

DIRECTORY PATH : R:\Active\Jack Laugel\1113 N Graham Rd\Design\CAD\Plans
DATE/USER : 6/11/2020 11:13 AM / LCOZ



EXISTING LEGEND			
	POWERPOLE		CONTOURS
	TELEPHONE RISER		PROPERTY LINE
	WATER VALVE		SECTION LINE
	FIRE HYDRANT		RIGHT-OF-WAY
	WATER METER		EASEMENT
	CABLE TV RISER		ADJONER LINE
	FIBER OPTIC MARKER		PAVEMENT LINE
	SIGN		PRIVACY FENCE
	MAILBOX		WIRE FENCE
	TEMP. BENCHMARK		DITCH
	MONUMENT FOUND		GAS LINE
	ASPHALT		WATER LINE
	GRAVEL		CABLE TV LINE
	BUILDING		OVERHEAD UTILITY LINE
	REMOVAL/DEMOLISH		SANITARY FORCEMAIN
			SANITARY SEWER W/MANHOLE
			STORM SEWER W/ MANHOLE & END SECTION

TOPOGRAPHICAL NOTES

1. CONTRACTOR SHALL DISPOSE OF ALL MATERIALS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.
2. UTILITIES ARE GRAPHICAL REPRESENTATION PER SURVEY AND MAPPING. CONTRACTOR SHALL FIELD VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL COORDINATE WITH APPLICABLE UTILITY COMPANIES FOR SERVICE DIS-CONNECTIONS.

FLOODPLAIN INFORMATION

BY GRAPHIC PLOTTING ONLY, THIS TRACT OF LAND DESCRIBED HEREON LIES WITHIN ZONE 'X' (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) AND IS NOT IN A SPECIAL FLOOD HAZARD AREA AS PLOTTED ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP FOR JOHNSON COUNTY, INDIANA, COMMUNITY PANEL NO. 18081C0143D, WHICH BEARS AN EFFECTIVE DATE OF AUGUST 2, 2007. ALSO, BY GRAPHIC PLOTTING ONLY, THERE ARE PORTIONS OF LAND WITHIN THE DNR BEST AVAILABLE FLOOD ZONE DATABASE THAT ARE WITHIN ZONE 'A' (1% ANNUAL CHANCE FLOOD HAZARD) & ZONE 'AE' (1% ANNUAL CHANCE FLOOD HAZARD).

LEGAL DESCRIPTION

A PART OF THE EAST HALF OF THE SOUTHWEST QUARTER OF SECTION 35, TOWNSHIP 13 NORTH, RANGE 4 EAST OF THE SECOND PRINCIPAL MERIDIAN, IN FRANKLIN TOWNSHIP, JOHNSON COUNTY, INDIANA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A MAG NAIL AT THE SOUTHEAST CORNER OF SAID SOUTHWEST QUARTER SECTION; THENCE SOUTH 88 DEGREES 58 MINUTES 18 SECONDS WEST (BASIS OF BEARING IS STATE PLANE COORDINATE SYSTEM - INDIANA EAST) ALONG THE SOUTH LINE OF SAID SOUTHWEST QUARTER SECTION 1328.60 FEET TO A MAG NAIL AT THE SOUTHWEST CORNER OF THE EAST HALF OF SAID SOUTHWEST QUARTER SECTION; THENCE NORTH 00 DEGREES 08 MINUTES 09 SECONDS WEST ALONG THE WEST LINE OF SAID HALF QUARTER SECTION 1188.50 FEET TO A MAG NAIL AT THE SOUTHWEST CORNER OF THE LAND OF WAYNE AND BARBARA J. DOWNING, AS RECORDED AS INSTRUMENT NUMBER 2003-029856, IN THE OFFICE OF THE JOHNSON COUNTY RECORDER; THENCE NORTH 88 DEGREES 58 MINUTES 18 SECONDS EAST ALONG THE SOUTH LINE OF SAID DOWNING AND BEING PARALLEL WITH THE SOUTH LINE OF SAID SOUTHWEST QUARTER SECTION 1330.60 FEET TO A CAPPED REBAR STAMPED WITH MAURER SURVEY FIRM #0051, SAID POINT BEING ON THE EAST LINE OF SAID SOUTHWEST QUARTER SECTION; THENCE SOUTH 00 DEGREES 02 MINUTES 23 SECONDS EAST ALONG SAID EAST LINE 1188.55 FEET TO THE POINT OF BEGINNING, CONTAINING 36.27 ACRES, MORE OR LESS.

SUBJECT TO ALL EASEMENTS, RIGHTS OF WAY, AND RESTRICTIONS OF RECORD.

LEGAL DRAIN NOTE:
NO STRUCTURES OR IMPROVEMENTS SHALL BE PERMITTED WITHIN THE LEGAL DRAIN EASEMENT. ALL BUILDINGS, PLANTINGS, CROPS, TREES, SHRUBS, AND WOOD VEGETATION GROWN WITHIN THE EASEMENT, OR LEGAL DRAIN, ARE AT THE RISK OF OWNER AND SUBJECT TO REMOVAL WITHOUT RESTITUTION.

THESE PLANS ARE BASED UPON INFORMATION FROM AN ALTA/NSPS LAND TITLE SURVEY PERFORMED BY MAURER SURVEYING INC. WITH JOB NO. 2320-ALTA-01 WHICH WAS DATED JULY 11, 2019. ALL SURVEY INFORMATION SHOWN HEREON WAS PROVIDED BY MAURER SURVEYING INC.

EXISTING UTILITY SIZE AND MATERIAL INFORMATION SHOWN ON THESE PLANS ARE PER THE BEST GRAPHICAL AND VISIBLE INFORMATION AVAILABLE. CONFLICTS MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL SIZING AND MATERIAL INFORMATION PROVIDED. IF ACTUAL CONDITIONS DIFFER FROM THAT INFORMATION SHOWN ON THE PLANS, THE CONTRACTOR SHALL PRIOR TO THE INSTALLATION OF ANY PROPOSED INFRASTRUCTURE, NOTIFY THE DESIGN ENGINEER IMMEDIATELY.



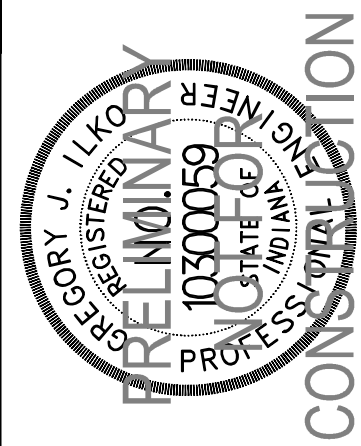
TOPOGRAPHICAL SURVEY

LAUGLE INDUSTRIAL PARK

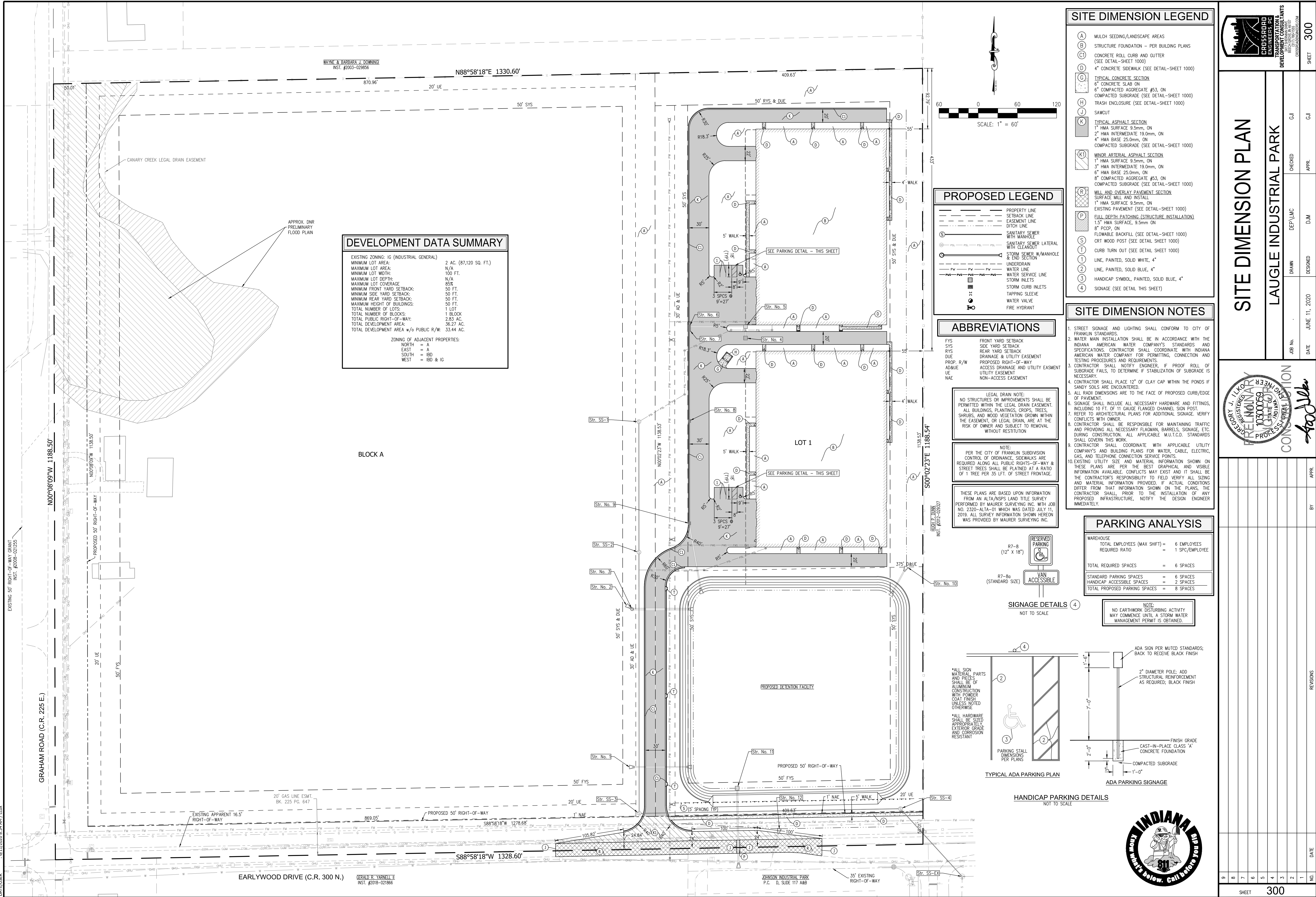
JOB No.	DRAWN	DEP' LMC	CHECKED	GJJ
DATE	JUNE 11, 2020	DESIGNED	DJM	APPR.

SHEET

200



NO.	DATE	REVISIONS	BY	APPR.
9				
8				
7				
6				
5				
4				
3				
2				
1				



DEVELOPMENT DATA SUMMARY	
EXISTING ZONING: IG (INDUSTRIAL GENERAL)	2 AC. (87,120 SQ. FT.)
MINIMUM LOT AREA:	N/A
MAXIMUM LOT AREA:	100 FT.
MINIMUM LOT WIDTH:	N/A
MAXIMUM LOT DEPTH:	85'
MINIMUM FRONT YARD SETBACK:	50 FT.
MINIMUM SIDE YARD SETBACK:	50 FT.
MINIMUM REAR YARD SETBACK:	50 FT.
MAXIMUM HEIGHT OF BUILDINGS:	50 FT.
TOTAL NUMBER OF LOTS:	1 LOT
TOTAL NUMBER OF BLOCKS:	1 BLOCK
TOTAL PUBLIC RIGHT-OF-WAY:	2.83 AC.
TOTAL DEVELOPMENT AREA:	36.27 AC.
TOTAL DEVELOPMENT AREA w/o PUBIC R/W:	33.44 AC.
ZONING OF ADJACENT PROPERTIES:	
NORTH	= A
EAST	= A
SOUTH	= IBO
WEST	= IBO & IG

PROPOSED LEGEND	
---	PROPERTY LINE
---	SETBACK LINE
---	EASEMENT LINE
---	DITCH LINE
---	SANITARY SEWER WITH MANHOLE
---	SANITARY SEWER LATERAL WITH CLEANOUT
---	STORM SEWER W/ MANHOLE & END SECTION
---	UNDERDRAIN
---	WATER LINE
---	WATER SERVICE LINE
---	STORM CURB INLETS
---	TAPPING SLEEVE
---	WATER VALVE
---	FIRE HYDRANT

ABBREVIATIONS	
FYS	FRONT YARD SETBACK
SYS	SIDE YARD SETBACK
RYS	REAR YARD SETBACK
DUE	DRAINAGE & UTILITY EASEMENT
PROP. R/W	PROPOSED RIGHT-OF-WAY
AD&UE	ACCESS DRAINAGE AND UTILITY EASEMENT
UE	UTILITY EASEMENT
NAE	NON-ACCESS EASEMENT

LEGAL DRAIN NOTE:
NO STRUCTURES OR IMPROVEMENTS SHALL BE PERMITTED WITHIN THE LEGAL DRAIN EASEMENT. ALL BUILDINGS, PLANTINGS, CROPS, TREES, SHRUBS, AND WOOD VEGETATION GROWN WITHIN THE EASEMENT, OR LEGAL DRAIN, ARE AT THE RISK OF OWNER AND SUBJECT TO REMOVAL WITHOUT RESTITUTION.

NOTE:
PER THE CITY OF FRANKLIN SUBDIVISION CONTROL OF ORDINANCE, SIDEWALKS ARE REQUIRED ALONG ALL PUBLIC RIGHTS-OF-WAY & STREET TREES SHALL BE PLANTED AT A RATIO OF 1 TREE PER 35 L.F. OF STREET FRONTAGE.

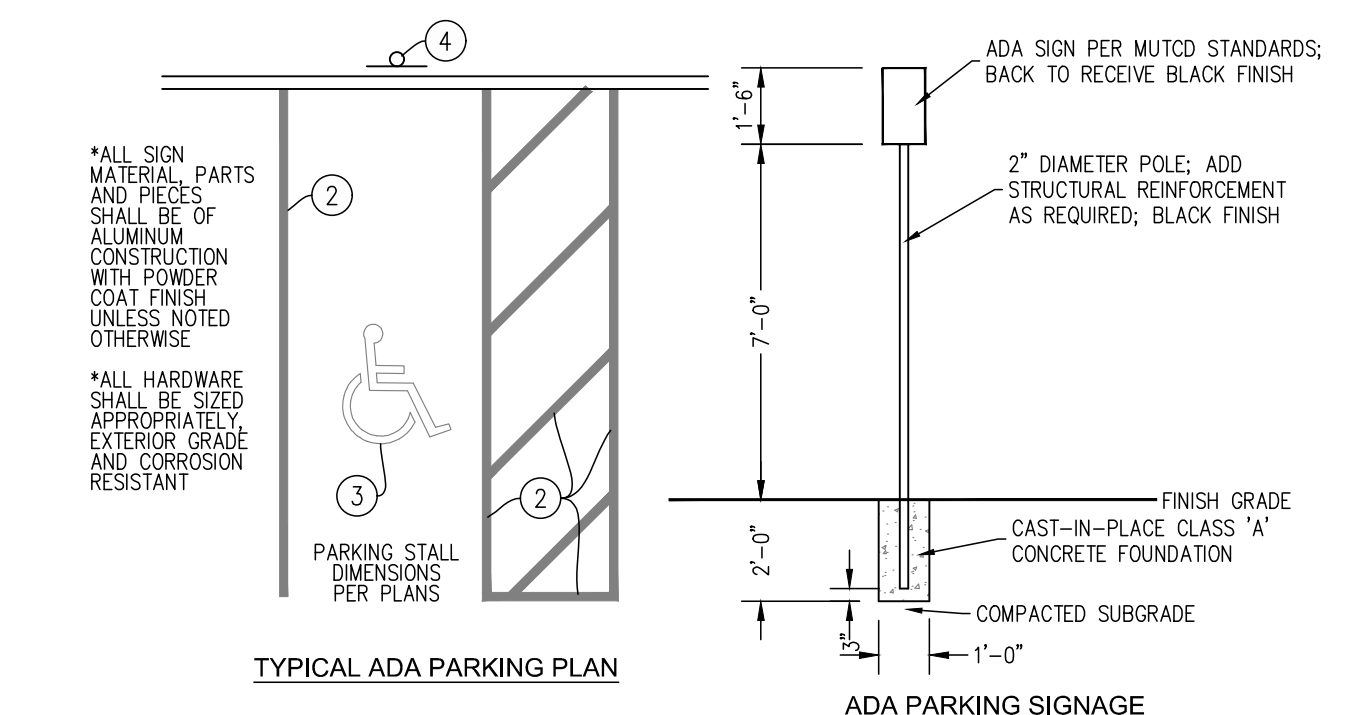
THESE PLANS ARE BASED UPON INFORMATION FROM AN ALTA/NSPS LAND TITLE SURVEY PERFORMED BY MAURER SURVEYING INC. WITH JOB NO. 2320-ALTA-01 WHICH WAS DATED JULY 11, 2019. ALL SURVEY INFORMATION SHOWN HEREON WAS PROVIDED BY MAURER SURVEYING INC.

SITE DIMENSION LEGEND	
(A)	MULCH SEEDING/LANDSCAPE AREAS
(B)	STRUCTURE FOUNDATION - PER BUILDING PLANS
(C)	CONCRETE ROLL CURB AND GUTTER (SEE DETAIL-SHEET 1000)
(D)	4" CONCRETE SIDEWALK (SEE DETAIL-SHEET 1000)
(E)	TYPICAL CONCRETE SECTION
(F)	6" CONCRETE SLAB ON 6" COMPACTED AGGREGATE #53, ON COMPACTED SUBGRADE (SEE DETAIL-SHEET 1000)
(G)	TRASH ENCLOSURE (SEE DETAIL-SHEET 1000)
(H)	SAWCUT
(I)	TYPICAL ASPHALT SECTION
(J)	1" HMA SURFACE 9.5mm, ON 2" HMA INTERMEDIATE 19.0mm, ON 4" HMA BASE 25.0mm, ON COMPACTED SUBGRADE (SEE DETAIL-SHEET 1000)
(K)	MINOR ARTERIAL ASPHALT SECTION
(L)	1" HMA SURFACE 9.5mm, ON 3" HMA INTERMEDIATE 19.0mm, ON 6" HMA BASE 25.0mm, ON COMPACTED SUBGRADE (SEE DETAIL-SHEET 1000)
(M)	MILL AND OVERLAY PAVEMENT SECTION
(N)	SURFACE MILL AND INSTALL EXISTING PAVEMENT (SEE DETAIL-SHEET 1000)
(O)	FULL DEPTH PATCHING (STRUCTURE INSTALLATION)
(P)	1.5" HMA SURFACE, 9.5mm ON 8" PCPP, ON FLOWABLE BACKFILL (SEE DETAIL-SHEET 1000)
(Q)	CRT WOOD POST (SEE DETAIL SHEET 1000)
(R)	CURB TURN OUT (SEE DETAIL SHEET 1000)
(S)	LINE, PAINTED, SOLID WHITE, 4"
(T)	LINE, PAINTED, SOLID BLUE, 4"
(U)	HANDICAP SYMBOL, PAINTED, SOLID BLUE, 4"
(V)	SIGNAGE (SEE DETAIL THIS SHEET)

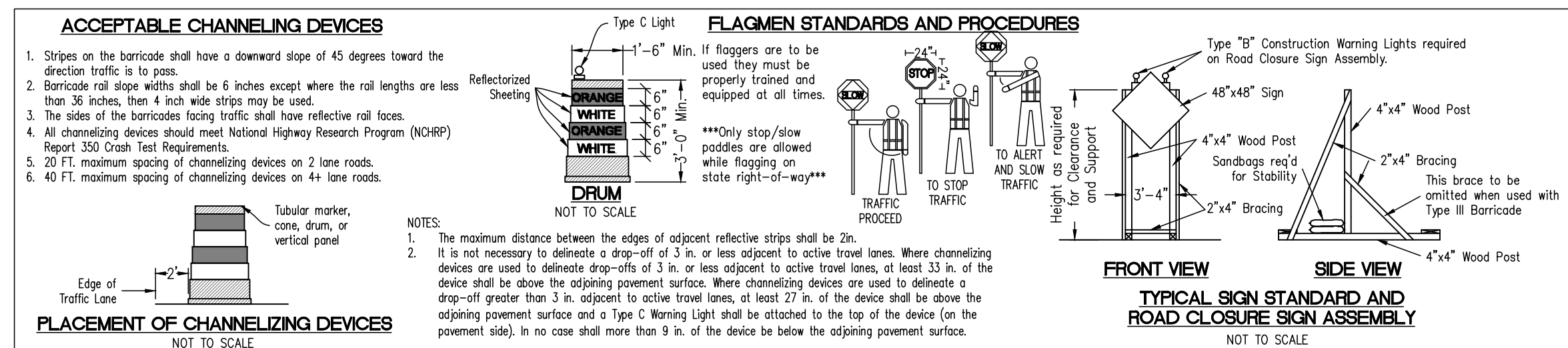
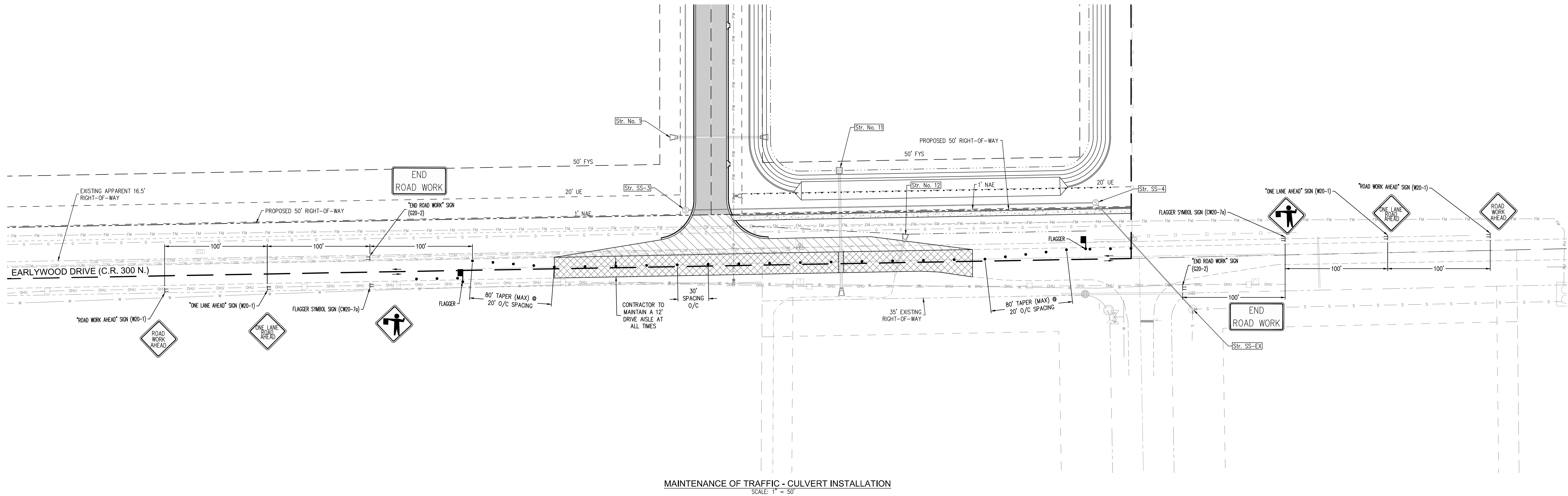
- SITE DIMENSION NOTES**
- STREET SIGNAGE AND LIGHTING SHALL CONFORM TO CITY OF FRANKLIN STANDARDS.
 - WATER MAIN INSTALLATION SHALL BE IN ACCORDANCE WITH THE INDIANA AMERICAN WATER COMPANY'S STANDARDS AND SPECIFICATIONS. CONTRACTOR SHALL COORDINATE WITH INDIANA AMERICAN WATER COMPANY FOR PERMITTING, CONNECTION AND TESTING PROCEDURES AND REQUIREMENTS.
 - CONTRACTOR SHALL NOTIFY ENGINEER, IF PROOF ROLL OF SUBGRADE FAILS, TO DETERMINE IF STABILIZATION OF SUBGRADE IS NECESSARY.
 - CONTRACTOR SHALL PLACE 12" OF CLAY CAP WITHIN THE PONDS IF SANDY SOILS ARE ENCOUNTERED.
 - ALL RADII DIMENSIONS ARE TO THE FACE OF PROPOSED CURB/EDGE OF PAVEMENT.
 - SIGNAGE SHALL INCLUDE ALL NECESSARY HARDWARE AND FITTINGS, INCLUDING 10 FT. OF 11 GAUGE FLANGED CHANNEL SIGN POST. REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL SIGNAGE. VERIFY CONFLICTS WITH OWNER.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC AND PROVIDING ALL NECESSARY FLAGMAN, BARRELS, SIGNAGE, ETC. DURING CONSTRUCTION. ALL APPLICABLE M.U.T.C.D. STANDARDS SHALL GOVERN THIS WORK.
 - CONTRACTOR SHALL COORDINATE WITH APPLICABLE UTILITY COMPANY'S AND BUILDING PLANS FOR WATER, ELECTRIC, GAS, AND TELEPHONE CONNECTION SERVICE POINTS.
 - EXISTING UTILITY SIZE AND MATERIAL INFORMATION SHOWN ON THESE PLANS ARE FOR THE BEST GRAPHICAL AND VISIBLE INFORMATION AVAILABLE. CONFLICTS MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL SIZING AND MATERIAL INFORMATION PROVIDED. IF ACTUAL CONDITIONS DIFFER FROM THAT INFORMATION SHOWN ON THE PLANS, THE CONTRACTOR SHALL, PRIOR TO THE INSTALLATION OF ANY PROPOSED INFRASTRUCTURE, NOTIFY THE DESIGN ENGINEER IMMEDIATELY.

PARKING ANALYSIS	
WAREHOUSE	
TOTAL EMPLOYEES (MAX SHIFT) =	6 EMPLOYEES
REQUIRED RATIO =	1 SPC/EMPLOYEE
TOTAL REQUIRED SPACES =	6 SPACES
STANDARD PARKING SPACES =	6 SPACES
HANDICAP ACCESSIBLE SPACES =	2 SPACES
TOTAL PROPOSED PARKING SPACES =	8 SPACES

NOTE:
NO EARTHWORK DISTURBING ACTIVITY MAY COMMENCE UNTIL A STORM WATER MANAGEMENT PERMIT IS OBTAINED.



