









ESTIMATED SANITARY QUANTITIES		
ITEM	QUANTITY	UNIT
CONNECT TO EX. SANITARY MAIN	1	EA
4" PVC SCHEDULE 40 SANITARY SERVICE	154	LF
4" CLEANOUT	2	EA
GREASE INTERCEPTOR	1	EA

ESTIMATED WATER QUANTITIES		
ITEM	QUANTITY	UNIT
CONNECT TO EX. WATER MAIN	1	EA
1" CURB STOP	1	EA
1" POLY CL 200 WATER SERVICE	138	LF

ESTIMATED STORM QUANTITIES		
ITEM	QUANTITY	UNIT
12" HDPE STORM PIPE	230	LF
12" FLARED END SECTION (FES)	1	EA
27" ROUND DIAMETER INLET (RDI)	1	EA
48" MANHOLE INLET (MHI)	2	EA

- NOTES:
- CONTRACTOR SHALL VERIFY INVERTS AT CONNECTION LOCATIONS PRIOR TO CONSTRUCTION.
  - GAS AND UNDERGROUND ELECTRICAL SERVICES SHALL BE INSTALLED BY OTHERS. CONTRACTOR SHALL COORDINATE WITH MECHANICAL ENGINEER AND UTILITY COMPANIES ON FINAL ROUTING INTO THE BUILDING.
  - CONTRACTOR SHALL COORDINATE WITH MECHANICAL/PLUMBER FOR UTILITY CONNECTIONS AT THE BUILDING.
  - CONTRACTOR TO COORDINATE WITH PLUMBING FOR EXACT LOCATION AND SPECIFICATIONS TO INSTALL GREASE INTERCEPTOR
  - HDPE STORM SEWER SIZES 12" THROUGH 60" SHALL MEET REQUIREMENTS OF ASTM F2306.
  - ALL PIPES SHALL MEET CURRENT MINNESOTA PLUMBING CODE QUALITY STANDARDS.
  - AN ALTERNATE MATERIAL REQUEST FOR HDPE PIPE SHALL BE SUBMITTED BY THE OWNER/ENGINEER AND APPROVED BY MNDL PRIOR TO CONSTRUCTION.
  - APPROVED RESILIENT RUBBER JOINTS (BOOTS, SAND COLLAR, OR WATER STOP GASKET) PER PLUMBING CODE SECTION 719.6 MUST BE USED TO MAKE WATERTIGHT CONNECTIONS AT ALL STORM SEWER STRUCTURES.
  - CENTER OF STORM INLET SYMBOL REPRESENTS FLOW LINE LOW POINT LOCATION. CONTRACTOR SHALL ADJUST STRUCTURE AS NECESSARY SO THAT INLETS IN CURB LINES AND VALLEY GUTTERS PROPERLY ALIGN WITH DESIGNATED LOW POINT.
  - IF ANY POTENTIAL UTILITY CONFLICTS OR PIPE COVER CONCERN AREAS ARE DISCOVERED, CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY TO EVALUATE OR RESOLVE THE ISSUE.
  - CONTRACTOR TO INSULATE SANITARY SERVICE PER DETAIL WITH A SINGLE LAYER OF POLYSTYRENE WHEN THERE IS LESS THAN 6' OF COVER FROM TOP OF PIPE TO FINISHED GRADE IN GRASS AREAS.
  - CONTRACTOR TO INSULATE SANITARY SERVICE PER DETAIL WITH A SINGLE LAYER OF POLYSTYRENE WHEN THERE IS LESS THAN 8' OF COVER FROM TOP OF PIPE TO FINISHED GRADE OVER PARKING OR PAVED AREAS.
  - CONTRACTOR TO INSULATE SANITARY SERVICE PER DETAIL WITH A DOUBLE LAYER OF POLYSTYRENE WHEN THERE IS LESS THAN 6' OF COVER FROM TOP OF PIPE TO FINISHED GRADE OVER PARKING OR PAVED AREAS.

- INSULATE SANITARY SERVICE PER DETAIL (SINGLE LAYER)
- INSULATE SANITARY SERVICE PER DETAIL (DOUBLE LAYER)

CASTING TABLE	
VALLEY GUTTER INLETS	EJW 7568 WITH TYPE 7567M VANE GRATE OR APPROVED EQUAL
YARD & DITCH INLETS	EJW 1020 WITH TYPE O1 BEEHIVE GRATE OR APPROVED EQUAL
FLARED END SECTIONS	SHALL BE PER CURRENT MnDOT SPECS & STANDARD DETAILS
FES TRASH GUARDS	SHALL BE PER CURRENT MnDOT SPECS & STANDARD DETAILS

