

Administrative Site Review Application

Planning and Development Customer Service Center • One Exchange Plaza, Suite 400 | Raleigh, NC 27601 | 919-996-2500



This form is required when submitting site plans as referenced in Unified Development Ordinance (UDO) Section 10.2.8. Please check the appropriate building types and include the plan checklist document when submitting.

Office Use Only: Case #: _____ Planner (print): _____

Please review UDO Section 10.2.8. to determine the site plan tier. If assistance determining a Site Plan Tier is needed a Site Plan Tier Verification request can be submitted online via the [Permit and Development Portal](#). (Note: There is a fee for this verification service.)

Site Plan Tier: Tier Two Site Plan		Tier Three Site Plan
Building and Development Type (Check all that apply)		Site Transaction History
Detached	General	Subdivision case #: _____
Attached	Mixed use	Scoping/sketch plan case #: _____
Townhouse	Civic	Certificate of Appropriateness #: _____
Apartment	Cottage Court	Board of Adjustment #: _____
Tiny house	Frequent Transit	Zoning Case #: _____
Open lot	Development Option	Design Alternate #: _____
GENERAL INFORMATION		
Development name:		
Inside City limits?	Yes	No
Property address(es):		
Site P.I.N.(s):		
Please describe the scope of work. Include any additions, expansions, and uses (UDO 6.1.4).		
Current Property Owner(s):		
Company:		Title:
Address:		
Phone #:		Email:
Applicant Name (If different from owner. See "who can apply" in instructions):		
Relationship to owner:	Lessee or contract purchaser	Owner's authorized agent
		Easement holder
Company:		Address:

Phone #:	Email:
NOTE: please attach purchase agreement or contract, lease or easement when submitting this form.	
Developer Contact:	
Company:	Title:
Address:	
Phone #:	Email:
Applicant Name:	
Company:	Address:
Phone #:	Email:

DEVELOPMENT TYPE + SITE DATE TABLE (Applicable to all developments)	
SITE DATA	BUILDING DATA
Zoning district(s) (please provide the acreage of each):	Existing gross floor area (not to be demolished):
Gross site acreage:	Existing gross floor area to be demolished:
# of parking spaces proposed:	New gross floor area:
Max # parking permitted (7.1.2.C):	Total sf gross (to remain and new):
Overlay District (if applicable):	Proposed # of buildings:
Existing use (UDO 6.1.4):	Proposed # of stories for each:
Proposed use (UDO 6.1.4):	Proposed # of basement levels (UDO 1.5.7.A.6)

STORMWATER INFORMATION	
Imperious Area on Parcel(s): Existing (sf) _____ Proposed total (sf) _____	Impervious Area for Compliance (includes ROW): Existing (sf) _____ Proposed total (sf) _____

RESIDENTIAL & OVERNIGHT LODGING DEVELOPMENTS			
Total # of dwelling units:		Total # of hotel bedrooms:	
# of bedroom units: 1br _____ 2br _____ 3br _____		4br or more _____	
# of lots:	Is your project a cottage court?		Yes No
	A frequent transit development?		Yes No

Continue to Applicant Signature Block on Page Three.

APPLICANT SIGNATURE BLOCK

Pursuant to state law (N.C. Gen. Stat. § 160D-403(a)), applications for development approvals may be made by the landowner, a lessee or person holding an option or contract to purchase or lease land, or an authorized agent of the landowner. An easement holder may also apply for development approval for such development as is authorized by the easement.

By submitting this application, the undersigned applicant acknowledges that they are either the property owner or one of the persons authorized by state law (N.C.G.S. 160D-403(a)) to make this application, as specified in the application. The undersigned also acknowledges that the information and statements made in the application are correct and the undersigned understands that developments approvals are subject to revocation for false statements or misrepresentations made in securing the development approval, pursuant to N.C. Gen. Stat. § 160D-403(f).

The undersigned indicates that the property owner(s) is aware of this application and that the proposed project described in this application will be maintained in all respects in accordance with the plans and specifications submitted herewith, and in accordance with the provisions and regulations of the City of Raleigh Unified Development Ordinance.

The undersigned hereby acknowledges that, pursuant to state law (N.C.G.S. 143-755(b1)), if this permit application is placed on hold at the request of the applicant for a period of six consecutive months or more, or if the applicant fails to respond to comments or provide additional information requested by the City for a period of six consecutive months or more, then the application review is discontinued and a new application is required to proceed and the development regulations in effect at the time permit processing is resumed shall apply to the new application.

Signature: 

Date:

Printed Name:

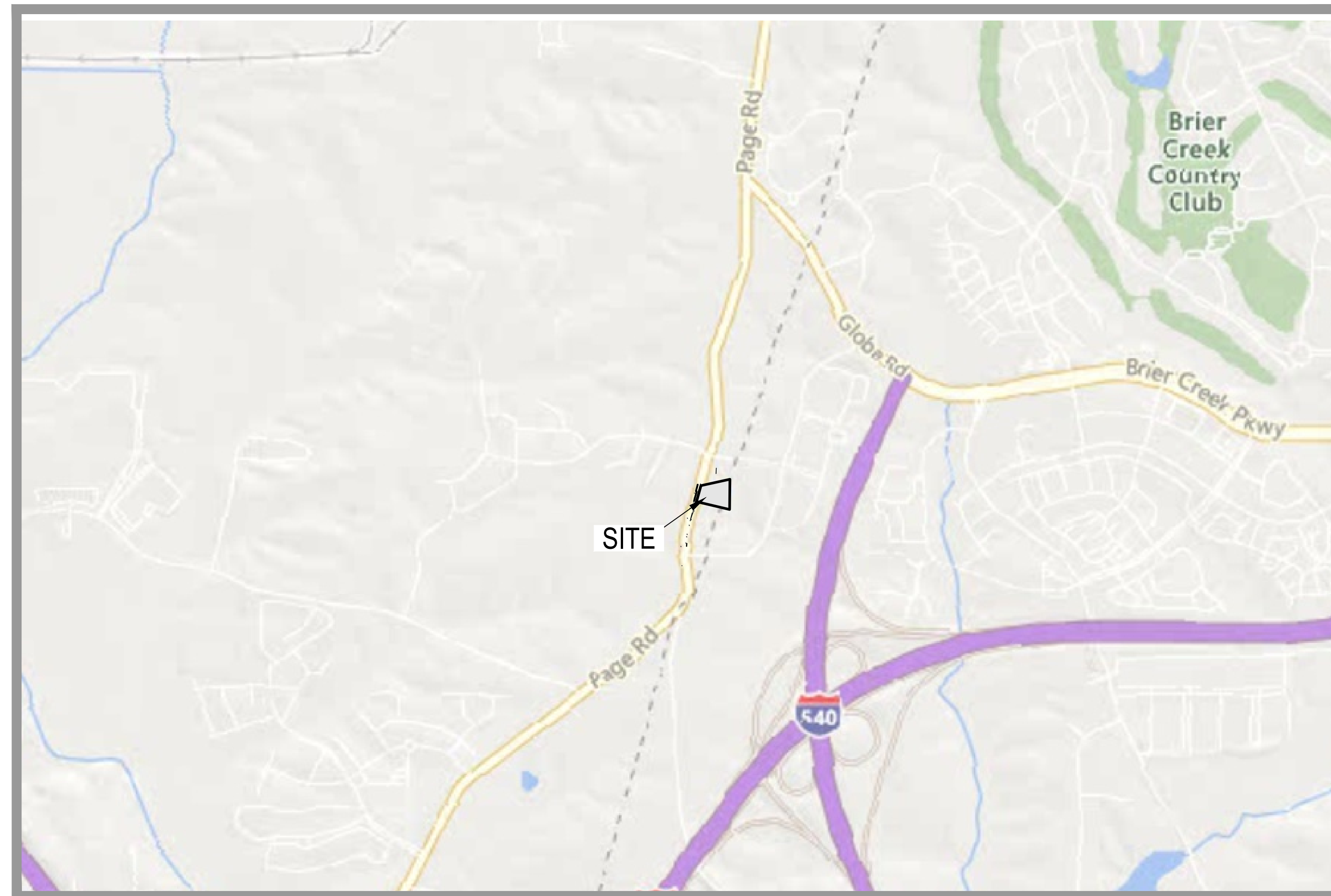
Drawing Index	
Sheet Number	Sheet Title
C0.0	COVER
C0.1	GENERAL NOTES AND FORMS
1 of 1	BOUNDARY & TOPOGRAPHIC SURVEY
C0.2	PROJECT DEMOLITION PLAN
C0.3	PAGE ROAD DEMOLITION PLAN
C1.0	PROPOSED PRIVATE DEVELOPMENT PLAN
C1.5	PROPOSED PUBLIC DEVELOPMENT PLAN
C2.0	PRE EXISTING DRAINAGE AREA MAP
C2.1	POST CONDITION DRAINAGE AREA MAP
C2.2	STORMWATER CALCULATIONS
C2.3	SWPPP
C3.0	OVERALL GRADING PLAN
C3.1	PAGE ROAD WIDENING PLAN AND PROFILE 1
C3.2	EXISTING STORMWATER OUTFALL TO SITE PLAN AND PROFILE 1
C3.3	EXISTING STORMWATER OUTFALL TO SITE PLAN AND PROFILE 2
C3.4	STORMWATER POND OUT FALL PLAN AND PROFILE
C3.5	STORMWATER POND CROSS SECTIONS
C3.6	ENTRY STORM WATER PLAN AND PROFILE
C3.7	STORM WATER PLAN AND PROFILE 3
C4.0	OVERALL UTILITY PLAN
C4.1	ONSITE SEWER LATERAL PLAN AND PROFILE
C4.2	PAGE ROAD WATER MAIN EXTENSION PLAN AND PROFILE 1
C4.3	PAGE ROAD WATER MAIN EXTENSION PLAN AND PROFILE 2
C5.0	EROSION CONTROL PLAN
C6.0	TYPICAL STREET SECTIONS AND DETAILS
C6.1	SITE DETAILS
C6.2	SITE DETAILS 2
C6.3	SITE DETAILS 3
C6.4	PARKING DETAILS
C6.5	RETAINING WALL AND GRADING DETAILS
C6.6	STORMWATER DETAILS 1
C6.7	STORMWATER DETAILS 2
C6.8	EROSION CONTROL DETAILS
C6.9	WATER DETAILS 1
C6.10	WATER DETAILS 2
C6.11	WATER DETAILS 3
C6.12	WATER DETAILS 4
C6.13	SEWER DETAILS

State of North Carolina Morrisville

PLANS OF PROPOSED

3601 Page Road - ADMINISTRATIVE SITE REVIEW

Real Engineering Inc. and Strong ARM Consulting LLC Project No. 2023121402
City of Raleigh Previously Reviewed under Case No. ASR-0015-2022



VICINITY MAP

NOT TO SCALE

Raleigh, North Carolina

SITE DATA SUMMARY	
LOT	
General Site Data	
Owner & Developer	KA Property Holdings NC LLC 241 Bally Shannon Way Apex NC 27539
Deed Book/Page and PIN	009462/000727 0758-91-5880
ZONING	IX-3-CY
OVERLAY DISTRICT	NONE
FLOOD PLAIN/FIRM PANEL NO.	Zone X; 3720075800K July 19, 2022
WATERSHED PROTECTION	NONE
RIGHT OF WAY DEDICATION	24.50' WIDTH OF ADDITIONAL RIGHT OF WAY 4797 SF /0.11 ACRES ADDITIONAL RIGHT OF WAY
TOTAL SITE AREA	2,1526 ACRES/93,767 SF
PROJECT AREA	2.24 ACRES/97,741 SF
LAND USE	LIGHT INDUSTRIAL
BUILDING DATA	COMMERCIAL WAREHOUSE AND OFFICE
	Building 1 24,995 SF (Net)
BUILDING HEIGHT - Stories/Feet	Building 1 1 Story - 24'-0"
BICYCLE PARKING	Required: Short Term: 7 spaces (1 per 5000 SF, 4 min.) Long Term: 0 spaces
BUILDING & PARKING SETBACKS	Building Front: 3' Side: 0' or 6' Rear: 0' or 6' Parking Primary Street 10' Side Lot 0' or 3' Rear Lot 0' or 3'
TREE CONSERVATION	In Compliance
TRANSPARENCY	Ground Floor: 20% req of 124' wall - 25 LF of wall
IMPERVIOUS AREA (EXISTING)	1492 SF (1.58%)
IMPERVIOUS AREA (PROPOSED)	57934.80 SF (61.57%)

SITE DATA SUMMARY	
LOT	
LOT COVERAGE	29%
FLOOR AREA RATIO	0.0292
Parking Calculations	
PARKING REQUIREMENTS	Office: 1 Per 200 SF
PARKING REQ'D	6 Regular stalls; 1 HC stalls - 7
PARKING PROVIDED	49 Total parking stalls: 2 HC stalls; 44 regular stalls; 3 Semi stalls
HC PARKING REQ'D	1 - Total HC;
HC PARKING PROVIDED	0-Regular HC, 2-Van accessible - Total: 2

SOLID WASTE COMPLIANCE STATEMENT
DEVELOPERS HAVE REVIEWED AND ARE IN COMPLIANCE WITH THE REQUIREMENTS SET FORTH IN THE "SOLID WASTE DESIGN MANUAL"

DATA FROM ITE TRIP GENERATION MANUAL 10TH EDITION
CODE 710 GENERAL OFFICE 2.45 PER 1000 SF GRA (1.5) 3.67 TRIPS
TRIPS GENERATED 3.67 TRIPS
RSDM REQUIREMENT FOR TRIPS >150

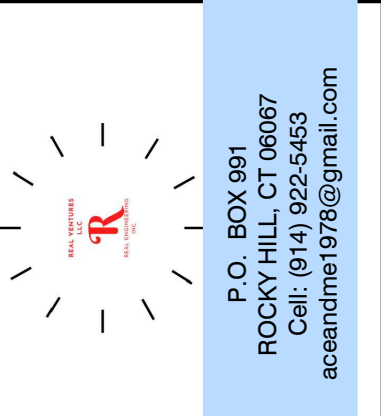
NO TRAFFIC IMPACT ANALYSIS IS REQUIRED FOR THIS PROJECT.

Z-35-08 CONDITIONAL USE	
ZONING	THOROUGHFARE DISTRICT CUD
OVERLAY DISTRICT	NONE
DWELLING UNITS.	NOT PERMITTED
ALLOWABLE OFFICE SQUARE FOOTAGE	NO MAXIMUM SPECIFIED
ALLOWABLE RETAIL SQUARE FOOTAGE	NO MAXIMUM SPECIFIED
ALLOWABLE GROUND SIGNS	HIGH PROFILE

NARRATIVE TO CONDITIONS:
1. ZONING: THIS PLAN IS IN COMPLIANCE WITH THOROUGHFARE DISTRICT ZONING AS IT RELATES TO COMMERCIAL DEVELOPMENT.
2. OVERLAY DISTRICT: THIS PLAN HAS NO OVERLAY DISTRICT ELEMENTS.
3. DWELLING UNITS: THIS PLAN PROPOSED COMMERCIAL DEVELOPMENT AND NO RESIDENTIAL UNITS ARE PLANNED.
4. ALLOWABLE OFFICE SQUARE FOOTAGE: PRIMARY USE FOR THIS DEVELOPMENT IS WAREHOUSE AND ANY OFFICE SQUARE FOOTAGE IS ANCILLARY TO THE PRIMARY USE.
5. ALLOWABLE RETAIL SQUARE FOOTAGE: PRIMARY USE FOR THIS DEVELOPMENT IS WAREHOUSE AND ANY RETAIL SQUARE FOOTAGE IS ANCILLARY TO PRIMARY USE.
6. ALLOWABLE GROUND SIGNS: ANY SIGN DESIGN SHALL BE IN COMPLIANCE WITH THE ALLOWABLE GROUND SIGN CONDITION FOR THIS PROJECT.
BLOCK EXEMPTIONS:
ACCORDING TO UDO SECTION 8.3.2.a.1.b.1 THE SITE TO BE DEVELOPED MUST MEET THE MINIMUM APPLICABLE SITE ARE FOUND IN THE TABLE I SEC. 8.3.2.a.2.b. OUR SITE IS 2.16 ACRES WHICH IS LESS THAN THE 9.0 ACRE MINIMUM STATED IN THE AFOREMENTIONED TABLE.

REVISIONS
New Submittal - ASR City comments 06/30/2022

DESIGNED BY: HDB/AC
DRAWN BY: HDB
CHECKED BY: AC
DATE: _____
SCALE: _____



2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

SHEET TITLE
COVER

C0.0
OF 37
PROJECT NO.
2023121402

OWNER/APPLICANT/DEVELOPER
KA Property Holdings NC, LLC
241 Bally Shannon Way
Apex, NC 27539
Phone: 571-344-4252

SURVEYOR
Angle Right Land Surveying, PLLC
3008 Anderson Dr. Suite 160
Raleigh, NC 27609
Telephone: 919-810-4324

SCALES
1" = _____
IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

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Site Plan Tier: Tier Two Site Plan [] Tier Three Site Plan [x]
Building and Development Type (Check all that apply)
[] Detached [x] General
[] Attached [] Mixed use
[] Townhouse [] Civic
[] Apartment [] Cottage Court
[] Tiny house [] Frequent Transit Development Option
[] Open lot

GENERAL INFORMATION
Development name: 3601 Page Road
Inside City limits? Yes [x] No []
Property address(es): 3601 Page Road Morrisville, NC 27560
Site P.I.N.(s): 0758915380
Please describe the scope of work. Include any additions, expansions, and uses (UDO 6.1.4). DEVELOPEMENT OF A ONE STORY, 24,995 SF COMMERCIAL WAREHOUSE SPACE WITH A 1,500 SF OFFICE SPACE ALONG WITH ONSITE PARKING. THE DEVELOPEMENT SHALL BE SERVICED BY CITY OF RALEIGH PUBLIC UTILITIES.

Current Property Owner(s): Kumar Chandran
Company: KA Property Holdings NC LLC Title: Owner/Applicant
Address: 241 Bally Shannon Way Apex, NC 27539
Phone #: 571-344-4252 Email: kumar.chandran@kapropertyholdings.com
Applicant Name (If different from owner. See "who can apply" in instructions):
Relationship to owner: [] Lessee or contract purchaser [] Owner's authorized agent [] Easement holder
Company: KA Property Holdings NC LLC Address:

Phone #: _____ Email: _____
NOTE: please attach purchase agreement or contract, lease or easement when submitting this form.
Developer Contact: Andy Chakraborty
Company: Real Ventures LLC, Real Engineering Inc Title: PE
Address: PO Box 991 Rocky Hill CT 06067
Phone #: 914-922-5453 Email: aceandme1978@gmail.com
Applicant Name: _____ Address: _____
Company: _____
Phone #: 914-922-5453 Email: _____

Table with 2 columns: SITE DATA, BUILDING DATA. Includes zoning district, gross site acreage, # of parking spaces, max # parking permitted, overlay district, existing use, and proposed use.

STORMWATER INFORMATION
Imperious Area on Parcel(s): Existing (sf) 1,492 Proposed total (sf) 57,935
Impervious Area for Compliance (includes ROW): Existing (sf) 148 Proposed total (sf) 7,433

RESIDENTIAL & OVERNIGHT LODGING DEVELOPMENTS
Total # of dwelling units: _____ Total # of hotel bedrooms: _____
of bedroom units: 1br _____ 2br _____ 3br _____ 4br or more _____
of lots: _____ Is your project a cottage court? [] Yes [] No
A frequent transit development? [] Yes [] No

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Signature: _____ Date: 05/31/2024
Printed Name: Saravanakumar Chandran

4/29/2022
SARAVANAKUMAR CHANDRAN
KA PROPERTY HOLDINGS NC LLC
3601 Page Rd
Morrisville, NC 27560

SARAVANAKUMAR CHANDRAN:

From recommending the right plan to providing reliable pickups, we're here to meet your business' needs.

Thank you for the opportunity to provide services for your business. At Republic Services, our most important relationships are the ones we have with our customers. We look forward to our partnership and to helping make recycling and waste removal easy.

We collect over 100 million tons of recycling and waste per year, and we will do our part in providing reliable services to meet your business needs. From responsible practices to on-time pickups, you can count on us to help keep your business running smoothly. We're here to make your life easier and our planet better with the following:
99.9% reliable pickup rate
30,000+ nationwide employees
340 collection operations
190 landfills
61 recycling centers

As a Republic Services customer, you can sign up for and use our online tool My Resource™. With this tool, you can easily manage your account anytime, anywhere, on any device. With the touch of a button you can do the following:
Pay your bill
Schedule a pickup
Discover and order new products and services
Receive weather and holiday service updates

Sign up at RepublicOnline.com

Attached you will find our proposal which outlines our recommended services configured to meet your business' needs. Let us help you simplify your vendor management by handling all your recycling and waste needs.

Thank you again for this opportunity. Please contact me with any questions.
Carolyn Moss
Republic Services, Inc.
Inside Sales Consultant Sm Lg Container
CMoss@republicservices.com

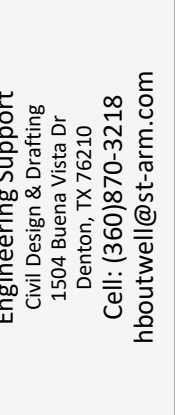
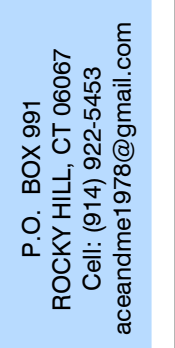
Assets and statistics referenced in this letter are based on operations of all Republic Services companies nationwide. Local company information may differ.

