

SANITARY SEWER NO. 823

METROPOLITAN SEWER & WATER DISTRICT MONCLOVA TOWNSHIP

APPROVED BY LUCAS COUNTY

BOARD OF LUCAS COUNTY COMMISSIONERS

Pete Gerken 3/19/24
PETE GERKEN, President DATE
APPROVAL VALID FOR EIGHTEEN (18) MONTHS FROM DATE OF SIGNING

Lisa A. Sobacki 3/19/24
LISA A. SOBECKI DATE
APPROVAL VALID FOR EIGHTEEN (18) MONTHS FROM DATE OF SIGNING

Anita Lopez 3/22/24
ANITA LOPEZ DATE
APPROVAL VALID FOR EIGHTEEN (18) MONTHS FROM DATE OF SIGNING

SANITARY ENGINEER

James P. Shaw, III 2/27/2024
JAMES P. SHAW III, P.E. DATE
APPROVAL VALID FOR EIGHTEEN (18) MONTHS FROM DATE OF SIGNING

COUNTY ENGINEER

DocuSigned by: *Mike Pniewski* 2/27/2024
MIKE PNIEWSKI, P.E., P.S. DATE
APPROVAL VALID FOR EIGHTEEN (18) MONTHS FROM DATE OF SIGNING

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BENCH MARK

LUCAS COUNTY BENCH MARK.....NO. 0288A
LOCATION...Monclova Road Bridge 727 over Swan Creek,
235' East of Albon Road.
References...Brass Plate in SW wingwall of bridge, 20' S. of CL Rd.

MEAS. NORTHING.....691733.128
MEAS. EASTING.....1629953.484
ELEVATION (NAVD_88_FE).....633.873

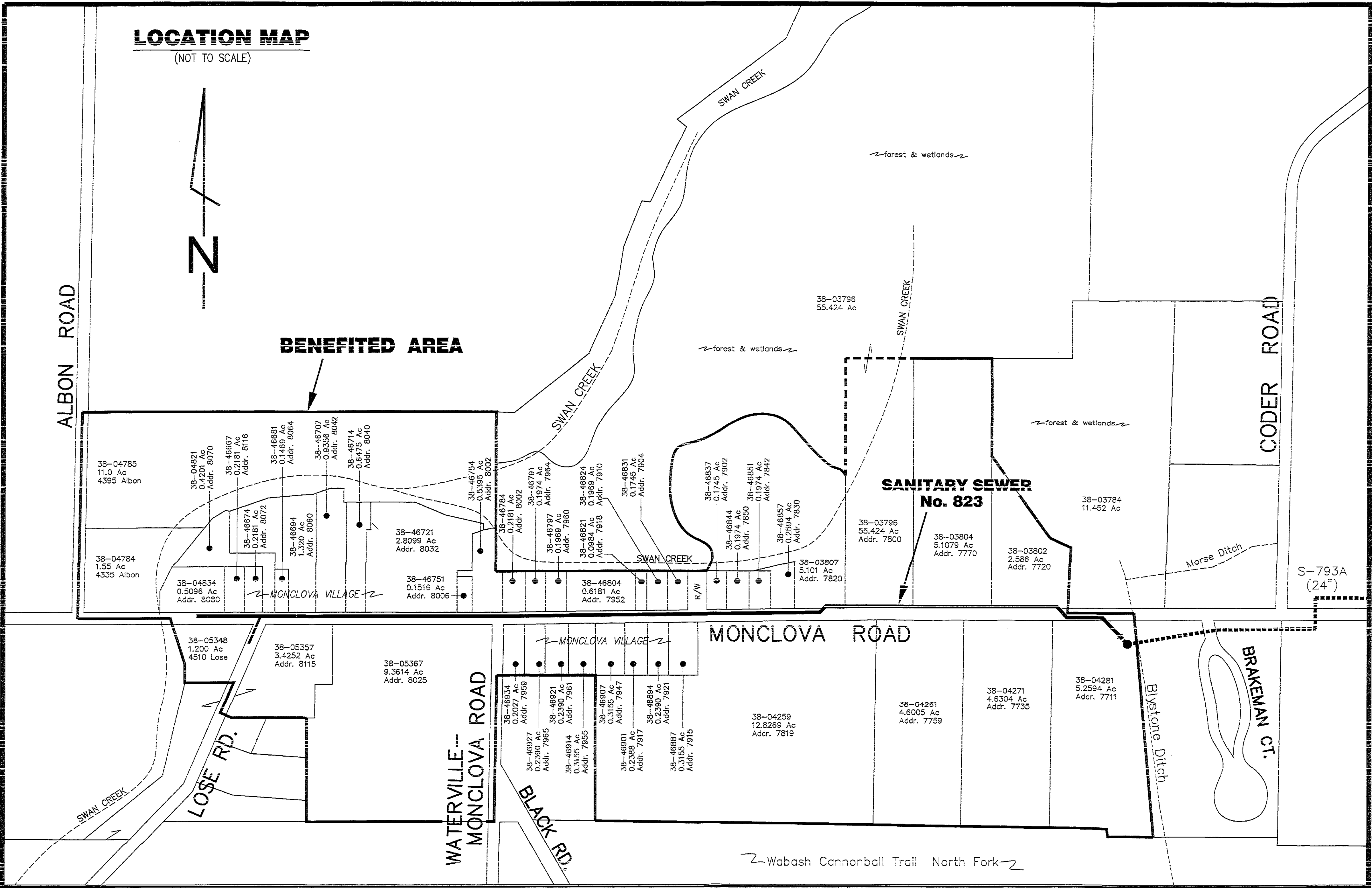
PLAN.....1"=20'
PROFILE, HORIZONTAL.....1"=20'
PROFILE, VERTICAL.....1"=5'
LOCATION MAP.....NTS

CONVENTIONAL SIGNS

PROPOSED SEWER LINE.....	MANHOLE.....
CENTERLINE.....	TELEPHONE POLE.....
DITCH / SWALE.....	POWER POLE.....
POWER CABLE.....	STORM/DRAIN PIPE.....
GAS LINE.....	MAIL BOX.....
TELEPHONE CABLE.....	LIGHT POLE.....
CATCH BASIN.....	BENCH MARK.....
FENCE LINE.....WOOD	CHAIN LINK
TREES.....EVERGREEN	DECIDUOUS

LOCATION MAP

(NOT TO SCALE)



CONSTRUCTION METHOD(S) SHALL BE SUBMITTED FOR APPROVAL A MINIMUM OF TWO (2) WEEKS PRIOR,
TO THE LUCAS COUNTY SANITARY ENGINEERS OFFICE.

THE CONTRACTOR SHALL OBTAIN A PERMIT FROM THE OFFICE OF THE LUCAS COUNTY ENGINEER,
ONE WEEK PRIOR TO COMMENCING WORK IN THE PUBLIC RIGHT-OF-WAY.
APPLICATION SHALL BE MADE THROUGH LCEXPRESS AND NOT AT THE OFFICE.

THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES.
THE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING UTILITIES.

S-823

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE 800-362-2764
OHIO UTILITIES PROTECTION SERVICE
or call 811
www.OhiO811.org

LUCAS COUNTY SANITARY ENGINEERS
1111 South McCord Road, Holland, Ohio 43528

DESIGNED BY: NLI
DRAWN BY: RTH

S-823 MONCLOVA ROAD (Gravity Sewer, Trunk Line)

TITLE SHEET

1
11

SPECIFICATIONS

ALL MATERIAL AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LUCAS COUNTY STANDARDS AND SPECIFICATIONS. SEWER LINES SHALL BE INSTALLED AND TESTED UNDER THE DIRECT SUPERVISION OF THE LUCAS COUNTY SANITARY ENGINEER. NO DEVIATION FROM THESE SPECIFICATIONS WILL BE PERMITTED. DETAILED SPECIFICATIONS MAY BE OBTAINED FROM THE LUCAS COUNTY SANITARY ENGINEER. THE LUCAS COUNTY SANITARY ENGINEER SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF CONSTRUCTION TAKING PLACE.

EXCEPT AS MODIFIED BY THESE PLANS AND THE DETAILED SPECIFICATIONS PERTAINING THERETO, ALL WORK ON THIS PROJECT SHALL BE GOVERNED BY THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTIONS AND MATERIAL SPECIFICATIONS, DATED JANUARY 1, 2023, AND BY SUCH SUPPLEMENTAL SPECIFICATIONS AS MAY BE IN EFFECT FOURTEEN (14) CALENDAR DAYS PRIOR TO THE AWARD OF THIS CONTRACT. IN THE AFORESAID SPECIFICATIONS, THE WORDS "STATE", "DIRECTOR" AND "ENGINEER" SHALL BE HELD TO MEAN THE LUCAS COUNTY SANITARY ENGINEER OR HIS REPRESENTATIVE.

ALL MATERIAL SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA. COPIES OF SUPPLIER'S INVOICES SHALL BE SUBMITTED TO THE ENGINEER.

SANITARY SEWER PIPE

ALL PIPE FOR SANITARY SEWER SHALL HAVE PREMIUM JOINTS AND SHALL BE ITEM 707.45 POLYVINYL CHLORIDE (PVC) SEWER PIPE AND FITTINGS CONFORMING TO A.S.T.M. D-3034-SDR35.

IF TYPE "B" OR "C" CONDUIT IS SPECIFIED, THE CONTRACTOR MAY USE POLYVINYL CHLORIDE (PVC) SEWER PIPE AND FITTINGS, A.S.T.M. (AMERICAN SOCIETY FOR TESTING AND MATERIALS) D-3034-SDR35. THE PIPE AND FITTINGS SHALL BE MADE OF PVC PLASTIC HAVING A CELL CLASSIFICATION OF 12454-B AS DEFINED IN SPECIFICATION D-1784. COMPOUNDS THAT HAVE DIFFERENT CELL CLASSIFICATIONS BECAUSE ONE OR MORE PROPERTIES ARE SUPERIOR TO THOSE OF THE SPECIFIED COMPOUNDS ARE ALSO ACCEPTABLE.

18" DIAMETER AND LARGER P.V.C. PIPE SHALL BE IN ACCORDANCE WITH A.S.T.M. F-679.

PIPE JOINT

ALL PIPE SHALL BE PREMIUM JOINT - ASTM D3212 FOR PVC PIPE.

PIPE SPECIALS

QUANTITIES FOR PIPE BENDS, TEES, WYES, PLUGS AND OTHER FITTINGS ARE LISTED ON THE PLANS FOR THE CONVENIENCE OF THE CONTRACTOR. THE COST OF ALL PIPE SPECIALS FOR ALL TYPES OF PIPE SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAR FOOT FOR THE PERTINENT CONDUIT ITEM.

SANITARY MANHOLES

FOR SEWERS WITH A DIAMETER OF 36 INCHES OR LESS, STANDARD TYPE 2, TYPE 3 DROP AND SPECIAL MANHOLES SHALL BE CONSTRUCTED WITH APPROVED PRECAST CONCRETE SECTIONS CONFORMING IN GENERAL TO A.S.T.M. C-478.

PRECAST REINFORCED CONCRETE RISER RINGS AND DOMES SHALL COMPLY WITH THE REQUIREMENTS OF ITEM 706.02 EXCEPT FOR MINIMUM DESIGNS AND MARKING. MINIMUM WALL THICKNESS SHALL BE 5 INCHES AND CIRCULAR REINFORCEMENT SHALL BE A MINIMUM OF 0.18 SQ. IN. PER FOOT. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 4,000 LBS. PER SQ. INCH.

1-¼ INCH HOLES FOR HANDLING MAY BE CAST INTO DOMES AND RINGS.

THE CONNECTION BOX FOR PRECAST MANHOLES ON SEWERS 42 INCHES AND OVER IN DIAMETER SHALL BE REINFORCED AS SPECIFIED AND SHOWN ON THE DETAIL SHEETS. CONCRETE FOR THE MANHOLE BASE, CONNECTION BOX AND INVERT SHALL BE CLASS "QC1", MEETING REQUIREMENTS OF ODOT ITEM 499.

THE FOLLOWING SHALL BE CLEARLY STENCILED OR IMPRESSED ON EACH RISER RING:

- A. M.H. NUMBER OR STATION AND OFFSET.
- B. THE DATE OF MANUFACTURE.
- C. THE NAME OR TRADE-MARK OF THE MANUFACTURER AND LOCATION OF THE PLANT.

CONNECTIONS FOR LATERAL SEWERS INCLUDING DROPS AND LEADS, EXCEPT PIPE INCLUDED IN ITEM 603 WILL BE CONSIDERED A PART OF ALL MANHOLES. MINIMUM DROP PIPE DIAMETER FOR SANITARY SEWER MANHOLES SHALL BE 6 INCHES. A DROP PIPE SHALL BE PROVIDED FOR A SEWER ENTERING A MANHOLE AT AN ELEVATION OF 30 INCHES OR MORE ABOVE THE MANHOLE INVERT.

OPENINGS FOR THE INLET AND OUTLET SEWER PIPE SHALL BE DRILLED OR CAST IN THE PRECAST RING AND SHALL BE FITTED WITH A GASKETED WATER-TIGHT CONNECTION, KOR-N-SEAL BOOT OR APPROVED EQUAL, TO PREVENT INFILTRATION.

SANITARY SEWER MANHOLES SHALL HAVE FLEXIBLE WATER-TIGHT JOINTS, USING RUBBER GASKETS FOR SEALING THE JOINTS CONFORMING IN GENERAL TO A.S.T.M. C-443. THE JOINTS SHALL BE OF SUCH DESIGN AS WILL PERMIT PLACEMENT WITHOUT APPRECIABLE IRREGULARITIES IN THE INTERIOR WALL SURFACE OF THE MANHOLE. ACCEPTABLE 48 INCH DIAMETER JOINTS SHALL BE OF THE "O" RING GASKET TYPE, OR APPROVED EQUAL.

ACCESS THROUGH MANHOLES SHALL BE BY MEANS OF STEPS MEETING THE REQUIREMENTS OF ITEM 604 - OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS.

MANHOLE SECTIONS MAY BE REPAIRED, IF NECESSARY, BECAUSE OF OCCASIONAL IMPERFECTIONS IN MANUFACTURE OR ACCIDENTAL DAMAGE DURING HANDLING AND WILL BE ACCEPTABLE IF, IN THE OPINION OF THE LUCAS COUNTY SANITARY ENGINEER, THE REPAIRS ARE SOUND AND PROPERLY FINISHED AND CURED AND THE REPAIRED MANHOLE SECTIONS CONFORM TO THE REQUIREMENTS OF A.S.T.M. C-478.

ADJUSTING RINGS, SHALL BE CRETEX PRORING OR APPROVED EQUAL CONFORMING TO AASHTO M308, ASTM C1244, ASTM C969, ASTM D4819-13, & SAE J1685. THERE SHALL BE A MINIMUM OF 4 INCHES & MAXIMUM OF 12 INCHES OF ADJUSTING RINGS. THE ENTIRE OUTER SURFACE OF THE ADJUSTING RINGS AND MANHOLE CASTINGS SHALL RECEIVE A SMOOTH COAT OF ½ INCH MINIMUM M-1 ADHESIVE/ SEALANT PER MANUFACTURER'S STANDARDS.

WHEN A MANHOLE IS LOCATED WITHIN THE PAVEMENT AREA, THE BACKFILL MATERIAL SHALL BE GRANULAR MATERIAL AND IT SHALL BE TAMPED IN PLACE AND THEN INUNDATED. THE GRANULAR MATERIAL SHALL MEET THE REQUIREMENTS SPECIFIED IN THE NOTES FOR BACKFILLING.

MANHOLE CASTINGS

STANDARD CAST IRON MANHOLE FRAME AND COVER SHALL BE NEENAH R-1771 OR APPROVED EQUAL. THE COMBINED WEIGHT SHALL NOT BE LESS THAN 485 LBS. WITH SOLID LID. IN PAVEMENT AREAS, OR WHERE REQUIRED, OR NOTED ON THE DETAILED PLANS, PROVIDE A SOLID LID. IN PAVEMENT AREAS, AFTER THE CASTING IS SET TO GRADE, A CIRCULAR AREA WITH A WIDTH OF 12 INCHES SHALL BE NEATLY CUT AWAY DOWN TO THE BEARING OF THE FLANGE OF THE CASTING. THE EXCAVATED AREA AROUND THE CASTING SHALL THEN BE FILLED AND COMPACTED TO 1/4 INCH BELOW THE NEW SURFACE WITH CLASS "QC1" CONCRETE, MEETING REQUIREMENTS OF ODOT ITEM 499.

ALL CASTINGS MUST:

- BE POURED IN A CLOSED MOLD AND SHALL BE TRUE TO PATTERN.
- BE FREE OF BLOWS, POROSITY, BURRS AND OTHER DEFECTS AND SHALL NOT UNDER ANY CIRCUMSTANCES BE PLUGGED.
- BE OF A GOOD GRADE OF MACHINABLE GREY IRON USED IN COMMERCIAL CASTINGS.
- ALL BEARING BASES SHALL BE MACHINED WHEN USED BY TRAFFIC.