REVISIONS

**7 BREW DRIVE-THRU COFFEE**  
**1050 HIGHWAY 210 WEST**  
**BAXTER, MINNESOTA**

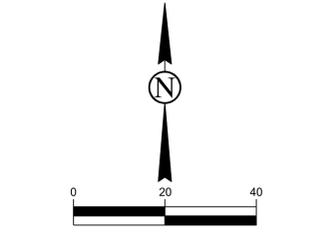
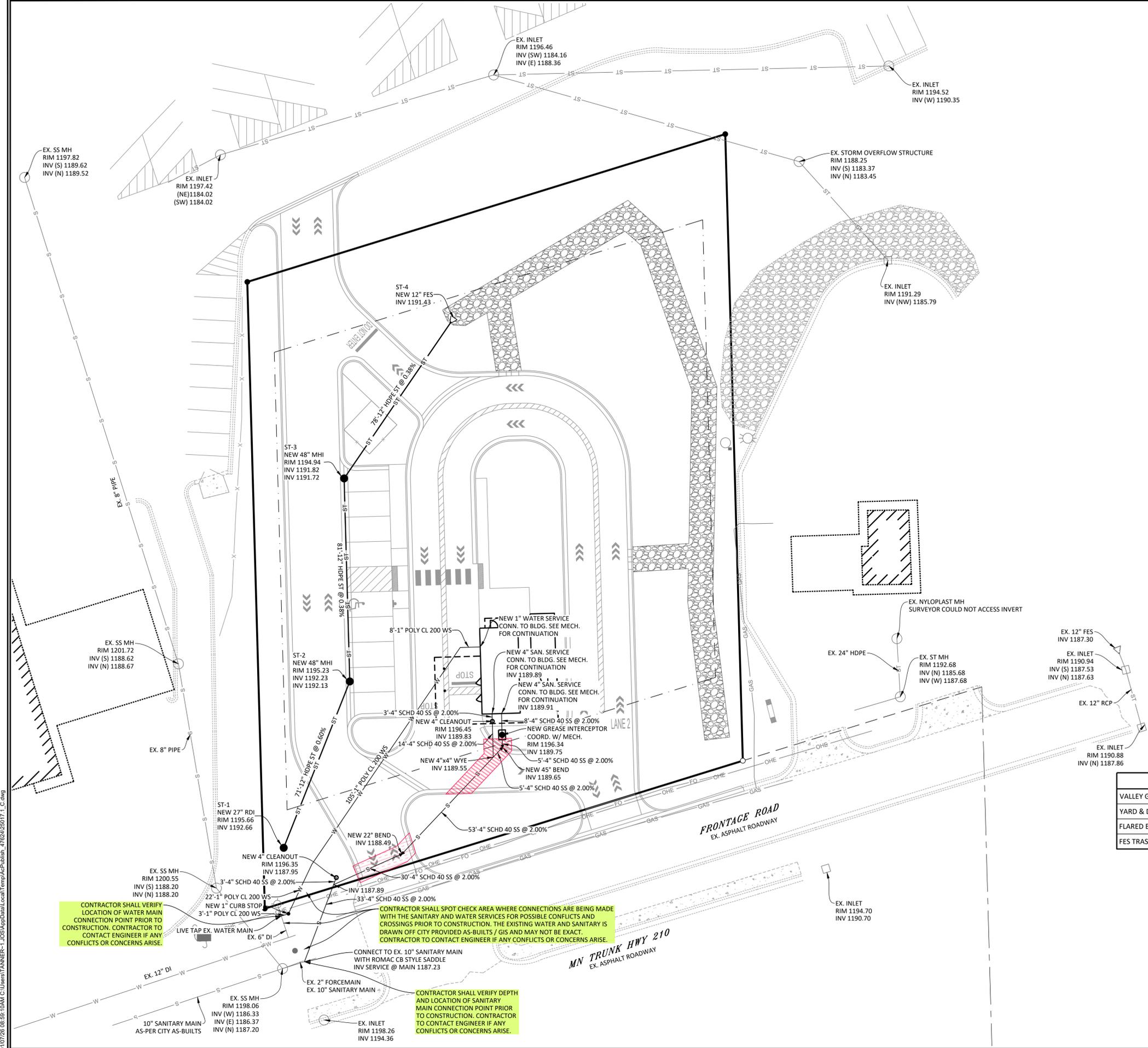
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*Andrew J. Thill*  
ANDREW J. THILL  
DATE: 1/7/26  
LICENSE #: 51435

