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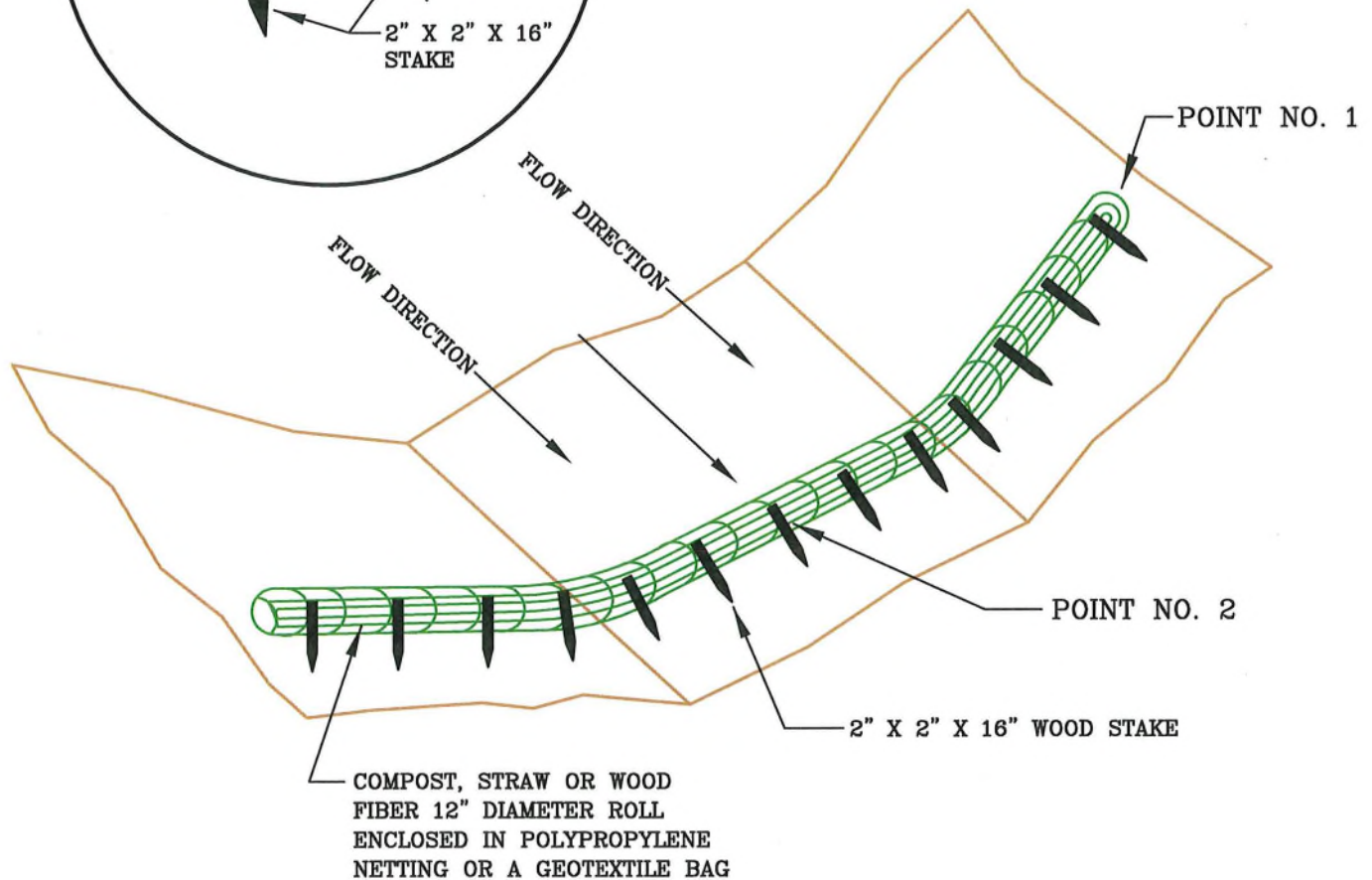
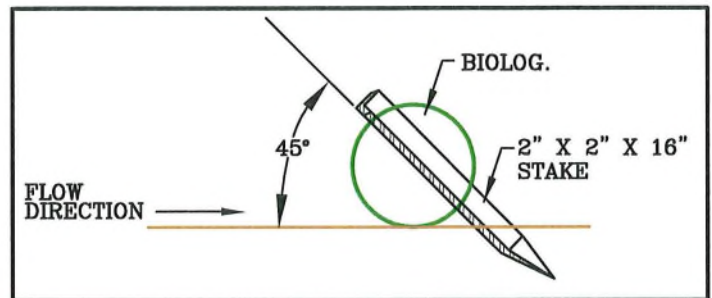
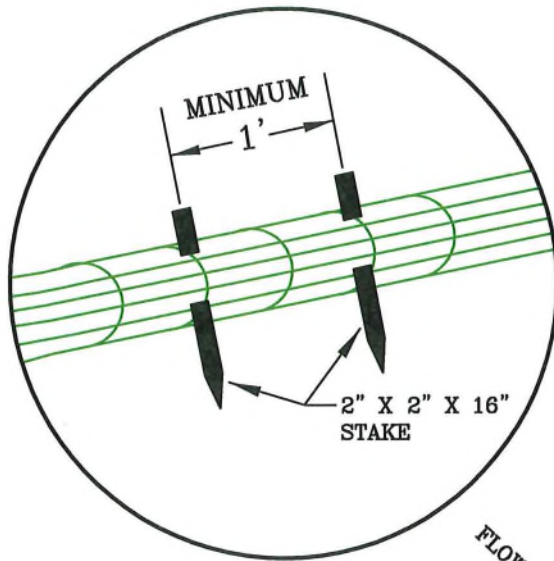
WAT-1 WATERMAIN HYDRANT
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STANDARD PLATE DETAILS INDEX

EROSION CONTROL BIOLOG DITCH CHECK

- NOTES:**
1. POINT NO. 1 MUST BE A MINIMUM OF 6" HIGHER THAN POINT NO. 2 TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS OF THE BIOLOG.
 2. EACH 2" X 2" X 16" LONG WOODEN STAKE WITH A MINIMUM OF 1.0' SPACING BETWEEN STAKES SHALL BE DRIVEN THROUGH THE BACK HALF OF THE COMPOST LOG AT AN ANGLE OF 45° WITH THE TOP OF THE STAKE POINTING UP STREAM.
 3. CONTRACTOR IS RESPONSIBLE FOR THE MAINTAINANCE OF EROSION CONTROL PER THE REQUIREMENTS OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP).





HEAVY DUTY SILT FENCE

NOTES: 1. CONTRACTOR IS RESPONSIBLE FOR THE MAINTAINANCE OF EROSION CONTROL PER REQUIREMENTS OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP).

STEEL FENCE POST
(T-POST) MINIMUM 5' LONG
WITH MAXIMUM OF 6' SPACING

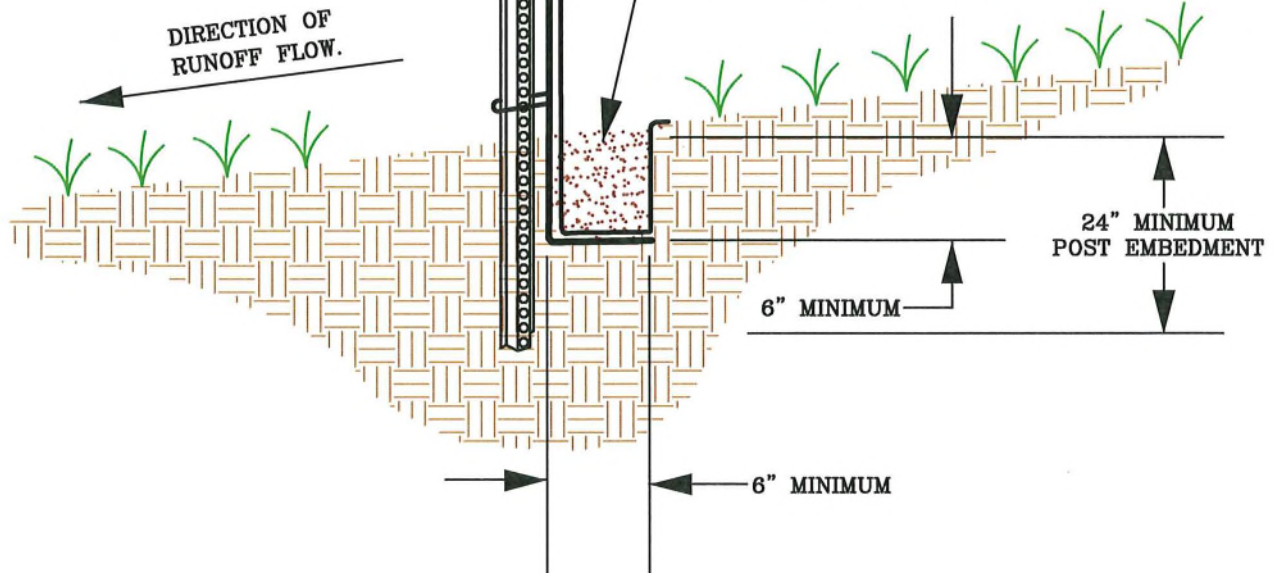
ATTACH FABRIC TO POSTS WITH A
MINIMUM OF 3 ZIP TIES WITH A
STRENGTH OF (50LB. TENSILE) PER
POST IN THE TOP 8' OF FABRIC.

WIRE MESH REINFORCEMENT, STANDARD FIELD
FENCE, WITH A MINIMUM OF 30" HIGH, WITH
A MAXIMUM MESH SPACING OF 6" AND WITH
A MINIMUM OF 14 1/2 GAUGE WIRE

GEOTEXTILE FABRIC PER MnDOT SPECIFICATION
TABLE 3886. OVERLAP THE TOP 6" OF FABRIC
AND FASTEN TO THE WIRE MESH FENCE AT
2' INTERVALS WITH RINGS OR WIRE TIES.

ATTACH WIRE MESH TO POSTS WITH A MINIMUM
OF 3-U SHAPED WIRE FASTENERS PER POST.

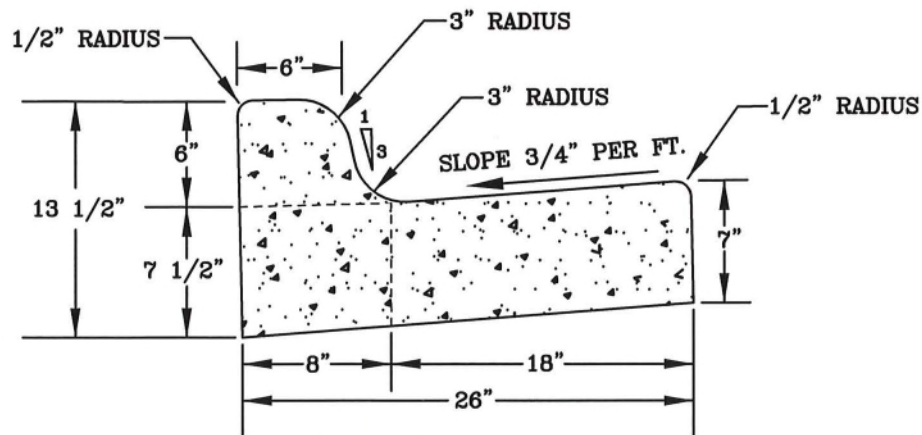
LAY FABRIC / WIRE MESH IN SAME TRENCH
AND BACKFILL WITH EXISTING SOIL, AND
COMPACT WITH LIGHT EQUIPMENT PRIOR TO
PLACEMENT OF POSTS.



