

DESIGN: CMC	DATE: 3-95	
DRAWN: RKL	FILENAME:P:WORKS\CAD\PLATES\P110	
REVISIONS	3-97	3-02



CITY OF MAPLEWOOD-ENGINEERING DEPT.

TYPICAL INTERSECTION

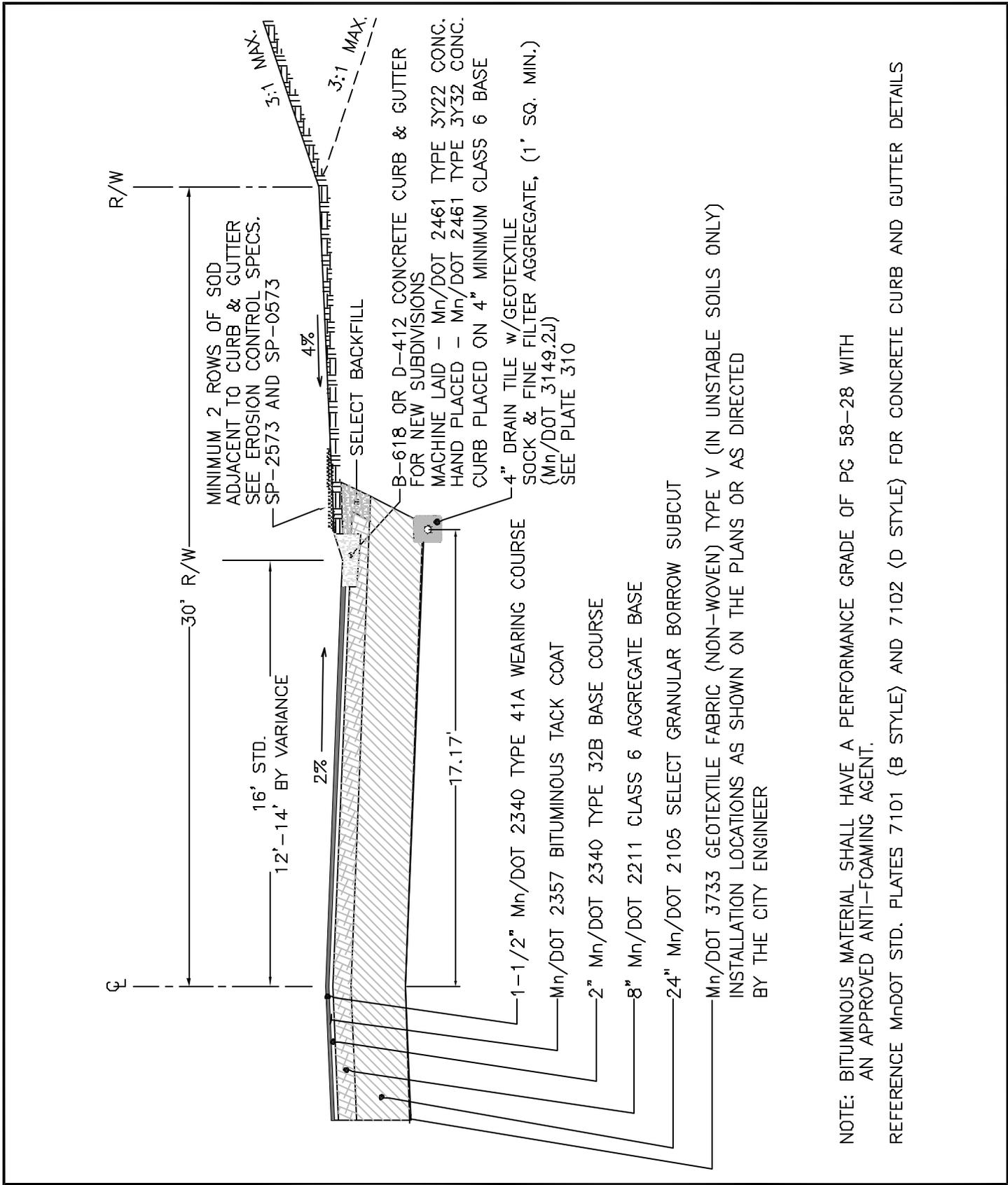
PLATE NO.
110

DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P111
REVISIONS	3-97 3-02

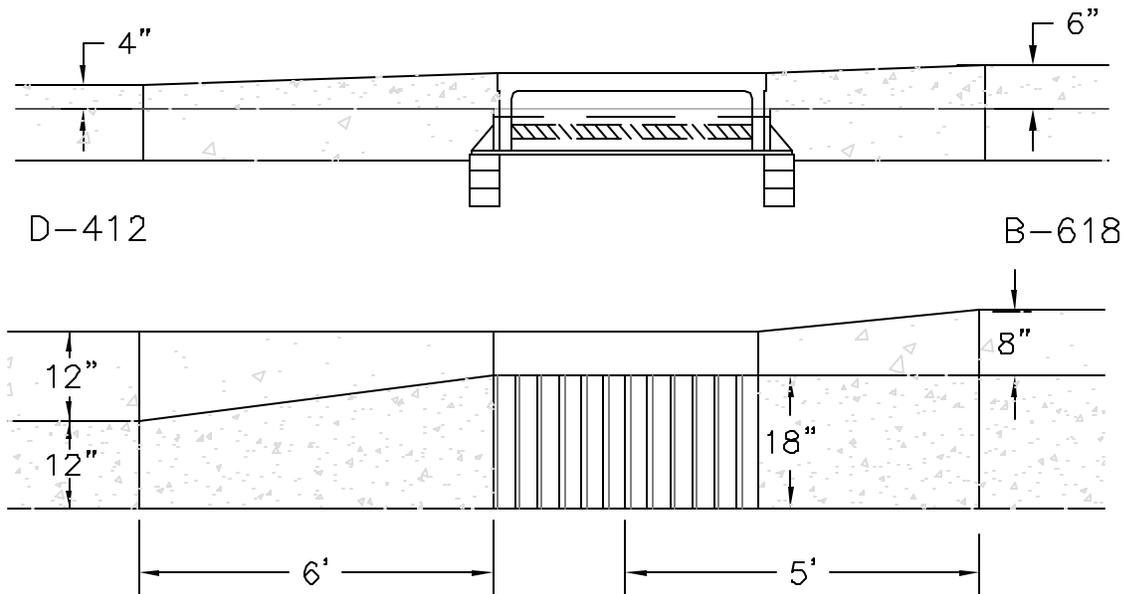


CITY OF MAPLEWOOD—ENGINEERING DEPT.
TYPICAL RESIDENTIAL
STREET SECTION—URBAN

PLATE NO.
111

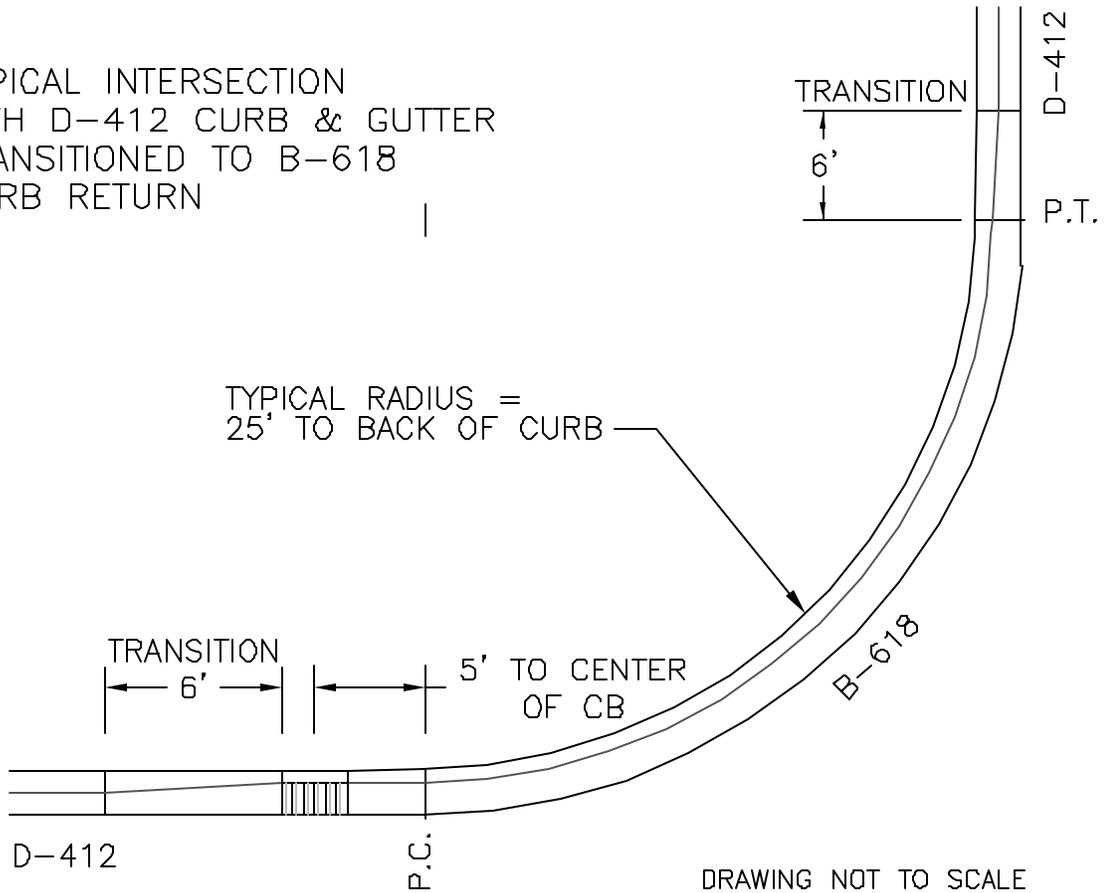


NOTE: BITUMINOUS MATERIAL SHALL HAVE A PERFORMANCE GRADE OF PG 58-28 WITH AN APPROVED ANTI-FOAMING AGENT.
REFERENCE MnDOT STD. PLATES 7101 (B STYLE) AND 7102 (D STYLE) FOR CONCRETE CURB AND GUTTER DETAILS



SEE PLATES 300, 304, 308 & 309 FOR DETAILS ON SETTING CASTINGS

TYPICAL INTERSECTION
WITH D-412 CURB & GUTTER
TRANSITIONED TO B-618
CURB RETURN



DRAWING NOT TO SCALE

DESIGN: CMC	DATE: 3-95		
DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P112		
REVISIONS	3-02		



CITY OF MAPLEWOOD-ENGINEERING DEPT.
C.B. PLACEMENT AND C. & G.
TRANSITION AT INTERSECTIONS

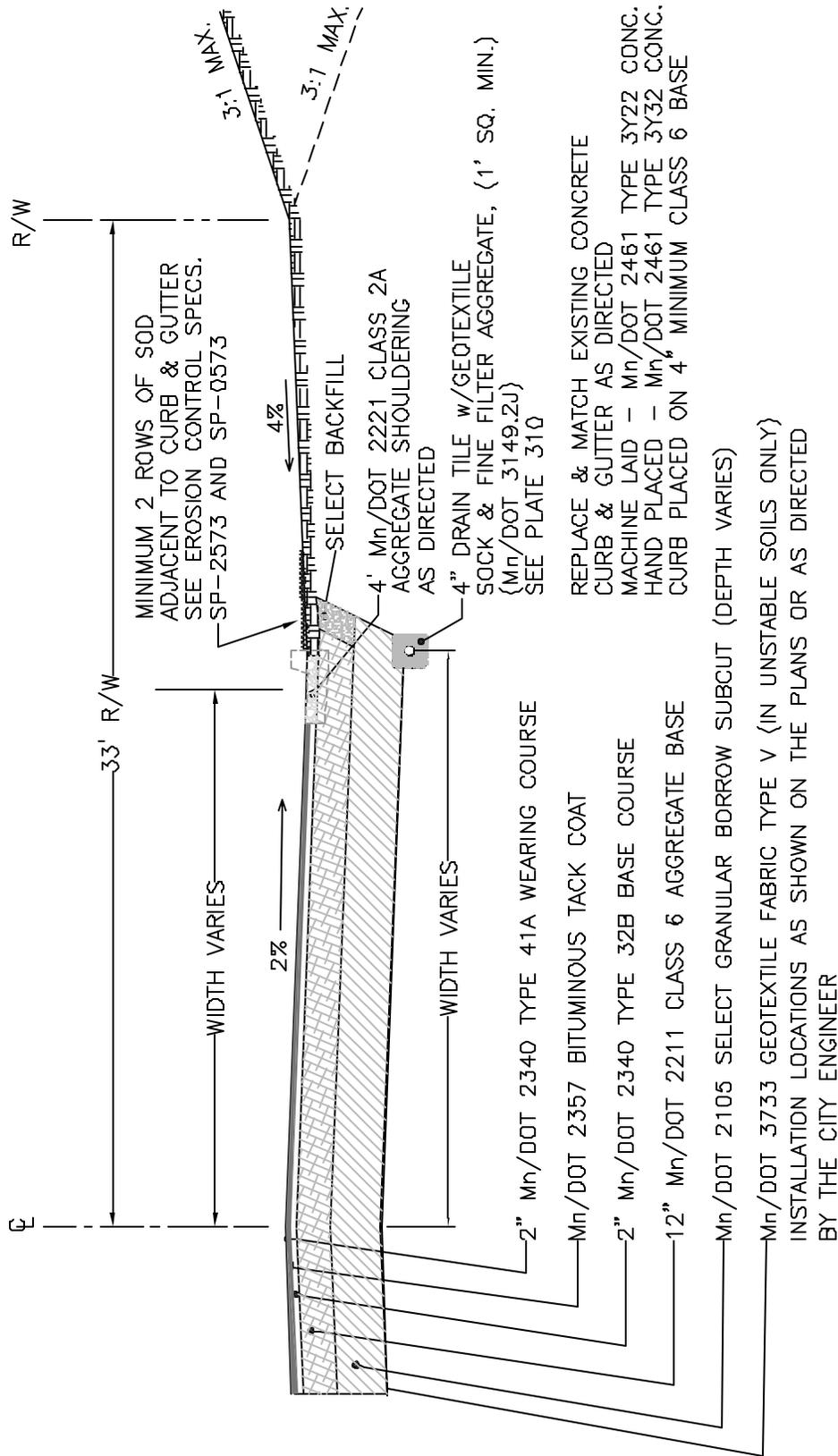
PLATE
NO.
112

DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P114
REVISIONS	3-97 3-02



CITY OF MAPLEWOOD—ENGINEERING DEPT.
 COUNTY ROAD REPLACEMENT

PLATE NO.
 114



* ALTERNATE HAND PLACED CONCRETE PAVEMENT OF MATCHING THICKNESS
 Mn/DOT 2301 WITH STRUCTURAL CONCRETE Mn/DOT 2461 TYPE 3A32-HE

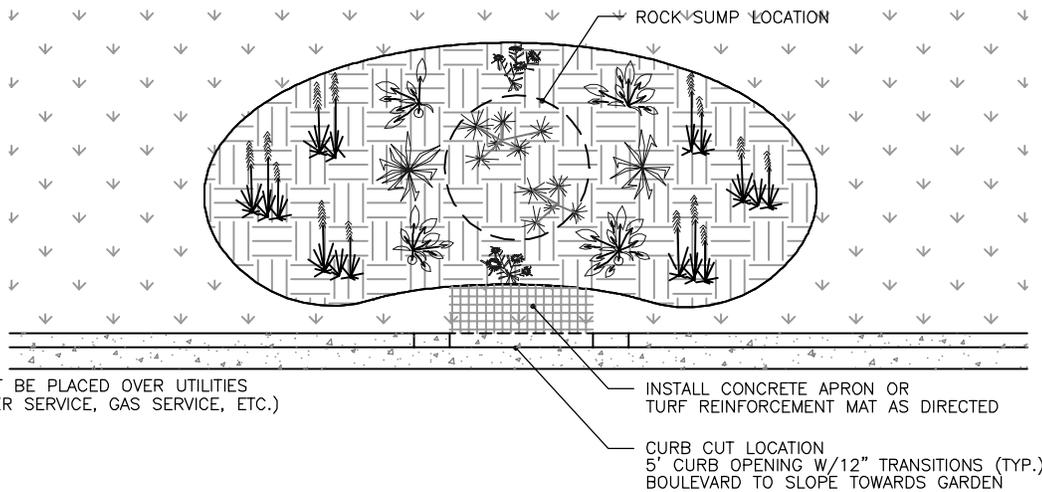
NOTE: BITUMINOUS MATERIAL SHALL HAVE A PERFORMANCE GRADE OF PG 58-28 WITH AN APPROVED ANTI-FOAMING AGENT.

REFERENCE MnDOT STD. PLATES 7101 (B STYLE) AND 7102 (D STYLE) FOR CONCRETE CURB AND GUTTER DETAILS

NOTE: MAXIMUM DRIVEWAY GRADES ARE +13% TO -5%.

BITUMINOUS MATERIAL SHALL HAVE A PERFORMANCE GRADE OF PG 58-28 WITH AN APPROVED ANTI-FOAMING AGENT.

RAINWATER GARDEN AND ROCK INFILTRATION SUMP PLAN VIEW

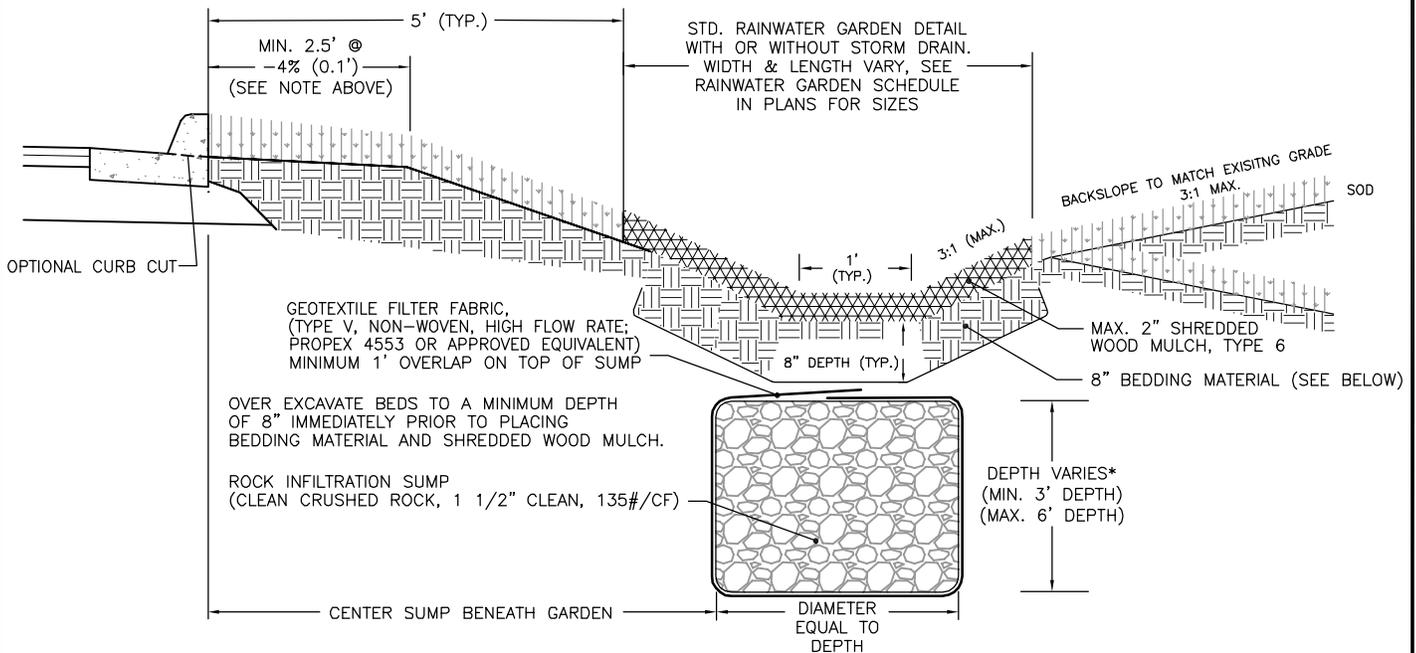


GARDEN SHALL NOT BE PLACED OVER UTILITIES
(SAN. SEWER, WATER SERVICE, GAS SERVICE, ETC.)

RAINWATER GARDEN AND ROCK INFILTRATION SUMP DETAIL

TYPICAL RAINWATER GARDEN SIZES		
8' X 16'	10' X 20'	12' X 24'

NOTE: C&G BACKFILL IN 2.5' INCREMENTS FOR SODDING
PURPOSES TO MATCH R/W AND GARDEN WIDTHS.



RAINWATER GARDEN PREPARATION

EXCAVATE GARDEN AREA TO ACCOMMODATE PLACEMENT
OF 8" OF BEDDING MATERIAL.
EXCAVATE & INSTALL ROCK INFILTRATION SUMP w/GEOTEXTILE FILTER FABRIC.
FILTER FABRIC SHALL COMPLETELY ENVELOPE ROCK SUMP.
SCARIFY GARDEN AREA PRIOR TO PLACEMENT OF BEDDING MATERIAL.
PLACE A MINIMUM 8" OF BEDDING MATERIAL.
PLACE MAX. 2" SHREDDED WOOD MULCH, (MULCHING MATERIAL TYPE 6.)

*HIGH PERMEABILITY SOILS (SAND) - 3' DEPTH
LOW PERMEABILITY SOILS (CLAY) - 6' DEPTH

BEDDING MATERIAL FOR GARDEN

AREAS SHALL BE APPROXIMATELY
50% SALVAGED IN SITU TOPSOIL
50% CLEAN ORGANIC COMPOST (GRADE 2)
IMPORTED TOPSOIL BORROW MAY NOT BE USED IN GARDEN AREAS.

DESIGN: CMC	DATE: 2-15-02		
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P116		
REVISIONS	3-04	3-06	1-07

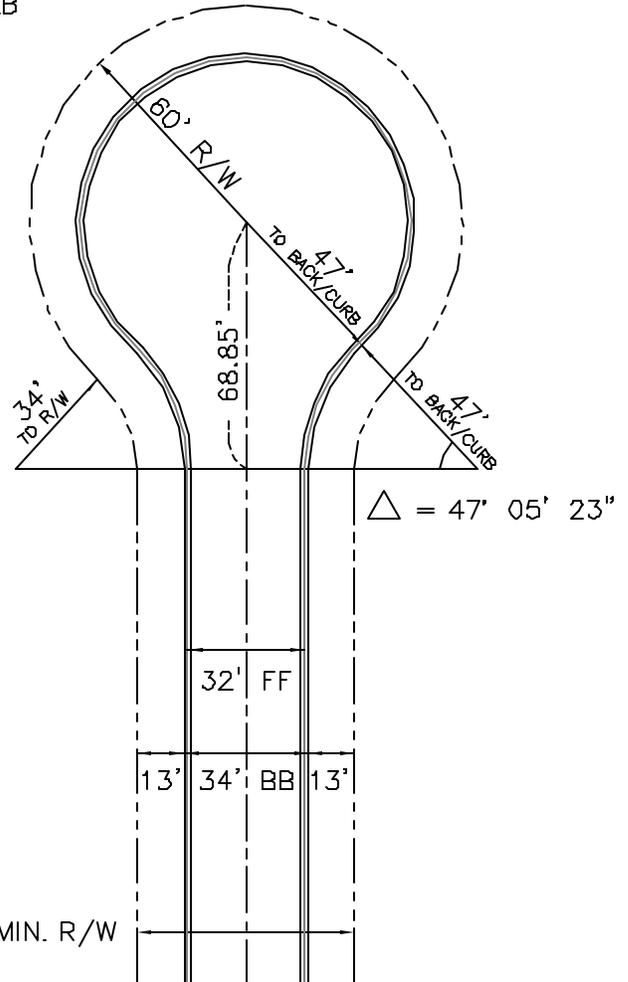
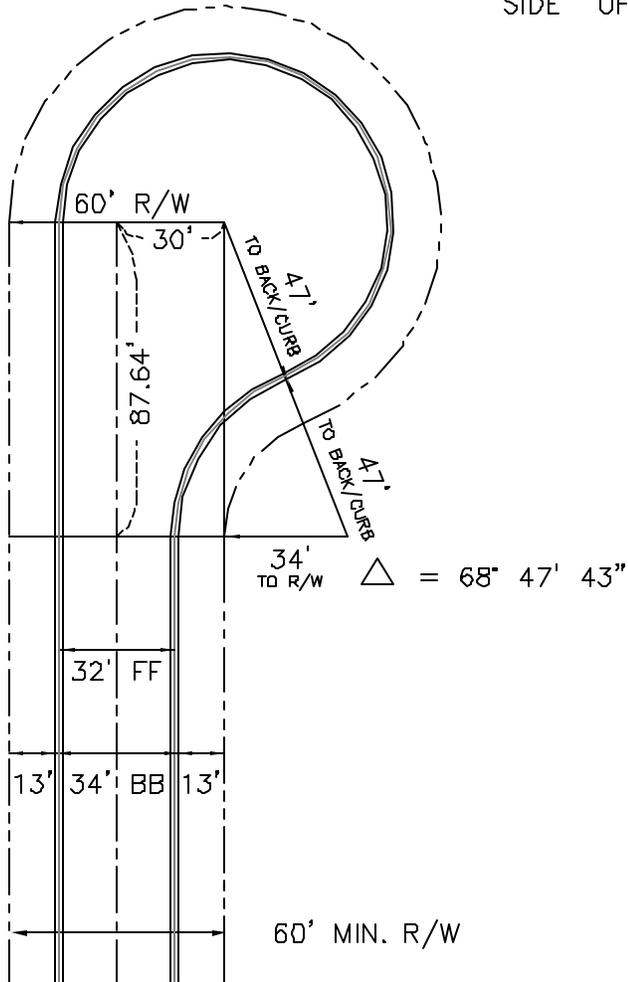
CITY OF MAPLEWOOD-ENGINEERING DEPT.

RAINWATER GARDEN

PLATE
NO.

116

NOTE: LOCATE HYDRANT
ON LOT LINE ON
SIDE OF BULB



DIMENSIONED FOR
D-412 C&G

DESIGN: CMC	DATE: 3-95		
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P120		
REVISIONS	3-02		

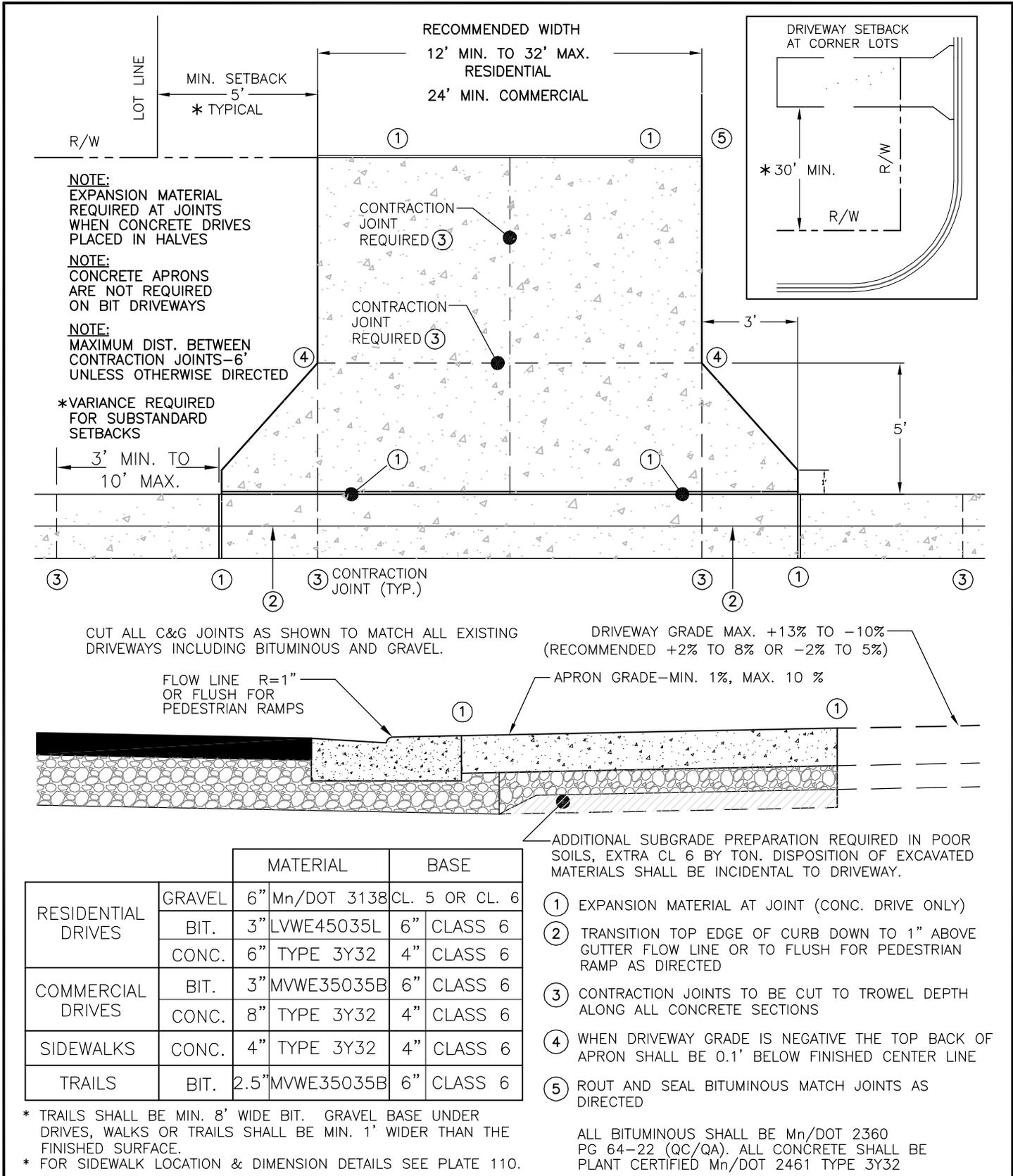


CITY OF MAPLEWOOD—ENGINEERING DEPT.

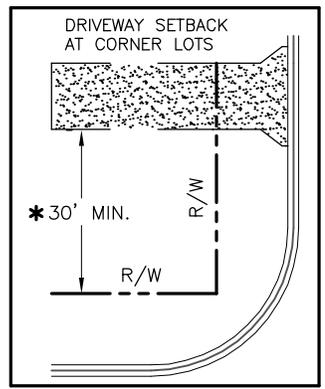
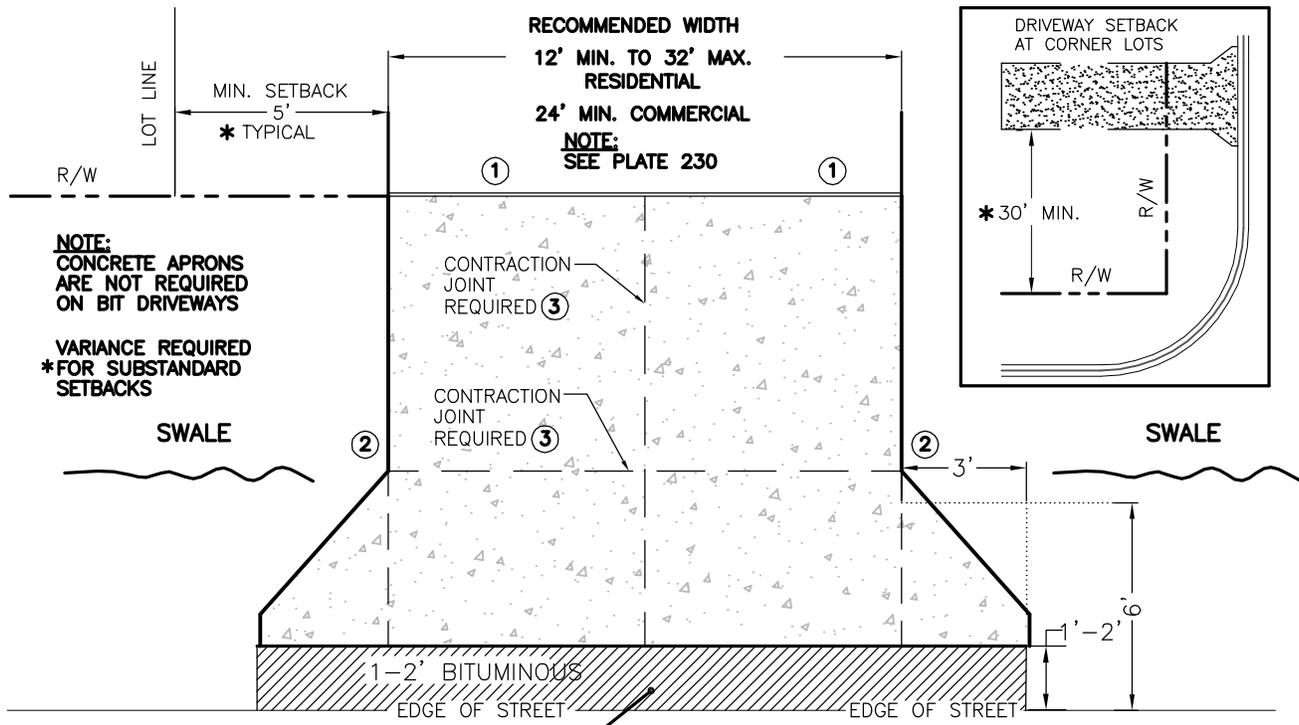
TYPICAL CULS—DE—SAC

PLATE
NO.

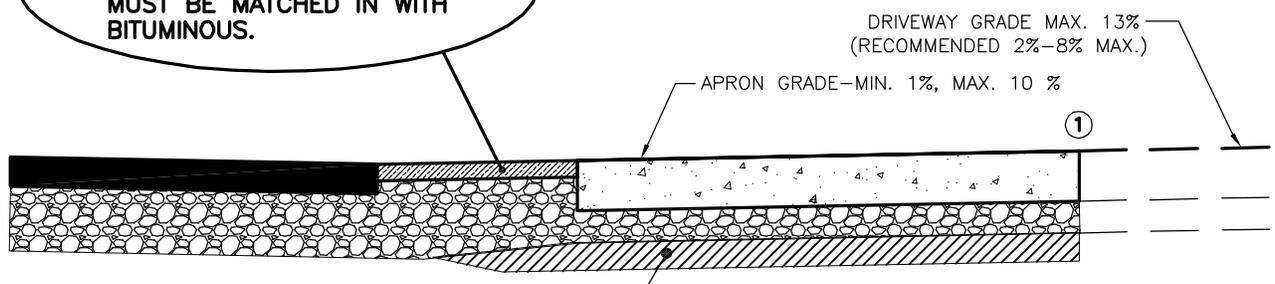
120



DESIGN: CMC	DATE: 3-95	CITY OF MAPLEWOOD—ENGINEERING DEPT. DRIVEWAYS, SIDEWALKS AND TRAILS	PLATE NO.
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P230		
REVISIONS	3-97 3-98 3-99		
3-02 3-04 3-06 3-07			230



IF DRIVEWAY IS CONCRETE THE 1'-2' ADJACENT TO THE STREET MUST BE MATCHED IN WITH BITUMINOUS.



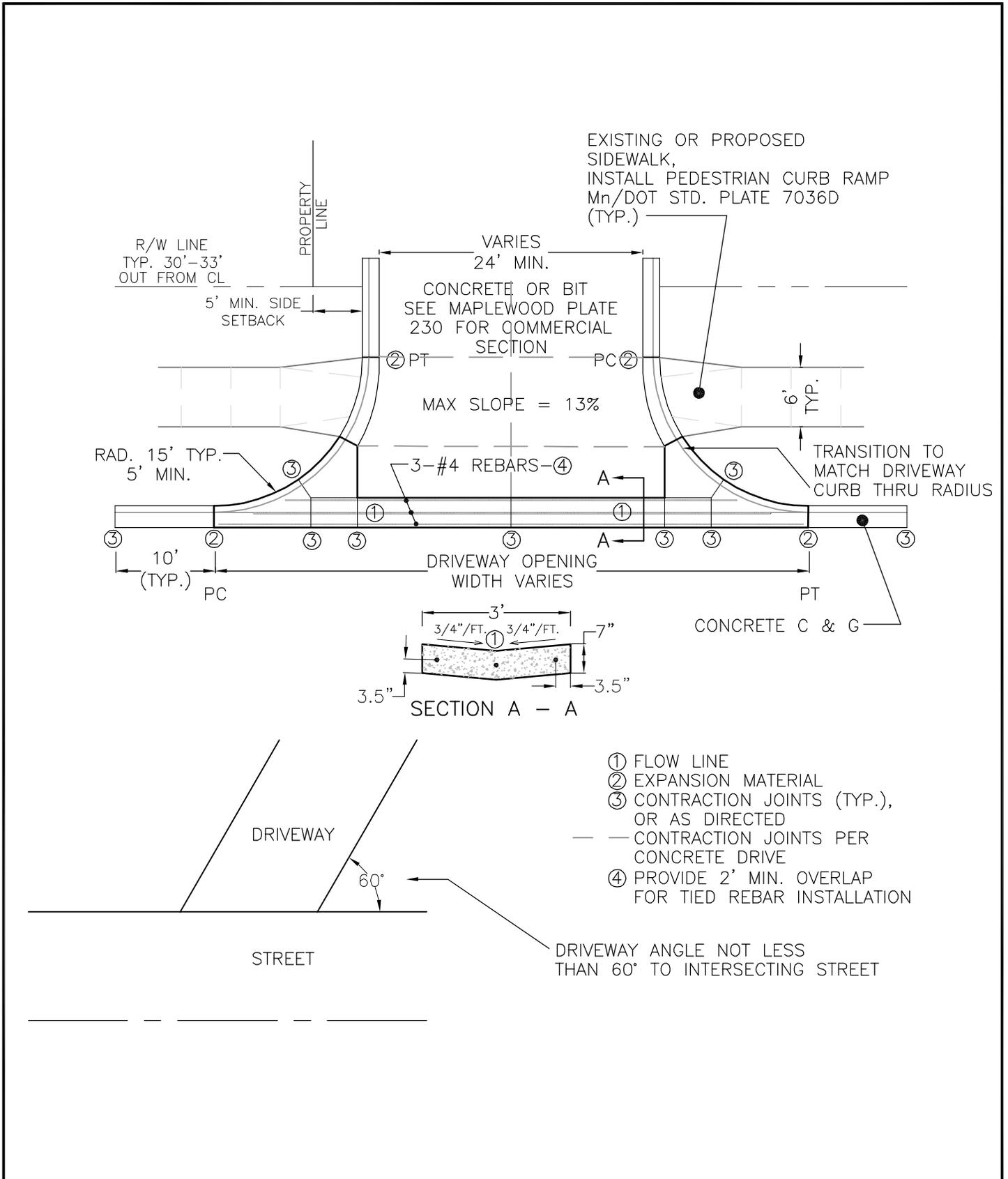
		MATERIAL	BASE
RESIDENTIAL DRIVES	GRAVEL	6" Mn/DOT 3138	CL. 5 OR CL. 6
	BIT.	2" TYPE 41B	6" CLASS 6
	CONC.	6" TYPE 3Y32	4" CLASS 6
COMMERCIAL DRIVES	BIT.	3" TYPE 41B	6" CLASS 6
	CONC.	8" TYPE 3Y32	4" CLASS 6
SIDEWALKS	CONC.	4" TYPE 3Y32	4" CLASS 6
TRAILS	BIT.	2" TYPE 41B	6" CLASS 6

- ① EXPANSION MATERIAL AT JOINT (CONCRETE DRIVE ONLY)
- ② WHEN DRIVEWAY GRADE IS FLAT (<1%) OR NEGATIVE THE DRIVEWAY SHOULD BE CONSTRUCTED WITH A LOW POINT @ 6" FROM THE EDGE OF THE STREET.
- ③ CONTRACTION JOINTS TO BE CUT TO TROWEL DEPTH ALONG ALL C&G SECTIONS

ALL BITUMINOUS SHALL BE Mn/DOT 2340 PG 64-22 (QC/QA). ALL CONCRETE SHALL BE PLANT CERTIFIED Mn/DOT 2461 TYPE 3Y32

* TRAILS SHALL BE MIN. 8' WIDE BIT. GRAVEL BASE UNDER DRIVES, WALKS OR TRAILS SHALL BE MIN. 1' WIDER THAN THE FINISHED SURFACE.
 * FOR SIDEWALK LOCATION & PLACEMENT DETAILS SEE PLATE 110.