LE JOB #	25017.1
PROJECT DATE:	1/7/2026
CHECKED BY:	AJT
DRAWN BY:	TJJ
APPROVED BY:	AJT

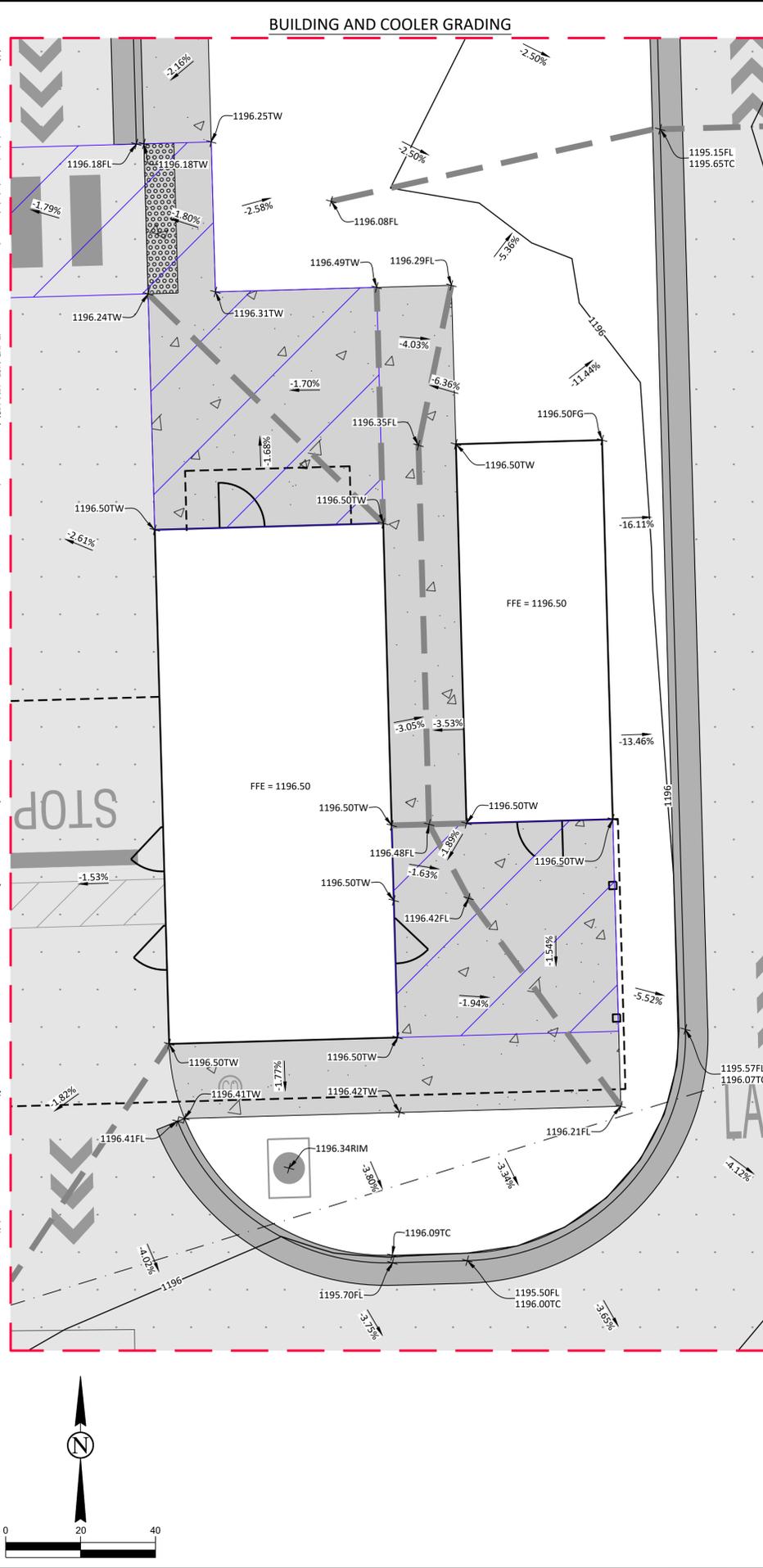
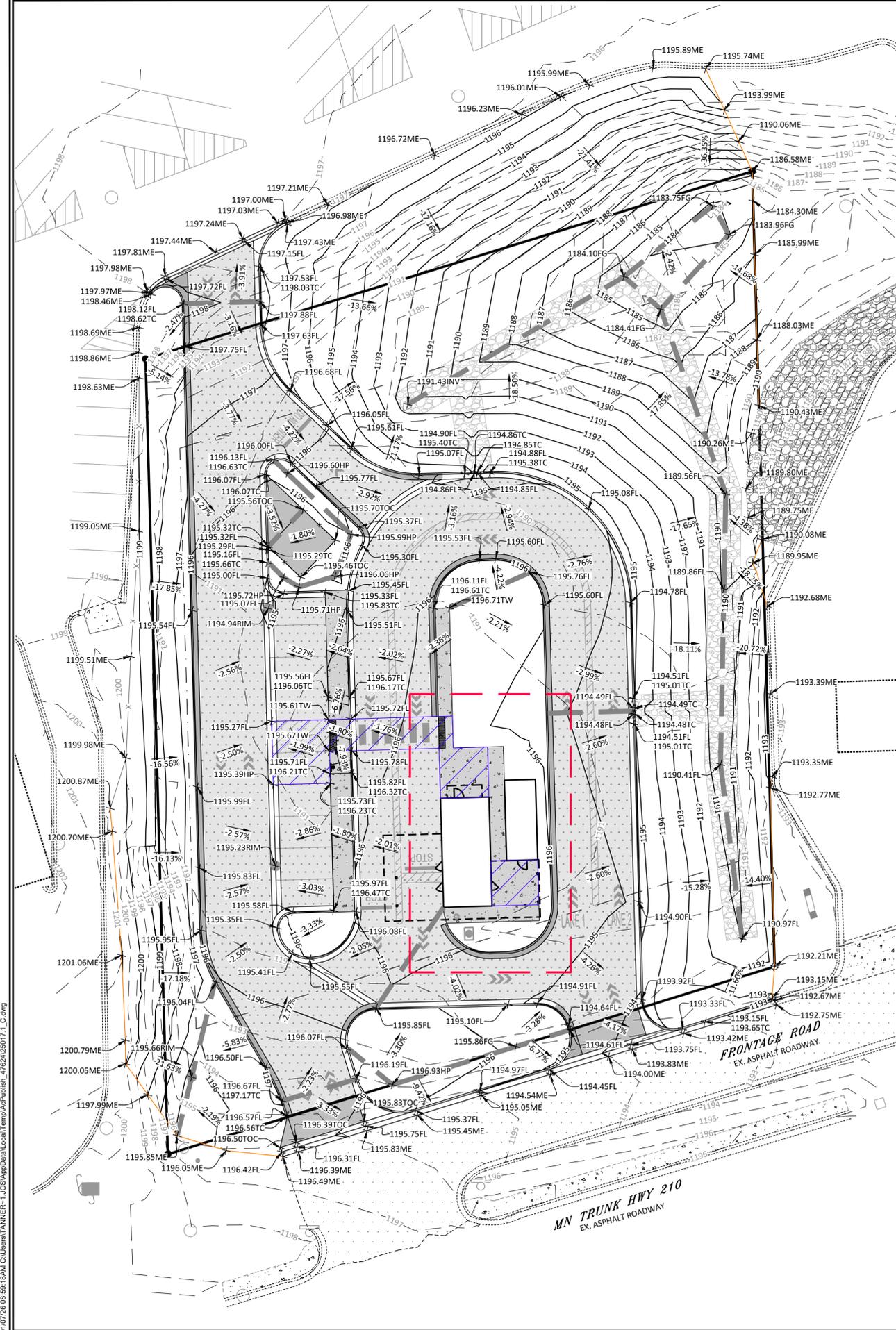
UTILITY PLAN

