



ENGINEERING

DATE

PUBLIC WORKS

DATE

FIRE MARSHAL

DATE

NOTE: THIS IS TO CERTIFY THAT THE ABOVE SIGNED HAVE REVIEWED ALL SHEETS PROVIDED AND FOUND THEM TO BE IN GENERAL COMPLIANCE WITH THE REQUIREMENTS ESTABLISHED BY THE CITY OF MANVEL. THIS APPROVAL IS ONLY VALID FOR TWO YEARS. PLEASE NOTE, THIS DOES NOT NECESSARILY MEAN THAT ALL THE CALCULATIONS PROVIDED IN THE PLANS HAVE BEEN COMPLETELY CHECKED AND VERIFIED, THE PLANS SUBMITTED HAVE BEEN PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE ENGINEERING IN THE STATE OF TEXAS, WHICH CONVEYS THE ENGINEER'S RESPONSIBILITY AND ACCOUNTABILITY.

GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISED CITY OF MANVEL DESIGN CRITERIA MANUAL.
2. TRENCH SAFETY SYSTEM TO MEET, AS A MINIMUM, THE REQUIREMENTS OF OSHA SAFETY AND HEALTH REGULATIONS, LATEST EDITION.
3. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT (713-223-4567) FOR CENTERPOINT AND AT&T TELEPHONE AND TEXAS ONE-CALL SYSTEM (1-800-245-4545) FOR PIPELINES AND CABLE TV.
4. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE DEPTH, ELEVATIONS, LOCATION AND EXISTENCE OF ALL EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED CONSTRUCTION.
5. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD BEFORE COMMENCING WORK. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPORT ANY AND ALL DISCREPANCIES TO THE OWNER AND THE ENGINEER IN A TIMELY MANNER.
6. CONTRACTOR SHALL ADEQUATELY PROTECT EXISTING STRUCTURES, UTILITIES, TREES, SHRUBS, OTHER PERMANENT OBJECTS AND ADJOINING PROPERTY.
7. NO OPEN EXCAVATIONS SHALL BE LEFT OPEN OVERNIGHT. ALL EXCAVATIONS WHICH CANNOT BE BACKFILLED OVERNIGHT SHALL BE COVERED, AS A MINIMUM, WITH STEEL PLATING WHEN IN PAVED AREAS; 3/4 INCH PLYWOOD, WOOD PLANKING WITH OSHA ORANGE PLASTIC EXPANDED MESH BARRIER AROUND PERIMETER IN UNPAVED AREAS, OR AS APPROVED BY THE CITY OF MANVEL.
8. EXISTING PAVEMENT, CURBS, SIDEWALKS AND DRIVEWAYS DAMAGED OR REMOVED DURING CONSTRUCTION BY THE CONTRACTOR FOR THEIR CONVENIENCE SHALL BE REPLACED PER CURRENT DESIGN CRITERIA MANUAL BY THE CONTRACTOR AT THEIR EXPENSE.
9. CONTRACTOR SHALL PLAN, SCHEDULE, AND PERFORM THEIR WORK SO AS TO PROVIDE AND MAINTAIN SAFE PUBLIC TRAFFIC (INGRESS AND EGRESS) AS WELL AS NON-INCONVENIENCE TO ALL PROPERTY OWNERS ALONG THE PROJECT RIGHT OF WAYS DURING CONSTRUCTION PERIOD.
10. FOR LOCATIONS WHERE OPEN CUT CONSTRUCTION IS REQUIRED IN STREETS THE CONTRACTOR SHALL FURNISH AND MAINTAIN ADEQUATE BARRICADES, WARNING AND DIRECTING SIGNS, FLAGS, AND LIGHTS, NOTIFY CITY OF MANVEL PERMIT DEPARTMENT (281-489-0630).
11. ALL SIGNS, BARRICADES, PAVEMENT MARKINGS, TRAFFIC SIGNALS, AND CHANNELIZING DEVICES USED TO HANDLE TRAFFIC SHALL BE SHOWN ON A TRAFFIC CONTROL PLAN (TO BE APPROVED BY THE CITY OF MANVEL) AND SHALL CONFORM TO THE LATEST REVISIONS OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD), "PART VI-TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS."
12. CONTRACTOR SHALL NOTIFY THE CITY OF MANVEL PERMIT DEPARTMENT (281-489-0630) 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
13. NO INSPECTABLE WORK CAN BE CONDUCTED ON SATURDAYS.
14. THE CITY SHALL NOT BE RESPONSIBLE FOR REPLACING OR THE COST ASSOCIATED WITH REPLACING ANY STRUCTURE OR APPARATUS THAT IS PLACED WITHIN A CITY RIGHT-OF-WAY OR EASEMENT.

TESTING:

1. ALL TESTING, WETHER FOR UTILITIES OR FOR SUBGRADE OR ANY OTHER TESTING THAT REQUIRES A LAB TECHNICIAN, IN ORDER TO BE SUCCESSFUL, SHALL BE WITNESSED BY A CITY INSPECTOR.
2. EXCAVATION AND BACKFILL FOR UTILITIES:
 3. BACKFILL SHALL BE PLACED IN MAXIMUM LIFTS OF EIGHT (8) INCHES AND COMPACTED TO A DENSITY OF NOT LESS THAN 95% STANDARD PROCTOR WITH A MOISTURE CONTENT OF PLUS (+) OR MINUS (-) THREE PERCENT (3%) OF OPTIMUM MOISTURE OR AS OTHERWISE SPECIFIED BY THE SOILS LABORATORY. TEST SHALL BE TAKEN EVERY LIFT, EVERY 500 LINEAR FEET, OR BETWEEN MANHOLES, WHICHEVER RESULTS IN THE GREATEST NUMBER OF DENSITY TESTS.
 4. FIELD MOISTURE/DENSITY TEST SHALL BE PERFORMED AT A FREQUENCY OF AT LEAST ONE (1) TEST PER 500 SQUARE YARDS OF COMPACTED LIFT. THE DENSITY SHALL NOT BE LESS THAN 95% OF STANDARD PROCTOR WITH A MOISTURE CONTENT OF PLUS (+) OR MINUS (-) THREE PERCENT (3%) OF OPTIMUM MOISTURE, OR AS DETERMINED BY SOILS LABORATORY. MAXIMUM LIFT FOR TESTING COMPACTED FILL SHALL NOT EXCEED TWELVE (12) INCHES.
 5. CAST-IN-PLACE CONCRETE MANHOLES AND PRECAST CONCRETE MANHOLES SHALL CONFORM TO TCEQ REQUIREMENTS 217.59
 6. EX-FILTRATION TEST SHALL BE REQUIRED FOR EACH MANHOLE SYSTEM.
 7. EACH MANHOLE IS TO BE PLUGGED, FILLED TO THE TOP OF THE RIM WITH WATER FOR THIRTY (30) MINUTES WITH ALLOWABLE LEAKAGE OF NOT MORE THAN 2 1/2 INCH RING WIDTH. TO PASS, MANDREL SHALL PASS FREELY THROUGH THE PIPE, PULLED BY ONE (1) WORKER. NO MECHANICAL MEANS SHALL BE ALLOWED TO PULL THE MANDREL.
 8. FLUG MANHOLE AND VACUUM TEST PER CITY OF MANVEL REQUIREMENTS.
3. WATER LINES
 4. PRESSURE TEST:
 9. A TEST, TO BE SUCCESSFUL SHALL BE WITNESSED BY THE CITY OF MANVEL PROJECT MANAGER FOR A FOUR (4) HOUR PERIOD, DURING REASONABLE HOURS. THE ALLOWABLE LEAKAGE SHALL BE NO GREATER THAN 1 PSI
 10. FIRE LINES SHALL BE TESTED AT 200 PSI FOR TWO (2) HOURS AND SHALL BE WITNESSED BY THE FIRE MARSHALL. LEAKAGE SHALL BE CALCULATED AS STATED ABOVE. BACTERIA TEST (BAC-TS)
 11. BACTERIA SAMPLE IS REQUIRED FOR EACH 1,000 FEET OF WATER MAIN, OR CLOSER DEPENDING ON FIRE HYDRANT LOCATIONS, OR PORTIONS THEREOF. ALSO DEAD ENDS ARE SUBJECT TO TESTING, SUCH AS CUL-DE-SACS, THE FORM NEEDS TO BE LABELED 'CONSTRUCTION' OR 'SPECIAL'.
 12. GRAVITY SANITARY SEWERS:
 12. LOW PRESSURE AIR TEST - THE PIPE SHALL UNDERGO A LOW PRESSURE AIR TEST WHICH SHALL CONFORM TO TCEQ REQUIREMENTS 217.57.
 13. MANDREL DEFLECTION TEST - FLEXIBLE AND SEMI-RIGID PIPE DIAMETER DEFLECTION TEST SHALL BE DONE NO SOONER THAN THIRTY (30) DAYS AFTER FINAL BACKFILL. RUN TEST WITH MANDREL HAVING A DIAMETER EQUAL TO 95% OF THE INSIDE NOMINAL DIAMETER OF THE PIPE BEING TESTED. MANDREL SHALL BE NINE (9) ARM WITH STEEL PROVING RING 2 1/2 INCH RING WIDTH. TO PASS, MANDREL SHALL PASS FREELY THROUGH THE PIPE, PULLED BY ONE (1) WORKER. NO MECHANICAL MEANS SHALL BE ALLOWED TO PULL THE MANDREL.
 14. FORCE MAIN TEST:
 14. FORCE MAINS SHALL BE TESTED IN THE SAME MANNER AS WATER MAINS ACCORDING TO PARAGRAPH 3.1.1.
 15. ALL GRAVITY SANITARY SEWER MAIN LINES SHALL BE TELEVIEWED AT THE ONE-YEAR WARRANTY PERIOD PRIOR TO FINAL ACCEPTANCE.
 16. MANHOLE VACUUM TEST - MANHOLE SHALL REMAIN NEGATIVE TEN (-10) FOR TWO (2) MINUTES. NO DROP IN MERCURY WILL BE ALLOWED.
 17. LOW PRESSURE TEST - 12" PIPES AND UNDER SHALL MAINTAIN 5 PSI FOR FIVE (5) MINUTES. ANY PIPES GREATER THAN 12" SHALL MAINTAIN 5 PSI FOR SEVEN (7) MINUTES. LIME STABILIZED SUBGRADE:
 18. LIME
 18. PERCENT LIME DETERMINATION TEST SHALL BE TAKEN BY A CERTIFIED TESTING LABORATORY IN ACCORDANCE WITH ASTM C977-92, BUT SHALL NOT BE LESS THAN 6%.
 19. THE PERCENT LIME USED SHALL BRING THE SOIL TO A P.I. OF NOT MORE 15.
 20. HYDRATED LIME SHALL BE SAMPLED AND TAKEN AT THE DISTRIBUTION AREA OF THE TANKER TRUCK AND TESTED. SUBGRADE:
 21. ALL SUBGRADE SHALL MEET THE FOLLOWING REQUIREMENTS WHEN TEST DRY BY LABORATORY SIEVES:
 22. MINIMUM PASSING 1/2 INCH SIEVE - 100%
 23. MINIMUM PASSING 3/8 INCH SIEVE - 85%
 24. MINIMUM PASSING #4 SIEVE - 60%
 25. ALL SUBGRADE SHALL PASS A DENSITY TEST OF NOT LESS THAN 95% STANDARD PROCTOR. METHOD OF TESTING AS PER ASTM D698. TEST TO BE TAKEN EVERY 200 FEET AS MEASURED ALONG CENTERLINE OF THE ROADWAY AT VARYING DISTANCES FROM CENTERLINE OF THE ROADWAY, OR AS DIRECTED BY THE CITY OF MANVEL.
 26. THICKNESS TEST SHALL BE TAKEN EVERY 200 FEET AS MEASURED ALONG THE CENTERLINE OF THE ROADWAY.
 27. IF A SINGLE STORM EVENT PRODUCES ONE (1) INCH OR MORE OF RAINFALL, CONTRACTOR SHALL RE-TEST THE SUBGRADE FOR DENSITY. THE INTERVAL FOR DENSITY RE-TESTS SHALL NOT BE LESS THAN 500 FEET AS MEASURED ALONG THE CENTERLINE OF THE ROADWAY.
 28. CONCRETE PAVING: (INCLUDING CURBS, MEDIANS, SIDEWALKS, CAST-IN-PLACE MANHOLES AND INLETS, ETC.)
 29. THE CONCRETE PAVEMENT WILL BE CORE DRILLED EACH 1,000 FEET SQUARE YARDS OR FOR EACH STREET, WHICHEVER IS GREATER, AND WILL BE TESTED FOR DEPTHS IN ACCORDANCE WITH ASTM C174 TEST OR OTHER APPROVED TESTING METHOD. THICKNESS SHALL NOT BE DEFICIENT BY MORE THAN 1/4 INCH. THE CORE SHALL ALSO BE TESTED FOR COMPREHENSIVE STRENGTH. STRUCTURAL CONCRETE:
 30. THE SLUMP, WHEN PLACING CONCRETE, SHALL NOT BE GREATER THAN FIVE (5) INCHES. THE TEST SHALL BE TAKEN FOR EVERY FIFTY (100) CUBIC YARDS OF CONCRETE, BUT MAY BE TAKEN WHEN IN DOUBT BY THE TESTING LABORATORY TECHNICIAN OR THE CITY OF MANVEL PROJECT MANAGER.
 31. TEMPERATURE OF THE CONCRETE WILL BE TAKEN AS DIRECTED BY THE CITY OF MANVEL PROJECT MANAGER AND SHALL BE LESS THAN 95° F.
 32. THERE SHALL BE CYLINDERS TAKEN BY THE TESTING LABORATORY TECHNICIAN NUMBERING FOUR (4) CYLINDERS PER 100 CUBIC YARDS OF PAVING OR PART THEREOF FOR EACH DAYS PLACEMENT. TWO (2) CYLINDERS SHALL BE TESTED AT SEVEN (7) AND TWO (2) CYLINDERS SHALL BE TESTED AT TWENTY-EIGHT (28) DAYS WITH A MINIMUM COMPREHENSIVE STRENGTH OF 4,000 PSI IN TWENTY-EIGHT (28) DAYS IN ACCORDANCE WITH ASTM C31 TEST.

STORM SEWERS:

1. STORM SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL, LATEST REVISIONS.
2. ALL STORM SEWER PIPE SHALL BE REINFORCED CONCRETE PIPE (RCP), ASTM C76, CLASS III, TONGUE AND GROOVE, RAM-NEK JOINTS UNLESS OTHERWISE NOTED.
3. REINFORCED CONCRETE STORM SEWER (PIPE, BOX, ETC.) SHALL BE INSTALLED, BEDDED AND BACKFILLED IN CONFORMITY WITH CITY OF MANVEL STANDARD DETAILS. STORM SEWER PIPE INSTALLED UNDER OR WITHIN ONE (1) FOOT OF PROPOSED OR EXISTING PAVEMENT SHALL BE BACKFILLED WITH CEMENT-STABILIZED SAND, (1.1 SACKS OF CEMENT PER TON OF SAND), TO THE BOTTOM OF THE SUBGRADE.
4. CONCRETE FOR INLETS AND MANHOLES SHALL BE CLASS 'A' AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT TWENTY-EIGHT (28) DAYS.
5. ALL MANHOLES SHALL BE ADJUSTED TO FINISHED GRADE AFTER PAVING IS COMPLETE.
6. MINIMUM STORM SEWER SIZE IS TWENTY-FOUR (24) INCH DIAMETER. MINIMUM UPSTREAM ROADSIDE DITCH CULVERT SIZE IS EIGHTEEN (18) INCH DIAMETER.
7. ALL STORM SEWER MANHOLE COVERS MUST INCLUDE THE WORDS, "STORM SEWER" AND "CITY OF MANVEL" AND HAVE THE "CITY SEAL." MANHOLE COVERS SHALL BE THIRTY-TWO (32) INCHES IN DIAMETER EXCEPT AT CURB INLET COVERS WHICH ARE TWENTY-FOUR (24) INCHES.
8. CONTRACTOR SHALL PROVIDE A MINIMUM OF SIX (6) INCHES CLEARANCE AT ALL UTILITY CROSSINGS WITH STORM SEWERS.
9. ALL INLETS IN RESIDENTIAL DEVELOPMENTS TO BE TYPE "H-2" OR TYPE "B-B" WITH GRATES. ALL INLETS IN COMMERCIAL DEVELOPMENTS AND ON MAJOR THOROUGHFARES TO BE TYPE "H-2" ONLY, UNLESS OTHERWISE APPROVED BY THE CITY OF MANVEL.
10. ALL DISTURBED AREAS IN DRAINAGE EASEMENTS OR DETENTION PONDS, SHALL BE HYDROMULCHED.
11. ALL STORM SEWER SHALL BE TELEVIEWED AT THE ONE-YEAR WARRANTY PERIOD PRIOR TO FINAL ACCEPTANCE.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. DURING THE COURSE OF ANY AND ALL CLEARING, GRUBBING, FILL, GRADING, EXCAVATION OR OTHER CONSTRUCTION, THE CONTRACTOR SHALL ENSURE THAT STORM DRAINAGE PATHWAYS REMAIN OPEN AND ARE MAINTAINED TO ENSURE POSITIVE DRAINAGE. CONVEYANCES ARE NOT TO BE IMPEDED OR BLOCKED IN ANY WAY. STORM SEWER INLETS SHALL BE PROTECTED FROM ENTRY OF SILT, TRASH, DEBRIS AND ANY OTHER SUBSTANCES THAT MAY DAMAGE THE STORM SEWER SYSTEM AND/OR WATERWAYS RECEIVING STORM WATER RUNOFF. AT COMPLETION OF WORK, THE CONTRACTOR SHALL FILL ALL LOW SPOTS, GRADE ALL RIGHTS-OF WAY, AND UTILITY EASEMENTS, AND REGRADE/RESTORE DITCHES AS NECESSARY TO MAINTAIN AND/OR ESTABLISH POSITIVE DRAINAGE.

PAVING:

1. PAVEMENT SUBGRADE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL, LATEST REVISIONS.
2. CONTRACTOR SHALL NOTIFY THE CITY OF MANVEL PERMIT DEPARTMENT (281-489-0630), TWENTY-FOUR (24) HOURS PRIOR TO ALL LIMING AND PAVING OPERATIONS.
3. ALL RETURNS SHALL HAVE A TWENTY-FIVE (25) FOOT RADIUS AT BACK OF CURB UNLESS OTHERWISE NOTED.
4. GUIDELINES SET FORTH IN THE 'TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES' SHALL BE OBSERVED.
5. ALL FILL IN EXISTING OR PROPOSED RIGHTS-OF WAY, INCLUDING BACKDRESSING BEHIND THE CURB, SHALL BE PLACED IN MAXIMUM LOOSE LIFTS OF EIGHT (8) INCHES OR LESS AND COMPACTED TO NINETY-FIVE PERCENT (95%) STANDARD PROCTOR DENSITY WITH A MOISTURE CONTENT OF ± THREE PERCENT (3%) OF OPTIMUM MOISTURE.
6. MINIMUM PAVEMENT REINFORCEMENT REQUIREMENT SHALL BE GRADE SIXTY (60), NO. FOUR (4) REBAR, SPACED AT EIGHTEEN (18) INCH ON CENTERS EACH WAY.
7. ALL PAVEMENT TO BE A MINIMUM OF SIX (6) INCHES THICK REINFORCED CONCRETE UNLESS OTHERWISE NOTED.
8. PAVING EXPANSION JOINTS SHALL BE PLACED AT A MAXIMUM OF SIXTY FEET (60').
9. ALL CONCRETE USED FOR PAVEMENT SHALL BE CLASS 'A' CONCRETE AND A MINIMUM 4,000 PSI COMPRESSIVE STRENGTH AT TWENTY-EIGHT (28) DAYS AND A MINIMUM OF 6.0 SACKS OF CEMENT PER CUBIC YARD, UNLESS OTHERWISE NOTED.
10. CLASS 'A' HYDRATED LIME SHALL BE APPLIED FOR SUBGRADE STABILIZATION AT A MINIMUM OF SIX PERCENT (6%) BY WEIGHT.
11. CONTRACTOR SHALL INSTALL STREET SIGNS AND STOP SIGNS PER CITY OF MANVEL DESIGN CRITERIA MANUAL.
12. ALIGNMENTS, CENTERLINE CURVE DATA, AND STATIONING FOR ALL CONSTRUCTION SHALL BE DETERMINED FROM SUBDIVISION PLAT.
13. FOR ALL CONCRETE TO BE REMOVED, A TWO (2) INCH DEEP SAW CUT SHALL BE PROVIDED PRIOR TO REMOVAL.
14. REPRESENTATIVES FROM THE CITY OF MANVEL, THE OWNER AND THE TESTING LABORATORY SHALL BE PRESENT FOR ALL DENSITY TESTS, LIME OPERATIONS AND PLACEMENT OF CONCRETE PAVING. NO INSPECTABLE WORK CAN BE CONDUCTED ON SATURDAYS.
15. UNDER NO CIRCUMSTANCES SHALL WATER BE ADDED TO A CONCRETE LOAD AFTER SLUMP TEST AND/OR CONCRETE CYLINDERS HAVE BEEN TAKEN.
16. BLUE REFLECTORIZED PAVEMENT MARKERS SHALL BE PLACED AT FIRE HYDRANT LOCATIONS AND OFFSET SIX (6) INCHES FROM THE CENTERLINE OF THE ROADWAY. REFLECTORS SHALL FACE FLOW OF TRAFFIC.
17. FOR PAVEMENT WIDTHS LESS THAN OR EQUAL TO TWENTY-EIGHT (28) FEET B/B OF CURB:
18. MINIMUM STABILIZED SUBGRADE THICKNESS SHALL BE SIX (6) INCHES.
19. MINIMUM CONCRETE SLAB THICKNESS SHALL BE SIX (6) INCHES.
20. FOR PAVEMENT WIDTHS GREATER THAN TWENTY-EIGHT (28) FEET B/B OF CURB AND ALL MAJOR ARTERIAL THOROUGHFARES:
21. MINIMUM STABILIZED SUBGRADE THICKNESS SHALL BE EIGHT (8) INCHES.
22. MINIMUM CONCRETE SLAB THICKNESS SHALL BE SEVEN (7) INCHES.
23. BLOCKOUTS SHALL BE INSTALLED AROUND ALL MANHOLES, JUNCTION BOXES, WATER VALVES, ETC. THAT LIE WITHIN THE PAVEMENT AREA.
24. BLOCKOUTS SHALL EXTEND A MINIMUM OF SIX (6) INCHES PAST THE LARGEST DIMENSION OF THE ITEM THAT IS BEING BLOCKED OUT AND SHALL HAVE AN EXPANSION JOINT BETWEEN THE BLOCKOUT AND THE PAVING.
25. CITY UTILITIES UNDER COMMERCIAL PAVED DRIVEWAYS, PARKING LOTS OR STRUCTURES SHALL HAVE A TEN (10) FOOT WIDE EXPANSION JOINT CENTERED OVER THE CITY UTILITY.
26. FLY ASH IS NOT ALLOWED IN ANY CONCRETE MIX DESIGN.