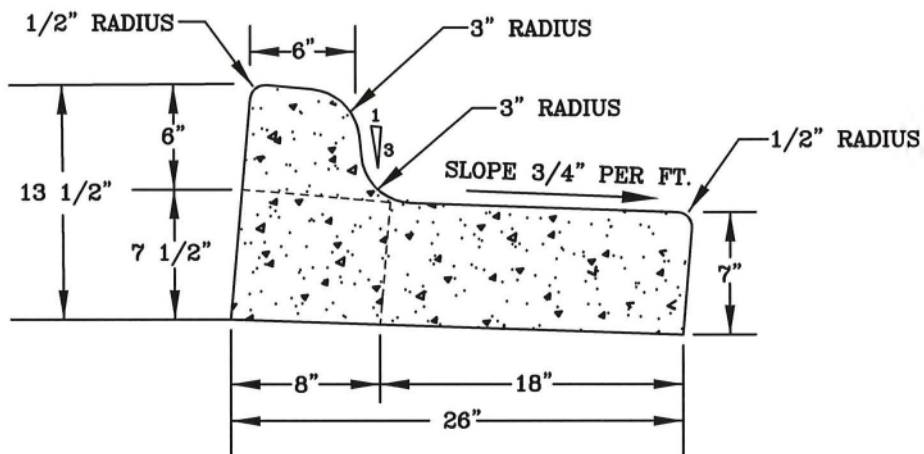
SHOREVIEW
PUBLIC WORKS

TYPICAL HEAVY DUTY
SILT FENCE INSTALLATION

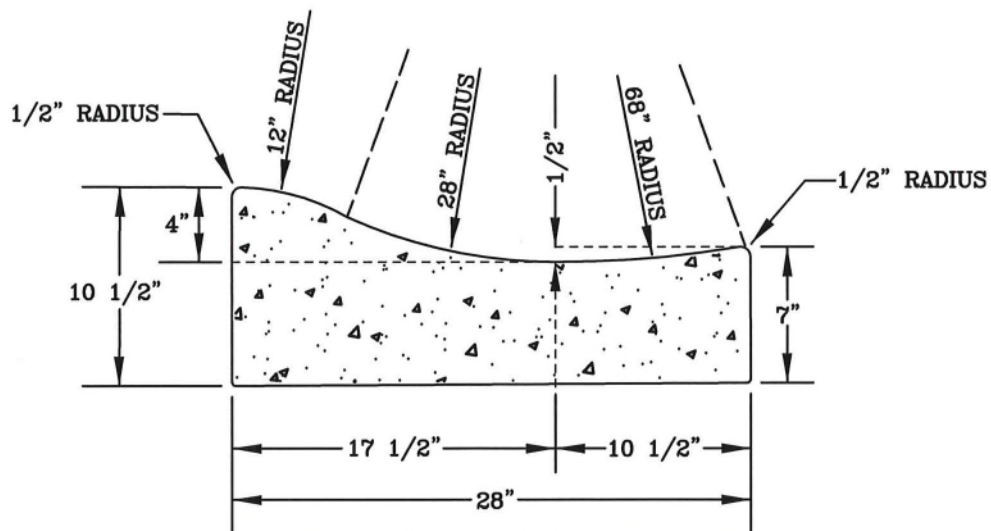
CONCRETE CURB & GUTTER



B618 CURB & GUTTER



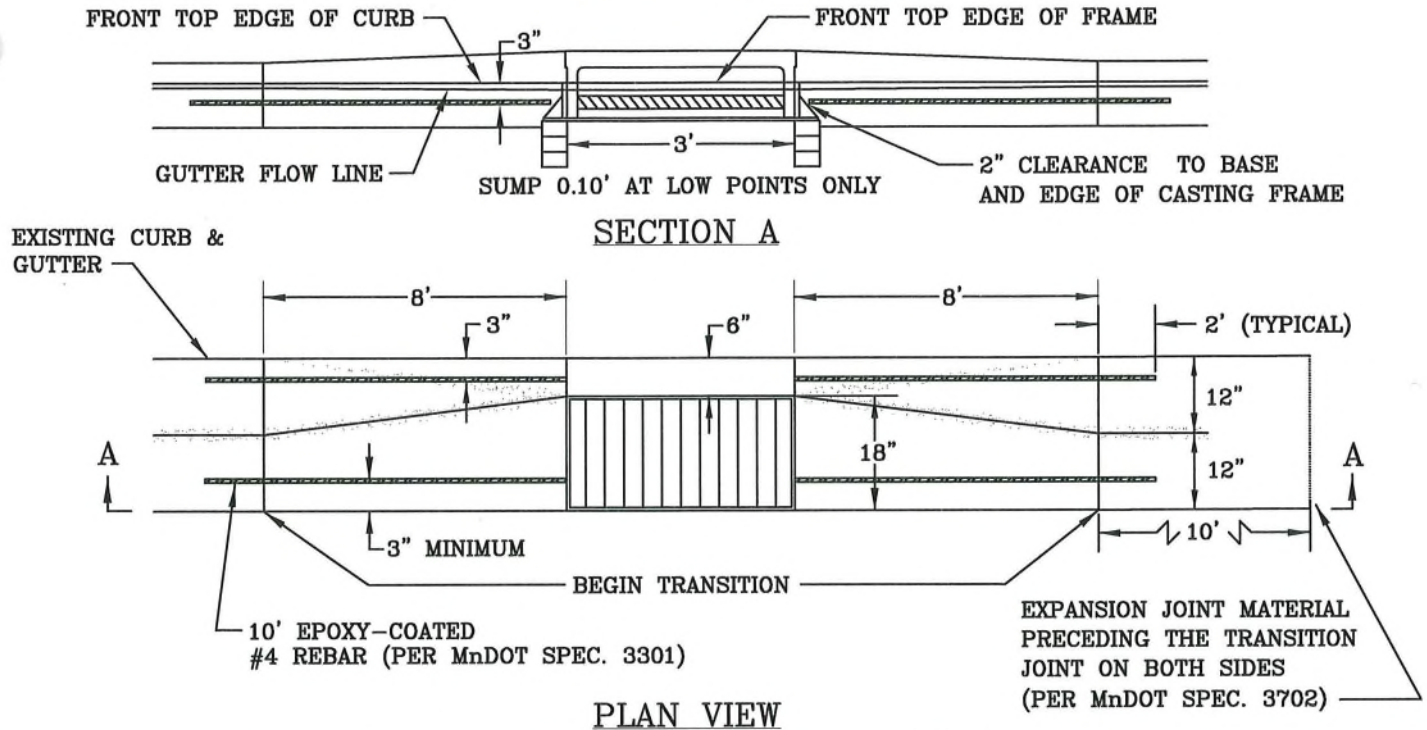
B618 CURB & GUTTER OUTFALL



SURMOUNTABLE CURB & GUTTER

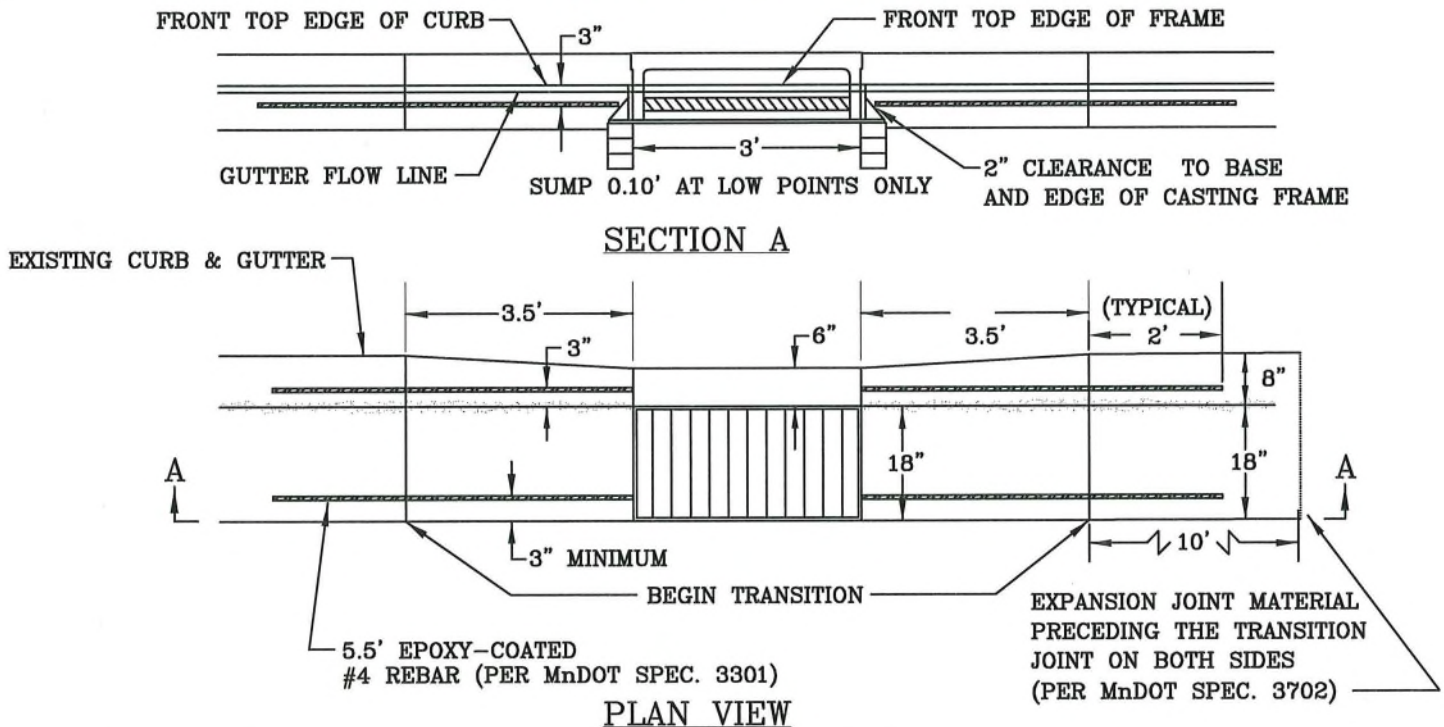
SURMOUNTABLE CONC. CURB & GUTTER

NEENAH R-3246 CASTING
W/TYPE C OR V GRATE



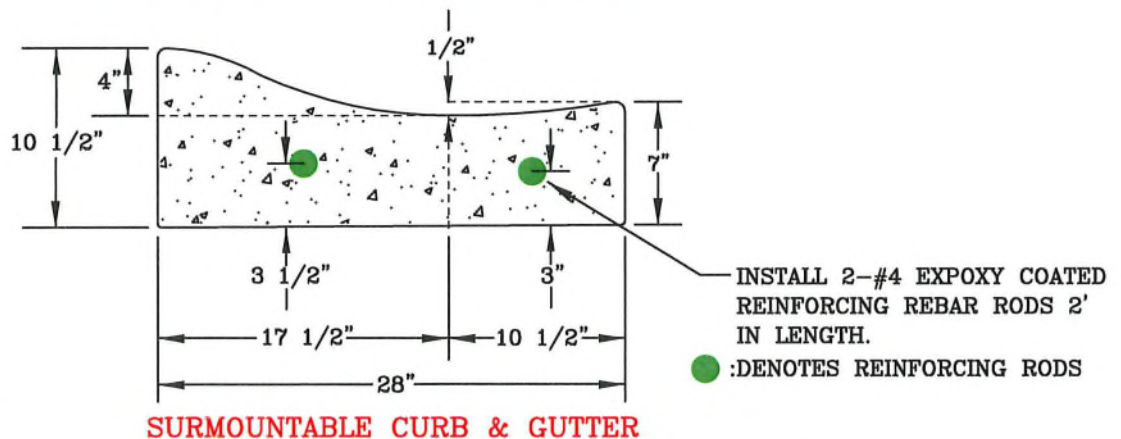
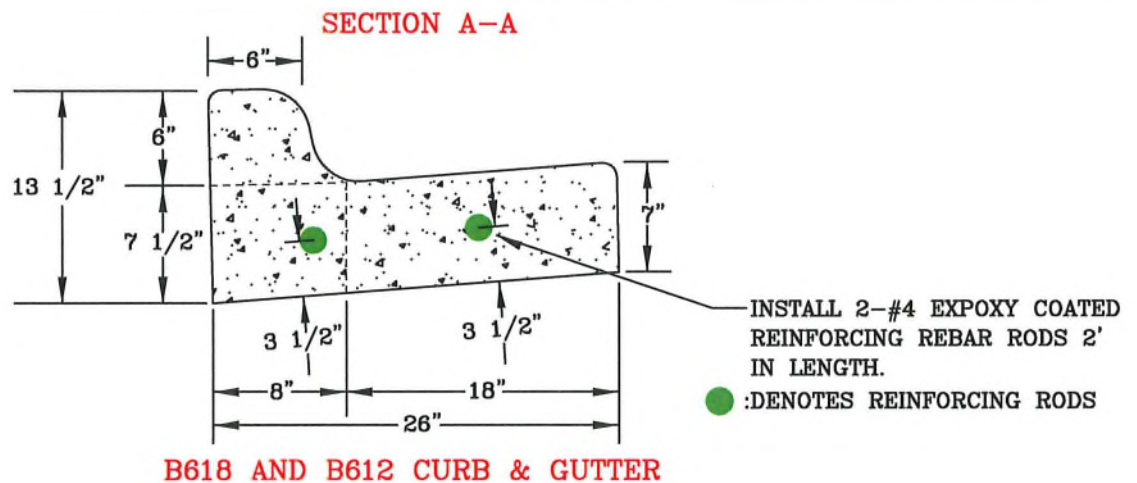
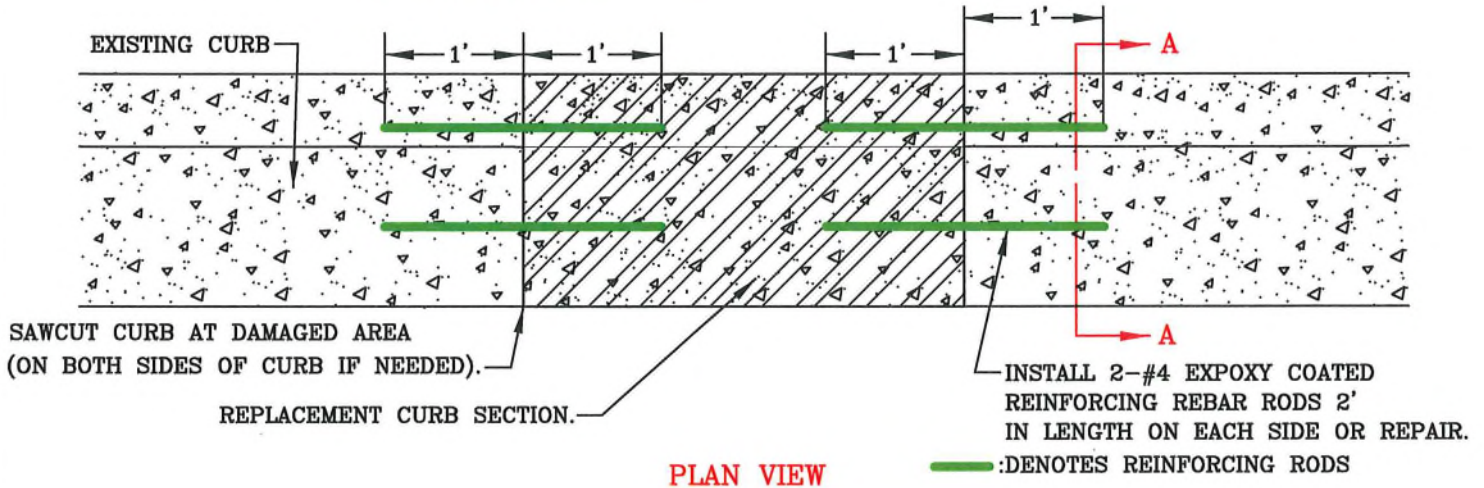
B-618 CONC. CURB & GUTTER

NEENAH R-3246 CASTING
W/TYPE C OR V GRATE

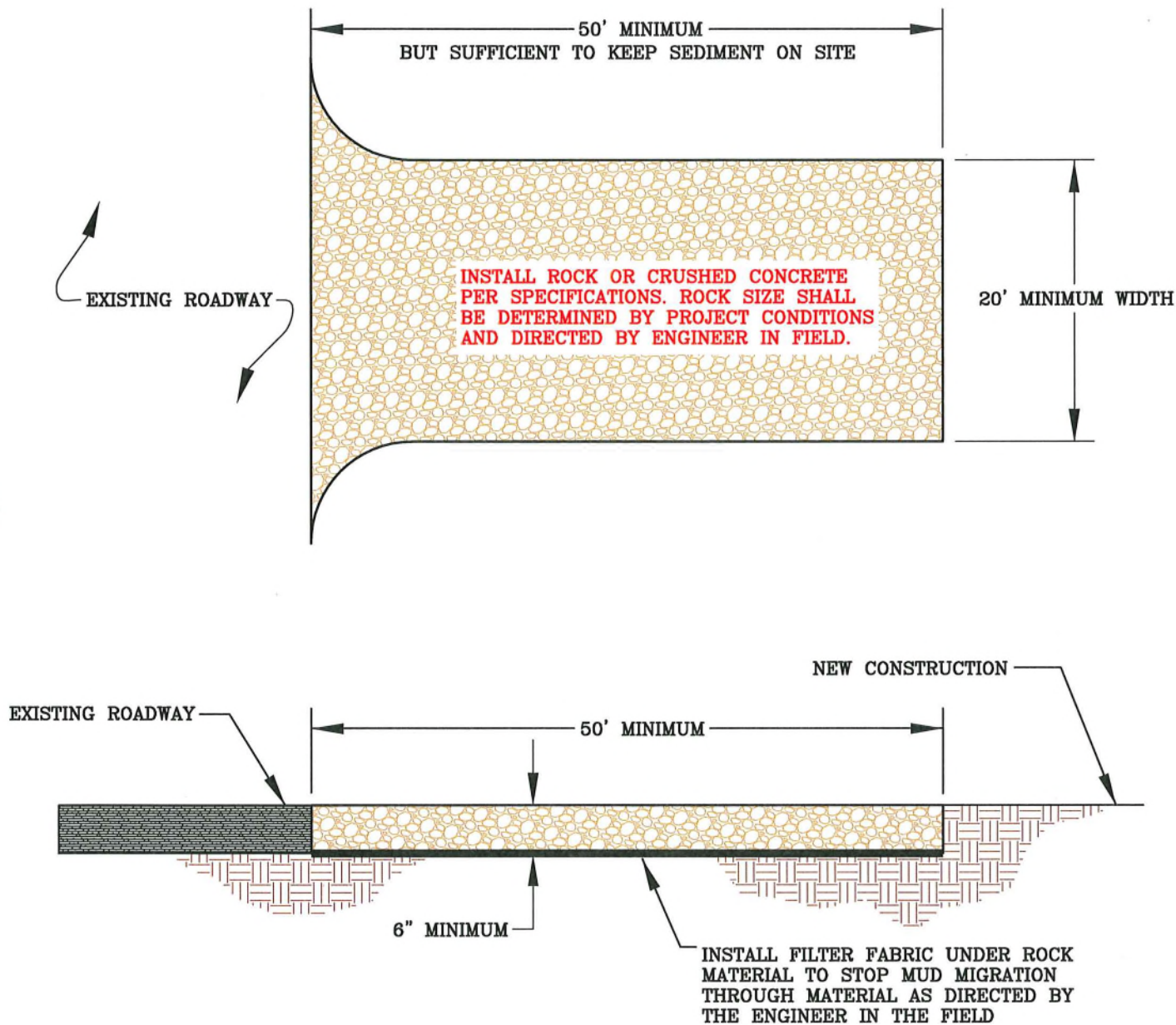


CONCRETE CURB & GUTTER SECTION REPLACEMENT

- NOTES:**
1. REFER TO MNDOT SPEC. 2531 FOR CONCRETE CURBING INSTALLATION.
 2. EXISTING CURB SHALL BE SAWCUT THRU ENTIRE DEPTH OF CURB ON BOTH SIDES OF DAMAGED AREA AS DIRECTED BY ENGINEER IN FIELD.
 3. DRILL EXISTING CURB SECTION AND INSTALL AND EXPOXY GROUT 2-#4 EXPOXY COATED REINFORCING REBAR RODS AS SHOWN ON DETAIL BELOW.
 4. COST TO SUPPLY & INSTALL DOWEL BARS SHALL BE INCIDENTAL TO THE CONCRETE CURB & GUTTER BID ITEM.

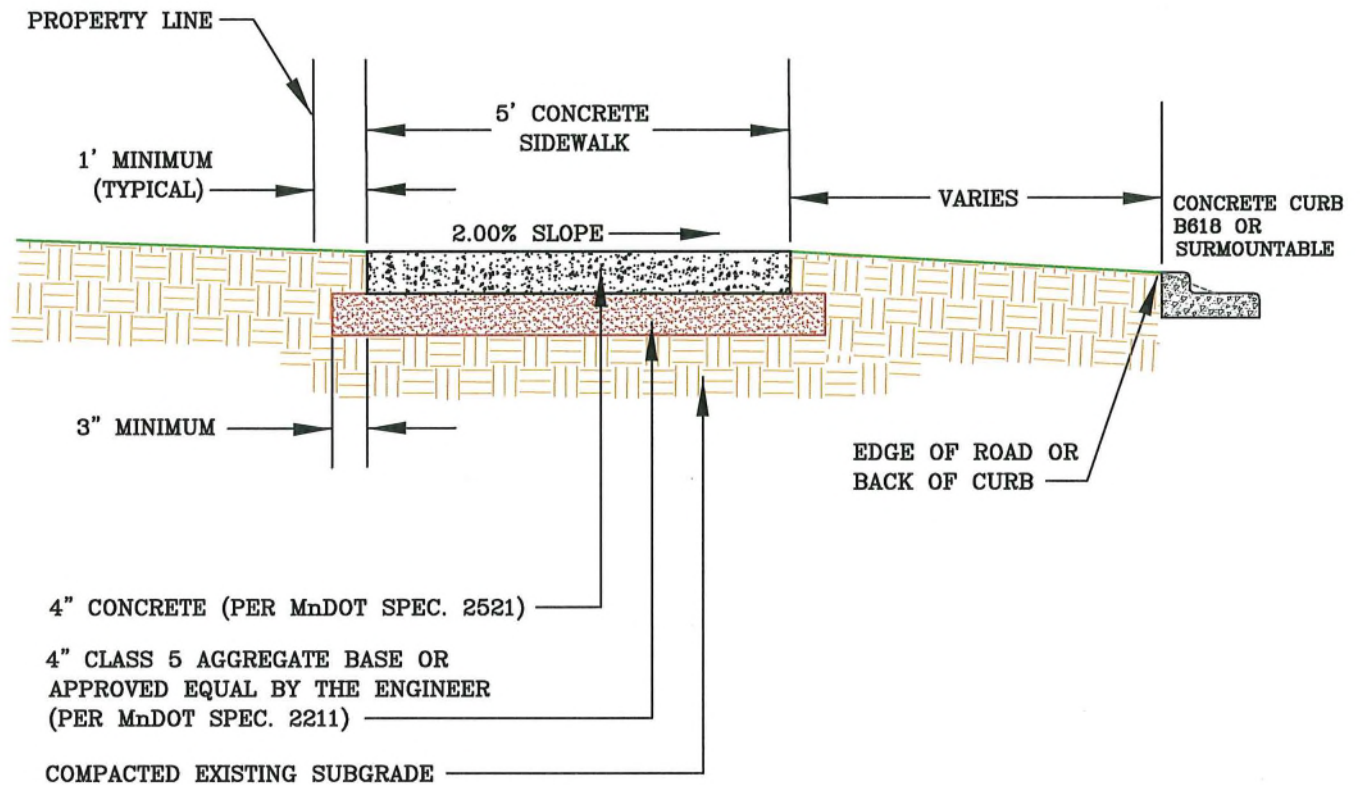


CONSTRUCTION ENTRANCE



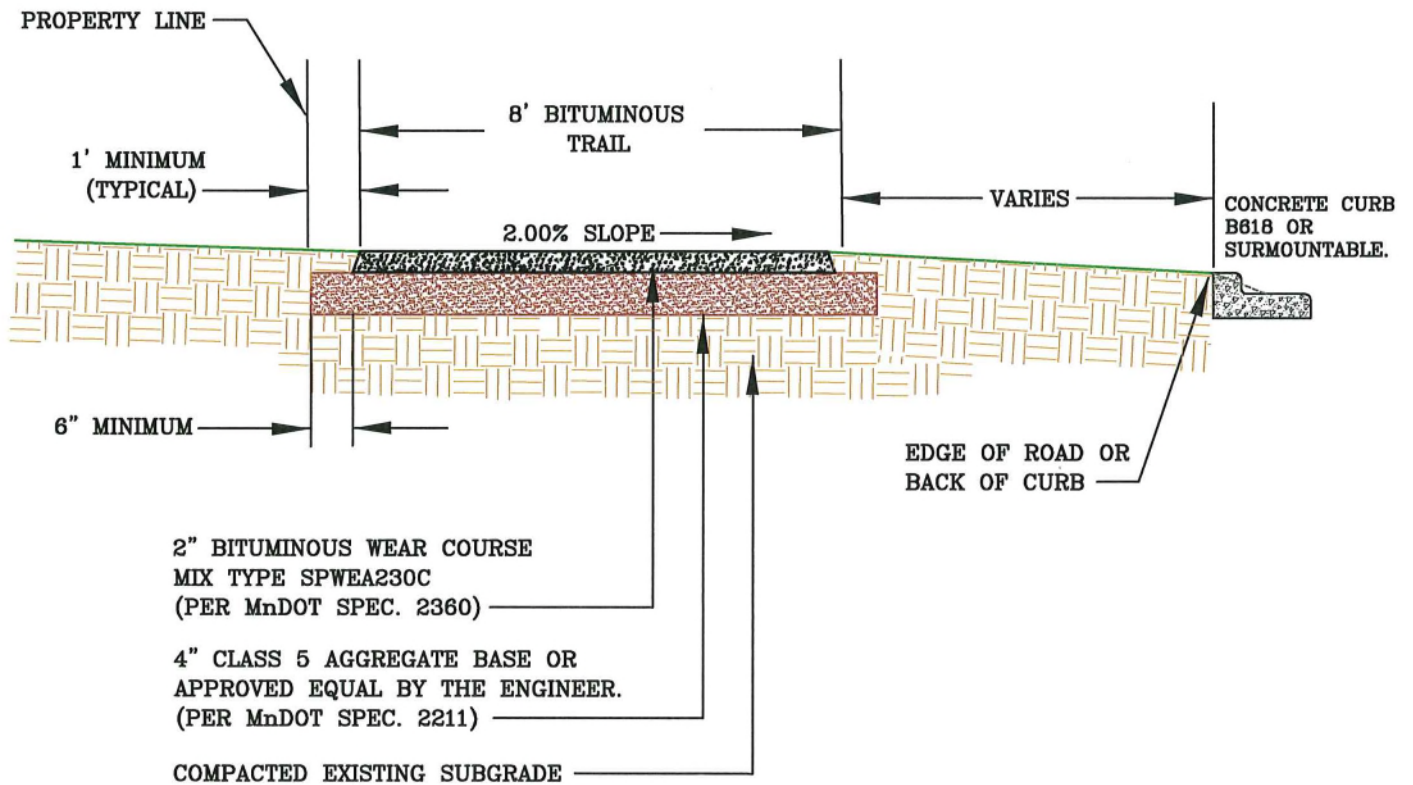
CONCRETE SIDEWALK

- NOTES:**
1. REFER TO MnDOT SPECIFICATIONS FOR ALL INSTALLATION INSTRUCTIONS ON PEDESTRIAN RAMPS.
 2. MINIMUM 6" THICK SIDEWALK AT ALL RESIDENTIAL DRIVEWAYS AND 8" THICK AT ALL COMMERCIAL DRIVEWAYS.
 3. PROVIDE EXPANSION JOINT MATERIAL EVERY 100' AND A 6' MAXIMUM SPACING ON TRAWLED JOINTS.
 4. PROVIDE EXPANSION JOINT MATERIAL ALONG BOTH EDGES OF SIDEWALK, WHERE WALK IS CONTAINED BETWEEN OBJECTS AND DRIVEWAY APRONS.



BITUMINOUS TRAIL

NOTES: 1. REFER TO MnDOT SPECIFICATIONS FOR ALL INSTALLATION INSTRUCTIONS ON PEDESTRIAN RAMPS.



CASTING FRAME & COVER SHALL BE NEEENAH
TYPE R-1733 WITH A TYPE B LID, LETTERED
WITH REQUIRED UTILITY LABEL AND TWO
CONCEALED PICK HOLES. _____

SET RIM 1/2" BELOW
FINISHED SURFACE

- CASTING SHALL BE SET ON RAM-NEK
OR APPROVED EQUAL SEALANT, WITH
GAP ON CASTING SEALED WITH MORTAR
INSIDE AND OUTSIDE. **ONLY PLASTIC
SHIMS WILL BE ACCEPTED. WOOD AND
BLOCK SHIMS ARE NOT ACCEPTABLE.**

- TYPE SP 12.5 BITUMINOUS
MIXTURE FOR PATCHING
(SEE DETAIL B FOR PATCH DIMENSIONS)

- TYPE SP 12.5 WEAR COURSE
MIX (3,C), BITUMINOUS DEPTH
PER PLAN

- STABILIZED FDR. BASE
DEPTH PER PLAN.

- WIDTH TO ALLOW FOR
MECHANICAL COMPACTION.

- COMPACTED SUBGRADE

PRECAST CONCRETE ADJUSTMENT RINGS SHALL BE SET WITH A FULL BED OF MORTAR BETWEEN EACH RING AND WIPED SMOOTH ON OUTSIDE AND INSIDE OF RINGS. A MINIMUM OF 2 AND A MAXIMUM OF 6-2" RINGS ARE ALLOWED.

(SEE STANDARD PLATE NO. STR-12 WHEN
USING CRETEX PRO RING EXPANDED
POLYETHYLENE (EPP) ADJUSTING RING
FOR INSTALLATION INSTRUCTION).

DRY SETTING OF THE CASTING AND RINGS
AND DAMAGED ADJUSTING RINGS ARE NOT
ACCEPTABLE.