IF CASTINGS ARE DELIVERED TO THE JOB UNPAINTED, THEY SHALL BE GIVEN ONE COAT OF ASPHALT VARNISH OR COAL-TAR PITCH PAINT BY THE CONTRACTOR.

SANITARY SERVICE CONNECTIONS

SANITARY SEWER SERVICES SHALL BE PROVIDED TO ALL UNITS WITHIN THE DEVELOPMENT AND SHALL MEET LUCAS COUNTY SANITARY ENGINEER STANDARDS AND SPECIFICATIONS.

ALL SANITARY SERVICE CONNECTIONS SHALL BE PROPERLY PLUGGED AND SUITABLY STAKED AT THE END OF THE SERVICE CONNECTION PLUG, WITH A PRESSURE TREATED 2"x4"x8' BOARD PAINTED GREEN. STAKE SHALL BE A MINIMUM 4 FEET ABOVE PLUG TO AID IN FUTURE LOCATION OF SERVICE CONNECTION. THE COST OF LABOR AND MATERIALS FOR INSTALLATION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE CONDUIT.

ALL SANITARY SEWER CONNECTIONS CONSTRUCTED FOR EXISTING BUILDINGS WITH BASEMENTS SHALL BE A MINIMUM OF 3 FEET BELOW THE BASEMENT FLOOR ELEVATION AT THE PROPERTY LINE. IF THE PROPERTY IS A VACANT LOT, THE CONNECTION SHALL BE A MINIMUM OF 8 FEET BELOW THE PAVEMENT ELEVATION AT THE PROPERTY LINE. ANY DEVIATION FROM THE ABOVE MINIMUM STANDARDS WILL BE SHOWN ON THE PLANS AND SHALL BE APPROVED BY THE LUCAS COUNTY SANITARY ENGINEER.

EXCEPT AS OTHERWISE NOTED, ALL CROSS-OVER TAPS SHALL HAVE A MINIMUM GRADE OF 1%.

SANITARY SERVICE CONNECTIONS (continued)

WHERE THE DEPTH OF THE MAIN SEWER, AT A SERVICE CONNECTION, IS OVER 12 FEET, A RISER SHALL BE REQUIRED AS SHOWN ON THE PLANS. THE RISER SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE SANITARY RISER DETAIL INCLUDED IN THESE SPECIFICATIONS.

RISERS SHALL BE 6" IN DIAMETER OR AS INDICATED ON PLANS. ALL RISERS SHALL BE ENCASED WITH A 12" SONATUBE AND BACKFILLED WITH AGGREGATE (ITEM 304).

ALL SERVICE CONNECTIONS SHALL BE PAINTED "GREEN" AT END OF PIPE. COLOR SHALL BE IN ACCORDANCE WITH O.S.H.A. SPECIFICATION 1010.144, APPROVED SAFETY COLOR.

QUANTITIES FOR RISERS, CROSS-OVERS, AND SERVICE CONNECTIONS HAVE BEEN CALCULATED FOR THE STANDARD SANITARY RISER DETAIL. IF THE CONTRACTOR, WITH THE APPROVAL OF THE LUCAS COUNTY SANITARY ENGINEER, ELECTS TO USE AN ALTERNATE RISER, IT SHALL BE AT NO ADDITIONAL COST TO THE OWNER.

SANITARY SEWER INSPECTION

ALL WORK PERFORMED WITHIN THE SCOPE OF THIS PROJECT IS SUBJECT TO THE INSPECTION AND APPROVAL OF THE LUCAS COUNTY SANITARY ENGINEER.

THE SANITARY SEWER SHALL BE VISUALLY INSPECTED FROM MANHOLE TO MANHOLE TO ASSURE CORRECT ALIGNMENT AND ABSENCE OF LEAKS. SEWER PIPE INVERT ELEVATIONS WILL BE CHECKED FROM MANHOLE TO MANHOLE. SEWERS WITH GRADES LESS THAN DESIGN GRADES ARE SUBJECT TO REJECTION. THE FOLLOWING TABLE IS THE MAXIMUM ALLOWABLE DEVIATION OF THE CONSTRUCTED CENTER OF THE SANITARY SEWER FROM MANHOLE TO MANHOLE FROM THE STRAIGHT LINE DESIGN BETWEEN THE TWO MANHOLES.

CONDUIT INSIDE DIAMETER	MAXIMUM ALLOWABLE DEVIATION FROM DESIGN CENTER OF CONDUIT
8 INCH	2 INCH
10 - 12 INCH	3 INCH
15 INCH	4 INCH
18 - 24 INCH	5 INCH

THE MAXIMUM SPACING BETWEEN MANHOLES SHALL BE 350 FEET, UNLESS SPECIFIED ON THE DETAILED PLANS.

THE CONSTRUCTION OF ANY PART OF THE SANITARY SEWER INCLUDING MANHOLES AND STRUCTURES OUTSIDE THE PERMANENT RIGHT-OF-WAY AND/OR THE PERMANENT SANITARY SEWER EASEMENT WILL NOT BE ACCEPTED BY THE LUCAS COUNTY SANITARY ENGINEER.

INSTALLATION

THE PIPE SHALL BE LAID ON A PROPERLY SHAPED AND FIRM BEDDING OF THE TYPE SPECIFIED AND MEETING REQUIREMENTS OF ITEM 611.07 OF THE CURRENT CONSTRUCTION AND MATERIAL SPECIFICATIONS, STATE OF OHIO, DEPARTMENT OF TRANSPORTATION. WHERE CONDITIONS WARRANT, UNSUITABLE MATERIAL SHALL BE REMOVED AND GRANULAR MATERIAL CONFORMING TO THE SPECIFICATION SHALL BE USED FOR BEDDING.

ALL PIPE AND APPURTENANCES SHALL BE INSTALLED TRUE TO LINE, GRADE AND LOCATION, WITH JOINTS CENTERED, SPIGOTS HOME AND PROPER SUPPORT AND BLOCKING PROVIDED. CARE SHALL BE USED TO LAY THE PIPE SO THAT IT IS SUPPORTED AND BEDDED THE FULL LENGTH OF THE BARREL.

WHEN NO BEDDING CLASS IS SPECIFIED, THE REQUIREMENTS FOR TYPE 2 BEDDING SHALL APPLY.

TYPE 2 BEDDING SHALL CONSIST OF A BED OF GRANULAR STONE MATERIAL (ITEM 703.11, TYPE 1 (ITEM 304) OR TYPE 3 (NO. 57 OR 67 AGGREGATE) HAVING A THICKNESS OF AT LEAST 6 INCHES BELOW THE BOTTOM OF THE PIPE AND EXTENDING UP AROUND THE PIPE FOR A DEPTH OF NOT LESS THAN 30% OF THE RISE OF THE CONDUIT. THE LAYER OF BEDDING MATERIAL SHALL BE SHAPED TO FIT THE CONDUIT FOR AT LEAST 10% OF THE VERTICAL DIAMETER OF THE CONDUIT AND SHALL HAVE RECESSES SHAPED TO RECEIVE THE BELL OF BELL-AND-SPIGOT PIPE.

FOR PVC PIPE, THE GRANULAR BEDDING, SPECIFIED ABOVE SHALL EXTEND A MINIMUM OF 12" ABOVE THE TOP OF PIPE.

TYPE 3 BEDDING SHALL CONSIST OF A NATURAL FOUNDATION WITH RECESSES SHAPED TO RECEIVE THE BELL OF BELL-AND-SPIGOT PIPE. SCARIFY AND LOOSEN THE MIDDLE ONE THIRD OF THE PIPE SPAN.

BACKFILLING

SHALL BE IN ACCORDANCE WITH THE LUCAS COUNTY ENGINEER'S OFFICE, STANDARD DRAWING RP-10. (REFER TO SHEET 3)

MANHOLE TESTING

TEST EACH MANHOLE AFTER ASSEMBLY AND AFTER ALL LIFT HOLES HAVE BEEN PLUGGED WITH NON-SHRINK GROUT AND, AT CONTRACTOR'S OPTION, BEFORE OR AFTER COMPLETING BACKFILLING.

TEST BY DRAWING A VACUUM ON THE MANHOLE USING EQUIPMENT SPECIFICALLY DESIGNED FOR SUCH TESTING.

PLUG AND BRACE PIPES ENTERING THE MANHOLE TO PREVENT BEING DRAWN INTO THE MANHOLE.

PLACE A TEST HEAD WITH NECESSARY GAUGES AND CONNECTIONS AT THE INSIDE OF THE TOP OF THE CASTING AND SEAL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

DRAW A VACUUM OF 10 INCHES OF MERCURY AND THEN SHUT THE VACUUM PUMP OFF. WITH VALVES CLOSED, MEASURE THE TIME FOR THE VACUUM TO DROP TO 9 INCHES. THE TEST SHALL BE SUCCESSFUL IF THE TIME MEASURED MEETS OR EXCEEDS THE VALUES INDICATED IN THE FOLLOWING TABLE:

MINIMUM TEST TIMES IN SECONDS							MINIMUM TEST TIMES IN SECONDS						
MANHOLE DEPTH	MANHOLE DIAMETER*						MANHOLE DEPTH	MANHOLE DIAMETER*					
	48"	60"	72"	84"	96"	108"		48"	60"	72"	84"	96"	108"
8' OR LESS	20	26	33	40	48	56	20'	50	65	81	97	113	129
10'	25	33	41	50	58	67	22'	55	72	89	106	123	140
12'	30	39	48	58	69	79	24'	59	78	97	116	135	152
14'	35	45	55	66	80	92	26'	64	85	105	126	148	168
16'	40	52	65	77	91	104	28'	69	91	113	135	157	179
18'	45	58	73	87	102	116	30'	74	98	121	144	166	188

* When there is a transition, add the times for each size based on the depth associated with each size.

TESTING REQUIREMENTS FOR SANITARY SEWERS

FOR FLEXIBLE SANITARY SEWER PIPE, FIVE PERCENT (5%) IS THE MAXIMUM ALLOWABLE DEFLECTION. THE DEFLECTION TEST CAN BE RUN BY USE OF A RIGID BALL OR MANDREL WHOSE DIAMETER IS EQUAL TO 95% OF THE INSIDE DIAMETER OF THE PIPE, PULLED THROUGH THE SEWER LINE. A DEFLECTION TEST WILL BE PERFORMED THREE TO SIX MONTHS AFTER BACKFILLING. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, ALL PVC PIPE WILL BE TESTED FOR DEFLECTION.

AFTER THE PIPE HAS BEEN LAID, BACKFILLED AND DEFLECTION TESTED (WHERE APPLICABLE), COMPLETE LEAKAGE TESTS SHALL BE CONDUCTED ON THE ENTIRE LENGTH OF THE PROJECT BETWEEN MANHOLES, SUCH TESTS SHALL BE CONDUCTED WITH A REPRESENTATIVE OF THE LOSE PRESENT. ALSO, PRIOR TO CONDUCTING LEAKAGE TESTS, THE CONTRACTOR SHALL MAKE A DETERMINATION OF GROUND WATER LEVEL BY INSTALLING GROUND WATER GAUGES IN MANHOLES AS SELECTED BY THE ENGINEER. THESE GAUGES SHALL CONSIST OF A RIGID SECTION OF 1/2 INCH DIAMETER PIPE, APPROXIMATELY 10 INCHES LONG, INSERTED HORIZONTALLY THROUGH THE MANHOLE WALL AS NEAR AS POSSIBLE TO THE CROWN OF THE PIPE, WITH ANY OPENING AROUND THE PIPE SEALED SO AS TO BE WATERTIGHT, AND A CLEAR PLASTIC TUBE ATTACHED TO THE PIPE WITHIN THE MANHOLE AND EXTENDED VERTICALLY TO THE TOP OF THE MANHOLE. PRIOR TO CONNECTING THE TUBE, AIR SHALL BE BLOWN THROUGH THE PIPE WITH SUFFICIENT PRESSURE TO CLEAR THE LINE. UPON SATISFACTORY COMPLETION OF THE TESTS, THE GROUND WATER GAUGES SHALL BE REMOVED AND THE OPENINGS IN THE MANHOLE WALLS NEATLY AND PERMANENTLY CLOSED WITH A NON-SHRINK AND NON-METALLIC GROUT.

WHEN THE CROWN OF THE PIPE IS COVERED WITH TWO FEET OR MORE OF WATER AT THE HIGHEST POINT IN THE TEST SECTION, AN INFILTRATION TEST SHALL BE CONDUCTED. SHOULD GROUND WATER NOT PROVIDE SUFFICIENT HEAD, THE CONTRACTOR SHALL FLOOD THE TRENCH WITHIN THE TEST SECTION, BULKHEADING EACH END OF THE SECTION, TO OBTAIN OR MAINTAIN THE SPECIFIED EXTERNAL HEAD, OR AN AIR TEST OR EXFILTRATION TEST SHALL BE CONDUCTED.

IN ADDITION, FOR ALL MAIN LINE SEWERS 8 INCHES THROUGH 30 INCHES IN DIAMETER TESTED BY INFILTRATION OR EXFILTRATION, AIR TESTS SHALL BE CONDUCTED FOR THE PURPOSE OF TESTING SERVICE CONNECTIONS EVEN WHEN THE CROWN OF THE PIPE IS COVERED WITH TWO FEET OR MORE OF WATER. FOR SUCH TESTS, THE INTERNAL AIR PRESSURE SHALL NEVER EXCEED 5.0 PSI, AND THE ACCEPTABILITY OF THE TESTS SHALL BE BASED ON THE MINIMUM HOLDING TIME SUBSEQUENTLY SPECIFIED FOR THE SIZE OF THE MAIN LINE SEWER.

IN ALL CASES, FOR ANY TEST SECTION FAILING TO MEET THE LIMITS OF THE SPECIFICATIONS, THE CONTRACTOR SHALL BE REQUIRED TO LOCATE AND REMEDY THE DEFECTS CAUSING THE FAILURE AND THE SECTION SHALL BE RETESTED AND REPAIRS OR REPLACEMENT CONTINUED UNTIL THE LIMITS OF THE SPECIFICATIONS ARE SATISFIED. FOR SEWERS NOT ACCESSIBLE, SHOULD A TEST FAIL DUE TO OTHER THAN A LEAKING PLUG, A CLOSED CIRCUIT TELEVISION INSPECTION OF THE TEST SECTION SHALL BE CONDUCTED TO DETERMINE THE CAUSE OF THE FAILURE. WHEN THE FAILURE IS THE RESULT OF A LEAKING JOINT(S), THE JOINT MAY BE CHEMICALLY GROUTED. THE TELEVISION INSPECTION AND CHEMICAL GROUTING OF JOINTS SHALL BE IN ACCORDANCE WITH ALL APPLICABLE "RECOMMENDED SPECIFICATIONS FOR SEWER COLLECTION SYSTEM REHABILITATION" OF THE NATIONAL ASSOCIATION OF SEWER SERVICE COMPANIES AND AS APPROVED BY THE ENGINEER. THE LUCAS COUNTY SANITARY ENGINEER SHALL BE FURNISHED VIDEO TAPES OF ALL TELEVISION INSPECTIONS. THE CONTRACTOR SHALL PAY ALL COSTS FOR INSPECTION AND GROUTING.

ALL VISIBLE LEAKAGE IN SEWERS AND MANHOLES SHALL BE REPAIRED, EVEN THOUGH TESTS MAY HAVE BEEN SATISFACTORY.

ALL PLUGS USED DURING LEAKAGE TESTS SHALL BE OF A LENGTH AT LEAST EQUAL TO THE DIAMETER OF THE PIPE BEING TESTED TO ENSURE A WATERTIGHT SEAL. PNEUMATIC PLUGS FOR AIR TESTING SHALL BE ABLE TO RESIST INTERNAL TEST PRESSURES WITHOUT REQUIRING EXTERNAL BLOCKING.

INFILTRATION TESTS

THE LENGTH OF SEWER SUBJECT TO EACH TEST SHALL BE THE DISTANCE BETWEEN TWO ADJACENT MANHOLES AS A MINIMUM, BUT SHALL BE LEFT TO THE DISCRETION OF THE ENGINEER. NO TEST SHALL EXCEED 900 FEET. THE TEST SECTION SHALL BE ISOLATED AND ALL SERVICE CONNECTIONS AND STUBS WITHIN THE SECTION SHALL BE CAPPED OR PLUGGED TO PREVENT THE ENTRY OF GROUND WATER. THE INFILTRATION SHALL BE MEASURED BY A V-NOTCH WEIR LOCATED IN THE DOWNSTREAM MANHOLE. THE TEST HEAD SHALL BE MAINTAINED FOR NOT LESS THAN 24 HOURS BEFORE A WEIR MEASUREMENT IS MADE. THE MAXIMUM ALLOWABLE LEAKAGE, INCLUDING MANHOLES, SHALL BE 100 GALLONS PER INCH OF DIAMETER PER MILE OF PIPE PER DAY.

