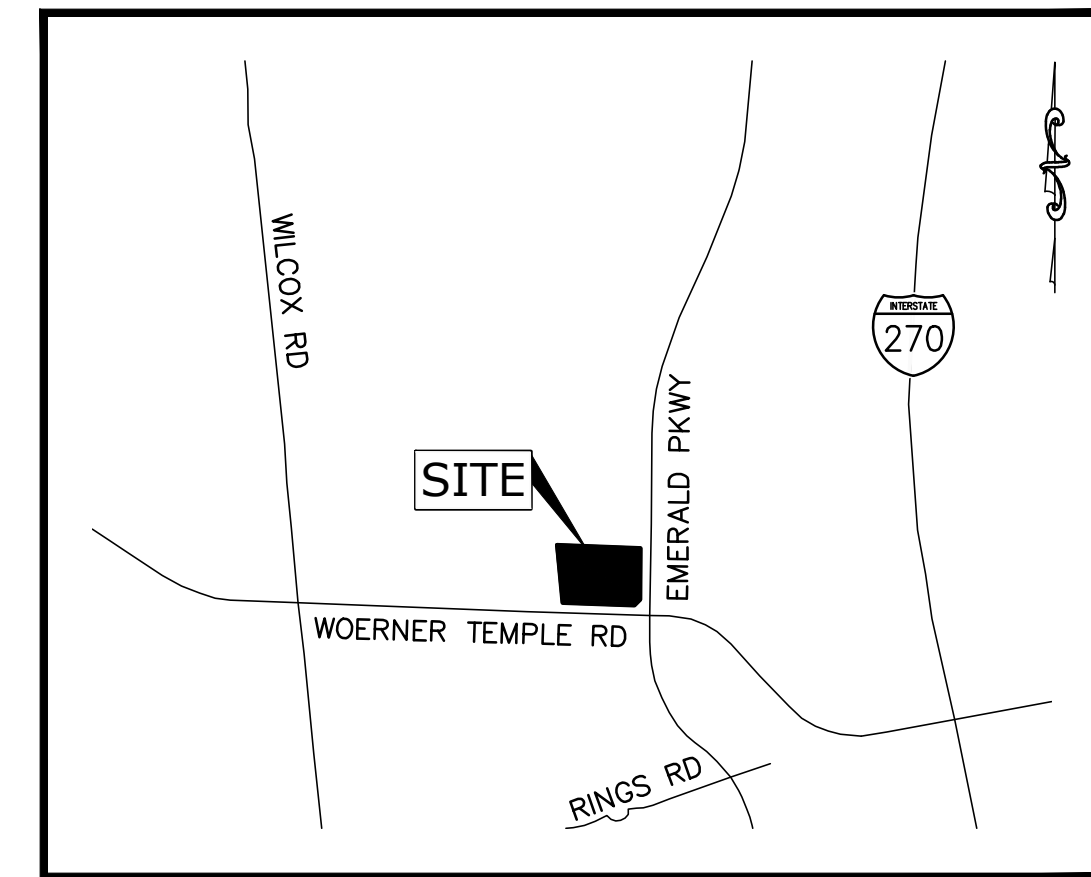


FINAL DEVELOPMENT PLAN

SHIHAB LAW OFFICE BUILDING

EMERALD PARKWAY DUBLIN, OHIO 43016 2023



LOCATION MAP
1" = 1000'

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SITE DATA

SITE ZONING: PCD THOMAS KOHLER SUBAREA C
TAX DISTRICT/PARCEL: 273-004511 (2.857 ACRES)
TO BE SPLIT INTO 1.037 ACRE AND 1.820 ACRE PARCELS

PROPERTY COVERAGE SUMMARY

PROPERTY COVERAGE	1.037 ACRES	1.820 ACRES
TOTAL AREA (ACRES):	1.037	1.820
BUILDING:	0.000	0.238
SIDEWALK/CONCRETE AREAS:	0.000	0.087
BIKE PATH (EXISTING & PROPOSED):	0.020	0.060
PAVEMENT:	0.120	0.497
PERCENT IMPERVIOUS PROPOSED/PROVIDED:	13.50%	48.46%
MAXIMUM LOT COVERAGE ALLOWED (PER ZONING):	70.00%	70.00%

DETENTION FACILITY NOTE

THE SHARED STORMWATER MANAGEMENT FACILITIES ARE DESIGNED BASED ON AN ASSUMED FUTURE IMPERVIOUS AREA OF 0.375 ACRE FOR THE NORTHERN LOT

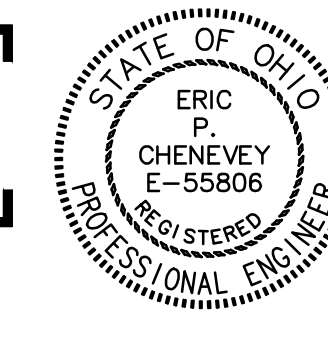
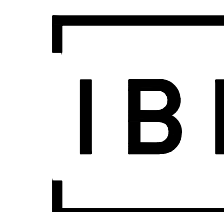
MUNICIPALITY APPROVAL

SIGNATURES BELOW SIGNIFY ONLY CONCURRENCE WITH THE GENERAL PURPOSES AND GENERAL LOCATION OF THE PROJECT AND DOES NOT CONSTITUTE ASSURANCE TO OPERATE AS INTENDED. ALL TECHNICAL DETAILS REMAIN THE RESPONSIBILITY OF THE CIVIL ENGINEER PREPARING THE PLANS.

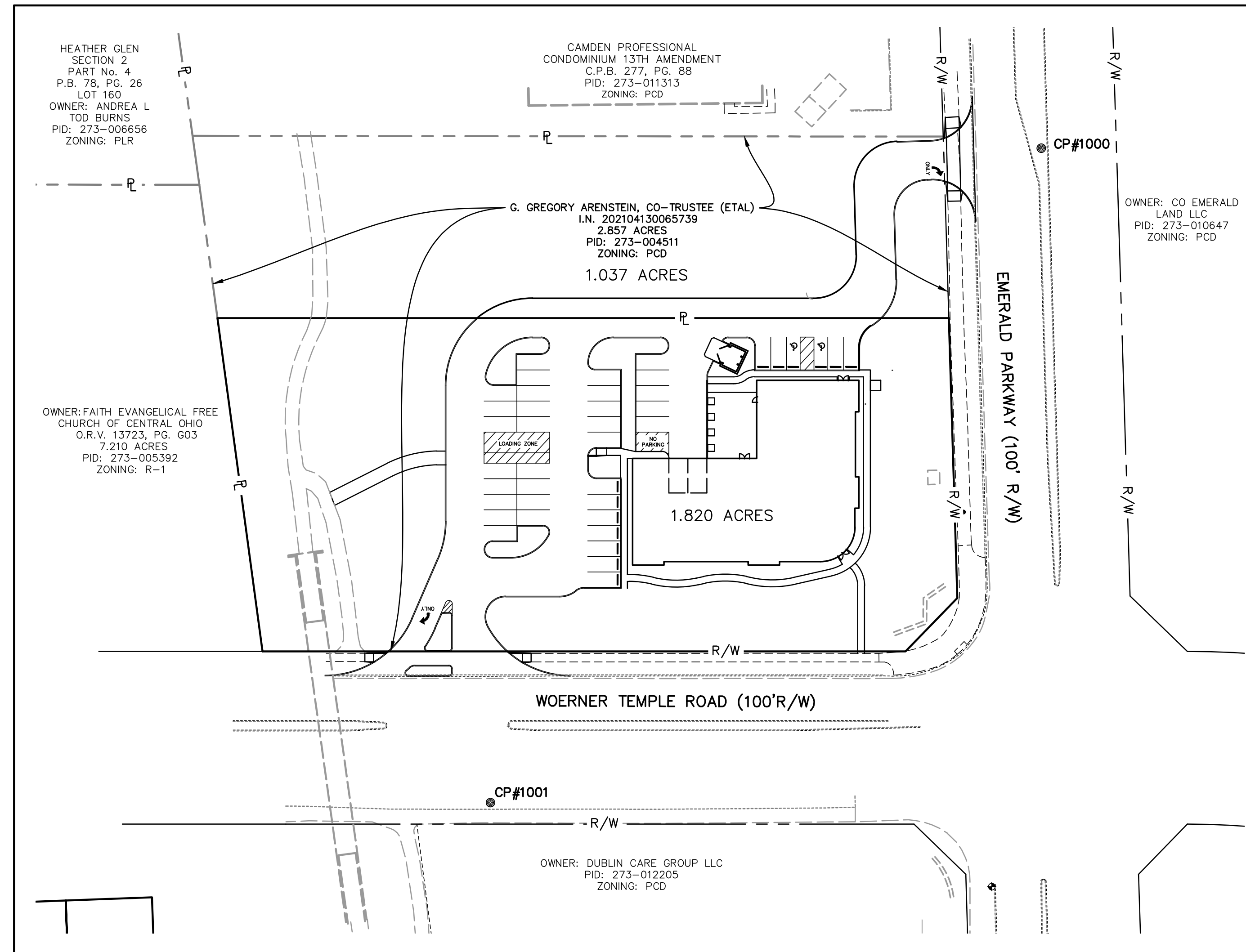
PAUL A. HAMMERSMITH, P.E. _____ DATE _____
DIRECTOR OF ENGINEERING/CITY ENGINEER

JENNIFER M. RAUCH, AICP _____ DATE _____
DIRECTOR OF PLANNING/CITY OF DUBLIN, OHIO

PLANS PREPARED BY:

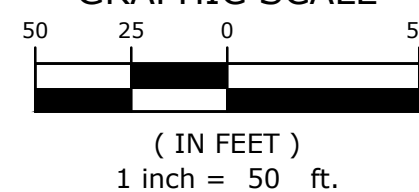


Eric P. Chenevey
REGISTERED ENGINEER NO. 55806
JULY 28, 2023
DATE



INDEX MAP

GRAPHIC SCALE



DEVELOPER / OWNER

THE LAW FIRM OF SHIHAB & ASSOCIATES, CO., LPA
65 E. STATE ST., SUITE 1550
COLUMBUS, OH 43215
CONTACT: GUS SHIHAB
PHONE: (877) 479-4872

ENGINEER

IBI GROUP
8101 NORTH HIGH ST. SUITE 100
COLUMBUS, OH 43235
CONTACT: ERIC CHENEVEY
PHONE: (614) 818-4900 x2041
FAX: (614) 818-4901
ERIC.CHENEVEY@BIGROUP.COM

SURVEYOR

IBI GROUP
8101 NORTH HIGH ST. SUITE 100
COLUMBUS, OH 43235
CONTACT: ERIC CHENEVEY
PHONE: (614) 818-4900 x2037
FAX: (614) 818-4901
BOB.WYND@BIGROUP.COM

BEARING REFERENCE

BEARINGS HEREIN ARE BASED ON THE OHIO STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, AND NAD 1983 (2011).

BENCHMARKS

ELEVATIONS ESTABLISHED FROM GPS OBSERVATIONS AND BY AN OCTOBER 2022 FIELD SURVEY BY IBI GROUP

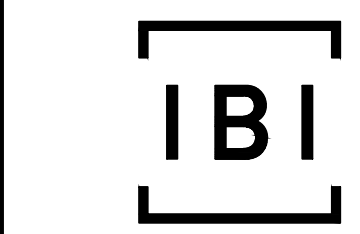
DATUM NAVD 88 (OHIO SOUTH)

CP #1000 5/8" REBAR SET "IBI GROUP"
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E=1788495.207
ELEV.=902.54

CP #1001 5/8" REBAR SET "IBI GROUP"
N=759867.436
E=1788162.731
ELEV.=907.26

FEMA NOTE

ACCORDING TO F.E.M.A. MAP PANEL 39049C0134K, DATED JUNE 17, 2008, THE AREA SHOWN HEREON IS LOCATED IN FLOOD ZONE "X", AREA OF MINIMAL FLOOD HAZARD.



IBI GROUP
8101 North High Street, Suite 100
Columbus, OH 43235
tel 614 818 4900
fax 614 818 4901

REVISION:

SUBMISSION:
05.24.2023 FINAL DEVELOPMENT PLAN

- PRELIMINARY ENGINEERING SET
- AGENCY REVIEW SET
- CONSTRUCTION DOCUMENT SET
- AS-BUILT DOCUMENT SET

STAMP:

NOT FOR CONSTRUCTION

**SHIHAB LAW
OFFICE BUILDING**

EMERALD PARKWAY
DUBLIN, OHIO

DESIGN	DRAFT	CHECK
LMS	LMS	EPC

IBI No.: 141124

DATE: July 28, 2023

SCALE:

SHEET TITLE:

COVER

SHEET NO.: 1/14

GENERAL PLAN NOTES

- CITY OF COLUMBUS AND OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS, CURRENT EDITIONS, AND ANY SUPPLEMENTS THERETO (HEREAFTER REFERRED TO AS STANDARD SPECIFICATIONS), SHALL COVER ALL CONSTRUCTION ITEMS UNLESS OTHERWISE NOTED. IF A CONFLICT BETWEEN SPECIFICATIONS IS FOUND, THE MORE STRICT SPECIFICATION WILL APPLY AS DECIDED BY THE CITY ENGINEER. ITEM NUMBERS LISTED REFER TO CITY OF COLUMBUS ITEM NUMBERS UNLESS OTHERWISE NOTED.
- THE CITY ENGINEER WILL NOT BE RESPONSIBLE FOR MEANS, METHODS, PROCEDURES, TECHNIQUES, OR SEQUENCES OF CONSTRUCTION THAT ARE NOT SPECIFIED HEREIN. THE CITY ENGINEER WILL NOT BE RESPONSIBLE FOR SAFETY ON THE WORK SITE, OR FOR FAILURE BY THE CONTRACTOR TO PERFORM WORK ACCORDING TO CONTRACT DOCUMENTS.
- THE DEVELOPER OR CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL NECESSARY PERMITS INCLUDING BUT NOT LIMITED TO OHIO EPA PERMITS TO INSTALL (PTI) AND NOTICES OF INTENT (NOI), BUILDING PERMITS, ETC.
- THE CONTRACTOR SHALL NOTIFY THE CITY OF DUBLIN DIVISION OF ENGINEERING IN WRITING AT LEAST 3 WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION.
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH ALL FEDERAL, STATE AND LOCAL SAFETY REQUIREMENTS INCLUDING THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970. THE CONTRACTOR SHALL EXERCISE PRECAUTION ALWAYS FOR THE PROTECTION OF PERSONS (INCLUDING EMPLOYEES) AND PROPERTY. IT SHALL ALSO BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INITIATE, MAINTAIN AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK, INCLUDING THE REQUIREMENTS FOR CONFINED SPACES PER 29 CFR 1910.146.
- FOLLOWING COMPLETION OF CONSTRUCTION OF THE SITE IMPROVEMENTS AND BEFORE REQUESTING OCCUPANCY, A PROOF SURVEY SHALL BE PROVIDED TO THE DIVISION OF ENGINEERING THAT DOCUMENTS "AS-BUILT" ELEVATIONS, DIMENSIONS, SLOPES AND ALIGNMENTS OF ALL ELEMENTS OF THIS PROJECT. THE PROOF SURVEY SHALL BE PREPARED, SIGNED AND SUBMITTED BY THE PROFESSIONAL ENGINEER WHO SEALED THE CONSTRUCTION DRAWINGS.
- THE CONTRACTOR SHALL RESTRICT CONSTRUCTION ACTIVITY TO PUBLIC RIGHT-OF-WAY AND AREAS DEFINED AS PERMANENT AND/OR TEMPORARY CONSTRUCTION EASEMENTS, UNLESS OTHERWISE AUTHORIZED BY THE CITY ENGINEER.
- THE CONTRACTOR SHALL CAREFULLY PRESERVE BENCHMARKS, PROPERTY CORNERS, REFERENCE POINTS, STAKES AND OTHER SURVEY REFERENCE MONUMENTS OR MARKERS. IN CASES OF WILLFUL OR CARELESS DESTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATIONS. RESETING OF MARKERS SHALL BE PERFORMED BY AN OHIO PROFESSIONAL SURVEYOR AS APPROVED BY THE CITY ENGINEER.
- NON-RUBBER Tired VEHICLES SHALL NOT BE MOVED ON OR ACROSS PUBLIC STREETS OR HIGHWAYS WITHOUT THE WRITTEN PERMISSION OF THE CITY ENGINEER.
- THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO EQUAL OR BETTER CONDITION THAN EXISTED BEFORE CONSTRUCTION. DRAINAGE DITCHES OR WATERCOURSES THAT ARE DISTURBED BY CONSTRUCTION SHALL BE RESTORED
- TRACKING OR SPILLING MUD, DIRT OR DEBRIS UPON STREETS, RESIDENTIAL OR COMMERCIAL DRIVES, SIDEWALKS OR BIKE PATHS IS PROHIBITED ACCORDING TO SECTION 97.38 OF THE DUBLIN CODE OF ORDINANCES. ANY SUCH OCCURRENCE SHALL BE CLEANED UP IMMEDIATELY BY THE CONTRACTOR AT NO COST TO THE CITY. IF THE CONTRACTOR FAILS TO REMOVE SAID MUD, DIRT, DEBRIS, OR SPILLAGE, THE CITY RESERVES THE RIGHT TO REMOVE THESE MATERIALS AND CLEAN AFFECTED AREAS, THE COST OF WHICH SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- DISPOSAL OF EXCESS EXCAVATION WITHIN SPECIAL FLOOD HAZARD AREAS (100-YEAR FLOODPLAIN) IS NOT PERMITTED.
- ALL SIGNS, LANDSCAPING, STRUCTURES OR OTHER APPURTENANCES WITHIN RIGHT-OF-WAY DISTURBED OR DAMAGED DURING CONSTRUCTION SHALL BE REPLACED OR REPAIRED TO THE SATISFACTION OF THE CITY ENGINEER. THE COST OF THIS WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL FIELD TILE BROKEN OR ENCOUNTERED DURING EXCAVATION SHALL BE REPLACED OR REPAIRED AND CONNECTED TO THE PUBLIC STORM SEWER SYSTEM AS DIRECTED BY THE CITY ENGINEER. THE COST OF THIS WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL PRECAST CONCRETE PRODUCTS SHALL BE INSPECTED AT THE LOCATION OF MANUFACTURE. APPROVED PRECAST CONCRETE PRODUCTS WILL BE STAMPED OR HAVE SUCH IDENTIFICATION NOTING THAT INSPECTION HAS BEEN CONDUCTED BY THE CITY OF COLUMBUS. PRECAST CONCRETE PRODUCTS WITHOUT PROOF OF INSPECTION SHALL NOT BE APPROVED FOR INSTALLATION.
- BACKFILL WITHIN A 1:1 INFLUENCE LINE OF EXISTING STRUCTURES (HOUSES, GARAGES, ETC.) OR PUBLIC INFRASTRUCTURE (PAVEMENT, CURBS, SIDEWALKS, BIKE PATHS, ETC.) SHALL BE COMPACTED GRANULAR BACKFILL ACCORDING TO ITEM 912 OF THE STANDARD SPECIFICATIONS OR FLOWABLE CDF, TYPE III ACCORDING TO ITEM 636. ITEM 911 OF THE STANDARD SPECIFICATIONS SHALL BE USED ELSEWHERE.
- THE CONTRACTOR SHALL SUBMIT A COPY OF THE APPROVED CONSTRUCTION DRAWINGS AND A LIST OF PROPOSED PRECAST CONCRETE PRODUCT MANUFACTURERS TO THE CITY OF COLUMBUS CONSTRUCTION INSPECTION DIVISION BEFORE COMMENCING CONSTRUCTION.
SEND THE INFORMATION TO THE FOLLOWING ADDRESS:

CONSTRUCTION INSPECTION DIVISION
CITY OF COLUMBUS
1800 EAST 17TH AVENUE
COLUMBUS, OHIO 43219

SEND A COPY OF THE TRANSMITTAL LETTER TO THE FOLLOWING ADDRESS:

DIVISION OF ENGINEERING
CITY OF DUBLIN
5800 SHIER RINGS ROAD
- ALL TRENCHES WITHIN PUBLIC RIGHT-OF-WAY SHALL BE BACKFILLED ACCORDING TO THE APPROVED CONSTRUCTION DRAWINGS OR SECURELY PLATED DURING NONWORKING HOURS. TRENCHES OUTSIDE THESE AREAS SHALL BE BACKFILLED OR SHALL BE PROTECTED BY APPROVED TEMPORARY FENCING OR BARRICADES DURING NONWORKING HOURS. CLEAN UP SHALL FOLLOW CLOSELY BEHIND THE TRENCHING OPERATION.
- ALL TREES WITHIN THE CONSTRUCTION AREA NOT SPECIFICALLY DESIGNATED FOR REMOVAL SHALL BE PRESERVED, WHETHER SHOWN OR NOT SHOWN ON THE APPROVED CONSTRUCTION DRAWINGS. TREES TO BE PRESERVED SHALL BE PROTECTED WITH HIGH VISIBILITY FENCING PLACED A MINIMUM 15 FEET FROM THE TREE TRUNK. TREES 6-INCHES OR GREATER AT DBH (DIAMETER BREST HEIGHT) MUST BE PROTECTED WITH FENCING PLACED AT THE CRITICAL ROOT ZONE OR 15 FEET, WHICHEVER IS GREATER. TREES NOT INDICATED ON THE APPROVED CONSTRUCTION DRAWINGS FOR REMOVAL MAY NOT BE REMOVED WITHOUT PRIOR APPROVAL OF THE DIVISION OF ENGINEERING
- CONDUIT MUST BE DIRECTIONALLY BORED ACROSS STREETS INSTEAD OF OPEN CUT, UNLESS SPECIFICALLY APPROVED BY THE CITY ENGINEER. USE OF PNEUMATIC AIR RAM DEVICES IS NOT PERMITTED. PERMITS TO CONSTRUCT IN THE RIGHT-OF-WAY OF EXISTING STREETS MUST BE OBTAINED FROM THE CITY OF DUBLIN DIVISION OF ENGINEERING BEFORE COMMENCING CONSTRUCTION. SHOULD OPEN CUTTING OF EXISTING PAVEMENT BE PERMITTED, CONTROLLED DENSITY BACKFILL (TYPE III) SHALL BE USED IN PLACE OF COMPACTED GRANULAR BACKFILL, ACCORDING TO ITEM 636 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONDITION OF TRENCHES WITHIN THE RIGHT-OF-WAY AND PUBLIC EASEMENTS FOR A PERIOD OF ONE YEAR FROM THE FINAL ACCEPTANCE OF THE WORK, AND SHALL MAKE ANY NECESSARY REPAIRS AT NO COST TO THE CITY.