**C-5**



**CALL BEFORE YOU DIG**  
**MINNESOTA**  
UTILITIES UNDERGROUND LOCATION SERVICE  
1-800-252-1166

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- NOTES:
1. CONTRACTOR IS RESPONSIBLE FOR CALCULATING THEIR OWN EARTHWORK/GRADING TAKEOFF QUANTITIES FOR THE PROPOSED SITE. PRIOR TO CONSTRUCTION, THE CONTRACTOR IS ENCOURAGED TO VISIT THE SITE TO BETTER DETERMINE THE NECESSARY AMOUNT OF STRIPPING TO OCCUR THROUGHOUT THE SITE.
  2. TOPSOIL SHALL NOT BE USED AS FILL UNDER THE PAVEMENT OR BUILDING AREAS.
  3. AGGREGATE BASE SHALL BE MNDOT CLASS 5.
  4. QUANTITY FOR AGGREGATE BASE IS ASSUMED TO BE IN PLACE AND COMPACTED. CONTRACTOR SHALL MAKE ADJUSTMENTS FOR LOOSE VOLUME IF NECESSARY.
  5. AGGREGATE BASE AND GEOTEXTILE FABRIC QUANTITIES ASSUME THEY EXTEND 1' BEYOND EDGE OF PAVEMENT.
  6. GEOTEXTILE FABRIC PANELS SHALL BE A MINIMUM OF 12' WIDE AND INSTALLED WITH A MINIMUM OVERLAP OF 18" WITH JOINTS ORIENTATED TO FOLLOW TRAFFIC MOVEMENT.
  7. GEOTEXTILE FABRIC QUANTITY DOES NOT INCLUDE REQUIRED OVERLAP.
  8. GEOTEXTILE FABRIC SHALL BE MNDOT TYPE V GEOTEXTILE.
  9. WHERE RUNOFF DRAINS AWAY FROM CURBING, GUTTER SHALL BE INSTALLED AS OUTFLOW. WHERE CURBING RECEIVES WATER, GUTTER SHALL BE INSTALLED AS INFLOW.
  10. SEE THE OVERALL SITE PLAN SHEET C-4 FOR NON-STANDARD HEIGHT CURBING LOCATIONS.