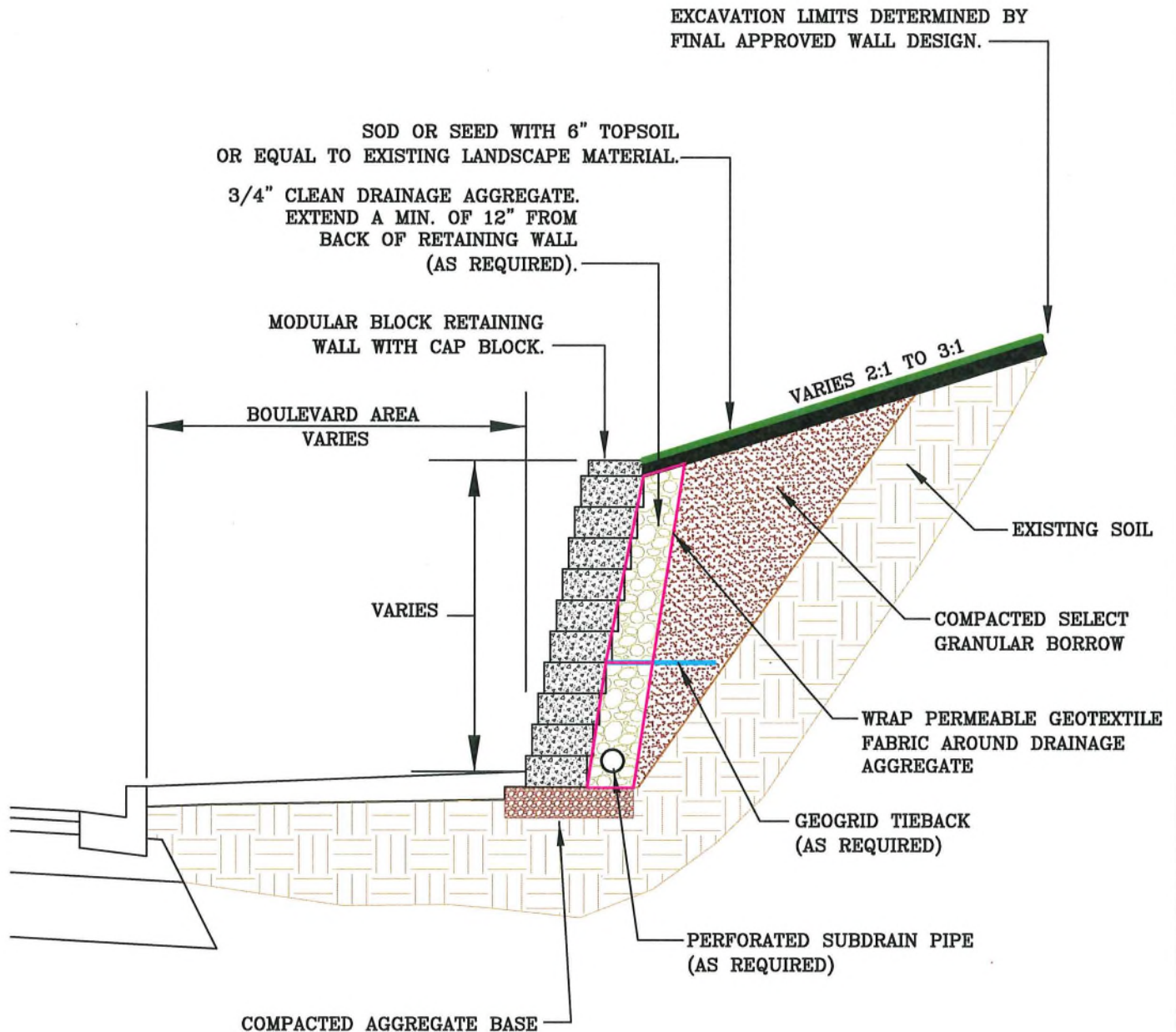
DETAIL A



TYPICAL BITUMINOUS
ROAD PATCH INSTALLATION FOR
SANITARY SEWER, STORM SEWER,
AND WATERMAIN MANHOLES

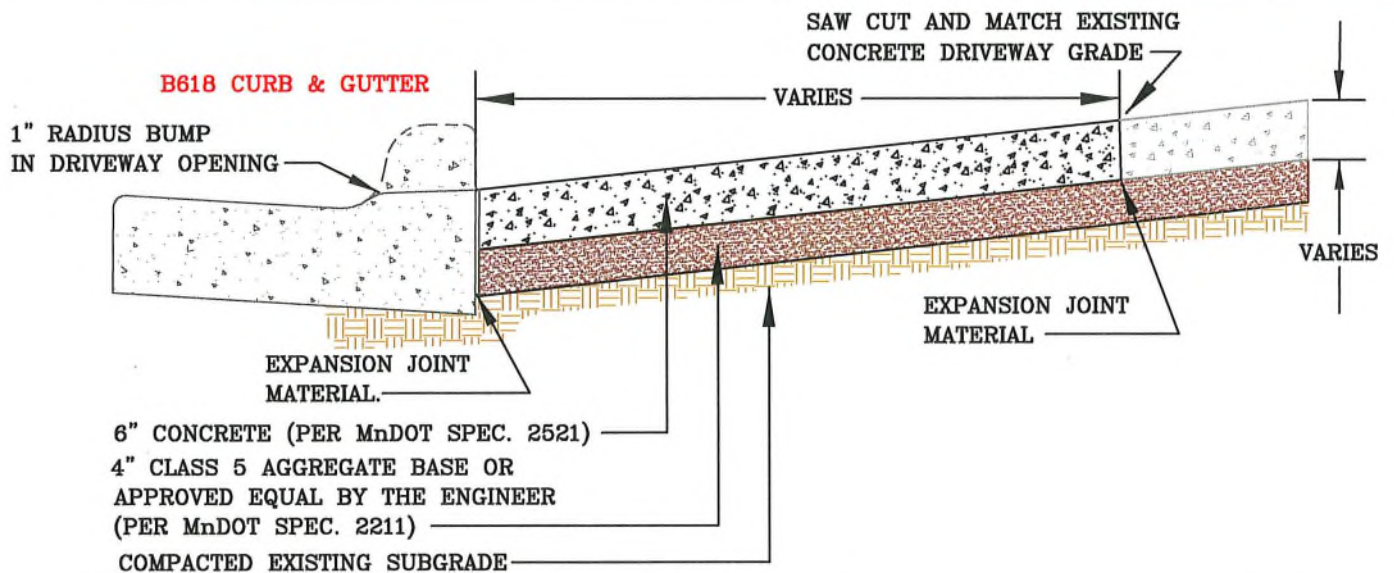
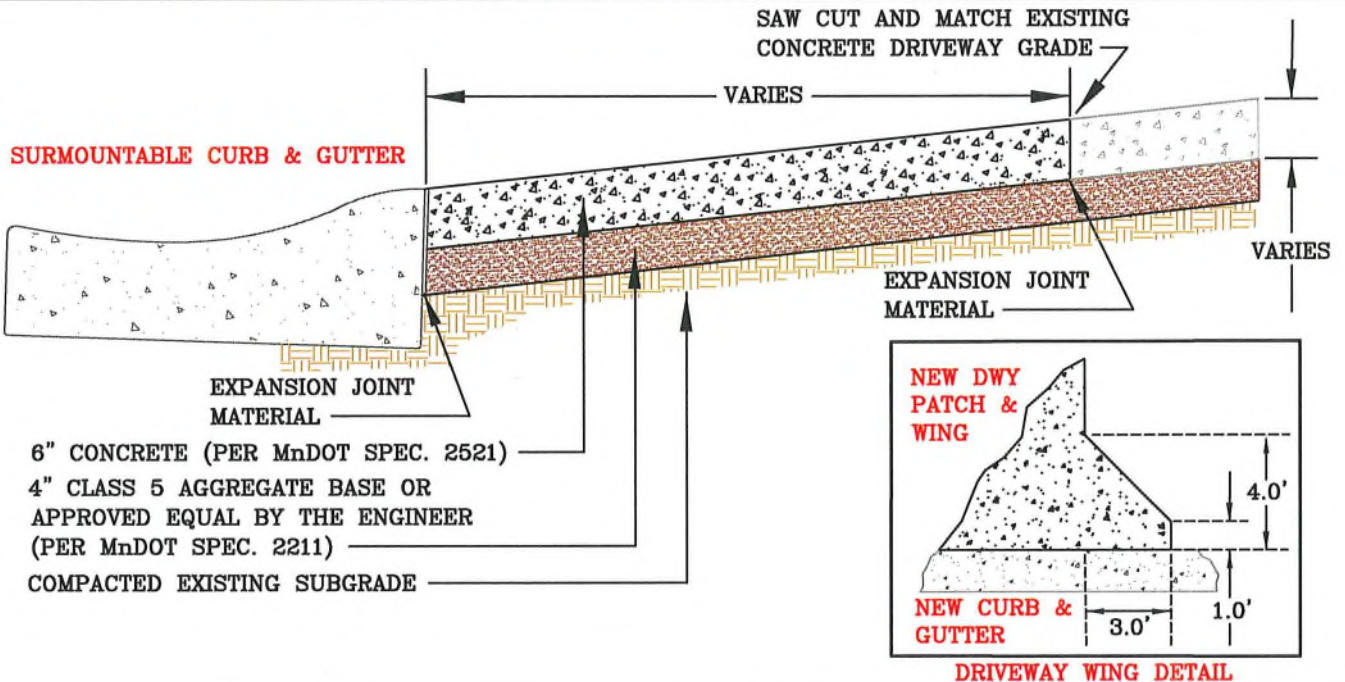
MODULAR BLOCK RETAINING WALL

- NOTES:**
1. FOR WALLS OVER 4' IN HEIGHT THE CONTRACTOR SHALL SUBMIT PROPOSED RETAINING WALL PLANS SIGNED BY A REGISTERED ENGINEER FOR APPROVAL BY THE CITY ENGINEER.
 2. SEE SECTION 2411 OF SPECIAL PROVISIONS FOR WALL REQUIREMENTS AND PAYMENT.
 3. ALL MATERIALS USED SHALL BE TO WALL REQUIRED DESIGN SPECIFICATIONS OR APPROVED EQUAL BY ENGINEER.
 4. BOULEVARD AREA MAY VARY IN WIDTH, DESIGN STYLE, OR RESTORATION.



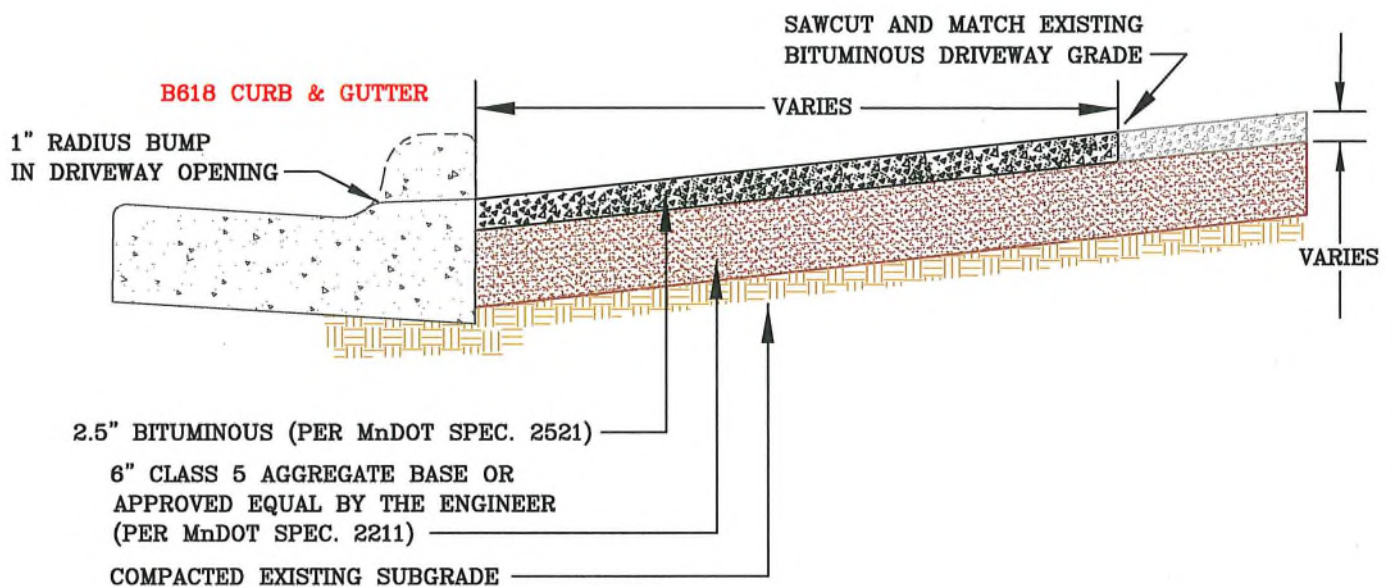
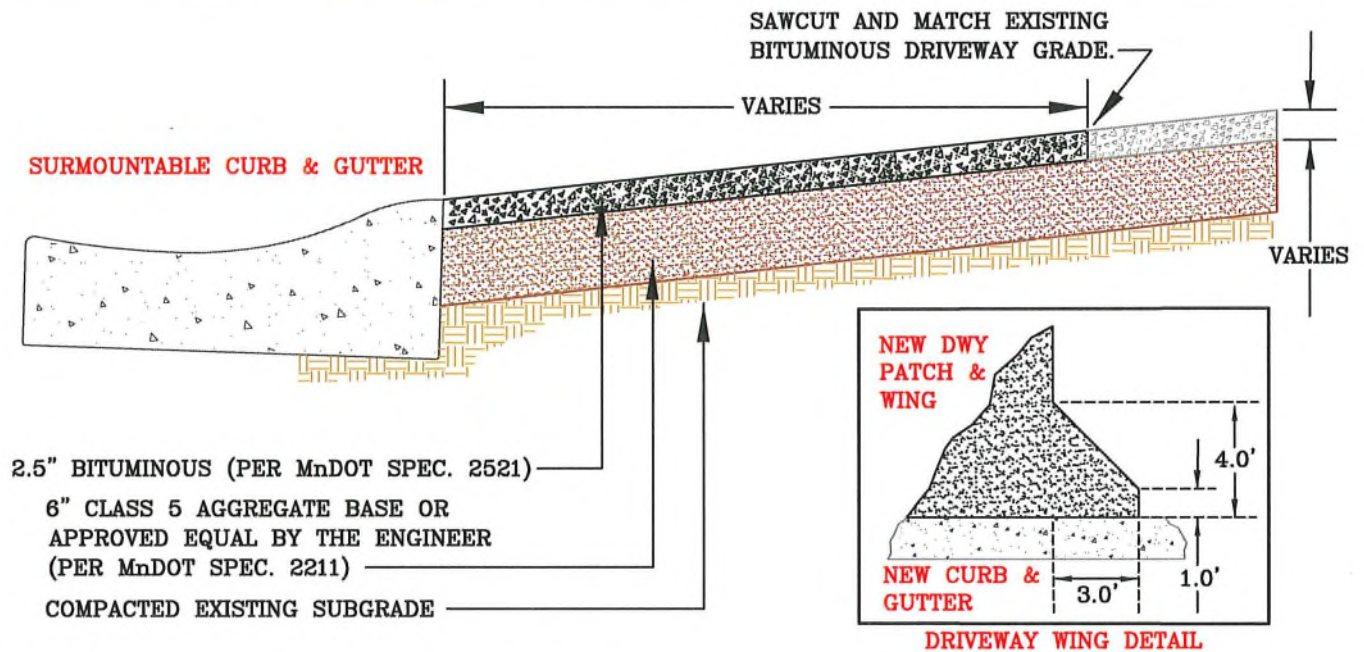
RESIDENTIAL CONCRETE DRIVEWAY REPLACEMENT

- NOTES:**
1. ALL DRIVEWAY REMOVALS SHALL BE MARKED BY THE ENGINEER IN THE FIELD AND RESTORED TO THE STANDARDS DETAILED BELOW.
 2. ALL EXISTING DRIVEWAYS REMOVED SHALL BE REPLACED AND RESTORED TO ORIGINAL DESIGN AND DIMENSIONS.
 3. WHEN MATCHING EXISTING CONCRETE DRIVEWAY PAVEMENT, ALIGN CONSTRUCTION JOINTS WITH EXISTING DRIVEWAY JOINTS AND MATCH TO JOINT STYLE.
 4. CONTRACTOR SHALL PROTECT ALL SAWCUT EDGES OF EXISTING DRIVEWAY AFTER BEING REMOVED, ANY ADDED DAMAGE TO EXISING DRIVEWAY WILL BE PAID FOR AT THE CONTRACTOR'S EXPENSE.
 5. CONTRACTOR SHALL INSTALL DRIVEWAY WINGS TO DIMENSIONS AND STYLE PER DRIVEWAY WING DETAIL BELOW.

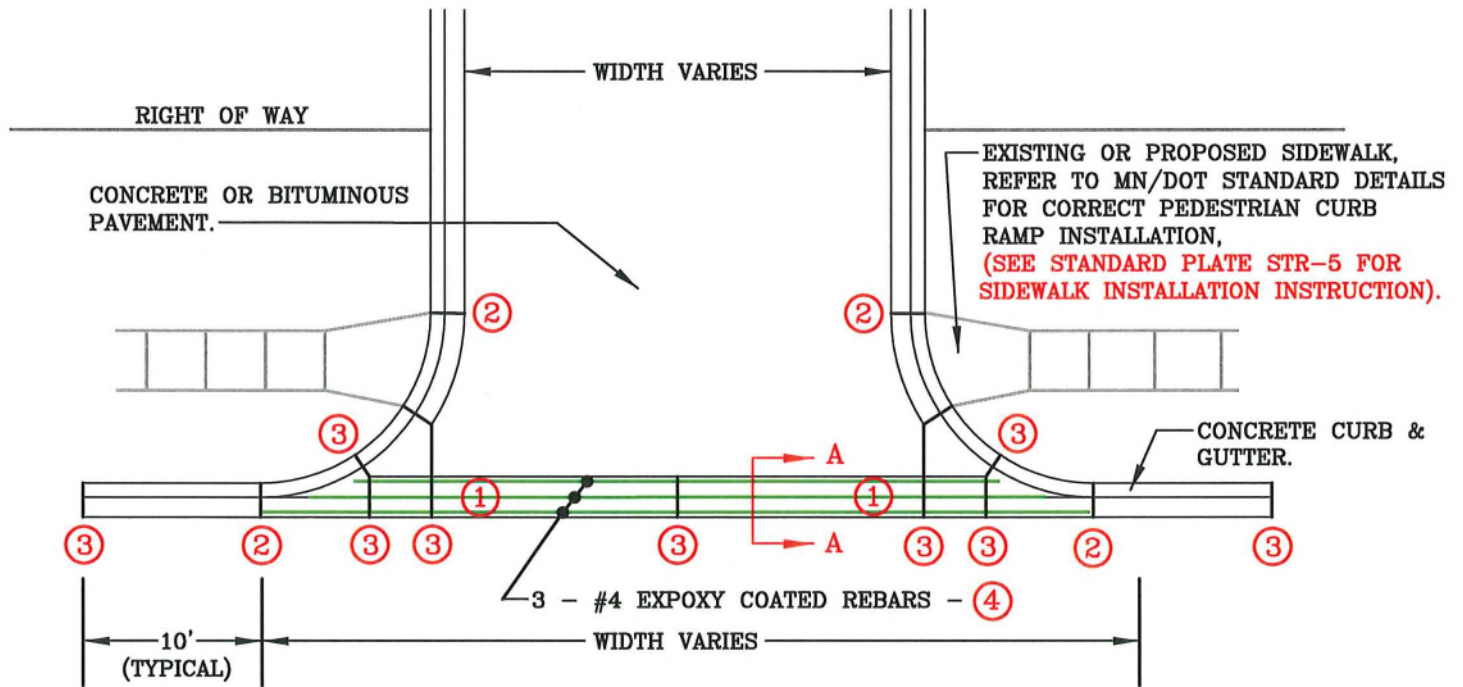


RESIDENTIAL BITUMINOUS DRIVEWAY REPLACEMENT

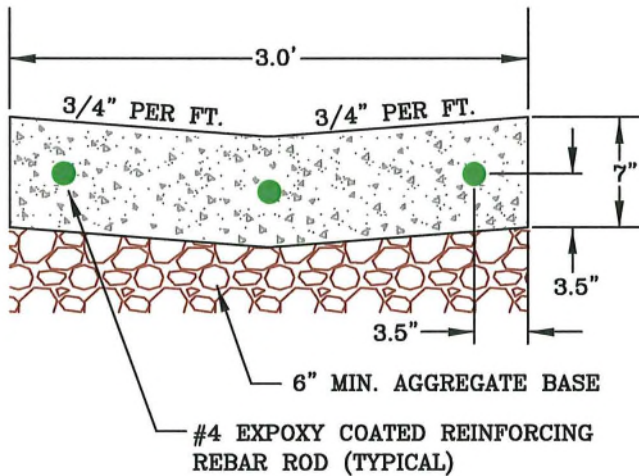
- NOTES:**
1. ALL DRIVEWAY REMOVALS SHALL BE MARKED BY THE ENGINEER IN THE FIELD AND RESTORED TO THE STANDARDS DETAILED BELOW.
 2. ALL EXISTING DRIVEWAYS REMOVED SHALL BE REPLACED AND RESTORED TO ORIGINAL DESIGN AND DIMENSIONS.
 3. CONTRACTOR SHALL PROTECT ALL SAWCUT EDGES OF EXISTING DRIVEWAY AFTER BEING REMOVED, ANY ADDED DAMAGE TO EXISING DRIVEWAY WILL BE PAID FOR AT THE CONTRACTOR'S EXPENSE.
 4. CONTRACTOR SHALL INSTALL DRIVEWAY WINGS TO DIMENSIONS AND STYLE PER DRIVEWAY WING DETAIL BELOW.



CONCRETE VALLEY GUTTER DETAIL



- NOTES:**
- ① FLOW LINE.
 - ② EXPANSION MATERIAL.
 - ③ CONSTRUCTION JOINTS (TYPICAL), CONSTRUCTION JOINTS SHALL BE INSTALLED IN CONCRETE PAVEMENT AS NEEDED OR AS DIRECTED IN FIELD.
 - ④ PROVIDE 2.0' MINIMUM OVERLAP FOR TIED REBAR INSTALLATION.



SECTION A-A

LADTECH INC. HIGH-DENSITY POLYETHYLENE (HDPE) ADJUSTING RINGS FOR SANITARY SEWER, STORM SEWER, WATERMAIN MANHOLES, AND CATCH BASINS

NOTES: 1. SEE MANUFACTURES SPECIFICATION FOR LADTECH INC. HIGH-DENSITY POLYETHYLENE (HDPE) PREFORMED ADJUSTMENT RINGS FOR CORRECT PRODUCTS NEEDED FOR INSTALLATION.

CASTING FRAME AND COVER SHALL BE NEENAH TYPE R-1733 WITH A TYPE B LID, LETTERED "SANITARY SEWER" AND WITH TWO CONCEALED PICK HOLES.

SET RIM 1/2" BELOW FINISHED SURFACE

CASTING SHALL BE SET ON 1 - BEAD OF M-1 ADHESIVE SEALANT, WITH GAP ON CASTING SEALED WITH MORTAR INSIDE AND OUTSIDE. **ONLY PLASTIC SHIMS WILL BE ACCEPTED. WOOD AND BLOCK SHIMS ARE NOT ACCEPTABLE.**

INTERNAL POLYETHYLENE I & I BARRIER AS MANUFACTURED BY STRIKE TOOL OR APPROVED EQUAL SHALL BE INSTALLED ON ALL SANITARY, STORM, AND WATER MANHOLES.

INFIL-SHIELD GATOR WRAP MATERIAL (OR APPROVED EQUAL) EXTERNAL I&I BARRIER SHALL BE INSTALLED AS RECOMMENDED BY MANUFACTURE ON CATCH BASINS AND CATCH BASIN MANHOLES.

TYPE SP 12.5 WEAR COURSE MIX (3,C), BITUMINOUS DEPTH PER PLAN

STABILIZED BASE DEPTH PER PLAN.