EXFILTRATION TESTS

THE LENGTH OF SEWER SUBJECT TO AN EXFILTRATION TEST SHALL BE THE DISTANCE BETWEEN TWO ADJACENT MANHOLES AS A MINIMUM, BUT SHALL BE LEFT TO THE DISCRETION OF THE ENGINEER. NO TEST SHALL EXCEED 900 FEET. THE INLETS OF THE UPSTREAM AND DOWNSTREAM MANHOLES SHALL BE CLOSED WITH WATERTIGHT PLUGS AND THE TEST SECTION FILLED WITH WATER UNTIL THE ELEVATION OF THE WATER IN THE UPSTREAM MANHOLE IS TWO FEET ABOVE THE CROWN OF THE PIPE IN THE LINE BEING TESTED, OR TWO FEET ABOVE THE EXISTING GROUND WATER IN THE TRENCH, WHICHEVER IS HIGHER. A STANDPIPE MAY BE USED INSTEAD OF THE UPSTREAM MANHOLE FOR PROVIDING THE PRESSURE HEAD WHEN APPROVED BY THE ENGINEER. EXFILTRATION SHALL BE MEASURED BY DETERMINING THE AMOUNT OF WATER REQUIRED TO MAINTAIN THE INITIAL WATER ELEVATION FOR ONE HOUR FROM THE START OF THE TEST. WITH ABSORPTIVE PIPE, THE ONE HOUR PERIOD SHALL BEGIN AFTER ALLOWING THE WATER TO STAND FOR A MINIMUM OF 45 MINUTES TO ALLOW FOR SATURATION OF THE PIPE. THE MAXIMUM ALLOWABLE LEAKAGE, INCLUDING MANHOLES, SHALL BE 100 GALLONS PER INCH OF DIAMETER PER MILE OF PIPE PER DAY.

AIR TESTS

AFTER BACKFILLING, AIR TESTS SHALL BE CONDUCTED BETWEEN TWO CONSECUTIVE MANHOLES. PRIOR TO CONDUCTING AIR TESTS ON AIR PERMEABLE PIPE, THE WALLS OF THE PIPE SHALL BE DAMPENED. DAMPENING OF THE PIPE WALLS AND OBSTRUCTION TESTING MAY BE ACCOMPLISHED AT THE SAME TIME BY PROPELLING A SNUG FITTING INFLATED BALL OR OTHER APPROVED DEVICE THROUGH THE PIPE WITH WATER.

FOR SEWERS 30 INCHES IN DIAMETER AND SMALLER, EACH END OF THE SECTION TO BE TESTED AND ALL PIPE OUTLETS IN THE SECTION SHALL BE PLUGGED WITH SUITABLE TEST PLUGS. ONE PLUG USED AT A MANHOLE SHALL HAVE AN INLET TAP OR OTHER PROVISION FOR CONNECTING AN AIR HOSE FROM THE AIR SUPPLY EQUIPMENT. THE EQUIPMENT SHALL INCLUDE VALVES TO CONTROL THE RATE AT WHICH AIR FLOWS INTO THE TEST SECTION AND PRESSURE GAUGES WITH MINIMUM GRADUATIONS OF 0.1 PSI AND AN ACCURACY OF ±0.04 PSI TO MONITOR THE AIR PRESSURE WITHIN THE TEST SECTION.

AIR TESTS (continued)

AIR PRESSURE SHALL BE APPLIED SLOWLY TO THE TEST SECTION UNTIL THE PRESSURE REACHES 4.0 PSI, PLUS AN ADJUSTMENT OF 0.433 PSI FOR EACH FOOT OF FOUND WATER ABOVE THE CROWN OF THE PIPE BEING TESTED. INTERNAL AIR PRESSURE, INCLUDING ADJUSTMENT FOR GROUND WATER, SHOULD NEVER EXCEED 5.0 PSI.

WHEN PRESSURE REACHES 4.0 PSI, PLUS ADJUSTMENT FOR GROUND WATER, THE AIR SUPPLY SHALL BE THROTTLED SO THAT THE INTERNAL PRESSURE IS MAINTAINED BETWEEN 4.0 AND 3.5 PSI FOR AT LEAST TWO MINUTES TO PERMIT TEMPERATURE STABILIZATION. WHEN THE PRESSURE HAS STABILIZED AND IS AT OR ABOVE 3.5 PSI, THE AIR SUPPLY SHALL BE DISCONNECTED AND A STOP WATCH STARTED AND ALLOWED TO RUN UNTIL THE PRESSURE HAD DROPPED 1.0 PSI.

THE PERMISSIBLE TIME ALLOCATED FOR THE 1.0 PSI PRESSURE DROP SHALL BE CALCULATED ON THE BASIS OF THE DIAMETER AND LENGTH OF MAIN SEWER TESTED AD NO ADJUSTMENT SHALL BE MADE FOR SERVICE CONNECTIONS INCLUDED IN THE TEST SECTION. THE AIR TEST FOR A SECTION SHALL BE CONSIDERED ACCEPTABLE IF THE TIME ELAPSED FOR THE 1.0 PSI PRESSURE DROP IS EQUAL TO OR GREATER THAN THE TIME INDICATED, AND SHALL BE CONSIDERED UNACCEPTABLE IF THE ELAPSED TIME IS LESS THAN THAT INDICATED IN THE FOLLOWING TABLE:

PIPE DIAMETER	MINIMUM TEST TIMES IN MINUTES REQUIRED FOR 1.0 PSI PRESSURE DROP (Min:Sec)						
	100'	150'	200'	250'	300'	350'	400'
4"	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6"	5:40	5:40	5:40	5:40	5:40	5:40	5:42
8"	7:34	7:34	7:34	7:34	7:36	8:52	10:08
10"	9:26	9:26	9:26	9:53	11:52	13:51	15:49
12"	11:20	11:20	11:24	14:15	17:05	19:56	22:47
15"	14:10	14:10	17:48	22:15	26:42	31:09	35:36
18"	17:00	19:13	25:38	32:03	38:27	44:52	51:16
21"	19:50	26:10	34:54	43:37	52:21	61:00	69:48
24"	22:47	34:11	45:34	56:58	68:22	79:46	91:10
27"	28:51	43:16	57:41	72:07	86:32	100:57	115:22

*Time for intermediate lengths shall be interpolated.

THE CONTRACTOR MAY AIR TEST SECTIONS BEFORE BACKFILLING THE TRENCH AS A CHECK FOR DEFECTS AND WORKMANIP. SUCH TESTS ARE AT THE OPTION OF THE CONTRACTOR AND ARE NOT A SUBSTITUTE FOR TESTS REQUIRED AFTER BACKFILLING HAS BEEN COMPLETED.

FOR SEWERS OVER 30 INCHES IN DIAMETER, INDIVIDUAL AIR TESTS AT JOINTS, LIFT HOLES, AND TEE OR WYE CONNECTIONS, ALONG WITH VISUAL INSPECTION SHALL BE CONDUCTED. MINIMUM AIR TEST HOLDING TIME SHALL BE BASED ON A LEAKAGE RATE OF 0.003 CFM LOSS PER SQUARE FOOT OF INTERNAL SURFACE BEING TESTED.

SHOULD ANY SECTION OF THE CONDUIT FAIL TO MEET THE ABOVE TEST REQUIREMENTS, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE TELEVISION INSPECTION AND TO PROVIDE NECESSARY CORRECTIONS. THE COST OF ALL MATERIALS, LABOR AND INCIDENTALS NECESSARY FOR PERFORMING THE TESTS AND MAKING THE CORRECTIONS AND REPLACEMENTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PERTINENT CONDUIT ITEM, INCLUDING ANY WATER AND ALL EQUIPMENT NECESSARY.

ROOF DRAINS

ROOF DRAINS, FOUNDATION DRAINS AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER ARE PROHIBITED.

SEWER-WATERLINE SEPARATION

SANITARY SEWER AND MANHOLE INSTALLATIONS SHALL BE LAID WITH AT LEAST TEN (10) FEET HORIZONTAL AND EIGHTEEN (18) INCHES VERTICAL SEPARATION FROM ANY WATERLINE MEASURED EDGE TO EDGE.

SAFETY REQUIREMENTS

THE CONTRACTOR SHALL AT ALL TIMES FOLLOW ALL STATE AND LOCAL SAFETY REQUIREMENTS DURING CONSTRUCTION OF THIS PROJECT. SPECIAL CARE SHALL BE TAKEN DURING ALL TRENCHING OPERATIONS. SHEETING AND BRACING, ETC., MUST BE INSTALLED TO PROVIDE MAXIMUM SAFETY TO THE CONTRACTOR'S WORKERS IN FULL COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS.

INSURANCE

NO CONTRACTOR OR SUBCONTRACTOR SHALL START ANY WORK UNTIL THE APPROVED CERTIFICATE OF LIABILITY INSURANCE IS FILED WITH LUCAS COUNTY NAMING LUCAS COUNTY AS THE INSURED.

CONSTRUCTION STAKING

CONSTRUCTION STAKING FOR SANITARY SEWERS WILL BE PERFORMED BY THE LUCAS COUNTY SANITARY ENGINEER. FORTY-EIGHT HOURS PRIOR NOTICE WILL BE REQUIRED FOR CONSTRUCTION STAKES. FOR SUBDIVISIONS, CONTROL POINTS WILL BE SET BY THE CONSULTING ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT AND PRESERVE THE CONSTRUCTION STAKES AND TO VERIFY THEIR CORRECTNESS PRIOR TO LAYING PIPE.

EXISTING SURVEY POINTS

SURVEY MONUMENTS, BENCH MARKS AND EXISTING CONTROL POINTS DAMAGED OR DISTURBED BY CONSTRUCTION SHALL BE REPLACED BY A REGISTERED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE. SHOULD THE CONTRACTOR FAIL TO PROPERLY REPLACE THESE POINTS, THE LUCAS COUNTY ENGINEER SHALL REPLACE THEM AT THE CONTRACTOR'S EXPENSE AFTER THREE WEEKS NOTICE.

REVIEW OF DRAINAGE FACILITIES

BEFORE ANY WORK IS STARTED ON THE PROJECT AND AGAIN BEFORE FINAL ACCEPTANCE BY THE COUNTY, REPRESENTATIVES OF THE TOWNSHIP, COUNTY SANITARY ENGINEER, COUNTY ENGINEER, AND THE CONTRACTOR SHALL MAKE AN INSPECTION OF THE EXISTING STORM SEWERS WITHIN THE PROJECT LIMITS WHICH ARE TO REMAIN IN SERVICE AND WHICH MAY BE AFFECTED BY THE WORK. THE CONDITION OF THE EXISTING CONDUITS AND THEIR APPURTENANCES SHALL BE DETERMINED FROM FIELD OBSERVATIONS. RECORDS OF THE INSPECTIONS SHALL BE KEPT IN WRITING BY THE COUNTY.

ALL NEW CONDUITS, INLETS, CATCH BASINS AND MANHOLES CONSTRUCTED AS A PART OF THE PROJECT SHALL BE FREE OF ALL FOREIGN MATTER AND IN A CLEAN CONDITION BEFORE THE PROJECT WILL BE ACCEPTED BY THE COUNTY.

ALL EXISTING STORM SEWERS INSPECTED INITIALLY BY THE ABOVE MENTIONED PARTIES SHALL BE MAINTAINED AND LEFT IN A CONDITION REASONABLY COMPARABLE TO THAT DETERMINED BY THE ORIGINAL INSPECTION. ANY CHANGE IN THE CONDITION RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE CORRECTED BY THE CONTRACTOR TO THE SATISFACTION OF THE COUNTY ENGINEER.

PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE UNIT PRICES BID FOR THE PERTINENT CONDUIT ITEMS OF THE CONTRACT.

EXCEPT AS OTHERWISE PROVIDED IN THESE PLANS, FLOW IN EXISTING STORM AND SANITARY SEWERS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION OF THIS PROJECT.

WHERE THE PLANS PROVIDE FOR THE PROPOSED CONDUIT TO BE CONNECTED TO, OR TO CROSS EITHER OVER OR UNDER AN EXISTING SEWER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE EXISTING PIPE BOTH AS TO LINE AND GRADE BEFORE HE STARTS CONSTRUCTION OF THE PROPOSED SEWER.

THE CONTRACTOR SHALL NOT REMOVE ANY MAILBOXES, PAPER BOXES, PRIVATE LIGHT POSTS, SPRINKLER SYSTEMS, SIGNS, UTILITY MARKERS, TREES, SHRUBBERY, FENCE, GUARDRAIL OR OTHER OBSTRUCTIONS WITHOUT THE PRIOR APPROVAL OF THE ENGINEER. WHEN APPROVAL IS GRANTED, THE CONTRACTOR SHALL NOTIFY THE OWNER OF SAID OBSTRUCTION AND ALLOW THE OWNER TWO (2) WEEKS TO RELOCATE THE SAID OBSTRUCTION. IF THE OWNER OF SAID OBSTRUCTION DOES NOT RELOCATE IT WITHIN TWO (2) WEEKS, THE CONTRACTOR SHALL REMOVE THE OBSTRUCTION AT THE DIRECTION OF THE ENGINEER. IF MAILBOXES CANNOT BE IMMEDIATELY REPLACED, THEN THE CONTRACTOR SHALL PROVIDE TEMPORARY MAIL SERVICE SUITABLE TO THE U.S. POSTAL SERVICE.

ALL EXISTING PUBLIC AND QUASI-PUBLIC FEATURES IN THE EXISTING PUBLIC RIGHT-OF-WAY & EASEMENT AREAS THAT ARE DISTURBED DUE TO CONSTRUCTION SUCH AS, BUT NOT LIMITED TO: MAIL BOXES, CURB, GUARDRAILS, DRIVEWAYS, SWALES, SEWERS, DITCHES, CATCH BASINS, BERMS, SEEDED AREAS, ETC., SHALL BE REPLACED TO THEIR ORIGINAL CONDITION IN ACCORDANCE WITH CURRENT OHIO DEPARTMENT OF TRANSPORTATION SPECIFICATIONS AND IN ACCORDANCE WITH ITEM 107.10 TO THE SATISFACTION OF THE LUCAS COUNTY ENGINEER.

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS HAVE BEEN OBTAINED BY DILIGENT FIELD CHECKS AND SEARCHES OF AVAILABLE RECORDS. IT IS BELIEVED THAT THEY ARE ESSENTIALLY CORRECT, BUT THE LUCAS COUNTY SANITARY ENGINEER DOES NOT GUARANTEE THEIR ACCURACY OR COMPLETENESS.

ANY AND ALL WORK REQUIRED FOR PUBLIC OR PRIVATE UTILITIES WILL BE DONE BY AND AT THE EXPENSE OF THEIR RESPECTIVE OWNERS, UNLESS OTHERWISE NOTED ON THESE PLANS. UTILITIES THAT ARE IN CONFLICT SHALL SUBMIT DETAILED PLANS OF UTILITY REARRANGEMENT TO THE LUCAS COUNTY SANITARY ENGINEER AND THE LUCAS COUNTY ENGINEER. UTILITY REARRANGEMENT PLANS SHALL BE APPROVED AND PERMIT ISSUED PRIOR TO COMMENCING WORK.