DESIGN: CMC	DATE: 3-95	 CITY OF MAPLEWOOD—ENGINEERING DEPT.	PLATE NO.
DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P235		DRIVEWAYS, SIDEWALKS AND TRAILS
REVISIONS	1-02	3-04	235
FOR RELAXED URBAN SECTION (WITHOUT CURB & GUTTER)			



DESIGN: CMC	DATE: 3-02
DRAWN: RKL	FILENAME:P:WORKS\CAD\PLATES\P236
REVISIONS	



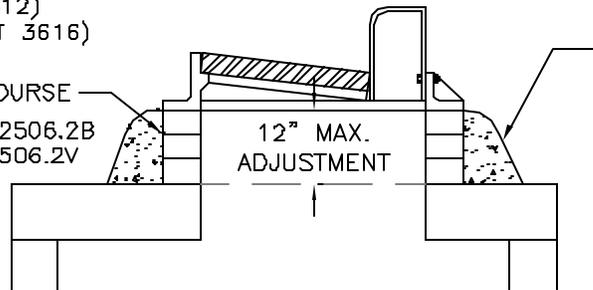
CITY OF MAPLEWOOD-ENGINEERING DEPT.

COMMERCIAL DRIVEWAY

PLATE NO.

236

UNDAMAGED CONCRETE RINGS (Mn/DOT PLATE 4010), (Mn/DOT 3622)
 SEWER BRICK (Mn/DOT 3612)
 CONCRETE BLOCK (Mn/DOT 3616)
 FULL 3/8" BED OF MORTAR BETWEEN EACH COURSE
 MORTAR: MAPLEWOOD SP-2506.2B
 GROUT: MAPLEWOOD SP-2506.2V
 SEE PROPORTIONS BELOW



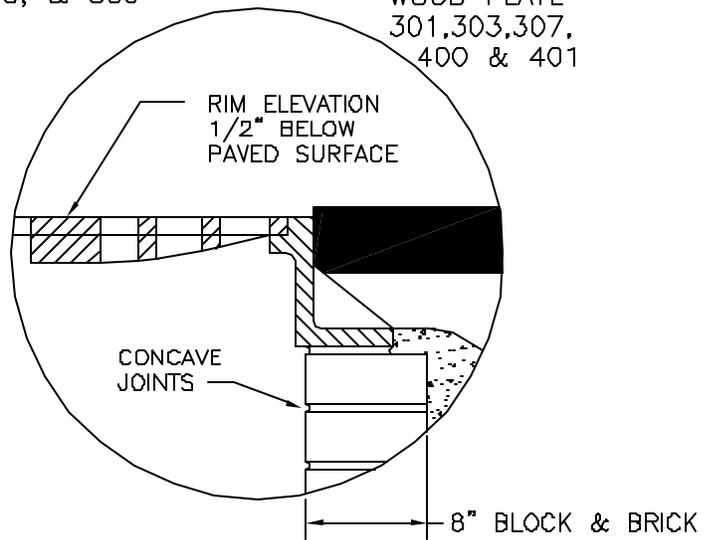
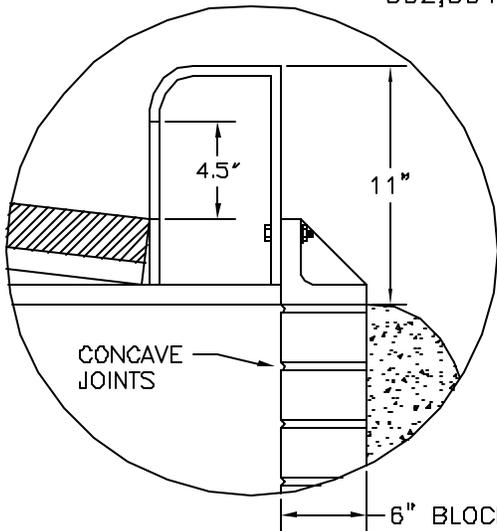
COAT EXTERIOR ONLY WITH 4" THICK CONCRETE Mn/DOT 2461 TYPE 3Y32
 BRUSH CLEAN EXCESS MORTAR ON INSIDE FACE OF BRICKS
 PROVIDE CONCAVE FACE ON MORTAR JOINTS

VERIFY CATCH BASIN ALIGNMENT WITH GUTTERLINE PRIOR TO MACHINE PLACEMENT OF CURB & GUTTER. SHIMS WHICH MAY DETERIORATE ARE NOT ALLOWED.

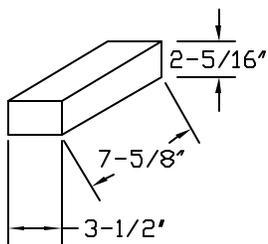
SETTING/ADJUSTING CASTING

CB DETAILS - SEE MAPLEWOOD PLATE 302,304,305,306,308, & 309

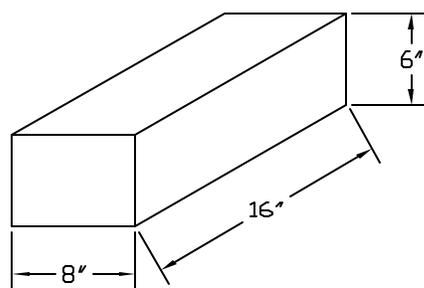
MH DETAILS - SEE MAPLEWOOD PLATE 301,303,307, 400 & 401



SEWER BRICK
 CLAY BRICK
 GRADE MM (MIN.)



SEWER BLOCK
 CONCRETE BLOCK
 AIR ENTRAINMENT (5 1/2 - 9%)



MORTAR

1 PART TYPE 1A PORTLAND CEMENT
 1/4 TO 1/2 PART HYDRATED LIME, TYPE SA
 2.25 TO 3 TIMES (TOTAL VOLUME OF ABOVE TWO INGREDIENTS) OF MORTAR SAND
 SUFFICIENT WATER FOR CONSISTENCY
 7-10% AIR CONTENT

NON-SHRINK GROUT
 CORP OF ENGINEERS GRD-C-621
 ASTM C1107 GRADE A-PREHARDENING VOLUME ADJUSTING
 USE FOR ALL REPAIR WORK

SIZE VARIES FOR CONCRETE RINGS (MATCH STRUCTURE OPENING SIZE)

CONCRETE RING, AIR ENTRAINMENT (5 1/2 - 9%)

ADJUSTING MATERIALS

DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P300
REVISIONS	3-97 3-02



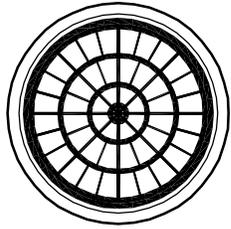
CITY OF MAPLEWOOD-ENGINEERING DEPT.

FRAME PLACEMENT DETAILS

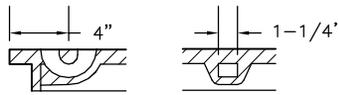
PLATE NO.

300

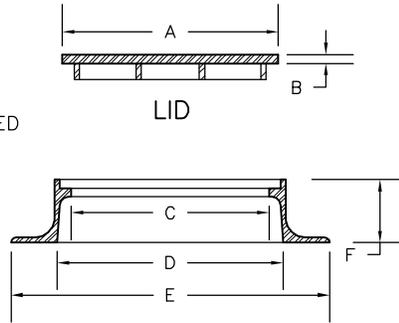
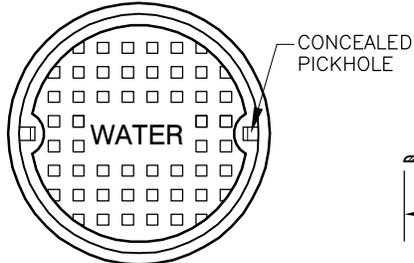
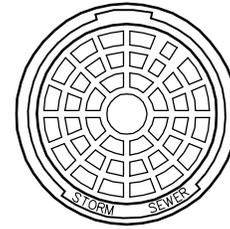
RADIAL GRATE



CONCEALED PICKHOLE

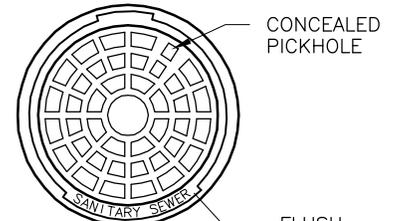


STORM SEWER LID



WATER LID

FRAME



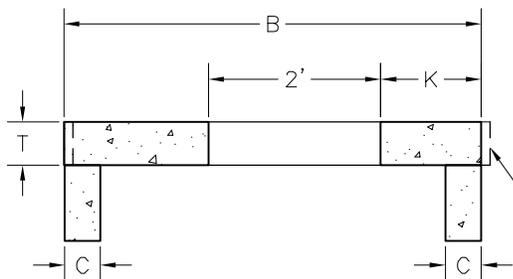
SANITARY LID

- ① FRAME MUST BE RAISED TO 1/2" BELOW FINISHED SURFACE PRIOR TO PAVING. MAINTAIN TOLERANCE WITH 1/2" PLYWOOD ROUND DURING ROLLING OPERATIONS.
- ② LABEL "SANITARY", "WATER", OR "STORM" AS REQUIRED. ALL LIDS SHALL HAVE CONCEALED PICKHOLES.
- ③ STORM LIDS SHALL BE TYPE C RADIAL GRATES AT LOW POINTS OR AS DIRECTED BY THE ENGINEER.
- ④ SEE MAPLEWOOD STANDARD PLATE #307 FOR SURFACE DRAIN CASTING

	NEENAH		MCI		EAST JORDAN	
SAN. SEWER	FRAME WT: 238#	LID WT: 140#	FRAME WT: 230#	LID WT: 135#	FRAME WT: 345#	LID WT: 150#
	R-1678-A	R-1422-0015	314	314SN	1675Z	1450A1
	"SAN. SEWER"	"SAN. SEWER"	"SAN. SEWER"	"SAN. SEWER"	"SAN. SEWER"	"SAN. SEWER"
	A = 23 3/4"	B = 1"	A = 23 3/4"	B = 1"	A = 23 3/4"	B = 1"
	C = 21 3/4"	D = N/A	C = 21 3/4"	D = 26"	C = 21 13/16"	D = 25 1/16"
E = 35"	F = 7"	E = 36"	F = 8"	E = 35"	F = 7"	
WATER	FRAME WT: 154#	LID WT: 166#	FRAME WT: 208#	LID WT: 172#	FRAME WT: 180#	LID WT: 150#
	R-1642	R-1642	309	309W	1045Z	1040A
	"WATER"	"WATER"	"WATER"	"WATER"	"WATER"	"WATER"
	A = 26"	B = 1 1/2"	A = 26 1/4"	B = 1 1/2"	A = 26"	B = 1 1/2"
	C = 24"	D = N/A	C = 24 1/8"	D = 26 1/2"	C = 24"	D = 28 7/16"
E = 35 7/8"	F = 7"	E = 36"	F = 7"	E = 36"	F = 7"	
STORM SEWER	FRAME WT: 238#	LID WT: 140#	FRAME WT: 230#	LID WT: 135#	FRAME WT: 180#	LID WT: 125#
	R-1678-A	R-1422-0016	314	314ST	1775Z	1450A1
	"STORM SEWER"	"STORM SEWER"	"STORM SEWER"	"STORM SEWER"	"STORM SEWER"	"STORM SEWER"
	A = 23 3/4"	B = 1"	A = 23 3/4"	B = 1"	A = 23 3/4"	B = 1"
	C = 21 3/4"	D = N/A	C = 21 3/4"	D = 26"	C = 21 3/16"	D = 25 1/16"
E = 35"	F = 7"	E = 36"	F = 8"	E = 35"	F = 7"	
RADIAL-SURFACE	FRAME WT: 238#	LID WT: 103#	FRAME WT: 230#	LID WT: 110#	FRAME WT: 180#	LID WT: 124#
	R-1678-A	R-2422-0009	314	314R	1775Z	TYPE 1450M
	TYPE C GRATE	TYPE C GRATE	TYPE C GRATE	TYPE C GRATE	(RADIAL FLAT GRATE)	
	A = 23 3/4"	B = 1"	A = 23 3/4"	B = 1"	A = 23 3/4"	B = 1"
	C = 21 3/4"	D = N/A	C = 21 3/4"	D = 26"	C = 21 3/16"	D = 25 1/16"
E = 35"	F = 7"	E = 36"	F = 8"	E = 35"	F = 7"	

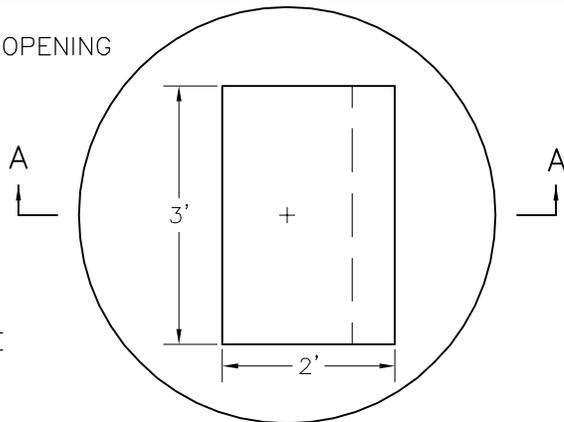
DESIGN: CMC	DATE: 3-95	 <p>CITY OF MAPLEWOOD-ENGINEERING DEPT.</p> <p>MANHOLE FRAME AND LID DETAILS</p>	PLATE NO.
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P301		<p>301</p>
REVISIONS	3/05 3/07		

HS 20 ROADWAY LOADING CATCH BASIN TOP SLAB
 PRECAST REINFORCED CONCRETE WITH RECTANGULAR OPENING



SECTION A-A

TOP SLAB
 MAX. 0.1'
 OFFSET TO
 ALIGN HOLE
 WITH CURB



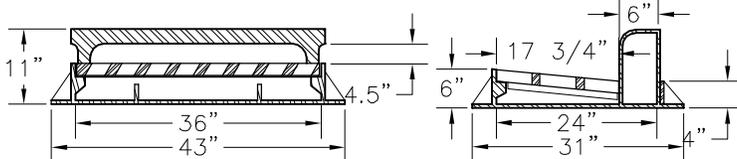
PLAN OF TOP SLAB

STRUCTURE REQUIREMENTS						
STORM PIPE LEAD DIA.	D	B	C	E	T	K
12"-18"	48"	58"	5"	6"	6"	*
21"-27"	60"	72"	6"	8"	8"	*
30"-36"	72"	86"	7"	8"	8"	*

TOP SLAB TO REST ON BED OF MASTIC,
 ON FULL THICKNESS OF STRUCTURE WALLS-
 NOT TO REST ON PIPE TONGUE OR GROOVE

* K VARIES WITH SUPPLIER AND SIZE
 STRUCTURE C LOCATION AS SHOWN
 IN THE STRUCTURE SCHEDULE IS
 BASED ON A 'K' DIMENSION OF 14"

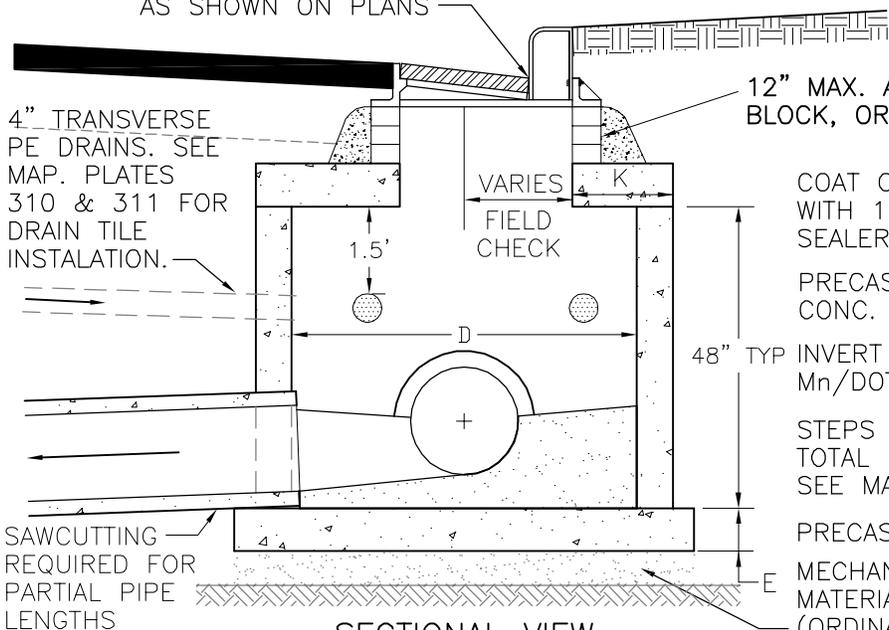
SEE MAPLEWOOD PLATES 112, 300,
 304, 305, & 309 FOR FRAME
 PLACEMENT DETAILS



CATCH BASIN	NEENAH	MCI	EAST JORDAN
FRAME	R-3067	R-3067	7030
GRATE	R-3067-V	R-3067-V	M4

FRAME & GRATE LOCATED IN DRIVEWAYS AS DIRECTED USE NEENAH R-3290-A

RIM ELEVATION
 AS SHOWN ON PLANS



SECTIONAL VIEW

12" MAX. ADJUSTMENT- SEWER BRICK,
 BLOCK, OR UNDAMAGED CONCRETE RINGS

COAT CUT ENDS OF RCP & REBAR
 WITH 100% SOLIDS, TWO PART EPOXY
 SEALER (SIKA GUARD 6Z OR EQUAL)

PRECAST REINFORCED
 CONC. BARREL STRUCTURE

48" TYP INVERT FILLET CAST IN PLACE
 Mn/DOT TYPE 2461 3B42 CONCRETE

STEPS REQUIRED @ STD. 16" O.C. WHEN
 TOTAL DEPTH EXCEEDS FIVE FEET
 SEE MAPLEWOOD PLATE 303

PRECAST REINFORCED CONCRETE BASE
 MECHANICALLY COMPACT 4" GRANULAR
 MATERIAL FOR LEVELING (Mn/DOT 3149.21
 (ORDINARY COMPACTION)

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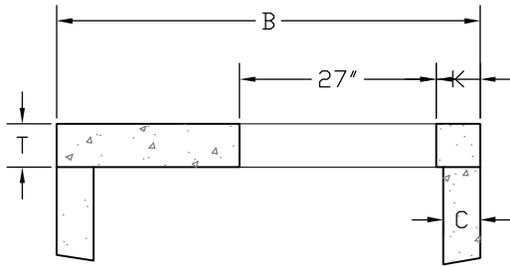
CITY OF MAPLEWOOD-ENGINEERING DEPT.

STANDARD CATCH BASIN

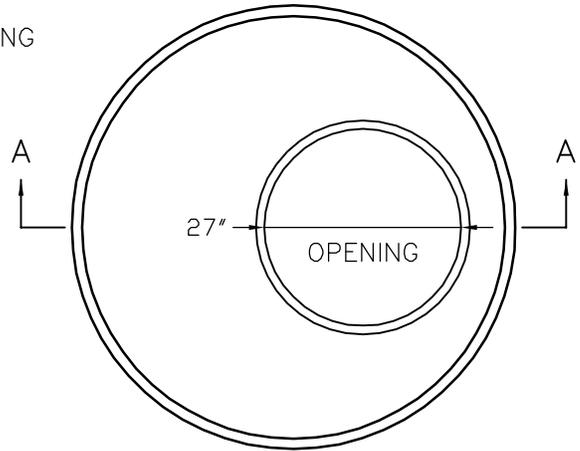
PLATE
 NO.

302

NOTE:
 HS 20 ROADWAY LOADING MANHOLE TOP SLAB OF
 PRECAST REINFORCED CONCRETE WITH ROUND OPENING

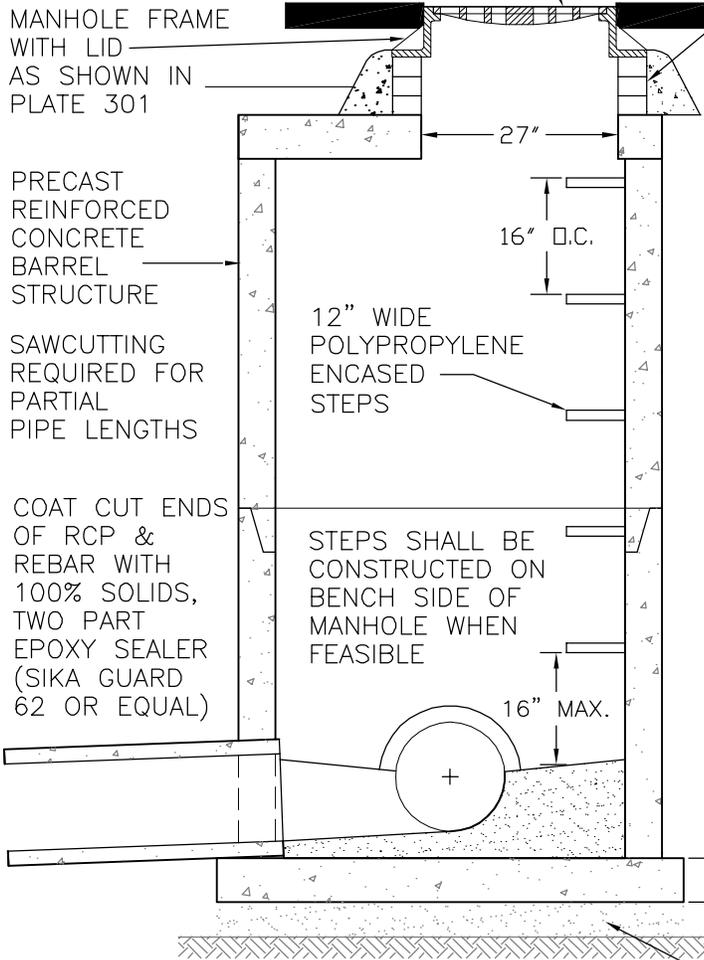


SECTION A-A



PLAN OF TOP SLAB

SET RIM 1/4" - 1/2" BELOW
 FINISHED SURFACE



SEE MAPLEWOOD PLATE 300 FOR FRAME
 PLACEMENT DETAILS. UNDAMAGED
 CONCRETE RINGS ARE AN ACCEPTABLE
 ALTERNATIVE TO SEWER BRICK.

TOP SLAB TO REST ON BED OF MASTIC
 (Mn/DOT 3728) ON FULL THICKNESS OF
 STRUCTURE WALLS - NOT TO REST ON
 PIPE TONGUE OR GROOVE

STRUCTURE REQUIREMENTS						
STORM PIPE LEAD DIA.	D	B	C	E	T	K
12"-18"	48"	58"	5"	6"	6"	6"
21"-27"	60"	72"	6"	8"	8"	7"
30"-36"	72"	86"	7"	8"	8"	8"

$B = D + 2C$

INVERT FILLET CAST IN PLACE
 Mn/DOT 2461 TYPE 3B42 CONCRETE
 OR CERTIFIED READY-MIX AIR-
 ENTRAINED MORTAR. (MW 2506.2B)

SECTIONAL VIEW

PRECAST REINFORCED CONCRETE BASE
 MECHANICALLY COMPACT 4" GRANULAR
 MATERIAL FOR LEVELING (Mn/DOT 3149.2F)
 (ORDINARY COMPACTION)

DESIGN: CMC	DATE: 3-95		
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P303		
REVISIONS	3-97	3-02	3-04
3-06			



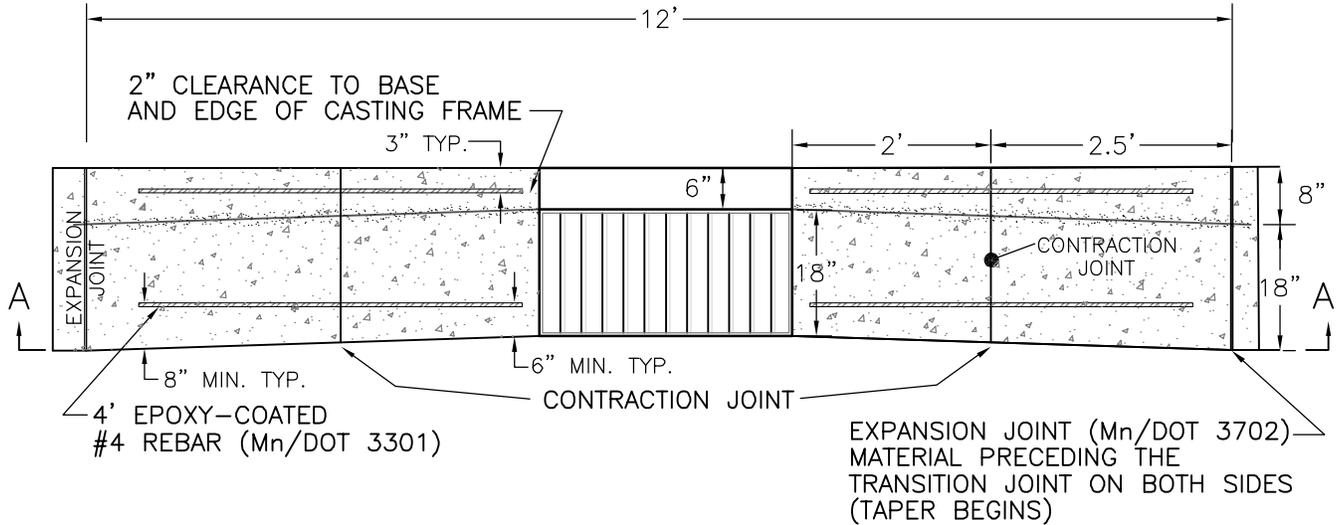
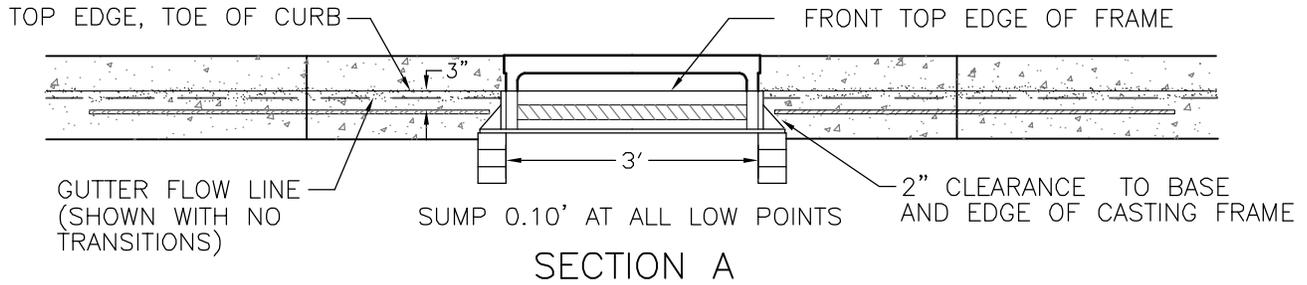
CITY OF MAPLEWOOD-ENGINEERING DEPT.

STORM SEWER MANHOLE

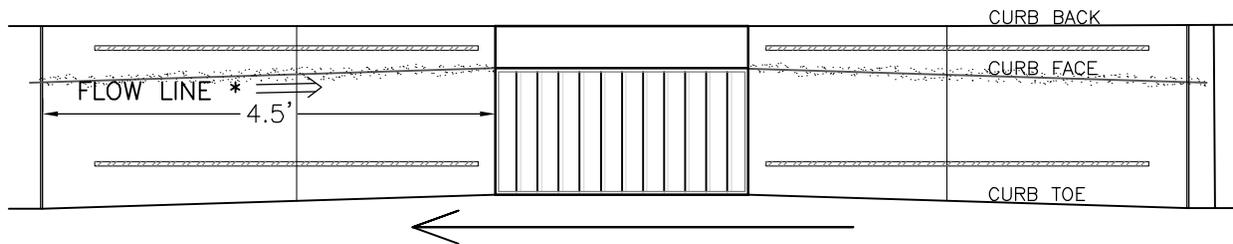
PLATE
 NO.

303

NOTE: SEE MAPLEWOOD MW-2531 FOR TWO PIECE DOWEL ASSEMBLY



PLAN VIEW B-618 CONC. CURB & GUTTER



SEE MAPLEWOOD PLATE 302 FOR FRAME GRATE & CURB BOX.
 SEE PLATE 300 FOR FRAME PLACEMENT DETAILS.
 SEE PLATE 112 FOR PLACEMENT AT INTERSECTION RADIUS RETURNS.

** SET FRAME TO MATCH STREET GRADE PROFILE.

* TRANSITION DOWNSTREAM FLOW LINE (4.5')
 TOWARDS THE CATCH BASIN FOR ALL
 STREET PROFILES LESS THAN 2%.

** SUMP CASTING 0.10' AT ALL LOW POINTS.

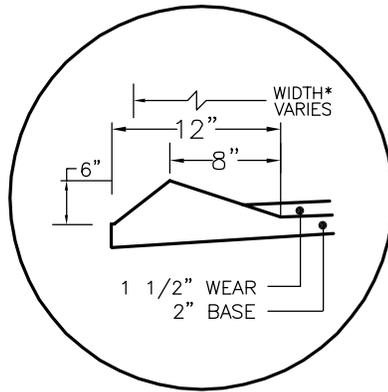
DESIGN: CMC	DATE: 3-95		
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REVISIONS	7-96	3-97	3-99
3-02	3-04	3-06	1-07



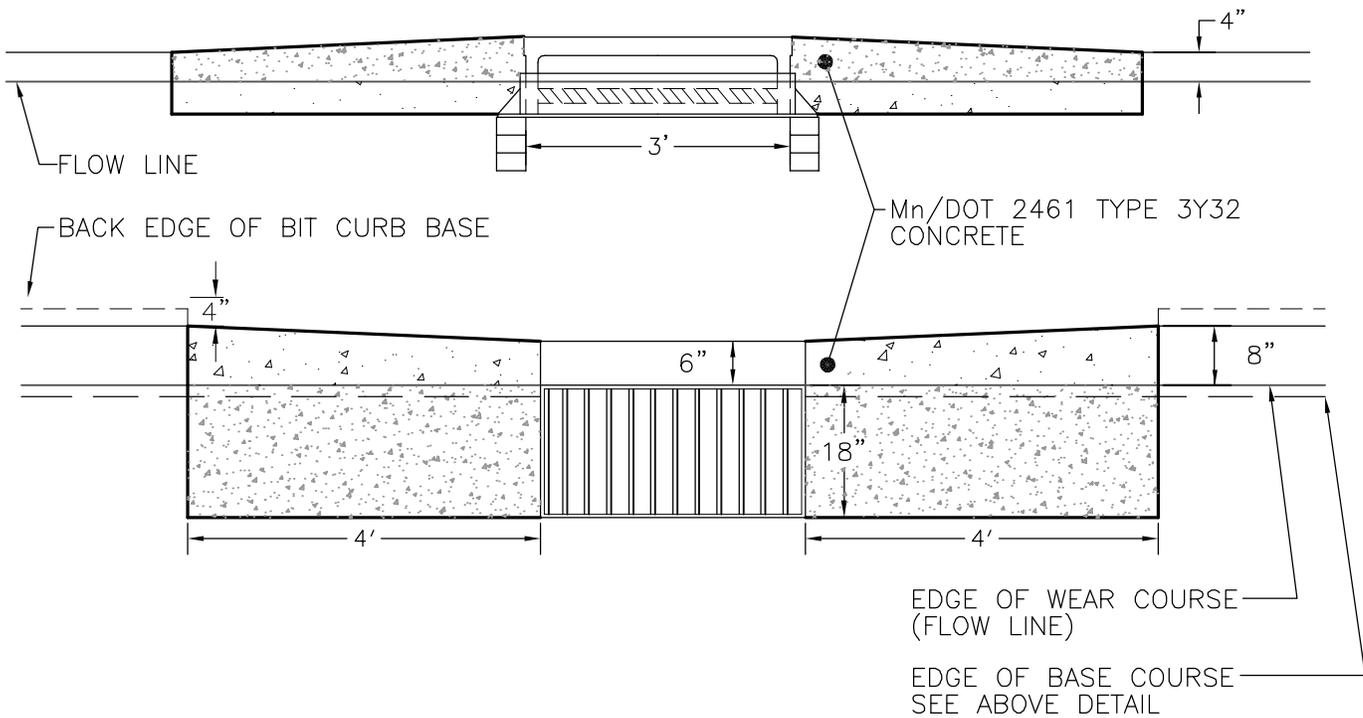
CITY OF MAPLEWOOD-ENGINEERING DEPT.
CB FRAME-CURB TRANSITION
B618 C & G

PLATE NO.

304



DETAIL OF INTEGRAL BIT. CURB



SEE MAPLEWOOD PLATE 302 FOR FRAME GRATE & CURB BOX.
 SEE PLATE 300 FOR FRAME PLACEMENT DETAILS.
 SEE PLATE 112 FOR PLACEMENT AT INTERSECTION RADIUS RETURNS.
 SEE PLATE 304 FOR SETTING FRAME TO MATCH STREET GRADE PROFILE.

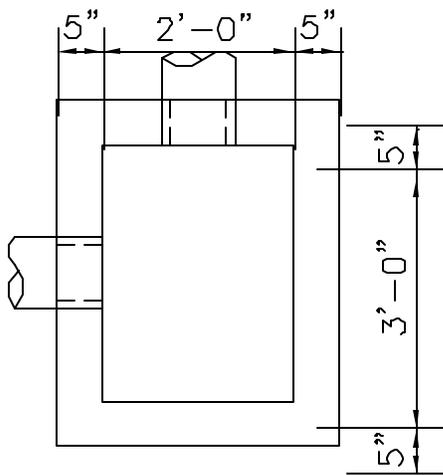
CONCRETE EXTENSIONS TO SUPPORT HOOD ARE INCIDENTAL TO CATCH BASIN CONSTRUCTION.

DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME:P:/WORKS/CAD/PLATES/P305
REVISIONS	3-02

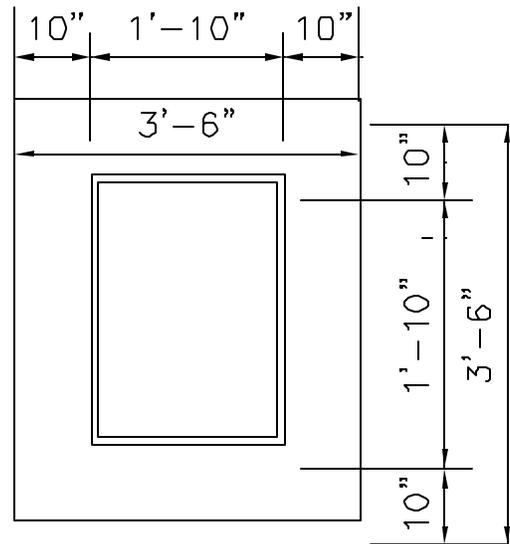


CITY OF MAPLEWOOD—ENGINEERING DEPT.
**CB FRAME—HOOD EXTENSIONS
 FOR INTEGRAL BIT. CURB**

PLATE
 NO.
305



CATCH BASIN
PLAN

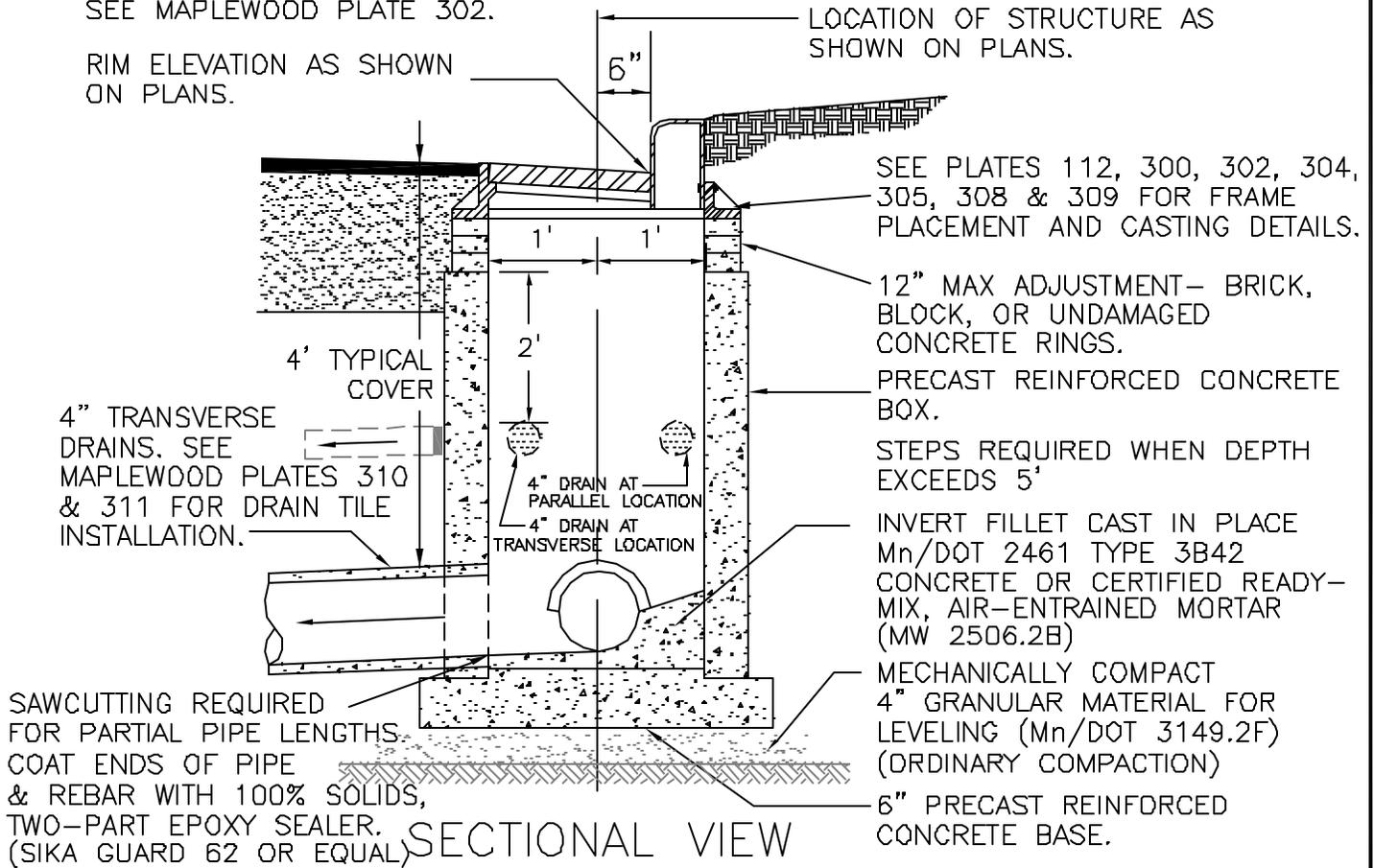


BASE SLAB
PLAN

FRAME, GRATE & CURB BOX
NEENAH OR MCI R-3067-V,
EAST JORDAN 7030-M4.
SEE MAPLEWOOD PLATE 302.