WATER:

1. WATER LINE CONSTRUCTION AND TESTING IS TO BE PERFORMED IN ACCORDANCE WITH CITY OF MANVEL DESIGN CRITERIA MANUAL, LATEST REVISION.
2. ALL WATER MAINS SHALL HAVE A MINIMUM COVER OF FOUR (4) FEET MEASURED FROM CENTERLINE OF STREET OR EXISTING NATURAL GROUND WHICHEVER DEPTH IS GREATER, UNLESS OTHERWISE NOTED. WATER MAINS 16" AND LARGER SHALL HAVE A MINIMUM OF 5 FEET OF COVER.
3. PRESSURE TEST OF ALL WATER LINES SHALL BE AT 150 PSI FOR FOUR (4) HOURS AND WITNESSED BY THE CITY OF MANVEL PROJECT MANAGER, EXCEPT FIRE LINES WHICH SHALL BE TESTED AT 200 PSI FOR TWO (2) HOURS AND SHALL BE WITNESSED BY THE FIRE MARSHALL.
4. SINGLE METER SERVICE LINES SHALL BE ONE (1) INCH MINIMUM I.D., C.T.S. POLYETHYLENE, SDR-9 WITH 1" TO 2" REDUCER.
5. CONTRACTOR TO FURNISH AND INSTALL SINGLE SERVICE METER BOXES AT FINISH GRADE.
6. FIRE HYDRANT ASSEMBLIES SHALL INCLUDE ONE (1) EACH LINE SIZE BY SIX (6) INCH TEE, ONE (1) EACH SIX (6) INCH GATE VALVE AND BOX, ONE (1) EACH FIRE HYDRANT WITH SIX (6) INCH LEAD PIPING AND THE BACKS. 5" STORZ CONNECTIONS ARE REQUIRED ON ALL HYDRANTS. HYDRANTS SHALL HAVE REFLECTIVE BAND AROUND QUICK CONNECT.
7. WATER VALVES ON MAIN LINES SHALL BE LOCATED AS CLOSE AS POSSIBLE TO EXTENDED PROPERTY LINE AND SHALL CONFORM TO AWWA C-500, OPEN COUNTER CLOCKWISE (LEFT), EQUIPPED WITH TWO (2) INCH SQUARE OPERATING NUT. OPERATING NUT SHALL BE A MAXIMUM OF FIVE (5) FEET BELOW FINISH GRADE.
8. WATER LINES FOUR (4) INCH THROUGH TWELVE (12) INCH I.D. SHALL COMPLY WITH THE REQUIREMENTS OF AWWA STANDARD C-900-75, CLASS 235, SDR-18, WITH CAST IRON OUTSIDE DIAMETER AND GASKET BELL END. FITTINGS ARE TO BE MECHANICAL JOINTS IN ACCORDANCE WITH AWWA C-100 OR C-110. WATERLINE PIPE SHALL BE OF THE COLOR BLUE.
9. ALL CONCRETE THRUST BLOCKING SHALL BE PLACED TO FORM A SOLID CONNECTION BETWEEN FITTINGS, VALVES, AND FIRE HYDRANTS AND UNDISTURBED EARTH. CONCRETE FOR THRUST BLOCKING SHALL BE CLASS 'C' AND HAVE A MINIMUM OF 2,500 PSI COMPRESSIVE STRENGTH AT TWENTY-EIGHT (28) DAYS AND CONFORM TO CITY OF MANVEL DESIGN CRITERIA MANUAL.
10. DUCTILE IRON FITTINGS SHALL CONFORM TO AWWA C-110 AND END JOINTS OF FITTINGS AND MAIN VALVES SHALL CONFORM TO AWWA C-110 AND END JOINTS TO FITTINGS AND MAIN LINE VALVES SHALL CONFORM TO AWWA C-111 FOR RUBBER GASKETED JOINTS. DUCTILE IRON FITTINGS SHALL BE CEMENT LINED OR EPOXY COATED.
11. MINIMUM BURY FOR ALL FIRE HYDRANTS SHALL BE FOUR (4) FEET UNLESS OTHERWISE NOTED. ALL FIRE HYDRANTS AND VALVE BOXES ARE TO BE ADJUSTED TO FINISH GRADE AFTER PAVING IS COMPLETE. PUMPER SERVICE CONNECTION TO FACE CURB.
12. INSTALL CONCRETE BLOCK BENEATH FIRE HYDRANTS BEFORE PLACING CONCRETE THRUST BLOCKING TO INSURE THAT FIRE HYDRANTS ARE INSTALLED LEVEL.
13. CONTRACTOR SHALL NOTIFY CITY OF MANVEL PROJECT MANAGER SEVENTY-TWO (72) HOURS PRIOR TO START OF CONSTRUCTION.
14. ALL WATER LINES TO BE BACKFILLED TO ONE (1) FOOT ABOVE TOP OF PIPE WITH BANK SAND. FOR PORTIONS OF PIPE LOCATED UNDER PAVEMENT, BACKFILL FROM INITIAL BACKFILL OF BANK SAND TO ONE (1) FOOT BELOW PROPOSED SUBGRADE UNDER PAVEMENT WITH CEMENT-STABILIZED SAND (1.1 SACKS OF CEMENT PER TON OF SAND).
15. ALL FIRE HYDRANTS ARE TO BE LOCATED AS SHOWN ON THE PLANS AND SET THREE (3) FEET BEHIND THE CURB, ONE (1) FOOT FROM PROPERTY LINE FOR STREETS WITH DITCHES OR AT AN APPROVED LOCATION ON RURAL SECTION ROADS. ALL FIRE HYDRANTS SHALL BE AUDITED, SANDBLASTED AND PAINTED AS PER CITY OF MANVEL DESIGN CRITERIA MANUAL, LATEST REVISION.
16. ALL TAPPING SLEEVES SHALL BE STAINLESS STEEL FULL CIRCLE WITH MECHANICAL JOINT TAPPING SLEEVE.
17. THE CONTRACTOR SHALL NOT OPERATE EXISTING CITY WATER VALVES. THE CONTRACTOR SHALL NOTIFY THE CITY PROJECT MANAGER AND CONTACT THE PUBLIC WORKS DEPARTMENT TWENTY-FOUR (24) HOURS MINIMUM, FOR ANY VALVE OPERATION NECESSARY FOR THE PROJECT. IF ANY VALVE CLOSING RESULTS IN INTERRUPTED SERVICE TO RESIDENTS OR BUSINESSES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PROPER NOTICE TO THE AFFECTED PARTIES TWENTY-FOUR (24) HOURS IN ADVANCE OF THE INTERRUPTION.
18. FOR ALL CONSTRUCTION WATER USAGE ON THE PROJECT, A FIRE HYDRANT METER SHALL BE OBTAINED FROM THE CITY. A DEPOSIT SHALL BE REQUIRED FOR THE METER AND A FEE SHALL BE CHARGED FOR ALL METERED WATER USAGE. THE CONTRACTOR SHALL SUPPLY A BACKFLOW PREVENTER FOR THE FIRE HYDRANT METER.
19. ALL WATER VALVES SHALL TURN ON IN THE COUNTER CLOCKWISE DIRECTION.
20. CONTRACTOR TO INSTALL TRACING LINE ON ALL PUBLIC WATER LINES AND SERVICE LINES UP TO THE PUBLIC ROW OR WATERLINE EASEMENT BOUNDARY.
21. ALL ROAD AND CREEK CROSSINGS SHALL BE CASED WITH A LARGER DIAMETER SDR PVC PIPE.
22. LONG SERVICE LEADS ARE TO BE CASED IN 2" SCHEDULE 40 PVC EXTENDED 2' FROM EACH EDGE OF PAVEMENT. CASING SHALL BE 3FT MINIMUM BELOW GRADE.
23. NON-POTABLE WATER SHALL BE PURPLE PIPE.

<p>CAUTION: AT&T CABLES</p> <p>THE CONTRACTOR SHALL CALL 1-800-344-8377 A MINIMUM OF FORTY-EIGHT (48) HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.</p> <p>WHEN EXCAVATING WITHIN TWENTY-FOUR (24) INCHES OF AT&T FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING THE CONTRACTOR SHALL EXPOSE THE AT&T FACILITIES.</p> <p>WHEN AT&T TELEPHONE FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.</p> <p>CAUTION: UNDERGROUND GAS FACILITIES</p> <p>THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 713-223-4567 OR 1-800-669-8344 A MINIMUM OF FORTY-EIGHT (48) HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.</p> <p>WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE CALL 713-967-8037 (7:00 AM TO 4:30 PM) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.</p> <p>WHEN EXCAVATING WITHIN TWENTY-FOUR (24) INCHES OF THE INDICATED LOCATION OF CENTER ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.</p>	<p>CAUTION: UNDERGROUND GAS FACILITIES (CONT.)</p> <p>WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.</p> <p>THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.</p> <p>CAUTION: OVERHEAD POWER LINES</p> <p>TEXAS LAW ARTICLE 1436C, PROHIBITS ALL ACTIVITIES IN WHICH PERSONS OR EQUIPMENT MAY COME WITHIN SIX (6) FEET OF ENERGIZED OVERHEAD POWER LINES, AND FEDERAL REGULATIONS, TITLE 29, PART 1910.180 (1) AND PART 1926.550 (AVI 15) REQUIRE A MINIMUM CLEARANCE OF TEN (10) FEET FROM THESE FACILITIES. THE ABOVE LAWS CARRY BOTH CRIMINAL AND CIVIL LIABILITIES. IF THE CONTRACTOR PERFORMS ANY WORK NEAR OVERHEAD POWER LINES HE MUST CALL 281-596-0453 FOR THE LINES TO BE DE-ENERGIZED AND/OR MOVED AT HIS EXPENSE PRIOR TO PERFORMING THE WORK.</p> <p>TEXAS LAW, SECTION 752, HEALTH AND SAFETY CODE, FORBIDS ALL ACTIVITIES WHICH PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES. CONTRACTORS ARE LEGALLY RESPONSIBLE FOR SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY POWER COMPANY.</p> <p>CONTRACTOR TO NOTIFY THE "UNDERGROUND UTILITY COORDINATING COMMITTEE" TELEPHONE 713-223-4567 FORTY-EIGHT (48) HOURS BEFORE STARTING WORK IN STREET RIGHTS-OF-WAY OR EASEMENTS.</p>
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GENERAL CONSTRUCTION NOTES 1 OF 2

DATE APPROVED: **JANUARY 20, 2026**
 REVISED DATE: **JANUARY 20, 2026 SCALE: NTS**

PROJECT NUMBER: _____ DATE SUBMITTED: _____ SHEET: _____
 OF 16

SANITARY:

1. FINISHED ELEVATION ON SANITARY MANHOLE RIMS SHALL BE THREE (3) INCHES ABOVE FINISHED GRADE WITHIN THE UTILITY EASEMENT. IF MANHOLE IS LOCATED ADJACENT TO A PUBLIC STREET, THE FINAL ELEVATION OF THE MANHOLE RIM SHALL BE TWO (2) INCHES ABOVE THE CURB OR CENTERLINE OF STREET FOR STREETS WITHOUT PERIMETER CURB.
2. WATER LINES AND SANITARY SEWERS SHALL BE INSTALLED IN SEPERATE TRANCHES AND HAVE A MINIMUM SEPEF NINE (9) FEET.
3. POLYVINYL CHLORIDE (PVC) SHALL BE IN ACCORDANCE WITH ASTM D2241 , SDR 26 FOR ALL DEPTHS UNLESS OTHERWISE NOTED ON THE CONSTRUCTION PLANS. SANITARY SEWER LINE SHALL BE THE COLOR GREEN.
4. ALL PVC PIPES (ALL TYPES AND SDR/DWR WALL THICKNESS TO BE USED) SHALL HAVE A RUBBER GASKET EQUIPPED BELL AND SPIGOT JOINTS CONFORMING TO ASTM D3212 . THE GASKET MATERIAL SHALL CONFORM TO ASTM F477, SOLVENT WELDED JOINTS WILL NOT BE APPROVED FOR CITY SANITARY SEWER LINES.
5. ALL DUCTILE IRON (DI) PIPE SHALL BE 150 PSI WITH EIGHT (8) MIL, BLACK VIRGIN POLYETHYLENE WRAP AS SPECIFIED IN ANSIAWWA A21.5/C105.
6. SANITARY SEWER MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL, LATEST REVISION. CONTRACTOR TO FURNISH TEST PLUGS AND RISERS. ALL SANITARY SEWER LINES TO BE AIR TESTED IN ACCORDANCE WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL.
7. SANITARY SEWER TRENCHES UNDER OR WITHIN ONE (1) FOOT OF PROPOSED OR FUTURE PAVEMENT ARE TO BE BACKFILLED WITH CEMENT-STABILIZED SAND BACKFILL, AS SPECIFIED, TO WITHIN ONE (1) FOOT OF SUBGRADE. BEDDING WILL BE CEMENT-STABILIZED SAND BACKFILL (1.1 SACKS CEMENT PER TON OF SAND) FOR ALL SANITARY SEWERS.
8. WATER LINE/NEW SEWER LINE SEPARATION. WHEN NEW SANITARY SEWERS ARE INSTALLED, THEY SHALL BE INSTALLED NO CLOSER TO WATER LINES THAN NINE (9) FEET IN ALL DIRECTIONS. SEWERS THAT PARALLEL TO WATER LINES MUST BE INSTALLED IN SEPARATE TRENCHES. WHEN NINE (9) FEET OF SEPARATION CANNOT BE MAINTAINED, THE FOLLOWING GUIDELINES APPLY: AT ALL TIMES WATER AND SANITARY CROSSINGS OR SEPARATIONS SHALL CONFORM TO TCEQ REQUIREMENTS - SEE NOTES 28-35 BELOW FOR MORE DETAIL.
9. WHEN THE SANITARY SEWER PARALLELS A WATER LINE, THE SANITARY SEWER SHALL BE CONSTRUCTED OF PVC. CAST IRON OR DUCTILE IRON WILL REQUIRE APPROVAL BY CITY OF MANVEL. SANITARY SEWER SHALL MEET ASTM SPECIFICATIONS WITH A PRESSURE RATING FOR BOTH THE PIPE AND JOINTS OF 150 PSI. THE VERTICAL SEPARATION SHALL BE A MINIMUM OF TWO (2) FEET BETWEEN OUTSIDE DIAMETERS AND THE HORIZONTAL SEPARATION SHALL BE A MINIMUM OF FOUR (4) FEET BETWEEN OUTSIDE DIAMETERS. THE SANITARY SEWER SHALL BE LOCATED BELOW THE WATER LINE.
10. WHEN A SANITARY SEWER CROSSES A WATER LINE AND THE SEWER IS CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC WITH A MINIMUM PRESSURE RATING OF 150 PSI; AN ABSOLUTE MINIMUM OF SIX (6) INCHES BETWEEN OUTSIDE DIAMETERS SHALL BE MAINTAINED. THE SANITARY SEWER SHALL BE LOCATED BELOW THE WATER LINE WHEN POSSIBLE AND ONE (1) LENGTH OF THE SANITARY SEWER PIPE MUST BE CENTERED ON THE WATER LINE. SEE NOTES 28-35 BELOW FOR MORE DETAIL.
11. WHEN A SANITARY SEWER CROSSES UNDER A WATER LINE AND THE SEWER IS CONSTRUCTED OF ABS TRUSS PIPE, SIMILAR SEMI-RIGID PLASTIC COMPOSITE PIPE, CLAY PIPE OR CONCRETE PIPE WITH GASKETED JOINTS, A MINIMUM OF TWO (2) FEET OF SEPARATION SHALL BE MAINTAINED. THE INITIAL BACKFILL SHALL BE CEMENT-STABILIZED SAND (MINIMUM 1.1 SACKS OF CONCRETE PER TON OF SAND) FOR ALL SECTIONS OF SANITARY SEWER WITHIN NINE (9) FEET OF THE WATER LINE. THE INITIAL BACKFILL SHALL BE FROM 1/4 DIAMETER BELOW THE CENTERLINE OF THE PIPE TO ONE PIPE DIAMETER (BUT NOT LESS THAN TWELVE (12) INCHES) ABOVE THE PIPE. SEE NOTES 28-35 BELOW FOR MORE DETAIL.
12. WHEN A SANITARY SEWER CROSSES OVER A WATER LINE, ALL PORTIONS OF THE SANITARY SEWER WITHIN NINE (9) FEET OF THE WATER LINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC PIPE WITH A PRESSURE RATING OF AT LEAST 150 PSI USING APPROPRIATE ADAPTERS. IN LIEU OF THIS PROCEDURE THE NEW WATERLINE MAY BE ENCASED IN A JOINT OF 150 PSI PRESSURE CLASS PIPE AT LEAST EIGHTEEN (18) FEET LONG AND TWO (2) NOMINAL SIZES LARGER THAN THE NEW WATERLINE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT INTERVALS OF FIVE (5) FEET WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHOULD BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH NON-SHRINK CEMENT GROUT OR WITH A MANUFACTURED SEAL. SEE NOTES 28-35 BELOW FOR MORE DETAIL.
13. ALL PROPOSED SANITARY SEWER LINES SHALL BE DUCTILE IRON OR SDR 26 PVC. DUCTILE IRON PIPE SHALL ONLY BE USED AS APPROVED BY THE CITY OF MANVEL.
14. FOR ALL PVC PIPE, USE MANHOLE WATER STOP GASKET AND CLAMP ASSEMBLY AT MANHOLE CONNECTIONS.
15. SANITARY SEWER MANHOLES SHALL BE STANDARD TYPE, UNLESS OTHERWISE NOTED. ALL SANITARY SEWER MANHOLES SHALL BE AT LEAST THREE
16. (3) INCHES ABOVE FINISHED GRADE OR ABOVE 100-YEAR BASE FLOOD ELEVATION (BFE). FOR MANHOLES LOCATED IN THE 100-YEAR FLOOD PLAIN,
17. VENT AND SEAL (BOLTED MANHOLE LID WITH FOUR (4) BOLTS, NO HOLES IN THE LID) THE MANHOLE TOP AND PROVIDE INFLOW PROTECTION INSERT UNDER COVER. SECTIONS OF PRECAST MANHOLES SHALL BE JOINED WITH "RAM-NEK" IN FLOOD PLAIN.
18. SANITARY SEWER LINE IN PIPE ZONE INSIDE LOT EASEMENT SHALL BE BACKFILLED WITH CEMENT-STABILIZED SAND OR SELECT FILL MATERIAL WITH A PI BETWEEN 20 AND 40.
19. IF WET SAND IS ENCOUNTERED IN TRENCH, USE SPECIAL BEDDING.
20. SANITARY SEWERS CROSSING UTILITIES OTHER THAN WATER LINES SHALL HAVE A MINIMUM CLEARANCE OF SIX (6) INCHES.
21. ALL PRECAST MANHOLES SHALL HAVE THE TOP ADJUSTMENT CONSTRUCTED OF PRECAST PCC RINGS NO GREATER THAN TWENTY-FOUR (24) INCHES IN HEIGHT, SEALED WITH NON-SHRINK GROUT INSIDE AND OUT. BRICK MANHOLES SHALL NOT BE ALLOWED.
22. ALL SANITARY SEWER MANHOLE COVERS MUST INCLUDE THE WORDS "SANITARY SEWER" AND "CITY OF MANVEL". THEY MUST ALSO HAVE THE CITY SEAL.
23. SANITARY SEWER MANHOLE COVERS SHALL BE A MINIMUM OF THIRTY-TWO (32) INCHES IN DIAMETER.
24. ALL SANITARY SEWER MANHOLES SHALL HAVE A STAINLESS STEEL INFLOW PROTECTOR.
25. CONTRACTOR TO INSTALL TRACING LINE ON ALL PUBLIC FORCE MAINS.
26. ALL INTERIOR CONCRETE OF THE MANHOLES, LIFT STATION WET WELLS AND SANITARY SEWER AIR RELEASE MANHOLES SHALL BE COATED COMPLETE WITH RAVEN 405 PROTECTIVE COATING WITH A MINIMUM THICKNESS OF 1/25 MIL OR APPROVED EQUAL. SEWERCOAT ONLY USED AS AN ALTERNATIVE IF APPROVED BY THE CITY OF MANVEL.
27. ALL MANHOLES WITHIN ANY FLOODZONE OTHER THAN ZONE X AND SHADED X SHALL HAVE THEIR COVERS BOLTED TO THE FRAME.
28. WHERE A NEW POTABLE WATERLINE CROSSES ABOVE A WASTEWATER MAIN OR LATERAL, THE SEGMENT OF THE WATERLINE SHALL BE CENTERED OVER AND MUST BE PERPENDICULAR TO THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. WHEN CROSSING AN EXISTING WASTEWATER MAIN OR LATERAL AND IT IS DISTURBED OR SHOWS SIGNS OF LEAKING, THE WASTEWATER MAIN OR LATERAL SHALL BE REPLACED FOR AT LEAST NINE FEET IN BOTH DIRECTIONS (18 FEET TOTAL) WITH AT LEAST 150 PSI PRESSURE RATED PIPE EMBEDDED IN CEMENT STABILIZED SAND (SEE ITEM 26 BELOW) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.
29. THE POTABLE WATERLINE SHALL BE AT LEAST TWO FEET ABOVE AN EXISTING, NON-PRESSURE RATED WASTEWATER MAIN OR LATERAL.
30. THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE AN EXISTING, PRESSURE RATED WASTEWATER MAIN OR LATERAL.
31. WHERE A NEW POTABLE WATER LINE CROSSES A NEW NON PRESSURE RATED WASTEWATER MAIN OR LATERAL, THE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER AND SHALL BE PERPENDICULAR TO THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST TWO FEET ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PIPE STIFFNESS OF 115 PSI AT 5% DEFLECTION. THE WASTER WATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAND (SEE ITEM 26 BELOW) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END. THE MATERIAL AND METHOD OF INSTALLATION SHALL CONFORM TO ONE OF THE FOLLOWING OPTIONS:
32. WITHIN NINE FEET HORIZONTALLY OF EITHER SIDE OF THE WATERLINE, THE WASTEWATER PIPE AND JOINTS SHALL BE CONSTRUCTED WITH PIPE MATERIAL HAVING A MINIMUM PRESSURE RATING OF 150 PSI. AN ABSOLUTE MINIMUM VERTICAL SEPARATION DISTANCE OF TWO FEET SHALL BE PROVIDED. THE WASTEWATER MAIN OR LATERAL SHALL BE LOCATED BELOW THE WATERLINE.
33. ALL SECTION OF WASTEWATER MAIN OR LATERAL WITHIN NINE FEET HORIZONTALLY OF THE WATERLINE SHALL BE ENCASED IN AN 1 FOOT OR LONGER SECTION OF PIPE. FLEXIBLE ENCASING PIPE SHALL A MINIMUM PIPE STIFFNESS OF 115 PSI AT 5% DEFLECTION. THE ENCASING PIPE SHALL BE CENTERED ON THE WATERLINE AND SHALL BE AT LEAST TWO NOMINAL PIPE SIZES LARGER THAN THE WASTEWATER MAIN OR LATERAL. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE FOOT INTERVALS (OR LESS) WITH SPACERS OR BE FILLED TO THE SPRING LINE WITH WASHED SAND. EACH END OF THE CASING SHALL BE SEALED WITH WATER TIGHT NON-SHRINK CEMENT GROUT OR A MANUFACTURED WATER TIGHT SEAL. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF SIX INCHES BETWEEN THE ENCASEMENT PIPE AND THE WATERLINE SHALL BE PROVIDED. THE WASTEWATER LINE SHALL BE LOCATED BELOW THE WATERLINE.
34. WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN OR LATERAL, THE WATERLINE SHALL BE ENCASED AS DESCRIBED FOR WASTEWATER MAINS OR LATERALS IN ITEM 23 OR CONSTRUCTED IN DUCTILE IRON OR STEEL PIPE WITH MECHANICAL OR WELDED JOINTS AS APPROPRIATE. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF ONE FOOT BETWEEN THE WATERLINE AND THE WASTEWATER MAIN OR LATERAL SHALL BE PROVIDED. WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN, THE PROCEDURES IN TCEQ 217.53(D) (RELATING TO PIPE DESIGN) MUST BE FOLLOWED.
35. WHERE A NEW POTABLE WATERLINE CROSSES A NEW, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER AND SHALL BE PERPENDICULAR TO THE WASTEWATER LINE SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTER LINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A PRESSURE RATING OF AT LEAST 150 PSI. THE WASTEWATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAND (SEE ITEM 26 BELOW) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT LENGTH PLUS 12 INCHES BEYOND THE JOINT ON EACH END.
36. WHERE CEMENT STABILIZED SAND BEDDING IS REQUIRED, THE CEMENT STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE, BASED ON LOOSE DRY WEIGHT VOLUME (AT LEAST 2.5 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF SIX INCHES ABOVE AND FOUR INCHES BELOW THE WASTEWATER MAIN OR LATERAL. THE USE OF BROWN COLORING IN CEMENT STABILIZED SAND FOR WASTEWATER MAIN OR LATERAL BEDDING IS RECOMMENDED FOR THE IDENTIFICATION OF PRESSURE RATED WASTEWATER MAINS DURING FUTURE CONSTRUCTION.
37. ALL SANITARY SEWER SHALL BE TELEVIEWED AT THE ONE-YEAR WARRANTY PERIOD PRIOR TO FINAL ACCEPTANCE.

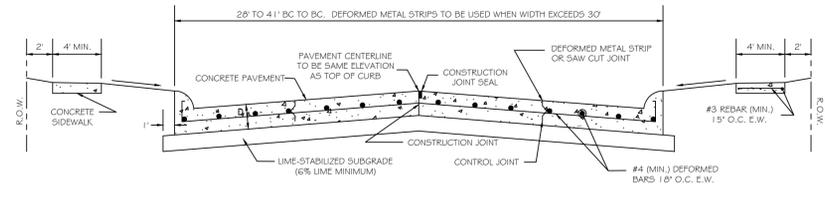
<p>CAUTION: AT&T CABLES</p> <p>THE CONTRACTOR SHALL CALL 1-800-344-8377 A MINIMUM OF FORTY-EIGHT (48) HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.</p> <p>WHEN EXCAVATING WITHIN TWENTY-FOUR (24) INCHES OF AT&T FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING THE CONTRACTOR SHALL EXPOSE THE AT&T FACILITIES.</p> <p>WHEN AT&T TELEPHONE FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.</p> <p>CAUTION: UNDERGROUND GAS FACILITIES</p> <p>THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 713-223-4567 OR 1-800-669-8344 A MINIMUM OF FORTY-EIGHT (48) HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.</p> <p>WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE CALL 713-967-8037 (7:00 AM TO 4:30 PM) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.</p> <p>WHEN EXCAVATING WITHIN TWENTY-FOUR (24) INCHES OF THE INDICATED LOCATION OF CENTER ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.</p>	<p>CAUTION: UNDERGROUND GAS FACILITIES (CONT.)</p> <p>WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.</p> <p>THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.</p> <p>CAUTION: OVERHEAD POWER LINES</p> <p>TEXAS LAW ARTICLE 1436C, PROHIBITS ALL ACTIVITIES IN WHICH PERSONS OF EQUIPMENT MAY COME WITHIN SIX (6) FEET OF A ENERGIZED OVERHEAD POWER LINES, AND FEDERAL REGULATIONS, TITLE 29, PART 1910.180 (1) AND PART 1926.550 (AVI) (5) REQUIRE A MINIMUM CLEARANCE OF TEN (10) FEET FROM THESE FACILITIES. THE ABOVE LAWS CARRY BOTH CRIMINAL AND CIVIL LIABILITIES. IF THE CONTRACTOR PERFORMS ANY WORK NEAR OVERHEAD POWER LINES HE MUST CALL 281-596-0453 FOR THE LINES TO BE DE-ENERGIZED AND/OR MOVED AT HIS EXPENSE PRIOR TO PERFORMING THE WORK.</p> <p>TEXAS LAW, SECTION 752, HEALTH AND SAFETY CODE, FORBIDS ALL ACTIVITIES WHICH PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES. CONTRACTORS ARE LEGALLY RESPONSIBLE FOR SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY POWER COMPANY.</p> <p>CONTRACTOR TO NOTIFY THE "UNDERGROUND UTILITY COORDINATING COMMITTEE" TELEPHONE 713-223-4567 FORTY-EIGHT (48) HOURS BEFORE STARTING WORK IN STREET RIGHTS-OF-WAY OR EASEMENTS.</p>
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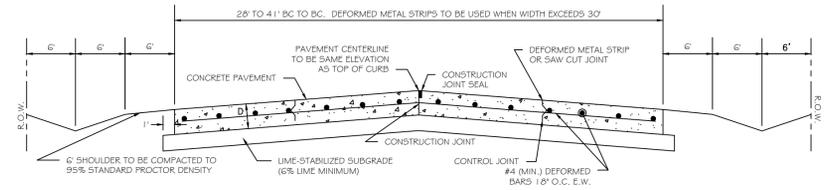
**GENERAL CONSTRUCTION
NOTES 2 OF 2**

DATE APPROVED: **JANUARY 20, 2026**
REVISED DATE: **JANUARY 20, 2026 SCALE: NTS**

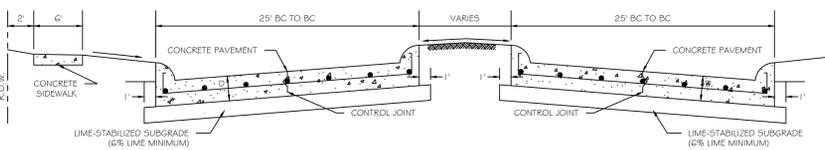
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SINGLE ROADWAY CURB SECTION



SINGLE ROADWAY OPEN DITCH SECTION

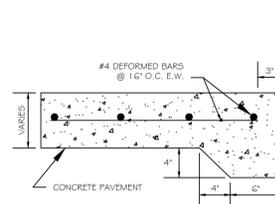


DOUBLE ROADWAY SECTION

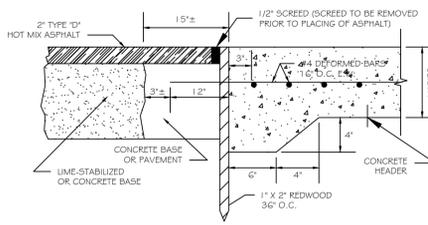
ROADWAY SECTIONS

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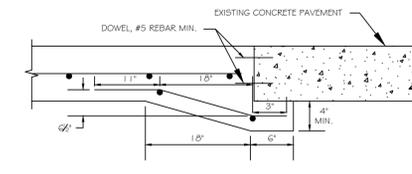
- FOR ALL SIX (6) AND SEVEN (7) INCH PAVING USE #4 REBAR ON EIGHTEEN (18) INCH CENTERS EACH WAY.
- ALL REINFORCING BAR SHALL CONFORM TO ASTM A15-54T AND A305-53T.
- THE LOCATION OF CONSTRUCTION JOINTS, CONTROL JOINTS AND DEFORMED STRIPS MAY BE VARIED, WITH THE APPROVAL OF THE CITY OF MANVEL, TO SUIT THE PROPOSED CONSTRUCTION METHODS OF THE CONTRACTOR. THE MAXIMUM LENGTH BETWEEN LONGITUDINAL JOINTS SHALL NOT EXCEED 15'-0".
- ALL PAVEMENT CROSS-SECTION SHALL EITHER BE HYPERBOLIC OR TANGENT CROWN. MINIMUM SLOPE SHALL BE ONE-QUARTER (1/4) INCH PER FOOT.
- D = SIX (6) INCH OR SEVEN (7) INCH. SEE PAVING CONSTRUCTION ITEMS ON THIS SHEET.
- MINIMUM SLOPE FOR ANY MEDIAN SHALL BE ONE-HALF (1/2) INCH PER FOOT.



