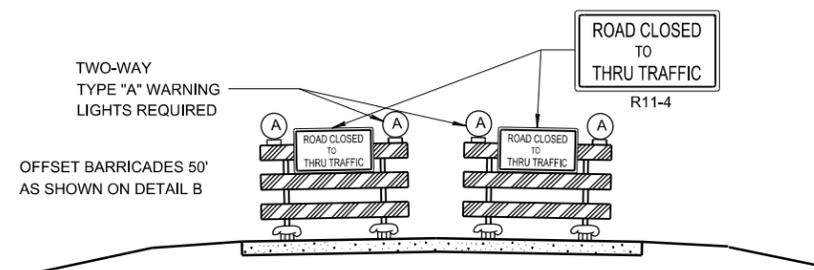


DETAIL D  
ROAD CLOSURE BARRICADE DETAIL  
APPROACH VIEW



DETAIL E  
LANE CLOSURE BARRICADE DETAIL  
APPROACH VIEW

**LEGEND**

- SIGN ON PERMANENT SUPPORT
- TYPE III BARRICADE
- TYPE III BARRICADE WITH ATTACHED SIGN
- TYPE "A" WARNING LIGHT (FLASHING)
- WORK AREA
- M4-8  
EAST M3-X
- M1-4 OR COUNTY XX OR M1-5A OR M1-6
- M05-1 OR M06-1
- FLAGS, 16" X 16" MIN., (ORANGE)

**GENERAL NOTES**

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND BARRICADES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

BARRICADES THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY RE-ESTABLISHED UPON COMPLETION OF THE OPERATION OR, FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

ALL TYPE III BARRICADES SHALL HAVE RAILS REFLECTORIZED ON BOTH FACES. STRIPES SHALL BE PROPERLY SLOPED DOWN TOWARD THE TRAFFIC SIDE OR AS SHOWN IN THE ROAD CLOSURE BARRICADE DETAIL D FOR FULL ROAD CLOSURES.

TYPE "A" LOW-INTENSITY FLASHING WARNING LIGHTS SHALL BE VISIBLE ON BOTH SIDES OF THE BARRICADE.

THE R11-2, R11-3, M4-9, R11-4 AND R10-61 SIGNS PLACED ON BARRICADES SHALL COVER NO MORE THAN THE TOP RAIL. THE SIGNS SHALL NOT COVER ANY PORTION OF THE MIDDLE OR BOTTOM RAILS.

"WO AND "MO" SIGNS ARE THE SAME AS "W" AND "M" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:

- R11-2 SHALL BE 48" X 30".
- R11-3, R11-4 AND R10-61 SHALL BE 60" X 30".
- M4-9 SHALL BE 30" X 24".
- M3-X SHALL BE 24" X 12". (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS.)
- M4-8 SHALL BE 24" X 12". (30" X 15" IF NEEDED TO MATCH EXISTING SIGNS.)
- M1-4, M1-5A, AND M1-6 SHALL BE 24" X 24". (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS.)
- M05-1 AND M06-1 SHALL BE 21" X 21". (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS.)
- D1-X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.
- R1-1 SHALL BE 36" X 36".

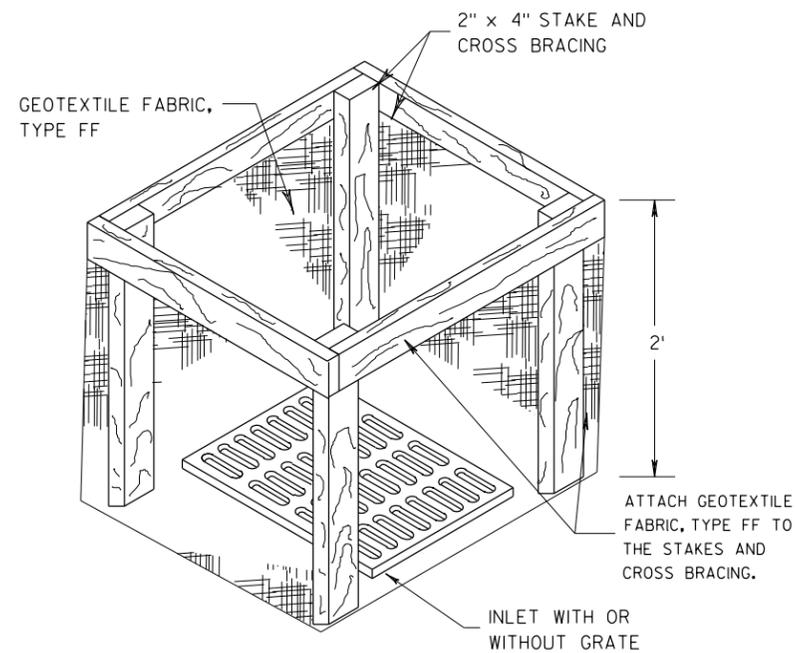
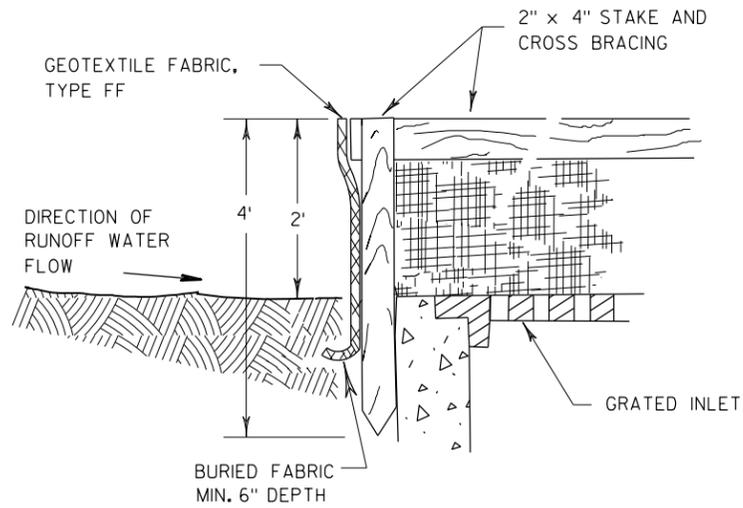
- 1 TWO WARNING LIGHTS SHALL BE PROVIDED ON THE CENTER BARRICADE AND A MINIMUM OF ONE WARNING LIGHT SHALL BE PROVIDED ON EACH OF THE OTHER BARRICADES WITHIN THE ROADWAY LIMITS. SPACING OF THE WARNING LIGHTS SHALL BE UNIFORM TO THE EDGE OF ROADWAY AS SHOWN (APPROX. 8-FOOT LIGHT SPACING).
- 2 THESE SIGNS AND BARRICADES ARE NOT REQUIRED IF ROAD CLOSURE BEGINS AT INTERSECTION.
- 3 FOR ROAD CLOSURE WITHOUT LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL D.
- 4 FOR ROAD CLOSURE WITH LOCAL ACCESS TO PROJECT, SEE LANE CLOSURE BARRICADE DETAIL E.
- 5 FOR BRIDGE OR CULVERT REPLACEMENTS, SUBSTITUTE "BRIDGE OUT" INSTEAD OF "ROAD CLOSED" ON R11-2 AND R11-3 SIGNS.
- 6 INSTALL DETOUR AND COMMUNITY GUIDE SIGNS AND ARROWS ONLY IF SPECIFIED IN THE CONTRACT. IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. MODIFY EXISTING SIGNS WHERE POSSIBLE. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. IF DETOUR SIGNS ARE BEING INSTALLED BY OTHERS, PLACE THE CONTRACTED TRAFFIC CONTROL SIGNS TO ALLOW FOR PLACEMENT OF ALL WARNING, DETOUR AND GUIDE SIGNS AS SHOWN.
- 7 "EAST" CARDINAL DIRECTION MARKERS AND RIGHT TURN ARROWS ARE SHOWN. USE OTHER CARDINAL DIRECTIONS AND ARROWS AS APPROPRIATE.

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PROJ. NO.

DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
CITY OF MARSHFIELD, WISCONSIN

**BARRICADES AND SIGNS  
FOR  
MAINLINE CLOSURES DETAIL  
(WISDOT SDD 15C 2-6B)**



**INLET PROTECTION, TYPE A**

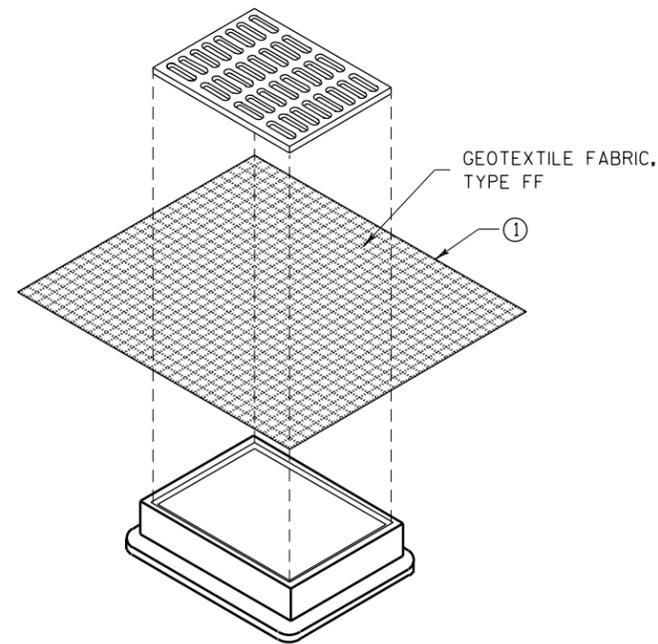
**GENERAL NOTES**

INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.

MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.

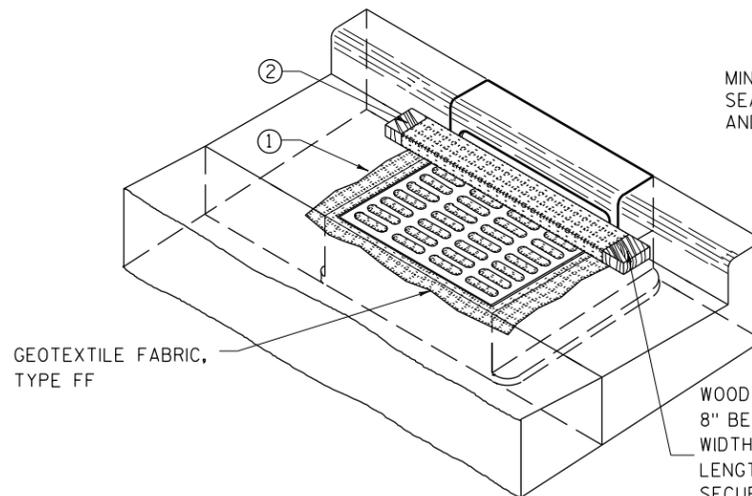
WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

- ① FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
- ② FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.
- ③ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.



**INLET PROTECTION, TYPE B  
(WITHOUT CURB BOX)**

(CAN BE INSTALLED IN ANY INLET WITHOUT A CURB BOX)



**INLET PROTECTION, TYPE C (WITH CURB BOX)**

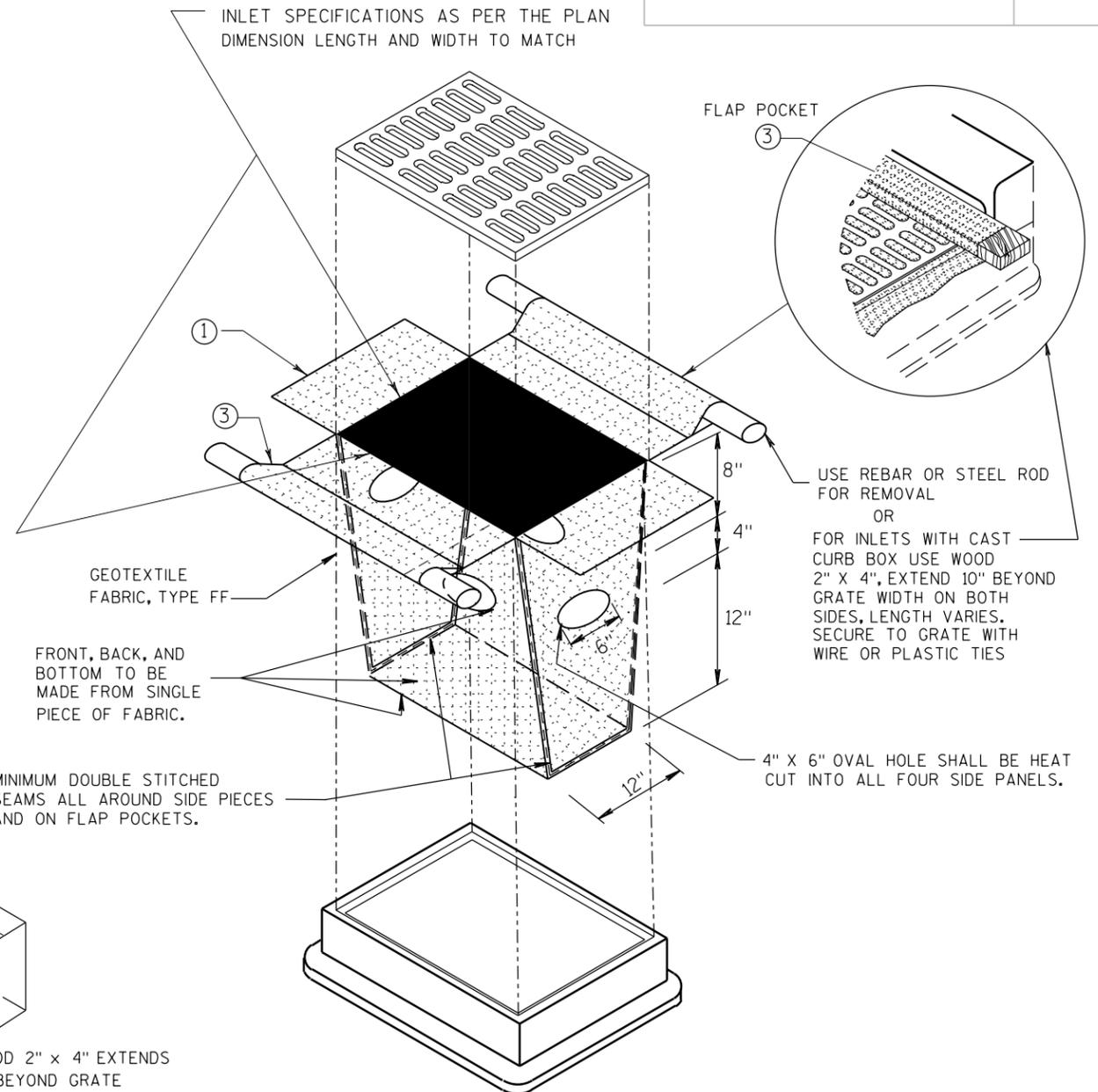
**INSTALLATION NOTES**

**TYPE B & C**

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.  
THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

**TYPE D**

DO NOT INSTALL INLET PROTECTION TYPE D IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE.  
TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.  
THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.



**INLET PROTECTION, TYPE D**

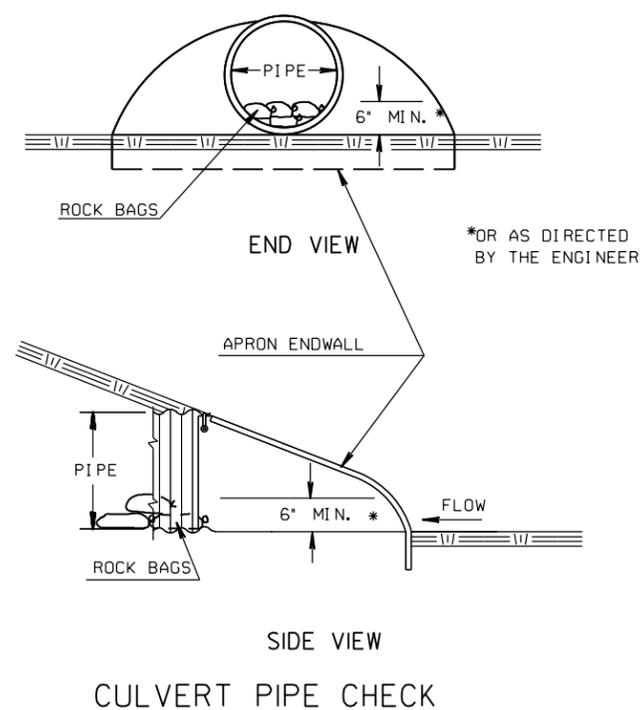
(CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX AS PER NOTE ②)

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PROJ. NO. DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION CITY OF MARSHFIELD, WISCONSIN  INLET PROTECTION DETAIL TYPE A, B, C, AND D (WISDOT SDD 8E 10-2)
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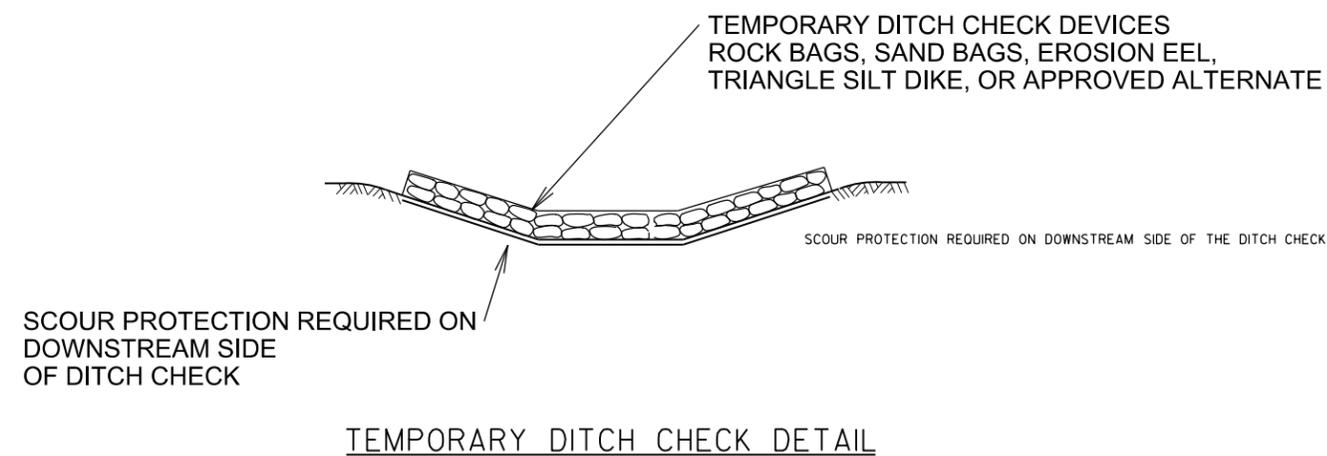
### GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.



### GENERAL NOTES

MANUFACTURED DEVICES SHALL BE INSTALLED AND ANCHORED PER THE MANUFACTURES RECOMMENDATIONS



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CITY OF MARSHFIELD, WISCONSIN

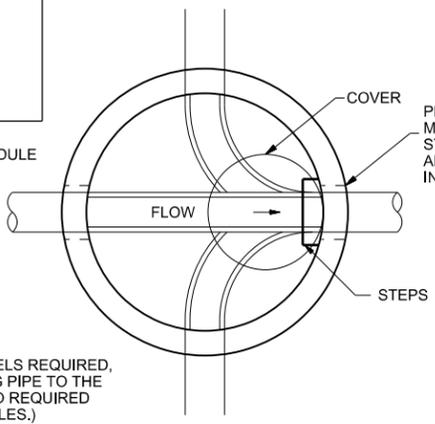
TYPICAL INSTALLATIONS OF  
CULVERT PIPE CHECKS,  
AND RIPRAP

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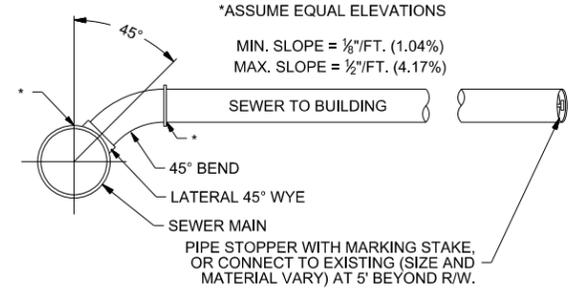
**SPECIFICATIONS:**

- MANUFACTURED TO CURRENT ASTM C-478 SPECIFICATIONS
- CONCRETE STRENGTH - 4000 PSI
- STEEL DESIGN IN ACCORDANCE WITH ASTM C-478 0.12 SQ. IN./FT.
- ALL REINFORCING IS DESIGNED FOR MIN. 1" COVER
- STEP - STEEL, PLASTIC COATED 16" ON CENTER
- MONOLITHIC BASE WITH INLET AND OUTLET OPENING AS REQUIRED
- 48" DIAMETER MANHOLE WILL ACCOMMODATE A 24" DIAMETER PIPE PASSING STRAIGHT THROUGH.
- 48" DIAMETER-5" WALL 890 LBS./FT.