RIM ELEVATION AS SHOWN
ON PLANS.

HORIZONTAL TOLERANCE = 0.1"
LOCATION OF STRUCTURE AS
SHOWN ON PLANS.



DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME: P:\WORKS/CAD/PLATES/P306
REVISIONS	3/02



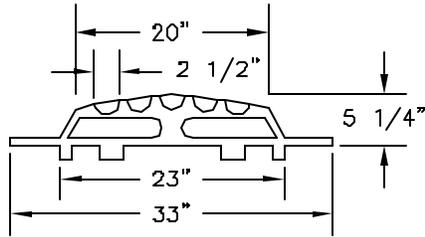
CITY OF MAPLEWOOD-ENGINEERING DEPT.

2' x 3' BOX
CATCH BASIN

PLATE
NO.

306

	NEENAH	MCI	EAST JORDAN
STOOL TYPE	FRAME ONLY WT: 205#	FRAME ONLY WT: 170#	FRAME ONLY WT: 205#
	R-4342	503	6489

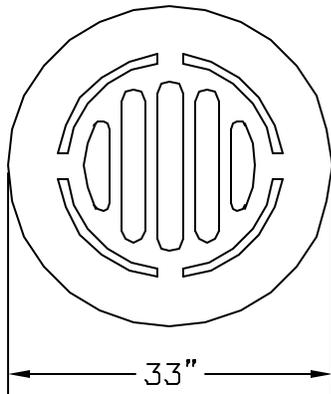


STOOL TYPE DITCH GRATE
IN NON-MAINTAINED DITCHES
OR AS DIRECTED BY THE ENGINEER

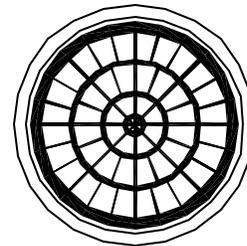
RADIAL - SEE MAPLEWOOD
PLATE 301 FOR RADIAL FRAME
AND LID DETAILS

STORM LIDS SHALL BE TYPE C
RADIAL GRATES AT LOW POINTS
FOR PAVED OR SODDED AREAS OR
AS DIRECTED BY THE ENGINEER

STOOL TYPE



RADIAL GRATE



SEE MAPLEWOOD PLATE 300 FOR
FRAME PLACEMENT DETAILS.

UNDAMAGED CONCRETE RINGS
ARE AN ACCEPTABLE ALTERNATIVE
TO SEWER BRICK

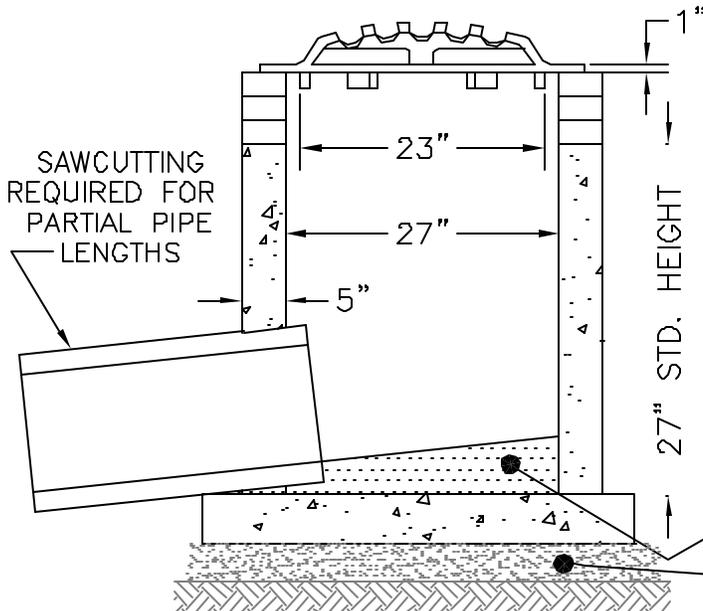
PRECAST REINFORCED
CONCRETE BARREL STRUCTURE

COAT CUT ENDS OF RCP & REBAR
WITH 100% SOLIDS, TWO PART EPOXY
SEALER (SIKA GUARD 62 OR EQUAL)

PRECAST REINFORCED CONCRETE BASE
40" DIA. x 5"

INVERT FILLET CAST IN PLACE
Mn/DOT TYPE 3B42 CONCRETE
OR CERTIFIED READY-MIX, AIR-
ENTRANED MORTAR (MW 2506.2B)

MECHANICALLY COMPACT
4" GRANULAR MATERIAL FOR
LEVELING (Mn/DOT 3149.2F)
(ORDINARY COMPACTION)



DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME: P:\WORKS/ CAD\PLATES\P307
REVISIONS	3-02

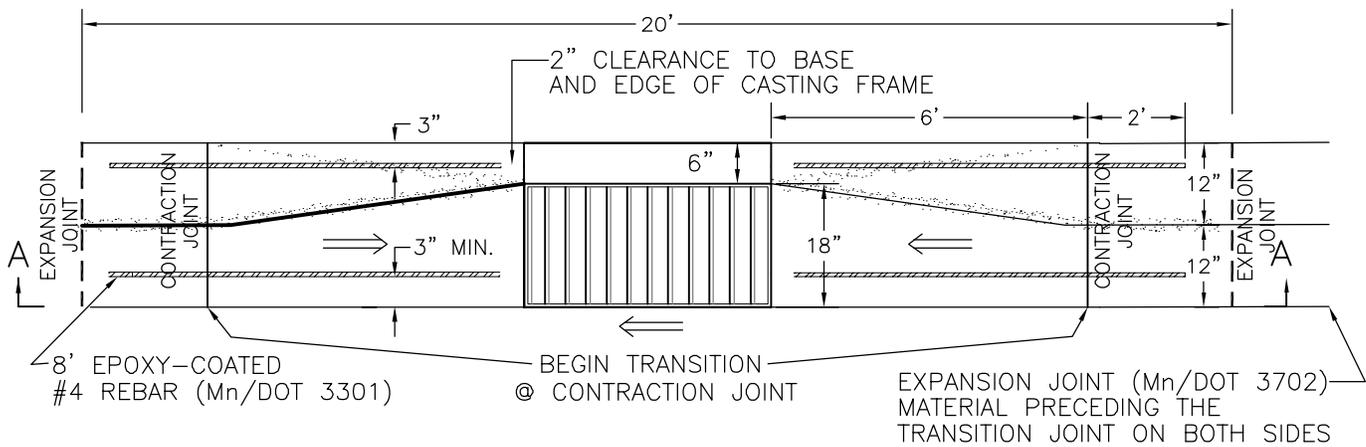
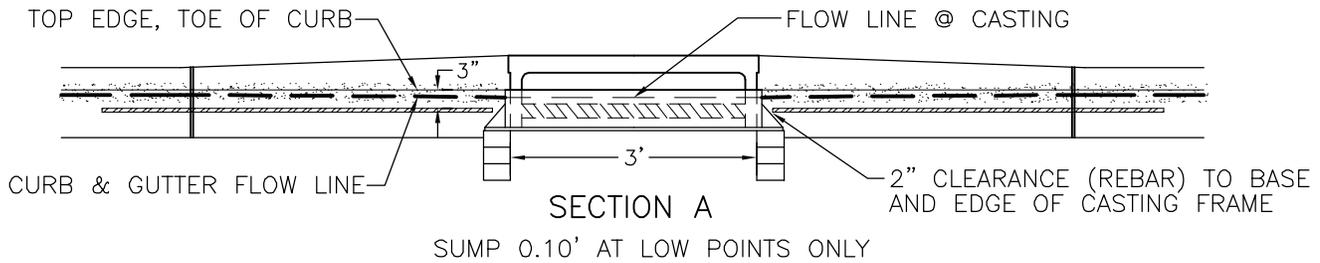


CITY OF MAPLEWOOD-ENGINEERING DEPT.

SURFACE DRAIN

PLATE
NO.

307



PLAN VIEW D-412 CONC. CURB & GUTTER

←← IF PROFILE GRADE < 2%

TRANSITION DOWNSTREAM FLOW LINE (5') (SEE MAPLEWOOD PLATE 304)
TOWARDS CB'S WITH DESIGN STREET
PROFILES LESS THAN 2%.

@ LOW PTS. SUMP CASTING 0.10'

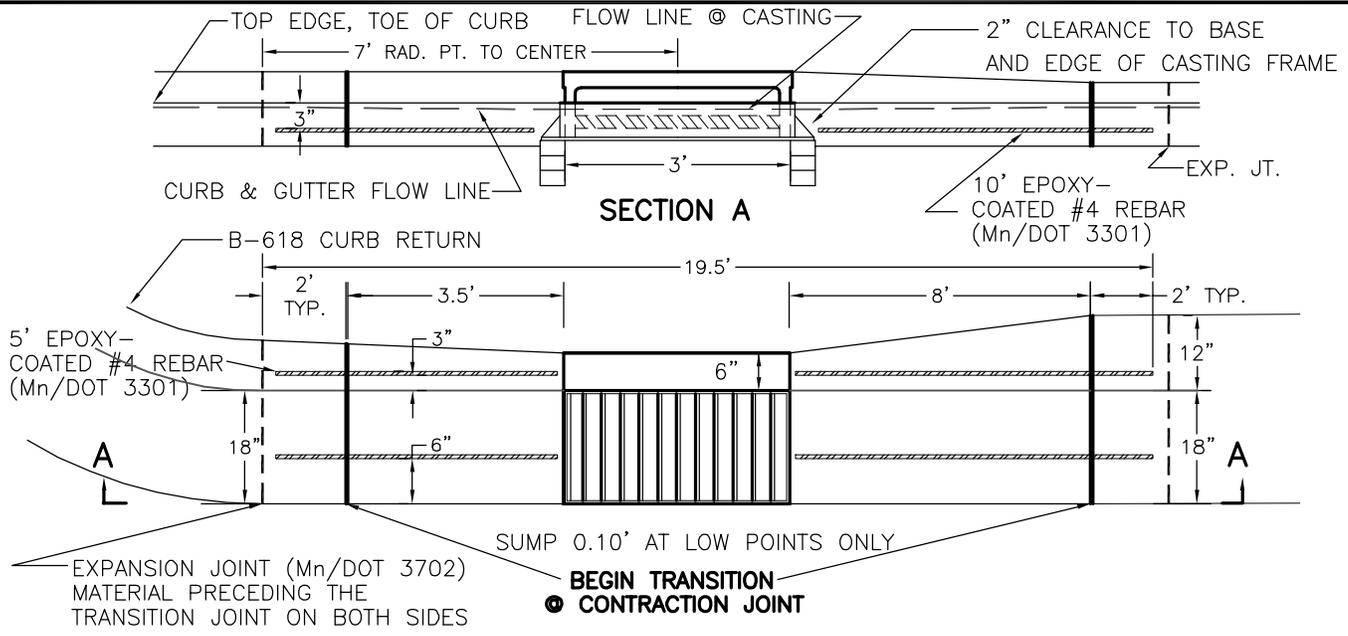
SEE MAPLEWOOD PLATE 302 FOR FRAME GRATE & CURB BOX.
SEE PLATE 300 FOR FRAME PLACEMENT DETAILS.
SEE PLATE 112 FOR PLACEMENT AT INTERSECTION RADIUS RETURNS.
SET FRAME TO MATCH STREET GRADE PROFILE.

DESIGN: CMC	DATE: 3/14/97
DRAWN: RKL	FILENAME: P:/WORKS/CAD/PLATES/P308
REVISIONS	3-02

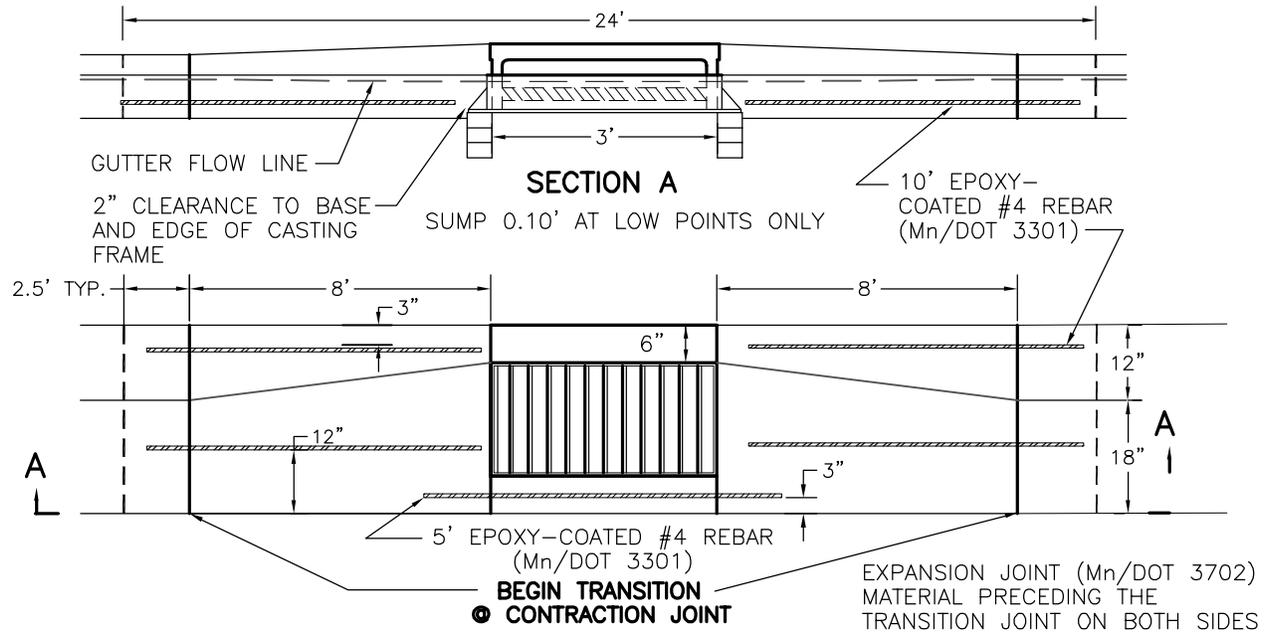


CITY OF MAPLEWOOD—ENGINEERING DEPT.
CB FRAME—CURB TRANSITION
FOR MODIFIED S C & G

PLATE NO.
308
0336



NOTE: SEE MAPLEWOOD SP-2531 FOR TWO PIECE DOWEL ASSEMBLY



SEE PLATE 302 FOR FRAME GRATE & CURB BOX.
 SEE PLATE 300 FOR FRAME PLACEMENT DETAILS.
 SEE PLATE 112 FOR PLACEMENT AT INTERSECTION RADIUS RETURNS.
 SET PLATE 304 TO ADJUST FOR STREET GRADE PROFILE.

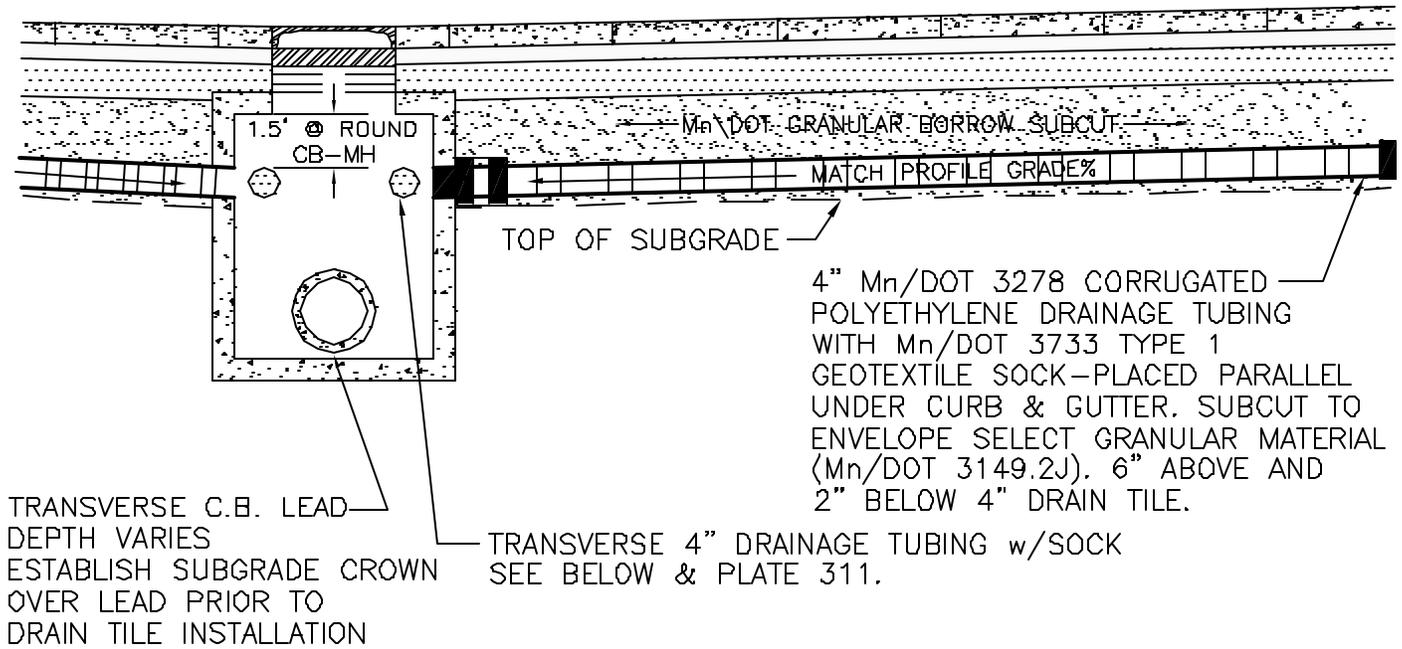
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DRAWN: RKL	FILENAME:P:/WORKS/CAD/PLATES/P309
REVISIONS	3-02 3-04



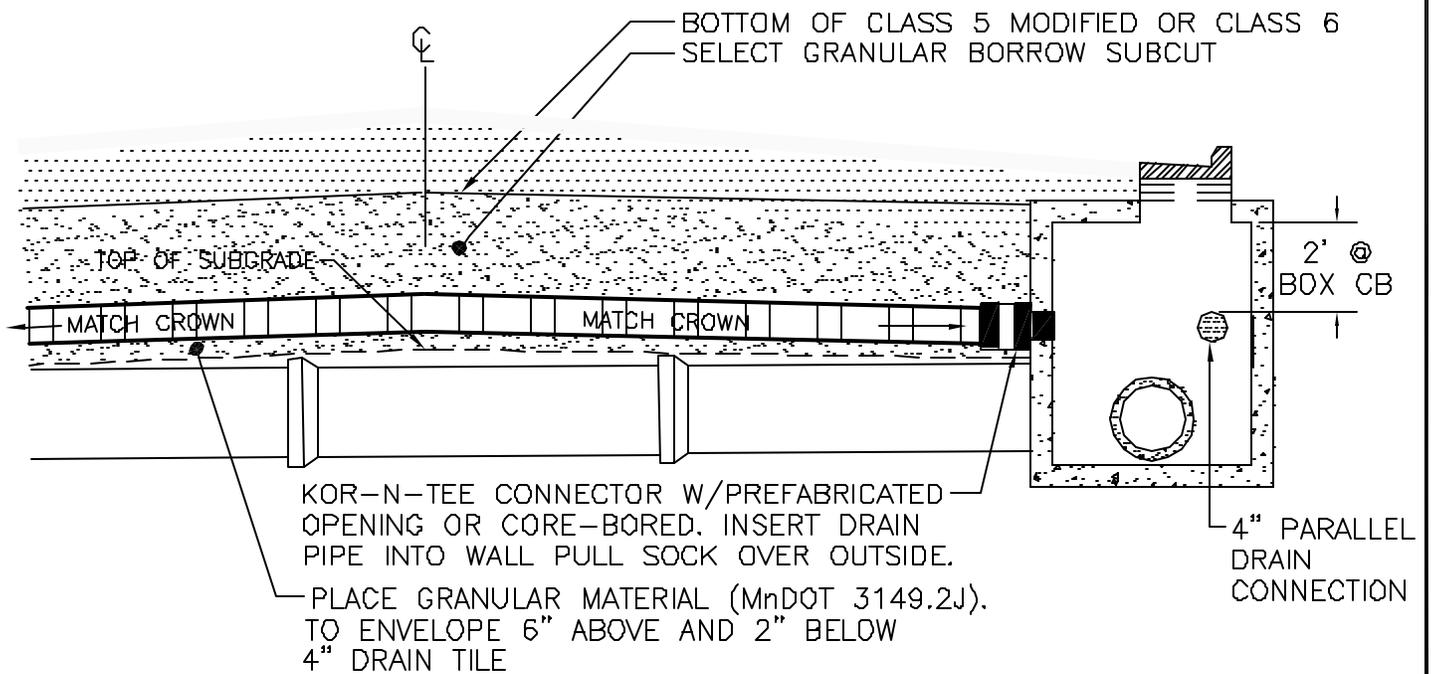
CITY OF MAPLEWOOD-ENGINEERING DEPT.
**CB FRAME-CURB TRANSITION
 FOR D418 CURB & GUTTER**

PLATE NO.
309

PROFILE OF 4" DRAIN TILE UNDER CURB & GUTTER



PROFILE OF TRANSVERSE 4" DRAIN TILE
SEE PLATE 311



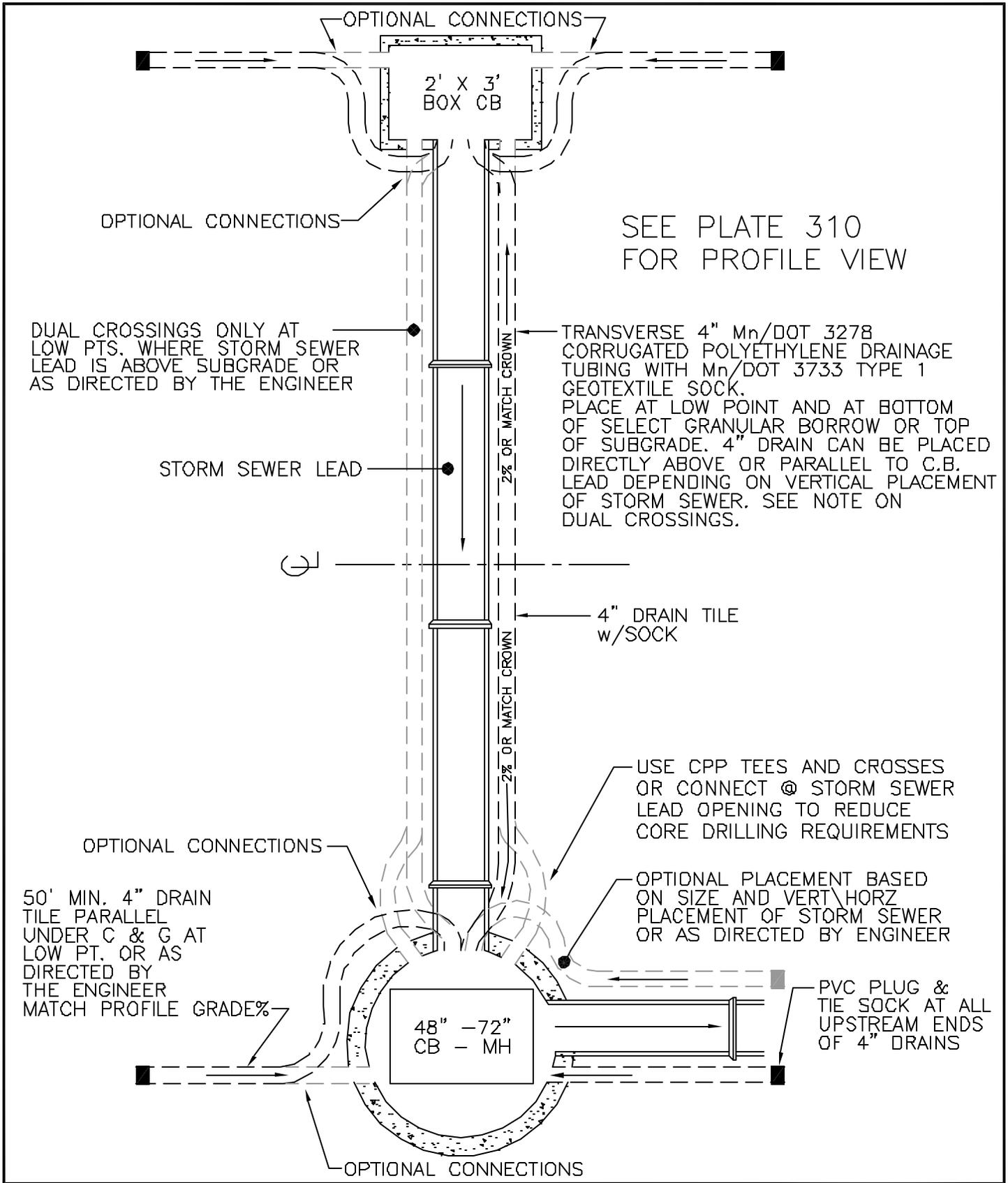
DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P310
REVISIONS	3/02



CITY OF MAPLEWOOD—ENGINEERING DEPT.
DRAIN TILE INSTALLATION
PROFILE

PLATE NO.

310



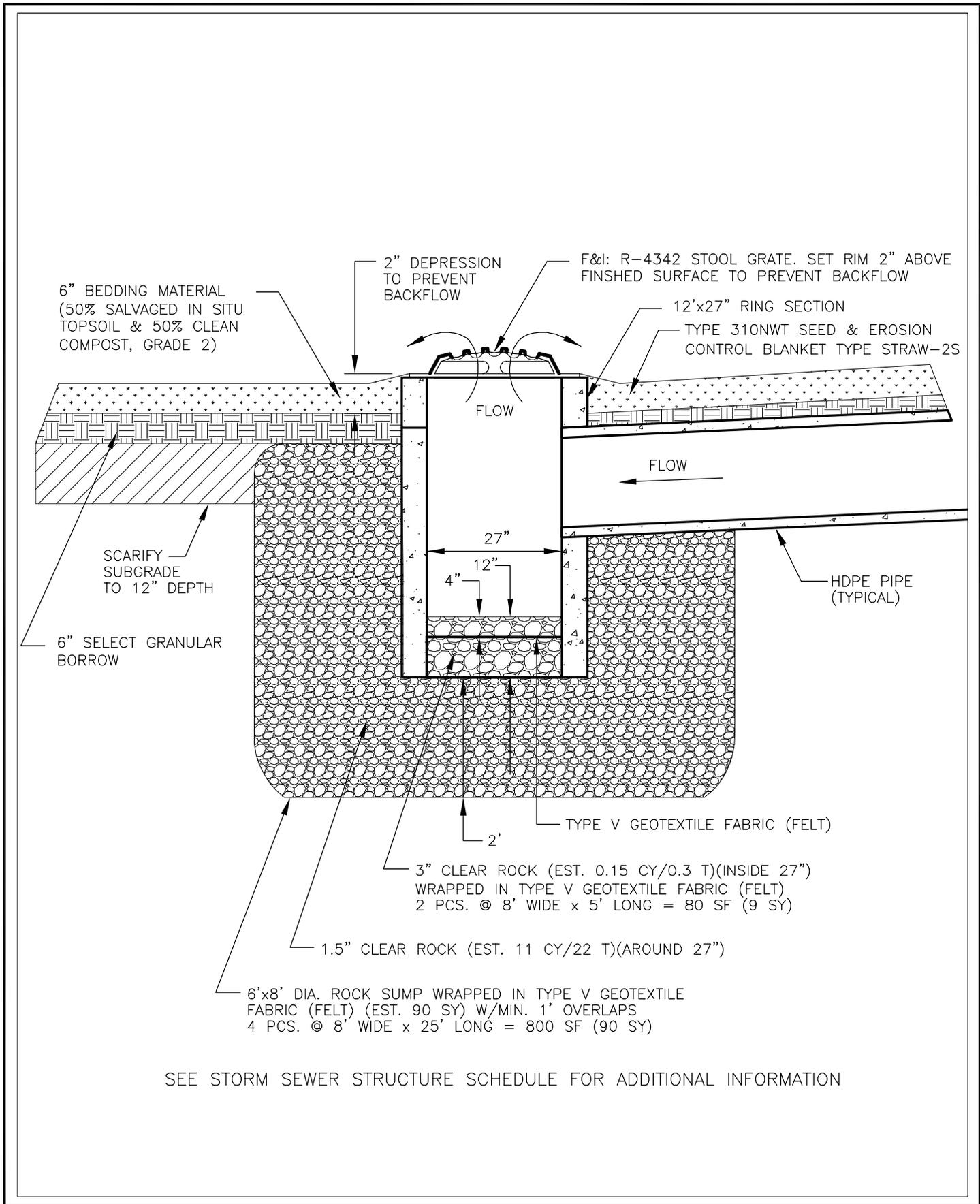
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DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P310
REVISIONS	12-95 3-02



CITY OF MAPLEWOOD-ENGINEERING DEPT.
 DRAIN TILE INSTALLATION
 PLAN VIEW

PLATE NO.

311



DESIGN: RAM	DATE: 5/3/96
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P313
REVISIONS	3-04



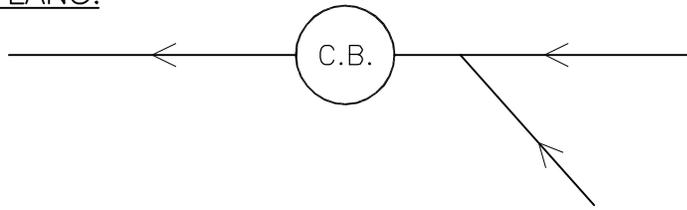
CITY OF MAPLEWOOD—ENGINEERING DEPT.

INFILTRATION OUTLET DETAIL

PLATE NO.

313

AS SHOWN ON PLANS:

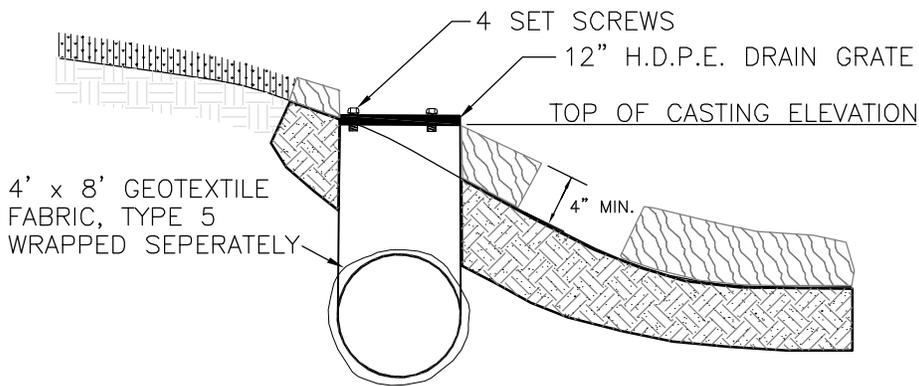
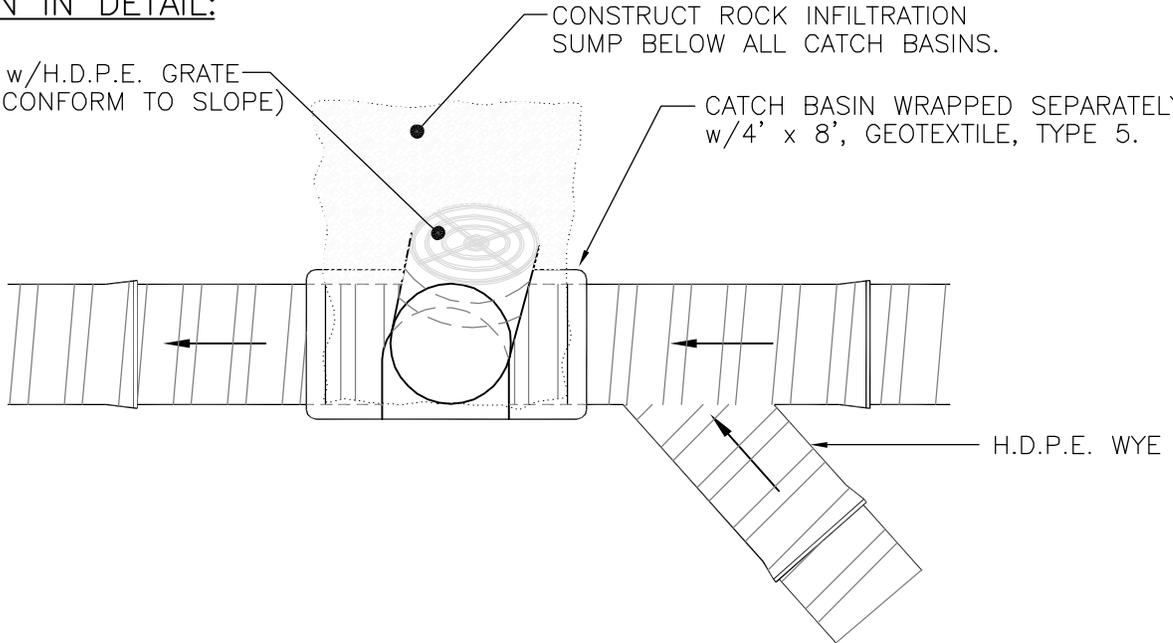


AS SHOWN IN DETAIL:

OR PVC TEE w/H.D.P.E. GRATE
FABRIC (TWIST TO CONFORM TO SLOPE)

CONSTRUCT ROCK INFILTRATION
SUMP BELOW ALL CATCH BASINS.

CATCH BASIN WRAPPED SEPARATELY
w/4' x 8', GEOTEXTILE, TYPE 5.



H.D.P.E. OR PVC TEE OR BEND

*UTILIZE ANY COMBINATION OF FIELD ASSEMBLED FITTINGS OR PREFABRICATED CATCH BASINS TO ACHIEVE THE REQUIRED INLETS AND ALIGNMENTS.

*ALL FITTINGS SHOULD BE PLACED SO THEY MAY BE INSPECTED VIA THE DRAIN GRATE OPENING.

DESIGN: CMC	DATE: 5-96
DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P317-0336
REVISIONS	9-04



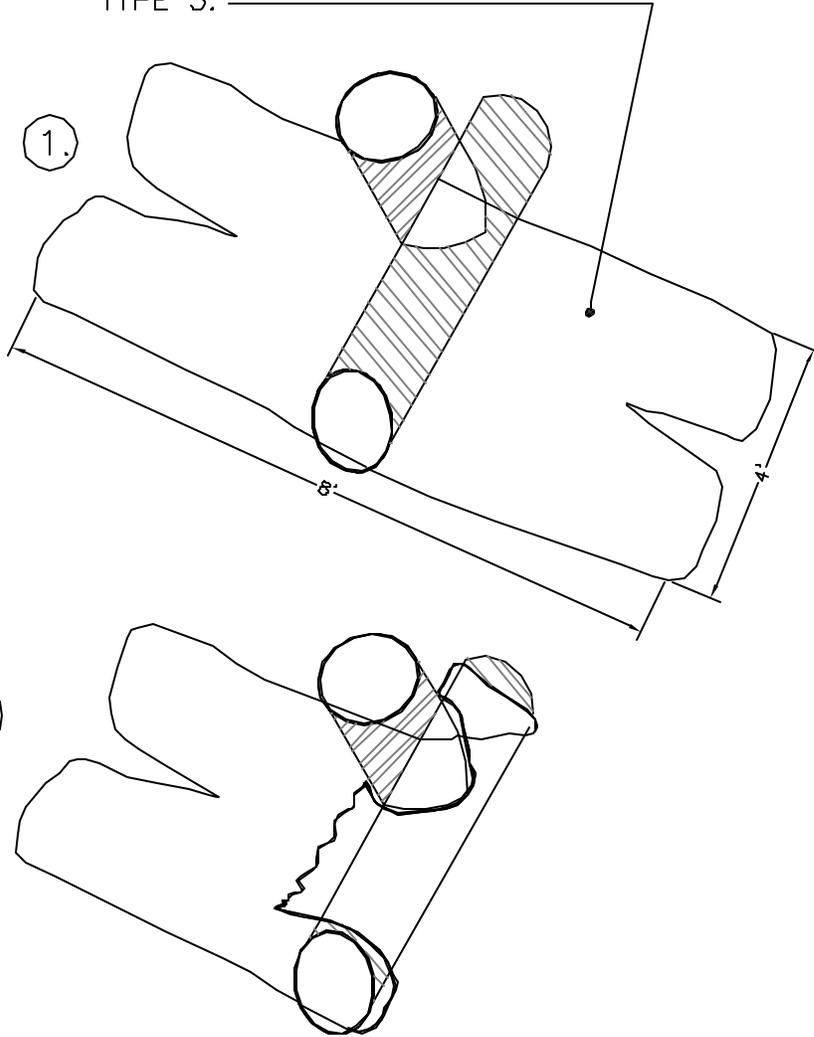
CITY OF MAPLEWOOD-ENGINEERING DEPT.

**SURFACE DRAIN
H.D.P.E. OR PVC**

PLATE
NO.

317
0336

WRAP CATCH BASIN WITH 4' x 8'
 GEOTEXTILE FABRIC,
 TYPE 5.