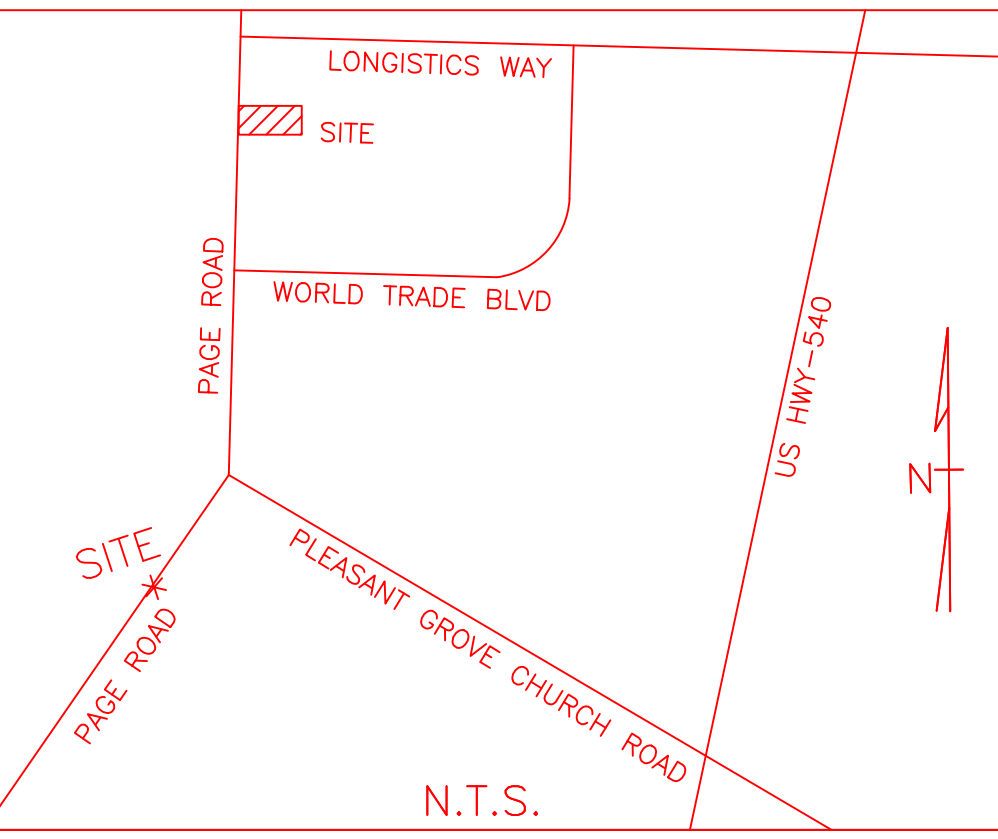


We'll handle it from here.™

GENERAL NOTES:
A. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF Raleigh SUBDIVISION REGULATIONS.
B. WHERE SPECIFIED NAME BRANDS ARE INDICATED, PRODUCTS OF EQUAL OR BETTER MAY BE CONSIDERED FOR APPROVAL UPON SUBMITTAL OF ALL SUPPORTING DATA TO THE CITY ENGINEER FOR REVIEW.
C. ALL VALVES, VALVE STACKS AND COVERS ON ABANDONED WATER MAINS SHALL BE REMOVED COMPLETELY; SURFACE SHALL BE REPAIRED TO MATCH EXISTING.
D. CONTRACTOR SHALL CONTACT TRANSPORTATION DEPARTMENT FOR THE REMOVAL OF CITY OR CITY SIGNS IN RIGHT-OF-WAY.
PIPE:
A. WATER MAINS UP TO 12" DIAMETER SHALL BE HDPE DR 11 (CLASS 150), OR PVC DR14 C900 (CLASS 200), WATER MAINS GREATER THAN 12" IN DIAMETER MAY BE ONE OF THE FOLLOWING:
1. REINFORCED CONCRETE CYLINDER PIPE (RCCP) C303 PRESSURE CLASS 150 OR GREATER AS SPECIFIED BY THE ENGINEER.
2. PVC PIPE SHALL BE DR18 C900 (CLASS 235) OR AS APPROVED BY THE ENGINEER.
B. PVC PIPE SHALL NOT BE USED FOR MAINS GREATER THAN 24" IN DIAMETER.
C. EMBEDMENT:
1. EMBEDMENT SHALL BE AS PER THE "PIPE EMBEDMENT DETAIL" ON THE WATER DETAILS SHEETS UNLESS SPECIFIED OTHERWISE BY THE ENGINEER.
2. FOR PIPE SIZES LARGER THAN 12", MINIMUM EMBEDMENT SHALL BE 14"-34" CRUSHED STONE 6" BELOW PIPE TO 6" ABOVE PIPE UNLESS SPECIFIED OTHERWISE BY THE ENGINEER.
D. COVER THE FOLLOWING MINIMUM COVERS OVER THE WATERLINE ARE REQUIRED:
1. 42" OF COVER OVER WATERLINES 8" IN DIAMETER OR LESS
2. 48" OF COVER OVER WATERLINES 12" IN DIAMETER.
3. 60" TO 72" OF COVER OVER WATERLINES LARGER THAN 12" IN DIAMETER. NOTE: WATER MAINS BURIED WITH OVER 72" OF COVER SHALL BE APPROVED BY THE CITY ENGINEER.
E. STORAGE: HDPE AND PVC WATER PIPE IS ALLOWED TO BE STORED A MAXIMUM OF SIX (6) MONTHS WITHOUT COVER. THEREAFTER ALL PIPES SHALL BE COVERED OR KEPT AWAY FROM SUNLIGHT AND SHALL BE PROTECTED FROM OTHER ELEMENTS.
F. INSTALLATION:
1. EITHER BLUE OR WHITE PVC WATER PIPE IS ACCEPTABLE FOR THE INSTALLATION. HOWEVER, WHEN EITHER COLOR PVC PIPE IS USED, THE CONTRACTOR IS RESPONSIBLE TO INSTALL THE PIPE IN A WAY THAT THE WRITING ON THE PIPE IS INSTALLED ON THE SIDE UP AND IS READABLE FROM THE TOP OF THE DITCH.
2. ALL WATER MAINS, VALVES, FITTINGS, ETC. MADE WITH DUCTILE IRON OR FERROUS METAL SHALL BE WRAPPED WITH 8 MIL POLYWRAP.
G. BEVELLED ENDS OF THE PIPE SHALL BE REMOVED WHEN USED IN MJ FITTING
H. CASINGS: WHEN PVC WATER PIPE IS INSTALLED IN CASING, SKIDS MUST BE USED TO PREVENT DAMAGE TO THE PIPE AND COOKE DURING INSTALLATION. PVC PIPE SHOULD NOT REST ON THE COOKES. PLASTIC SPACERS SUCH AS RAGI OR APPROVED EQUAL SHALL BE USED.
I. PLACE PIPE WITH LETTERING FACING UP (ON TOP OF PIPE)
J. MAXIMUM PIPE DEFLECTION SHALL BE AS RECOMMENDED BY MANUFACTURER
K. DUCTILE IRON PIPE WHERE SPECIFIED BY THE ENGINEER SHALL HAVE CEMENT-MORTAR LINING PER AWWA C104 SPECIFICATIONS AND SHALL BE OF A MINIMUM THICKNESS CLASS 51 OR GREATER AND HAVE A MINIMUM 8 MILS POLYWRAP.
FITTINGS:
A. THE CONTRACTOR MAY USE CAST IRON OR DUCTILE IRON FITTINGS, COMPLETE WITH EPOXY COATING AND 8 MIL (MIN.) POLYWRAP
B. ALL FITTINGS SHALL BE BLOCKED AS PER DETAILS ON THIS SHEET.
C. ALL FITTINGS SHALL BE MJ UNLESS SPECIFIED OTHERWISE. PVC FITTINGS ARE NOT ALLOWED
D. ALL BENDS, TEES AND PLUGS SHALL HAVE RETAINER GLANDS.
E. USE AWWA C110 DUCTILE IRON FITTINGS FOR PIPES 3"-48" IN DIAMETER AND AWWA C153 FOR DUCTILE IRON COMPACT FITTINGS FOR PIPES 3"-16" IN DIAMETER
F. DUCTILE IRON INTEGRAL RESTRAINED JOINT FITTINGS ARE PERMISSIBLE FOR PVC AND DUCTILE IRON PIPE SIZES 4"-12" IN DIAMETER; NOTE: CONCRETE BLOCKING IS NOT REQUIRED WITH THESE FITTINGS.
G. ALL DUCTILE IRON AND CAST IRON FITTINGS SHALL BE MANUFACTURED IN THE UNITED STATES.
H. POLYWRAP SADDLES WITH 8 MIL POLYWRAP.
VALVES:
A. VALVES INSTALLED ON WATERLINES 12" IN DIAMETER OR LESS SHALL BE VERTICAL GATE VALVES
B. VALVES INSTALLED ON WATERLINES LARGER THAN 12" IN DIAMETER SHALL BE DIRECT BURY BUTTERFLY VALVES WITH A VALVE BOX. PLEASE NOTE THAT SPECIAL FITTINGS SHALL BE INSTALLED TO ALLOW POLY-PIGGING OF NEW INSTALLATIONS. COST INCIDENTAL TO PROJECT OVERALL
C. BUTTERFLY VALVES SHALL CONFORM TO AWWA C504 STANDARDS LATEST REVISION.
D. BUTTERFLY VALVES SHALL BE MUELLER, CLOW, PRATT, M&H OR AN APPROVED EQUAL.
E. ALL GATE VALVES SHALL HAVE NON-RISING STEMS AND RESILIENT SEATED WEDGE
F. ALL VALVES AND FIRE HYDRANTS SHALL BE IN LINE WITH THE PROPERTY LINE, WHERE POSSIBLE.
G. ALL VALVE LOCATIONS SHALL BE MARKED WITH "V" STAMPED OR CUT ON THE CURB.
H. ALL STUB-OUT VALVES TO HAVE A MINIMUM 20' JOINT OF PIPE.
I. ALL VALVES TO BE FLANGED VALVES OR ANCHOR COUPLE TO TEE WHERE APPLICABLE.
TESTING:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FOLLOWING:
1. PURGING BY USING THE "POLY-PIG" METHOD TO ENTER AND EXIT AT APPROVED STRATEGIC LOCATIONS AND TO INCLUDE ALL EQUIPMENT, MATERIAL, FITTINGS, AND LABOR.
2. HYDROSTATIC TEST.
3. STERILIZATION.
4. SPECIFICATIONS AND AS APPROVED BY THE CITY ENGINEER.
5. ALL TEMPORARY TEST POINTS TO HAVE CORPORATION STOPS AT THE MAIN.
6. ALL TEMPORARY TESTING & CHLORINATION POINTS SHALL BE REMOVED AT THE CORPORATION, PRIOR TO FINAL ACCEPTANCE.
7. ONE WATER SAMPLE PER EACH STREET NAME, OR AS APPROVED BY THE CITY ENGINEER.
(i) PLEASE REFER TO THE STANDARD GENERAL TESTING REQUIREMENTS FOR WATER, WASTEWATER, STORM DRAIN AND PAVEMENT CONSTRUCTION DETAIL SHEET.
(ii) THE CITY WILL PROVIDE BACKFILL, DENSITY AND CONCRETE TESTING FOR ALL PROJECTS UNLESS SPECIFIED OTHERWISE. ALL REPORTS SHALL BE TURNED IN TO THE INSPECTOR WITHIN FIVE (5) WORKING DAYS.
MATERIAL:
A. ALL MATERIAL INCORPORATED IN THE CONSTRUCTION SHALL BE NEW.
PRIVATE DEVELOPMENT PROJECTS:
A. THE DEVELOPER/OWNER SHALL PROVIDE ESCROW FUNDS FOR GEOTECHNICAL AND MATERIAL TESTING FOR BACKFILL, DENSITY AND CONCRETE TESTING PRIOR TO BEGINNING ANY CONSTRUCTION.

REVISIONS: New Submittal - ASR City comments 06/30/2022
APPROVALS: DESIGNED: _____ DRAWN: _____ CHECKED: _____ DATE: _____ SCALE: _____
ENGINEERED BY: [Signature]
PREPARED BY: [Signature]
PROJECT LEGAL: 2.16 AC DB 5766, PG 984 PIN: 0758.03-32-9153 Triangle Township Durham County, NC
GENERAL NOTES AND FORMS
SHEET NO. C0.1 OF 37 PROJECT NO. 2023121402

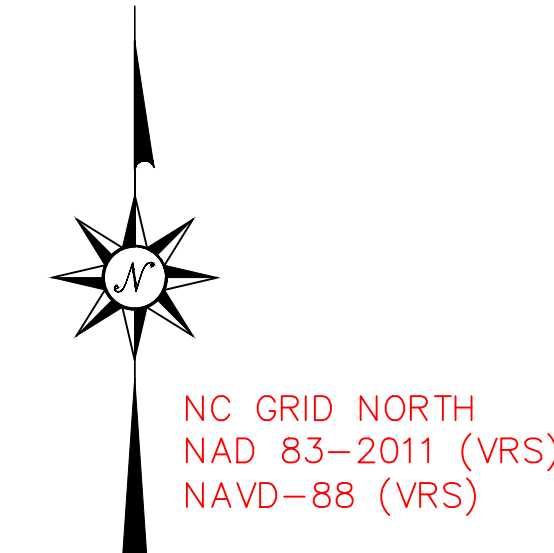




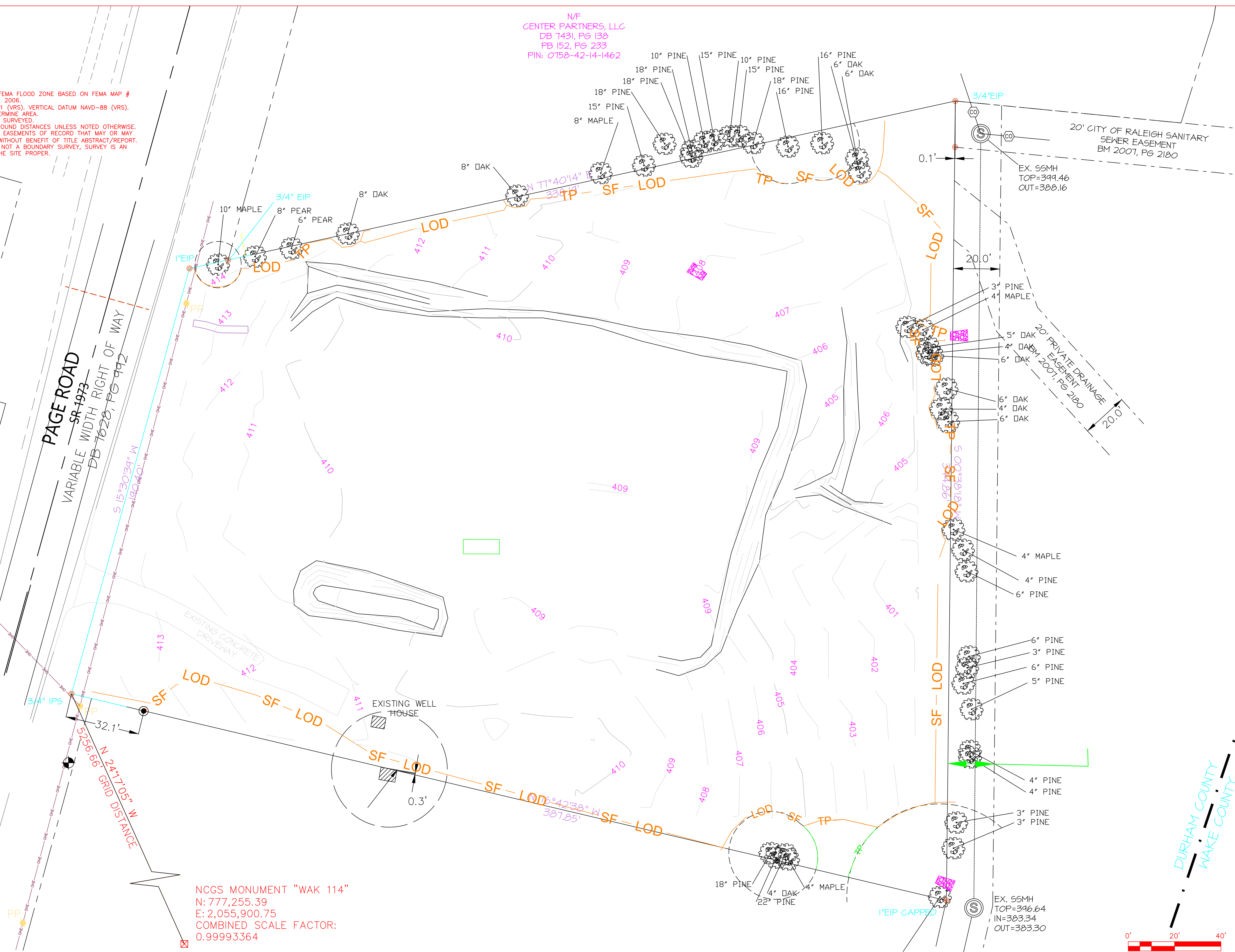
- LEGEND**
- ⊙ EIP EXIST. IRON PIPE
 - △ CALCULATED POINT
 - PP POWER POLE
 - ★ LP LIGHT POLE
 - ⊙ W WATER METER
 - ⊙ C CLEANOUT
 - ⊙ G GAS METER
 - ⊙ E ELECTRIC METER
 - ⊙ V WATER VALVE
 - EXISTING WOOD FENCE
 - POWER LINE
 - ⊙ GAS VALVE
 - ⊙ FIBER OPTIC MARKER
 - ⊙ SEWER MANHOLE
 - ⊙ FIBER VAULT
 - ##### ADDRESS

REFERENCES:
 PB 2007, PG 2180
 PB 159, PG 231
 PB 19, PG 77
 BM 2007, PG 2180
 DB 9452, PG 727
 OTHERS AS NOTED

NOTE:
 1. THIS PROPERTY IS NOT WITHIN AN FEMA FLOOD ZONE BASED ON FEMA MAP # 3720075800J EFFECTIVE DATED MAY 2, 2006.
 2. HORIZONTAL DATUM IS NAD 83/2011 (VRS), VERTICAL DATUM NAVD-88 (VRS).
 3. COORDINATE METHOD USED TO DETERMINE AREA.
 4. ALL DASHED LINES HAVE NOT BEEN SURVEYED.
 5. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES UNLESS NOTED OTHERWISE.
 6. THIS PROPERTY IS SUBJECT TO ALL EASEMENTS OF RECORD THAT MAY OR MAY NOT BE SHOWN. SURVEY CONDUCTED WITHOUT BENEFIT OF TITLE ABSTRACT/REPORT.
 7. NOT FOR SALES OR CONVEYANCES, NOT A BOUNDARY SURVEY, SURVEY IS AN UPDATED TOPOGRAPHIC SURVEY FOR THE SITE PROPER.



N/F
 CENTER PARTNERS, LLC
 DB 1431, PG 138
 PB 152, PG 233
 PIN: 0758-42-14-1462



NCGS MONUMENT "WAK 114"
 N: 777,255.39
 E: 2,055,900.75
 COMBINED SCALE FACTOR:
 0.99993364

THAT THE SURVEY IS OF AN EXISTING FEATURE, SUCH AS A BUILDING OR OTHER STRUCTURE, OR NATURAL FEATURE, SUCH AS A WATERCOURSE.

I, MICHAEL P. TUTT, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION AND THAT THE RATIO OF PRECISION OR POSITIONAL ACCURACY AS CALCULATED IS 1:26,025. WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS 10TH DAY OF JUNE, A.D., 2024.

NOT A CERTIFIED DOCUMENT, ORIGINALLY SIGNED AND SEALED BY MICHAEL P. TUTT, PLS ON 6-10-24

SURVEYOR REGISTRATION NUMBER L-4443 DATE

ANGLE RIGHT LAND SURVEYING, PLLC
 SURVEYING THE PAST AND THE FUTURE TODAY
 919-810-4324
 P-0446 LIC#
 3008 ANDERSON DRIVE, SUITE 160 RALEIGH, NC 27609

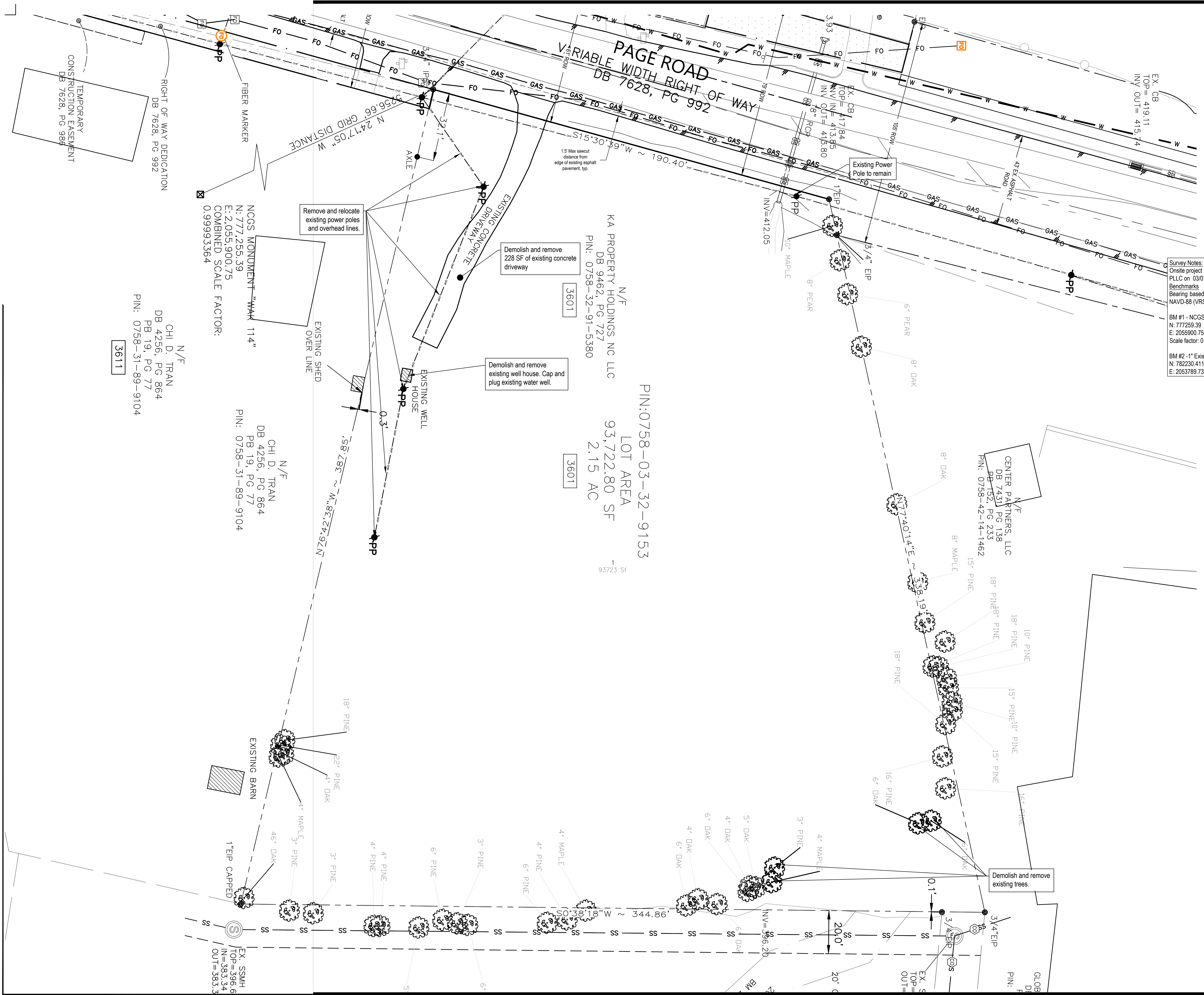
REV.	DESCRIPTION	BY	DATE

UPDATED TOPOGRAPHIC SURVEY OF:
3601 PAGE ROAD
 TRIANGLE TOWNSHIP, DURHAM COUNTY, CITY OF RALEIGH, NC
 OWNER: KA PROPERTY HOLDINGS, LLC
 241 BALLY SHANNON WAY APEX, NC 27539

SURVEYOR: ANGLE RIGHT LAND SURVEYING
 RALEIGH ETJ ZOND IX-3-CU
 DATE OF SURVEY: 15-16-24
 JOB NUMBER: 21_327 PAGE ROAD
 SCALE: 1"=20'
 PAGE 1 OF 1



DURHAM COUNTY
 WAKE COUNTY



FLOOD STATEMENT: According to Community Panel No. 372008700K, dated Dec 06, 2019, of the Federal Emergency Management Agency, National Flood Insurance Program Map.

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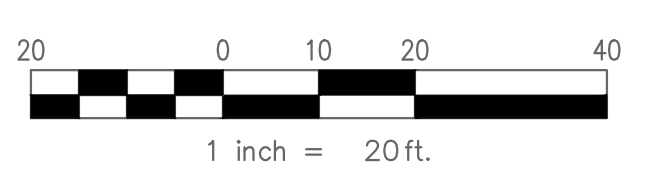
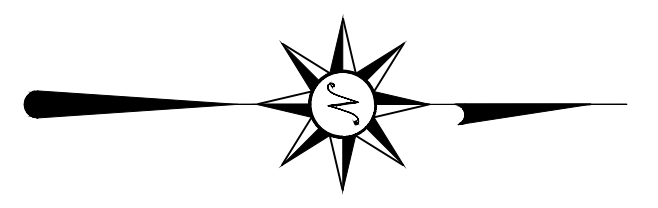
- NOTES:
- EXISTING CONDITIONS INFORMATION PROVIDED BY Angle Right Land Surveying, PLLC PERFORMED ON 12/16/2021.
 - THE UTILITY LOCATIONS SHOWN ARE AS MARKED BY THEIR OWNERS. FROM THE OWNERS RECORDS OR FROM FIELD EVIDENCE. THE SIZE AND LOCATION OF UNDERGROUND UTILITIES WAS NOT VERIFIED BY EXCAVATION. THE OWNER/CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING UTILITIES DURING CONSTRUCTION.
 - ELEVATIONS BASED ON NAD83 DATUM DERIVED FROM STATIC GPS OBSERVATIONS.
 - EXISTING SEPTIC AND DRINKING WATER SYSTEMS MAY EXIST BUT WERE NOT LOCATED DURING SURVEY. OWNER/CONTRACTOR TO LOCATE AND REMOVE IF FOUND.
 - EXISTING MAILBOX LOCATIONS WERE NOT LOCATED. FIELD VERIFY LOCATIONS BEFORE COMMENCING WITH ANY OFFSITE CONSTRUCTION ACTIVITY.

Survey Notes:
Onsite project survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
Benchmarks
Bearing based on North Carolina Grid North, NAD83/2011 (VRS). Vertical datum NAVD-88 (VRS); US survey feet, derived from GPS observations.

BM #1 - NCGS Monument "WAK 114"
N: 777259.39
E: 2055900.75
Scale factor: 0.99993364

BM #2 - 1" Existing Iron Pin, Northwest property corner. El. 416.00'
N: 782230.4116
E: 2053789.7322

- Legend**
- Existing Curb/Gutter
 - Existing Fence
 - Existing Property Line
 - Existing Manhole
 - Existing Vault
 - Existing Electric Meter
 - Existing Sanitary Sewer Cleanout
 - Existing Water Valve
 - Existing Power Pole
 - Existing Property Corner
 - Existing Gas Meter
 - Existing Light Pole
 - Existing Tree
 - Existing Aerial Power Line



SCALES
IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REVISIONS: 06/30/2022 New Submittal - ASR City comments

APPROVALS: DESIGNED: HDB/AC DRAWN: HDB CHECKED: AC DATE: 02/01/2024 SCALE: _____

ENGINEERED BY: [Signature]

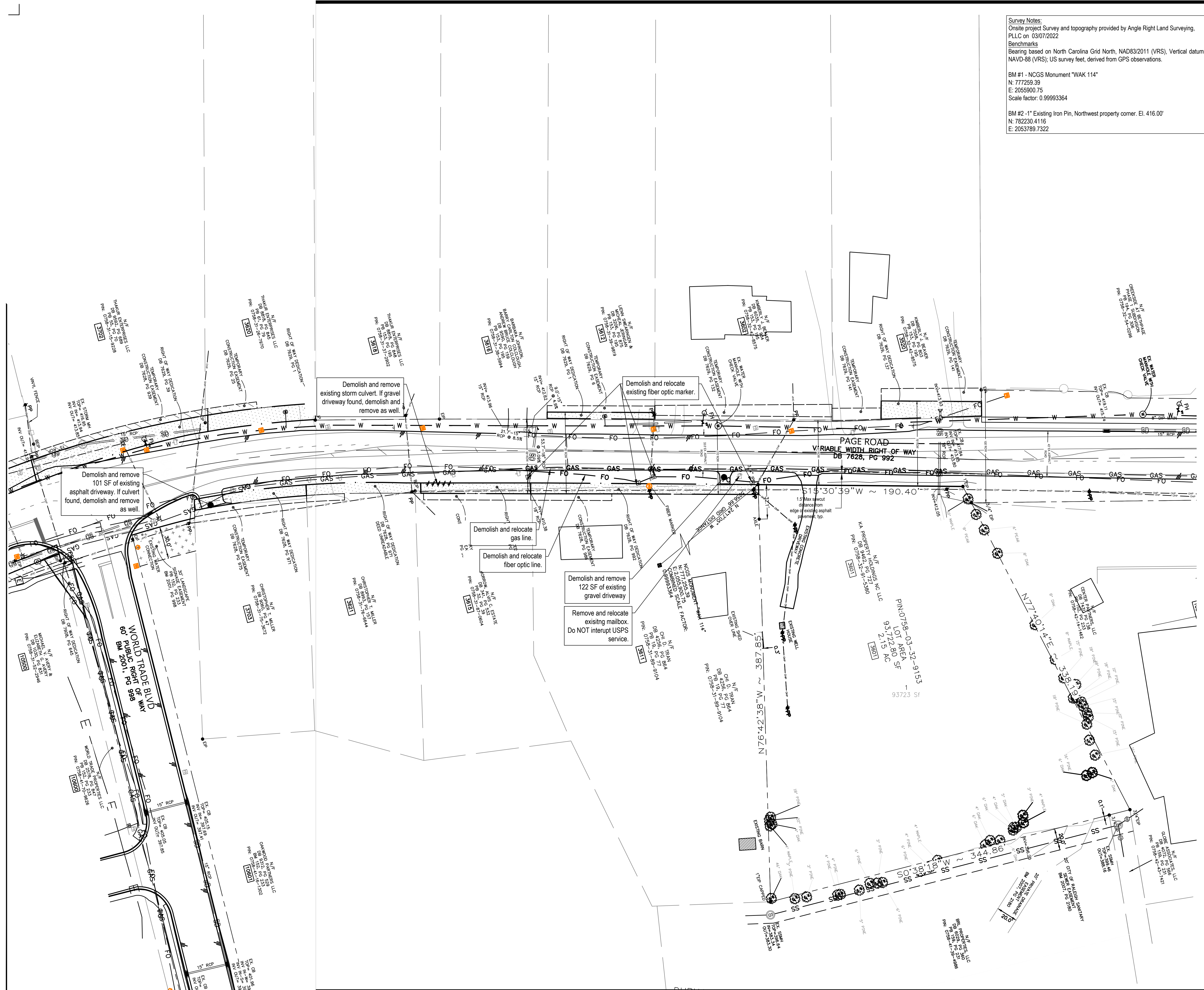
PREPARED BY: [Signature]

PROJECT LEGAL: 2.16 AC DB 5766, PG 984 PIN: 0758-03-32-9153 Triangle Township Durham County, NC

PROJECT LOCATION: 3601 Page Road Morrisville, NC 27560 City of Raleigh Case # ASR-0015-2022

SHEET TITLE: PROJECT DEMOLITION PLAN SHEET NO: C0.2 OF 37 PROJECT NO: 2023121402

P.O. BOX 991
 ROCKY MOUNT, NC 27857
 Cell: (919) 922-5453
 acesandme1978@gmail.com
 hbootwell@st-arm.com



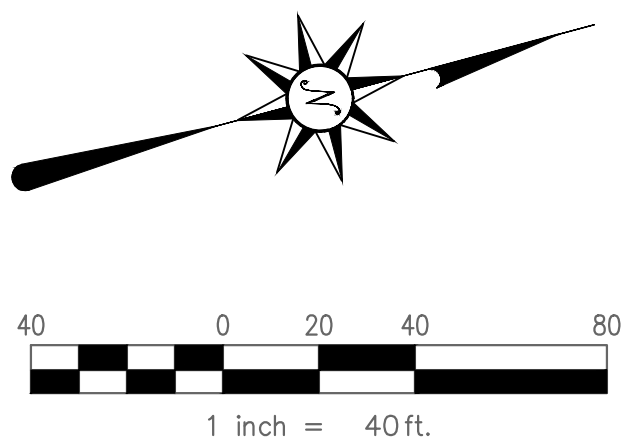
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 E: 2055900.75
 Scale factor: 0.99993364
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 N: 782230.4116
 E: 2053789.7322

FLOOD STATEMENT: According to Community Panel No. 3720088700K, dated Dec 06, 2019, of the Federal Emergency Management Agency, National Flood Insurance Program Map. This property is within several flood zones, Flood Zone "X" (areas determined to be outside 500-year floodplain), which is not a special flood hazard area. This statement shall not create liability on the part of the Surveyor.