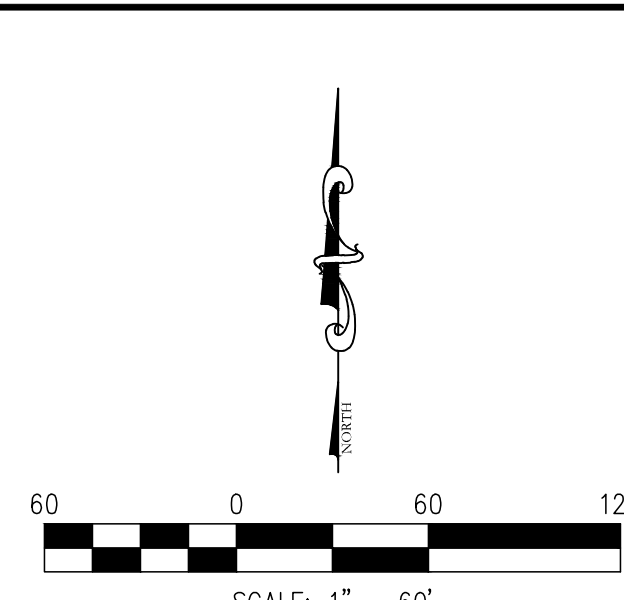
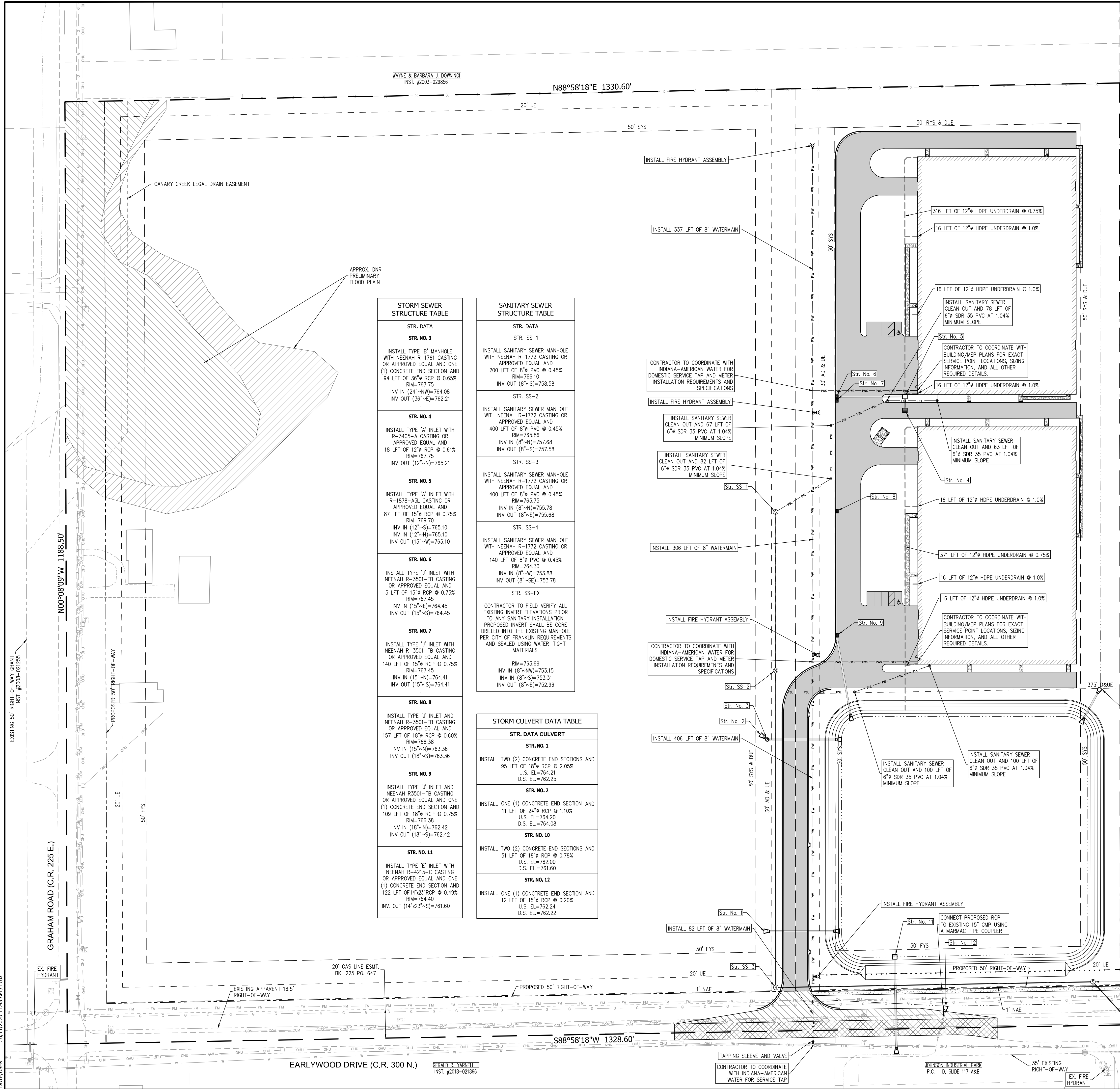
		SHEET 300	
SITE DIMENSION PLAN		LAUGLE INDUSTRIAL PARK	
JOB NO.		DRAWN	DEP/LMC
DATE		DESIGNED	DJM
JUNE 11, 2020		CHECKED	GJJ
BY		APPR.	GJJ
NO.		DATE	REVISIONS
9			
8			
7			
6			
5			
4			
3			
2			
1			
0			



- MAINTENANCE OF TRAFFIC NOTES

1. CONTRACTOR SHALL CONDUCT ALL ROAD CONSTRUCTION AND SURFACING OPERATIONS WHILE MAINTAINING TRAFFIC. CONTRACTOR SHALL UTILIZE FLAGGERS AS NECESSARY DURING CONSTRUCTION OPERATIONS. CONSTRUCTION SHALL BE SEQUENCED SO THAT TWO-WAY TRAFFIC CAN BE RESUMED BY THE END OF CONSTRUCTION EACH WORK DAY.
2. ALL CONSTRUCTION SHALL BE COMPLETED PRIOR TO FLAGGERS AND LANE CLOSURES SHALL BE COMPLETED FOR ONE SIDE OF ROAD BEFORE BEGINNING CONSTRUCTION ON OPPOSITE SIDE OF ROAD. TAPERS SHALL BE ADJUSTED TO REDIRECT TRAFFIC TO APPROPRIATE TRAVEL LANE.
3. ALL CONSTRUCTION TRAFFIC CONTROL MEASURES SHALL BE EXECUTED IN ACCORDANCE WITH THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."





LEGAL DRAIN NOTE:
NO STRUCTURES OR IMPROVEMENTS SHALL BE PERMITTED WITHIN THE LEGAL DRAIN EASEMENT. ALL BUILDINGS, PLANTINGS, CROPS, TREES, SHRUBS, AND WOOD VEGETATION GROWN WITHIN THE EASEMENT, OR LEGAL DRAIN, ARE AT THE RISK OF OWNER AND SUBJECT TO REMOVAL WITHOUT RESTITUTION.

NOTE:
PER THE CITY OF FRANKLIN SUBDIVISION CONTROL OF ORDINANCE, SIDEWALKS ARE REQUIRED ALONG ALL PUBLIC RIGHTS-OF-WAY & STREET TREES SHALL BE PLANTED AT A RATIO OF 1 TREE PER 35 LFT. OF STREET FRONTAGE.

THESE PLANS ARE BASED UPON INFORMATION FROM AN ALTA/NPS LAND TITLE SURVEY PERFORMED BY MAURER SURVEYING INC. WITH JOB NO. 2320-ALTA-01 WHICH WAS DATED JULY 11, 2019. ALL SURVEY INFORMATION SHOWN HEREON WAS PROVIDED BY MAURER SURVEYING INC.

PROPOSED LEGEND	
	PROPERTY LINE
	SETBACK LINE
	EASEMENT LINE
	DITCH LINE
	SANITARY SEWER WITH MANHOLE
	SANITARY SEWER LATERAL WITH CLEANOUT
	STORM SEWER W/MANHOLE & END SECTION
	UNDERDRAIN
	WATER LINE
	WATER SERVICE LINE
	STORM CURB INLETS
	TAPPING SLEEVE
	WATER VALVE
	FIRE HYDRANT

EXISTING LEGEND	
	POWERPOLE
	TELEPHONE RISER
	WATER VALVE
	FIRE HYDRANT
	WATER METER
	CABLE TV RISER
	FIBER OPTIC MARKER
	SIGN
	MAILBOX
	TEMP. BENCHMARK
	MONUMENT FOUND
	ASPHALT
	GRAVEL
	BUILDING
	REMOVAL/DEMOLISH
	CONTOURS
	PROPERTY LINE
	SECTION LINE
	RIGHT-OF-WAY
	EASEMENT
	ADJOWNER LINE
	PAVEMENT LINE
	PRIVACY FENCE
	WIRE FENCE
	DITCH
	GAS LINE
	WATER LINE
	CABLE TV LINE
	OVERHEAD UTILITY LINE
	SANITARY FOREMAN W/MANHOLE
	STORM SEWER W/ MANHOLE & END SECTION

- ### UTILITIES NOTES
- CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC AND PROVIDING ALL NECESSARY FLAGMAN, BARRELS, SIGNAGE, ETC. DURING CONSTRUCTION. ALL APPLICABLE M.U.I.C.D. STANDARDS SHALL COVER THIS WORK.
 - CONTRACTOR SHALL COORDINATE WITH APPLICABLE UTILITY COMPANIES AND CABLE, ELECTRIC, AND TELEPHONE CONNECTION SERVICE INSTALLATIONS.
 - CONTRACTOR SHALL CONFIRM ELECTRICAL TRANSFORMER LOCATIONS, DIMENSIONS, AND SPECIFICATIONS, WITH DUKE ENERGY. CONTRACTOR SHALL COORDINATE WITH DUKE ENERGY FOR NECESSARY ELECTRIC SERVICE REQUIREMENTS.
 - EXISTING UTILITY SIZE AND MATERIAL INFORMATION SHOWN ON THESE PLANS ARE PER THE BEST GRAPHICAL AND VISIBLE INFORMATION AVAILABLE. CONFLICTS MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL SIZING AND MATERIAL INFORMATION PROVIDED. IF ACTUAL CONDITIONS DIFFER FROM THAT INFORMATION SHOWN ON THE PLANS, THE CONTRACTOR SHALL, PRIOR TO THE INSTALLATION OF ANY PROPOSED INFRASTRUCTURE, NOTIFY THE DESIGN ENGINEER IMMEDIATELY.
 - ALL SANITARY SEWER MAIN SHALL BE SDR-35 PVC PIPE.
 - DURING CONSTRUCTION, CONTRACTOR SHALL INSTALL TWO (2) GREEN METAL SIGN POSTS AT EACH SANITARY MANHOLE, AND ONE (1) GREEN METAL SIGN POST AT EACH LATERAL STUB. CONTRACTOR SHALL PROTECT POSTS DURING CONSTRUCTION ACTIVITIES.
 - ALL STORM SEWER CASTINGS SHALL INCLUDE AN EMBOSSED ENVIRONMENTAL LOGO WITH A DEPICTION OF A FISH AND THE PHRASE "DUMP NO WASTE-DRAINS TO STREAM".
 - ALL STORM SEWER LOCATED WITHIN PUBLIC RIGHT-OF-WAY SHALL BE REINFORCED CONCRETE PIPE (RCP), CLASS III, WITH TYPE B WALL THICKNESS, UTILIZING GASKET FITTINGS.
 - ALL HDPE PIPE SHALL BE SOIL TIGHT, N-12 DUAL WALL HDPE PIPE AS MANUFACTURED BY ADS DRAINAGE SOLUTIONS OR AN APPROVED EQUAL.
 - ALL FIELD TILES DISTURBED DURING CONSTRUCTION MUST BE REPAIRED/CONNECTED TO NEW DRAINAGE FACILITIES.
 - WATER MAIN INSTALLATION SHALL BE IN ACCORDANCE WITH INDIANA AMERICAN WATER COMPANY STANDARDS AND SPECIFICATIONS. CONTRACTOR SHALL COORDINATE WITH IAWC FOR CONNECTION AND TESTING PROCEDURES AND REQUIREMENTS.
 - COORDINATE INSTALLATION OF FIRE HYDRANTS WITH INDIANA AMERICAN WATER AND THE CITY OF FRANKLIN FIRE DEPARTMENT. TYPE, MATERIAL, AND MANUFACTURER OF FIRE HYDRANTS SHALL BE IN ACCORDANCE WITH FRANKLIN FIRE DEPARTMENT REQUIREMENTS. ALL PUBLIC FIRE HYDRANTS ARE TO BE YELLOW AND ALL PRIVATE FIRE HYDRANTS ARE TO BE RED WITH THE TOP CAP COLOR CODED TO SHOW WATER FLOW, AS FOLLOWS: 1500 gpm=BLUE, 1000-1499 gpm=GREEN, AND 500-999 gpm=ORANGE.
 - ALL HYDRANTS SHALL HAVE A STORZ CONNECTION.

- ### WATER MAIN INSTALLATION NOTES
- FOR PVC C900 PIPE INSTALLATION: DR14 PIPE IS REQUIRED. DEFLECTION OF PIPE JOINTS AND BENDING OF PIPES ARE NOT PERMITTED. ALL ANGLES SHALL BE MADE WITH PROPER FITTINGS. WHEN RESTRAINT OF PIPE-TO-PIPE JOINTS ARE REQUIRED, ALL JOINTS SHALL BE RESTRAINED WITH EXTERNAL SPLIT SERRATED RESTRAINT HARNESSSES. SELECT FILL MATERIAL REQUIRED FOR BEDDING AND EMBEDMENT REGARDLESS OF PIPE'S PROXIMITY TO PAVEMENT.
 - ENCASE ALL DUCTILE IRON PIPING, DUCTILE IRON FITTINGS, VALVES, HYDRANTS, AND ALL OTHER METALLIC APPURTENANCES IN 12MI. POLYETHYLENE.
 - ALL FIRE HYDRANT LATERALS SHALL BE DUCTILE IRON PIPE.
 - ALL MJ T-BOLTS AND FLANGE BOLTS SHALL HAVE XYLAN OR FLUOROKOTE #1 CORROSION RESISTANT COATING.
 - ALL FITTINGS SHALL BE RESTRAINED USING MJ RETAINER GLANDS OR POURED CONCRETE THRUST BLOCKS.
 - COPPER LEAD STEEL TRACER WIRE REQUIRED ON INSTALLATION OF ALL PIPE. TRACER WIRE SHALL BE TAPPED TO PIPE OR POLYETHYLENE ENCASUREMENT AT A MINIMUM SPACING OF 10-FEET. SPLICES SHALL BE ENCASED IN WATERPROOF CONNECTORS. CONTINUITY SHALL BE TESTED AFTER COMPLETION OF BACKFILL.
 - SELECT FILL MATERIAL REQUIRED FOR FINAL BACKFILL WHEN WITHIN 5-FEET OF PAVEMENT PER SPECIFICATION SECTION 02210.
 - MAINTAIN THE REQUIRED 10-FEET OF HORIZONTAL SEPARATION AND 18-INCHES OF VERTICAL SEPARATION FROM SANITARY AND STORM SEWERS. MAINTAIN 8-FEET OF HORIZONTAL SEPARATION FROM SANITARY AND STORM STRUCTURES. SEE 327 IAC 6-3.2-9 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
 - MAINTAIN MINIMUM COVER DEPTH OF 54" AND A MAXIMUM OF 54"+24".

STORM SEWER STRUCTURE TABLE	
STR. DATA	
STR. NO. 3	INSTALL TYPE 'B' MANHOLE WITH NEENAH R-1761 CASTING OR APPROVED EQUAL AND ONE (1) CONCRETE END SECTION AND 94 LFT OF 36" RCP @ 0.65% RIM=767.75 INV IN (24"-NW)=764.08 INV OUT (36"-E)=762.21
STR. NO. 4	INSTALL TYPE 'A' INLET WITH R-3405-A CASTING OR APPROVED EQUAL AND 18 LFT OF 12" RCP @ 0.61% RIM=767.75 INV OUT (12"-N)=765.21
STR. NO. 5	INSTALL TYPE 'A' INLET WITH R-1878-ASL CASTING OR APPROVED EQUAL AND 87 LFT OF 15" RCP @ 0.75% RIM=769.70 INV IN (12"-S)=765.10 INV IN (12"-N)=765.10 INV OUT (15"-W)=765.10
STR. NO. 6	INSTALL TYPE 'J' INLET WITH NEENAH R-3501-TB CASTING OR APPROVED EQUAL AND 5 LFT OF 15" RCP @ 0.75% RIM=767.45 INV IN (15"-E)=764.45 INV OUT (15"-S)=764.45
STR. NO. 7	INSTALL TYPE 'J' INLET WITH NEENAH R-3501-TB CASTING OR APPROVED EQUAL AND 140 LFT OF 15" RCP @ 0.75% RIM=767.45 INV IN (15"-N)=764.41 INV OUT (18"-S)=763.36
STR. NO. 8	INSTALL TYPE 'J' INLET AND NEENAH R3501-TB CASTING OR APPROVED EQUAL AND ONE (1) CONCRETE END SECTION AND 109 LFT OF 18" RCP @ 0.75% RIM=766.38 INV IN (18"-N)=762.42 INV OUT (18"-S)=762.42
STR. NO. 11	INSTALL TYPE 'E' INLET WITH NEENAH R-4215-C CASTING OR APPROVED EQUAL AND ONE (1) CONCRETE END SECTION AND 122 LFT OF 14"x23" RCP @ 0.49% RIM=764.40 INV. OUT (14"x23"-S)=761.60

SANITARY SEWER STRUCTURE TABLE	
STR. DATA	
STR. SS-1	INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPROVED EQUAL AND 200 LFT OF 8" PVC @ 0.45% RIM=766.10 INV OUT (8"-S)=758.58
STR. SS-2	INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPROVED EQUAL AND 400 LFT OF 8" PVC @ 0.45% RIM=765.86 INV IN (8"-N)=757.68 INV OUT (8"-S)=757.58
STR. SS-3	INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPROVED EQUAL AND 400 LFT OF 8" PVC @ 0.45% RIM=765.75 INV IN (8"-N)=755.78 INV OUT (8"-E)=755.68
STR. SS-4	INSTALL SANITARY SEWER MANHOLE WITH NEENAH R-1772 CASTING OR APPROVED EQUAL AND 140 LFT OF 8" PVC @ 0.45% RIM=764.30 INV IN (8"-W)=753.88 INV OUT (8"-SE)=753.78
STR. SS-EX	CONTRACTOR TO FIELD VERIFY ALL EXISTING INVERT ELEVATIONS PRIOR TO ANY SANITARY INSTALLATION. PROPOSED INVERT SHALL BE CORE DRILLED INTO THE EXISTING MANHOLE PER CITY OF FRANKLIN REQUIREMENTS AND SEALED USING WATER-TIGHT MATERIALS. RIM=763.69 INV IN (8"-NW)=753.15 INV IN (8"-S)=753.31 INV OUT (8"-E)=752.96

STORM CULVERT DATA TABLE	
STR. DATA CULVERT	
STR. NO. 1	INSTALL TWO (2) CONCRETE END SECTIONS AND 95 LFT OF 18" RCP @ 2.05% U.S. EL.=764.21 D.S. EL.=762.25
STR. NO. 2	INSTALL ONE (1) CONCRETE END SECTION AND 11 LFT OF 24" RCP @ 1.10% U.S. EL.=764.20 D.S. EL.=764.08
STR. NO. 10	INSTALL TWO (2) CONCRETE END SECTIONS AND 51 LFT OF 18" RCP @ 0.78% U.S. EL.=762.00 D.S. EL.=761.60
STR. NO. 12	INSTALL ONE (1) CONCRETE END SECTION AND 12 LFT OF 15" RCP @ 0.20% U.S. EL.=762.24 D.S. EL.=762.22

INSTALL FIRE HYDRANT ASSEMBLY

INSTALL 337 LFT OF 8" WATERMAIN

CONTRACTOR TO COORDINATE WITH INDIANA-AMERICAN WATER FOR DOMESTIC SERVICE TAP AND METER INSTALLATION REQUIREMENTS AND SPECIFICATIONS

INSTALL FIRE HYDRANT ASSEMBLY

INSTALL SANITARY SEWER CLEAN OUT AND 67 LFT OF 6" SDR 35 PVC AT 1.04% MINIMUM SLOPE

INSTALL SANITARY SEWER CLEAN OUT AND 82 LFT OF 6" SDR 35 PVC AT 1.04% MINIMUM SLOPE

INSTALL 306 LFT OF 8" WATERMAIN

INSTALL FIRE HYDRANT ASSEMBLY

CONTRACTOR TO COORDINATE WITH INDIANA-AMERICAN WATER FOR DOMESTIC SERVICE TAP AND METER INSTALLATION REQUIREMENTS AND SPECIFICATIONS

INSTALL 406 LFT OF 8" WATERMAIN

INSTALL 82 LFT OF 8" WATERMAIN

TAPPING SLEEVE AND VALVE
CONTRACTOR TO COORDINATE WITH INDIANA-AMERICAN WATER FOR SERVICE TAP

316 LFT OF 12" HDPE UNDERDRAIN @ 0.75%

16 LFT OF 12" HDPE UNDERDRAIN @ 1.0%

16 LFT OF 12" HDPE UNDERDRAIN @ 1.0%

INSTALL SANITARY SEWER CLEAN OUT AND 78 LFT OF 6" SDR 35 PVC AT 1.04% MINIMUM SLOPE

CONTRACTOR TO COORDINATE WITH BUILDING/MEP PLANS FOR EXACT SERVICE POINT LOCATIONS, SIZING INFORMATION, AND ALL OTHER REQUIRED DETAILS.

16 LFT OF 12" HDPE UNDERDRAIN @ 1.0%

INSTALL SANITARY SEWER CLEAN OUT AND 63 LFT OF 6" SDR 35 PVC AT 1.04% MINIMUM SLOPE

16 LFT OF 12" HDPE UNDERDRAIN @ 1.0%

371 LFT OF 12" HDPE UNDERDRAIN @ 0.75%

16 LFT OF 12" HDPE UNDERDRAIN @ 1.0%

16 LFT OF 12" HDPE UNDERDRAIN @ 1.0%

CONTRACTOR TO COORDINATE WITH BUILDING/MEP PLANS FOR EXACT SERVICE POINT LOCATIONS, SIZING INFORMATION, AND ALL OTHER REQUIRED DETAILS.

INSTALL SANITARY SEWER CLEAN OUT AND 100 LFT OF 6" SDR 35 PVC AT 1.04% MINIMUM SLOPE

INSTALL SANITARY SEWER CLEAN OUT AND 100 LFT OF 6" SDR 35 PVC AT 1.04% MINIMUM SLOPE

INSTALL FIRE HYDRANT ASSEMBLY

CONNECT PROPOSED RCP TO EXISTING 15" CMP USING A MARIAC PIPE COUPLER

PROPOSED 50' RIGHT-OF-WAY

1" NAE

35' EXISTING RIGHT-OF-WAY

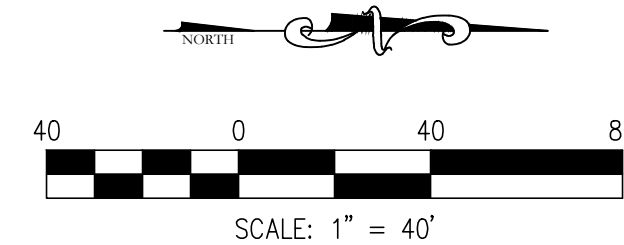
EX. FIRE HYDRANT

500°02'23"E 1188.54'
SECTION 100
INST. #2018-02837

THESE PLANS ARE BASED UPON INFORMATION FROM AN ALTA/NSPS LAND TITLE SURVEY PERFORMED BY MAURER SURVEYING INC. WITH JOB NO. 2320-ALTA-01 WHICH WAS DATED JULY 11, 2019. ALL SURVEY INFORMATION SHOWN HEREON WAS PROVIDED BY MAURER SURVEYING INC.

X 860.00' TOP OF CURB
 X 859.50' EDGE OF PAVEMENT
 X 860.00' FINISH GRADE
 X 859.50' *
 X 860.00' *
 F.F. ELEV. = 810.70
 PROPOSED FINISH FLOOR ELEVATION
 DRAINAGE SWALE
 800
 EXISTING CONTOURS
 800
 PROPOSED CONTOURS
 GRADE BREAK
 CURB HEIGHT TO TAPER FROM
 0.5' TO 0.0' IN 6 L.F.
 MINIMUM FLOOD PROTECTION GRADE
 MFGP

1. CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AWAY FROM ALL BUILDINGS IN FINAL GRADING OF SITE. CONTRACTOR SHALL COORDINATE WITH THE ARCHITECT TO DETERMINE PROPER FOUNDATION EXPOSURE FOR EACH BUILDING TYPE, HOWEVER, IN NO INSTANCE SHALL DRAINAGE TOWARDS THE BUILDING FOUNDATION BE ALLOWED.
2. CONTRACTOR SHALL NOT ALLOW DRAINAGE FROM PROJECT SITE TO DISCHARGE ONTO ADJACENT PROPERTIES IN FINAL GRADING OF SITE.



LAUGLE INDUSTRIAL PARK

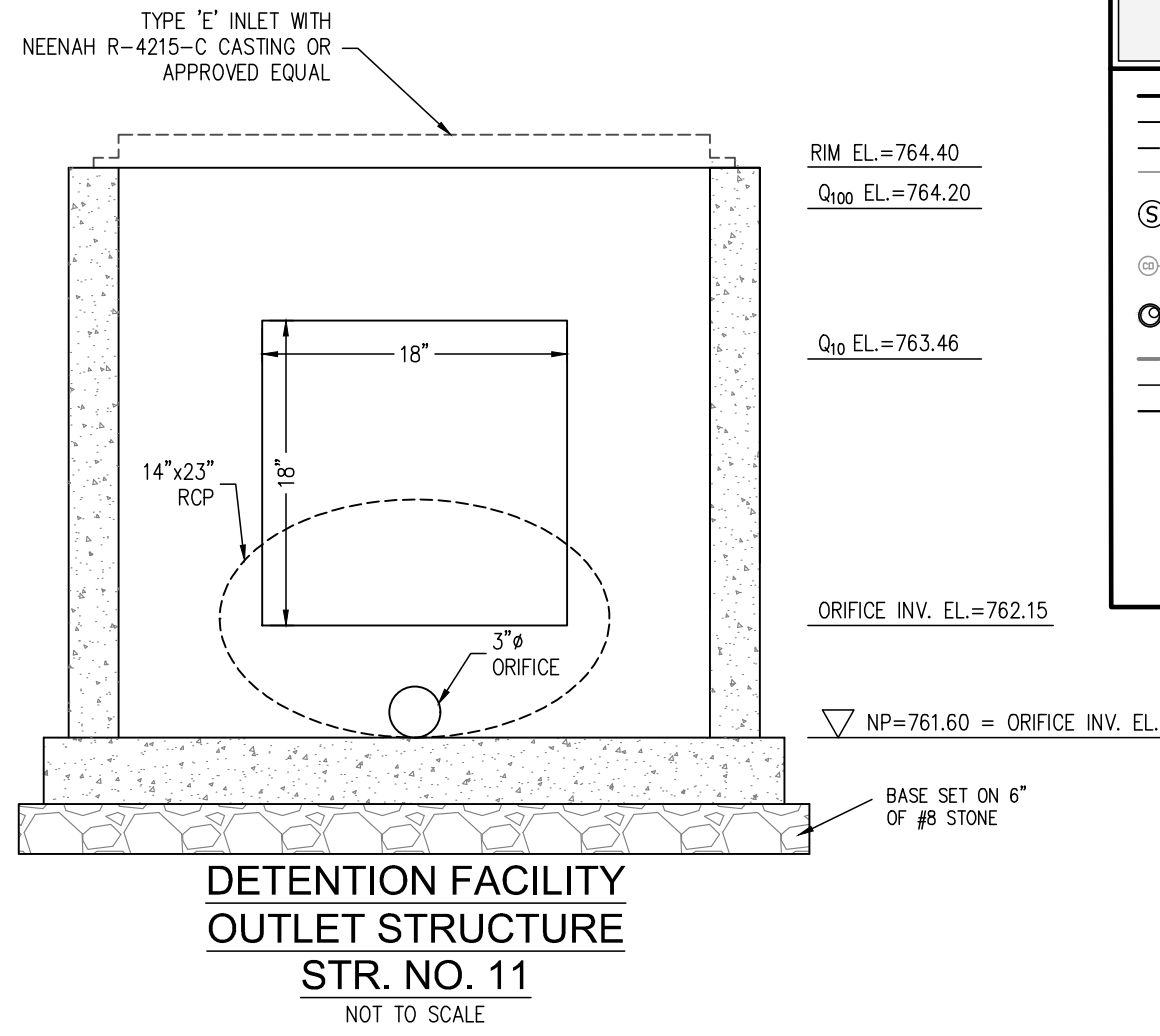
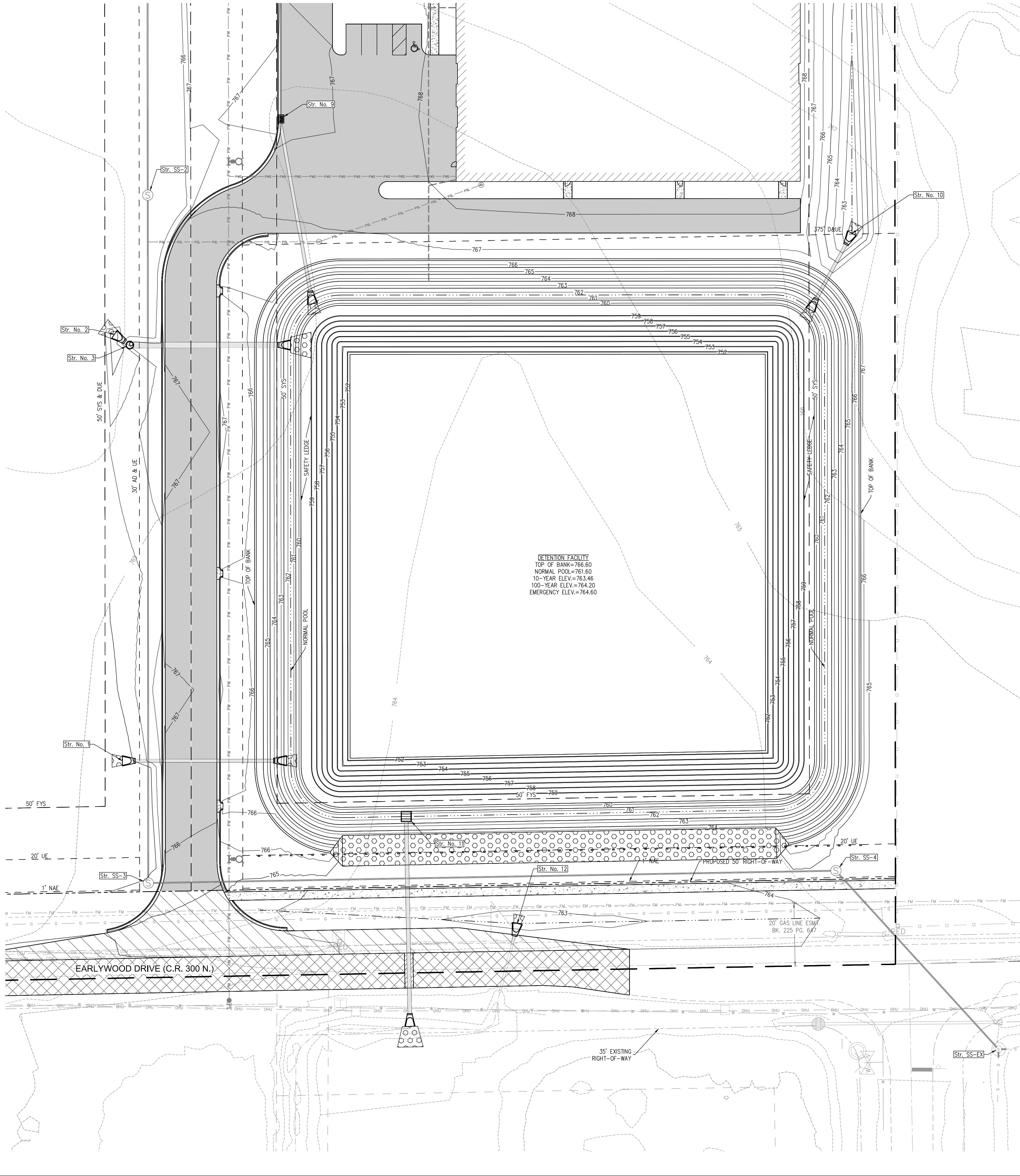
JOB No.		DRAWN	DEF\LMC	CHECKED	GJJ
DATE	JUNE 11, 2020	DESIGNED	DJM	APPR.	GJJ