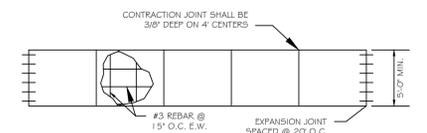
CONCRETE PAVING HEADER



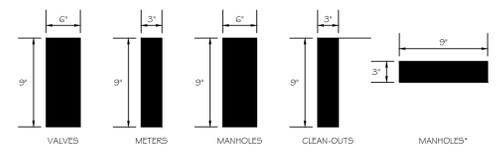
ASPHALT PAVING HEADER
PAVING HEADERS



UNDERCUT DETAIL



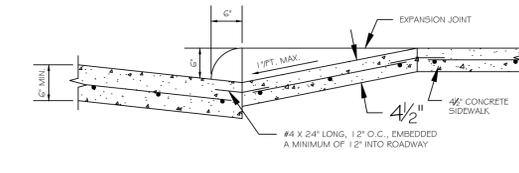
SIDEWALK PLAN VIEW



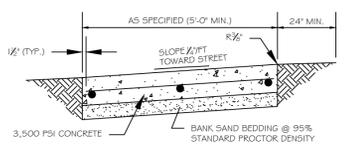
WATER LINES SANITARY SEWER STORM SEWER
UTILITY MARKINGS

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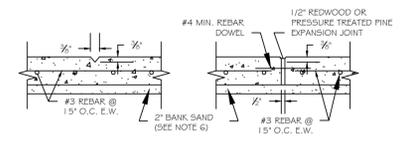
- SAW CUT CURB OR EDGE AND APPLY APPROPRIATE MARKING AS LISTED BELOW.
- WATER VALVE MARKING SHALL BE 6" X 9" IN SIZE MARKED IN BLUE PAINT ON CURB OR EDGE OF STREET.
- WATER METER MARKING SHALL BE 3" X 9" IN SIZE MARKED IN BLUE PAINT ON CURB OR EDGE OF STREET.
- SANITARY SEWER MANHOLE MARKING SHALL BE 6" X 9" IN SIZE MARKED IN GREEN PAINT ON CURB OR EDGE OF STREET.
- SANITARY SEWER CLEAN-OUT MARKING SHALL BE 3" X 9" IN SIZE AND MARKED IN GREEN PAINT ON CURB OR EDGE OF STREET.
- STORM SEWER MANHOLE MARKING SHALL BE 3" X 9" IN SIZE AND MARKED IN BLACK PAINT. *ONLY STORM SEWER MANHOLES SHALL BE MARKED NOT, INLETS.



SIDEWALK & WHEELCHAIR RAMP SECTION



SIDEWALK SECTION



CONTRACTION JOINT EXPANSION JOINT
SIDEWALK JOINTS

NOTES:

- ALL EDGES SHALL BE ROUNDED WITH 3/8" RADIUS.
- CONTRACTION JOINTS SHALL BE PLACED AT 5'-0" INTERVALS.
- CONTRACTION JOINTS SHALL BE 3/8" DEEP AND HAVE TROWEL EDGE.
- EXPANSION JOINT MATERIAL REQUIRED WHERE SIDEWALKS ABUT BUILDINGS, CURBS, DRIVEWAYS, OR EXISTING SIDEWALKS.
- EXPANSION JOINTS SHALL BE PLACED AT 20'-0" INTERVALS.
- 2" INCH CLEAN BANK SAND SHALL BE TAMPED TO 95% STANDARD PROCTOR.
- WHERE NEW SIDEWALK IS PLACED AGAINST EXISTING SIDEWALK, SAW CUT EXISTING SIDEWALK TO AN EVEN STRAIGHT LINE PRIOR TO INSTALLATION OF THE NEW SIDEWALK. INSTALL #4 REBAR DOWEL INTO EXISTING SIDEWALK.
- PROVIDE 12 INCHES OF DOWEL WITH 6 INCH SLEEVES WHERE NEW SIDEWALK IS PLACED AGAINST PROPOSED OR FUTURE SIDEWALK.

NOTES:

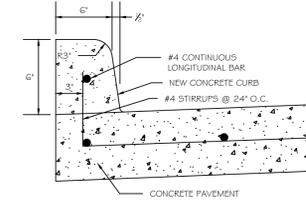
- ALL RAMP SHALL BE TYPED TYPE 7 STYLE WITH REDBLACK PAVERS.
- RAMP SHALL MEET ADA (AMERICANS WITH DISABILITIES ACT) AND TABA (TEXAS ARCHITECTURAL BARRIERS ACT).
- CONTRACTOR SHALL MAKE ADJUSTMENTS TO RAMP TO FIT LOCAL CONDITION.
- ALL CUTOUTS MUST HAVE BARRIAGES INSTALLED UNTIL WHEELCHAIR RAMP IS COMPLETED.
- MINIMUM CLEARANCE (WIDTH) OF RAMP SHALL BE SIXTY (60) INCHES.
- FINISH SURFACES OF RAMP AND SIDE SLOPE SHALL BE TREATED WITH COLOR SO THAT THE SURFACES ARE IN CONTRAST WITH SURFACE COLOR OF ADJACENT SIDEWALKS AND STREETS.
- CONTRAST COLOR OF WHEELCHAIR RAMP AND SIDE SLOPES SHALL BE THE BLACK PAVERS.
- CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, LANDING OR TRANSITION TO STREET.

WHEELCHAIR RAMP - PLAN VIEW

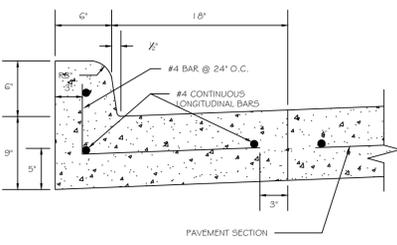
SIDEWALKS AND WHEELCHAIR RAMP

PAVING CONSTRUCTION NOTES:

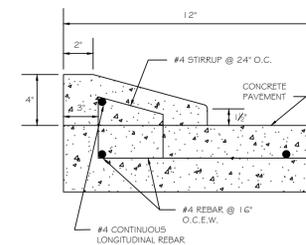
- PAVEMENT SUBGRADE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL, LATEST REVISIONS.
- CONTRACTOR SHALL NOTIFY THE CITY OF MANVEL PERMIT DEPARTMENT (281-489-0630), TWENTY-FOUR (24) HOURS PRIOR TO ALL LIMING AND PAVING OPERATIONS.
- ALL RETURNS SHALL HAVE A TWENTY-FIVE (25) FOOT RADIUS AT BACK OF CURB UNLESS OTHERWISE NOTED.
- GUIDELINES SET FORTH IN THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE OBSERVED.
- ALL FILL IN EXISTING OR PROPOSED RIGHTS-OF-WAY, INCLUDING BACKDRESSING BEHIND THE CURB, SHALL BE PLACED IN MAXIMUM LOOSE LIFTS OF EIGHT (8) INCHES OR LESS AND COMPACTED TO NINETY-FIVE PERCENT (95%) STANDARD PROCTOR DENSITY WITH A MOISTURE CONTENT OF ± THREE PERCENT (3%) OF OPTIMUM MOISTURE.
- MINIMUM PAVEMENT REINFORCEMENT REQUIREMENT SHALL BE GRADE SIXTY (60), NO. FOUR (4) REBAR, SPACED AT EIGHTEEN (18) INCH ON CENTERS EACH WAY.
- ALL PAVEMENT TO BE A MINIMUM OF SIX (6) INCHES THICK REINFORCED CONCRETE UNLESS OTHERWISE NOTED.
- PAVING EXPANSION JOINTS SHALL BE PLACED AT A MAXIMUM OF SIXTY FEET (60).
- ALL CONCRETE USED FOR PAVEMENT SHALL BE CLASS 'A' CONCRETE AND A MINIMUM 4,000 PSI COMPRESSIVE STRENGTH AT TWENTY-EIGHT (28) DAYS AND A MINIMUM OF 6.0 SACKS OF CEMENT PER CUBIC YARD, UNLESS OTHERWISE NOTED.
- CLASS 'A' HYDRATED LIME SHALL BE APPLIED FOR SUBGRADE STABILIZATION AT A MINIMUM OF SIX PERCENT (6%) BY WEIGHT.
- CONTRACTOR SHALL INSTALL STREET SIGNS AND STOP SIGNS PER CITY OF MANVEL DESIGN CRITERIA MANUAL.
- ALIGNMENTS, CENTERLINE CURVE DATA, AND STATIONING FOR ALL CONSTRUCTION SHALL BE DETERMINED FROM SUBDIVISION PLAT.
- FOR ALL CONCRETE TO BE REMOVED, A TWO (2) INCH DEEP SAW CUT SHALL BE PROVIDED PRIOR TO REMOVAL.
- REPRESENTATIVES FROM THE CITY OF MANVEL, THE OWNER AND THE TESTING LABORATORY SHALL BE PRESENT FOR ALL DENSITY TESTS, LIME OPERATIONS AND PLACEMENT OF CONCRETE PAVING. NO INSPECTABLE WORK CAN BE CONDUCTED ON SATURDAYS.
- UNDER NO CIRCUMSTANCES SHALL WATER BE ADDED TO A CONCRETE LOAD AFTER SLUMP TEST AND/OR CONCRETE CYLINDERS HAVE BEEN TAKEN.
- BLUE REFLECTORIZED PAVEMENT MARKERS SHALL BE PLACED AT FIRE HYDRANT LOCATIONS AND OFFSET SIX (6) INCHES FROM THE CENTERLINE OF THE ROADWAY. REFLECTORS SHALL FACE FLOW OF TRAFFIC.
- FOR PAVEMENT WIDTHS LESS THAN OR EQUAL TO TWENTY-EIGHT (28) FEET B/B OF CURB:
 - MINIMUM STABILIZED SUBGRADE THICKNESS SHALL BE SIX (6) INCHES.
 - MINIMUM CONCRETE SLAB THICKNESS SHALL BE SIX (6) INCHES.
- FOR PAVEMENT WIDTHS GREATER THAN TWENTY-EIGHT (28) FEET B/B OF CURB AND ALL MAJOR ARTERIAL THOROUGHFARES:
 - MINIMUM STABILIZED SUBGRADE THICKNESS SHALL BE EIGHT (8) INCHES.
 - MINIMUM CONCRETE SLAB THICKNESS SHALL BE SEVEN (7) INCHES.
- BLOCKOUTS SHALL BE INSTALLED AROUND ALL MANHOLES, JUNCTION BOXES, WATER VALVES, ETC. THAT LIE WITHIN THE PAVEMENT AREA. BLOCKOUTS SHALL EXTEND A MINIMUM OF SIX (6) INCHES PAST THE LARGEST DIMENSION OF THE ITEM THAT IS BEING BLOCKED OUT AND SHALL HAVE AN EXPANSION JOINT BETWEEN THE BLOCKOUT AND THE PAVING.
- CITY UTILITIES UNDER COMMERCIAL PAVED DRIVEWAYS, PARKING LOTS OR STRUCTURES SHALL HAVE A TEN (10) FOOT WIDE EXPANSION JOINT CENTERED OVER THE CITY UTILITY.
- FLY ASH IS NOT ALLOWED IN ANY CONCRETE MIX DESIGN.



TYPE I - 6" CONCRETE CURB



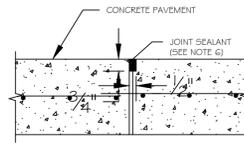
TYPE II - MONOLITHIC CONCRETE CURB AND GUTTER



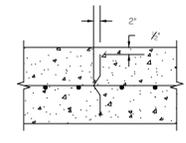
TYPE III - 4" x 12" CONCRETE CURB

CONCRETE CURB

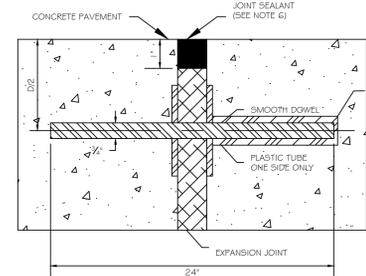
- NOTE:
- WHEN CONCRETE CURB IS TO BE PLACED ON EXISTING CONCRETE BASE #4 DEFORMED BARS, 7' LONG, 24" O.C. DOWELED 4" MIN. AND SET IN EPOXY.
 - REDWOOD EXPANSION JOINTS SHALL BE INSTALLED AT ALL PAVEMENT EXPANSION JOINTS.
 - MORTAR FINISH IS NOT REQUIRED WHEN CURB IS PLACED BY A MACHINE, BUT CURB SHALL STILL HAVE THE SAME OUTSIDE DIMENSIONS.



CONSTRUCTION JOINT



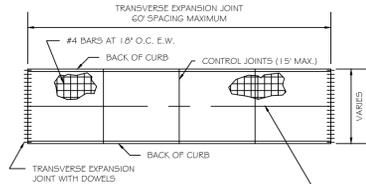
DEFORMED METAL STRIP



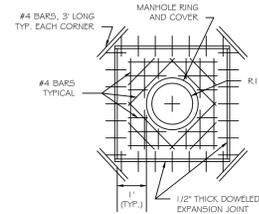
DOWEL EXPANSION JOINT

NOTES:

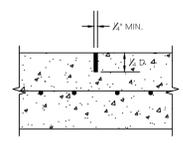
- CANTILEVER TYPE, CAST MALLEABLE IRON LOAD TRANSMISSION UNIT-STARLUG MODEL D-27 OR EQUAL ON 24" O.C. ARE ACCEPTABLE ALTERNATIVES.
- EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS AND SPACED A MINIMUM OF 60'. MATCH TO EXPANSION JOINTS IN PAVING PANELS.
- STAKES FOR TRANSVERSE JOINTS SHALL NOT BE PLACED CLOSER THAN 6" TO A LONGITUDINAL JOINT. THE TOP OF STAKE SHALL NOT BE LESS THAN 1/2" BELOW THE FINISH SURFACE.
- LOCATION OF CONSTRUCTION JOINTS AND DEFORMED STRIPS MAY BE VARIED WITH THE APPROVAL OF THE CITY, TO SUIT PROPOSED CONSTRUCTION OF THE CONTRACTOR.
- CONTROL JOINTS SHALL BE SPACED AT A MAXIMUM OF 15'-0".
- JOINTS AND SEALANTS SHALL ADHERE TO CITY OF MANVEL TECHNICAL SPECIFICATION 02240 - CONCRETE PAVEMENT JOINTS.
- PLASTIC TUBE SHALL EXTEND BEYOND THE DOWEL AT A LENGTH EQUAL TO THE WIDTH OF THE EXPANSION JOINT.



PAVING PANEL



MANHOLE BLOCKOUT



CONTRACTION JOINT

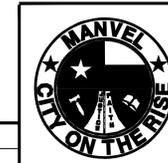
NOTES:

- D = DEPTH OF CONCRETE.
- SAW-CUT CONTRACTION JOINT TO DIMENSIONS SHOWN.

PAVEMENT JOINTS

DATE APPROVED: JANUARY 20, 2026

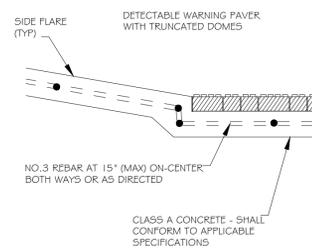
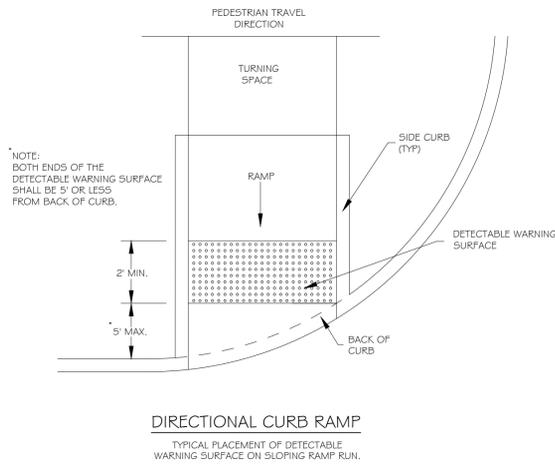
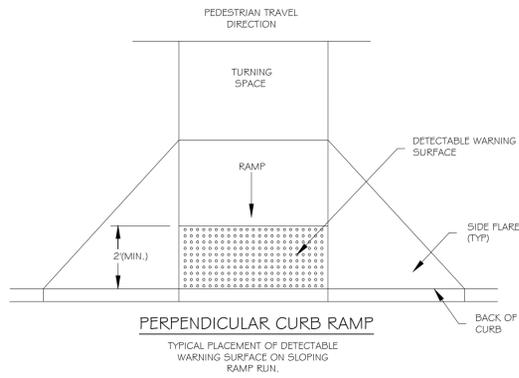
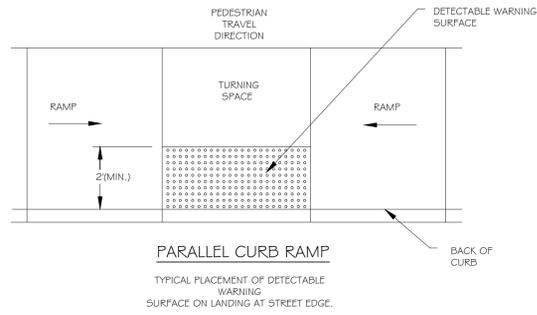
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PAVING
STANDARD DETAILS 1 OF 2

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DETECTABLE WARNING SURFACE DETAILS



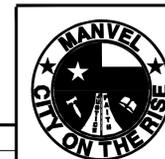
SECTION VIEW DETAIL
CURB RAMP AT DETECTABLE WARNINGS

DETECTABLE WARNING MATERIAL

1. CURB RAMPs MUST CONTAIN A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED TRUNCATED DOMES COMPLYING WITH PROWAG. THE SURFACE MUST CONTRAST VISUALLY WITH ADJOINING SURFACES, INCLUDING SIDE FLARES. FURNISH AND INSTALL AN APPROVED CAST-IN-PLACE DARK BROWN OR DARK RED DETECTABLE WARNING SURFACE MATERIAL ADJACENT TO UNCOLORED CONCRETE, UNLESS SPECIFIED ELSEWHERE IN THE PLANS.
2. DETECTABLE WARNING MATERIALS MUST MEET TXDOT DEPARTMENTAL MATERIALS SPECIFICATION DMS 4350 AND BE LISTED ON THE MATERIAL PRODUCER LIST. INSTALL PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. DETECTABLE WARNING SURFACES MUST BE FIRM, STABLE AND SLIP RESISTANT.
4. DETECTABLE WARNING SURFACES SHALL BE A MINIMUM OF 24 INCHES IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET.
5. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS AT THE BACK OF CURB AND NEITHER END OF THAT EDGE IS GREATER THAN 5 FEET FROM THE BACK OF CURB. DETECTABLE WARNING SURFACES MAY BE CURVED ALONG THE CORNER RADIUS.
6. SHADED AREAS ON SHEET 2 OF 2 INDICATE THE APPROXIMATE LOCATION FOR THE DETECTABLE WARNING SURFACE FOR EACH CURB RAMP TYPE.

DETECTABLE WARNING PAVERS (IF USED)

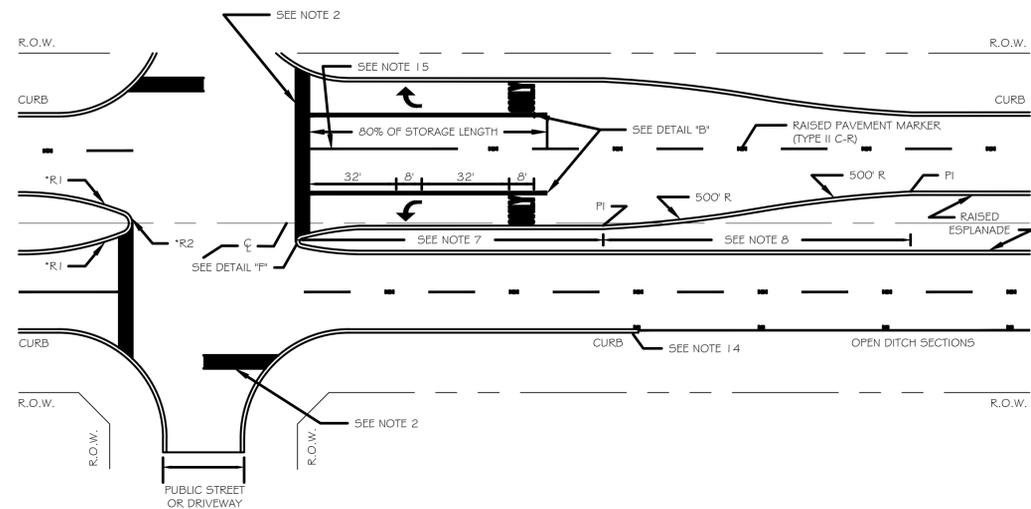
7. FURNISH DETECTABLE WARNING PAVER UNITS MEETING ALL REQUIREMENTS OF ASTM C-936, C-33. LAY IN A TWO BY TWO UNIT BASKET WEAVE PATTERN OR AS DIRECTED.
8. LAY FULL-SIZE UNITS FIRST FOLLOWED BY CLOSURE UNITS CONSISTING OF AT LEAST 25 PERCENT (25%) OF A FULL UNIT. CUT DETECTABLE WARNING PAVER UNITS USING A POWER SAW.