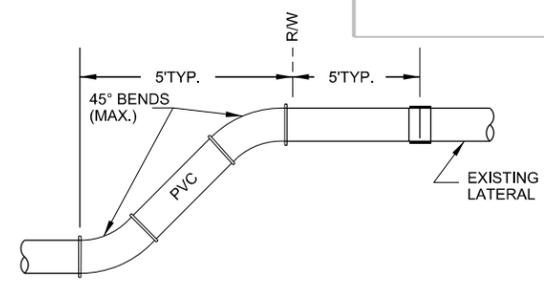
NOTE: ALL STRUCTURES AND COMPONENTS SHALL BE LABELED BY THE MANUFACTURER IN ACCORDANCE WITH PLAN/SCHEDULE IDENTIFICATION



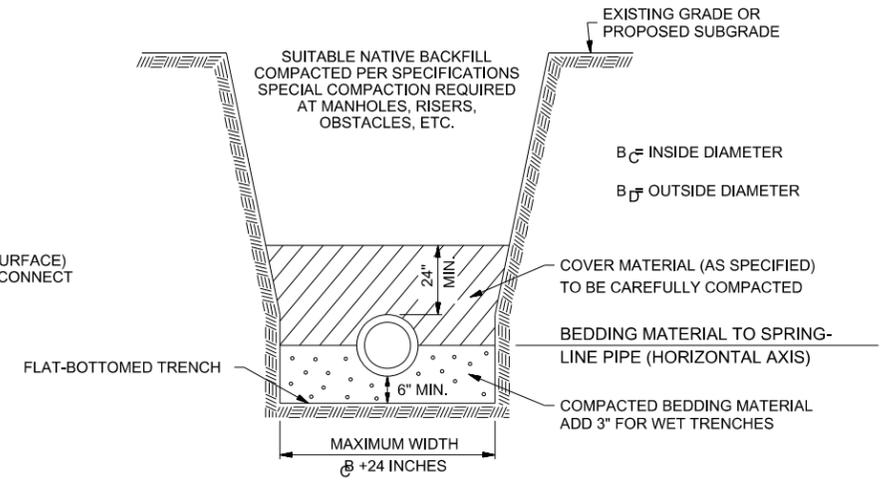
DEFINED FLOW CHANNELS REQUIRED, FROM EACH INFLOWING PIPE TO THE DISCHARGE PIPE. (ALSO REQUIRED FOR DEAD-END MANHOLES.) ALL FLOWLINES SHALL BE SMOOTH.



**LATERAL DETAIL TYPE A**



**DROP CONNECTION TO EXISTING LATERAL**



NOTES:

BEDDING AND COVER MATERIAL: CRUSHED STONE CHIPS MEETING THE FOLLOWING GRADING REQUIREMENTS.

SIEVE SIZE	PERCENTAGE PASSING BY WEIGHT
1/2"	100
3/8"	90 TO 100
NO. 8	0 TO 15
NO. 30	0 TO 3

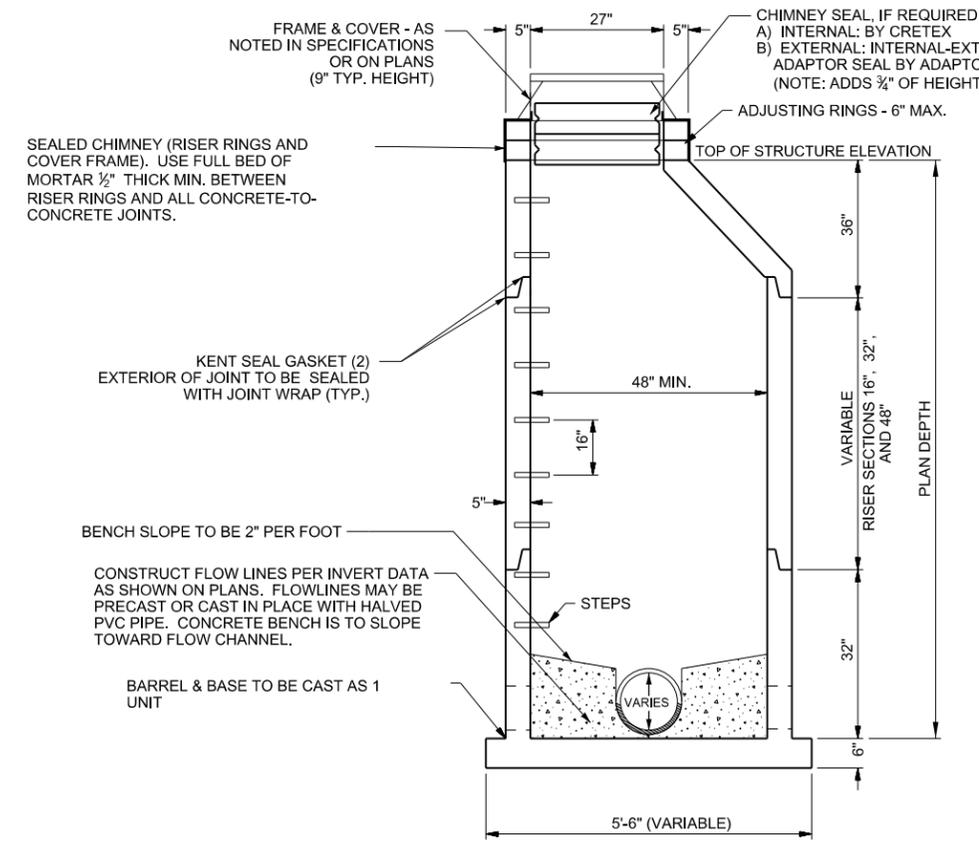
TRENCH WIDTH: THE MAXIMUM TRENCH WIDTH AT THE TOP OF THE PIPE SHALL BE B<sub>c</sub> + 24 INCHES.

SPECIAL COMPACTION REQUIRED AT MANHOLES, RISERS, ETC.

**TYPICAL TRENCH SECTION SANITARY SEWER CONSTRUCTION**

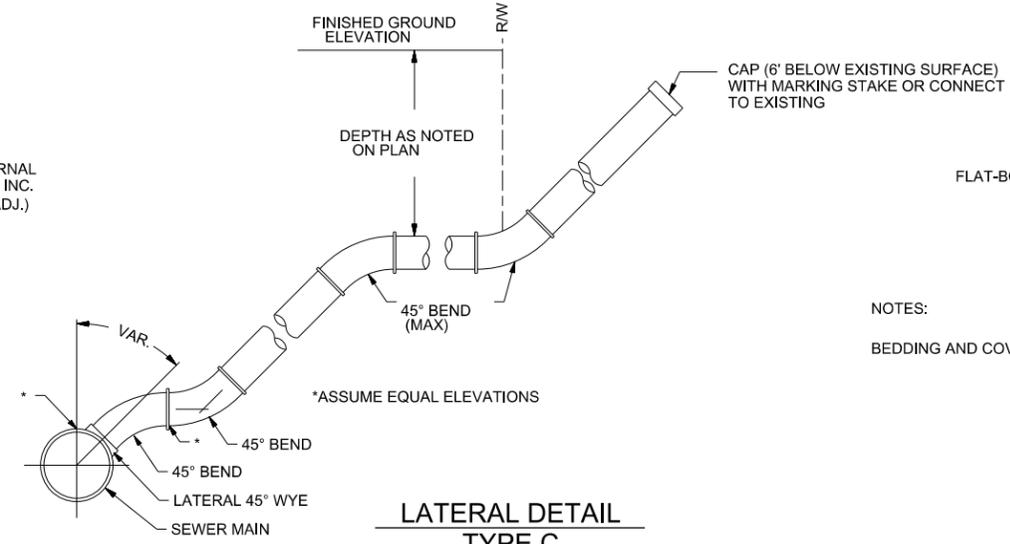
GRAVITY MAINS, LATERALS AND FORCE MAINS

AT APPROX. 20' UPSTREAM OF MANHOLES, INSTALL APPROVED NATIVE MATERIAL (CLAY TRENCH PLUG) TO FULL TRENCH DEPTH, 6' ALONG PIPE, ACROSS FULL TRENCH WIDTH, IN LEU OF BEDDING AND COVER MATERIAL.



**PRE-CAST CONCRETE SANITARY MANHOLE, TYPE 1 DETAIL**

NOTE: LENGTH OF SANITARY SEWER MAINS = MANHOLE CENTER TO MANHOLE CENTER. PIPE SLOPE CALCULATED FROM INSIDE MANHOLE WALL TO INSIDE MANHOLE WALL. INVERT ELEVATION IS AT INSIDE MANHOLE WALL. PAY DEPTH IS FROM BOTTOM OF CASTING TO LOWEST INVERT.

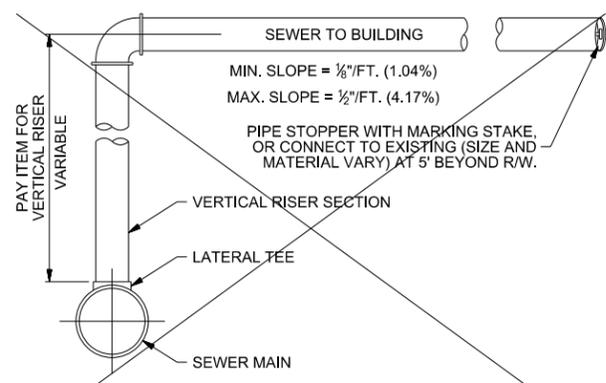


**LATERAL DETAIL TYPE C**

NOTES: MAINTAIN 30" HORIZONTAL CLEARANCE WHERE SANITARY SEWER LATERALS PARALLEL WATER SERVICES.

USE COVER MATERIAL AS BACKFILL FOR VERTICAL RISER

FERNCO CONNECTOR IF EXISTING LATERAL IS NOT PVC. GASKETED COUPLING IF EXISTING LATERAL IS PVC.



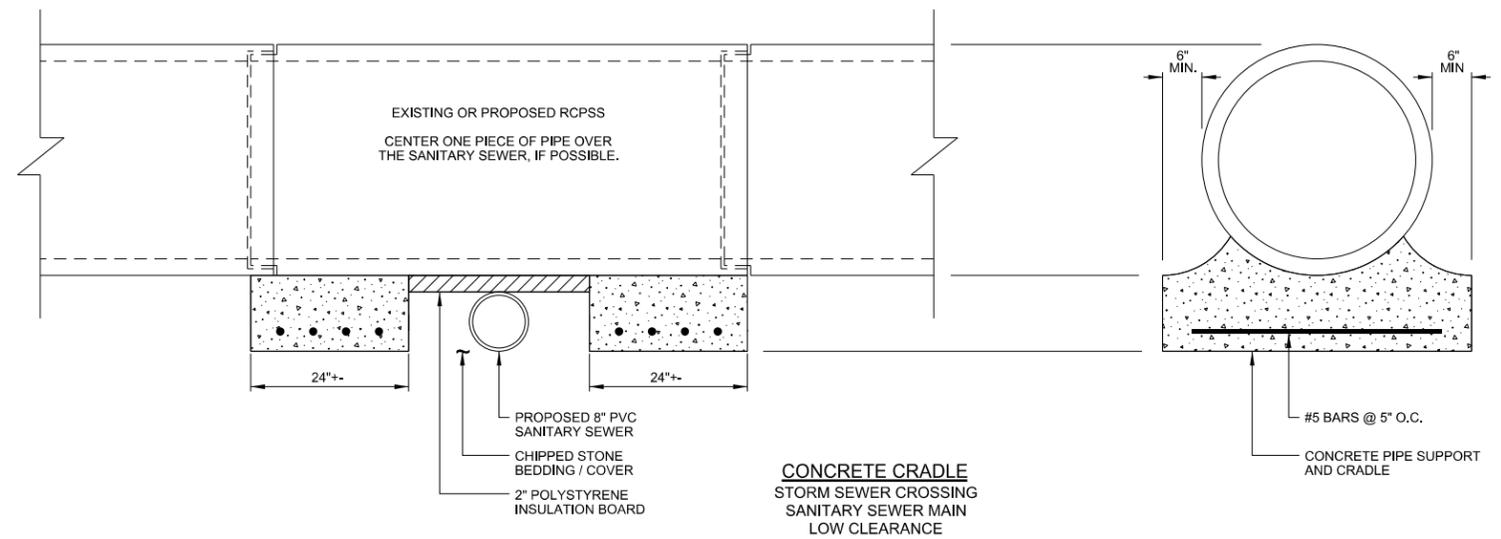
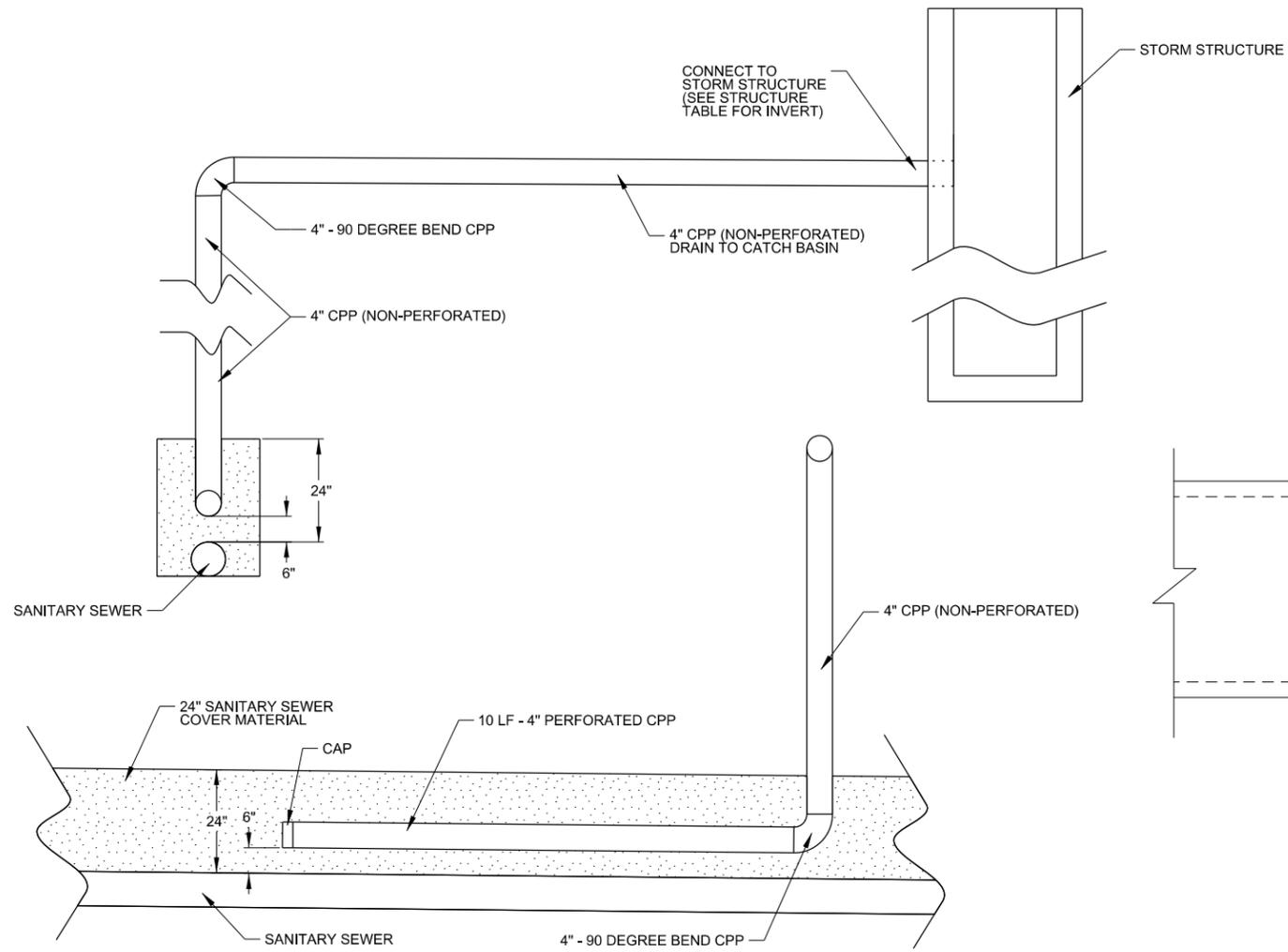
**LATERAL/RISER DETAIL TYPE B**

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DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
CITY OF MARSHFIELD, WISCONSIN

**SANITARY SEWER DETAILS**

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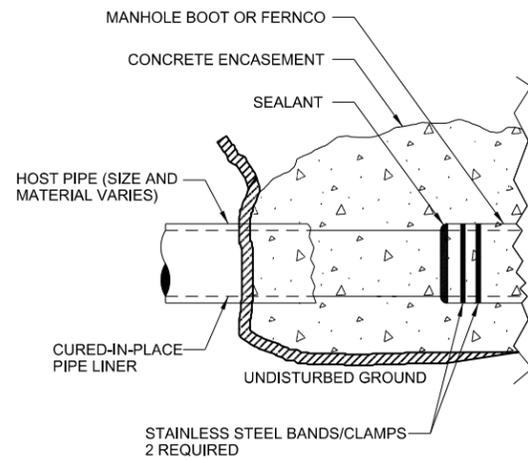


HAND EXCAVATE TO TOP OF SANITARY SEWER  
HAND EXCAVATE SIDES / BOTTOM OF CONCRETE PIPE SUPPORT / CRADLE  
CONCRETE TO BE CURED PRIOR TO PLACEMENT OF RCP  
USE NON SHRINK GROUT BETWEEN RCP & CONCRETE CRADLE

**SANITARY SEWER - PIPE UNDERDRAIN**

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DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION CITY OF MARSHFIELD, WISCONSIN
<b>SANITARY SEWER DETAILS</b>



ELEVATION/PROFILE VIEW

**CONNECT TO EXISTING LINED SANITARY SEWER MAIN (MANHOLE OR FERNCO)**

**WORK REQUIRED**

CAREFULLY REMOVE THE HOST PIPE FROM THE LINER PIPE. EXPOSE LINER PIPE TO AT LEAST 18-INCHES FROM THE MANHOLE BOOT OR FERNCO. REMOVE ENTIRE CIRCUMFERENCE OF HOST PIPE (ALL AROUND THE PIPE). DO NOT DAMAGE/MAR/CUT LINER PIPE.

REMOVE IRREGULARITIES IN/ON THE SURFACE OF THE LINER PIPE NEAR THE CONNECTION. THIS SURFACE SHALL BE SMOOTH SUCH THAT A LEAK-FREE SEAL CAN BE ACCOMPLISHED.

INSTALL THE MANHOLE BOOT/FERNCO ONTO THE LINER PIPE. APPLY SEALANT TO THE EXTERIOR OF THE BOOT OR FERNCO JOINT CONNECTION. FASTEN BOOT/FERNCO TO LINER USING 2 STAINLESS STEEL TYPE CLAMPS.

BLOCK/SUPPORT PIPE TO STABILIZE AND ACHIEVE PROPER SLOPE.