COMPACTED SUBGRADE

LADTECH INC. HIGH-DENSITY POLYETHYLENE (HDPE) ADJUSTMENT RINGS SHALL BE SET AND INSTALLED USING APPROVED ADHESIVE OR SEALANT PRODUCT AS RECOMMEND BY THE MANUFACTURER PER SPECIFICATIONS.

2" RINGS SHALL BE BETWEEN A MIN. OF 2 OR MAX. OF 6 RINGS. CONTRACTOR SHALL POUR A CONCRETE COLLAR AROUND ALL CATCH BASINS AND CATCH BASIN MANHOLES.

CASTING FRAME SHALL BE NEENAH TYPE R-3246 WITH GRATE TYPE C OR V, AND R-3235 IF ROUND CASTING FRAME & STRUCTURE.

CATCH BASIN MANHOLE

CATCH BASIN



LADTECH INC. HIGH-DENSITY
POLYETHYLENE (HDPE) ADJUSTING RING
INSTALLATION FOR SANITARY, STORM, AND
WATER MANHOLES AND CATCH BASINS

STANDARD PLATE NO. STR-12

REVISED NOVEMBER 2025

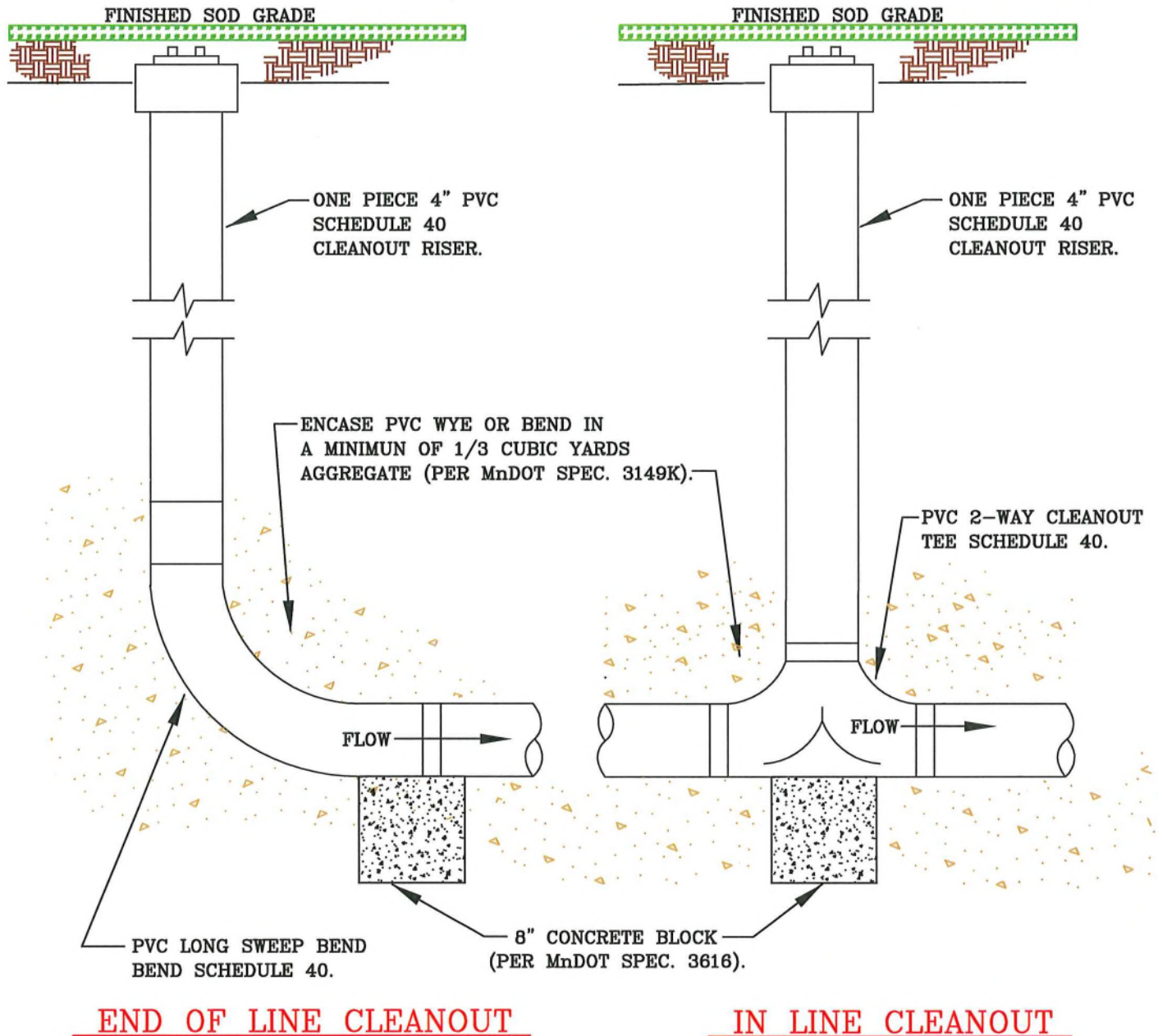
SANITARY SEWER 4" SERVICE CLEANOUT

NOTES: 1. 4" HUB WITH THREADED METAL CAP (BAR STYLE CAP FROM MALLEABLE FITTINGS OR APPROVED EQUAL).

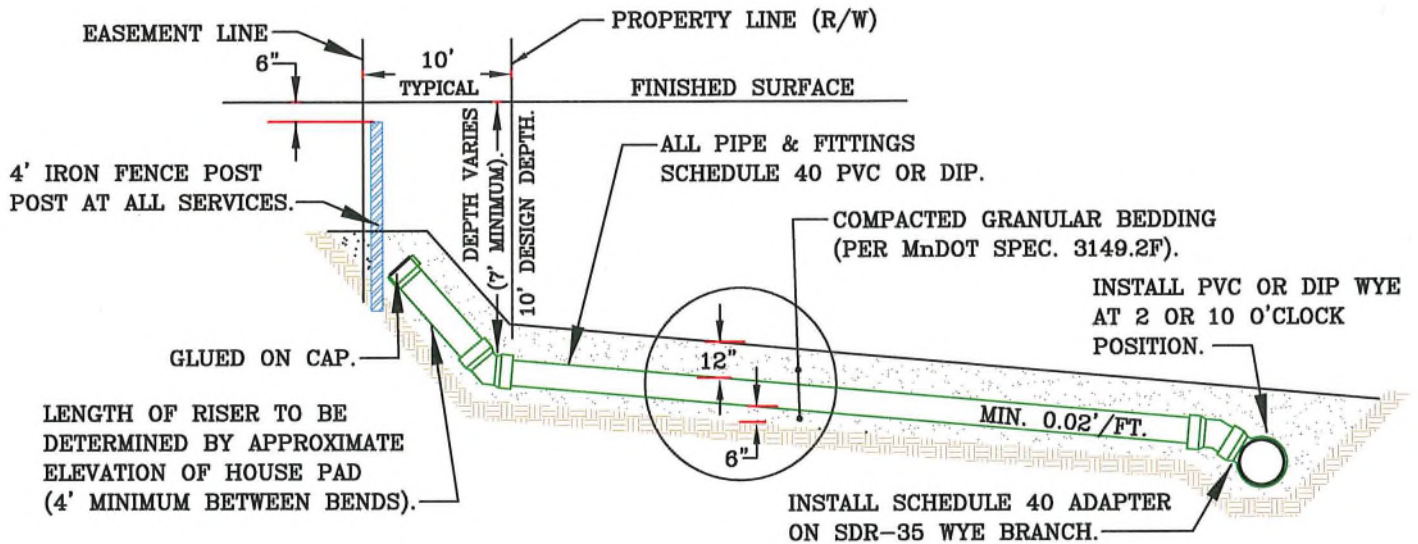


(BAR STYLE CAP)

2. ENCLOSE LONG SWEEP BEND OR COMBINATION WYE IN AGGREGATE AS SHOWN.
3. CLEANOUT CAPS TO BE BELOW FINISHED SOD GRADE.

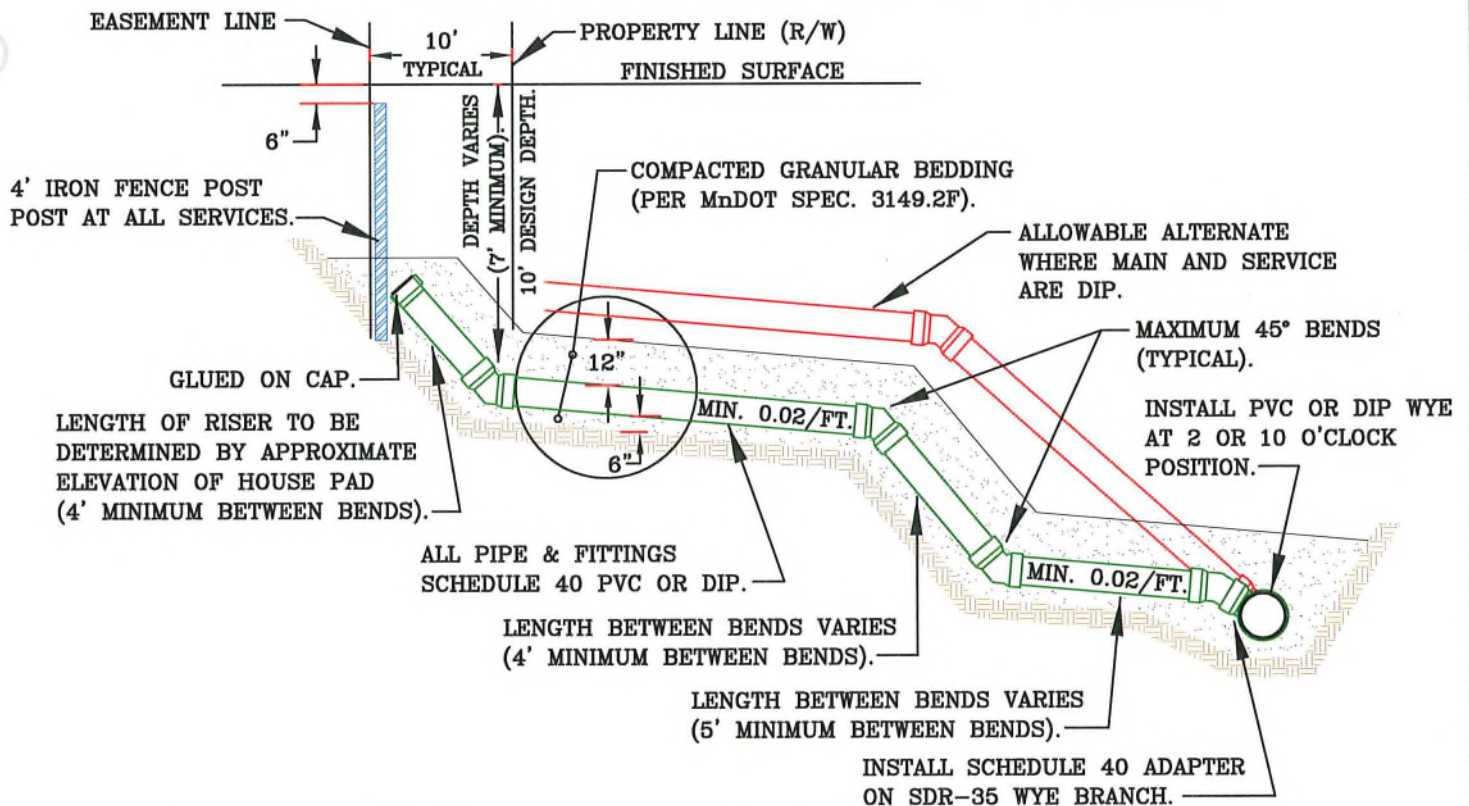


SANITARY SEWER MAIN 13' DEEP OR LESS



SANITARY SEWER MAIN MORE THAN 13' DEEP

- NOTES:**
1. DESIGN ALSO APPLIES TO AREAS OF HIGH GROUND WATER.
 2. DEPTH OF COVER AT RIGHT OF WAY TO BE 10' UNLESS NOTED WITH A MINIMUM COVER OF 7'.
 3. ALL WYE CONNECTIONS BELOW 13' SHALL BE ENCASED WITH 3000 PSI CONCRETE WITH A MINIMUM 4" THICKNESS.



SANITARY SEWER MANHOLE

SMOOTH FINISH
PREFORMED INVERT

- NOTES:**
1. ALL CONNECTIONS MADE TO EXISTING MANHOLE STRUCTURES SHALL BE CORE DRILLED.
 2. SEE STANDARD PLATE NO. STR-7 FOR PREPERATION AND PATCHING OF ROAD AROUND MANHOLE AFTER CONCRETE ADJUSTING RINGS AND CASTING HAVE BEEN ADJUSTED TO CORRECT ELEVATION.
 3. SEE STANDARD PLATE NO. STR-12 WHEN USING LADTECH INC. HIGH-DENSITY POLYETHYLENE (HDPE) ADJUSTING RING FOR INSTALLATION INSTRUCTION).

BROOM FINISH
STEP LOCATION (TYPICAL)

CASTING FRAME AND COVER SHALL BE NEENAH TYPE R-1733 WITH A TYPE B LID, LETTERED "SANITARY SEWER" AND WITH TWO CONCEALED PICK HOLES.

CASTING SHALL BE SET ON RAM-NEK OR APPROVED EQUAL SEALANT, WITH GAP ON CASTING SEALED WITH MORTAR INSIDE AND OUTSIDE. **ONLY PLASTIC SHIMS WILL BE ACCEPTED. WOOD AND BLOCK SHIMS ARE NOT ACCEPTABLE.**

LADTECH INC. HIGH-DENSITY POLYETHYLENE (HDPE) ADJUSTMENT RINGS SHALL BE SET AND INSTALLED USING APPROVED ADHESIVE OR SEALANT PRODUCT AS RECOMMENDED BY THE MANUFACTURER PER SPECIFICATIONS.

INTERNAL POLYETHYLENE I & I BARRIER AS MANUFACTURED BY STRIKE TOOL OR APPROVED EQUAL.

IF USING PRECAST CONCRETE RINGS, SET RINGS WITH A FULL BED OF MORTAR BETWEEN EACH RING AND WIPE SMOOTH ON OUTSIDE AND INSIDE. **DAMAGED, AND DRY SET, RINGS AND CASTINGS ARE NOT ACCEPTABLE.**

TYPE "B" ECCENTRIC CONE SECTION (PER MnDOT SPEC. 4005M).

2" RINGS SHALL BE BETWEEN A MIN. OF 2 OR MAX. OF 6 RINGS. CONTRACTOR SHALL POUR A CONCRETE COLLAR AROUND ALL CATCH BASINS AND CATCH BASIN MANHOLES.

MANHOLE JOINTS SHALL BE SEALED WITH INFI-SHIELD GATOR WRAP OR APPROVED EQUAL.

SEE STANDARD PLATE NO. STR-7 FOR BIT. MANHOLE PATCHING DETAIL.

PRECAST SECTION CONFORMING TO ASTM C-478.

MANHOLE SECTION JOINTS SHALL BE OF THE TONGUE AND GROOVE DESIGN AND SEALED WITH RUBBER "O" RING OR PROFILE GASKETS.

DOGHOUSES AROUND PIPE SHALL BE FILLED WITH MORTAR ON THE THE INSIDE OF THE STRUCTURE AND WIPED SMOOTH, (PER MnDOT SPEC. 2506).

MANHOLE STEPS, ARE NEEHAH POLYPROPYLENE PLASTIC (R-1981-N) OR APPROVED EQUAL, STEPS ARE 16" ON CENTER AND CONSTRUCTED ON DOWNSTREAM INVERT OUTLET.

PRECAST BOTTOM SECTION WITH PREFORMED INVERT.

RUBBER BOOT WITH STAINLESS STEEL STRAP AT PIPE OPENING.

MECHANICALLY COMPACT 4" GRANULAR MATERIAL FOR LEVELING (PER MnDOT SPEC. 3149.2F). (ORDINARY COMPACTION)

MINIMUM THICKNESS OF PRECAST BASE IS 6" FOR 14' DEEP OR LESS, INCREASES 1" IN THICKNESS FOR EVERY 4' OF DEPTH GREATER THAN 14', AND REINFORCE WITH 6" X 6" WITH 10/10 MESH.



TYPICAL SANITARY SEWER MANHOLE INSTALLATION

SANITARY SEWER MANHOLE CASTING INSTALLATION

- NOTES:**
1. SEE STANDARD PLATE NO. STR-7 FOR PREPERATION AND PATCHING OF ROAD AROUND MANHOLE AFTER CONCRETE ADJUSTING RINGS AND CASTING HAVE BEEN ADJUSTED TO CORRECT ELEVATION.
 2. SEE STANDARD PLATE NO. STR-12 WHEN USING LADTECH INC. HIGH-DENSITY POLYETHYLENE (HDPE) ADJUSTING RING FOR INSTALLATION INSTRUCTION).

LADTECH INC. HIGH-DENSITY POLYETHYLENE (HDPE) ADJUSTMENT RINGS SHALL BE SET AND INSTALLED USING APPROVED ADHESIVE OR SEALANT PRODUCT AS RECOMMENDED BY THE MANUFACTURER PER SPECIFICATIONS.

IF USING PRECAST CONCRETE RINGS, SET RINGS WITH A FULL BED OF MORTAR BETWEEN EACH RING AND WIPE SMOOTH ON OUTSIDE AND INSIDE. **DAMAGED, AND DRY SET, RINGS AND CASTINGS ARE NOT ACCEPTABLE.**

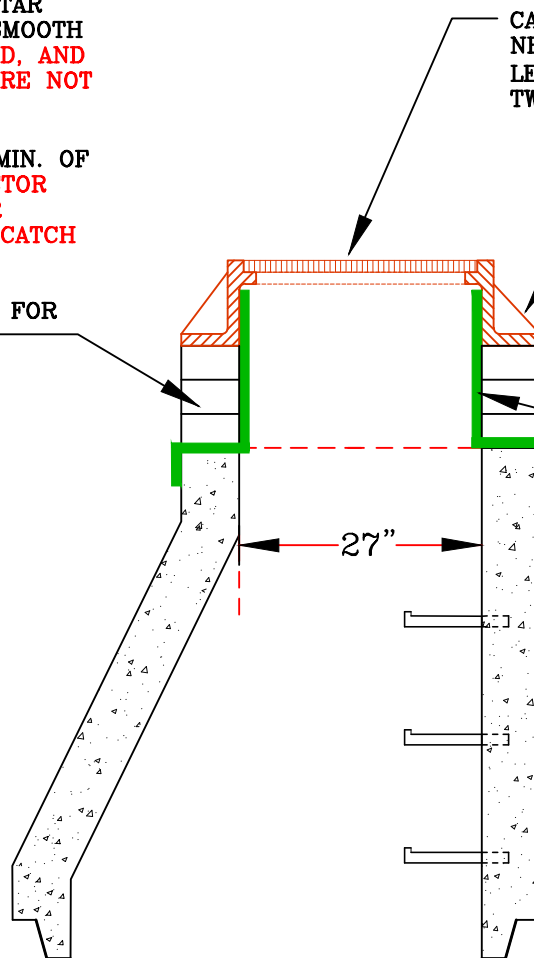
2" RINGS SHALL BE BETWEEN A MIN. OF 2 OR MAX. OF 6 RINGS. **CONTRACTOR SHALL POUR A CONCRETE COLLAR AROUND ALL CATCH BASINS AND CATCH BASIN MANHOLES.**

SEE STANDARD PLATE NO. STR-7 FOR BIT. MANHOLE PATCHING DETAIL.

CASTING FRAME AND COVER SHALL BE NEENAH TYPE R-1733 WITH A TYPE B LID, LETTERED "SANITARY SEWER" AND WITH TWO CONCEALED PICK HOLES.

CASTING SHALL BE SET ON RAM-NEK OR APPROVED EQUAL SEALANT, WITH GAP ON CASTING SEALED WITH MORTAR INSIDE AND OUTSIDE. **ONLY PLASTIC SHIMS WILL BE ACCEPTED. WOOD AND BLOCK SHIMS ARE NOT ACCEPTABLE.**

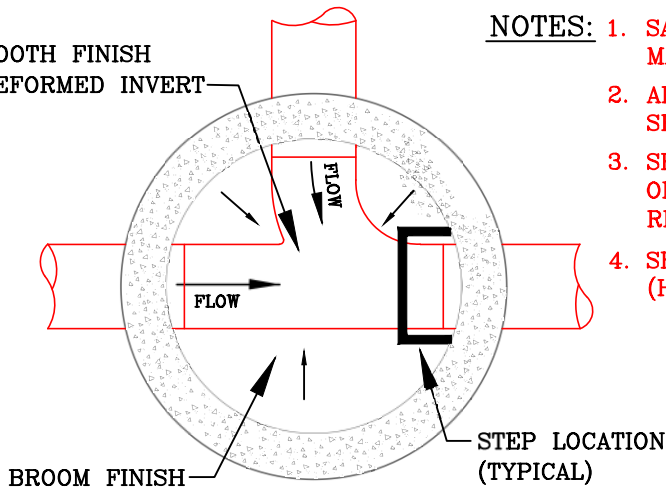
INTERNAL POLYETHYLENE I & I BARRIER AS MANUFACTURED BY STRIKE TOOL OR APPROVED EQUAL.



SANITARY SEWER MANHOLE INSIDE DROP

- NOTES:**
1. SANITARY SEWER INSIDE DROP SECTION SHALL BE DESIGNED AND MANUFACTURED BY RELINER / DURAN INC.
 2. ALL CONNECTIONS MADE TO EXISTING MANHOLE STRUCTURES SHALL BE CORE DRILLED.
 3. SEE STANDARD PLATE NO. STR-7 FOR PREPERATION AND PATCHING OF ROAD AROUND MANHOLE AFTER CONCRETE ADJUSTING RINGS RINGS AND CASTING HAVE BEEN ADJUSTED TO CORRECT ELEVATION.
 4. SEE STANDARD PLATE NO. STR-12 WHEN USING LADTECH INC. (HDPE) ADJUSTING RING FOR INSTALLATION INSTRUCTION.