- NOTES:**
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 - EXISTING MAILBOX LOCATIONS WERE NOT LOCATED VIA SURVEY. FIELD VERIFY LOCATIONS BEFORE COMMENCING WITH ANY OFFSITE CONSTRUCTION ACTIVITY.
 - CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE USPS MAIL DELIVERY CAN BE MADE TO ANY MAILBOX WITHIN THE PROJECT LIMITS.
 - CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY MAIL BOX LOCATIONS IF A MAILBOX MUST BE REMOVED FOR CONSTRUCTION PURPOSES.
 - CONTRACTOR IS RESPONSIBLE FOR RELOCATING THE EXISTING MAILBOXES WITHIN THE PROJECT LIMITS TO A NEW LOCATION AFTER CONSTRUCTION IS COMPLETE.

Legend

- Existing Curb/Gutter
- Existing Fence
- Existing Property Line
- Existing Manhole
- Existing Vault
- Existing Electric Meter
- Existing Sanitary Sewer Cleanout
- Existing Water Valve
- Existing Power Pole
- Existing Property Corner
- Existing Gas Meter
- Existing Light Pole
- Existing Tree
- Existing Aerial Power Line



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 IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REVISIONS
 New Submittal - ASR City comments 06/30/2022

APPROVALS
 DESIGNED: HDB/AC
 DRAWN: HDB
 CHECKED: AC
 DATE: 02/01/2024
 SCALE:

ENGINEERED BY

 STARR
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27620
 Cell: (919) 922-5453
 aaceandme1978@gmail.com

PREPARED BY
 Stray ARM Consulting
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27620
 Cell: (360) 870-3218
 hboutwell@st-arm.com

PROJECT LEGAL
 2.16 AC
 DB 5766, PG 984
 PIN: 0758.03-32-9153
 Triangle Township
 Durham County, NC

PROJECT LOCATION
 3601 Page Road
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022

SHEET TITLE
 PAGE ROAD DEMOLITION PLAN

SHEET NO.
 C0.3

OF 37
 PROJECT NO.
 2023121402

Survey Notes:
 Onsite project survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022.
Benchmarks
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 Scale factor: 0.99993364
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 E: 2053789.7322

FLOOD STATEMENT: According to Community Panel No. 3720075800K, dated July 19, 2022, of the Federal Emergency Management Agency, National Flood Insurance Program Map. This property is within several flood zones, Flood Zone "X" (areas determined to be outside 500-year floodplain), which is not a special flood hazard area. This statement shall not create liability on the part of the Surveyor.

SITE DATA SUMMARY	
LOT	
General Site Data	
Owner & Developer	KA Property Holdings NC LLC 241 Bally Shannon Way Apex NC 27539
Deed Book/Page and PIN	009462/000727 0758-91-5880
ZONING	IX-3-CY
OVERLAY DISTRICT	NONE
FLOOD PLAN/FIRM PANEL NO.	Zone X; 3720075800K, July 19, 2022
WATERSHED PROTECTION	NONE
RIGHT OF WAY DEDICATION	24.50' WIDTH OF ADDITIONAL RIGHT OF WAY 4797 SF/0.11 ACRES ADDITIONAL RIGHT OF WAY
TOTAL SITE AREA	2,152.6 ACRES/93,722 SF
PROJECT AREA	2.24 ACRES/97,741 SF
LAND USE	COMMERCIAL WAREHOUSE AND OFFICE
BUILDING DATA	Building # 24,995 SF

SITE DATA SUMMARY	
LOT	
BUILDING HEIGHT - Stories/Feet	11 Story - 24'-0"
BICYCLE PARKING	Required: Short Term: 7 spaces (1 per 5000 SF, 4 min.) Long Term: 0 spaces
BUILDING & PARKING SETBACKS	Front: Building 3' Side: 0' or 6' Rear: 0' or 6' Parking: Primary Street 10' Side Lot 0' or 3' Rear Lot 0' or 3'
TREE CONSERVATION TRANSPARENCY	In Compliance Ground Floor: 20% req. of 124' wall = 25 LF of wall
IMPERVIOUS AREA (EXISTING)	1492 SF (1.58%)
IMPERVIOUS AREA (PROPOSED)	57934.80 SF (61.37%)
LOT COVERAGE	26%
FLOOR AREA RATIO	0.0292

SITE DATA SUMMARY	
LOT	
Parking Calculations	
PARKING REQUIREMENTS	Office: 1 Per 200 SF
PARKING REQ'D	6 Regular stalls; 1 HC stalls - 7
PARKING PROVIDED	56 Total parking stalls: 2 HC stalls; 51 regular stalls; 3 Semi stalls.
HC PARKING REQ'D	1 - Total HC;
HC PARKING PROVIDED	0-Regular HC, 2-Van accessible - Total: 2

SOLID WASTE COMPLIANCE STATEMENT
 DEVELOPERS HAVE REVIEWED AND ARE IN COMPLIANCE WITH THE REQUIREMENTS SET FORTH IN THE "SOLID WASTE DESIGN MANUAL"

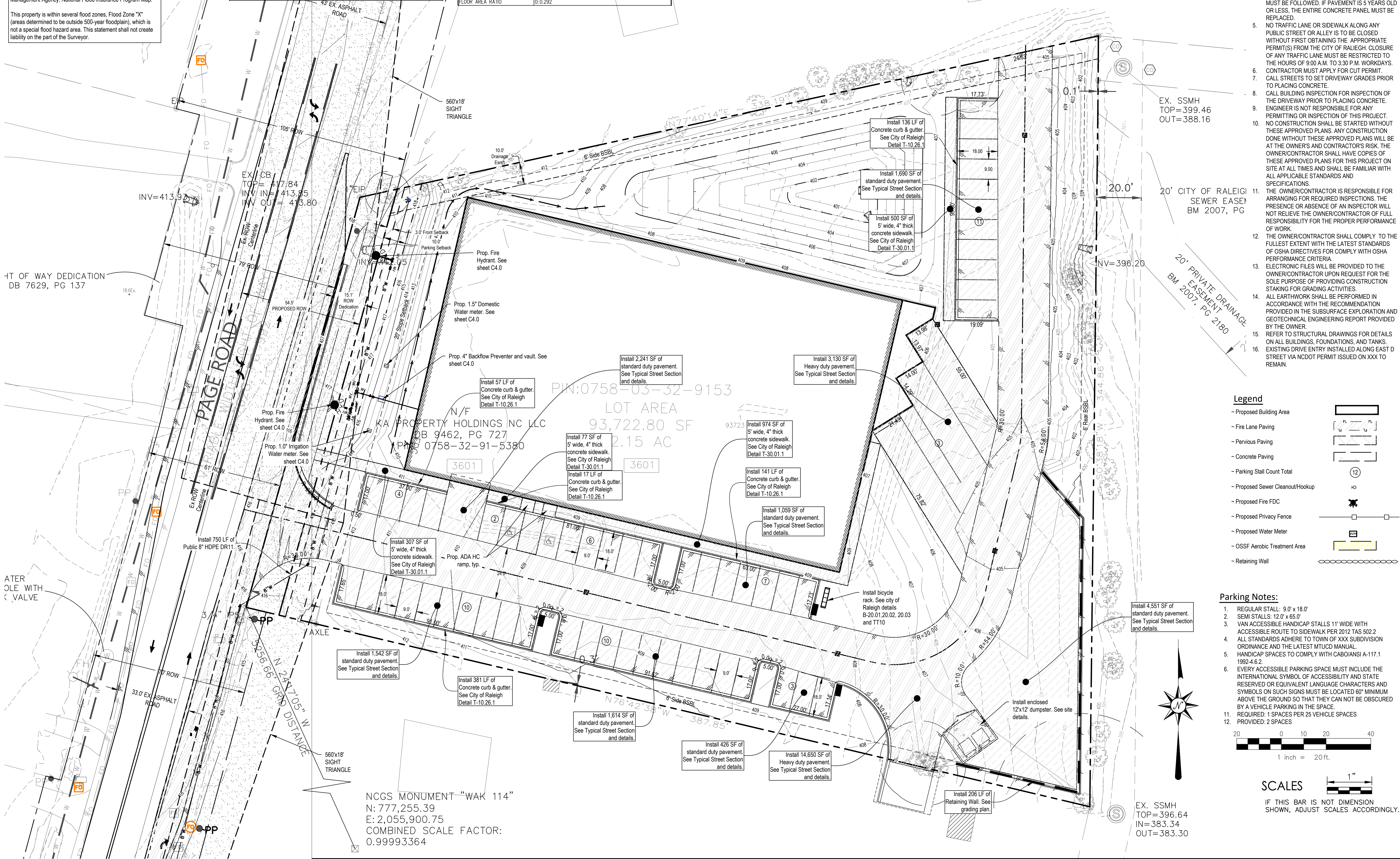
Commercial Setbacks			On Site Requirements - Parking				
Type	Required	Provided	Type	Size	Required	Existing	Provided
Front	20	20 Ft	Standard	9'x18'	6	0	51
Side	6	6	SEMI	12'x65'	0	0	3
Side Street	0	0	Disabled	11'x18' w/5' no parking	1	0	2
Rear	6	6					

SITE COVER:

- TOTAL SITE AREA: 93,722.80 SF (2.15 AC)
- PROPOSED LAND USE: LIGHT INDUSTRIAL
- ZONING: IX-3-CY
- HEIGHT OF BUILDINGS: N/A

SURVEY NOTE:
 These drawings have been prepared without benefit of current title report. There may be conditions or easements that affect this subject property. All existing filed data has been taken from xxx.

- General Notes:**
- ALL STANDARDS ADHERE TO CITY OF RALEIGH SUBDIVISION REGULATIONS LATEST EDITION.
 - ACCORDING TO COMMUNITY PANEL NO. 3720088700K, DATED Dec 06, 2019 OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY, NATIONAL FLOOD INSURANCE PROGRAM MAP, THIS PROPERTY IS WITHIN FLOOD ZONE X.
 - NO PERSON SHALL CONSTRUCT, RECONSTRUCT, ALTER, REPAIR, REMOVE, REPLACE, PAVE, REPAIR, SURFACE OR RESURFACE ANY WALK, DRIVE, CURB, GUTTER, PAVED AREA OR APPURTENANCE ON PUBLIC PROPERTY IN THE CITY WITHOUT FIRST OBTAINING FROM THE BUILDING INSPECTOR A PERMIT SO TO DO.
 - SAWCUT LINES SHOWN ON THE DESIGN PLANS FOR THE REMOVAL AND REPLACEMENT OF CONCRETE PAVEMENT, DRIVES, SLABS, SIDEWALKS, ETC. ARE FOR INFORMATIONAL PURPOSES ONLY. IF PAVEMENT IS MORE THAN 5 YEARS OLD, THE PAVEMENT CUT AND REPAIR STANDARDS MANUAL MUST BE FOLLOWED. IF PAVEMENT IS 5 YEARS OLD OR LESS, THE ENTIRE CONCRETE MUST BE REPLACED.
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 - CALL STREETS TO SET DRIVEWAY GRADES PRIOR TO PLACING CONCRETE.
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 - REFER TO STRUCTURAL DRAWINGS FOR DETAILS ON ALL BUILDINGS, FOUNDATIONS, AND TANKS. EXISTING DRIVE ENTRY INSTALLED ALONG EAST STREET VIA NCDOT PERMIT ISSUED ON XXX TO REMAIN.

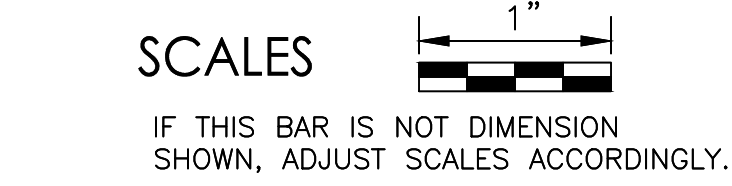


Legend

- Proposed Building Area
- Fire Lane Paving
- Pervious Paving
- Concrete Paving
- Parking Stall Count Total
- Proposed Sewer Cleanout/Hookup
- Proposed Fire FDC
- Proposed Privacy Fence
- Proposed Water Meter
- OSSF Aerobic Treatment Area
- Retaining Wall

Parking Notes:

- REGULAR STALL: 9'0" x 18'0"
- SEMI STALLS: 12'0" x 6'5'0"
- VAN ACCESSIBLE HANDICAP STALLS 11' WIDE WITH ACCESSIBLE ROUTE TO SIDEWALK PER 2012 IAS 502.2
- ALL STANDARDS ADHERE TO TOWN OF XXX SUBDIVISION ORDINANCE AND THE LATEST MUTCD MANUAL
- HANDICAP SPACES TO COMPLY WITH CABO/ANSI A-117.1 1992-4.6.2.
- EVERY ACCESSIBLE PARKING SPACE MUST INCLUDE THE INTERNATIONAL SYMBOL OF ACCESSIBILITY AND STATE RESERVED OR EQUIVALENT LANGUAGE CHARACTERS AND SYMBOLS ON SUCH SIGNS MUST BE LOCATED 60" MINIMUM ABOVE THE GROUND SO THAT THEY CAN NOT BE OBTURED BY A VEHICLE PARKING IN THE SPACE.
- REQUIRED: 1 SPACES PER 25 VEHICLE SPACES
- PROVIDED: 2 SPACES



REVISIONS: New Submittal - ASR City comments 06/30/2022

APPROVALS: DESIGNED: HDB/AC, DRAWN: HDB, CHECKED: AC, DATE: SCALE:

ENGINEERED BY: [Signature]

PREPARED BY: [Signature]

PROJECT LEGAL: 2.16 AC, DB 5766, PG 984, PIN: 0758.03-32-9153, Triangle Township, Durham County, NC

PROJECT LOCATION: 3601 Page Road, Morrisville, NC 27560, City of Raleigh Case # ASR-0015-2022

SHEET TITLE: PROPOSED PRIVATE DEVELOPMENT PLAN

SHEET NO. C1.0 OF 37 PROJECT NO. 2023121402

3601 Page Road

Survey Notes:
 Onsite project survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022.
Benchmarks
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Legend

- Proposed Building Area
- Fire Lane Paving
- Previous Paving
- Concrete Paving
- Parking Stall Count Total
- Proposed Sewer Cleanout/Hookup
- Proposed Fire FDC
- Proposed Privacy Fence
- Proposed Water Meter
- OSSF Aerobic Treatment Area
- Retaining Wall

SCALES
 1 inch = 40 ft.
 IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REVISIONS

DESIGNED	HDB/AC
DRAWN	HDB
CHECKED	AC
DATE	
SCALE	

New Submittal - ASR City comments 06/30/2022

APPROVALS

DESIGNED	HDB/AC
DRAWN	HDB
CHECKED	AC
DATE	
SCALE	

ENGINEERED BY

STRAY ARM CONSULTING

P.O. BOX 1991
 ROCKY MOUNT, NC 27867
 Cell: (919) 922-5453
 ascan@strayarm.com

PREPARED BY

STRAY ARM CONSULTING

Engineering Support
 Civil Design & Drafting
 Durham, NC 27710
 Cell: (360) 870-3218
 hboutwell@strayarm.com

PROJECT LEGAL

2.16 AC
 DB 5766, PG 984
 PIN: 0758.03-32-9153
 Triangle Township
 Durham County, NC

PROJECT LOCATION

3601 Page Road
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022

SHEET TITLE
PROPOSED PUBLIC DEVELOPEMENT PLAN

PROJECT NO.
C1.5
 OF 37
 PROJECT NO.
2023121402

3601 Page Road

Pre-Existing Conditions Calculations

Project: AC
 Reviewed: AC
 Date: 4/25/2023
 Creator: HDB

PRE - 3601 Page Road

Drainage Area ID	Area	C1	A1	C2	A2	C _{tot}	I ₁	I ₂	I ₃	I ₁₀	I ₂₅	I ₅₀	I ₁₀₀	A [*] C _{tot}	Q ₁	Q ₂	Q ₅	Q ₁₀	Q ₂₅	Q ₅₀	Q ₁₀₀	Tc	Description
A	1.57	0.40	1.54	0.60	0.03	0.40	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.63	2.40	2.81	3.23	3.58	3.92	4.18	4.41	12	Undeveloped lot flows to existing onsite pond
B	0.10	0.40	0.10	0.60	0.00	0.40	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.04	0.15	0.18	0.20	0.23	0.25	0.26	0.28	10	Undeveloped lot flows east to sewer easement
C	0.49	0.40	0.49	0.60	0.00	0.40	3.16	3.72	4.28	4.76	5.24	5.56	5.84	0.20	0.62	0.73	0.84	0.93	1.03	1.09	1.14	15	Undeveloped lot flows east to sewer easement
OSW	0.97	0.50	0.66	0.80	0.31	0.59	3.16	3.72	4.28	4.76	5.24	5.56	5.84	0.57	1.82	2.14	2.46	2.74	3.01	3.20	3.36	13	Developed lots and roadway ROW flows to existing 18" Culvert
Design Point 1	2.16	0.40	2.13	0.60	0.03	0.40	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.87	3.30	3.85	4.43	4.92	5.38	5.74	6.06	12	Undeveloped flow at outflow point of existing pond

Survey Notes:
 Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
Benchmarks
 Bearing based on North Carolina Grid North, NAD83/2011 (VRS), Vertical datum NAVD-88 (VRS); US survey feet, derived from GPS observations.
 BM #1 - NCGS Monument "WAK 114"
 N: 777259.39
 E: 2055900.75
 Scale factor: 0.99993364
 BM #2 - 1" Existing Iron Pin, Northwest property corner. El. 416.00'
 N: 782230.4116
 E: 2053769.7322

FLOOD STATEMENT: According to Community Panel No. 3720088700K, dated Dec 06, 2019, of the Federal Emergency Management Agency, National Flood Insurance Program Map.
 This property is within several flood zones, Flood Zone "X" (areas determined to be outside 500-year floodplain), which is not a special flood hazard area. This statement shall not create liability on the part of the Surveyor.

Legend

- Proposed Building Area
- Fire Lane Paving
- Pervious Paving
- Concrete Paving
- Parking Stall Count Total
- Proposed Sewer Cleanout/Hookup
- Proposed Fire FDC
- Proposed Privacy Fence
- Proposed Water Meter
- OSSF Aerobic Treatment Area
- Drainage Area
- Drainage Area No. Area (acres) 100 Yr. Flow (CFS, rounded)
- Drainage Direction
- Existing Contour
- Runoff Travel Path
- Proposed Contour



Notes:
 1. ALL STANDARDS ADHERE TO COUNTY OF DURHAM SUBDIVISION REGULATIONS

DRAINAGE DESIGN CRITERIA
 Drainage Storm Frequency = 100 years
 $Q_{100} (cfs) = C \times I (in/hr) \times A (ac)$
 Existing Onsite Impervious Area = 0 SF
 Existing Onsite Pervious Area = 435,600 SF
 ENGINEER HAS FIELD VERIFIED THE DRAINAGE BOUNDARIES AND THE ONSITE AND OFFSITE DRAINAGE STRUCTURES.

P.E. REAL ENGINEERING, INC.
 SIGNATURE _____ DATE Jun 2024

 SCALES
 IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REVISIONS: New Submittal - ASR City comments 06/30/2022

DESIGNED: HDB/AC
 DRAWN: HDB
 CHECKED: AC
 DATE: 02/01/2024
 SCALE:

ENGINEERED BY:
 P.O. BOX 691
 ROCKY MOUNT, NC 27853
 aaronm1978@gmail.com

PREPARED BY:
 Stray ARM Consulting
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27710
 Cell: (360)870-3218
 hboutwell@str-arm.com

PROJECT LOCATION: 2.16 AC
 DB 5766, PG 984
 PIN: 0758.03-32-9153
 Triangle Township
 Durham County, NC

PROJECT LOCATION: 3601 Page Road
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022
 SHEET TITLE: PRE EXISTING DRAINAGE AREA MAP
 SHEET NO.: C2.0
 PROJECT NO.: 2023121402

Project: AC
 Reviewed: 4/25/2023
 Date: HDB
 Creator:

Drainage Area ID	Area	C1	A1	C2	A2	C _{cr}	I ₁	I ₂	I ₃	I ₄	I ₅	I ₆	I ₇	I ₈	I ₉	I ₁₀	A*Cr _{cr}	Q ₁	Q ₂	Q ₃	Q ₄	Q ₅	Q ₆	Q ₇	Q ₈	Q ₉	Q ₁₀	Tc	Description								
A	1.57	0.40	1.54	0.60	0.03	0.40	3.79	4.43	5.09	5.65	6.18	6.60	6.96	6.63	2.40	2.81	3.23	3.58	3.92	4.18	4.41	12	Undeveloped lot flows to existing onsite pond														
B	0.10	0.40	0.10	0.60	0.00	0.40	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.04	0.15	0.18	0.20	0.23	0.25	0.26	0.28	10	Undeveloped lot flows east to sewer easement														
C	0.49	0.40	0.49	0.60	0.00	0.40	3.16	3.72	4.28	4.76	5.24	5.56	5.84	0.20	0.62	0.73	0.84	0.93	1.03	1.09	1.14	15	Undeveloped lot flows east to sewer easement														
OSW	0.97	0.50	0.66	0.80	0.31	0.59	3.16	3.72	4.28	4.76	5.24	5.56	5.84	0.57	1.82	2.14	2.46	2.74	3.01	3.20	3.36	13	Developed lots and roadway ROW flows to existing 18" Culvert														
Design Point 1	2.16	0.40	2.13	0.60	0.03	0.40	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.87	3.30	3.85	4.43	4.92	5.38	5.74	6.06	12	Undeveloped flow at outflow point of existing pond														

Post Conditions Calculations

Project: AC
 Reviewed: 4/25/2023
 Date: HDB
 Creator:

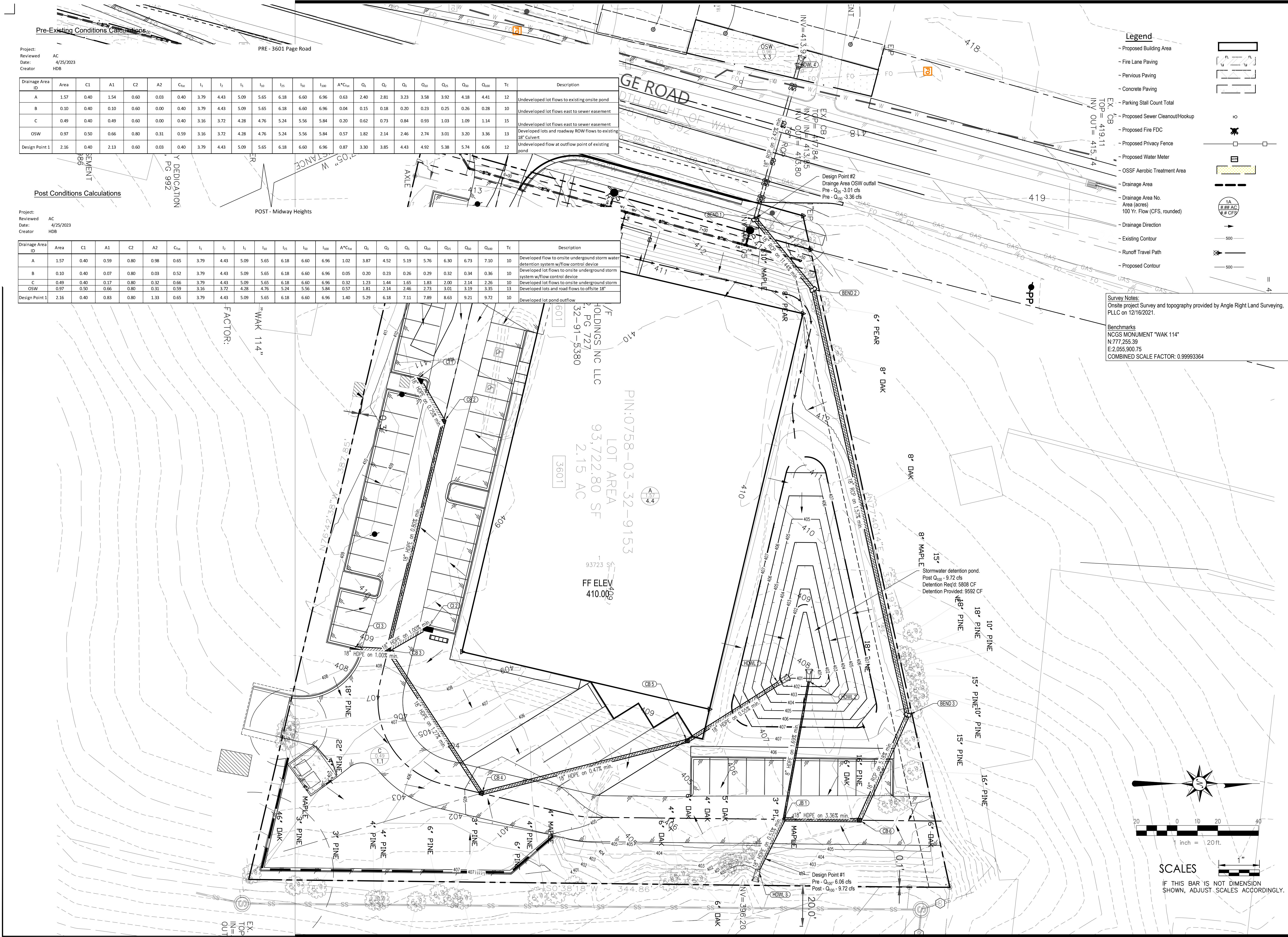
Drainage Area ID	Area	C1	A1	C2	A2	C _{cr}	I ₁	I ₂	I ₃	I ₄	I ₅	I ₆	I ₇	I ₈	I ₉	I ₁₀	A*Cr _{cr}	Q ₁	Q ₂	Q ₃	Q ₄	Q ₅	Q ₆	Q ₇	Q ₈	Q ₉	Q ₁₀	Tc	Description								
A	1.57	0.40	0.59	0.80	0.98	0.65	3.79	4.43	5.09	5.65	6.18	6.60	6.96	1.02	3.87	4.52	5.19	5.76	6.30	6.73	7.10	10	Developed flow to onsite underground storm water detention system w/flow control device														
B	0.10	0.40	0.07	0.80	0.03	0.52	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.05	0.20	0.23	0.26	0.29	0.32	0.34	0.36	10	Developed lot flows to onsite underground storm system w/flow control device														
C	0.49	0.40	0.17	0.80	0.32	0.66	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.32	1.23	1.44	1.65	1.83	2.00	2.14	2.26	10	Developed lot flows to onsite underground storm														
OSW	0.97	0.50	0.66	0.80	0.31	0.59	3.16	3.72	4.28	4.76	5.24	5.56	5.84	0.57	1.81	2.14	2.46	2.73	3.01	3.19	3.35	13	Developed lots and road flows to offsite 18"														
Design Point 1	2.16	0.40	0.83	0.80	1.33	0.65	3.79	4.43	5.09	5.65	6.18	6.60	6.96	1.40	5.29	6.18	7.11	7.89	8.63	9.21	9.72	10	Developed lot pond outflow														

Legend

- Proposed Building Area
- Fire Lane Paving
- Previous Paving
- Concrete Paving
- Parking Stall Count Total
- Proposed Sewer Cleanout/Hookup
- Proposed Fire FDC
- Proposed Privacy Fence
- Proposed Water Meter
- OSSF Aerobic Treatment Area
- Drainage Area
- Drainage Area No. Area (acres)
- 100 Yr. Flow (CFS, rounded)
- Drainage Direction
- Existing Contour
- Runoff Travel Path
- Proposed Contour

Survey Notes:
 Onsite project survey and topography provided by Angle Right Land Surveying, PLLC on 12/16/2021.

Benchmarks
 NCGS MONUMENT "WAK 114"
 N:777,255.39
 E:2,055,900.75
 COMBINED SCALE FACTOR: 0.99993364



SCALES

IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REVISIONS:
 New Submittal - ASR City comments 06/30/2022

APPROVAL:
 DESIGNED: HDB/AC
 DRAWN: HDB
 CHECKED: AC

DATE: _____
 SCALE: _____

ENGINEERED BY:

PREPARED BY:

 STARM Consulting, Inc.
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27710
 Cell: (360)870-3218
 hboutwell@st-arm.com

PROJECT LOCATION:
3601 Page Road
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022

PROJECT LEGAL:
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

SHEET TITLE:
POST CONDITION DRAINAGE AREA MAP

SHEET NO. OF 37 PROJECT NO.
C2.1

2023121402

Project: PRE - 3601 Page Road
 Reviewed: AC
 Date: 4/25/2023
 Creator: HDB

PRE - 3601 Page Road

Drainage Area ID	Area	C1	A1	C2	A2	C _{tot}	I ₁	I ₂	I ₅	I ₁₀	I ₂₅	I ₅₀	I ₁₀₀	A*C _{tot}	Q ₁	Q ₂	Q ₅	Q ₁₀	Q ₂₅	Q ₅₀	Q ₁₀₀	Tc	Description
A	1.57	0.40	1.54	0.60	0.03	0.40	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.63	2.40	2.81	3.23	3.58	3.92	4.18	4.41	12	Undeveloped lot flows to existing onsite pond
B	0.10	0.40	0.10	0.60	0.00	0.40	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.04	0.15	0.18	0.20	0.23	0.25	0.26	0.28	10	Undeveloped lot flows east to sewer easement
C	0.49	0.40	0.49	0.60	0.00	0.40	3.16	3.72	4.28	4.76	5.24	5.56	5.84	0.20	0.62	0.73	0.84	0.93	1.03	1.09	1.14	15	Undeveloped lot flows east to sewer easement
OSW	0.97	0.50	0.66	0.80	0.31	0.59	3.16	3.72	4.28	4.76	5.24	5.56	5.84	0.57	1.82	2.14	2.46	2.74	3.01	3.20	3.36	13	Developed lots and roadway ROW flows to existing 18" Culvert
Design Point 1	2.16	0.40	2.13	0.60	0.03	0.40	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.87	3.30	3.85	4.43	4.92	5.38	5.74	6.06	12	Undeveloped flow at outflow point of existing pond

Time of Concentration Calculations

Project: 3601 Page Road
 CSJ: 0
 Computed by: HDB
 Date: 4/25/2024

DA I.D.	Sheet Flow					Shallow Concentrated Flow					Open Channel Flow										
	DELTA ELEV.	L (ft)	S	n	Surface Description	DELTA ELEV.	S	L (ft)	n	Surface Description	DELTA ELEV.	L (ft)	S	n	WP (ft)	R (ft)	V (ft/s)	T _c (min)	T _c (min)	T _c Lag (min)	
A	414.81	409.2	150	3.73%	Grass: short prairie	0.150	3.92	10	409.2	396.3	4.60%	280.7	unpaved	16.13	2	396.3	NA	NA	0	12	7.20
B	409.2	400.5	132	6.59%	Grass: short prairie	0.150	3.92	7	396.3	NA	NA	NA	unpaved	16.13	1	399.7	NA	NA	0	10	6.00
C	411.7	409.2	150	1.67%	Grass: short prairie	0.150	3.92	14	409.2	399.7	7.09%	134	unpaved	16.13	1	399.7	NA	NA	0	15	9.00
OSW	422.0	418.6	150	2.27%	Grass: short prairie	0.150	3.92	12	418.6	415.7	3.77%	77	unpaved	16.13	1	415.7	NA	NA	0	13	7.80

Storm Freq.	Duration	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
1	4.74	3.79	3.16	2.70	2.39	2.16	1.95	1.78	1.64	1.53	1.40	1.32	1.27	1.20	1.13	1.08	1.04
2	5.54	4.43	3.72	3.18	2.82	2.56	2.31	2.11	1.95	1.82	1.71	1.61	1.51	1.43	1.35	1.29	1.24
5	6.36	5.09	4.28	3.72	3.34	3.06	2.77	2.54	2.36	2.20	2.07	1.96	1.84	1.74	1.65	1.57	1.51
10	7.06	5.65	4.76	4.16	3.75	3.44	3.13	2.88	2.68	2.51	2.36	2.24	2.11	1.99	1.89	1.80	1.74
25	7.76	6.18	5.24	4.63	4.20	3.88	3.54	3.26	3.06	2.87	2.72	2.58	2.43	2.30	2.19	2.09	2.02
50	8.27	6.60	5.56	4.94	4.51	4.18	3.84	3.56	3.33	3.14	2.98	2.84	2.68	2.54	2.42	2.31	2.23
100	8.72	6.96	5.84	5.23	4.80	4.48	4.12	3.83	3.60	3.40	3.23	3.08	2.91	2.76	2.63	2.51	2.43

Project: POST - 3601 Page Rd
 Reviewed: AC
 Date: 4/25/2023
 Creator: HDB

POST - 3601 Page Rd

Drainage Area ID	Area	C1	A1	C2	A2	C _{tot}	I ₁	I ₂	I ₅	I ₁₀	I ₂₅	I ₅₀	I ₁₀₀	A*C _{tot}	Q ₁	Q ₂	Q ₅	Q ₁₀	Q ₂₅	Q ₅₀	Q ₁₀₀	Tc	Description
A	1.57	0.40	0.59	0.80	0.98	0.65	3.79	4.43	5.09	5.65	6.18	6.60	6.96	1.02	3.87	4.52	5.19	5.76	6.30	6.73	7.10	10	Developed flow to onsite underground storm water detention system w/flow control device
B	0.10	0.40	0.07	0.80	0.03	0.52	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.05	0.20	0.23	0.26	0.29	0.32	0.34	0.36	10	Developed lot flows to onsite underground storm system w/flow control device
C	0.49	0.40	0.17	0.80	0.32	0.66	3.79	4.43	5.09	5.65	6.18	6.60	6.96	0.32	1.23	1.44	1.65	1.83	2.00	2.14	2.26	10	Developed lot flows to onsite underground storm
OSW	0.97	0.50	0.66	0.80	0.31	0.59	3.16	3.72	4.28	4.76	5.24	5.56	5.84	0.57	1.81	2.14	2.46	2.73	3.01	3.19	3.35	13	Developed lots and road flows to offsite 18"
Design Point 1	2.16	0.40	0.83	0.80	1.33	0.65	3.79	4.43	5.09	5.65	6.18	6.60	6.96	1.40	5.29	6.18	7.11	7.89	8.63	9.21	9.72	10	Developed lot pond outflow

Stormwater Detention Required Calculations

Storm (MIN)	Rainfall (IN)	Storage Sizing 100 Yr - Area All						
		C _{in} K _A	C _{und} x Q _{und} x A	DUR _r x Q _{in} x 60	Q _{out}	VOL _{in} - VOL _{out}	VOL _{STG}	T _{DEV} +T _{DUR}
15	5.84	8.15	6.06	7337.38	2724.84	4612.54	7.5	
20	5.23	7.30	6.06	8761.30	3633.12	5128.18	10	
25	4.80	6.70	6.06	10051.20	4541.40	5509.80	12.5	
30	4.48	6.25	6.06	11257.34	5449.68	5807.66	15	
35	4.12	5.75	6.06	12078.19	6357.96	5720.23	17.5	
40	3.83	5.35	6.06	12832.03	7266.24	5565.79	20	
45	3.60	5.03	6.06	13569.12	8174.52	5394.60	22.5	
50	3.40	4.75	6.06	14239.20	9082.80	5156.40	25	
55	3.23	4.51	6.06	14879.96	9991.08	4888.88	27.5	
60	3.08	4.30	6.06	15478.85	10899.36	4579.49	30	
65	2.91	4.06	6.06	15843.20	11807.64	4035.56	32.5	
70	2.76	3.85	6.06	16182.43	12715.92	3466.51	35	
75	2.63	3.67	6.06	16521.66	13624.20	2897.46	37.5	
80	2.51	3.50	6.06	16819.01	14532.48	2286.53	40	

Detention Pond Stage Storage Calculations

ELEV	AREA (sq. ft.)	DEPTH (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)
402.00	761.36	N/A	N/A	0.00
403.00	1,428.07	1.00	1094.71	1094.71
404.00	2,268.15	1.00	1848.11	2942.82
405.00	3,281.62	1.00	2774.88	5717.71
406.00	4,468.47	1.00	3875.04	9592.75
407.00	5,828.70	1.00	5148.59	14741.34

Prepared by Strong ARM Consulting LLC
 HydroCAD® 10.20-5a s/n 12862 © 2023 HydroCAD Software Solutions LLC
 Printed 4/25/2024
 Page 4

Summary for Pond 6P: Detention B

Inflow Area = 2.160 ac. 0.00% Impervious. Inflow Depth = 0.47" for 100-yr event
 Inflow = 6.18 cfs @ 0.09 hrs. Volume= 0.085 af
 Outflow = 1.49 cfs @ 0.23 hrs. Volume= 0.083 af. Atten= 76%. Lag= 8.4 min
 Primary = 1.49 cfs @ 0.23 hrs. Volume= 0.083 af

Routing by Stor-Ind method, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Peak Elev= 403.95' @ 0.23 hrs Surf Area= 2,224 sf Storage= 2,825 cf
 Plug-Flow detention time= 20.1 min calculated for 0.082 af (97% of inflow)
 Center-of-Mass det. time= 20.4 min (27.9 - 7.5)

Volume #1	Invert	Avail. Storage	Storage Description
402.00'	14,741 cf	Onsite Det Pond (Prismatic)	Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
402.00	761	0	0
403.00	1,428	1,095	1,095
404.00	2,268	1,848	2,943
405.00	3,282	2,775	5,718
406.00	4,468	3,875	9,593
407.00	5,829	5,149	14,741

Device Routing Invert Outlet Devices
 #1 Primary 402.10' 8.0" Round 8" Outfall Pipe
 L= 62.7' CMP, square edge headwall, Ke= 0.500
 Inlet / Outlet Invert= 402.10' / 399.33' S= 0.0442' /' Cc= 0.900
 n= 0.025 Corrugated metal. Flow Area= 0.35 sf

Primary OutFlow Max=1.49 cfs @ 0.23 hrs HW=403.95' (Free Discharge)
 L=8" Outfall Pipe (Barrel Controls 1.49 cfs @ 4.26 fps)

Detention Maintenance Notes.

MAINTENANCE

Proper and timely maintenance is critical for permeable pavement systems. The surface of the permeable pavement should be properly maintained to provide a durable and safe driving surface, as well as to minimize the clogging potential. The ability of the system to effectively infiltrate water can be affected by pavement use and maintenance practices. Extensive use of winter sanding and biomass loading from surrounding vegetation (trees, grass, weeds, etc.) can substantially reduce system infiltration and should be avoided where possible. In the past, conventional wisdom held that regular preventive maintenance activities such as vacuum sweeping could help maintain system permeability. In areas where permeability was reduced by sanding, permeability can be restored by more aggressive maintenance practices, such as power washing and regenerative air vacuuming. Preventive Maintenance Preventive maintenance will help to ensure the long-term durability of the pavement.

Key activities include:

- Inspect and monitor the integrity and function of the permeable pavement.
- Permeability checks should be completed using standard infiltration tests (ASTM C1701-09 for pervious concrete and ASTM C1781-13 for PICIP).
- Visual inspection of clogging and durability.
- Inspect permeable pavements after major rain events to ensure pavement structural integrity and surface infiltration.
- Perform vacuum sweeping at regular intervals in high-risk areas, such as areas where sources of sediment or organic debris are higher and where the ratio of tributary to pervious area is high. It is recommended that vacuum sweeping be performed twice per year, or more often in areas subject to higher concentrations and deposition rates of dust and debris, biomass loading, etc. (Henderson & Tighe 2011).
- Restore any joint filler loss for PICIP.
- Properly maintain upstream drainage pathways and landscaping to minimize additional water and run-on of sediment and ASTM Concrete Pavements 9
- Inspect and clean all outlet structures to ensure positive water flow from the pavement.
- Provide inspection ports and regularly monitor drainage rates of the stone reservoir to identify if clogging of underlying soils or outlet structures has occurred; remedy to avoid damage associated with extended ponding.
- Eliminate the use of sand for winter maintenance activities.
- Clearing snow completely after every storm is recommended. Special plow blades can be used but are not necessary. Raised plow blades are not recommended, and any bouncing movement of the vehicle may result in damage to the permeable pavement surface.
- Limit the use of winter deicing chemicals for sensitive vegetation areas, sensitive receiving waters, or for pavements designed to capture and reuse water. See Winter Maintenance Considerations section below. Winter Maintenance Considerations Properly designed permeable surfaces can be resistant to freeze-thaw related damage. Due to the higher porosity of the surface material, winter deicing chemicals are rarely required. Sanding operations should be avoided, as the sand can lead to increased clogging. Deicing chemicals should be used moderately. After snow plowing operations, snow may remain in the open voids of the surfaces temporarily. Studies have shown that heat stored within the permeable pavement will assist in melting the snow trapped in the open pore structure immediately following snow plowing operations. In cold climates, snow plows may cause abrasion of the surface. Snow plow damage may be reduced by using wide blades and minimizing back-blading.

Permeability Restoration

The permeability of these pavements will be reduced over time due to clogging. Permeability may be restored through:

- Restorative vacuum sweeping using specialized, full vacuum street cleaning equipment.
- Power washing the pavement. However, this should be considered a "last resort" in maintaining the surface course, as it may break up and drive contaminants from the surface and upper layers of the stone reservoir deeper in the pavement, resulting in a reduction in the service life of the overall pavement. If the observed performance of the pavement indicates a significant reduction in permeability from the last inspection, complete infiltration testing in accordance with local or project-specific requirements is warranted. In the absence of site specific requirements, use the simplified infiltration test with the representative dewatering times for simplified infiltration testing:

- Newly installed/recently maintained: <30 seconds.
- Acceptable—continue preventative maintenance: 30-60 seconds.
- Partially clogged—restorative maintenance should be scheduled: 60-90 seconds.
- Clogged—requires restorative maintenance immediately: >90 seconds.

PERFORMANCE

The performance of a permeable pavement system is usually governed by its ability to infiltrate and treat stormwater. Most permeable pavements are constructed on pathways, parking areas, and low-volume roadways and do not tend to receive heavy, frequent traffic. As the pavement ages, it may be necessary to treat localized areas to restore the pavement surface condition. This may include removal and replacement of pervious concrete or pavers, leveling or addition of new aggregate materials, removal and replacement of jointing material, etc. Edge restraints should be inspected to ensure that they are performing their required function. Outlet drains and observation wells should be inspected to confirm continued drainage from the pavement structure. Areas up-slope of the permeable pavement should be examined for potential sources of contaminants that may reduce system permeability. A maintenance plan should be developed and followed. The plan should include documentation of key design features of the system, operational constraints (e.g., restrict use of winter sand, maintain overflow and outflow features, monitor 10 Permeable Concrete Pavements observation wells), inspection schedules and checklists, maintenance procedures, rehabilitation activities and timing, and other such factors. Personnel responsible for the maintenance and operation of the permeable pavement should be identified and provided with the maintenance plan. The maintenance plan should be reviewed and modified based on actual use and operation of the facility. The structural design life (performance period) of a permeable pavement is the length of time until it is no longer able to satisfy the performance requirements. Structural rehabilitation typically addresses shear failure of the bedding, base, subbase, or subgrade soils, often indicated by surface deformation (rutting) from wheel loads for PICIP or cracking of the pervious concrete. At the end of the structural design life, some settlement, rutting, cracked pervious concrete, some damaged pavers, loss of jointing material, and/or edge restraint damage can be expected. These distresses can be addressed by removing and replacing the damaged areas to cost-effectively extend the service life of the pavement.

NCDOT Runoff Coefficients for Rational Method

Type of Surface	C
Pavement	0.7 - 0.9
Gravel surfaces	0.4 - 0.6
Industrial areas	0.5 - 0.9
Residential (Single-family)	0.3 - 0.5
Residential (Apartments, etc.)	0.5 - 0.7
Grassed, steep slopes	0.3 - 0.4
Grassed, flat slopes	0.2 - 0.3
Woods / Forest	0.1 - 0.2

DRAINAGE DESIGN CRITERIA

Drainage Storm Frequency = 25 & 100 years
 Q₁₀₀ (cfs) = C x I (in/hr) x A (ac)

Definitions:

- C- Runoff Coefficient (open space - 0.3; industrial 0.80)
- I- Rainfall Intensity (in/hr)
- A- Drainage Area (AC)
- Q- Runoff Rate (CFS)

Time of Concentration Calculation

Tc = Tcs + Tcss + Ttp + Tcc

Definitions:

- Tc- Time of Concentration (hr)
- Tcs- Time of Concentration representing Sheet flow (hr)
- Tcss- Time of Concentration representing Shallow Concentrated flow (hr)
- Ttp- Time of Concentration representing Pipe flow (hr)
- Tcc- Time of Concentration representing Stream or Channel flow (hr)

Sheet Flow Calculation

A. GENERAL SITE DATA

PROJECT LIMITS: **2.16 AC** situated in the, Triangle Township Durham County, NC

Begin Project Coordinates : Latitude (N) : **30.9961** Longitude (W) : **-97.1393**

PROJECT SITE MAPS:

- * Project Location Map: The Title Sheet, C0.0
- * Drainage Patterns: Drainage Area Maps C2.0, and C2.1
- * Slopes Anticipated After Major Gradings or Areas of Soil Disturbance: C3.0 and C6.5 Typical Sections
- * Location of Erosion and Sediment Controls: C5.0 SW3P Site Maps C1
- * Surface Waters and Discharge Locations: C3.2-C3.7 Drainage and Culvert Layouts
- * Project Specific Location(s) (PSL): To be determined by the project Construction Personnel. Location(s) shown on SW3P Site Map (If PSL location(s) is within one mile of project) and information located in project SW3P Binder (Reference Item #10 below).

PROJECT DESCRIPTION:

3601 Page Road Morrisville, NC, New commercial building and drive aisles within the City of Morrisville, TX. BEING 2.16 AC situated in the, Triangle Township Durham County, NC.

MAJOR SOIL DISTURBING ACTIVITIES:

On site grading.

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:

- 62.9% Creedmoor Sandy Loam, 2-6% slopes, grass covered.
- 3.1% Gullied Land, clayey materials, grass covered.
- 14.3% Mayodan Sandy Loam, 15-25% slopes, grass covered.
- 19.6% Urban Land, grass and tree covered.

TOTAL PROJECT AREA: **2.16** Acres

TOTAL AREA TO BE DISTURBED: **2.65** Acres (100%)

WEIGHTED RUNOFF COEFFICIENT

BEFORE CONSTRUCTION: **0.40**
AFTER CONSTRUCTION: **0.65**

NAME OF RECEIVING WATERS:

Brier Creek

PROJECT SW3P Binder:

A. For projects disturbing one to five acres, General Contractor will maintain a SW3P Binder at the project field office (If there is not a project field office, should be kept at the Area Office) which contains the following: Index Sheet, NCEQ Signature Authority, NCEQ Small Construction Site Notice, Contractor Certification of Compliance, SW3P Inspector Qualification Statements, Inspection and Maintenance Reports (Form 2118), EPIC Sheet, SW3P Sheet, Site Location Maps, Stored Material Lists specifying associated control measures and the Appendix which contains the NCPDES Construction General Permit, MS4 Operator Notification(s) and the Construction PSL Permits per all applicable requirements.

B. EROSION AND SEDIMENT CONTROLS

1. SOIL STABILIZATION PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- | | |
|---|--|
| <input checked="" type="checkbox"/> TEMPORARY SEEDING | <input type="checkbox"/> PRESERVATION OF NATURAL RESOURCES |
| <input checked="" type="checkbox"/> MULCHING (Hay or Straw) | <input type="checkbox"/> FLEXIBLE CHANNEL LINER |
| <input type="checkbox"/> BUFFER ZONES | <input type="checkbox"/> RIGID CHANNEL LINER |
| <input type="checkbox"/> PLANTING | <input type="checkbox"/> SOIL RETENTION BLANKET |
| <input type="checkbox"/> SEEDING | <input type="checkbox"/> COMPOST MANUFACTURED TOPSOIL |
| <input type="checkbox"/> SODDING | <input type="checkbox"/> VERTICAL TRACKING |
| | <input type="checkbox"/> OTHER: (Specify Practice) |

2. STRUCTURAL PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- SILT FENCES
- EROSION CONTROL LOGS
- EROSION CONTROL COMPOST BERMS (Low Velocity)
- ROCK FILTER DAMS
- DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- DIVERSION DIKE AND SWALE COMBINATIONS
- PIPE SLOPE DRAINS
- PAVED FLUMES
- ROCK BEDDING AT CONSTRUCTION EXIT
- TIMBER MATTING AT CONSTRUCTION EXIT
- CHANNEL LINERS
- SEDIMENT TRAPS
- SEDIMENT BASINS
- STORM INLET SEDIMENT TRAP
- STONE OUTLET STRUCTURES
- CURBS AND GUTTERS
- STORM SEWERS
- VELOCITY CONTROL DEVICES
- OTHER: (Specify Practice)

NOTE: TOP OF BMP'S SHOULD NOT BE HIGHER THAN ROADWAY ELEVATION AS NOT TO FLOOD ROADWAY UNLESS PRIOR APPROVAL FROM ENGINEER IS OBTAINED.