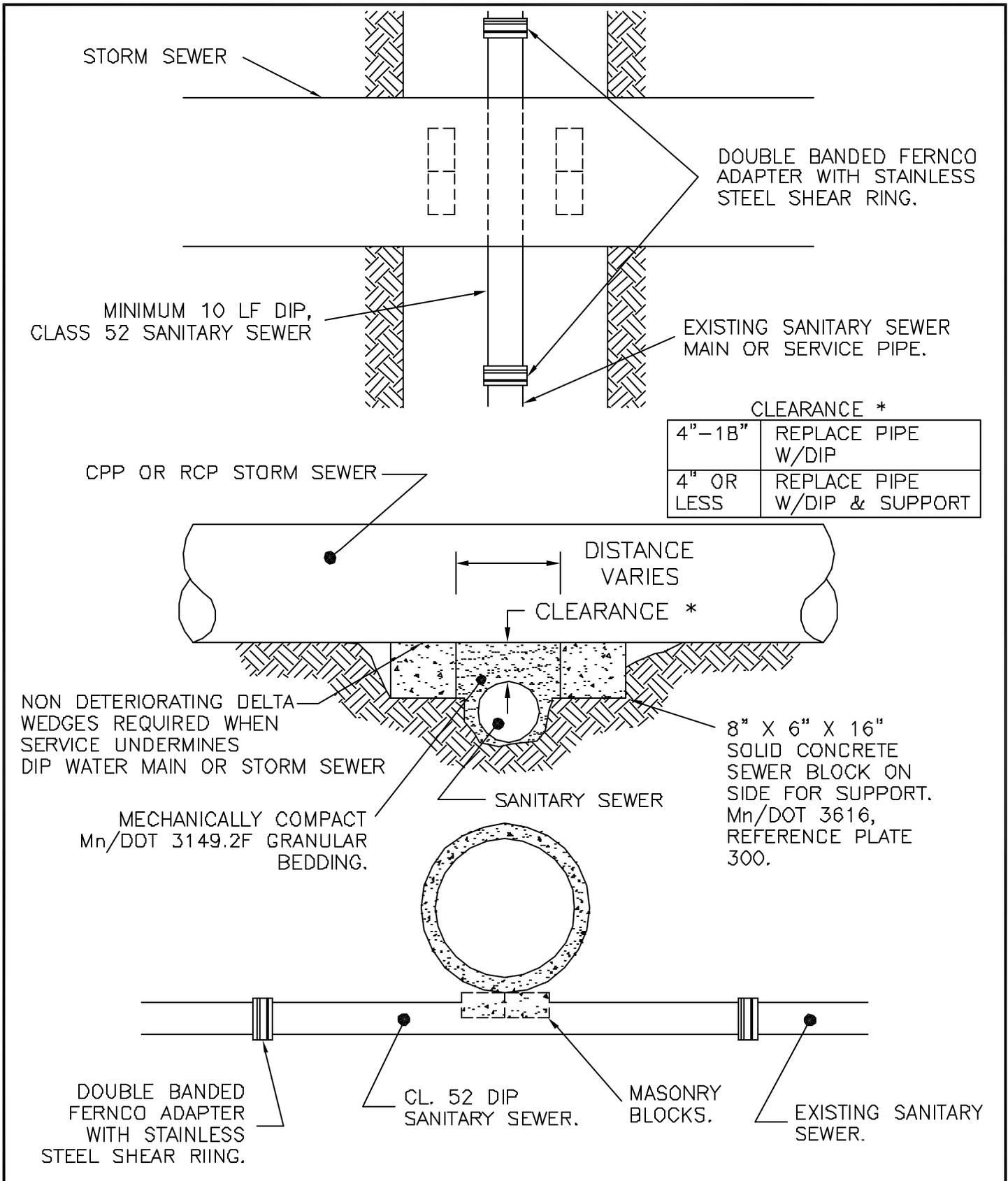


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REVISIONS	3-02		

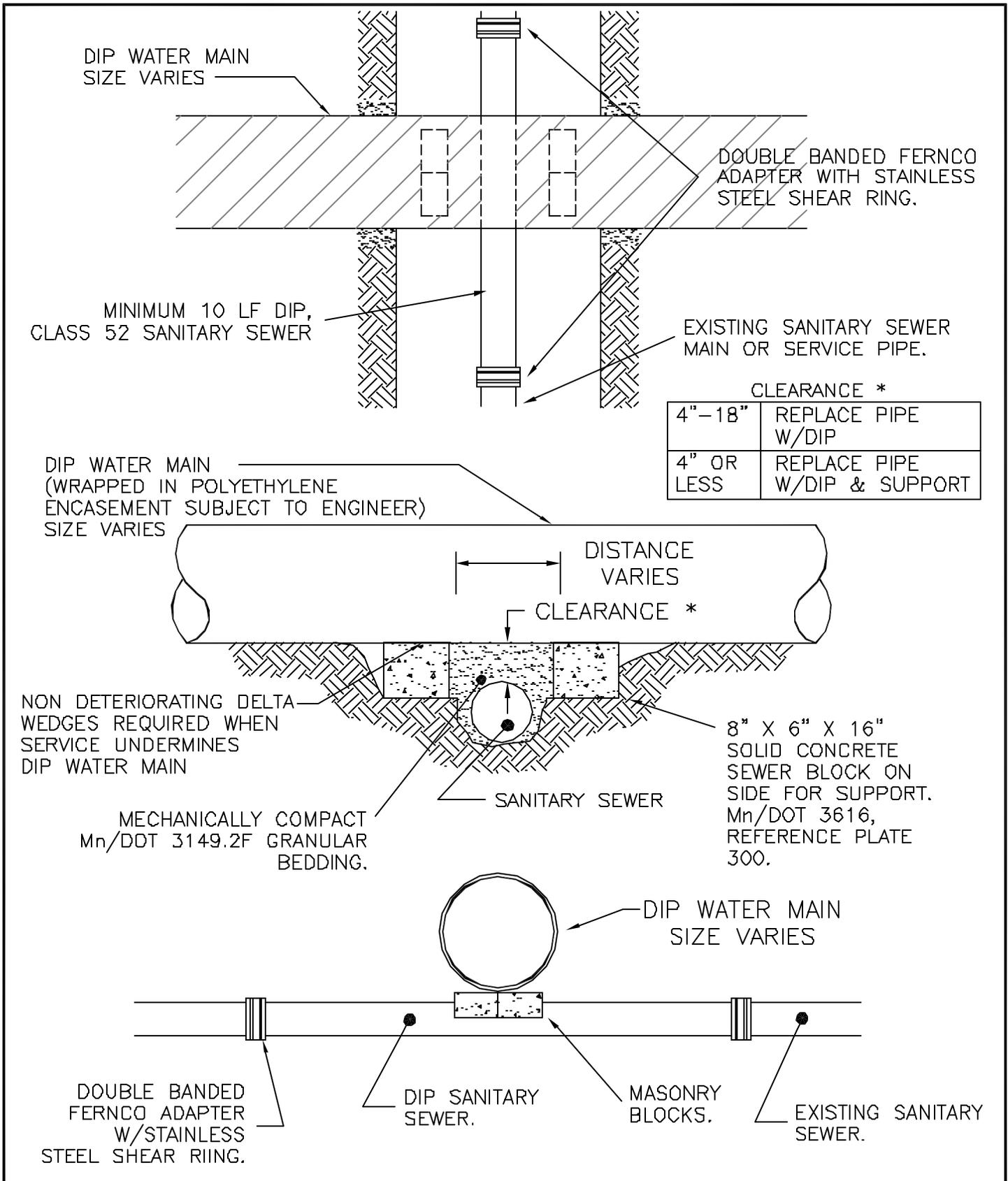


CITY OF MAPLEWOOD-ENGINEERING DEPT.
 GEOTEXTILE WRAP FOR
 H.D.P.E. SURFACE DRAIN

PLATE
 NO.
 317A



DESIGN: CMC	DATE: 3-95		CITY OF MAPLEWOOD-ENGINEERING DEPT. STORM SEWER SUPPORT AT SANITARY SEWER CROSSING	PLATE NO.
DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P320			
REVISIONS	1-02			

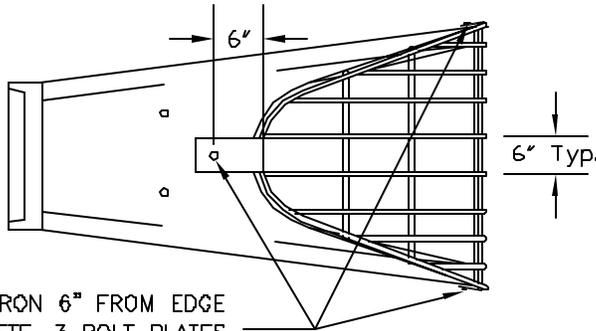


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REVISIONS	3-02

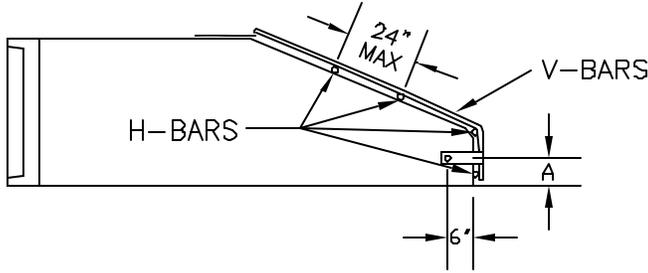


CITY OF MAPLEWOOD-ENGINEERING DEPT.
DIP WATER MAIN SUPPORT AT
SANITARY SEWER CROSSING

PLATE NO.
321



BOLT TO APRON 6" FROM EDGE
OF CONCRETE, 3 BOLT PLATES
REQ'D 1/4"X 4"X 10"



NOTES

1. BARS & PLATES ARE HOT-ROLLED STEEL.
2. BARS, PLATES, & PIPE ARE FINISHED WITH 2 COATS OF ALUMINUM PAINT.
3. BOLTS ARE GALVANIZED.
4. SEE Mn/DOT PLATES 3100 & 3110 FOR APRON DIMENSIONS.
5. WRAP LAST 2 SECTIONS W/TYPE V GEOTEXTILE NON WOVEN FILTER FABRIC.
6. CUT OFF BOTTOM BARS ON ALL OUTLET APRONS.
7. REFER TO PLAN QUANTITY AND MNDOT PLATES FOR RIP RAP DETAIL.

	APRON SIZE	V-BAR SIZE	H-BAR SIZE	NO. OF H-BARS REQ'D	BOLT DIA.	"A" DIM.
	INCHES				INCHES	
ROUND PIPE APRONS	12	1/2 ϕ	5/8 ϕ	3	1/2	4
	15	1/2 ϕ	5/8 ϕ	3	1/2	4 1/2
	18	1/2 ϕ	5/8 ϕ	4	1/2	4 1/2
	21	1/2 ϕ	5/8 ϕ	4	1/2	5
	24	5/8 ϕ	3/4 ϕ	4	1/2	5
	27	5/8 ϕ	3/4 ϕ	4	1/2	5 1/2
	30	5/8 ϕ	3/4 ϕ	4	1/2	5 1/2
	36	3/4 ϕ	1 ϕ	4	3/4	8
	42	3/4 ϕ	1 ϕ	4	3/4	8
	48	3/4 ϕ	1 ϕ	5	3/4	8
	54	3/4 ϕ	1 1/2 PIPE	5	3/4	8
	60	3/4 ϕ	1 1/2 PIPE	5	3/4	8
	66	3/4 ϕ	1 1/2 PIPE	6	3/4	8
	72	3/4 ϕ	1 1/2 PIPE	6	3/4	9
	84	3/4 ϕ	1 1/2 PIPE	7	3/4	10
90	3/4 ϕ	1 1/2 PIPE	7	3/4	14	

	APRON SIZE	V-BAR SIZE	H-BAR SIZE	NO. OF H-BARS REQ'D	BOLT DIA.	"A" DIM.
	INCHES				INCHES	
ARCH PIPE APRONS	18	1/2 ϕ	5/8 ϕ	3	1/2	5
	24	5/8 ϕ	3/4 ϕ	4	1/2	7
	30	5/8 ϕ	3/4 ϕ	4	1/2	7 1/2
	36	3/4 ϕ	1 ϕ	4	1/2	10 1/2
	42	3/4 ϕ	1 ϕ	4	3/4	11
	48	3/4 ϕ	1 1/2 PIPE	4	3/4	12
	54	3/4 ϕ	1 1/2 PIPE	4	3/4	12
	60	3/4 ϕ	1 1/2 PIPE	5	3/4	14
	72	3/4 ϕ	1 1/2 PIPE	5	3/4	14
	84	3/4 ϕ	1 1/2 PIPE	6	3/4	15

DESIGN: CMC	DATE: 3-95		
DRAWN: JPD	FILENAME: P:\WORKS\CAD\PLATES\P330		
REVISIONS	3-02		

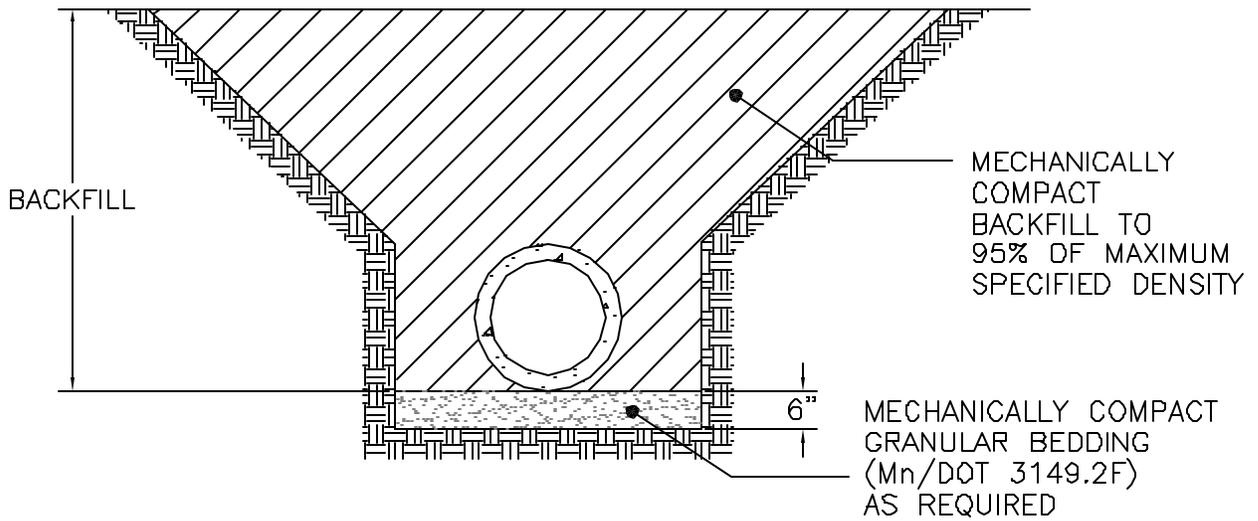


CITY OF MAPLEWOOD-ENGINEERING DEPT.

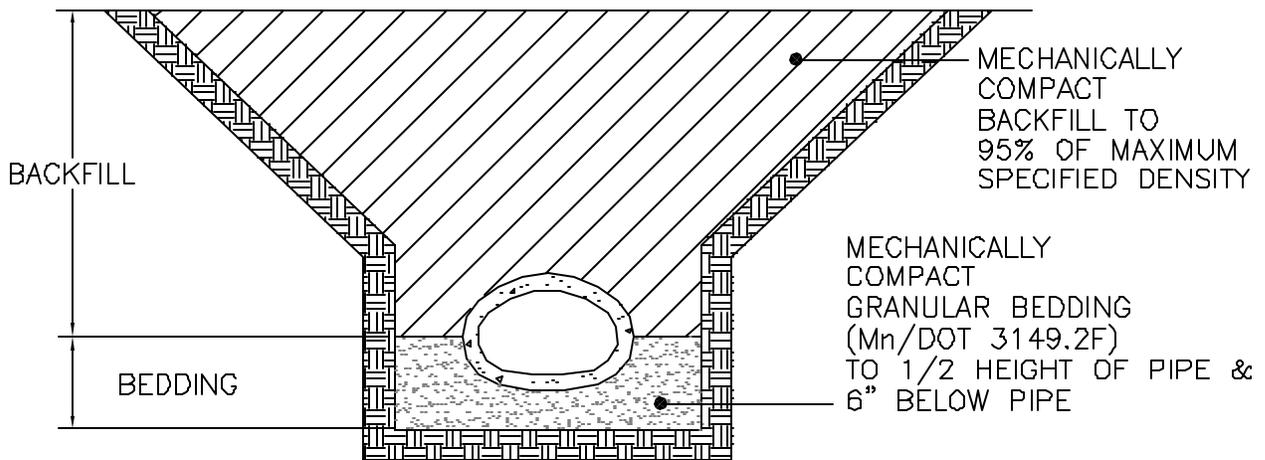
TRASH GUARDS FOR
CONCRETE APRONS

PLATE
NO.

330



ROUND PIPE EMBEDMENT IN TYPICAL SOILS



ARCH PIPE EMBEDMENT IN TYPICAL SOILS

IN UNSTABLE SOILS, PROVIDE MINIMUM 12" FOUNDATION AS SHOWN ON PLATE 440 OR 540.

GRANULAR BEDDING SHALL BE COMPACTED WITH MOTOR DRIVEN EQUIPMENT UNTIL THERE IS NO VISIBLE ADDITIONAL COMPACTION. PARTICULAR CARE SHALL BE TAKEN TO ASSURE NO VOIDS UNDER PIPE HAUNCHES.

ALL BACKFILL AND BEDDING OF TRENCHES SHALL BE UNIFORMLY COMPACTED, TO 95% OF MAXIMUM SPECIFIED DENSITY. TESTS SHALL BE TAKEN AT 500' INTERVALS, EVERY 3' LAYER OR AS DIRECTED BY THE ENGINEER.

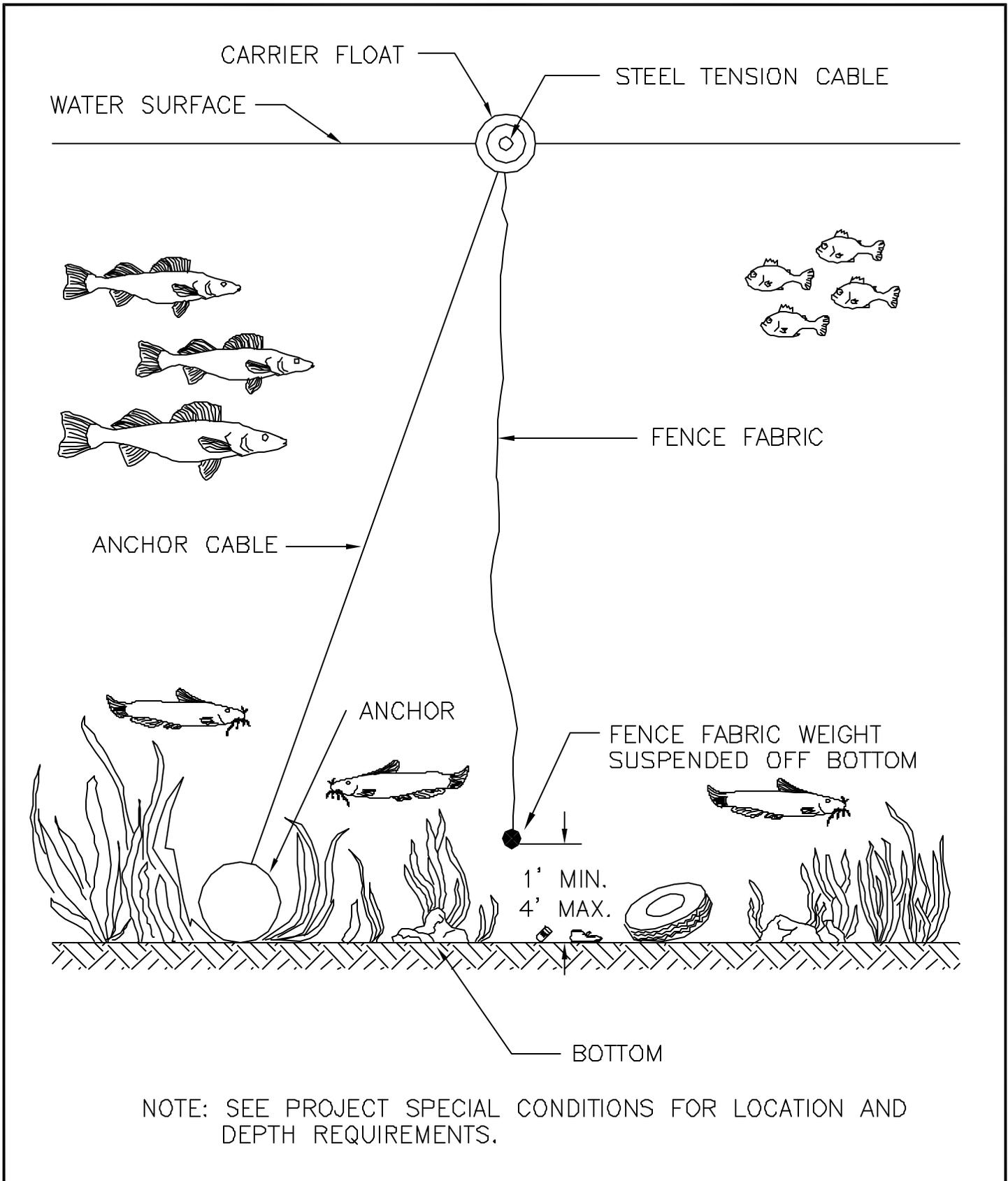
ALL EXCAVATIONS MUST COMPLY WITH THE REQUIREMENTS OF OSHA 29 CFR, PART 1926, SUBPART P, "EXCAVATION AND TRENCHES."

DESIGN: RAM	DATE: 3-95	
DRAWN: RKL	FILENAME:P:\WORKS/GAD\PLATES\P340	
REVISIONS	3-97	3-02



CITY OF MAPLEWOOD-ENGINEERING DEPT.
 EMBEDMENT DETAILS FOR
 REINFORCED CONCRETE PIPE

PLATE
 NO.
 340



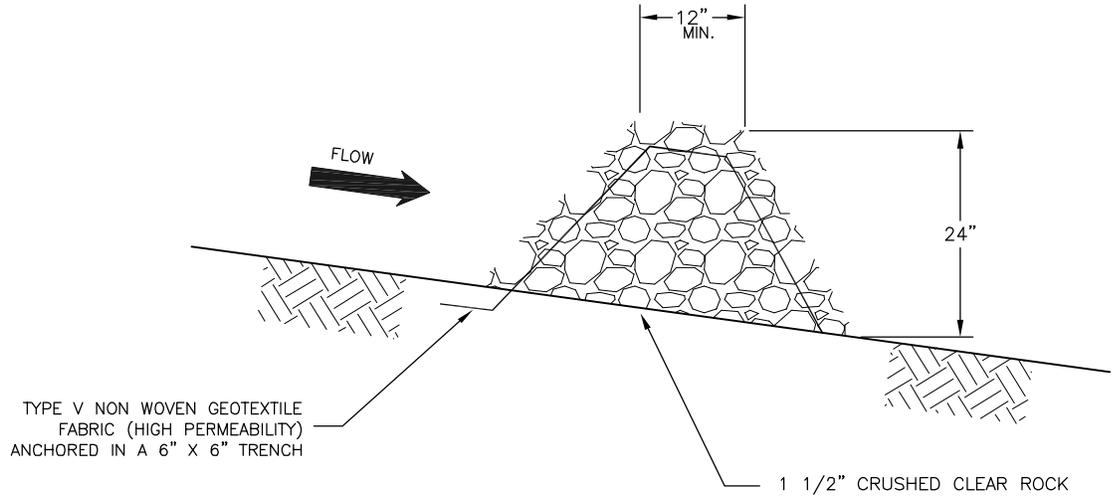
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REVISIONS	10-94 1-02



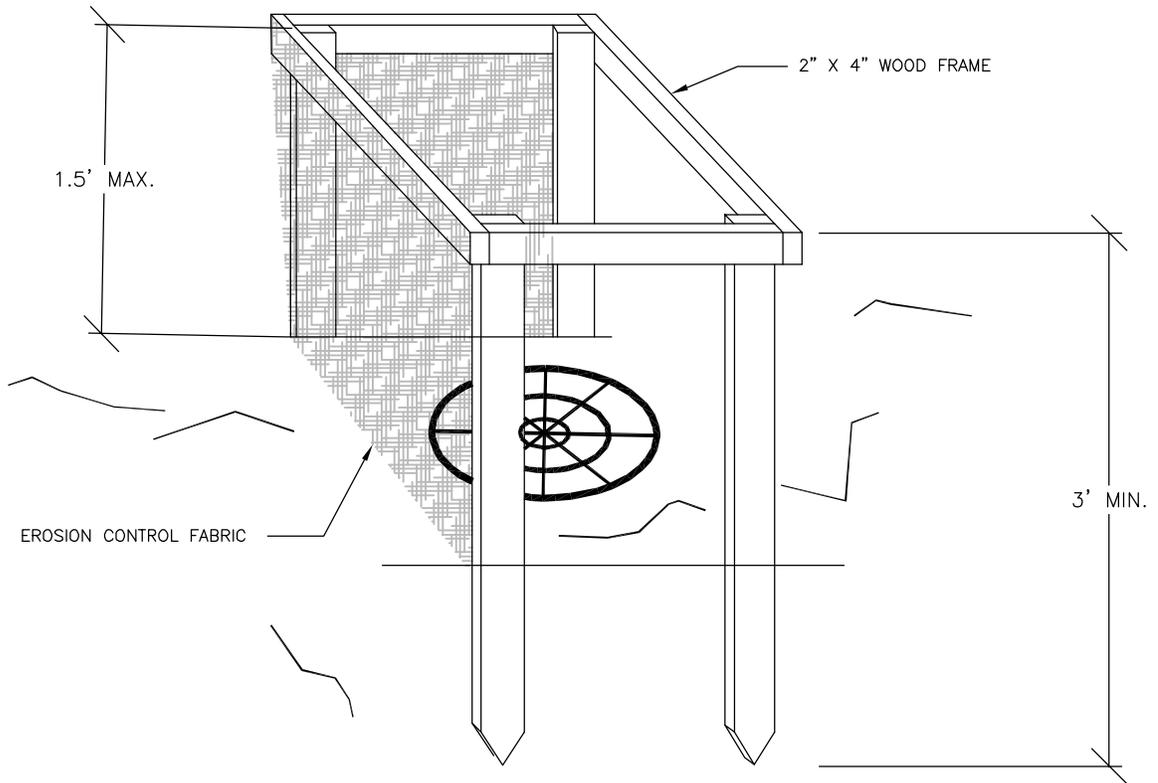
CITY OF MAPLEWOOD-ENGINEERING DEPT.
 TEMPORARY FLOTATION
 SILT CURTAIN

PLATE
 NO.
 349

ROCK BERM WEEPER



SILT FENCE INLET PROTECTION



DESIGN:

DRAWN: JPD

REVISIONS

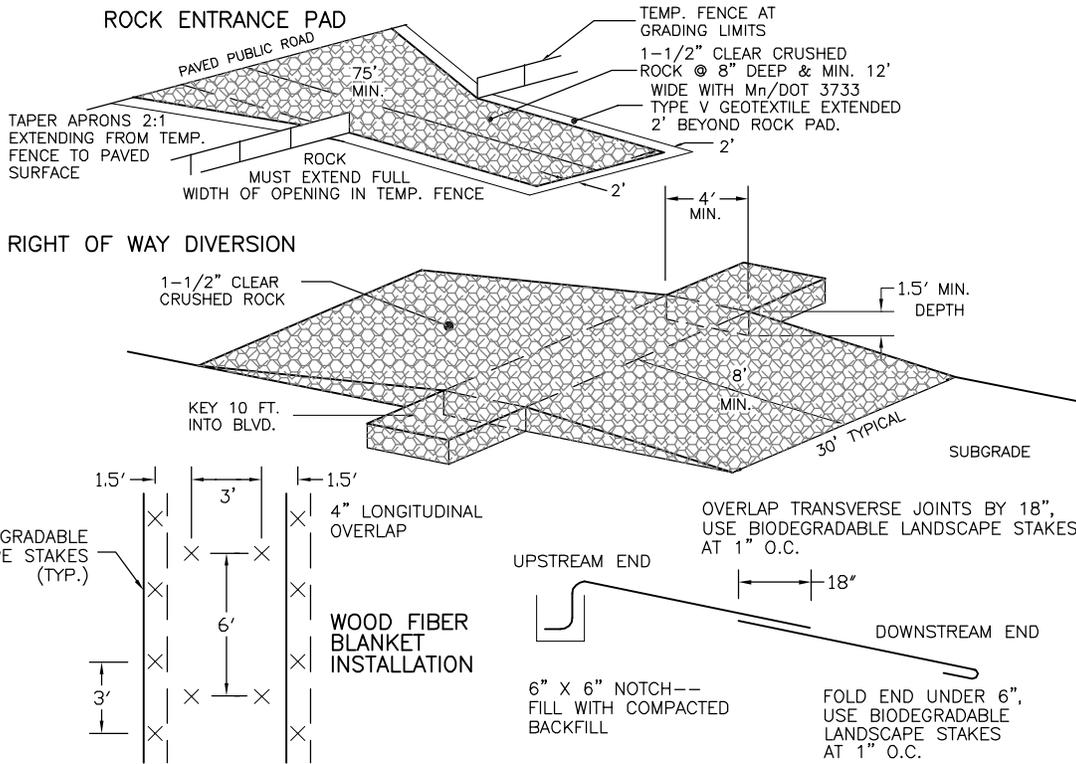


CITY OF MAPLEWOOD—ENGINEERING DEPT.
EROSION CONTROL
OFF ROAD STRUCTURES

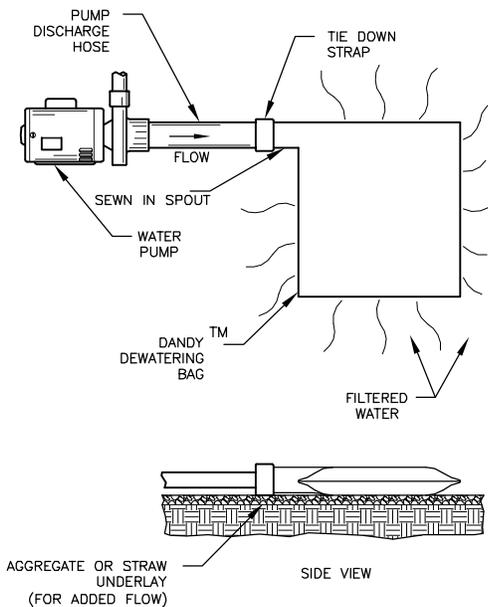
PLATE NO.

350A

1 of 5



DANDY DEWATERING BAG™



DETAIL OF A DEWATERING BAG
* OR ENGINEER APPROVED EQUAL

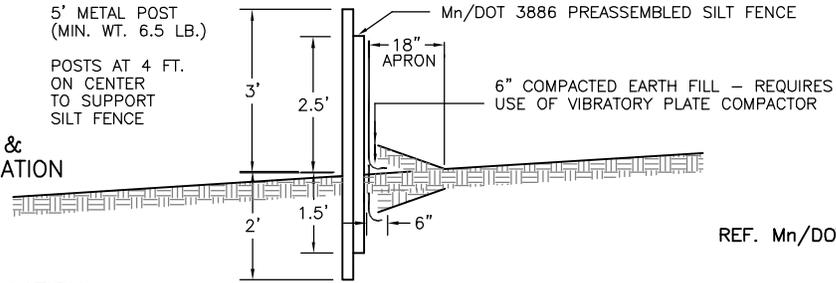
DESIGN:	
DRAWN: JPD	
REVISIONS	



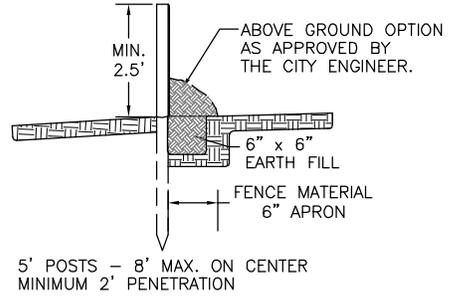
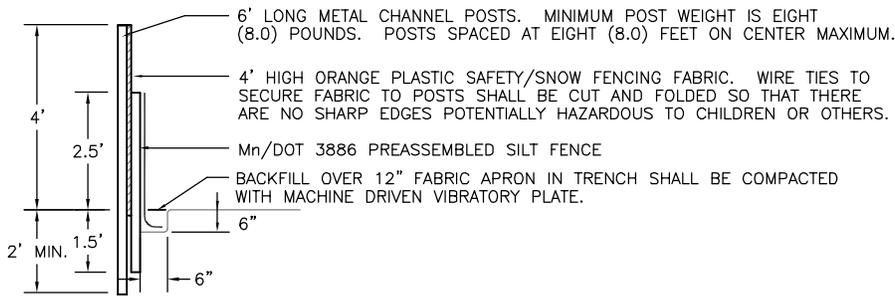
CITY OF MAPLEWOOD—ENGINEERING DEPT.
**EROSION CONTROL
RUNOFF PROTECTION**

PLATE NO.
350B
2 of 5

GRADING LIMITS & SILT FENCE COMBINATION

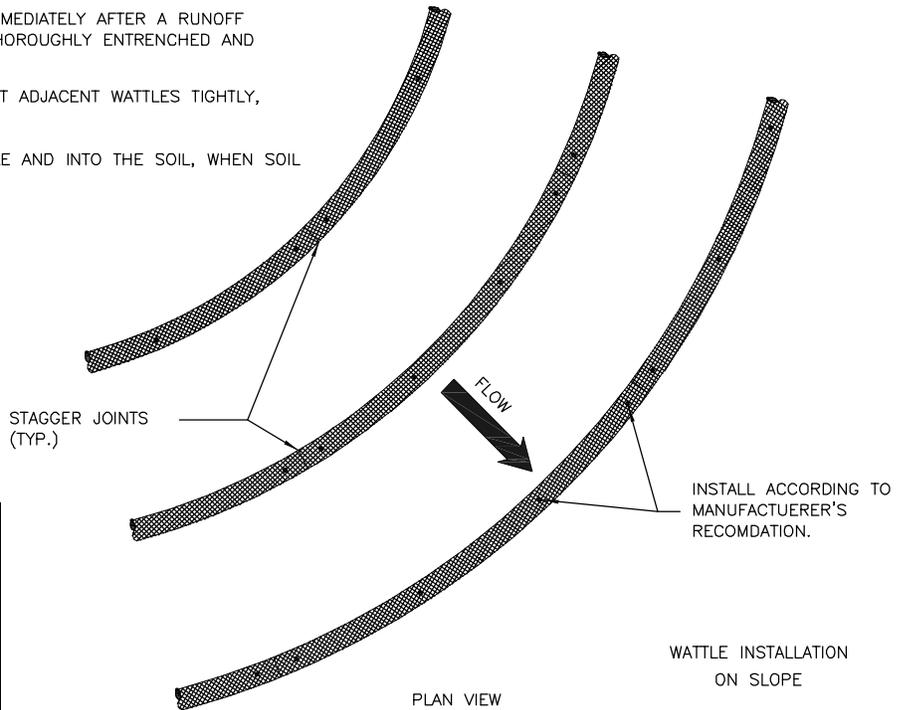


SILT FENCE INSTALLATION



NOTES

1. INSTALL WATTLES ALONG CONTOURS
2. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RUNOFF PRODUCING RAINFALL, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
3. INSTALL WATTLES SNUGLY INTO THE TRENCH. ABUT ADJACENT WATTLES TIGHTLY, END TO END, WITHOUT OVERLAPPING THE ENDS.
4. PILOT HOLES MAY BE DRIVEN THROUGH THE WATTLE AND INTO THE SOIL, WHEN SOIL CONDITIONS REQUIRE.



SLOPE	MAXIMUM SPACING
1:1	10 FEET
2:1	20 FEET
3:1	30 FEET
4:1	40 FEET

DESIGN:	
DRAWN: JPD	
REVISIONS	



CITY OF MAPLEWOOD—ENGINEERING DEPT.
**EROSION CONTROL
 RUNOFF PROTECTION**

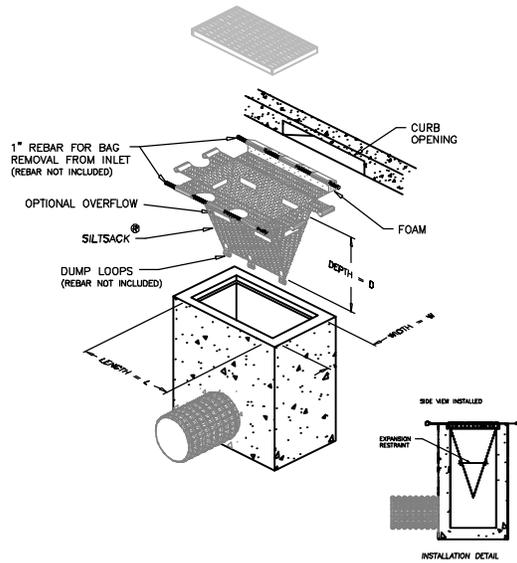
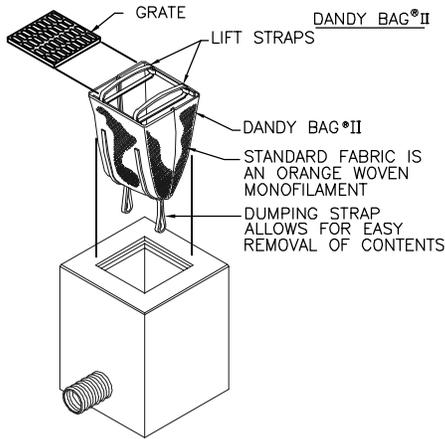
PLATE NO.
350C
 3 of 5

DANDY BAG® II

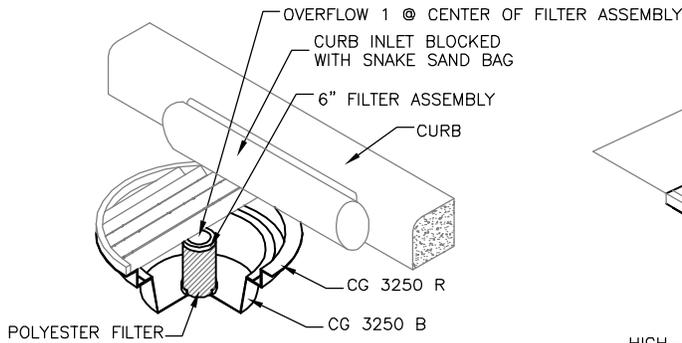
Installation and Maintenance Guidelines

Installation: Remove the grate from catch basin. If using optional oil absorbents, place absorbent pillow in unit. Stand the grate on end. Move the top lifting straps out of the way and place the grate into the Dandy Bag® II so that the grate is below the top straps and above the lower straps. Holding the lifting devices, insert the grate into the inlet.

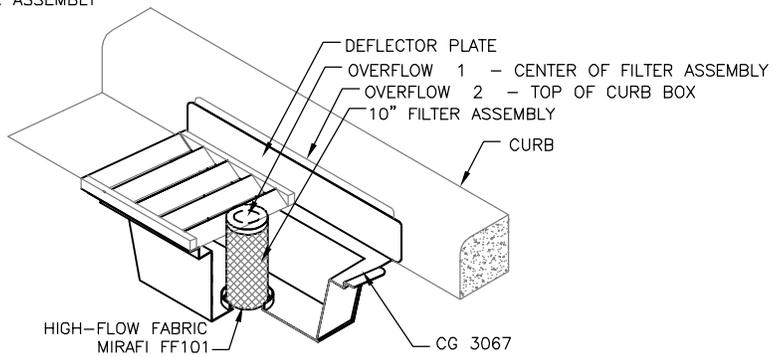
Maintenance: Remove all accumulated sediment and debris from vicinity of unit after each storm event. After each storm event and at regular intervals, look into the Dandy Bag® II. If the containment area is more than 1/3 full of sediment, the unit must be emptied. To empty unit, lift the unit out of the inlet using the lifting straps and remove the grate. If using optional oil absorbents, replace absorbent when near saturation.



DETAIL OF INLET SEDIMENT CONTROL DEVICE WITH CURB DEFLECTOR
ACF ENVIRONMENTAL SILTSACK



WIMCO ROAD DRAIN CURB AND GUTTER MODEL CG 3250 R



WIMCO ROAD DRAIN CURB AND GUTTER MODEL CG 3067

NOTE: * TO BE USED AT LOW POINTS AND AREAS OF INCREASED RUNOFF
* SIDE INLET PROTECTION TO BE USED AT ALL TIMES.