FOR FERNCO INSTALLATIONS, FLOWLINES SHALL BE ALIGNED, WITHOUT OFFSET BETWEEN THE LINER AND PVC PIPES. REMOVE SHARP EDGES ON THE INSIDE OF THE UPSTREAM PIPE AND BEVEL (1/4") THE INSIDE EDGES OF THE DOWNSTREAM PIPE.

ENCASE THE MANHOLE BOOT/FERNCO, EXPOSED LINER PIPE AND AT LEAST 6-INCHES OF HOST PIPE IN CONCRETE. THICKNESS OF CONCRETE SHALL BE 6-INCHES MINIMUM, AND SHALL COMPLETELY ENCASE THE LENGTH AND CIRCUMFERENCE. EXTEND CONCRETE ENCASUREMENT TO COVER DEFECTS IN THE HOST PIPE (CRACKS, ETC.). CONCRETE SHALL BE PLACED AGAINST UNDISTURBED GROUND UNDER ALL EXPOSED MAIN/HOST PIPE AND SHALL COMPLETELY FILL THE VOID UNDER SAID EXISTING MAIN.

VOIDS ALONGSIDE OF THE CONCRETE ENCASED MAINLINE PIPE SHALL BE FILLED USING CHIPPED STONE BEDDING/COVER MATERIAL (APPROVED FOR SANITARY SEWERS). COVER THE REMAINDER OF EXCAVATION WITH SAID STONE MATERIAL TO A POINT 2-FEET ABOVE THE CONCRETE ENCASUREMENT.

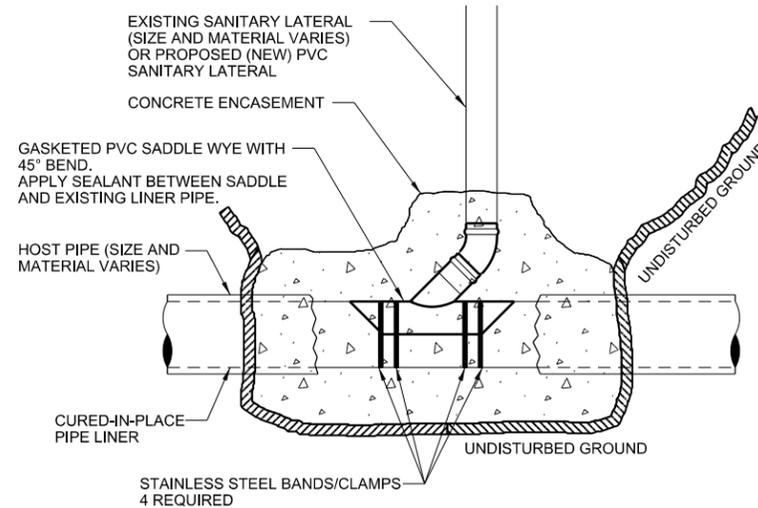
WATERTIGHT CONNECTIONS WILL BE VERIFIED BY INSPECTION AND/OR TELEVISION BY THE CITY. LEAKING OR OFFSET CONNECTIONS SHALL BE REMEDIED BY THE CONTRACTOR (INCIDENTAL). LEAKS SHALL BE ELIMINATED BY PRESSURE GROUTING FROM WITHIN THE MAIN. THE ENGINEER SHALL APPROVE THE MATERIALS/SUBCONTRACTOR FOR SAID REMEDY PRIOR TO USE.

**MATERIALS**

FERNCO'S (FLEXIBLE PLUMBING ADAPTORS) SHALL BE AS MANUFACTURED BY FERNCO INC. PART NO.S LISTED BELOW ARE PROVIDED FOR INFORMATION ONLY (CONTRACTOR SHALL VERIFY THE SIZE/OUTSIDE DIAMETER OF THE EXISTING CIPP LINER PIPE AS THIS DIMENSION MAY VARY). CONFIRM PART NO.S WITH MANUFACTURER PRIOR TO ORDERING (810/503-9000).  
 - 8" LINER TO 8" PVC: #1006-68 (2-PIECE ADAPTOR SET, 8" PVC TO 6" CONC. W/REDUCING DONUT)  
 - 10" LINER TO 10" PVC: #1056-1010 ADAPTOR, AND #10.60-9.65 R REDUCING DONUT  
 - 12" LINER TO 12" PVC: #1056-1212 ADAPTOR, AND #12.75-11.80 R REDUCING DONUT  
 - 15" LINER TO 15" PVC: #1056-1515 ADAPTOR. (REDUCING DONUT NOT REQUIRED)

SEALANT TO BE "PTI-707 ARCHITECTURAL SEALANT" AS MANUFACTURED BY H.B. FULLER CO., OR DAP BUTYL-FLEX RUBBER GUTTER AND FLASHING SEALANT, OR APPROVED EQUAL.

CONCRETE TO BE A QUALITY MIX, FROM A READY MIX PLANT OR PROPERLY MIXED ON-SITE (3/8" MINUS AGGREGATE IS ACCEPTABLE). MIX MUST BE 6-BAG/GRADE A AS A MINIMUM AND CAPABLE OF ACHIEVING 4,000 PSI STRENGTH. SLUMP SHALL NOT EXCEED 3-INCH.



ELEVATION/PROFILE VIEW

**SADDLE WYE INSTALLED ON EXISTING LINED SANITARY SEWER MAIN**

**WORK REQUIRED**

CAREFULLY REMOVE THE HOST PIPE FROM THE LINER PIPE. EXPOSE LINER PIPE TO AT LEAST 6-INCHES FROM THE SADDLE AND CLAMPS. REMOVE ENTIRE CIRCUMFERENCE OF HOST PIPE (ALL AROUND THE PIPE). DO NOT DAMAGE/MAR LINER PIPE.

MARK PROPOSED HOLE FOR NEW SADDLE ON THE LINER PIPE, CENTERED ON EXISTING HOLE/DIMPLE (EXISTING LATERAL). PROPOSED HOLE SHALL BE THE SAME SIZE AND SHAPE AS THE HOLE IN THE SADDLE.

REMOVE IRREGULARITIES IN/ON THE SURFACE OF THE LINER NEAR THE SADDLE. THIS SURFACE SHALL BE SMOOTH SUCH THAT A LEAK-FREE SEAL TO THE SADDLE CAN BE ACCOMPLISHED.

SAW HOLE IN LINER PIPE USING HOLE/JIG SAW. HOLE MUST BE CLEANLY SAWED. FILE THE HOLE AND ALL EDGES AROUND THE HOLE.

INSTALL SADDLE WYE ONTO THE LINER PIPE. THE HOLE IN THE SADDLE SHALL BE ALIGNED WITH THE HOLE IN PIPE. APPLY ENTIRE TUBE OF SEALANT TO SADDLE/LINER CONNECTION. FASTEN SADDLE TO LINER USING 4 STAINLESS STEEL TYPE CLAMPS. WIPE AWAY ALL EXCESS SEALANT FROM THE INSIDE OF THE SADDLE WYE AND LINER PIPE.

ENCASE THE SADDLE, EXPOSED LINER PIPE AND AT LEAST 6-INCHES OF HOST PIPE IN CONCRETE. THICKNESS OF CONCRETE SHALL BE 6-INCHES MINIMUM, AND SHALL COMPLETELY ENCASE THE BRANCH OF THE WYE AND THE 45° BEND, FOR EITHER HORIZONTAL RUNS OR VERTICAL RISERS. EXTEND CONCRETE ENCASUREMENT TO COVER DEFECTS IN THE HOST PIPE (CRACKS, ETC.). CONCRETE SHALL BE PLACED AGAINST UNDISTURBED GROUND UNDER ALL EXPOSED MAIN/HOST PIPE AND SHALL COMPLETELY FILL THE VOID UNDER SAID EXISTING MAIN.

VOIDS ALONGSIDE OF THE CONCRETE ENCASED MAINLINE PIPE SHALL BE FILLED USING CHIPPED STONE BEDDING/COVER MATERIAL (APPROVED FOR SANITARY SEWERS). COVER THE REMAINDER OF EXCAVATION WITH SAID STONE MATERIAL TO A POINT 2-FEET ABOVE THE CONCRETE ENCASUREMENT.

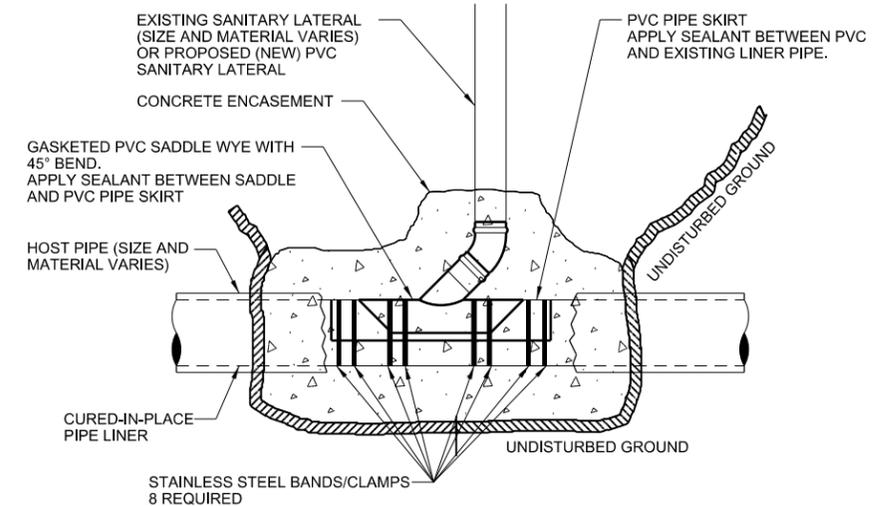
WATER-TIGHT CONNECTIONS WILL BE VERIFIED BY MAINLINE TELEVISION BY THE CITY. LEAKING CONNECTIONS SHALL BE REMEDIED BY THE CONTRACTOR (INCIDENTAL). LEAKS SHALL BE ELIMINATED BY PRESSURE GROUTING FROM WITHIN THE MAIN. THE ENGINEER SHALL APPROVE THE MATERIALS/SUBCONTRACTOR FOR SAID REMEDY PRIOR TO USE.

**MATERIALS**

SADDLE WYES SHALL BE AS MANUFACTURED BY GPK PRODUCTS, INC., OR APPROVED EQUAL; AND SHALL INCLUDE GASKETED BRANCH, GASKETED SKIRT W/STRAPS, 4-INCH OR 6-INCH X NOMINAL DIAMETER OF THE MAIN.

SEALANT TO BE "PTI-707 ARCHITECTURAL SEALANT" AS MANUFACTURED BY H.B. FULLER CO., OR DAP BUTYL-FLEX RUBBER GUTTER AND FLASHING SEALANT, OR APPROVED EQUAL. (ONE STANDARD 14 OZ CAULK GUN TYPE TUBE IS REQUIRED FOR EACH SADDLE)

CONCRETE TO BE A QUALITY MIX, FROM A READY MIX PLANT OR PROPERLY MIXED ON-SITE (3/8" MINUS AGGREGATE IS ACCEPTABLE). MIX MUST BE 6-BAG/GRADE A AS A MINIMUM AND CAPABLE OF ACHIEVING 4,000 PSI STRENGTH. SLUMP SHALL NOT EXCEED 3-INCH.



ELEVATION/PROFILE VIEW

**PVC PIPE SKIRT FOR OVERSIZED LINER HOLE REPAIR OR ABANDON CUT OUT EXISTING LINED SANITARY SEWER MAIN**

**OVERSIZED HOLE REPAIR**

IF THE EXISTING CUT-OUT HOLE IN THE LINER IS TOO LARGE (SADDLE WYE GASKET DOES NOT SURROUND HOLE / CONTACT LINER FOR FULL CIRCUMFERENCE) THEN DO THE FOLLOWING:

HOLE MUST BE CLEANLY SAWED. FILE THE HOLE AND ALL EDGES AROUND THE HOLE.

CUT / FABRICATE PVC PIPE SKIRT AS SHOWN. PVC PIPE SKIRT MUST BE 12 INCHES LONGER (TOTAL) THAN THE SADDLE WYE SKIRT, AND CIRCUMFERENTIALLY 1-INCH MORE THAN HALF PIPE.

PVC PIPE SKIRT SHALL BE FABRICATED FROM SDR 35 SEWER PIPE (PER ASTM D-3034)

SEAL PVC PIPE SKIRT USING FULL TUBE OF SEALANT.

SECURE PVC PIPE SKIRT USING (4) STAINLESS STEEL BANDS/CLAMPS ( (2) AT EACH END, AS SHOWN)

INSTALL SADDLE WYE AS SHOWN / DISCUSSED HEREIN.

**ABANDON CUT-OUT**

TO SEAL OR ABANDON A LATERAL CONNECTED TO A LINER, DO ALL WORK AS LISTED ABOVE (FOR SADDLE WYE, OVERSIZE HOLE REPAIR, ETC) EXCEPT:

LENGTH OF PVC PIPE SKIRT SHALL BE 12-INCHES LONGER THAN THE PREPARED HOLE.

DO NOT CUT A HOLE IN THE PVC PIPE SKIRT.

USE (4) STAINLESS STEEL BANDS / CLAMPS EQUALLY SPACED.

ENCASE (CONCRETE), COVER, BACKFILL / COMPACT AS DESCRIBED.

PROJ. NO.

DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
CITY OF MARSHFIELD, WISCONSIN

SANITARY SEWER DETAILS

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NOTES: EXISTING WATER SYSTEM AND PROPOSED ISOLATION GATE VALVES SHALL ONLY BE OPERATED BY MARSHFIELD UTILITIES.

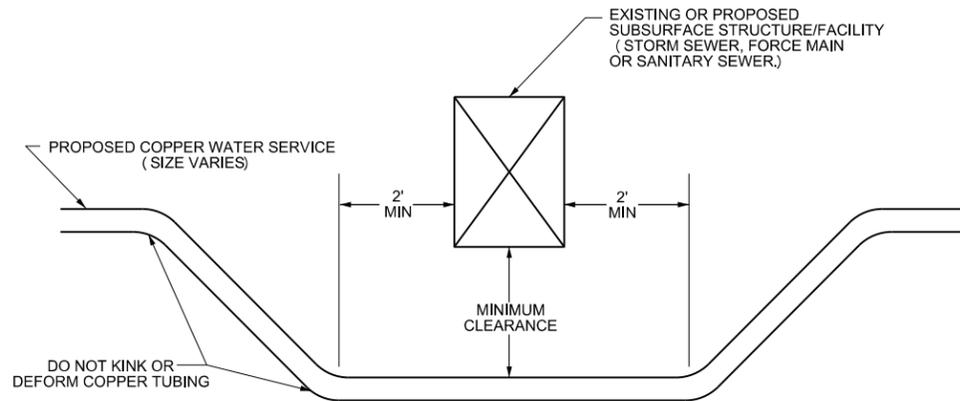
CONTRACTOR TO PROVIDE A CONTINUOUS SUPPLY OF SAFE WATER TO AFFECTED PROPERTIES, WHEN APPLICABLE.

ALL PIPE, VALVES, FITTINGS AND HYDRANTS TO BE POLYWRAPPED.

CONDUCTIVITY PROVISIONS SUCH AS STRAPS OR CABLES ARE REQUIRED FOR ALL JOINTS INCLUDING PIPE, VALVES, FITTINGS AND SLEEVES. CONDUCTIVITY TESTING WILL BE REQUIRED.

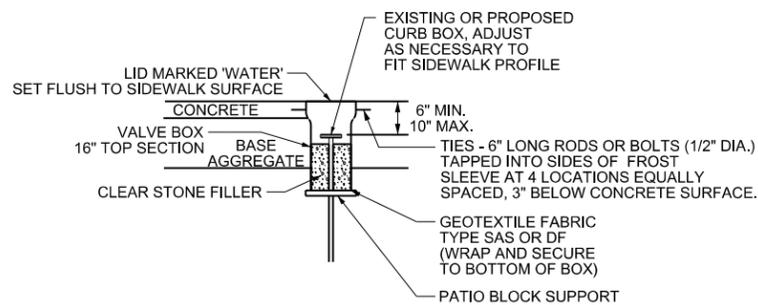
HYDROSTATIC TEST PRESSURE FOR WATER PIPE SHALL BE 150 PSI.

SPECIAL COMPACTION IS REQUIRED AT HYDRANTS, VALVE BOXES, CURB BOXES, AND OTHER RISERS.



MINIMUM CLEARANCE SHALL BE 12" FOR EXISTING FACILITIES TO REMAIN AND 18" FOR PROPOSED FACILITIES.

**WATER SERVICE OFFSET**



**CURB BOX FROST SLEEVE**

JOINT RESTRAINT SHALL BE REQUIRED. ACCEPTABLE MATERIALS INCLUDE 3/4" THREADED RODS (2) W/RETAINER GLANDS, RESTRAINING PIPE JOINT GASKETS, OR RESTRAINING MECHANICAL JOINT GLANDS (MEGA LUGS, ETC.) .

LENGTH OF PIPELINE TO BE RESTRAINED SHALL BE AS FOLLOWS:

RUN OF TEE  
ALL SIZES = 10 LF EACH SIDE OF BRANCH

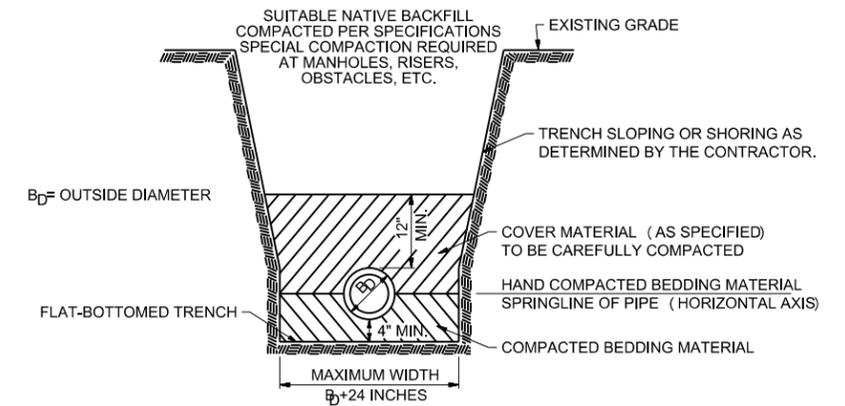
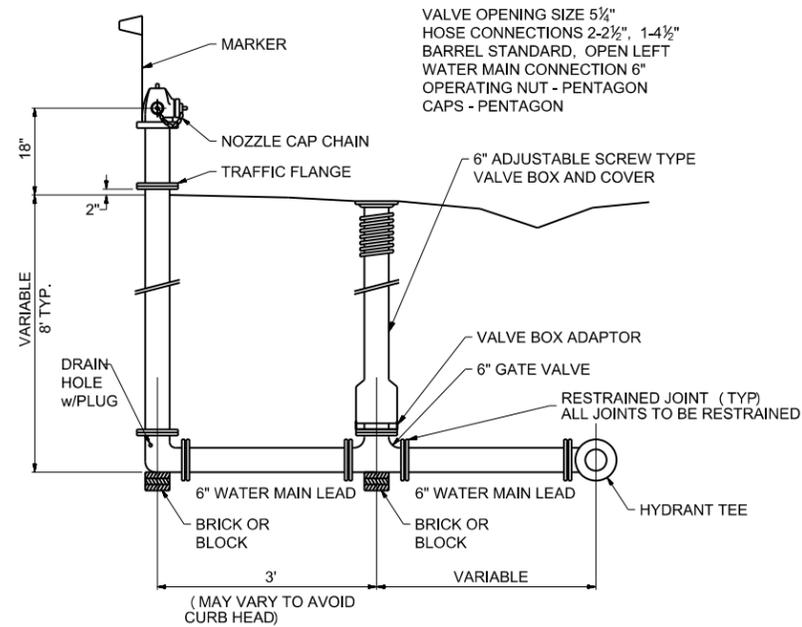
BRANCH OF TEE:  
6" & 8" PIPE = 35 LF  
10" PIPE = 45 LF  
12" PIPE = 55 LF  
16" PIPE = 65 LF

BENDS:  
6" & 8" PIPE = 25 LF EACH SIDE OF FITTING  
10" PIPE = 35 LF EACH SIDE OF FITTING  
12" PIPE = 45 LF EACH SIDE OF FITTING  
16" PIPE = 55 LF EACH SIDE OF FITTING

DEAD ENDS:  
6" & 8" PIPE = 35 LF  
10" PIPE = 45 LF  
12" PIPE = 55 LF  
16" PIPE = 65 LF

NOTE: MJ OFFSET FITTINGS MAY BE USED IF APPROVED BY THE ENGINEER.