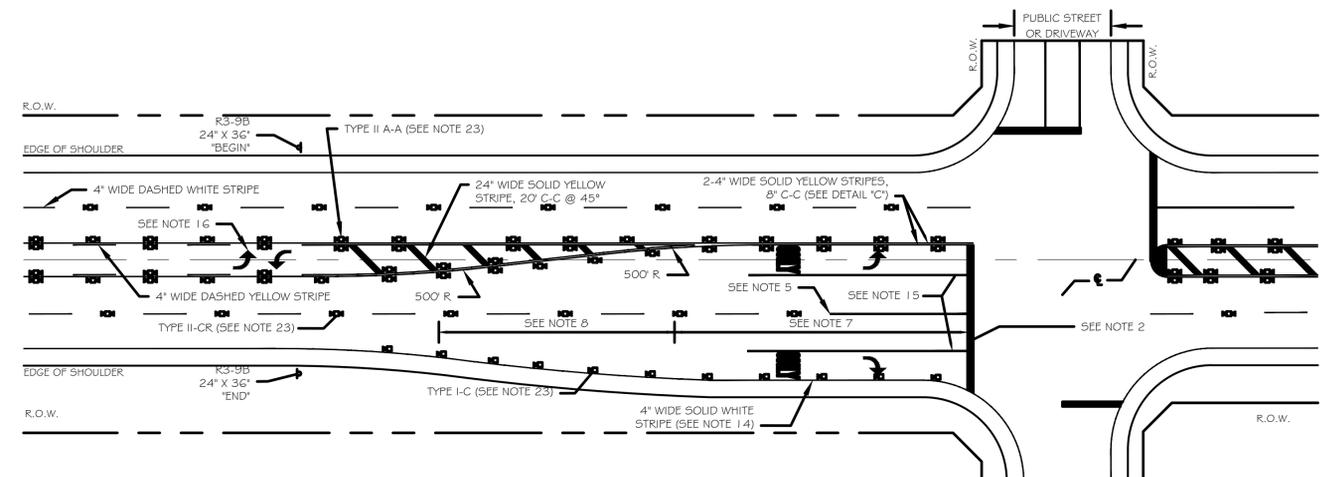
PAVING
STANDARD DETAILS 2 OF 2

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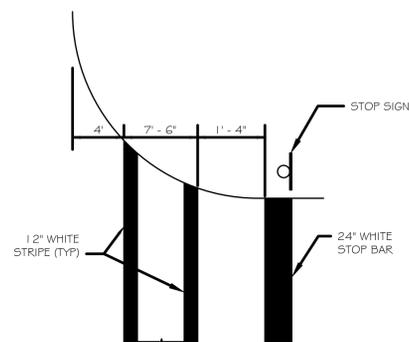
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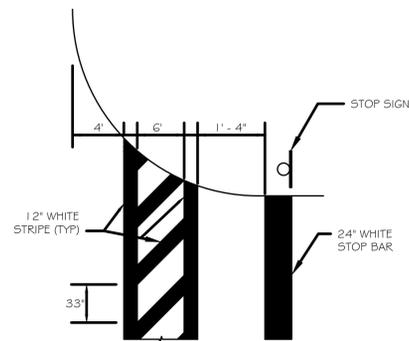
TYPICAL RAISED ESPLANADE SECTION



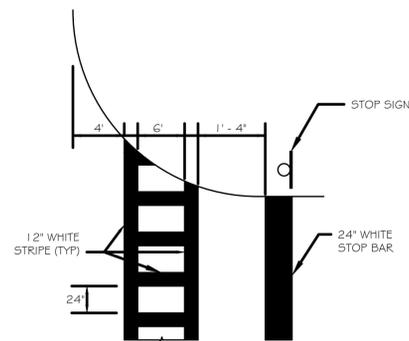
TYPICAL TWO-WAY LEFT TURN SECTION



STANDARD TYPE



SCHOOL ZONE TYPE 1

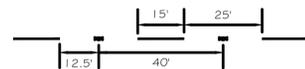


SCHOOL ZONE TYPE 2

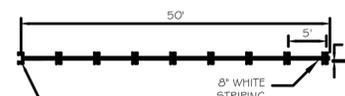
TYPICAL CROSSWALK PLACEMENT

ESPLANADE	*R1	*R2
<8'	N/A	W/2
8'-38'	90'	W/5
>38'	N/A	15'

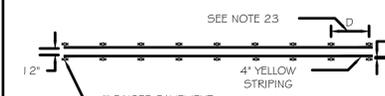
RADIUS DIMENSIONS



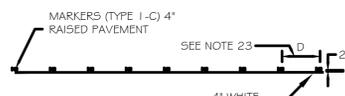
DETAIL "A"



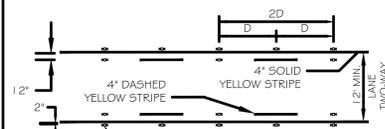
DETAIL "B"



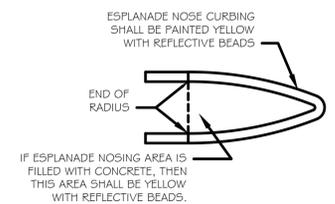
DETAIL "C"



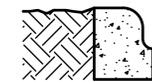
DETAIL "D"



DETAIL "E"



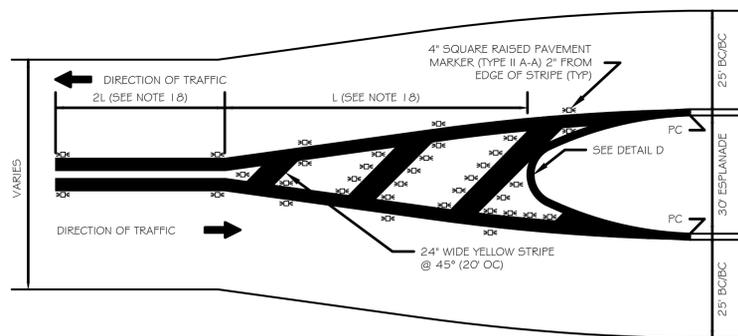
ESPLANADE NOSING PLAN VIEW



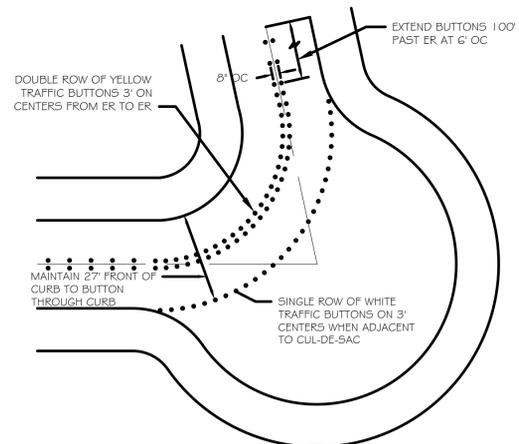
TYPICAL CURB SECTION

DETAIL "F"

NOTE:
1. PAINT FROM THE BACK OF THE CURB TO THE GUTTER LINE.



UNDIVIDED STREET TO ESPLANADE SECTION



TYPICAL BUTTON DETAIL FOR CURVES > 60°

- PERMANENT PAVEMENT MARKING CONSTRUCTION NOTES:
- IF A CROSSWALK IS REQUIRED, SEE TYPICAL CROSSWALK PLACEMENT DETAIL AND CONFIRM WITH CITY TYPE TO BE USED AND LOCATION OF CROSSWALK.
 - ALL INTERSECTIONS WHERE A STOP SIGN/SIGNAL IS LOCATED SHALL HAVE A STOP BAR. STOP BARS SHALL BE LOCATED 4'-0" BEHIND CROSSWALKS, WHERE PEDESTRIAN CROSSWALKS ARE PROVIDED. STOP BARS SHALL BE 24" WIDE SOLID WHITE STRIPE EXTENDING ACROSS ALL APPROACH LANES TO INDICATE THE POINT AT WHICH THE STOP IS INTENDED OR REQUIRED TO BE MADE. CROSSWALKS SHALL BE A MINIMUM INSIDE WIDTH OF 5'. AT LOCATIONS WHERE ADDITIONAL VISIBILITY IS REQUIRED, WHERE TRAFFIC CONTROL DEVICES ARE NOT PRESENT, CONTINENTAL TYPE CROSSWALKS SHALL BE USED.
 - NOT ALL INTERSECTIONS ARE FOUR-WAY STOP CONTROLLED. AS SUCH, NOT ALL STRIPING AND MARKINGS MAY APPLY.
 - ON APPROACH TO INTERSECTION - BEGINNING WITH STOP BAR, INSTALL A 4" WIDE SOLID WHITE LINE FOR 50' FROM BACK OF STOP BAR, SKIP 25' AND BEGIN NORMAL LANE LINE.
 - ON EXIT FROM INTERSECTION - BEGINNING WITH THE CROSSWALK, OR 12' FROM CURB LINE OF INTERSECTING STREET, INSTALL 4" SOLID WHITE LINE FOR 50' AND BEGIN NORMAL LANE LINE.
 - TURN STORAGE BAYS SHALL BE A MINIMUM OF 100' FOR MINOR STREETS AND 150' FOR MAJOR STREETS.
 - TRANSITIONS TO STORAGE BAYS SHALL BE A MINIMUM OF 100', THOUGH 160' IS DESIRABLE.
 - ALL STREET CROSSINGS SHALL COMPLY WITH T.A.S AND A.D.A DETAILS AND CRITERIA.
 - PAVEMENT SURFACE AREAS PRIOR TO PLACEMENT OF PAVEMENT MARKINGS, AND/OR RAISED PAVEMENT MARKERS SHALL BE CLEANED IN ACCORDANCE WITH CITY OF MANVEL DESIGN CRITERIA MANUAL (COFTS). AREAS SHALL BE FREE OF CURING MEMBRANE, DIRT, GREASE, LOOSE AND/OR FLAKING EXISTING MARKERS AND OTHER FORMS OF DEBRIS. SURFACES SHALL BE DRY BEFORE APPLYING PAVEMENT MARKINGS OR RAISED PAVEMENT MARKERS.
 - CONCRETE SURFACES SHALL BE CLEANED BY ABRASIVE BLASTING MEDIUM.
 - ASPHALTIC PAVEMENT SURFACES SHALL BE CLEANED BY BRUSHING, WASHING, COMPRESSED AIR, AND/OR HIGH-PRESSURE WATER.
 - ALL PAVEMENT MARKINGS AT INTERSECTIONS SHALL BE THERMOPLASTIC IN ACCORDANCE WITH C.O.F.T.S. APPROVED PRODUCTS LIST.
 - ALL PAVEMENT MARKINGS SHALL BE SHOWN ON THE APPROVED CONSTRUCTION PLANS. ALL PAVEMENT MARKINGS SHALL BE RETRO-REFLECTIVE MATERIAL APPLIED TO ROAD SURFACE IN A MOLTEN STATE BY SCREED/EXTRUSION, SUSPENDED EXTRUSION OR SPRAY MEANS, WITH A SURFACE APPLICATION OF GLASS BEADS.
 - ALL ESPLANADE NOSING, AND CURBS IN LEFT TURN STORAGE BAYS SHALL BE PAINTED WITH YELLOW REFLECTORIZED PAINT AND SHALL COMPLY WITH T.M.U.T.C.D., A.D.A AND T.A.S AND ALL REVISIONS THEREOF.
 - ALL ROADWAYS WITHOUT CURB SHALL HAVE A 4" SOLID WHITE REFLECTORIZED STRIPE 12" INSIDE THE EDGE OF PAVEMENT (SEE DETAIL 'D').
 - INTERSECTIONS HAVING TWO-LANES IN ONE DIRECTION SHALL SEPARATE LANES BY INSTALLING A 8" SOLID WHITE STRIPE FROM STOP BAR TO 80% OF TURN STORAGE BAY LENGTH (SEE DETAIL 'B').
 - REPEAT CENTER TURN ARROWS AT APPROXIMATELY EVERY 100' THROUGHOUT TWO-WAY CENTER TURN LANE.
 - ALL PAVEMENT MARKINGS, AND/OR RAISED PAVEMENT MARKERS SHALL COMPLY WITH T.M.U.T.C.D., A.D.A., T.A.S., AND C.O.F.T.S. AND ALL REVISIONS THEREOF.
 - TRANSITIONS FROM UNDIVIDED TO DIVIDED AND/OR ESPLANADE SECTIONS:
 - FOR SPEEDS 45 MPH AND GREATER USE L=W'S.
 - 5 = POSTED OR STATUTORY SPEED LIMIT.
 - W = WIDTH OF CENTER LANE OR ESPLANADE OR OFFSET DISTANCE.
 - MINIMUM L IN URBAN AREAS SHALL BE 100'.
 - MINIMUM L IN RURAL AREAS SHALL BE 200'.
 - L SHALL BE EXTENDED AS REQUIRED FOR SIGHT DISTANCE CONDITIONS.
 - THE COLOR OF RAISED PAVEMENT MARKERS UNDER DAYLIGHT AND NIGHTTIME CONDITIONS SHALL CONFORM TO THE COLOR OF THE MARKING FOR WHICH THEY SERVE AS A POSITIONING GUIDE OR FOR WHICH THEY SUPPLEMENT OR SUBSTITUTE.
 - ALL TRAFFIC BUTTONS AND RAISED PAVEMENT MARKERS SHALL BE INSTALLED ADJACENT TO STRIPES AT APPROXIMATELY 2' FROM EDGE OF BUTTON/MARKER TO STRIPE.
 - ALL BUTTONS AND RAISED PAVEMENT MARKERS SHALL BE INSTALLED WITH AN APPROVED EPOXY.
 - A BLUE REFLECTORIZED RAISED PAVEMENT MARKER (TYPE II B-B) SHALL BE SET 6' OFF CENTERLINE OF ROADWAY OR PAVEMENT STRIP ON THE ADJACENT SIDE OF ALL FIRE HYDRANTS.
 - SPACING OF RAISED PAVEMENT MARKERS TYPE II A-A, TYPE II C-R AND TYPE I-C:
 - IN STORAGE BAYS AND TRANSITIONS TO STORAGE BAYS D=5' O.C.
 - IN CURVES D=20' O.C.
 - IN NORMAL ROADWAY D=40' O.C.
 - ALL MARKINGS SHALL HAVE A UNIFORM CROSS-SECTION, AND THE DENSITY AND QUALITY OF THE MARKINGS SHALL BE UNIFORM THROUGHOUT THEIR THICKNESS.
 - PAVEMENT MARKINGS, BUTTONS AND RAISED PAVEMENT MARKERS THAT ARE NOT IN ALIGNMENT OR SEQUENCE, AS SHOWN IN THE DRAWINGS OR STATED IN THE PROJECT'S SPECIFICATIONS SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.



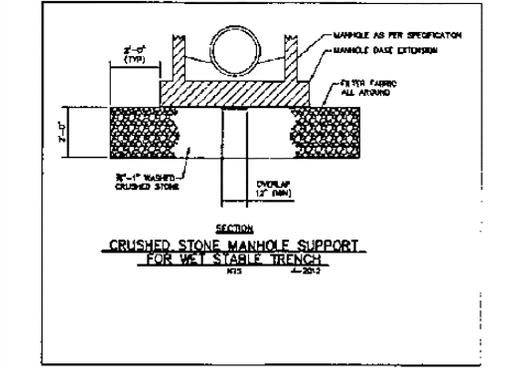
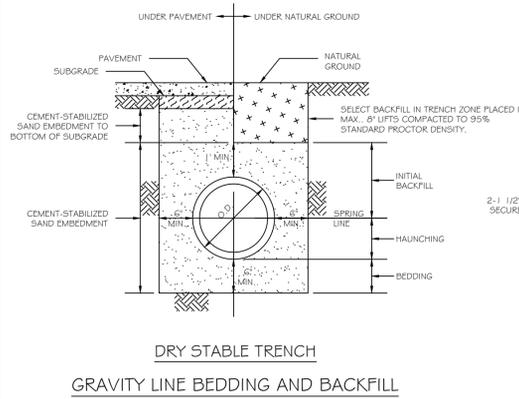
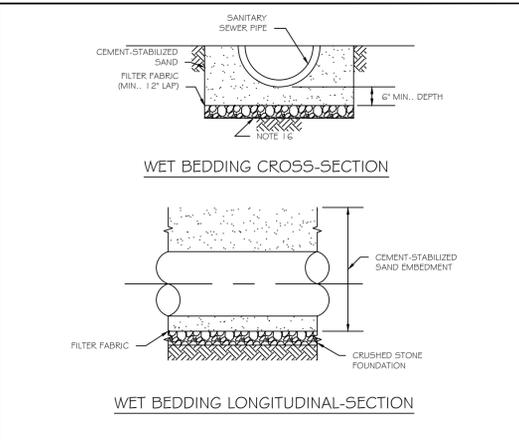
PERMANENT PAVEMENT MARKING DETAILS

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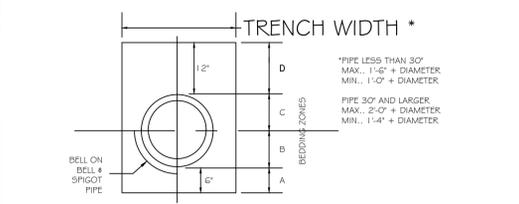
SANITARY SEWER CONSTRUCTION NOTES

1. FINISHED ELEVATION ON SANITARY MANHOLE RIMS SHALL BE THREE (3) INCHES ABOVE FINISHED GRADE IN UTILITY EASEMENTS. IF THE MANHOLE IS LOCATED ADJACENT TO A PUBLIC STREET, THE FINAL ELEVATION SHALL BE TWO (2) INCHES ABOVE THE TOP OF THE CURB OR TWO (2) INCHES ABOVE THE CENTERLINE OF THE STREET FOR STREETS WITH NO PERIMETER CURB (TOP OF CURB SHOULD EQUAL CENTERLINE OF STREET).
2. WATER LINES AND SANITARY SEWER LINES SHALL BE INSTALLED IN SEPARATE TRENCHES, PER ITEM EIGHT (8) BELOW.
3. POLYVINYL CHLORIDE (PVC) SHALL BE IN ACCORDANCE WITH ASTM D2241, SDR 26 FOR ALL DEPTHS UNLESS OTHERWISE NOTED ON THE CONSTRUCTION PLANS. SANITARY SEWER LINE SHALL BE THE COLOR GREEN.
4. ALL PVC PIPE (ALL TYPES SDR/DR WALL THICKNESS TO BE USED) SHALL HAVE RUBBER GASKET EQUIPPED BELL AND SPIGOT JOINTS CONFORMING TO ASTM D3212. THE GASKET MATERIAL SHALL CONFORM TO ASTM F477. SOLVENT WELDED JOINTS WILL NOT BE APPROVED FOR CITY SANITARY SEWER LINES.
5. ALL DUCTILE IRON PIPE SHALL BE 150 PSI WITH EIGHT (8) MIL BLACK VIRGIN POLYETHYLENE WRAP AS SPECIFIED IN ANSI A21.5/AWWA C105.
6. SANITARY SEWER MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL AND STANDARD DETAILS, LATEST REVISION. CONTRACTOR TO FURNISH TEST PLUGS AND RISERS. ALL SANITARY SEWER LINES TO BE AIR TESTED.
7. SANITARY SEWER TRENCHES WITHIN OR UNDER ONE (1) FOOT OF PROPOSED OR FUTURE PAVEMENT TO BE BACKFILLED WITH CEMENT-STABILIZED SAND BACKFILL (1.1 SACKS OF CEMENT PER TON OF SAND) TO THE BOTTOM OF THE SUBGRADE. BEDDING, HAUNCHING AND INITIAL FILL SHALL BE CEMENT-STABILIZED SAND FOR GRAVITY SANITARY SEWERS AND BANK SAND FOR FORCE MAIN SANITARY SEWERS.
8. WATER LINE/NEW SANITARY SEWER LINE SEPARATION. WHEN NEW SANITARY SEWERS ARE INSTALLED, THEY SHALL BE INSTALLED NO CLOSER THAN NINE (9) FEET IN ALL DIRECTIONS. SANITARY SEWERS THAT PARALLEL WATER LINES SHALL BE INSTALLED IN SEPARATE TRENCHES. WHEN NINE (9) FEET OF SEPARATION CANNOT BE MAINTAINED, THEN THE FOLLOWING GUIDELINES APPLY (AT ALL TIMES WATER AND SANITARY CROSSINGS OR SEPARATIONS SHALL CONFORM TO TCEQ REQUIREMENTS):
9. WHEN THE SANITARY SEWER PARALLELS A WATER LINE, THE SANITARY SEWER SHALL BE CONSTRUCTED OF CAST IRON OR PVC MEETING ASTM SPECIFICATIONS WITH THE PRESSURE RATING FOR BOTH THE PIPE AND JOINTS OF 150 PSI. THE VERTICAL SEPARATION SHALL BE A MINIMUM OF TWO (2) FEET BETWEEN THE OUTSIDE DIAMETERS OF THE PIPE AND THE HORIZONTAL SEPARATION SHALL BE A MINIMUM OF FOUR (4) FEET BETWEEN THE OUTSIDE DIAMETERS OF THE PIPE. THE SANITARY SEWER LINE SHALL BE LOCATED BELOW THE WATER LINE.
10. WHEN A SANITARY SEWER CROSSES A WATER LINE AND THE SANITARY SEWER LINE IS CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC WITH A MINIMUM PRESSURE RATING OF 150 PSI; AN ABSOLUTE MINIMUM DISTANCE OF SIX (6) INCHES BETWEEN THE OUTSIDE DIAMETERS SHALL BE MAINTAINED. THE SANITARY SEWER LINE SHALL BE LOCATED BELOW THE WATERLINE WHEN POSSIBLE AND ONE (1) LENGTH OF THE SANITARY SEWER PIPE SHALL BE CENTERED ON THE WATER LINE. SEE GENERAL CONSTRUCTION NOTES SHEET 2, SANITARY SEWERS NOTES 28-35 FOR MORE DETAIL.
11. WHEN A SANITARY SEWER LINE CROSSES UNDER A WATER LINE AND THE SANITARY SEWER IS CONSTRUCTED OF ABS TRUSS PIPE, SIMILAR SEMI-RIGID PLASTIC COMPOSITE PIPE, CLAY PIPE OR CONCRETE PIPE WITH GASKETED JOINTS, A MINIMUM OF TWO (2) FEET OF SEPARATION SHALL BE MAINTAINED. THE INITIAL BACKFILL SHALL BE CEMENT-STABILIZED SAND (1.1 SACKS OF CEMENT PER 1 TON OF SAND) FOR ALL SECTIONS OF SANITARY SEWER WITHIN NINE (9) FEET OF THE WATER LINE. SEE GENERAL CONSTRUCTION NOTES SHEET 2, SANITARY SEWERS NOTES 28-35 FOR MORE DETAIL.
12. WHEN A SANITARY SEWER CROSSES OVER A WATER LINE, ALL PORTIONS OF THE SANITARY SEWER WITHIN NINE (9) FEET OF THE WATER LINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC PIPE WITH A PRESSURE RATING OF AT LEAST 150 PSI USING APPROPRIATE ADAPTERS. IN LIEU OF THIS PROCEDURE THE NEW WATERLINE MAY BE ENCASED IN A JOINT OF 150 PSI CLASS PIPE AT LEAST EIGHTEEN (18) FEET LONG AND A MINIMUM OF TWO (2) NOMINAL SIZES LARGER THAN THE NEW WATERLINE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT INTERVALS OF FIVE (5) FEET WITH SPACERS OR BE FILLED TO THE SPRING LINE WITH WASHED SAND. THE ENCASEMENT PIPE SHOULD BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR WITH AN APPROVED MANUFACTURER SEAL. SEE GENERAL CONSTRUCTION NOTES SHEET 2, SANITARY SEWERS NOTES 28-35 FOR MORE DETAIL.
13. FOR ALL PVC PIPE, USE MANHOLE WATER STOP GASKET AND CLAMP ASSEMBLY AT MANHOLE CONNECTIONS. CLAMP SHALL BE STAINLESS STEEL MATERIAL.
14. SANITARY SEWER MANHOLES SHALL BE STANDARD TYPE, UNLESS OTHERWISE NOTED. TOP OF RIMS OF ALL SANITARY SEWER MANHOLES SHALL BE AT OR ABOVE THE 100-YEAR BASE FLOOD ELEVATION AND HAVE STAINLESS STEEL INFLOW PROTECTORS UNDER THE COVERS. FOR MANHOLES LOCATED IN THE 100-YEAR FLOOD PLAIN, VENT AND SEAL THE MANHOLE COVERS. SECTIONS OF PRECAST MANHOLES SHALL BE JOINED WITH "RAM NEK" GASKET MATERIAL OR AS APPROVED BY THE CITY OF MANVEL.
15. SANITARY SEWER LINES LOCATED IN OTHER AREAS NOT SPECIFIED IN ITEM 7 SHALL BE BACKFILLED ABOVE THE INITIAL BACKFILL WITH CEMENT-STABILIZED SAND OR SELECT BACKFILL MATERIAL WITH A PI BETWEEN TWENTY (20) AND FORTY (40).
16. IF WET SAND IS ENCOUNTERED IN THE FIELD, USE SPECIAL BEDDING. A MINIMUM OF 2' OF CRUSHED STONE WILL BE REQUIRED UNDER MANHOLES LOCATED IN WET BEDDING SITUATIONS. A MINIMUM OF 1' OF CRUSHED STONE WILL BE REQUIRED UNDER PIPES.
17. SANITARY SEWERS CROSSING UTILITIES OTHER THAN WATER SHALL HAVE A MINIMUM CLEARANCE OF SIX (6) INCHES.
18. ALL PRECAST CONCRETE MANHOLES SHALL HAVE THE TOP ADJUSTMENT CONSTRUCTED OF PRECAST PCC RINGS, SEALED WITH NON-SHRINK GROUT INSIDE AND OUTSIDE, AND BETWEEN EACH SECTION AND MANHOLE COVERS.
19. ALL SANITARY SEWER MANHOLE COVERS SHALL INCLUDE THE WORDS "SANITARY SEWER" AND "CITY OF MANVEL" AND INCLUDE THE CITY OF MANVEL SEAL. ALL MANHOLE COVERS SHALL HAVE A MINIMUM DIAMETER OF THIRTY-TWO (32) INCHES, AS SHOWN IN THE DETAIL ON THIS SHEET.
20. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. DURING THE COURSE OF ANY AND ALL CLEARING, GRUBBING, FILL, GRADING, EXCAVATION OR OTHER CONSTRUCTION, CONTRACTOR SHALL ENSURE THAT STORM SEWER DRAINAGE PATHWAYS ARE MAINTAINED AND REMAIN OPEN TO ENSURE POSITIVE DRAINAGE AND THAT SUCH CONVEYANCES ARE NOT IMPEDED OR BLOCKED IN ANY WAY. STORM SEWER INLETS SHALL BE PROTECTED FROM ENTRY OF SILT, TRASH, DEBRIS AND ANY SUBSTANCES DELETERIOUS TO THE STORM SEWER SYSTEM AND/OR WATERWAYS RECEIVING STORM WATER RUNOFF. CONTRACTOR SHALL, AT COMPLETION OF WORK, FILL LOW SPOTS AND GRADE ALL RIGHTS-OF-WAY AND UTILITY EASEMENTS AND RE-GRADE/RESTORE DITCHES AS NECESSARY TO MAINTAIN AND/OR ESTABLISH POSITIVE DRAINAGE.
21. ALL PUBLIC SANITARY SEWER SHALL BE TELEVISED PRIOR TO THE 2-YEAR WARRANTY PERIOD FOR FINAL ACCEPTANCE.