* OR ENGINEER APPROVED EQUAL

DESIGN:	
DRAWN: JPD	
REVISIONS	



CITY OF MAPLEWOOD—ENGINEERING DEPT.
**INLET PROTECTION
BELOW GRADE**

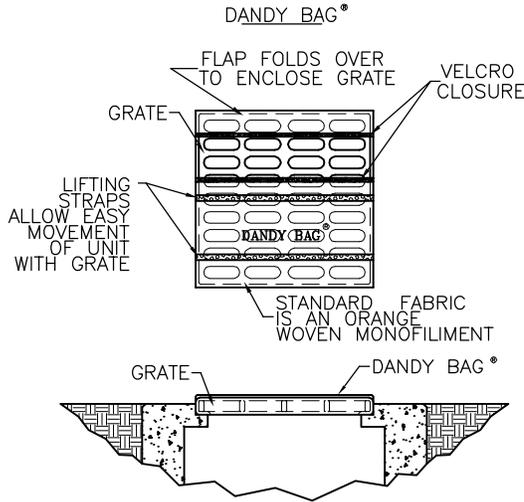
PLATE NO.
350D
4 of 5

DANDY BAG®

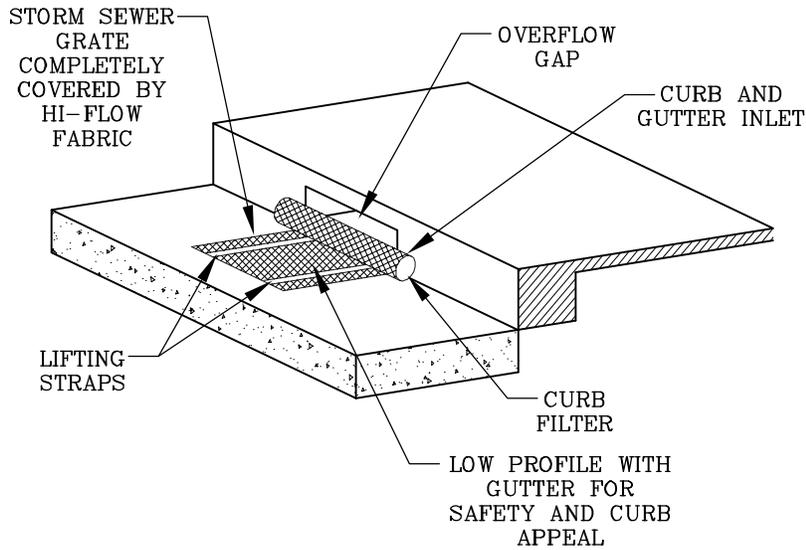
Installation and Maintenance Guidelines

Installation: The empty Dandy Bag® should be placed over the grate as the grate stands on end. If using optional oil absorbents; place absorbent pillow in pouch, on the bottom (below-grade side) of the unit. Attach absorbent pillow to tether loop. Tuck the enclosure flap inside to completely enclose the grate. Holding the lifting devices (do not rely on lifting devices to support the entire weight of the grate), place the grate into its frame.

Maintenance: Remove all accumulated sediment and debris from surface and vicinity of unit after each storm event. Remove sediment that has accumulated within the containment area of the Dandy Bag® as needed. If using optional oil absorbents; remove and replace absorbent pillow when near saturation.



DANDY CURB BAG™



* OR ENGINEER APPROVED EQUAL

DESIGN:	
DRAWN: JPD	
REVISIONS	



CITY OF MAPLEWOOD—ENGINEERING DEPT.
**INLET PROTECTION
 AT GRADE**

PLATE NO.
350E
 5 of 5

LIFTING HOLES WHICH PENETRATE THROUGH SECTION WALLS ARE NOT PERMITTED.

MANHOLE FRAME WITH LID AS SHOWN IN PLATE 301

SET RIM 1/4" - 1/2" BELOW FINISHED SURFACE

SEE MAPLEWOOD STANDARD PLATE 300 FOR FRAME PLACEMENT DETAILS. UNDAMAGED CONCRETE RINGS ARE AN ACCEPTABLE ALTERNATIVE TO SEWER BRICK.

PRECAST REINFORCED ECCENTRIC CONE & RISER SECTIONS AS CONFORMING TO ASTM C478.

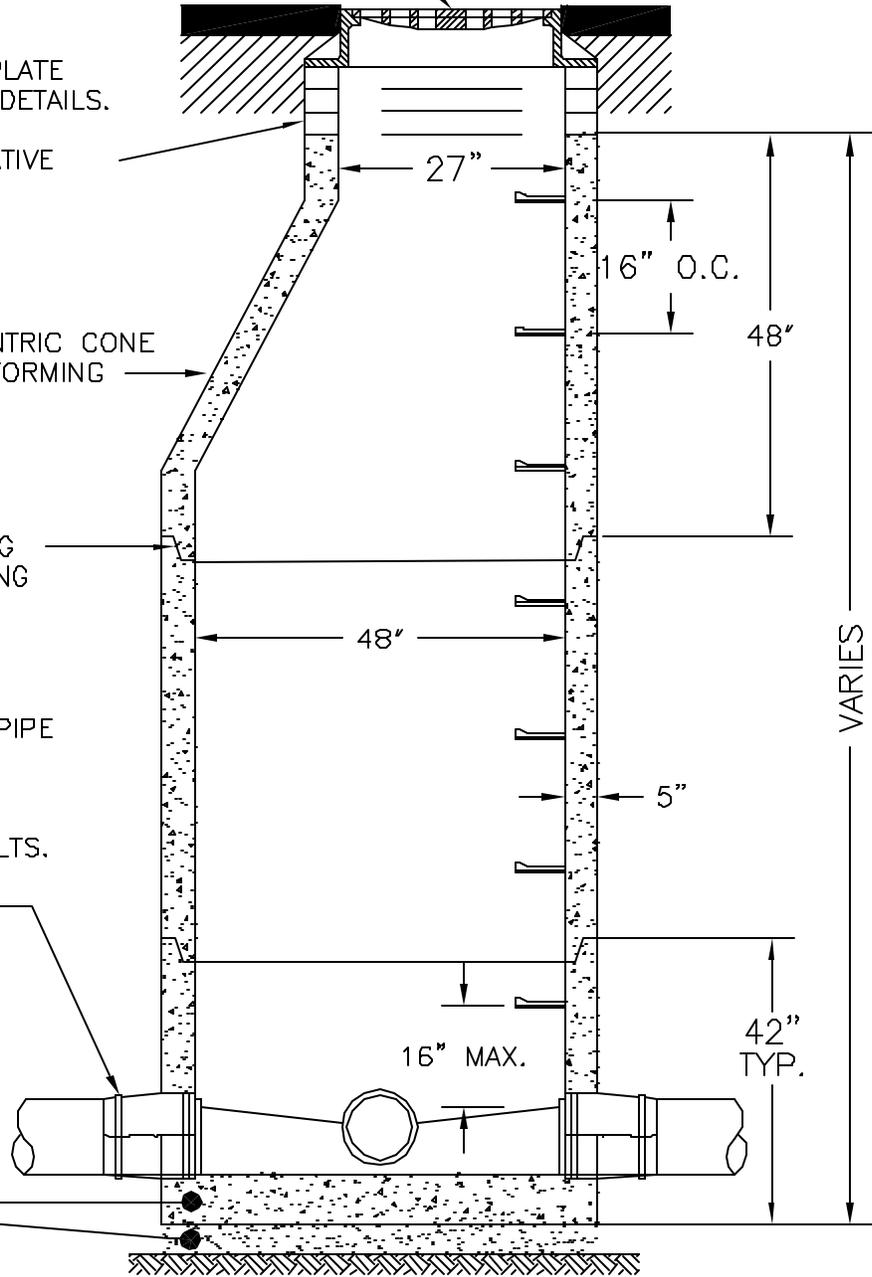
JOINTS BETWEEN PRECAST SECTIONS SHALL USE O-RING RUBBER GASKETS CONFORMING TO ASTM C443.

12" WIDE POLYPROPYLENE ENCASED STEPS LOCATE OVER DOWNSTREAM PIPE

POSITIVE MECHANICAL SEAL STAINLESS STEEL EXTERNAL CLAMP W/DRAW NUTS & BOLTS. (KOR-N-SEAL BOOT BY NPC OR APPROVED EQUAL)

PRECAST INTEGRAL BASE & BOTTOM BARREL SECTION OR INVERT FILLET CAST IN PLACE WITH Mn/DOT 2461 TYPE 3B42 CONCRETE OR CERTIFIED READY-MIX AIR-ENTRAINED MORTAR (MW 2506.2B)

MECHANICALLY COMPACT 4" GRANULAR MATERIAL FOR LEVELING (Mn/DOT 3149.2F) (ORDINARY COMPACTION)



IF A SEWER MAIN IS CONNECTED TO A MANHOLE MORE THAN 24" ABOVE THE INVERT OF THE OUTGOING SEWER, CONNECTION SHALL BE BY MEANS OF AN OUTSIDE DROP SEE PLATE 401. INVERTS FOR INSIDE DROP CONNECTIONS WHICH ARE LESS THEN 24" SHALL BE FORMED BY USING A LATERAL CUT SECTION OF PVC MAIN PIPE, OR A BEND.

DESIGN: CMC	DATE: 10/5/94
DRAWN: RKL	FILENAME:P:/WORKS/CAD/PLATES/P400
REVISIONS	10-94 3-97 3-02



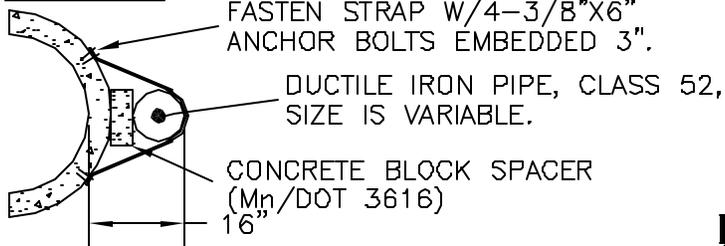
CITY OF MAPLEWOOD-ENGINEERING DEPT.

SANITARY SEWER
MANHOLE

PLATE
NO.

400

PLAN VIEW



LIFTING HOLES WHICH PENETRATE THROUGH SECTION WALLS ARE NOT PERMITTED.

SEE MAPLEWOOD STANDARD PLATE 300 FOR FRAME PLACEMENT DETAILS. UNDAMAGED CONCRETE RINGS ARE AN ACCEPTABLE ALTERNATIVE TO SEWER BRICK.

PRECAST REINFORCED ECCENTRIC CONE & RISER SECTIONS AS CONFORMING TO ASTM C478.

JOINTS BETWEEN PRECAST SECTIONS SHALL USE O-RING RUBBER GASKETS CONFORMING TO ASTM C443.

12" WIDE POLYPROPYLENE ENCASED STEPS LOCATE OVER DOWNSTREAM PIPE.

DOUBLE BANDED FERNCO OR APPROVED ADAPTER WITH STAINLESS STEEL SHEAR RING.

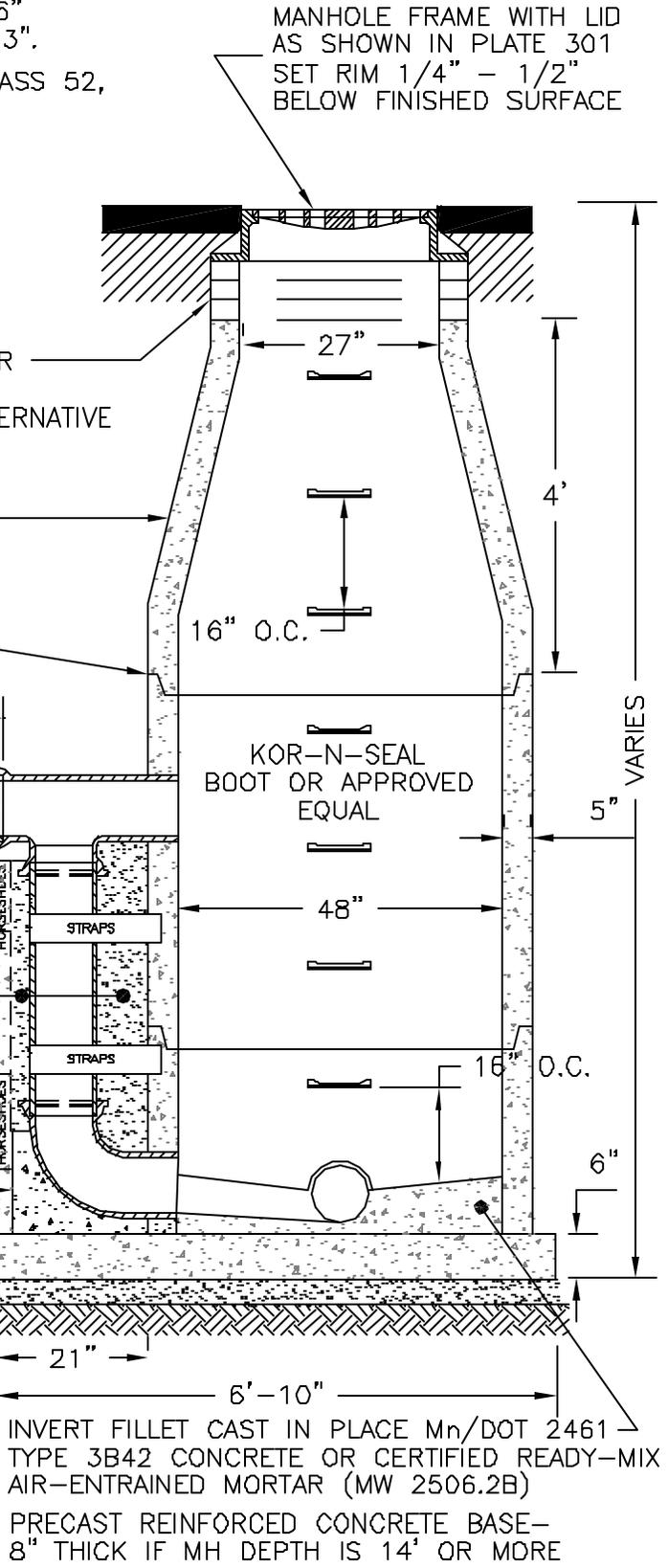
FILL ALL VOIDS WITH AND MECHANICALLY COMPACT GRANULAR BEDDING BETWEEN MH & DROP (Mn/DOT 3149.2F)

MJ DIP FITTINGS TO BE USED FOR DROP.

DIP ELBOW & SUPPORT INTEGRALLY CAST WITH BASE & BARREL AS ALTERNATIVE.

MECHANICALLY COMPACT 4" GRANULAR MATERIAL FOR LEVELING (Mn/DOT 3149.2F) (ORDINARY COMPACTION)

ALTERNATIVE TO CONC HORSESHOES 3"-14 GAUGE HOT DIPPED GALVANIZED STRAPS FASTENED TO THE MANHOLE AT 6" MAX. ON CENTER. MIN. 2 STRAPS PER DROP. SEE PLAN VIEW ABOVE.



DESIGN: KGH	DATE: 3/95
DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P401
REVISIONS	10-94 3-97 1-02

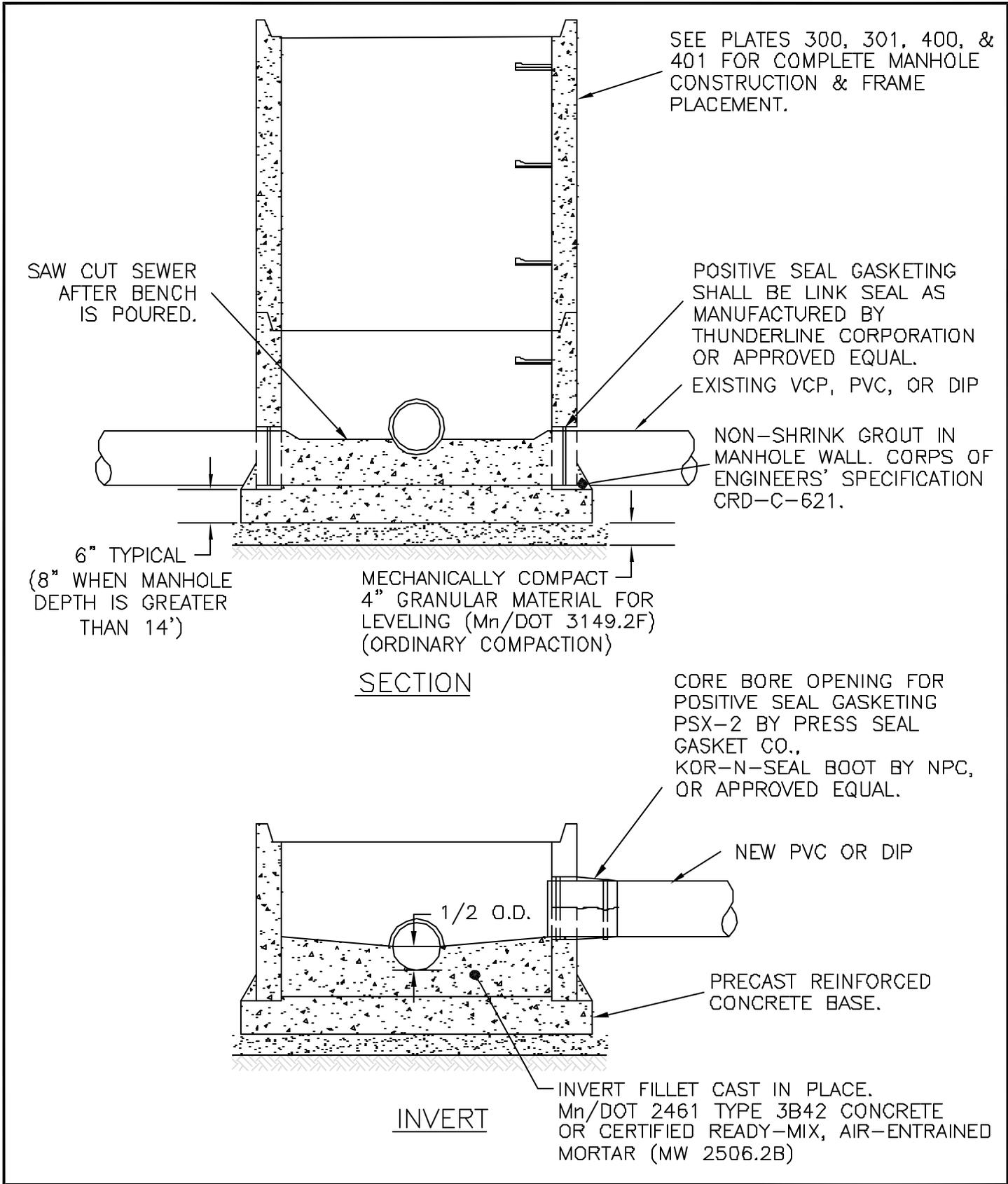


CITY OF MAPLEWOOD-ENGINEERING DEPT.

SANITARY SEWER
DROP MANHOLE

PLATE NO.

401

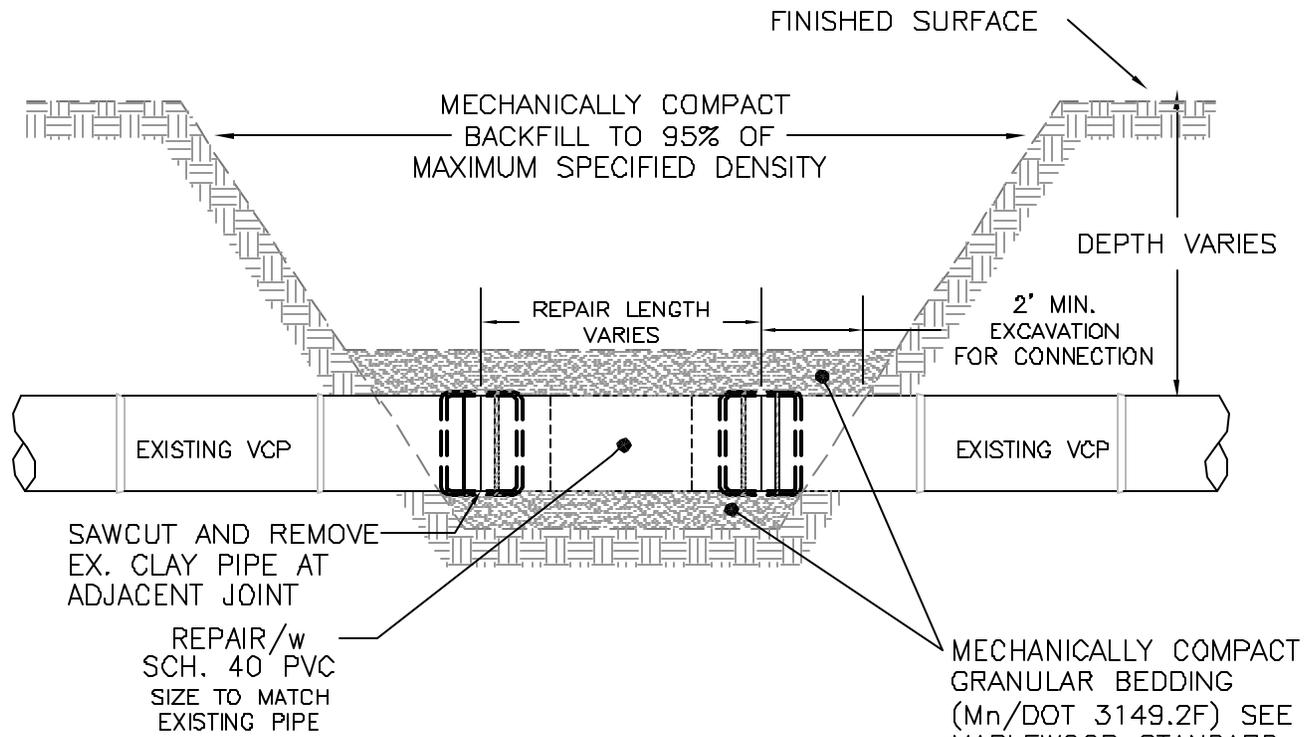


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DRAWN: RKL	FILENAME:P:\WORKS/GAD\PLATES\P403
REVISIONS	3-97 1-02



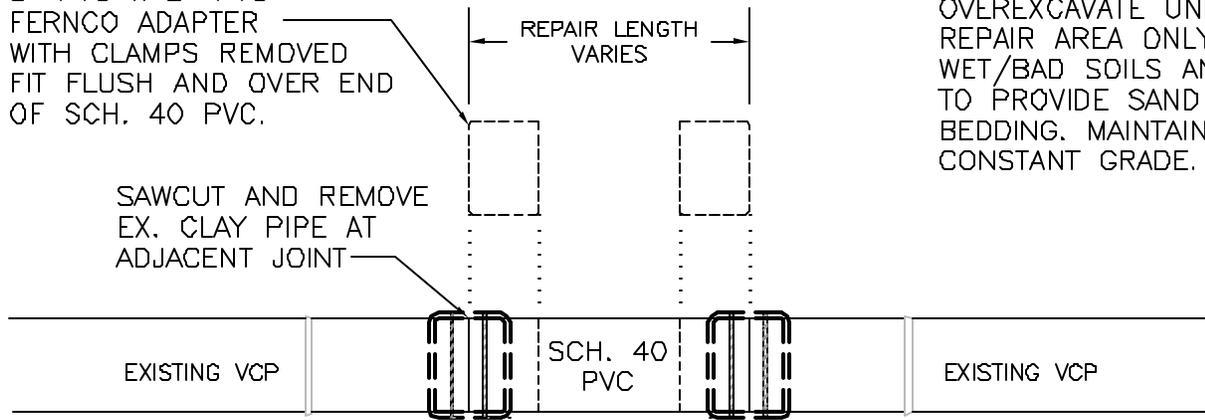
CITY OF MAPLEWOOD-ENGINEERING DEPT.
 MANHOLE CONSTRUCTION OVER
 EXISTING SANITARY SEWER MAIN

PLATE NO.
 403



8" PVC x 8" PVC
FERNCO ADAPTER
WITH CLAMPS REMOVED
FIT FLUSH AND OVER END
OF SCH. 40 PVC.

SAWCUT AND REMOVE
EX. CLAY PIPE AT
ADJACENT JOINT



8" VCP x 8" VCP FERNCO
ADAPTER WITH STAINLESS
STEEL SHEAR RING (TYP.).
PLACE OVER END OF
EX. VCP AND FERNCO
ADAPTER TO OBTAIN EQUAL
OUTSIDE AND INSIDE DIAMETERS.
TIGHTEN OUTER FERNCO.

DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P409
REVISIONS	3-97 3-02

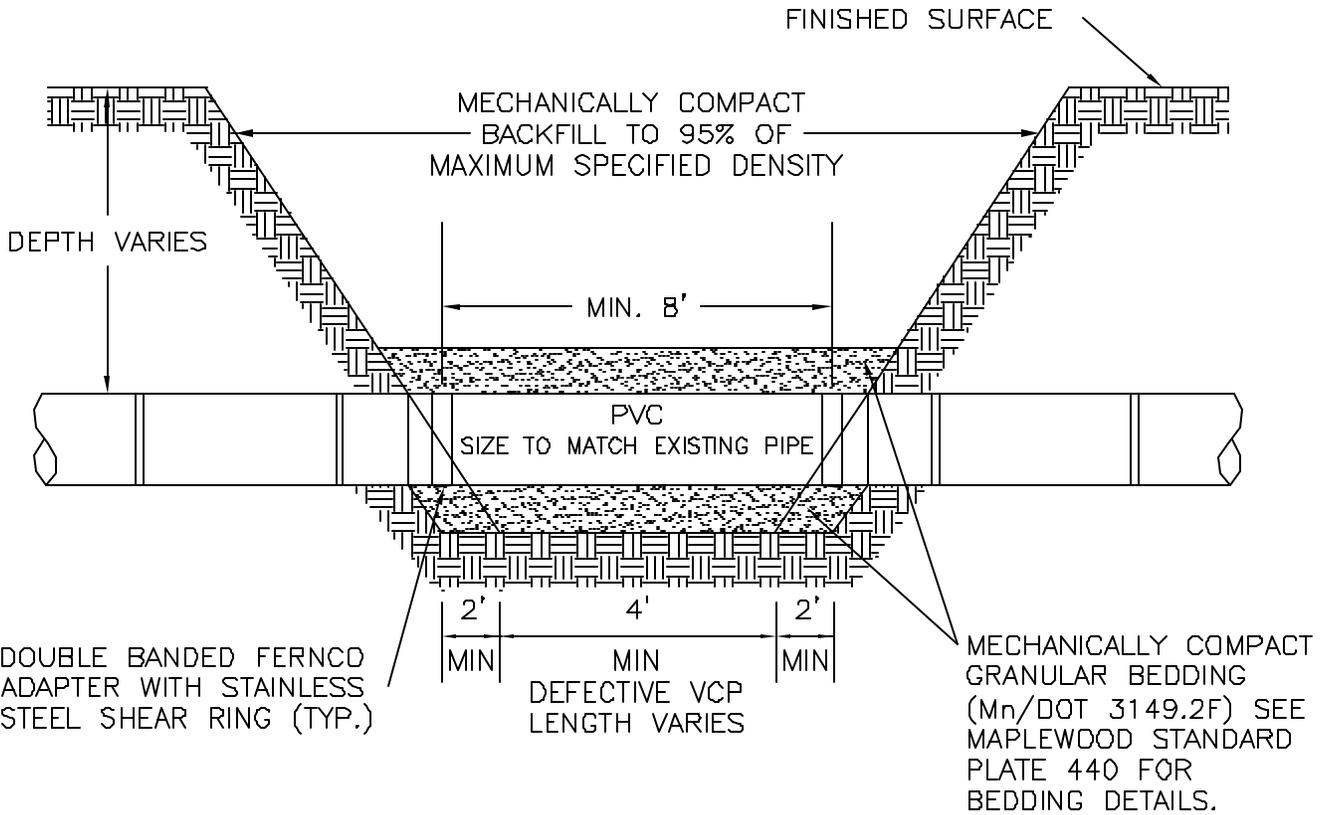


CITY OF MAPLEWOOD—ENGINEERING DEPT.

SANITARY SEWER MAIN REPAIR

PLATE
NO.

409



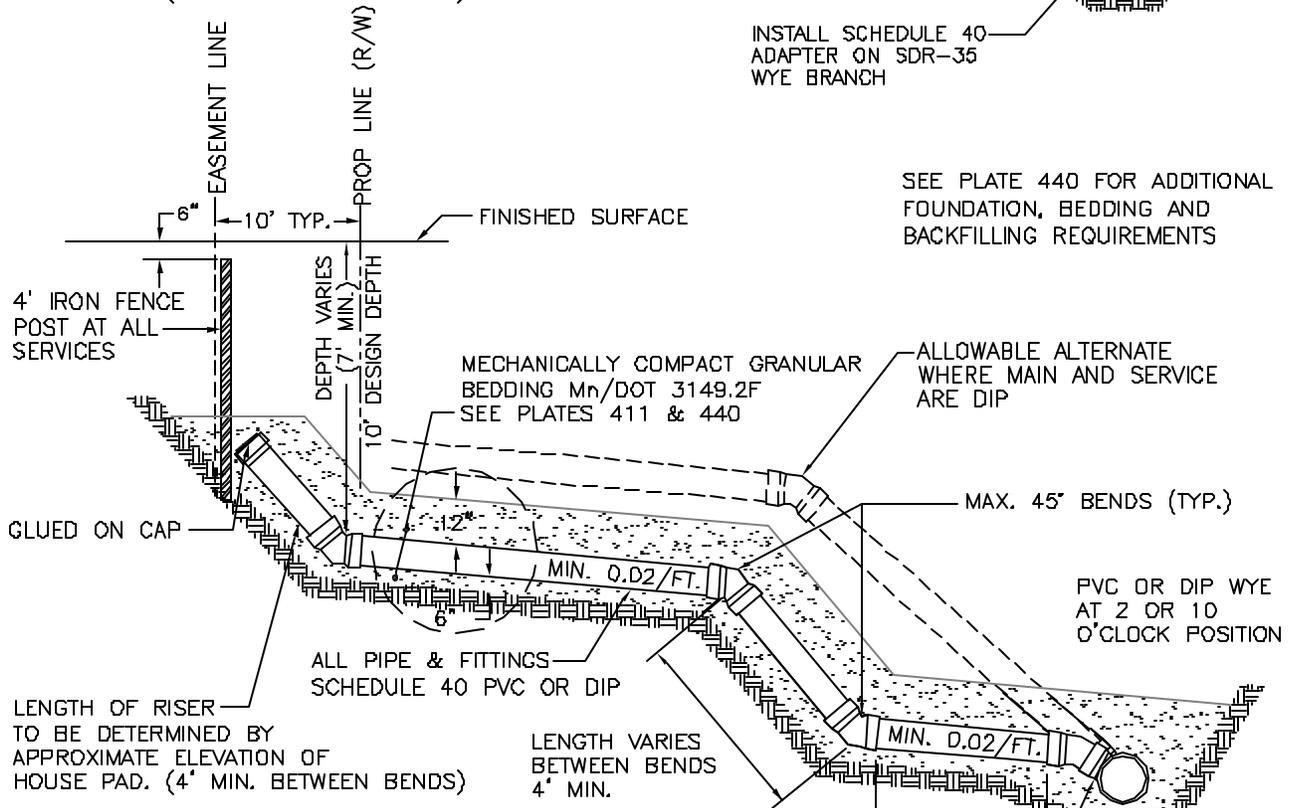
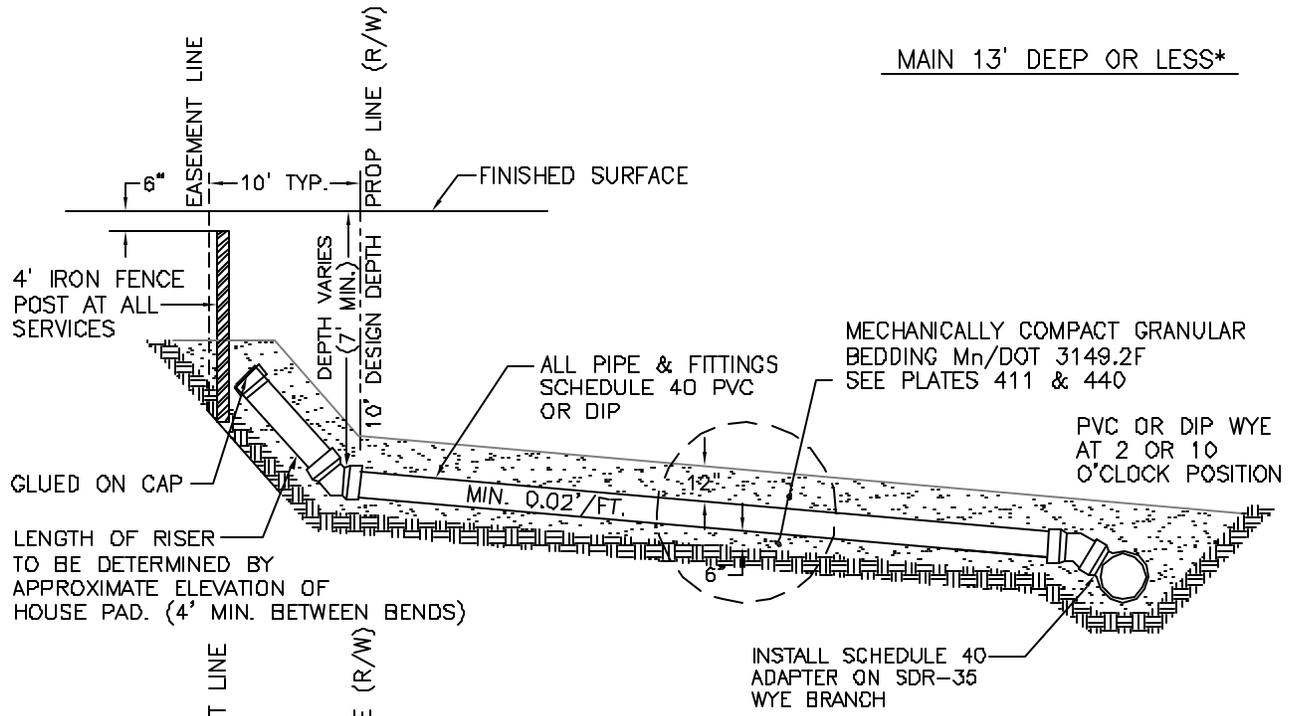
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DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P409A
REVISIONS	3-97 1-02



CITY OF MAPLEWOOD—ENGINEERING DEPT.
 SANITARY SEWER MAIN REPAIR
 ALTERNATE

PLATE NO.
 409
 A

MAIN 13' DEEP OR LESS*



MAIN MORE THAN 13' DEEP *

DESIGN ALSO APPLIES TO AREAS OF HIGH GROUND WATER

* DEPTH OF COVER AT R/W TO BE 10' UNLESS NOTED (7' MIN.)

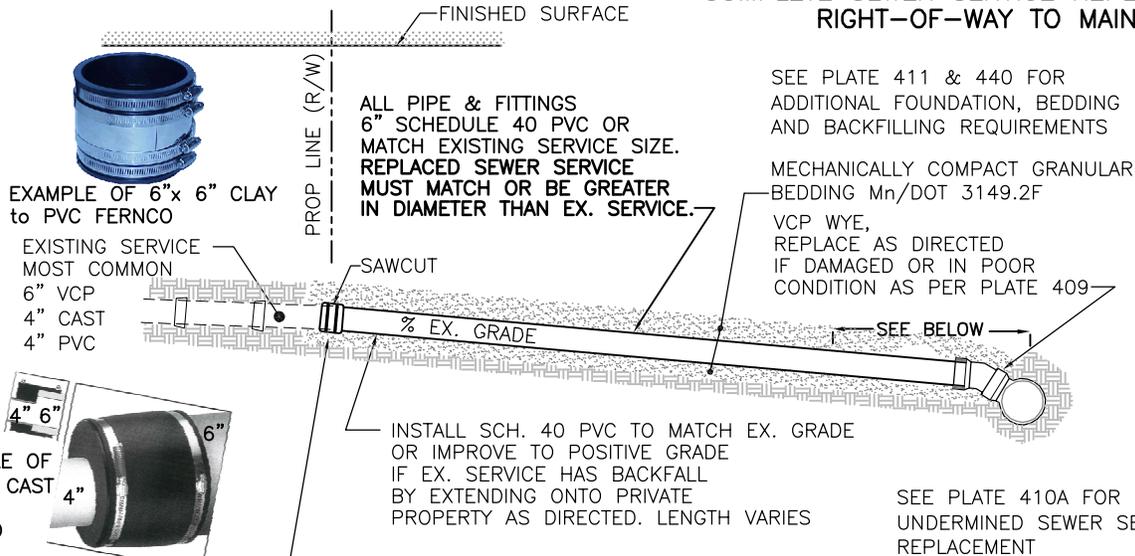
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DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P410
REVISIONS	12-95 1-02



CITY OF MAPLEWOOD-ENGINEERING DEPT.
SANITARY SEWER SERVICE

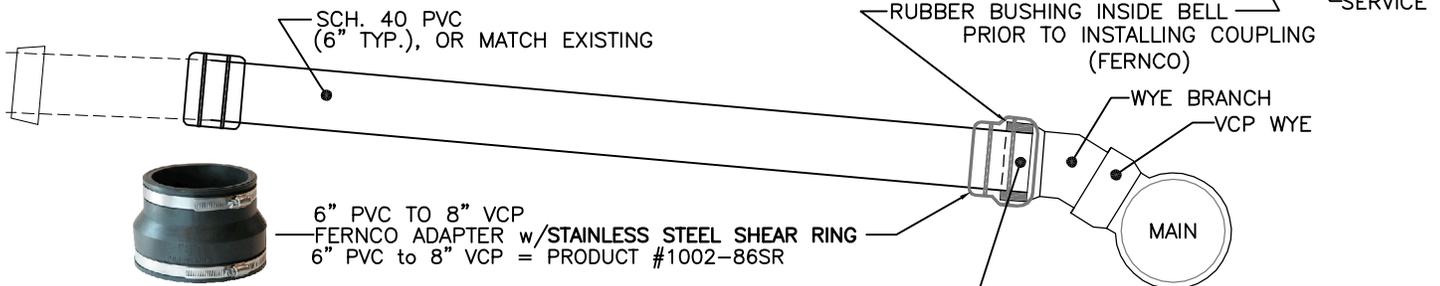
PLATE NO.
410

COMPLETE SEWER SERVICE REPLACEMENT RIGHT-OF-WAY TO MAIN



CONNECT TO EXISTING
SEWER SERVICE @ R/W LINE (TYP.).
IF 4" CAST USE 4"x6" (CAST TO PVC) FERNCO ADAPTER w/STAINLESS STEEL SHEAR RING
IF 6" CLAY USE 6"x6" (CLAY TO PVC) FERNCO ADAPTER w/STAINLESS STEEL SHEAR RING
IF (4" CIP TO 4" PVC) OR (4" CIP TO 4" CIP) USE 4" FERNCO w/STAINLESS STEEL SHEAR RING

6" PVC to 6" CLAY = PRODUCT #1002-66SR
6" PVC to 4" CAST = PRODUCT #1056-64SR
6" PVC to 4" PVC(all SCH. 40) = PRODUCT #1056-64SR



EXAMPLE OF 6"x 8" CLAY
to PVC FERNCO SHOWN
WITHOUT SHEAR RING

CAREFULLY REMOVE EX. SERVICE FROM BELL END
@ WYE BRANCH, INSERT SCH. 40 PVC WITH
RUBBER BUSHING SECURED OVER OUTSIDE AND
FLUSH WITH END OF PVC. INSERT INTO ENTIRE
BELL END OF EX. WYE BRANCH. INSTALL AND
SECURE 8" VCP TO 6" PVC FERNCO. 8" END FITS
OVER & AROUND BELL END OF VCP WYE.