SMOOTH FINISH
PREFORMED INVERT



CASTING SHALL BE SET ON RAM-NEK OR APPROVED EQUAL SEALANT, WITH GAP ON CASTING SEALED WITH MORTAR INSIDE AND OUTSIDE. ONLY PLASTIC SHIMS WILL BE ACCEPTED. WOOD AND BLOCK SHIMS ARE NOT ACCEPTABLE.

INTERNAL POLYETHYLENE I & I BARRIER AS MANUFACTURED BY STRIKE TOOL OR APPROVED EQUAL.

TYPE "B" ECCENTRIC CONE SECTION (PER MnDOT SPEC. 4005M).

MANHOLE JOINTS SHALL BE SEALED WITH INFI-SHIELD GATOR WRAP OR (APPROVED EQUAL).

PRECAST SECTION CONFORMING TO ASTM C-478.

MANHOLE SECTION JOINTS SHALL BE OF THE TONGUE AND GROOVE DESIGN AND SEALED WITH RUBBER "O" RING OR PROFILE GASKETS.

MANHOLE STEPS, ARE NEEHAH POLYPROPYLENE PLASTIC (R-1981-N) OR APPROVED EQUAL, STEPS ARE 16" ON CENTER AND CONSTRUCTED ON DOWNSTREAM INVERT OUTLET.

RUBBER BOOT WITH STAINLESS STEEL STRAP AT PIPE OPENING.

PRECAST BOTTOM SECTION WITH PREFORMED INVERT.

MECHANICALLY COMPACT 4" GRANULAR MATERIAL FOR LEVELING (PER MnDOT SPEC. 3149.2F). (ORDINARY COMPACTION)

CASTING FRAME AND COVER SHALL BE NEENAH TYPE R-1733 WITH A TYPE B LID, LETTERED "SANITARY SEWER" AND WITH TWO CONCEALED PICK HOLES.

LADTECH INC. HIGH-DENSITY POLYETHYLENE (HDPE) ADJUSTMENT RINGS SHALL BE SET AND INSTALLED USING APPROVED ADHESIVE OR SEALANT PRODUCT AS RECOMMENDED BY THE MANUFACTURER PER SPECIFICATIONS.

IF USING PRECAST CONCRETE RINGS, SET RINGS WITH A FULL BED OF MORTAR BETWEEN EACH RING AND WIPE SMOOTH ON OUTSIDE AND INSIDE. DAMAGED, AND DRY SET, RINGS AND CASTINGS ARE NOT ACCEPTABLE.

2" RINGS SHALL BE BETWEEN A MIN. OF 2 OR MAX. OF 6 RINGS. CONTRACTOR SHALL POUR A CONCRETE COLLAR AROUND ALL CATCH BASINS AND CATCH BASIN MANHOLES.

SEE STANDARD PLATE NO. STR-7 FOR BIT. MANHOLE PATCHING DETAIL.

INSIDE DROP BOWL (SECURED WITH STAINLESS STEEL FASTENERS).

RUBBER BOOT WITH STAINLESS STEEL STRAP AT PIPE OPENING.

PVC SANITARY SEWER INLET PIPE.

EXTERNAL PIPE COUPLER

STAINLESS STEEL PIPE BRACKET SECURED TO STRUCTURE WITH TWO TWO STAINLESS BOLTS, (4' INTERVALS, MINIMUM 2).

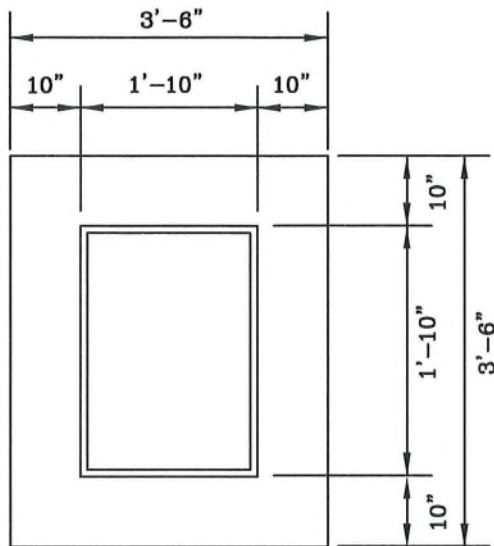
PVC SANITARY SEWER DROP PIPE

MINIMUM THICKNESS OF PRECAST BASE IS 6" FOR 14' DEEP OR LESS, INCREASES 1" IN THICKNESS FOR EVERY 4' OF DEPTH GREATER THAN 14', AND REINFORCE WITH 6" X 6" WITH 10/10 MESH.

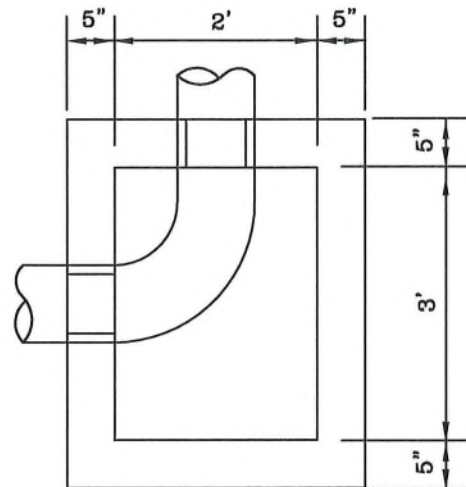


TYPICAL SANITARY SEWER INSIDE DROP MANHOLE INSTALLATION

2' X 3' CATCH BASIN



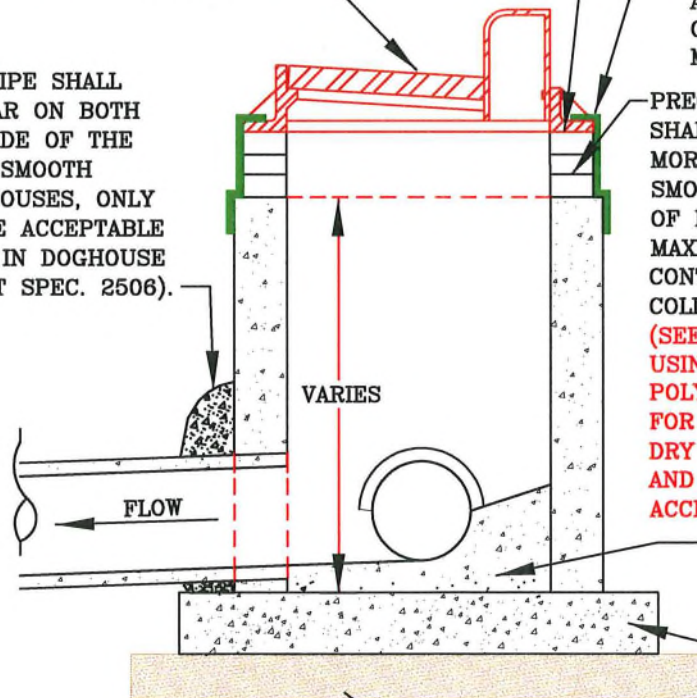
BASE SLAB PLAN



CATCH BASIN PLAN

CASTING FRAME SHALL BE NEENAH TYPE R-3246 WITH GRATE TYPE C OR V, AND R-3235 IF ROUND CASTING FRAME & STRUCTURE.

DOGHOUSES AROUND PIPE SHALL BE FILLED WITH MORTAR ON BOTH THE INSIDE AND OUTSIDE OF THE STRUCTURE. FILL AND SMOOTH MORTAR AROUND DOGHOUSES, ONLY MORTAR BRICK WILL BE ACCEPTABLE TO FILL EXCESS GAPS IN DOGHOUSE OPENINGS. (PER MnDOT SPEC. 2506).



CASTING SHALL BE SET ON RAM-NEK OR APPROVED EQUAL SEALANT, WITH GAP ON CASTING SEALED WITH MORTAR INSIDE AND OUTSIDE. ONLY PLASTIC SHIMS WILL BE ACCEPTED. WOOD AND BLOCK SHIMS ARE NOT ACCEPTABLE.

INFI-SHIELD GATOR WRAP MATERIAL (OR APPROVED EQUAL) EXTERNAL I&I BARRIER SHALL BE INSTALLED AS RECOMMENDED BY MANUFACTURE ON CATCH BASINS AND CATCH BASIN MANHOLES.

PRECAST CONCRETE ADJUSTMENT RINGS SHALL BE SET WITH A FULL BED OF MORTAR BETWEEN EACH RING AND WIPED SMOOTH ON OUTSIDE AND INSIDE OF OF RINGS. A MINIMUM OF 2 AND A MAXIMUM OF 6 - 2" RINGS ARE ALLOWED, CONTRACTOR SHALL POUR A CONCRETE COLLAR AROUND CATCH BASINS.

(SEE STANDARD PLATE NO. STR-12 WHEN USING CRETEX PRO RING EXPANDED POLYETHYLENE (EPP) ADJUSTING RING FOR INSTALLATION INSTRUCTION), DRY SETTING OF THE CASTING AND RINGS AND DAMAGED ADJUSTING RINGS ARE NOT ACCEPTABLE.

GROUT BOTTOM TO 1/2 DIAMETER OF PIPE AND FORM AND SMOOTH INVERT TO OUTLET.

6" PRECAST REINFORCED CONCRETE BASE.

MECHANICALLY COMPACT 4" GRANULAR MATERIAL FOR LEVELING PER MnDOT SPEC. 3149.2F (ORDINARY COMPACTION).

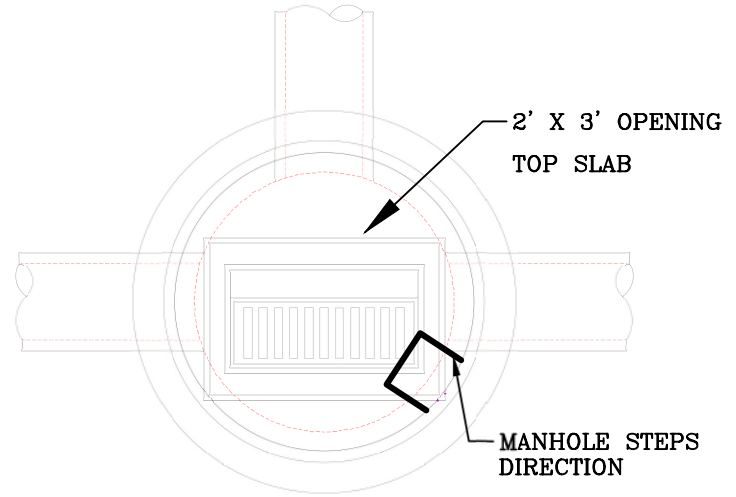
CATCH BASIN MANHOLE

PRECAST CONCRETE RINGS SHALL BE SET WITH A FULL BED OF MORTAR BETWEEN EACH RING AND WIPE SMOOTH ON OUTSIDE AND INSIDE. **DAMAGED, AND DRY SET, RINGS AND CASTINGS ARE NOT ACCEPTABLE.**

IF USING LADTECH INC. HIGH-DENSITY POLYETHYLENE (HDPE) ADJUSTMENT RINGS SHALL BE SET AND INSTALLED USING APPROVED ADHESIVE OR SEALANT PRODUCT AS RECOMMENDED BY THE MANUFACTURER PER SPECIFICATIONS.

2" RINGS SHALL BE BETWEEN A MIN. OF 2 OR MAX. OF 6 RINGS. **CONTRACTOR SHALL POUR A CONCRETE COLLAR AROUND ALL CATCH BASINS AND CATCH BASIN MANHOLES.**

SEE STANDARD PLATE NO. STR-7 FOR BIT. MANHOLE PATCHING DETAIL.



CASTING FRAME SHALL BE NEENAH TYPE R-3246 WITH GRATE TYPE C OR V, AND R-3235 IF ROUND CASTING FRAME & STRUCTURE.

CASTING SHALL BE SET ON RAM-NEK OR APPROVED EQUAL SEALANT, WITH GAP ON CASTING SEALED WITH MORTAR INSIDE AND OUTSIDE. **ONLY PLASTIC SHIMS WILL BE ACCEPTED. WOOD AND BLOCK SHIMS ARE NOT ACCEPTABLE.**

PRECAST SECTION
CONFORMING TO ASTM C478.

MANHOLE JOINTS SHALL BE SEALED WITH INFI-SHIELD GATOR WRAP OR (APPROVED EQUAL).

DOGHOUSES AROUND PIPE SHALL BE FILLED WITH MORTAR ON BOTH THE INSIDE AND OUTSIDE OF THE STRUCTURE. FILL AND SMOOTH MORTAR AROUND DOGHOUSES, ONLY MORTAR BRICK WILL BE ACCEPTABLE TO FILL EXCESS GAPS IN DOGHOUSE OPENINGS. (PER MnDOT SPEC. 2506).

INFI-SHIELD GATOR WRAP MATERIAL (OR APPROVED EQUAL) EXTERNAL I&I BARRIER SHALL BE INSTALLED AS RECOMMENDED BY MANUFACTURE ON CATCH BASINS AND CATCH BASIN MANHOLES.

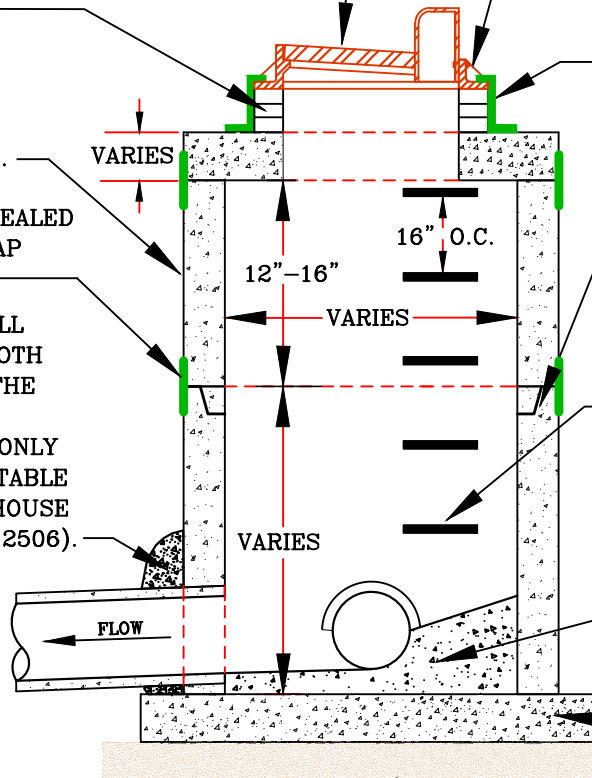
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MANHOLE STEPS, ARE NEEHAH POLYPROPYLENE PLASTIC (R-1981-N) OR APPROVED EQUAL, STEPS ARE 16" ON CENTER AND CONSTRUCTED ON BENCH SIDE OF MANHOLE WHEN FEASIBLE.

GROUT BOTTOM TO 1/2 DIAMETER OF PIPE AND FORM A SMOOTH INVERT TO OUTLET.

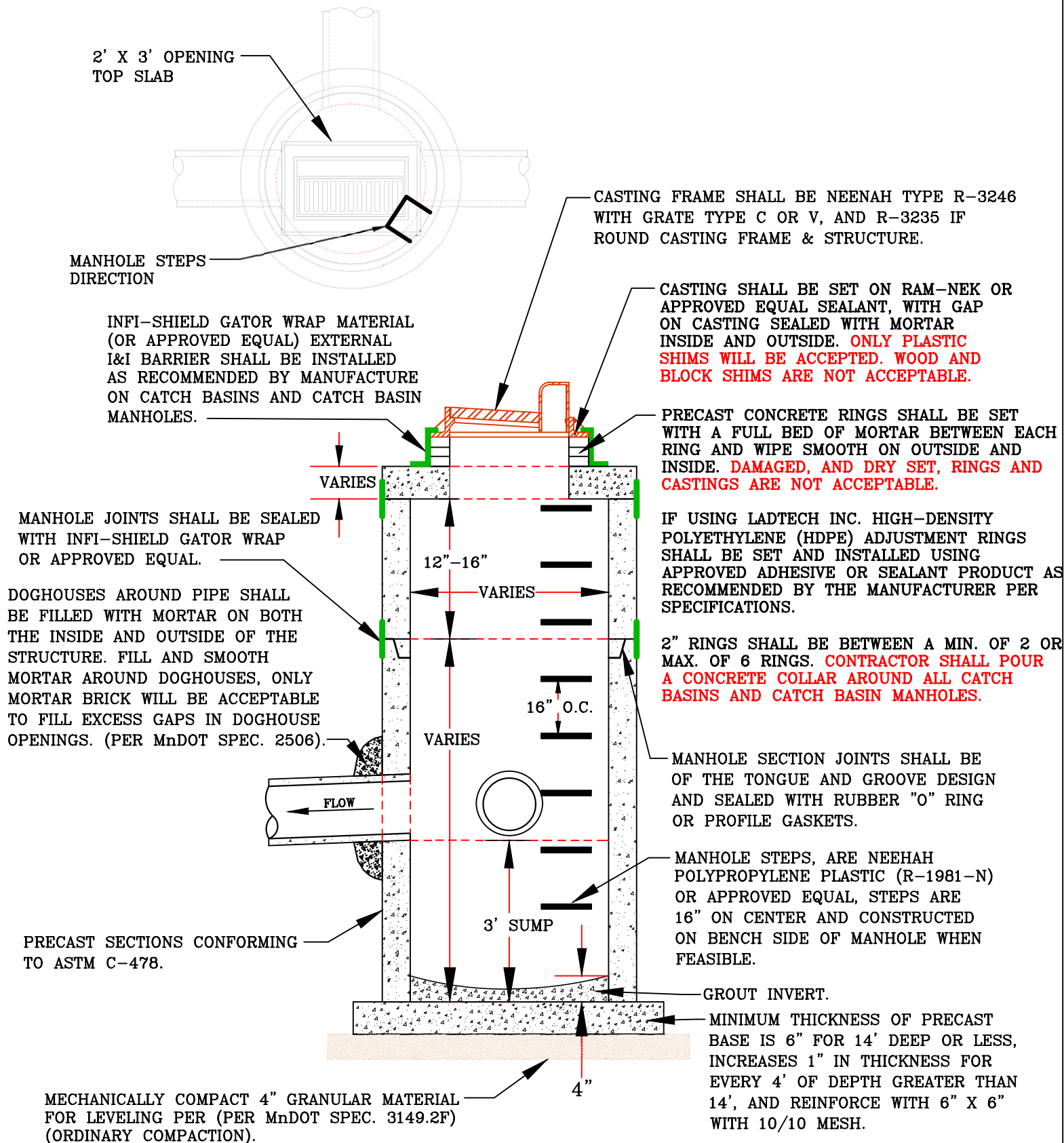
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MECHANICALLY COMPACT 4" GRANULAR MATERIAL FOR LEVELING PER (PER MnDOT SPEC. 3149.2F) (ORDINARY COMPACTION).



TYPICAL CATCH BASIN MANHOLE INSTALLATION

CATCH BASIN SUMP MANHOLE



STORM SEWER MANHOLE

LADTECH INC. HIGH-DENSITY POLYETHYLENE (HDPE) ADJUSTMENT RINGS SHALL BE SET AND INSTALLED USING APPROVED ADHESIVE OR SEALANT PRODUCT AS RECOMMENDED BY THE MANUFACTURER PER SPECIFICATIONS.

IF USING PRECAST CONCRETE RINGS, SET RINGS WITH A FULL BED OF MORTAR BETWEEN EACH RING AND WIPE SMOOTH ON OUTSIDE AND INSIDE. DAMAGED, AND DRY SET, RINGS AND CASTINGS ARE NOT ACCEPTABLE.

2" RINGS SHALL BE BETWEEN A MIN. OF 2 OR MAX. OF 6 RINGS. CONTRACTOR SHALL POUR A CONCRETE COLLAR AROUND ALL CATCH BASINS AND CATCH BASIN MANHOLES.

SEE STANDARD PLATE NO. STR-7 FOR BIT. MANHOLE PATCHING DETAIL.

CASTING FRAME AND COVER SHALL BE NEENAH TYPE R-1733 WITH A TYPE B LID, LETTERED "STORM SEWER" AND WITH TWO CONCEALED PICK HOLES.

CASTING SHALL BE SET ON RAM-NEK OR APPROVED EQUAL SEALANT, WITH GAP ON CASTING SEALED WITH MORTAR INSIDE AND OUTSIDE. ONLY PLASTIC SHIMS WILL BE ACCEPTED. WOOD AND BLOCK SHIMS ARE NOT ACCEPTABLE.

INTERNAL POLYETHYLENE I & I BARRIER AS MANUFACTURED BY STRIKE TOOL OR APPROVED EQUAL.

TYPE "B" ECCENTRIC CONE SECTION (PER MnDOT SPEC. 4005M).

MANHOLE JOINTS SHALL BE SEALED WITH INFI-SHIELD GATOR WRAP OR (APPROVED EQUAL).

MANHOLE SECTION JOINTS SHALL BE OF THE TONGUE AND GROOVE DESIGN AND SEALED WITH RUBBER "O" RING OR PROFILE GASKETS.

PRECAST SECTION CONFORMING TO ASTM C-478.