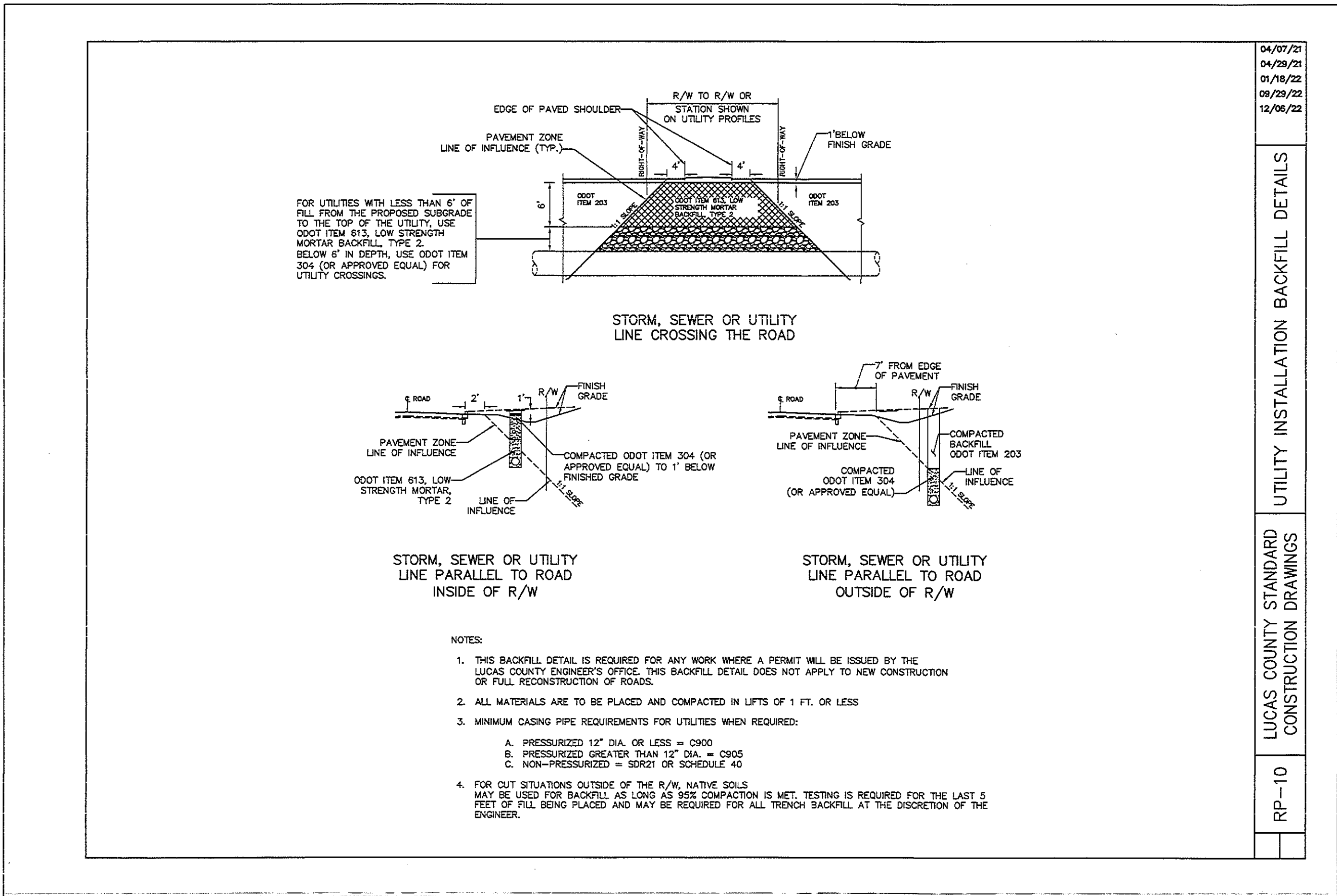
THE CONTRACTOR SHALL NOTIFY ALL INVOLVED UTILITY COMPANIES AT LEAST FIVE (5) CONSTRUCTION DAYS BEFORE ANY CONSTRUCTION WORK IS PERFORMED IN THE AREA WHERE UTILITIES ARE LOCATED. NOTIFY OHIO UTILITIES PROTECTION SERVICE (O.U.P.S.) 2 WORKING DAYS BEFORE DIGGING AT A TOLL FREE NUMBER: 1-800-362-2764. NON-MEMBER UTILITIES MUST BE CONTACTED DIRECTLY.

GRADING AND CLEANUP SHALL FOLLOW CLOSELY BEHIND ANY CONSTRUCTION. THIS WORK SHALL INCLUDE GRADING, TO ACHIEVE POSITIVE DRAINAGE OF WORK LIMITS AND CLEANUP INCLUDING ANY REMOVAL FROM THE SITE OF ANY MATERIALS, SPOILS, ETC. THIS GRADING AND CLEANUP SHALL BE PERFORMED SIMULTANEOUSLY WITH ALL CONSTRUCTION PHASES OF THE PROJECT.

THE CONTRACTOR SHALL POWER BROOM SWEEP THE ROADWAY AT THE END OF EACH DAY THAT SEDIMENT TRACKING OCCURS IN THE ROAD.

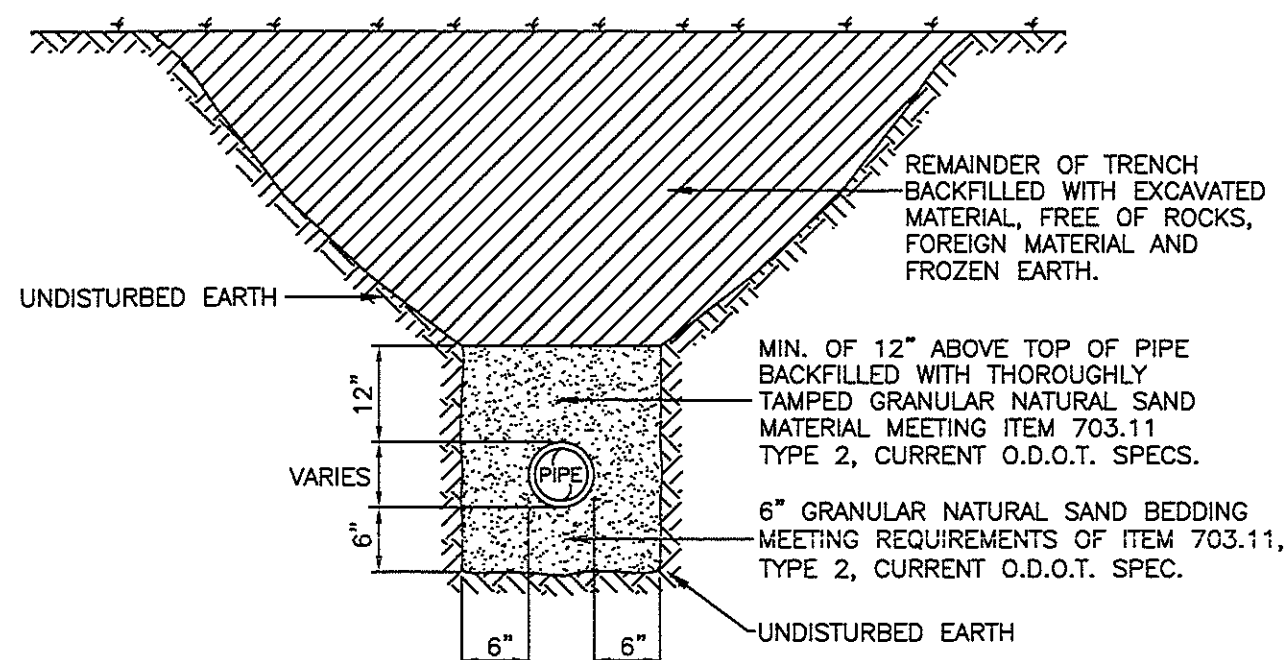
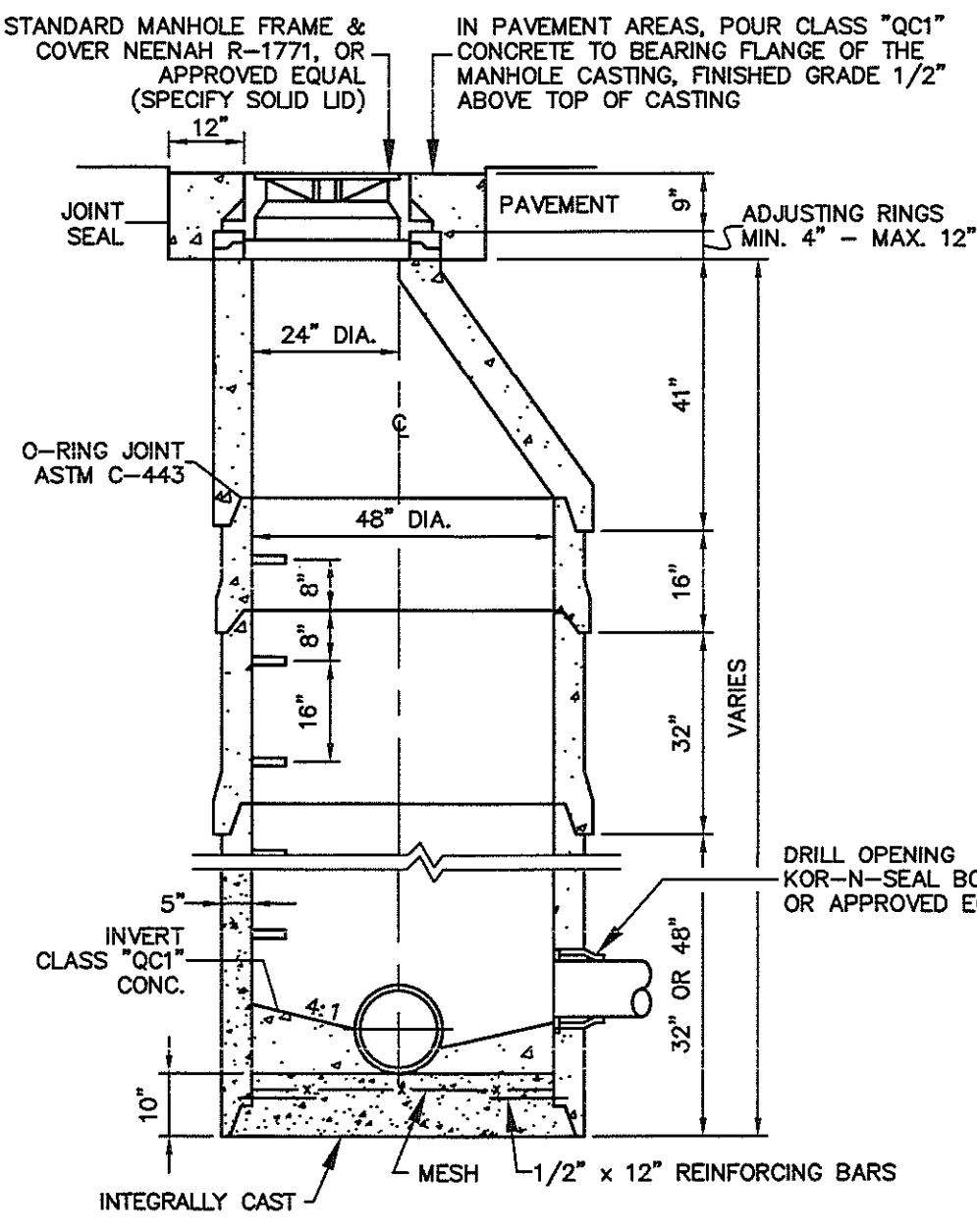
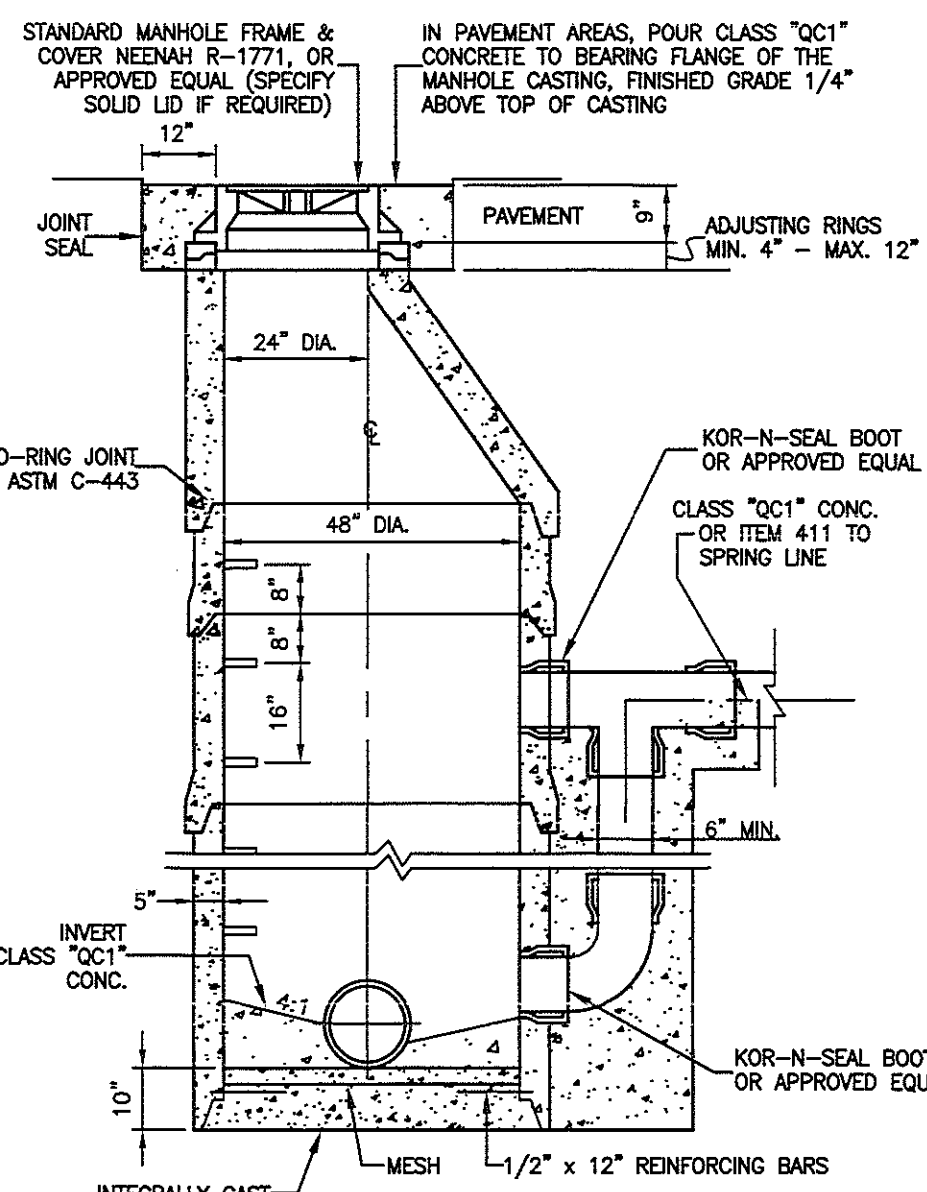
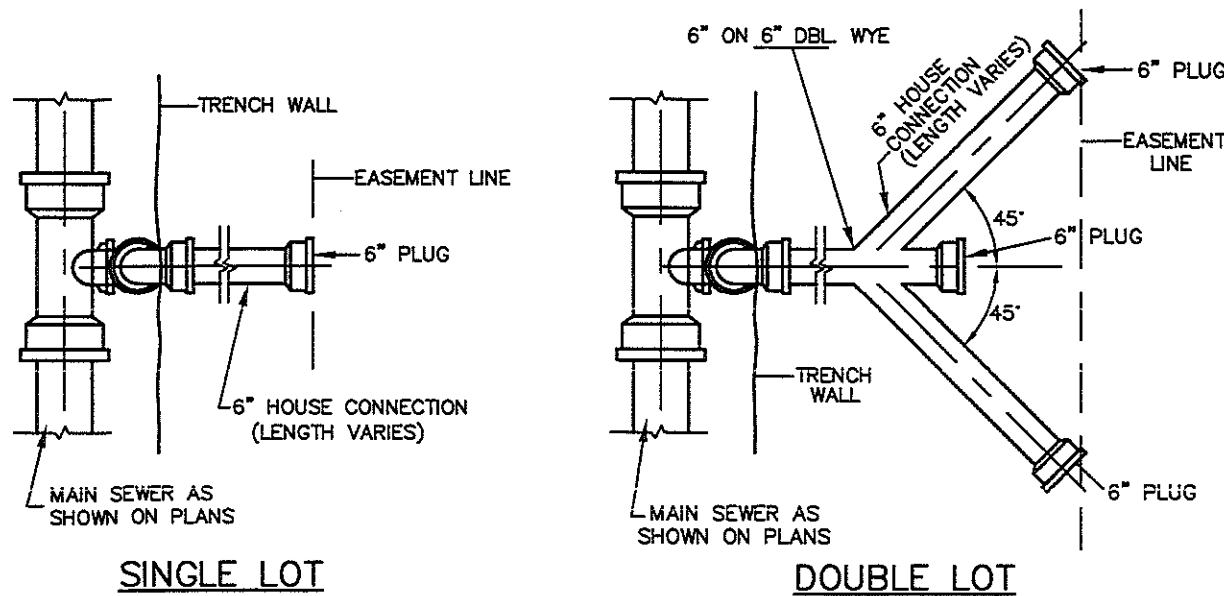
THE CONTRACTOR SHALL OBTAIN ALL REQUIRED WORK PERMITS. COPIES OF PERMITS SHALL BE SUBMITTED TO THE LUCAS COUNTY SANITARY ENGINEER PRIOR TO CONSTRUCTION.

PRIOR TO FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE THE LUCAS COUNTY SANITARY ENGINEER A TWO-YEAR MAINTENANCE BOND FOR 25% OF THE BID AMOUNT. THE COST OF THE MAINTENANCE BOND SHALL BE INCLUDED IN THE COST OF MATERIALS.