**TYPICAL HYDRANT, HYDRANT LEAD, AND GATE VALVE INSTALLATION**

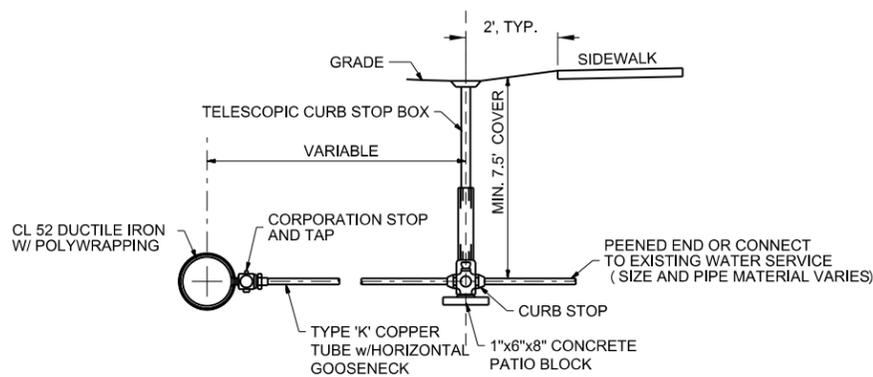


NOTES:

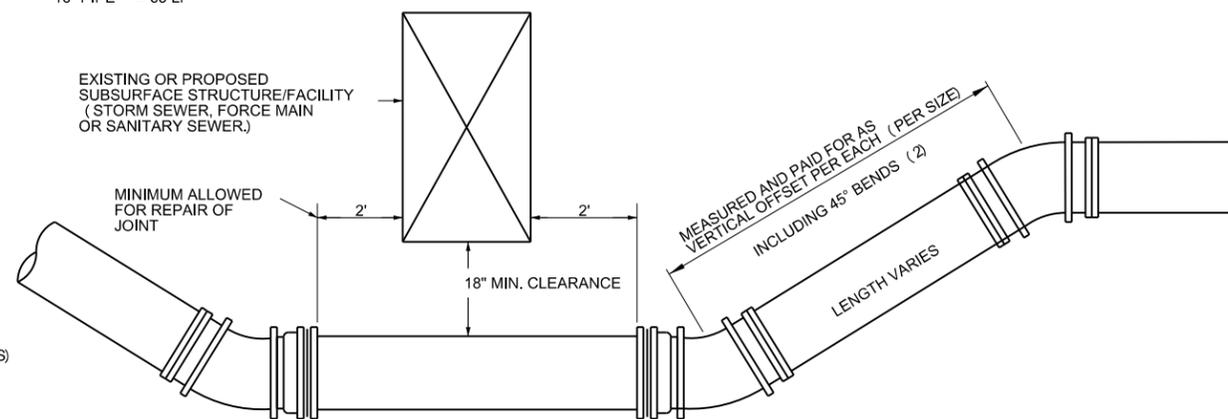
BEDDING AND COVER MATERIAL SHALL BE BANK-RUN SAND, CRUSHED BANK RUN GRAVEL, OR OTHER APPROVED MATERIAL CONFORMING SUBSTANTIALLY TO THE FOLLOWING GRADING REQUIREMENTS.

SIEVE SIZE	PERCENTAGE PASSING BY WEIGHT
1"	100
3/4"	85 TO 100
NO. 40	15 TO 35
NO. 200	2 TO 10

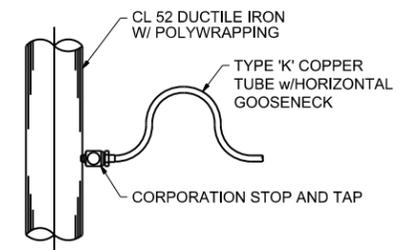
**TYPICAL TRENCH SECTION WATER MAIN AND WATER SERVICE CONSTRUCTION**



**TYPICAL WATER SERVICE CONNECTION**  
PROFILE VIEW



**WATER MAIN OR HYDRANT LEAD VERTICAL OFFSET**



**TYPICAL WATER SERVICE CONNECTION**  
PLAN VIEW

PROJ. NO. \_\_\_\_\_

DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
CITY OF MARSHFIELD, WISCONSIN

**WATER DETAILS**

**STRUCTURE SPECIFICATIONS:**

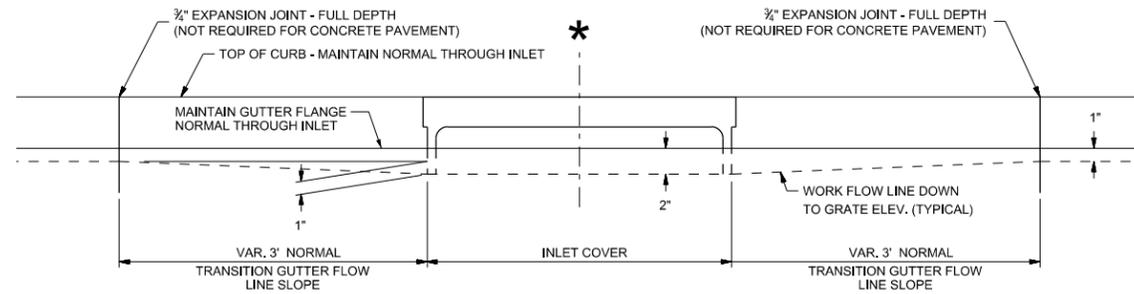
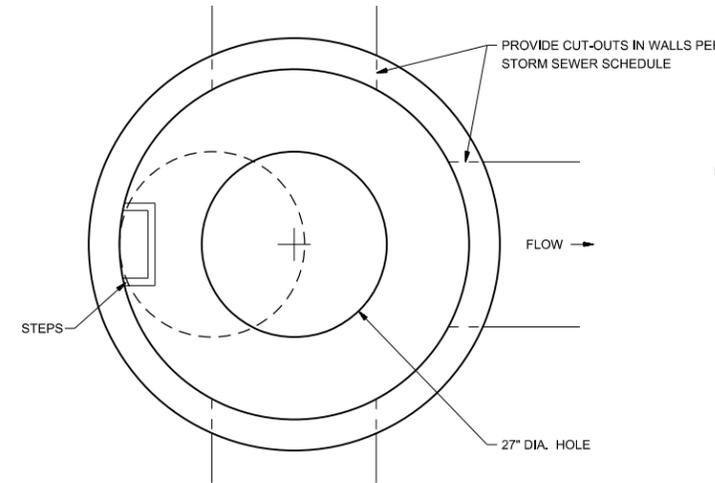
- MANUFACTURED TO A.S.T.M. C-478 AND AASHTO M199 SPECIFICATIONS
- CONCRETE STRENGTH - 4000 P.S.I.
- STEEL DESIGN IN ACCORDANCE WITH A.S.T.M. C-478 0.12 SQ. IN./FT.
- ALL REINFORCING IS DESIGNED FOR MIN. 2" COVER
- MONOLITHIC BASE WITH INLET AND OUTLET OPENING AS REQUIRED

NOTES: STEPS REQUIRED IN MANHOLES IF DEPTH EXCEEDS 4.0 V.F.

MANHOLES WITH STEPS REQUIRE ECCENTRIC 27" DIA. HOLE FOR ACCESS TO STEPS. ECCENTRIC CONE SECTIONS MAY BE USED INSTEAD OF FLAT COVER W/ECCENTRIC ACCESS HOLE IF STRUCTURE DEPTH EXCEEDS 9.0 V.F.

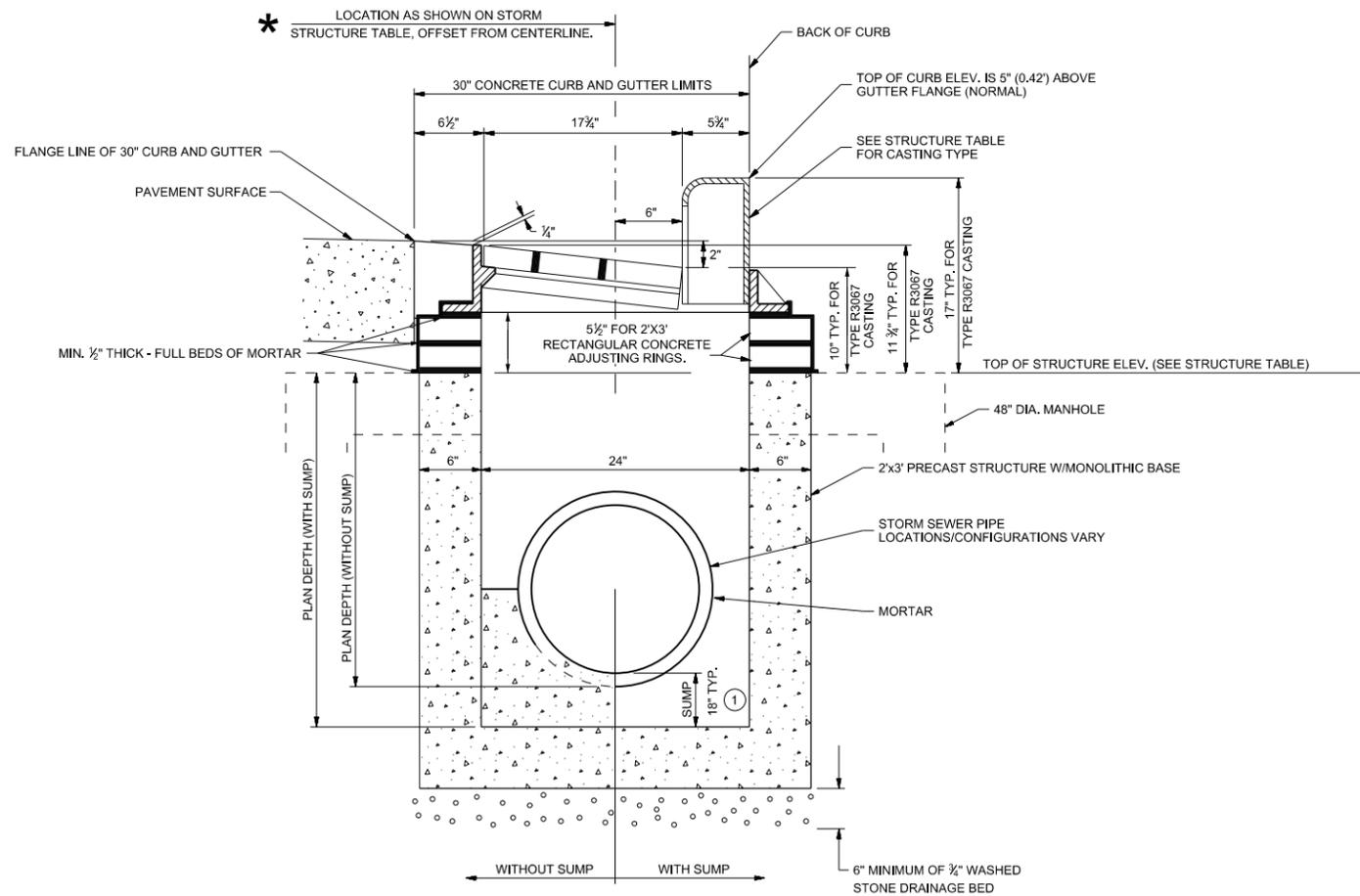
ALL STRUCTURES AND COMPONENTS SHALL BE LABELED BY THE MANUFACTURER IN ACCORDANCE WITH PLAN/SCHEDULE IDENTIFICATION

WHEN STRUCTURES ARE PAID PER VERTICAL FOOT, PAY DEPTH SHALL BE MEASURED FROM THE BOTTOM OF THE CASTING TO: THE SUMP FLOOR; OR THE LOWEST PIPE O.D. (INVERT PLUS WALL THICKNESS).



ELEVATION VIEW

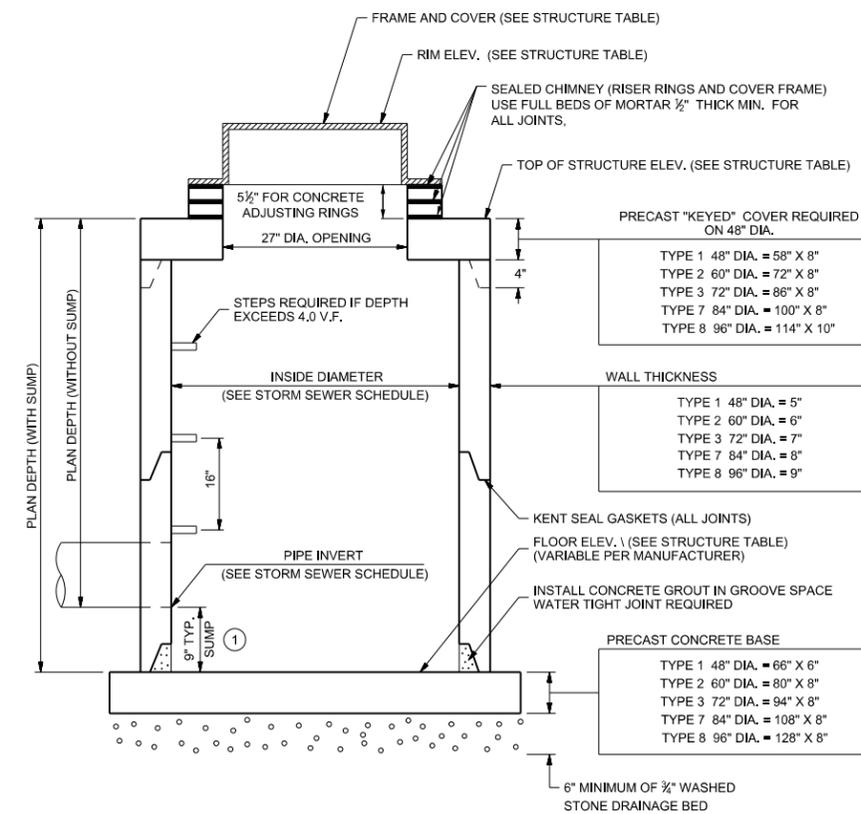
\* CATCH BASIN HORIZONTAL LOCATIONS ARE REFERENCED TO THE CENTER OF THE REAR INSIDE WALL OF THE BOX.



TYPE 2 RECTANGULAR CATCH BASIN

NOTES:

① STRUCTURES WITHOUT SUMPS SHALL INCLUDE A POURED CONCRETE FLOWLINE WITH BENCHES EXTENDING TO THE SPRINGLINE OF EACH CONNECTING PIPE



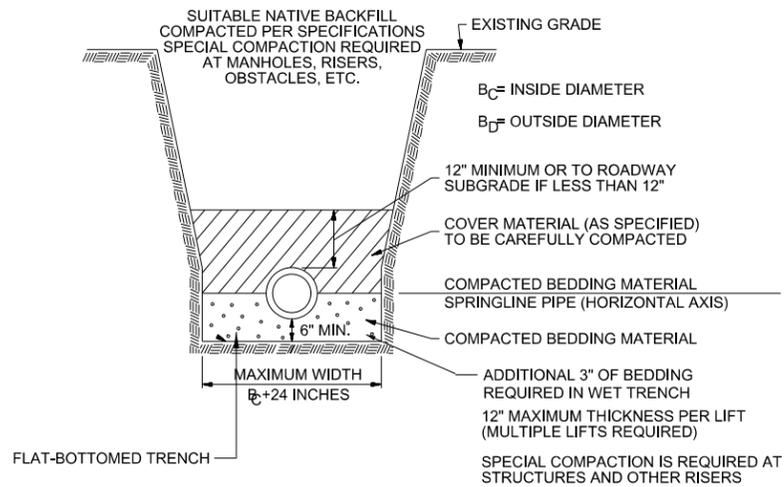
TYPICAL MANHOLE - REINFORCED PRECAST CONCRETE

PROJ. NO.

DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
CITY OF MARSHFIELD, WISCONSIN

STORM SEWER DETAILS

PLOTTED ON: 2/20/2020 3:18:27 PM



**TYPICAL TRENCH SECTION**  
STORM SEWER CONSTRUCTION

**RCP STORM SEWER CONSTRUCTION**

MATERIALS AND INSTALLATION SHALL COMPLY WITH THE TYPICAL TRENCH SECTION. BEDDING AND COVER MATERIAL SHALL BE AS FOLLOWS:

**BEDDING & COVER MATERIAL**

SCREENED SAND OR BANK RUN GRAVEL MEETING THE FOLLOWING GRADING REQUIREMENTS SHALL BE USED.

SIEVE SIZE	PERCENTAGE PASSING BY WEIGHT
1"	100
3/4"	85 TO 100
NO. 40	15 TO 35
NO. 200	2 TO 10

**SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE, (SICPP) STORM SEWER**

MATERIALS AND INSTALLATION SHALL COMPLY WITH THE TYPICAL TRENCH SECTION. BEDDING AND COVER MATERIAL SHALL BE AS FOLLOWS:

FOR SEWER PIPE 18 INCHES IN DIAMETER OR LESS, CRUSHED STONE CHIPS MEETING THE FOLLOWING GRADING REQUIREMENTS SHALL BE USED.

SIEVE SIZES	PERCENTAGE PASSING BY WEIGHT
1/2 INCH	100%
3/8 INCH	90 - 100
NO. 8	0 - 15
NO. 30	0 - 3

FOR PIPE LARGER THAN 18 INCHES IN DIAMETER CRUSHED STONE CHIPS BEDDING MEETING THE FOLLOWING GRADING REQUIREMENTS SHALL BE USED.

SIEVE SIZES	PERCENTAGE PASSING BY WEIGHT
1 INCH	100%
3/4 INCH	90 - 100
3/8 INCH	20 - 55
NO. 4	0 - 10
NO. 8	0 - 5

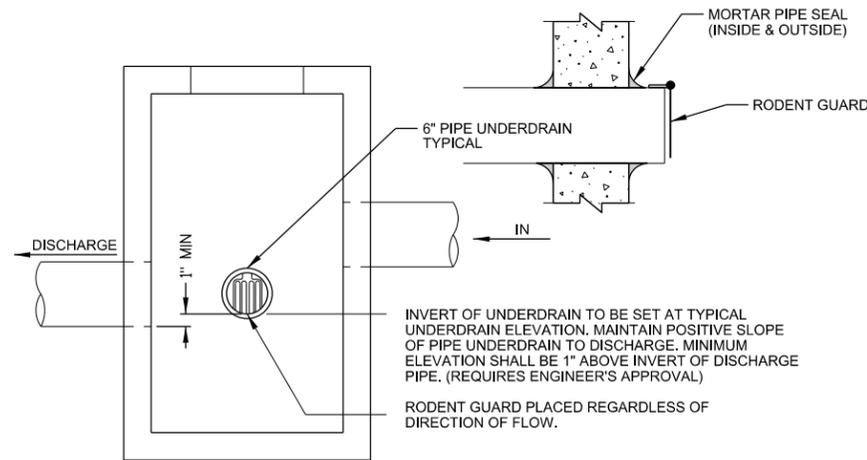
**SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE, PERFORATED (SICPPP) STORM SEWER, WRAPPED TRENCH**

MATERIALS AND INSTALLATION SHALL COMPLY WITH THE TYPICAL TRENCH SECTION. BEDDING AND COVER MATERIAL SHALL BE AS FOLLOWS:

WELL GRADED CRUSHED STONE CHIPS MEETING THE REQUIREMENTS OF CRUSHED STONE CHIPS OF SICPP. (NOTED ABOVE) SICPPP SHALL BE INSTALLED WITHIN A TRENCH WRAPPED WITH GEOTEXTILE FABRIC, TYPE DF SCHEDULE A, SIMILAR TO PIPE UNDERDRAIN DETAIL

**PVC STORM SEWER**

MATERIALS AND INSTALLATION SHALL COMPLY WITH THE TYPICAL TRENCH SECTION FOR RCP STORM SEWER CONSTRUCTION, EXCEPT BEDDING AND COVER MATERIAL SHALL BE WELL GRADED CRUSHED BASE AGGREGATE DENSE 3/4-INCH.