3. STORM WATER MANAGEMENT:

- A. Storm water drainage will be provided by sheet flow and swales which carry drainage within the R.O.W. to the lows within the roadway and/or project site which drains to natural facilities.
- B. Other permanent erosion controls include hydraulic design to limit grading design generally consisting of 4:1 or flatter slopes with permanent vegetative cover.

4. STORM WATER MANAGEMENT ACTIVITIES: (Sequence of Construction)

- Phase 1: Stripping and grubbing, remove all vegetation in grading areas. Stockpile reusable soil. Discard the unusable soil offsite
- Phase 2: Grade overall site, seed and sod slopes greater than 3:1.
- Phase 3: Grade drive aisles, seed and sod slopes greater than 3:1, install swales where required.

5. NON-STORM WATER DISCHARGES:

Filter non-storm water discharges, or hold in retention basins, before being allowed to mix with storm water. These discharges consist of, but not limited to, non-polluted ground water, spring water, foundation or footing drain water, water used for dust control or pavement washing and vehicle washwater containing no detergents.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:

Maintain all erosion and sediment controls in good working order. Perform any necessary cleaning/repairs/replacements at the earliest possible date prior to next rain event, but no later than 7 calendar days. Ensure the surrounding ground has dried sufficiently to prevent damage from equipment. "Too Wet" is the only reason for not adhering to timeframes described. When construction activities permanently or temporarily cease and are not expected to resume for 14 or more days on a disturbed portion of the site, stabilization measures must be initiated immediately.

2. INSPECTION:

A General Contractor Inspector will perform a regularly scheduled SW3P inspection every 7 calendar days. An Inspection and Maintenance Report, signed by the General Contractor Inspector and the Contractor, will be filed for each inspection. Revise/clean/repair/replace each BMP control device in accordance with the current Field Inspection and Maintenance Report (Form 2118) and Item 1 (Maintenance) above.

3. WASTE MATERIALS:

On a daily basis, or as may be directed, collect all waste materials, trash and debris from the construction site and deposit into a metal dumpster having a secure cover and which meets all state and local city solid waste management requirements. Empty the dumpster as required by regulation, or as may be directed, at a local approved landfill site. Do not bury construction waste on the construction project site.

4. HAZARDOUS WASTE & SPILL REPORTING:

As a minimum, any products in the following categories are considered to be hazardous: Paints, Acids, Solvents, Fuels, Asphalt Products, Chemical Additives for Soil Stabilization, and Concrete Curing Compounds or Additives. When storing hazardous material on the project site, or at a Project Specific Location, take all practicable precaution to prevent and/or contain any spillage of these materials. In the event of a spill, contact the spill coordinator immediately.

5. SANITARY WASTE:

Use a licensed sanitary waste management contractor to collect all sanitary waste from portable units as may be required by local regulation, or as directed.

6. CONSTRUCTION VEHICLE TRACKING:

On a regular basis, or as may be directed, dampen haul roads for dust control and stabilize construction entrances/exits. Provide for a motorized broom or vacuum type sweeper to be available on a daily basis, or as may be directed, to remove sediment from paved roadways abutting or traversing the project site.

7. MANAGEMENT PRACTICES:

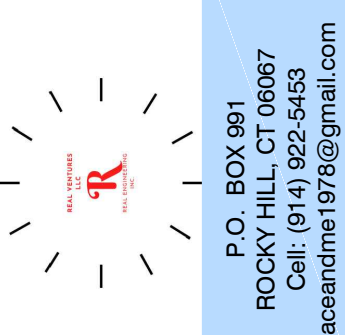
- A. Construct disposal areas, stockpiles, haul roads and PSL's in a manner that will minimize and control the amount of sediment that may enter receiving waters. Do not locate disposal areas in any wetland, waterbody or streambed.
- B. Locate construction staging areas, vehicle maintenance and PSL's areas in a manner to minimize the runoff of pollutants.
- C. When working in or near a wetland, install and maintain operating soil erosion and sediment controls at all times during construction and isolate the work from the wetland.
- D. Clear all waterways as soon as practicable of temporary embankment, temporary bridges, matting, falsework, piling, debris or other obstructions placed during construction operations that are not a part of the finished work.
- E. Procedures and/or practices should be taken to control dust.
- F. Sediment to be removed from roadways daily or when work begins after weather events if construction activities have ceased due to weather event.

REVISIONS: New Submittal - ASR City comments 06/30/2022

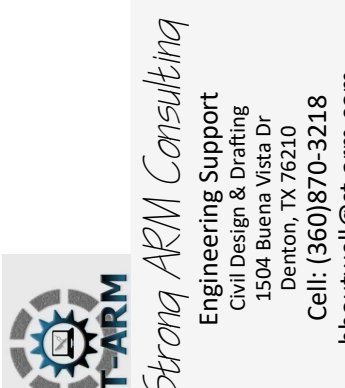
APPROVALS:
DESIGNED: _____
DRAWN: _____
CHECKED: _____
DATE: _____
SCALE: _____

SCALE

ENGINEERED BY



PREPARED BY



PROJECT LEGAL

2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

PROJECT LOCATION

3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

SHEET TITLE
SW/PPP

C2.3
OF 37
PROJECT NO.

2023121402

Grading and Drainage Notes:

1. THESE PLANS ARE SUBJECT TO THE INTERPRETATION OF INTENT BY THE ENGINEER. ALL QUESTIONS REGARDING THESE PLANS SHALL BE PRESENTED TO THE ENGINEER. ANYONE WHO TAKES IT UPON THEMSELF THE INTERPRETATION OF THE DRAWINGS OR MAKES REVISIONS TO THE SAME WITHOUT CONFERRING WITH THE DESIGN ENGINEER SHALL BE RESPONSIBLE FOR THE CONSEQUENCES THEREOF.
2. THE ESTIMATED QUANTITIES SHOWN ARE FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETENESS AND ACCURACY OF A DETAILED ESTIMATE BASED ON THESE PLANS, CURRENT CODES, AND SITE VISITATION.
3. ALL EARTHWORK CONSTRUCTION SHALL CONFORM TO THE LATEST CITY OF RALEIGH STANDARD DETAILS AND/OR SPECIFICATIONS INCLUDING ANY SUPPLEMENTS THERETO, AND ALL APPENDA.
4. PRIOR TO BIDDING THE WORK, THE CONTRACTOR SHALL THOROUGHLY SATISFY HIMSELF AS TO THE ACTUAL CONDITIONS, REQUIREMENTS OF THE WORK AND EXCESS OR DEFICIENCY IN QUANTITIES. NO CLAIMS SHALL BE MADE AGAINST THE OWNER/DEVELOPER OR ENGINEER FOR ANY EXCESS OR DEFICIENCY THEREIN, ACTUAL OR RELATIVE.
5. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES OR SAFETY PRECAUTIONS OR PROGRAMS UTILIZED IN CONNECTION WITH THE WORK, AND WILL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR COORDINATING THE RELOCATION OF UTILITIES, POWER POLES, ETC.
7. THE CONTRACTOR SHALL MAKE NO CLAIM AGAINST THE OWNER

OR THE SURVEYOR REGARDING ALLEGED INACCURACY OF CONSTRUCTION STAKES SET BY THE SURVEYOR UNLESS ALL SURVEY STAKES SET BY THE ENGINEER ARE MAINTAINED INTACT AND CAN BE VERIFIED AS TO THEIR ORIGIN. IF, IN THE OPINION OF THE SURVEYOR, THE STAKES ARE NOT MAINTAINED INTACT AND CANNOT BE VERIFIED AS TO THEIR ORIGIN, ANY REMEDIAL WORK REQUIRED TO CORRECT ANY ITEM OF IMPROPER CONSTRUCTION WORK SHALL BE PERFORMED AT THE SOLE EXPENSE OF THE RESPONSIBLE CONTRACTOR OR SUBCONTRACTOR.

8. THE SURVEYOR WILL MAKE FIELD AS-BUILT MEASUREMENTS OF THE WORK UPON NOTIFICATION BY THE CLIENT OR HIS REPRESENTATIVE THAT THE WORK IS COMPLETE AND READY FOR AS-BUILT SURVEY. FOR PIPE WORK, THE CONTRACTOR IS RESPONSIBLE FOR LEAVING TRENCHES OPEN SO THAT AS-BUILTS CAN BE PERFORMED TO COMPLY WITH THE CITY REQUIREMENTS. IF THE TRENCHES ARE BACKFILLED AND OBTURED TO THE POINT THAT AS-BUILT MEASUREMENTS CANNOT BE PERFORMED, IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO POTHOLE UTILITY TRENCHES AS NECESSARY TO COMPLETE AN AS-BUILT SURVEY.

9. THE CONTRACTOR IS TO VERIFY THE LOCATION, ELEVATION, CONDITION, AND PAVEMENT CROSS-SLOPE OF ALL EXISTING SURFACES AT POINTS OF TIE-IN AND MATCHING, PRIOR TO COMMENCEMENT OF GRADING, PAVING, CURB AND GUTTER OR OTHER SURFACE CONSTRUCTION. SHOULD EXISTING LOCATIONS, ELEVATIONS, CONDITION, OR PAVEMENT CROSS-SLOPE DIFFER FROM THAT SHOWN ON THESE PLANS, RESULTING IN THE DESIGN INTENT REFLECTED ON THE PLANS NOT ABLE TO BE CONSTRUCTED, THE CONTRACTOR SHALL NOTIFY THE OWNER'S AGENT IMMEDIATELY FOR DIRECTION ON HOW TO PROCEED PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE

CONTRACTOR ACCEPTS RESPONSIBILITY FOR ALL COSTS ASSOCIATED WITH CORRECTIVE ACTION IF THESE PROCEDURES ARE NOT FOLLOWED.

10. EXISTING UTILITIES SHOWN ON THESE PLANS HAVE BEEN LOCATED ACCORDING TO INFORMATION PROVIDED BY THE AGENCY OPERATING EACH UTILITY. LOCATIONS SHOWN ARE APPROXIMATE ONLY, AND ARE NOT RELIABLE FOR CONSTRUCTION PURPOSES. CALL BLUE STAKE FOR FIELD LOCATION AT TEXAS 811. THE CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING UTILITIES ON THE SITE. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN OR NOT ON THE DRAWING, SHALL BE REPAIRED/REPLACED AT THE CONTRACTOR'S EXPENSE. EXISTING SURFACE FEATURES AND FENCING SHALL BE REPLACED IN KIND.

11. THE ENGINEER AND APPLICABLE AGENCY MUST APPROVE, PRIOR TO CONSTRUCTION, ANY ALTERATION, OR VARIANCE FROM THESE PLANS. ANY VARIATIONS FROM THESE PLANS SHALL BE PROPOSED ON CONSTRUCTION FIELD PRINTS AND TRANSMITTED TO THE ENGINEER.

12. ANY INSPECTION BY COUNTY, ENGINEER, OR OTHER JURISDICTIONAL AGENCY, SHALL NOT, IN ANY WAY, RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM THE WORK IN STRICT COMPLIANCE WITH APPLICABLE CODES AND AGENCY REQUIREMENTS.

13. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL STORM DRAIN PIPES, STORM WATER RETENTION PIPES AND DRAINAGE FACILITIES FROM DAMAGE DURING ALL STAGES OF CONSTRUCTION. THE DEPTH OF COVER ON THE STORM DRAIN PIPE IS DESIGNED FOR FINAL GRADE. THEREFORE, EXTRA CARE SUCH AS BERMING OVER PIPES, FLAGGING, OR SIGNAGE SHOULD BE USED DURING CONSTRUCTION TO MAINTAIN COVER OR

PROTECT THE PIPES.

14. THE ENGINEER MAKES NO REPRESENTATION OR GUARANTEE REGARDING EARTHWORK QUANTITIES OR THAT THE EARTHWORK FOR THIS PROJECT WILL BALANCE DUE TO THE VARYING FIELD CONDITIONS, CHANGING SOIL TYPES, ALLOWABLE CONSTRUCTION TOLERANCES AND CONSTRUCTION METHODS THAT ARE BEYOND THE CONTROL OF THE ENGINEER.

15. THE CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE AND REPLACE, AT NO ADDITIONAL COST TO THE CITY/CLIENT, ANY AND ALL PAVEMENT, SIDEWALK, CURB AND GUTTER, DRAINAGE STRUCTURES, ETC., OUTSIDE THE PAY LIMIT THAT ARE DAMAGED DUE TO THEIR ACTIVITIES ON THE PROJECT. THIS INCLUDES, BUT IS NOT LIMITED TO, THE REMOVAL AND REPLACEMENT OF NEWLY CRACKED ROADWAY INFRASTRUCTURE, THE REMOVAL AND REPLACEMENT OF EXISTING CRACKED ROADWAY INFRASTRUCTURE WHERE THE CRACKS HAVE BEEN ENLARGED DUE TO THE CONTRACTOR'S OPERATIONS, THE REMOVAL AND REPLACEMENT OF DEFORMED ROADWAY INFRASTRUCTURE. ALL SAWCUTS USED FOR THE REMOVAL OF THESE ITEMS SHALL BE PERPENDICULAR AND PARALLEL TO THE CENTERLINE CONTROLLING THAT ITEM, OR AT THE DIRECTION OF THE CITY'S CAPITAL PROJECTS INSPECTOR.

21. THE EXTREME OUTFALL OF THE SITE IS LOCATED BY THE SOUTHEAST CORNER OF THE PROPERTY AT ELEVATION 396.64

22. THIS PROPERTY IS WITHIN AN FEMA FLOOD ZONE X BASED ON FEMA MAP # 3720075800K, dated July 19, 2022.

23. HORIZONTAL DATUM IS NAD 83/2011 (VRS), VERTICAL DATUM NAVD-88 (VRS).

24. COORDINATE METHOD USED TO DETERMINE AREA.

Survey Notes:
 Onsite project survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
Benchmarks
 Bearing based on North Carolina Grid North, NAD83/2011 (VRS), Vertical datum NAVD-88 (VRS); US survey feet, derived from GPS observations.
 BM #1 - NCGS Monument "WAK 114"
 N: 777259.39
 E: 2055900.75
 Scale factor: 0.99993364
 BM #2 - 1" Existing Iron Pin, Northwest property corner. EI. 416.00'
 N: 782230.4116
 E: 2053789.7322

FLOOD STATEMENT: According to Community Panel No. 3720075800K, dated July 19, 2022, of the Federal Emergency Management Agency, National Flood Insurance Program Map. This property is within several flood zones, Flood Zone "X" (areas determined to be outside 500-year floodplain), which is not a special flood hazard area. This statement shall not create liability on the part of the Surveyor.

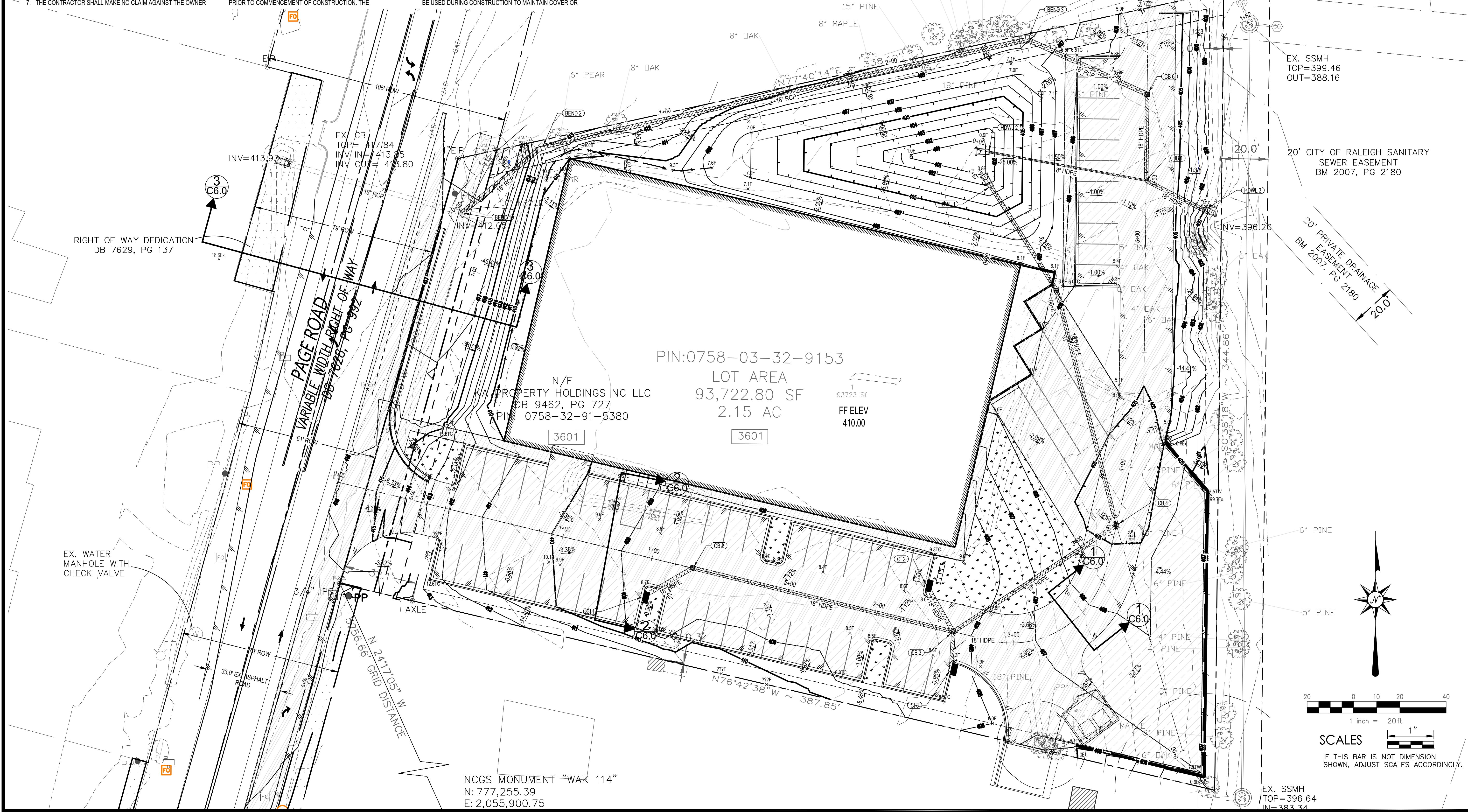
Specified Grades
 Min. Earth Grade - 0.5%
 Max. Earth Grade - 25.0%
 Min. Pavement Grade - 0.4%
 Min. Ditch Grade - 1.0% (regrade front to slope away both directions)
 Min. Adjacent Grade - 5.0% (IRC)
 Standing water shall not be allowed adjacent to the foundation.

Legend

- Building Area
- Existing Elevation
- Existing Spot Elevation
- Flood direction
- Proposed Elevation
- Proposed Spot Elevation
- Swale
- Retaining Wall

REVISIONS
 New Submittal - ASR City comments 06/30/2022

DESIGNED	HDB/AC
DRAWN	HDB
CHECKED	AC
DATE	1" = 20'
SCALE	



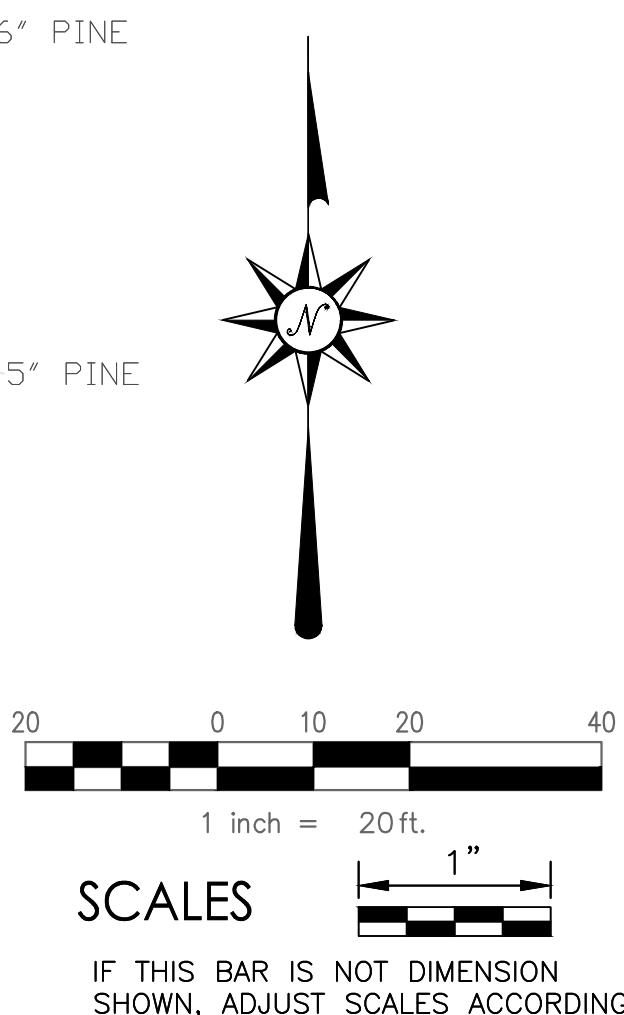
RIGHT OF WAY DEDICATION
 DB 7629, PG 137

EX. SSMH
 TOP=399.46
 OUT=388.16

20' PRIVATE DRAINAGE EASEMENT
 BM 2007, PG 2180

PIN:0758-03-32-9153
 LOT AREA
 93,722.80 SF
 2.15 AC
 FF ELEV
 410.00

NCGS MONUMENT "WAK 114"
 N: 777,255.39
 E: 2,055,900.75



ENGINEERED BY

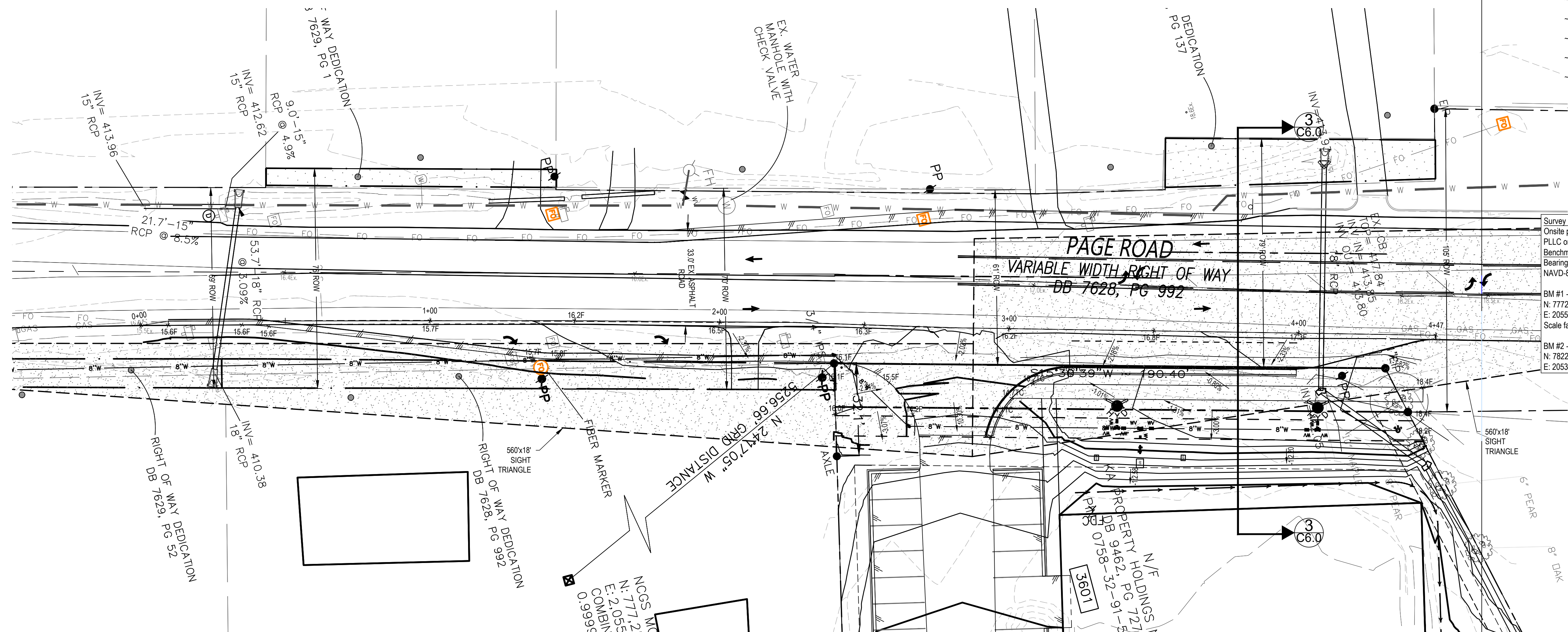
 P.O. BOX 984
 3601 Page Road
 Cell: (919) 922-5453
 aacandmel1978@gmail.com

PREPARED BY

 Star ARM Consulting
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27710
 Cell: (360)870-3218
 hboutwell@star-arm.com

PROJECT LEGAL
 2.16 AC
 DB 5766, PG 984
 PIN: 0758.03-32-9153
 Triangle Township
 Durham County, NC

PROJECT LOCATION
 3601 Page Road
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022
 SHEET TITLE
OVERALL GRADING PLAN
 SHEET NO.
C3.0
 OF 37
 PROJECT NO.
2023121402