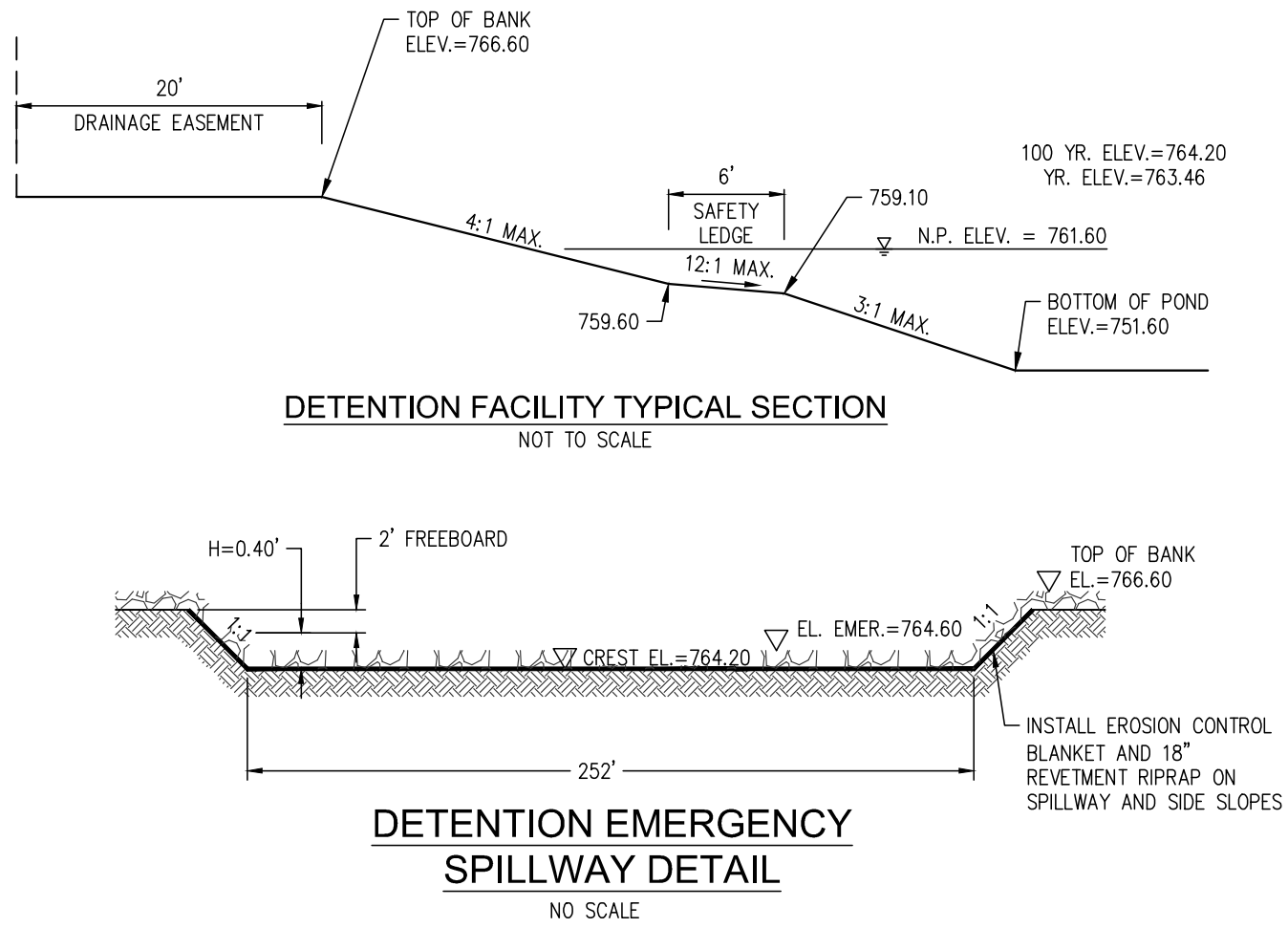
500

500

DIRECTORY PATH : R:\Active\Jack Laugel\1113 N Graham Rd\Design\CAD\Plans
DATE/USER : 6/11/2020 11:42 AM / JLoz



PROPOSED LEGEND	
	PROPERTY LINE
	SETBACK LINE
	EASEMENT LINE
	DITCH LINE
	SANITARY SEWER WITH MANHOLE
	SANITARY SEWER LATERAL WITH CLEANOUT
	STORM SEWER w/MANHOLE & END SECTION
	UNDERDRAIN
	WATER LINE
	WATER SERVICE LINE
	STORM INLETS
	STORM CURB INLETS
	TAPPING SLEEVE
	WATER VALVE
	FIRE HYDRANT



LEGAL DRAIN NOTE:
NO STRUCTURES OR IMPROVEMENTS SHALL BE PERMITTED WITHIN THE LEGAL DRAIN EASEMENT. ALL BUILDINGS, PLANTINGS, CROPS, TREES, SHRUBS, AND WOOD VEGETATION GROWN WITHIN THE EASEMENT, OR LEGAL DRAIN, ARE AT THE RISK OF OWNER AND SUBJECT TO REMOVAL WITHOUT RESTITUTION.

NOTE:
PER THE CITY OF FRANKLIN SUBDIVISION CONTROL OF ORDINANCE, SIDEWALKS ARE REQUIRED ALONG ALL PUBLIC RIGHTS-OF-WAY & STREET TREES SHALL BE PLANTED AT A RATIO OF 1 TREE PER 35 LFT. OF STREET FRONTAGE.

THESE PLANS ARE BASED UPON INFORMATION FROM AN ALTA/NSPS LAND TITLE SURVEY PERFORMED BY MAURER SURVEYING INC. WITH JOB NO. 2320-ALTA-01 WHICH WAS DATED JULY 11, 2019. ALL SURVEY INFORMATION SHOWN HEREON WAS PROVIDED BY MAURER SURVEYING INC.

ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BY STATE, CITY OR COUNTY OFFICIALS.

NOTE:
NO EARTHWORK DISTURBING ACTIVITY MAY COMMENCE UNTIL A STORM WATER MANAGEMENT PERMIT IS OBTAINED.



CROSSROADS
ENGINEERS, INC.
TRANSPORTATION &
DEVELOPMENT CONSULTANTS
REGISTERED PROFESSIONAL ENGINEERS
REGISTERED IN INDIANA
CROSSROADSENGINEERS.COM

DRAINAGE PLAN

LAUGLE INDUSTRIAL PARK

JOB No.

DATE

JUNE 11, 2020

DRAWN

DESIGNED

APPR.

CJJ

CJJ

CJJ

SHEET

600

REGISTERED PROFESSIONAL ENGINEER
PELINDA J. ILLKOY
1030050
STATE OF INDIANA
CONSULTATION

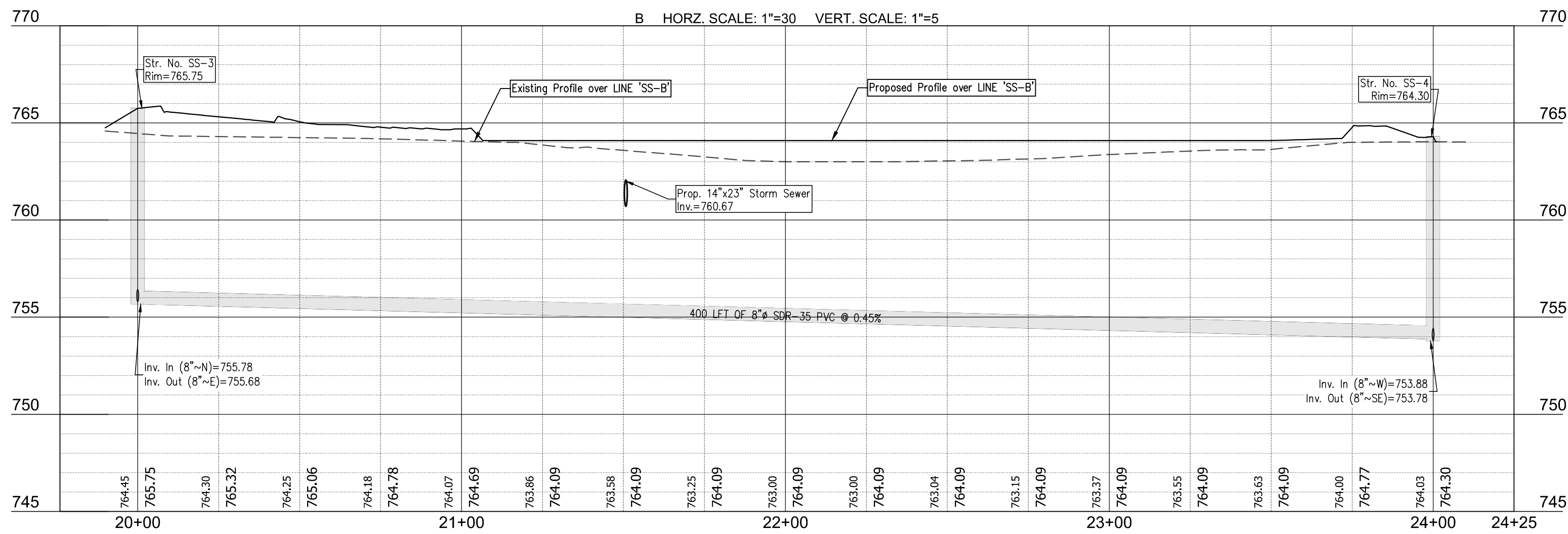
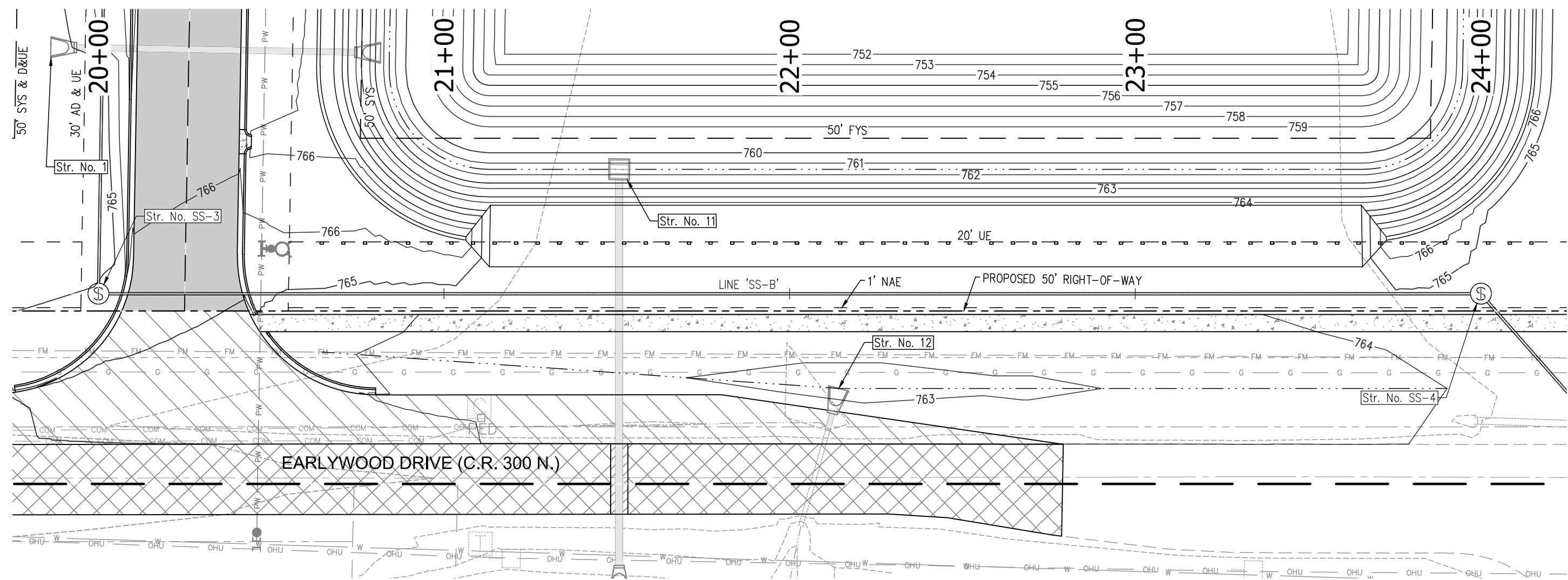
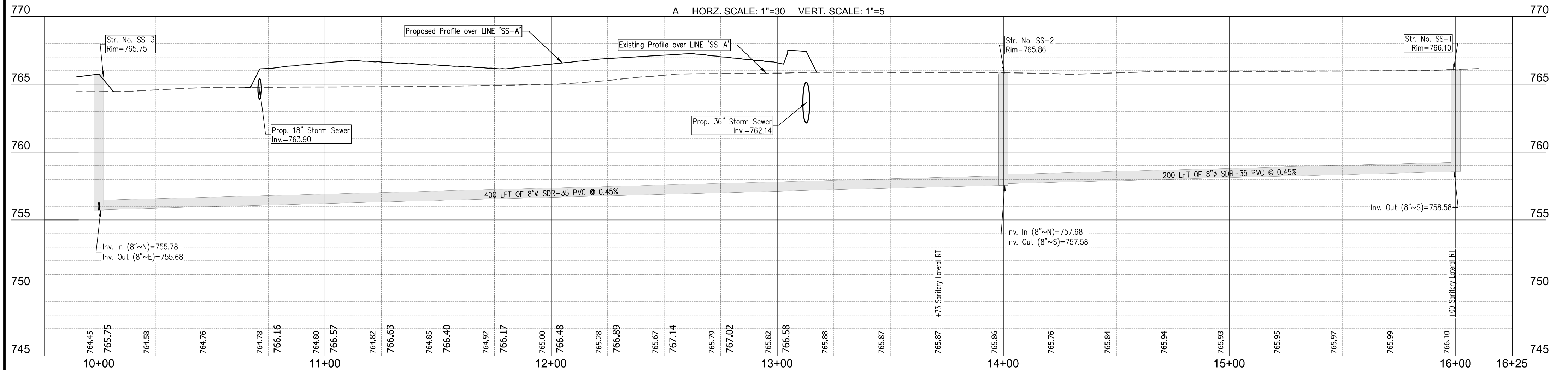
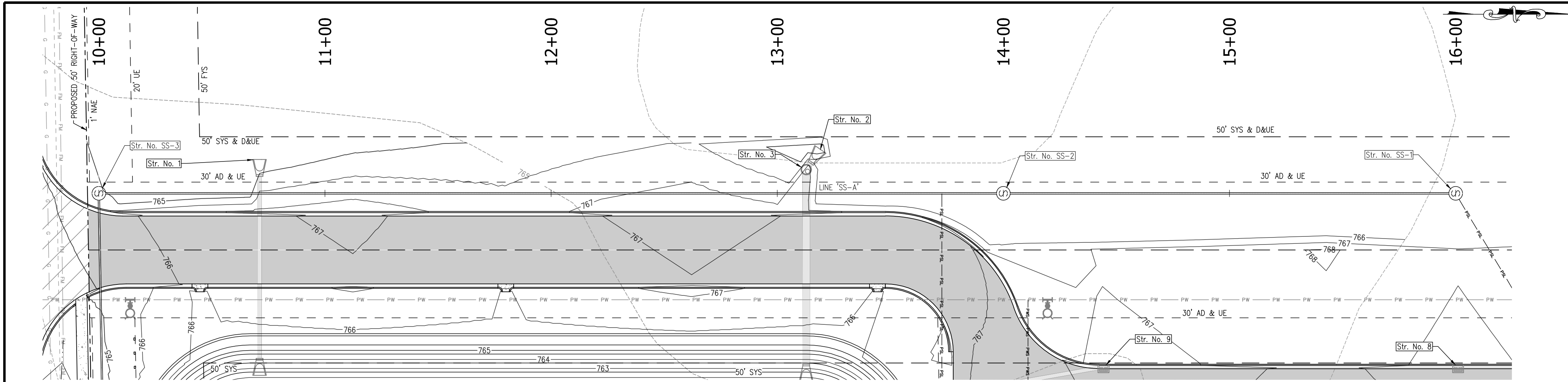
NO.

DATE

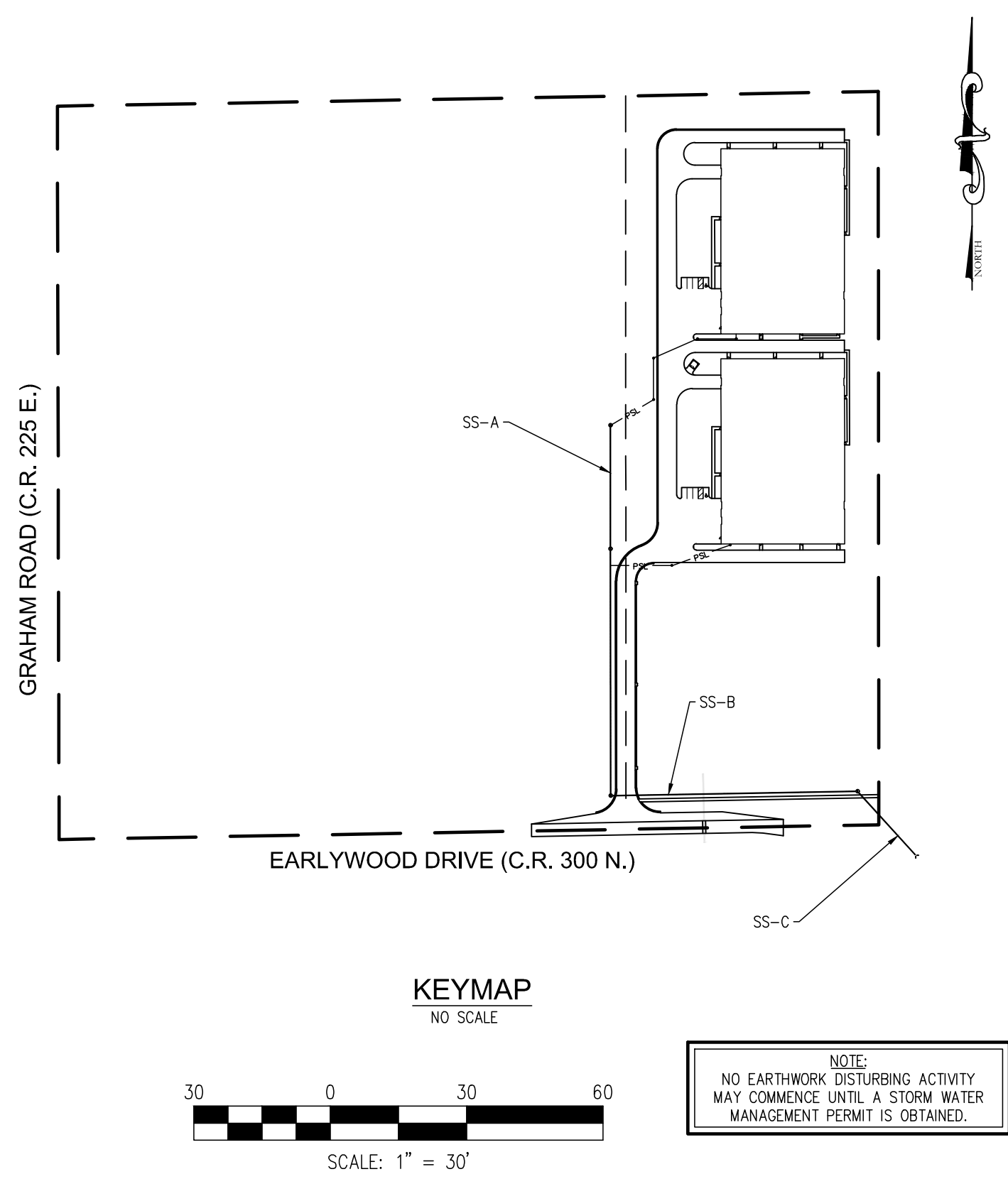
BY

APPR.

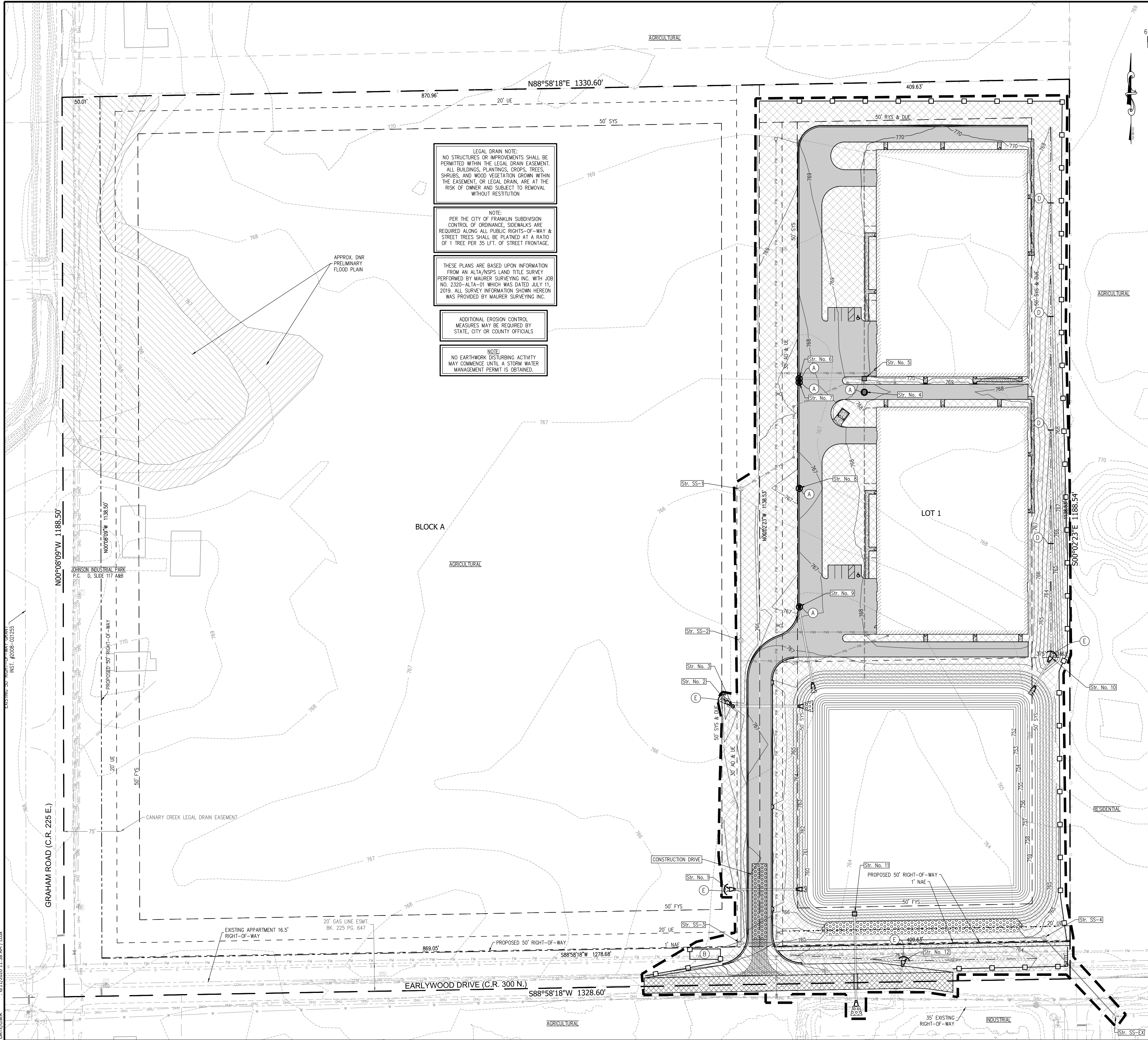
DIRECTORY PATH : R:\Active\Jack Laugel\1111 N Graham Rd\Design\CAD\Plans
DATE/USER : 6/11/2020 11:41 AM / LCL



PROPOSED LEGEND	
	PROPERTY LINE
	SETBACK LINE
	EASEMENT LINE
	DITCH LINE
	SANITARY SEWER WITH MANHOLE
	SANITARY SEWER LATERAL WITH CLEANOUT
	STORM SEWER W/MANHOLE & END SECTION
	UNDERDRAIN
	WATER LINE
	WATER SERVICE LINE
	STORM INLETS
	STORM CURB INLETS
	TAPPING SLEEVE
	WATER VALVE
	FIRE HYDRANT



		SHEET 700	
SANITARY PLAN AND PROFILE		LAUGLE INDUSTRIAL PARK	
JOB No.	DRAWN	DEP' LMC	CJJ
DATE	JUNE 11, 2020	DESIGNED	CJJ
APPROVED		APPR.	CJJ
REVISIONS		BY	APPR.
9			
8			
7			
6			
5			
4			
3			
2			
1			
DATE		NO.	
SHEET 700			



60 0 60 120

SCALE: 1" = 60'

EXISTING CONTOUR INTERVAL = 1'

PROPOSED CONTOUR INTERVAL = 1'

ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BY STATE OR COUNTY OFFICIALS

EROSION CONTROL LEGEND

MULCHED SEEDING

EROSION CONTROL BLANKET (NORTH AMERICAN GREEN SC-150 OR EQUAL) AND MULCHED SEEDING

REVTMENT RIPRAP

CONSTRUCTION DRIVE (SEE DETAIL THIS SHEET)

EXISTING CONTOURS

PROPOSED CONTOURS

SILT FENCE SLOPE CHECK (NUTEC 3 NWS-6 OR APPROVED EQUAL)

CONSTRUCTION LIMITS

SILT SACK INLET PROTECTION (SEE DETAIL-SHEET 901)

CONCRETE WASHOUT AREA (SEE DETAIL-SHEET 901)

ROCK CHECK DAM (SEE DETAIL-SHEET 901)

FILTER TUBE/FILTER SOCK (COR LOG) (SEE DETAIL-SHEET 901)

EROSION CONTROL NOTES

1. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BY STATE, COUNTY, OR LOCAL OFFICIALS.

2. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED IN THE FIELD BY THE INSPECTOR.

3. THERE SHALL BE NO DIRT, DEBRIS, OR STORAGE OF MATERIALS WITHIN THE EARLYWOOD DRIVE RIGHT-OF-WAY.

4. CONSTRUCTION STAGING AREA (TO BE DETERMINED BY CONTRACTOR) SHALL INCLUDE THE NOI POSTING, PORT-O-LETS, TRASH CONTAINERS, AND FUELING TANKS.

5. A TRAINED INDIVIDUAL MUST PERFORM AN INSPECTION ONCE A WEEK AND AFTER EVERY 1/2" OR MORE RAIN EVENT. A LOG OF THE INSPECTION REPORTS MUST BE KEPT AND MADE AVAILABLE TO THE TOWN INSPECTOR UPON REQUEST.

6. CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES AS NECESSARY.

7. ALL STORM WATER CASTINGS SHALL BE PHASE 1 COMPLIANT.

8. ALL PORT-O-LETS MUST BE ANCHORED DOWN TO PREVENT SPILLS.

9. ALL EROSION CONTROL PRACTICES SHALL BE IN ACCORDANCE WITH THE INDIANA STORM WATER QUALITY MANUAL.

10. THE CITY ENGINEER HAS THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES IN THE FIELD AS CONDITIONS WARRANT.

PIPE OUTLET NO.

A

B

C

D

REVTMENT (TONS)

GEOTEXTILE (SYS)

1

18"

4.5'

6'

7.5'

3

8

2

24"

6'

8'

10'

5

13

3

36"

9'

12'

15'

12

25

9

18"

4.5'

6'

7.5'

3

8

10

18"

4.5'

6'

7.5'

3

8

11

23"

6'

8'

10'

5

13

12

15"

4'

5'

6'

2

6

END SECTION RIPRAP APRON DIMENSIONS NOT TO SCALE

18" MIN. DEPTH OF REVTMENT OVER GEOTEXTILE FABRIC

C

A

B

D

CONSTRUCTION ENTRANCE

1. INSTALL CONSTRUCTION ENTRANCE FROM STREET TO FACE OF PROPOSED BUILDING OR AT A 50' MINIMUM LENGTH. UNSE #2 STONE AT A 6" MINIMUM DEPTH.

2. A GEO-TEXTILE IS REQUIRED UNDERNEATH THE ENTRANCE TO EXTEND ITS FUNCTIONALITY.

3. FLARE OUT ENTRANCE WHERE IT MEETS THE STREET SO THAT VEHICLE TURN RADIIUS DO NOT TRAVEL OVER DISTURBED GROUND.

4. PERIMETER CONTROLS (SILT FENCE) SHOULD BE TURNED INTO THE LOT FOR A FEW FEET WHERE THEY MEET THE CONSTRUCTION ENTRANCE.

5. INSPECT WEEKLY AND WITHIN 24 HOURS OF A 1/2" OF RAIN. FRESHEN OR REPLACE AS NEEDED TO PREVENT OFF SITE TRACKING. IF OFF SITE TRACKING IS OCCURRING CLEAN UP IMMEDIATELY AND CORRECT THE REASON WHY THE DRIVE IS FAILING AS SOON AS POSSIBLE. COMPLETE REPAIRS BEFORE THE NEXT ANTICIPATED RAIN AND BY NO LATER TAN ONE WEEK FROM THE DATE THEY ARE NOTED.

SLOPE CHECK

36-INCH (MIN.) HARDWOOD POST

COMPACTED FILL

FLOW

18" (MIN.) GROUND LINE

GEOTEXTILE FABRIC LAID ON DOWN-SLOPE SIDE AND BOTTOM OF TRENCH

JOINING FENCES

POST

EXISTING SOIL

8" X 4" TRENCH

SILT FENCE

SILT FENCE DETAIL NOT TO SCALE

PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE

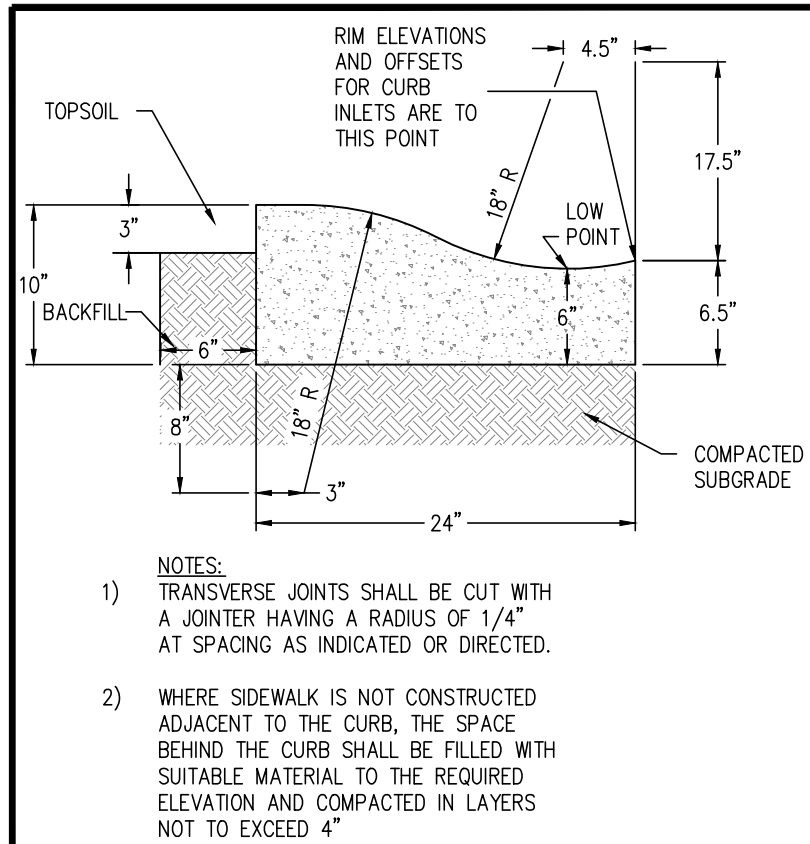
ROTATE BOTH POSTS AT LEAST 180 DEGREES IN A CLOCKWISE DIRECTION TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL

DRIVE BOTH POSTS ABOUT 10 INCHES INTO THE GROUND AND BURY FLAP

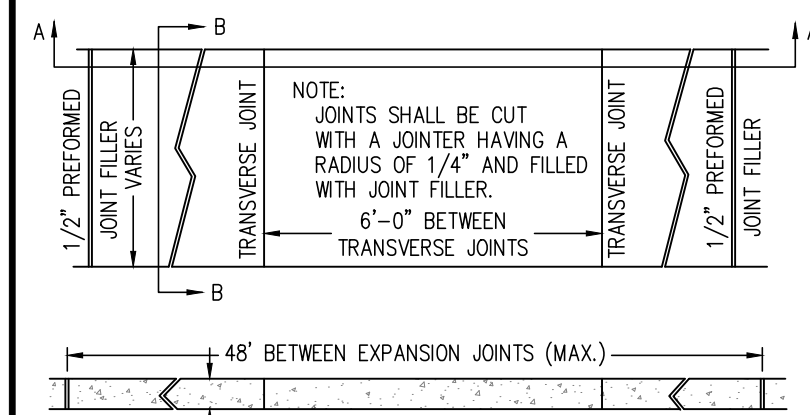
ATTACHING TWO SILT FENCES

INDIANA 811

Call before you dig

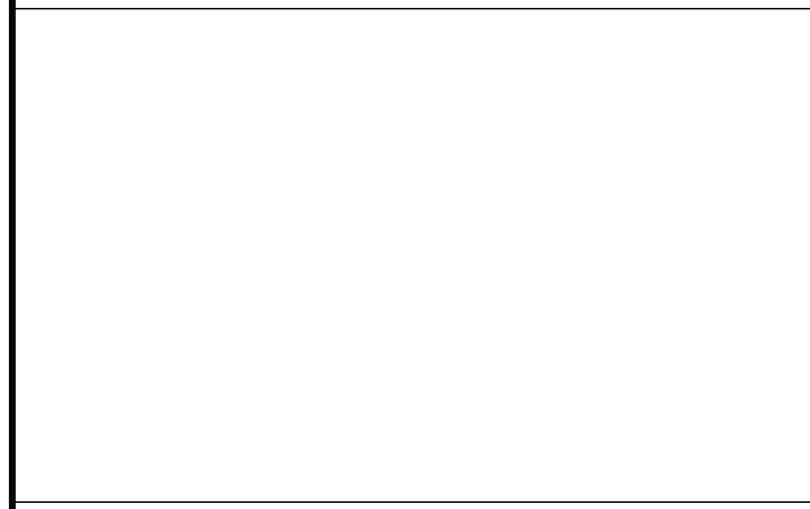


TYPE I ROLL CURB AND GUTTER (C1)
NOT TO SCALE

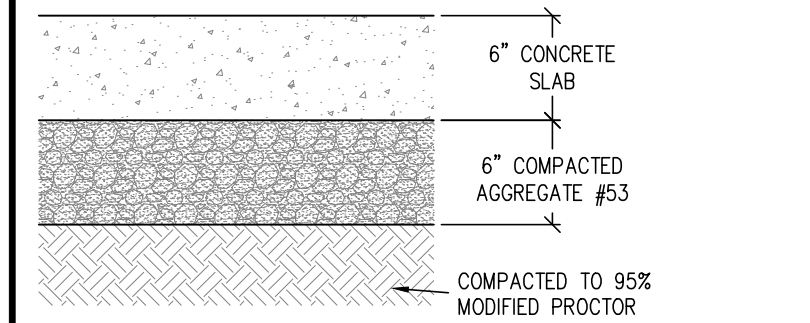


CONCRETE SIDEWALK (D)
NOT TO SCALE

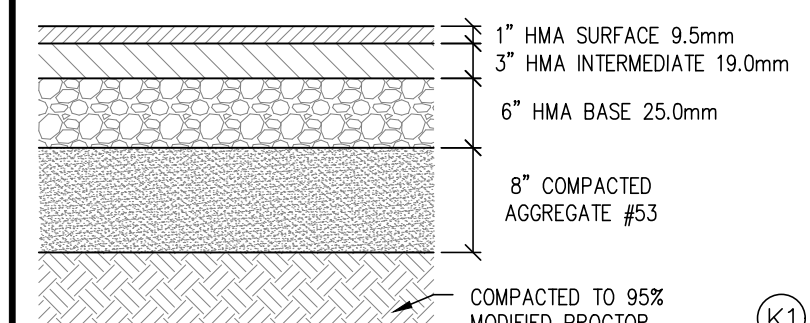
NOTES:
1) MAXIMUM ALLOWABLE CROSS SLOPE OF SIDEWALK SHALL NOT EXCEED 2% IN ACCORDANCE WITH A.D.A. REQUIREMENTS.
2) WHEN AS EXISTING THE ALLOWABLE CROSS SLOPE BE REJECTED AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND REPLACEMENT.



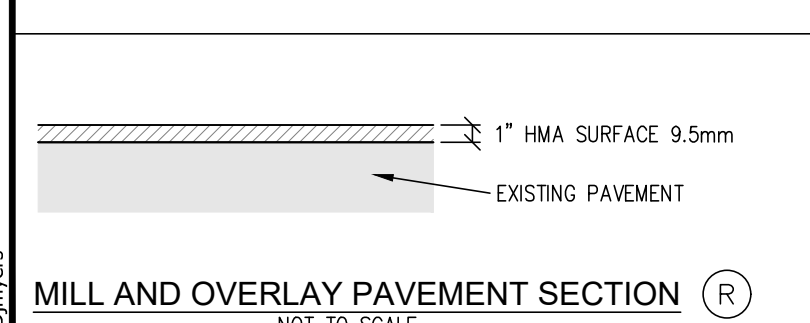
TYPICAL CONCRETE PAVEMENT SECTION (G)
NOT TO SCALE



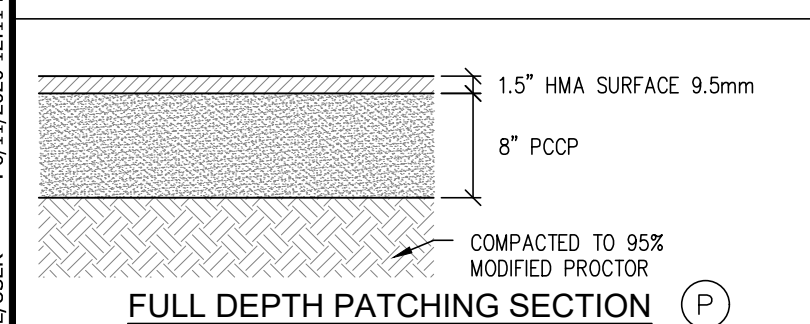
TYPICAL ASPHALT PAVEMENT SECTION (K)
NOT TO SCALE



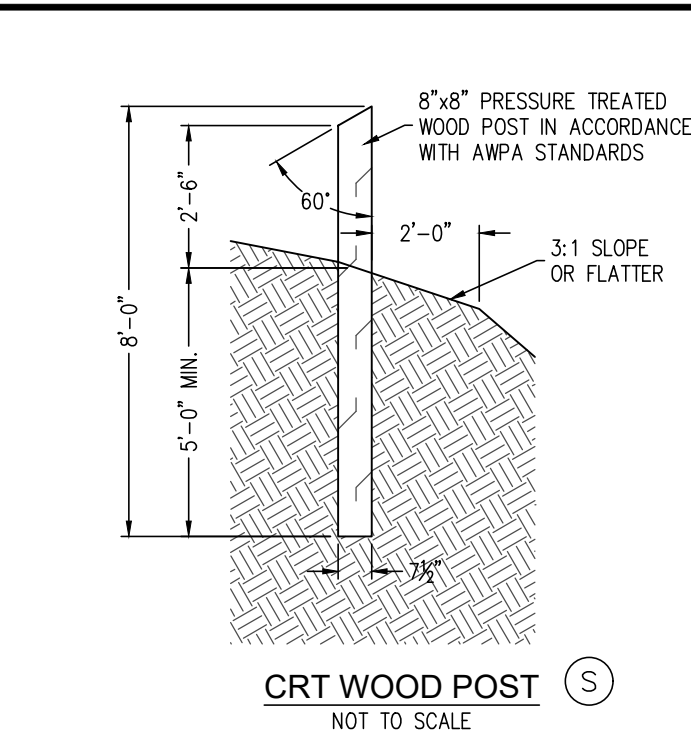
MINOR ARTERIAL ASPHALT PAVEMENT SECTION (K1)
NOT TO SCALE



MILL AND OVERLAY PAVEMENT SECTION (R)
NOT TO SCALE

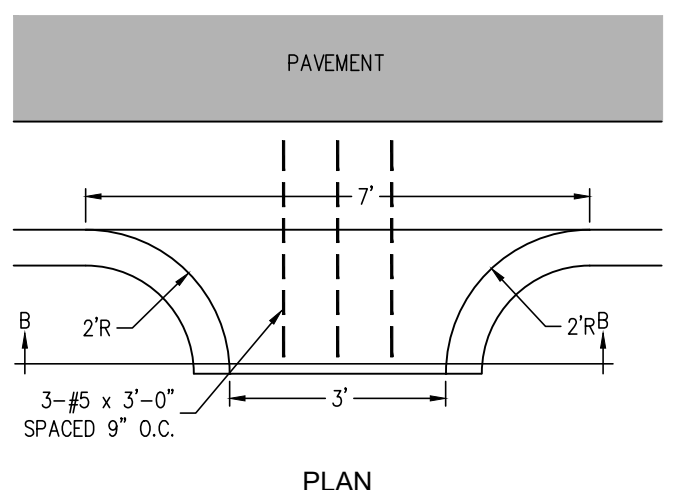


FULL DEPTH PATCHING SECTION (P)
NOT TO SCALE

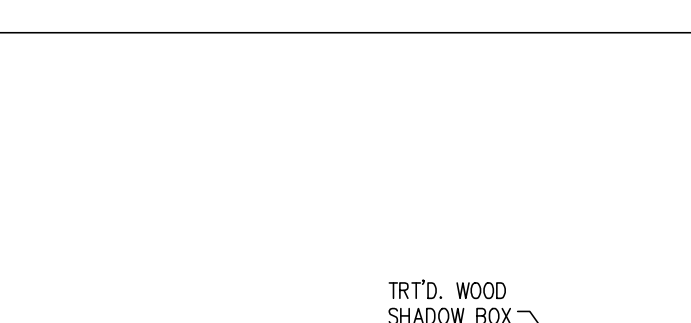


CRT WOOD POST (S)
NOT TO SCALE

NOTE: POSTS SHALL BE SPACED AT 5-FOOT INTERVALS ALONG TOP OF BANK ADJACENT TO THE EARLYWOOD DRIVE RIGHT-OF-WAY

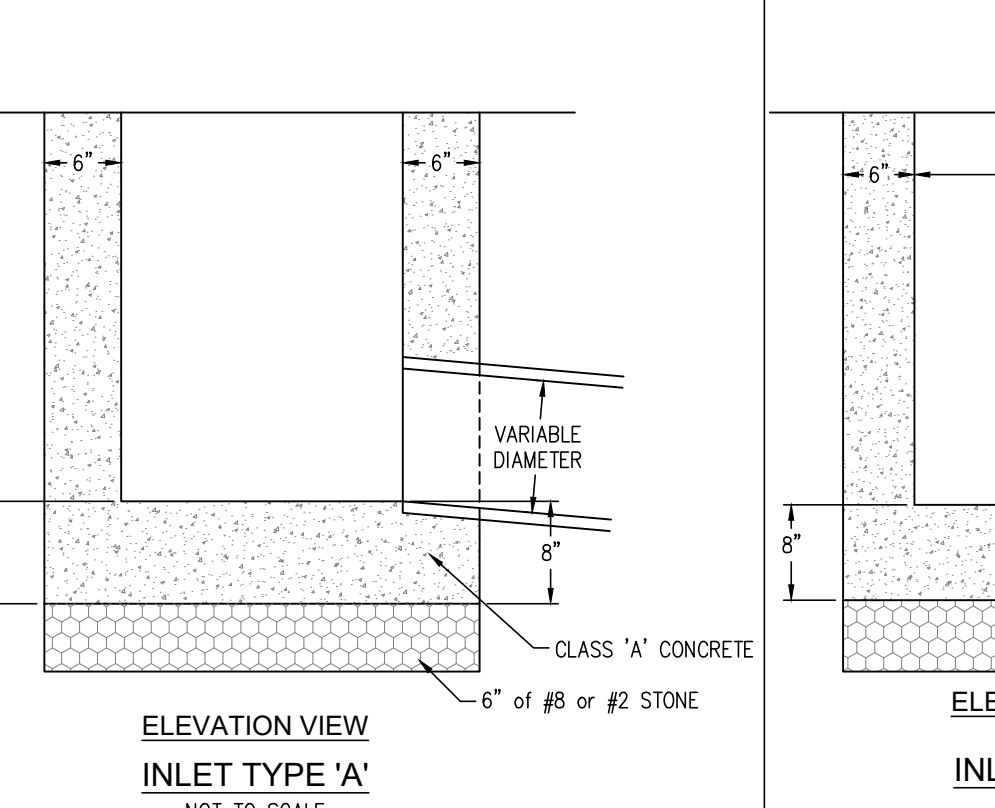
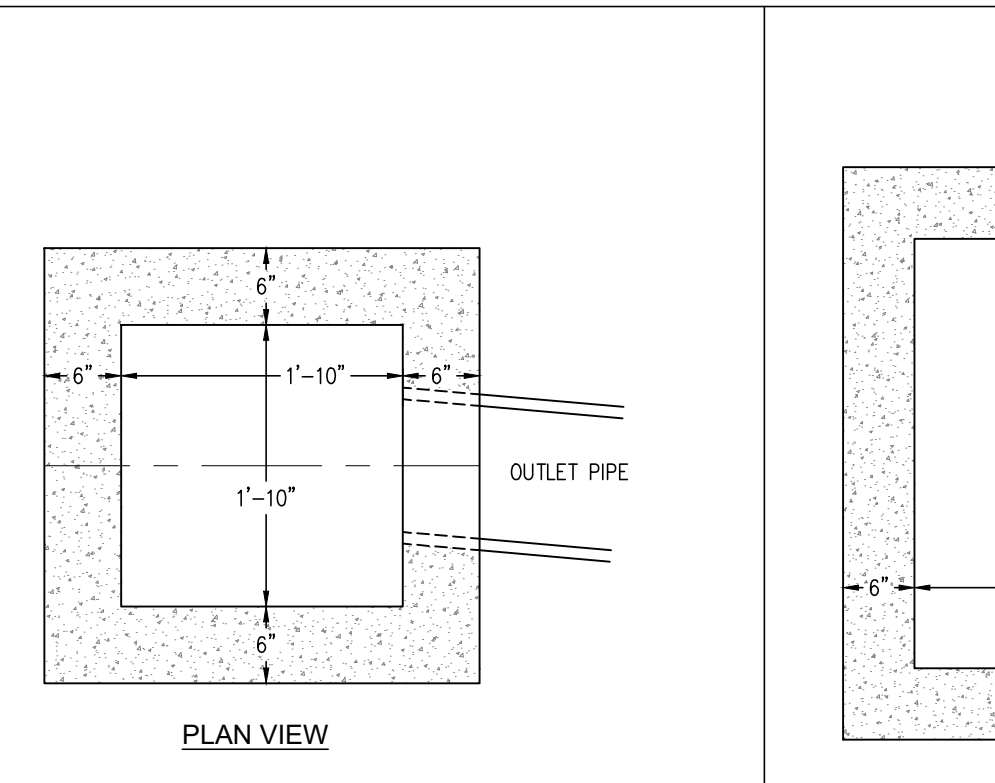


CURB TURNOUT DETAIL (T)
NOT TO SCALE

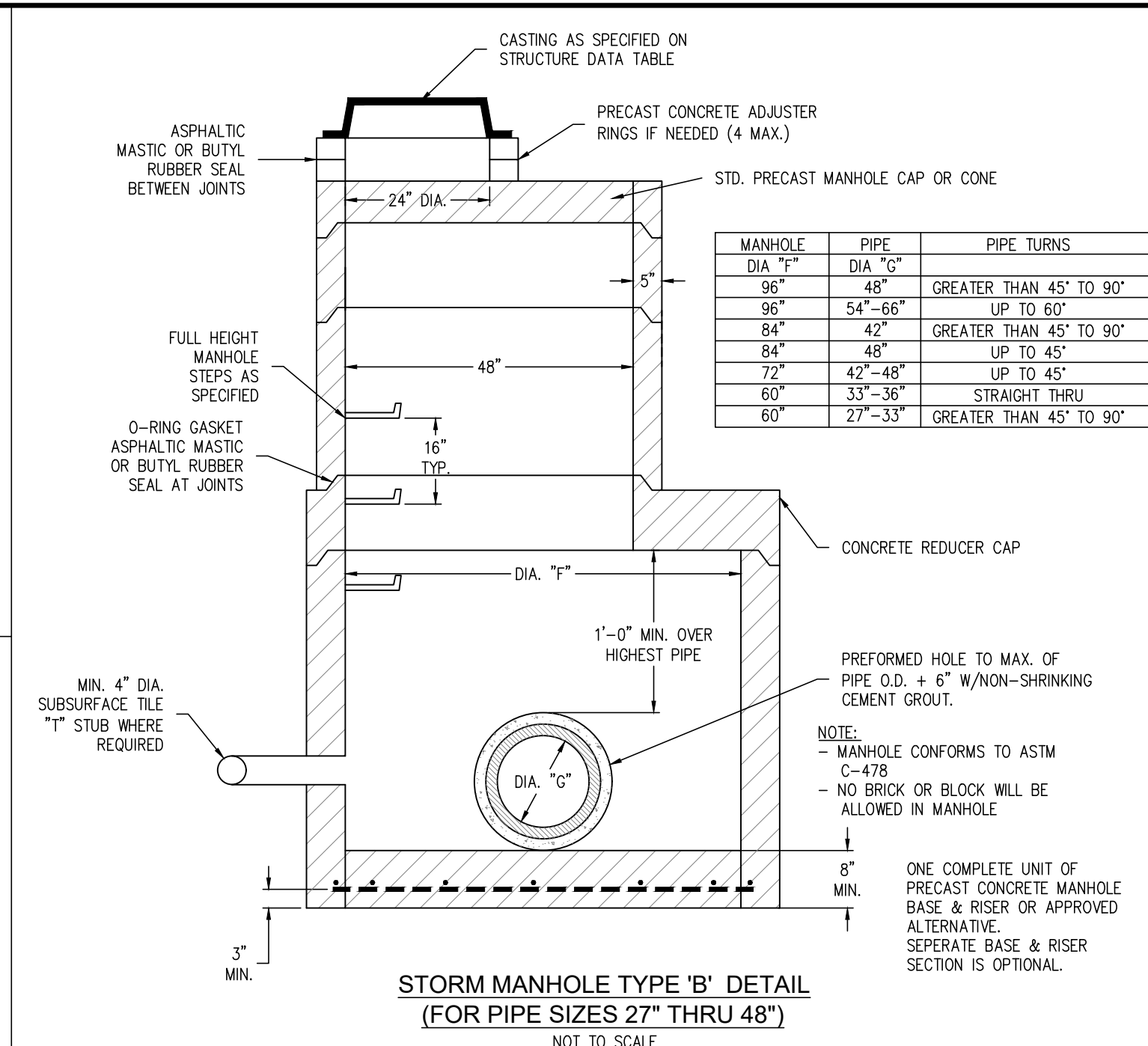


TYPICAL SIDE ELEVATION
NO SCALE

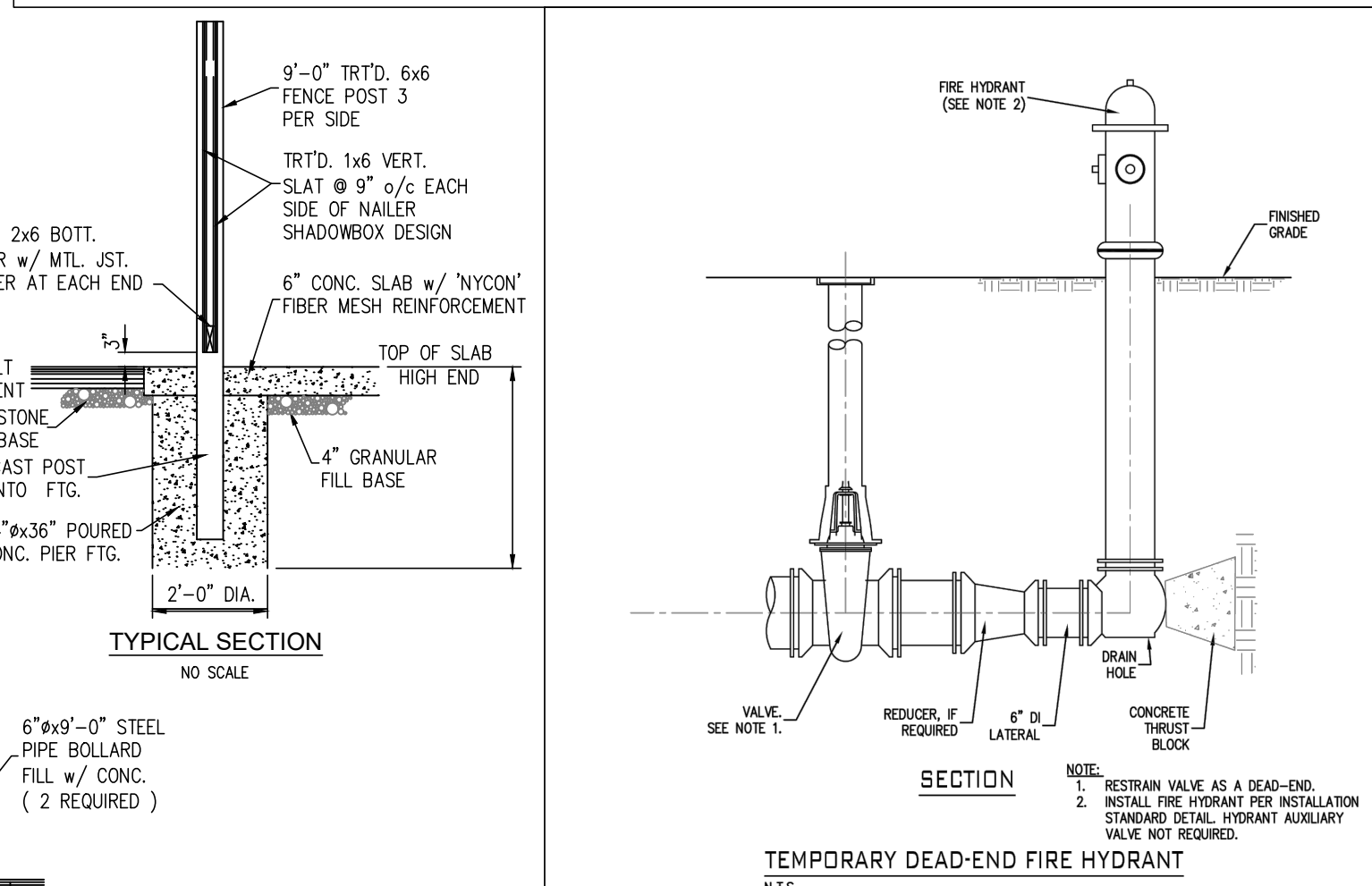
CEDAR SHADOW BOX FENCE ENCLOSURE (H)
NOT TO SCALE