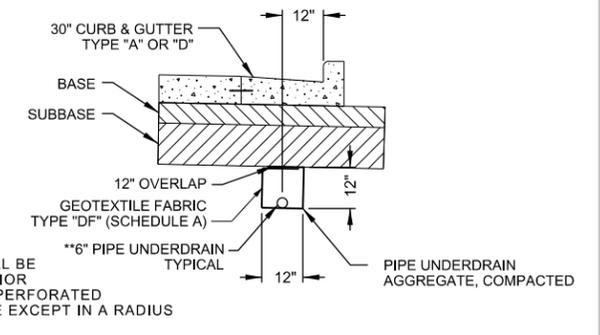


**PIPE UNDERDRAIN CONNECTION DETAIL**

TYPICAL FOR CATCH BASIN OR MANHOLE

PIPE UNDERDRAIN AGGREGATE SHALL BE CLEAN STONE AGGREGATE MEETING THE FOLLOWING GRADATION.

SIEVE SIZES	PERCENTAGE PASSING BY WEIGHT
1 INCH	100%
3/4 INCH	90 - 100
3/8 INCH	20 - 55
NO. 4	0 - 10
NO. 8	0 - 5

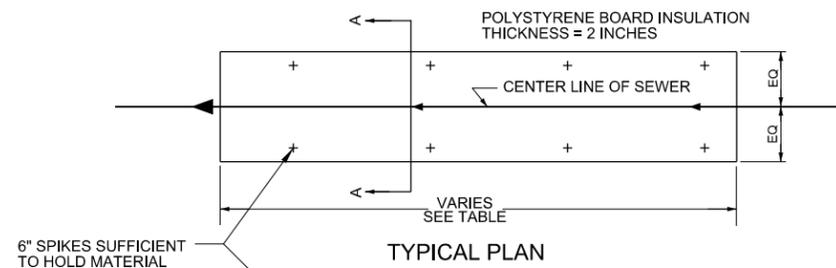


\*\* MATERIAL SHALL BE SMOOTH INTERIOR CORRUGATED POLYETHYLENE EXCEPT IN A RADIUS (SICPPP)

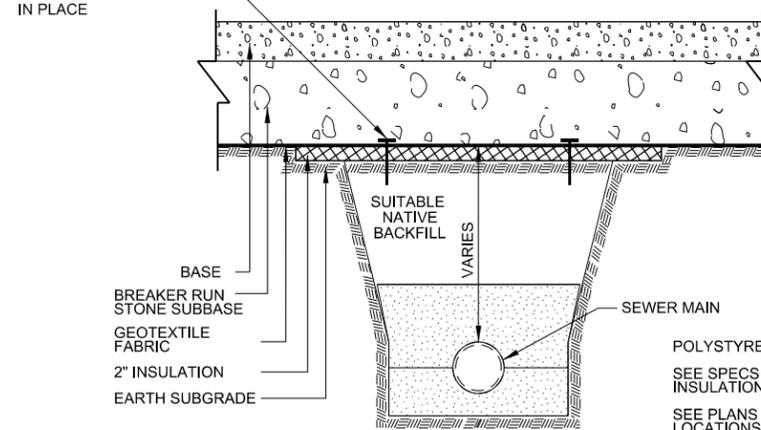
**GENERAL NOTES:**

- UNDERDRAIN SHALL BE CONNECTED TO INLETS AS SHOWN REGARDLESS OF FLOW DIRECTION FOR DRAINAGE AND MAINTENANCE ACCESS. RODENT SCREEN IS REQUIRED AT EACH UNDERDRAIN CONNECTION.
- UNDERDRAIN SHALL BE LAID PARALLEL TO THE GRADE OF THE ROAD UNLESS SHOWN OR NOTED OTHERWISE ON THE PLAN SHEETS.

**PIPE UNDERDRAIN DETAIL**



**TYPICAL PLAN**

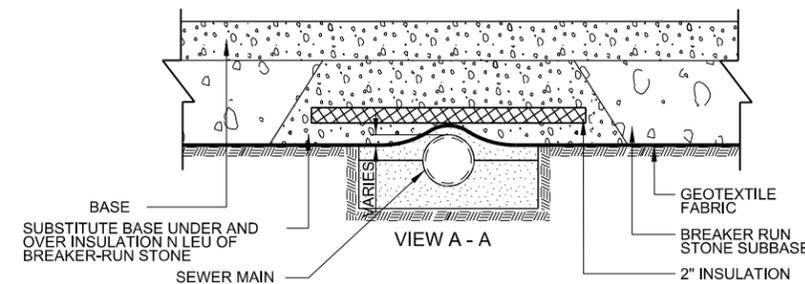


**VIEW A - A**  
INSULATION NOTCHED INTO SUBGRADE

SEE SPECS OR BID ITEM NAME FOR TYPE/CLASS OF INSULATION REQUIRED

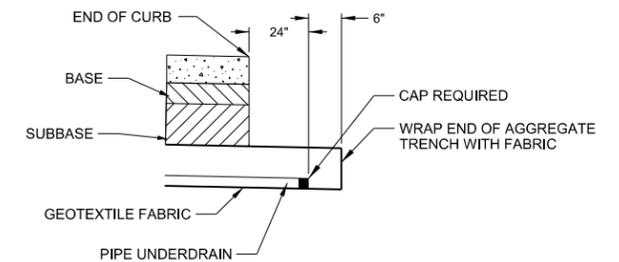
SEE PLANS FOR EXACT DIMENSIONS OF THE DIFFERENT LOCATIONS OF INSULATION.

NO ADJUSTMENTS MADE FOR QUANTITIES OF EARTHWORK, SUBBASE OR BASE MATERIAL, AND BASE IS INCIDENTAL TO SEWER INSULATION.



**VIEW A - A**  
INSULATION WITHIN BREAKER-RUN STONE SUBBASE

**SEWER INSULATION**

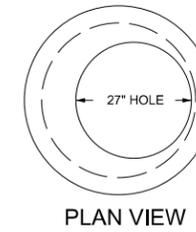
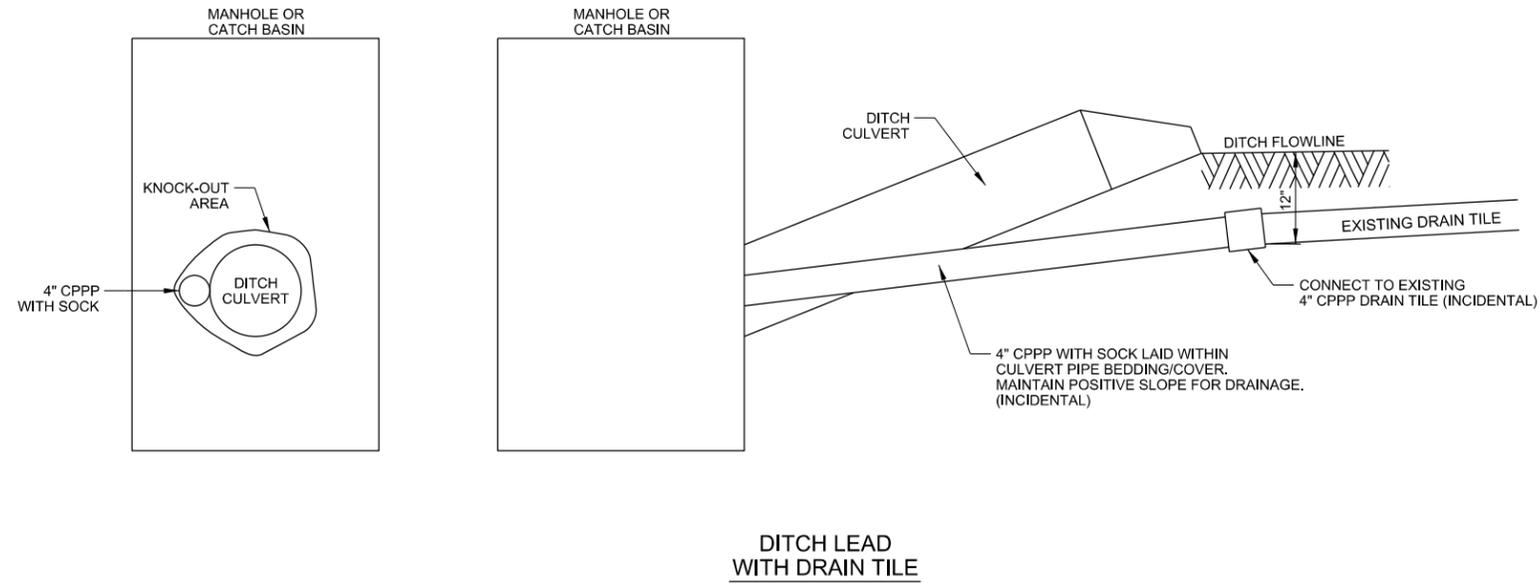


**PIPE UNDERDRAIN DETAIL AT END OF CURB & GUTTER**

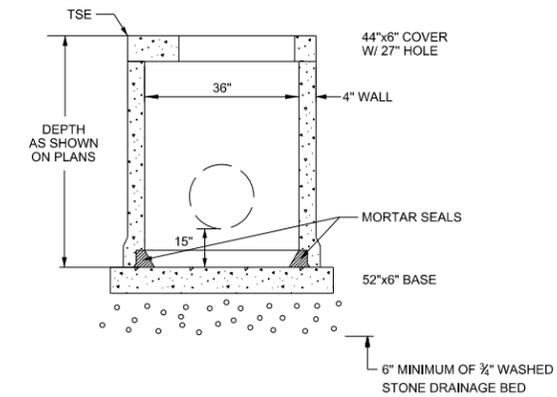
PROJ. NO.

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CITY OF MARSHFIELD, WISCONSIN

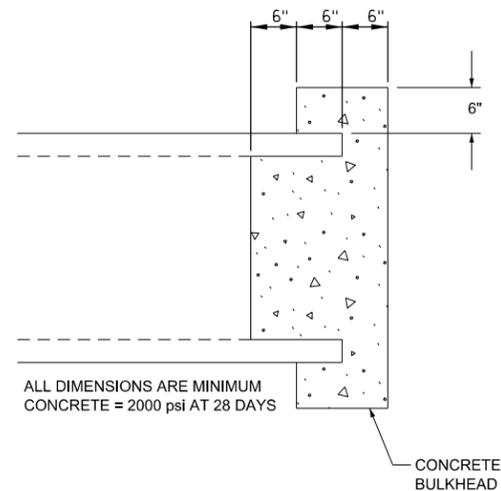
**STORM SEWER DETAILS**



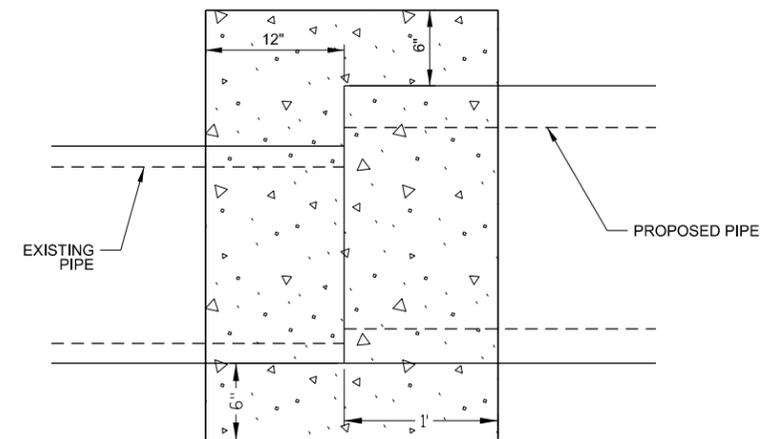
NOTE: SEE STORM MANHOLE DETAILS FOR ADJUSTMENT OF CASTING



CATCH BASIN TYPE 4  
PRECAST REINFORCED CONCRETE



BULKHEADING DETAIL

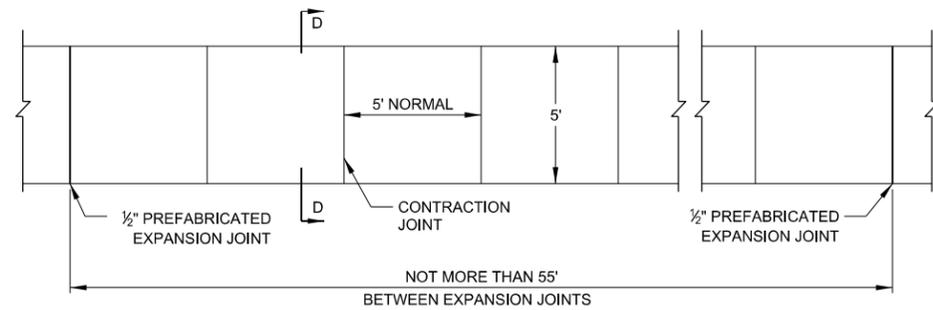


CONCRETE COLLAR DETAIL

PROJ. NO.

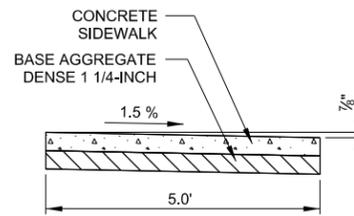
DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
CITY OF MARSHFIELD, WISCONSIN

STORM SEWER DETAILS

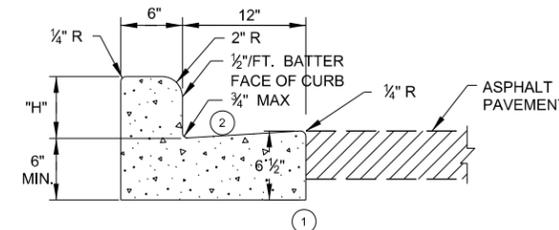


**STANDARD 5' SIDEWALK**

TYPICAL SIDEWALK SECTION:  
 5" CONCRETE SIDEWALK OVER 4" BASE AGGREGATE DENSE 1 1/4-INCH  
 6" CONCRETE SIDEWALK OVER 6" BASE AGGREGATE DENSE 1 1/4-INCH  
 8" CONCRETE SIDEWALK OVER 6" BASE AGGREGATE DENSE 1 1/4-INCH



**SECTION D-D**  
SIDEWALK CROSS SLOPE



**18" CURB & GUTTER, TYPE D**

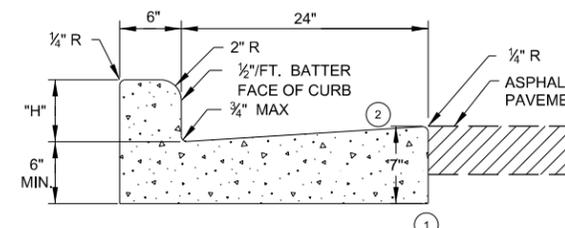
**NOTES**

"H" = 8" MAX., 3 1/2" MIN. & SHALL BE 6" UNLESS OTHERWISE SHOWN ON THE PLANS

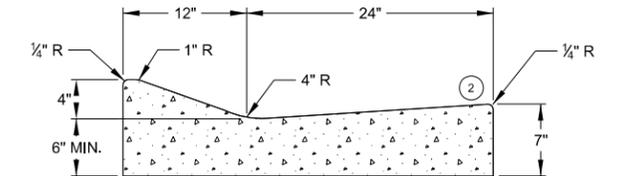
- ① THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED THE MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ② THE TRANSVERSE SLOPE OF THE GUTTER PAN SHALL BE 1/2" / FT (4.0%) UNLESS SHOWN OTHERWISE ON THE PLANS.

**GENERAL NOTES:**

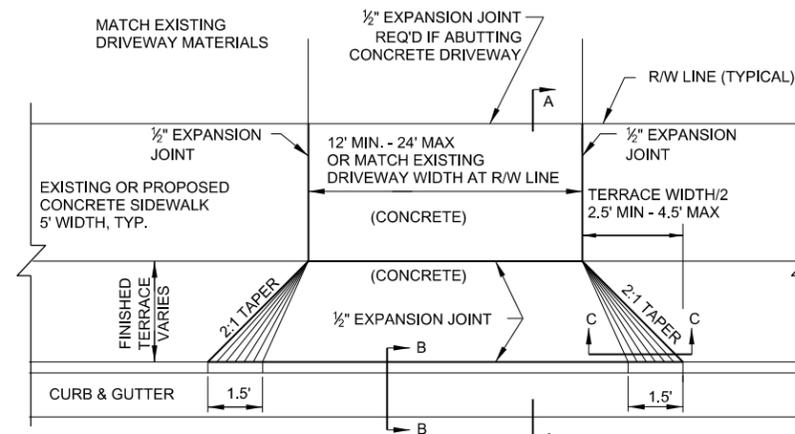
DRIVEWAY SLOPES: DESIRABLE MAXIMUM  
 11% UP AWAY FROM SIDEWALK (SAG)  
 8% DOWN AWAY FROM SIDEWALK (CREST)  
 PROVIDE CONSTRUCTION JOINTS ALONG THE CENTER OF THE CONCRETE FOR DRIVEWAYS UNDER 20 FEET IN WIDTH AND AT THE THIRD POINTS OVER 20 FEET IN WIDTH.



**30" CURB & GUTTER, TYPE D**

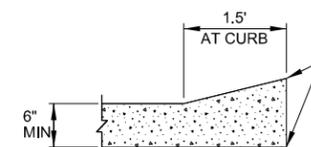


**36" CURB & GUTTER, TYPE HM**

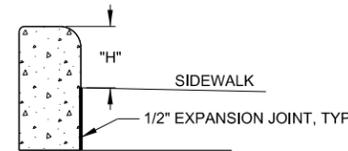


**ENTRANCE DETAIL (PE'S & CE'S)**  
CURB & GUTTER WITH CONCRETE SIDEWALK

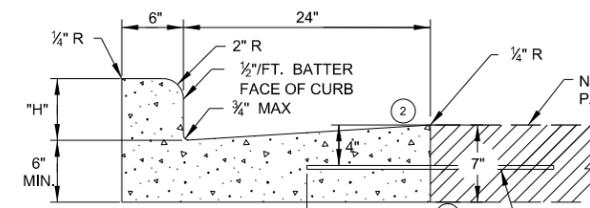
NOTE: THE EXACT LOCATION & WIDTHS OF ENTRANCES TO BE DETERMINED IN THE FIELD BY THE ENGINEER.