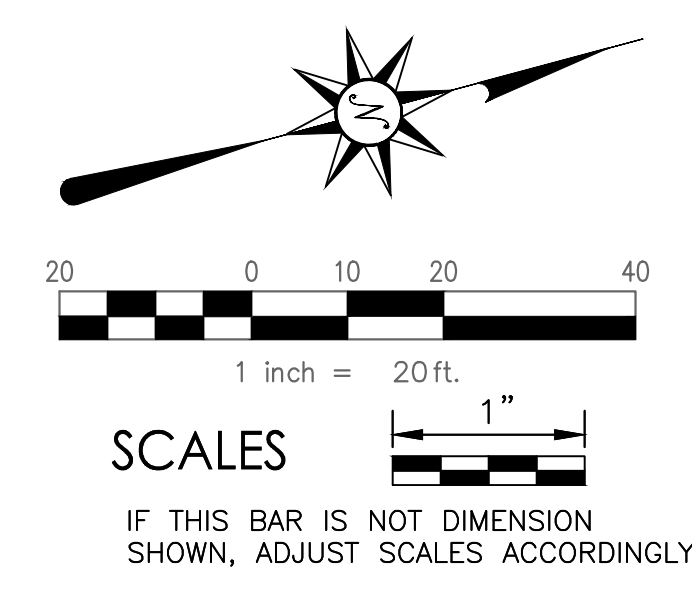
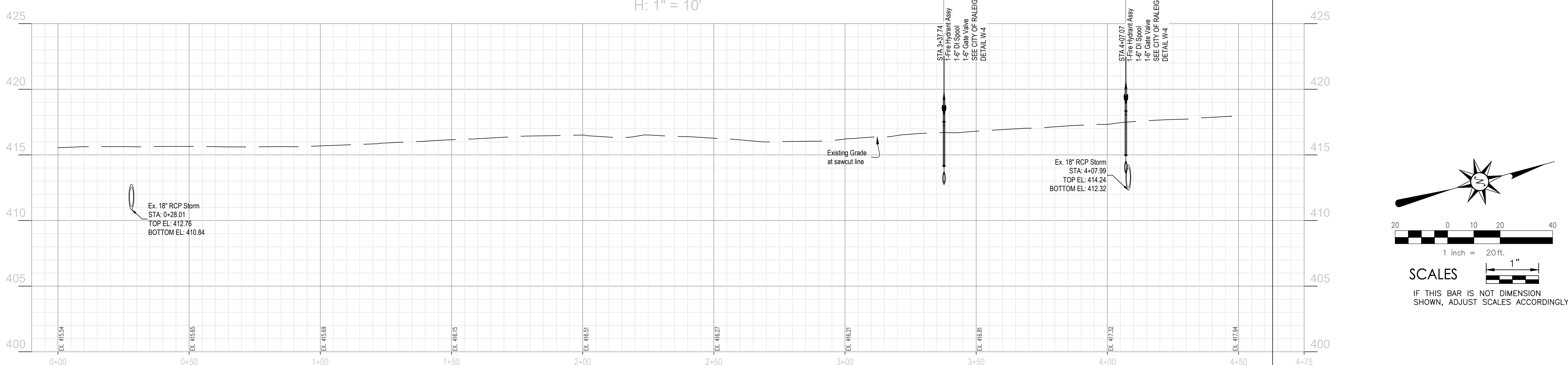
Legend

- Proposed Building Area
- Driveway Chip Seal
- Parking Stall Count Total
- Proposed Sewer Cleanout/Hookup
- Proposed Yard Hydrant
- Proposed Water Meter
- Proposed Water Hookup
- Proposed Electrical Hookup
- Proposed Privacy /Fence
- Existing Contours
- Proposed Contours
- Proposed Swale
- Proposed Storm Headwall
- Proposed Storm Piping
- Limits of Construction

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Survey Notes:
 Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
 Benchmarks
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 N: 777259.39
 E: 2055900.75
 Scale factor: 0.99993364
 BM #2 - 1" Existing Iron Pin, Northwest property corner. El. 416.00'
 N: 782230.4116
 E: 2053789.7322

Page Rd
 V: 1" = 2'
 H: 1" = 10'



REVISIONS:
 New Submittal - ASR City comments 06/30/2022

APPROVALS:

DESIGNED	HDB/AC
DRAWN	HDB
CHECKED	AC
DATE	1" = 20'
SCALE	

ENGINEERED BY

 STAR
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27710
 Cell: (360)870-3218
 hboutwell@star-arm.com

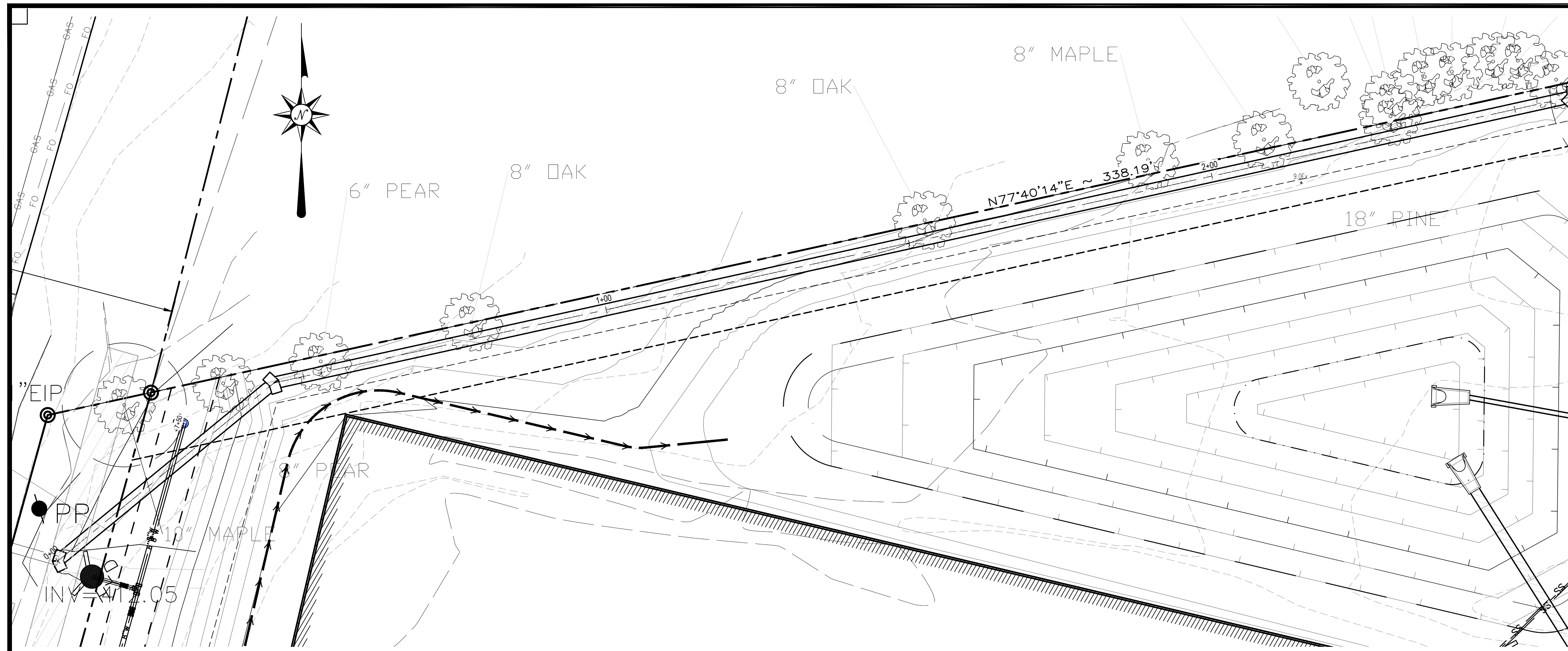
PREPARED BY

 STAR
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27710
 Cell: (360)870-3218
 hboutwell@star-arm.com

PROJECT LOCATION:
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

PROJECT TITLE:
PAGE ROAD WIDENING PLAN
AND PROFILE 1

SHEET NO:
C3.1
 OF 37
 PROJECT NO:
2023121402

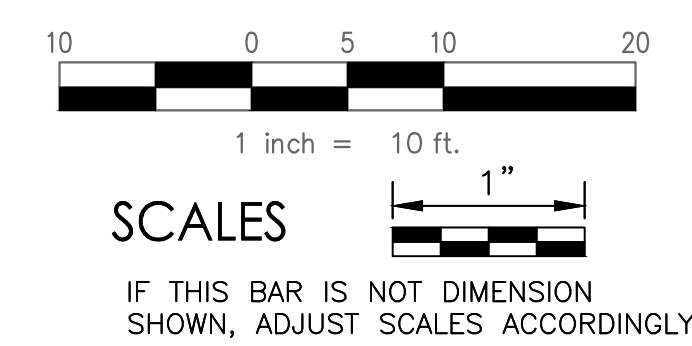
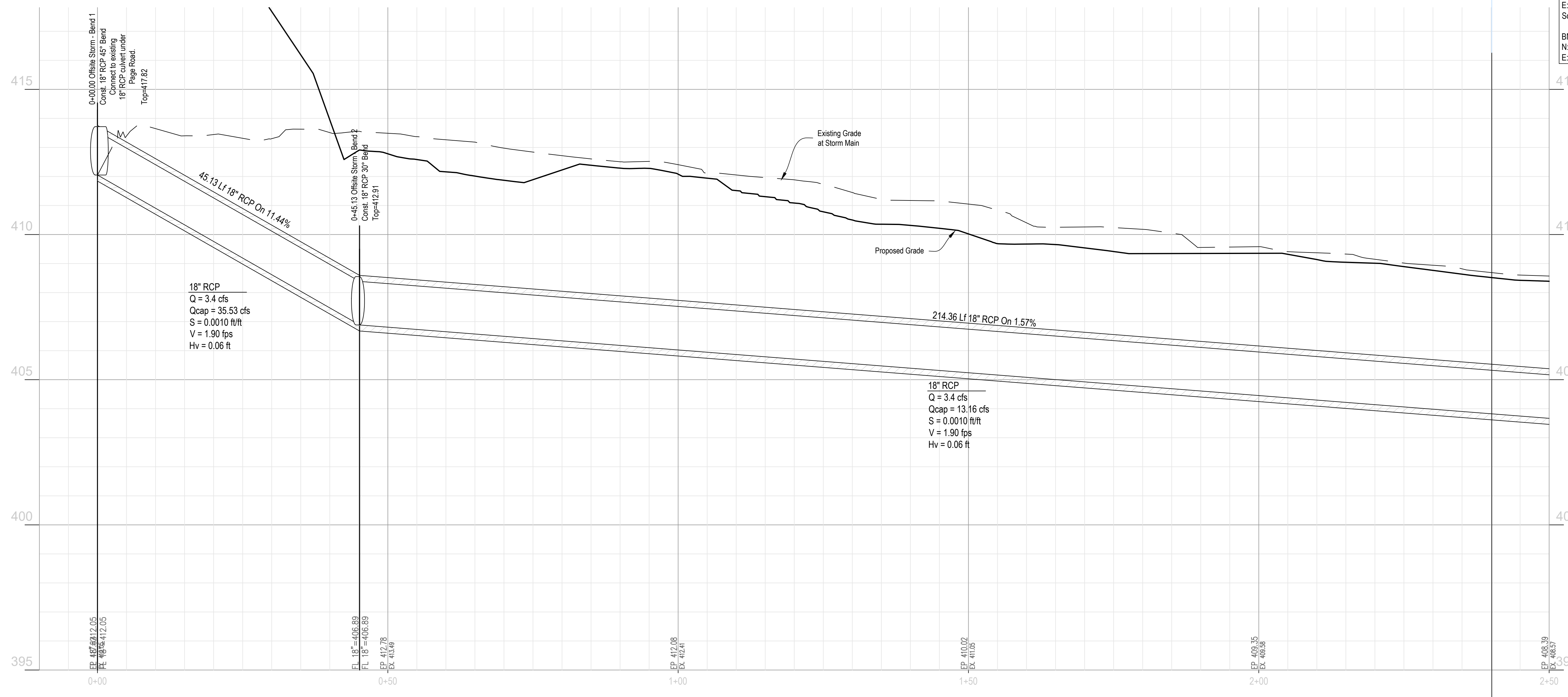


Legend

Building Area (BSBL)	
Proposed Sanitary Sewer	
Proposed Water	
Proposed Storm	
Existing Sanitary Sewer Cleanout	
Existing Sanitary Sewer Manhole	
Existing Sanitary Sewer Pipe	
Existing Water Main	
Existing Vault	
Existing Electrical Meter	
Existing Gas Meter	
Proposed Sewer Manhole	
Proposed Sewer Cleanout	
Proposed Drop Inlet/Catch Basin	
Proposed Curb Inlet	
Proposed Storm Junction Box	

Survey Notes:
 Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
Benchmarks
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REVISIONS
 New Submittal - ASR City comments 06/30/2022

APPROVALS

DESIGNED	HDB/AC
DRAWN	HDB
CHECKED	AC
DATE	11/11/2022
SCALE	1" = 10'

ENGINEERED BY

P.O. BOX 981
 RCP, LLC
 Cell: (919) 922-5453
 aacandmet1978@gmail.com

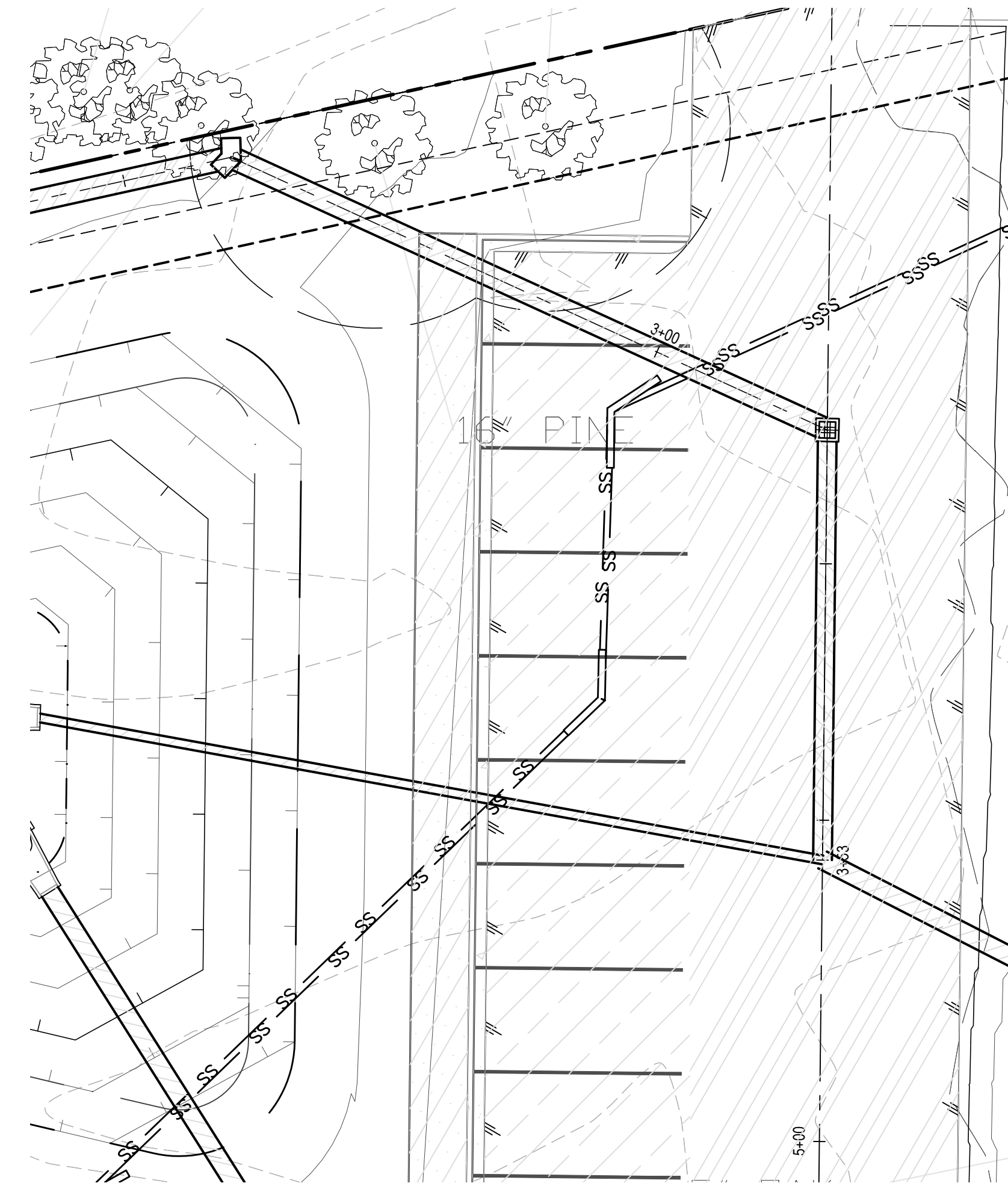
PREPARED BY

STARM Consulting, Inc.
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27710
 Cell: (360) 870-3218
 hboutwell@st-arm.com

PROJECT LOCATION
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

SHEET TITLE
EXISTING STORMWATER OUTFALL
TO SITE PLAN AND PROFILE 1

PROJECT NO.
C3.2
2023121402

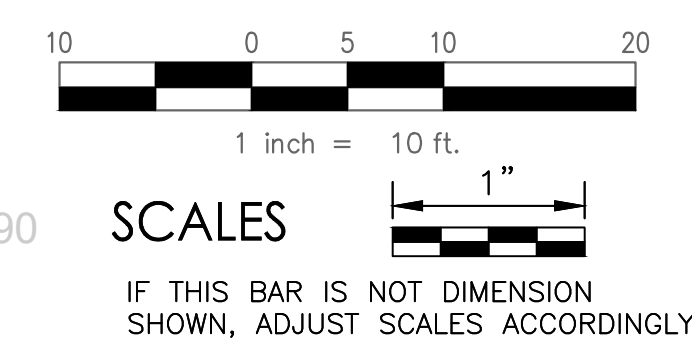
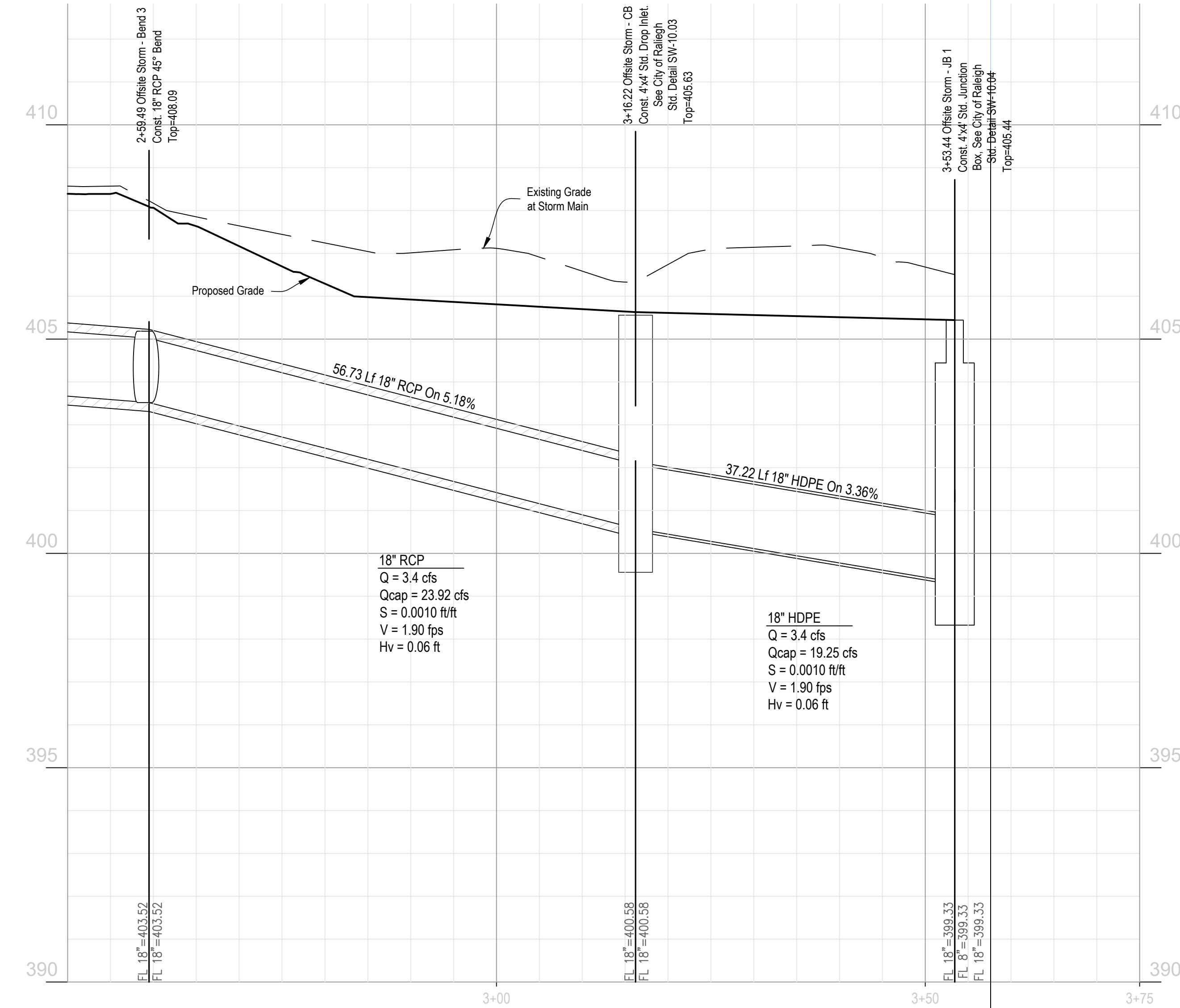


Legend

- Building Area (BSBL)
- Proposed Sanitary Sewer
- Proposed Water
- Proposed Storm
- Existing Sanitary Sewer Cleanout
- Existing Sanitary Sewer Manhole
- Existing Sanitary Sewer Pipe
- Existing Water Main
- Existing Vault
- Existing Electrical Meter
- Existing Gas Meter
- Proposed Sewer Manhole
- Proposed Sewer Cleanout
- Proposed Drop Inlet/Catch Basin
- Proposed Curb Inlet
- Proposed Storm Junction Box

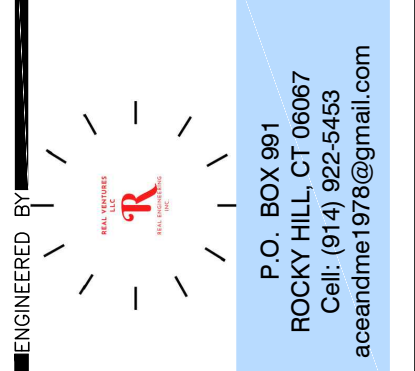
Survey Notes:
 Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
 Benchmarks
 Bearing based on North Carolina Grid North, NAD83/2011 (VRS), Vertical datum NAVD-88 (VRS); US survey feet, derived from GPS observations.
 BM #1 - NCGS Monument "WAK 114"
 N: 777259.39
 E: 2055900.75
 Scale factor: 0.99993364
 BM #2 - 1" Existing Iron Pin, Northwest property corner. El. 416.00'
 N: 782230.4116
 E: 2053789.7322

FLOOD STATEMENT: According to Community Panel No. 3720075900K, dated July 19, 2022, of the Federal Emergency Management Agency, National Flood Insurance Program Map.
 This property is within several flood zones, Flood Zone "X" (areas determined to be outside 500-year floodplain), which is not a special flood hazard area. This statement shall not create liability on the part of the Surveyor.