- PAVEMENTS SHALL BE CUT IN NEAT, STRAIGHT LINES THE FULL DEPTH OF THE EXISTING PAVEMENT, OR AS REQUIRED BY THE CITY ENGINEER. PAVEMENT REPLACEMENT SHALL BE CONDUCTED ACCORDING TO CITY OF COLUMBUS STANDARD DRAWING 1441 DR. A AND APPLICABLE CITY OF DUBLIN STANDARD DRAWINGS. THE REPLACEMENT OF DRIVEWAYS, HANDICAPPED RAMPS, SIDEWALKS, BIKE PATHS, PARKING LOT PAVEMENT, ETC. SHALL BE PROVIDED ACCORDING TO THE APPROVED CONSTRUCTION DRAWINGS AND CITY OF DUBLIN STANDARD CONSTRUCTION DRAWINGS.
- TREE TRIMMING WITHIN THE CONSTRUCTION ZONE IS TO BE COMPLETED BY A CERTIFIED ARBORIST. AT THE COMPLETION OF THE PROJECT, THE ARBORIST IS TO RETURN AND TRIM ANY BROKEN BRANCHES AS NEEDED.
- ANY MODIFICATION TO THE WORK SHOWN ON DRAWINGS MUST HAVE PRIOR WRITTEN APPROVAL BY THE CITY ENGINEER, CITY OF DUBLIN.
- ALL INLETS SHALL BE CHANNELIZED.
- PARK AREAS SHALL BE FINE-GRADED AND SEEDED WITH THE FOLLOWING MIXTURE:
IMPROVED KENTUCKY BLUEGRASS: 40% OF WEIGHT (2 VARIETIES IN EQUAL PARTS)
IMPROVED PERENNIAL RYE: 60% OF WEIGHT (2 VARIETIES IN EQUAL PARTS)
GERMINATION RATE: 85%
APPLICATION RATE: 7 LBS PER 1000 SQ FT OR AS DIRECTED BY THE DIVISION OF PARKS AND RECREATION, CITY OF DUBLIN, OHIO.
- TRAFFIC CONTROL AND OTHER REGULATORY SIGNS SHALL BE TYPE S WITH A SQUARE POST ANCHOR BASE INSTALLATION AND MEET ALL REQUIREMENTS OF ODOT TC-41.20 AND APPLICABLE CITY OF DUBLIN SPECIFICATIONS.
- STREET SIGNS SHALL MEET ALL CITY OF DUBLIN SPECIFICATIONS WITH LETTERING COLORED IN WHITE DISPLAYED OVER A BROWN BACKGROUND. SIGN TUBING SHALL BE BROWN IN COLOR AND CONFORM WITH THE TYPE S, SQUARE POST ANCHOR BASE INSTALLATION REQUIREMENTS OF ODOT TC-41.20.

UTILITIES

1. THE FOLLOWING UTILITIES ARE KNOWN TO BE LOCATED WITHIN THE LIMITS OF THIS PROJECT:

- | | |
|--|---|
| CITY OF DUBLIN
DIVISION OF ENGINEERING
6555 SHIER RINGS ROAD
DUBLIN, OHIO 43016
(614) 410-4631 | COLUMBIA GAS OF OHIO
ROB CALDWELL – LEADER FIELD ENGINEERING
3550 JOHNNY APPESEED CT.
OFFICE: (614) 818-2104
CELL: (614) 370-1906
CUSTOMER SERVICE: (800) 344-4077
DAMAGE PREVENTION: (866) 632-6243
COLUMBIAGAS.COLUMBUS@ENG.NISOURCE.COM
ALSO COPY: RCALDWELL@NISOURCE.COM |
| CHARTER COMMUNICATIONS/SPECTRUM
(AKA TIME WARNER COMMUNICATIONS)
3760 INTERCHANGE ROAD
COLUMBUS, OHIO 43204
DL-MOH-CONSTRUCTION-FRELO-
TEAM@CHARTER.COM | AMERICAN ELECTRIC POWER
PAUL PAXTON
(CITY PROJECTS/DISTRIBUTION)
ENGINEERING LIAISON COORDINATOR
777 HOPEWELL DRIVE
HEATH, OHIO 43056
OFFICE: (740) 348-5322
AEP SOLUTION CENTER: (800) 277-2177
PTPAXTON@AEP.COM
ALSO COPY: AEP TELCOM UNA BLANUSA
OHFBERRRELOCATE@AEP.COM |
| CITY OF COLUMBUS
DIVISION OF WATER
910 DUBLIN ROAD, 2ND FLOOR
COLUMBUS, OHIO 43215
(614) 645-7677 | VERIZON BUSINESS (AKA MCI/XO)
757 COMMERCE CT.
LEWIS CENTER, OHIO 43035
CELL: (614) 593-6685 (MAURICE JONES)
CELL: (614) 816-0361 (BOB DILLOW)
VZ.NET.COLUMBUS@VERIZON.COM
ALSO COPY:
JOHN.CORNELL@VERIZONWIRELESS.COM
MICHAEL.HENNON@VERIZONWIRELESS.COM
MICHAEL.BONDY@VERIZONWIRELESS.COM
SVEN.CHRISTIANSON@VERIZONWIRELESS.COM |
| AT&T OF OHIO
TOM ZIOMEK
111 NORTH 4TH STREET
COLUMBUS, OHIO 43215
(614) 223-7162 | |
| BREEZELINE (FKA WOW)
3675 CORPORATE DRIVE
COLUMBUS, OHIO 43231
DL_CMHFR@ATLANTALTAICBB.COM
MFREY@BREEZELINE.COM | |

- THE CONTRACTOR SHALL GIVE NOTICE OF INTENT TO CONSTRUCT TO OHIO UTILITIES PROTECTION SERVICE (TELEPHONE NUMBER 800-362-2764), PRODUCER'S UNDERGROUND PROTECTION SERVICE (TELEPHONE NUMBER 614-587-0486), AND TO OWNERS OF UNDERGROUND UTILITIES THAT ARE NOT MEMBERS OF A REGISTERED UNDERGROUND PROTECTION SERVICE. NOTICE SHALL BE GIVEN AT LEAST 2 WORKING DAYS BEFORE START OF CONSTRUCTION.
- THE IDENTITY AND LOCATIONS OF EXISTING UNDERGROUND UTILITIES IN THE CONSTRUCTION AREA HAVE BEEN SHOWN ON THE APPROVED CONSTRUCTION DRAWINGS AS ACCURATELY AS PROVIDED BY THE OWNER OF THE UNDERGROUND UTILITY. THE CITY OF DUBLIN AND THE CITY ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR DEPTHS OF UNDERGROUND FACILITIES SHOWN ON THE APPROVED CONSTRUCTION DRAWINGS. IF DAMAGE IS CAUSED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF THE SAME AND FOR ANY RESULTING CONTINGENT DAMAGE.
- LOCATION, SUPPORT, PROTECTION AND RESTORATION OF ALL EXISTING UTILITIES AND APPURTENANCES, WHETHER SHOWN OR NOT SHOWN ON THE APPROVED CONSTRUCTION DRAWINGS, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- WHEN UNKNOWN OR INCORRECTLY LOCATED UNDERGROUND UTILITIES ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND THE CITY ENGINEER.
- PUBLIC STREET LIGHTING MAY BE IN THE VICINITY OF THIS PROJECT. CONTACT THE CITY OF DUBLIN, DIVISION OF ENGINEERING AT 410-4637, TWO DAYS PRIOR TO BEGINNING WORK.

TRAFFIC CONTROL

- TRAFFIC CONTROL SHALL BE FURNISHED, ERECTED, MAINTAINED, AND REMOVED BY THE CONTRACTOR ACCORDING TO OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD), CURRENT EDITION.
- ALL TRAFFIC LANES OF PUBLIC ROADWAYS SHALL BE FULLY OPEN TO TRAFFIC FROM 7:00 AM TO 9:00 AM AND FROM 4:00 PM TO 6:00 PM UNLESS AUTHORIZED DIFFERENTLY BY THE CITY ENGINEER. AT ALL OTHER HOURS THE CONTRACTOR SHALL MAINTAIN MINIMUM ONE-LANE TWO-WAY TRAFFIC. UNIFORMED, OFF-DUTY POLICE OFFICERS SHALL REPLACE FLAGMEN DESIGNATED BY THE OMUTCD, AND SHALL BE PRESENT WHENEVER ONE-LANE, TWO-WAY TRAFFIC CONTROL IS IN EFFECT. POLICE CRUISERS MAY BE REQUIRED AS DIRECTED BY THE CITY ENGINEER.
- IF THE CITY ENGINEER DETERMINES THAT THE CONTRACTOR IS NOT PROVIDING PROPER PROVISIONS FOR TRAFFIC CONTROL, THE CITY ENGINEER SHALL ASSIGN UNIFORMED, OFF-DUTY POLICE OFFICERS TO THE PROJECT AT NO COST TO THE CITY.
- STEADY-BURNING, TYPE "C" LIGHTS SHALL BE REQUIRED ON ALL BARRICADES, DRUMS, AND SIMILAR TRAFFIC CONTROL DEVICES IN USE AT NIGHT.
- ACCESS FROM PUBLIC ROADWAYS TO ALL ADJOINING PROPERTIES FOR EXISTING RESIDENTS OR BUSINESSES SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT FOR MAIL, PUBLIC WATER AND SANITARY SEWER SERVICE, AND EMERGENCY VEHICLES. THE CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL PLAN DETAILING THE PROPOSED MAINTENANCE OF TRAFFIC PROCEDURES. THE TRAFFIC CONTROL PLAN MUST INCORPORATE ANY TRAFFIC CONTROL DETAILS CONTAINED HEREIN. THE TRAFFIC CONTROL PLAN PROPOSED BY THE CONTRACTOR MUST BE APPROVED BY THE CITY ENGINEER PRIOR TO CONSTRUCTION.

BLASTING (IF PERMITTED)

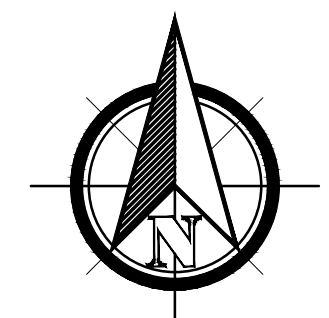
1. THE CONTRACTOR MUST OBTAIN A BLASTING PERMIT FROM WASHINGTON TOWNSHIP FIRE DEPARTMENT PRIOR TO BLASTING FOR ROCK EXCAVATION. THE CONTRACTOR SHALL SUBMIT BLASTING REPORTS UPON COMPLETION OF BLASTING TO THE CITY ENGINEER, THE OWNER, AND THE OWNER'S ENGINEER. TOP OF ROCK ELEVATIONS SHALL BE SHOWN ON "AS-BUILT" CONSTRUCTION DRAWINGS.

SANITARY SEWERS

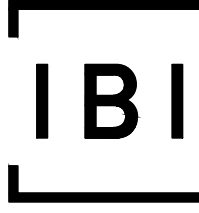
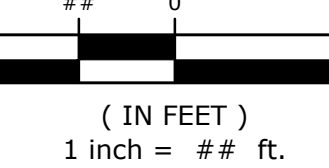
- CONNECTIONS TO THE SANITARY SEWER WILL BE PERMITTED UPON RECEIVING AN OEPA PERMIT TO INSTALL (PTI), AND UPON RECEIVING A SATISFACTORY LETTER FROM THE DESIGN ENGINEER STATING THAT THE PROJECT HAS BEEN CONSTRUCTED AS PER THE PLANS, AND ALL OF THE CONDITIONS OF THE PTI HAVE BEEN MET. THE DEVELOPER IS RESPONSIBLE FOR OBTAINING ALL REQUIRED OHIO EPA APPROVALS AND PAYING REVIEW FEES.
- SANITARY SEWAGE COLLECTION SYSTEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE RULES, REGULATIONS, STANDARDS AND SPECIFICATIONS OF THE CITY OF DUBLIN, OHIO EPA, OHIO DEPARTMENT OF HEALTH AND THE CURRENT EDITION OF THE GREAT LAKES-UPPER MISSISSIPPI RIVER BOARD (TEN STATES) – RECOMMENDED STANDARDS FOR WASTEWATER FACILITIES.
- THE MINIMUM REQUIREMENTS FOR SANITARY SEWER PIPE WITH DIAMETERS 15 INCHES AND SMALLER SHALL BE REINFORCED CONCRETE PIPE ASTM C76 CLASS 3, OR PVC SEWER PIPE ASTM D3034, SDR 35. PIPE FOR 6-INCH DIAMETER HOUSE SERVICE LINES SHALL BE PVC PIPE ASTM D3034, SDR 35. PVC PIPE SHALL NOT BE USED AT DEPTHS GREATER THAN 28 FEET. PIPE MATERIALS AND RELATED STRUCTURES SHALL BE SHOP TESTED IN ACCORDANCE WITH CITY OF COLUMBUS CONSTRUCTION INSPECTION DIVISION QUALITY CONTROL REQUIREMENTS.
- THE MINIMUM REQUIREMENTS FOR SANITARY SEWER PIPES WITH DIAMETERS GREATER THAN 15 INCHES SHALL BE REINFORCED CONCRETE PIPE ASTM C76 WITH CLASS DESIGNATION SPECIFIED IN THE APPROVED CONSTRUCTION DRAWINGS.
- ALL IN-LINE WYE AND TEE CONNECTIONS IN CONCRETE SEWERS, 18-INCH DIAMETER AND LARGER, SHALL BE EITHER KOR-N-TEE OR KOR-N-SEAL CONNECTIONS CONFORMING TO THE MANUFACTURER'S RECOMMENDATIONS.
- GRANULAR BACKFILL SHALL BE COMPACTED GRANULAR MATERIAL ACCORDING TO ITEM 912 OF THE STANDARD SPECIFICATIONS OR CONTROLLED DENSITY BACKFILL ACCORDING TO ITEM 636, TYPE III OF THE STANDARD SPECIFICATIONS AS DIRECTED BY THE CITY ENGINEER.
- ALL MANHOLE LIDS SHALL BE PROVIDED WITH CONTINUOUS SELF-SEALING GASKETS. THE APPROVED CONSTRUCTION DRAWINGS SHALL SHOW WHERE BOLT-DOWN LIDS ARE REQUIRED. SANITARY SEWER MANHOLES SHALL BE PRECAST CONCRETE OR AS APPROVED BY THE CITY ENGINEER AND CONFORM TO THE CITY OF DUBLIN SANITARY MANHOLE STANDARD DRAWING. MANHOLE LIDS SHALL INCLUDE CITY OF DUBLIN LOGO.
- ALL PVC SEWER PIPES SHALL BE DEFLECTION TESTED NO LESS THAN 60 DAYS AFTER COMPLETION OF BACKFILLING OPERATIONS. ALL OTHER REQUIREMENTS SHALL BE ACCORDING TO ITEM 901.21 OF THE STANDARD SPECIFICATIONS.
- TEMPORARY BULKHEADS SHALL BE PLACED IN PIPES AT LOCATIONS SHOWN ON THE APPROVED CONSTRUCTION DRAWINGS AND SHALL REMAIN IN PLACE UNTIL THE PERMIT TO INSTALL (PTI) HAS BEEN ISSUED BY THE OEPA AND THE SEWERS HAVE BEEN APPROVED FOR USE BY THE CITY ENGINEER. THE COST FOR FURNISHING, INSTALLING, MAINTAINING, AND REMOVING BULKHEADS SHALL BE INCLUDED IN THE CONTRACT UNIT BID PRICE FOR THE VARIOUS SANITARY SEWER ITEMS.
- ALL SANITARY SEWERS INCLUDING SANITARY SEWER SERVICE LINES SHALL BE SUBJECTED TO AND PASS INFILTRATION OR EXFILTRATION TESTS ACCORDING TO ITEM 901 OF THE STANDARD SPECIFICATIONS AND MUST BE APPROVED FOR USE BY THE CITY ENGINEER BEFORE ANY SERVICE CONNECTIONS ARE TAPPED INTO SEWERS.
- FOR SANITARY SEWER INFILTRATION, LEAKAGE THROUGH JOINTS SHALL NOT EXCEED 100 GALLONS PER INCH OF TRIBUTARY SEWER DIAMETER PER 24 HOURS PER MILE OF LENGTH OR THE COMPUTED EQUIVALENT. ALL SANITARY SEWERS SHALL BE TESTED.
- AT THE DETERMINATION OF THE CITY ENGINEER, THE CONTRACTOR MAY BE REQUIRED TO PERFORM A TV INSPECTION OF THE SANITARY SEWER SYSTEM PRIOR TO FINAL ACCEPTANCE BY THE CITY. THIS WORK SHALL BE COMPLETED BY THE CONTRACTOR AT HIS EXPENSE.
- VISIBLE LEAKS OR OTHER DEFECTS OBSERVED OR DISCOVERED DURING TV INSPECTION SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.
- ROOF DRAINS, FOUNDATION DRAINS, FIELD TILE OR OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE STRICTLY PROHIBITED ACCORDING TO SECTION 51.23 OF THE DUBLIN CODE OF ORDINANCES.
- ALL WATER LINES SHALL BE LOCATED AT LEAST 10 FEET HORIZONTALLY AND 18 INCHES VERTICALLY, FROM SANITARY SEWERS AND STORM SEWERS, TO THE GREATEST EXTENT PRACTICABLE. WHERE SANITARY SEWERS CROSS WATER MAINS OR OTHER SEWERS OR OTHER UTILITIES, TRENCH BACKFILL SHALL BE PLACED BETWEEN THE PIPES CROSSING AND SHALL BE COMPACTED GRANULAR MATERIAL ACCORDING TO ITEM 912 OF THE STANDARD SPECIFICATIONS. IN THE EVENT THAT A WATER LINE MUST CROSS WITHIN 18 INCHES OF A SANITARY SEWER, THE SANITARY SEWER SHALL BE CONCRETE ENCASED OR CONSIST OF DUCTILE IRON PIPE MATERIAL.
- SERVICE RISERS SHALL BE INSTALLED WHERE THE DEPTH FROM WYES TO PROPOSED GROUND ELEVATION EXCEEDS 10 FEET. TOPS OF RISERS SHALL BE NO LESS THAN 9 FEET BELOW PROPOSED GROUND ELEVATION IF BASEMENT SERVICE IS INTENDED.
- WHERE SERVICE RISERS ARE NOT INSTALLED, A MINIMUM 5-FOOT LENGTH OF SANITARY SEWER SERVICE PIPE OF THE SAME SIZE AS THE WYE OPENING SHALL BE INSTALLED.
- THE CONTRACTOR SHALL FURNISH AND PLACE, AS DIRECTED, APPROVED WYE POLES MADE OF 2 INCHES X 2 INCHES LUMBER AT ALL WYE LOCATIONS, ENDS OF EXTENDED SERVICES, OR AT THE END OF EACH RISER WHERE RISERS ARE REQUIRED. WYE POLES SHALL BE VISIBLE BEFORE ACCEPTANCE BY THE CITY. THE COST OF THESE POLES SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR THE VARIOUS SEWER ITEMS.
- EXISTING SANITARY SEWER FLOWS SHALL BE MAINTAINED AT ALL TIMES. COSTS FOR PUMPING AND BYPASSING SHALL BE INCLUDED IN THE CONTRACTOR'S UNIT PRICE BID FOR THE RELATED ITEMS.
- THE CONTRACTOR SHALL FURNISH ALL MATERIAL, EQUIPMENT, AND LABOR TO MAKE CONNECTIONS TO EXISTING MANHOLES. THE SEWER PIPE TO MANHOLE CONNECTIONS FOR ALL SANITARY SEWERS SHALL BE FLEXIBLE AND WATERTIGHT. ALL HOLES SHALL BE NEATLY CORED. THE SEWER PIPE BARREL AT THE SPRINGLINE SHALL NOT EXTEND MORE THAN 1 INCH BEYOND THE INSIDE FACE OF THE MANHOLE. TO MAINTAIN FLEXIBILITY IN THE CONNECTION, A 1-INCH SPACE SHALL BE LEFT BETWEEN THE END OF THE PIPE INSIDE THE MANHOLE AND THE CONCRETE CHANNEL; THIS SPACE SHALL BE FILLED WITH A WATERPROOF FLEXIBLE JOINT FILLER. ANY METAL THAT IS USED SHALL BE TYPE 300 SERIES STAINLESS STEEL. THE CONNECTION MAY BE ANY OF THE FOLLOWING TYPES:

A. RUBBER SLEEVE WITH STAINLESS STEEL BANDING.
1) KOR-N-SEAL AS MANUFACTURED BY NATIONAL POLLUTION CONTROL SYSTEMS, INC.
2) LOCK JOINT FLEXIBLE MANHOLE SLEEVE AS MANUFACTURED BY INTERPACE CORPORATION.
3) OR EQUAL AS APPROVED BY THE CITY ENGINEER.

B. RUBBER GASKET COMPRESSION.
1) PRESS WEDGE II AS MANUFACTURED BY PRESS-SEAL GASKET CORPORATION.
2) DURA SEAL III AS MANUFACTURED BY DURA TECH, INC.
3) LINK-SEAL AS MANUFACTURED BY THUNDERLINE CORPORATION.
4) OR EQUAL AS APPROVED BY THE CITY ENGINEER.
THE COST FOR THIS WORK ALONG WITH A NEW CHANNELIZED BASE FOR THE MANHOLE SHALL BE INCLUDED IN THE UNIT BID PRICE FOR THE RELATED ITEMS OF WORK.