NOTE:
WHEN CROSSING UNDER CIP WM
DURING REPLACEMENT, AND
IF SERVICE IS 4" CIP OR PVC FROM R/W
TO HOUSE, SLIPLINE NEW
4" PVC THROUGH EXISTING
6" VCP TO AVOID EXCAVATING UNDER WM.

SHEAR RINGS

- All stainless steel bands, nuts, and housings (Series 300 Stainless Steel).
- Designed to fit Fernco's 1001 (Clay to Clay), 1004 (Concrete to Concrete), 1055 (AC to AC) or 1056 (CI/Plastic to CI/Plastic) series couplings.
- Available for 1-1/2" to 15" couplings.
- CUSTOM SIZES AVAILABLE



PRODUCT LISTINGS

SHEAR RING PART #	SHEAR RING LENGTH	BAND SIZE	SHIELD WIDTH	FERNCO COUPLING PART #
SR-9	9"	32	1.5"	1056-150
SR-11	11"	44	1.5"	1056-22
SR-15	15"	64	2"	1056-33
SR-19	19"	88	2"	1056-44, 1056-44
SR-22	22"	96	2"	1001-44, 1004-44, 1056-55
SR-25	25"	116	4"	1056-66
SR-27	27"	128	4"	1001-60, 1055-86
SR-28	28"	140	4"	1004-56
SR-33	33"	152	4"	1056-58
SR-35	35"	164	4"	1001-88, 1056-88
SR-37	37"	184	4"	1004-88
SR-39	39"	184	4"	1055-1010, 1056-1010, 1001-1010, 1004-1010, 1051-1212, 1055-1212, 1056-1212
SR-46	46"	(2) 116	4"	1001-1212, 1004-1212, 1056-1515
SR-54	54"	(2) 128	4"	1001-1212, 1004-1212, 1056-1515
SR-59	59"	(2) 152	4"	1001-1515
SR-63	63"	(6) 8 & 152	4"	1056-1918
SR-73	73"	(2) 184	4"	1056-2121



Fernco Strong Back RC Series Repair Couplings
Offer 6-012" stainless steel shielded coupling that has a molded in bushing for those areas that require extra support.

STRONG BACK RC Series Repair Coupling

For where there is a need for resistance to heavy earth loads, shear forces and improved alignment.

PART #	DESCRIPTION
1001 RC Series - For Clay to Clay	
1001-44RC	4" Clay to 4" Clay
1001-66RC	6" Clay to 6" Clay
1001-88RC	8" Clay to 8" Clay
1001-1010RC	10" Clay to 10" Clay
1001-1212RC	12" Clay to 12" Clay
1002 IRC Series - For Clay to Cast Iron or Plastic	
1002-44RC	4" Clay to 4" Cast Iron or Plastic
1002-66RC	6" Clay to 6" Cast Iron or Plastic
1002-88RC	8" Clay to 8" Cast Iron or Plastic
1002-1010RC	10" Clay to 10" Cast Iron or Plastic
1002-1212RC	12" Clay to 12" Cast Iron or Plastic

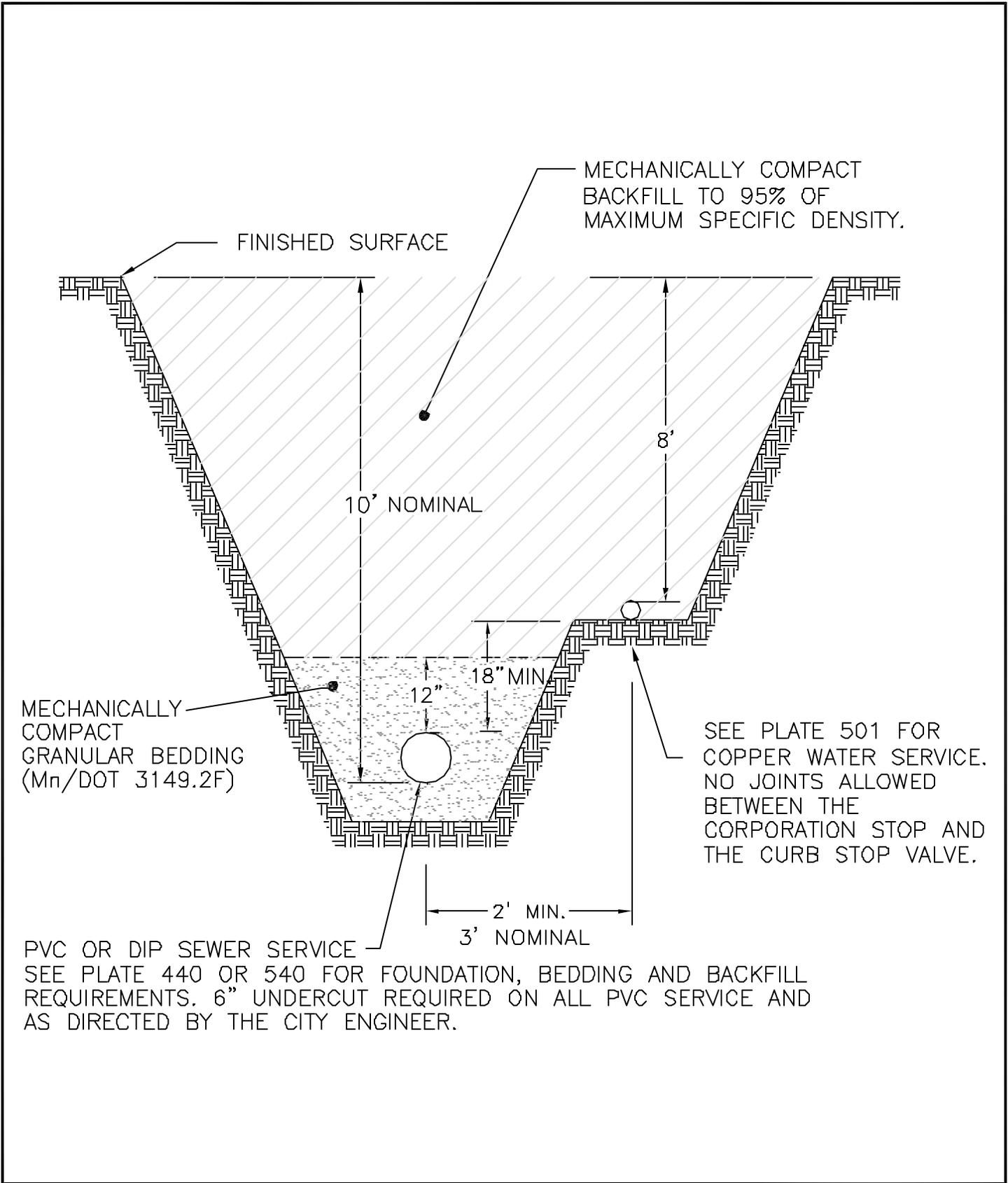
PRODUCT LISTINGS

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DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P410B
REVISIONS	3-06 3-07



CITY OF MAPLEWOOD-ENGINEERING DEPT.
**SANITARY SEWER SERVICE
REPLACEMENT (MAIN TO R/W)**

PLATE
NO.
**410
A**



DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P411
REVISIONS	3-97 3-02



CITY OF MAPLEWOOD-ENGINEERING DEPT.
 SERVICES IN COMMON TRENCH

PLATE NO.
 411

ADJUSTABLE COMPRESSION STRAP,
BOLTS, WASHERS, AND NUTS—ALL
OF TYPE 304 STAINLESS STEEL.
THREADS SHALL BE TEFLON COATED.

CAST IRON OR DUCTILE IRON
SADDLE CASTING

ADAPTER FOR SERVICE PIPE

SERVICE PIPE

GASKET

MECHANICALLY COMPACT
GRANULAR BEDDING
Mn/DOT TYPE 3149.2F
(ORDINARY COMPACTION)

CORE DRILL HOLE IN
EXISTING SEWER TO
PROVIDE UNOBSTRUCTED
PASSAGE AND CONTINUOUS
CONTACT WITH GASKET
AROUND PERIMETER.

SEWER SADDLE TO BE ROMAC, JCM
SEWER SADDLE OR APPROVED EQUAL.

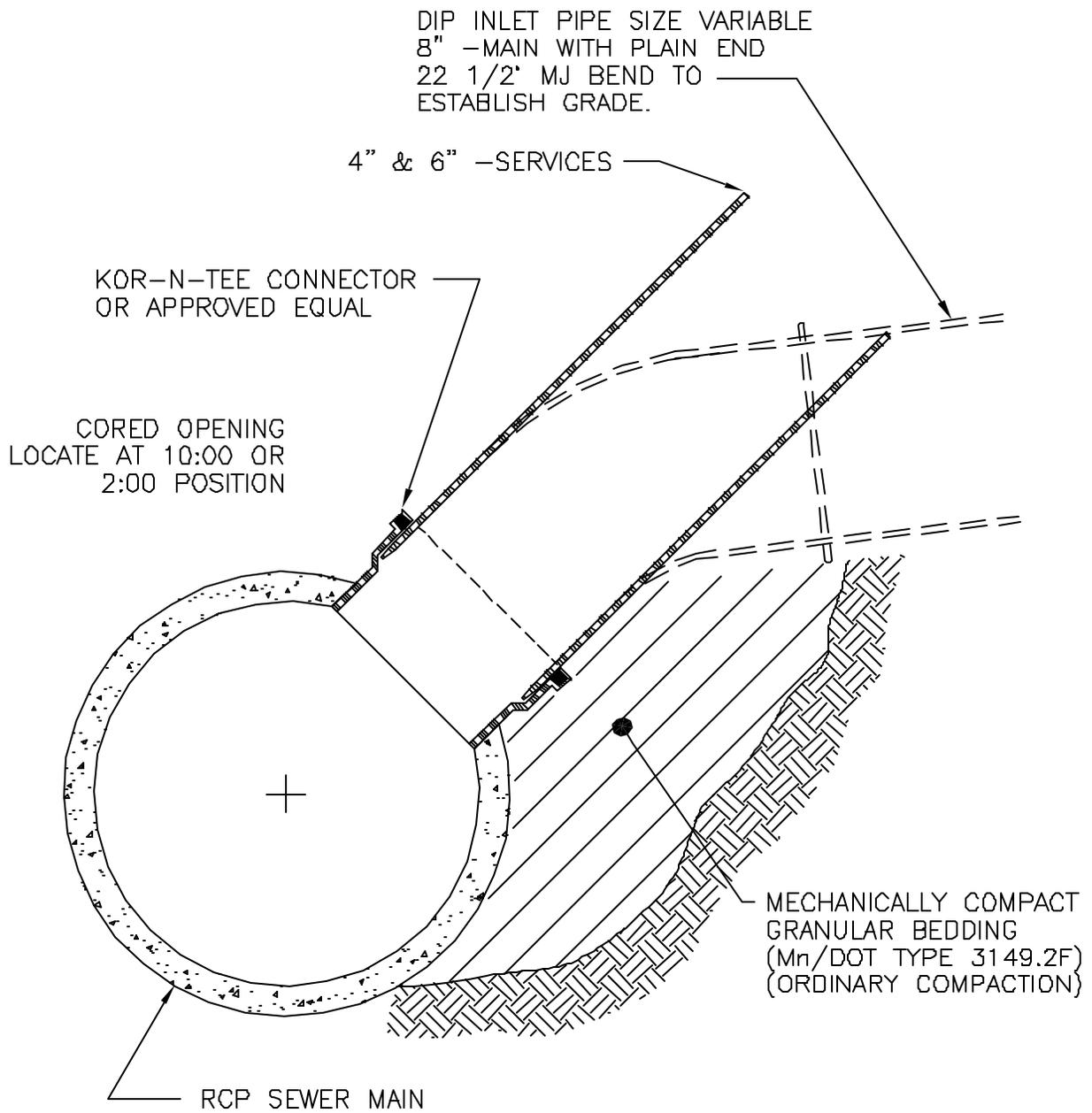
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DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P412
REVISIONS	3-97 3-02



CITY OF MAPLEWOOD—ENGINEERING DEPT.
SADDLE TAP TO EXISTING
PVC OR VCP SANITARY SEWER

PLATE
NO.

412

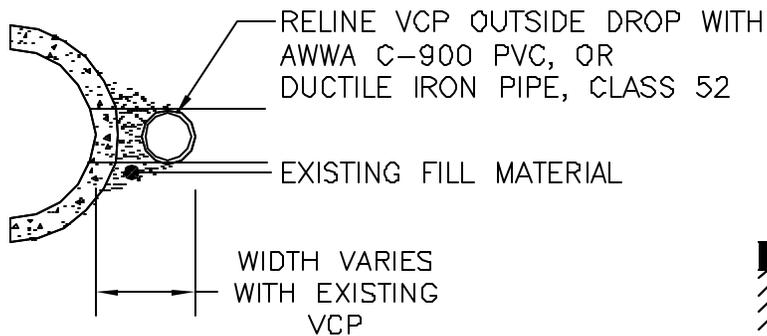


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REVISIONS	3-97 1-02



CITY OF MAPLEWOOD-ENGINEERING DEPT.
INLET PIPE CORE DRILLED
TO RCP MAIN

PLATE
NO.
420



REPLACE DAMAGED OR MISSING STEPS WITH
12" WIDE POLYPROPYLENE ENCASED STEPS
LOCATE OVER DOWNSTREAM PIPE.

PRECAST REINFORCED ECCENTRIC CONE
& RISER SECTIONS AS CONFORMING
TO ASTM C478. (IF RECONSTRUCTING EXISTING MH).
JOINTS BETWEEN PRECAST SECTIONS SHALL
USE O-RING RUBBER GASKETS CONFORMING
TO ASTM C443.

EXISTING VCP
MAIN AND DROP

DOUBLE BANDED FERNCO
OR APPROVED ADAPTER
WITH STAINLESS STEEL
SHEAR RING.

REMOVE EXISTING VCP MAIN & DROP
TO ALLOW CONST. OF 8"x 6" PVC OR
MJ PLAIN END TEE & RET. GLANDS.

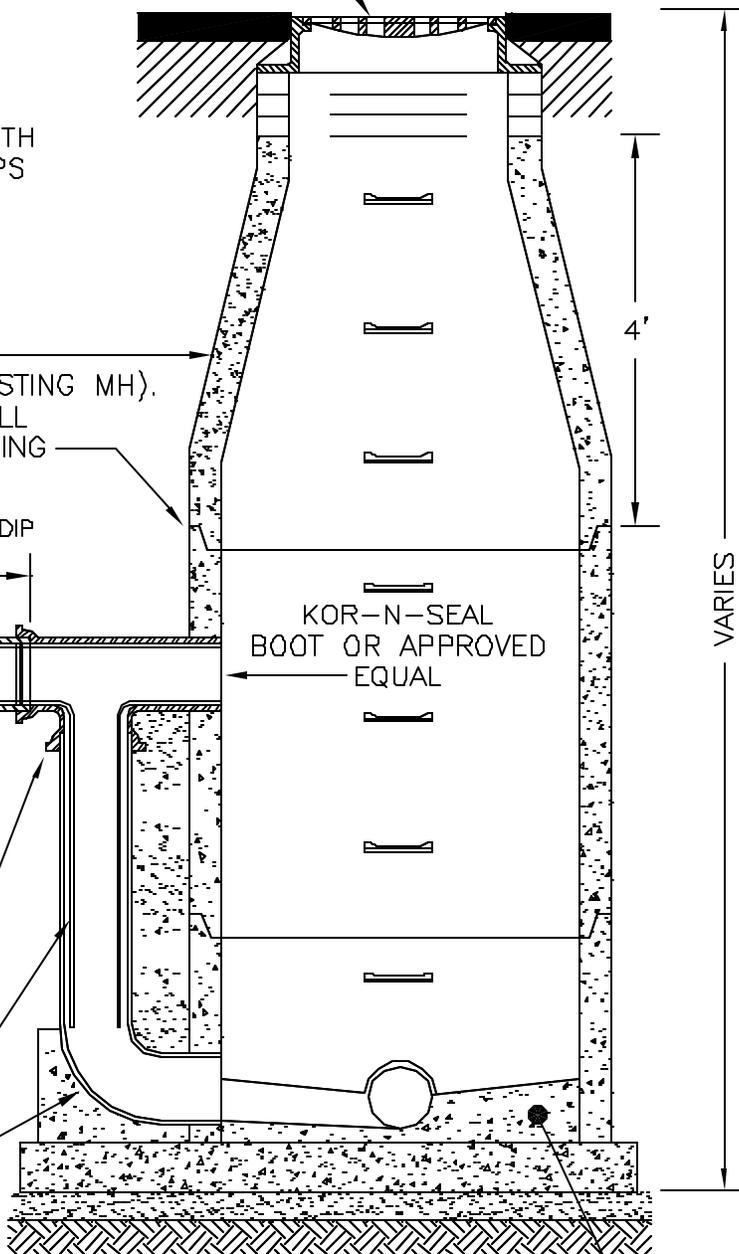
MJ DIP FITTINGS TO
BE USED FOR DROP IF USING DIP

SINGLE PIECE AWWA C-900 6" PVC
OR 6" DIP CL. 52

EXISTING VCP ELBOW OR BEND

6' PVC OR DIP
MIN.

MANHOLE FRAME WITH LID
AS SHOWN IN PLATE 301
SET RIM 1/4" - 1/2"
BELOW FINISHED SURFACE



INVERT FILLET CAST IN PLACE
Mn/DOT 2461 TYPE 3B42 CONCRETE
OR CERTIFIED READY-MIX AIR-ENTRAINED
MORTAR (MW 2506.2B)

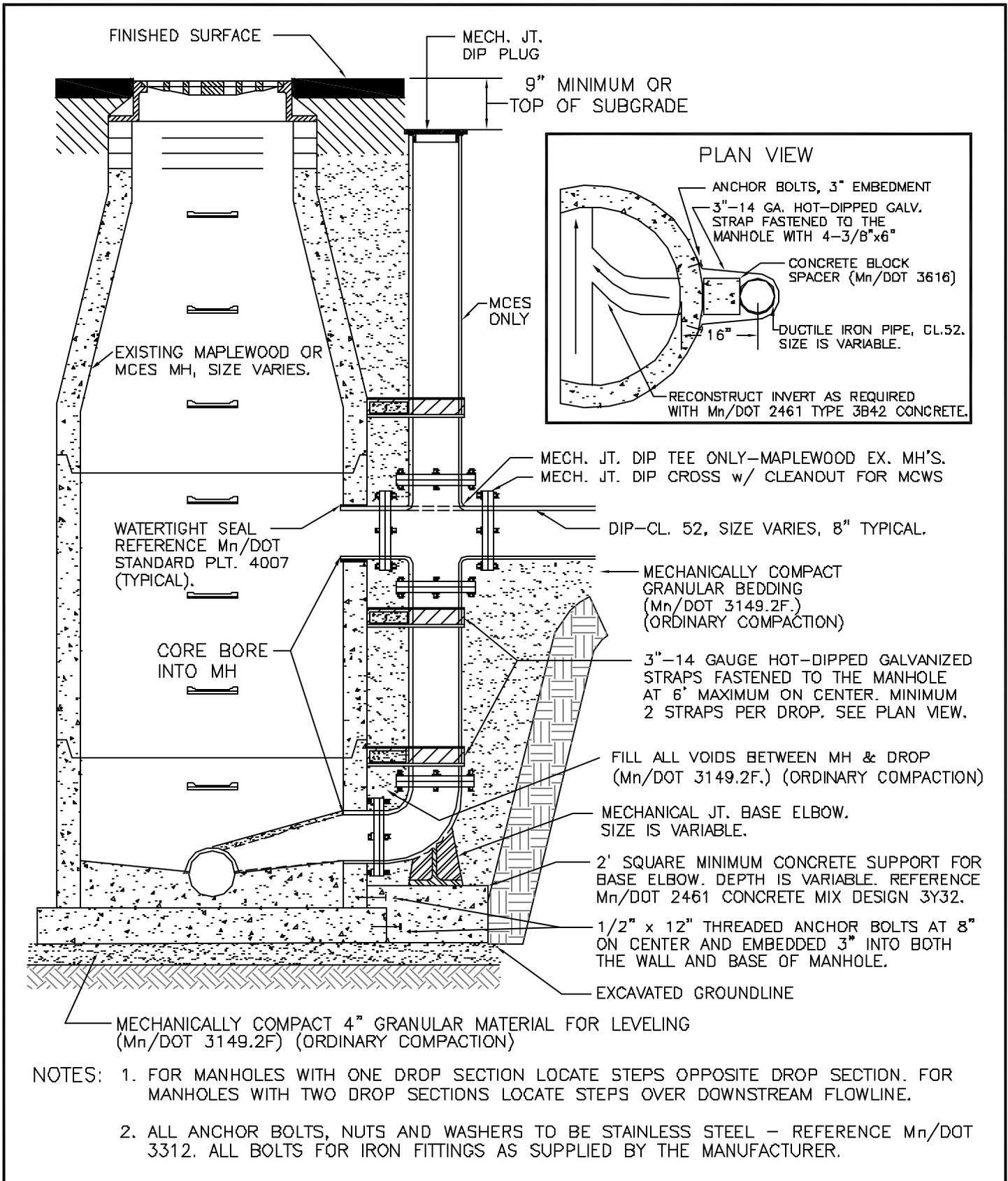
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DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\421		
REVISIONS	10-94	1-97	3-97
3-02			



CITY OF MAPLEWOOD-ENGINEERING DEPT.
RELINING OUTSIDE DROP FOR
SANITARY SEWER MANHOLE

PLATE
NO.

421



DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P422
REVISIONS	3-97 3-02

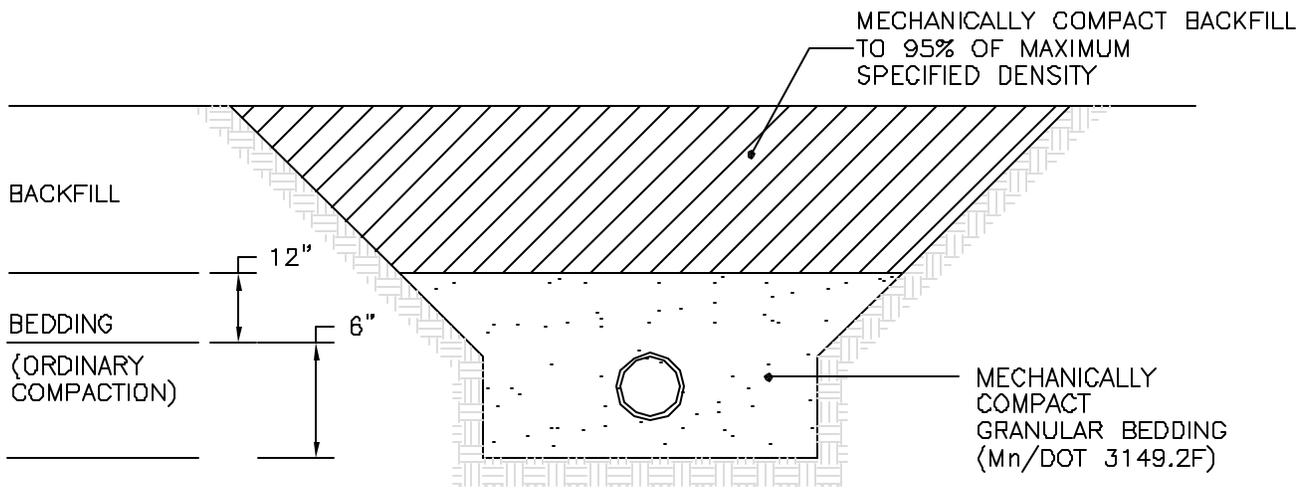


CITY OF MAPLEWOOD—ENGINEERING DEPT.

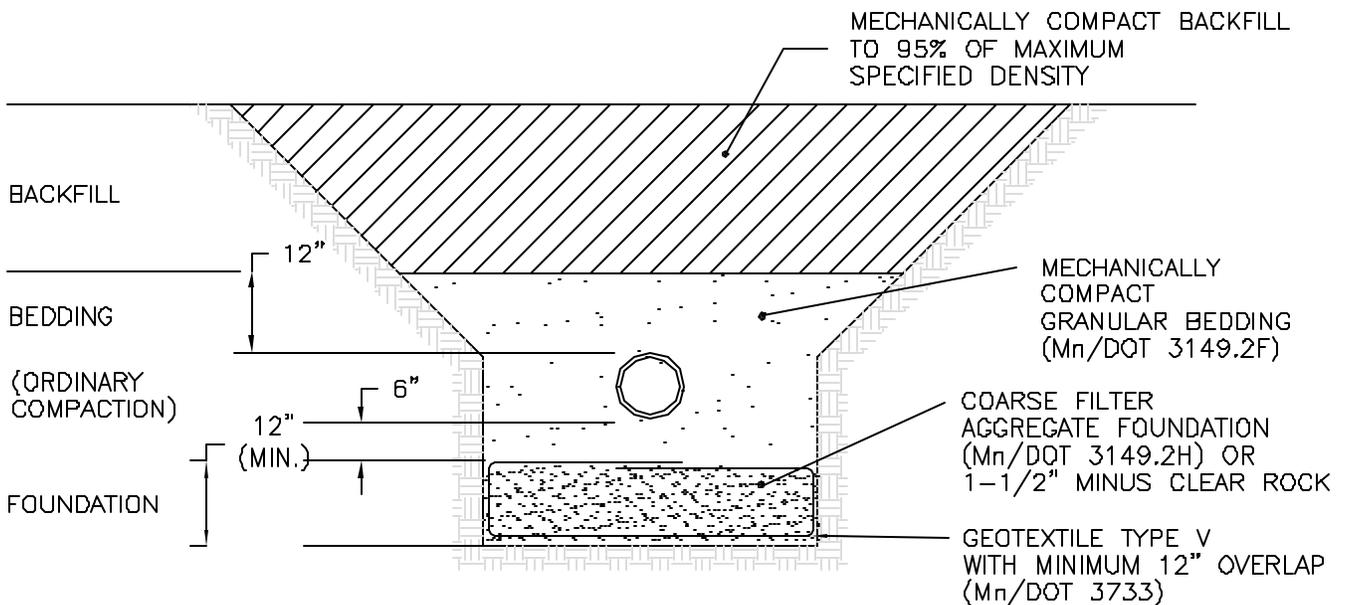
STANDARD DROP CONNECTION TO EXISTING MANHOLE

PLATE NO.

422



TYPICAL PIPE BEDDING



PIPE FOUNDATION IN UNSTABLE SOILS

GRANULAR BEDDING SHALL BE COMPACTED WITH MOTOR DRIVEN EQUIPMENT UNTIL THERE IS NO VISIBLE ADDITIONAL COMPACTION. PARTICULAR CARE SHALL BE TAKEN TO ASSURE NO VOIDS UNDER PIPE HAUNCHES.

BACKFILL OF TRENCHES SHALL BE UNIFORMLY COMPACTED TO 95% OF MAXIMUM SPECIFIED DENSITY. TESTS SHALL BE TAKEN AT 500' INTERVALS, EVERY 3' LAYER, OR AS DIRECTED BY ENGINEER.

ALL EXCAVATIONS MUST COMPLY WITH THE REQUIREMENTS OF OSHA 29 CFR, PART 1926, SUBPART P, EXCAVATION AND TRENCHES.

DESIGN: CMC	DATE: 3-95
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REVISIONS	3-97 3-02

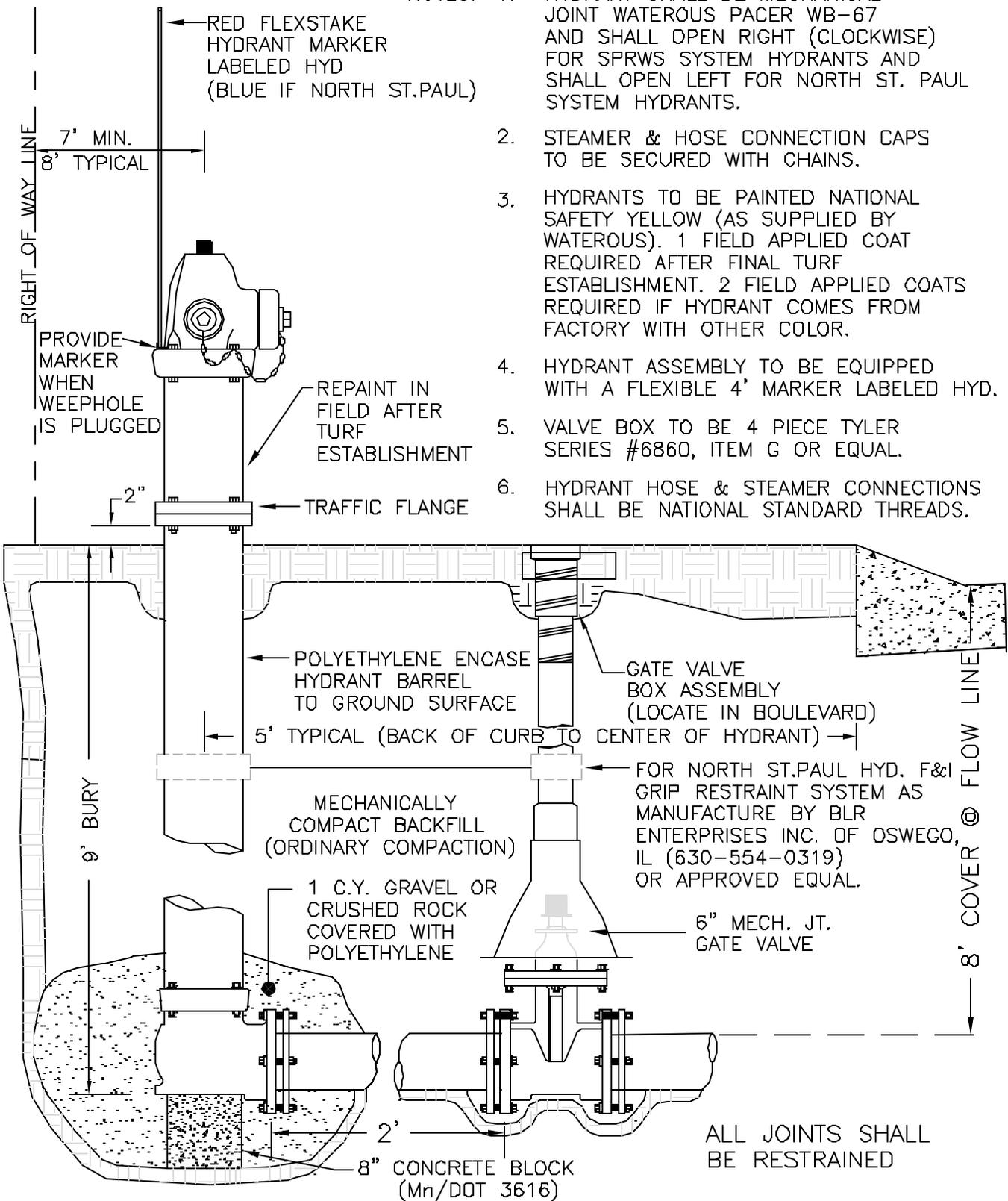


CITY OF MAPLEWOOD—ENGINEERING DEPT.
 EMBEDMENT DETAILS FOR
 P.V.C. OR H.D.P.E. PIPE

PLATE
 NO.

440

- NOTES: 1. HYDRANT SHALL BE MECHANICAL JOINT WATEROUS PACER WB-67 AND SHALL OPEN RIGHT (CLOCKWISE) FOR SPRWS SYSTEM HYDRANTS AND SHALL OPEN LEFT FOR NORTH ST. PAUL SYSTEM HYDRANTS.
2. STEAMER & HOSE CONNECTION CAPS TO BE SECURED WITH CHAINS.
3. HYDRANTS TO BE PAINTED NATIONAL SAFETY YELLOW (AS SUPPLIED BY WATEROUS). 1 FIELD APPLIED COAT REQUIRED AFTER FINAL TURF ESTABLISHMENT. 2 FIELD APPLIED COATS REQUIRED IF HYDRANT COMES FROM FACTORY WITH OTHER COLOR.
4. HYDRANT ASSEMBLY TO BE EQUIPPED WITH A FLEXIBLE 4' MARKER LABELED HYD.
5. VALVE BOX TO BE 4 PIECE TYLER SERIES #6860, ITEM G OR EQUAL.
6. HYDRANT HOSE & STEAMER CONNECTIONS SHALL BE NATIONAL STANDARD THREADS.



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REVISIONS	3-97 3-02



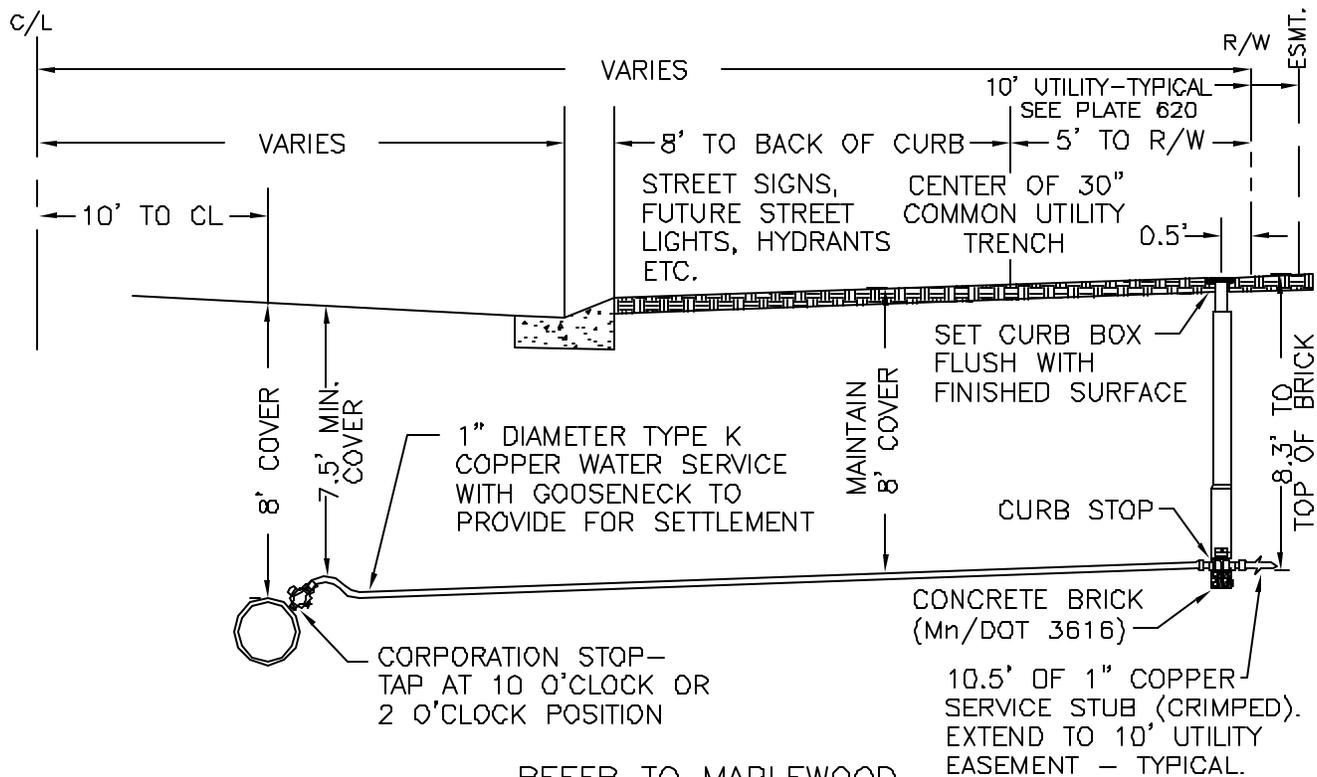
CITY OF MAPLEWOOD-ENGINEERING DEPT.

HYDRANT INSTALLATION

(REFERENCE SPRWS STANDARD PLATE D-3)

PLATE NO.

500



REFER TO MAPLEWOOD SPECIFICATION 0.504:2 AND SPRWS STANDARDS SECTION 3320

	1"
CORP. STOP	FORD FB600-4
	McDONALD 4701B
	MUELLER B-25000
CURB STOP	FORD B22-444M
	McDONALD 6104
	MUELLER MARK II ORISEAL H-15154
CURB BOX	MUELLER B-25154
	FORD EM2-80-56 (1 1/4" I.D.)
	McDONALD 5614 (1 1/4" I.D.)
	* WESTERN NO. 100 TYPE 2"

* MPLS. THREAD BRASS RETAINER RINGS ARE REQUIRED WITH ALL WESTERN NO. 100 CURB BOXES.

* 1 1/2" & 2" WATER SERVICES REQUIRE LARGER BOTTOM SECTION. SEE MAPLEWOOD SPECIFICATION 2504.2

LIQUID TEFLON OR TEFLON TAPE REQUIRED AT ALL THREADED FITTINGS.

TREE PLANTING IN BOULEVARD IS NOT RECOMMENDED—REFERENCE MAPLEWOOD ORDINANCE CHAPTER 33, TREES.