REVISIONS
 New Submittal - ASR City comments 06/30/2022

APPROVALS
 DESIGNED: HDB/AC
 DRAWN: HDB
 CHECKED: AC
 DATE: _____
 SCALE: 1" = 10'

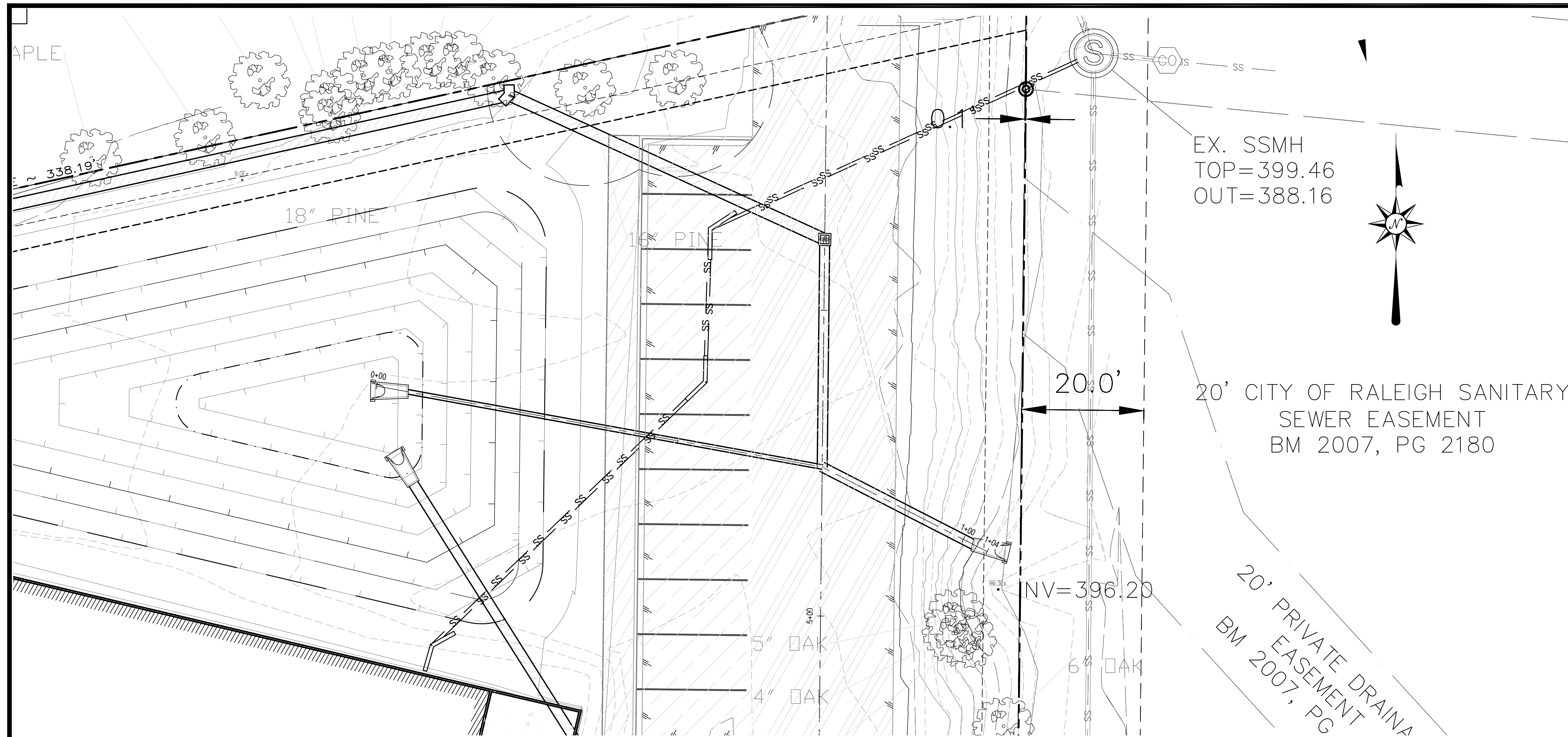


PREPARED BY
STARM
 Stray ARM Consulting
 Engineering Support
 Civil Design & Drafting
 Denton, TX 76210
 Cell: (360)870-3218
 hboutwell@st-arm.com

PROJECT LEGAL
 2.16 AC
 DB 5766, PG 984
 PIN: 0758.03-32-9153
 Triangle Township
 Durham County, NC

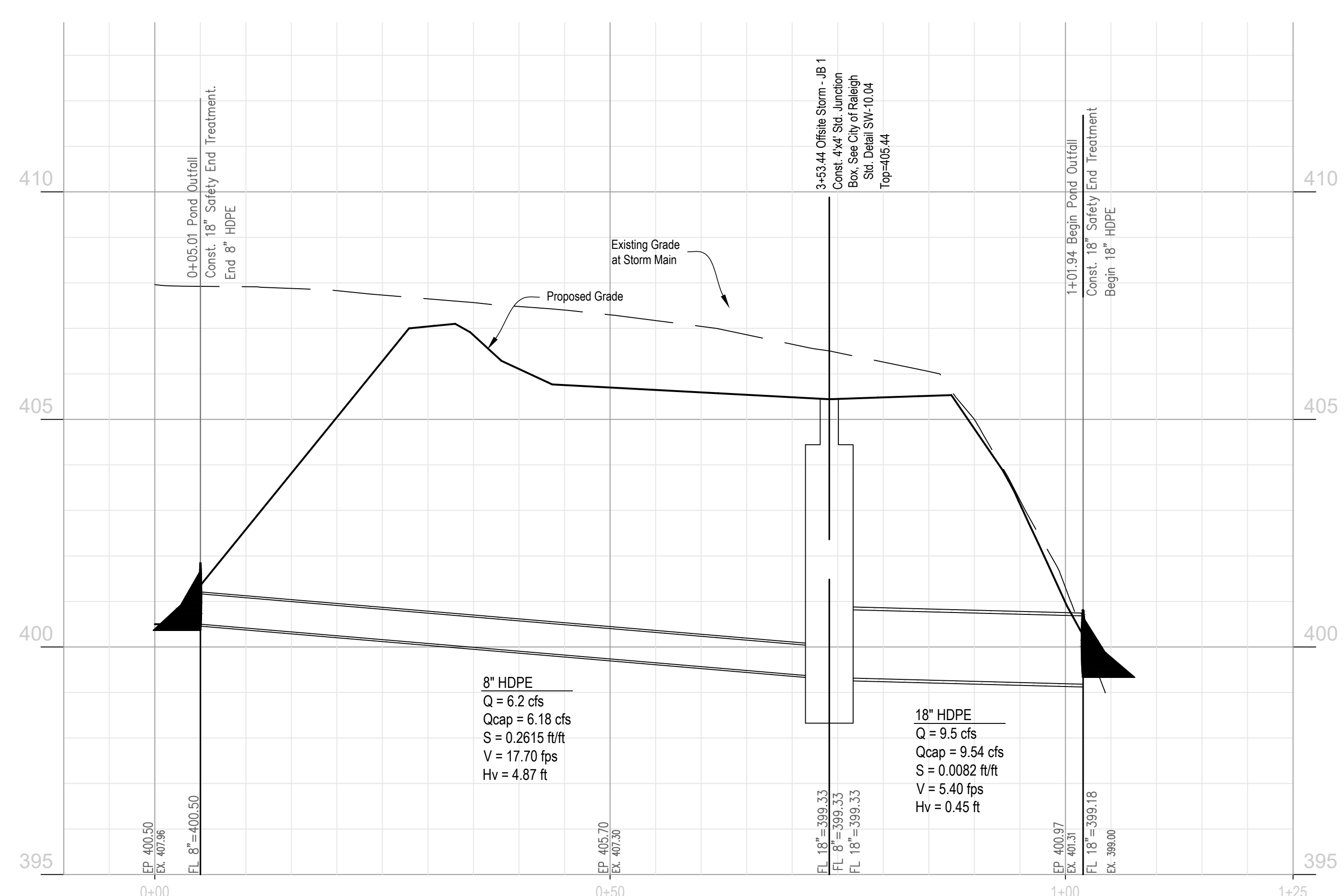
PROJECT LOCATION
 3601 Page Road
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022
 SHEET TITLE
 EXISTING STORMWATER OUTFALL
 TO SITE PLAN AND PROFILE 2

SHEET NO.
C3.3
 OF 37
 PROJECT NO.
2023121402



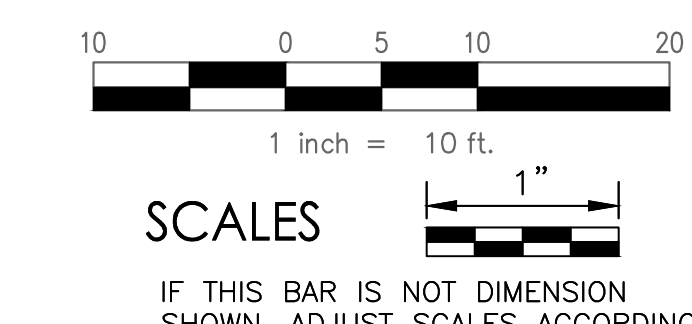
Legend

Building Area (BSBL)	
Proposed Sanitary Sewer	
Proposed Water	
Proposed Storm	
Existing Sanitary Sewer Cleanout	
Existing Sanitary Sewer Manhole	
Existing Sanitary Sewer Pipe	
Existing Water Main	
Existing Vault	
Existing Electrical Meter	
Existing Gas Meter	
Proposed Sewer Manhole	
Proposed Sewer Cleanout	
Proposed Drop Inlet/Catch Basin	
Proposed Curb Inlet	
Proposed Storm Junction Box	



Survey Notes:
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 E: 2055900.75
 Scale factor: 0.99993364
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 N: 782230.4116
 E: 2053789.7322

FLOOD STATEMENT: According to Community Panel No. 3720075800K, dated July 19, 2022, of the Federal Emergency Management Agency, National Flood Insurance Program Map.
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REVISIONS: New Submittal - ASR City comments 06/30/2022

APPROVALS: HDB/AC, HDB, AC

DESIGNED: _____ DRAWN: _____ CHECKED: _____ DATE: _____ SCALE: 1" = 10'

ENGINEERED BY: P.O. BOX 984, RDU, NC 27709, Cell: (919) 922-5453, acesandme1978@gmail.com

PREPARED BY: **STARY ARM Consulting** Engineering Support Civil Design & Drafting Denton, TX 76210 Cell: (360)870-3218 hboutwell@st-arm.com

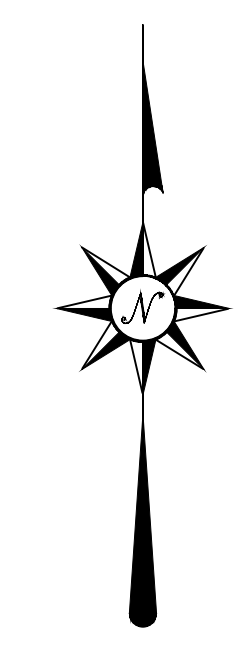
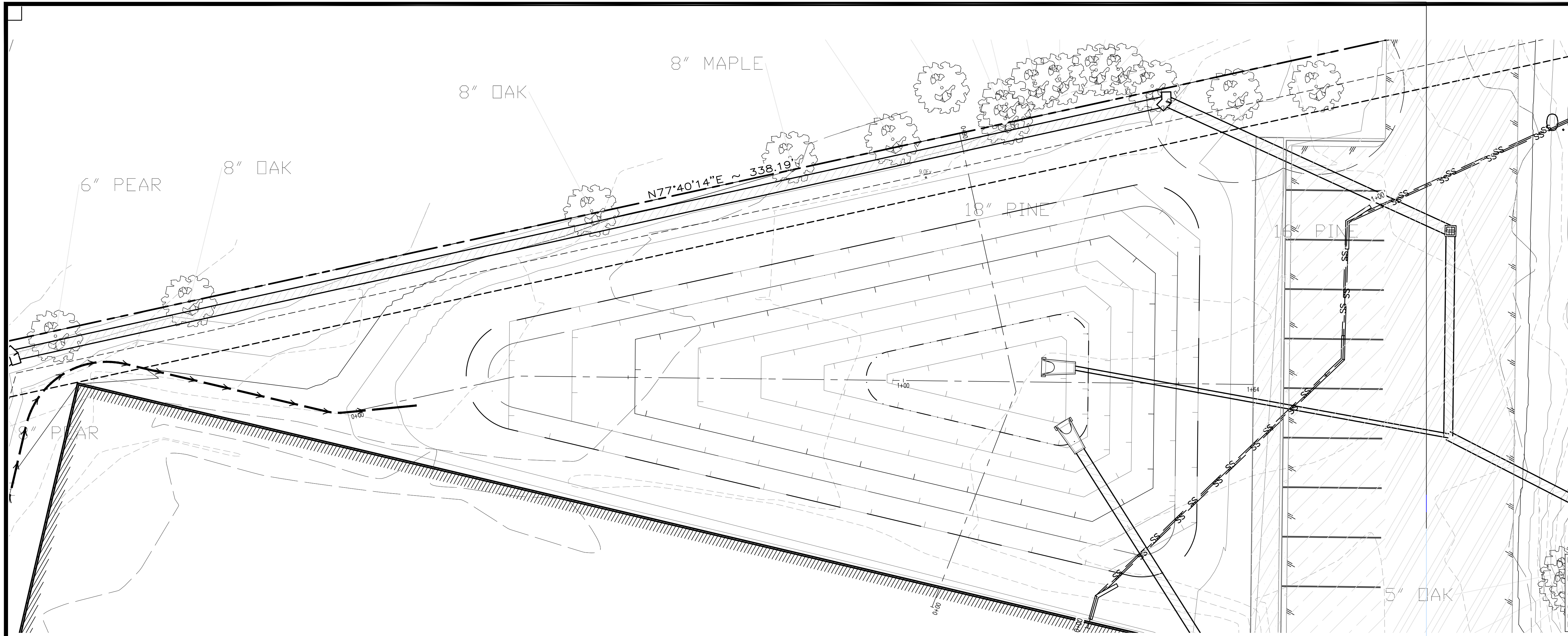
PROJECT LEGAL: 2.16 AC DB 5766, PG 984 PIN: 0758.03-32-9153 Triangle Township Durham County, NC

PROJECT LOCATION: 3601 Page Road Morrisville, NC 27560 City of Raleigh Case # ASR-0015-2022

SHEET TITLE: STORMWATER POND OUT FALL PLAN AND PROFILE

PROJECT NO.: C3.4 SHEET NO.: 2023121402

3601 Page Road

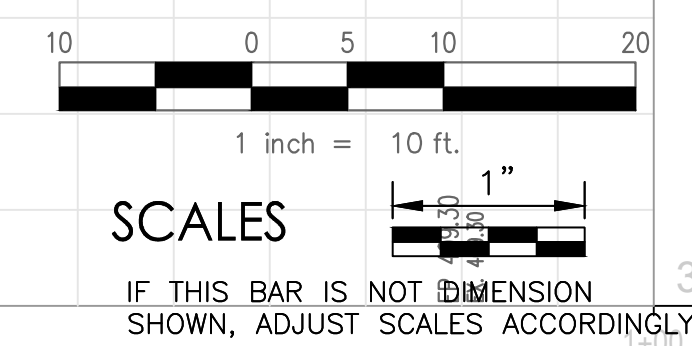
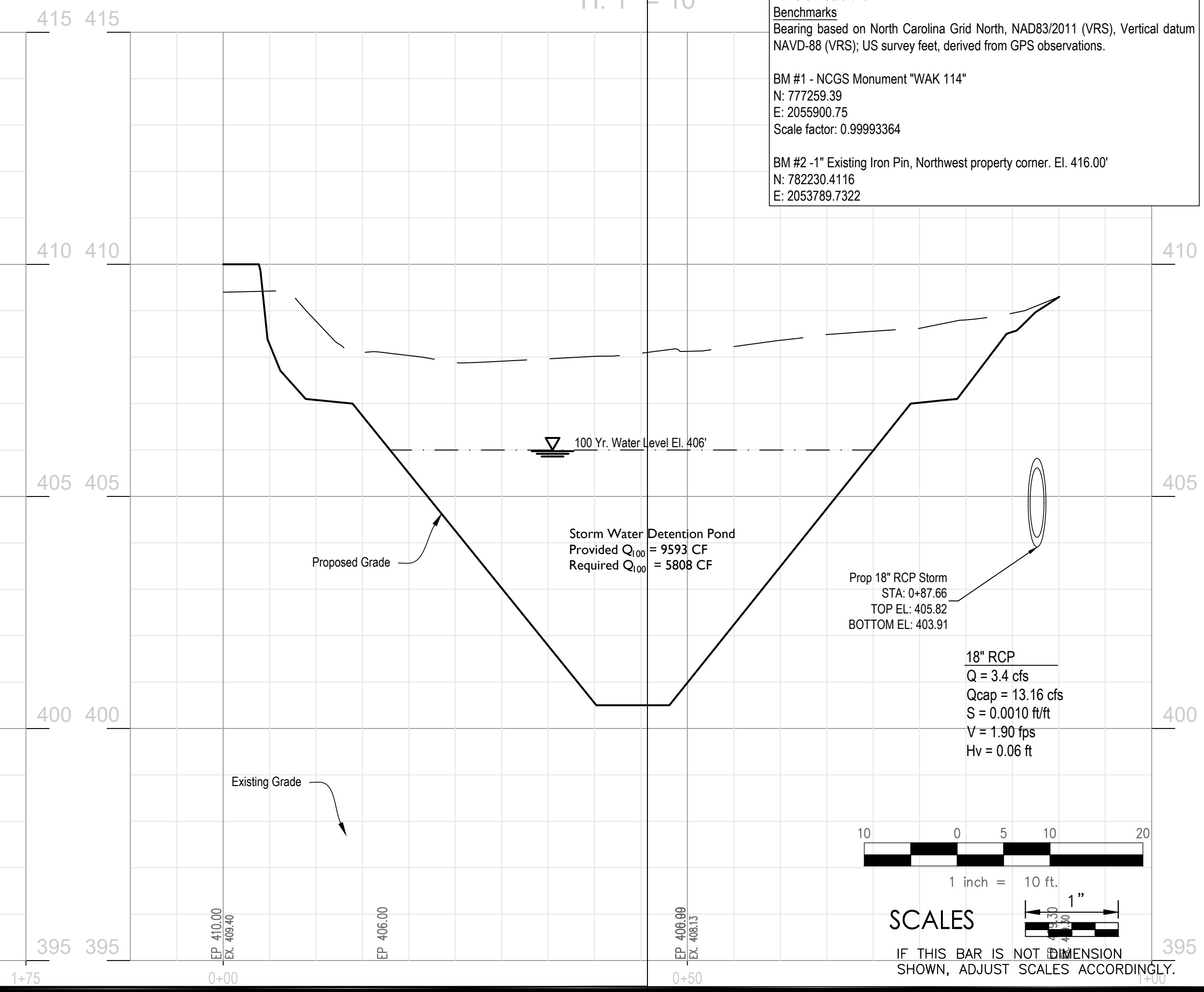
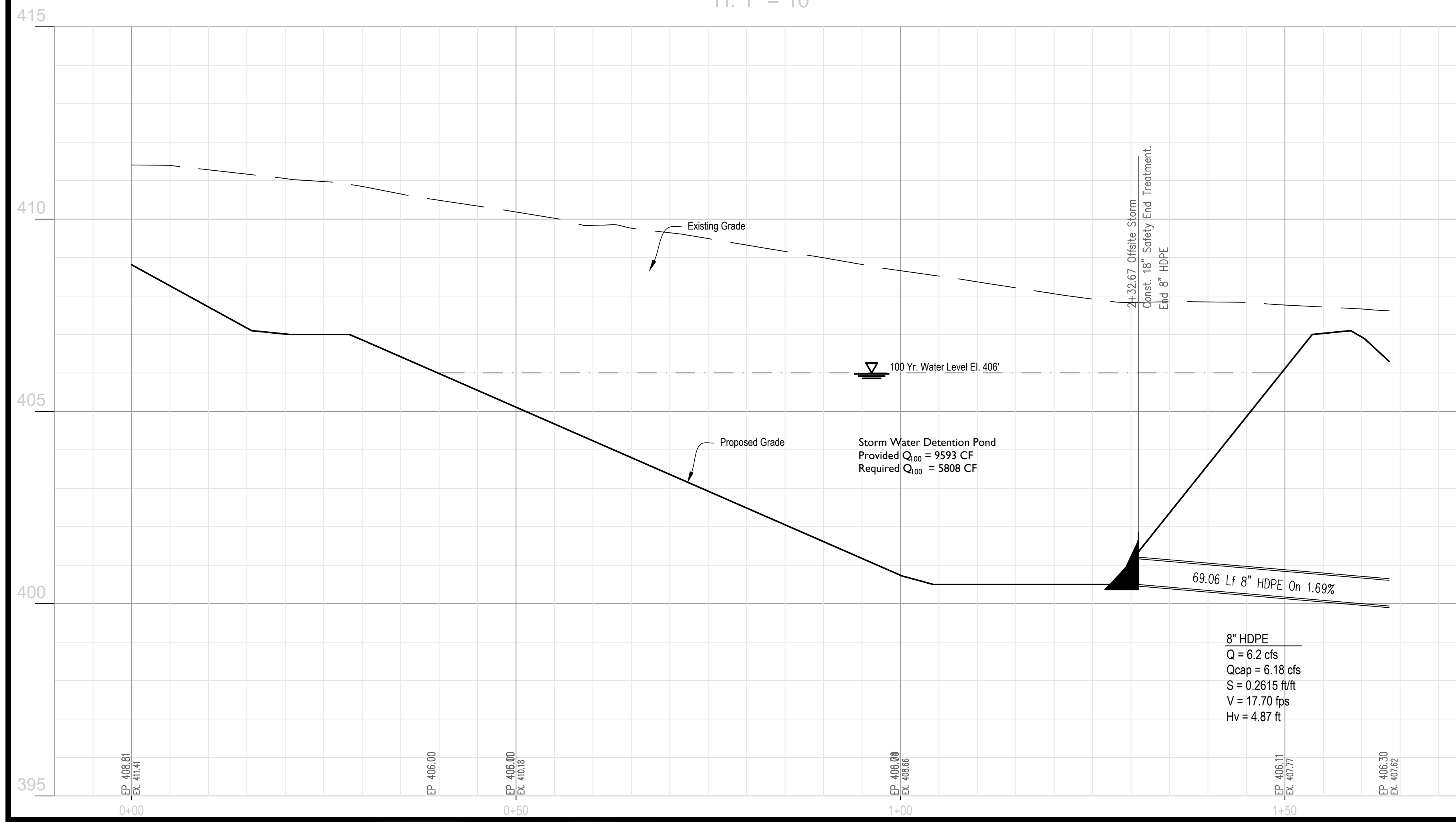


FLOOD STATEMENT: According to Community Panel No. 3720075800K, dated July 19, 2022, of the Federal Emergency Management Agency, National Flood Insurance Program Map. This property is within several flood zones, Flood Zone "X" (areas determined to be outside 500-year floodplain), which is not a special flood hazard area. This statement shall not create liability on the part of the Surveyor.

Pond W_E
V: 1" = 2'
H: 1" = 10'

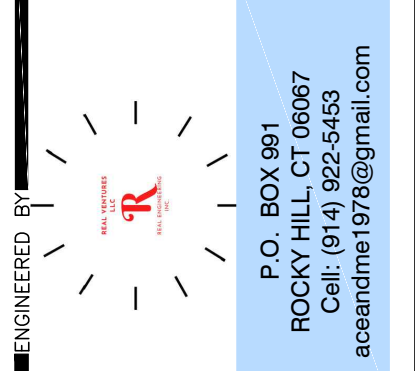
Pond S_N
V: 1" = 2'
H: 1" = 10'

Survey Notes:
Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
Benchmarks
Bearing based on North Carolina Grid North, NAD83/2011 (VRS), Vertical datum NAVD-88 (VRS); US survey feet, derived from GPS observations.
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Scale factor: 0.99993364
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N: 782230.4116
E: 2053789.7322



REVISIONS
New Submittal - ASR City comments 06/30/2022

DESIGNED: HDB/AC
DRAWN: HDB
CHECKED: AC
DATE: _____
SCALE: 1" = 10'



PREPARED BY
STARM
Stray ARM Consulting
Engineering Support
Civil Design & Drafting
Denton, TX 76210
Cell: (360)870-3218
hboutwell@st-arm.com

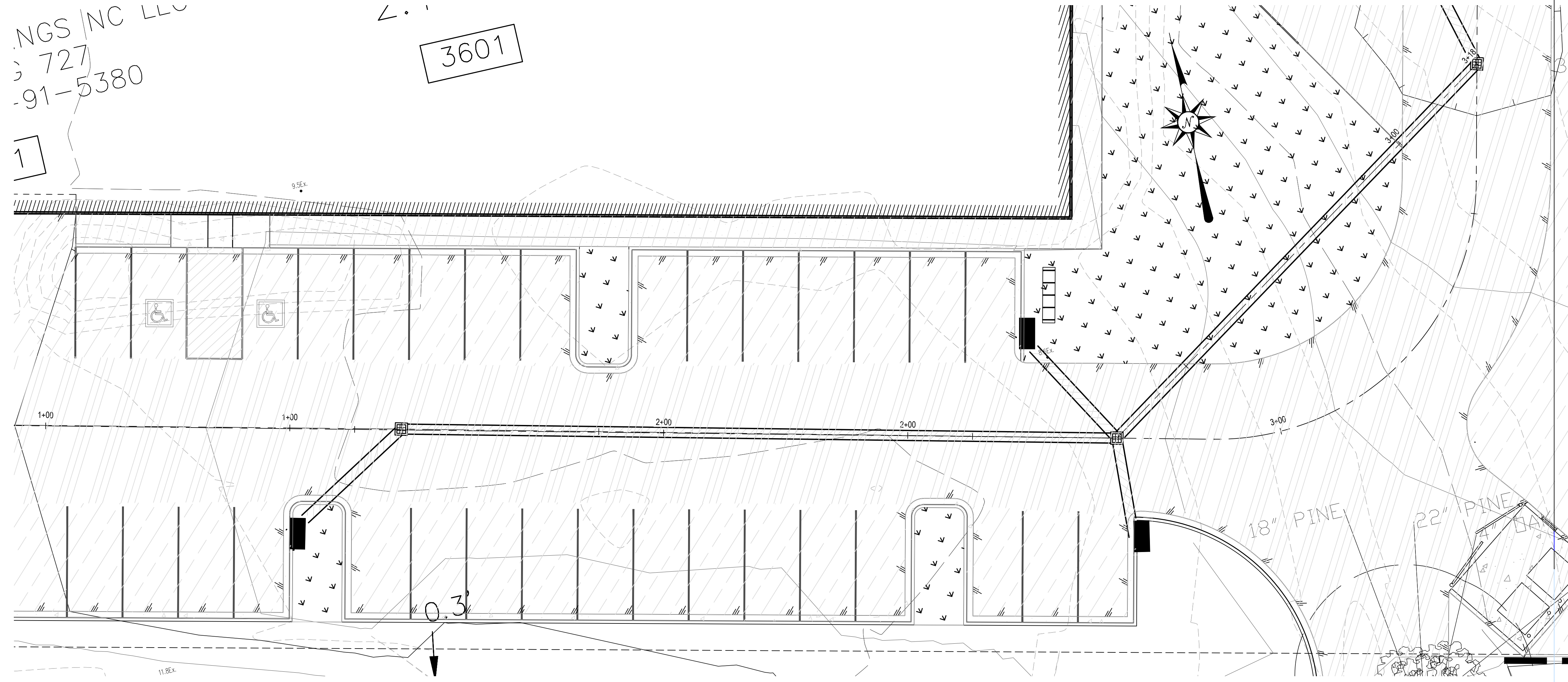
PROJECT LEGAL
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