GRAPHIC SCALE



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- PRELIMINARY ENGINEERING SET
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STAMP:

**SHIHAB LAW OFFICE
BUILDING**

EMERALD PARKWAY
DUBLIN, OHIO

DESIGN	DRAFT	CHECK
LMS	LMS	EPC

IBI No.: 141124

DATE: July 28, 2023

SCALE:

SHEET TITLE:

GENERAL NOTES

NOT FOR CONSTRUCTION

WATER LINE

1. ALL WATER LINE MATERIALS SHALL BE PROVIDED AND INSTALLED ACCORDING TO CURRENT SPECIFICATIONS OF THE CITY OF COLUMBUS DIVISION OF WATER.
2. ALL PUBLIC WATER PIPE WITH A DIAMETER 3 INCHES TO 8 INCHES SHALL BE DUCTILE IRON, CLASS 53. PUBLIC WATER PIPE 12 INCHES IN DIAMETER OR LARGER SHALL BE DUCTILE IRON, CLASS 54. PUBLIC WATER PIPE 20 INCHES IN DIAMETER OR LARGER MAY BE PRESTRESSED CONCRETE PIPE. PRIVATE WATER PIPE SHALL MEET THE APPROVAL OF THE CITY OF COLUMBUS DIVISION OF WATER PRIOR TO APPROVAL OF THE CONSTRUCTION DRAWINGS.
3. ONLY FIRE HYDRANTS CONFORMING TO CITY OF COLUMBUS STANDARDS WILL BE APPROVED FOR USE.
4. PUBLIC WATER LINES SHALL BE DISINFECTED BY THE CITY OF COLUMBUS DIVISION OF WATER. REQUESTS FOR WATER LINE CHLORINATION SHALL BE MADE THROUGH THE CITY OF DUBLIN DIVISION OF ENGINEERING. THE COST FOR CHLORINATION SHALL BE PAID FOR BY THE CONTRACTOR.
5. ALL WATER LINES SHALL BE DISINFECTED ACCORDING TO ITEM 801.13 OF THE STANDARD SPECIFICATIONS. SPECIAL ATTENTION IS DIRECTED TO APPLICABLE SECTIONS OF AMERICAN WATER WORKS ASSOCIATION SPECIFICATION C-651, PARTICULARLY FOR FLUSHING (SECTION 5) AND FOR CHLORINATING VALVES AND FIRE HYDRANTS (SECTION 7). PRESSURE TESTING SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 801.12 OF THE CITY OF COLUMBUS CONSTRUCTION AND MATERIAL SPECIFICATIONS. WHEN WATER LINES ARE READY FOR DISINFECTION, THE CITY OF DUBLIN SHALL SUBMIT TWO (2) SETS OF "AS-BUILT" PLANS, AND A LETTER STATING THAT THE WATER LINES HAVE BEEN PRESSURE TESTED AND NEED TO BE DISINFECTED, TO THE DIVISION OF WATER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE DISINFECTION OF ALL WATER LINES CONSTRUCTION PER THIS PLAN. PRESSURE TESTING SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 801.12 OF THE CITY OF COLUMBUS CONSTRUCTION AND MATERIAL SPECIFICATIONS.
6. THE CONTRACTOR SHALL PAINT ALL FIRE HYDRANTS ACCORDING TO CITY OF DUBLIN STANDARDS. THE COST OF PAINTING FIRE HYDRANTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR FIRE HYDRANTS.
7. NO WATER TAPS OR SERVICE CONNECTIONS (E.G., TO CURB STOPS OR METER PITS) MAY BE ISSUED UNTIL ADJACENT PUBLIC WATER LINES SERVING THE CONSTRUCTION SITE HAVE BEEN DISINFECTED BY THE CITY OF COLUMBUS DIVISION OF WATER AND HAVE BEEN ACCEPTED BY THE CITY ENGINEER. A TAP PERMIT FOR EACH WATER SERVICE MUST BE OBTAINED FROM THE CITY OF DUBLIN AND THE CITY OF COLUMBUS DIVISION OF WATER BEFORE MAKING ANY TAPS INTO PUBLIC WATER LINES.
8. THE CONTRACTOR SHALL NOTIFY THE CITY OF COLUMBUS DIVISION OF WATER AT 645-7788 AND THE CITY OF DUBLIN DIVISION OF ENGINEERING AT LEAST 24 HOURS BEFORE TAPPING INTO EXISTING WATER LINES.
9. ALL WATER MAIN STATIONING SHALL BE BASED ON STREET CENTERLINE STATIONING.
10. ALL BENDS, JOINT DEFLECTIONS AND FITTINGS SHALL BE BACKED WITH CONCRETE PER CITY OF COLUMBUS STANDARDS.
11. THE CONTRACTOR SHALL GIVE WRITTEN NOTICE TO ALL AFFECTED PROPERTY OWNERS AT LEAST 1 WORKING DAY BUT NOT MORE THAN 3 WORKING DAYS PRIOR TO ANY TEMPORARY INTERRUPTION OF WATER SERVICE. INTERRUPTION OF WATER SERVICE SHALL BE MINIMIZED AND MUST BE APPROVED BY THE CITY ENGINEER.
12. WATER METERS SHALL BE INSTALLED INSIDE PROPOSED STRUCTURES UNLESS A METER PIT INSTALLATION IS APPROVED BY THE CITY OF COLUMBUS DIVISION OF WATER. METER PITS MUST CONFORM TO STANDARD DRAWINGS L-7103, A&B FOR 5/8" THROUGH 1" METERS OR L-6317, A, B, C&D FOR 1-1/2" OR LARGER METERS.
13. WATER LINES TO BE INSTALLED IN EMBANKMENT AREAS SHALL BE PLACED AFTER THE EMBANKMENT HAS BEEN PLACED AND COMPACTED ACCORDING TO THE STANDARD SPECIFICATIONS.
14. CURB STOP BOXES SHALL BE LOCATED AT LEAST 1 FOOT INSIDE THE RIGHT-OF-WAY AND SET AT FINISHED GRADE.
15. IF THE TOP OF THE OPERATING NUT OF ANY VALVE IS GREATER THAN 36 INCHES BELOW FINISHED GRADE, AN EXTENSION STEM SHALL BE FURNISHED TO BRING THE TOP OF THE OPERATING NUT TO WITHIN 24 INCHES OF FINISHED GRADE ELEVATION.
16. ALL WATER LINES SHALL BE PLACED AT A MINIMUM DEPTH OF 4 FEET MEASURED FROM TOP OF FINISHED GRADE TO TOP OF WATER LINE. WATER LINES SHALL BE SET DEEPER AT ALL POINTS WHERE NECESSARY TO CLEAR EXISTING OR PROPOSED UTILITY LINES OR OTHER UNDERGROUND RESTRICTIONS BY A MINIMUM OF 18 INCHES.
17. TWO 3/4 INCH TAPS SHALL BE INSTALLED WITHIN 2 FEET OF THE END OF THE LINE ON ALL DEAD-END WATER LINES.

STORM SEWER

1. ALL STORM WATER DETENTION AND RETENTION AREAS AND MAJOR FLOOD ROUTING SWALES SHALL BE CONSTRUCTED TO FINISH GRADE AND HYDRO-SEEDED AND HYDRO-MULCHED ACCORDING TO ITEMS 203 AND 659 OF THE STANDARD SPECIFICATIONS.
2. WHERE PRIVATE STORM SEWERS CONNECT TO PUBLIC STORM SEWERS, THE LAST RUN OF PRIVATE STORM SEWER CONNECTING TO THE PUBLIC STORM SEWER SHALL BE REINFORCED CONCRETE PIPE CONFORMING TO ASTM DESIGNATION C76, WALL B, CLASS IV FOR PIPE DIAMETERS 12 INCHES TO 15 INCHES, CLASS III FOR 18 INCHES TO 24 INCH PIPES, AND 27 INCHES AND LARGER PIPE SHALL BE CLASS II, UNLESS OTHERWISE SHOWN ON THE APPROVED CONSTRUCTION DRAWINGS. INSPECTION IS REQUIRED BY THE CITY OF DUBLIN'S DIVISION OF ENGINEERING.
3. GRANULAR BACKFILL SHALL BE COMPACTED GRANULAR MATERIAL ACCORDING TO ITEM 912 OF THE STANDARD SPECIFICATIONS OR CONTROLLED DENSITY BACKFILL ACCORDING TO ITEM 636, TYPE III OF THE STANDARD SPECIFICATIONS AS DIRECTED BY THE CITY ENGINEER. 4. ALL STORM SEWERS SHALL BE REINFORCED CONCRETE PIPE CONFORMING TO ASTM DESIGNATION C76, WALL B, CLASS IV FOR PIPE DIAMETERS 12 INCHES TO 15 INCHES, CLASS III FOR 18 INCHES TO 24 INCH PIPES, AND 27 INCHES AND LARGER PIPE SHALL BE CLASS II, UNLESS OTHERWISE SHOWN ON THE APPROVED CONSTRUCTION DRAWINGS.
5. HEADWALLS AND ENDWALLS SHALL BE REQUIRED AT ALL STORM SEWER INLETS OR OUTLETS TO AND FROM STORMWATER MANAGEMENT FACILITIES. NATURAL STONE AND/OR BRICK APPROVED BY THE CITY ENGINEER SHALL BE PROVIDED ON ALL VISIBLE HEADWALLS AND/OR ENDWALLS SURFACES.
6. STORM INLETS OR CATCH BASINS SHALL BE CHANNELIZED AND HAVE BICYCLE SAFE GRATES. MANHOLE LIDS SHALL INCLUDE CITY OF DUBLIN LOGO AND ALL CURB INLET AND CATCH BASIN GRATES SHALL INCLUDE ENGRAVED LETTERING: "DUMP NO WASTE; DRAINS TO RIVER."
7. STORM SEWER OUTLETS GREATER THAN 18 INCHES IN DIAMETER ACCESSIBLE FROM STORMWATER MANAGEMENT FACILITIES OR WATERCOURSES SHALL BE PROVIDED WITH SAFETY GRATES, AS APPROVED BY THE CITY ENGINEER.

MAIL DELIVERY

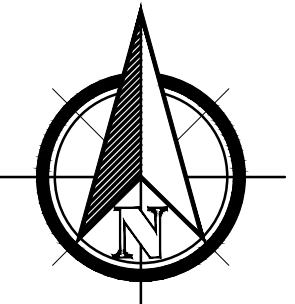
1. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT US MAIL DELIVERY WITHIN THE PROJECT LIMITS IS NOT DISRUPTED BY CONSTRUCTION OPERATIONS. THIS RESPONSIBILITY IS LIMITED TO RELOCATION OF MAILBOXES TO A TEMPORARY LOCATION THAT WILL ALLOW THE COMPLETION OF THE WORK AND SHALL ALSO INCLUDE THE RESTORATION OF MAILBOXES TO THEIR ORIGINAL LOCATION OR APPROVED NEW LOCATION. ANY RELOCATION OF MAILBOX SERVICES MUST BE FIRST COORDINATED WITH THE US POSTAL SERVICE AND THE HOMEOWNER.
2. BEFORE RELOCATING ANY MAILBOXES, THE CONTRACTOR SHALL CONTACT THE U.S. POSTAL SERVICE AND RELOCATE MAILBOXES ACCORDING TO THE REQUIREMENTS OF THE POSTAL SERVICE.

USE OF FIRE HYDRANTS

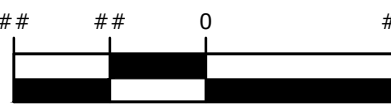
1. THE CONTRACTOR SHALL MAKE PROPER ARRANGEMENTS WITH THE DUBLIN SERVICE DEPARTMENT AND THE COLUMBUS DIVISION OF WATER FOR THE USE OF FIRE HYDRANTS WHEN USED FOR WORK PERFORMED UNDER THIS CONTRACT AND PROVIDE THE CITY OF DUBLIN A COPY OF THE HYDRANT USAGE PERMIT OBTAINED FROM THE CITY OF COLUMBUS. THE CONTRACTOR SHALL ALSO SEND A COPIES OF PERMITS OBTAINED FROM DUBLIN AND COLUMBUS TO THE WASHINGTON AND/OR PERRY TOWNSHIP FIRE DEPARTMENT. PERMITS SHALL BE KEPT AT THE CONSTRUCTION SITE AT ALL TIMES.
2. BEFORE THE FINAL ESTIMATE IS PAID, THE CONTRACTOR SHALL SUBMIT A LETTER FROM THE CITY OF COLUMBUS DIVISION OF WATER TO THE CITY ENGINEER STATING THAT THE CONTRACTOR HAS RETURNED THE SIAMESE VALVE TO THE CITY OF COLUMBUS AND HAS PAID ALL COSTS ARISING FROM THE USE OF THE FIRE HYDRANTS.

EROSION AND SEDIMENT CONTROL

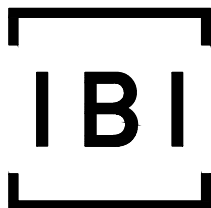
1. THE CONTRACTOR OR DEVELOPER IS RESPONSIBLE FOR SUBMITTING A NOTICE OF INTENT (NOI) TO BE REVIEWED AND APPROVED BY THE OHIO EPA. THE NOI MUST BE SUBMITTED TO OEPA 45 DAYS PRIOR TO THE START OF CONSTRUCTION AND MAY ENTITLE COVERAGE UNDER THE OHIO EPA GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY. A PROJECT LOCATION MAP MUST BE SUBMITTED WITH THE NOI. A SEDIMENT AND EROSION CONTROL PLAN MUST BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL IF A SEDIMENT AND EROSION CONTROL PLAN HAS NOT ALREADY BEEN INCLUDED WITH THE APPROVED CONSTRUCTION DRAWINGS. THIS PLAN MUST BE MADE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE DESIGN OF EROSION CONTROL SYSTEMS SHALL FOLLOW THE REQUIREMENTS OF OHIO EPA, ITEM 207 OF OHIO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, AND THE CITY ENGINEER. AN INDIVIDUAL NPDES STORMWATER DISCHARGE PERMIT MAY BE REQUIRED. THE CONTRACTOR SHALL BE CONSIDERED THE PERMITTEE.
2. THE CONTRACTOR SHALL PROVIDE SEDIMENT CONTROL AT ALL POINTS WHERE STORM WATER RUNOFF LEAVES THE PROJECT, INCLUDING WATERWAYS, OVERLAND SHEET FLOW, AND STORM SEWERS.
3. ACCEPTED METHODS OF PROVIDING EROSION/SEDIMENT CONTROL INCLUDE BUT ARE NOT LIMITED TO: SEDIMENT BASINS, SILT FILTER FENCE, AGGREGATE CHECK DAMS, AND TEMPORARY GROUND COVER. HAY OR STRAW BALES ARE NOT PERMITTED.
4. THE CONTRACTOR SHALL PROVIDE ADEQUATE DRAINAGE OF THE WORK AREA AT ALL TIMES CONSISTENT WITH EROSION CONTROL PRACTICES.
5. DISTURBED AREAS THAT WILL REMAIN UNWORKED FOR 30 DAYS OR MORE SHALL BE SEEDED OR PROTECTED WITHIN SEVEN CALENDAR DAYS OF THE DISTURBANCE. OTHER SEDIMENT CONTROLS THAT ARE INSTALLED SHALL BE MAINTAINED UNTIL VEGETATIVE GROWTH HAS BEEN ESTABLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL TEMPORARY SEDIMENT DEVICES AT THE CONCLUSION OF CONSTRUCTION BUT NOT BEFORE GROWTH OF PERMANENT GROUND COVER.



GRAPHIC SCALE



(IN FEET)
1 inch = ## ft.



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SUBMISSION:
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NOT FOR CONSTRUCTION

**SHIHAB LAW OFFICE
BUILDING**

EMERALD PARKWAY
DUBLIN, OHIO

DESIGN	DRAFT	CHECK
LMS	LMS	EPC

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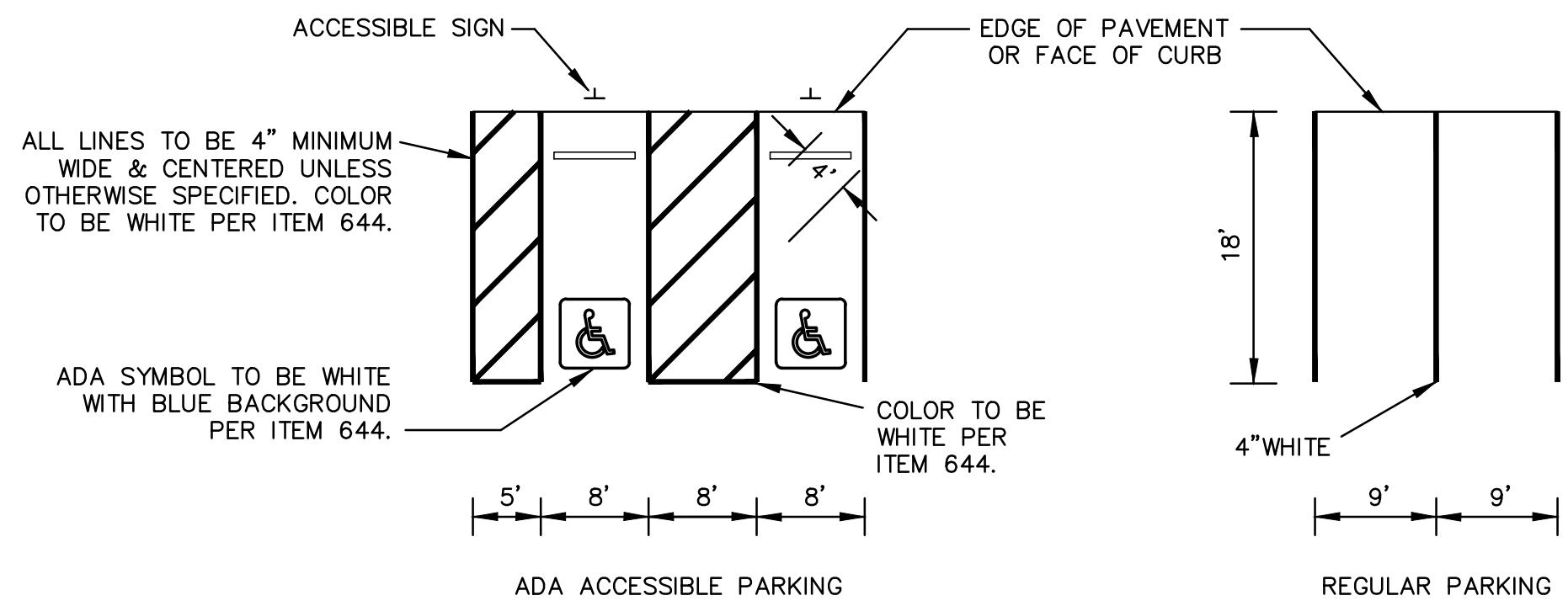
DATE: July 28, 2023

SCALE:

SHEET TITLE:

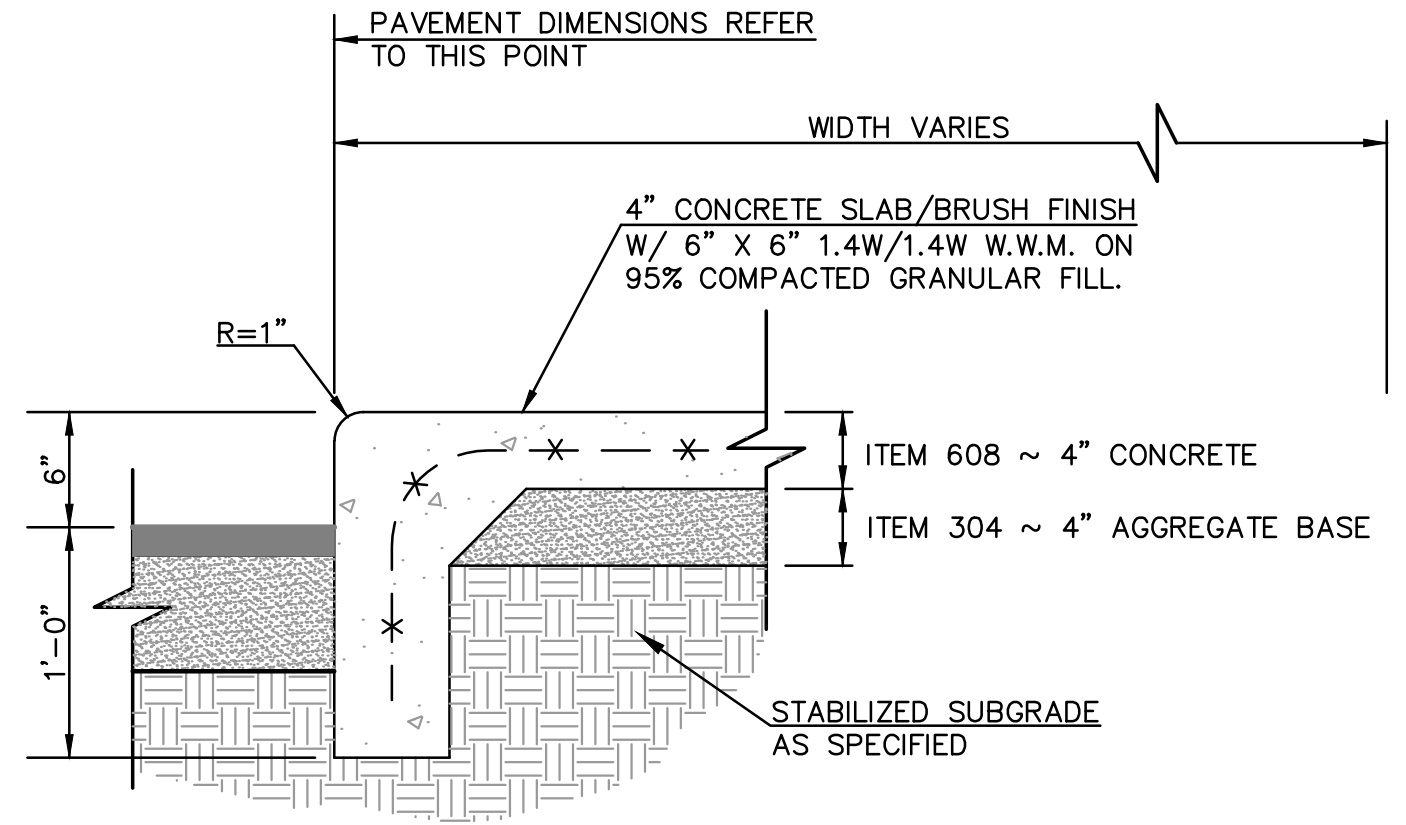
**GENERAL NOTES &
ESTIMATE OF
QUANTITIES**

SHEET NO.: 3/14



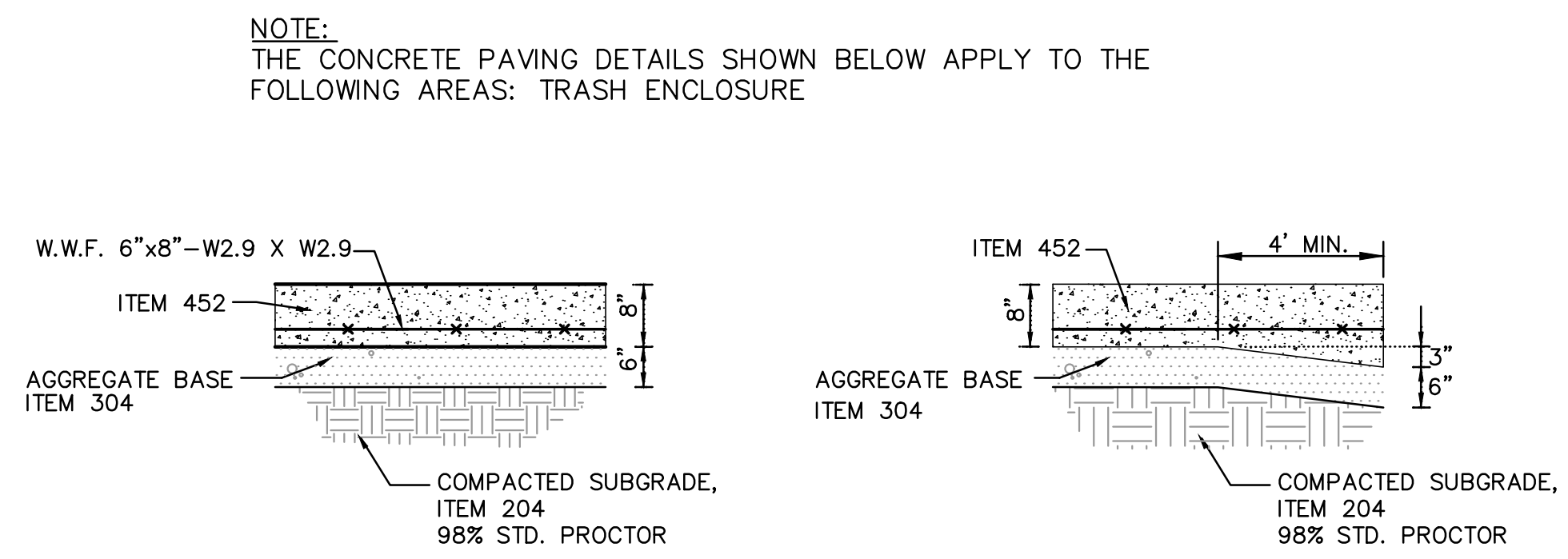
NOTES
 1. MAXIMUM SLOPE IN ALL ADA PARKING AREAS SHALL BE LESS THAN 2.00% IN ANY DIRECTION.
 2. CONTRACTOR SHALL COMPLY WITH ALL CURRENT ADA ACCESSIBILITY GUIDELINES FOR CONSTRUCTION OF PROPOSED ADA PARKING AREA AND ACCESSIBLE ROUTE.
 3. ALL PAVEMENT MARKING ON ASPHALT SHALL BE AS PER ODOT ITEM 644.

PARKING STRIPING DETAILS
NOT TO SCALE



NOTES
 1. WHERE NEW WALK ABUTS ADJOINING WALK, SAWCUT EXISTING WALK TO NEAREST JOINT AND INSTALL EXPANSION JOINT.
 2. EXPANSION JOINT LOCATION AND SPACING PER ITEM 608.03.
 3. ITEM NUMBERS REFER TO CITY OF COLUMBUS CMSC, CURRENT EDITION. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THESE SPECIFICATIONS.