ELEVATION VIEW
INLET TYPE 'A'
NOT TO SCALE



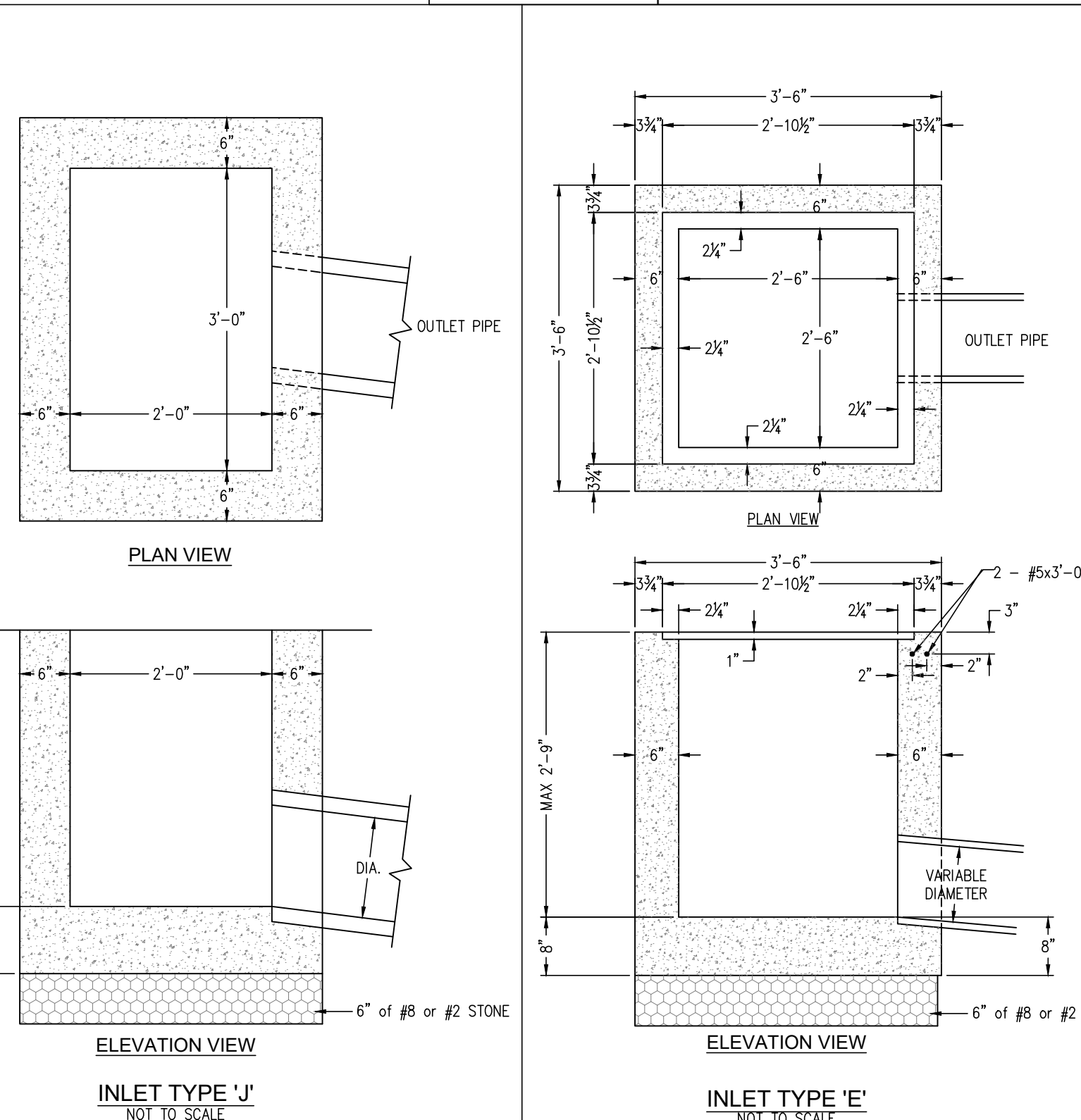
STORM MANHOLE TYPE 'B' DETAIL
(FOR PIPE SIZES 27\"/>



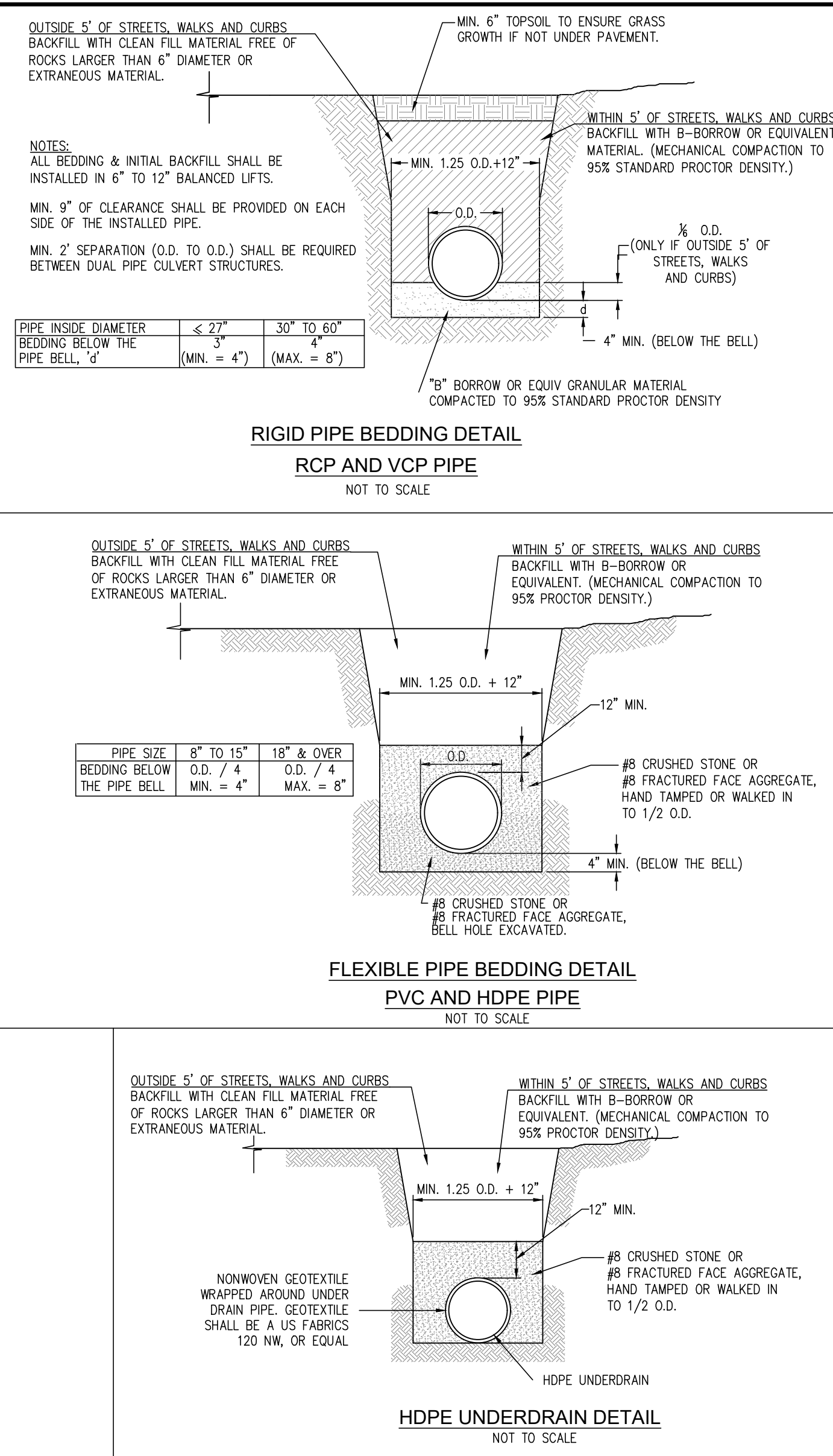
STANDARD DETAIL
TEMPORARY DEAD-END
FIRE HYDRANT DETAIL

INDIANA
AMERICAN WATER
ENGINEERING DEPARTMENT
153 N. EMERSON AVENUE
GREENWOOD, INDIANA 46143

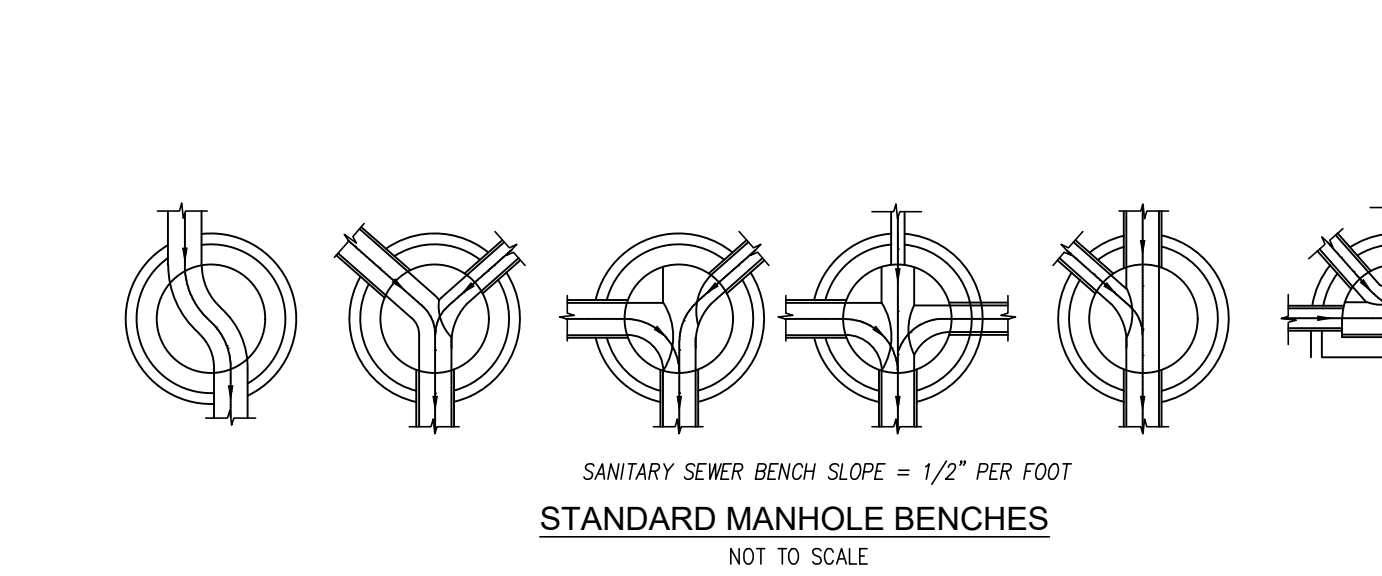
DATE: JANUARY, 2018 DRAWN BY: S. FORD
LATEST REV: JANUARY, 2018 APP'D BY: M.S./E.N.



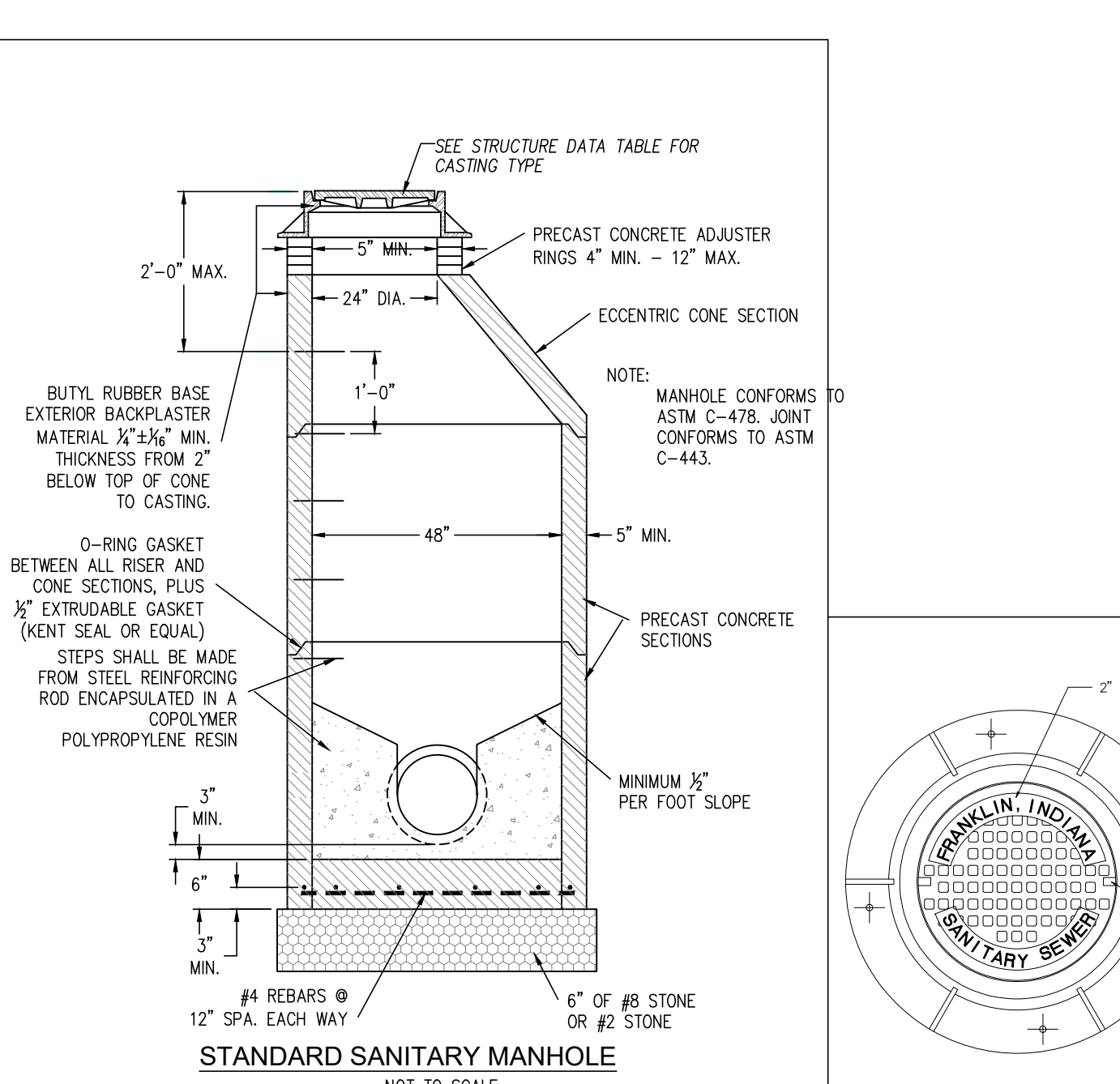
INLET TYPE 'E'
NOT TO SCALE



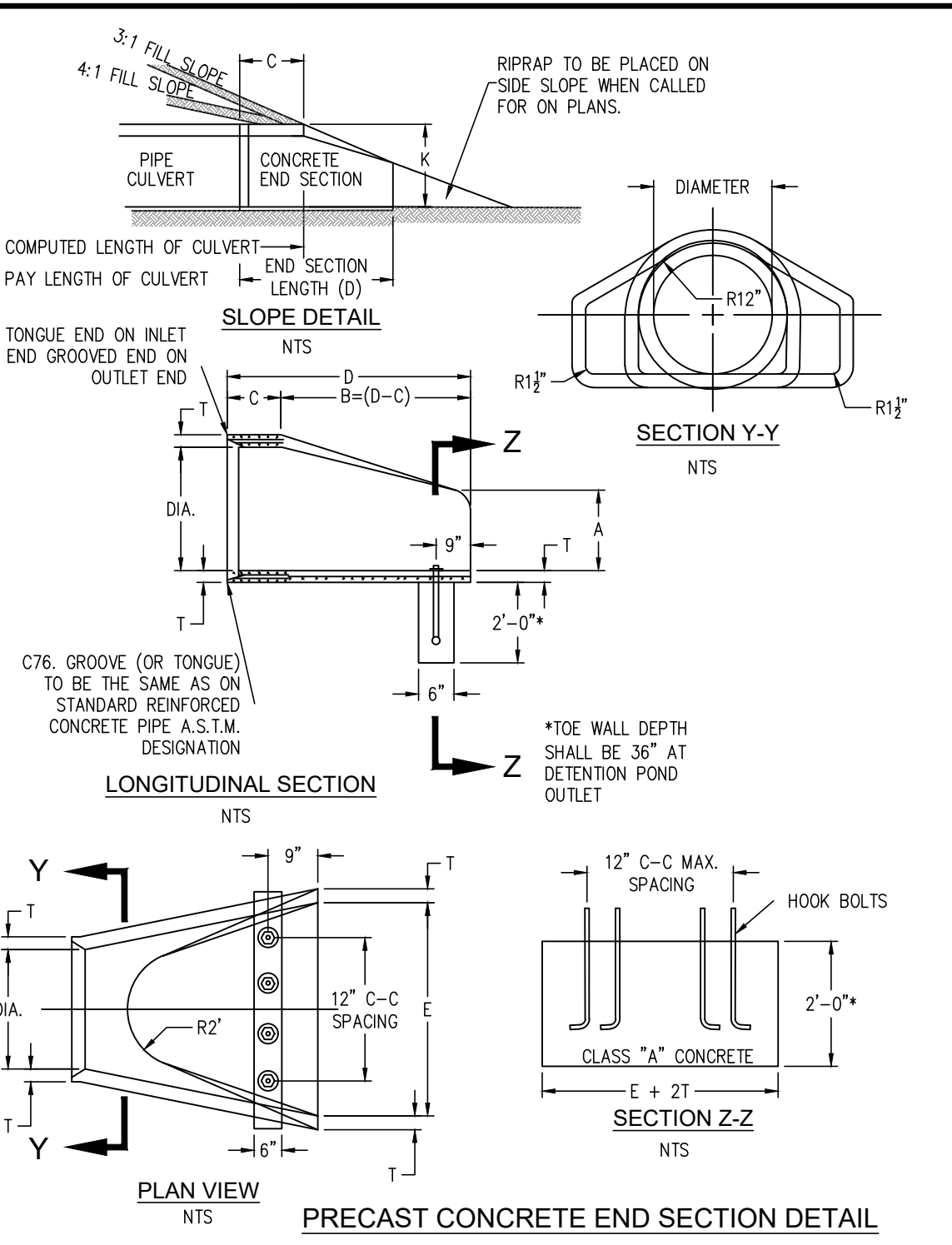
FLEXIBLE PIPE BEDDING DETAIL
PVC AND HDPE PIPE
NOT TO SCALE



STANDARD MANHOLE BENCHES
NOT TO SCALE



STANDARD SANITARY MANHOLE
NOT TO SCALE



PRECAST CONCRETE END SECTION DETAIL

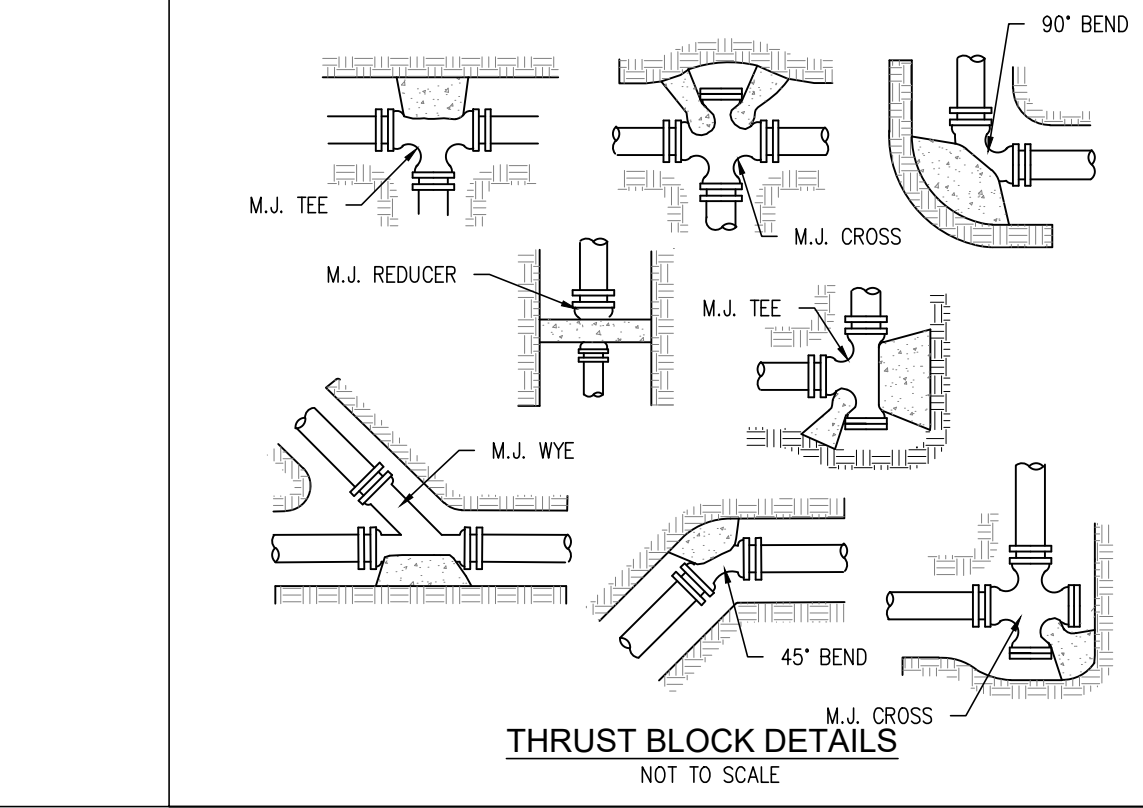
PRECAST CONCRETE END SECTION TABLE													
DIA.	WALL G OR T	WT. SEC.	A	B	C	D	E	DIA.+1	R-1	SKIRT			
12	2	1 1/2	530	4	24	48 1/2	72 1/2	24	13	10 1/2	3 1/2		
15	2 1/2	2	740	6	27	46	73	30	16	12 1/2	3 1/2		
18	2 1/2	2 1/2	990	9	27	46	73	36	19	15 1/2	4		
21	2 1/2	2 1/2	1280	9	35	38	73	42	22	16 1/2	4		
24	2 1/2	2 1/2	1520	9	43 1/2	30	73 1/2	48	25	16 1/2	4 1/2		
27	2 1/2	2 1/2	1930	10 1/2	48	25 1/2	73 1/2	54	28	17 1/2	4 1/2		
30	3	3	2190	12	54	19 1/2	73 1/2	60	31	18 1/2	5		
33	3 1/2	3 1/2	3150	13 1/2	58 1/2	39 1/2	97 1/2	66	34	23 1/2	5 1/2		
36	3 1/2	3 1/2	4100	15	63	34 1/2	97 1/2	72	37	24 1/2	5 1/2		
42	3 1/2	3 1/2	5380	21	63	35	98	78	43	27 1/2	5 1/2		
46	4 1/2	4 1/2	6550	24	72	26	98	84	49	28 1/2	5 1/2		
54	4 1/2	4 1/2	8040	27	85	35	100	90	55	32 1/2	6		
60	5	5	8750	30	60	39	99	96	61	36 1/2	6 1/2		
66	5 1/2	5 1/2	10630	34	78	21	99	102	67	35 1/2	7 1/2		
72	6	6	12520	34	78	21	99	108	73	38 1/2	7 1/2		
78	6 1/2	6 1/2	14430	24	78	21	99	114	79	41 1/2	8 1/2		
84	7	7	16350	24	78	21	99	120	85	44 1/2	9		

NOTES:
1) MANUFACTURE OF END SECTION IS IN ACCORDANCE WITH APPLICABLE PORTIONS OF A.S.T.M. SPECIFICATION C76.

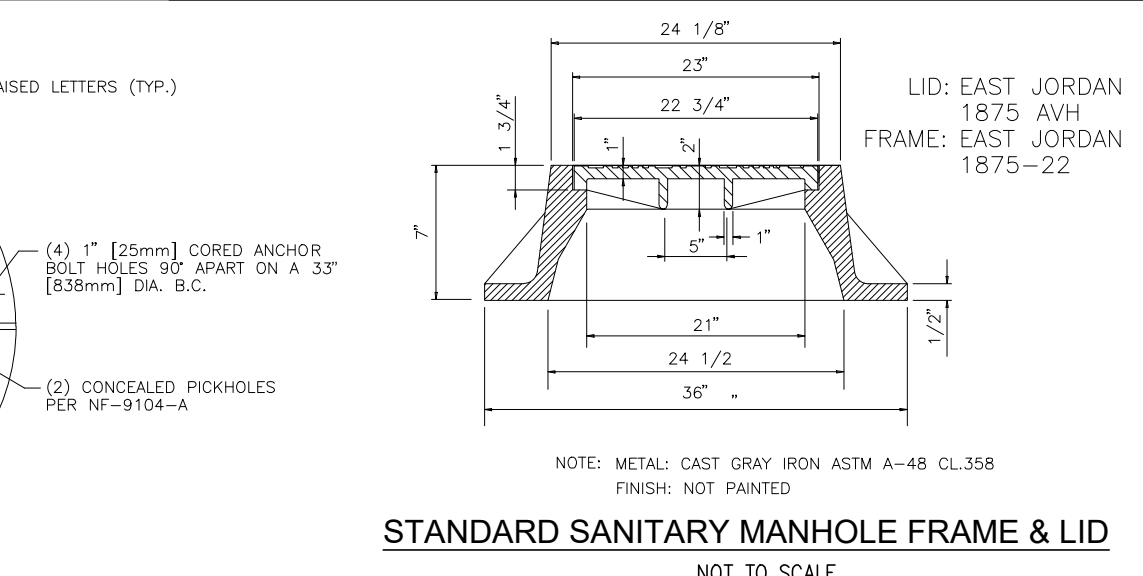
THRUST BLOCK SCHEDULE						
PIPE SIZE	90°	45°	22 1/2°	11 1/4°	TEE	REDUCER
16"	37.8	19.1	11.2	3.0	28.6	21.4
14"	29.8	14.9	8.9	2.3	23.2	16.4
12"	21.1	8.6	6.6	1.7	16.6	10.5
10"	11.5	5.9	3.6	1.2	9.4	7.8
8"	7.2	3.7	2.1	1.2	5.4	4.6
6"	3.2	3.0	1.3	1.2	3.5	2.6
4" & UNDER	1.3	3.0	1.3	1.2	3.5	1.3

NOTE: CLASS 150 PIPE, TEST PRESSURE P.S.I.; SOIL BEARING: 2000 P.S.I. THRUST BLOCK CONTACT AREA OF UNDISTURBED EARTH BANK IN SQUARE FEET.