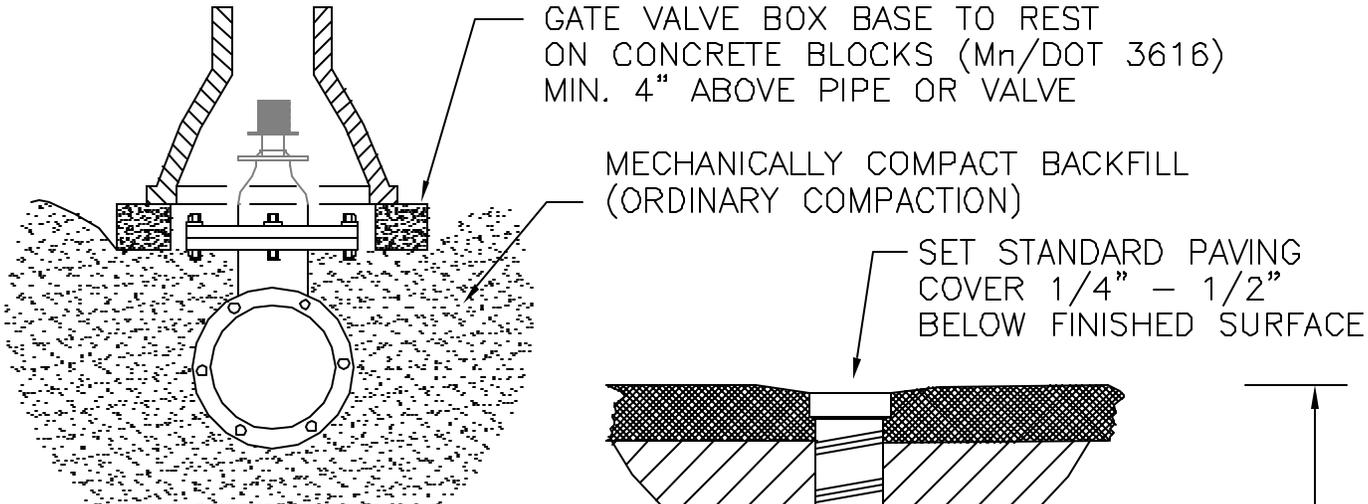
10' CLEARANCE TO TREES REQUIRED BY MAPLEWOOD ENGINEERING STANDARDS CHAPTER 7 @ 7.2B2300

DESIGN: RAM	DATE: 3-95
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REVISIONS	12-95 3-97 11-97
1-02	



CITY OF MAPLEWOOD—ENGINEERING DEPT.
 WATER SERVICE CONNECTION AND
 TYPICAL BOULEVARD PLACEMENT

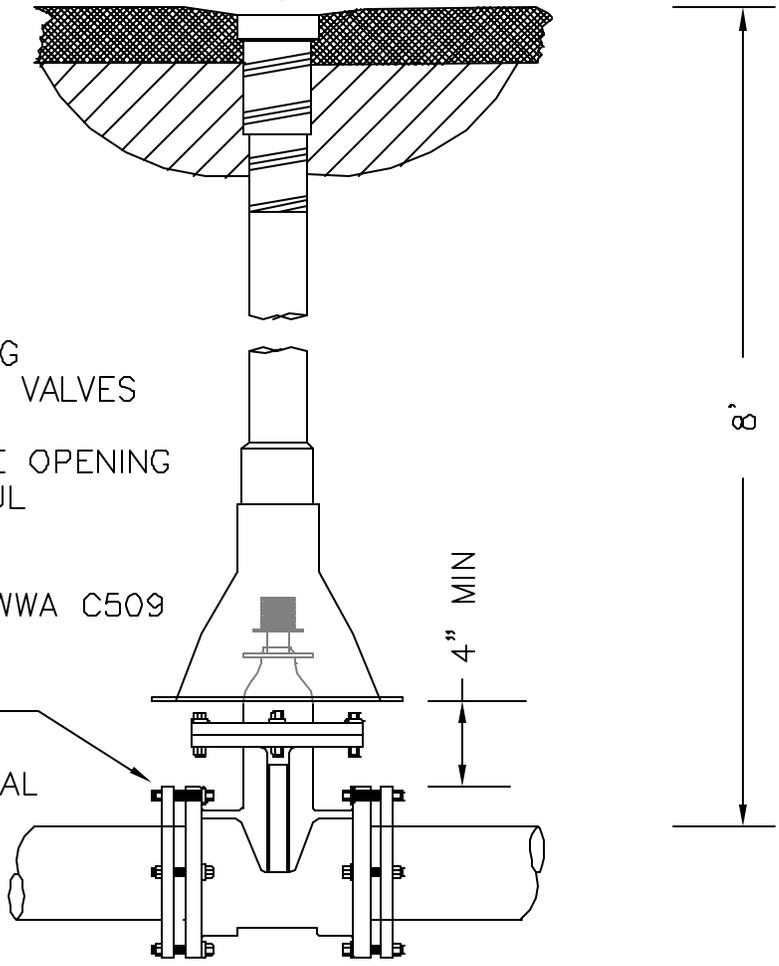
PLATE NO.
 501



DETAIL OF
BASE SUPPORT

- * GATE VALVE
CLOCKWISE OPENING
ON SPRWS SYSTEM VALVES
- COUNTERCLOCKWISE OPENING
ON NORTH ST. PAUL
SYSTEM VALVES
- CONFORMING TO AWWA C509

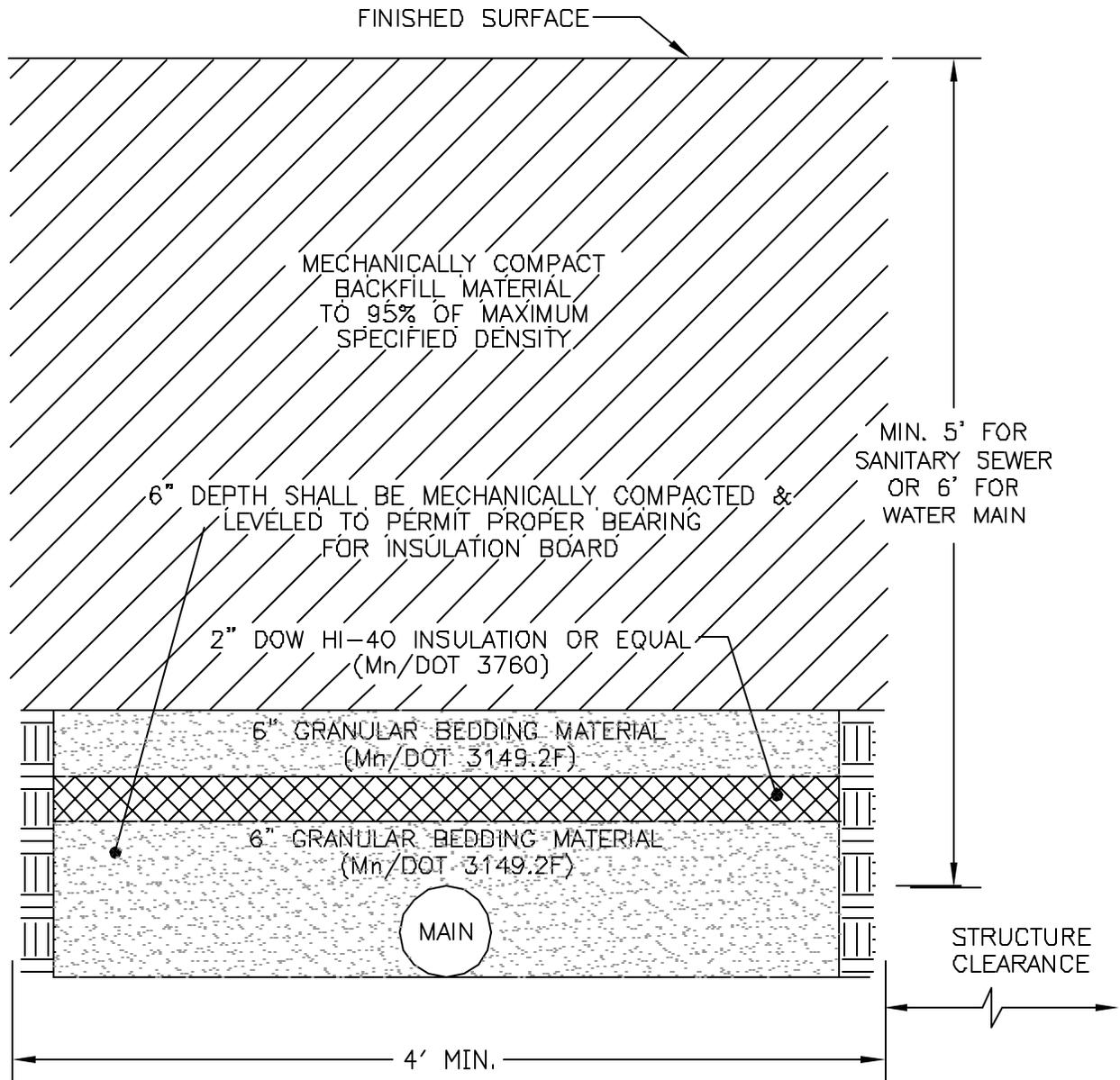
MECHANICAL JOINT FITTING
WITH RESTRAINED JOINTS
MEGALUGS OR APPROVED EQUAL



STANDARD VALVE BOX
TYLER SERIES 6860, ITEM G OR EQUAL

* 16" WATER MAINS AND LARGER REQUIRE BUTTERFLY VALVES

DESIGN: CMC	DATE: 3-95		CITY OF MAPLEWOOD-ENGINEERING DEPT.		PLATE NO.
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P502		GATE VALVE BOX & INSTALLATION		
REVISIONS	3-97	3-02	(REFERENCE SPRWS STANDARD PLATE D-2)		502



STORM SEWER CROSSING WATER MAIN OR SERVICE WITH LESS THAN 3' CLEARANCE REQUIRES AN 8' x 8' SQUARE OF INSULATION CENTERED ON POINT OF CROSSING.

SHALL BE USED ON WATER MAIN IF COVER IS REDUCED TO LESS THAN 7' OR ON SANITARY SEWER IF COVER IS REDUCED TO LESS THAN 6'.

STRUCTURE CLEARANCE OF 12" OR LESS REQUIRES SHEET INSULATION ON EDGE TO A DEPTH EQUAL TO THE BOTTOM OF THE MAIN.

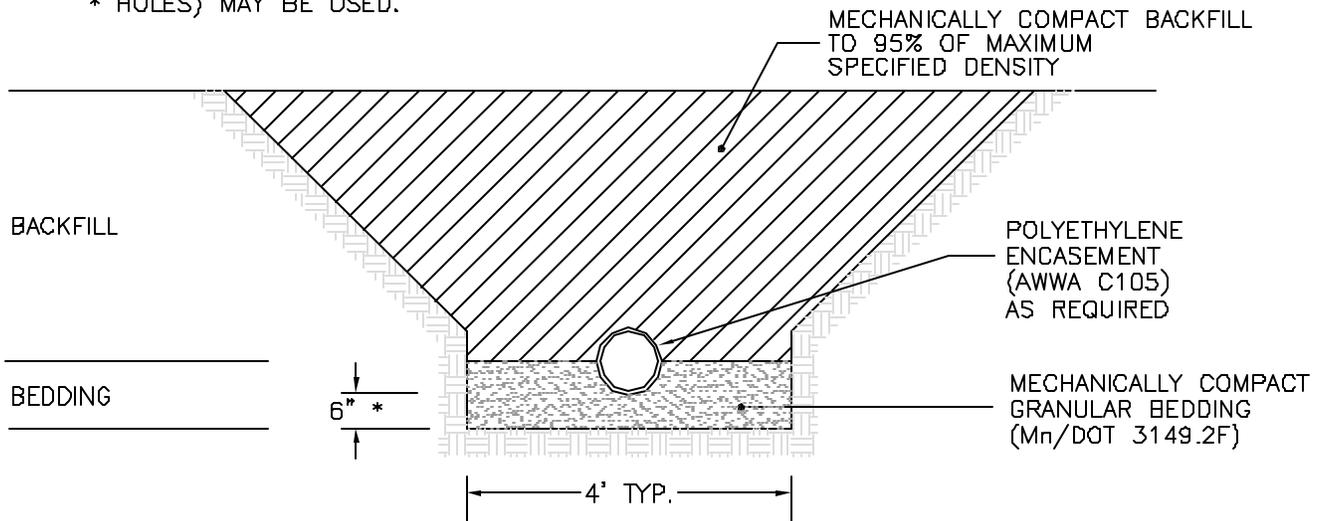
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REVISIONS	3-97 3-02



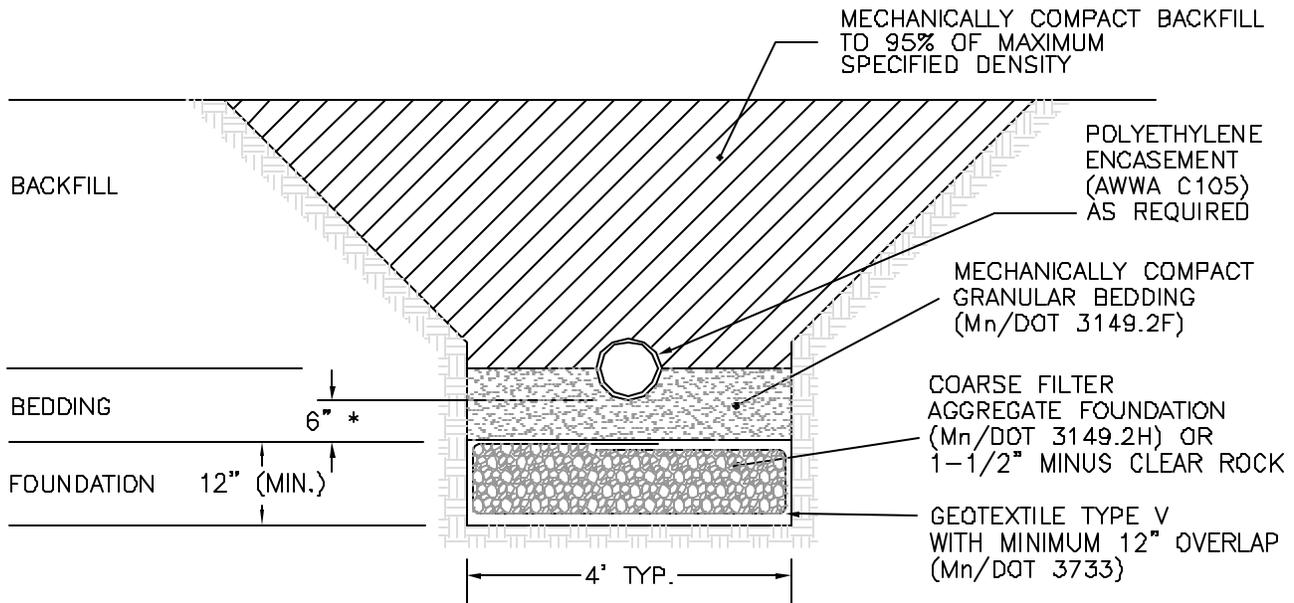
CITY OF MAPLEWOOD-ENGINEERING DEPT.
 PIPE INSULATION DETAIL
 (REFERENCE SPRWS STANDARD PLATE D-5)

PLATE NO.
 530

IN SOILS APPROVED BY THE CITY ENGINEER, A FLAT BOTTOM TRENCH (EXCAVATE BELL * HOLES) MAY BE USED.



PIPE BEDDING
IN HEAVY CLAY OR ROCKY SOILS



PIPE FOUNDATION & BEDDING IN UNSTABLE SOILS

GRANULAR BEDDING SHALL BE COMPACTED WITH MOTOR DRIVEN EQUIPMENT UNTIL THERE IS NO VISIBLE ADDITIONAL COMPACTION. PARTICULAR CARE SHALL BE TAKEN TO ASSURE NO VOIDS UNDER PIPE HAUNCHES.

ALL BACKFILL AND BEDDING SHALL BE UNIFORMLY COMPACTED TO 95% OF MAXIMUM SPECIFIED DENSITY. TEST SHALL BE TAKEN AT 500' INTERVALS, EVERY 3' LAYER, OR AS DIRECTED BY ENGINEER.

ALL EXCAVATIONS MUST COMPLY WITH THE REQUIREMENTS OF OSHA 29 CFR, PART 1926, SUBPART P, EXCAVATION AND TRENCHES.

DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P540
REVISIONS	3-97 3-02



CITY OF MAPLEWOOD-ENGINEERING DEPT.

EMBEDMENT DETAILS
FOR DUCTILE IRON PIPE

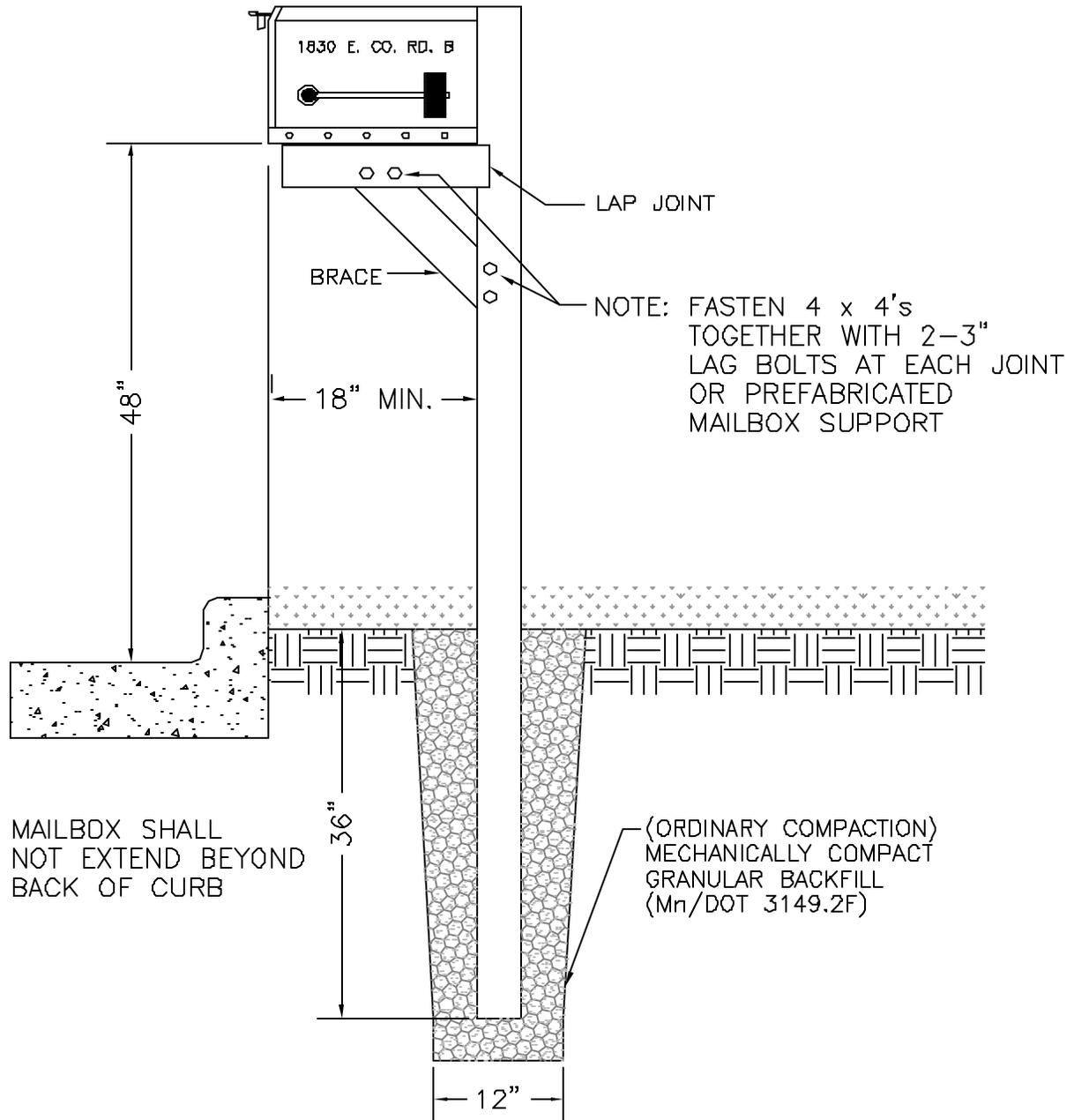
PLATE
NO.

540

HAVE BOX EXTEND AS FAR IN FRONT OF SUPPORT POST AS POSSIBLE. (THIS PREVENTS POSSIBLE SNOW PLOW DAMAGE.)

ADDRESS MUST BE ON SIDE OF BOX FROM WHICH CARRIER APPROACHES IN ONE INCH LETTERS (MIN. HEIGHT) (OR ON FRONT WHERE BOXES ARE GROUPED.)

BOX MUST BE LOCATED SO CARRIER CAN SERVE WITHOUT LEAVING VEHICLE.

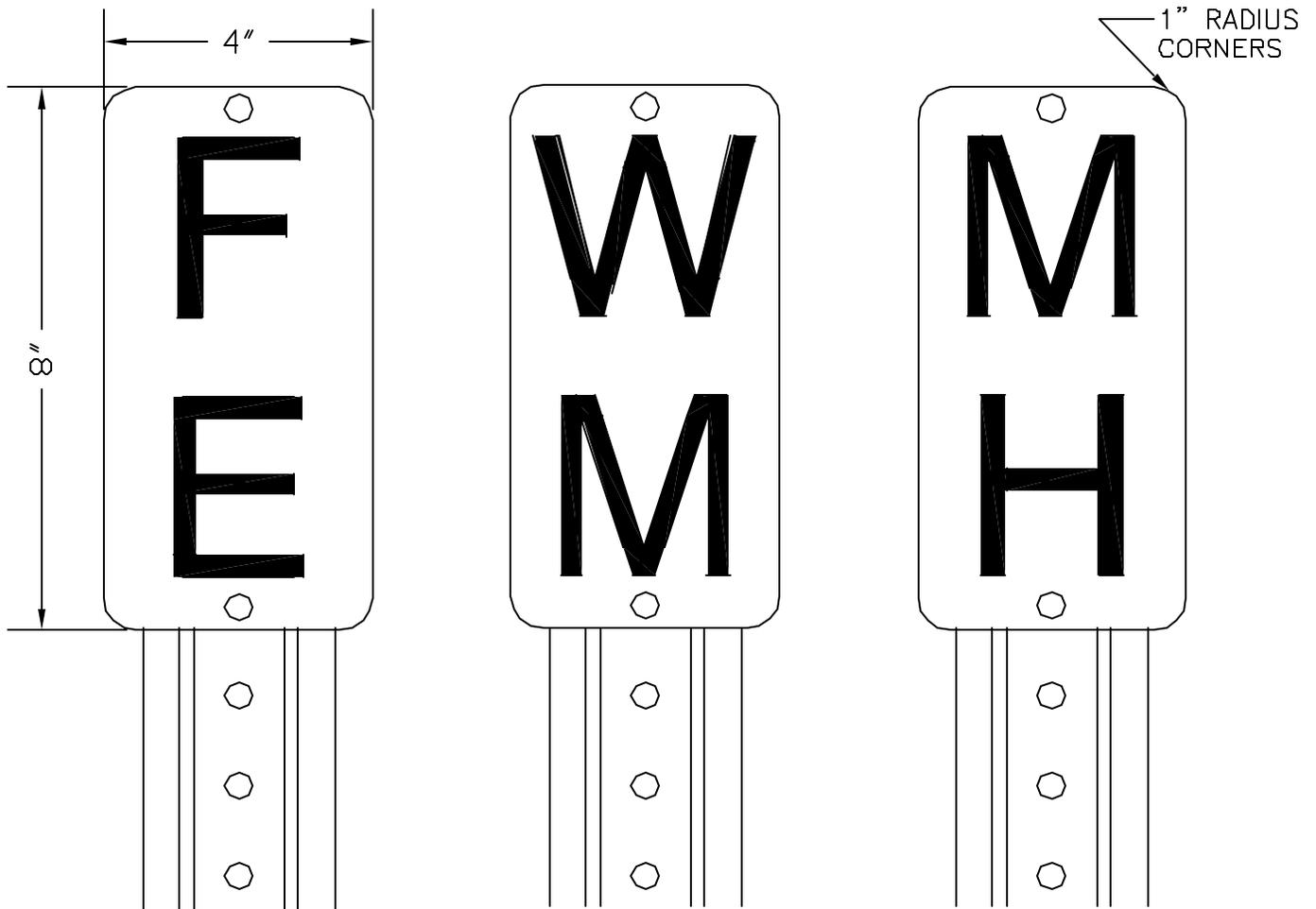


DESIGN: CMC	DATE: 3-95		
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P600		
REVISIONS	3-97	3-99	3-02



CITY OF MAPLEWOOD-ENGINEERING DEPT.
**CORRECT METHOD OF MAILBOX
 INSTALLATION FOR CITY DELIVERY**

PLATE
 NO.
600



0.063" THICK ALUMINUM HIGH INTENSITY
RETRO-REFLECTORIZED FOR ALL SIGNS.

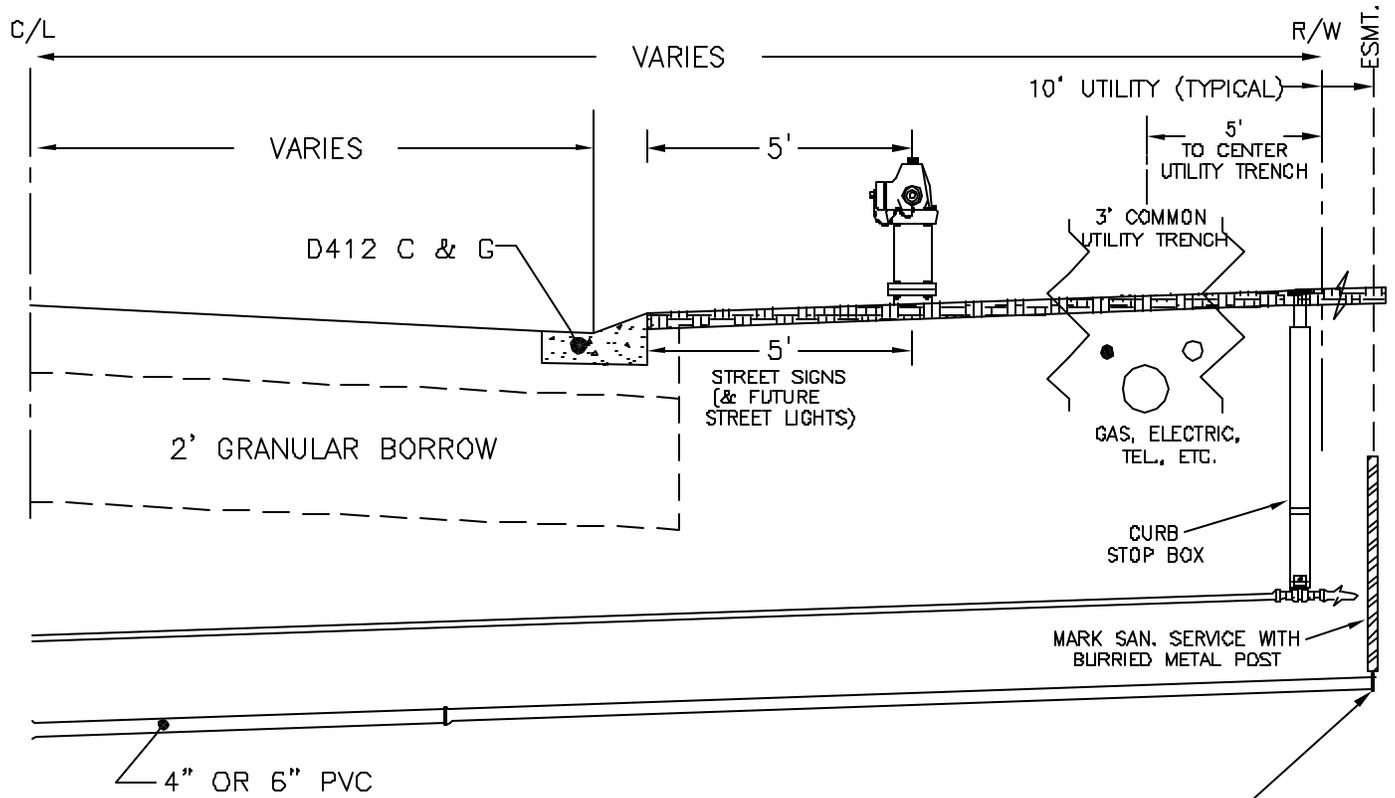
BLACK LETTERS ON WHITE BACKGROUND FOR SEWER.

WHITE LETTERS ON BLUE BACKGROUND FOR WATER.

U-CHANNEL POST, MINIMUM 3.0 LB./FT.,
7.5' LONG, GALVANIZED & BURIED 2.5'.

MARKERS REQUIRED AT ALL OFF ROAD STRUCTURES
EXCEPT AS DIRECTED BY THE ENGINEER.

DESIGN: CMC	DATE: 3-95		CITY OF MAPLEWOOD-ENGINEERING DEPT. OFF ROAD STRUCTURE MARKERS	PLATE NO.
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\P801			601
REVISIONS				



PRIOR TO PLACEMENT OF GRANULAR BORROW INSTALL 4" OR 6" PVC, SCHEDULE 40, SOLVENT WELD CONDUIT. REFERENCE MAPLEWOOD SPECIAL PROVISION MW-2505. CAP ENDS TO PREVENT WATER INFILTRATION. EXTEND SEWER AND WATER TO EASEMENT LINE

TREE PLANTING IN BOULEVARD IS NOT RECOMMENDED- REFERENCE MAPLEWOOD ORDINANCE CHAPTER 33, TREES.

TYPICAL UTILITY CONDUIT LENGTHS—OPTIONAL, PLACED AT OR BEFORE C & G PC'S OR PT'S

"D" CURB - TYPICAL CITY STREETS (MINIMUM)

"B" CURB - TYPICAL COUNTY ROADS (MINIMUM)

F-F	B-B	(F-F + 14')
28'	30'	42'
32'	34'	46'
36'	38'	50'
40'	42'	54'

F-F	B-B	(F-F + 14')
40'	41.33'	54'
44'	45.33'	58'
52'	53.33'	66'
66'	67.33'	80'

LENGTHS WILL INCREASE WHEN PLACED WITHIN A STANDARD 25' RADIUS

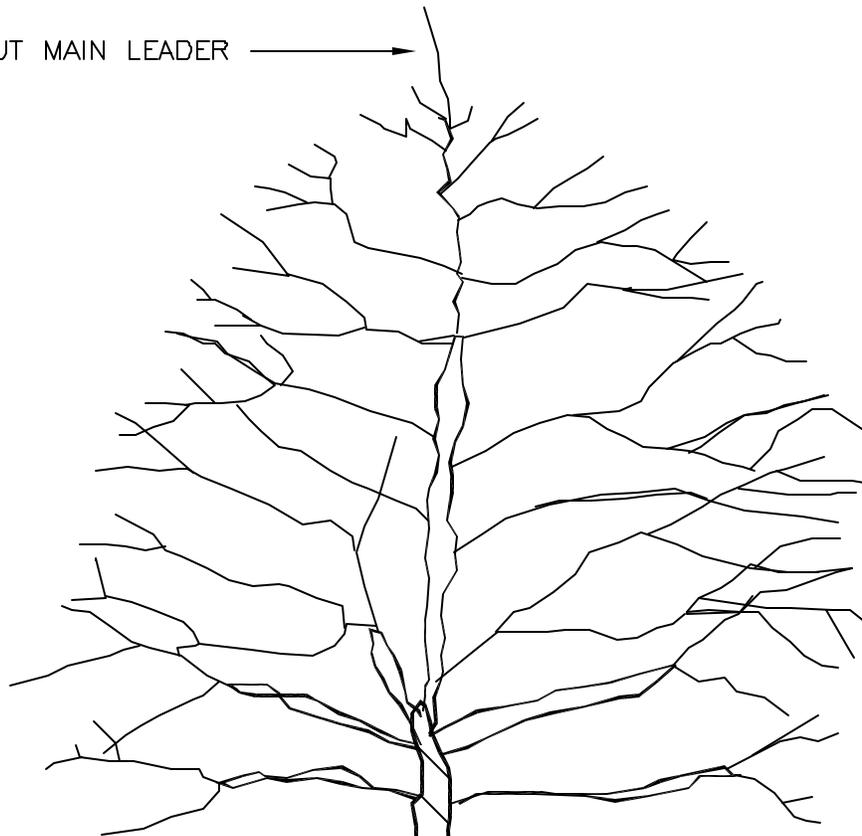
DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME: P:\WORKS\CAD\PLATES\ P620
REVISIONS	3-97 1-02



CITY OF MAPLEWOOD—ENGINEERING DEPT.
TYPICAL BOULEVARD UTILITIES

PLATE NO.
620

DO NOT CUT MAIN LEADER →



SET TREE PLUMB

4" WOOD CHIP MULCH
(4' DIA. CIRCLE)

KEEP AWAY FROM CONTACT
WITH TRUNK

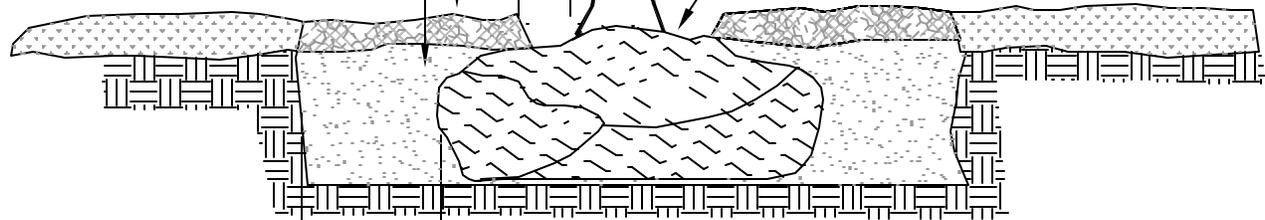
CUT STRINGS & FOLD
BURLAP BACK

DEPTH TO MATCH
ROOT BALL

4"
MIN.

WRAP TRUNK TO LOWER
BRANCHES w/COMMERCIAL
GRADE TREE WRAP &
SECURE (FALL PLANTING
ONLY)

GROUND LINE TO BE SAME
AS AT NURSERY
DO NOT PLANT TOO DEEP



18" MIN.
PLANTING SOIL
& MULCH

DESIGN: CMC	DATE: 3-95
DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P650
REVISIONS	3-97 3-01



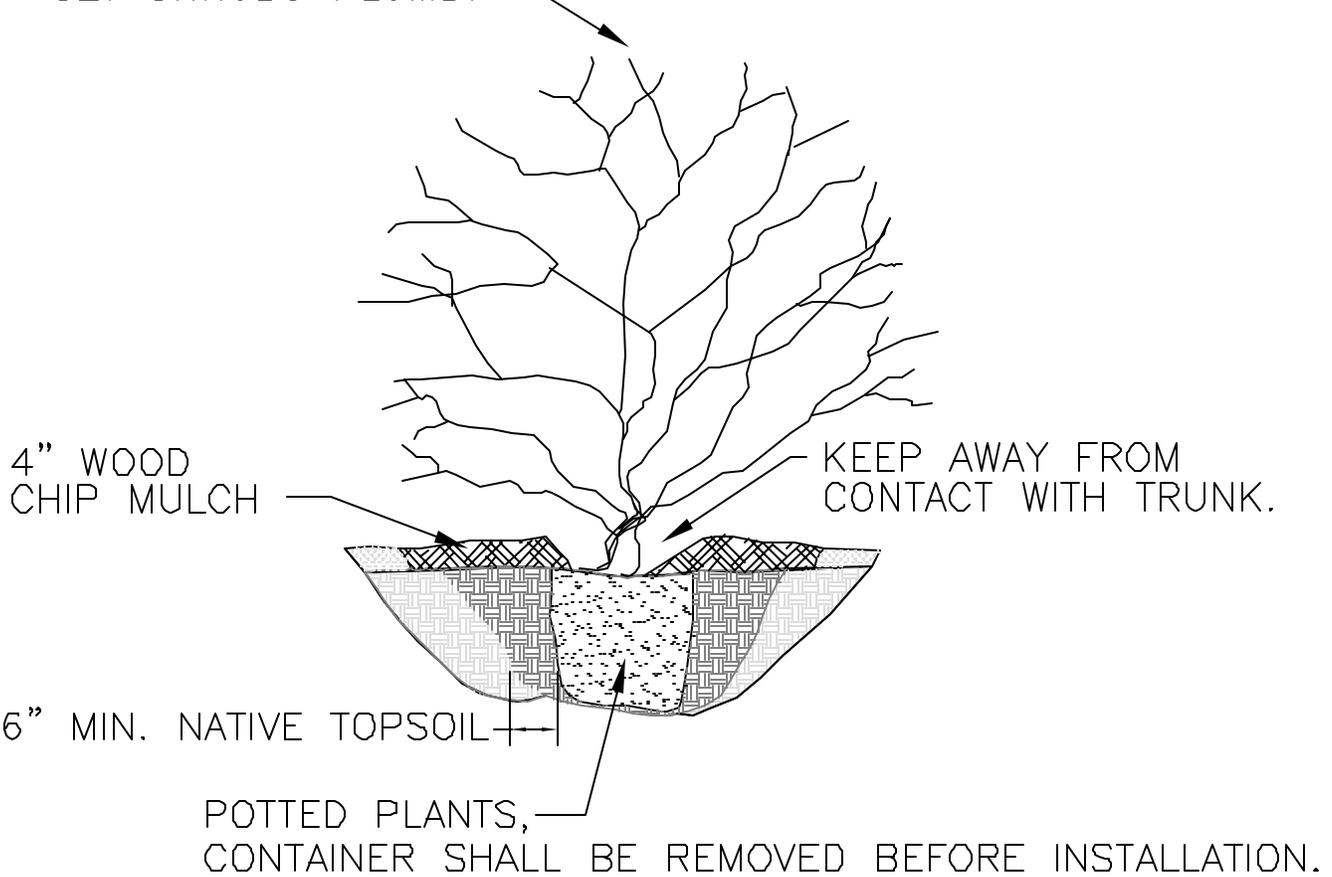
CITY OF MAPLEWOOD-ENGINEERING DEPT.

TREE PLANTING DETAIL

PLATE
NO.

650

REMOVE POT BEFORE PLANTING.
 LEAVE SOIL & ROOTS INTACT.
 SET SHRUBS PLUMB.



DESIGN: CMC	DATE: 5/96		
DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P651		
REVISIONS			



CITY OF MAPLEWOOD—ENGINEERING DEPT.

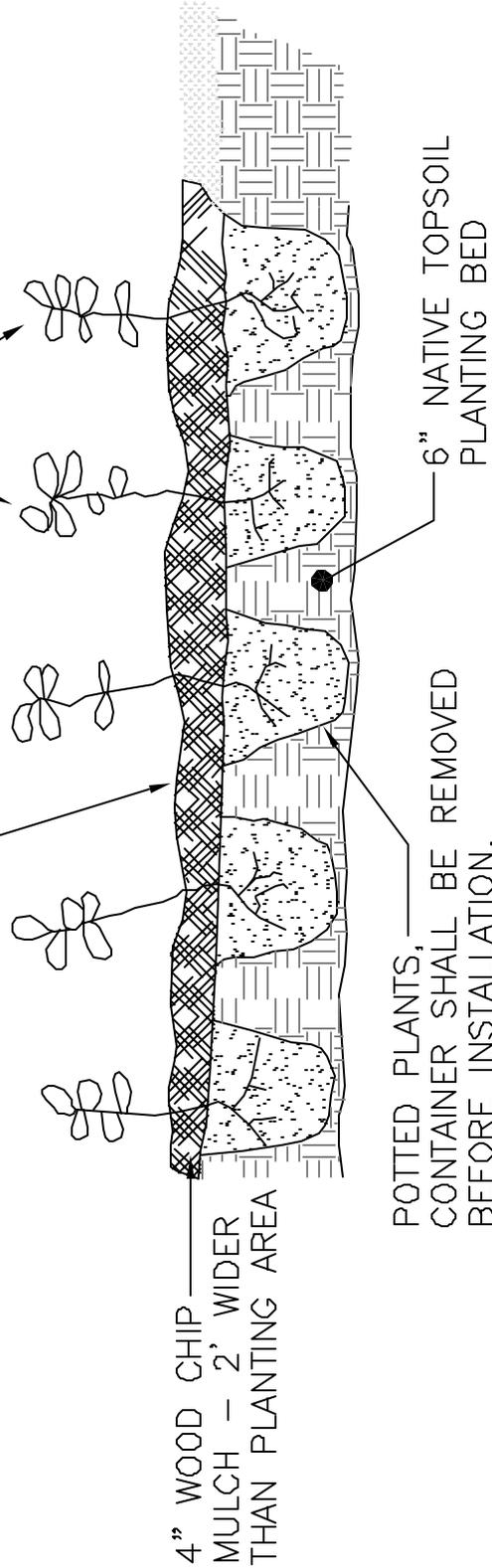
SHRUB PLANTING DETAIL

PLATE NO.