BRUSHED CONCRETE WALK
NOT TO SCALE

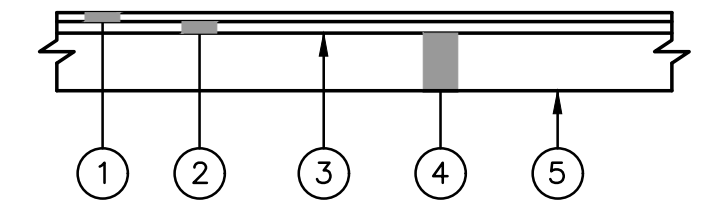


NOTE:
 1.) CONTROL JOINTS 15' O.C. MAX.
 2.) EXPANSION JOINTS 30' O.C. MAX.
 3.) CONCRETE SHALL BE 4000 PSI AE
 4.) DOWELS AT EXPANSION JOINTS

NOTE:
 1.) CONTROL JOINTS 15' O.C. MAX.
 2.) EXPANSION JOINTS 30' O.C. MAX.
 3.) CONCRETE SHALL BE 4000 PSI AE
 4.) DOWELS AT EXPANSION JOINTS

CONCRETE PAVING DETAIL
NOT TO SCALE

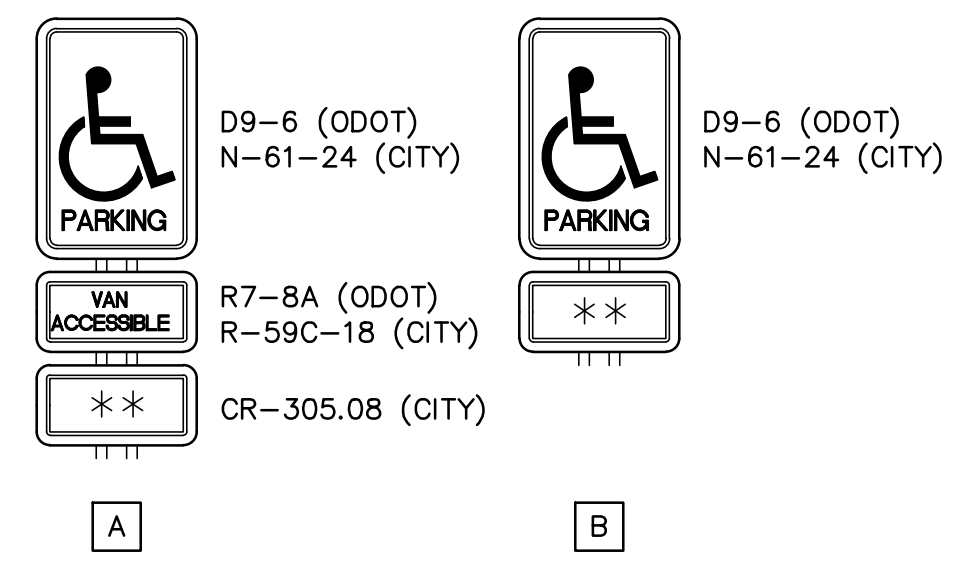
CONCRETE PAVING THICKENED EDGE DETAIL
NOT TO SCALE



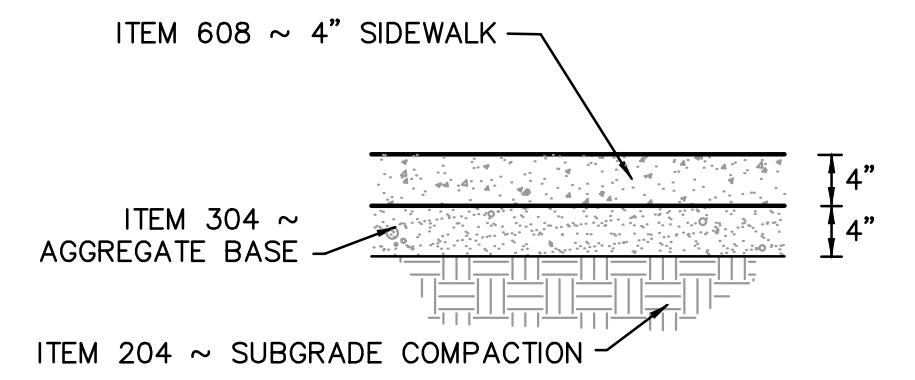
LEGEND:
 ① ITEM 448 - 1-1/2" ASPHALT CONCRETE, SURFACE COURSE
 ② ITEM 448 - 1-1/2" ASPHALT CONCRETE, INTERMEDIATE COURSE
 ③ ITEM 408 - PRIME COAT (0.2 GAL. / SQ. YD.)
 ④ ITEM 304 - 8" AGGREGATE BASE
 ⑤ ITEM 204 - SUBGRADE COMPACTION

LIGHT DUTY PAVEMENT BUILDUP
TO BE PROVIDED IN PARKING SPACES

NOTE: ADA SIGNS TO BE MOUNTED ON ITEM 630 - 2" X 2" PLAIN 14 GAUGE TUBING (NO PERFORATIONS) PAINTED BLACK. BOTTOM OF SIGN TO BE A MINIMUM 7" FROM GROUND.
 ** SIGN TO INCLUDE THE FOLLOWING OR SIMILAR WORDING "UNLAWFUL PARKING HAS A MINIMUM FINE OF \$500, SECTION 4511.99 ORC"

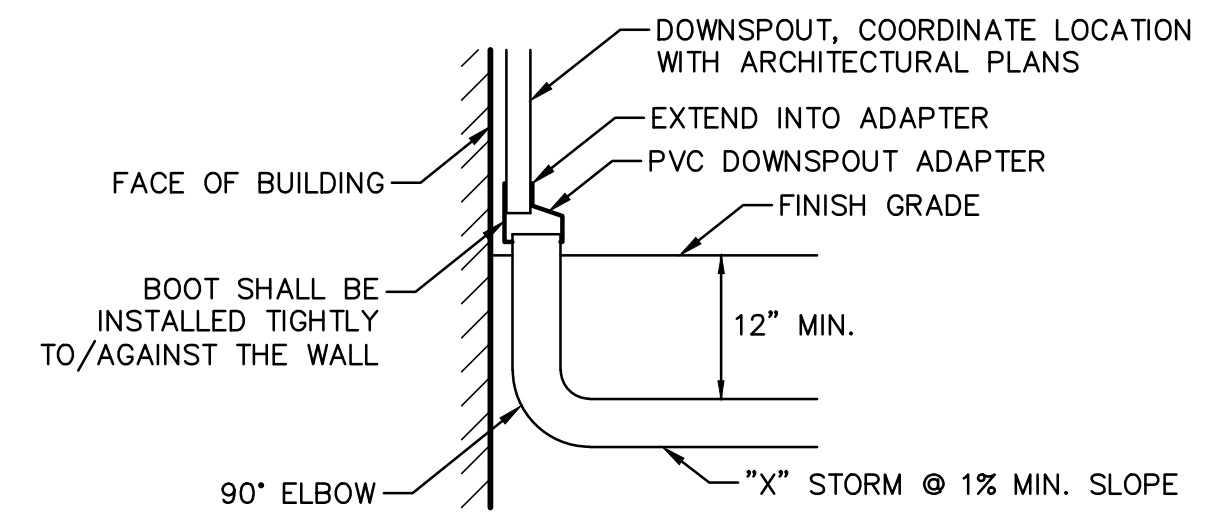


SIGN DETAILS
NOT TO SCALE

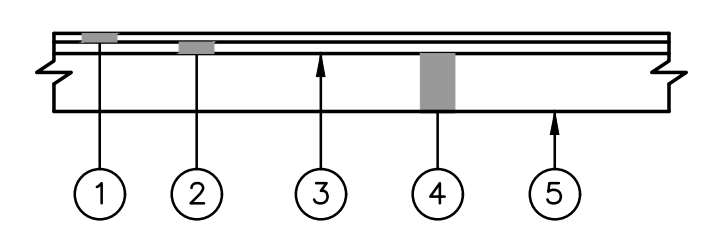


NOTES:
 1. FOR ADDITIONAL NOTES AND DETAILS NOT SHOWN, SEE CITY OF DUBLIN STANDARD DRAWING RD-05.
 2. MINIMUM CROSS SLOPE ON SIDEWALK TO BE 1/8" (1.04%). DESIRED CROSS SLOPE ON SIDEWALK TO BE 3/16" (1.56%).
 3. MAXIMUM LONGITUDINAL SLOPE ON SIDEWALK IS 5%.
 4. CONTRACTOR SHALL COMPLY WITH ALL CURRENT ADA ACCESSIBILITY GUIDELINES FOR CONSTRUCTION OF PROPOSED SIDEWALK

CONCRETE WALK DETAIL
NOT TO SCALE

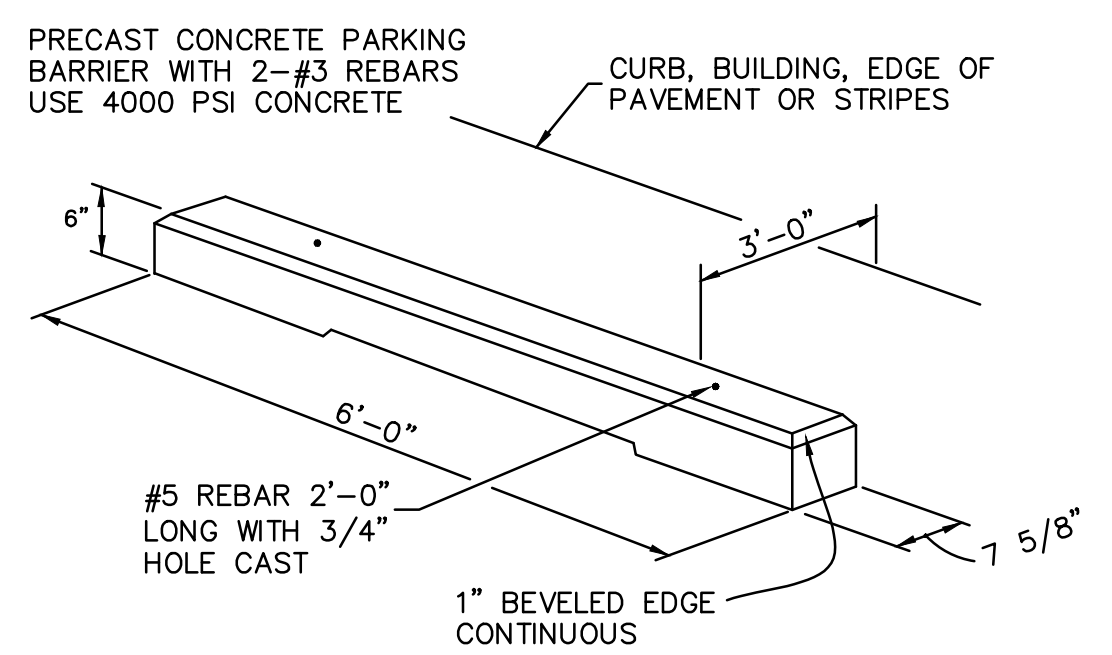


DOWNSPOUT CONNECTION DETAIL
NOT TO SCALE

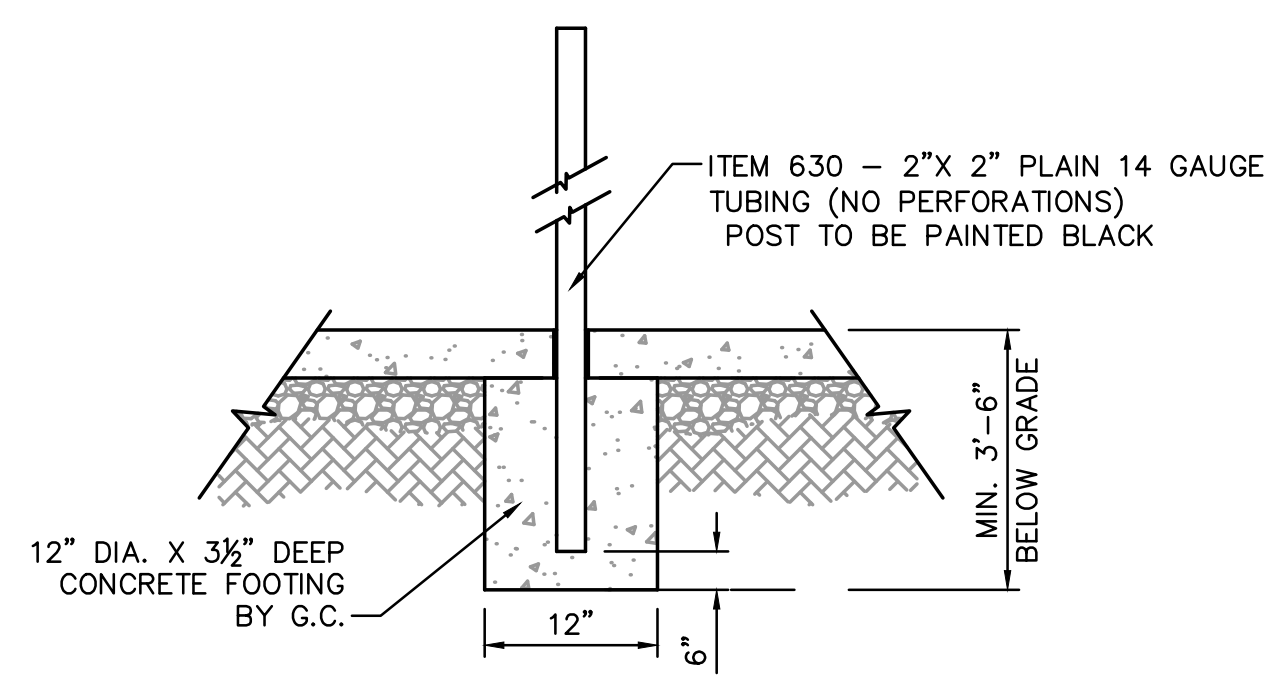


LEGEND:
 ① ITEM 448 - 1-1/2" ASPHALT CONCRETE, SURFACE COURSE
 ② ITEM 448 - 2-1/2" ASPHALT CONCRETE, INTERMEDIATE COURSE
 ③ ITEM 408 - PRIME COAT (0.2 GAL. / SQ. YD.)
 ④ ITEM 304 - 10" AGGREGATE BASE
 ⑤ ITEM 204 - SUBGRADE COMPACTION

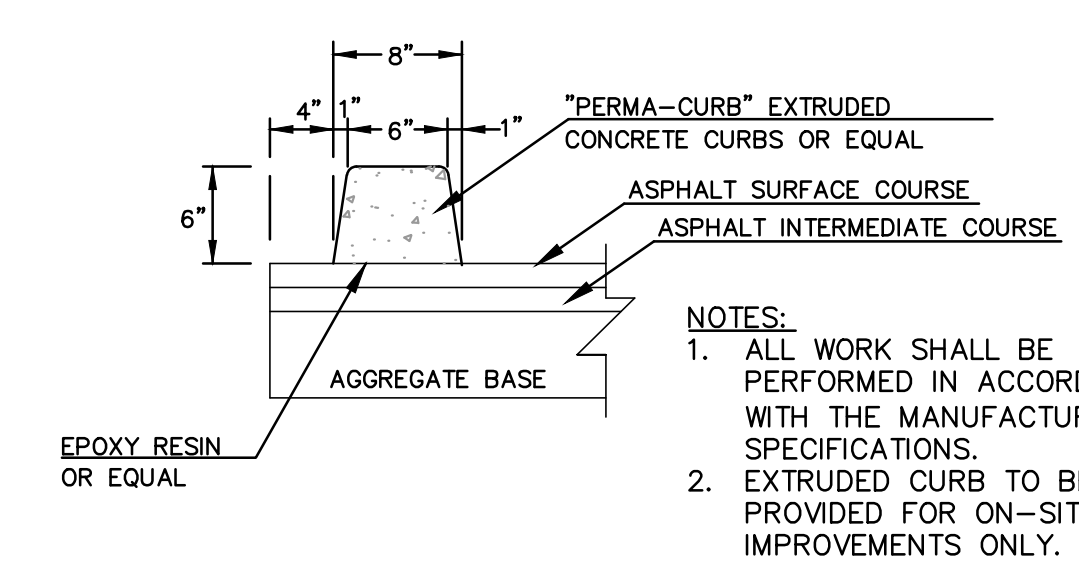
HEAVY DUTY PAVEMENT BUILDUP
TO BE PROVIDED IN AREAS OF HEAVY TRAFFIC



CONCRETE PARKING BLOCK
NOT TO SCALE



SIGN POST FOUNDATION
NOT TO SCALE



EXTRUDED CURB DETAIL
NOT TO SCALE

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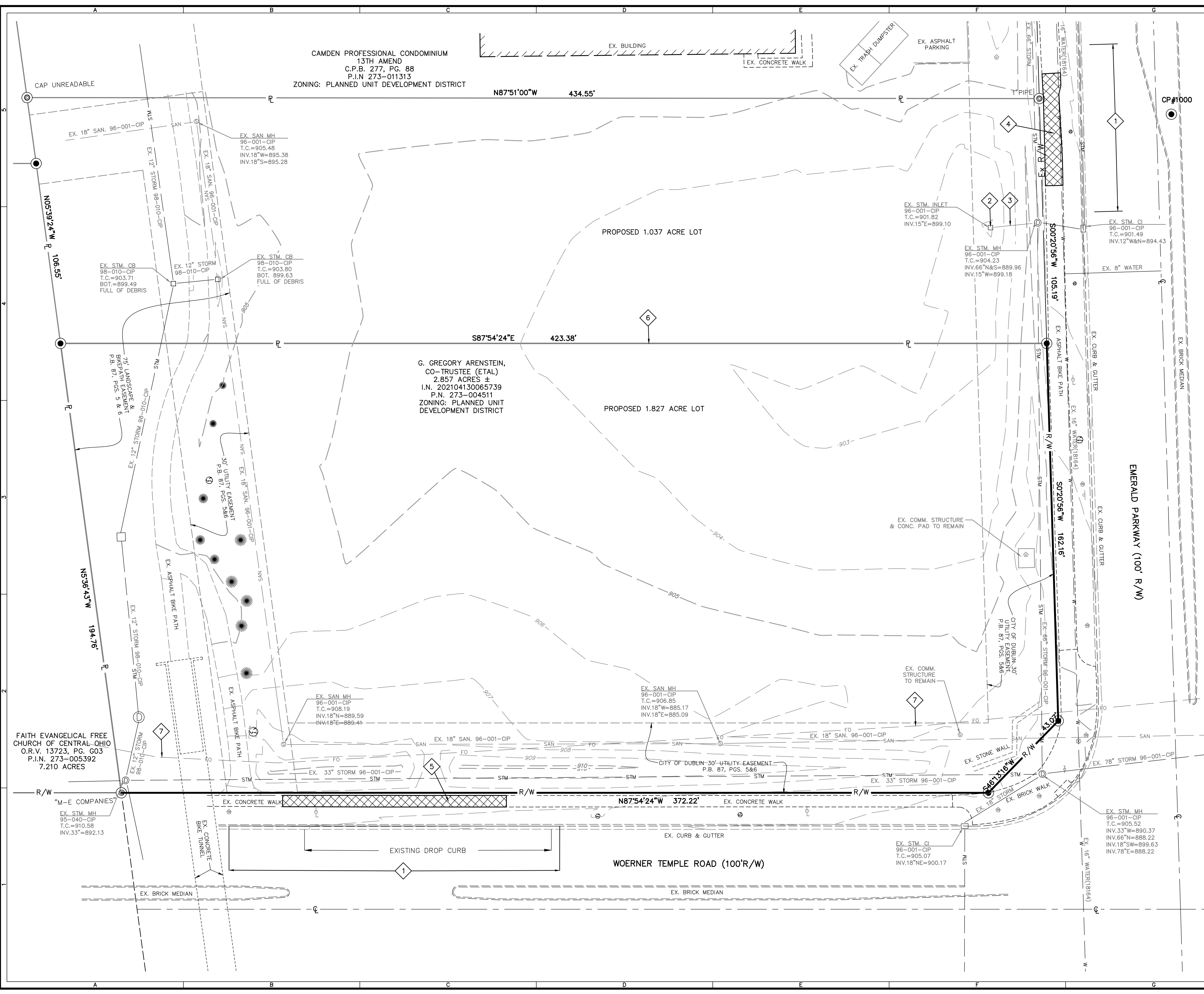
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SHIHAB LAW
 OFFICE BUILDING
 EMERALD PARKWAY
 DUBLIN, OHIO

DESIGN	DRAFT	CHECK
LMS	LMS	EPC

IBI No.: 141124
 DATE: July 28, 2023
 SCALE:

SHEET TITLE:
 DETAILS



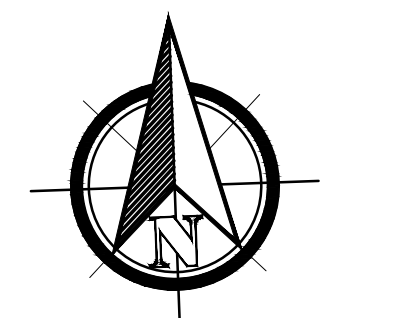
CODED NOTES

1. SAWCUT EXISTING CURB (TO NEAREST JOINT) AND PAVEMENT PER RD-07 AND REMOVE PER ITEM 202 TO ACCOMMODATE CONSTRUCTION OF DRIVEWAY APPROACH. ANY EXISTING DEPRESSED CURB NEEDS TO BE REMOVED AND REPLACED WITH FULL HEIGHT CURB BEYOND DRIVEWAY APPROACH LIMITS.
2. REMOVE EXISTING CATCH BASIN PER ITEM 202
3. REMOVE EXISTING 20"-15" STORM PIPE PER ITEM 202
4. REMOVE EXISTING ASPHALT PATH TO ACCOMMODATE CONSTRUCTION OF DRIVEWAY APPROACH
5. REMOVE EXISTING CONCRETE WALK TO ACCOMMODATE CONSTRUCTION OF DRIVEWAY APPROACH
6. PROPOSED LOT SPLIT PROPERTY LINE
7. EXISTING FIBER OPTIC LINE, PER DUBSCOVERY GIS MAP. CONTRACTOR TO FIELD VERIFY LOCATION.

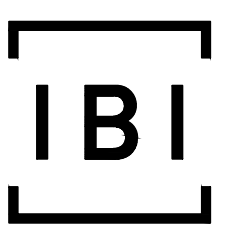
LEGEND

- SIGN**
- EX. SANITARY LINE
 - EX. STORM SEWER LINE
 - FIRE HYDRANT
 - WATER VALVE
 - WATER METER
 - UTILITY BOX
 - LIGHT POLE
 - COMMUNICATION BOX
 - MAIL BOX
 - SANITARY MANHOLE
 - SANITARY CLEANOUT
 - BENCHMARK
 - GAS LINE
 - WATER LINE
 - GAS METER
 - IRON PIN FOUND (AS NOTED)
 - IRON PIN SET
 - UNDERGROUND ELECTRIC LINE
 - UNDERGROUND COMMUNICATION LINE
 - OVERHEAD POWER LINE
 - UNDERGROUND FIBER OPTIC LINE
 - SIDEWALK/PATH TO BE REMOVED

NOTE: SEE SHEET CV FOR ADDITIONAL BENCHMARK INFORMATION.