	DAYLIGHT EDGE
	NEW CURB(IN-FLOW)
	NEW CURB(OUT-FLOW)
	GRADE BREAK/FLOWLINE/HIGH POINT
	FINISH GROUND
	FLOWLINE
	HIGH POINT
	STRUCTURE INVERT ELEVATION
	LOW POINT
	MIDPOINT OF CURVE
	MATCH EXISTING GROUND
	POINT OF CURVATURE
	STRUCTURE RIM ELEVATION
	TOP OF CURB/THICKENED EDGE
	TOP OF CONCRETE
	TOP OF WALK
	TOP OF WALL
	BOTTOM OF WALL

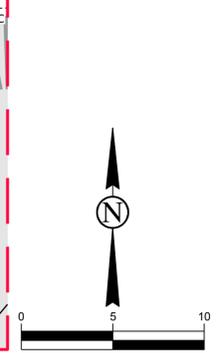
	ADA ACCESSIBLE ROUTE
	MEETS ADA GRADING REQUIREMENTS

PROJECT BENCHMARK #1: TOP NUT OF EXISTING FIRE HYDRANT LOCATED APPROXIMATELY 5 FEET EAST FROM THE SOUTHWEST CORNER OF THE SUBJECT PROPERTY. ELEVATION: 1198.94 (NAVD 83)

PROJECT BENCHMARK #2: RIM OF EXISTING SANITARY MANHOLE LOCATED APPROXIMATELY 21 FEET NORTHWEST FROM THE SOUTHWEST CORNER OF THE SUBJECT PROPERTY. ELEVATION: 1200.55 (NAVD 83)

PROJECT BENCHMARK #3: RIM OF EXISTING SANITARY MANHOLE LOCATED APPROXIMATELY 98 FEET NORTHWEST FROM THE NORTHWEST CORNER OF THE SUBJECT PROPERTY. ELEVATION: 1197.82 (NAVD 83)

BASIS OF BEARING: CROW WING COUNTY



NO.	REVISIONS

**7 BREW DRIVE-THRU COFFEE**  
**1050 HIGHWAY 210 WEST**  
**BAXTER, MINNESOTA**

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GRADING PLAN

**C-6**

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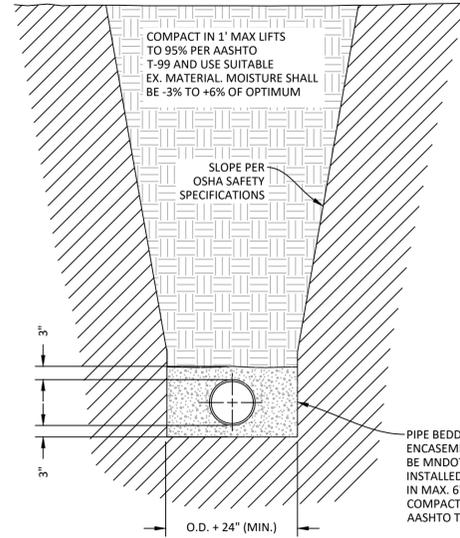
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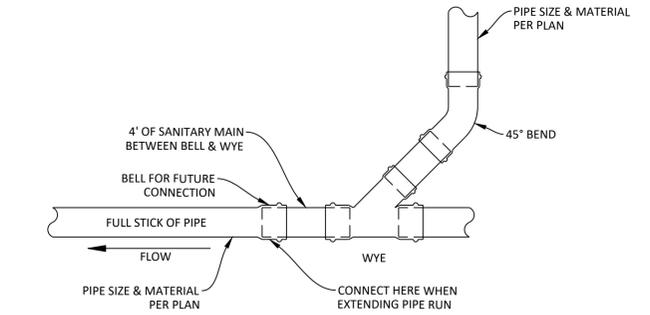




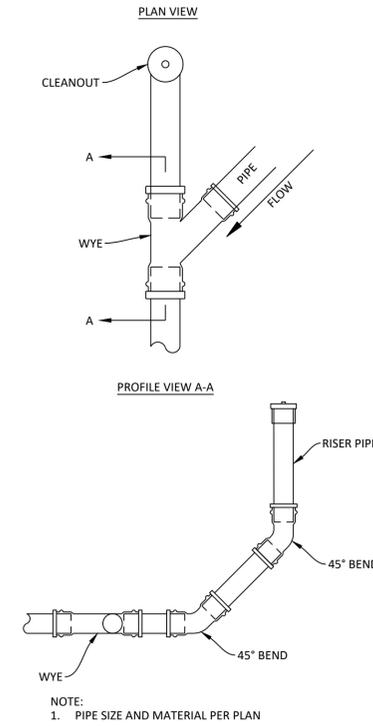
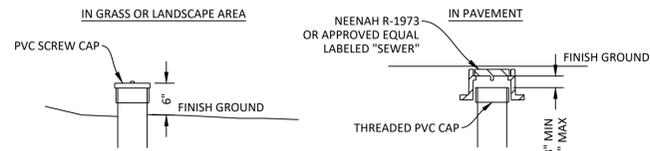




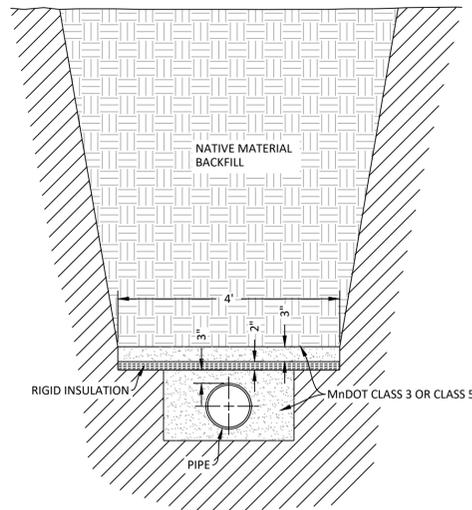
**1 SANITARY TRENCH BACKFILL**  
N.T.S.