651

MOVE WOOD CHIP MULCH ASIDE, LOOSEN & PLANT IN PREPARED TOPSOIL. REPLACE WOOD CHIPS BEING CAREFUL NOT TO COVER PLANTS.

SPACING AS SHOWN ON PLAN



4" WOOD CHIP MULCH - 2' WIDER THAN PLANTING AREA

POTTED PLANTS, CONTAINER SHALL BE REMOVED BEFORE INSTALLATION.

6" NATIVE TOPSOIL PLANTING BED

DESIGN: CMC	DATE: 5/1/96
DRAWN: RKL	FILENAME:P:\WORKS\CAD\PLATES\P652
REVISIONS	

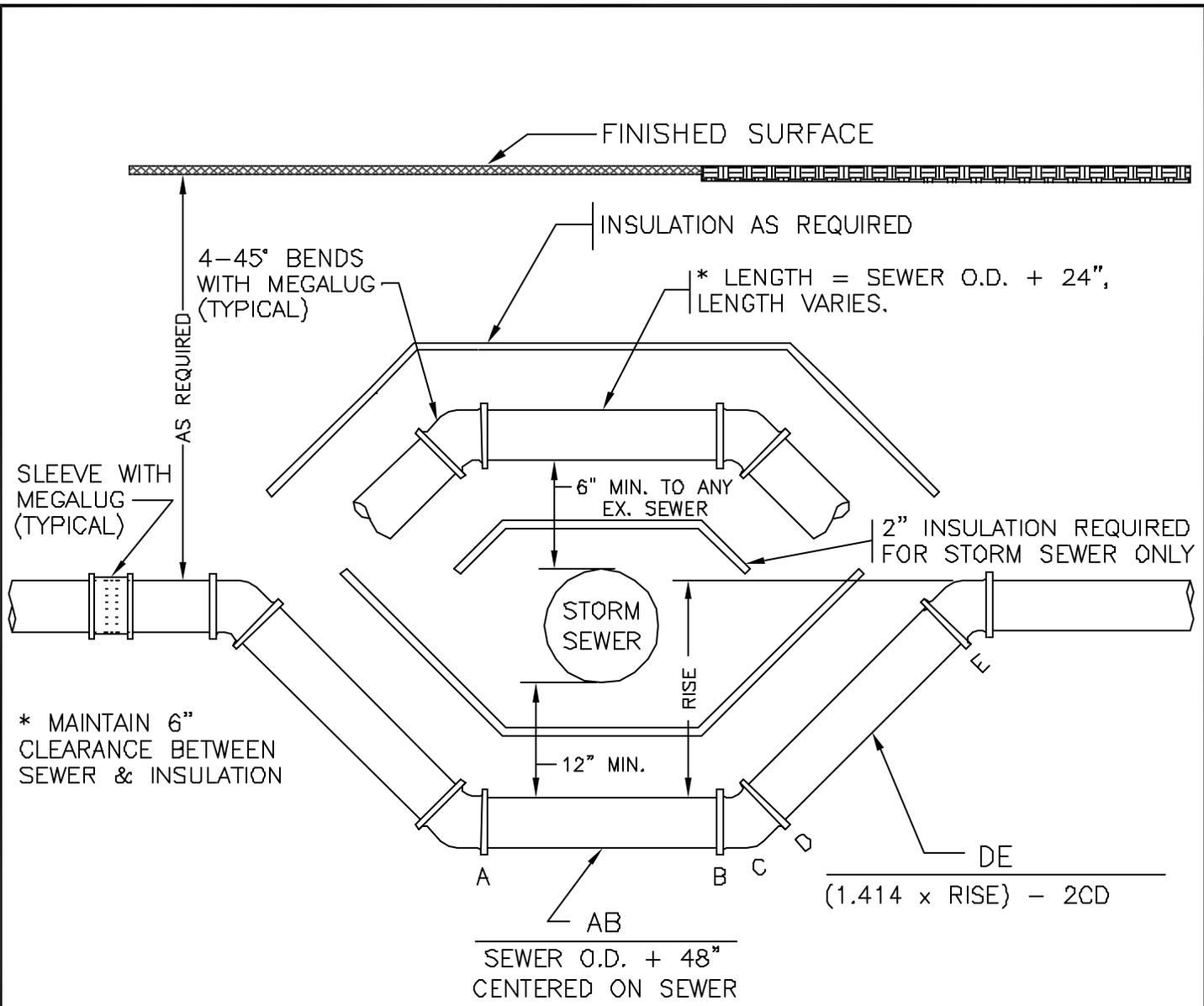


CITY OF MAPLEWOOD-ENGINEERING DEPT.

GROUND COVER PLANTING DETAIL

PLATE NO.

652



WM DIA.	CD(STD. CIP)	CD(COMPACT DIP)
6"	5"	3"
8"	5.5"	3.5"
12"	7.5"	5.5"
16"	8"	5.5"

*FOR RESTRAINED PIPE LENGTHS ON EACH SIDE OF BENDS SEE PLATE D-11

DR.	TR.	WATER UTILITY - CITY OF ST. PAUL, MN.	STANDARD PLATE
CH.			
APPROVED			
TYPICAL WATER MAIN OFFSETS			D-10

MINIMUM FEET OF RESTRAINED PIPE REQUIRED ON EACH SIDE OF BEND FOR DUCTILE IRON PIPE

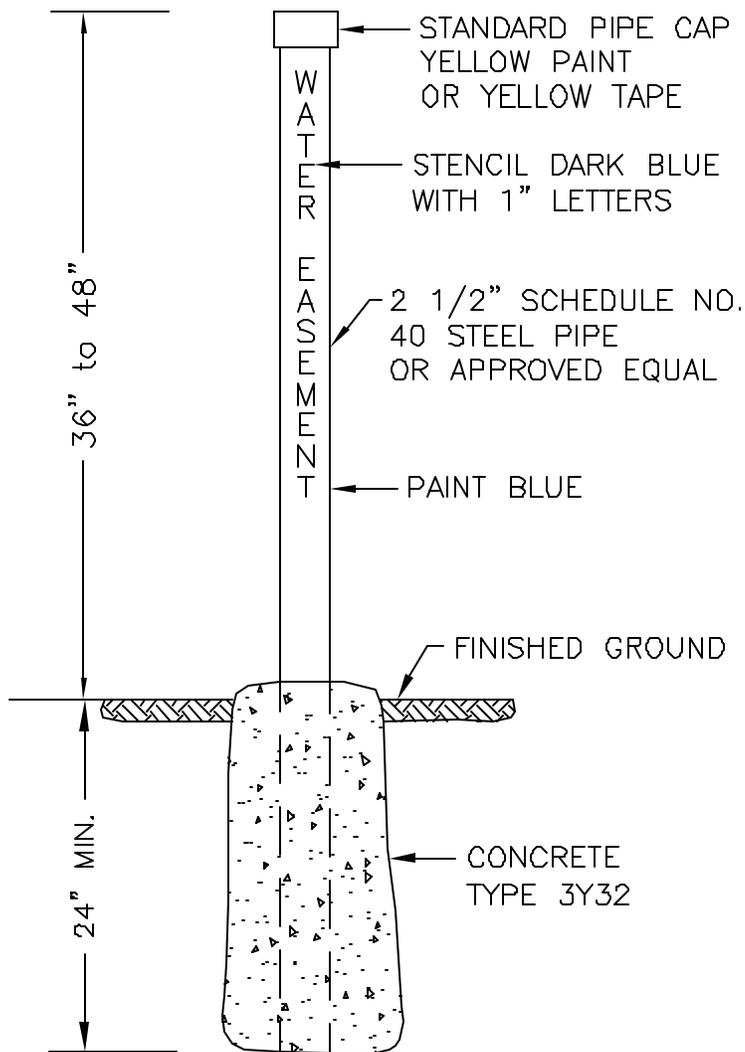
INCREASE MINIMUM LENGTHS BY THE FOLLOWING
AMOUNTS IF PIPE IS WRAPPED IN POLYETHYLENE.

50% INCREASE ON ALL DEAD ENDS.
20% INCREASE ON ALL BENDS.

PIPE SIZE	7.0' COVER				7.5' COVER				8.0' COVER			
	22.5°	45°	90°	DEAD END	22.5°	45°	90°	DEAD END	22.5°	45°	90°	DEAD END
4"	2	3	8	18	2	3	8	18	1	3	8	17
6"	2	5	12	26	2	5	11	25	2	4	11	25
8"	3	6	15	34	3	6	15	33	3	6	14	32
12"	4	9	22	50	4	9	21	48	4	8	20	46
16"	6	12	29	65	5	11	27	63	5	11	26	61
20"	7	15	35	80	7	14	34	77	6	13	32	75
24"	8	17	41	95	8	16	40	92	8	16	38	89
30"	10	21	50	117	10	20	48	113	9	19	46	109
36"	12	24	59	138	11	23	57	133	11	22	54	129
42"	13	28	67	159	13	27	65	153	12	26	62	148
48"	15	31	75	179	14	30	72	173	14	29	69	167

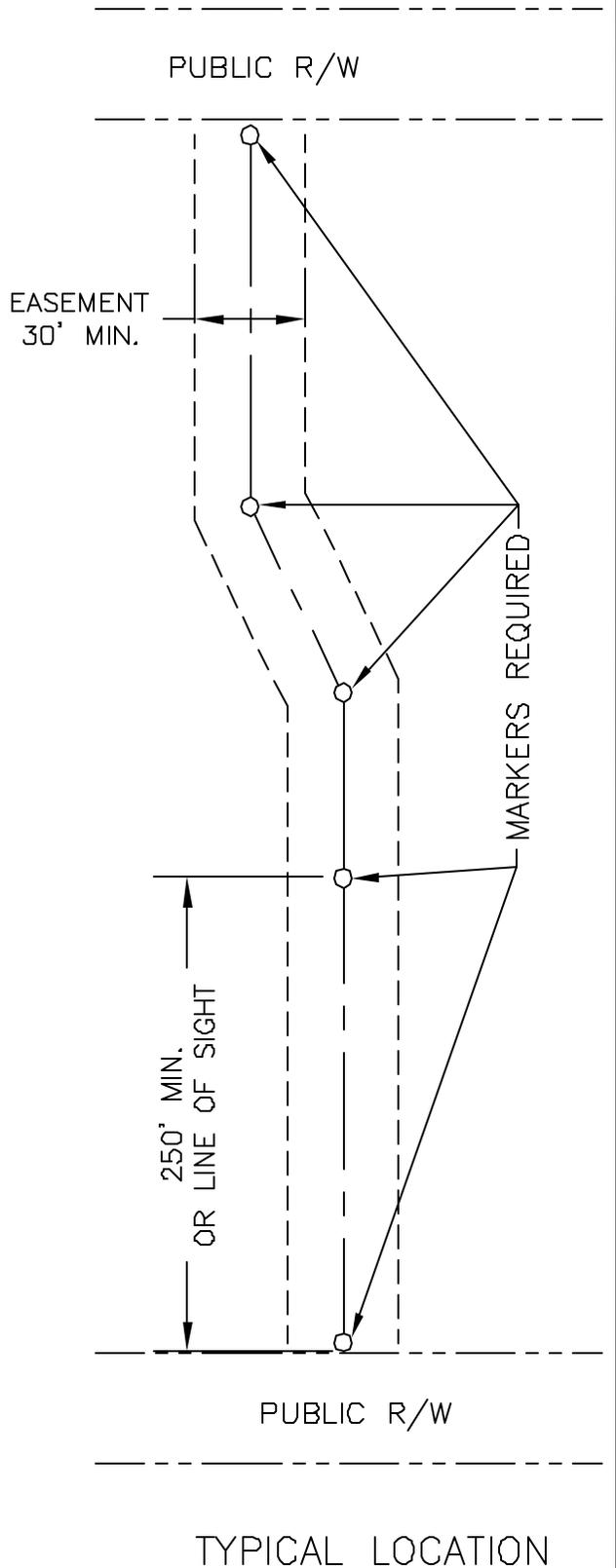
THE TABLE WAS DEVELOPED FROM CRITERIA IDENTIFIED IN THE 1992 EDITION OF "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE", AS PUBLISHED BY THE DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA). THE TABLE ASSUMES COH-GRAN SOIL AND TYPE 4 LAYING CONDITIONS. REFER TO DIPRA FOR MINIMUM LENGTHS IF DIFFERENT SOIL OR LAYING CONDITIONS ARE ENCOUNTERED.

DR.	TR.	WATER UTILITY – CITY OF ST. PAUL, MN. RESTRAINED PIPE REQUIREMENT 7.0' – 8.0' EARTH COVER	STANDARD PLATE
CH.			D-11
APPROVED			3 of 3



MARKER DETAIL

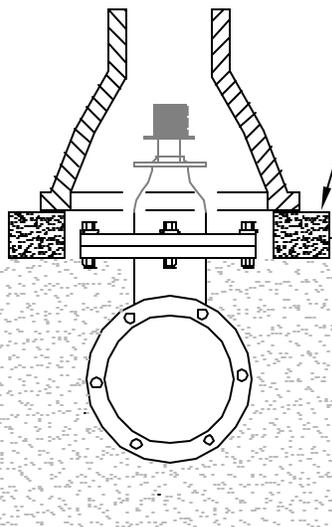
NOTE: THE HEIGHT, MATERIAL, AND COLOR OF THE MARKER MAY BE ADJUSTED BY THE WATER UTILITY INSPECTOR AS FIELD CONDITIONS REQUIRE. HOWEVER, THE MINIMUM HEIGHT ABOVE GROUND LEVEL SHALL BE 36".



DR.	TR.
CH.	1-02
APPROVED	

WATER UTILITY - CITY OF ST. PAUL, MN.
**STANDARD EASEMENT
 MARKER**

STANDARD PLATE
D-12

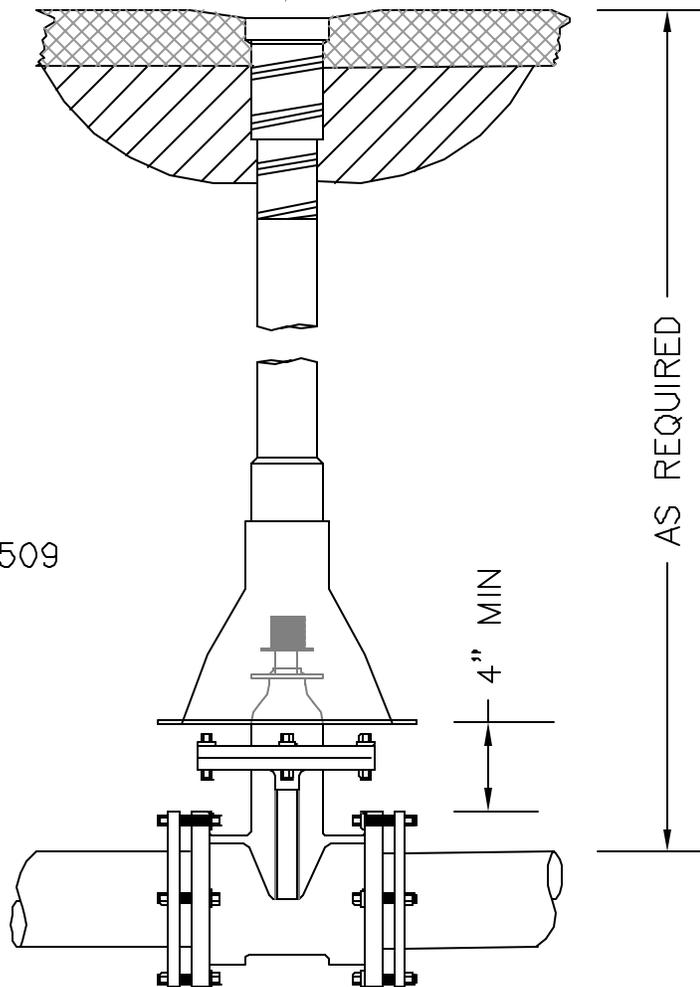


DETAIL OF
BASE SUPPORT

GATE BOX BASE TO REST
ON CONCRETE BLOCKS (Mn/DOT 3616)
MIN. 4" ABOVE AND ALONG SIDE OF
PIPE OF VALVE

COMPACTED
BACKFILL

SET STANDARD PAVING
COVER BETWEEN FLUSH
AND 1/2" BELOW
FINISHED SURFACE



GATE VALVE
MECHANICAL JOINT
CLOCKWISE OPENING
CONFORMING TO AWWA C509

VALVE BOX
TYLER SERIES 6860
ITEM G OR
APPROVED EQUAL

4" MIN

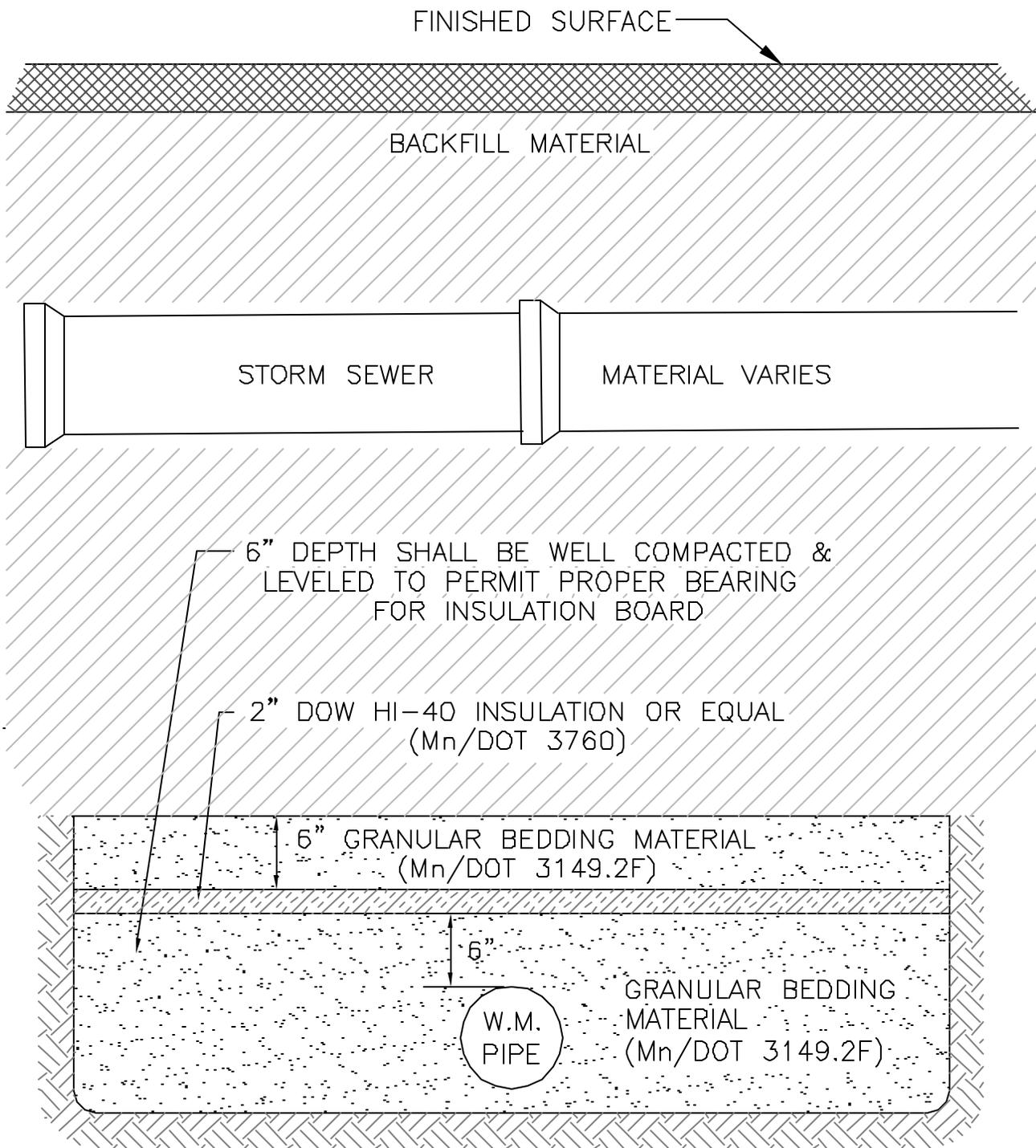
AS REQUIRED

12" WATER MAINS AND LARGER REQUIRE BUTTERFLY VALVES

DR.	TR.
CH.	
APPROVED	

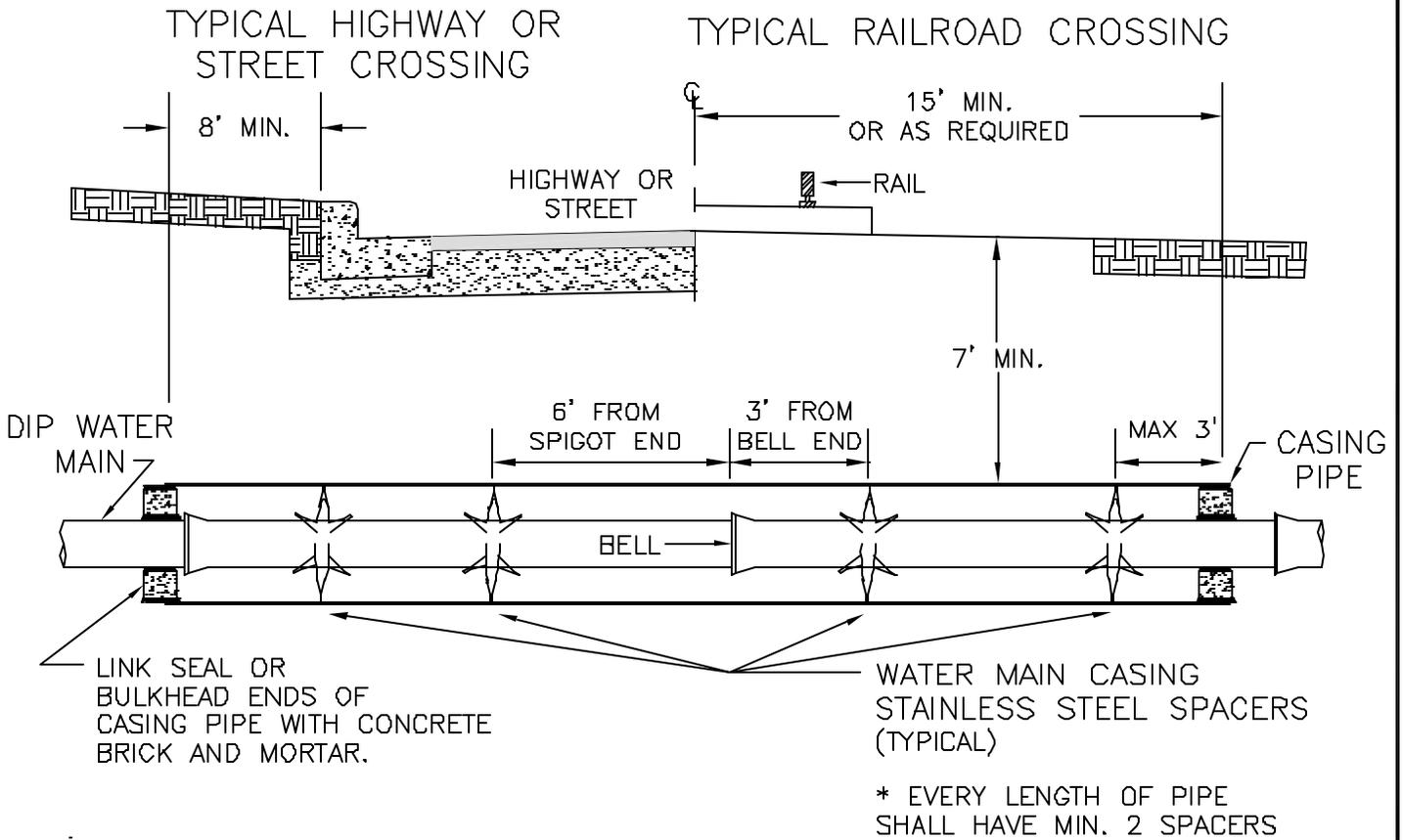
WATER UTILITY - CITY OF ST. PAUL, MN.
GATE VALVE BOX & INSTALLATION

STANDARD PLATE
D-2



STORM SEWER CROSSING WATER MAIN OR SERVICE WITH LESS THAN 3' CLEARANCE REQUIRES AN 8' x 8' SQUARE OF INSULATION CENTERED ON POINT OF CROSSING.

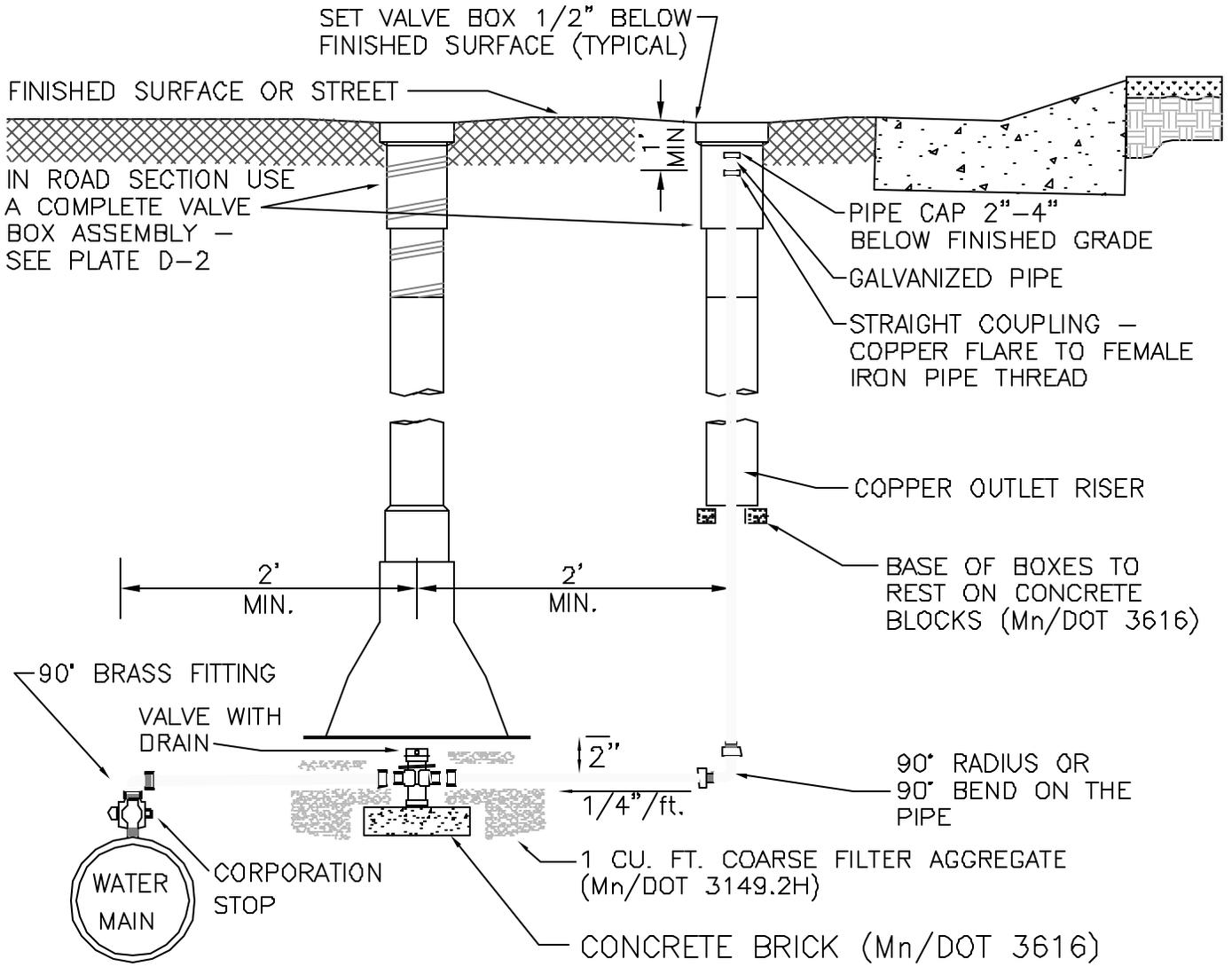
DR.	TR.	WATER UTILITY - CITY OF ST. PAUL, MN.	STANDARD PLATE
CH.	PIPE INSULATION DETAIL		
APPROVED			



BELL O.D. (MJ PIPE)	SIZE OF MAIN	MINIMUM CASING SIZE	MINIMUM CASING WALL THICKNESS
11.12"	6"	18"	0.250"
13.37"	8"	20"	0.250"
17.88"	12"	24"	0.250"
22.50"	16"	30"	0.375"
27.00"	20"	36"	0.500"
31.50"	24"	42"	0.500"

- * CASING SPACERS ARE REQUIRED ON WATER MAIN AND SHALL BE INCIDENTAL TO CASING UNLESS OTHERWISE SPECIFIED.
- * ALL WATER MAIN IN CASING PIPE SHALL BE APPROVED RESTRAINED JOINT.
- * CASING PIPE TO BE WELDED STEEL WITH A MINIMUM YIELD OF 35,000 PSI. WALL THICKNESS SHALL BE AS DESIGNATED BY THE PERMITTING AUTHORITY. IN NO CASE SHALL THE CASING PIPE WALL THICKNESS BE LESS THAN 0.25". STEEL CASING PIPE COATING AS PER ASTM A139, GRADE B RED MILL ON THE INSIDE AND OUTSIDE OF THE PIPE SHALL BE COAL TAR ENAMEL COATED AS PER AWWA C203.
- * CASING SPACERS SHALL BE STAINLESS STEEL AS MANUFACTURED BY CASCADE WATERWORKS MFG., ADVANCED PRODUCTS & SYSTEMS, INC., OR APPROVED EQUAL.
- * ENDS OF CASING PIPE SHALL BE SEALED WITH BRICKS AND MORTAR OR LINK SEAL, SAND FILL IN CASING TUBE IS NOT ALLOWED.

DR.	TR.	WATER UTILITY – CITY OF ST. PAUL, MN. TYPICAL CASING PIPE INSTALLATION	STANDARD PLATE
CH.			
APPROVED			D-6



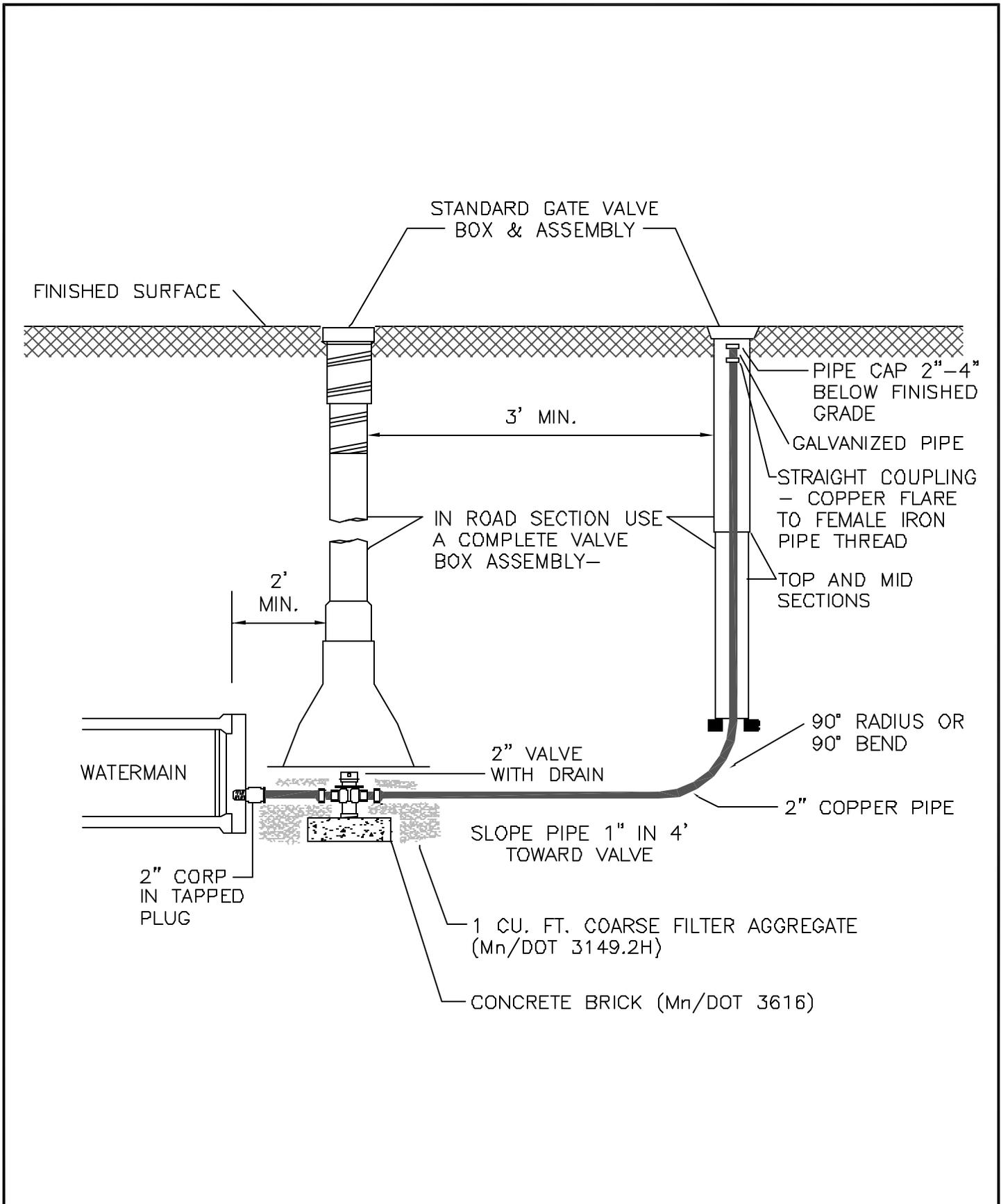
MAIN SIZE	AIR VENT SIZE
LESS THAN 12"	1"
12"	1 1/2"
16"	1 1/2"
20"	1 1/2"
GREATER THAN 20"	2"

NOTE: TEE VALVE MUST BE APPROVED DRAINING VALVE. SEE SECTION 331C WATER SERVICE CURB STOP VALVES

DR. TR.
CH.
APPROVED

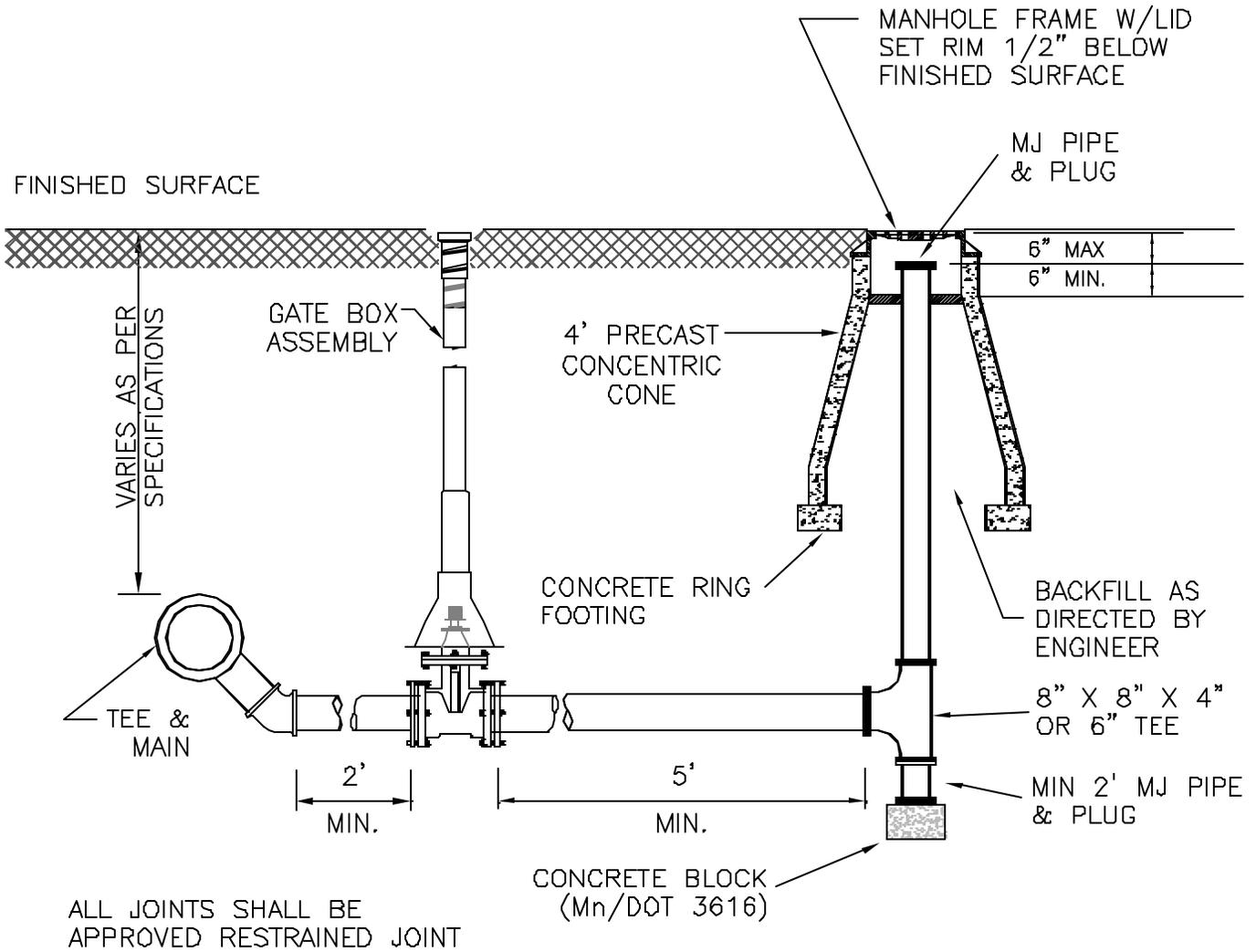
WATER UTILITY - CITY OF ST. PAUL, MN.
AIR VENT INSTALLATION

STANDARD PLATE
D - 7



DR.	TR.	WATER UTILITY – CITY OF ST. PAUL, MN. BLOWOFF FOR 6" AND 8" MAINS	STANDARD PLATE
CH.			
APPROVED			D-8

PIPE SIZE	SIZE BLOW OFF REQUIRED
12" - 16"	4" MINIMUM
OVER 16"	6" MINIMUM



DR.	TR.
CH.	
APPROVED	

WATER UTILITY - CITY OF ST. PAUL, MN.

BLOWOFF FOR
12" & LARGER MAINS

STANDARD
PLATE

D-9