GRAPHIC SCALE
 20 10 0 10 20
 (IN FEET)
 1 inch = 20 ft.



IBI GROUP
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REVISION:

SUBMISSION:
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- PRELIMINARY ENGINEERING SET
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- CONSTRUCTION DOCUMENT SET
- AS-BUILT DOCUMENT SET

STAMP:

NOT FOR CONSTRUCTION

SHIHAB LAW OFFICE BUILDING
 EMERALD PARKWAY
 DUBLIN, OHIO

DESIGN	DRAFT	CHECK
LMS	LMS	EPC

IBI No.: 141124

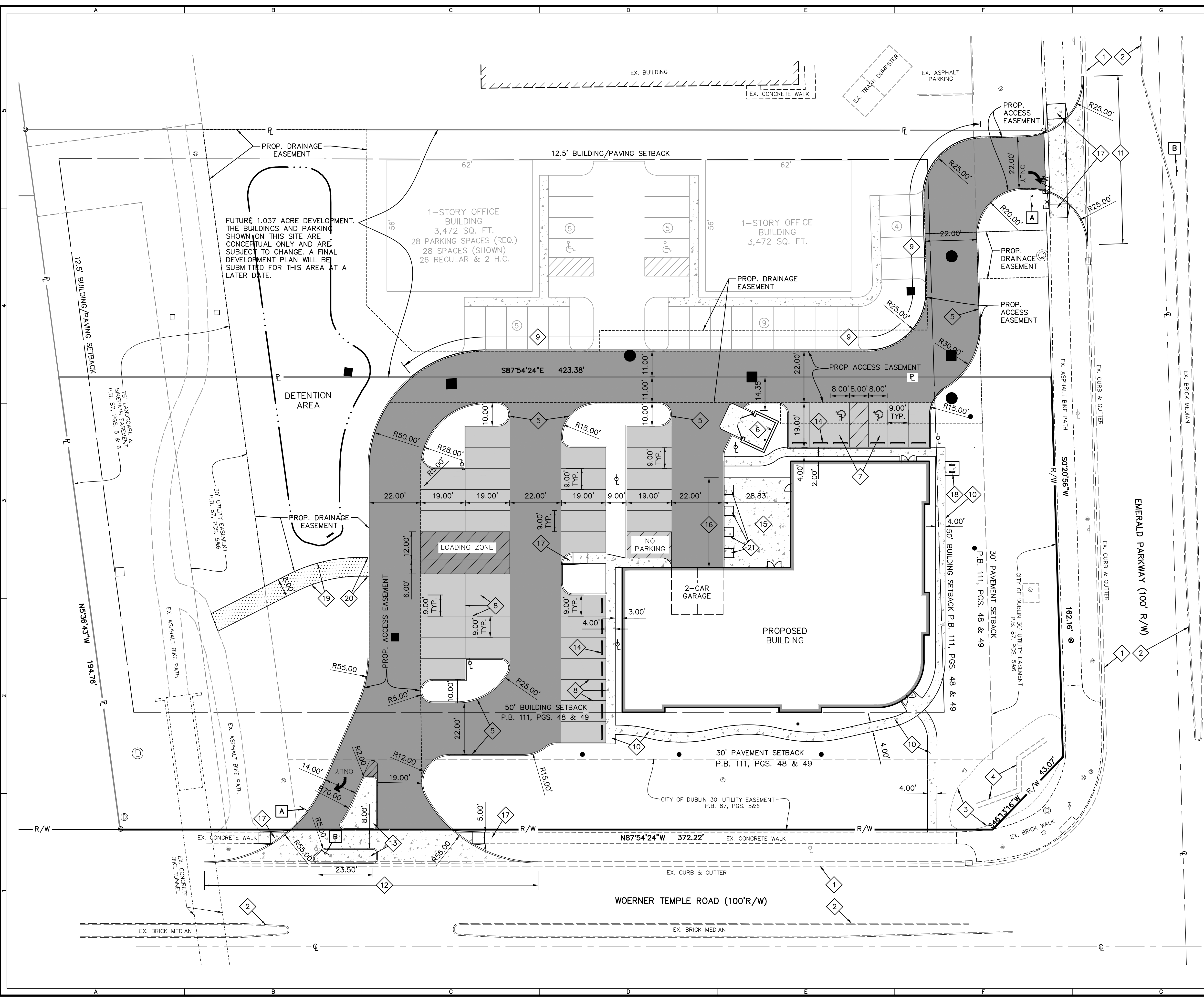
DATE: July 28, 2023

SCALE:

SHEET TITLE:

EXISTING CONDITIONS & DEMOLITION PLAN

SHEET NO.: 5/14



FUTURE 1.037 ACRE DEVELOPMENT. THE BUILDINGS AND PARKING SHOWN ON THIS SITE ARE CONCEPTUAL ONLY AND ARE SUBJECT TO CHANGE. A FINAL DEVELOPMENT PLAN WILL BE SUBMITTED FOR THIS AREA AT A LATER DATE.

- CODED NOTES**
- EXISTING CURB AND GUTTER
 - EXISTING CURB
 - EXISTING LANDSCAPE AREA
 - EXISTING STONE WALL
 - PROPOSED STRAIGHT 18" CONCRETE CURB PER MODIFIED STD. DWG. RD-11. NOTE THAT NO UNDERDRAIN TO BE CONSTRUCTED.
 - PROPOSED DUMPSTER ENCLOSURE
 - PROPOSED ITEM 644 ADA PAVEMENT MARKINGS
 - PROPOSED ITEM 644 PARKING SPACE STRIPING
 - PROVIDE EXTRUDED CURB ALONG PAVEMENT EDGE ON ADJACENT PROPERTY. SEE DETAIL ON SHEET 4
 - PROPOSED CONCRETE WALK
 - SAWCUT EXISTING CURB AND CONSTRUCT DRIVE WAY APPROACH PER STD. DWG. RD-07
 - CONSTRUCT DRIVE WAY APPROACH PER STD. DWG. RD-07
 - PROPOSED CONCRETE MEDIAN
 - PROPOSED WHEEL STOP (TYP.)
 - PROPOSED CONCRETE PATIO
 - ASPHALT PAVEMENT TO BE FLUSH WITH PATIO
 - PROPOSED CURB RAMP TYPE C PER STD. DWG. PD-06
 - PROPOSED BIKE RACK
 - PROPOSED SHARED USE PATH (STANDARD) PER STD. DWG. RD-06
 - TRANSITION CURB HEIGHT FROM 0" TO 6" IN 12" HORIZONTAL DISTANCE
 - PROPOSED PLANTER BOX

- SITE PLAN LEGEND**
- SIGN
- EX. SANITARY LINE — SAN —
 - EX. STORM SEWER LINE — STM —
 - FIRE HYDRANT
 - WATER VALVE
 - WATER METER
 - UTILITY BOX
 - LIGHT POLE
 - COMMUNICATION BOX
 - MAIL BOX
 - SANITARY MANHOLE
 - SANITARY CLEANOUT
 - BENCHMARK
 - GAS LINE
 - WATER LINE
 - GAS METER
 - IRON PIN FOUND (AS NOTED)
 - UNDERGROUND ELECTRIC LINE
 - UNDERGROUND COMMUNICATION LINE
 - OVERHEAD POWER LINE
 - UNDERGROUND FIBER OPTIC LINE
 - PROPOSED LIGHT DUTY PAVEMENT
 - PROPOSED HEAVY DUTY PAVEMENT
 - PROPOSED BIKE PATH
 - PROPOSED CONCRETE

PARKING NOTE

TAX DISTRICT/PARCEL: 273-004511

SITE AREA: 79,282 S.F. = 1.820 ACRES (TO BE SPLIT OUT OF 2.857 ACRES PARCEL)

LOT COVERAGE:

BUILDING = 10,380 S.F.
 PARKING LOT = 21,255 S.F.
 SIDEWALK/PATIO = 3,450 S.F.
 EXISTING S.U.P. = 2,047 S.F.
 PROPOSED S.U.P. = 659 S.F.
 37,791 S.F.

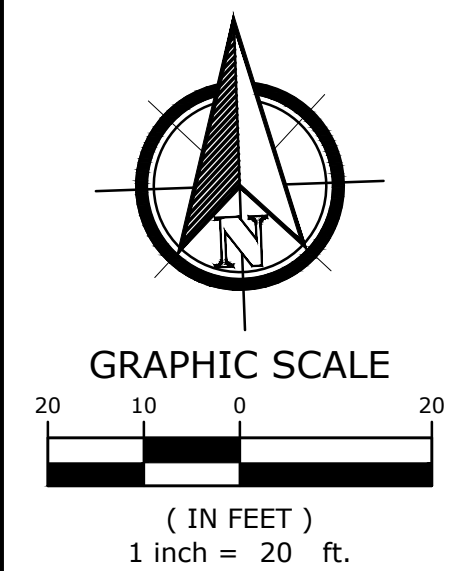
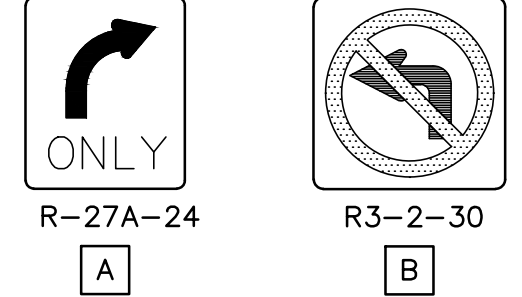
% LOT COVERAGE = $37,791 / 79,282 = 47.67\%$

VEHICLE PARKING

REQUIRED: 1 SPACE PER 250 S.F.
 REQUIRED PARKING = $10,380 / 250 = 42$
 PROVIDED PARKING = 38 (STANDARD SPACE)
 2 (ADA SPACES)
 2 (GARAGE SPACE)
 42

LEGEND - PROPOSED TRAFFIC SIGNS

NOTE: SIGNS ARE TO BE MOUNTED ON ITEM 630 ~ 2" SQUARE GALVANIZED POST, POWDER COATED BLACK (BREAKAWAY). BOTTOM OF SIGN TO BE A MINIMUM 7" FROM GROUND.



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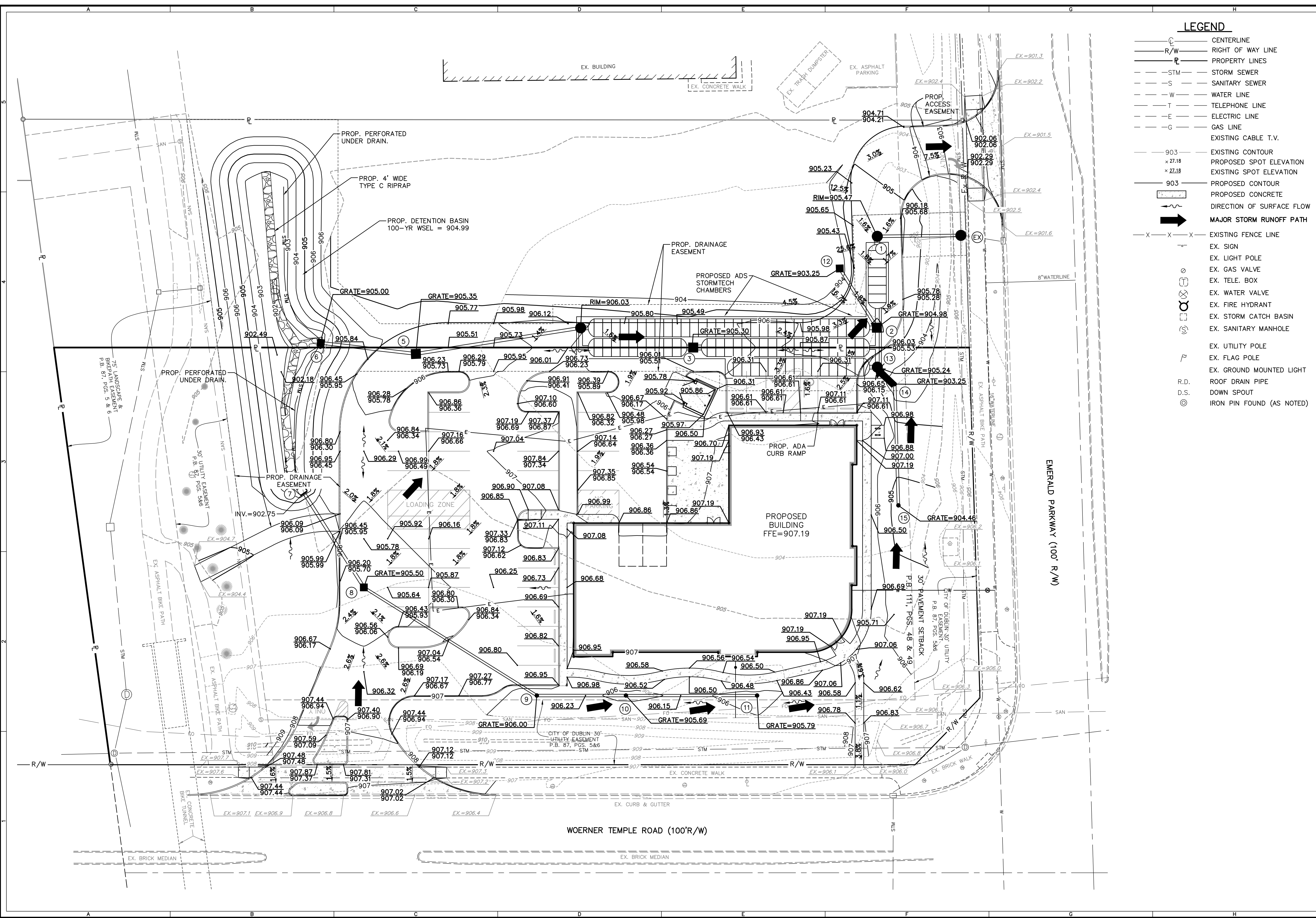
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 EMERALD PARKWAY
 DUBLIN, OHIO

DESIGN	DRAFT	CHECK
LMS	LMS	EPC

IBI No.: 141124
 DATE: July 28, 2023
 SCALE:

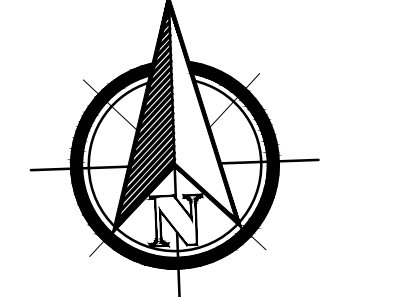
SHEET TITLE:
SITE DIMENSION PLAN

SHEET NO.: 6/14

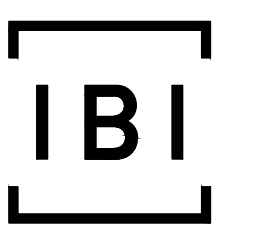


LEGEND

- C — CENTERLINE
- R/W — RIGHT OF WAY LINE
- P — PROPERTY LINES
- STM — STORM SEWER
- S — SANITARY SEWER
- W — WATER LINE
- T — TELEPHONE LINE
- E — ELECTRIC LINE
- G — GAS LINE
- — — EXISTING CABLE T.V.
- 903 — EXISTING CONTOUR
- x 27.18 — PROPOSED SPOT ELEVATION
- x 27.18 — EXISTING SPOT ELEVATION
- 903 — PROPOSED CONTOUR
- [] — PROPOSED CONCRETE
- [] — DIRECTION OF SURFACE FLOW
- [] — MAJOR STORM RUNOFF PATH
- X — X — EXISTING FENCE LINE
- [] — EX. SIGN
- [] — EX. LIGHT POLE
- [] — EX. GAS VALVE
- [] — EX. TELE. BOX
- [] — EX. WATER VALVE
- [] — EX. FIRE HYDRANT
- [] — EX. STORM CATCH BASIN
- [] — EX. SANITARY MANHOLE
- [] — EX. UTILITY POLE
- [] — EX. FLAG POLE
- [] — EX. GROUND MOUNTED LIGHT
- [] — R.D. ROOF DRAIN PIPE
- [] — D.S. DOWN SPOUT
- [] — [] — IRON PIN FOUND (AS NOTED)



GRAPHIC SCALE
 20 10 0 20
 (IN FEET)
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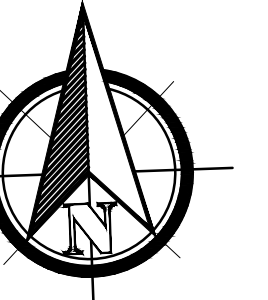
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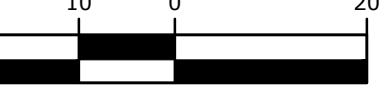
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LMS	LMS	EPC

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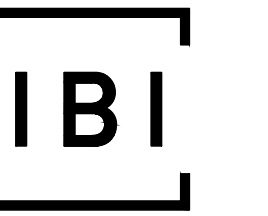
SHEET TITLE:
 SITE GRADING
 PLAN