CONCRETE THRUST BLOCKS TO BE 2500 P.S.I. CONCRETE, POURED IN PLACE WITH SLUMP BETWEEN 1" MINIMUM AND 4" MAXIMUM



THRUST BLOCK DETAILS
NOT TO SCALE



STANDARD SANITARY MANHOLE FRAME & LID
NOT TO SCALE

EARTHWORK

1. SCOPE OF WORK
- A. EXTENT: THE WORK REQUIRED UNDER THIS SECTION CONSISTS OF ALL EXCAVATING, FILLING, ROUGH GRADING AND RELATED ITEMS NECESSARY TO COMPLETE THE WORK INDICATED ON THE DRAWINGS AND DESCRIBED IN THE SPECIFICATIONS. THE CONTRACTOR SHALL NOTIFY IN WRITING THE OWNER AND THE ENGINEER OF ANY CHANGES, ERRORS OR OMISSIONS FOUND ON THE PLANS OR IN THE FIELD, BEFORE WORK IS STARTED OR RESUMED.
1. IN GENERAL, THE ITEMS OF WORK TO BE PERFORMED UNDER THIS SECTION SHALL INCLUDE CLEARING AND GRUBBING, REMOVAL OF TREES AND STUMPS, STRIPPING AND STORAGE OF TOPSOIL, FILL, COMPACTION AND ROUGH GRADING OF ENTIRE SITE. ALL TREES SHALL BE REMOVED UNLESS OTHERWISE NOTED BY OWNER OR DIRECTED BY OWNER.
2. EXCAVATED MATERIAL THAT IS SUITABLE MAY BE USED FOR FILLS. ALL UNSUITABLE MATERIAL AND ALL SURPLUS EXCAVATED MATERIAL NOT REQUIRED SHALL BE REMOVED FROM THE SITE. THE LOCATION OF DUMP AND LENGTH OF HAUL SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
3. SPONGE AND PLACE ANY ADDITIONAL FILL MATERIAL FROM OFF THE SITE AS MAY BE NECESSARY TO PRODUCE THE GRADES REQUIRED. FILL OBTAINED FROM OFF SITE SHALL BE OF KIND AND QUALITY AS SPECIFIED FOR FILLS HEREIN AND THE SOURCE APPROVED BY THE OWNER.
4. THE CONTRACTOR SHALL ACCEPT THE SITE AS HE FINDS IT AND SHALL REMOVE ALL TRASH, RUBBISH AND DEBRIS FROM THE SITE PRIOR TO STARTING EXCAVATION.
2. BENCHMARK
- A. MAINTAIN CAREFULLY ALL BENCH MARKS, MONUMENTS AND OTHER REFERENCE POINTS; IF DISTURBED OR DESTROYED, CONTRACTOR SHALL CONTACT ENGINEER.
3. REMOVAL OF TREES
- A. THE INTEGRITY OF THE TOPOGRAPHIC FEATURES (INCLUDING TREES) SHALL BE PRESERVED AS MUCH AS POSSIBLE. THE CONTRACTOR SHALL COORDINATE WITH OWNER AND/OR ENGINEER PRIOR TO CLEARING THE SITE FOR CONSTRUCTION.
- B. ALL BRUSH, STUMPS, WOOD AND OTHER REFUSE FROM THE TREES REMOVED SHALL BE HAULED TO DISPOSAL AREAS. ALL OTHER DEBRIS FROM THE SITE SHALL BE REMOVED UNLESS PROPER PERMITS ARE OBTAINED (WHERE APPLICABLE).
4. HANDLING OF TOPSOIL
- A. REMOVE ALL ORGANIC MATERIAL FROM THE AREAS TO BE OCCUPIED BY BUILDINGS, ROADS, WALKS AND PARKING AREAS. PILE AND STORE TOPSOIL AT A LOCATION WHERE IT WILL NOT INTERFERE WITH CONSTRUCTION OPERATIONS. TOPSOIL SHALL BE REASONABLE FREE FROM SUBSOIL, DEBRIS, WEEDS, GRASS, STONES, ETC.
- AFTER COMPLETION OF SITE GRADING AND SUBSURFACE UTILITY INSTALLATION, TOPSOIL SHALL BE REPLACED IN AREAS DESIGNATED ON THE EROSION CONTROL PLAN FOR SEEDING AND/OR SOODING. ANY REMAINING TOPSOIL SHALL BE USED FOR FINISHED GRADING AROUND STRUCTURES AND LANDSCAPING AREAS.
5. DISPOSITION OF UTILITIES
- A. RULES AND REGULATIONS GOVERNING THE RESPECTIVE UTILITIES SHALL BE OBSERVED IN EXECUTING ALL WORK UNDER THIS SECTION.
- B. IF ACTIVE UTILITIES ARE ENCOUNTERED BUT NOT SHOWN ON THE DRAWINGS, THE ENGINEER SHALL BE ADVISED BEFORE WORK IS CONTINUED.
- C. INACTIVE AND ABANDONED UTILITIES ENCOUNTERED IN EXCAVATING AND GRADING OPERATIONS SHALL BE REPORTED TO THE ENGINEER. THEY SHALL BE REMOVED, PLUGGED OR CAPPED AS DIRECTED BY THE UTILITY COMPANY OR THE ENGINEER.
- D. IT SHALL BE THE RESPONSIBILITY OF EACH CONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS PERTAINING TO HIS PHASE OF THE WORK. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNERS OF THE VARIOUS UTILITIES BEFORE WORK IS STARTED.
6. SITE GRADING
- A. GRADES: CONTRACTOR SHALL PERFORM ALL CUTTING, FILLING, COMPACTING OF FILLS AND ROUGH GRADING REQUIRED TO BRING ENTIRE PROJECT AREA TO GRADE AS SHOWN ON THE DRAWINGS.
- B. ROUGH GRADING: THE TOLERANCE FOR PAVED AREAS SHALL NOT EXCEED 0.10 FEET PLUS OR MINUS ABOVE THE ESTABLISHED SUBGRADE. ALL OTHER AREAS SHALL NOT EXCEED 0.10 FEET PLUS OR MINUS THE ESTABLISHED GRADE. ALL BANKS AND OTHER BREAKS IN GRADE SHALL BE ROUNDED AT THE TOP AND BOTTOM.
- C. COMPACTION REQUIREMENTS:
1. ALL BUILDING AND PAVED AREAS SHALL BE COMPACTED TO STANDARDS SPECIFIED BY LOCAL AND/OR STATE BUILDING CODES.
2. COMPACTION REQUIREMENTS OF PAVED AREAS SHALL BE 95% OF MAXIMUM DRY DENSITY.
7. EARTH WORK BALANCE
- A. THE CONTRACTOR SHALL CONFIRM ALL EARTHWORK QUANTITIES PRIOR TO START OF CONSTRUCTION. IF AN EXCESS OR SHORTAGE OF EARTH IS ENCOUNTERED, THE CONTRACTOR SHALL CONFIRM WITH THE OWNER AND ENGINEER THE REQUIREMENTS FOR STOCKPILING, REMOVAL OR IMPORTING OF EARTH.

MINOR ADJUSTMENTS TO THE GRADES MAY BE REQUIRED TO EARTHWORK BALANCES WHEN MINOR EXCESS MATERIAL OR SHORTAGES ARE ENCOUNTERED. IT IS RECOGNIZED BY THE PARTIES HERETO THAT THE CALCULATIONS OF THE ENGINEER IN ACCORDANCE WITH THE AMERICAN SOCIETY OF CIVIL ENGINEERS STANDARDS FOR SUCH CALCULATIONS. FURTHER, THAT THESE CALCULATIONS ARE SUBJECT TO THE INTERPRETATIONS OF THE PROFESSIONAL ENGINEER. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING OF ANY CHANGES, ERRORS OR OMISSIONS FOUND ON THESE PLANS OR IN THE FIELD BEFORE WORK IS STARTED OR RESUMED.

STREETS

1. SCOPE OF WORK
- A. THE WORK REQUIRED UNDER THIS SECTION INCLUDES ALL CONCRETE AND BITUMINOUS PAVING AND RELATED ITEMS NECESSARY TO COMPLETE THE WORK INDICATED ON THE DRAWINGS AND DESCRIBED IN THE SPECIFICATIONS, INCLUDING BUT NOT LIMITED TO:
1. ALL STREETS, PARKING AREAS WITHIN THE CONTRACT LIMITS.
2. CURBS AND CONCRETE RAMPS.
3. SIDEWALKS AND CONCRETE SLABS.
4. IN THE CASE OF ANY CONFLICTS WITH THESE SPECIFICATIONS AND LOCAL, STATE, FEDERAL SPECIFICATIONS THE MORE STRINGENT SHALL APPLY.
- B. IN THE CASE OF ANY CONFLICTS WITH THESE SPECIFICATIONS AND LOCAL, STATE, FEDERAL SPECIFICATIONS THE MORE STRINGENT SHALL APPLY.
2. PAVEMENT CONSTRUCTION
- A. ALL STREET CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS AND CONFORM TO THE MINIMUM STANDARDS OF THE CITY OF FRANKLIN AND ENGINEERING DEPARTMENTS, AND IF THERE ARE AREAS UNDEFINED USE THE CURRENT I.N.D.O.T. STANDARDS SPECIFICATIONS, AS REVISED.
- B. FLEXIBLE PAVEMENT
1. MATERIALS
- A. GENERAL: USE LOCALLY AVAILABLE MATERIALS AND GRADATIONS WHICH EXHIBIT A SATISFACTORY RECORD OF PREVIOUS INSTALLATIONS.
- B. COMPACTED AGGREGATE BASE: SOUND, ANGULAR CRUSHED LESTONE, CRUSHED OR UNCRUSHED GRAVEL, OR CRUSHED OR PROCESS AIR-COOLED BLAST FURNACE SLAG. COURSE AGGREGATE SHALL BE CLASS A, TYPE "O" AND CONFORM TO I.N.D.O.T. STANDARD SPECIFICATIONS SECTION 903.
- C. BASE COURSE AGGREGATE: SOUND, ANGULAR CRUSHED STONE, CRUSHED OR UNCRUSHED GRAVEL, OR CRUSHED SLAG, SAND, STONE, OR SLAG SCREENINGS. COARSE AGGREGATES SHALL BE CLASS A OR B AND CONFORM TO I.N.D.O.T. STANDARDS SPECIFICATIONS SECTION 903.
- D. COARSE AGGREGATE FOR SURFACE AND BINDER MIXTURES: CRUSHED STONE, CRUSHED GRAVEL, CRUSHED SLAB, AND SHARP DENSE NATURAL SAND. SURFACE COARSE AGGREGATES SHALL BE CLASS A AND CONFORM TO I.N.D.O.T. STANDARDS SPECIFICATIONS SECTION 903.
- E. ASPHALT CEMENT: PETROLEUM ASPHALT CEMENT, ACP 5 WITH PENETRATION OF 60-70 OR VISCOUSITY GRADED ASPHALT CEMENT AC-20 CONFORMING TO I.N.D.O.T. STANDARD SPECIFICATIONS SECTION 903.
- F. PRIME COAT: MEDIUM-CURE LIQUID ASPHALT OR ASPHALT EMULSION CONFORMING TO I.N.D.O.T. STANDARD SPECIFICATIONS SECTION 408.
- G. TACK COAT: RAPID-CURE LIQUID ASPHALT OR ASPHALT EMULSION CONFORMING TO I.N.D.O.T. STANDARD SPECIFICATIONS SECTION 409.
- H. LANE MARKING PAINT: CHLORINATED RUBBER-ALKYD TYPE, AASHTO M248 (FS TT-115), TYPE III.
3. ASPHALT-AGGREGATE MIXTURE
- A. ALL BITUMINOUS MIXTURES ARE TO CONFORM TO CURRENT I.N.D.O.T. SPECIFICATIONS
- B. SURFACE COURSE: HMA SURFACE 9.5mm
- C. BINDER COURSE: HMA INTERMEDIATE 19.0mm
- D. BASE COURSE: TYPE HMA BASE 25.0mm
- **PROVIDED A JOB MIX FORMULA FOR EACH TYPE OF ASPHALT PRIOR TO THE BEGINNING OF THE CONSTRUCTION PROJECT.
4. SURFACE PREPARATION
- A. REMOVE LOOSE MATERIAL FROM COMPACTED SUBBASE SURFACE IMMEDIATELY BEFORE APPLYING PRIME COAT.
1. PROOF ROLL SUBGRADE SURFACE WITH LOADED TRI-AXLE TRUCK (48 HOUR NOTICE IS REQUIRED TO BE GIVEN TO THE CITY OF FRANKLIN ENGINEERING DEPT.) TO CHECK FOR UNSTABLE AREAS AND AREAS REQUIRING ADDITIONAL COMPACTION. IF PROOF ROLL EXCEEDS MAXIMUM ¼" DEFLECTION, CONTRACTOR SHALL COORDINATE WITH ENGINEER AND CITY OF FRANKLIN TO DETERMINE IF SUBGRADE STABILIZATION IS REQUIRED.
2. NOTIFY CONTRACTOR OF UNSATISFACTORY CONDITIONS. DO NOT BEGIN PAVING WORK UNTIL DEFICIENT SUBBASE AREAS HAVE BEEN CORRECTED AND ARE READY TO RECEIVE PAVING.
3. AGGREGATE BASE: AFTER PLACEMENT, PROOF ROLL COMPACTED AGGREGATE BASE SURFACE TO CHECK FOR UNSTABLE AREAS AND AREAS REQUIRING ADDITIONAL COMPACTION.
4. NOTIFY CONTRACTOR OF UNSATISFACTORY CONDITIONS. DO NOT BEGIN PAVING WORK UNTIL DEFICIENT AGGREGATE BASE AREAS HAVE BEEN CORRECTED AND ARE READY TO RECEIVE PAVING.
5. REMOVE LOOSE MATERIAL FROM COMPACTED AGGREGATE BASE SURFACE IMMEDIATELY BEFORE APPLYING PRIME COAT.
5. PLACING THE MIX
- A. GENERAL: PLACE BITUMINOUS AGGREGATE MIXTURE ON PREPARED SURFACE, SPREAD AND STRIKE-OFF. SPREAD MIXTURE AT MINIMUM TEMPERATURE OF 225 DEGREES F.(107 DEGREES C). PLACE INACCESSIBLE AND SMALL AREAS BY HAND. PLACE EACH COURSE TO REQUIRED GRADE, CROSS-SECTION, AND COMPACTED THICKNESS.
- B. BASE COURSE, COMPACTED AGGREGATE: SPREAD AND COMPACT IN TWO LIFTS AS FOLLOWS:
- 1) FIRST LIFT: NO. 55'S SHALL BE A MINIMUM OF 4" OR ½ THE TOTAL DEPTH OF AGGREGATE. EXTEND THE FIRST LIFT 4" OR A DISTANCE EQUAL TO THE DEPTH OF THE LIFT BEYOND THE SECOND LIFT.
- 2) SECOND LIFT: SIZE NO. 55
- C. PRIME COAT: SUBBASE SURFACE SHALL BE PRIMED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF SECTION 408 OF I.N.D.O.T. STANDARD SPECIFICATIONS.
- D. HOT ASPHALT CONCRETE BINDER COURSE: SPREAD AND ROLL TO MINIMUM FINISH DEPTHS INDICATED ON DETAILS.
- E. TACK COAT: BINDER COURSE SHALL BE TACKED PRIOR TO THE INSTALLATION OF THE SURFACE COURSE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF SECTION 409 OF I.N.D.O.T. STANDARD SPECIFICATIONS.

- F. SURFACE COURSE: SPREAD AND ROLL TO MINIMUM FINISH DEPTH INDICATED ON DETAILS. FINISH ELEVATION SHALL BE TRUE TO LINE AND GRADE WITHIN ¼" OF TRUE ELEVATIONS.
- G. PAVEMENT PLACING: PLACE IN STRIPS NOT LESS THAN 10' WIDE, UNLESS OTHERWISE ACCEPTABLE TO ARCHITECT/ENGINEER. AFTER FIRST STRIP HAS BEEN PLACED AND ROLLED, PLACE SUCCEEDING STRIPS AND EXTEND ROLLING TO OVERLAP PREVIOUS STRIPS. COMPLETE BINDER COURSE FOR A SECTION BEFORE PLACING SURFACE COURSE WITH THESE SPECIFICATIONS AND LOCAL, STATE, FEDERAL SPECIFICATIONS THE MORE STRINGENT SHALL APPLY.
- H. JOINTS: MAKE JOINTS BETWEEN OLD AND NEW PAVEMENTS, OR BETWEEN PAVEMENT PASSES, OR BETWEEN SUCCESSIVE DAYS WORK, TO ENSURE CONTINUOUS BOND BETWEEN ADJOINING WORK. CONSTRUCTION JOINTS TO HAVE SAME TEXTURE, DENSITY AND SMOOTHNESS AS OTHER SECTIONS. CLEAN CONTACT SURFACES AND APPLY TACK COAT.
6. ROLLING
- A. GENERAL: BEGIN ROLLING WHEN MIXTURE WILL BEAR ROLLER WEIGHT WITHOUT EXCESSIVE DISPLACEMENT. 1) COMPACT MIXTURE WITH HOT HAND TAMPER OR VIBRATING PLATE COMPACTORS IN AREAS INACCESSIBLE TO ROLLERS.
2. BREAKDOWN ROLLING: ACCOMPLISH BREAKDOWN OR INITIAL ROLLING IMMEDIATELY FOLLOWING ROLLING OF JOINTS AND OUTSIDE EDGE. CHECK SURFACE AFTER BREAKDOWN ROLLING, AND REPAIR DISPLACED AREAS BY LOOSENING AND FILLING, IF REQUIRED, WITH HOT MATERIAL.
3. SECOND ROLLING: FOLLOW BREAKDOWN ROLLING AS SOON AS POSSIBLE, WHICH MIXTURE IS HOT. CONTINUE SECOND ROLLING UNTIL MIXTURE HAS BEEN THOROUGHLY COMPACTED.
4. FINISH ROLLING: PERFORM FINISH ROLLING WHILE MIXTURE IS STILL WARM ENOUGH FOR REMOVAL OF ROLLER MARKS. CONTINUE ROLLING UNTIL ROLLER MARKS ARE ELIMINATED AND COURSE HAS ATTAINED MAXIMUM DENSITY.
5. PATCHING: REMOVE AND REPLACE PAVING AREAS MIXED WITH FOREIGN MATERIALS AND DEFECTIVE AREAS, CUT OUT SUCH AREAS AND FILL WITH FRESH, HOT BITUMINOUS AGGREGATE MIX. COMPACT BY ROLLING TO MAXIMUM SURFACE DENSITY AND SMOOTHNESS.
6. PROTECTION: AFTER FINAL ROLLING, DO NOT PERMIT VEHICULAR TRAFFIC ON PAVEMENT UNTIL IT HAS COOLED AND HARDENED.
7. ERECT BARRICADES TO PROTECT PAVING FROM TRAFFIC UNTIL MIXTURE HAS COOLED ENOUGH NOT TO BECOME MARKED.
8. LANE MARKING
- A. CLEANING: SWEEP AND CLEAN SURFACE TO ELIMINATE LOOSE MATERIAL AND DUST.
- B. STRIPPING: USE CHLORINATED RUBBER BASE TRAFFIC LANE-MARKING PAINT, FACTORY MIXED, QUICK-DRYING, AND NON-BLEEDING.
- C. COLOR: YELLOW.
- D. DO NOT APPLY TRAFFIC AND LANE MARKING PAINT UNTIL LAYOUT AND PLACEMENT HAS BEEN VERIFIED WITH ARCHITECT/ENGINEER.
- E. APPLY PAINT WITH MECHANICAL EQUIPMENT TO PRODUCE UNIFORM STRAIGHT EDGES. APPLY IN TWO COATS AT MANUFACTURER'S RECOMMENDED RATES.
9. FIELD QUALITY CONTROL
- A. TESTING AND INSPECTION SERVICE:
- 1) OWNER SHALL EMPLOY A TESTING LABORATORY TO PERFORM PAVEMENT TESTING AND INSPECTION SERVICE FOR QUALITY CONTROL DURING PAVING OPERATIONS.
- 2) TESTING SERVICE SHALL HAVE REPRESENTATIVE PRESENT TO OBSERVE AND PERFORM TESTS AT ALL TIMES PAVING WORK IS IN PROGRESS.
- B. GENERAL: TESTING SERVICE SHALL TAKE A MINIMUM OF TWO SAMPLES PER LIFT OF BITUMINOUS AGGREGATE MIX EACH DAY BEFORE PAVING OPERATION. LABORATORY TEST SHALL BE PERFORMED ON THESE SAMPLES TO DETERMINE AGGREGATE GRADATION AND ASPHALT CONTENT.
- C. TESTING IN-PLACE COMPACTED BITUMINOUS AGGREGATE MIX COURSES FOR COMPLIANCE WITH REQUIREMENTS FOR THICKNESS, DENSITY AND AIR Voids AND SURFACE SMOOTHNESS. REPAIR OR REMOVE AND REPLACE UNACCEPTABLE PAVING AS DIRECTED BY ENGINEER.
- D. A TEST SECTION AT A MINIMUM SIZE OF 100'X12' SHALL BE PLACED AT A LOCATION AS DIRECTED BY THE COUNTY PRIOR TO FULL PRODUCTION FOR EACH TYPE OF MIX. THE TEST SECTION SHALL BE COMPACTED TO DETERMINE A TARGET DENSITY FOR THE REMAINDER OF THE PAVEMENT.
- E. THICKNESS: IN-PLACE COMPACTED THICKNESS WILL NOT BE ACCEPTABLE IF EXCEEDING FOLLOWING ALLOWABLE VARIATION FROM REQUIRED THICKNESS:
- AGGREGATE BASE COURSE: ¼", PLUS OR MINUS
- BASE COURSE: ¼", PLUS OR MINUS
- BACKFILL: BACKFILL SHALL BE PLACED AS SHOWN IN THE PLANS. NOTE THAT PVC & HOPE PIPE SHALL BE COVERED WITH 12" MINIMUM OF #8 STONE. COMPACT THIS BACKFILL THOROUGHLY, TAKING CARE NOT TO DISTURB THE PIPE. BACKFILL UNDER AND WITHIN 5 FEET OF WALKS, PARKING AREAS, DRIVEWAYS AND STREETS SHALL BE "B" BORROW OR EQUIVALENT GRANULAR MATERIAL ONLY AND THOROUGHLY COMPACTED BY APPROVED METHODS.
- F. MANHOLE INVERTS: CONSTRUCT MANHOLE FLOW CHANNELS OF CONCRETE SEWER PIPE OR BRICK, SMOOTHLY FINISHED AND OF SEMICIRCULAR SECTION CONFORMING TO THE INSIDE DIAMETER OF THE CONNECTING SEWERS. MAKE CHANGES IN SIZE OR GRADE GRADUALLY AND CHANGES IN DIRECTION BY TRUE CURVES. PROVIDE SUCH CHANNELS FOR ALL CONNECTING SEWERS AT EACH MANHOLE.
- G. SUBDRAINS: ALL SUBDRAINS SHALL BE OF THE SIZE SHOWN ON THE PLANS AND SHALL BE CONSTRUCTED TO THE GRADES SHOWN. ALL DRAINS CONSTRUCTED OFF-SITE AS PART OF THE OUTLET DRAIN WILL BE LOCATED AS SHOWN.
- H. UTILITIES: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS PERTAINING TO HIS WORK. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNERS OF THE VARIOUS UTILITIES BEFORE WORK IS STARTED. THE CONTRACTOR SHALL NOTIFY IN WRITING THE OWNER AND THE ENGINEER OF ANY CHANGES, ERRORS OR OMISSIONS FOUND ON THESE PLANS OR IN THE FIELD BEFORE WORK IS STARTED OR RESUMED.
- E. SURFACE SMOOTHNESS: TEST FINISHED SURFACE FOR SMOOTHNESS, USING 10' STRAIGHTEDGE APPLIED PARALLEL WITH, AND AT RIGHT ANGLES TO, CENTERLINE OF PAVED AREA. SURFACE WILL NOT BE ACCEPTABLE IF EXCEEDING THE FOLLOWING TOLERANCES FOR SMOOTHNESS:
- AGGREGATE BASE COURSE SURFACE: 1/4" BASE COURSE SURFACE: 1/4" BINDER COURSE SURFACE: 1/8" WEARING COURSE SURFACE: 1/8"
- F. DENSITY TESTS: DENSITY TESTS SHALL BE MADE AT EACH LIFT. TEST SHALL BE AS FOLLOWS:
- 1) TESTS WILL BE REQUIRED AT VARIOUS TIMES AND LOCATIONS FOR SUBGRADE AND BASE COURSES FOR ASPHALT PAVING AREAS.
- G. TESTING SERVICE SHALL SUBMIT CERTIFIED RESULTS TO THE OWNER AND ENGINEER WITHIN 72 HOURS AFTER TESTS ARE MADE WITH THEIR COMMENTS AND RECOMMENDATIONS FOR ACTION.
- H. PAVEMENT WHICH FAILS TO COMPLY WITH APPROVED JOB MIX FORMULA SHALL BE REPLACED AS DIRECTED BY THE ARCHITECT/ENGINEER.
- I. SURFACE SMOOTHNESS: TEST FINISHED SURFACE FOR SMOOTHNESS, USING 10' STRAIGHTEDGE APPLIED PARALLEL WITH, AND AT RIGHT ANGLES TO, CENTERLINE OF PAVED AREA. SURFACE WILL NOT BE ACCEPTABLE IF EXCEEDING THE FOLLOWING TOLERANCES FOR SMOOTHNESS:
- AGGREGATE BASE COURSE SURFACE: 1/4" BASE COURSE SURFACE: 1/4" BINDER COURSE SURFACE: 1/8" WEARING COURSE SURFACE: 1/8"
- J. CHECK SURFACE AREAS AT INTERVALS AS DIRECTED BY TESTING SERVICE.

- F. DENSITY TESTS: DENSITY TESTS SHALL BE MADE AT EACH LIFT. TEST SHALL BE AS FOLLOWS:
- 1) TESTS WILL BE REQUIRED AT VARIOUS TIMES AND LOCATIONS FOR SUBGRADE AND BASE COURSES FOR ASPHALT PAVING AREAS.
- G. TESTING SERVICE SHALL SUBMIT CERTIFIED RESULTS TO THE OWNER AND ENGINEER WITHIN 72 HOURS AFTER TESTS ARE MADE WITH THEIR COMMENTS AND RECOMMENDATIONS FOR ACTION.
- H. PAVEMENT WHICH FAILS TO COMPLY WITH APPROVED JOB MIX FORMULA SHALL BE REPLACED AS DIRECTED BY THE ARCHITECT/ENGINEER.
- I. SURFACE SMOOTHNESS: TEST FINISHED SURFACE FOR SMOOTHNESS, USING 10' STRAIGHTEDGE APPLIED PARALLEL WITH, AND AT RIGHT ANGLES TO, CENTERLINE OF PAVED AREA. SURFACE WILL NOT BE ACCEPTABLE IF EXCEEDING THE FOLLOWING TOLERANCES FOR SMOOTHNESS:
- AGGREGATE BASE COURSE SURFACE: 1/4" BASE COURSE SURFACE: 1/4" BINDER COURSE SURFACE: 1/8" WEARING COURSE SURFACE: 1/8"
- J. CHECK SURFACE AREAS AT INTERVALS AS DIRECTED BY TESTING SERVICE.
1. EXPANSION JOINTS: SHALL BE 1/2 INCH THICK PREMOULDED AT ENDS OF ALL RETURNS AND AT A MAXIMUM SPACING OF 100 FEET.
2. CONTRACTION JOINTS: UNLESS OTHERWISE PROVIDED, CONTRACTION JOINTS SHALL BE SAWED JOINTS SPACED TO FEET ON CENTER.
3. FINISH: TAMP AND SROED CONCRETE AS SOON AS PLACED, AND FILL ANY HONEY COMBED PLACES. FINISH SQUARE CORNERSTONE 1/4 INCH RADIUS AND OTHER CORNERS TO RADI SHOWN.
4. CONCRETE WALKS AND EXTERIOR STEPS
1. SLOPES: PROVIDE ¼ INCH PER FOOT CROSS SLOPE. MAKE ADJUSTMENTS ON SLOPES AT WALK INTERSECTIONS AS NECESSARY TO PROVIDE PROPER DRAINAGE.
2. DIMENSIONS: WALKS AND STEPS SHALL BE ONE COURSE CONSTRUCTION AND OF WIDTHS AND DETAILS SHOWN ON THE DRAWINGS.
3. FINISH: SROED CONCRETE AND TROWEL WITH A STEEL TROWEL TO A HARD DENSE SURFACE AFTER SURFACE WATER HAS DISAPPEARED. APPLY MEDIUM BROOM FINISH AND SCRIBE TRANSVERSE JOINTS AT 6 FOOT SPACING. PROVIDE ½ INCH EXPANSION JOINTS WHERE SIDEWALKS INTERSECT, AND AT A MAXIMUM SPACING OF 48 FEET BETWEEN EXPANSION JOINTS.
- H. CURING CONCRETE FOR WALKS AND CURBS: EXCEPT AS OTHERWISE SPECIFIED, CURE ALL CONCRETE BY ONE OF THE METHODS DESCRIBED IN SECTION 501.17 OF THE I.N.D.O.T. SPECIFICATIONS, LATEST REVISION.
- I. BITUMINOUS PAVEMENT: HOT MIX ASPHALT PAVEMENT SHALL BE AS SPECIFIED IN SECTION 402 OF THE I.N.D.O.T. SPECIFICATIONS LATEST REVISIONS. PAVING WILL NOT BE PERMITTED DURING UNFAVORABLE WEATHER OR THEN THE TEMPERATURE IS 40 DEGREES F. AND FALLING.
- J. COMPACTED AGGREGATE SUBGRADE: THE THICKNESS SHOWN ON THE DRAWINGS IS THE MINIMUM THICKNESS THE FULLY COMPACTED SUBGRADE. COMPACTION SHALL BE ACCOMPLISHED BY ROLLING WITH A SMOOTH WHEELED ROLLER WEIGHING 8 TO 10 TONS. COMPACT TO 98% COMPACTION USING STANDARD TESTING PROCEDURES. ALONG CURBS, HEADERS AND WALLS AND AT ALL PLACES NOT ACCESSIBLE TO THE ROLLER, THE AGGREGATE MATERIAL SHALL BE TAMPED WITH MECHANICAL TAMPERS OR WITH APPROVED HAND TAMPERS.
- K. CONCRETE RAMPS
1. CONCRETE RAMPS FOR THE DISABLED SHALL BE REQUIRED AS SPECIFIED IN THE PLANS AND SHALL CONFORM WITH CURRENT SPECIFICATIONS ESTABLISHED BY THE AMERICAN DISABILITIES ACT (ADA), SECTION 4.7, "CURB RAMPS."
2. THE CONCRETE RAMP SHALL BE FLUSH AND FREE OF ABRUPT CHANGES WITH SIDEWALKS, CUTTERS OR STREETS, AND PROVIDE A MAXIMUM SLOPE OF 1:12.
3. THE MINIMUM WIDTH OF A CONCRETE RAMP SHALL BE (48) INCHES EXCLUSIVE OF FLARED SIDES.
4. SIDES OF CONCRETE RAMPS SHALL HAVE FLARED SIDES AS SHOWN IN THE PLANS.