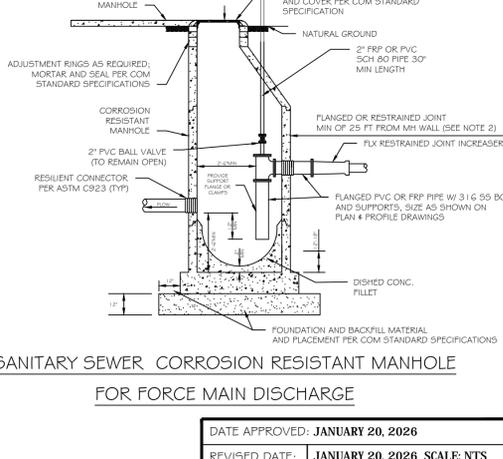
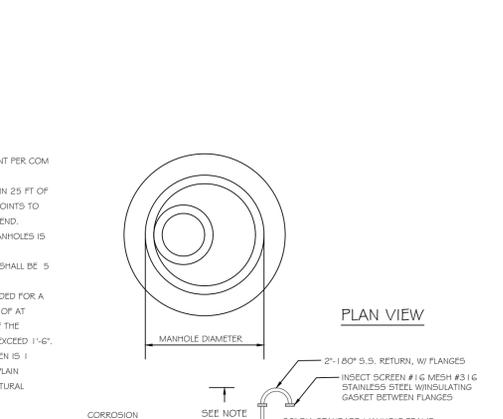
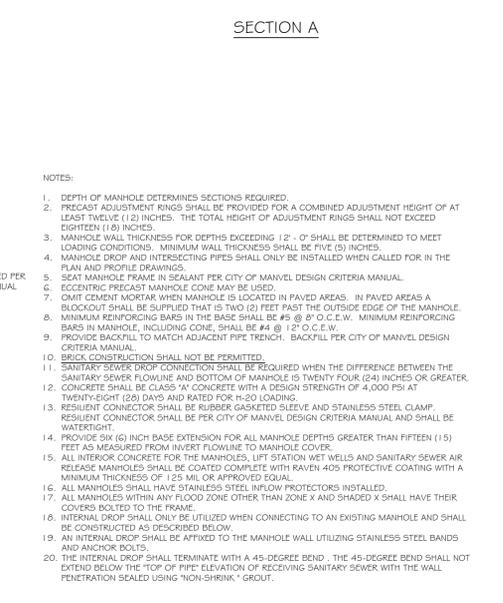
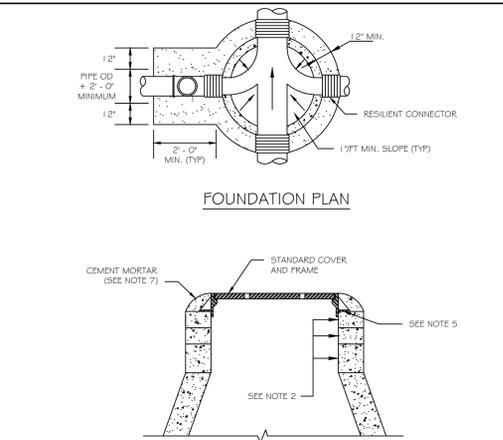
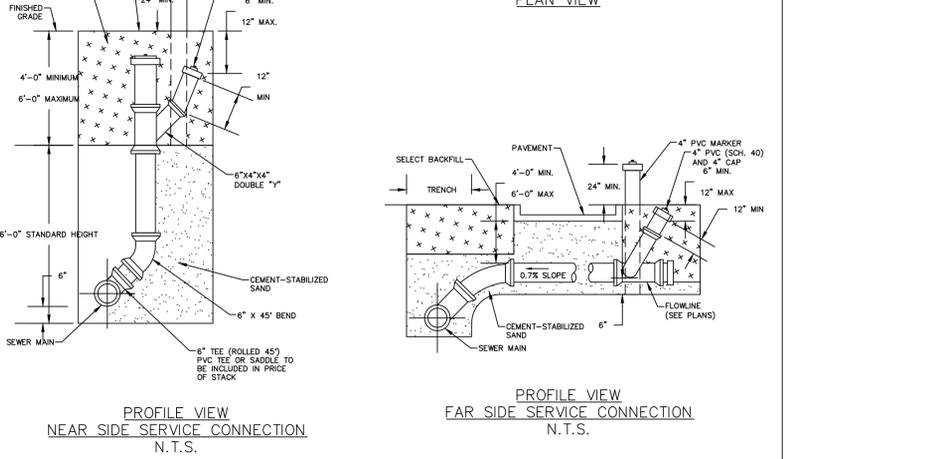
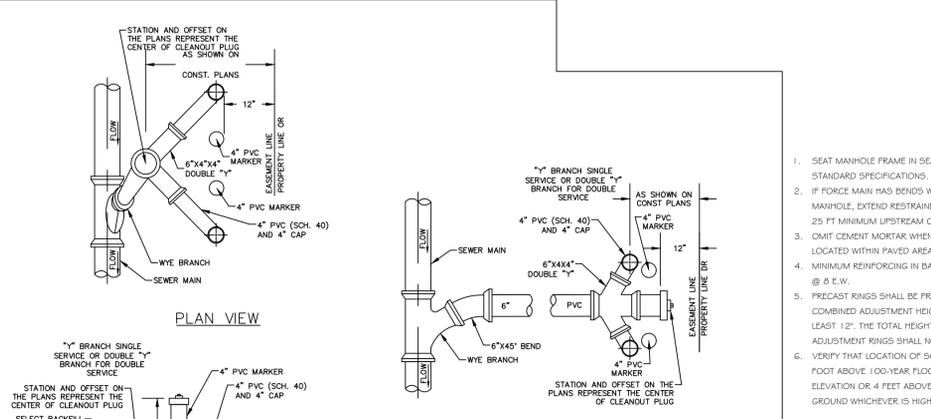
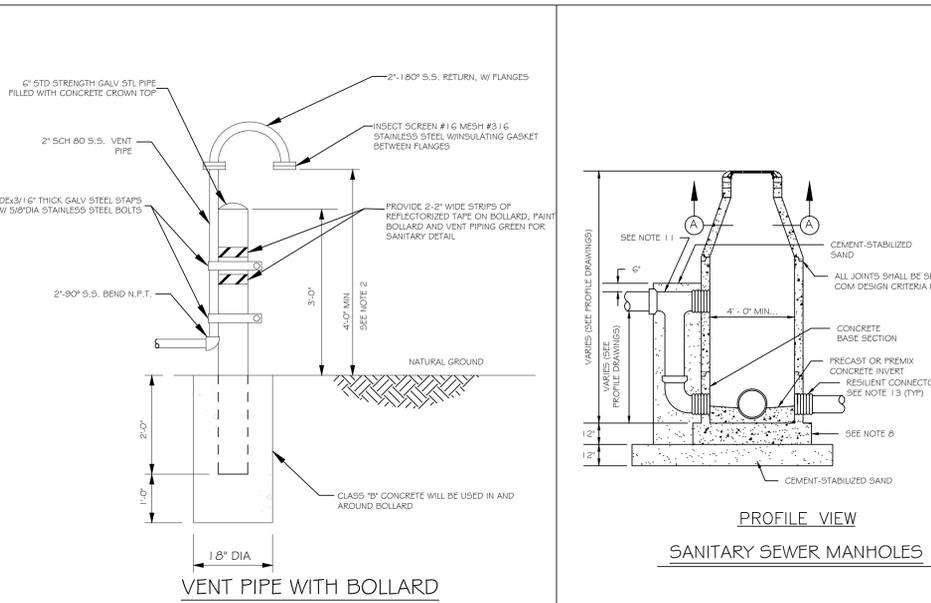
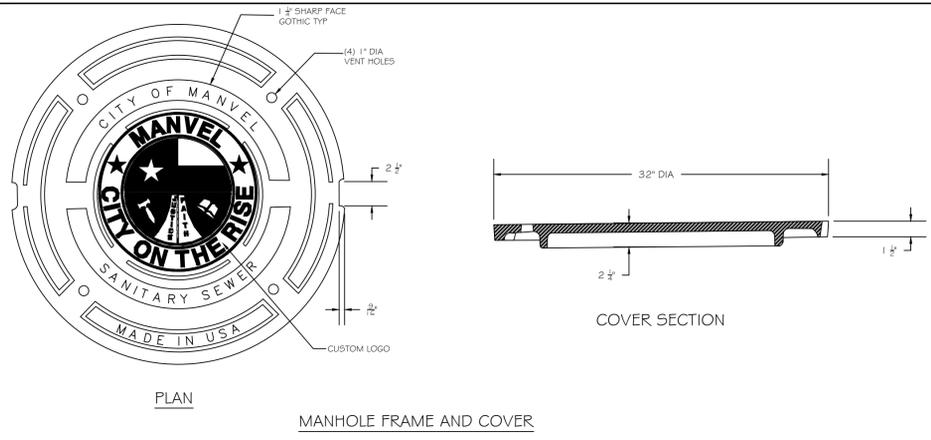


PIPE MATERIAL	BEDDING ZONE			
	A	B	C	D
CAST IRON	B5	B5	B5	EF
DUCTILE IRON (PRESSURE)	B5	B5	B5	EF
DUCTILE IRON (GRAVITY)	C5	C5	C5	EF
PVC (PRESSURE PIPE)	B5	B5	B5	EF
PVC (GRAVITY PIPE)	C5	C5	C5	EF
STEEL	B5	B5	B5	EF

B5-BANK SAND
 AB-AGGREGATE BEDDING (WET CONDITIONS ONLY)
 ES-SELECT EARTH PLACED SAME DAY PIPE IS LAID
 EF-EARTH FILL PLACED NEXT DAY (OR LATER) AFTER PIPE IS LAID
 CS-CEMENT STABILIZED SAND



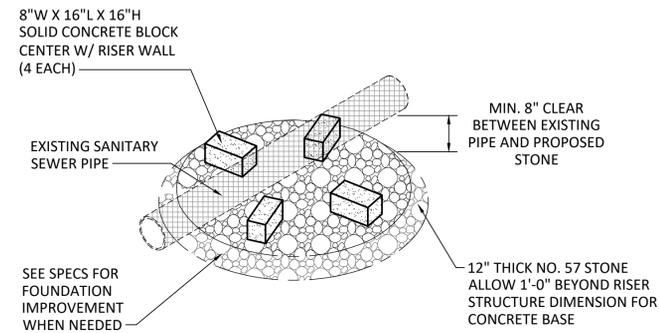
ORDINARY TRENCH EMBEDMENT & BACKFILL DETAIL



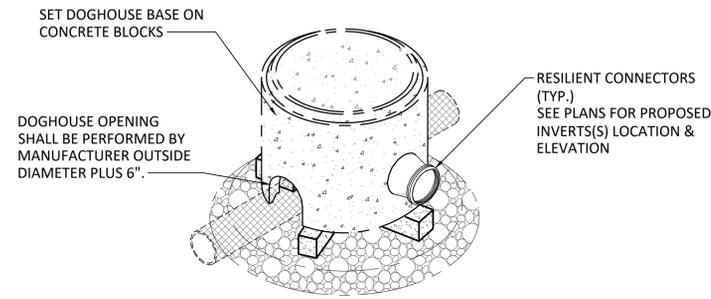
DATE APPROVED: JANUARY 20, 2026
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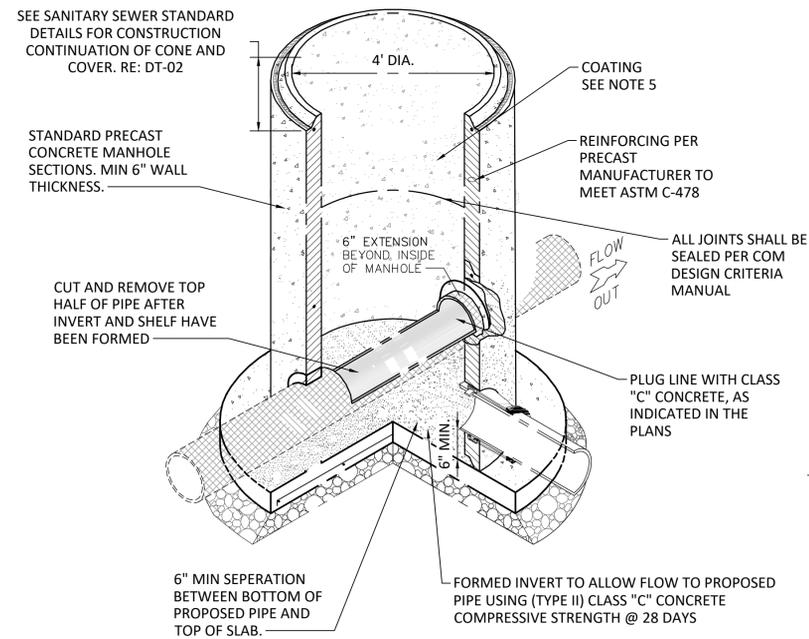
SANITARY SEWER STANDARD DETAILS 1 OF 2



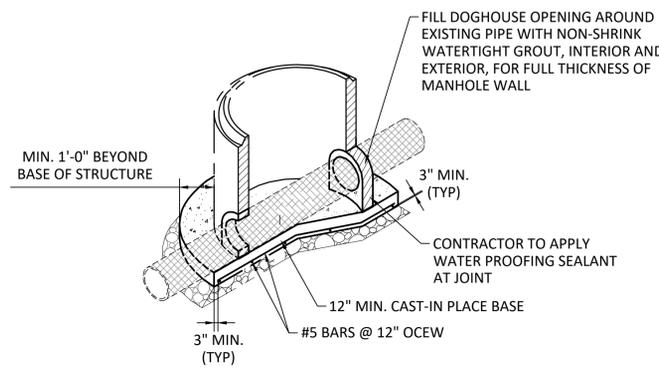
BASE ISOMETRIC VIEW



RISER ISOMETRIC VIEW



INVERT SECTION VIEW

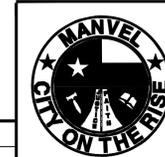


FOUNDATION SECTION VIEW

DOGHOUSE MANHOLE DETAIL

NOTES:

1. WHEN CONSTRUCTING THE MANHOLE OVER EXISTING PIPE, CARE SHALL BE TAKEN TO NOT DISTURB PIPE GRADE, EMBEDMENT, OR ALIGNMENT. THE EXISTING SEWER SHALL BE SUPPORTED FROM ABOVE WITH SLINGS DURING ALL PHASES OF CONSTRUCTION. SLINGS ARE TO BE REMOVED ONLY AFTER CONCRETE WITHIN THE STRUCTURE HAS CURED.
2. THE BASE MAY BE A PRECAST SECTION, BUT ADDITIONAL EXCAVATION TO SLIDE IN PRECAST SECTION WILL BE COMPLETED AT THE CONTRACTOR'S OWN EXPENSE. CONTRACTOR TO COMPLETE EXCAVATION NECESSARY TO ACCOMMODATE PLACEMENT OF PRECAST BASE WITHOUT DAMAGING EXISTING PIPE.
3. CONTRACTOR MUST HAVE BYPASS PUMP EQUIPMENT AVAILABLE IN CASE THE EXISTING PIPE IS DAMAGED AND FLOW NEEDS TO BE DIVERTED TO COMPLETE NECESSARY REPAIRS.
4. CONCRETE BASE MUST BE POURED AGAINST WOODDED FORMA IN A SINGLE POUR WITH A SULFATE RESISTANT CONCRETE (TYPE II) THAT HAS A CLASS C COMPRESSIVE STRENGTH.
5. FOR INTERIOR COATING OF MANHOLE, SEE SPECIFICATION 09 96 01.
6. VACUUM TESTING SHALL BE COMPLETE PRIOR TO COATING.
7. BACKFILL COMPACTED CEMENT STABILIZED SAND TO 95% MAX. DRY DENSITY, PER ASTM D 698, MIN. 2' AROUND THE MANHOLE AND UP TO 2' FROM THE TOP OF THE MANHOLE.
8. CEMENT STABILIZED SAND CAN BE USED IN LIEU OF NO. 57 STONE FOR THE 12" BASE.

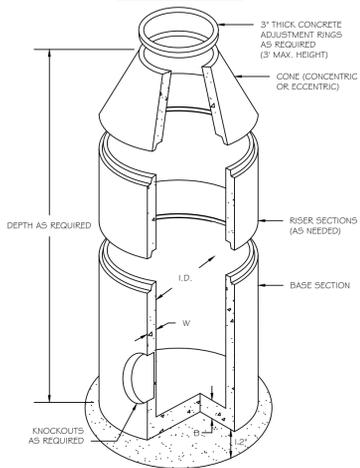


SANITARY SEWER
STANDARD DETAILS 2 OF 2

DATE APPROVED: JANUARY 20, 2026
REVISED DATE: JANUARY 20, 2026 SCALE: NTS

PROJECT NUMBER: DATE SUBMITTED: SHEET:
11 OF 16

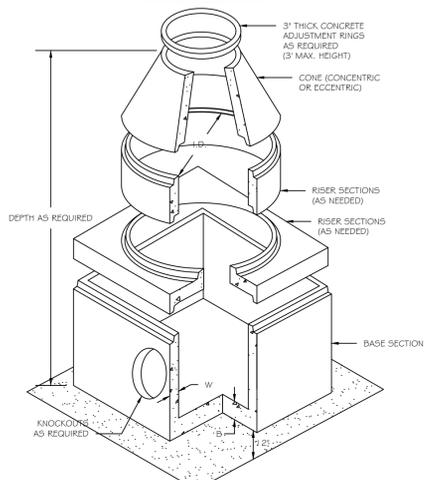
DIMENSIONS AND WEIGHTS			
ID SIZE (IN)	W (IN)	B (IN)	RISER WT/LF (LB)
48	5	6	65.8
60	6	8	130.0
72	7	8	181.1
96	9	8	309.0



CONCRETE MANHOLE

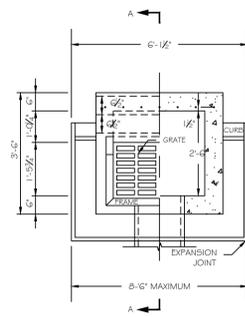
- NOTES:
- LIFTING INSERTS AS REQUIRED.
 - ALL JOINTS SHALL BE SEALED WITH RAM-NECK OR APPROVED EQUAL.
 - MANHOLES TO BE PLACED ON 1" OF CEMENT-STABILIZED SAND.
 - CONCRETE DESIGN STRENGTH SHALL BE 4000 PSI AT 28 DAYS, RATED FOR H-20 LOADING.
 - FOR USE WITH PIPE 72" DIAMETER AND SMALLER ONLY.

DIMENSIONS AND WEIGHTS			
ID SIZE (IN)	W (IN)	B (IN)	RISER WT/LF (LB)
48	5	6	65.8
60	6	8	130.0
72	7	8	181.1
96	9	8	309.0

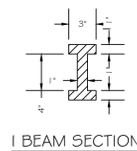


CONCRETE JUNCTION BOX

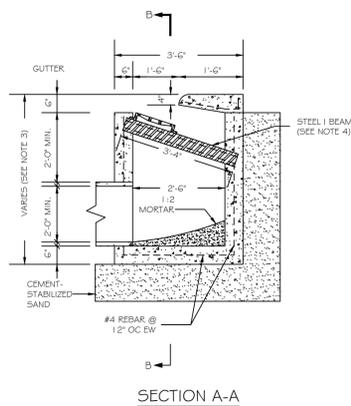
- NOTES:
- LIFTING INSERTS AS REQUIRED.
 - ALL JOINTS SHALL BE SEALED WITH RAM-NECK OR APPROVED EQUAL.
 - MANHOLES TO BE PLACED ON 1" OF CEMENT-STABILIZED SAND.
 - CONCRETE DESIGN STRENGTH SHALL BE 4000 PSI AT 28 DAYS, RATED FOR H-20 LOADING.
 - WIDTH VARIES ACCORDING TO PIPE SIZE.



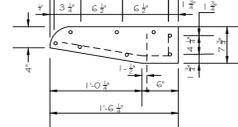
HALF PLAN HALF HORIZ. SECTION



I BEAM SECTION

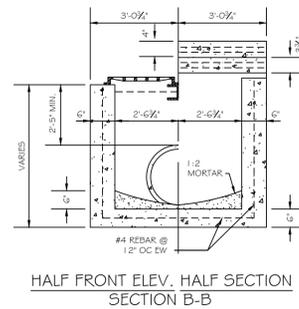


SECTION A-A

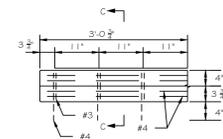


SECTION C-C
TYPE B AND B-B INLET

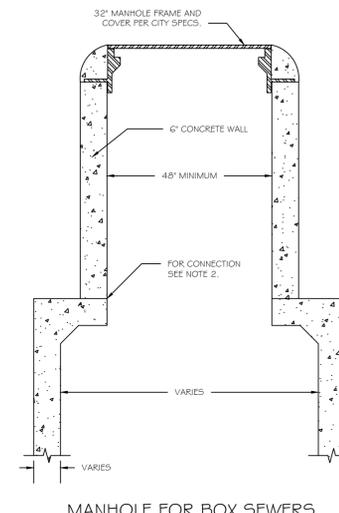
- NOTES:
- USE STANDARD CAST IRON FRAME AND GRATES.
 - LEADS SHALL LEAVE INLET AT LOCATION AND GRADE REQUIRED.
 - DIMENSION VARIES BASED ON PIPE DIAMETER AND WALL THICKNESS.
 - CENTER STEEL BEAM ON INLET AND CAST WALLS AS SHOWN (B-B INLET ONLY).
 - TYPE B AND B-B INLETS ARE FOR RESIDENTIAL USE ONLY.



HALF FRONT ELEV. HALF SECTION
SECTION B-B

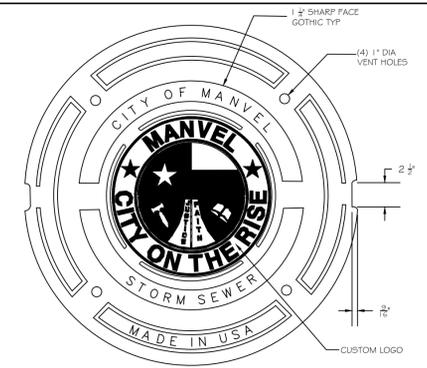


INLET TOP
HALF FRONT ELEVATION

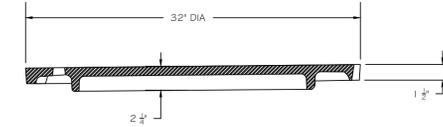


MANHOLE FOR BOX SEWERS

- NOTE:
- 1" INLET GRATE MAY BE USED IN PLACE OF MANHOLE COVER.
 - CONNECT MANHOLE TO TOP BY USING KEYWAY, DOWELING OR PRECAST JOINT.

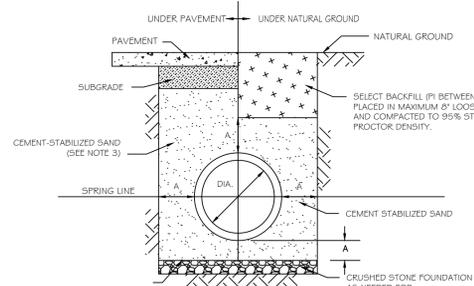


PLAN



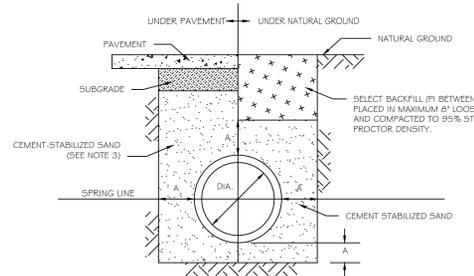
COVER SECTION

MANHOLE FRAME AND COVER



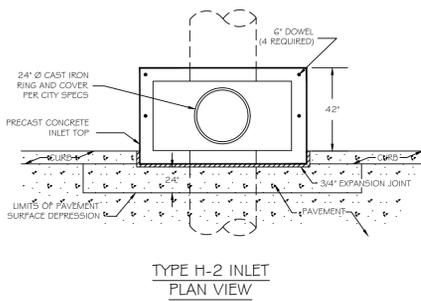
UNSATISFACTORY SOIL CONDITIONS

A	STORM SEWER DIAMETER
0'	36" OR LESS
12"	42" OR GREATER

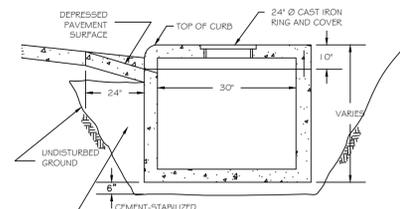


SATISFACTORY SOIL CONDITIONS
BEDDING AND BACKFILL

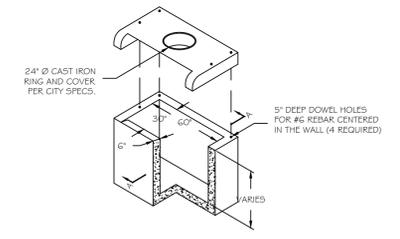
- NOTES:
- THE SATISFACTORY SOIL CONDITIONS METHOD SHALL BE USED FOR STORM SEWER PIPE WHERE THE SOIL CONDITIONS ARE AS FOLLOWS:
 - STRATA FROM THE SPRING LINE TO 3 FT BELOW THE FLOWLINE OF THE PIPE CONSIST OF NON-WATERBEARING COHESIVE SOILS HAVING A SHEAR STRENGTH OF 1000 PSF OR GREATER.
 - NO WET SAND STRATA EXIST IN AREA FROM 1 FT ABOVE THE TOP OF THE PIPE TO 3 FT BELOW THE FLOWLINE.
 - FOR ALL OTHER SOIL CONDITIONS USE THE DETAIL FOR UNSATISFACTORY CONDITIONS SHOWN ABOVE.



TYPE H-2 INLET
PLAN VIEW

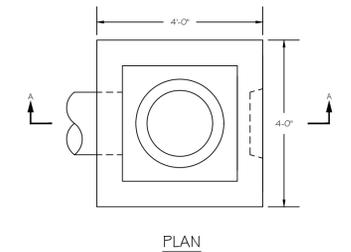


SECTION A-A
TYPE H-2 INLET
CROSS SECTION

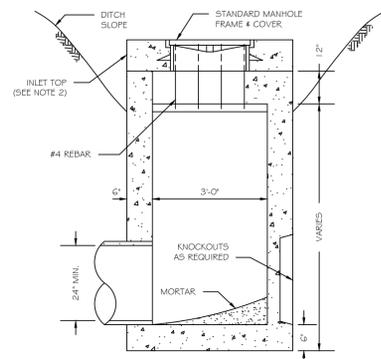


ISOMETRIC VIEW
TYPE H-2 INLET

- NOTES:
- H-2 TYPE 1 LENGTH = 5'-0"; H-2 TYPE 2 LENGTH 1'-0'-0".
 - THIN WALL KNOCK-OUTS OR THRU HOLES FOR PIPE PER JOB REQUIREMENTS.
 - REFER TO PAVING DETAIL SHEET FOR INSTALLATION OF H-1 TYPE 1 5'-0" CURB INLET.
 - INLET WALLS MAY BE EXTENDED USING PRECAST RISER SECTION.
 - INLET TOPS SHALL BE SECURED TO THE INLET WALL USING #6 DOWELS DRILLED AND GROUTED A MINIMUM DEPTH OF 3" INTO THE INLET WALL.
 - INLET BACKFILL SHALL BE CEMENT-STABILIZED SAND TO THE TOP OF THE INLET FIRST STAGE.
 - GRADE GO, #4 REINFORCEMENT BARS TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.
 - GROUT ALL EXPOSED LIFT HOLES.