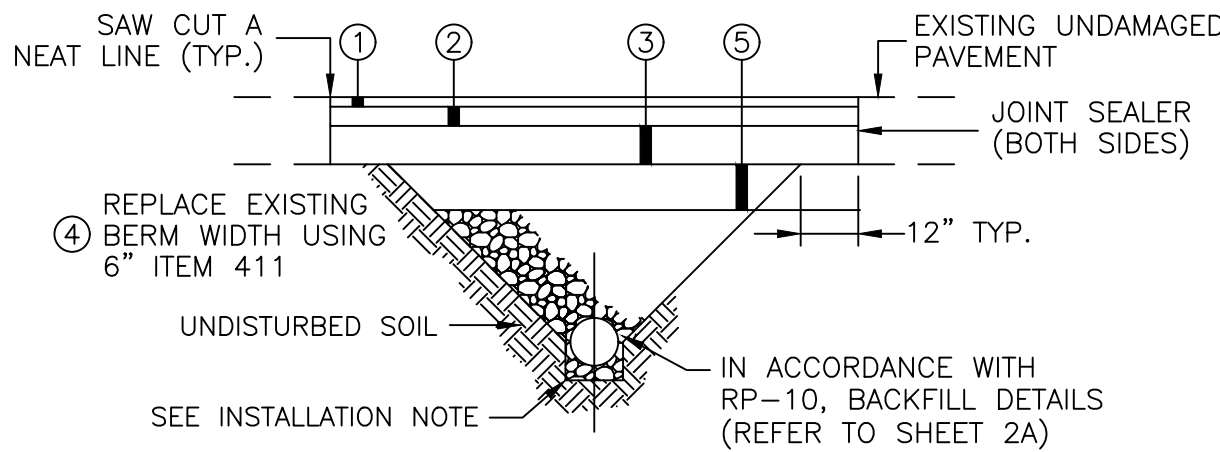
SANITARY SEWER QUANTITIES

NO.	ITEM	QTY.	UNIT	DESCRIPTION
1	611	80	L.F.	24" CONDUIT, TYPE "C"
2	611	2,261	L.F.	15" CONDUIT, TYPE "B"
3	611	850	L.F.	15" CONDUIT, TYPE "C"
4	611	100	L.F.	8" CONDUIT, TYPE "B"
5	611	235.6	V.F.	TYPE 2, STANDARD MANHOLE INCLUDING CASTING (15)
6	611	543	L.F.	6" SERVICE CONNECTION, TYPE "B"
7	611	518	L.F.	6" SERVICE LATERAL, DIRECTIONAL DRILL (13)
8	611	1	EA.	6" on 8" TEE
9	611	33	EA.	6" on 15" TEE
10	611	7	EA.	6" on 6" DOUBLE WYE
11	611	200	L.F.	STORM PIPE, 12" AND UNDER; REMOVE & REPLACE
12	611	100	L.F.	STORM PIPE, OVER 12"; REMOVE & REPLACE
13	611	1	EA.	CATCH BASIN, REMOVE & REPLACE
14	SPEC.	1	LUMP	GRINDER PUMP & FORCE MAIN INSTALLATION
				(Monclova Twp. Fire Station)
15	SPEC.	1,500	S.Y.	PAVEMENT REMOVAL & REPLACEMENT, FULL DEPTH
16	201	1	LUMP	CLEARING AND GRUBBING
17	201	1	LUMP	TREE REMOVAL
18	SPEC.	1	LUMP	VIDEO TAPING - PRE CONSTRUCTION, PROJECT SITE(S)
19	SPEC.	1	LUMP	VIDEO TAPING SANITARY - 18 MONTHS POST CONSTRUCTION
20	SPEC.	1	LUMP	TEMPORARY SEDIMENT AND EROSION CONTROL
21	SPEC.	1	LUMP	RESTORATION OF RIGHT-OF-WAY & EASEMENT AREA
22	614	1	LUMP	MAINTAINING TRAFFIC

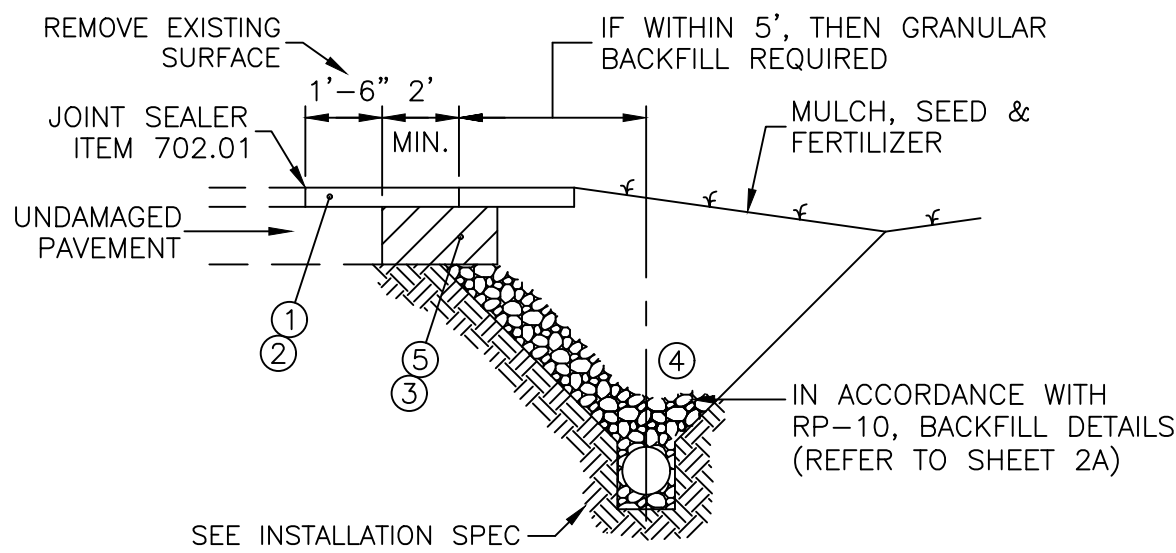
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- CONSTRUCTION METHODS, EQUIPMENT AND MATERIALS PROPOSED FOR PAVEMENT RESTORATION SHALL BE APPROVED BY THE LUCAS COUNTY ENGINEER PRIOR TO BEGINNING THIS WORK.
- WHERE EXISTING PAVEMENT SURFACE AND/OR BASE IS DAMAGED OR UNDERMINED AS DETERMINED BY THE ENGINEER, REPLACEMENT OR RESURFACING AS DETAILED BELOW SHALL BE REQUIRED.

- ① 1 1/2" - ITEM 441 ~ ASPHALT CONCRETE, SURFACE COURSE, TYPE 1, (449) PG 64-22
- ② 2 1/2" - ITEM 441 ~ ASPHALT CONCRETE, INTERMEDIATE COURSE, TYPE 2
- ③ 6" - ITEM 301 ~ ASPHALT CONCRETE BASE, PG 64-22
- ④ 6" - ITEM 411 ~ BERM, STABILIZED CRUSHED AGGREGATE MATCH EXISTING WIDTH
- ⑤ 8" - ITEM 304 ~ AGGREGATE BASE



CROSSOVER
N.T.S.



ADJACENT TO PAVEMENT

PAVEMENT REPLACEMENT DETAILS
N.T.S.

DRIVES DISTURBED DUE TO CONSTRUCTION ARE TO BE REPLACED WITH A MINIMUM FROM THE FOLLOWING TABLE. THE COST IS TO BE INCLUDED IN THE UNIT PRICE FOR THE PERTINENT CONDUIT ITEM.

ASPHALTIC DRIVES

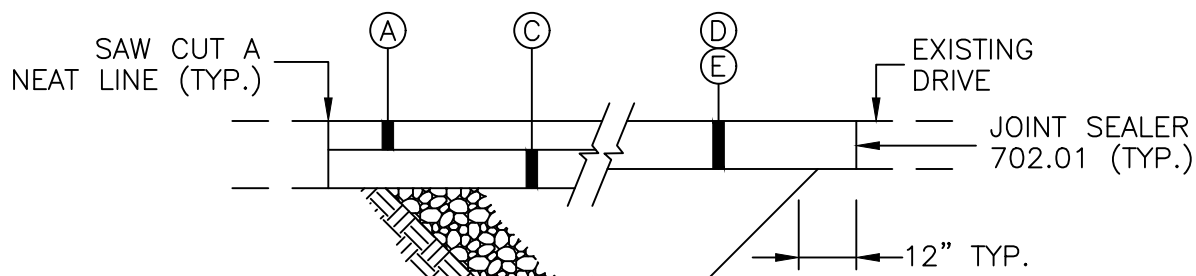
- ① 2" - ITEM 441 ~ ASPHALT CONCRETE, SURFACE COURSE, TYPE 1, (448) PG 64-22
- ② 6" - ITEM 304 ~ AGGREGATE BASE

CONCRETE DRIVES

- ③ 6" - ITEM 452 ~ NON-REINFORCED CONCRETE PAVEMENT, CLASS QC MS

STONE DRIVES

- ④ 6" - ITEM 304 ~ AGGREGATE BASE



BACKFILL SHALL MEET CURRENT O.D.O.T. SPECIFICATIONS Items 703.11, TYPE 1 (ITEM 304). GRADATION AND COMPACTION TESTING SHALL BE REQUIRED BY THE LUCAS COUNTY ENGINEER. BACKFILL SHALL BE PLACED IN 12" LIFTS.

ALL DRIVE APPROACHES AND X-OVER PAVEMENT CUTS SHALL BE SAW CUT.
DRIVE REPLACEMENT SHALL BE FROM EDGE OF PAVEMENT TO BACK OF TRENCH.

DRIVEWAY REPLACEMENT DETAILS
N.T.S.

MAINTENANCE OF TRAFFIC

CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL MAINTENANCE OF TRAFFIC FOR ROADWAYS AND PATHS IMPACTED BY THE PROJECT OPERATIONS. WORK SHALL INCLUDE SUBMITTAL OF A TRAFFIC IMPACT REPORT AND PLAN OF ACTION FOR REVIEW BY THE LUCAS COUNTY ENGINEER'S OFFICE, AND THE FULL IMPLEMENTATION AND MAINTENANCE OF THE APPROVED PLAN. ALL TEMPORARY SIGNS, BARRICADES AND DETOURS REQUIRED FOR THE SAFE AND ACCEPTABLE MAINTENANCE OF TRAFFIC SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

TRAFFIC SHALL BE MAINTAINED AND SAFETY PROVISIONS MADE IN ACCORDANCE WITH ITEM 614 OF THE OHIO DEPARTMENT OF TRANSPORTATION'S CONSTRUCTION AND MATERIAL SPECIFICATIONS, THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAY (THE OHIO MANUAL) AND THE REQUIREMENTS OF THIS NOTE.

WHEN THE ROAD IS RE-OPENED TO TWO-WAY TRAFFIC, THE ROAD CONSTRUCTION AHEAD SIGN SHALL REMAIN IN PLACE WHILE THE ONE LANE ROAD AHEAD AND THE FLAGGER AHEAD SIGNS SHALL BE REMOVED OR COVERED.

IF MAINTENANCE OF TRAFFIC FACILITIES, PROVISIONS FOR TRAFFIC CONTROL AND SAFETY ARE NOT ACCOMPLISHED TO THE SATISFACTION OF THE LUCAS COUNTY ENGINEER, THEN THE ENGINEER WILL NOTIFY THE CONTRACTOR OF THE NATURE AND EXTENT OF SUCH PROBLEMS.

METHODS OF MAINTAINING TRAFFIC SHALL BE IN ACCORDANCE WITH ITEM 614, THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (THE OHIO MANUAL) AND THE FOLLOWING:

ONE WAY TRAFFIC FLOW MAY BE ESTABLISHED FOR THE PROJECT DURATION OF A TRAFFIC LANE AT LEAST TEN (10) FEET WIDE SHALL BE PROVIDED PER THE DETAILS. TRAFFIC CONTROL DEVICES SHALL BE PLACED TO LIMIT TRAFFIC TO ONE LANE IN ACCORDANCE WITH THE OHIO MANUAL AND O.D.O.T. STANDARD DRAWING MT-97.10 AND MT-97.12.

CLOSURE OF WESTBOUND TRAFFIC, RESTRICTING MONCLOVA ROAD TO ONE WAY TRAFFIC FLOW (EASTBOUND), WILL BE PERMITTED TO COMPLETE THIS CONSTRUCTION. THE EASTBOUND DIRECTION OF TRAVEL SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION UNTIL OCTOBER 31, 2024. A TRAFFIC LANE AT LEAST TEN (10) FEET WIDE SHALL BE PROVIDED AT ALL TIMES.

LIQUIDATED DAMAGES OF \$900. PER DAY WILL BE ASSESSED IF THIS DATE IS NOT MET.

THE CONTRACTOR SHALL PROVIDE, ERECT, AND MAINTAIN SIGNS AS PER THE OHIO MANUAL. IN NO CASE WILL ONE WAY FLOW BE PERMITTED UNTIL ADEQUATE TRAFFIC CONTROL DEVICES ARE IN PLACE AND APPROVED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES SHALL BE SET UP PRIOR TO THE START OF CONSTRUCTION AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH SPECIAL CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS THEY ARE NEEDED AND SHALL BE IMMEDIATELY REMOVED THEREAFTER. ALL SIGNS WITH MESSAGES WHICH DO NOT APPLY DURING A CERTAIN PERIOD SHALL BE COVERED OR SET ASIDE OUT OF VIEW OF TRAFFIC. ALL TRAFFIC CONTROL DEVICES SHALL BE KEPT IN PROPER POSITION, CLEAN, LEGIBLE AND IN GOOD WORKING CONDITION AT ALL TIMES.

DRIVEWAY ACCESS SHALL BE MAINTAINED AT ALL PERIODS OF CONSTRUCTION BY USE OF EXISTING AND PROPOSED PAVEMENT, BERMS, OR SHOULDERS TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL PROVIDE RESIDENTS AND/OR BUSINESSES WITH A MINIMUM FORTY-EIGHT (48) HOUR NOTICE WHEN ACCESS TO THEIR DRIVEWAYS WILL BE RESTRICTED DUE TO CONSTRUCTION.

THE CONTRACTOR MAY SUBMIT ALTERNATE METHODS FOR THE MAINTENANCE OF TRAFFIC PROVIDED THE INTENT OF THE PREVIOUS PROVISIONS IS FOLLOW AND NO ADDITIONAL INCONVENIENCE TO THE TRAVELING PUBLIC RESULTS THEREFROM. NO ALTERNATE PLAN SHALL BE PLACED INTO EFFECT UNTIL APPROVAL HAS BEEN GRANTED IN WRITING BY THE COUNTY.

POWER BROOM

THE CONTRACTOR SHALL POWER BROOM SWEEP THE ROADWAY AT THE END OF EACH DAY IF DEEMED NECESSARY BY THE BY THE ENGINEER. COST ARE INCLUDED IN MAINTAINING TRAFFIC, ITEM 614.

IF THE CONTRACTOR FAILS TO DO ANY OF THE WORK AS PER GENERAL NOTES AND STANDARD SPECIFICATIONS, THE WORK WILL BE DONE BY LUCAS COUNTY FORCES AND ALL COSTS WILL BE DEDUCTED FROM PAYMENTS TO THE CONTRACTOR. A MINIMUM OF \$500 WILL BE DEDUCTED FOR EACH EVENT.

PAVEMENT MARKINGS

ANY PAVEMENTS MARKINGS DAMAGED/REMOVED AS PART OF THIS PROJECT SHALL BE REPLACED TO THE SATISFACTION OF THE LUCAS COUNTY ENGINEER'S DEPARTMENT. COST ARE INCLUDED IN MAINTAINING TRAFFIC, ITEM 614.

THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTIES AND/OR BUSINESSES AT ALL TIMES EXCEPT WHEN WORKING DIRECTLY IN FRONT OF PROPERTY.

DRIVEWAY ACCESS SHALL BE MAINTAINED AT ALL PERIODS OF CONSTRUCTION BY USE OF EXISTING AND PROPOSED PAVEMENT, BERMS, OR SHOULDERS TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL PROVIDE RESIDENTS AND/OR BUSINESSES WITH A MINIMUM FORTY-EIGHT (48) HOUR NOTICE WHEN ACCESS TO THEIR DRIVEWAYS WILL BE RESTRICTED DUE TO CONSTRUCTION.

DURING THE CONSTRUCTION AT LOSE ROAD, EASTBOUND MONCLOVA ROAD SHALL BE SHIFTED TO THE NORTH AROUND THE CONSTRUCTION AND UTILIZING THE WESTBOUND LANE. ALL ODOT STANDARDS SHALL APPLY TO THE LANE SHIFT. THE LANE SHIFTS SHALL BE ON ONE DAY BETWEEN 9AM AND 3PM ONLY.

THE CONTRACTOR CAN NOT BEGIN PROJECT PRIOR TO JULY 15TH, 2024 DUE TO OPWC FUNDING, BUT MUST BEGIN PROJECT BEFORE AUGUST 15TH, 2024 DUE TO THE BRIDGE REPLACEMENT PROJECT ON MONCLOVA ROAD AT BLYSTONE DITCH (NEAR STA. 432+00) BY THE LUCAS COUNTY ENGINEER'S OFFICE.