**SECTION C-C**  
DRIVEWAY APPROACH TAPER

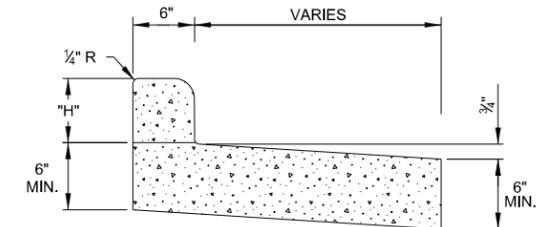


**PEDESTRIAN CURB**



**30" CURB & GUTTER, TYPE A**

NO. 4 x 2'-0" EPOXY COATED PAVEMENT TIES SPACED 3' C.-C. IF ADJACENT PAVEMENT IS CONCRETE AND TIE BAR IS SET IN WET CONCRETE (BOTH ENDS OF TIE BAR)

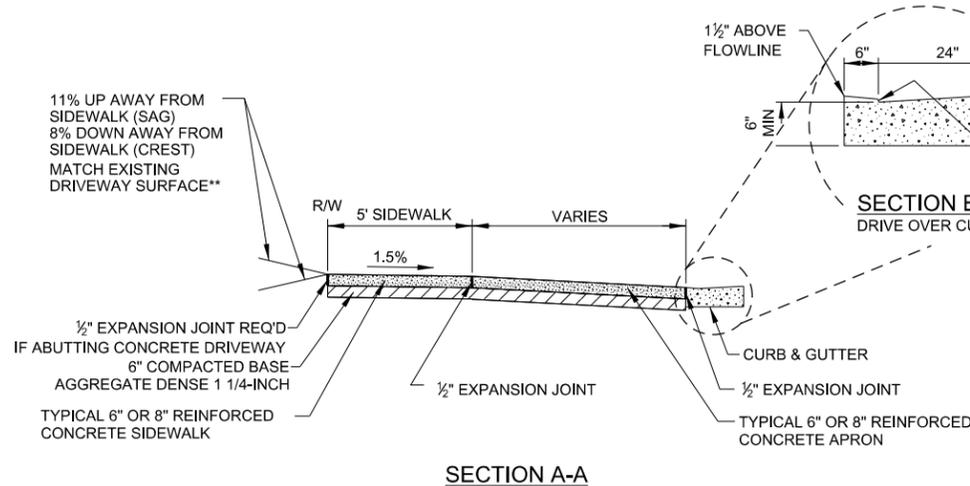


**REJECT CURB & GUTTER**

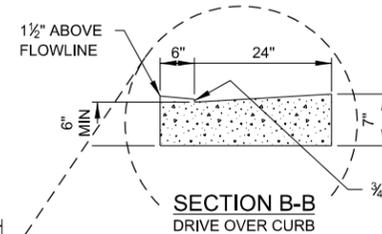
**\*\* MINIMUM DRIVEWAY TYPICAL SECTIONS**

GRAVEL DRIVEWAYS: 6" BASE AGGREGATE DENSE 3/4-INCH  
 MILLINGS DRIVEWAYS: 3" ASPHALT MILLINGS OVER 6" BASE AGGREGATE DENSE 1 1/4-INCH  
 ASPHALT DRIVEWAYS: 3 1/2" HMA OVER 6" BASE AGGREGATE DENSE 1 1/4-INCH  
 CONCRETE DRIVEWAYS: 6" OR 8" CONCRETE OVER 6" BASE AGGREGATE DENSE 1 1/4-INCH

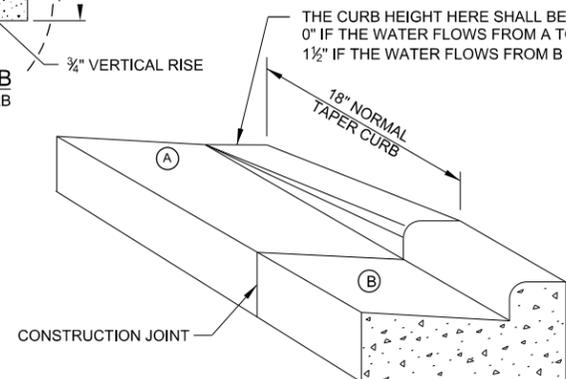
- CONTRACTION JOINTS TO BE SPACED 5' TYP. AT BUILDING CORNERS ALIGN CONTRACTION JOINTS WITH EACH FACE OF THE BUILDING.
- THE EXPOSED FACE OF PEDESTRIAN CURB SHALL BE VERTICAL.



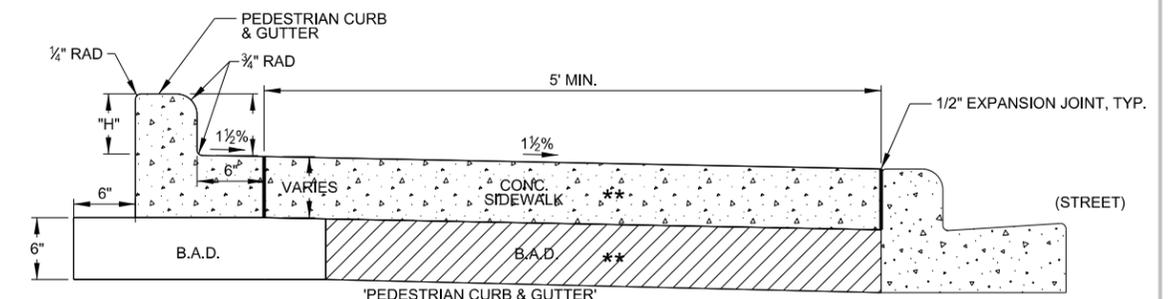
**SECTION A-A**



**SECTION B-B**  
DRIVE OVER CURB

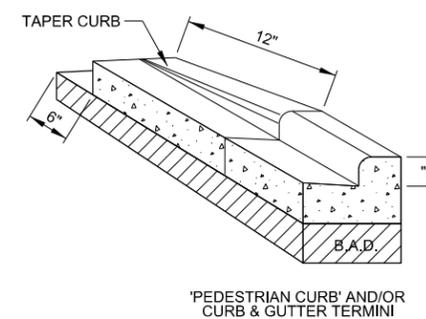


**DETAIL OF CURB & GUTTER TERMINI**



**PEDESTRIAN CURB & GUTTER**

\*\* THICKNESS OF CONCRETE SIDEWALK AND BASE VARIES - SEE PLANS AND DETAILS



**'PEDESTRIAN CURB' AND/OR CURB & GUTTER TERMINI**

PROJ. NO. \_\_\_\_\_  
 DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
 CITY OF MARSHFIELD, WISCONSIN  
**CONCRETE ENTRANCE**  
**CONCRETE CURB & GUTTER**  
**DETAILS**

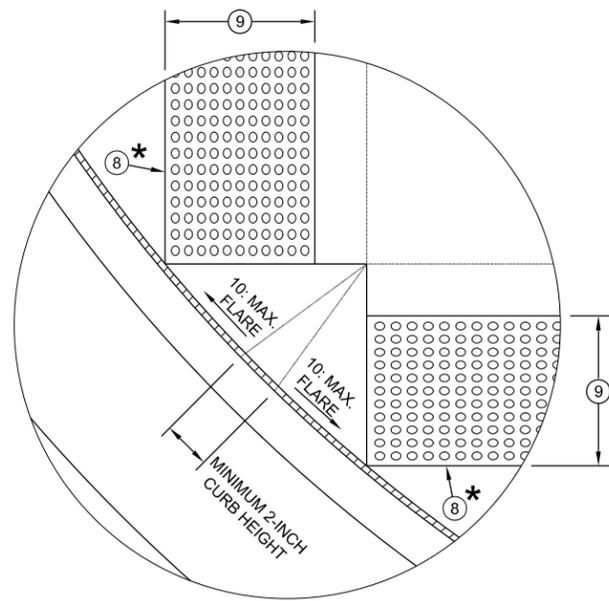
**GENERAL NOTES**

AVOID PLACING DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREAS.

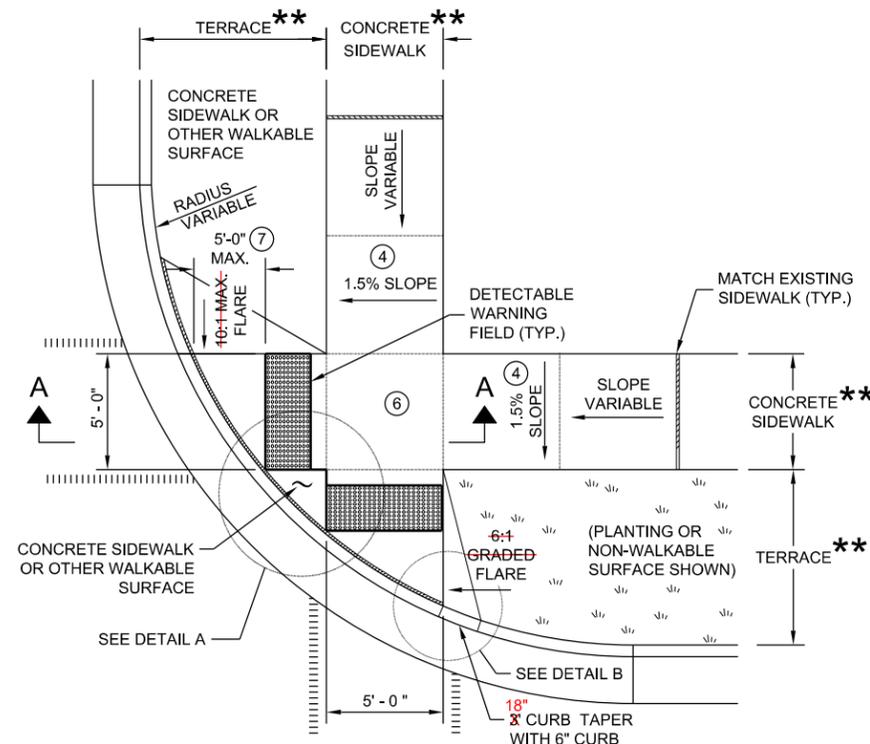
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

DETECTABLE WARNING FIELDS THAT ARE INSTALLED AS A GROUP OR SIDE BY SIDE SHALL BE FROM THE SAME MANUFACTURER.

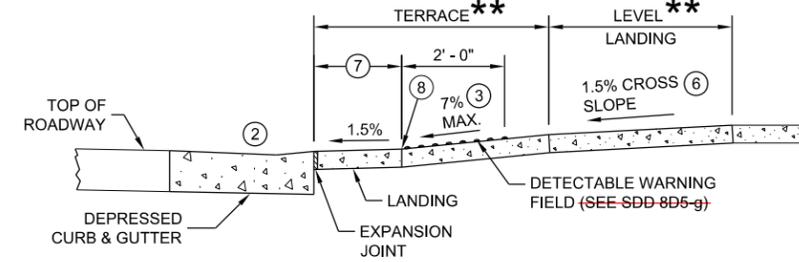
- ② GRADE CHANGE BETWEEN GUTTER FLAG SLOPE AND THE CURB RAMP SLOPE SHALL NOT EXCEED 11%. MAXIMUM GUTTER FLAG SLOPE IS 4%. PROVIDE LONGITUDINAL DRAINAGE AROUND CURB AND AWAY FROM CURB RAMP. NO VERTICAL LIPS OR DISCONTINUITIES GREATER THAN 1/4" ARE ALLOWED. SLOPE OF CURB HEAD OPENING SHALL MATCH THE RAMP SLOPE, MINIMALLY 1.5% AND NOT TO EXCEED 7%. WHEN ADJACENT TO 1.5% LANDING, CONSTRUCT CURB HEAD OPENING AT 1.5% IN THE DIRECTION OF PEDESTRIAN TRAVEL.
- ③ AN 8.33% CURB RAMP SLOPE IS ALLOWABLE WITH FLATTENED GUTTER FLAG SLOPE (2.67% OR LESS) AND NOT TO EXCEED 11% GRADE CHANGE.
- ④ ±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
- ⑥ PROVIDE A LEVEL LANDING (MAXIMUM 2% SLOPE) IN ANY DIRECTION OF PEDESTRIAN TRAVEL. STANDARD LEVEL LANDING SIZE IS 5 FEET X 5 FEET.
- ⑦ WHEN GRADE BREAK DISTANCE EXCEEDS 5 FEET, USE RADIAL DETECTABLE WARNING FIELD PER SDD 8D5-f.
- ⑧ PROVIDE GRADE BREAK PERPENDICULAR TO DIRECTION OF WHEELCHAIR TRAVEL.
- ⑨ WHEN DISTANCE IS LESS THAN 6' - 0", IT MAY BE DIFFICULT TO ACHIEVE A 7% SLOPE OR FLATTER ALONG THE RAMP. REDUCE CURB HEIGHT IN TRIANGLE AREA TO ACHIEVE 7% SLOPE OR FLATTER ON RAMP. CONSTRUCT 2-INCH MINIMUM CURB HEIGHT BETWEEN 10:1 FLARES.



**DETAIL A**

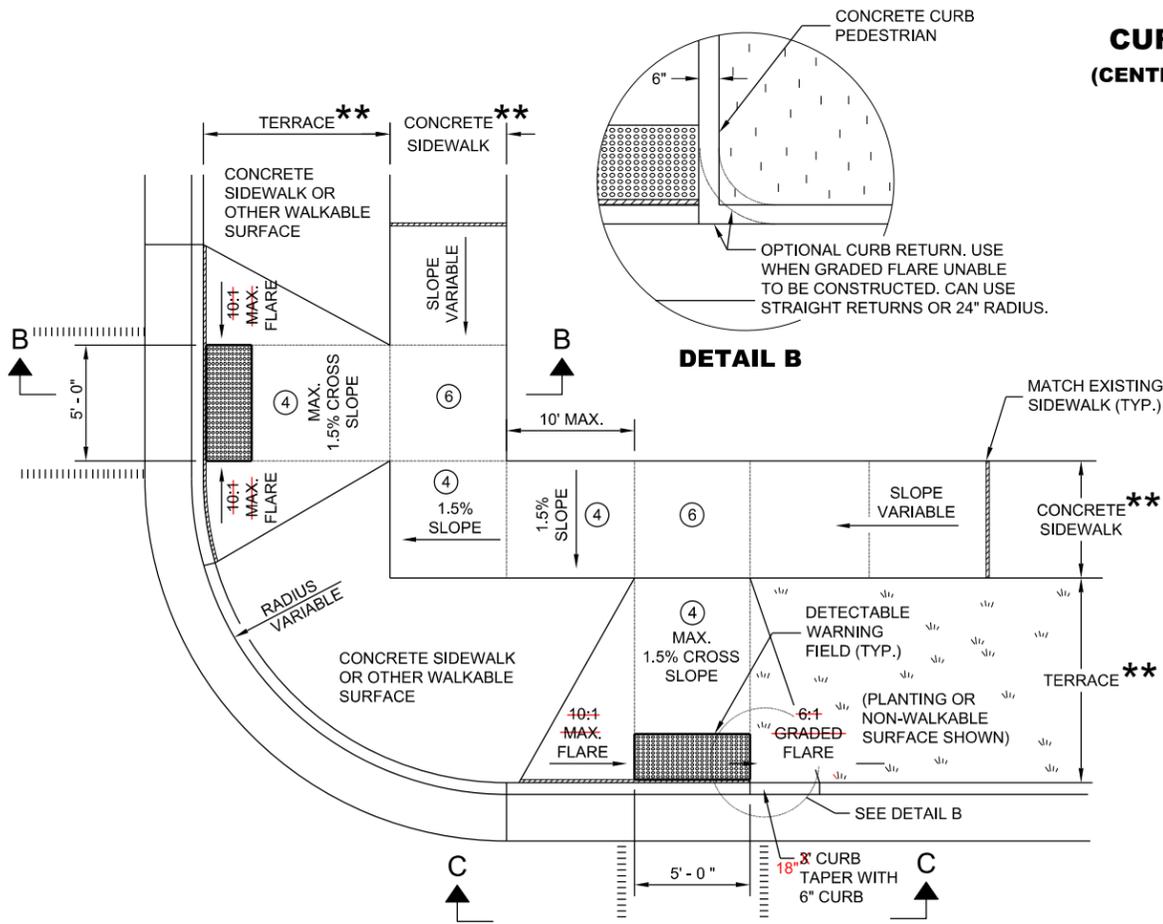


**PLAN VIEW CURB RAMP TYPE 2 (CENTER OF CORNER RADIUS)**

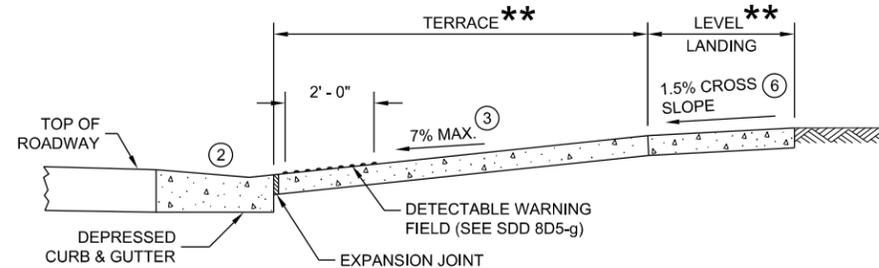


**SECTION A - A FOR TYPE 2**

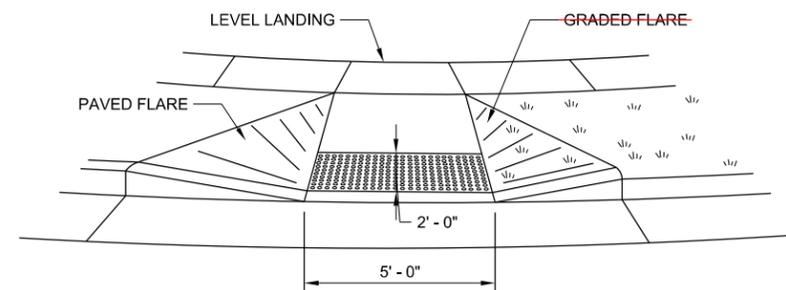
\* MAXIMUM 2.0% SLOPE IN ALL DIRECTIONS IN FRONT OF GRADE BREAK  
 \*\* WIDTH SHOWN ELSEWHERE IN THE PLANS



**PLAN VIEW CURB RAMP TYPE 3 (OUTSIDE OF CROSSWALK AREA)**



**SECTION B - B FOR TYPE 3**



**VIEW C - C FOR TYPE 3**

**LEGEND**

- ▬ 1/2" EXPANSION JOINT SIDEWALK
- ▬ CONTRACTION JOINT SIDEWALK
- ▬ PAVEMENT MARKING CROSSWALK (WHITE)

PROJ. NO. \_\_\_\_\_  
 DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
 CITY OF MARSHFIELD, WISCONSIN  
**CURB RAMP TYPE 2**  
 SDD 08D05-20b

CITY OF MARSHFIELD  
STANDARDS FOR REPAIR OF STREET PAVEMENTS

I. All Pavement Repairs

- All work and materials shall comply with the City of Marshfield Standard Specifications for Public Works Construction (current year edition, available on the City web site, [http://ci.marshfield.wi.us/public\\_works/files/spec.pdf](http://ci.marshfield.wi.us/public_works/files/spec.pdf)), Concrete/Pavement Repair and Replacement detail drawings, and these standards; and shall be the responsibility of the prime contractor or permittee.
- Backfill material shall be suitable native material (typically clay) compacted in lifts.
- Pavement, base and subbase materials shall be replaced in-kind. Match existing thicknesses of base and pavement if the existing thicknesses exceed the minimum thicknesses as detailed for asphalt or concrete pavements.
- Roadway underdrains, if encountered shall be repaired in-kind (including pipe, fabric, media, etc.).
- Longitudinal joints shall be parallel to the centerline of the travelled way, but shall not be located in a wheel path. Transverse joints shall be perpendicular to longitudinal joints. Skewed joints will only be allowed if approved by the City Engineer.
- All repaired surface areas shall be flush with existing pavements and provide a smooth ride along with proper drainage. Repair areas that do not satisfy these requirements shall be removed and replaced.
- Seal all new joints within the repair area, and perimeter joints between the repair area and existing pavement. Reseal existing joints beyond the repair area if disturbed by construction. Completely fill the joint with hot-pour elastic sealant.
- Re-establish all pavement markings removed within the repair area, and beyond if disturbed by construction. Pavement markings shall be repainted in-kind (i.e. existing epoxy/preformed plastic/latex pavement markings shall be replaced with new epoxy/preformed plastic/latex pavement markings).
- Roadway shoulders shall be restored if within the repair area or disturbed by construction. Shouldering material shall be replaced in-kind (i.e. paved asphalt/recycled asphalt millings/gravel shall be replaced with paved asphalt/recycled asphalt millings/gravel).