STORM SEWER SYSTEMS

1. SCOPE OF WORK
- A. THE WORK UNDER THIS SECTION INCLUDES ALL STORM SEWERS, STORM WATER INLETS, AND RELATED ITEMS, INCLUDING EXCAVATING AND BACKFILLING NECESSARY TO COMPLETE THE WORK SHOWN ON THE DRAWINGS.
- B. BEFORE PLACING SURFACE COURSE WITH THESE SPECIFICATIONS AND LOCAL, STATE, FEDERAL SPECIFICATIONS THE MORE STRINGENT SHALL APPLY.
2. STORM SEWER CONSTRUCTION
- A. STORM SEWERS
1. STORM SEWER STRUCTURES SHALL COMPLY WITH CURRENT SPECIFICATIONS OF THE CITY OF FRANKLIN PLANNING AND ALL OTHER RESPONSIBLE AGENCIES IN RESPECT TO DESIGN AND QUALITY OF CONSTRUCTION.
2. ALL STORM SEWER CONSTRUCTION INSIDE PUBLIC RIGHT-OF-WAY, EITHER EXISTING OR TO BE DEDICATED, SHALL BE IN ACCORDANCE WITH THE MOST CURRENT I.N.D.O.T. STANDARD SPECIFICATION.
3. WHERE REINFORCED CONCRETE PIPE IS SHOWN ON THE CONSTRUCTION PLANS, IT SHALL BE IN ACCORDANCE WITH A.S.T.M. C-76 CLASS III WALL "B" UNLESS OTHERWISE SPECIFIED ON THE PLANS.
4. STORM SEWER PIPE AND FITTINGS SHALL CONFORM TO ASTM D2680 LATEST REVISION.
5. TRACER WIRE SHALL BE INSTALLED WITH ALL NEW SANITARY PIPE.
- B. MANHOLES
1. PRECAST REINFORCED CONCRETE MANHOLE SECTIONS AND STEPS SHALL CONFORM TO ASTM C-478 LATEST REVISION. EXTERIOR OF THE MANHOLE SHALL BE WATERPROOFED WITH BITUMATIC MATERIAL.
2. CASTINGS SHALL BE OF UNIFORM QUALITY, FREE FROM BLOW HOLES, POROSITY, HARD SPOTS, SHRINKAGE DISTORTION OR OTHER DEFECTS. THEY SHALL BE SMOOTH AND WELL-CLEANED BY SHOT-BLASTING OR BY OTHER APPROVED METHOD. JOINTS SHALL BE COATED WITH ASPHALT PAINT. THE FULL BACKFILL RESULT IN A SMOOTH COATING, THOUGH AND TENACIOUS WHEN COLD, NOT TACKY OR BRITTLE. THEY SHALL BE GRAY IRON MEETING ASTM A-48 LATEST REVISION. MANHOLE COVERS FOR SANITARY SEWER SHALL BE NENAH TYPE R-1722 W/AR-1712-B-SF FRAME W/SE-1F-SEALING APPLICATION.
3. JOINTS: MANHOLE SECTIONS SHALL BE JOINED WITH A NOMINAL ½ INCH SIZE BUTYL RUBBER GASKET MATERIAL, CONFORMING TO AASHTO M-198 AND FEDERAL SPECIFICATION SS-5-210A. JOINT CONFORMS TO ASTM C-443.
4. MANHOLES SHALL INCLUDE STEPS. SANITARY SEWER STANDARDS REVISIONS SHALL BE THAT STEPS ARE TO BE POLYPROPYLENE COATED STEEL REINFORCING OR AN APPROVED NON-CORROSIVE FIBERGLASS MATERIAL. THE COPOLYMER POLYPROPYLENE SHALL MEET THE REQUIREMENTS OF ASTM-D-4017 WITH DEFORMED ½ INCH DIAMETER OR LARGER REINFORCING STEEL CONFORMING TO ASTM A-615, GRADE 60. STEPS SHALL BE A MAXIMUM OF 24 INCHES FROM TOP, 24 INCHES FROM BOTTOM AND 16 INCHES SPACING BETWEEN.
- C. SANITARY FORCE MAINS
1. ALL SANITARY FORCE MAIN PIPE AND FITTINGS SHALL CONFORM TO ASTM D2241, STANDARD SPECIFICATION FOR POLY VINYL CHLORIDE (PVC) PRESSURE-RATED PIPE, (SDR 21), GREATER THAN 4 INCH (DIAMETER).
2. TRACER WIRE SHALL BE INSTALLED WITH ALL SANITARY FORCE MAIN PIPE.
- D. CASING
1. SANITARY SEWERS CONSTRUCTED WITH POLYVINYL CHLORIDE (PVC) AND INSTALLED UNDER RAILROADS SHALL BE CASED IN CONFORMANCE WITH AWWA STANDARD C900-89, STANDARD FOR POLYVINYL CHLORIDE (PVC) PRESSURE PIPE, 4 IN. THROUGH 12 IN. FOR WATER DISTRIBUTION, APPENDIX A.
3. APPLICATION
- A. PERMITS AND CODES: THE INTENT OF THIS SECTION OF THE SPECIFICATIONS IS THAT THE CONTRACTOR'S BID ON THE WORK COVERED HEREIN SHALL BE BASED UPON THE DRAWINGS AND SPECIFICATIONS BUT THAT THE WORK SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS AS AMENDED BY ANY WAIVERS. THE CONTRACTOR SHALL FURNISH ALL BONDS NECESSARY TO GET PERMITS FOR CUTS AND CONNECTIONS TO EXISTING SEWERS.
- B. LOCAL STANDARDS: THE TERM "LOCAL STANDARDS" AS USED HEREIN MEANS THE STANDARDS OF DESIGN AND CONSTRUCTION OF THE RESPECTIVE MUNICIPAL DEPARTMENT OR UTILITY COMPANY.
- C. EXISTING IMPROVEMENTS: THE CONTRACTOR SHALL MAINTAIN IN OPERATING CONDITION ALL ACTIVE UTILITIES, SEWERS AND OTHER DRAINS ENCOUNTERED IN THE SEWER INSTALLATION. THE CONTRACTOR SHALL REPAIR TO THE SATISFACTION OF THE OWNER ANY DAMAGE TO EXISTING AGGREGATE, CONCRETE AND TO BE APPROVED BY ALL LOCAL AND STATE AGENCIES HAVING JURISDICTION.
- D. TRENCHING: LAY ALL PIPE IN OPEN TRENCHES, EXCEPT WHEN THE LOCAL AUTHORITY GIVES WRITTEN PERMISSION FOR TUNNELING. OPEN THE TRENCH SUFFICIENTLY AHEAD OF PIPE-LAYING TO REVEAL ANY OBSTRUCTIONS. THE MIN. WIDTH OF TRENCH SHALL BE 1.25 TIMES THE OUTSIDE DIA. OF PIPE, SHEET PILE AND BRACE. TRENCH AS NECESSARY TO PROTECT WORKMEN AND ADJACENT STRUCTURES. ALL TRENCHING TO COMPLY WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION STANDARDS. KEEP TRENCHES FREE FROM WATER WHILE CONSTRUCTION IS IN PROGRESS. UNDER NO CIRCUMSTANCES SHALL PIPE OR APPURTENANCES BE LAID IN STANDING WATER. CONDUCT THE DISCHARGE FROM TRENCH DE-WATERING TO DRAINS OR NATURAL DRAINAGE CHANNELS.
- E. WORKMANSHIP: THIS WORK SHALL CONFORM TO ALL LOCAL, STATE AND NATIONAL CODES AND TO BE APPROVED BY ALL LOCAL AND STATE AGENCIES HAVING JURISDICTION.
- F. SPECIAL SUPPORTS: WHENEVER, IN THE OPINION OF THE ENGINEER, THE SOIL AT OR BELOW THE PIPE GRADE IS UNSUITABLE FOR SUPPORTING SEWERS AND APPURTENANCES SPECIFIED IN THIS SECTION, SUCH SPECIAL SUPPORT, IN ADDITION TO THOSE SHOWN OR SPECIFIED, SHALL BE PROVIDED AS THE ENGINEER MAY DIRECT, AND THE CONTRACT WILL BE ADJUSTED.
- G. BACKFILLING: BACKFILL SHALL BE PLACED AS SHOWN IN THE PLANS. NOTE THAT PVC & HOPE PIPE SHALL BE COVERED WITH 12" MINIMUM OF #8 STONE. COMPACT THIS BACKFILL THOROUGHLY, TAKING CARE NOT TO DISTURB THE PIPE. BACKFILL UNDER AND WITHIN 5 FEET OF WALKS, PARKING AREAS, DRIVEWAYS AND STREETS SHALL BE "B" BORROW OR EQUIVALENT GRANULAR MATERIAL ONLY AND THOROUGHLY COMPACTED BY APPROVED METHODS.
- H. MANHOLE INVERTS: CONSTRUCT MANHOLE FLOW CHANNELS OF CONCRETE SEWER PIPE OR BRICK, SMOOTHLY FINISHED AND OF SEMICIRCULAR SECTION CONFORMING TO THE INSIDE DIAMETER OF THE CONNECTING SEWERS. MAKE CHANGES IN SIZE OR GRADE GRADUALLY AND CHANGES IN DIRECTION BY TRUE CURVES. PROVIDE SUCH CHANNELS FOR ALL CONNECTING SEWERS AT EACH MANHOLE.
- I. SUBDRAINS: ALL SUBDRAINS SHALL BE OF THE SIZE SHOWN ON THE PLANS AND SHALL BE CONSTRUCTED TO THE GRADES SHOWN. ALL DRAINS CONSTRUCTED OFF-SITE AS PART OF THE OUTLET DRAIN WILL BE LOCATED AS SHOWN.
- J. UTILITIES: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS PERTAINING TO HIS WORK. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNERS OF THE VARIOUS UTILITIES BEFORE WORK IS STARTED. THE CONTRACTOR SHALL NOTIFY IN WRITING THE OWNER AND THE ENGINEER OF ANY CHANGES, ERRORS OR OMISSIONS FOUND ON THESE PLANS OR IN THE FIELD BEFORE WORK IS STARTED OR RESUMED.

WATER LINE SYSTEM

1. SCOPE OF WORK
- A. THE WORK UNDER THIS SECTION INCLUDES ALL WATER MAIN, FIRE HYDRANTS, SERVICES AND RELATED ITEMS, INCLUDING EXCAVATING AND BACKFILLING NECESSARY TO COMPLETE THE WORK SHOWN ON THE DRAWINGS.
2. MATERIALS
- A. ALL MATERIALS SHALL CONFORM TO ALL LOCAL, STATE, AND NATIONAL CODES AND SHALL BE APPROVED BY ALL LOCAL AND STATE AGENCIES HAVING JURISDICTION. ALL C-900 PVC WATER MAIN SHALL BE DR-14 CLASSIFICATION.
3. APPLICATION
- A. PERMITS AND CODES: THE INTENT OF THIS SECTION OF THE SPECIFICATIONS IS THAT THE CONTRACTOR'S BID ON THE WORK COVERED HEREIN SHALL BE BASED UPON THE DRAWINGS AND SPECIFICATIONS BUT THAT THE WORK SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS AS AMENDED BY ANY WAIVERS. THE CONTRACTOR SHALL FURNISH ALL BONDS NECESSARY TO GET PERMITS FOR CUTS AND CONNECTIONS TO EXISTING WATER MAINS.
- B. LOCAL STANDARDS: THE TERM "LOCAL STANDARDS" AS USED HEREIN MEANS THE STANDARDS OF DESIGN AND CONSTRUCTION OF THE RESPECTIVE MUNICIPAL DEPARTMENT OR UTILITY COMPANY.
- C. EXISTING IMPROVEMENTS: THE CONTRACTOR SHALL MAINTAIN IN OPERATING CONDITION ALL ACTIVE UTILITIES, SEWERS AND OTHER DRAINS ENCOUNTERED IN THE WATER LINE INSTALLATION. THE CONTRACTOR SHALL REPAIR TO THE SATISFACTION OF THE OWNER ANY DAMAGE TO EXISTING AGGREGATE, CONCRETE AND TO BE APPROVED BY ALL LOCAL AND STATE AGENCIES HAVING JURISDICTION. THIS INCLUDES ALL REQUIRED CLEANING AND TESTING PROCEDURES REQUIRED BY THE STATE AND LOCAL AGENCIES.
- D. TRENCHING: LAY ALL PIPE IN OPEN TRENCHES, EXCEPT WHEN THE LOCAL AUTHORITY GIVES WRITTEN PERMISSION FOR TUNNELING. OPEN THE TRENCH SUFFICIENTLY AHEAD OF PIPE-LAYING TO REVEAL ANY OBSTRUCTIONS. THE MIN. WIDTH OF TRENCH SHALL BE 1.25 TIMES THE OUTSIDE DIA. OF PIPE, SHEET PILE AND BRACE. TRENCH AS NECESSARY TO PROTECT WORKMEN AND ADJACENT STRUCTURES. ALL TRENCHING TO COMPLY WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION STANDARDS. KEEP TRENCHES FREE FROM WATER WHILE CONSTRUCTION IS IN PROGRESS. UNDER NO CIRCUMSTANCES SHALL PIPE OR APPURTENANCES BE LAID IN STANDING WATER. CONDUCT THE DISCHARGE FROM TRENCH DE-WATERING TO DRAINS OR NATURAL DRAINAGE CHANNELS.
- E. SPECIAL SUPPORTS: WHENEVER, IN THE OPINION OF THE ENGINEER, THE SOIL AT OR BELOW THE PIPE GRADE IS UNSUITABLE FOR SUPPORTING PIPE AND APPURTENANCES SPECIFIED IN THIS SECTION, SUCH SPECIAL SUPPORT, IN ADDITION TO THOSE SHOWN OR SPECIFIED, SHALL BE PROVIDED AS THE ENGINEER MAY DIRECT, AND THE CONTRACT WILL BE ADJUSTED.
- F. BACKFILLING: BACKFILL SHALL BE PLACED AS SHOWN IN THE PLANS. NOTE THAT PVC & HOPE PIPE SHALL BE COVERED WITH 12" MINIMUM OF #8 STONE. COMPACT THIS BACKFILL THOROUGHLY, TAKING CARE NOT TO DISTURB THE PIPE. BACKFILL UNDER AND WITHIN 5 FEET OF WALKS, PARKING AREAS, DRIVEWAYS AND STREETS SHALL BE "B" BORROW OR EQUIVALENT GRANULAR MATERIAL ONLY AND THOROUGHLY COMPACTED BY APPROVED METHODS.
- H. UTILITIES: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS PERTAINING TO HIS WORK. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNERS OF THE VARIOUS UTILITIES BEFORE WORK IS STARTED. THE CONTRACTOR SHALL NOTIFY IN WRITING THE OWNER AND THE ENGINEER OF ANY CHANGES, ERRORS OR OMISSIONS FOUND ON THESE PLANS OR IN THE FIELD BEFORE WORK IS STARTED OR RESUMED.

SANITARY SEWER SYSTEMS

1. SCOPE OF WORK
- A. THE WORK UNDER THIS SECTION INCLUDES ALL SANITARY SEWERS, MANHOLES, CLEANOUTS AND RELATED ITEMS INCLUDING EXCAVATING AND BACKFILLING, NECESSARY TO COMPLETE THE WORK SHOWN IN THE DRAWINGS, STARTING OUTSIDE THE BUILDING WALLS. THE END OF SEWERS SHALL BE TIGHTLY PLUGGED OR CAPPED AT THE TERMINAL POINTS, ADJACENT TO THE BUILDING DRAWN AS SPECIFIED IN THE PLUMBING SPECIFICATIONS AND/OR ARCHITECTURAL DRAWINGS.
2. MATERIALS
- A. SANITARY SEWERS
1. ALL GRAVITY PLASTIC SEWER PIPE FITTINGS SHALL CONFORM TO ASTM D3034 WITH A CELL CLASSIFICATION OF 12454-B OR 12454-C. FLEXIBLE GASKETED COMPRESSION JOINTS SHALL BE USED FOR PVC & PVC TRUSS PIPE. NO SOLVENT CEMENT JOINTS SHALL BE ALLOWED.
2. SANITARY SEWER PIPE AND FITTINGS SHALL CONFORM TO ASTM D2680 LATEST REVISION.
3. TRACER WIRE SHALL BE INSTALLED WITH ALL NEW SANITARY PIPE.
- B. MANHOLES
1. PRECAST REINFORCED CONCRETE MANHOLE SECTIONS AND STEPS SHALL CONFORM TO ASTM C-478 LATEST REVISION. EXTERIOR OF THE MANHOLE SHALL BE WATERPROOFED WITH BITUMATIC MATERIAL.
2. CASTINGS SHALL BE OF UNIFORM QUALITY, FREE FROM BLOW HOLES, POROSITY, HARD SPOTS, SHRINKAGE DISTORTION OR OTHER DEFECTS. THEY SHALL BE SMOOTH AND WELL-CLEANED BY SHOT-BLASTING OR BY OTHER APPROVED METHOD. JOINTS SHALL BE COATED WITH ASPHALT PAINT. THE FULL BACKFILL RESULT IN A SMOOTH COATING, THOUGH AND TENACIOUS WHEN COLD, NOT TACKY OR BRITTLE. THEY SHALL BE GRAY IRON MEETING ASTM A-48 LATEST REVISION. MANHOLE COVERS FOR SANITARY SEWER SHALL BE NENAH TYPE R-1722 W/AR-1712-B-SF FRAME W/SE-1F-SEALING APPLICATION.
3. JOINTS: MANHOLE SECTIONS SHALL BE JOINED WITH A NOMINAL ½ INCH SIZE BUTYL RUBBER GASKET MATERIAL, CONFORMING TO AASHTO M-198 AND FEDERAL SPECIFICATION SS-5-210A. JOINT CONFORMS TO ASTM C-443.
4. MANHOLES SHALL INCLUDE STEPS. SANITARY SEWER STANDARDS REVISIONS SHALL BE THAT STEPS ARE TO BE POLYPROPYLENE COATED STEEL REINFORCING OR AN APPROVED NON-CORROSIVE FIBERGLASS MATERIAL. THE COPOLYMER POLYPROPYLENE SHALL MEET THE REQUIREMENTS OF ASTM-D-4017 WITH DEFORMED ½ INCH DIAMETER OR LARGER REINFORCING STEEL CONFORMING TO ASTM A-615, GRADE 60. STEPS SHALL BE A MAXIMUM OF 24 INCHES FROM TOP, 24 INCHES FROM BOTTOM AND 16 INCHES SPACING BETWEEN.
- C. SANITARY FORCE MAINS
1. ALL SANITARY FORCE MAIN PIPE AND FITTINGS SHALL CONFORM TO ASTM D2241, STANDARD SPECIFICATION FOR POLY VINYL CHLORIDE (PVC) PRESSURE-RATED PIPE, (SDR 21), GREATER THAN 4 INCH (DIAMETER).
2. TRACER WIRE SHALL BE INSTALLED WITH ALL SANITARY FORCE MAIN PIPE.
- D. CASING
1. SANITARY SEWERS CONSTRUCTED WITH POLYVINYL CHLORIDE (PVC) AND INSTALLED UNDER RAILROADS SHALL BE CASED IN CONFORMANCE WITH AWWA STANDARD C900-89, STANDARD FOR POLYVINYL CHLORIDE (PVC) PRESSURE PIPE, 4 IN. THROUGH 12 IN. FOR WATER DISTRIBUTION, APPENDIX A.
3. APPLICATION
- A. PERMITS AND CODES: THE INTENT OF THIS SECTION OF THE SPECIFICATIONS IS THAT THE CONTRACTOR'S BID ON THE WORK COVERED HEREIN SHALL BE BASED UPON THE DRAWINGS AND SPECIFICATIONS BUT THAT THE WORK SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS AS AMENDED BY ANY WAIVERS. THE CONTRACTOR SHALL FURNISH ALL BONDS NECESSARY TO GET PERMITS FOR CUTS AND CONNECTIONS TO EXISTING SEWERS.
- B. LOCAL STANDARDS: THE TERM "LOCAL STANDARDS" AS USED HEREIN MEANS THE STANDARDS OF DESIGN AND CONSTRUCTION OF THE RESPECTIVE MUNICIPAL DEPARTMENT OR UTILITY COMPANY.
- C. EXISTING IMPROVEMENTS: THE CONTRACTOR SHALL MAINTAIN IN OPERATING CONDITION ALL ACTIVE UTILITIES, SEWERS AND OTHER DRAINS ENCOUNTERED IN THE SEWER INSTALLATION. THE CONTRACTOR SHALL REPAIR TO THE SATISFACTION OF THE OWNER ANY DAMAGE TO EXISTING AGGREGATE, CONCRETE AND TO BE APPROVED BY ALL LOCAL AND STATE AGENCIES HAVING JURISDICTION.
- D. TRENCHING: LAY ALL PIPE IN OPEN TRENCHES, EXCEPT WHEN THE LOCAL AUTHORITY GIVES WRITTEN PERMISSION FOR TUNNELING. OPEN THE TRENCH SUFFICIENTLY AHEAD OF PIPE-LAYING TO REVEAL ANY OBSTRUCTIONS. THE MIN. WIDTH OF TRENCH SHALL BE 1.25 TIMES THE OUTSIDE DIA. OF PIPE, SHEET PILE AND BRACE. TRENCH AS NECESSARY TO PROTECT WORKMEN AND ADJACENT STRUCTURES. ALL TRENCHING TO COMPLY WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION STANDARDS. KEEP TRENCHES FREE FROM WATER WHILE CONSTRUCTION IS IN PROGRESS. UNDER NO CIRCUMSTANCES SHALL PIPE OR APPURTENANCES BE LAID IN STANDING WATER. CONDUCT THE DISCHARGE FROM TRENCH DE-WATERING TO DRAINS OR NATURAL DRAINAGE CHANNELS.
- E. WORKMANSHIP: THIS WORK SHALL CONFORM TO ALL LOCAL, STATE AND NATIONAL CODES AND TO BE APPROVED BY ALL LOCAL AND STATE AGENCIES HAVING JURISDICTION.
- F. SPECIAL SUPPORTS: WHENEVER, IN THE OPINION OF THE ENGINEER, THE SOIL AT OR BELOW THE PIPE GRADE IS UNSUITABLE FOR SUPPORTING SEWERS AND APPURTENANCES SPECIFIED IN THIS SECTION, SUCH SPECIAL SUPPORT, IN ADDITION TO THOSE SHOWN OR SPECIFIED, SHALL BE PROVIDED AS THE ENGINEER MAY DIRECT, AND THE CONTRACT AS SHOWN.
- G. BACKFILLING: BACKFILL SHALL BE PLACED AS SHOWN IN THE PLANS. COMPACT THIS BACKFILL THOROUGHLY, TAKING CARE NOT TO DISTURB THE PIPE. BACKFILL UNDER AND WITHIN 5 FEET OF WALKS, PARKING AREAS, DRIVEWAYS AND STREETS SHALL BE GRANULAR MATERIAL ONLY AND THOROUGHLY COMPACTED BY APPROVED METHODS.
- H. FLOW CHANNELS: THE FLOW CHANNELS WITHIN MANHOLES SHALL BE AN INTEGRAL PART OF THE PRECAST BASE. THE CHANNELS SHALL BE SHAPED AND FORMED FOR A CLEAN TRANSITION WITH PROPER HYDRAULICS TO THE SMOOTH CONVEYANCE OF FLOW THROUGH THE MANHOLE. THE BENCH WALL SHALL BE FORMED TO THE CROWN OF THE INLET AND OUTLET PIPES TO FORM A "U" SHAPED CHANNEL. THE BENCH WALL SHALL SLOPE BACK FROM THE CROWN AT ¼ INCH PER FOOT TO THE MANHOLE WALL.
- I. LEAKAGE TESTING: THE CONTRACTOR SHALL FURNISH THE NECESSARY EQUIPMENT TO TEST SEWERS FOR INFILTRATION. ALL SANITARY SEWER GRAVITY LINES, UPON COMPLETION, SHALL BE REQUIRED TO PASS ONE OF THE FOLLOWING TESTS:
- J. HYDROSTATIC TEST: A HYDROSTATIC TEST SHALL BE PERFORMED WITH A MINIMUM OF TWO (2) FEET OF POSITIVE HEAD. THE RATE OF EXFILTRATION OR INFILTRATION SHALL NOT EXCEED TWO HUNDRED (200) GALLONS PER INCH OF PIPE DIAMETER PER LINEAR MILE PER DAY.
- K. LOW PRESSURE AIR TEST: A LOW PRESSURE AIR TEST SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM F1417, STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW PRESSURE AIR, FOR PLASTIC PIPE.
- L. ALL SANITARY FORCE MAIN LINES, UPON COMPLETION, SHALL BE REQUIRED TO PASS A LEAKAGE TEST CONDUCTED IN ACCORDANCE WITH AWWA STANDARD C905-94, AWWA STANDARD FOR UNDERGROUND INSTALLATION OF POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS FOR WATER.
- M. ALL SANITARY SEWER MANHOLES SHALL ALSO BE AIR TESTED IN ACCORDANCE WITH ASTM C1244-93, STANDARD TEST METHOD FOR CONCRETE SEWER MANHOLES BY NEGATIVE AIR PRESSURE (VACUUM) TEST.
- N. FLUSHING SEWERS: FLUSH ALL SANITARY SEWERS EXCEPT BUILDING SEWERS WITH WATER TO OBTAIN FREE FLOW THROUGH EACH LINE. REMOVE ALL SILT AND TRASH FROM APPURTENANCES JUST PRIOR TO ACCEPTANCE OF WORK.
- O. PLASTIC SEWER PIPE INSTALLATION: PLASTIC SEWER PIPE SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321 PER LATEST REVISION. PIPES SHALL BE TESTED AFTER THIRTY DAYS, USING A MANHOLE THAT IS 95% OF THE INSIDE DIAMETER OF THE PIPE BEING TESTED. SAID MANHOLE SHALL BE PULLED BY HAND THROUGH EACH PIPE SECTION TO ENSURE DEFLECTION IS LESS THAN ACCEPTABLE LIMITS.
- P. STORM WATER CONNECTIONS: NO ROOF DRAINS, FOOTING DRAINS AND/OR SURFACE WATER DRAINS MAY BE CONNECTED TO THE SANITARY SEWER SYSTEMS, INCLUDING TEMPORARY CONNECTIONS DURING CONSTRUCTION.
- Q. WATERLINE CROSSING: WHERE WATER LINES AND SANITARY SEWERS CROSS AND WATER LINES CANNOT BE PLACED ABOVE THE SEWER WITH A MINIMUM OF 18 INCHES VERTICAL CLEARANCE, THE SEWER MUST BE CONSTRUCTED OF WATER WORKS GRADE DUCTILE IRON PIPE WITH MECHANICAL JOINTS WITHIN 10 FEET OF THE WATER LINE.
- R. UTILITIES: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS PERTAINING TO HIS WORK. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNERS OF THE VARIOUS UTILITIES BEFORE WORK IS STARTED. THE CONTRACTOR SHALL NOTIFY IN WRITING THE OWNER AND THE ENGINEER OF ANY CHANGES, ERRORS OR OMISSIONS FOUND ON THESE PLANS OR IN THE FIELD BEFORE WORK IS STARTED OR RESUMED.
- S. SERVICE LATERALS: INDIVIDUAL BUILDING LINES SHALL BE 6 INCHES IN DIAMETER AND OF MATERIAL EQUAL TO THAT SPECIFIED IN 2A OF THIS SECTION. SERVICE LINES SHALL BE CONNECTED TO THE MAIN SEWER AT LOCATIONS SHOWN IN THESE PLANS.