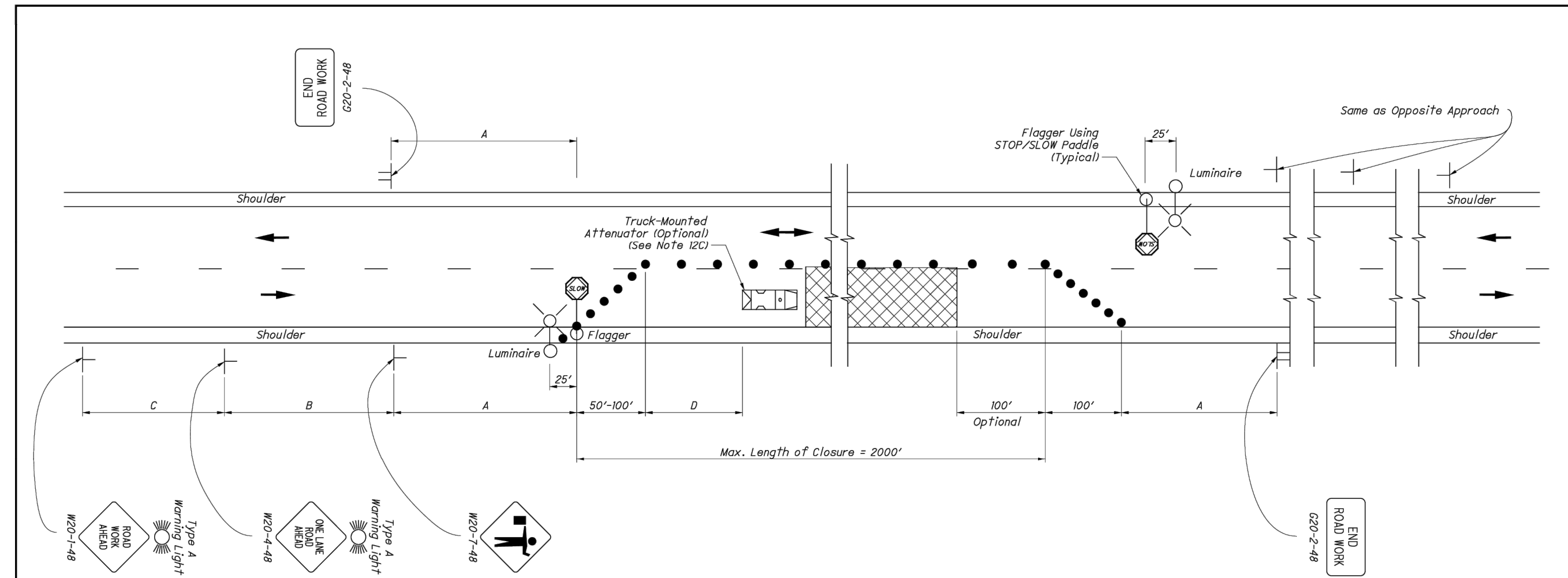


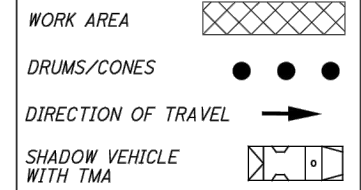
TABLE I (SIGN SPACING)

ROAD TYPE	A	B	C
Two-Lane (40 MPH)	100	100	100
Two-Lane (45-50 MPH)	350	350	350
Two-Lane (55-60 MPH)	500	500	500

TABLE II

SPEED LIMIT (MPH)	BUFFER (FT) MIN.
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570

LEGEND



NOTES:

FLAGGERS

1. Flaggers, one for each direction, shall be used to control traffic continuously for as long as a one lane operation is in effect. The flaggers shall be able to communicate with each other at all times.

LENGTH OF CLOSURE

2. Several small work areas close together should be combined into one work zone. However, the closure shall not be more than 2000' long unless approved by the Engineer. The minimum length between closures shall be 2000'. Only one side of the road shall be closed in any one work zone.

SIGN LOCATION AND SPACING

- 3A. The minimum spacing between work zone signs is shown in Table I. Maximum spacing should not be greater than 1.5 times the distances shown in Table I.
- 3B. Sign spacing should be adjusted to avoid conflict with existing signs. Minimum spacing to existing signs shall be 200' for speeds of 45 mph or less and a minimum of 400' for speeds of 50 mph or greater.
- 3C. The location of the advance warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.

ADJUSTMENTS FOR SIGHT DISTANCE

4. The location of the flagger station and the advance warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.

BASIC SIGNING

- 5A. ROAD WORK AHEAD (W20-1) signs shall be provided on entrance ramps or roadways entering the work limits.
- 5B. END ROAD WORK (20-2) signs are only required for lane closures of more than 1 day. If it is intended that these signs be placed on the mainline, on all exit ramps, and on roadways exiting the work limits.
- 5C. Overlapping of signing for adjacent projects should be avoided where the messages could be confusing. Any ROAD WORK AHEAD (W20-1) or END ROAD WORK (20-2) sign which falls within the limits of another traffic control zone shall be omitted or covered during the period when both projects are active.

SIGNING DETAILS

- 6A. The Advisory Speed (W13-P) plaque shall be used when specified in the plan.
- 6B. 36" warning signs may be used when the approach speed limit is 40 mph or less.

FLASHING WARNING LIGHTS

7. Type A Flashing warning lights shown on the ROAD WORK AHEAD (W20-1) signs and on the LANE CLOSED AHEAD (W20-5) signs are required whenever a night lane closure is necessary.

DRUMS / CONES

- 8A. Drum spacing shall be as follows:
- a) Spacing along the closure shall be 40' center-to-center.
- b) Spacing along the approach taper shall be 10' center-to-center.
- 8B. Cones may be substituted for drums as follows:
- a) Cones used for daytime traffic control shall have a minimum height of 28".
- b) Cones used for nighttime traffic control shall have a minimum height of 42".
- c) Use of cones at night shall be prohibited along Tapers.
- 8C. Provisions shall be made to stabilize the cones and drums to prevent them from blowing over.
- 8D. A minimum of two drums shall be used to close the paved shoulder.

(RESERVED FOR FUTURE USE)

AREA ILLUMINATION

- 10A. Adequate area illumination of each flagger station shall be provided at night. Use of portable flood lighting is acceptable. Luminaires shall be located adjacent to each flagger station.
- 10B. To ensure the adequacy of floodlight placement and the elimination of glare, the Contractor and the Engineer shall drive through the worksite each night when the lighting is in place. Light placement and shielding shall be adjusted to the satisfaction of the Engineer.

INTERSECTION / DRIVEWAY ACCESS

11. Within the length of closure, provision shall be made to control traffic entering from intersecting streets and major drives as necessary. To prevent wrong-way movements and to keep vehicles off of new pavement not ready for traffic, the Contractor shall:
- a) Place across the closed lane, either three drums (cones) or barricades, and/or
- b) Provide an additional flagger at every public street intersection and major driveway.

Drums (cones) placed across the closed lane shall be located 25' beyond the projected pavement edges of the driveway or cross highway, as shown in Standard Construction Drawings (SCDs) MT-97.11 or MT-97.12. For barricades, see SCD MT-101.60.

Existing STOP signs shall be relocated as necessary to assure proper location for the traffic conditions.

The method of control shall be subject to the approval of the Engineer.

SHADOW VEHICLE

- 12A. The shadow vehicle shall be in place and unoccupied whenever workers are in the work area. This vehicle shall be removed from the pavement whenever workers are not in the work area.
- 12B. The shadow vehicle shall be equipped with a high-intensity yellow rotating, flashing, oscillating, or strobe light(s).
- 12C. The shadow vehicle shall be equipped with a truck-mounted or trailer attenuator (TMA) in accordance with CMS 614.03 when called for in the plans.

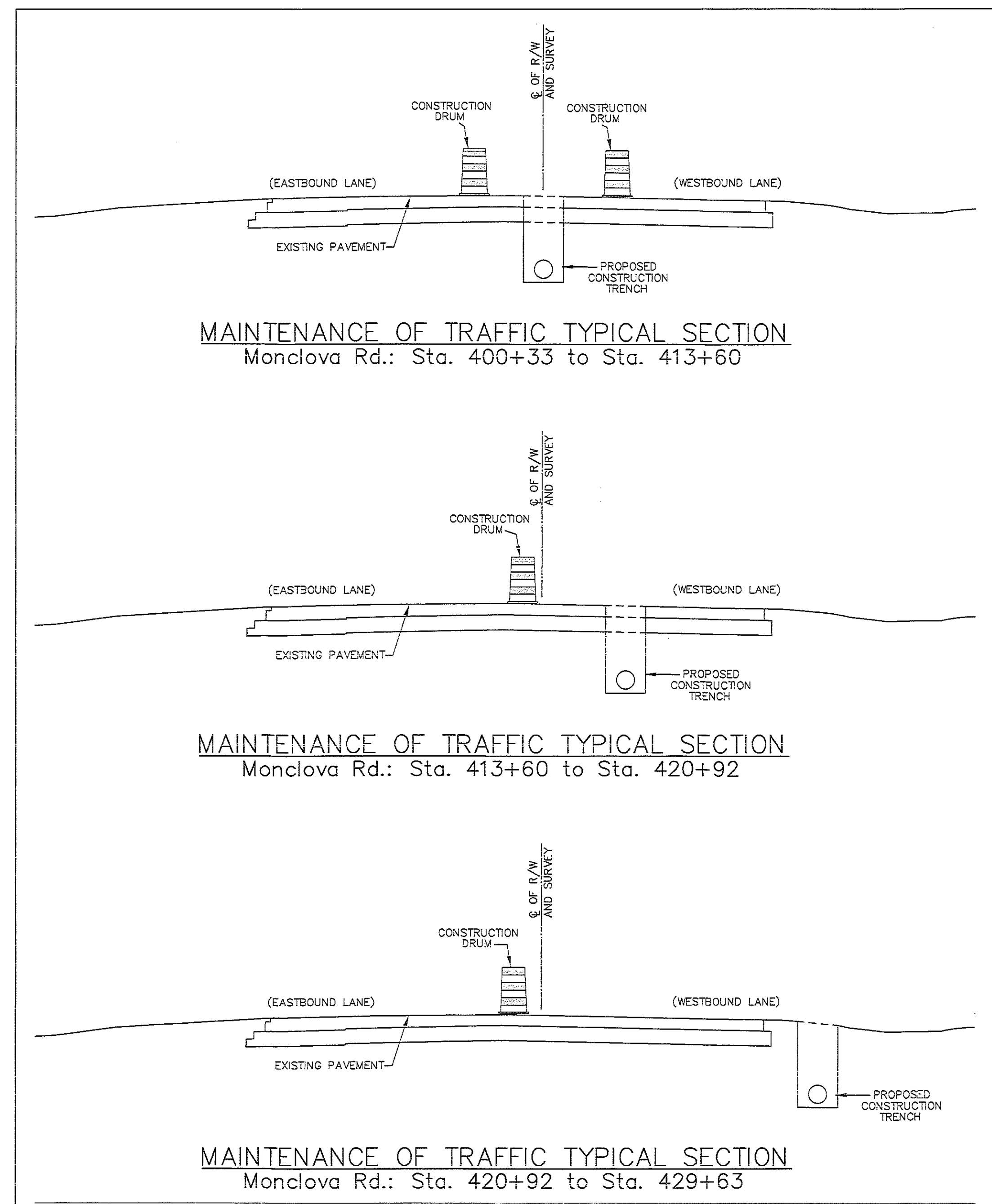
CHIP SEAL OPERATIONS

13. For chip seal operations, additional signing shall be incorporated in the advanced warning area.
- a) The LOOSE GRAVEL (W8-7) and FRESH TAR (W3-2) signs shall both be used in advance of the chip seal operation.
- b) Repeat the LOOSE GRAVEL sign with a 35 mph Advisory Speed (W13-P) plaque every half mile per CMS 422.09.
- c) The FRESH TAR and the LOOSE GRAVEL signs shall both be used for signing of side roads intersecting the work area.

THIS DRAWING REPLACES MT-97.10 DATED 07-18-2014.

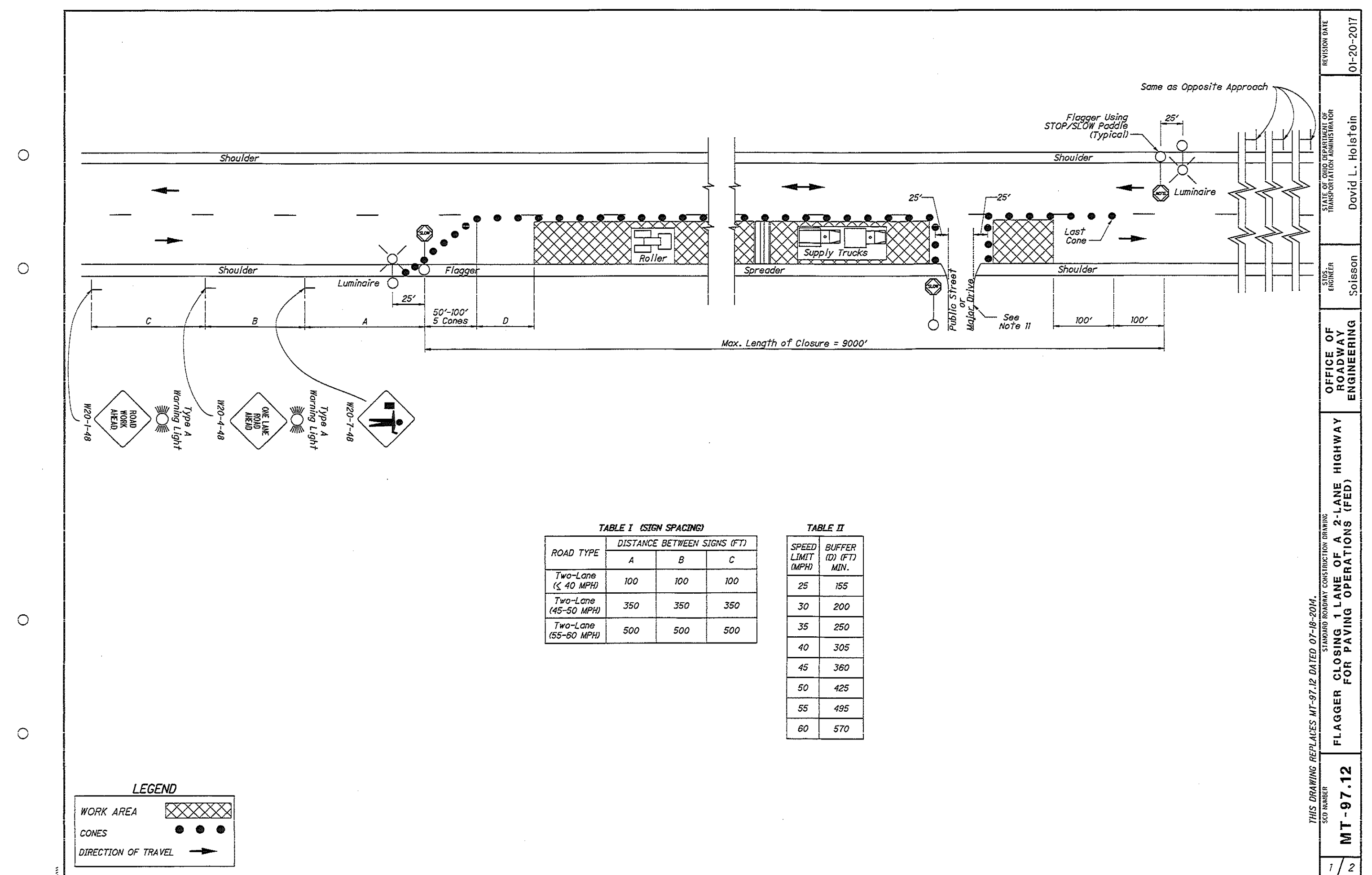
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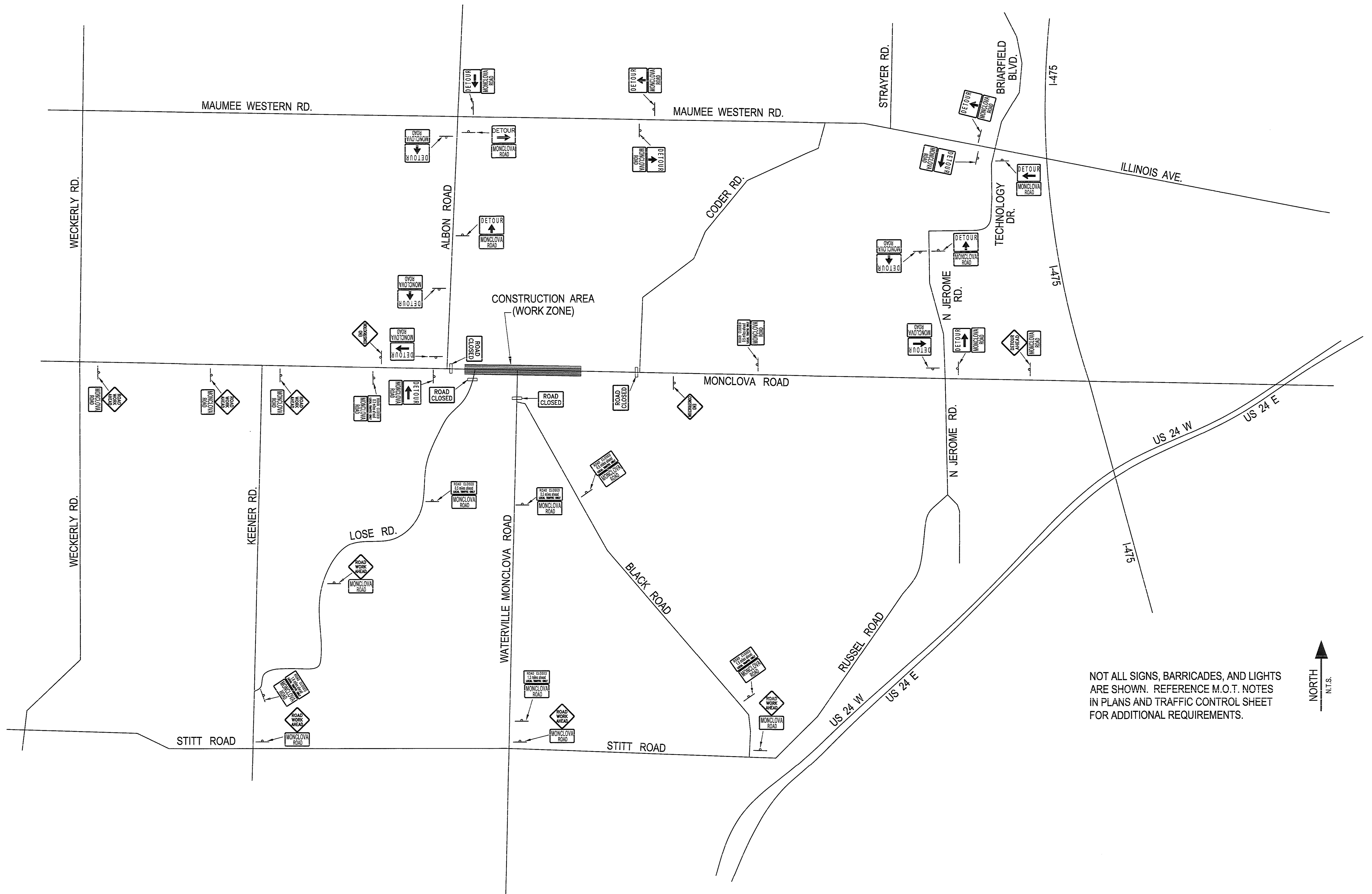
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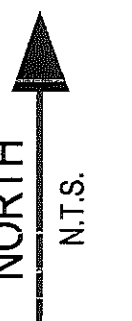
TRENCH WIDTH MUST STAY WITHIN
DESIGNATED LANE