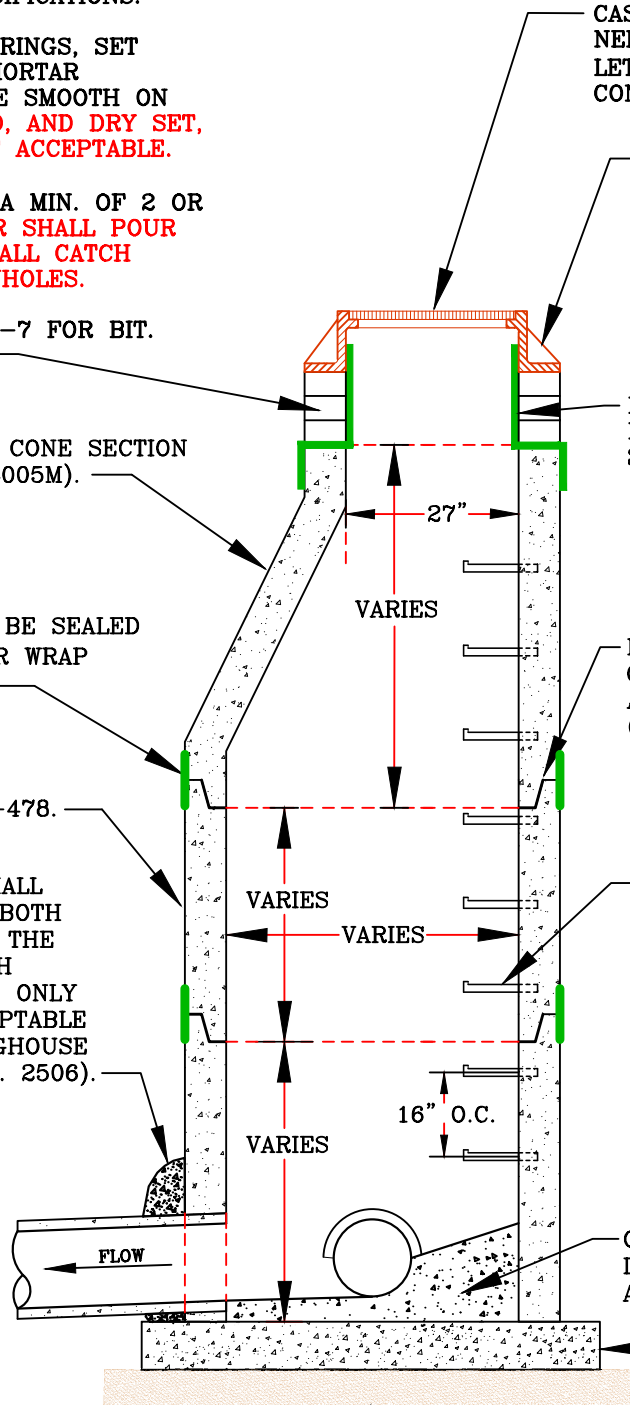
DOGHOUSES AROUND PIPE SHALL BE FILLED WITH MORTAR ON BOTH THE INSIDE AND OUTSIDE OF THE STRUCTURE. FILL AND SMOOTH MORTAR AROUND DOGHOUSES, ONLY MORTAR BRICK WILL BE ACCEPTABLE TO FILL EXCESS GAPS IN DOGHOUSE OPENINGS. (PER MnDOT SPEC. 2506).

MANHOLE STEPS, ARE NEEHAH POLYPROPYLENE PLASTIC (R-1981-N) OR APPROVED EQUAL, STEPS ARE 16" ON CENTER AND CONSTRUCTED ON BENCH SIDE OF MANHOLE WHEN FEASIBLE.

GROUT BOTTOM TO 1/2 DIAMETER OF PIPE AND FORM A SMOOTH INVERT TO OUTLET.

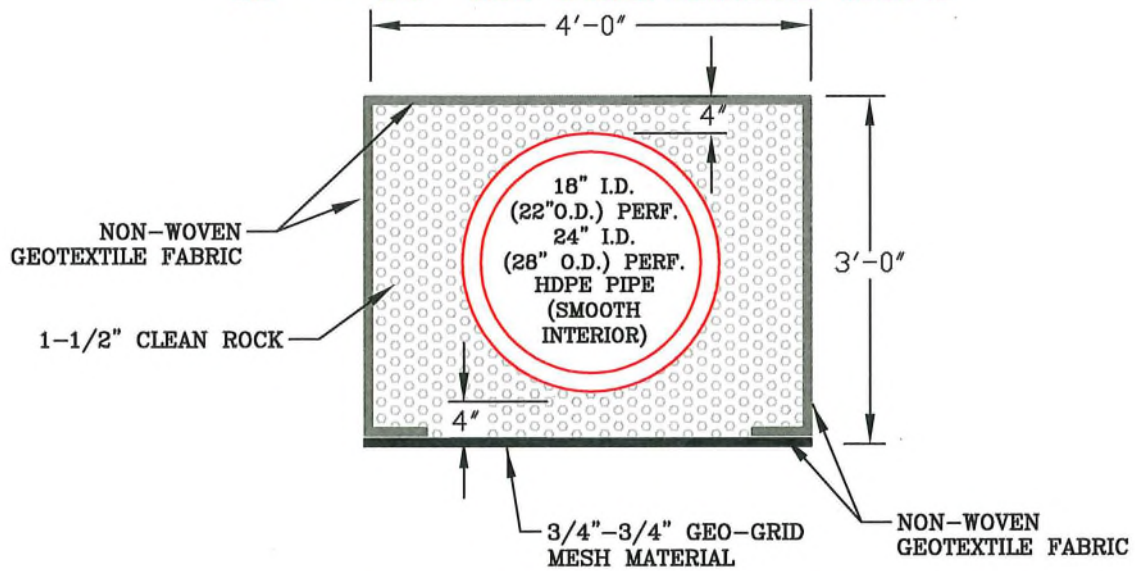
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MECHANICALLY COMPACT 4" GRANULAR MATERIAL FOR LEVELING PER (MnDOT SPEC. 3149.2F). (ORDINARY COMPACTION)

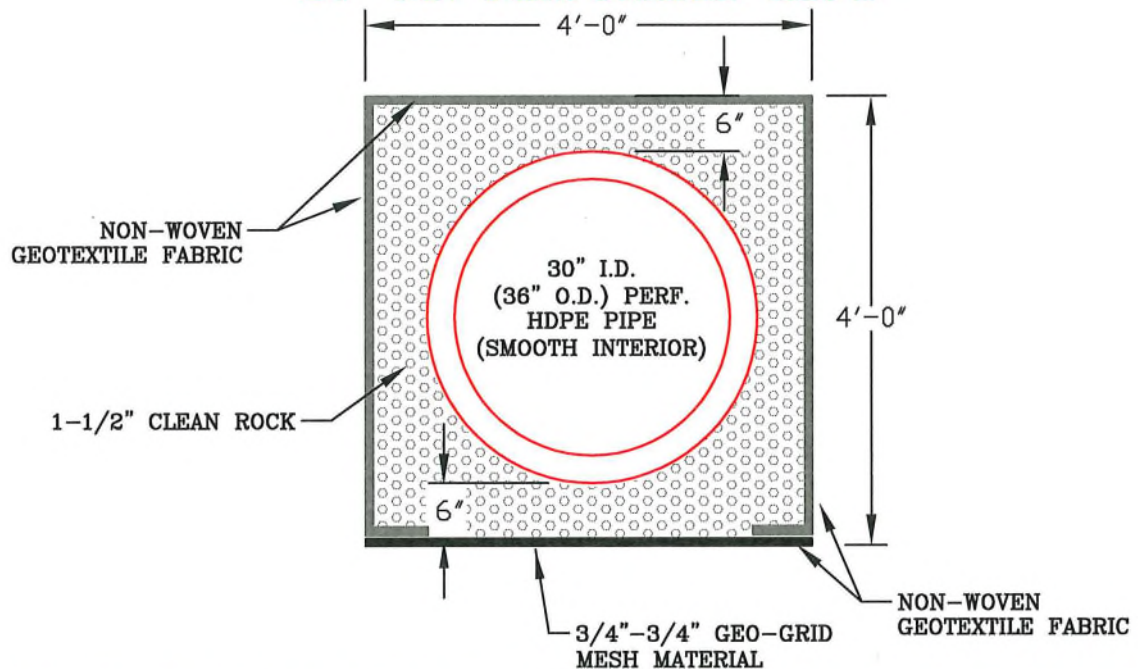


INFILTRATION PIPING

18" - 24" I.D. PERFORATED HDPE



30" I.D. PERFORATED HDPE

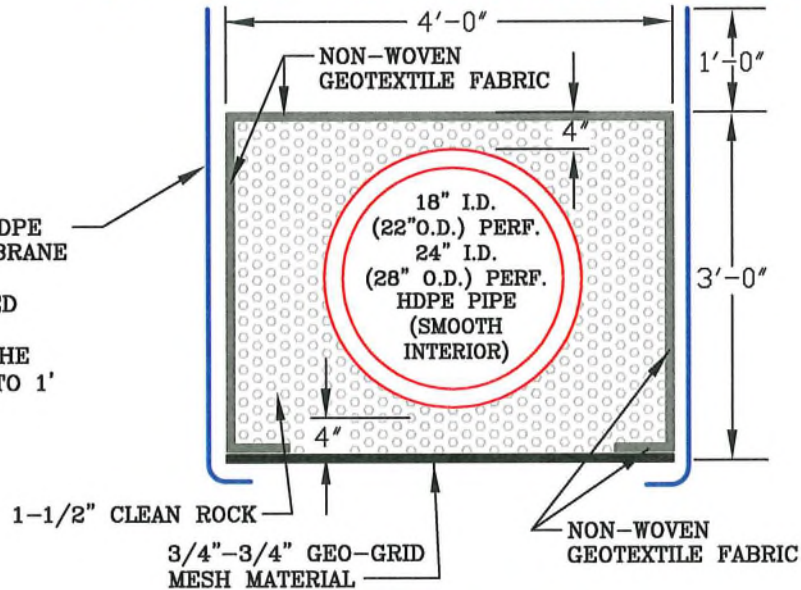


- NOTES:**
1. 1-1/2" CLEAN ROCK SHALL BE UNIFORMLY GRADED, WASHED, CLASS A CRUSHED STONE BEARING NO NATURALLY OCCURRING WORN SURFACES WITH NO FINES AND CONTAIN A MINIMUM OF 40% VOID SPACE ACCORDING TO AASHTO T19. GRADATION SHALL BE MODIFIED AASHTO #3 OF COMPARABLE WITH LESS THAN 5% FINES BELOW 1/2" AND LESS THAN 2% PASSING THE #200 SEIVE.
 2. LOCAL MATERIAL HAVING A RECORD OF SATISFACTORY PERFORMANCE SHALL BE USED. A SAMPLE OF THE MATERIALS SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.
 3. NON-WOVEN GEOTEXTILE FABRIC SHALL BE ADS GEOSYNTHETICS 0601T OR APPROVED EQUAL.
 4. PLASTIC GEOGRID MESH MATERIAL INSTALLED ON BOTTOM OF TRENCH ACCORDING TO WIDTH OF TRENCH AND PIPE SIZE BEING INSTALLED SHALL BE TENSAR BX-1100 OR BX-1500 OR APPROVED EQUAL.

INFILTRATION PIPING

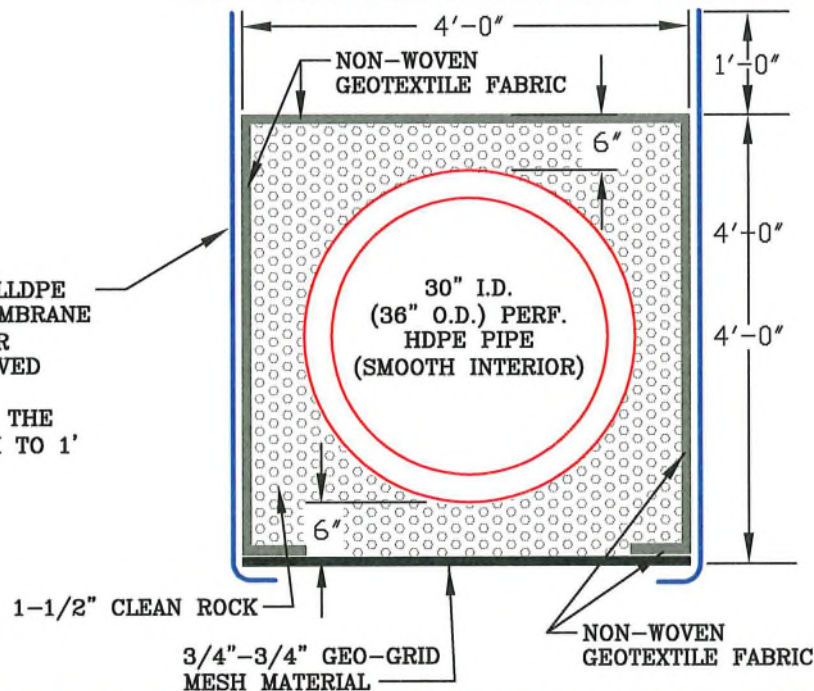
18" - 24" I.D. PERFORATED HDPE

INSTALL 40-MIL LLDPE IMPERMEABLE MEMBRANE BY AQUABLOK (OR ENGINEER APPROVED EQUAL). EXTEND MEMBRANE FROM THE BOTTOM OF ROCK TO 1' ABOVE ROCK.



30" I.D. PERFORATED HDPE

INSTALL 40-MIL LLDPE IMPERMEABLE MEMBRANE BY AQUABLOK (OR ENGINEER APPROVED EQUAL). EXTEND MEMBRANE FROM THE BOTTOM OF ROCK TO 1' ABOVE ROCK.



- NOTES:**
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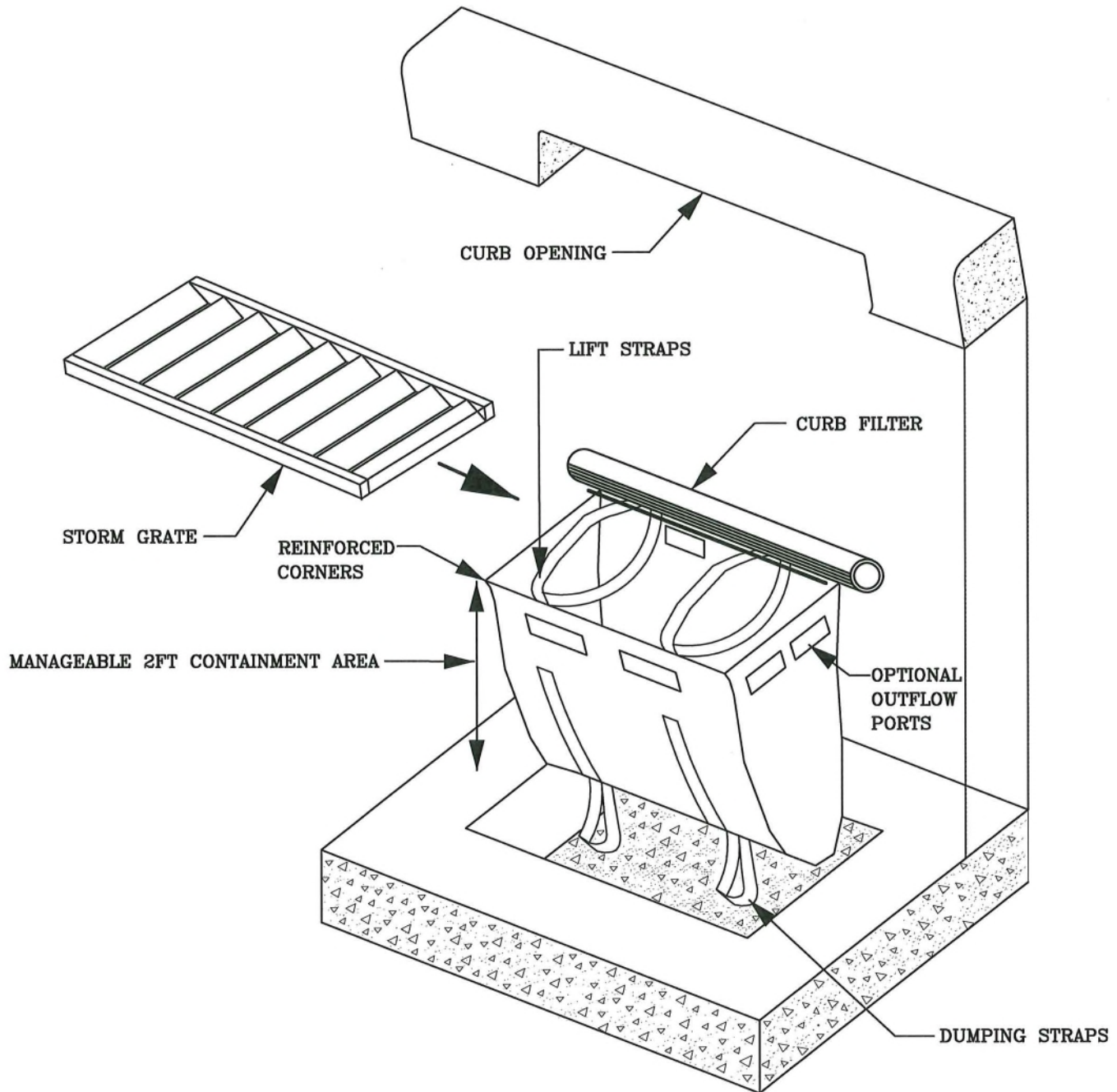


SHOREVIEW
PUBLIC WORKS

TYPICAL HDPE PIPE
INFILTRATION INSTALLATION

STORM SEWER STRUCTURE INLET PROTECTION

NOTES: 1. ALL EXISTING AND NEWLY INSTALLED STORM SEWER STRUCTURES SHALL HAVE A DANDY CURB SACK INSTALLED (OR APPROVED EQUAL) FOR EROSION CONTROL PROTECTION.

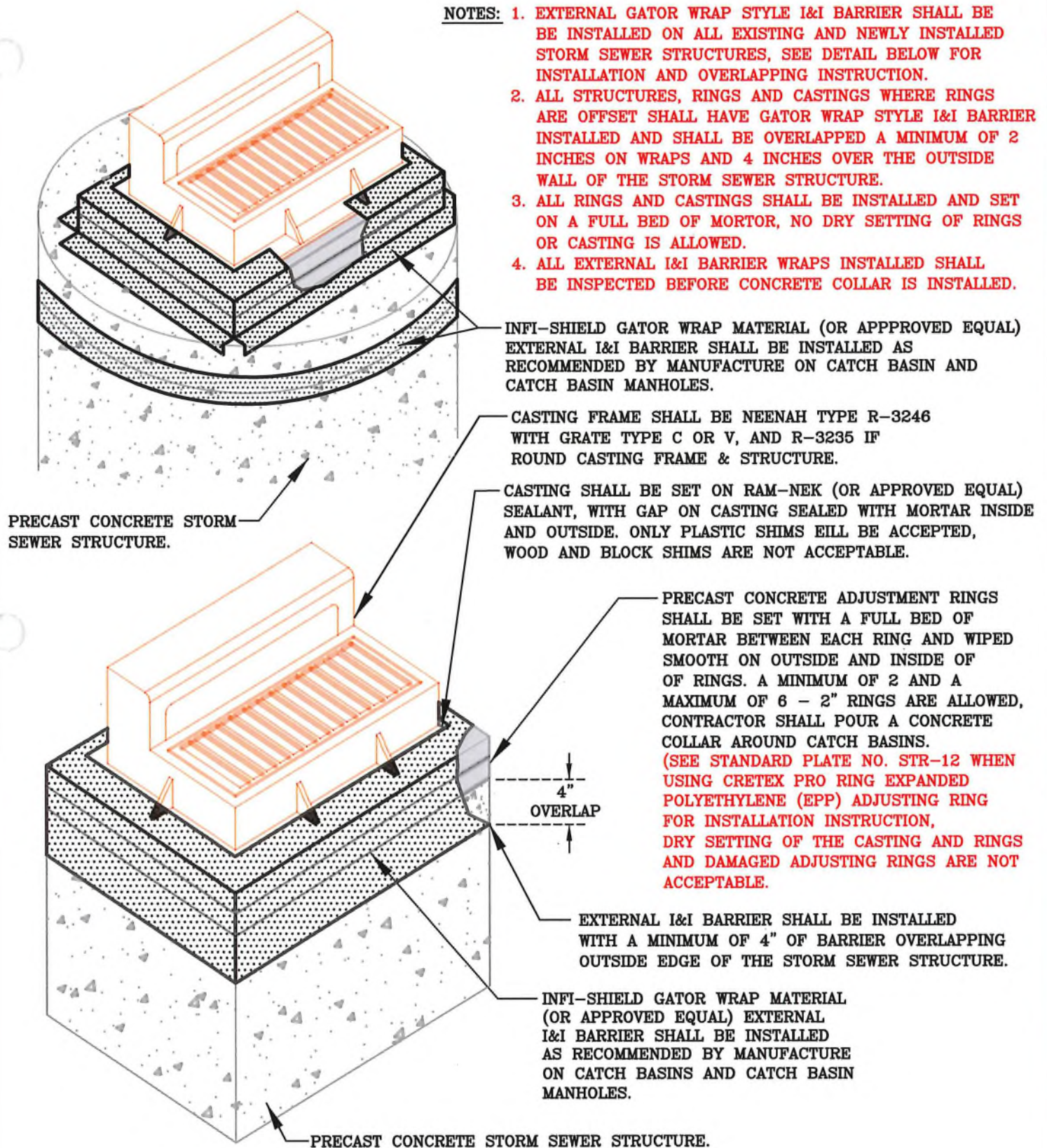


SHOREVIEW
PUBLIC WORKS

TYPICAL STORM SEWER INLET
PROTECTION INSTALLATION

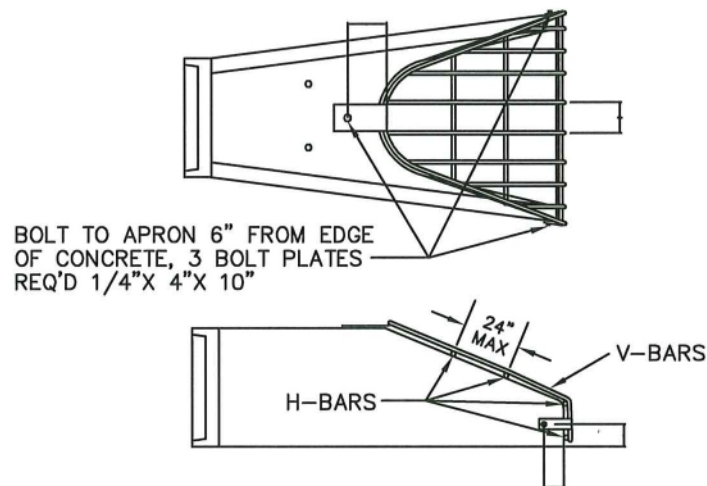
INFI-SHIELD EXTERNAL GATOR WRAP I&I BARRIER

- NOTES:**
1. EXTERNAL GATOR WRAP STYLE I&I BARRIER SHALL BE BE INSTALLED ON ALL EXISTING AND NEWLY INSTALLED STORM SEWER STRUCTURES, SEE DETAIL BELOW FOR INSTALLATION AND OVERLAPPING INSTRUCTION.
 2. ALL STRUCTURES, RINGS AND CASTINGS WHERE RINGS ARE OFFSET SHALL HAVE GATOR WRAP STYLE I&I BARRIER INSTALLED AND SHALL BE OVERLAPPED A MINIMUM OF 2 INCHES ON WRAPS AND 4 INCHES OVER THE OUTSIDE WALL OF THE STORM SEWER STRUCTURE.
 3. ALL RINGS AND CASTINGS SHALL BE INSTALLED AND SET ON A FULL BED OF MORTAR, NO DRY SETTING OF RINGS OR CASTING IS ALLOWED.
 4. ALL EXTERNAL I&I BARRIER WRAPS INSTALLED SHALL BE INSPECTED BEFORE CONCRETE COLLAR IS INSTALLED.