**2 SANITARY SEWER CLEANOUT**  
N.T.S.

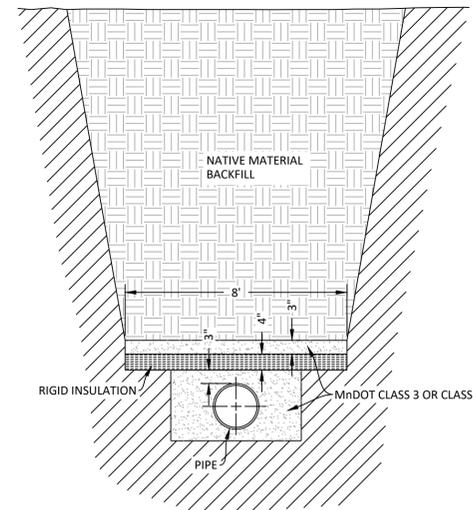


**3 SANITARY SEWER CLEANOUT AT BEND**  
N.T.S.



NOTE:  
1. THIS DETAIL IS INTENDED TO SHOW THE INSULATION PORTIONS ONLY. TRENCH BACKFILL AND OTHER ITEMS SHALL BE PER TRENCH DETAIL.  
2. RIGID INSULATION SHALL BE POLYSTYRENE PLASTIC FOAM SPECIFICALLY DESIGNED FOR USE IN UNDERGROUND CONSTRUCTION. SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 35 PSI. BOARDS MUST COMPLY WITH ASTM-D 1621.

**4 SINGLE LAYER INSULATION IN TRENCH - 2"**  
N.T.S.



NOTE:  
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**5 DOUBLE LAYER INSULATION IN TRENCH - 4"**  
N.T.S.

REVISIONS


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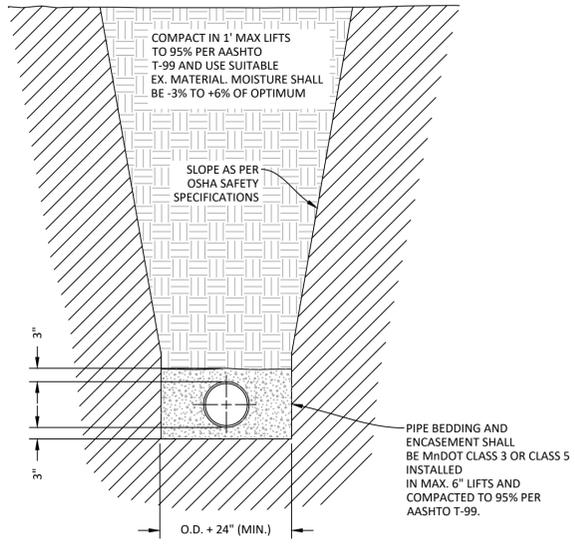
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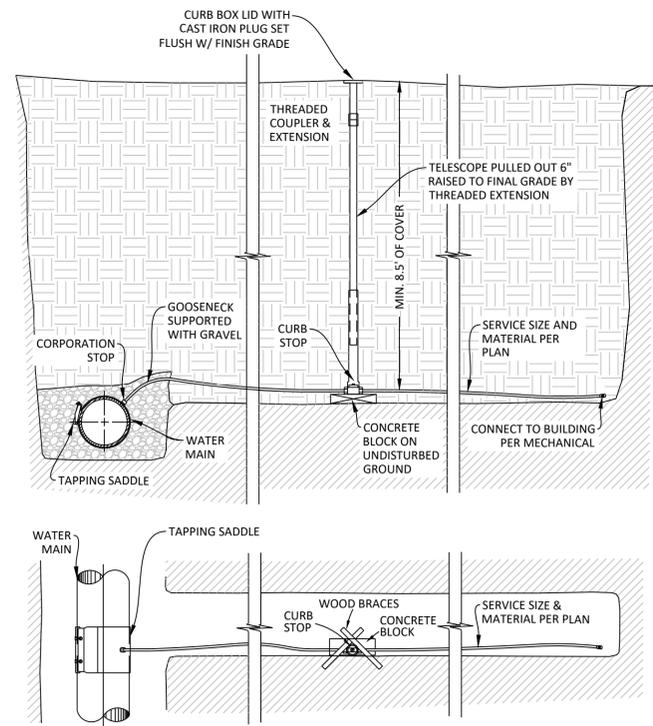
TYPICAL DETAILS