PLAN

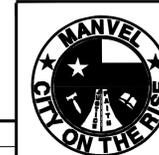


SECTION A-A
TYPE "E" INLET

- NOTES:
- USE #4 REBAR IN THROAT OPENING AT 6" CENTERS.
 - CONNECT INLET TO TOP BY USING KEYWAY, DOWELING OR PRECAST JOINT.

STORM SEWER CONSTRUCTION NOTES:

- STORM SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF MANVEL DESIGN CRITERIA MANUAL AND STANDARD DETAILS, LATEST REVISIONS.
- ALL STORM SEWER PIPE SHALL BE REINFORCED CONCRETE PIPE (RCP), ASTM C-76, CLASS III, TONGUE AND GROOVE, UNLESS OTHERWISE NOTED AND APPROVED BY THE CITY.
- REINFORCED CONCRETE STORM SEWER (PIPE, BOX, ETC.) SHALL BE INSTALLED, BEDDED AND BACKFILLED IN CONFORMITY WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL AND STANDARD DETAILS. STORM SEWER INSTALLED UNDER PROPOSED PAVEMENT SHALL BE BACKFILLED WITH CEMENT-STABILIZED SAND (1.1 SACKS OF CEMENT PER TON OF SAND, TO THE BOTTOM OF THE SUBGRADE. STORM SEWER INSTALLED UNDER EXISTING PAVEMENT SHALL BE BACKFILLED WITH CEMENT-STABILIZED SAND TO THE BOTTOM OF THE PAVEMENT.
- CONCRETE FOR INLETS AND MANHOLES SHALL BE CLASS A AND SHALL HAVE A MINIMUM STRENGTH OF 4000 PSI AT 28 DAYS AND HAVE REINFORCING BARS TO MEET AASHTO H20-44 LOADING REQUIREMENTS.
- ALL MANHOLES SHALL BE ADJUSTED TO FINISHED GRADE.
- MINIMUM STORM SEWER SIZE IS TWENTY-FOUR (24) INCH INSIDE DIAMETER. MINIMUM ROADSIDE DITCH CULVERT IS EIGHTEEN (18) INCH INSIDE DIAMETER OR APPROVED EQUAL.
- ALL STORM SEWER MANHOLES SHALL INCLUDE THE WORDS "STORM SEWER" AND "CITY OF MANVEL." MANHOLE COVERS SHALL CONFORM TO THE STANDARD DETAILS SHOWN ON THIS SHEET.
- CONTRACTOR SHALL PROVIDE A MINIMUM OF SIX (6) INCHES OF CLEARANCE AT ALL UTILITY CROSSINGS WITH STORM SEWER.
- ALL INLETS, AT ROADWAY PAVEMENT IN RESIDENTIAL DEVELOPMENTS, SHALL BE TYPE "B", "B-B", TYPE "C" OR "H-2". ALL INLETS IN COMMERCIAL DEVELOPMENTS, AND/OR ON MAJOR THOROUGHFARES SHALL BE TYPE "H-2" ONLY, UNLESS OTHERWISE APPROVED BY THE CITY OF MANVEL.
- ALL DISTURBED AREAS IN DRAINAGE EASEMENTS OR DETENTION PONDS, SHALL BE HYDRO-MULCHED.
- CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. DURING THE COURSE OF ANY AND ALL CLEARING, GRUBBING, FILL, GRADING, EXCAVATION OR OTHER CONSTRUCTION, THE CONTRACTOR SHALL ENSURE THAT STORM DRAINAGE PATHWAYS REMAIN OPEN AND ARE MAINTAINED TO ENSURE POSITIVE DRAINAGE. CONVEYANCES ARE NOT TO BE IMPEDED OR BLOCKED IN ANY WAY. STORM SEWER INLETS SHALL BE PROTECTED FROM ENTRY OF SILT, TRASH, DEBRIS AND ANY OTHER SUBSTANCES THAT MAY DAMAGE THE STORM SEWER SYSTEM AND/OR WATERWAYS RECEIVING STORM WATER RUNOFF. AT COMPLETION OF WORK, THE CONTRACTOR SHALL FILL ALL LOW SPOTS, GRADE ALL RIGHTS-OF WAY, AND UTILITY EASEMENTS, AND REGRADE/RESTORE DITCHES AS NECESSARY TO MAINTAIN AND/OR ESTABLISH POSITIVE DRAINAGE.
- ALL PUBLIC STORM SEWER SHALL BE TELEVISED AT THE ONE-YEAR WARRANTY PERIOD PRIOR TO FINAL ACCEPTANCE.

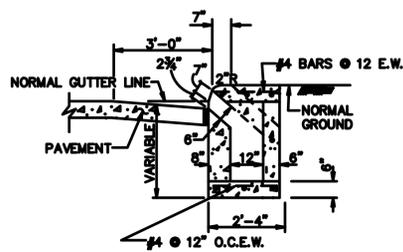


STORM SEWER
STANDARD DETAILS 1 OF 2

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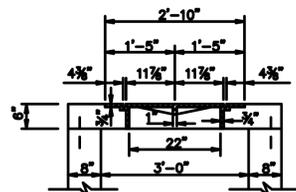
WALLS TO BE 6" REINF. CONC. OR MAY BE MADE OF BRICK WITH 8" WALL, IF SO USE STRAIGHT WALL IN BACK WITH 6" REINF. CONC SLAB TOP



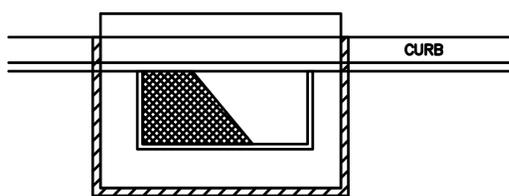
SECTION A-A

NOTE:

THE WALLS MAY BE BUILT WITH BRICK AND ALL TOP SLABS DOWELED INTO THE BRICK WALLS WITH # 4 X 8" @ 12"

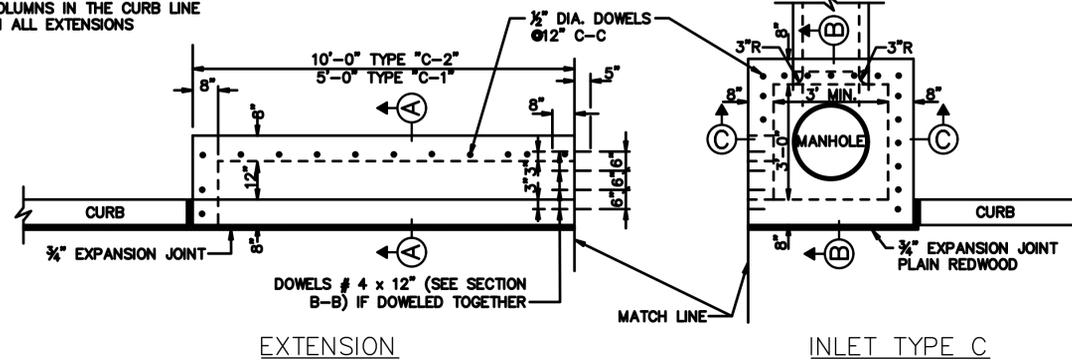


SECTION C-C



PLAN VIEW - CURB INLET

NOTE:
TYPE "C-2" PROVIDE A CENTER 6" X 6" COLUMNS IN THE CURB LINE BETWEEN ALL EXTENSIONS



EXTENSION

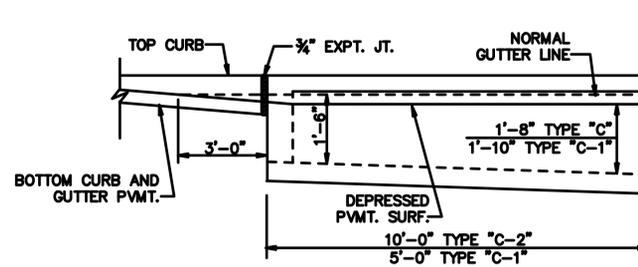
INLET TYPE C

GENERAL NOTE

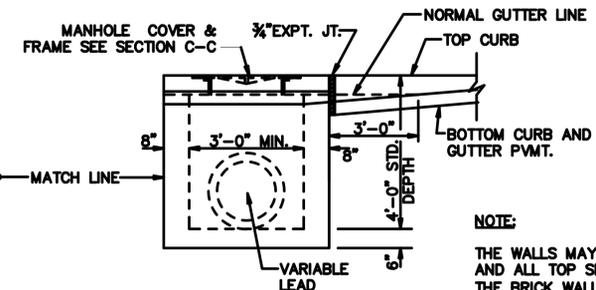
- TYPE "C" INLET WITH ONE EXTENSION (5'-0" LONG)
- TYPE "C-1" INLET WITH DOUBLE EXTENSION (10'-0" LONG)
- TYPE "C-2" INLET WITH ONE EXTENSION ON EACH SIDE
- TYPE "C-3" INLET WITH NO EXTENSION

NOTES:

1. FOR TYPE "C-2A" INLETS PROVIDE A CENTER 6" X 6" COLUMNS IN THE CURB LINE BETWEEN ALL EXTENSIONS.
2. WALLS TO BE 6" IF BUILT WITH REINFORCED CONCRETE. WHEN BUILT WITH BRICK WALL, USE STRAIGHT WALL IN BACK WITH 6" REINFORCED CONCRETE TOP SLABS DOWELED INTO BRICK WALLS WITH # 4 X 8" @ 12".

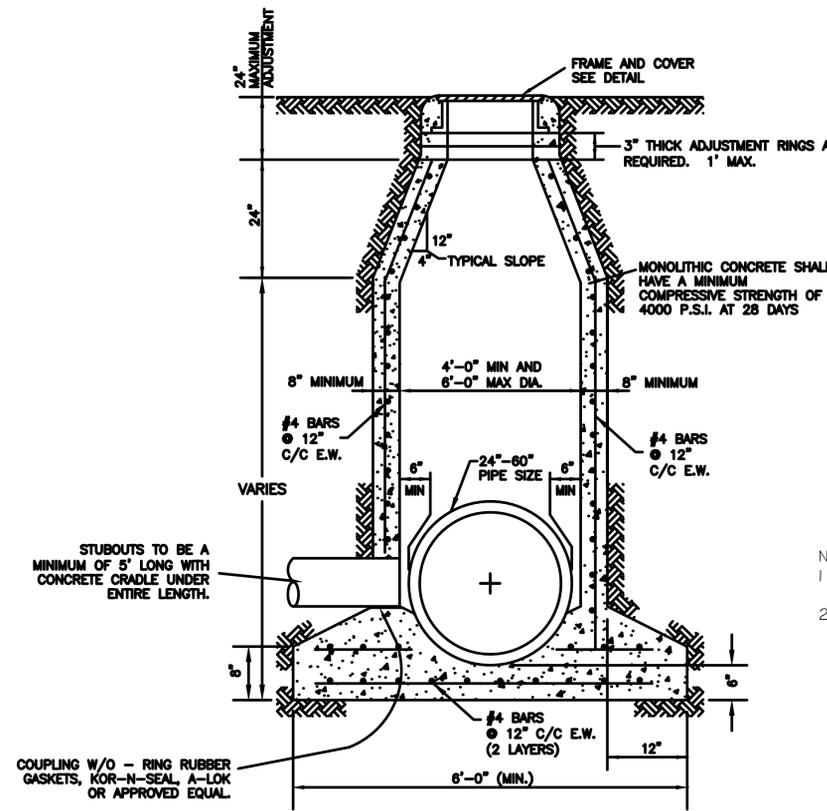


PLAN



NOTE:

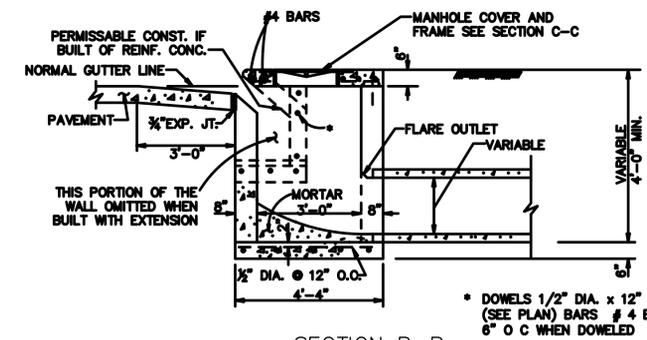
THE WALLS MAY BE BUILT WITH BRICK AND ALL TOP SLABS DOWELED INTO THE BRICK WALLS WITH # 4 X 8" @ 12"



TYPE "C" CAST-IN-PLACE STORM SEWER MANHOLE

NOTE

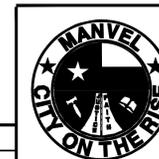
1. CONCRETE SHALL BE A MONOLITHIC POUR.
2. 1" THICK 1.5 SACK CEMENT STABILIZED SAND BACKFILL COMPACTED TO 95% MAX. DRY DENSITY WITH MIN. 100 PSI COMPRESSIVE STRENGTH AROUND MANHOLE COMPACTED IN 8" LIFTS.



SECTION B-B

NOTE

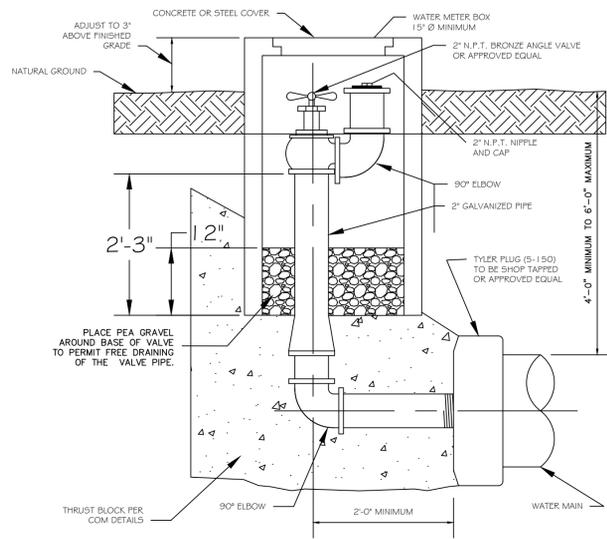
1. ONLY CAST-IN-PLACE OR PRE-CAST MANHOLES SHALL BE USED.
2. NO BRICKS OF ANY KIND WILL BE ALLOWED IN CONSTRUCTION OF MANHOLES OR INLETS
3. FOR ALL PRE-CAST AND POURED-IN-PLACE INLETS AND JUNCTION BOXES, CENTER DOUBLE- SEALING GASKET IN WALL AND GROUT COMPLETELY AROUND DUAL WALL PVC PIPE. GROUT SHALL BE SMOOTH AND FLUSH WITH INNER AND OUTER WALL WHEN ENTERING AT AN ANGLE TO THE WALL OR THROUGH THE CORNER OF AN INLET OR JUNCTION BOX, THE GASKET MAY BE OMITTED.
4. ALL CEMENT STABILIZED SAND BACKFILL SHALL CONFORM TO SPECIFICATION CEMENT STABILIZED SAND - SECTION 02252.



STORM SEWER
STANDARD DETAILS 2 OF 2

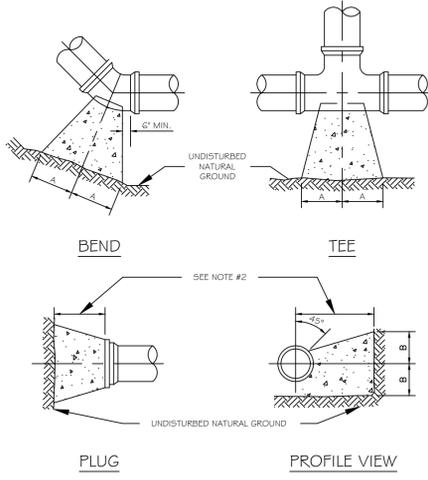
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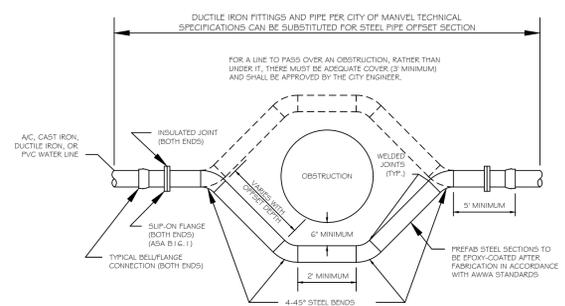
BLOW-OFF VALVE ASSEMBLY

SIZE	90° BEND		45° BEND		22.5° BEND		TEES		PLUGS	
	A	B	A	B	A	B	A	B	A	B
4"	10"	7"	6"	7"	3"	7"	7"	7"	10"	20"
6"	15"	10"	8"	10"	6"	8"	10"	12"	10"	21"
8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	28"
10"	28"	17"	14"	17"	10"	15"	16"	20"	14"	30"
12"	29"	21"	16"	21"	11"	18"	18"	24"	16"	41"
14"	35"	24"	18"	24"	12"	20"	22"	27"	18"	45"
16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"



THRUST BLOCK

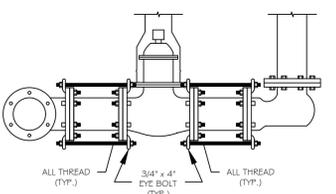
- NOTES:
- THRUST BLOCKS AT TRENCH FACE SHALL HAVE A MINIMUM BEARING SURFACE OF 1.0 SF AND THE LEAST DIMENSION SHALL BE NO SMALLER THAN 1.5 TIMES PIPE DIAMETER.
 - FROM THE BACK OF PIPE TO THE TRENCH WALL SHALL BE A MINIMUM OF 1'0" FOR PIPE DIAMETERS OF 1.0 INCHES AND LESS, AND A MINIMUM OF 2'4" FOR PIPE DIAMETERS OF 1.2 INCHES OR GREATER.
 - ALL CONCRETE SHALL BE CLASS "C" AS PER COM DESIGN CRITERIA MANUAL.



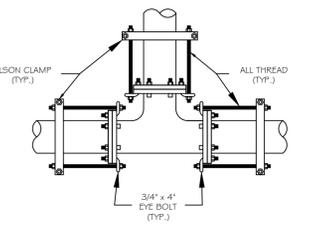
STEEL PIPE OFFSET SECTION

MINIMUM WALL THICKNESS FOR PIPE AND FITTINGS	TYPICAL STEEL SECTION FITTINGS
4"	0.250"
6"	0.250"
8"	0.325"
12"	0.375"

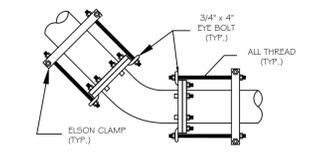
- ALL MATERIALS AND COATINGS SHALL BE IN ACCORDANCE WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL.
- RESTRAIN EXISTING PIPING BEYOND STEEL SECTION AS REQUIRED TO PREVENT MOVEMENT.
- INSULATED JOINT SHALL BE MADE UP USING INSULATING GASKETS, PLASTIC BOOT SHEETVES AND WASHERS OF INSULATING GASKET MATERIAL BACKED WITH STAINLESS STEEL WASHERS OR OTHER METHODS APPROVED BY THE CITY ENGINEER.
- NO FIELD FABRICATION OR INTERIOR COATING OF STEEL WATER PIPE OFFSETS ALLOWED.
- FOR PVC PIPE OFFSET SEE SHEET 2 OF 2 OF WATER DISTRIBUTION STANDARD DETAILS.



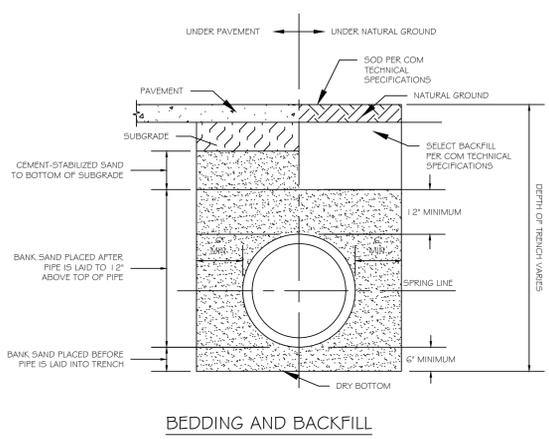
FIRE HYDRANT ASSEMBLY



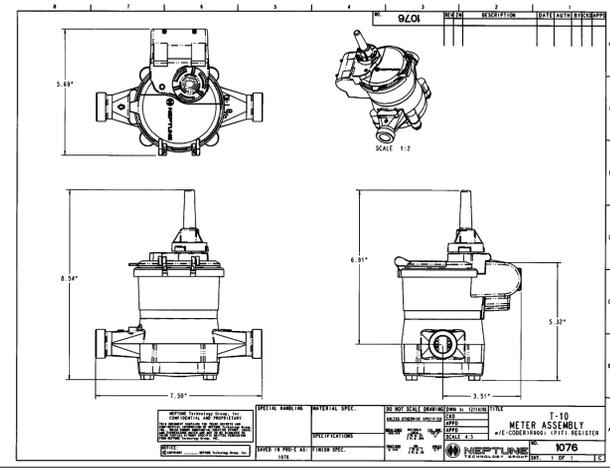
BEND FITTING ANCHORS



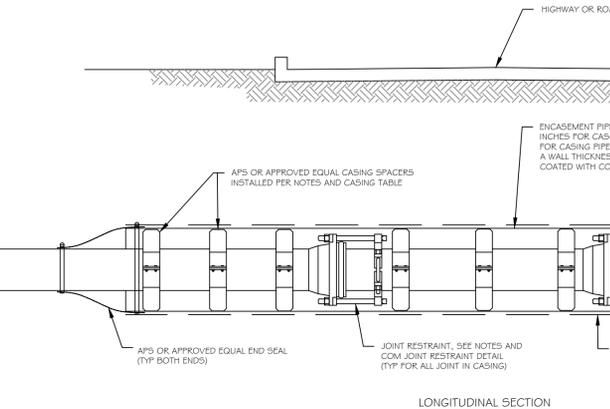
- NOTES:
- MEGA-LUGS MAY BE USED IN PLACE OF ELSON CLAMPS AND ALL THREAD TO RESTRAIN JOINTS.
 - ALL NUTS, WASHERS AND ALL THREAD SHALL BE STAINLESS STEEL.



BEDDING AND BACKFILL

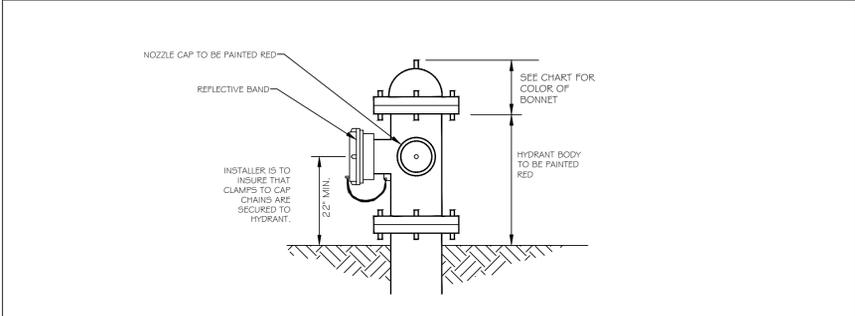
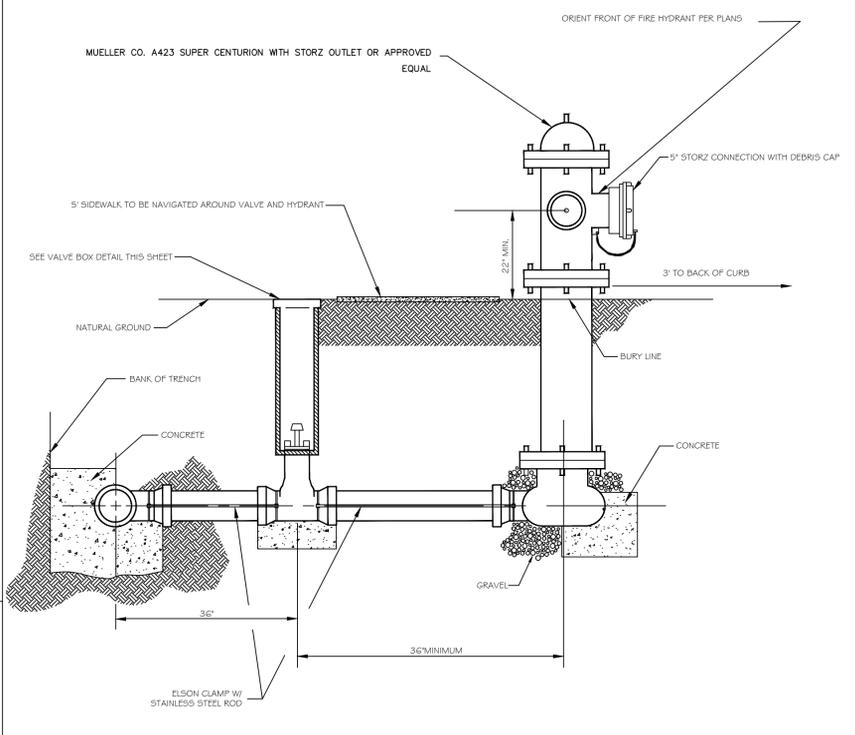


METER ASSEMBLY



LONGITUDINAL SECTION

- NOTES:
- SPACERS FOR CARRIER PIPE SHALL BE ADVANCE PRODUCTS AND SYSTEMS, INC., STAINLESS STEEL, NEOPRENE OR APPROVED EQUAL AND SHALL BE INSTALLED TO CENTER CARRIER PIPE WITHIN CASING WITH A MAX TOLERANCE OF 1/8" BETWEEN RUNNER AND CASING INSIDE AS WELL AS PREVENT THE CARRIER PIPE FROM RESTING ON THE BELLS WITHIN THE CASING. SEE CASING TABLE FOR SPACER DISTANCE AND NUMBER OF SPACERS.
 - CONTRACTOR TO TAKE INTO CONSIDERATION THE SIZE AND LIMITS OF PIPE RESTRAINTS WHEN ORDER AND INSTALLING CASING PIPE TO ALLOW FOR ADEQUATE CLEARANCE.
 - SPACERS TO BE PLACED A MIN OF 1" BACK FROM EACH JOINT THAT FALLS WITHIN CASING, A GREATER SET BACK MAY BE REQUIRED FOR LARGER PIPE. SEE CASING TABLE FOR ADDITIONAL INFO ON SPACING OF SUPPORTS.
 - WHEN INSTALLING GRAVITY PIPE WITH CASING CONTRACTOR SHALL TAKE INTO CONSIDERATION PIPE GRADE SO THAT THE SEWER PIPE MAINTAINS THE PROPER FALL.
 - JOINT RESTRAINTS ARE REQUIRED ON ALL JOINTS THAT FALL UNDER OR WITHIN 1.0' OF HIGHWAY CROSSINGS REGARDLESS OF PIPE MATERIAL, CAGED OR NOT.