II. Concrete Pavement

A. Sawing

- Saw existing concrete pavement, full depth.
- Minimize over-sawing into adjacent pavements/panels. Do not oversaw beyond the repair area unless the saw blade is within an existing joint.
- If existing pavement is 5 years old or less, then saw/remove full panel(s), existing joint to existing joint.
- If existing pavement is 6 years old or older, then saw as follows:
  - Provide 6' minimum distance between an existing joint or crack and the proposed saw cut for the repair area.
  - Repair area shall be at least 6' for both longitudinal and transverse directions.
  - Rule of thumb: Don't take anything less than 6' and don't leave anything less than 6'.
  - Saw to remove defective or spalling (existing) joints.

B. Chipped Joints

- Minimize the possibility for joints or sawed edges to become chipped or damaged through utilization of secondary saw cuts and careful removal (excavation, backfilling, grading) procedures.
- Chips 1" or less horizontally shall be repaired unless the existing street pavement joints are spalled/widened to this degree.
- Chips between 1" and 2" horizontally may be repaired if existing street pavement joints are spalled/widened to this degree. If, in the opinion of the City Engineer, repairing the chip would be detrimental to the street as compared to the general condition of said street pavement, then re-saw the joint/edge, for the entire length ("Boxing-out" around the chip is not allowed).
- Chips larger than 2" horizontally will require re-sawing the joint/edge for the entire length.
- Joints/sawed edges with multiple chips will typically require re-sawing the joint/edge for the entire length.
- Use VersaSpeed as manufactured by the Euclid Chemical Company for repairing chipped concrete. Follow the manufacturer's installation directions for use.
- Note: Resawing may substantially increase the size of the repair, as necessary to comply with the saw cut location requirements.

C. Minimum Thicknesses

- Gravel base shall not be less than 6", compacted.
- Concrete pavement shall not be less than 8".

D. Dowel Bars

- All transverse joints shall be doweled, unless the thickness of the existing concrete is less than 7", thence tie bars shall be installed.
- Dowel bars shall be 1-1/4" x 18", Epoxy Coated Steel.
- When drilled into existing pavement, drill 1-3/8" x 9" holes, spaced 15" on-center, and anchored with an epoxy.
- When set into new pavement, use baskets with bars spaced 12" on-center.

E. Tie Bars

- All longitudinal joints shall be reinforced with pavement ties.
- When drilled into existing pavement, drill (1/8" larger than bar) 6" deep and use No. 6 Epoxy Coated Rebar, 12" long, spaced 30" on-center, and anchored with an epoxy.
- When set into new pavement, use No. 4 Epoxy Coated Rebar, 24" long, spaced 30" on-center.

F. Ready Mix Concrete

- Concrete mix shall be from an approved ready mix concrete supplier.
- Design of the mix shall comply with current City of Marshfield Standard Specifications for Public Works Construction, Section 10, and modifications thereof. Air entrainment and Type II cement are required.
- Use of 9-bag or Special High Early Strength mixes is not allowed.
- Use of chloride or accelerating admixtures to increase early strength development or decrease set time is not allowed.
- Preparation, forming, handling, placing, finishing, curing and protecting shall comply with the City's Standard Specifications. Curing compound shall be Tri-Kote 26, or approved equal, and shall be spray applied.
- Open to traffic after concrete has attained 3000 psi compressive strength as verified through cylinder testing (arterial and collector streets) or equivalent curing days for other locations.

III. Asphalt Pavement

- Asphalt pavement may be sawed before or after excavation, however, the edge(s) of existing asphalt pavement bounding the repair area must be vertical and undamaged when permanent repairs are made.
- Minimum thicknesses for asphalt pavement repairs shall be not less than 9" of gravel (compacted) and not less than 3" of asphalt.
- Asphalt repair patches for locations within the travelled way of collector and arterial streets; and all other streets of which the surface is 5 years old or less, shall be at least 10' wide (transverse dimension) and 10' long as a minimum (allows placement of asphalt by a paver).
- Hot mix asphalt for streets, alleys, driveways, etc. shall be placed and compacted in lifts.
- Damage to existing pavement beyond the excavation must be repaired as part of the patch. Damage may include cracking, separation, lifted mat, scratches, gouges, imprints, etc.
- Asphalt surface treatments such as chip seal treatment, slag seal treatment, coat tar or asphalt emulsion sealant, etc. shall be restored where disturbed by construction.

IV. Asphalt Overlaid on Concrete Base

- Remove all broken, damaged or unsound concrete. Full depth sawing of the concrete pavement is not required.
- Transverse joint reinforcement: Use drilled tie bars, No. 6 x 12", spaced 12" on-center.
- Longitudinal joint reinforcement: Use drilled tie bars, No. 6 x 12", spaced 30" on-center.
- If brick pavers are found underlying the asphalt surface, then remove all loose bricks and pour concrete base against remaining stable bricks (reinforcement or ties not required).
- All other requirements for Concrete Pavement shall apply.
- Saw and remove asphalt beyond the base concrete repair area.
- Location of asphalt joints shall comply with requirements for asphalt pavement.
- All other requirements for Asphalt Pavement shall apply.
- Note: Curb and gutter repair shall be done such that the pan will be overlaid with asphalt, however, the curb head shall remain exposed (including depressed curb head through driveways).

V. Subsurface Utility Excavation (SUE)/Pothing

- Use air (vacuum) within pavement structure. Use air or water (jetting) in other R/W areas beyond the pavement structure.
- Full depth core saw existing pavement, 12" diameter round, typical. Remove and save the 'core'.
- Provide/use a temporary protective steel ring to protect the edge of the opening. Provide/use a temporary round plate (with skirt) to protect opening if subjected to traffic prior to pavement repair.
- Match existing thicknesses of bedding/cover, base and surface materials.
- If suitable for reuse, reinstall the 'core' in the opening at the original alignment/orientation, using approved non-shrink grout placed into the opening and forced to the surface (filling annular space) upon placement/reinsertion of the 'core'.
- If the 'core' cannot be reused, then concrete repairs shall comply with all requirements for concrete pavement except as discussed herein. The joint of the new concrete patch shall be tied to existing concrete using #4 Epoxy Coated Rebar, 8" long, space 120° apart. Clean the vertical surface of existing concrete and prepare using a bonding agent. Concrete shall be ready mix or an approved high quality, air entrained bagged mixture. Finish, cure and protect as required for Concrete Pavement.
- Asphalt repairs shall comply with all requirements for Asphalt Pavement except as discussed herein. The joint of the new asphalt patch shall be adhered/tacked to the existing asphalt. Asphalt material shall be Hot Mix Asphalt or an approved mixture such as Quikrete Commercial Grade High Performance Blacktop Repair.

{End of Standards}

Rev. 1/14

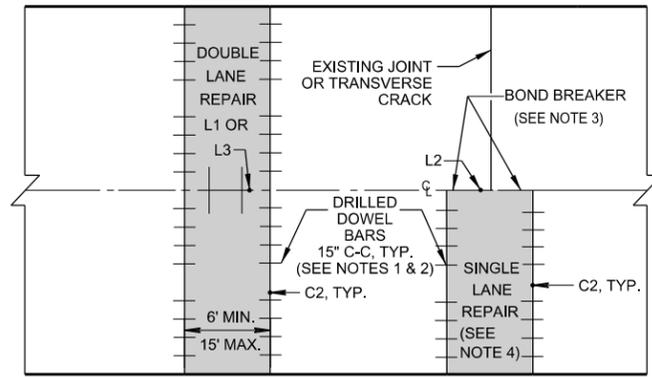
PROJ. NO.

DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
CITY OF MARSHFIELD, WISCONSIN

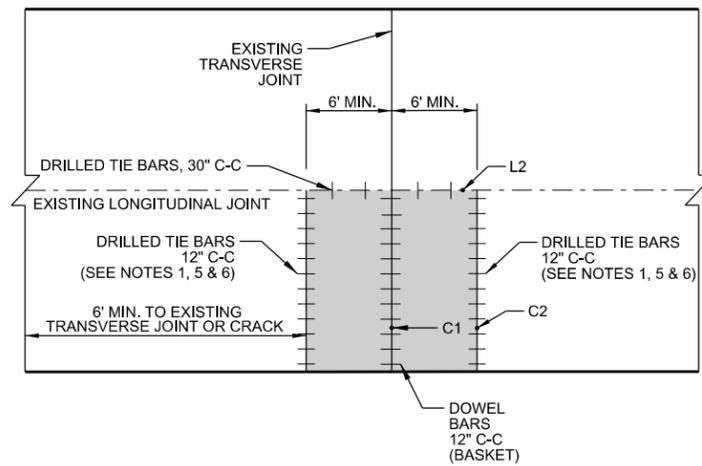
CONCRETE /PAVEMENT  
REPAIR & REPLACEMENT  
(STREET REPAIR STANDARDS)  
SHEET 1 OF 3

**GENERAL NOTES**

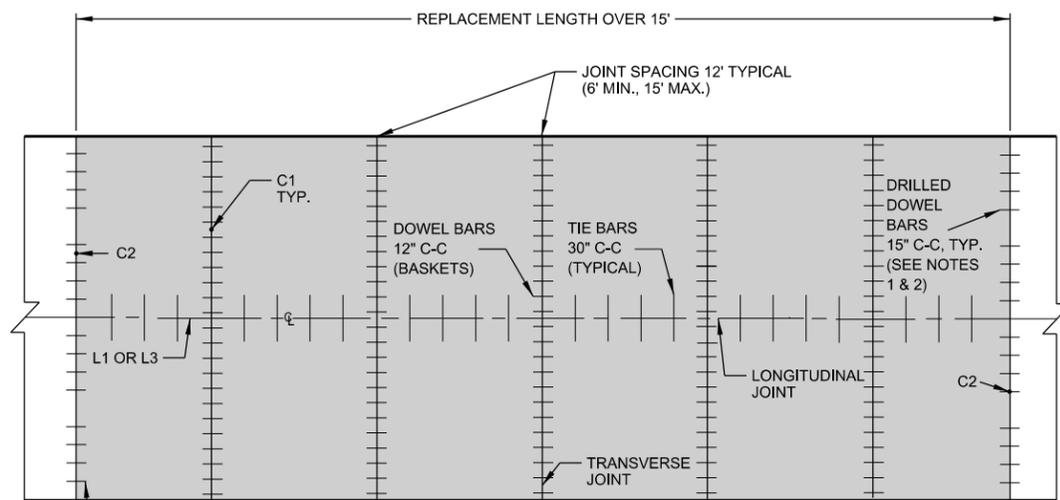
- DO NOT OVERSAW BEYOND THE REPAIR AREA UNLESS THE SAW BLADE IS WITHIN AN EXISTING JOINT.
- DOWEL BARS SHALL BE INSTALLED PARALLEL TO THE PAVEMENT CENTERLINE AND PAVEMENT SURFACE.
- CONCRETE PAVEMENT REPAIRS OF EXISTING NON DOWELED CONCRETE PAVEMENTS SHALL BE DOWELED.
- ALL NEW AND EXISTING JOINTS SHALL BE FILLED/SEALED.
- 1. ANCHOR DOWEL AND TIE BARS INTO DRILLED HOLES WITH AN EPOXY.
- 2. APPLY A THIN UNIFORM COATING OF SURFACE TREATMENT TO THE FREE END OF DOWEL BARS TO PREVENT BONDING.
- 3. USE AN ENGINEER-APPROVED BOND BREAKER (0.5MM FREE STANDING PLASTIC SHEETING, RELEASE AGENT, CURING COMPOUND, 30LB TAR PAPER, ETC.) FOR SINGLE LANE REPAIRS UP TO 15 FEET IN LENGTH.
- 4. SINGLE LANE JOINT REPAIR PATCH WITH OFFSET TRANSVERSE JOINT NOT ALLOWED FOR REPAIR OF UTILITY CUTS.
- 5. PROVIDE A MINIMUM DISTANCE OF 15 INCHES FROM AN EXISTING TRANSVERSE JOINT OR THE EDGE OF REPLACEMENT TO THE CENTER OF THE TIE BAR NEAREST THAT JOINT OR EDGE.
- 6. RESTRICT THE POTENTIAL FOR JOINT MOVEMENT WHEN INTRODUCING NEW TRANSVERSE JOINTS THAT DO NOT EXTEND ACROSS THE ENTIRE WIDTH OF PAVEMENT.
- 7. DRILLED TIE BARS ARE REQUIRED WHERE LONGITUDINAL EDGES OF THE REPAIR/REPLACEMENT AREAS ABUT CONCRETE CURB & GUTTER OR PAVEMENT.



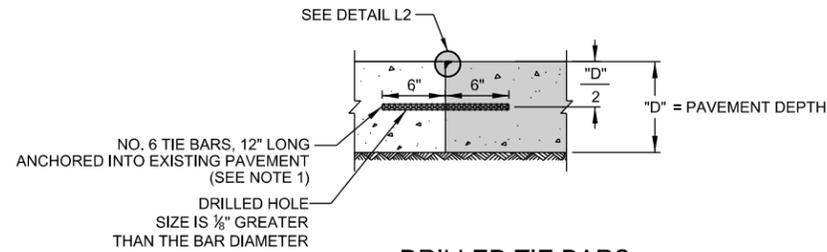
**CONCRETE PAVEMENT JOINT REPAIR/REPLACEMENT**



**SINGLE LANE CONCRETE PAVEMENT REPAIR**

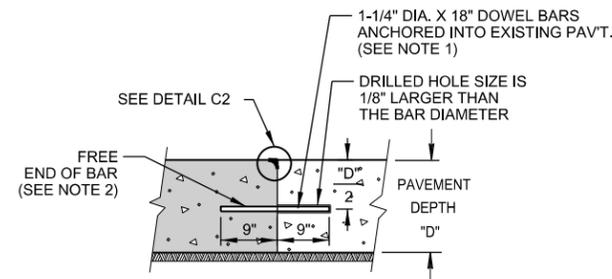


**MULTI-LANE CONCRETE PAVEMENT REPLACEMENT**



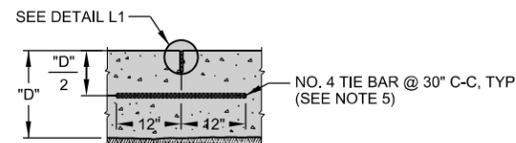
**DRILLED TIE BARS**

(DRILLED INTO EXISTING CONCRETE PAVEMENT)



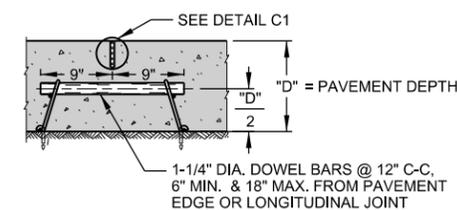
**DRILLED DOWEL BARS**

(DRILLED INTO EXISTING CONCRETE PAVEMENT)



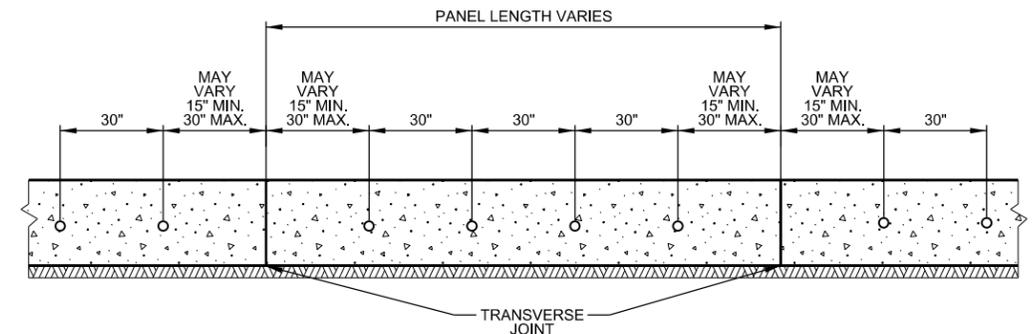
**LONGITUDINAL/TIED JOINT**

(WITHIN NEW PAVEMENT/PATCH)



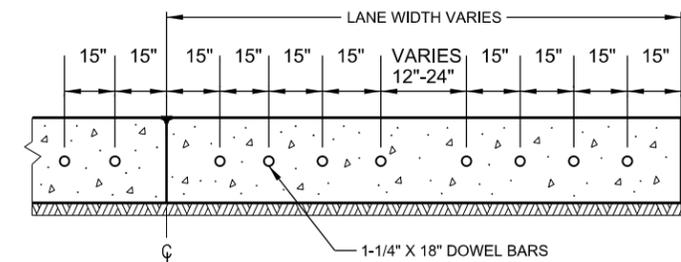
**TRANSVERSE/DOWELED JOINT**

(WITHIN NEW PAVEMENT/PATCH)



**TIE BAR SPACING**

(DRILLED INTO EXISTING PAVEMENT OR PLACED WITHIN NEW PAVEMENT/PATCH)



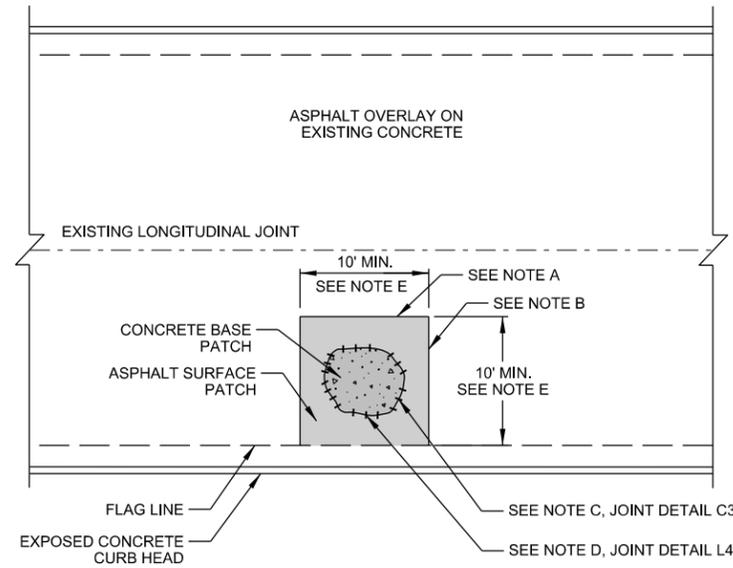
**DRILLED DOWEL BAR SPACING**

(DRILLED INTO EXISTING PAVEMENT)

PROJ. NO.

DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
CITY OF MARSHFIELD, WISCONSIN

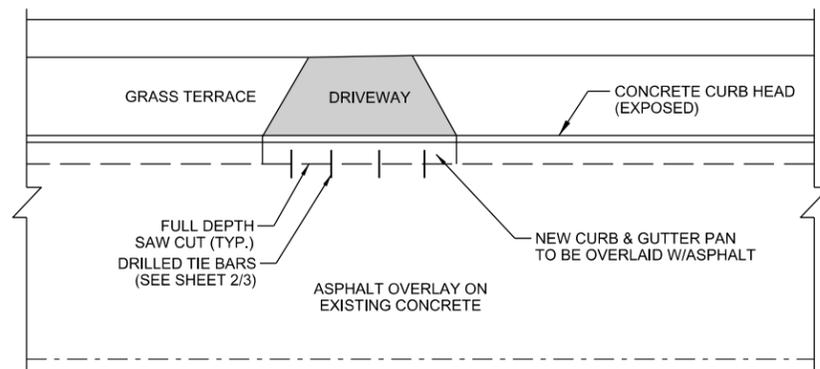
**CONCRETE PAVEMENT  
REPAIR & REPLACEMENT  
(STREET REPAIR STANDARDS)  
SHEET 2 OF 3**



**ASPHALT OVERLAY ON CONCRETE BASE (REPAIR)**

**NOTES:**

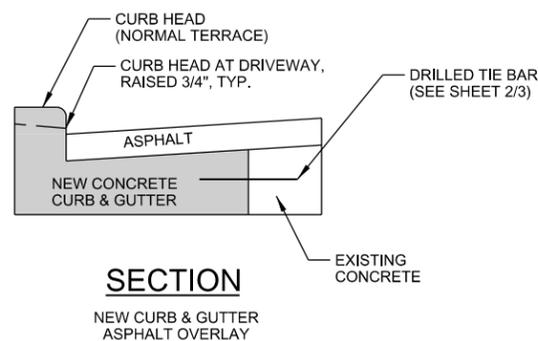
- A. LONGITUDINAL JOINTS SHALL BE AT THE  $\frac{1}{4}$  OR PARALLEL WITH THE  $\frac{1}{4}$  AT THE MIDDLE OR EDGE OF THE LANE/TRAVELED WAY. LONGITUDINAL JOINTS SHALL NOT BE AT A WHEEL PATH.
- B. TRANSVERSE JOINTS SHALL BE ALIGNED WITH OR AT LEAST 6' FROM AN EXISTING TRANSVERSE JOINT OR CRACK.
- C. TRANSVERSE JOINT REINFORCEMENT SHALL BE DRILLED TIE BARS (NO. 6x12" SPACED 12" C-C, SEE SHEET 2/3)
- D. LONGITUDINAL JOINT REINFORCEMENT SHALL BE DRILLED TIE BARS (NO. 6x12" SPACED 30" C-C, SEE SHEET 2/3)
- E. MINIMUM DIMENSIONS FOR ASPHALT REPAIRS AS SHOWN SHALL BE REQUIRED ON COLLECTOR AND ARTERIAL STREETS; AND RESIDENTIAL STREETS WITH ASPHALT SURFACE AGE OF 5 YEARS OR LESS.