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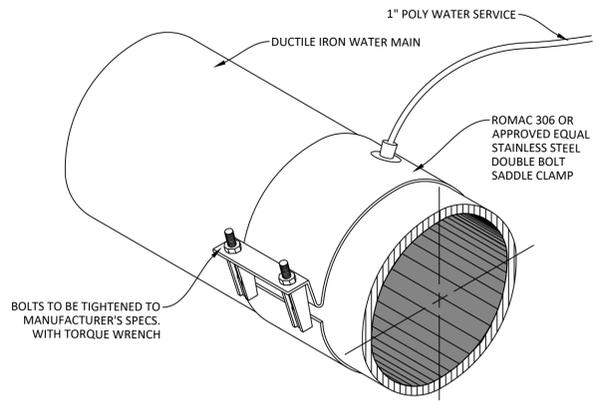
NOTE:  
1. CONTRACTOR SHALL INSTALL RIBBON 18" ABOVE TOP OF CENTER OF PIPE.

1 WATER MAIN TRENCH DETAIL  
N.T.S.



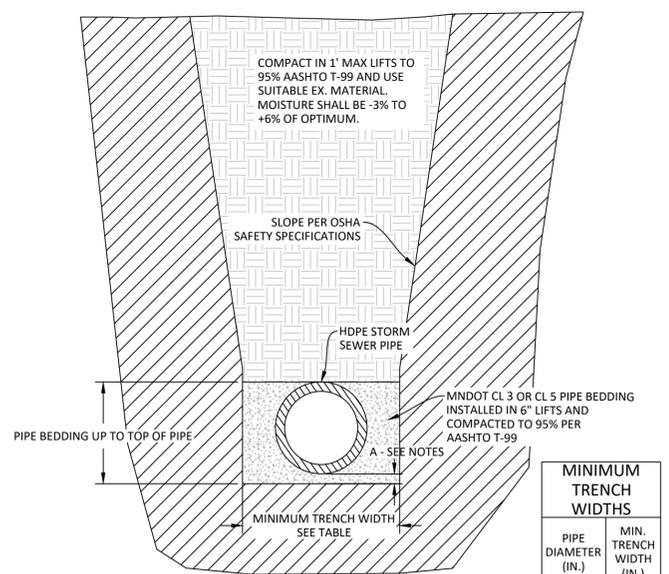
NOTE:  
1. STOP BOX TO BE INSTALLED ALONG SIDE OF TRENCH AND SUPPORTED TO THE TRENCH WALL WITH TWO WOODEN BRACES TO PROVIDE SUPPORT DURING BACKFILL.  
2. CURB STOP SHALL BE TYPICAL 6104 A.Y. MCDONALD OR APPROVED EQUAL.  
3. CORP. STOP SHALL BE TYPICAL 4701 A.Y. MCDONALD OR APPROVED EQUAL.  
4. TAPPING SADDLE SHALL BE ROMAC 306 STAINLESS STEEL WITH DOUBLE BOLT OR APPROVED EQUAL. BOLTS SHALL BE TIGHTENED TO MANUFACTURER'S SPECIFICATIONS WITH TORQUE WRENCH.

2 WATER SERVICE FOR NEW INSTALLATIONS  
N.T.S.



BOLTS TO BE TIGHTENED TO MANUFACTURER'S SPECS. WITH TORQUE WRENCH

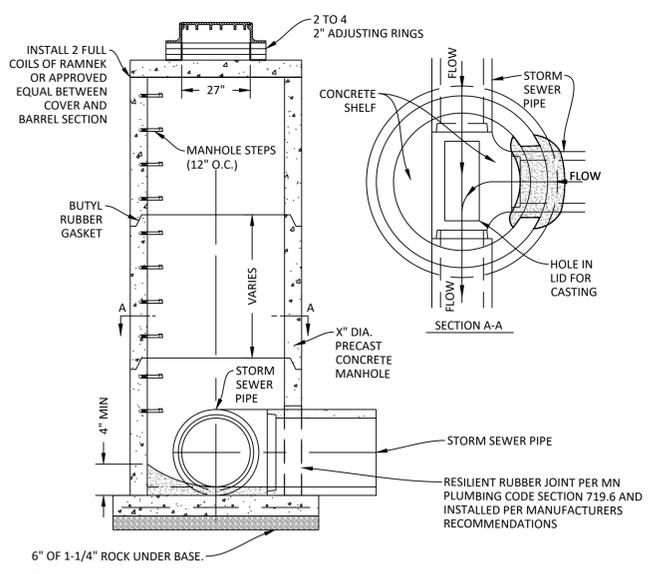
3 WATER MAIN TAPPING SADDLE  
N.T.S.



NOTES:  
1. BEDDING DEPTH BELOW PIPE (DIMENSION A ABOVE) SHALL BE 4" FOR 4"-36" PIPE AND 6" FOR 42"-60" PIPE.  
2. IN CLAY SOILS, LAST 3" OF PIPE MEASURED FROM BACK OF FLARED END SECTION TO BE BEDDED IN CLAY AND NOT CLASS 5 OR CLASS 3 TO PREVENT SCOUR.