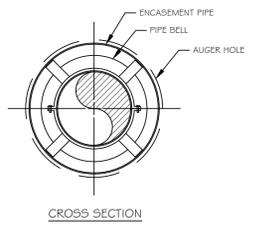


COLOR CODE

COLOR CODE (BONNETS)

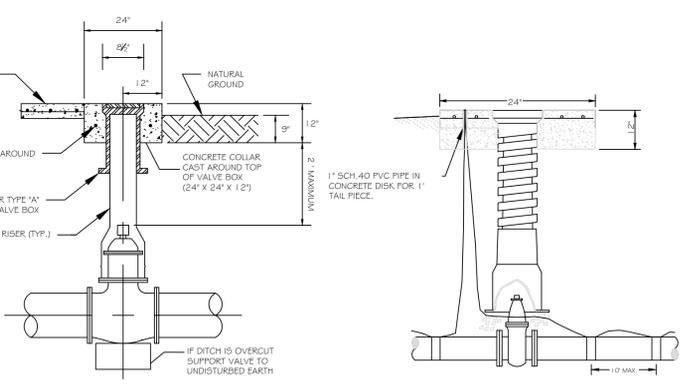
- MAIN SIZE**
- 4" RED
 - 6" JOHN DEERE YELLOW CODE NO. 225A138
 - 8" WHITE
 - 10"-20" JOHN DEERE GREEN CODE NO. 225A133
 - 24" ORANGE

NOMINAL PIPE SIZE DIA IN INCHES	CASING TABLE	
	CASING SIZE INSIDE DIA IN INCHES	MAX SKID SUPPORT SPACING IN FEET
4	6-10	4.7
6	10-12	6.3
8	14-16	7.4
10	16-18	8.5
12	18-20	9.6
15	20-22	11.0
18	24-26	12.0
21	28-30	12.0
24	31-33	12.0
27	34-36	12.0



CROSS SECTION

PIPE CASING DETAIL



VALVE BOX INSTALLATION

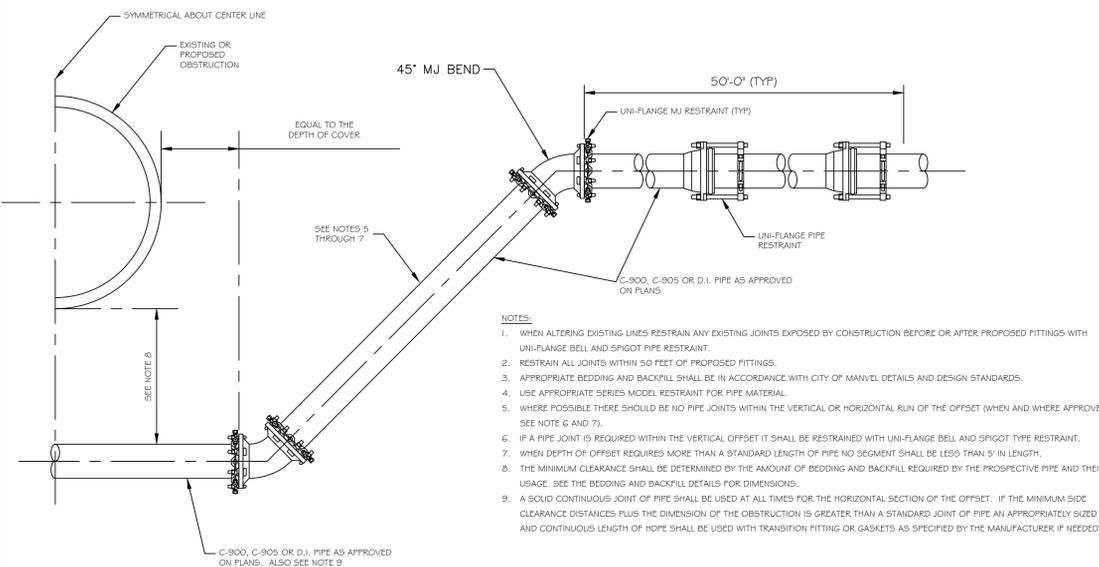
- ALL FLUSHING AND GATE VALVES TO BE MECHANICAL JOINT AWWA STANDARD COUNTER-CLOCKWISE OPENING WITH RESILIENT SEATS.



WATER DISTRIBUTION STANDARD DETAILS 1 OF 2

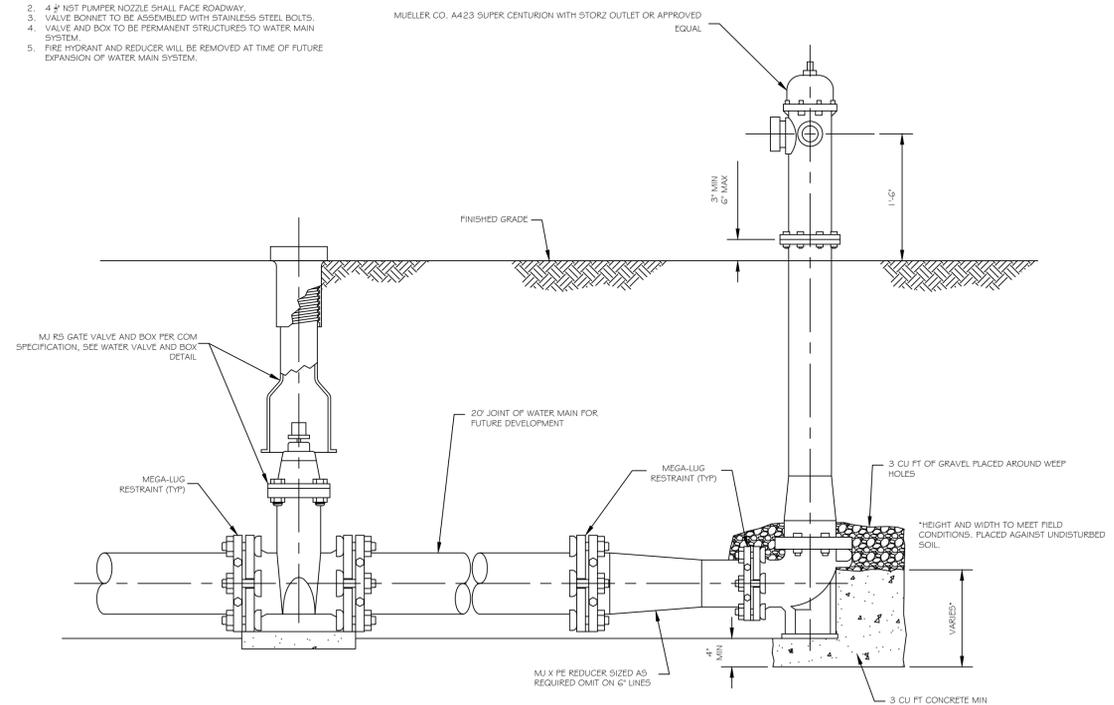
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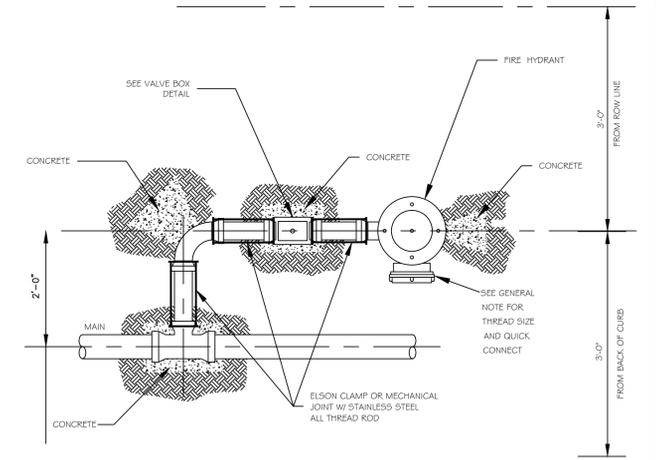


RESTRAINED MECHANICAL JOINT VERTICAL OFFSET
NTS

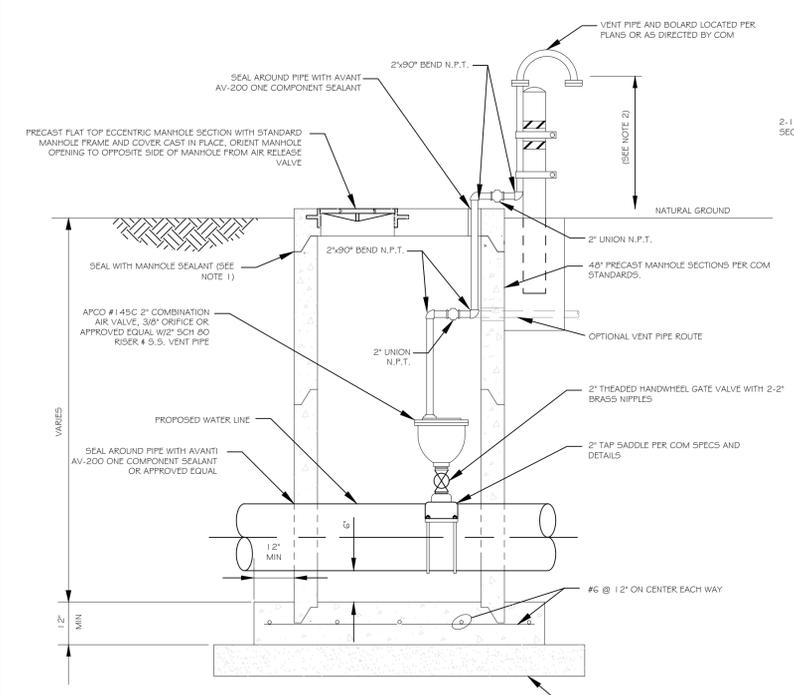
- NOTES:**
1. OIL SHALL BE PLACED IN HYDRANT AT THE TIME OF INSTALLATION.
 2. 4" NST PLUMPER NOZZLE SHALL FACE ROADWAY.
 3. VALVE BONNET TO BE ASSEMBLED WITH STAINLESS STEEL BOLTS.
 4. VALVE AND BOX TO BE PERMANENT STRUCTURES TO WATER MAIN SYSTEM.
 5. FIRE HYDRANT AND REDUCER WILL BE REMOVED AT TIME OF FUTURE EXPANSION OF WATER MAIN SYSTEM.



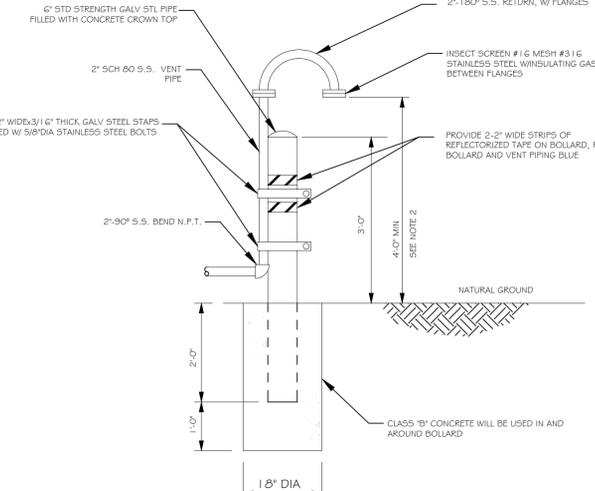
END OF LINE FIRE HYDRANT AND VALVE FOR FUTURE LINE EXTENSION
NTS



ALTERNATE FIRE HYDRANT - PLAN

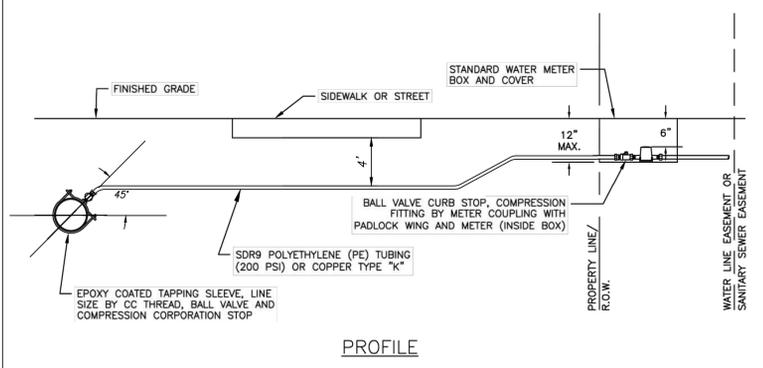


COMBINATION AIR RELEASE/AIR VACUUM VALVE ASSEMBLY DETAIL
NTS

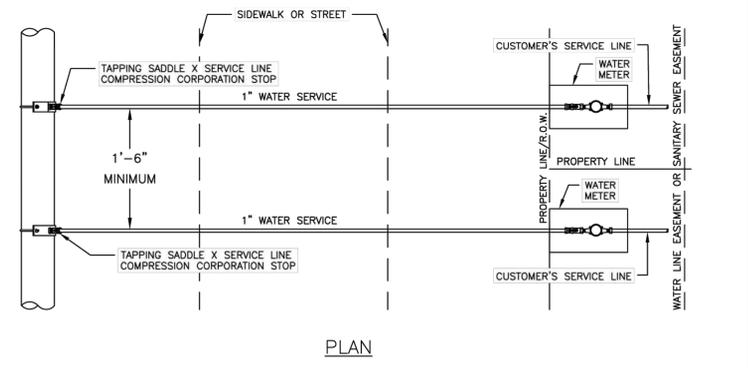


VENT PIPE WITH BOLLARD

- NOTES:**
1. PROVIDE RAM-NEK OR APPROVAL EQUAL BETWEEN PRECAST SEGMENTS OF THE MANHOLE.
 2. VERIFY THAT LOCATION OF SCREEN IS 1 FOOT ABOVE 100-YEAR FLOOD PLAIN ELEVATION OR 4 FEET ABOVE NATURAL GROUND WHICHEVER IS HIGHER.
 3. REFER TO PLAN AND PROFILE SHEETS FOR LOCATIONS OF AIR RELEASE VALVE AND MANHOLES.
 4. MANHOLE BASE SHALL BE A PRECAST SECTION WITH PROPER SIZED KNOCK OUTS FOR PROPOSED WATER LINE. SEAL AROUND WATER LINE AND MANHOLE AS DESCRIBED IN DETAIL.
 5. MANHOLE SHALL BE SET ON A MIN OF 1.2" COMPACTED CEMENT STABILIZED SAND BEDDING FOR DRY STABLE TRENCH, SEE CRUSHED STONE MANHOLE SUPPORT OR MANHOLE PILE SUPPORT FOR WET AND UNSTABLE CONDITIONS.



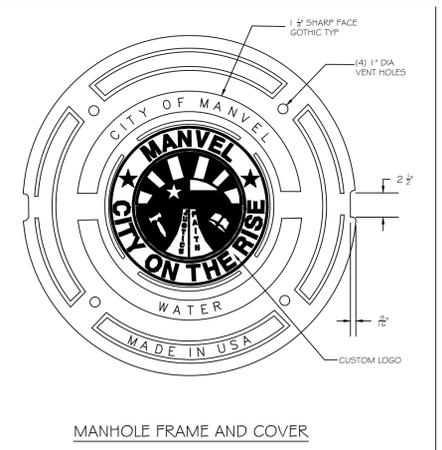
PROFILE



PLAN

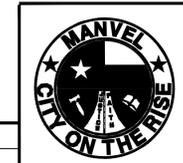
- NOTES:**
1. ONLY SINGLE SERVICE CONNECTIONS SHALL BE ALLOWED FOR WATER SERVICE CONNECTIONS.
 2. DOMESTIC WATER SERVICE LEADS SHALL BE 1" UNLESS OTHERWISE NOTED. SERVICE LEADS SHALL HAVE 2" SCHEDULE 40 P.V.C. SLEEVES FOR ROAD CROSSINGS. COMMERCIAL SERVICE LEADS SHALL BE 2" MINIMUM UNLESS OTHERWISE NOTED.
 3. WATER METER SHALL BE SIZED TO SERVICE LEAD UNLESS OTHERWISE NOTED.

WATER SERVICE CONNECTIONS



MANHOLE FRAME AND COVER

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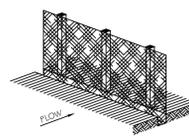
**WATER DISTRIBUTION
STANDARD DETAILS 2 OF 2**

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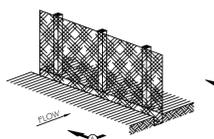


STEP 1:
SET POSTS AND EXCAVATE FOUR (4) INCH BY FOUR (4) INCH TRENCH UPSLOPE ALONG LINE OF POSTS (SEE NOTE 1).

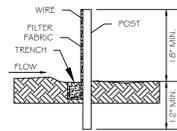
STEP 2:
SECURE WIRE FENCING TO POSTS (SEE NOTE 2).



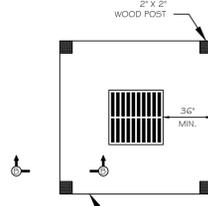
STEP 3:
ATTACH FILTER FABRIC MATERIAL TO WIRE FENCE AND EXTEND IT INTO TRENCH (SEE NOTE 3).



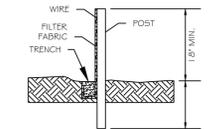
STEP 4:
BACKFILL AND COMPACT EXCAVATED SOIL (SEE NOTE 4).



SECTION "A" - "A"

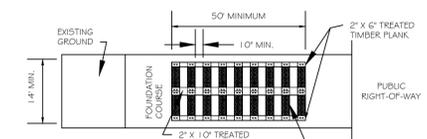
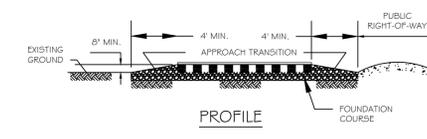


SECTION "B" - "B"



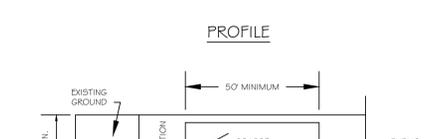
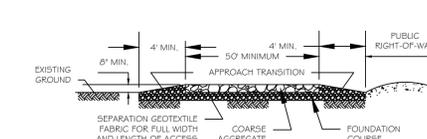
INLET PROTECTION TYPE I

- NOTES:
1. MAXIMUM POST SPACING SHALL BE FOUR (4) FEET. ADDITIONAL POSTS MAY BE ADDED AS NEEDED. POSTS SHALL BE PLACED A MINIMUM AT EACH CORNER AS SHOWN.
 2. PLACEMENT OF FILTER FABRIC BARRIER FROM INLET SHALL VARY ACCORDING TO SITE CONDITIONS. TYPICAL PLACEMENT SHALL BE A MINIMUM OF THIRTY-SIX (36) INCHES FROM INLET EDGE.



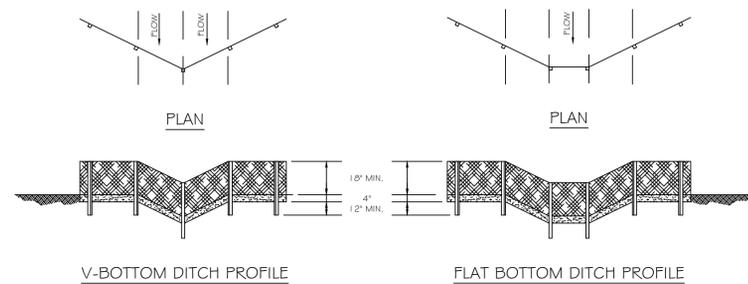
CONSTRUCTION ACCESS TYPE I

- NOTES:
1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN FIFTY (50) FEET.
 2. THICKNESS SHALL BE A MINIMUM OF EIGHT (8) INCHES.
 3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS AND EGRESS.
 4. THE TREATED TIMBER PLANKS SHALL BE #2 GRADE MINIMUM, AND SHOULD BE FREE FROM LARGE AND LOOSE KNOTS.
 5. THE TREATED TIMBER PLANKS SHALL BE ATTACHED TO THE RAILROAD TIES WITH 1/2" X 6" MINIMUM LAG BOLTS. OTHER FASTENERS MAY BE USED AS APPROVED BY THE CITY.
 6. APPROACH TRANSITION SHALL BE A MINIMUM OF EIGHT (8) INCHES IN DEPTH AND 6:1 SLOPE MINIMUM.
 7. FOUNDATION COURSE SHALL BE A MINIMUM OF SIX (6) INCHES. FOUNDATION COURSE MATERIAL SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL APPROVED BY THE CITY.
 8. ACCESS SHALL BE GRADED TO PREVENT RUN-OFF FROM LEAVING SITE, ALLOWING DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
 9. CONSTRUCTION ACCESS SHALL ADHERE TO CITY OF MANVEL SPECIFICATION G2020 - STABILIZED CONSTRUCTION ACCESS, ROADS, PARKING AND WASH AREAS.
 10. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION ACCESS, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
 11. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMMODATE TRUCK WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR TRUCK WASHING AREA.
 12. STABILIZED CONSTRUCTION ACCESS SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.



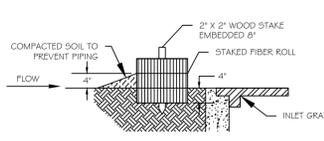
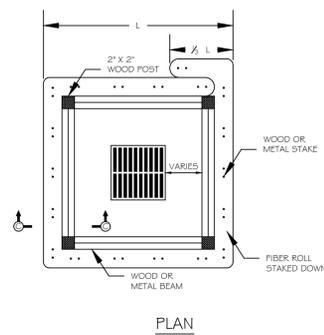
CONSTRUCTION ACCESS TYPE II

- NOTES:
1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN FIFTY (50) FEET.
 2. THICKNESS SHALL BE A MINIMUM OF EIGHT (8) INCHES.
 3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS AND EGRESS.
 4. APPROACH TRANSITION SHALL BE A MINIMUM OF EIGHT (8) INCHES IN DEPTH AND 6:1 SLOPE MINIMUM.
 5. FOUNDATION COURSE SHALL BE A MINIMUM OF SIX (6) INCHES. FOUNDATION COURSE MATERIAL SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL APPROVED BY THE CITY.
 6. ACCESS SHALL BE GRADED TO PREVENT RUN-OFF FROM LEAVING SITE.
 7. CONSTRUCTION ACCESS SHALL ADHERE TO CITY OF MANVEL SPECIFICATION G2020 - STABILIZED CONSTRUCTION ACCESS, ROADS, PARKING AND WASH AREAS.
 8. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION ACCESS, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
 9. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMMODATE TRUCK WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR TRUCK WASHING AREA.
 10. STABILIZED CONSTRUCTION ACCESS SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.



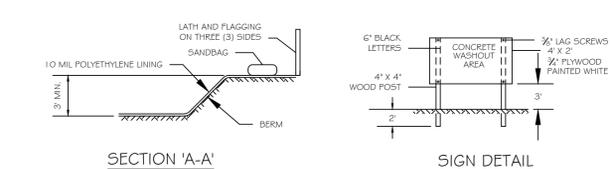
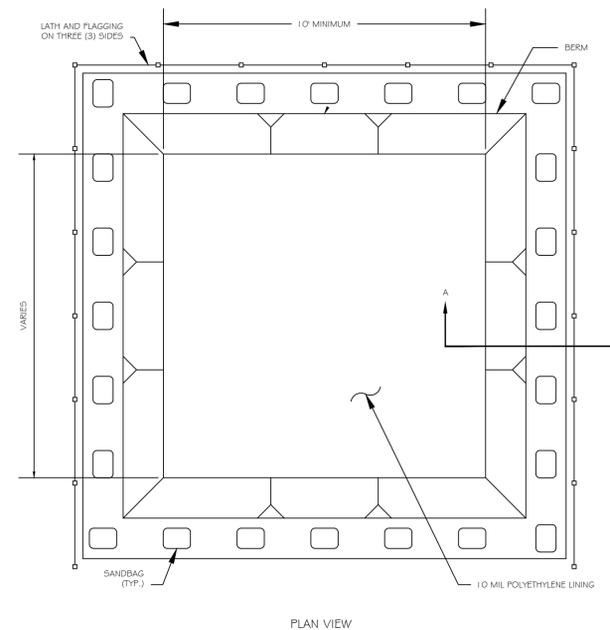
SILT FILTER FABRIC FENCE

- NOTES:
1. SET TWO (2) INCH BY TWO (2) INCH WOODEN STAKES EMBEDDED TWELVE (12) INCHES INTO GROUND. SPACING SHALL BE A MAXIMUM OF SIX (6) FEET APART FOR REINFORCED FILTER FABRIC FENCE AND A MAXIMUM OF THREE (3) FEET APART FOR NON-REINFORCED FILTER FABRIC FENCE.
 2. REINFORCED FILTER FABRIC FENCE SHALL HAVE WOVEN WIRE FENCE WHICH SHALL BE FASTENED SECURELY TO FENCE POSTS.
 3. FASTEN FILTER FABRIC FENCE AS FOLLOWS:
 - 3.1. REINFORCED FILTER FABRIC FENCE SHALL SECURELY FASTENED TO WOVEN WIRE FENCE WITH TIES SPACED EVERY TWENTY-FOUR (24) INCHES AT TOP AND MIDSECTION.
 - 3.2. NON-REINFORCED FILTER FABRIC FENCE SHALL BE FASTENED AT EVERY WOOD POST AT TOP AND MIDSECTION.
 4. MINIMUM HEIGHT OF FILTER FABRIC SHALL BE EIGHTEEN (18) INCHES ABOVE NATURAL GROUND AND A MAXIMUM OF THIRTY-SIX (36) INCHES ABOVE NATURAL GROUND.
 5. FILTER FABRIC SHALL EXTEND INTO THE FOUR (4) INCH BY FOUR (4) INCH TRENCH DOWN THE SIDE CLOSEST TO THE WOODEN POSTS, ACROSS THE BOTTOM OF THE TRENCH AND HALF WAY UP THE OPPOSITE SIDE.
 6. ALL INSTALLATIONS OF SILT FENCE SHALL BE IN ACCORDANCE WITH THE CITY OF MANVEL TECHNICAL SPECIFICATION SECTION G2005 - FILTER FABRIC SILT FENCE.
 7. METAL STAKES OR T-POSTS MAY BE USED IN LIEU OF WOOD POSTS.