HORIZONTAL DIRECTIONAL DRILLING

- PART 1. GENERAL
- 1.1 SECTION INCLUDES
- A. THE WORK SPECIFIED IN THIS

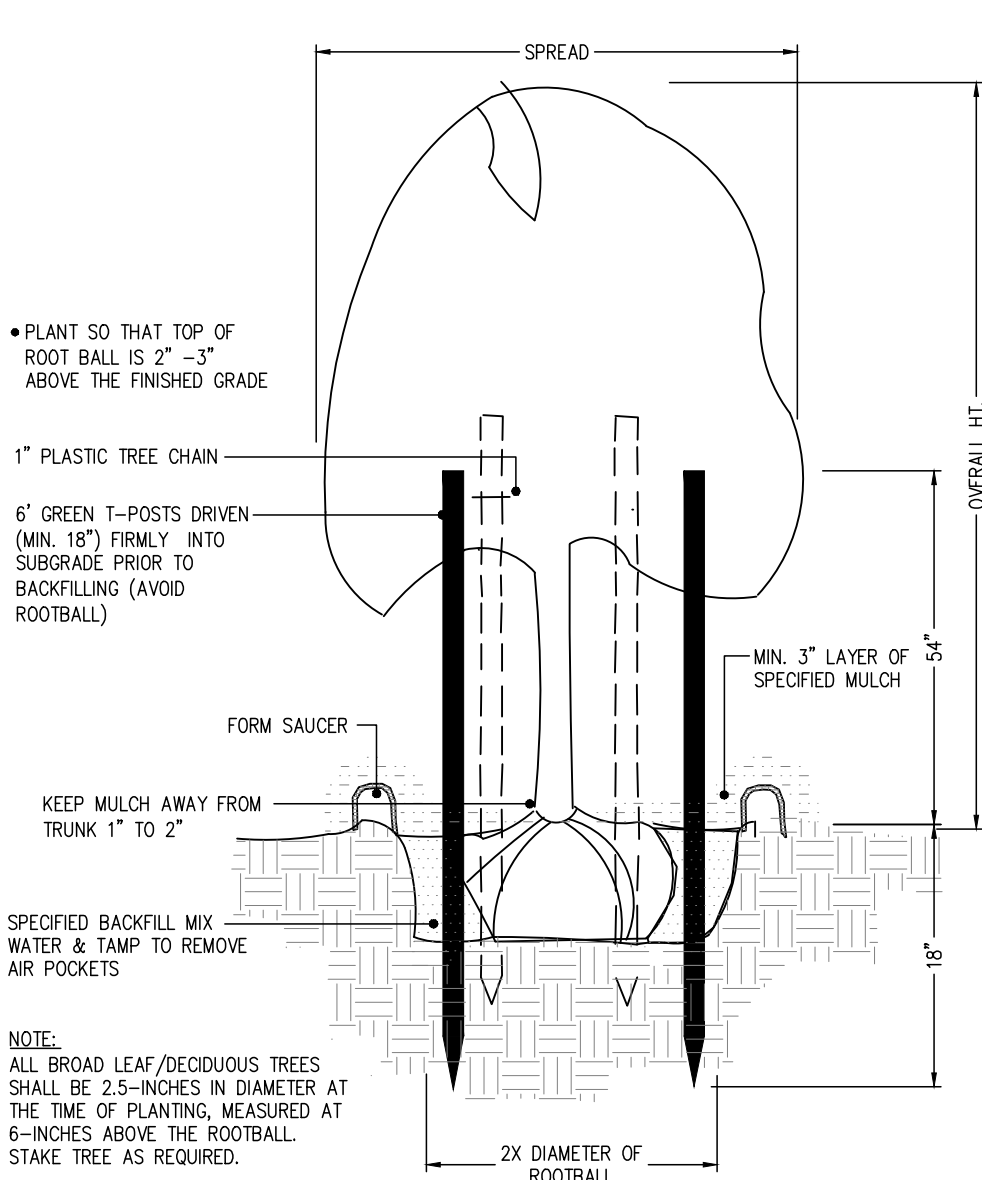
LEGAL DRAIN NOTE:
NO STRUCTURES OR IMPROVEMENTS SHALL BE PERMITTED WITHIN THE LEGAL DRAIN EASEMENT. ALL BUILDINGS, PLANTINGS, CROPS, TREES, SHRUBS, AND WOOD VEGETATION GROWN WITHIN THE EASEMENT, OR LEGAL DRAIN, ARE AT THE RISK OF OWNER AND SUBJECT TO REMOVAL WITHOUT RESTITUTION.

NOTE:
PER THE CITY OF FRANKLIN SUBDIVISION CONTROL OF ORDINANCE, SIDEWALKS ARE REQUIRED ALONG ALL PUBLIC RIGHTS-OF-WAY & STREET TREES SHALL BE PLANTED AT A RATIO OF 1 TREE PER 35 L.F. OF STREET FRONTAGE.

THESE PLANS ARE BASED UPON INFORMATION FROM AN ALTA/NSPS LAND TITLE SURVEY PERFORMED BY MAURER SURVEYING INC. WITH JOB NO. 2320-ALTA-01 WHICH WAS DATED JULY 11, 2019. ALL SURVEY INFORMATION SHOWN HEREON WAS PROVIDED BY MAURER SURVEYING INC.

ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BY STATE, CITY OR COUNTY OFFICIALS.

NOTE:
NO EARTHWORK DISTURBING ACTIVITY MAY COMMENCE UNTIL A STORM WATER MANAGEMENT PERMIT IS OBTAINED.



TREE PLANTING AND STAKING DETAIL
NOT TO SCALE

LANDSCAPE PLANTING SPECIFICATIONS

QUALIFICATIONS OF LANDSCAPE CONTRACTOR

- The landscaping shall be performed by a single firm specializing in landscape planting.
- A list of successfully completed projects of this type, size and nature may be requested by the Owner for further qualification measures.
- The Landscape Contractor must hold a valid Nursery and Floral Certificate issued by the Indiana Department of Agriculture, as well as operate under a Commercial Pesticide Applicator License - issued by either the Indiana Department of Agriculture or the Indiana Structural Pest Control Board.

SCOPE OF WORK

- Work covered by these sections includes the furnishing of any paying for all materials, labor, services, equipment, licenses, taxes and any other items that are necessary for the execution, installation and completion of all work, specified herein and / or shown on the Landscape Plan.
- All work shall be performed in accordance with all applicable laws, codes and regulations required by authorities having jurisdiction over such work and provide all inspections and permits required by federal, state and local authorities in supply, transportation and installation of materials.
- The Landscape Contractor is responsible for the verification of all underground utility lines (telephone, gas, water, electrical, cable, television, etc.) prior to the start of any work.

PLANT MATERIALS

- Provide plants typical of their species or variety, with normal, densely developed branches and vigorous, fibrous root systems.
- Provide only sound, healthy, vigorous plants free from defects, disfiguring knots, unsound injuries, frost cracks, abrasions of the bark, plant disease, insect eggs, borers and all other forms of infestation.
- All plants shall be balled and burlapped or container grown as specified. No container grown stock will be accepted if it is root bound. All root wrapping material made of synthetics shall be removed at time of planting.
- All material shall conform to the guidelines established by the American Association of Nurserymen.
- Cracked or mushroomed rootballs are not acceptable.
- Caliper measurement for standard (single trunk) trees shall be taken as follows: Six inches above the natural grade line for trees up to and including four inches in caliper; and twelve inches above the natural grade line for trees exceeding four inches in caliper - unless specified differently on the Landscape Plan.
- Multi-trunk trees shall be measured by their overall planted height.

PRODUCTS

- All manufactured products will be new.
- Topsoil: A friable, loamy topsoil (or silty sand) with minimal clay clods.
- Planting Mix: An equal part mixture of topsoil, sand and compost.
- Starter Fertilizer: A 13-13-13 ratio with 25% sulfur, 5% sulfur, 2% iron and additional micronutrients.
- Pre-Emergence: Any granular, non-staining pre-emergence that is labeled for the specific ornamentals or turf it will be utilized on. A pre-emergence herbicide is to be applied per the manufacturer's labeled rates.
- Mulch: As specified on the planting plan - well decomposed.
- Steel Edging: Professional steel edging, 14 gauge thick x 4 inches wide factory painted dark green. Acceptable manufacturers include Co-Met or approved equal.
- Weed Barrier: A 5 ounce, woven, needle-punched fabric. Acceptable product includes DeWitt's Pro 5, or approved equal.
- Tree Stakes: 6" green metal t-posts
- Tree Chain: 1" wide plastic tree chain

TREE PLANTING

- Tree holes shall be excavated to a width of two times the width of the rootball, and to a depth equal to the depth of the rootball (less two inches).
- Scarify the sides and bottom of the tree hole prior to the placement of the tree. Remove any glazing that may have been caused during the excavation of the hole.
- Install the tree so the top of the rootball is one to two inches above the surrounding grade.
- Backfill the tree hole utilizing the existing topsoil from on-site. Clay, rocks and other debris shall be removed from the soil prior to the backfill. Should additional soil be required to accomplish this task, import additional topsoil from off-site, add no additional cost to the Owner.
- The total number of tree stakes (beyond the minimum's listed below) will be left to the Landscape Contractor's discretion. Should any trees fall or lean, it will be the responsibility of the Landscape Contractor to straighten the tree, or replace it should it become damaged. Tree staking will consist of, at a minimum:
 - 15 - 30 gal Trees (2) Stakes per Tree
 - 45 - 100 gal Trees (3) Stakes per Tree
 - Multi-Trunk Trees No Minimum
- Upon completion of the planting, an earth watering basin will be constructed around the tree. The interior of the tree ring will then be covered with the weed barrier cloth, and topped with a three inch layer of mulch.

SHRUB AND GROUND COVER PLANTING

- Upon approval of the grade level by the General Contractor, the Landscape Contractor will rototill the proposed bed locations (BEFORE adding the imported soil). A four inch depth of the specified planting mix will then be evenly spread over the designated bed area. The planting bed will then be rototilled AGAIN, and a pre-emergence and starter fertilizer will be applied.
- The planting bed will then be hand raked smooth and crowned for proper drainage.
- Dig the hole twice as wide as the plant's rootball. Install the plant in the hole. Backfill around the plant.
- Install the weed barrier cloth, overlapping it at the ends. Utilize steel staples to keep the weed barrier cloth in place.
- A two inch depth of mulch will then be installed as a top dressing, covering the entire planting area.

TURF AREA PREPARATION

- The General Contractor will leave all turf areas (excluding the detention ponds) at two (2) inches below final grade. The Landscape Contractor shall import and spread a compacted two inch depth of loamy topsoil - ensuring the soil is compacted.
- Landscape Contractor will ensure all areas are crowned for proper drainage.
- Apply the starter fertilizer.

SODDING

- Sod variety to be coordinated with the Owner.
- Lay sod within 24 hours from the time of stripping. Do not lay if the ground is frozen.
- Lay the sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod strips - do not overlap. Stagger strips to offset joints in adjacent courses.
- Water the sod thoroughly with a fine spray immediately after planting to obtain at least six inches of penetration into the soil below the sod.
- Roll the sod to ensure good contact of the sod's root system with the soil underneath.

HYDROMULCHING

- The hydromulch mix (per 1,000 sq ft) shall be as follows:

35# Cellulose Fiber Mulch
2# Fescue Seed
1# Annual Rye Seed
10# 15-15-15 Water Soluble Fertilizer

CLEAN UP

- During landscape preparation and planting, keep all pavement clean and all work areas in a neat, orderly condition.
- All excavated materials will be disposed of legally off the project site.

INSPECTION AND ACCEPTANCE

- Upon completion of the work, provide the site clean and free of materials and suitable for use as intended.
- When the planting work is completed, the Owner will make an inspection to determine acceptability.
- When the inspected planting work does not comply with the contract documents, replace the rejected work within 24 hours.
- Landscape maintenance will continue until re-inspected by the Owner and found to be acceptable. Once acceptable, Final Acceptance will be issued, and the required maintenance period will commence.

LANDSCAPE MAINTENANCE

- The maintenance period shall commence once Final Acceptance has been issued by the Owner, and shall continue for a period of ninety (90) days.
- The monitoring and scheduling of the irrigation system will be the responsibility of the Landscape Contractor during this time. Coordinate all scheduling and any access requirements with the Owner.
- Landscape maintenance shall include, but not be limited to: WEEKLY SITE VISITS FOR mowing, edging, blowing, weeding, trimming, pruning, fertilizing, weed control, insect control, disease control, re-staking, re-setting of plants to their proper grade or their upright position, and any other means to keep the plantings healthy, free of insects and diseases, and in a continual thriving condition.

WARRANTY PERIOD, PLANT GUARANTEE AND REPLACEMENTS

- Plant materials supplied shall be warranted to remain alive and healthy for a period of twelve (12) months after the date of Final Acceptance by Owner (seasonal annuals for 90 days from Final Acceptance). Plants in an impaired, dead or dying condition after initial acceptance or within the warranty period shall be removed and replaced immediately to the satisfaction of the Owner.

RECORD DRAWINGS

- Provide a minimum of (2) copies of record drawings to the Owner upon completion of work. A record drawing is a record of all changes that occurred in the field and that are documented through change orders, addenda, or contractor/consultant drawing markups.

LANDSCAPE CONTRACTOR TO COORDINATE WITH OWNER FOR SELECTION OF TREE SPECIES. ALL TREES SHALL BE ON THE APPROVED CITY OF FRANKLIN QUALIFYING BROAD LEAF/DECIDUOUS TREE LIST

LANDSCAPE LEGEND

TREE

BROAD LEAF/DECIDUOUS TREE

EROSION CONTROL

REVEGETATION RIPRAP

GROUND COVER

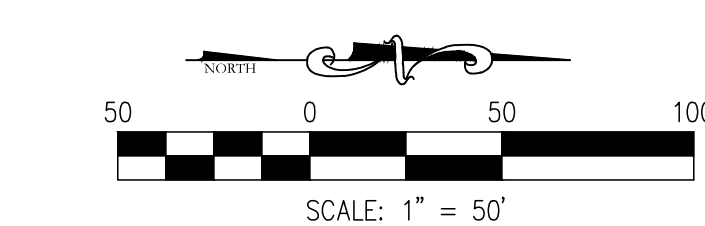
SEED AND MULCH S.F. ± 186,350
LOW MAINTENANCE MIX AS AVAILABLE FROM INDIANA SEED SOLUTIONS 65% TALL FESCUE, 25% PRG, 10% OR FESCUE

INTERIOR LANDSCAPING REQUIREMENTS

OPEN AREA (15% OF LOT 1) = 69,946.7 SQ. FT.
REQUIRED TREE PLANTING RATIO = 1 TREE/5000 SQ. FT.
PROVIDED TREES = 14 BROAD LEAF/DECIDUOUS TREES

STREET TREE REQUIREMENTS

REQUIRED TREE PLANTING RATIO = 1 TREE/35 L.F.
REQUIRED TREES = 12 BROAD LEAF/DECIDUOUS TREES
PROVIDED TREES = 12 BROAD LEAF/DECIDUOUS TREES



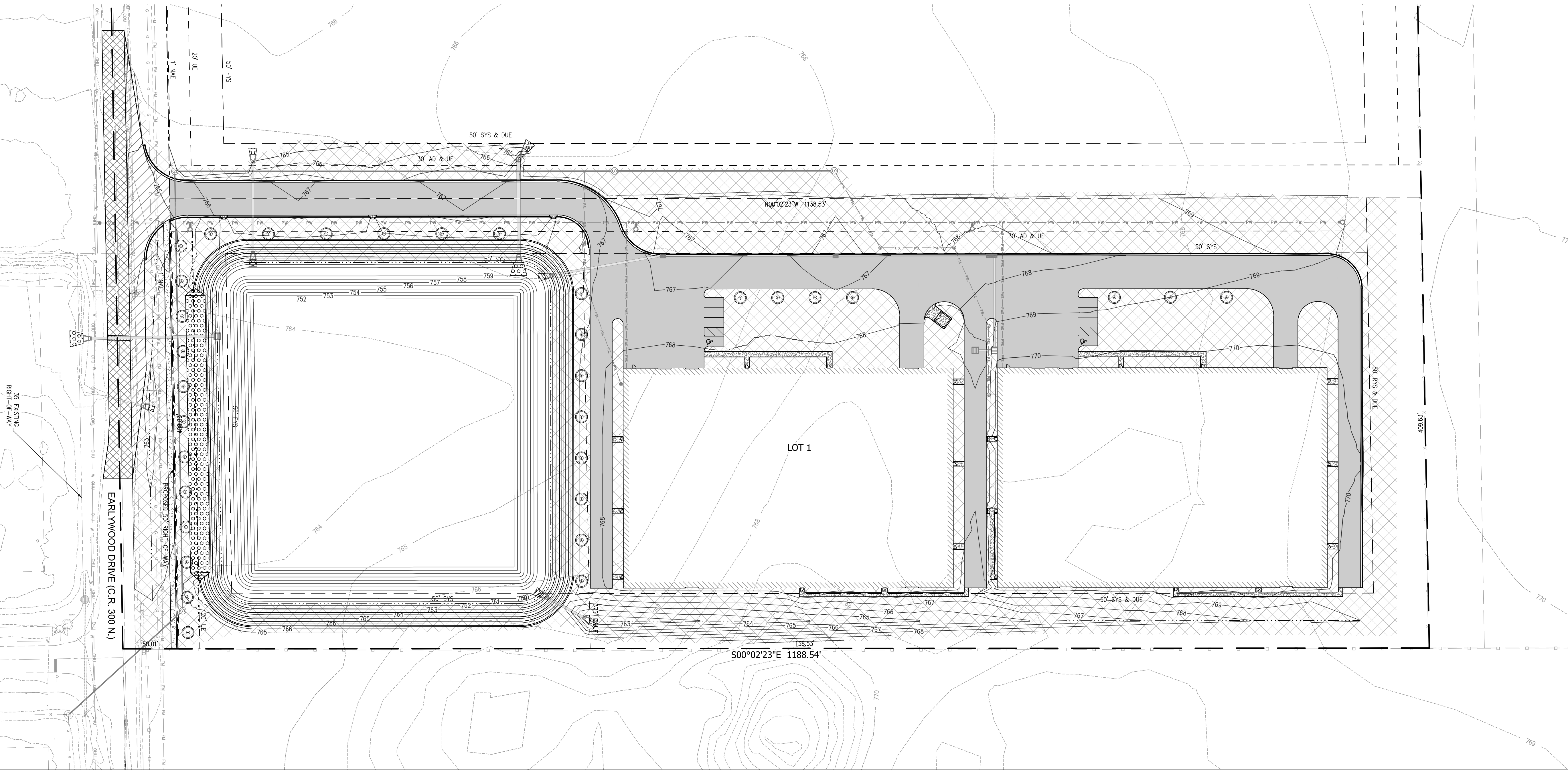
LANDSCAPE NOTES

- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL VEGETATION AND LEAVING ALL LANDSCAPE AREAS AT TWO INCHES BELOW FINAL GRADE. THE LANDSCAPE CONTRACTOR WILL PROVIDE AND SPREAD A COMPACTED TWO INCH DEPTH OF LOAMY TOPSOIL IN ALL TURF AREAS - BRINGING THESE AREAS TO TOP OF CURB/FINAL GRADE (COMPACTED). THE LANDSCAPE CONTRACTOR WILL PROVIDE AND INSTALL A FOUR INCH DEPTH OF PLANTING MIX TO ALL PLANTING BEDS - CROWNING FOR PROPER DRAINAGE. (SEE SPECIFICATIONS FOR MORE DETAILED INSTRUCTION ON TURF AREA AND PLANTING BED PREPARATION.)
- A THREE INCH DEPTH OF SHREDDED HARDWOOD BARK MULCH WILL BE USED AS A TOP DRESSING FOR ALL PLANTING BEDS AND TREE RINGS.
- LANDSCAPE CONTRACTOR SHALL MAKE OWN PLANT QUANTITY TAKEOFFS USING DRAWINGS, SPECIFICATIONS AND PLANT SCHEDULE. PLANT SCHEDULE REQUIREMENTS (I.E. SPACING) DICTATE, UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE DESIGNER. LANDSCAPE CONTRACTOR TO VERIFY BED MEASUREMENTS AND INSTALL APPROPRIATE QUANTITIES AS GOVERNED BY THE PLANT SCHEDULE PER THE SCHEDULE. ENSURE ALL MINIMUM REQUIREMENTS OF THE LOCAL GOVERNING AUTHORITY ARE MET (I.E. MINIMUM PLANT QUANTITIES).
- LANDSCAPE CONTRACTOR TO COORDINATE WITH OWNER FOR SELECTION OF TREE SPECIES. ALL TREES SHALL BE ON THE APPROVED CITY OF FRANKLIN QUALIFYING BROAD LEAF/DECIDUOUS TREE LIST.
- LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR THE LANDSCAPE MAINTENANCE OF THIS PROJECT UNTIL FINAL ACCEPTANCE. TURF AREAS WILL NOT BE ACCEPTED UNTIL THEY AREA AT A MINIMUM OF 1-1/2 INCHES TALL, AND NO BARE AREAS LARGER THAN 12 SQUARE INCHES.
- TREES SHALL BE PLANTED AT LEAST TWO AND ONE-HALF FEET (2'-6") FROM SIDEWALK OR CURB EDGE.

INTERIOR PARKING LOT LANDSCAPING REQUIREMENTS

PAVEMENT AREA = 40,655 SQ. FT.
REQUIRED LANDSCAPE AREA RATIO = 5% OF PAVED AREA
REQUIRED LANDSCAPE AREA = 2,033 SQ. FT.
PROVIDED LANDSCAPE AREA = 20,214 SQ. FT.

REQUIRED TREE RATIO = 1 BROAD LEAF/DECIDUOUS TREE PER 300 SQ. FT. OF REQUIRED LANDSCAPE AREA
REQUIRED TREES = 7 BROAD LEAF/DECIDUOUS TREES
PROVIDED TREES = 7 BROAD LEAF/DECIDUOUS TREES



CONSTRUCTION

LAUGLE INDUSTRIAL PARK

LANDSCAPE PLAN

NO. 1200

DATE

BY

APPR.

REVISIONS

NO.

DATE

JUNE 11, 2020

APR.

DESIGNED

DJM

DRAWN

DEP/LWC

CHECKED

GJ

DATE

GJ

1200

SHEET

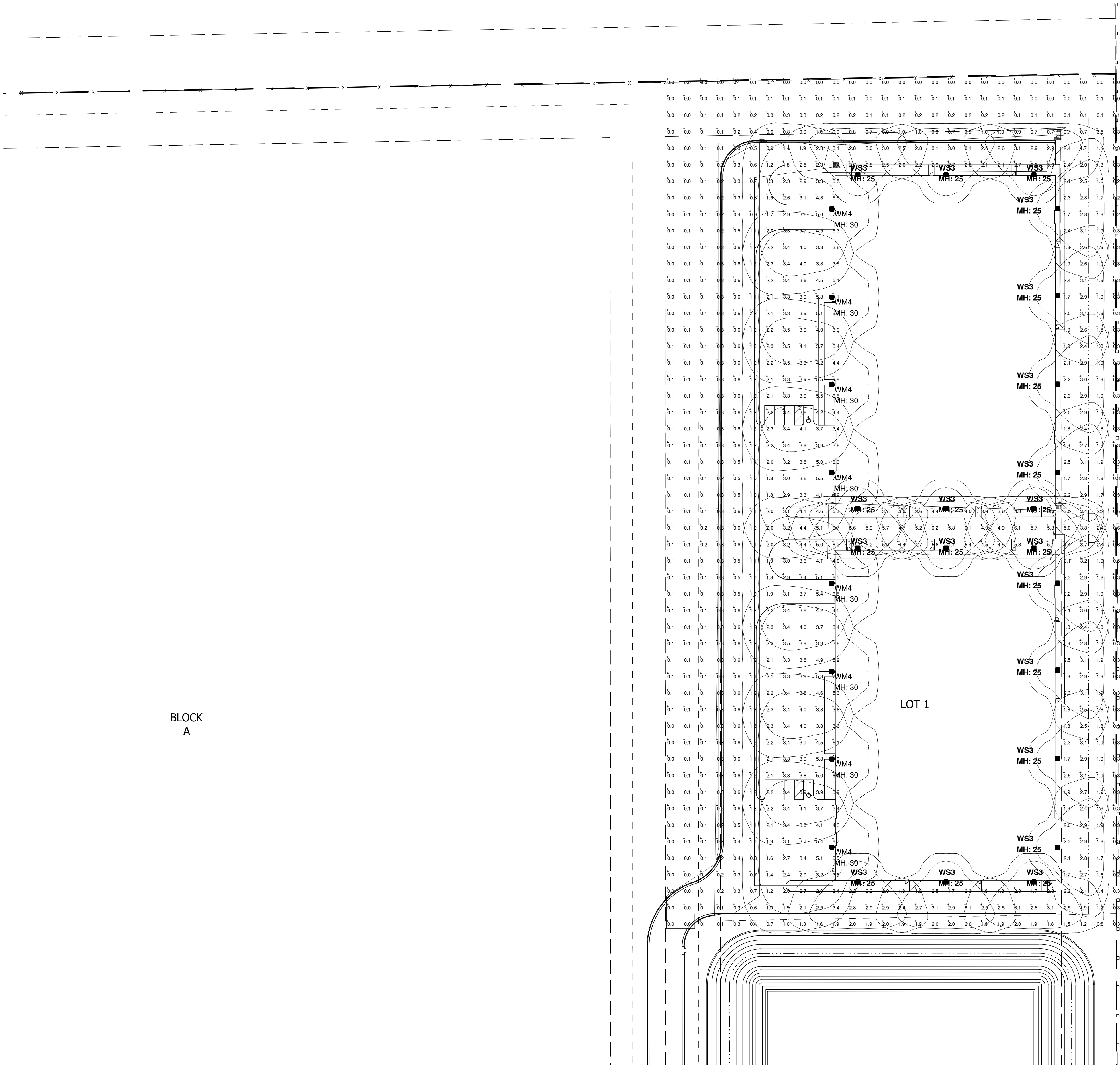
COOPER ENGINEERS, PC

TRANSPORTATION & DEVELOPMENT CONSULTANTS

REGISTERED PROFESSIONAL ENGINEERS IN INDIANA

REGISTERED PROFESSIONAL LANDSCAPE ARCHITECTS IN INDIANA

CROSSROADSPARTNERS.COM



BLOCK
A

1 LIGHTING PLAN
SCALE: 1" = 50' (24x36) 1" = 100' +/- (11x17)

TYPE WS-3



TYPE WM-4



LIGHTING NOTES:

- 1. Type WS-3 are mounted 25' AFF and type WM-4 are mounted 30' AFF.
- 2. Footcandle values are calculated at 2'-6" A.F.G.
- 3. Footcandle values are maintained with a .90 lumen loss factor.

National Lighting Vendor:

For pricing and technical assistance contact: Rob Thomson of
CBMC INC, tel# 317-828-4119 / rthomson@cbmcinc.com
William Proctor - Lighting Consultant - wproctor@cbmcinc.com

Calculation Summary						
Label	CalcType	Units	Avg	Max	Min	Avg/Min
LOT1 - ALL POINTS	Illuminance	Fc	1.78	7.2	0.0	N.A.
ALL PAVED AREAS	Illuminance	Fc	2.90	7.2	0.0	N.A.
EAST-WEST CENTER DRIVE	Illuminance	Fc	4.99	6.7	3.5	1.43
EAST-WEST SIDE DRIVES	Illuminance	Fc	2.75	3.4	2.0	1.38
MAIN DRIVE NORTH-SOUTH	Illuminance	Fc	0.73	1.3	0.1	7.30
PARKING-DOCKS	Illuminance	Fc	3.75	7.2	1.3	2.88

Luminaire Schedule						
Qty	Label	Arrangement	Description	Lum. Watts	Total Watts	Lum. Lumens
20	WS3	SINGLE	XWM-3-LED-12L-50 / WALL MOUNT / TYPE 3 OPTIC / FULL CUT-OFF	102.2	2044	11986
8	WM4	SINGLE	MRM-LED-30L-SIL-FT-50-70CRI / BKS XBO WM / WALL MOUNT	247	1976	32656

All electrical work shall comply with National, State, and Local codes including and not limited to the National Electric Code, NFPA 101 Life Safety Code, ASHREA and/or IECC Energy Codes.

The information contained in this document is proprietary to CBMC Lighting Solutions. This document is prepared for a specific site and incorporates calculations based on data available from the client at this time. By accepting and using this document, the recipient agrees to protect its contents from further dissemination, (other than that within the organization necessary to evaluate such specification) without the written permission of CBMC Lighting Solutions. the contents of this document are not to be reproduced or copied in whole or in part without the written permission of CBMC Lighting Solutions. copyright © 2020 CBMC Lighting Solutions all rights reserved.

CBMC

**LIGHTING
SOLUTIONS**

5855 KOPETSKY DR. SUITE G. | INDIANAPOLIS, IN 46217
317-780-8350 | WWW.CBMCINC.COM



This lighting pattern represents illumination levels calculated from laboratory data taken under controlled conditions in accordance with IESNA approved methods. Actual performance of any manufacturer's luminaire may vary due to variation in electrical voltage, tolerance in lamps and LED lumen package, location adjustments, and other variable field conditions.

Contractor to check and verify all dimensions on site before commencing any work shown.

CROSSROAD ENGINEERS, P.C.
3417 SHERMAN DRIVE
BEECH GROVE, IN 46107
crossroadengineers.com

FRANKLIN INDUSTRIAL STORAGE LOT1
Lighting Plan Calculations
3113 NORTH GRAHAM ROAD, WHITELAND, IN. 46131

Scale:	NTS	Project No:	CB16942	Revision
Date:	6/9/20	Drawing No:	E01	
Drawn By:	WP			
Checked By:	RT			