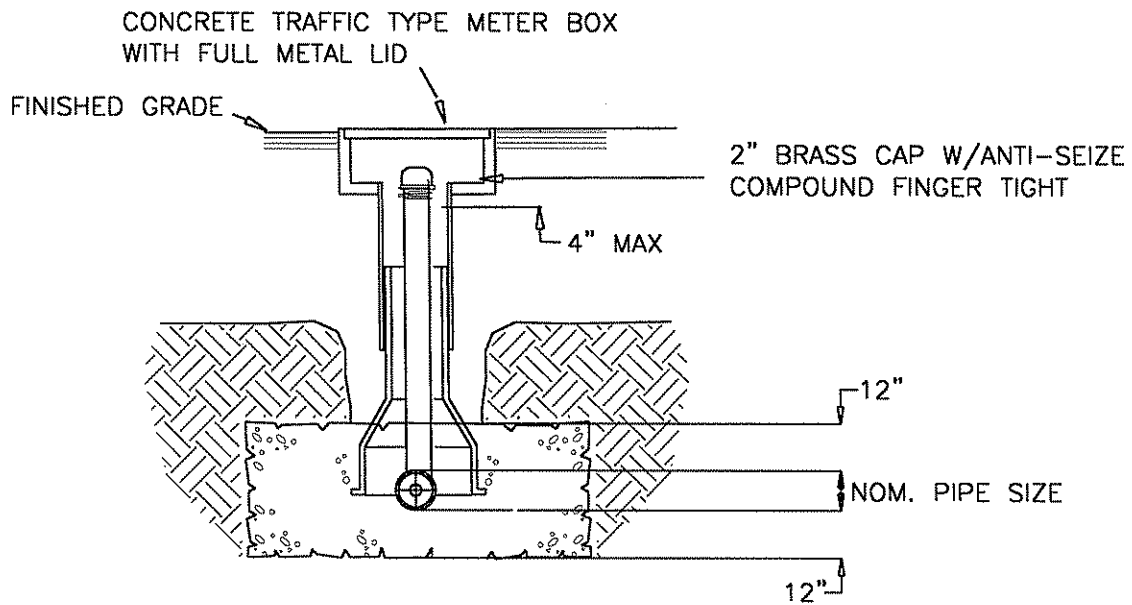
ELIPSE #88 SAMPLING STATION

REVISION:

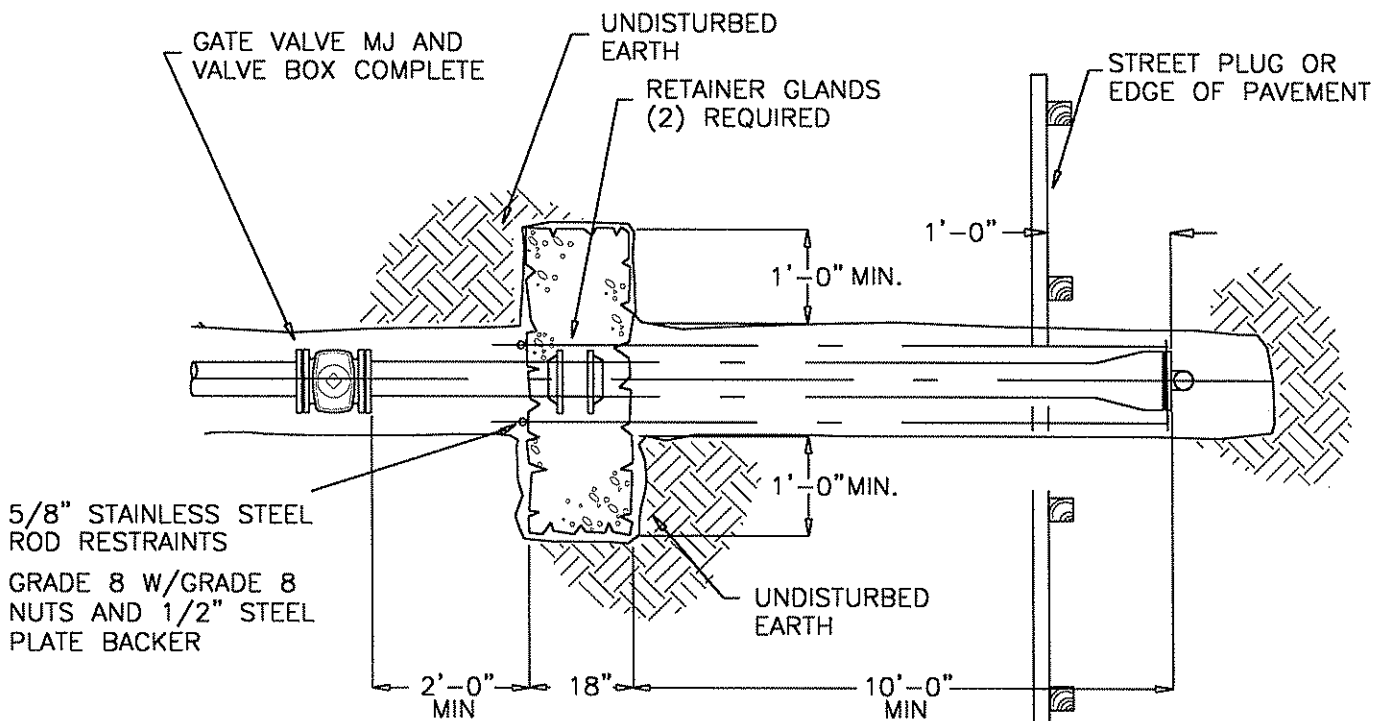
NC

DRAWING NO:

421



SECTION



PLAN

KEY COLLAR BLOCK INTO TRENCH SIDES AND BOTTOM A MINIMUM OF 1'-0"

DRAWN BY:
T. UNDERWOOD

CHECKED BY:

DATE:

SCALE:

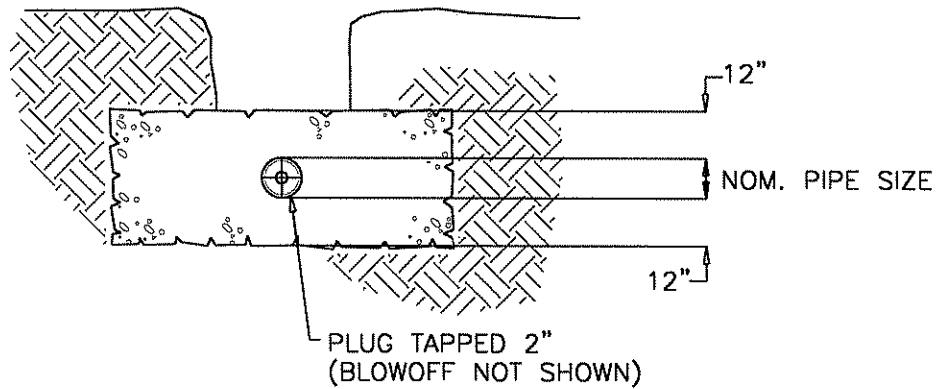


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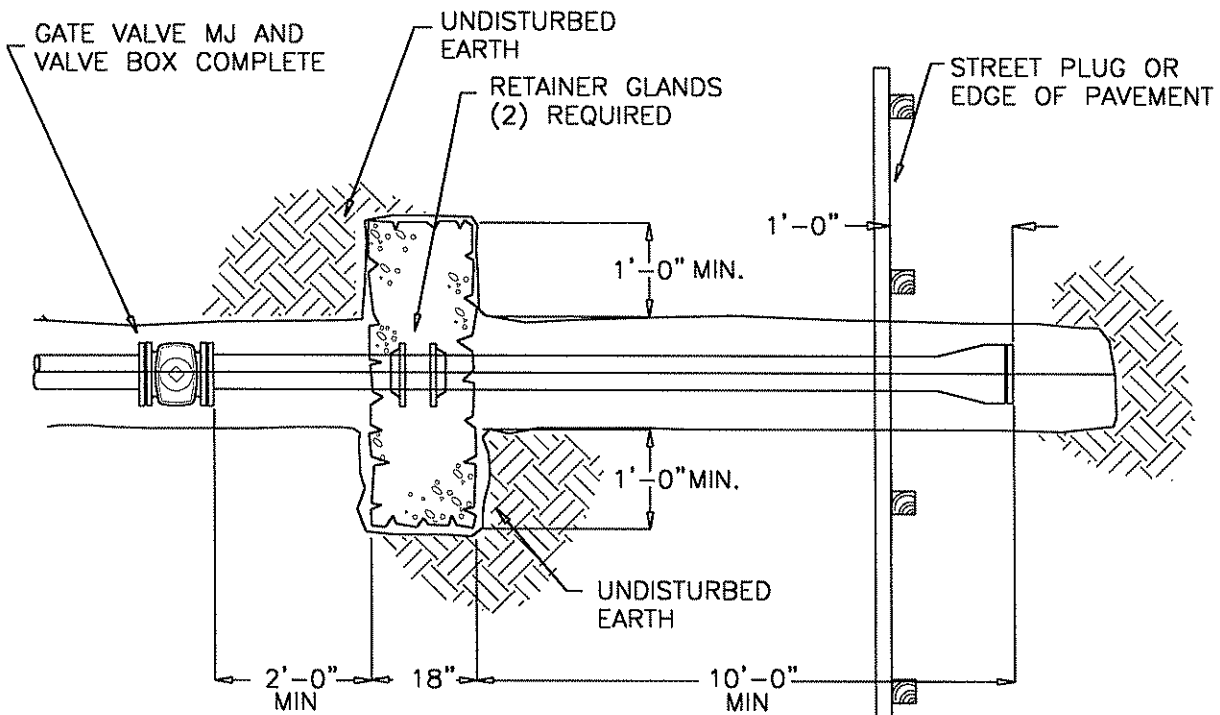
REVISION:

DRAWING NO:
422

TITLE:
TEMPORARY 2" BLOWOFF



SECTION



PLAN

KEY COLLAR BLOCK INTO TRENCH SIDES AND BOTTOM A MINIMUM OF 1'-0"

DRAWN BY: T. KOLLN

CHECKED BY:

DATE:

SCALE:



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TITLE:

COLLAR THRUST BLOCK

REVISION:

NC

DRAWING NO:

425

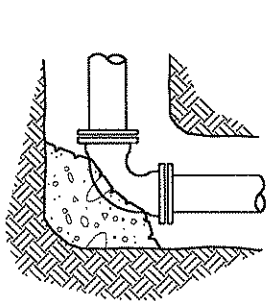
(HORIZONTAL)
BEARING AREA OF THRUST BLOCKS IN SQ. FT.

FITTING SIZE	TEE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
4	1.3	1.9	1.3		
6	2.8	4.0	2.1	1.3	
8	5.1	7.1	3.9	2.0	1.3
12	11.3	16.0	8.8	4.5	2.3

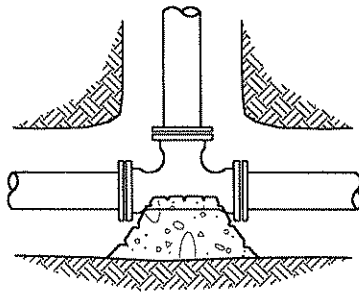
VOLUME OF THRUST BLOCK
IN CU. YDS. (VERTICAL)

FITTING SIZE	BEND ANGLE		
	45°	22.5°	11.25°
4	1.1	0.4	0.2
6	2.7	1.0	0.4
8	4.0	1.5	0.6
12	8.5	3.2	1.3

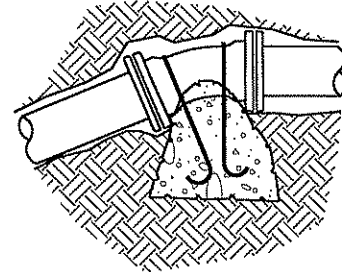
VALUES BASED ON 150 PSI WATER PRESSURE AND 1500 PSF SOIL BEARING CAPACITY.



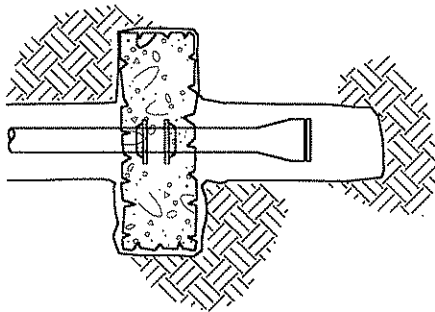
BEND



TEE



VERTICAL BEND



STRADDLE BLOCK

FITTING SIZE	ROD SIZE	EMBEDMENT
4"-12"	#6	30"
14"-16"	#8	36"

NOTES:

- 1) CONCRETE BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH
- 2) ALL CONCRETE TO BE CLASS 3000
- 3) INSTALL 12 MIL TOTAL THICKNESS POLYETHENE SHEET AROUND FITTING. SECURE SHEET ENDS TO PREVENT INFILTRATION OF DIRT BETWEEN SHEET AND PIPE FITTING PRIOR TO POURING THRUST BLOCKING
- 4) PROTECT MECHANICAL JOINT FOLLOWERS AND BOLTS FROM CONCRETE WITH TEMPOARY FORMS AND POLYETHENE SHEETING SEE NOTE No. 3

DRAWN BY: T. KOLLN

CHECKED BY:

DATE:

SCALE:



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TITLE:

THRUST BLOCKING DETAILS

REVISION:

NC

DRAWING NO:

430