MANHOLE CONSTRUCTION MUST STAY
WITHIN DESIGNATED LANE

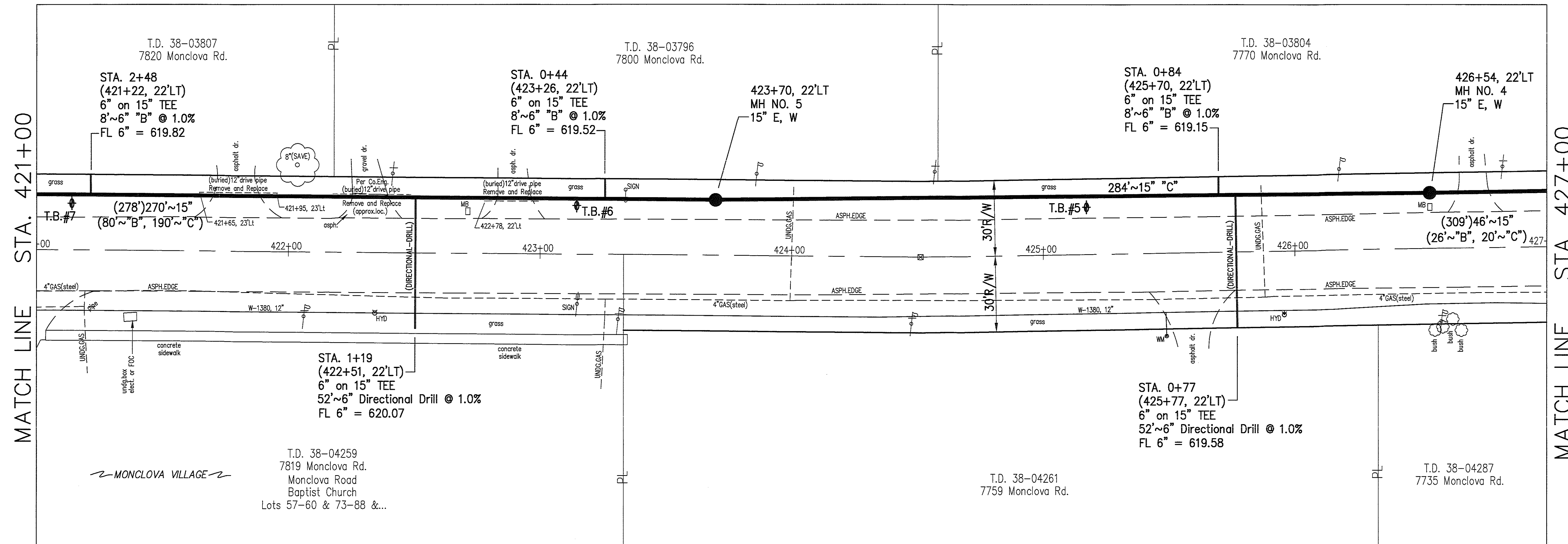




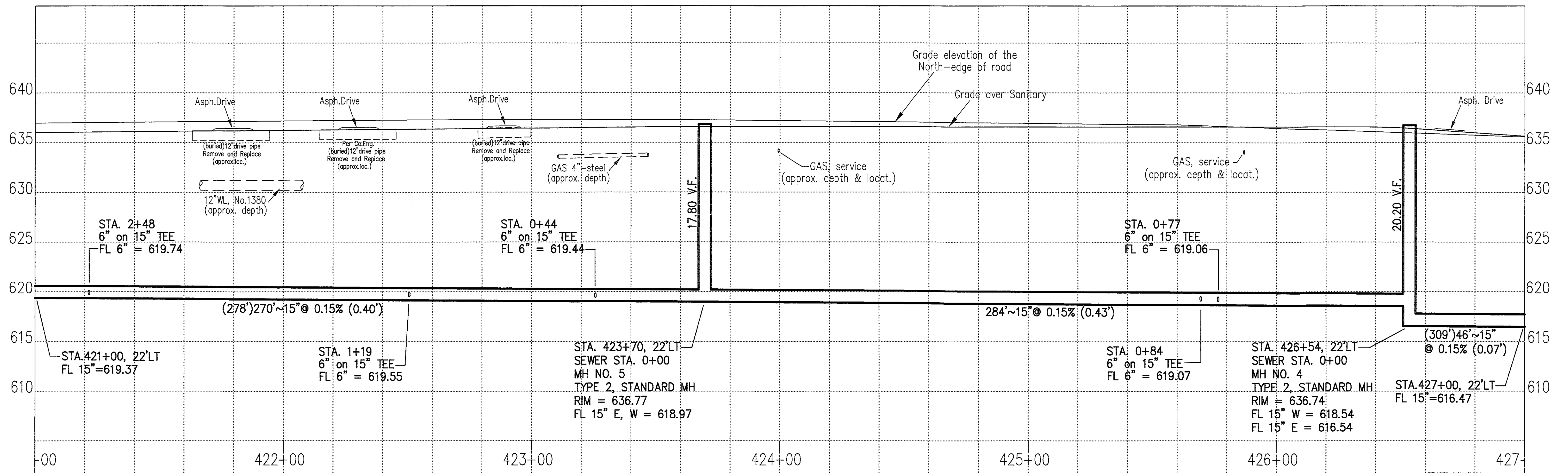
NOT ALL SIGNS, BARRICADES, AND LIGHTS ARE SHOWN. REFERENCE M.O.T. NOTES IN PLANS AND TRAFFIC CONTROL SHEET FOR ADDITIONAL REQUIREMENTS.

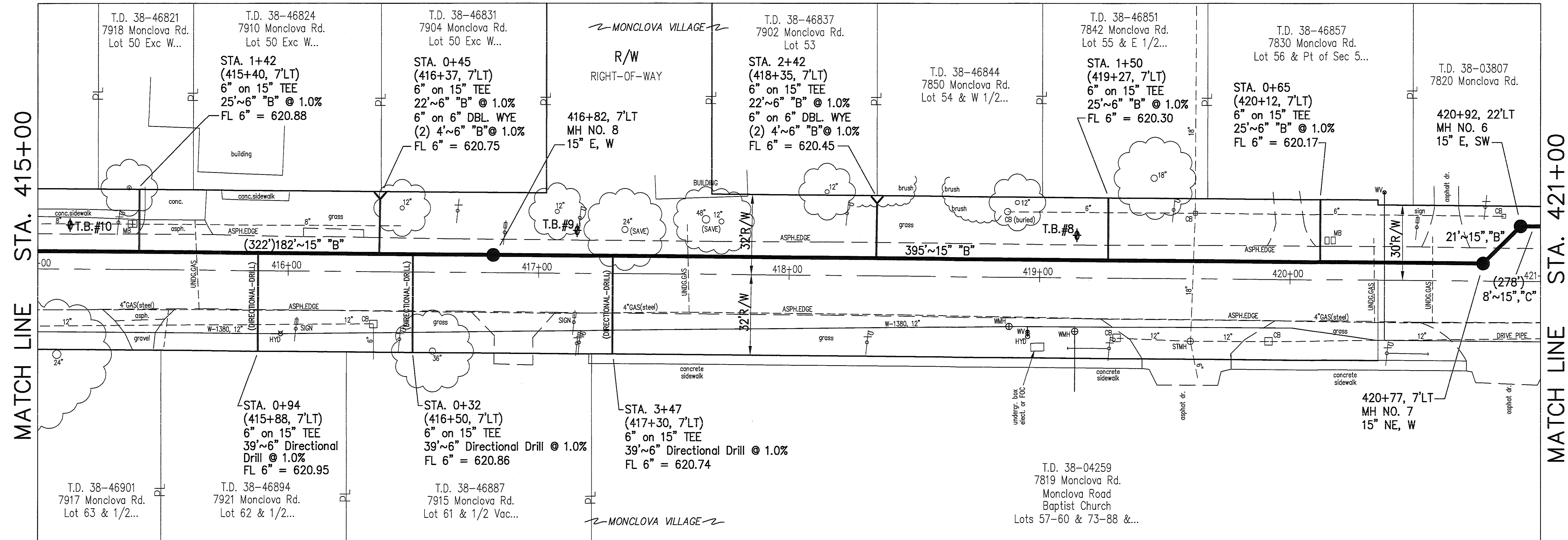


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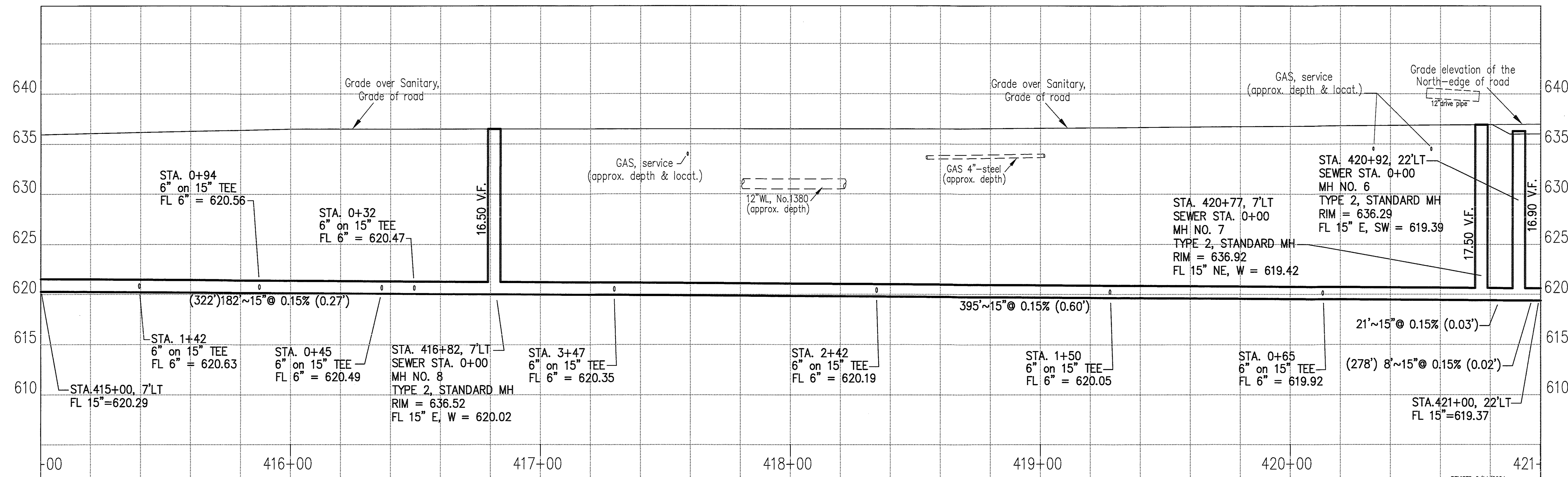


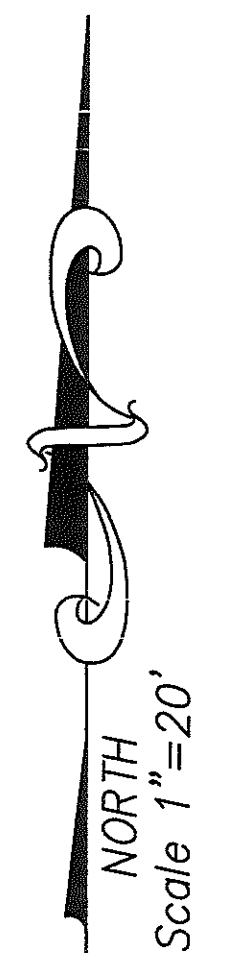
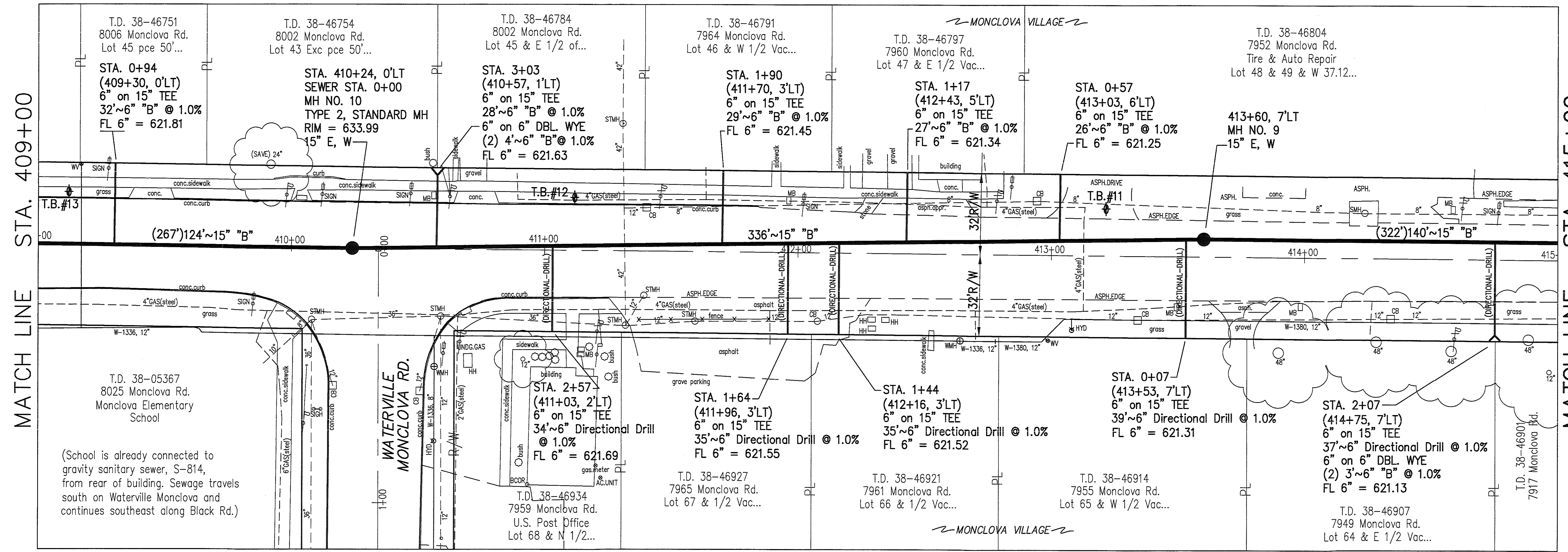
MONCLOVA ROAD