GRAPHIC SCALE



(IN FEET)
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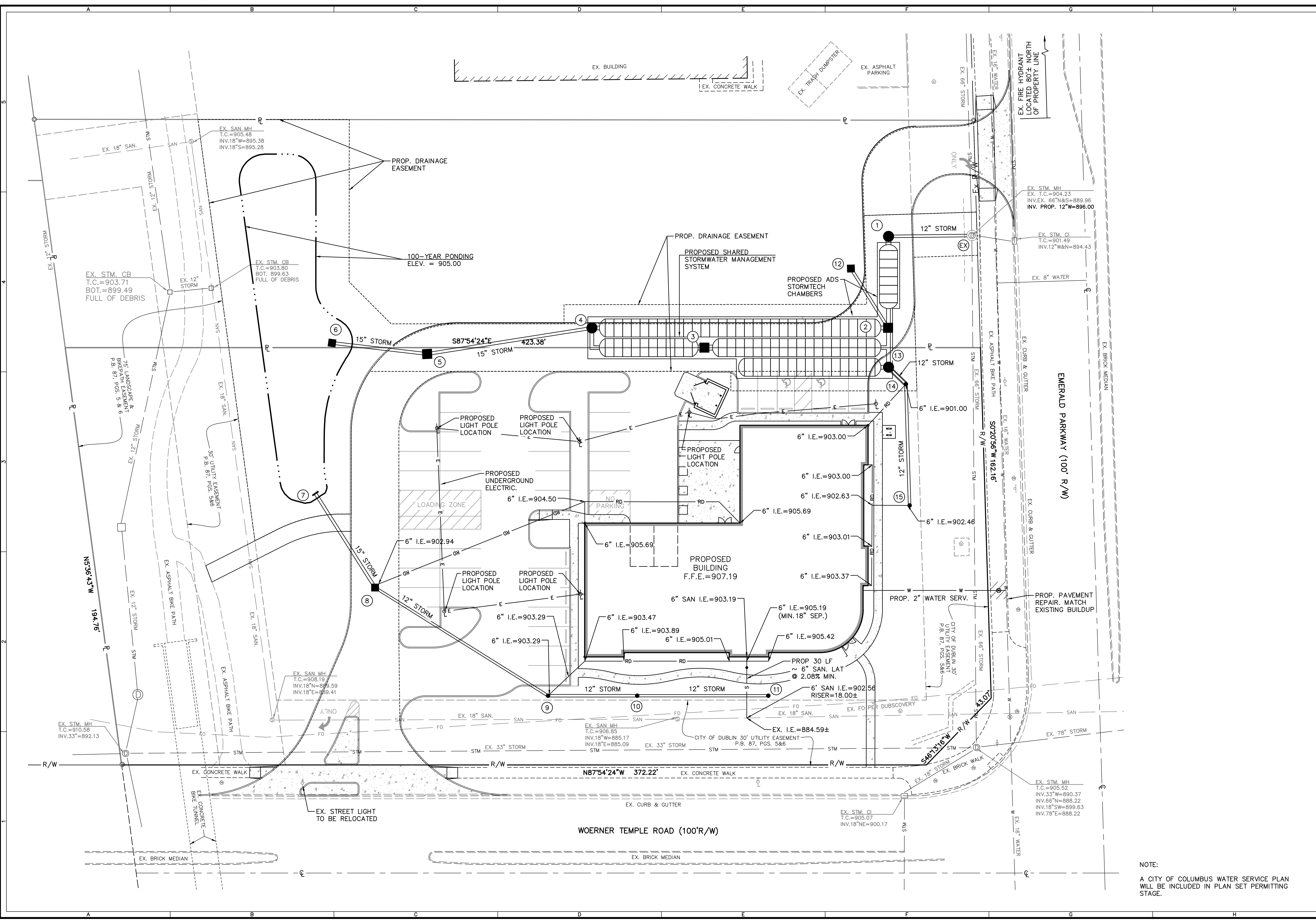
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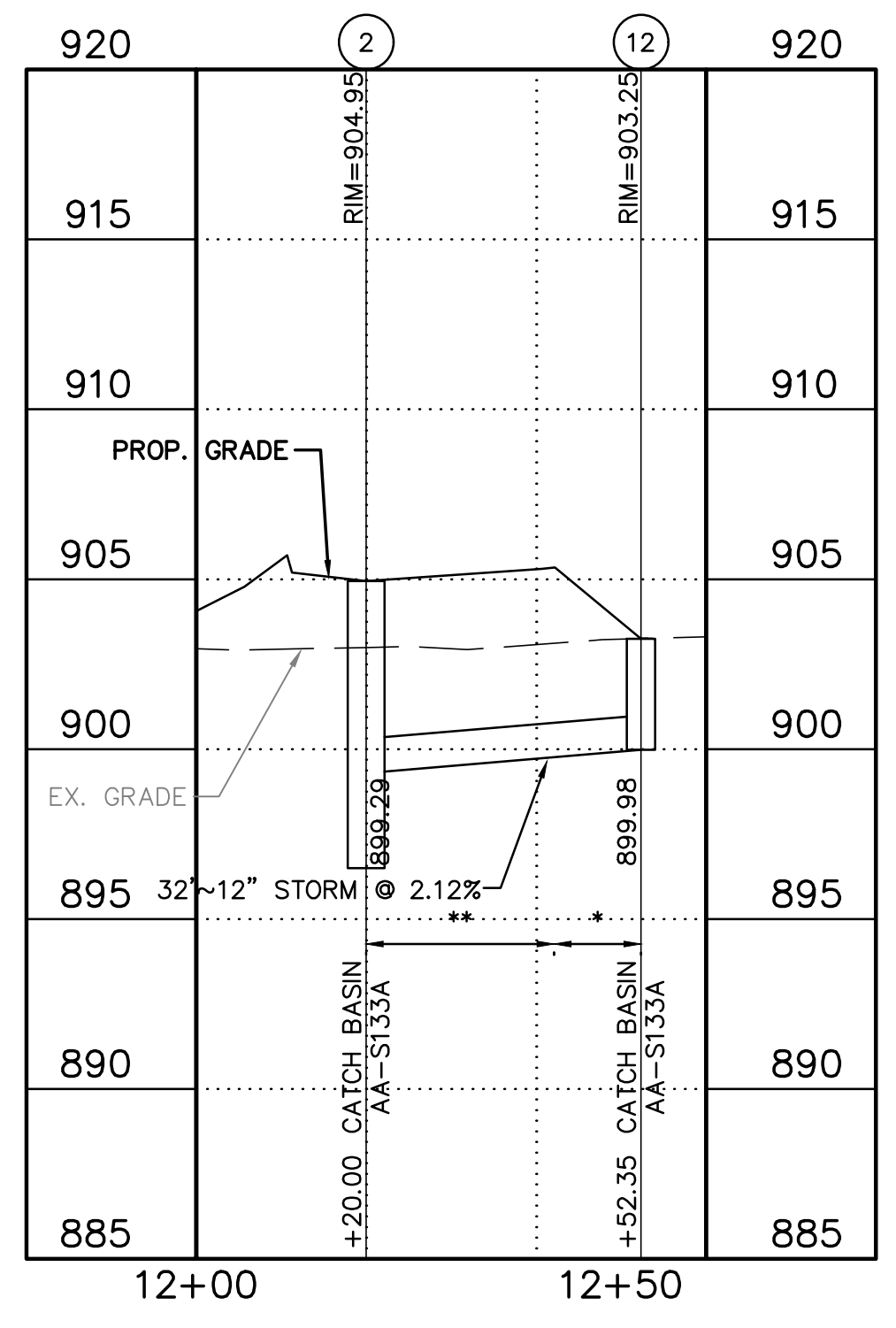
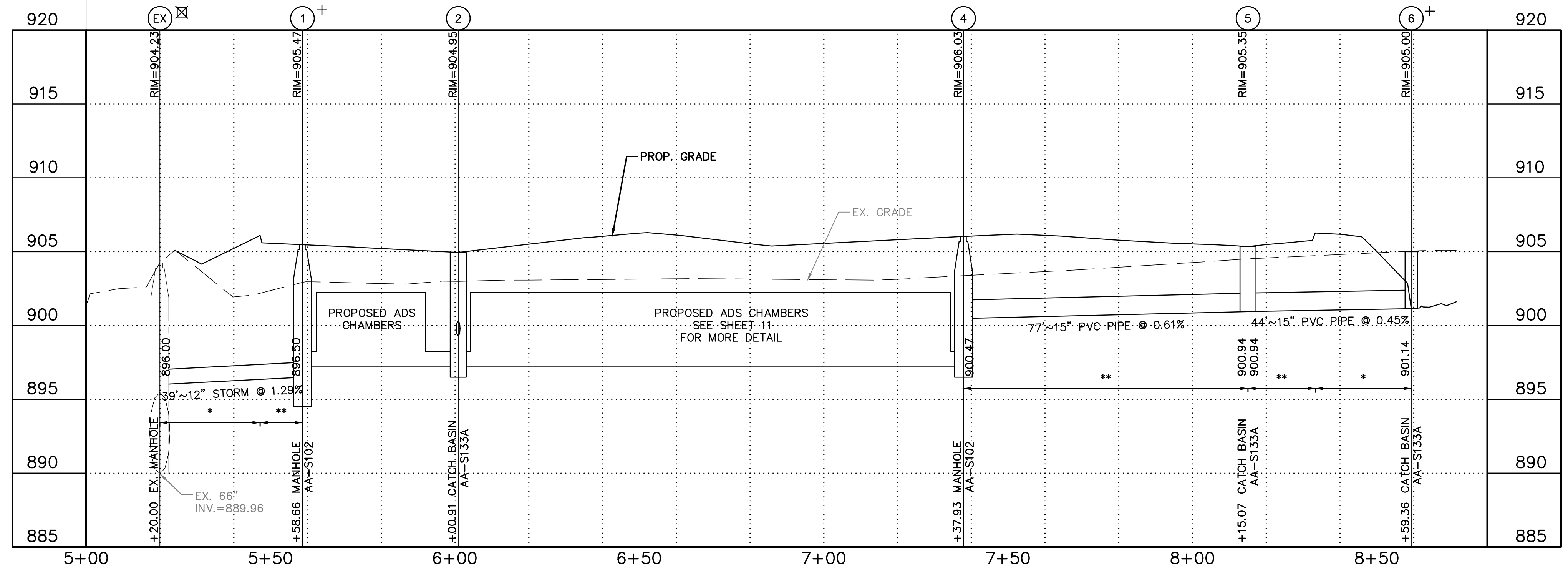
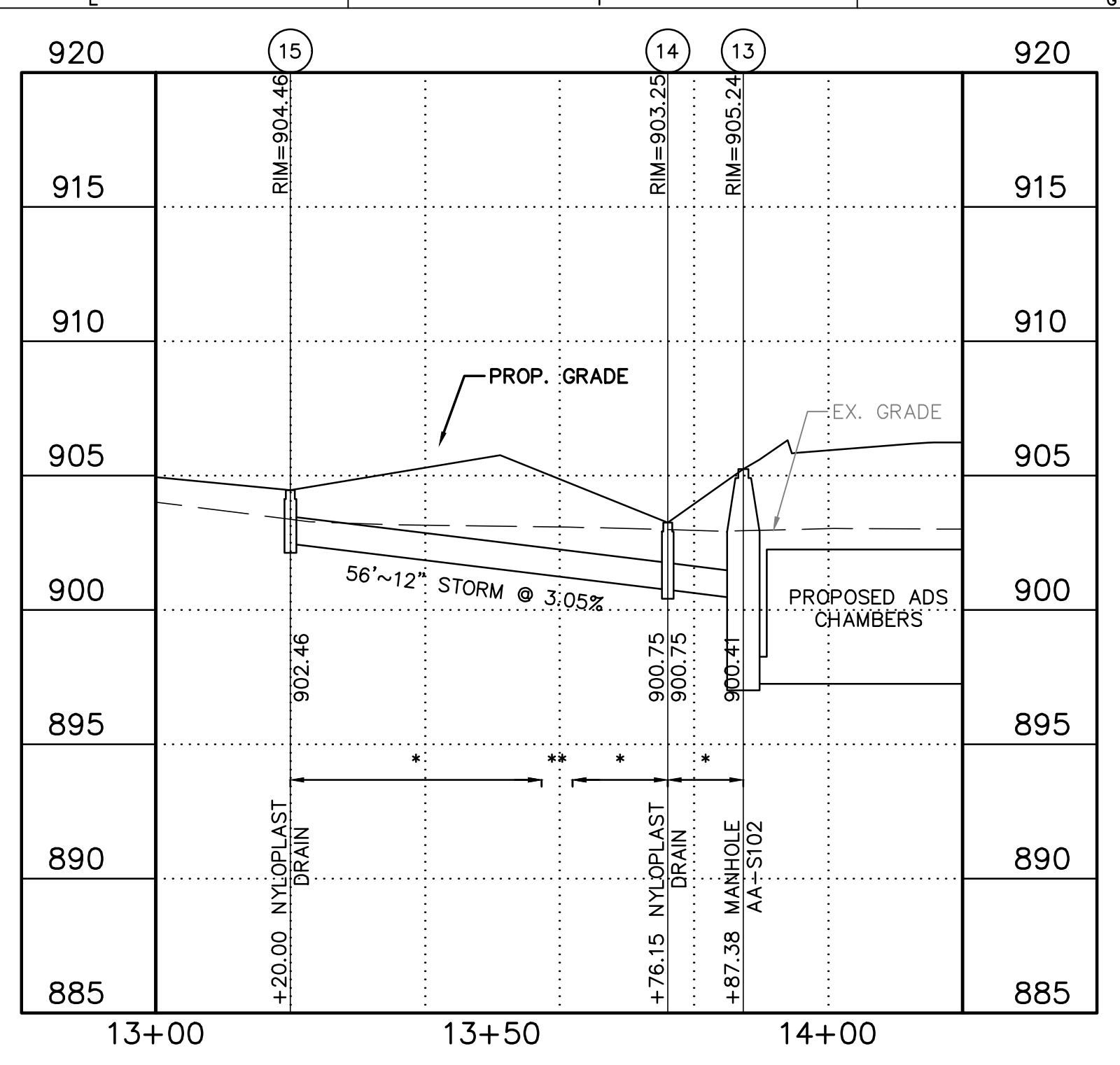
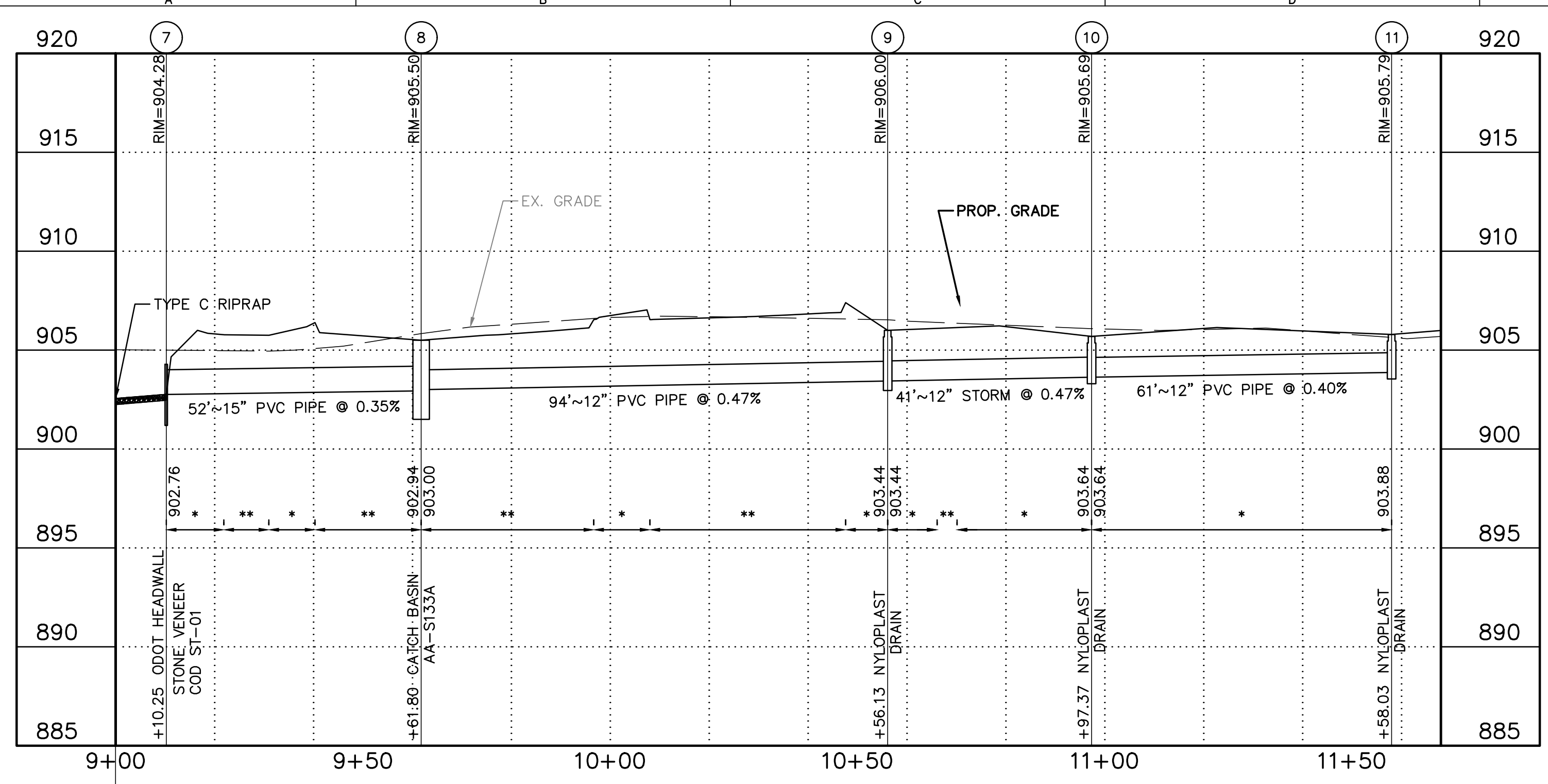
SHEET TITLE:

SITE UTILITY PLAN

SHEET NO.: 8/14

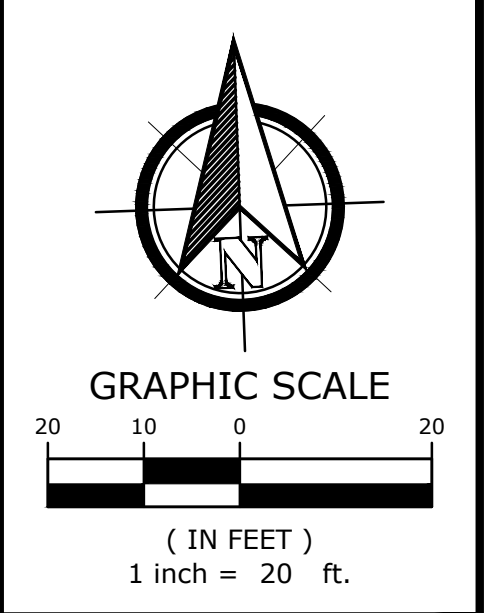


NOTE:
A CITY OF COLUMBUS WATER SERVICE PLAN
WILL BE INCLUDED IN PLAN SET PERMITTING
STAGE.



BACKFILL SHALL BE COMPACTED TO THE DENSITY OF THE ADJACENT SUITABLE SOIL UNLESS OTHERWISE NOTED.

- * PROVIDE COMPACTED BACKFILL PER ITEM 911
- ** PROVIDE COMPACTED GRANULAR BACKFILL PER ITEM 912
- ☒ INVERT SHOWN PER SITE SURVEY. CONTRACTOR TO FIELD VERIFY INVERT AND LOCATION OF EXISTING UTILITY PRIOR TO ORDERING MATERIALS.
- † SEE SHEET 10 FOR STRUCTURE DETAIL(S)



[BI]

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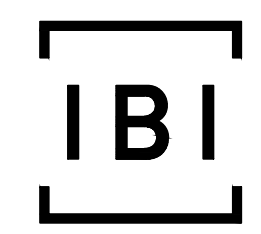
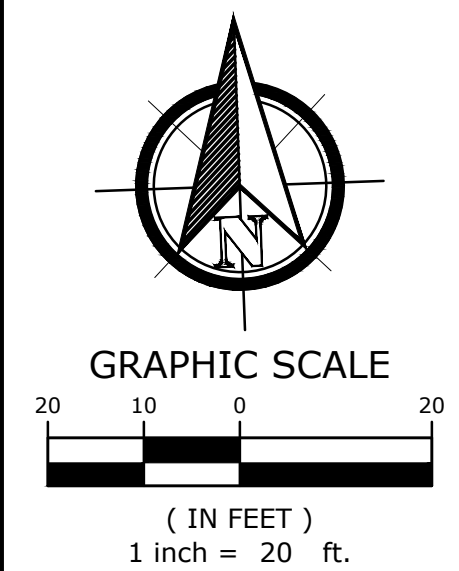
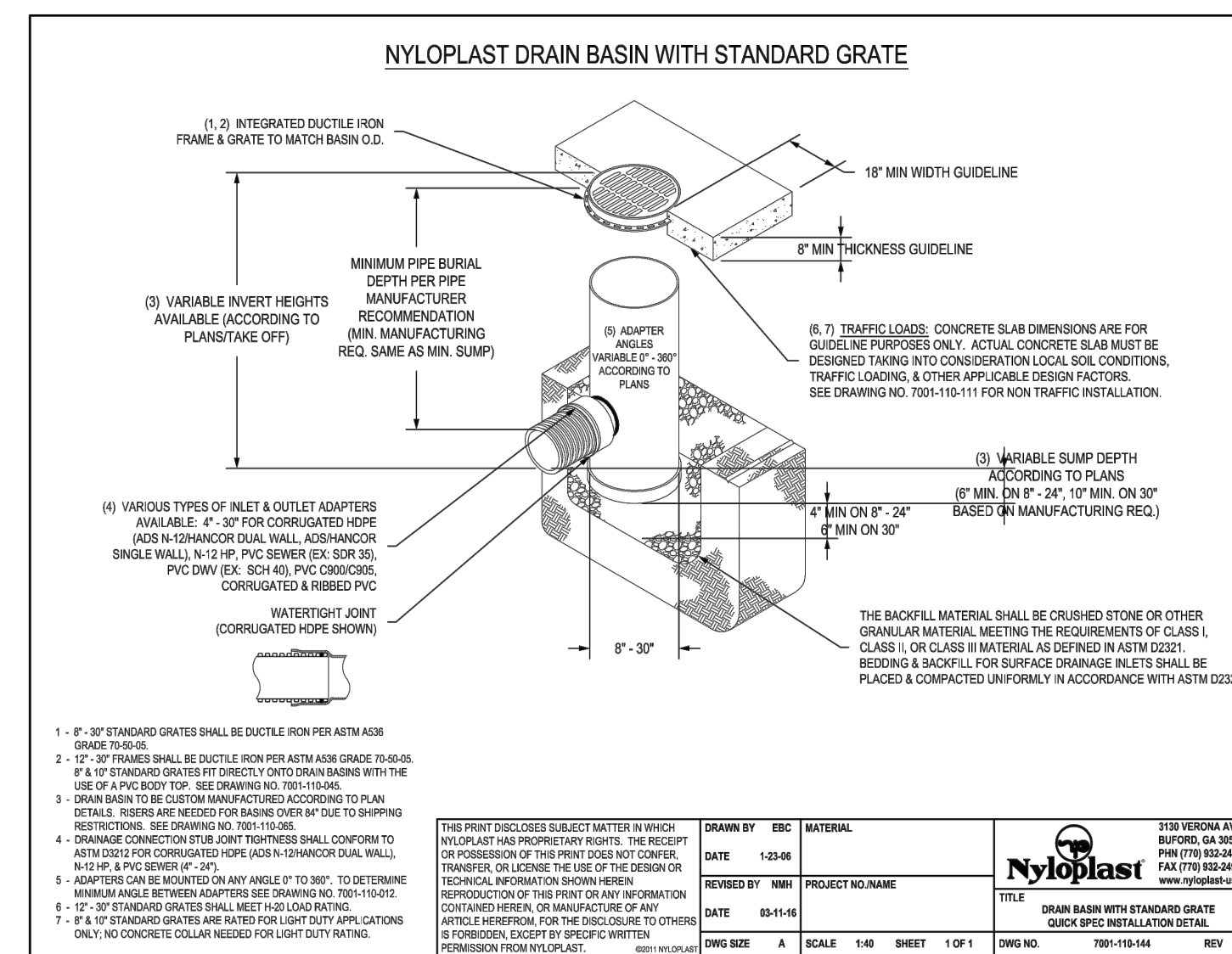
SHEET TITLE:

STORM PROFILES

SHEET NO.: 9/14

STORM STRUCTURE COORDINATE TABLE					
STRUCTURE	DESCRIPTION	DESIGN		AS-BUILT	
		NORTHING	EASTING	NORTHING	EASTING
1	OUTLET CONTROL STRUCTURE	760191.02	1788397.49		
2	CATCH BASIN AA-S133A	760148.80	1788395.78		
3	CATCH BASIN AA-S133A	760142.73	1788310.53		
4	MANHOLE AA-S102	760153.71	1788258.84		
5	CATCH BASIN AA-S133A	760144.48	1788182.25		
6	OUTLET CONTROL STRUCTURE	760151.18	1788138.48		
7	ODOT HEADWALL	760081.91	1788128.26		
8	CATCH BASIN AA-S133A	760037.40	1788154.25		
9	NYLOPLAST YARD DRAIN	759984.49	1788232.35		
10	NYLOPLAST YARD DRAIN	759982.99	1788273.56		
11	NYLOPLAST YARD DRAIN	759980.77	1788334.18		
12	CATCH BASIN AA-S133A	760176.81	1788379.60		
13	MANHOLE AA-S102	760130.56	1788395.28		
14	NYLOPLAST YARD DRAIN	760122.45	1788403.06		
15	NYLOPLAST YARD DRAIN	760066.30	1788402.71		

STORM SEWER TABLE			
RUN	BEARING	LENGTH	SIZE
EX-1	N88°32'48"W	38.6'	12"
1-ADS	S02°05'36"W	5.5'	12"
4-5	N83°07'53"E	77.1'	15"
5-6	N81°18'07"W	44.3'	15"
7-8	N30°16'53"W	51.5'	15"
8-9	N55°53'04"W	94.3'	12"
9-10	S87°54'24"E	41.2'	12"
10-11	N87°54'24"W	60.6'	12"
12-ADS	N30°00'25"W	32.3'	12"
13-14	S43°46'43"E	11.2'	12"
14-15	N00°20'56"E	56.2'	12"