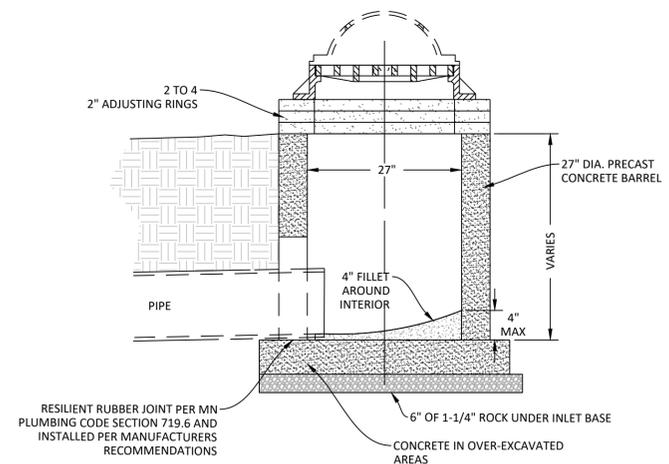
MINIMUM TRENCH WIDTHS	
PIPE DIAMETER (IN.)	MIN. TRENCH WIDTH (IN.)
4	21
6	23
8	26
10	28
12	30
15	34
18	39
24	47
30	56
36	63
42	72
48	80
60	96

4 HDPE PIPE CULVERT TRENCH BACKFILL  
N.T.S.



NOTES:  
1. ALL ROUND MANHOLES SHALL MEET REQUIREMENTS OF ASTM C478.  
2. LIFT HOLES TO BE MANUFACTURED WATER PROOF.  
3. BACKFILL AROUND MANHOLE IN 1' MAX LIFTS TO 95% PER AASHTO T-99. USE EXISTING MATERIAL UNLESS NOTED OTHERWISE. MOISTURE SHALL BE -3% TO +6% OF OPTIMUM.  
4. CASTING TYPE PER MANHOLE SCHEDULE.  
5. SOLID COVERS SHALL BE CAST WITH THE WORD "STORM" IN THE CENTER OF THE COVER IN LETTERS 2" HIGH.  
6. CONTRACTOR MAY USE CONCRETE OR HDPE RINGS. IF HDPE RINGS ARE UTILIZED, SILICONE SEAL SHALL BE USED IN BETWEEN RINGS PER MANUFACTURER RECOMMENDATIONS. IF CONCRETE RINGS ARE USED, GROUT SHALL BE USED BETWEEN, OUTSIDE, AND INSIDE OF RINGS. GROUT SHALL MEET REQUIREMENTS OF ASTM C270.  
7. REBAR AND WALL THICKNESS PER MANUFACTURERS RECOMMENDATION.  
8. IF MANHOLE IS USED AS A CURB & GUTTER INLET, THE MANHOLE SHALL HAVE HOLE AVAILABLE FOR CONNECTION TO CURB & GUTTER DRAIN TILE AS REQUIRED.  
9. BUTYL RUBBER GASKET SHALL BE INSTALLED ON ALL JOINTS. GASKET SHALL MEET ASTM C443 REQUIREMENTS.  
10. DOGHOUSE TO BE CONCRETE INSIDE AND OUT WITH 3,000 PSI CONCRETE. CONCRETE SHALL BE VIBRATED AND TROWL FINISHED.  
11. WHEN STRUCTURE IS INSTALLED IN THE CURB LINE, THE CONTRACTOR SHALL SET MANHOLE SO THAT BACK OF CASTING ALIGNS WITH CURB FLOW LINE.  
12. ALL ROUND MANHOLES/INLETS INSTALLED IN PAVEMENT SHALL HAVE A MINIMUM HEIGHT OF SIX (6) FEET FROM RIM TO BOTTOM OF STRUCTURE. IF LOWEST INVERT IS ABOVE THIS, CONTRACTOR SHALL FILL BOTTOM VOID WITH 4,000 PSI CONCRETE AND FORM INVERTS ACCORDINGLY.

5 ROUND STORM MANHOLE/INLET  
N.T.S.



RESILIENT RUBBER JOINT PER MN PLUMBING CODE SECTION 719.6 AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS

NOTES:  
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7. IF MANHOLE IS USED AS A CURB & GUTTER INLET, THE MANHOLE SHALL HAVE HOLE AVAILABLE FOR CONNECTION TO CURB & GUTTER DRAIN TILE AS REQUIRED.  
8. BUTYL RUBBER GASKET IS REQUIRED ON ALL JOINTS. GASKET SHALL MEET ASTM C443 REQUIREMENTS.  
9. DOGHOUSE TO BE CONCRETE INSIDE AND OUT WITH 3,000 PSI CONCRETE. CONCRETE SHALL BE VIBRATED AND TROWL FINISHED.  
10. WHEN STRUCTURE IS INSTALLED IN THE CURB LINE, THE CONTRACTOR SHALL SET MANHOLE SO THAT BACK OF CASTING ALIGNS WITH CURB FLOW LINE.

6 27" YARD INLET  
N.T.S.

REVISIONS


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