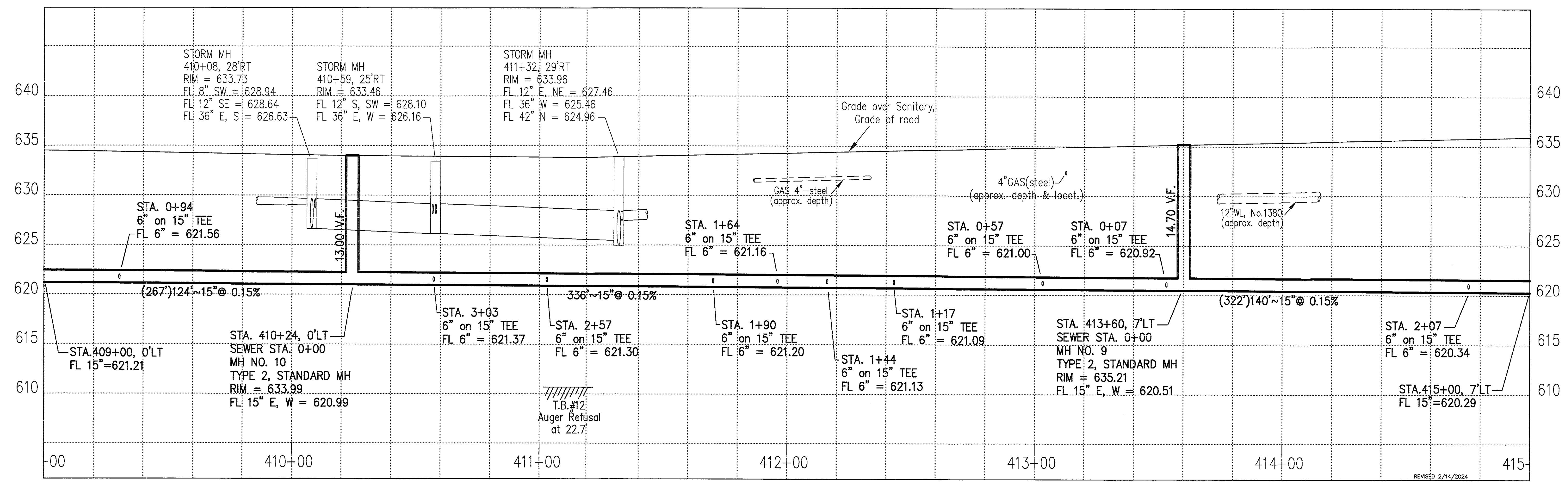


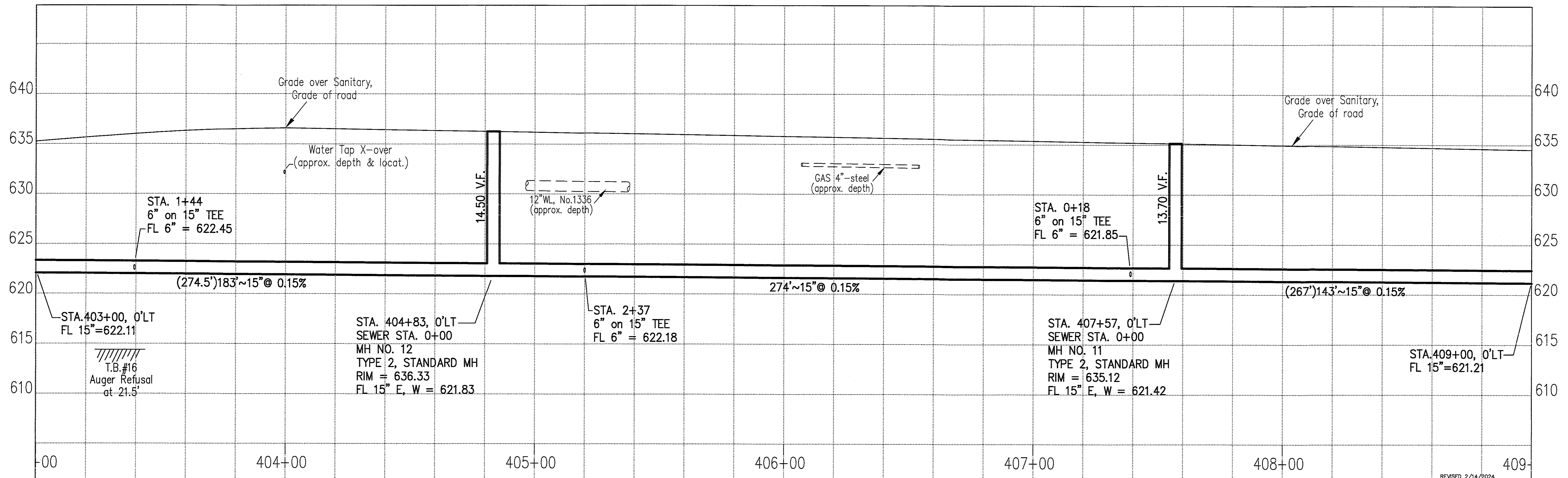
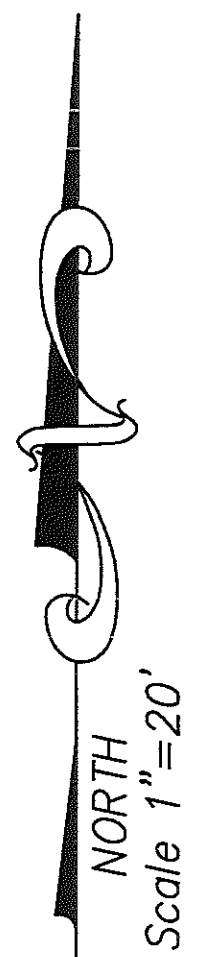
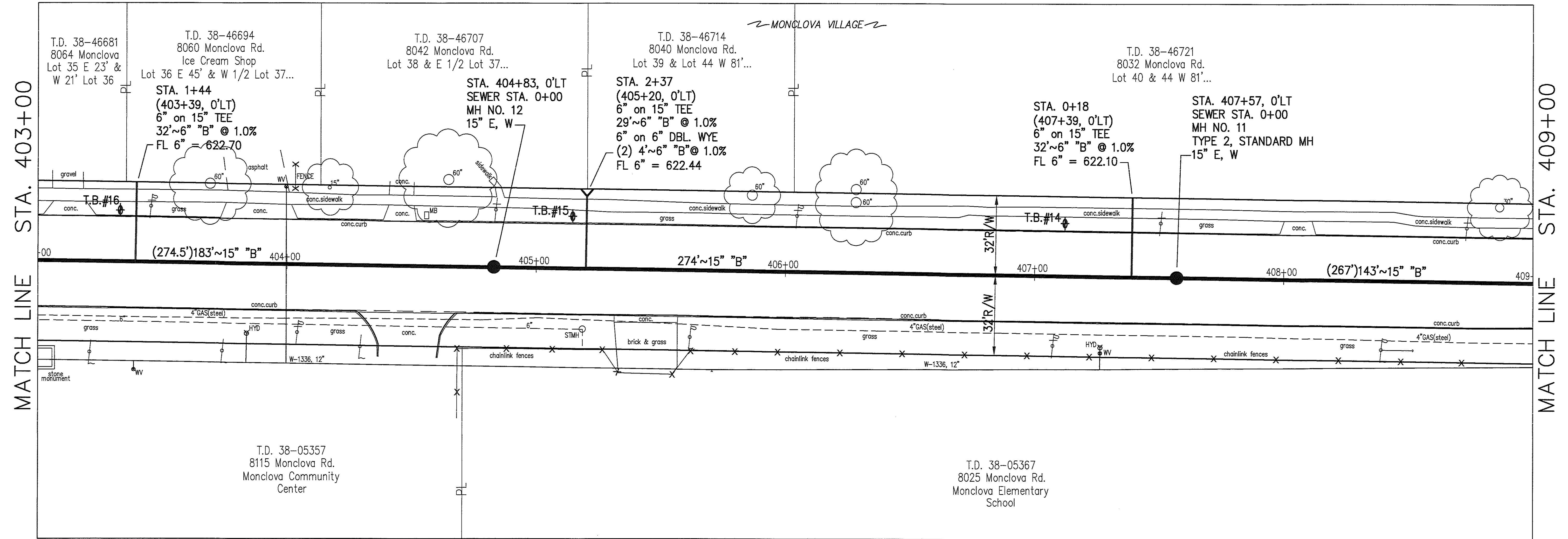
MONCLOVA ROAD

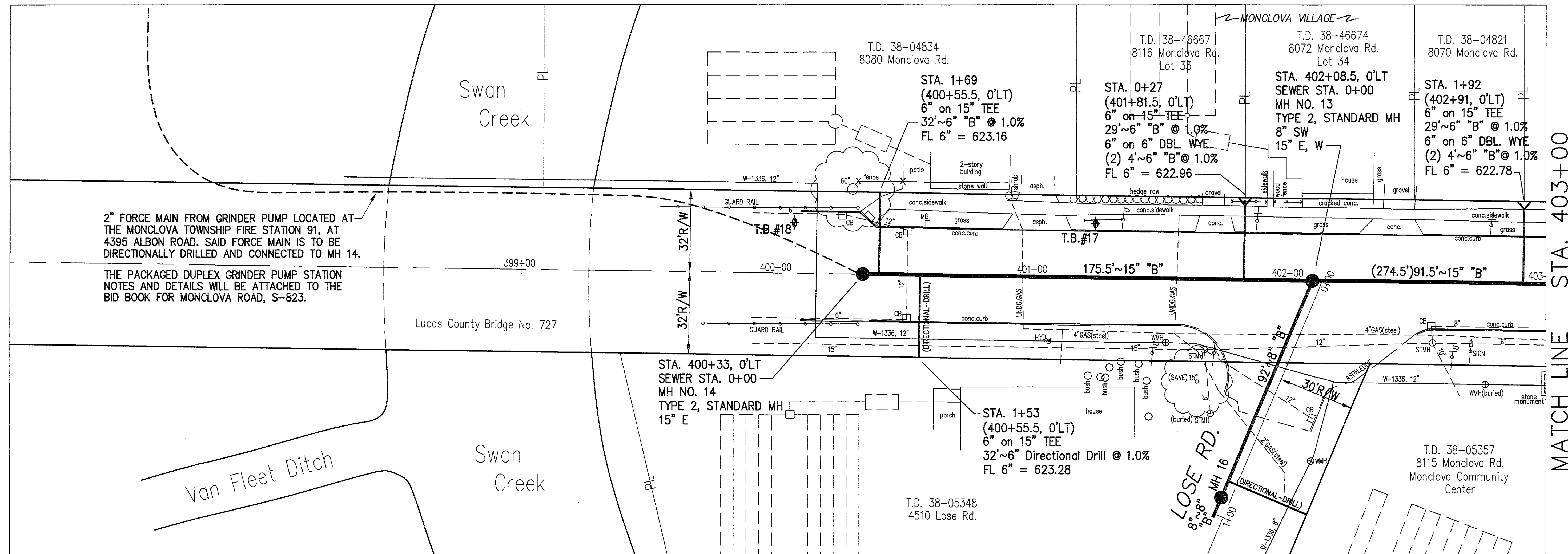




MONCLOVA ROAD

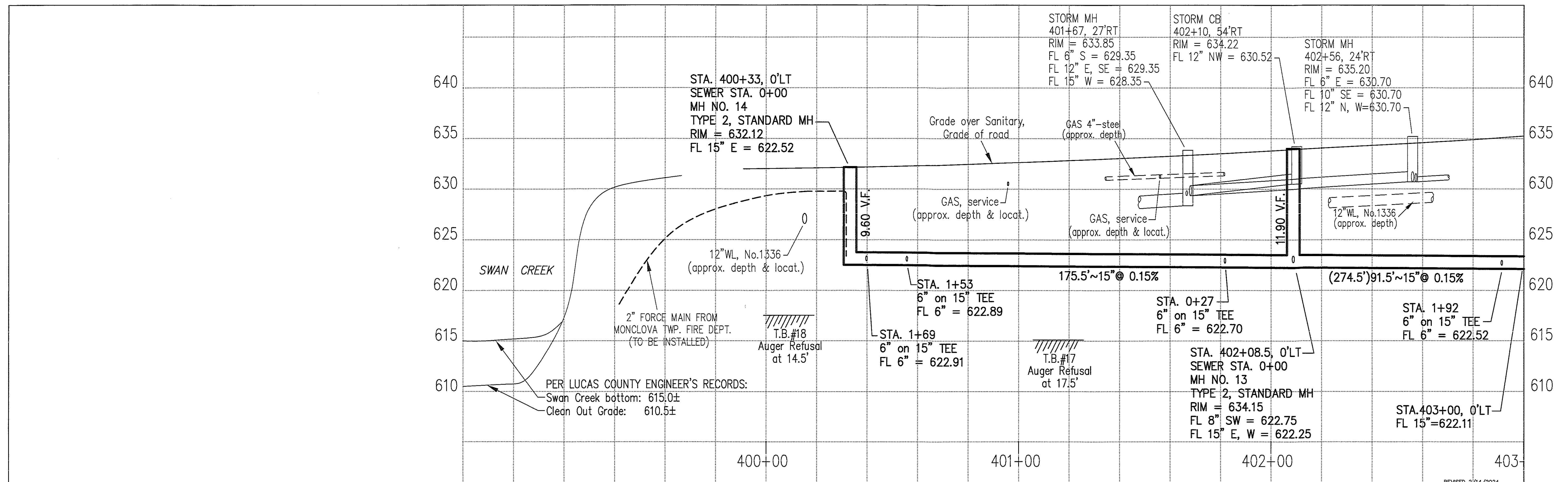


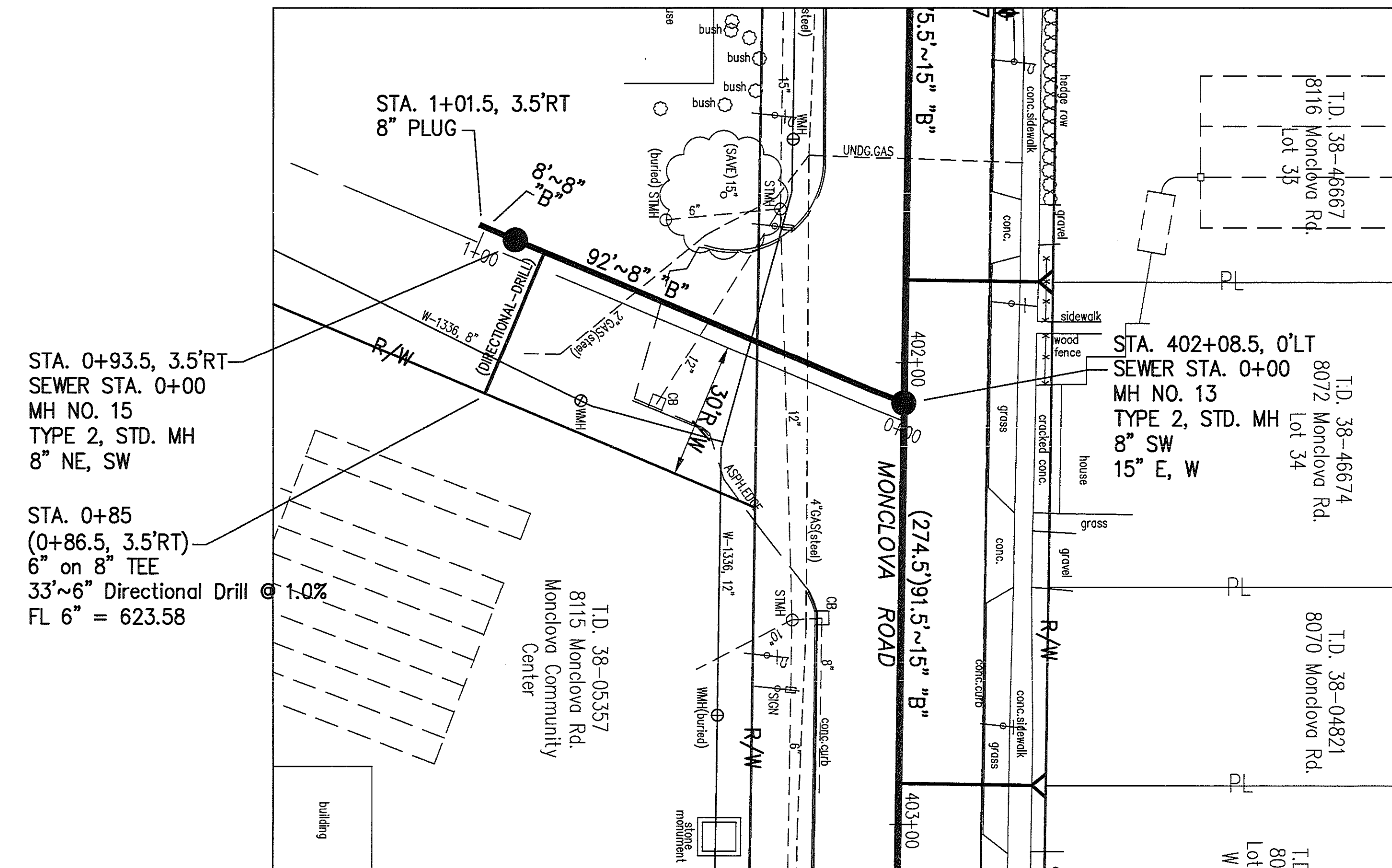
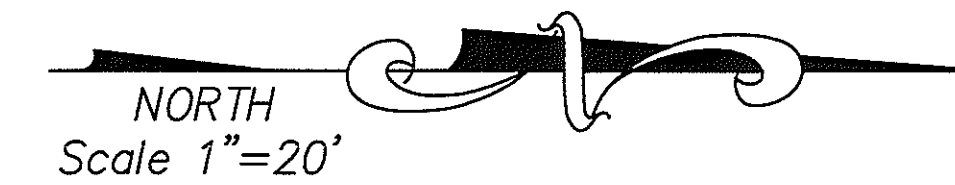




MONCLOVA ROAD

(See Sheet 11)





LOSE ROAD (See Sheet 10)