**CURB & GUTTER ON ASPHALT OVERLAID CONCRETE PAVEMENT**

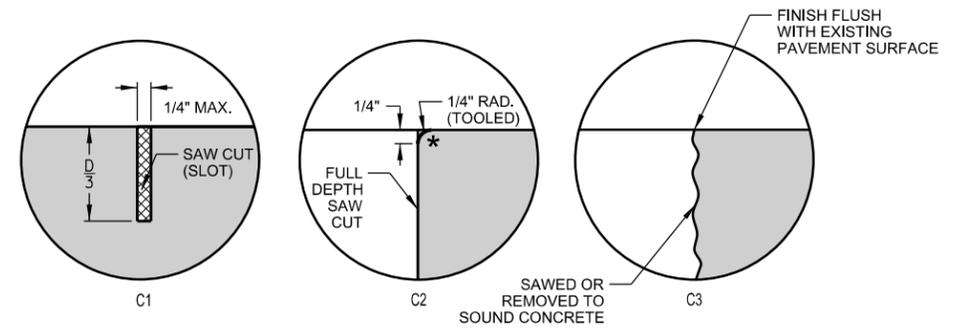
**NOTES:**

- CURB OPENINGS FOR NEW DRIVEWAYS MAY BE CONSTRUCTED BY SAWING OFF THE CURB HEAD (IF PROFESSIONALLY DONE BY TRAINED PERSONNEL USING PROPER EQUIPMENT) IN LIEU OF REMOVAL AND REPLACEMENT.
- NEW CONCRETE CURB & GUTTER PAN SHALL NOT BE EXPOSED UNLESS APPROVED BY THE CITY ENGINEER.

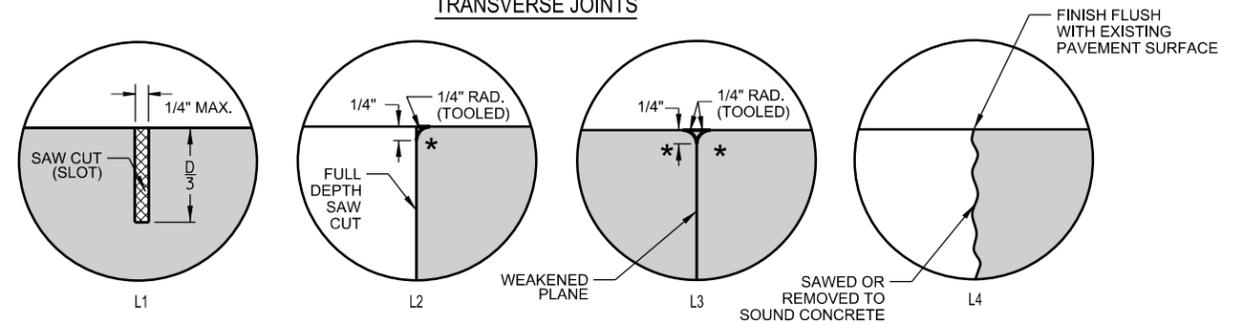


☒ HOT-POUR ELASTIC SEALANT REQUIRED

\* TROWEL/EDGE NEW CONCRETE TO CREATE A RESERVOIR FOR JOINT SEALANT

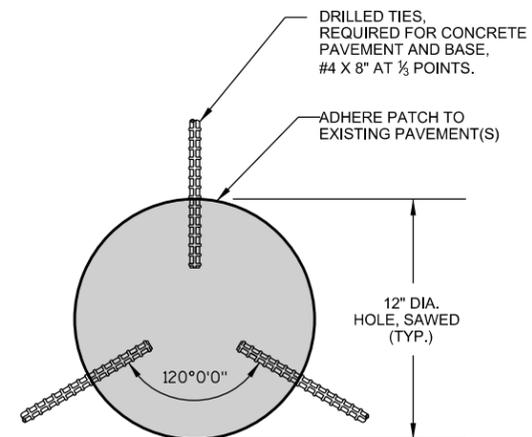


**TRANSVERSE JOINTS**



**LONGITUDINAL JOINTS**

**CONCRETE PAVEMENT JOINT DETAILS**

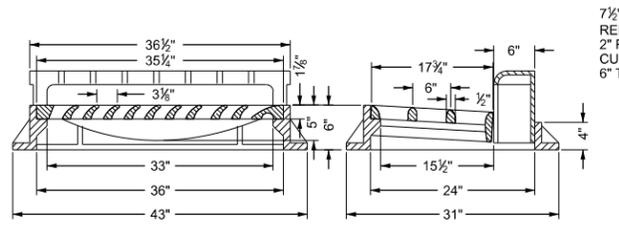


**S.U.E./POTHOLE REPAIR**  
(CONCRETE PAVEMENT/BASE)

PROJ. NO.

DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
CITY OF MARSHFIELD, WISCONSIN

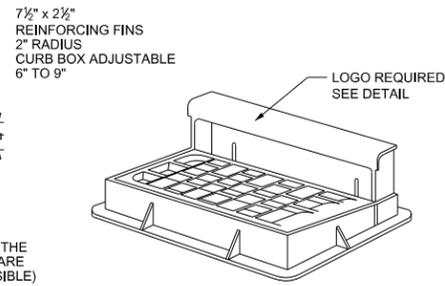
**CONCRETE PAVEMENT JOINT DETAILS &  
ASPHALT OVERLAY/ POTHOLE REPAIRS**  
(STREET REPAIR STANDARDS)  
SHEET 3 OF 3



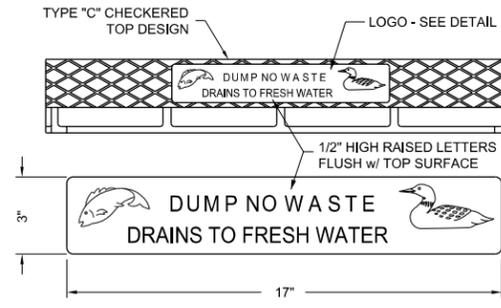
SIMILAR TO NEENAH FDY. CO. CAT. NO. R-3067 WITH TYPE L GRATE

NOTE: GRATE SHALL BE ORIENTED TO THE DIRECTION OF FLOW. (GRATES ARE MANUFACTURED TO BE REVERSIBLE)

CATCH BASIN COVER-TYPE "H"

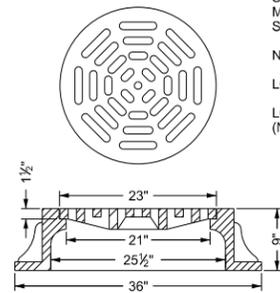


(GRATE TYPE "L")

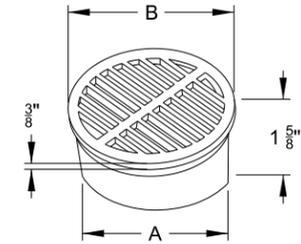


LOGO DETAIL

SIMILAR TO NEENAH MANHOLE LID WITH TYPE "D" STANDARD FLAT DESIGN  
NEENAH NO. R-2050  
LOW PROFILE DESIGNATED "C-LP"  
LOW PROFILE FRAME - NEENAH NO. R-1689 (NON-ROCKING)



MANHOLE OR CATCH BASIN COVER-TYPE "C"

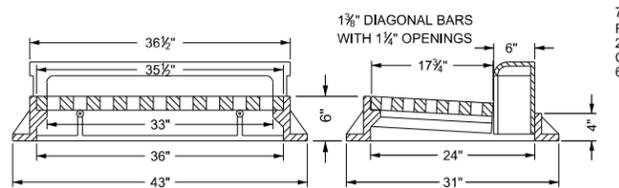


INLET COVER-TYPE "K"

TYPE K GRATES				
TYPE	SIZE	MATERIAL	A	B
12K	12"	DUCTILE IRON	11.47"	15.7"
15K	15"	DUCTILE IRON	14.225"	19.45"
18K	18"	DUCTILE IRON	17.33"	23.5"

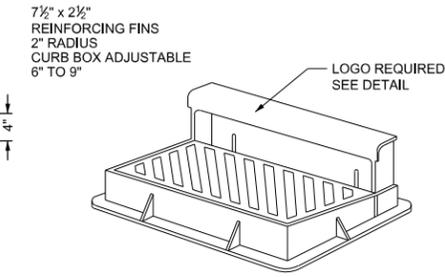
NOTE: 4.5" WIDE SOD STRIP REQUIRED AROUND INLET IF LOCATED IN GRASSED AREA.

SIMILAR TO HARCO PEDESTRIAN DROP-IN GRATE

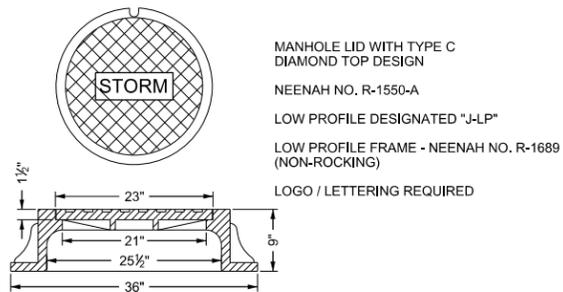


SIMILAR TO NEENAH FDY. CO. CAT. NO. R-3067 WITH TYPE R GRATE

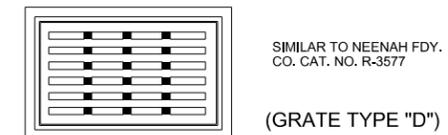
CATCH BASIN COVER-TYPE "H-S"



(GRATE TYPE "R")

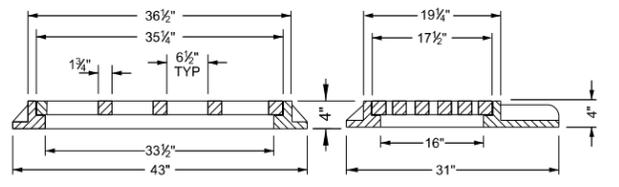


MANHOLE COVER-TYPE "J"



(GRATE TYPE "D")

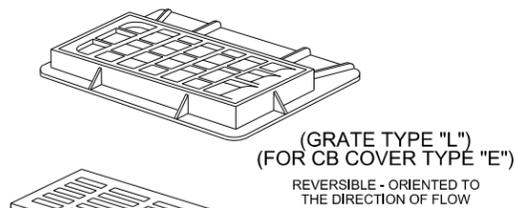
SIMILAR TO NEENAH FDY. CO. CAT. NO. R-3577



SIMILAR TO NEENAH FDY. CO. CAT. NO. R-3067-C WITH TYPE L GRATE ("E") OR TYPE C GRATE ("E-S")

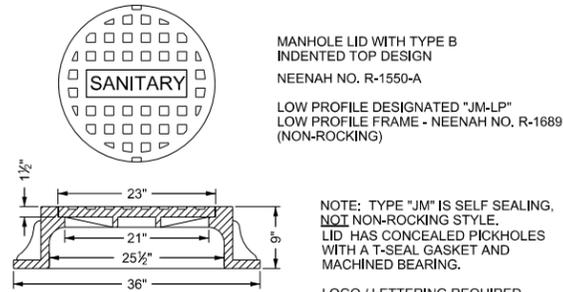
NOTE: GRATE SHALL BE ORIENTED TO THE DIRECTION OF FLOW. (GRATES ARE MANUFACTURED TO BE REVERSIBLE SHALL BE FURNISHED)

CATCH BASIN COVER-TYPE "E" AND "E-S"

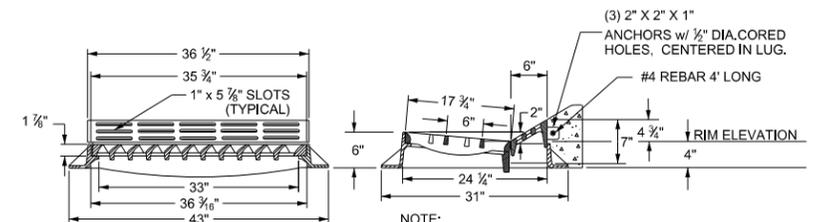


(GRATE TYPE "L") (FOR CB COVER TYPE "E")

REVERSIBLE - ORIENTED TO THE DIRECTION OF FLOW

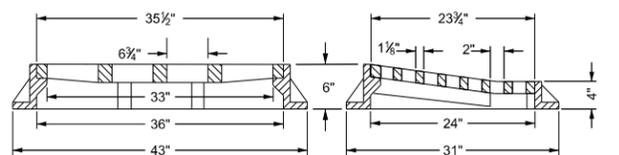


MANHOLE COVER-TYPE "JM"



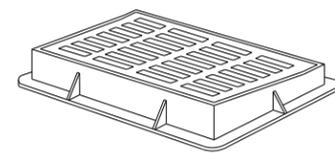
CATCH BASIN COVER-TYPE "HM"

NOTE: SPECIAL GRATE FOR THE TYPE "H" COVER MAY ALSO BE USED FOR THE TYPE "HM" COVER SEE CATCH BASIN AND INLET COVER TYPE "HS" NOTED AS TYPE HM-S ON STRUCTURE TABLE

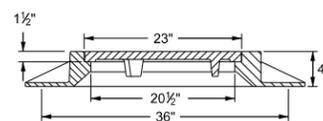


SIMILAR TO NEENAH FDY. CO. CAT. NO. R-3290-A WITH TYPE C GRATE

CATCH BASIN COVER-TYPE "D"



(GRATE TYPE "C")



MANHOLE OR CATCH BASIN COVER FRAME-TYPE "XX-LP"

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR INLET COVERS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ROUND FRAMES AND COVERS SHALL HAVE CONTINUOUSLY MACHINED BEARING SURFACES TO PREVENT ROCKING AND RATTLING

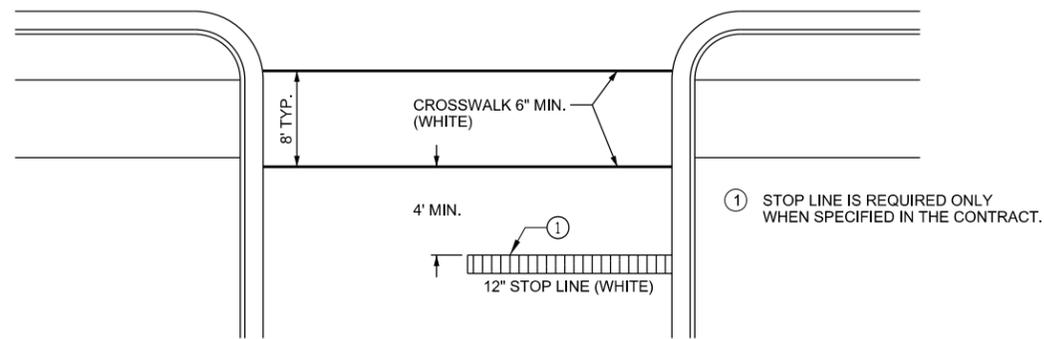
PLOTTED ON: 2/20/2020 3:18:34 PM

PROJ. NO.  
DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
CITY OF MARSHFIELD, WISCONSIN  
CASTING  
DETAILS

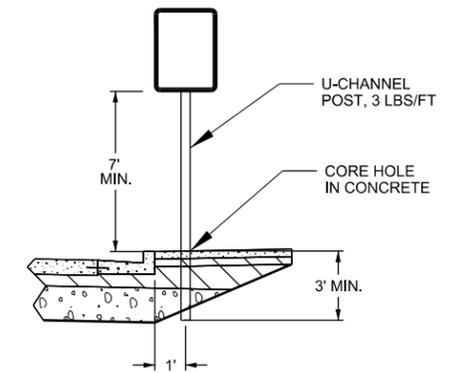
**GENERAL NOTES**

DETAILS OF INSTALLATION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

ALL LETTERS AND SYMBOLS SHALL BE IN CONFORMANCE WITH REQUIREMENTS INCLUDED IN "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKING" BY THE FEDERAL HIGHWAY ADMINISTRATION. ALL LETTERS, ARROWS AND SYMBOLS SHALL BE WHITE AND REFLECTORIZED.



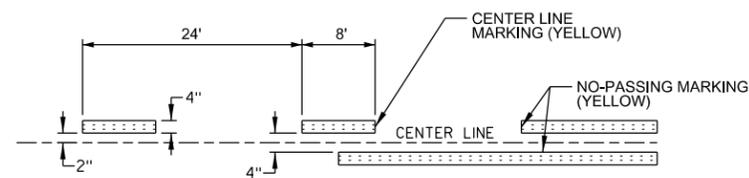
**STOP LINE AND CROSSWALK DETAIL**



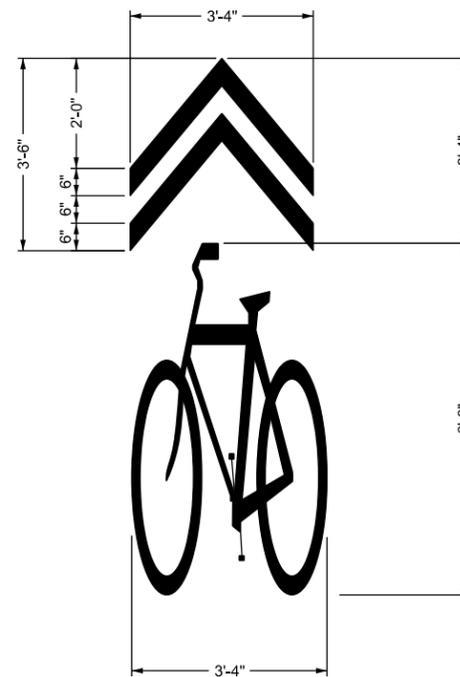
NOTE: SEE TYPICAL SECTIONS FOR UNDERLYING MATERIALS

**SIGN PLACEMENT DETAIL**

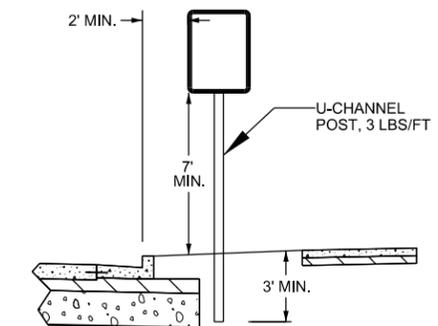
**NO TERRACE**



**CENTERLINE MARKING DETAIL-STREET**



**BIKE SYMBOL FOR SHARED LANE**



**SIGN PLACEMENT DETAIL**

**TERRACED AREA**

PROJ. NO.

DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION  
CITY OF MARSHFIELD, WISCONSIN

PAVEMENT MARKING  
MAINLINE, CROSSWALKS,  
AND STOP BARS