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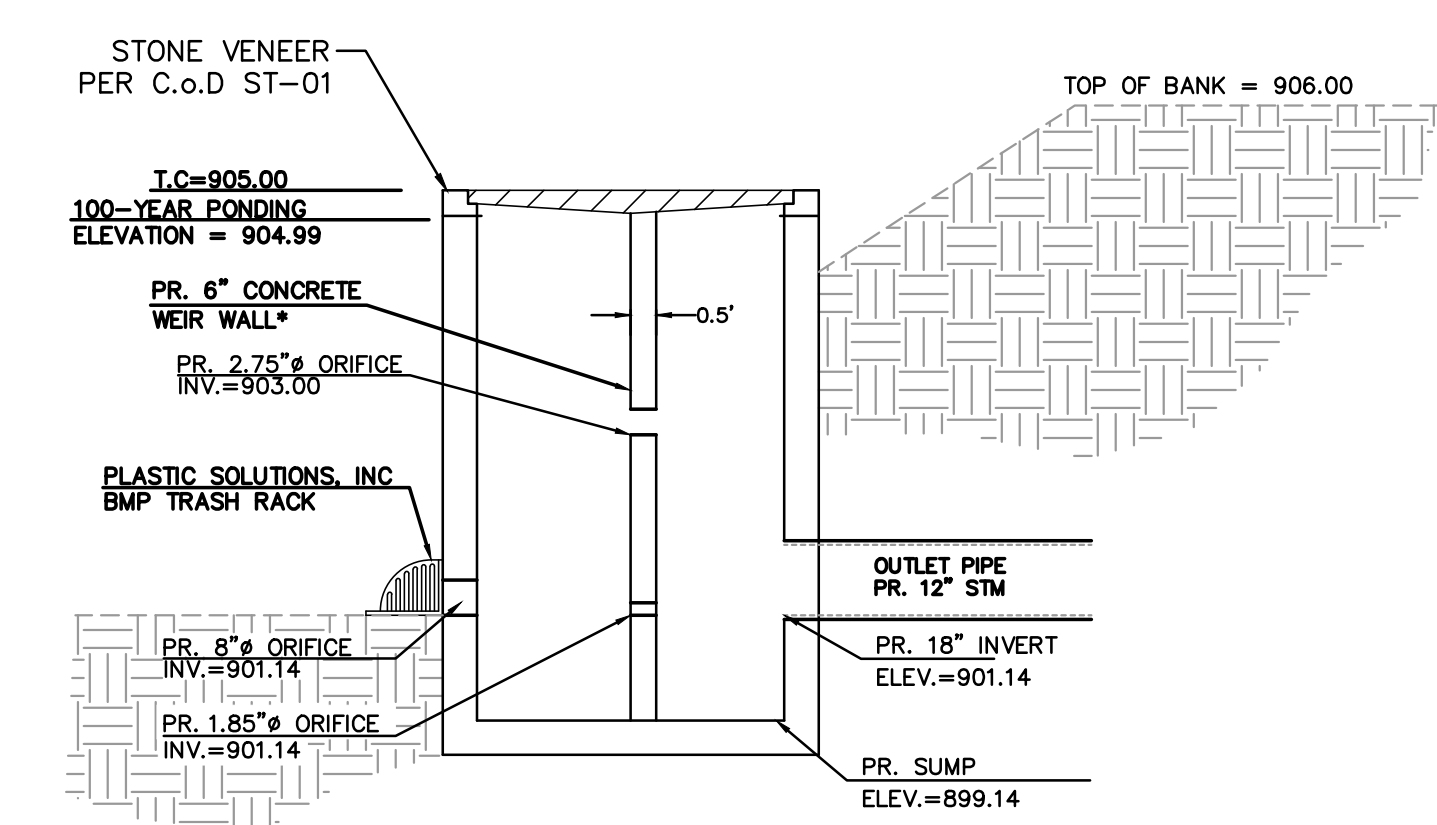
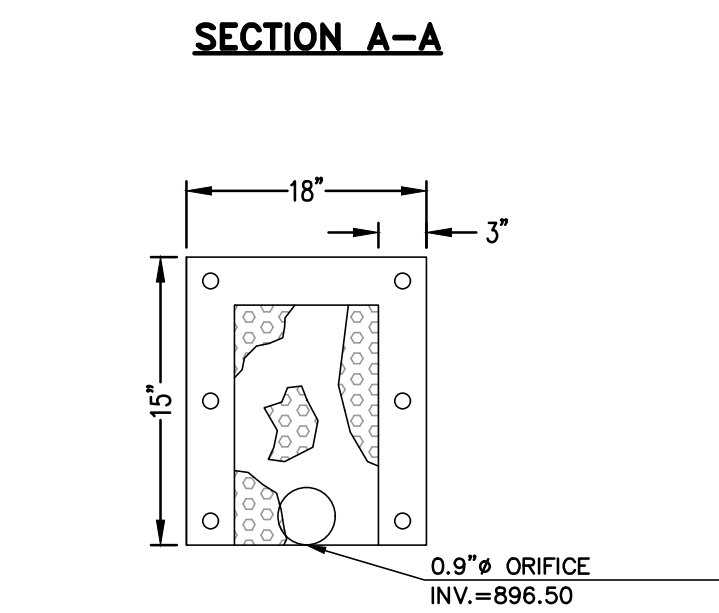
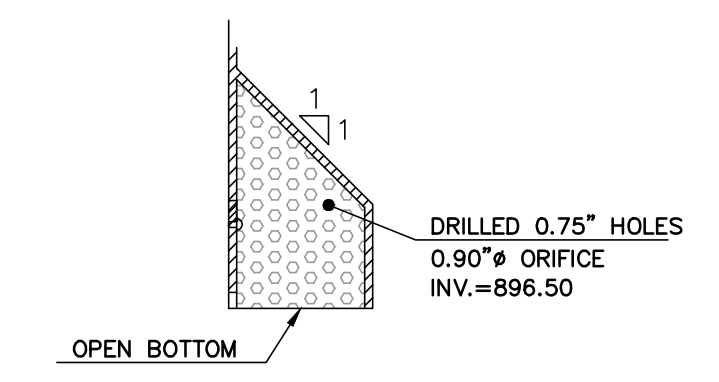
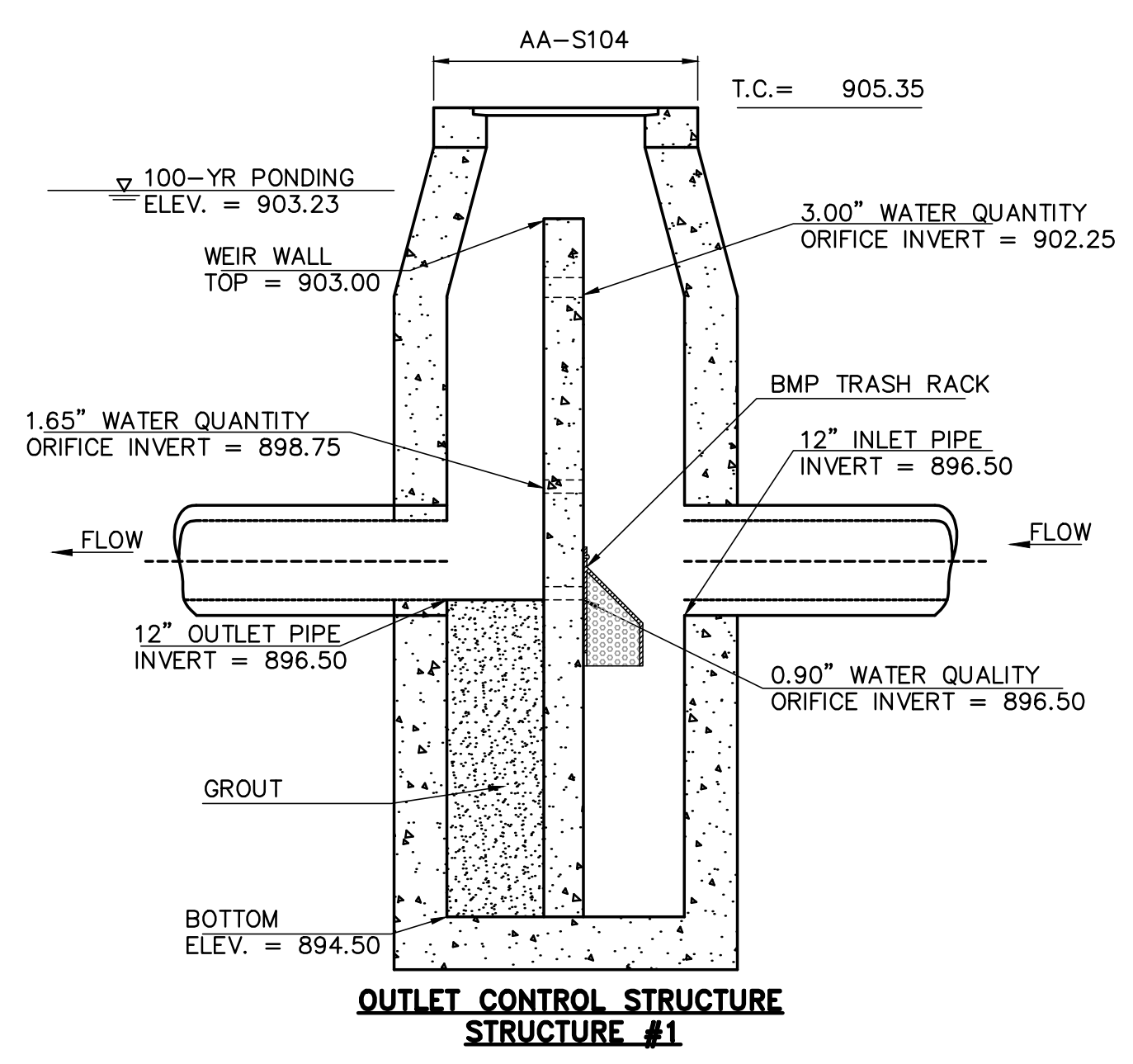
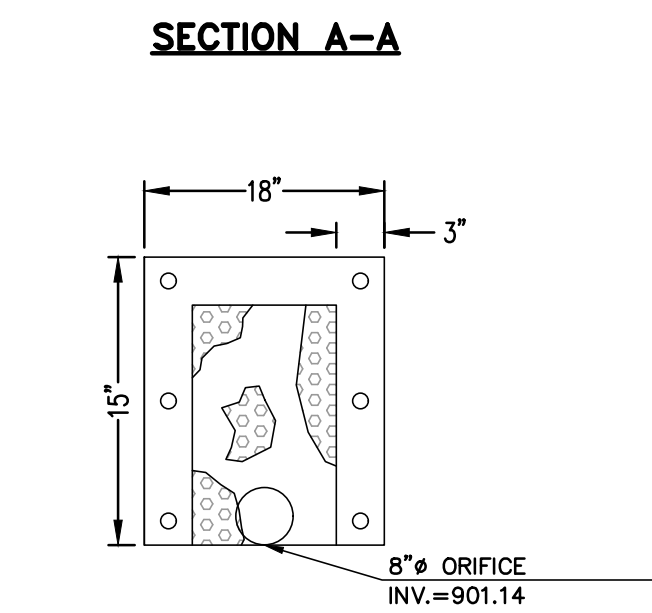
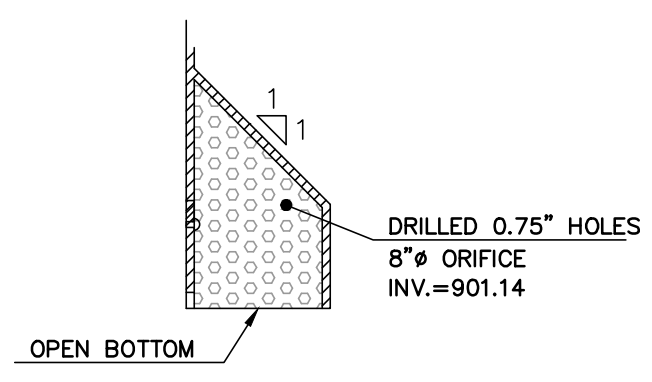
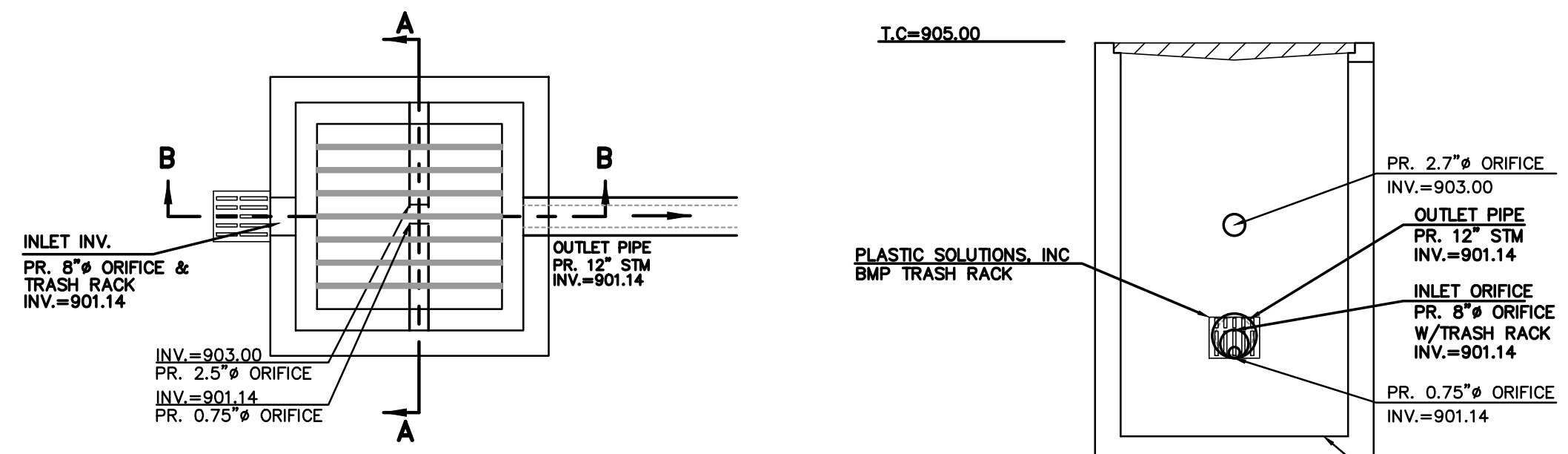
DATE: July 28, 2023

SCALE:

SHEET TITLE:

STORM PROFILES

SHEET NO. 10/14



OUTLET CONTROL STRUCTURE DETAIL
STRUCTURE #6
 NOT TO SCALE

* WEIR WALL MATERIAL AND INSTALLATION TO BE COORDINATED WITH MANUFACTURER

PROJECT INFORMATION	
ENGINEERED	ANDREA TAGLIONE
PRODUCT	614-881-2918
MANAGER	ANDREA TAGLIONE@ADSPIPE.COM
ADS SALES REP	JOHN MCGEORGE
	614-878-1561
	JOHN.MCGEORGE@ADSPIPE.COM
PROJECT NO.	S355259



SHIHAB LAW OFFICE BUILDING

DUBLIN, OH

MC-4500 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-4500.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPED FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT². THE AS₂ IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
 - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
 - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
 - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-4500 CHAMBER SYSTEM

- STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - STONE/ROCK LOCATED OFF THE CHAMBER BED.
 - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG-BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELLED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
- INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
- STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
- STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

- STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- THE USE OF EQUIPMENT OVER MC-4500 CHAMBERS IS LIMITED:
 - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
 - NO RUBBER Tired LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

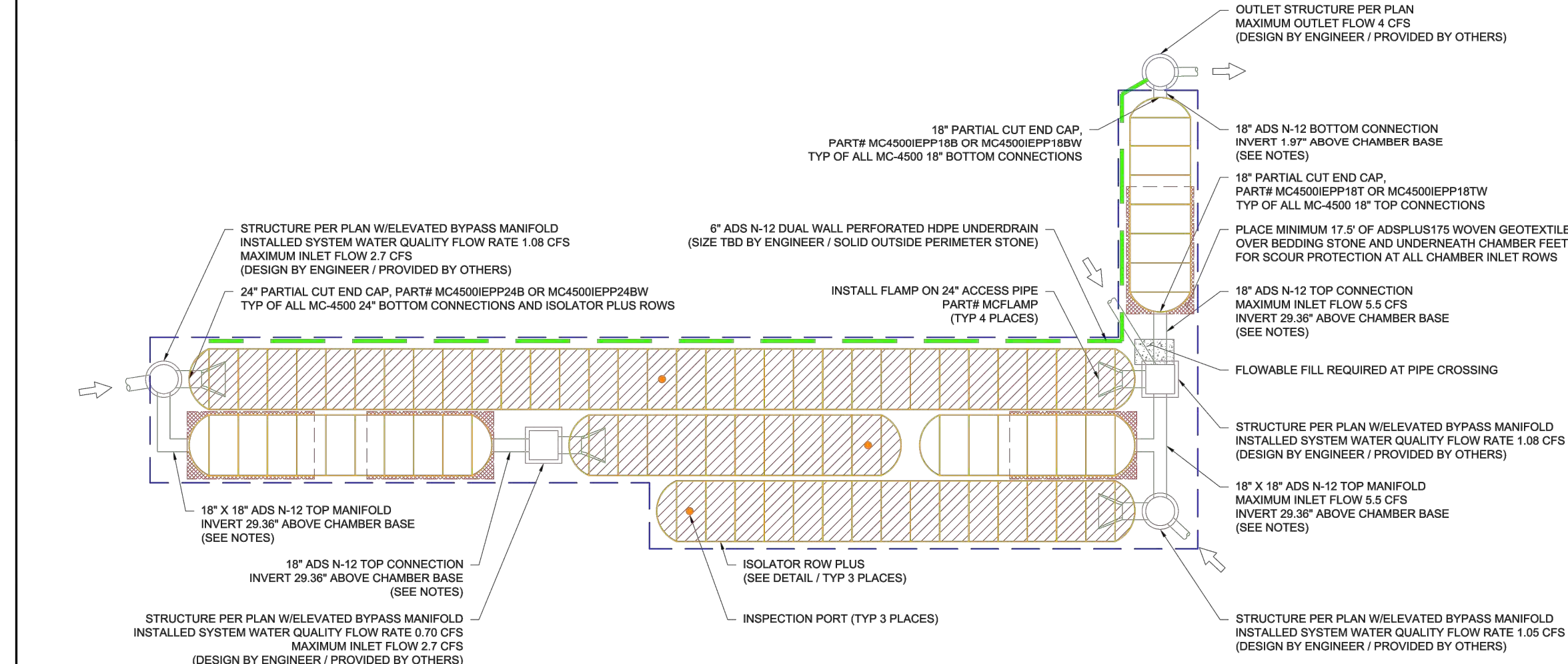
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2994 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT	
77	STORMTECH MC-4500 CHAMBERS
12	STORMTECH MC-4500 END CAPS
12	STONE ABOVE (n)
9	STONE BELOW (n)
0	% STONE VOID
15,862	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)
4,098	INSTALLED SYSTEM WATER QUALITY VOLUME (CF) BELOW INVERT
896.21	(PERIMETER STONE INCLUDED)
3947	SYSTEM AREA (SF)
415	SYSTEM PERIMETER (ft)

PROPOSED ELEVATIONS	
909.25	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
904.75	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
904.25	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
904.25	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
904.25	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
903.25	TOP OF STONE
902.25	TOP OF MC-4500 CHAMBER
899.70	18" TOP MANIFOLD CONNECTION INVERT
897.44	24" ISOLATOR ROW PLUS CONNECTION INVERT
897.41	18" BOTTOM CONNECTION INVERT
897.25	BOTTOM OF MC-4500 CHAMBER
896.50	UNDERDRAIN INVERT
896.50	BOTTOM OF STONE

- NOTES**
- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECHNICAL NOTE 6.32 FOR MANIFOLD SIZING GUIDANCE.
 - DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
 - THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
 - THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSTALLED SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
 - THE SITE DESIGN ENGINEER MUST REVIEW THE PROXIMITY OF THE CHAMBERS TO THE SLOPE AND CONSIDER EFFECTS OF POSSIBLE SATURATED SOILS ON THE SLOPE'S INTEGRITY.



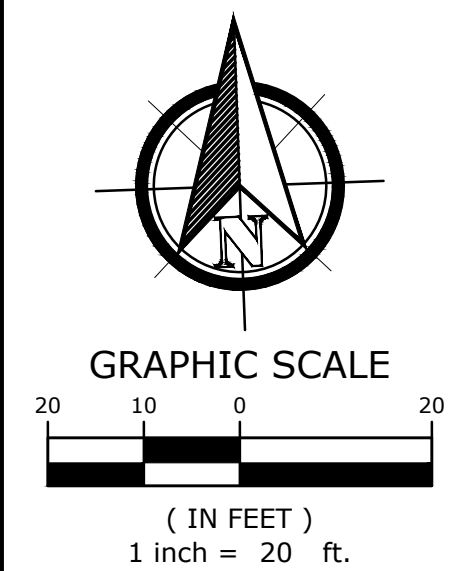
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DUBLIN, OH

DATE: 05/23/23 DRAWN: MWH
PROJECT #: S355259 CHECKED: RWD

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HILLIARD, OH 43026

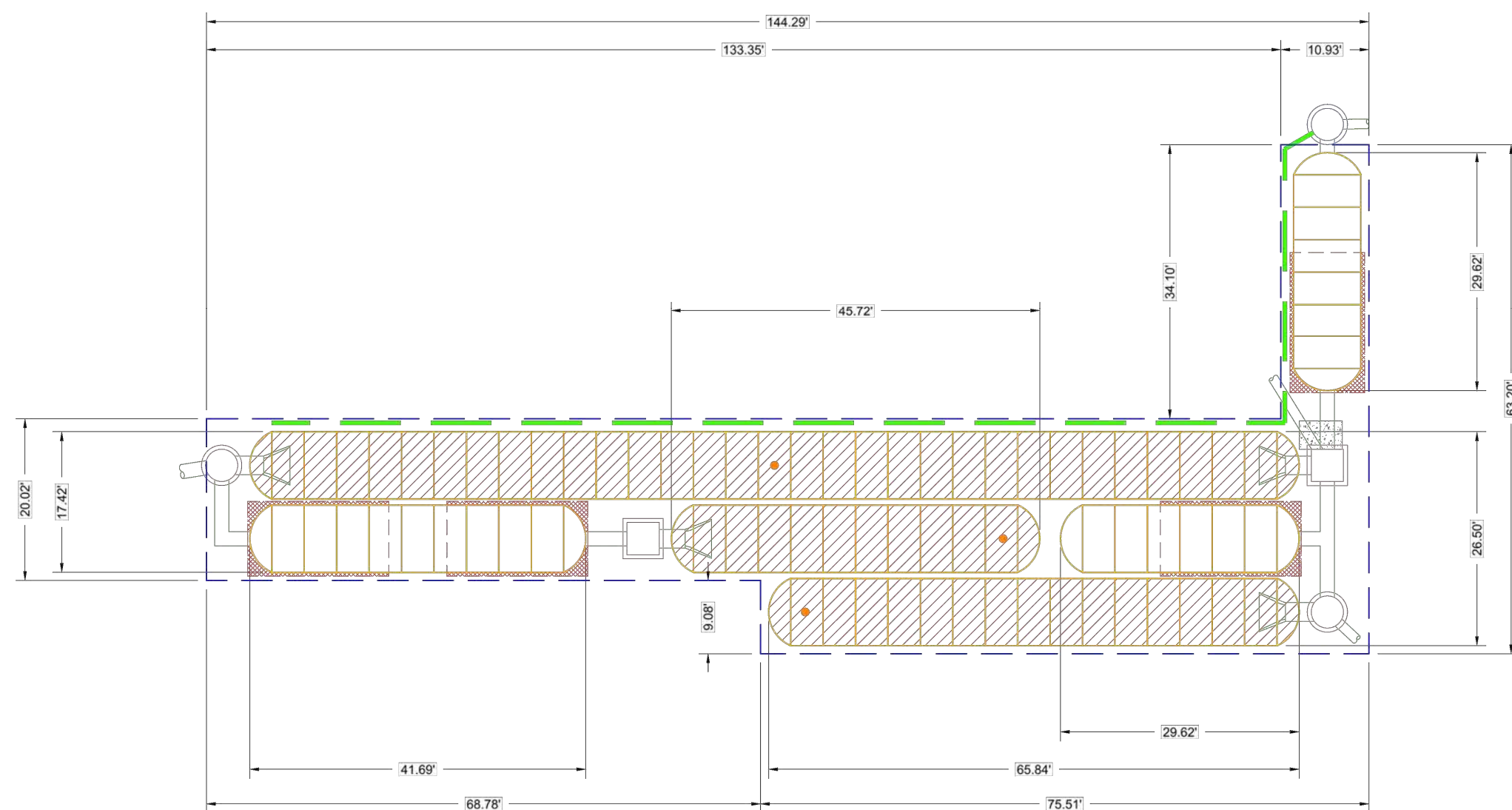
2 SHEET OF 6



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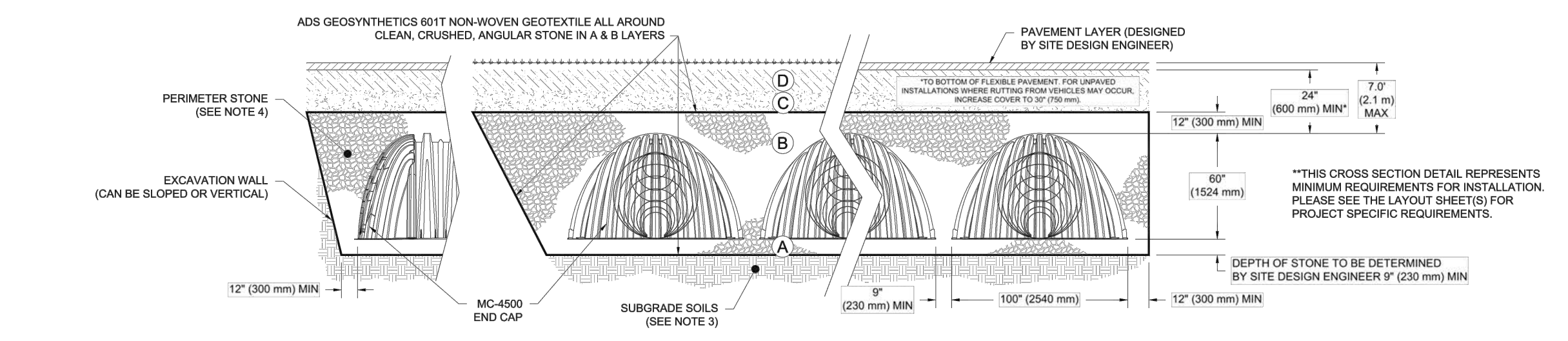
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3 SHEET OF 6