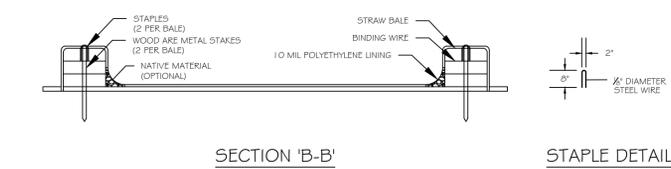
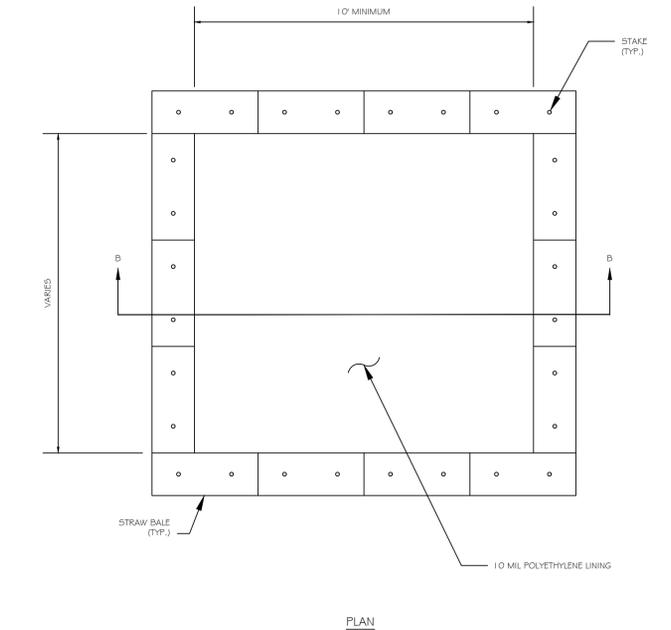
INLET PROTECTION TYPE II

- NOTES:
1. MAXIMUM POST SPACING SHALL BE FOUR (4) FEET. ADDITIONAL POSTS MAY BE ADDED AS NEEDED. POSTS SHALL BE PLACED A MINIMUM AT EACH CORNER AS SHOWN.
 2. PLACEMENT OF FIBER ROLL FROM INLET SHALL VARY ACCORDING TO SITE CONDITIONS. TYPICAL PLACEMENT SHALL BE TWENTY-FOUR (24) INCHES FROM INLET.
 3. FIBER ROLLS SHALL BE UTILIZED ONLY WHEN SITE CONDITIONS DO NOT PERMIT THE USE OF FILTER FABRIC BARRIER.
 4. IF UNDERLYING MATERIAL IS BASE OR OTHER HARD-PACKED MATERIAL, THEN FIBER ROLLS MAY BE PLACED ON HARD PACKED SURFACE AND WEIGHTED DOWN WITH GRAVEL BAGS.



CONCRETE WASHOUT AREA

- NOTES:
1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
 2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN THREE (3) FEET OF THE CONCRETE WASHOUT FACILITY.



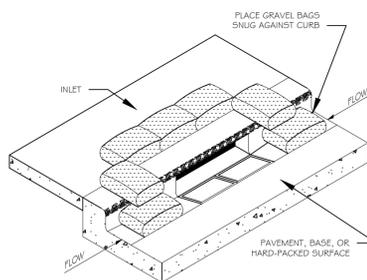
CONCRETE WASHOUT AREA

- NOTES:
1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
 2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN THREE (3) FEET OF THE CONCRETE WASHOUT FACILITY.

- SC STABILIZED CONSTRUCTION EXIT
- FF FILTER FABRIC SILT FENCE
- RFB REINFORCED FILTER FABRIC BARRIER

- IPB-I INLET PROTECTION BARRIER TYPE I
- IPB-II INLET PROTECTION BARRIER TYPE II
- IPB-III INLET PROTECTION BARRIER TYPE III
- CW-A CONCRETE WASHOUT AREA - ABOVE GROUND
- CW-B CONCRETE WASHOUT AREA - BELOW GROUND

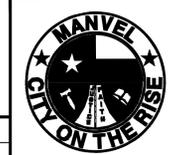
SWPPP SYMBOLS



INLET PROTECTION BARRIER TYPE III

- NOTES:
1. IPB TYPE III SHALL BE USED FOR EXISTING OR PROPOSED STAGE II TYPE 'B', 'B-B' AND '1'-2' INLETS ONLY.
 2. PLACE GRAVEL BAG IN THE GUTTER ON EACH SIDE OF THE INLET OPENING. GRAVEL BAG SHALL BE PLACED TIGHTLY AGAINST THE FACE OF CURB.
 3. PLACE GRAVEL BAGS AT BACK OF CURB ALONG INLET.
 4. DO NOT PLACE BAGS TO BLOCK THROAT OF INLET, UNLESS DIRECTED BY THE ENGINEER AND APPROVED BY THE CITY OF MANVEL.

DATE APPROVED: JANUARY 20, 2026
REVISED DATE: JANUARY 20, 2026 SCALE: NTS

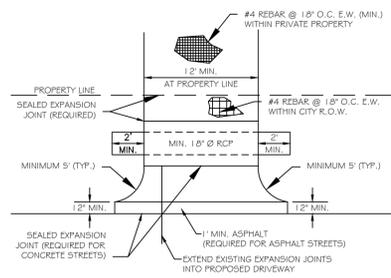


STORM WATER POLLUTION PREVENTION PLAN (SWPPP) STANDARD DETAILS

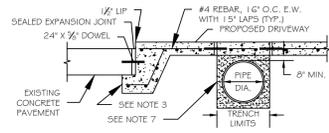
PROJECT NUMBER: DATE SUBMITTED: SHEET: 15 OF 16

**BARRICADE AND MISCELLANEOUS
CONSTRUCTION NOTES:**

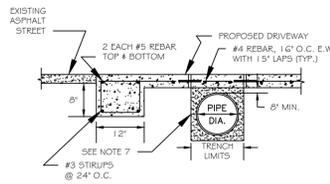
- BARRICADES SHALL BE CONSTRUCTED OF CLEAN SOUND LUMBER SURFACED ON TWO SIDES CUT TO THE NOMINAL DIMENSION SHOWN ON THESE DETAILS. BARRICADES SHALL BE PAINTED WITH TWO (2) COATS OF AN APPROVED BRAND OF WHITE PAINT TO PROVIDE THOROUGH COVERAGE AND A UNIFORM WHITE COLOR. THE PAINT FOR BARRICADE STRIPES SHALL BE AN APPROVED BRAND OF RED OR ORANGE AND WHITE PAINT APPLIED TO PROVIDE UNIFORM COLOR, AND THEY SHALL BE REFLECTORIZED.
- REFLECTORIZATION FOR BARRICADES OR SIGNS MAY BE BY MEANS OF APPROVED REFLECTIVE COATINGS ON THE SIGN BACKGROUND WHICH SHALL CONSIST OF EITHER GLASS BEADS ON PAINT, REFLECTIVE SHEETING, REFLECTIVE LIQUID, OR RETRO-DIRECTIVE REFLECTORS. THE RETRO-DIRECTIVE REFLECTORS MAY BE EITHER GLASS OR CRYSTAL PLASTIC REFLECTOR BUTTONS. ALL REFLECTING ELEMENTS SHALL REFLECT WHITE LIGHT, UNLESS OTHERWISE INDICATED IN THE DETAILS.
- ALL BARRICADES EXTENDING ACROSS MOVING LANES OR FOR DELINEATION THROUGH A PROJECT SHALL BE SUPPLEMENTED BY LIGHTS, PLACED SO AS NOT TO INTERFERE WITH THE VISIBILITY OF REFLECTOR BUTTONS OR REFLECTORIZED SURFACES. THESE LIGHTS SHALL BE MAINTAINED IN CONTINUOUS OPERATION FROM SUNSET TO SUNRISE AND SHALL BE OF THE FLASHING ELECTRIC TYPE, WITH THE RATE OF FLASHING BETWEEN SEVENTY (70) AND ONE HUNDRED-TWENTY (120) FLASHES PER MINUTE. FLASHING ELECTRIC LIGHTS SHALL NOT BE CONNECTED IN SERIES. ALL LIGHTS SHALL BE OF THE COLOR YELLOW.
- BARRICADE TYPE III SHALL BE TREATED WITH EIGHT POUND (8 LB.) PENTACHLOROPHENOL (OR SIMILAR TREATMENT ALLOWED BY AWPA) WOOD PRESERVATIVE AND PAINTED WITH A PRIME COAT CONSISTING OF SPAR VARNISH VEHICLE ALUMINUM PAINT, FOLLOWED WITH ONE (1) COAT OF EXTERIOR GRADE WHITE PAINT STRIPED WITH ALTERNATE DIAGONAL ORANGE OR RED REFLECTIVE STRIPES WHERE SPECIFIED.
- BARRICADES FOR CONSTRUCTION SHALL BE ALTERNATE ORANGE AND WHITE STRIPES SLOPING DOWNWARD AT AN ANGLE OF FORTY-FIVE DEGREES (45°) IN THE DIRECTION TRAFFIC IS TO PASS. BARRICADES USED OTHER THAN FOR CONSTRUCTION SHALL BE ALTERNATE RED AND WHITE STRIPES. THE ORANGE AND WHITE, AND RED AND WHITE MARKINGS SHALL NOT BE INTERMIXED IN THE SAME INSTALLATION AREA.
- PERMANENT BARRICADES SHALL HAVE RED AND WHITE STRIPING.
- TEMPORARY CONSTRUCTION BARRICADES SHALL HAVE ORANGE AND WHITE STRIPING.
- SIGNS FOR BARRICADES SHALL BE MADE FROM WOOD, HARDBOARD, METAL OR PLASTIC CONFORMING WITH THESE REQUIREMENTS:
 - METAL OR PLASTIC - SIGNS SHALL CONSIST OF STEEL, ALUMINUM ALLOY, OR PLASTIC WITH SUFFICIENT THICKNESS TO RETAIN RIGIDITY UNDER NORMAL CONDITIONS.
 - WOOD - SIGN STOCK SHALL BE TWO INCH (2") STOCK B # B GRADE, KILN-DRIED LUMBER, OR EQUAL, OR WATERPROOF RESIN-BONDED EXTERIOR GRADE PLYWOOD, DOUGLAS FIR PLYWOOD ASSOCIATION OR EQUAL. ALL WOODEN SIGNS CONSTRUCTED OF TWO (2) OR MORE BOARDS SHALL HAVE A ONE INCH (1") BY SIX INCH (6") CLEAT FASTENED TO THE BACK OF THE SIGN AT EACH END AND EXTENDING FULL DEPTH OF THE SIGN. IN ADDITION TO CLEATS, THE BOARDS SHALL BE FASTENED TOGETHER WITH ONE-HALF INCH (1/2") CORRUGATED FASTENERS SPACED AT NOT MORE THAN TWELVE INCH (12") CENTERS DRIVEN FROM THE BACK OF THE SIGN. IT IS RECOMMENDED THAT WOOD USED FOR SIGNS BE TREATED WITH EITHER CHROMATED ZINC CHLORIDE, WOLMAN SALTS OR PENTACHLOROPHENOL. ALL WOOD PRESERVATIVES SHALL BE OF A TYPE WHICH WILL PROHIBIT THE BLEEDING OF PRESERVATIVE THROUGH PAINT COATINGS.
 - HARDBOARD - SIGN STOCK SHALL BE TEMPERED DUOLUX, THREE-EIGHTHS INCH (3/8") NOMINAL THICKNESS, LAMINATED WITH WATERPROOF CASEIN GLUE, OR EQUAL.
- ALL SIGN LETTERING SHALL BE WELL-DEFINED, REFLECTIVE, OPEN ROUNDED TYPE CAPITAL LETTERS, AS APPROVED BY THE JOINT COMMITTEE ON UNIFORM TRAFFIC CONTROL DEVICES AND PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. DURING THE COURSE OF ANY AND ALL CLEARING, GRUBBING, FILL, GRADING, EXCAVATION OR OTHER CONSTRUCTION, CONTRACTOR SHALL ENSURE THAT STORM DRAINAGE PATHWAYS ARE MAINTAINED AND REMAIN OPEN TO ENSURE POSITIVE DRAINAGE AND THAT SUCH CONVEYANCES ARE NOT IMPEDED OR BLOCKED IN ANY WAY. STORM SEWER INLETS SHALL BE PROTECTED FROM ENTRY OF SILT, TRASH, DEBRIS, AND ANY SUBSTANCES DELETERIOUS TO THE STORM SEWER SYSTEM AND/OR WATERWAYS RECEIVING STORM WATER RUNOFF. CONTRACTOR SHALL, AT COMPLETION OF WORK, FILL LOW SPOTS AND GRADE ALL RIGHTS-OF-WAY AND UTILITY EASEMENTS AND REGRADE/RESTORE DITCHES AS NECESSARY TO MAINTAIN AND/OR ESTABLISH POSITIVE DRAINAGE.



PLAN - ALL STREETS



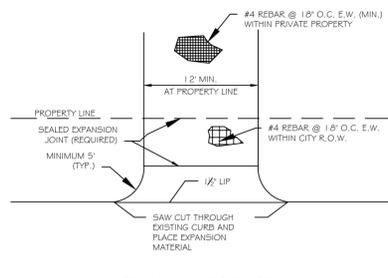
PROFILE - CONCRETE STREETS



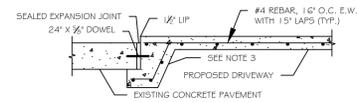
PROFILE - ASPHALT STREETS

**RESIDENTIAL CONCRETE DRIVEWAY
(OPEN DITCH STREETS)**

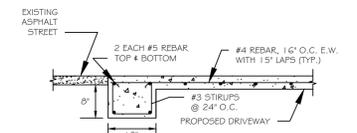
- NOTES:
- EXPANSION JOINT ON CONCRETE STREETS SHALL BE NOMINAL REDWOOD OR ASPHALTIC EXPANSION JOINT MATERIAL WITH 1" FULL-OF STRIP TO BE FILLED WITH APPROVED JOINT SEALANT.
 - 1/2" LIP (CONCRETE STREETS ONLY) SHALL NOT BE REQUIRED ON STREETS WITH 4" X 12" MOUNTABLE CURB.
 - CONCRETE PAVEMENT HEADERS SHALL BE BUILT IN ACCORDANCE WITH CITY OF MANVEL PAVING DETAILS.
 - CONNECTION TO EXISTING ASPHALT STREETS SHALL BE MADE BY BLOCKING NEW CONCRETE WITH EDGE OF PAVEMENT. A 6" DEEP BY 12" WIDE BEAM SHALL BE PLACED ALONG THE EDGE OF THE ASPHALT PAVEMENT. NO EXPANSION JOINT MATERIAL REQUIRED BETWEEN EXISTING ASPHALT STREET AND NEW CONCRETE DRIVEWAY.
 - DAMAGE TO EXISTING STREETS, WHETHER ASPHALT OR CONCRETE, SHALL BE REPAIRED AT CONTRACTORS EXPENSE.
 - ALL CONCRETE SHALL BE CLASS "A", 3,500 PSI AT TWENTY-EIGHT DAYS.
 - USE MATERIAL AND DIMENSION AS SPECIFIED IN STORM SEWER DETAILS FOR TRENCH WIDTHS AND BACKFILL.
 - NO MORE THAN ONE (1) DRIVEWAY ON LOTS WITH LESS THAN 120' OF FRONTAGE.



PLAN - ALL STREETS



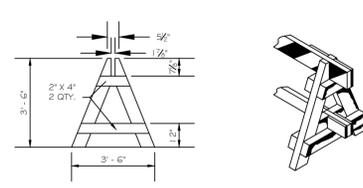
PROFILE - CONCRETE STREETS



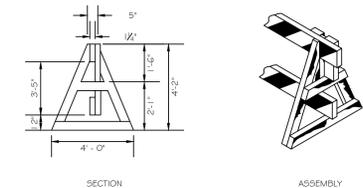
PROFILE - ASPHALT STREETS

**RESIDENTIAL CONCRETE DRIVEWAY
(CURB & GUTTER STREETS)**

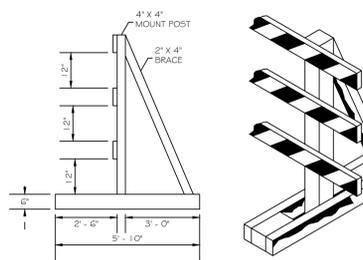
- NOTES:
- EXPANSION JOINT ON CONCRETE STREETS SHALL BE NOMINAL REDWOOD OR ASPHALTIC EXPANSION JOINT MATERIAL WITH 1" FULL-OF STRIP TO BE FILLED WITH APPROVED JOINT SEALANT.
 - 1/2" LIP (CONCRETE STREETS ONLY) SHALL NOT BE REQUIRED ON STREETS WITH 4" X 12" MOUNTABLE CURB.
 - CONCRETE PAVEMENT HEADERS SHALL BE BUILT IN ACCORDANCE WITH CITY OF MANVEL PAVING DETAILS.
 - CONNECTION TO EXISTING ASPHALT STREETS SHALL BE MADE BY BLOCKING NEW CONCRETE WITH EDGE OF PAVEMENT. A 6" DEEP BY 12" WIDE BEAM SHALL BE PLACED ALONG THE EDGE OF THE ASPHALT PAVEMENT. NO EXPANSION JOINT MATERIAL REQUIRED BETWEEN EXISTING ASPHALT STREET AND NEW CONCRETE DRIVEWAY.
 - DAMAGE TO EXISTING STREETS, WHETHER ASPHALT OR CONCRETE, SHALL BE REPAIRED AT CONTRACTORS EXPENSE.
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 - NO MORE THAN ONE (1) DRIVEWAY ON LOTS WITH LESS THAN 120' OF FRONTAGE.



"A" FRAME STAND

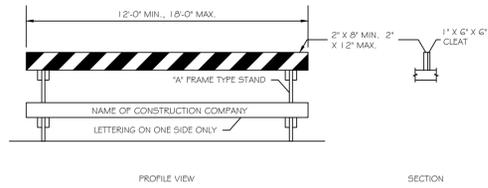


MODIFIED "A" FRAME STAND

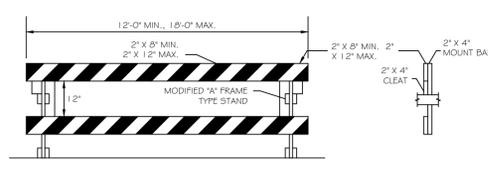


SKID & POST STAND

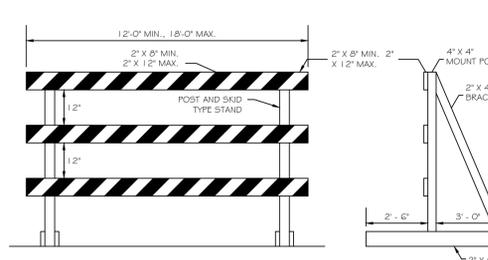
BARRICADE STANDS



TYPE I BARRICADE

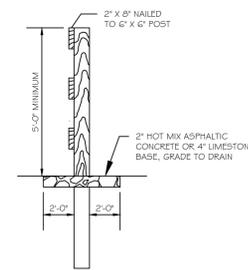


TYPE II BARRICADE

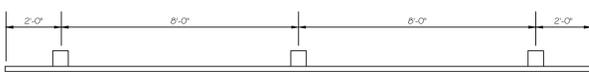


TYPE III BARRICADE

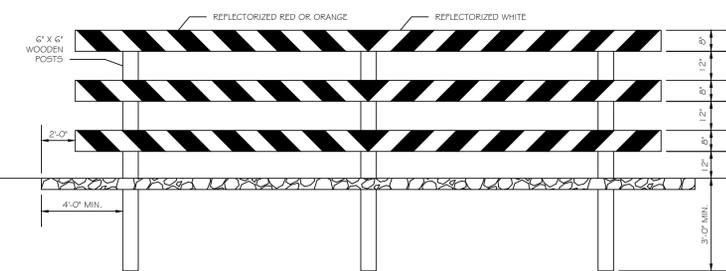
TEMPORARY BARRICADES



SIDE VIEW



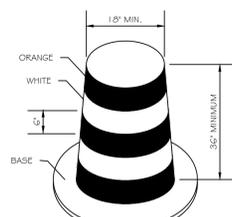
PLAN



FRONT VIEW

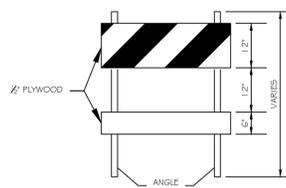
PERMANENT TYPE III BARRICADE

- NOTE:
- USE ORANGE AND WHITE REFLECTORIZED STRIPES DURING CONSTRUCTION ONLY. ALL OTHER TIMES RED AND WHITE REFLECTORIZED STRIPES SHALL BE USED.

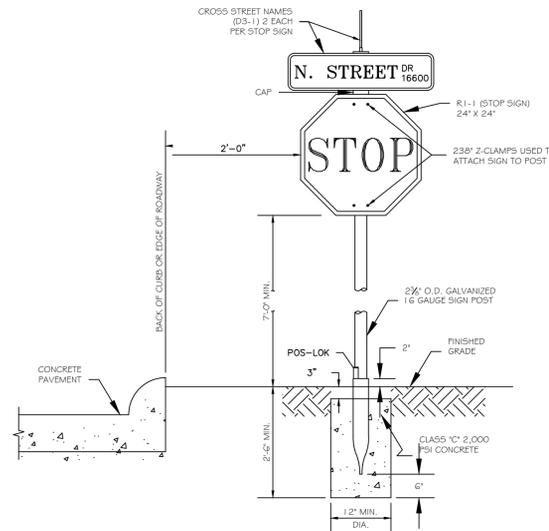


BARREL DETAIL

- NOTES:
- TWO (2) WHITE STRIPES SHALL BE REFLECTORIZED AND SHALL BE 4" TO 6" WIDE.
 - FLASHING OR STEADY BURN LIGHTS SHALL BE USED ON BARRICADES, PANELS AND BARRELS AS NEEDED.
 - METAL BARRELS ARE NOT PERMITTED.



PORTABLE TYPE I BARRICADE

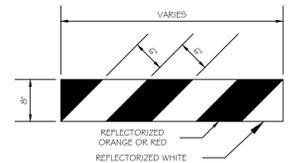


TYPICAL SIGN MOUNT DETAIL

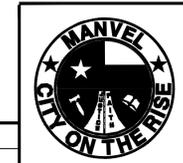
- NOTES:
- SIGN MATERIAL CONSISTS OF PRESSURE ACTIVATED WHITE BACKING MADE OF SUPER HIGH DENSITY OR DIAMOND/PRISMATIC VINYL WITH MINIMUM TEN (10) YEAR REFLECTIVITY WARRANTY. LETTERING CUT OUT OF SIGN MAKING FILM 0.5 M. OR 3M TRANSPARENT VINYL SHEETING CUT ON CAD SIGN PLOTTER.
 - SIGN BLANKS SHALL BE .090" FLAT TRAFFIC GRADE (5052) ALUMINUM.
 - STREET SIGN BLANKS SHALL BE COVERED WITH WHITE DIAMOND/PRISMATIC VINYL. FOUR (4) INCH LETTERS IN FONT TYPE "B". ALL CAPITALS, CUT OUT OF GREEN TRANSPARENT VINYL SHALL BE PLACED OVER THE WHITE DIAMOND/PRISMATIC VINYL TO PROTECT WHITE LETTERING WITH GREEN BACKGROUND.
 - PER T.M.U.I.C.D. ALL STREET SIGNS POSTED ON THOROUGHFARES AND MAJOR ROADWAYS WITH A POSTED SPEED LIMIT OF 25 MPH OR GREATER SHALL BE ON 9" BLANKS WITH 6" LETTERING.
 - ALL CUL-DE-SAC STREETS SHALL HAVE A SIGN WITH A "NO OUTLET" DESIGNATION.
 - NO OUTLET SIGN TO BE REPLACED IF STREET BECOMES A THRU STREET.
 - STOP SIGNS SHALL BE RED 3M REFLECTIVE COATING ON WHITE DIAMOND/PRISMATIC VINYL BACKGROUND. THOROUGHFARES AND MAJOR ROADWAYS POSTED GREATER THAN 25 MPH SHALL USE 30" X 30" SIGNS.
 - SIGN POST SHALL BE 2 3/8" O.D., 1 1/2" GAUGE GALVANIZED 120 CR22 STEEL POST 690, TEN (10) FEET LONG.
 - SIGN POST SHALL BE MOUNTED WITH "POS-LOK" OR SIMILAR SYSTEM CONSISTING OF 2" GALVANIZED SLEEVE AND REMOVABLE WEDGE.



STREET SIGN



STRIPING



**BARRICADE AND
MISCELLANEOUS DETAILS**

DATE APPROVED: **JANUARY 20, 2026**
REVISED DATE: **JANUARY 20, 2026** SCALE: NTS

PROJECT NUMBER: _____ DATE SUBMITTED: _____ SHEET: _____
16 OF 16