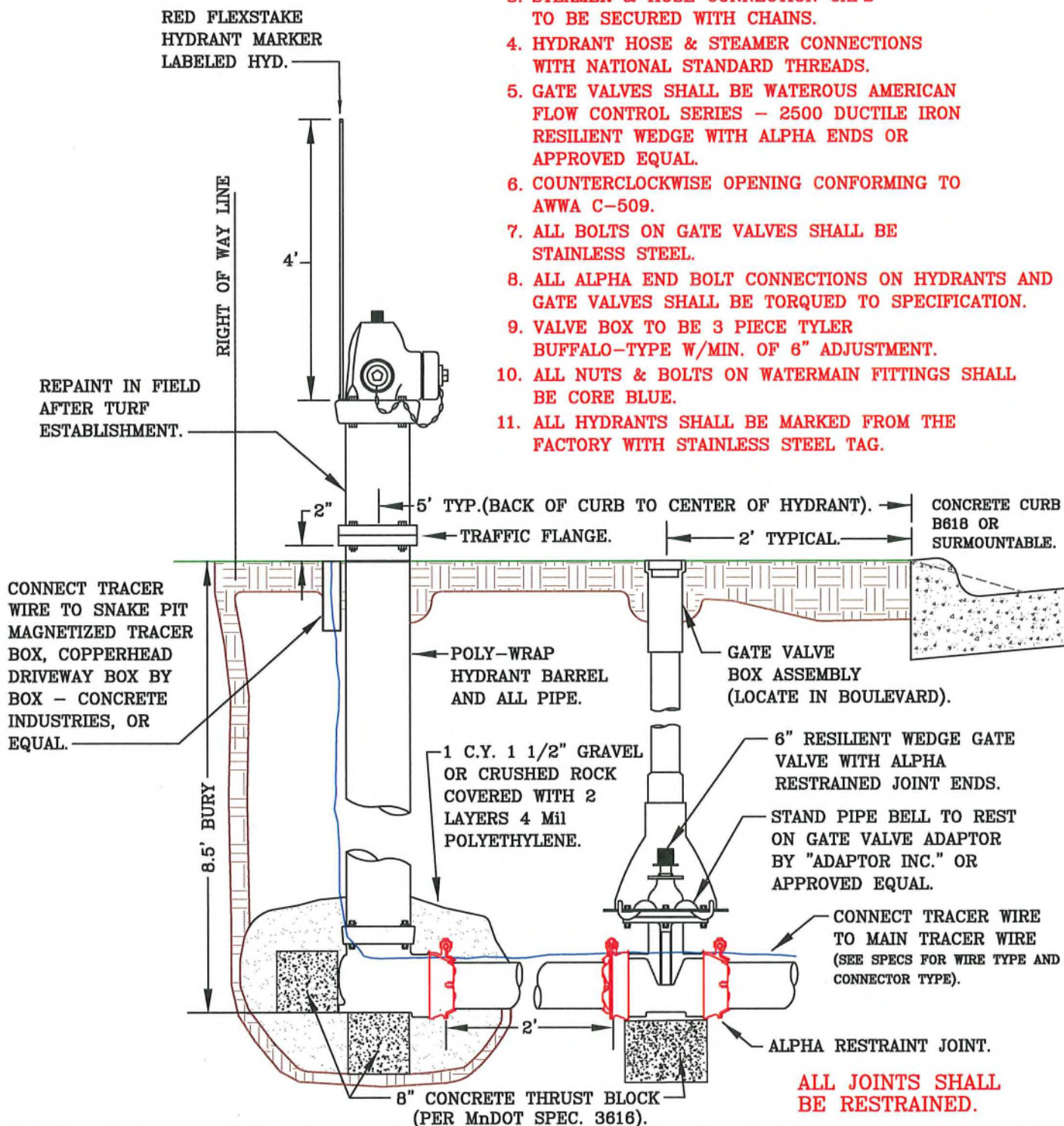
STORM SEWER CONCRETE APRON TRASH GUARD

- NOTES**
1. BARS & PLATES SHALL BE HOT-ROLLED STEEL.
 2. BARS, PLATES, & PIPE SHALL BE FINISHED WITH 2 COATS OF ALUMINUM PAINT.
 3. BOLTS SHALL BE GALVANIZED.
 4. SEE Mn/DOT PLATES 3100G & 3110G FOR APRON DIMENSIONS.



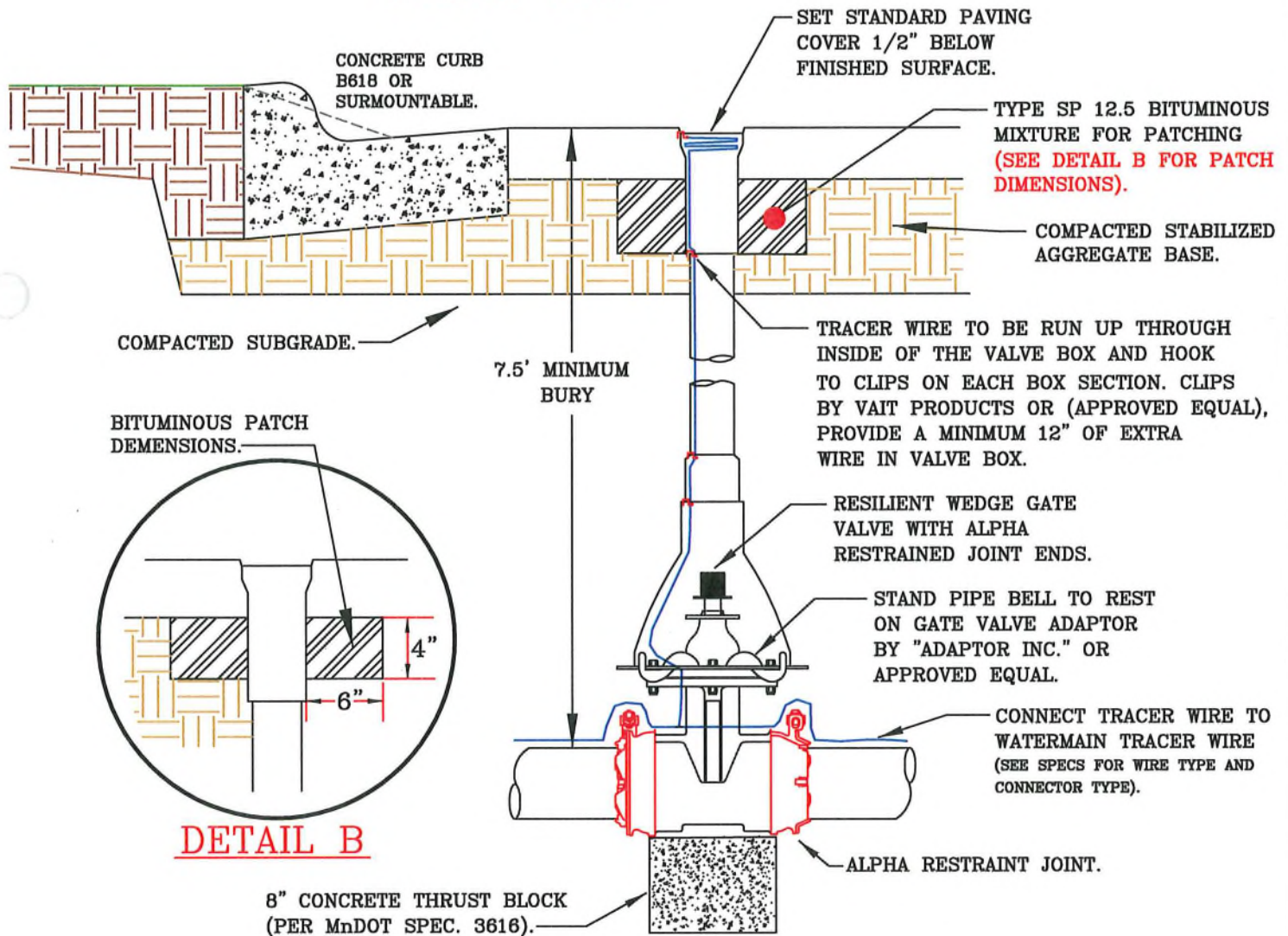
WATEROUS PACER WB-67-250 WITH ALPHA END

- NOTES:**
1. HYDRANT SHALL BE AMERICAN FLOW CONTROL WATEROUS PACER WB-67-250 WITH ALPHA ENDS.
 2. HYDRANT SHALL MEET OR EXCEED AWWA C-502.
 3. STEAMER & HOSE CONNECTION CAPS TO BE SECURED WITH CHAINS.
 4. HYDRANT HOSE & STEAMER CONNECTIONS WITH NATIONAL STANDARD THREADS.
 5. GATE VALVES SHALL BE WATEROUS AMERICAN FLOW CONTROL SERIES - 2500 DUCTILE IRON RESILIENT WEDGE WITH ALPHA ENDS OR APPROVED EQUAL.
 6. COUNTERCLOCKWISE OPENING CONFORMING TO AWWA C-509.
 7. ALL BOLTS ON GATE VALVES SHALL BE STAINLESS STEEL.
 8. ALL ALPHA END BOLT CONNECTIONS ON HYDRANTS AND GATE VALVES SHALL BE TORQUED TO SPECIFICATION.
 9. VALVE BOX TO BE 3 PIECE TYLER BUFFALO-TYPE W/MIN. OF 6" ADJUSTMENT.
 10. ALL NUTS & BOLTS ON WATERMAIN FITTINGS SHALL BE CORE BLUE.
 11. ALL HYDRANTS SHALL BE MARKED FROM THE FACTORY WITH STAINLESS STEEL TAG.



WATEROUS AFC-2500 DUCTILE IRON RESILIENT WEDGE GATE VALVE AND BUFFALO - TYPE VALVE BOX

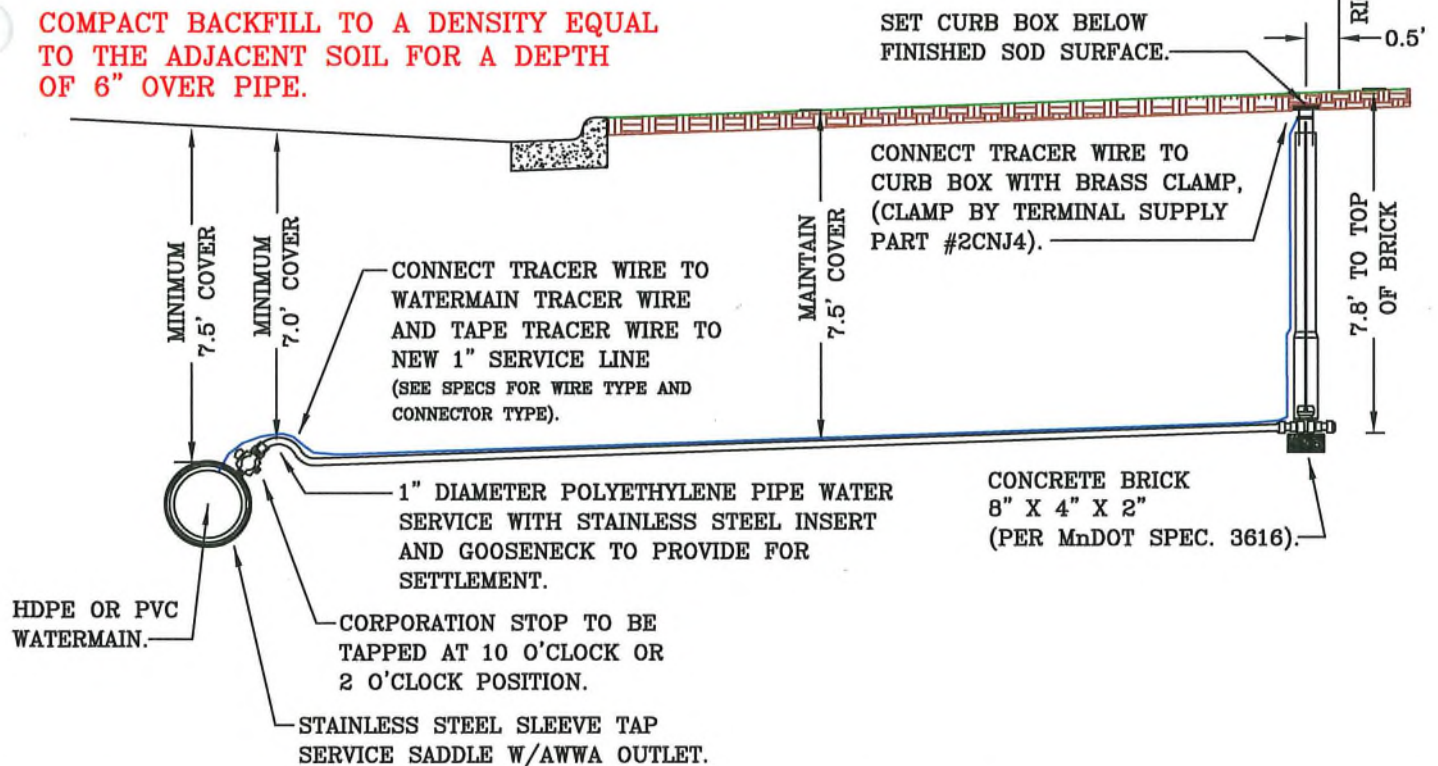
- NOTES:**
1. GATE VALVES SHALL BE WATEROUS AMERICAN FLOW CONTROL SERIES-2500 DUCTILE IRON RESILIENT WEDGE WITH ALPHA ENDS OR APPROVED EQUAL.
 2. COUNTERCLOCKWISE OPENING CONFORMING TO AWWA C-509.
 3. VALVE BOX TO BE 3 PIECE TYLER BUFFALO-TYPE W/MINIMUM OF 6" ADJUSTMENT.
 4. GATE VALVE BOLTS SHALL BE TORQUED TO VALVE SPECIFICATIONS.
 5. ALL BOLTS ON GATE VALVES SHALL BE STAINLESS STEEL.
 6. ALL NUTS & BOLTS ON WATERMAIN FITTINGS SHALL BE CORE BLUE.
 7. 12" WATERMAINS AND LARGER REQUIRE BUTTERFLY VALVES.



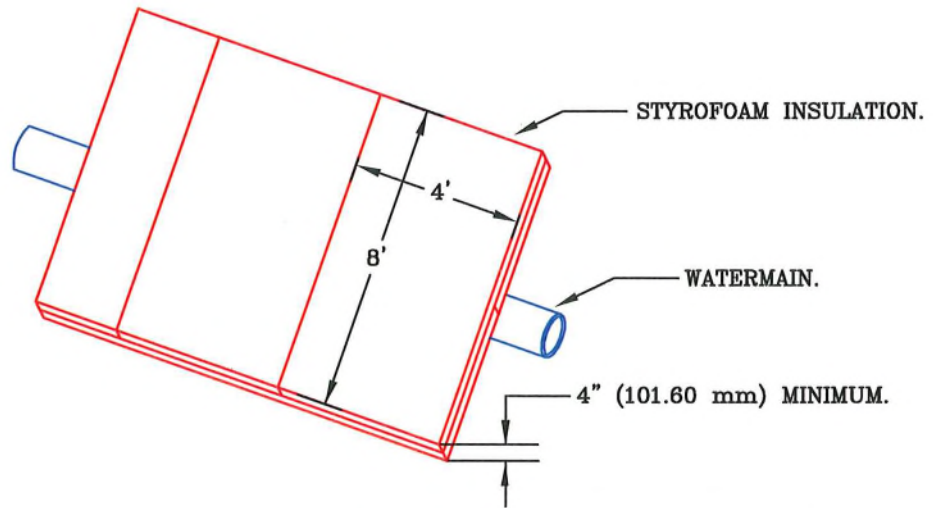
RESIDENTIAL 1" POLYETHYLENE WATER SERVICE AND CORPORATION STOP AND CURB STOP/CURB BOX & ROD

- NOTES:**
1. WATER SERVICE MUST BE CONTINUOUS PIPE WITHOUT JOINTS.
 2. TRACER WIRE SHALL BE INSTALLED ALONG WATER SERVICE CONTINUOUSLY FROM WATERMAIN TO CURB BOX AND AFFIXED TO PIPE WITH A 12" LOOP IN TRACER WIRE AT SPICED END OF WIRE AT THE WATERMAIN CONNECTION.
(SEE SPECS FOR WIRE TYPE, CONNECTOR TYPE AND WIRE SPLICING)
 3. CURB BOXES THAT ARE LOCATED IN DRIVEWAYS AND SIDEWALKS SHALL HAVE A FORD METER BOX A-1 TYPE CASTING INSTALLED OVER THE CURB BOX.
 4. 1 1/2" & 2" WATER SERVICES REQUIRE A LARGER BOTTOM SECTION.

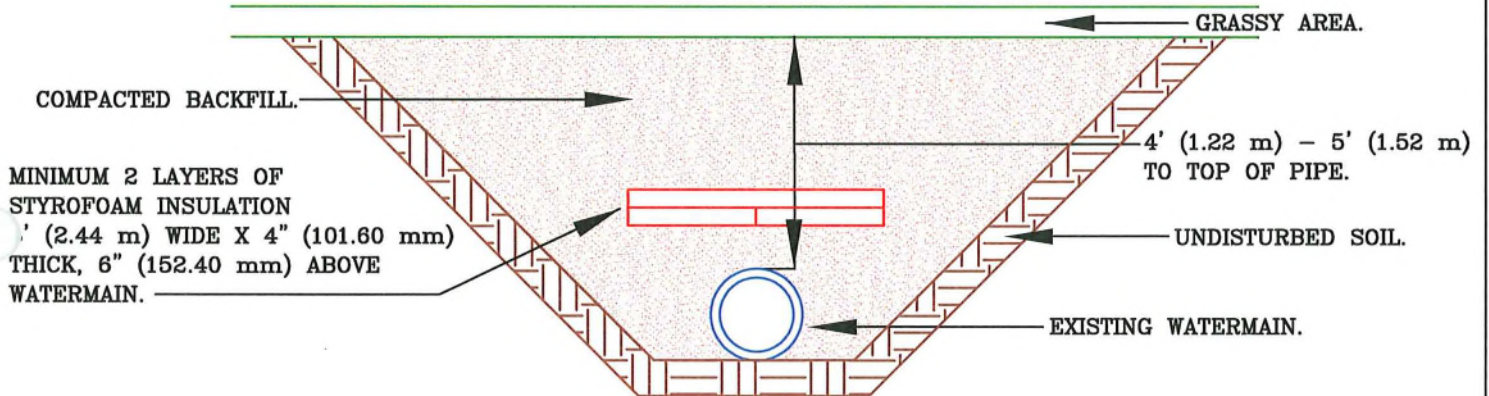
ACCEPTABLE CORPORATION STOP
A.Y. McDONALD 74701BQ
FORD FB1000-4-Q-NL
ACCEPTABLE CURB STOP
A.Y. McDONALD 76104Q
FORD B44-444M-Q-NL
ACCEPTABLE CURB BOX & STATIONARY ROD
A.Y. McDONALD 5622AND 5660
*PER AWWA C800 REQUIREMENTS