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBBASE REQUIREMENTS.	N/A
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <3% FINES OR PROCESSED AGGREGATE. OR MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 ¹ A-1, A-2.4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 67, 68, 7, 78, 8, 88, 9, 10
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 ¹ 3, 4
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 ¹ 3, 4

- PLEASE NOTE:
- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
 - STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) MAX LIFTS USING TWO FULL COVERS WITH A VIBRATORY COMPACTOR.
 - WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
 - ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



- NOTES:**
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
 - MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
 - THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
 - PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
 - REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT². AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

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4 SHEET OF 6

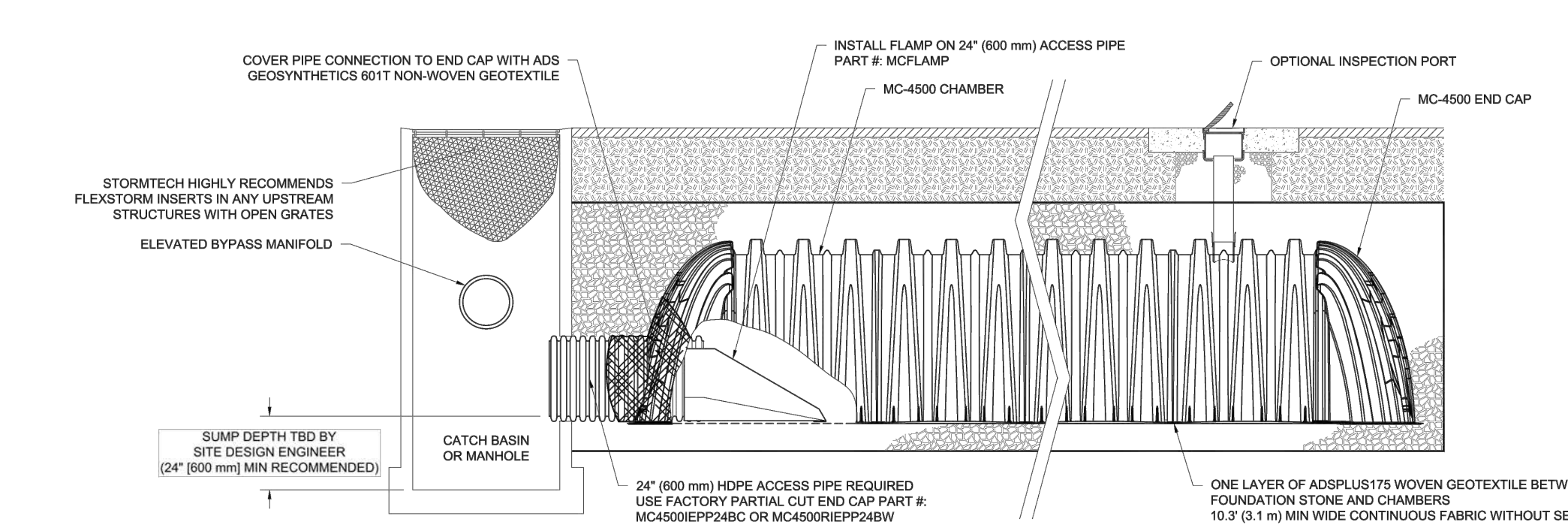
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SHIHAB LAW OFFICE BUILDING
EMERALD PARKWAY
DUBLIN, OHIO

DESIGN	DRAFT	CHECK
LMS	LMS	EPC

IBI No.: 141124
DATE: July 28, 2023
SCALE:

SHEET TITLE:
UNDERGROUND DETENTION DETAILS



MC-4500 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
 - A.1. REMOVE OPEN LID ON NYLOPLAST INLINE DRAIN
 - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
 - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
 - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
 - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
 - B. ALL ISOLATOR PLUS ROWS
 - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
 - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
 - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
 - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
 - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

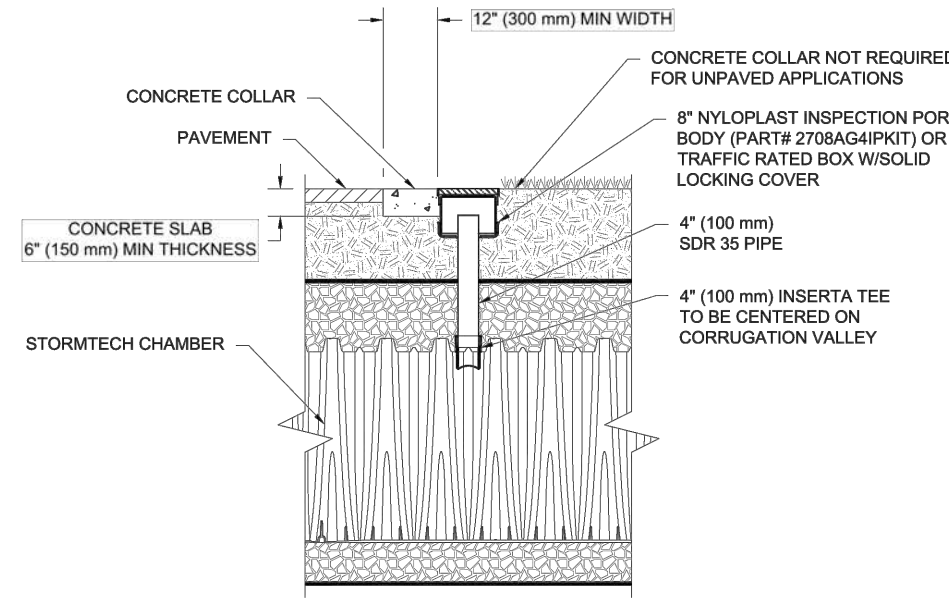
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
 - B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
 - C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



4" PVC INSPECTION PORT DETAIL
(MC SERIES CHAMBER)
NTS

NOTE: INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.

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NO. DATE DESCRIPTION

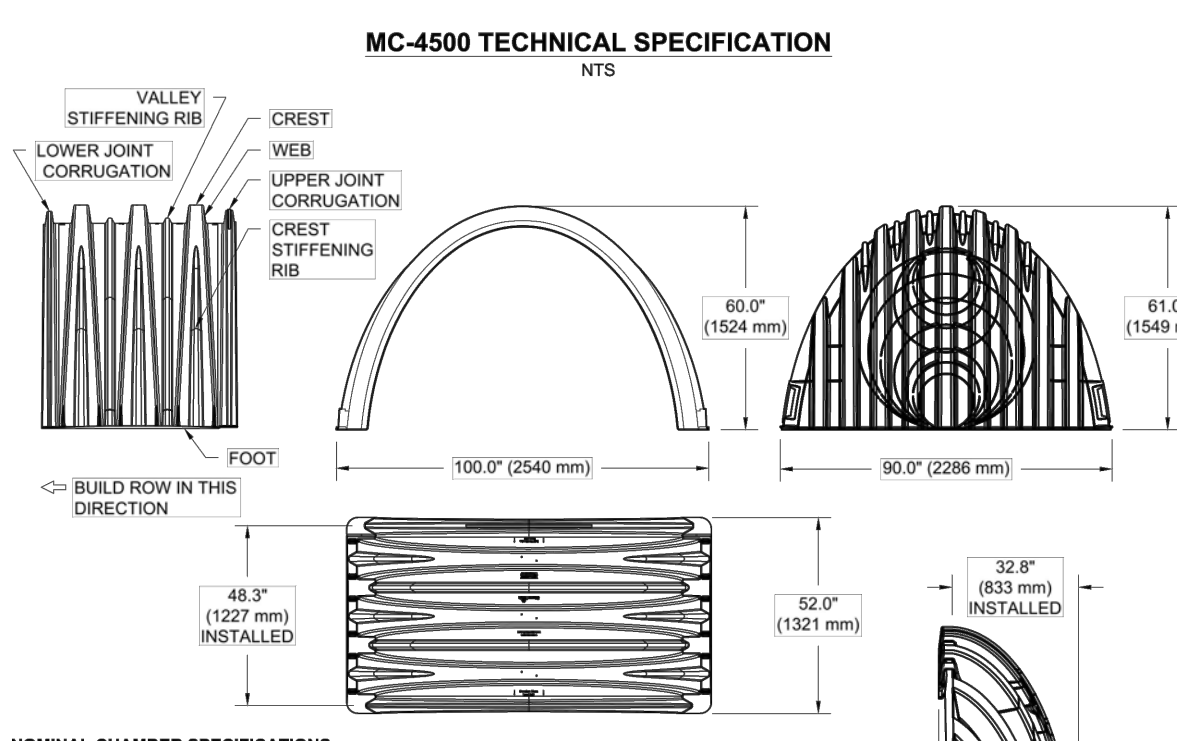
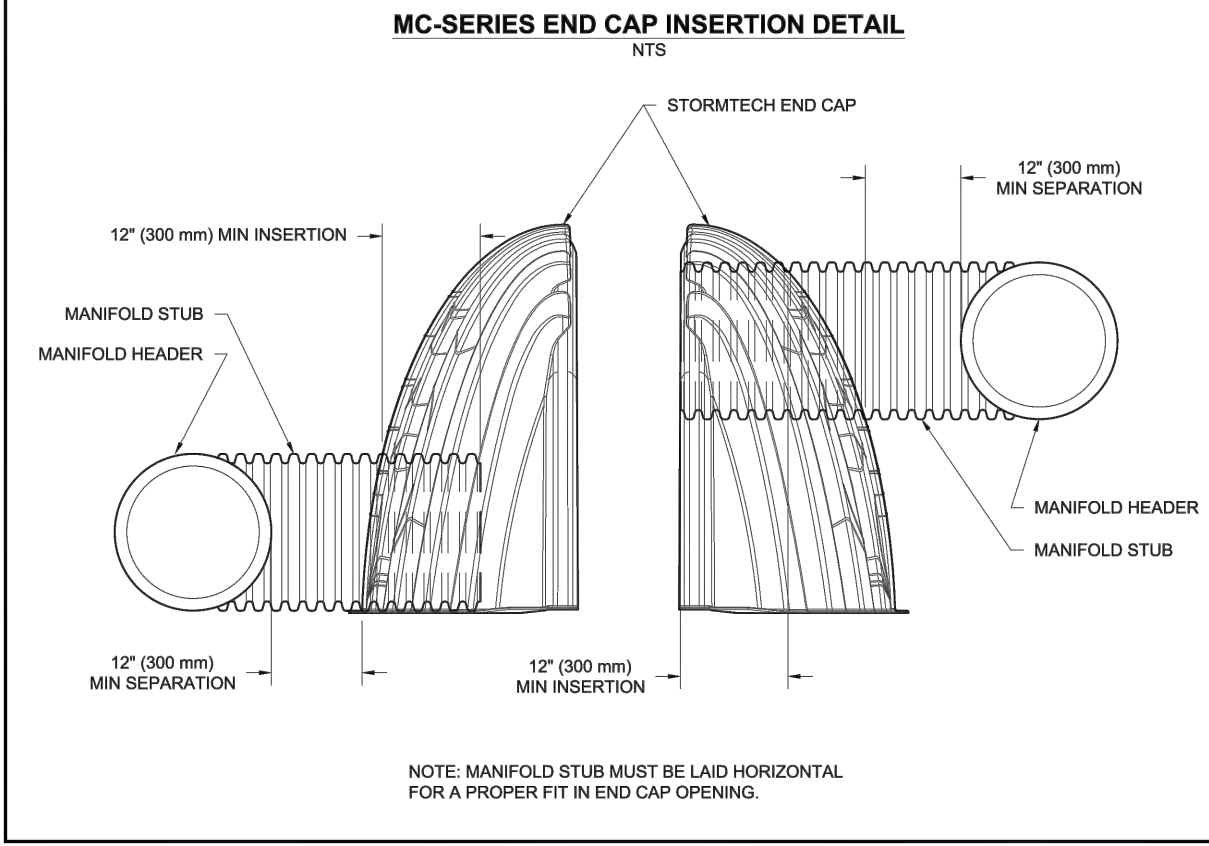
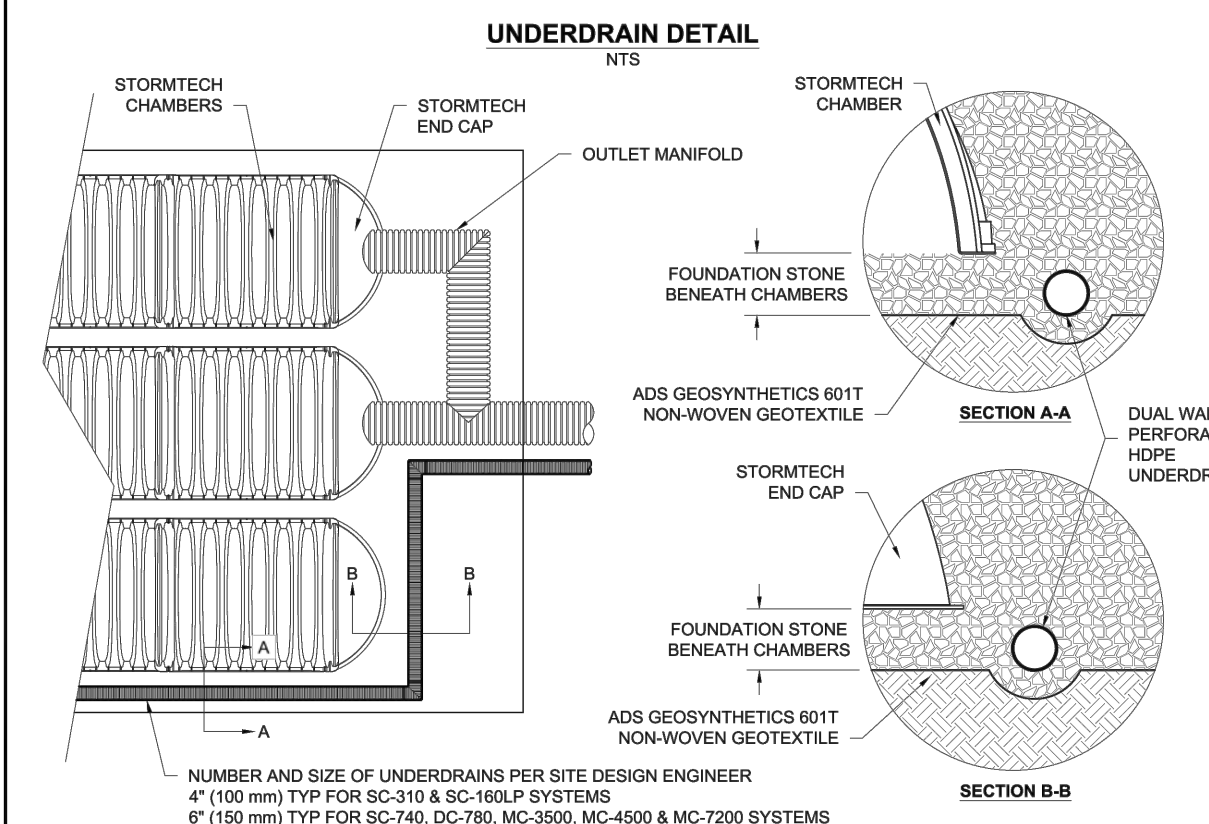
1. 05/23/23 MWH HAD LOCATED CHAMBERS FROM EXISTENT STORMTECH SYSTEM. REVIEW THE DRAWING FOR COORDINATION. IT IS THE USER'S RESPONSIBILITY TO VERIFY THE DIMENSIONS AND MATERIALS OF THE EXISTING SYSTEMS AND TO PROVIDE NECESSARY NOTES TO THE CONTRACTOR.

StormTech Chamber System

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ADS

5 SHEET OF 6



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	CHAMBER STORAGE	MINIMUM INSTALLED STORAGE* WEIGHT (NOMINAL)
100.0" X 60.0" X 48.3" (2540 mm X 1524 mm X 1227 mm)	106.6 CUBIC FEET (3.01 m ³)	162.6 CUBIC FEET (4.60 m ³) (64.7 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	END CAP STORAGE	MINIMUM INSTALLED STORAGE* WEIGHT (NOMINAL)
90.0" X 61.0" X 32.8" (2286 mm X 1549 mm X 833 mm)	39.5 CUBIC FEET (1.12 m ³)	115.3 CUBIC FEET (3.28 m ³) (40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"

PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC4500EPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC4500EPP08B	---	40.50" (1029 mm)	0.86" (22 mm)
MC4500EPP08T	8" (200 mm)	---	---
MC4500EPP08B	---	---	1.01" (26 mm)
MC4500EPP10T	10" (250 mm)	---	---
MC4500EPP10B	---	---	1.33" (34 mm)
MC4500EPP12T	12" (300 mm)	36.69" (937 mm)	---
MC4500EPP12B	---	---	1.55" (39 mm)
MC4500EPP15T	15" (375 mm)	32.72" (831 mm)	---
MC4500EPP15B	---	---	1.70" (43 mm)
MC4500EPP18T	18" (450 mm)	29.36" (746 mm)	---
MC4500EPP18B	---	---	1.97" (50 mm)
MC4500EPP18BW	---	---	---
MC4500EPP24T	24" (600 mm)	23.05" (585 mm)	---
MC4500EPP24B	---	---	2.26" (57 mm)
MC4500EPP24BW	---	---	2.95" (75 mm)
MC4500EPP30BW	---	---	3.25" (83 mm)
MC4500EPP36BW	---	---	3.55" (90 mm)

CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

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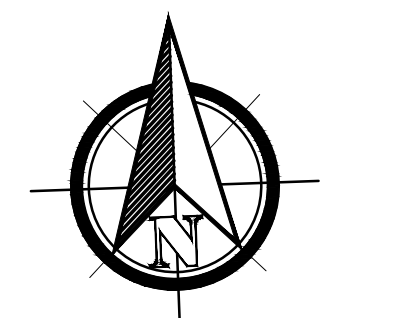
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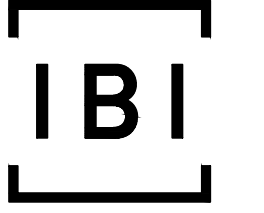


GRAPHIC SCALE

20 10 0 10 20

(IN FEET)

1 inch = 20 ft.



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EMERALD PARKWAY

DUBLIN, OHIO

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LMS	LMS	EPC

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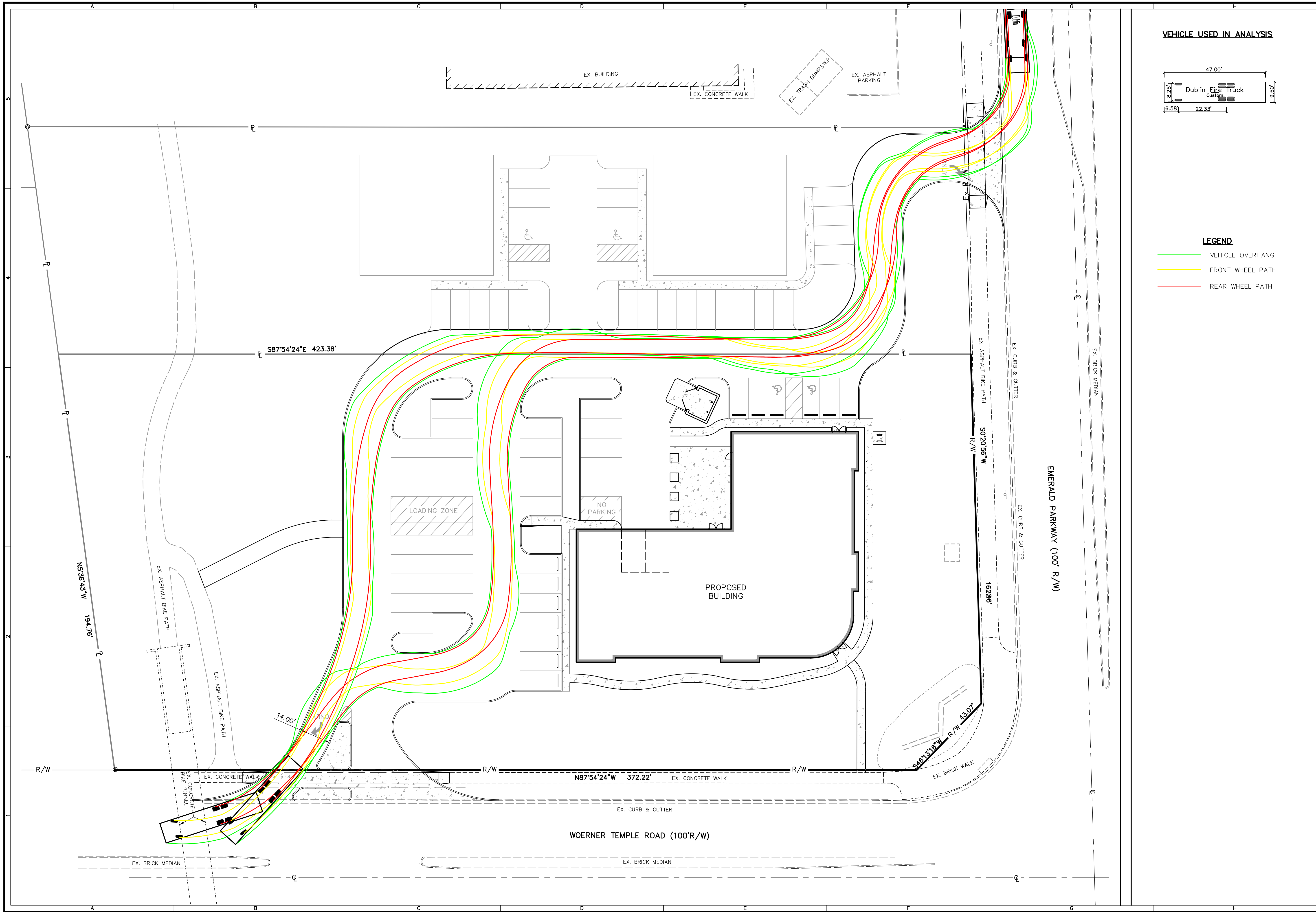
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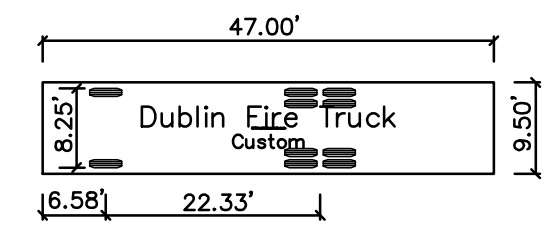
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UNDERGROUND DETENTION DETAILS

SHEET NO. 12/14

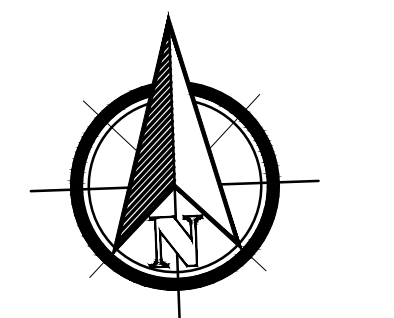


VEHICLE USED IN ANALYSIS

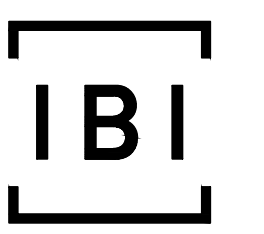


LEGEND

- VEHICLE OVERHANG
- FRONT WHEEL PATH
- REAR WHEEL PATH



GRAPHIC SCALE
 (IN FEET)
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TURNING EXHIBIT FROM EMERALD PARKWAY