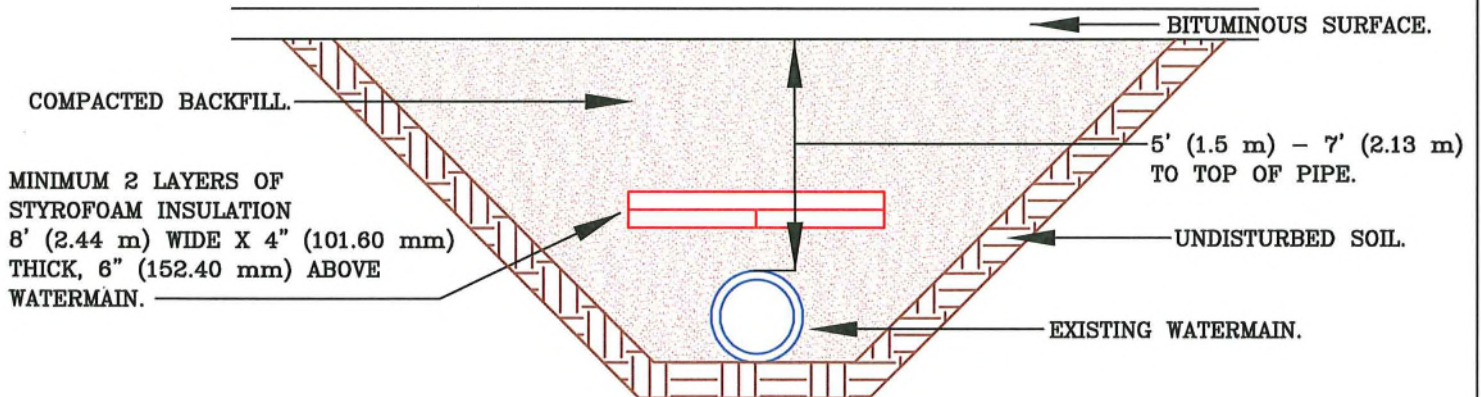
WATERMAIN INSULATION



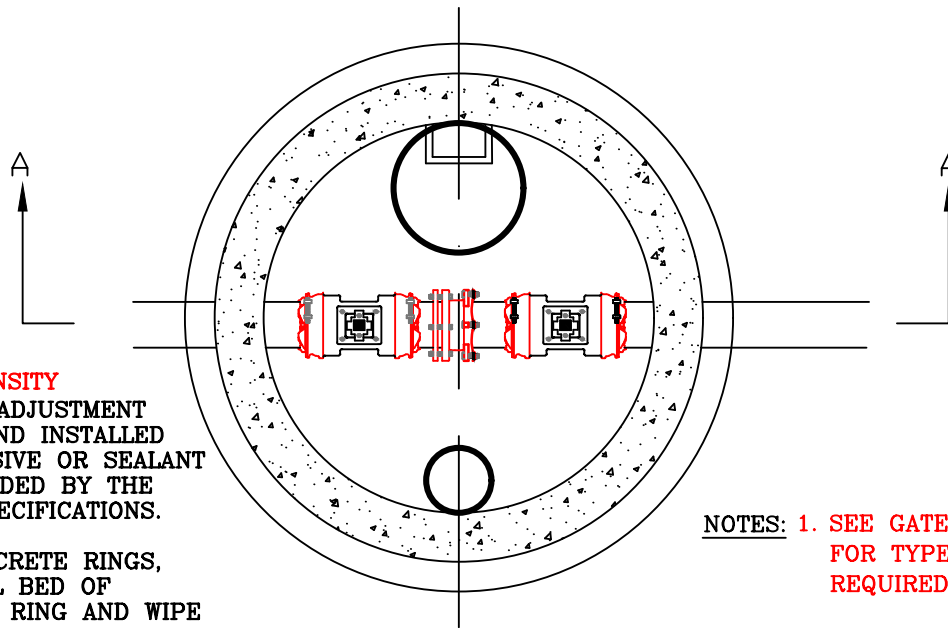
BOULEVARD SECTION



ROAD SECTION



WATERMAIN GATE VALVE MANHOLE



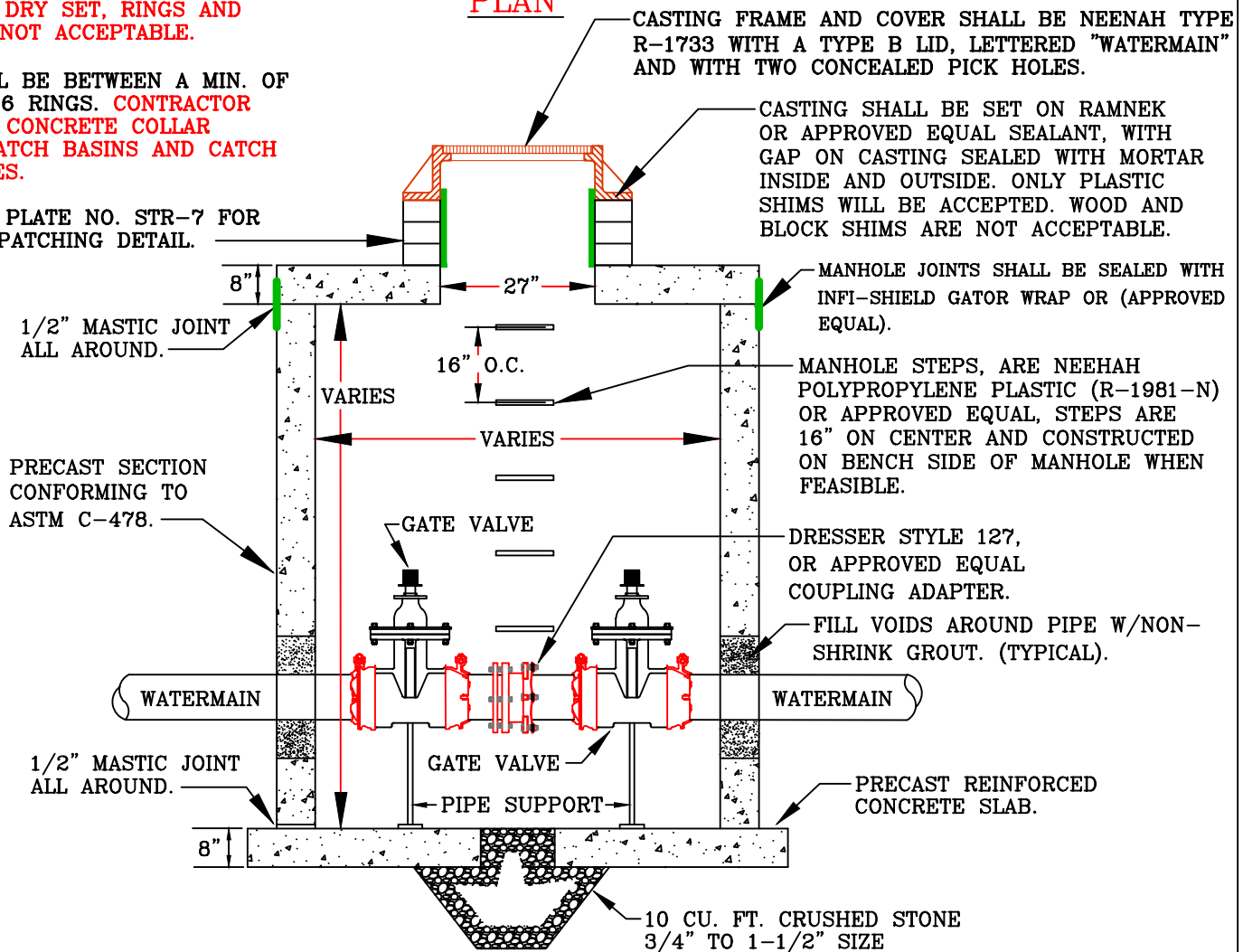
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IF USING PRECAST CONCRETE RINGS, SET RINGS WITH A FULL BED OF MORTAR BETWEEN EACH RING AND WIPE SMOOTH ON OUTSIDE AND INSIDE. DAMAGED, AND DRY SET, RINGS AND CASTINGS ARE NOT ACCEPTABLE.

2" RINGS SHALL BE BETWEEN A MIN. OF 2 OR MAX. OF 6 RINGS. CONTRACTOR SHALL POUR A CONCRETE COLLAR AROUND ALL CATCH BASINS AND CATCH BASIN MANHOLES.

SEE STANDARD PLATE NO. STR-7 FOR BIT. MANHOLE PATCHING DETAIL.

NOTES: 1. SEE GATE VALVE DETAIL WAT-3 FOR TYPE OF GATE VALVE REQUIRED.



TYPICAL WATERMAIN GATEVALVE MANHOLE INSTALLATION

BUTTERFLY GATE VALVE MANHOLE

- NOTES:**
1. 12" WATERMAINS AND LARGER REQUIRE BUTTERFLY VALVES.
 2. BUTTERFLY VALVE SHALL BE HENRY PRATT AWWA GROUNDHOG MECHANICAL JOINT STYLE GATE VALVE.
 3. ALL NUTS & BOLTS SHALL BE CORE BLUE.
 4. ALL BOLTS ON GATE VALVES SHALL BE STAINLESS.
 5. GATE VALVE ACCESS HOLE IN THE LID SHALL BE CORED DRILLED IN THE FIELD AFTER VALVE INSTALLATION, (INCIDENTAL).

PRECAST CONCRETE ADJUSTMENT RINGS SHALL BE SET WITH A FULL BED OF MORTAR BETWEEN EACH RING AND WIPE SMOOTH OUTSIDE AND INSIDE OF RINGS. A MINIMUM OF 2 AND A MAXIMUM OF 6 - 2" RINGS ARE ALLOWED.

(SEE STANDARD PLATE NO. STR-7 FOR BIT. MANHOLE PATCH INSTALLATION INSTRUCTION).

(SEE STANDARD PLATE NO. STR-12 WHEN USING CRETEX PRO RING EXPANDED POLYETHYLENE (EPP) ADJUSTING RING FOR INSTALLATION INSTRUCTION).

DRY SETTING OF THE CASTINGS AND RINGS AND DAMAGED ADJUSTING RINGS ARE NOT ACCEPTABLE.

CASTING FRAME & COVER SHALL BE NEENAH TYPE R-1733 WITH A TYPE B LID, LETTERED "WATERMAIN" AND TWO CONCEALED PICK HOLES.

CASTING SHALL BE SET ON RAMNEK OR APPROVED EQUAL SEALANT, WITH GAP ON CASTING SEALED WITH MORTAR INSIDE AND OUTSIDE. ONLY PLASTIC SHIMS WILL BE ACCEPTED, WOOD AND BLOCK SHIMS ARE NOT ACCEPTABLE.

INFI-SHIELD GATOR WRAP MATERIAL (OR APPROVED EQUAL) EXTERNAL I&I BARRIER SHALL BE INSTALLED AS RECOMMENDED BY MANUFACTURE.

MANHOLE STEPS, ARE NEEHAH POLYPROPYLENE PLASTIC (R-1981-N) OR APPROVED EQUAL, STEPS ARE 16" ON CENTER AND CONSTRUCTED ON BENCH SIDE OF MANHOLE WHEN FEASIBLE.

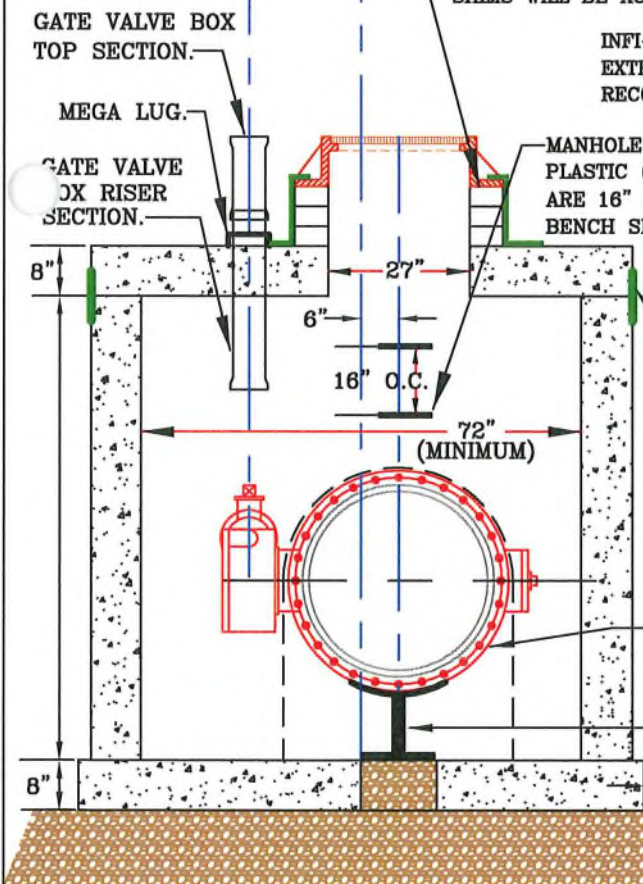
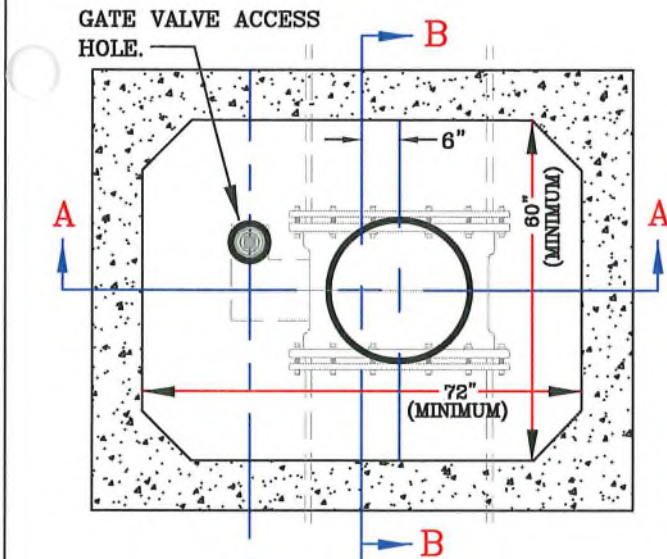
MANHOLE JOINTS SHALL BE SEALED WITH INFI-SHIELD GATOR WRAP OR (APPROVED EQUAL).

DOGHOUSE TO BE FILLED WITH FOAM INSULATION & WATERMAIN SHALL BE OUTSIDE WRAPPED WITH TYPE V GEOTEXTILE FABRIC.

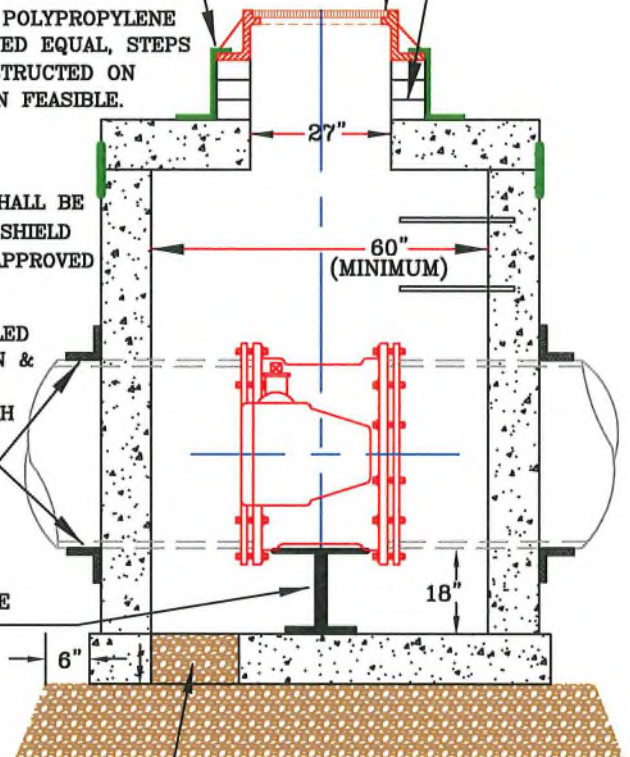
PRATT AWWA GROUNDHOG BUTTERFLY VALVE.

FABRICATED PIPE SUPPORT.

12"-CRUSHED 3/4" TO 1 1/2" SIZE.
12" ROCK SUMP.



SECTION A-A



SECTION B-B

BUTTERFLY GATE VALVE MANHOLE

- NOTES:**
1. 12" WATERMAINS AND LARGER REQUIRE BUTTERFLY VALVES.
 2. BUTTERFLY VALVE SHALL BE HENRY PRATT AWWA GROUNDHOG MECHANICAL JOINT STYLE GATE VALVE.
 3. ALL NUTS & BOLTS SHALL BE CORE BLUE.
 4. ALL BOLTS ON GATE VALVES SHALL BE STAINLESS.
 5. GATE VALVE ACCESS HOLE IN THE LID SHALL BE CORED DRILLED IN THE FIELD AFTER VALVE INSTALLATION, (INCIDENTAL).

LADTECH INC. HIGH-DENSITY POLYETHYLENE (HDPE) ADJUSTMENT RINGS SHALL BE SET AND INSTALLED USING APPROVED ADHESIVE OR SEALANT PRODUCT AS RECOMMENDED BY THE MANUFACTURER PER SPECIFICATIONS.

IF USING PRECAST CONCRETE RINGS, SET RINGS WITH A FULL BED OF MORTAR BETWEEN EACH RING AND WIPE SMOOTH ON OUTSIDE AND INSIDE. **DAMAGED, AND DRY SET, RINGS AND CASTINGS ARE NOT ACCEPTABLE.**

2" RINGS SHALL BE BETWEEN A MIN. OF 2 OR MAX. OF 6 RINGS. **CONTRACTOR SHALL POUR A CONCRETE COLLAR AROUND ALL CATCH BASINS AND CATCH BASIN MANHOLES.**

CASTING FRAME & COVER SHALL BE NEENAH TYPE R-1733 WITH A TYPE B LID, LETTERED "WATERMAIN" AND TWO CONCEALED PICK HOLES.

CASTING SHALL BE SET ON RAMNEK OR APPROVED EQUAL SEALANT, WITH GAP ON CASTING SEALED WITH MORTAR INSIDE AND OUTSIDE. ONLY PLASTIC SHIMS WILL BE ACCEPTED, WOOD AND BLOCK SHIMS ARE NOT ACCEPTABLE.

INFI-SHIELD GATOR WRAP MATERIAL (OR APPROVED EQUAL) EXTERNAL I&I BARRIER SHALL BE INSTALLED AS RECOMMENDED BY MANUFACTURE.

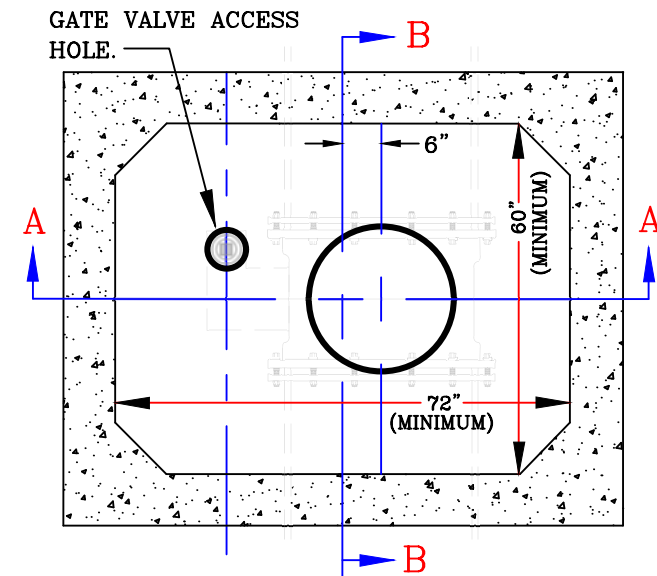
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MANHOLE JOINTS SHALL BE SEALED WITH INFI-SHIELD GATOR WRAP OR (APPROVED EQUAL).

DOGHOUSE TO BE FILLED WITH FOAM INSULATION & WATERMAIN SHALL BE OUTSIDE WRAPPED WITH TYPE V GEOTEXTILE FABRIC.

PRATT AWWA GROUNDHOG BUTTERFLY VALVE.

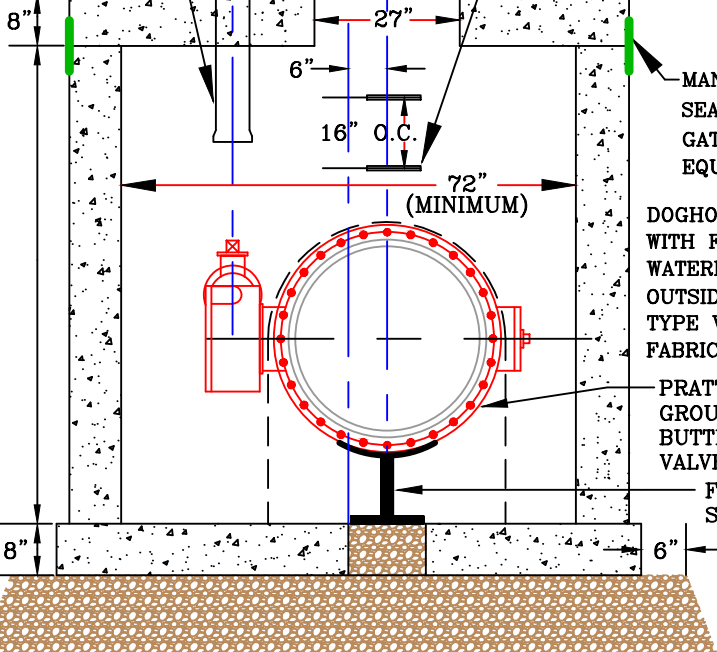
FABRICATED PIPE SUPPORT.



GATE VALVE BOX TOP SECTION.

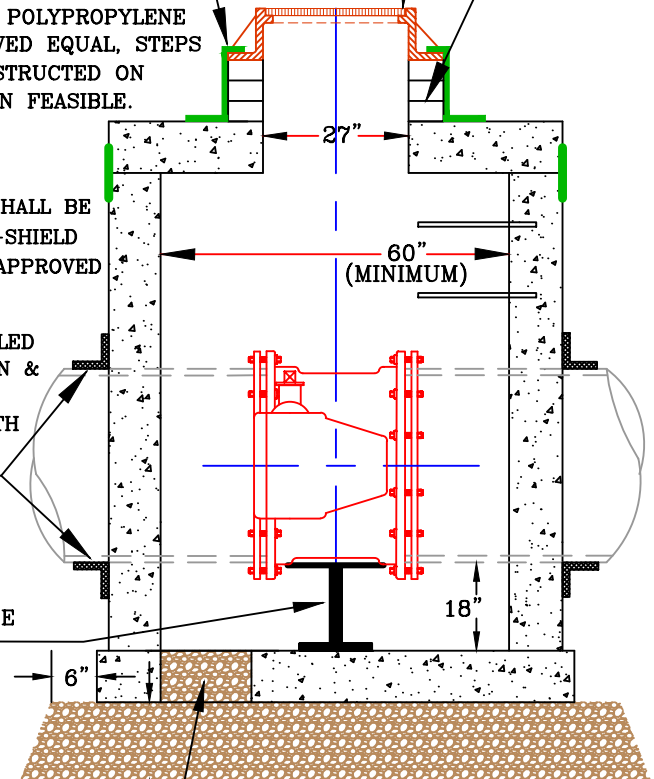
MEGA LUG.

GATE VALVE BOX RISER SECTION.



SECTION A-A

12"-CRUSHED 3/4" TO 1 1/2" SIZE.
12" ROCK SUMP.



SECTION B-B



TYPICAL BUTTERFLY GATE VALVE
MANHOLE INSTALLATION