PROJECT LOCATION
3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022
SHEET TITLE
STORMWATER POND CROSS
SECTIONS

PROJECT NO.
2023121402

NGS/NC LLC
 727
 -91-5380

3601

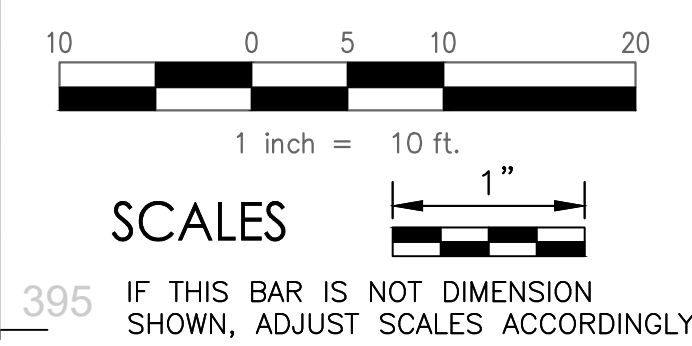
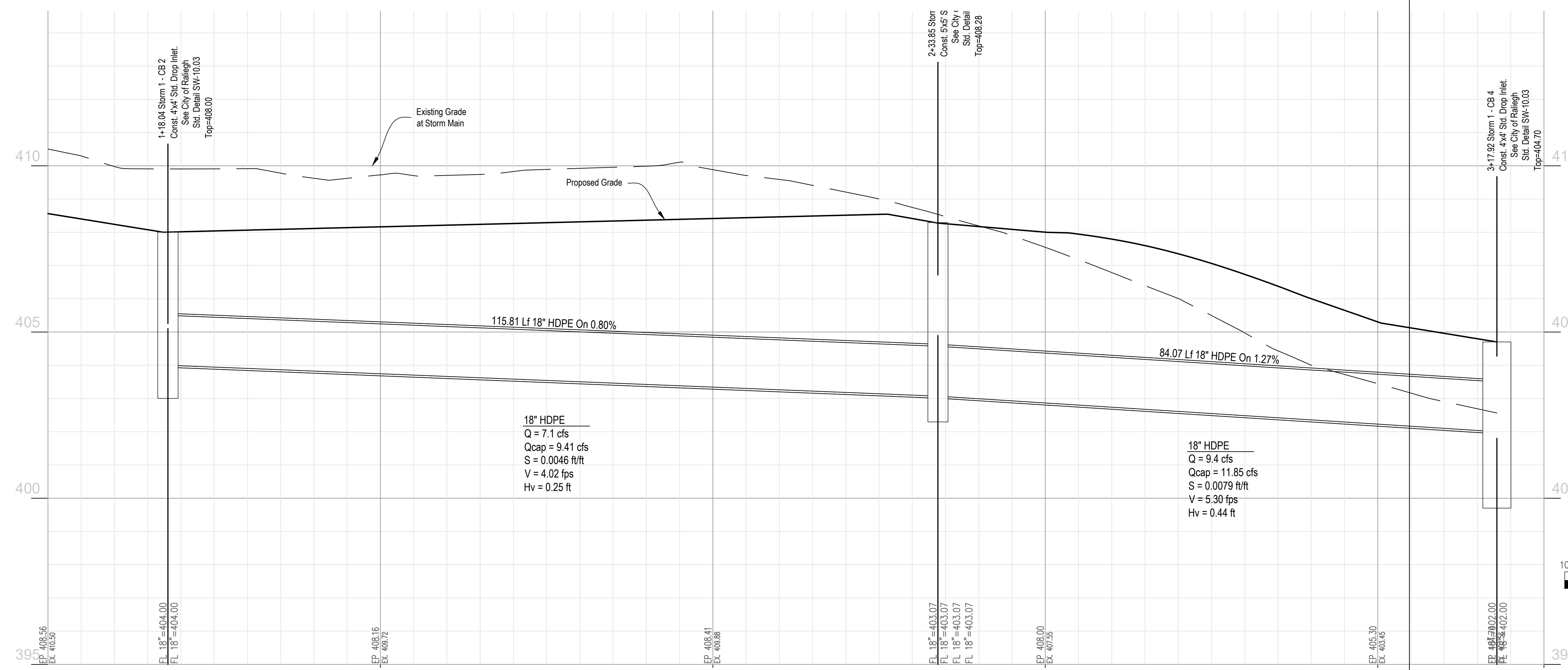


Legend

Building Area (BSBL)	
Proposed Sanitary Sewer	
Proposed Water	
Proposed Storm	
Existing Sanitary Sewer Cleanout	
Existing Sanitary Sewer Manhole	
Existing Sanitary Sewer Pipe	
Existing Water Main	
Existing Vault	
Existing Electrical Meter	
Existing Gas Meter	
Proposed Sewer Manhole	
Proposed Sewer Cleanout	
Proposed Drop Inlet/Catch Basin	
Proposed Curb Inlet	
Proposed Storm Junction Box	

Survey Notes:
 Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
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FLOOD STATEMENT: According to Community Panel No. 3720075800K, dated July 19, 2023, of the Federal Emergency Management Agency, National Flood Insurance Program Map.
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REVISIONS
 New Submittal - ASR City comments 06/30/2022

DESIGNED: HDB/AC
 DRAWN: HDB
 CHECKED: AC
 DATE: _____
 SCALE: 1" = 10'

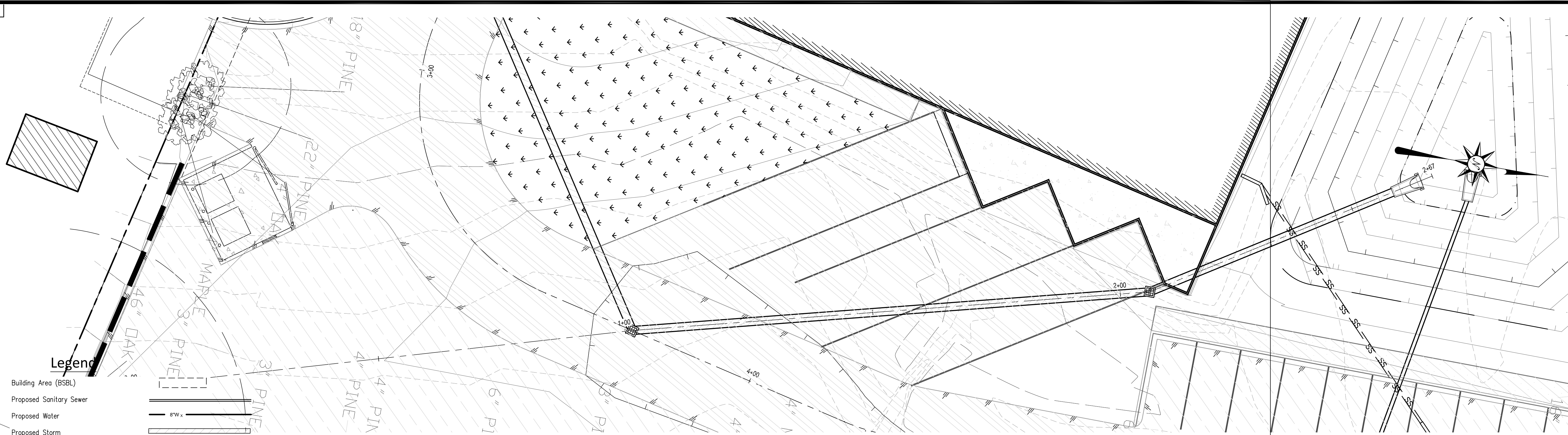
STARM
 P.O. BOX 981
 ROCKY HILL, NC 27687
 Cell: (919) 922-5453
 acesandmel1978@gmail.com

STARM
 Stray ARM Consulting
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27610
 Cell: (360) 870-3218
 hboutwell@st-arm.com

PROJECT LEGAL
 2.16 AC
 DB 5766, PG 984
 PIN: 0758.03-32-9153
 Triangle Township
 Durham County, NC

PROJECT LOCATION
 3601 Page Road
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022
 SHEET TITLE
 ENTRY STORM WATER PLAN AND
 PROFILE

C3.6
 PROJECT NO.
 2023121402

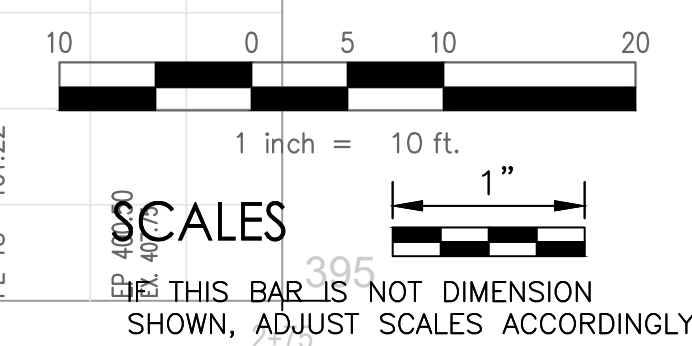
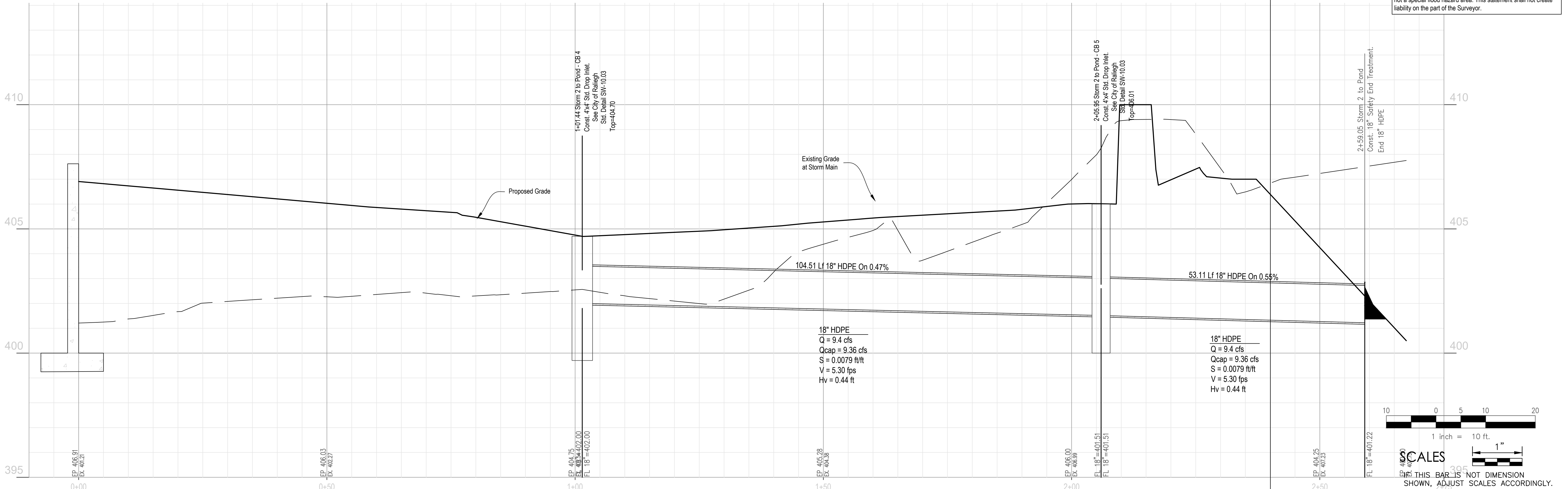


Legend

- Building Area (BSBL)
- Proposed Sanitary Sewer
- Proposed Water
- Proposed Storm
- Existing Sanitary Sewer Cleanout
- Existing Sanitary Sewer Manhole
- Existing Sanitary Sewer Pipe
- Existing Water Main
- Existing Vault
- Existing Electrical Meter
- Existing Gas Meter
- Proposed Sewer Manhole
- Proposed Sewer Cleanout
- Proposed Drop Inlet/Catch Basin
- Proposed Curb Inlet
- Proposed Storm Junction Box

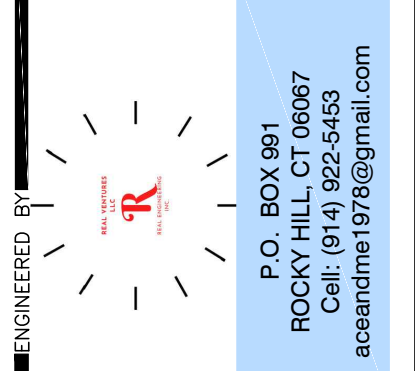
Survey Notes:
 Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
Benchmarks
 Bearing based on North Carolina Grid North, NAD83/2011 (VRS), Vertical datum NAVD-88 (VRS); US survey feet, derived from GPS observations.
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 E: 2053789.7322

FLOOD STATEMENT: According to Community Panel No. 3720075800K, dated July 19, 2022, of the Federal Emergency Management Agency, National Flood Insurance Program Map.
 This property is within several flood zones, Flood Zone "X" (areas determined to be outside 500-year floodplain), which is not a special flood hazard area. This statement shall not create liability on the part of the Surveyor.



APPROVALS
 DESIGNED: HDB/AC
 DRAWN: HDB
 CHECKED: AC
 DATE: _____
 SCALE: 1" = 10'

REVISIONS
 1. 06/30/2022 New Submittal - ASR City comments

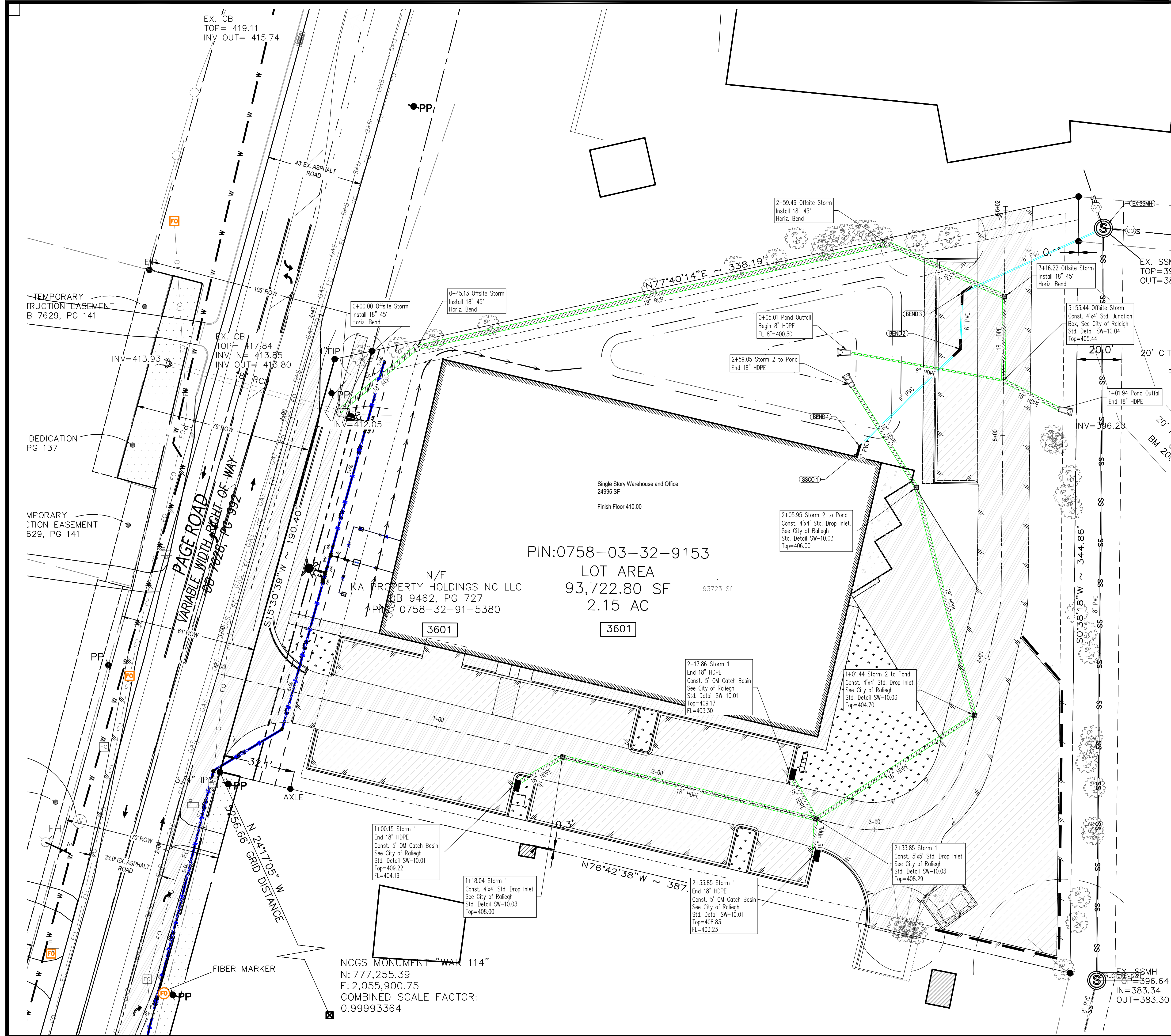


STARM
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27710
 Cell: (360)870-3218
 hboutwell@st-arm.com

2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

3601 Page Road
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022
STORM WATER PLAN AND
PROFILE 3

C3.7
 PROJECT NO.
2023121402



Legend

Building Area (BSBL)	
Proposed Sanitary Sewer	
Proposed Water	
Proposed Storm	
Existing Sanitary Sewer Cleanout	
Existing Sanitary Sewer Manhole	
Existing Sanitary Sewer Pipe	
Existing Water Main	
Existing Water Meter	
Existing Fire Hydrant	
Existing Vault	
Existing Electrical Meter	
Existing Gas Meter	
Proposed Fire Hydrant	
Proposed Sewer Manhole	
Proposed Sewer Cleanout	
Proposed Drop Inlet	
Proposed Curb Inlet	
Proposed Storm Junction Box	
Proposed Fire Dept Connection	
Proposed Water Meter	

Survey Notes:
 Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
 Benchmarks
 Bearing based on North Carolina Grid North, NAD83/2011 (VRS), Vertical datum NAVD-88 (VRS); US survey feet, derived from GPS observations.
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 Scale factor: 0.99993364
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 E: 2053789.7322

FLOOD STATEMENT: According to Community Panel No. 3720075800K, dated July 19, 2022, of the Federal Emergency Management Agency, National Flood Insurance Program Map.
 This property is within several flood zones. Flood Zone "X" (areas determined to be outside 500-year floodplain), which is not a special flood hazard area. This statement shall not create liability on the part of the Surveyor.

IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

PIN:0758-03-32-9153
 LOT AREA
 93,722.80 SF
 2.15 AC

NCGS MONUMENT "WAK 114"
 N: 777,255.39
 E: 2,055,900.75
 COMBINED SCALE FACTOR:
 0.99993364

REVISIONS: New Submittal - ASR City comments 06/30/2022

APPROVALS:

DESIGNED	HDB/AC	HDB	AC
DRAWN			
CHECKED			
DATE			
SCALE			1"=20'

ENGINEERED BY:

PREPARED BY:

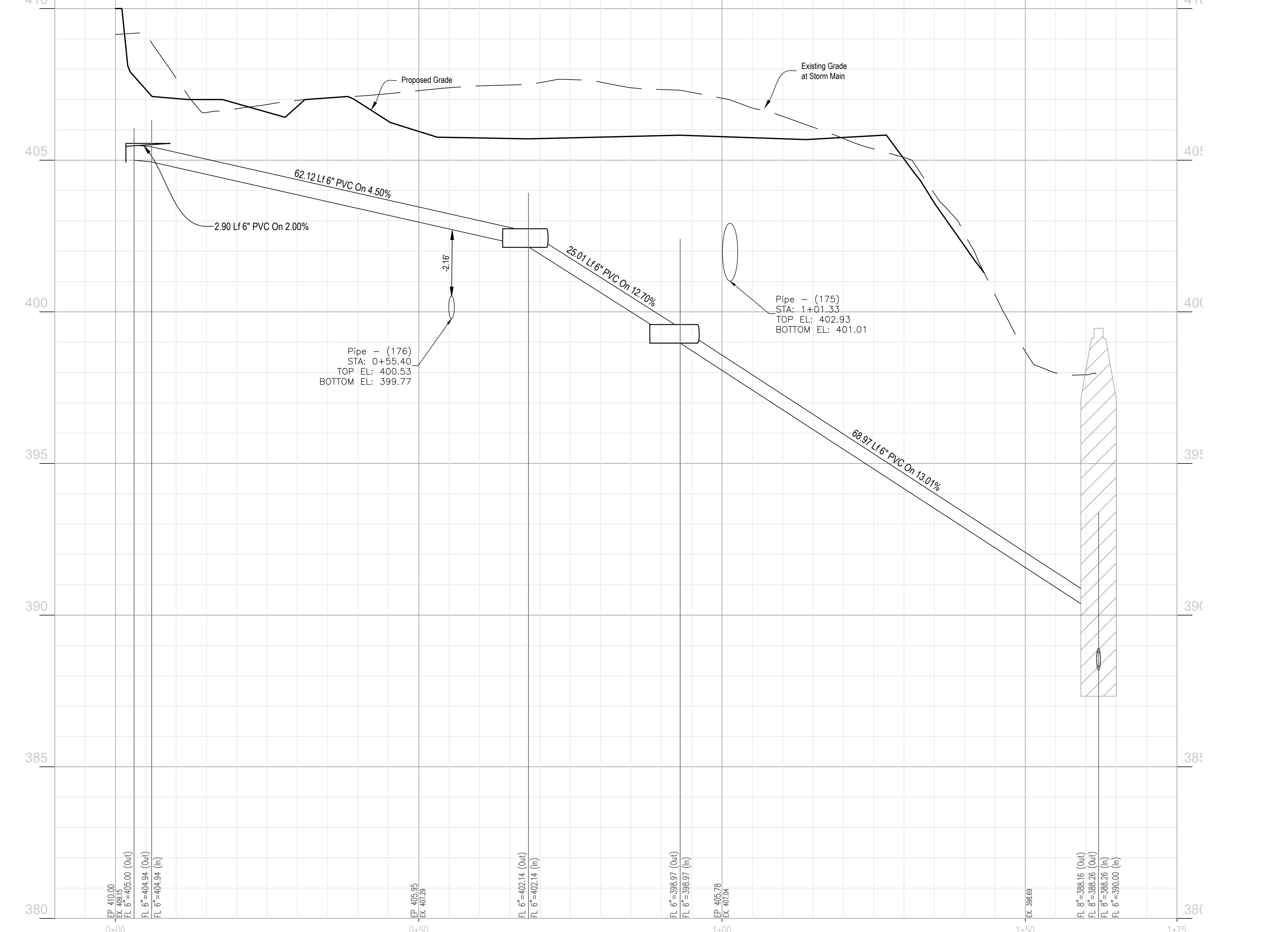
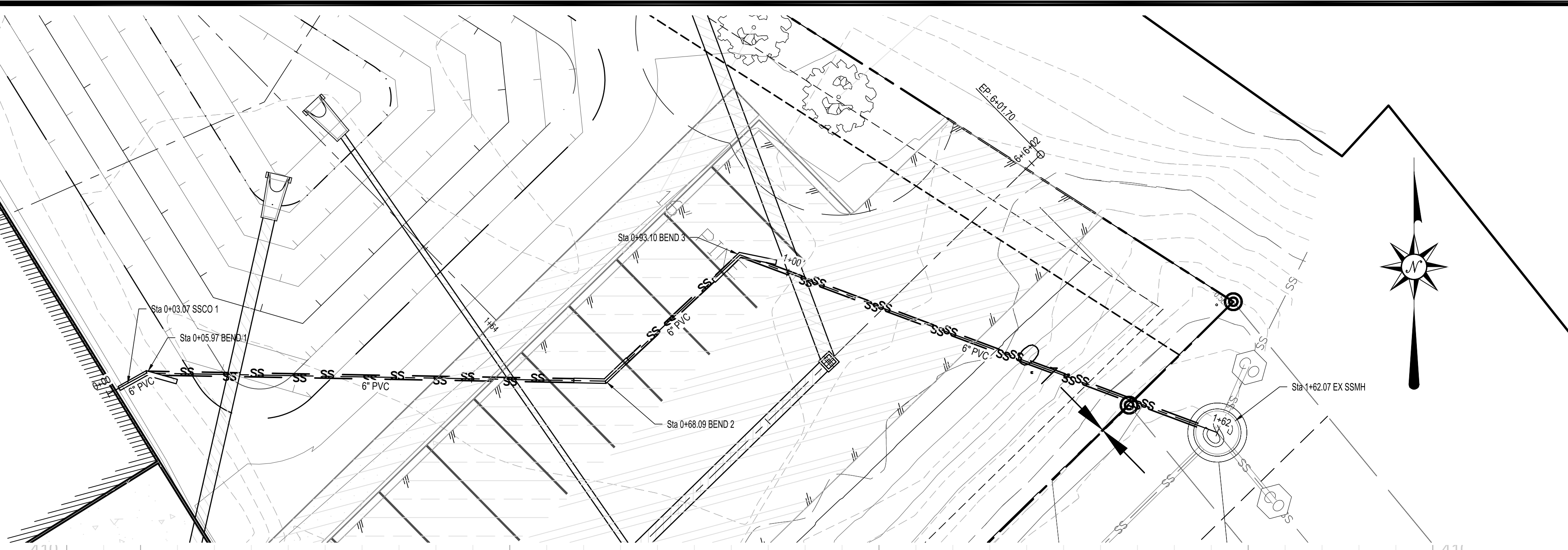
PROJECT LOCATION: 3601 Page Road, 3601 Page Road, Morrisville, NC 27560, City of Raleigh Case # ASR-0015-2022

SHEET TITLE: OVERALL UTILITY PLAN

SHEET NO. C4.0

PROJECT NO. 2023121402

3601 Page Road

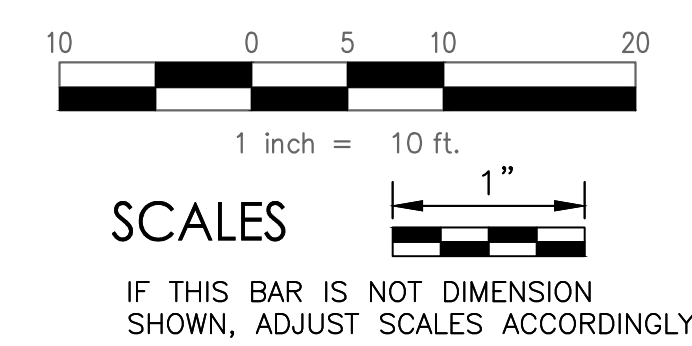


Legend

- Building Area (BSBL)
- Proposed Sanitary Sewer
- Proposed Water
- Proposed Storm
- Existing Sanitary Sewer Cleanout
- Existing Sanitary Sewer Manhole
- Existing Sanitary Sewer Pipe
- Existing Water Main
- Existing Vault
- Existing Electrical Meter
- Existing Gas Meter
- Proposed Sewer Manhole
- Proposed Sewer Cleanout
- Proposed Drop Inlet/Catch Basin
- Proposed Curb Inlet
- Proposed Storm Junction Box

Survey Notes:
 Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
 Benchmarks
 Bearing based on North Carolina Grid North, NAD83/2011 (VRS), Vertical datum NAVD-88 (VRS); US survey feet, derived from GPS observations.
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FLOOD STATEMENT: According to Community Panel No. 3720075800K, dated July 19, 2022, of the Federal Emergency Management Agency, National Flood Insurance Program Map.
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APPROVALS: REVISIONS:
 New Submittal - ASR City comments 06/30/2022

DESIGNED: HDB/AC
 DRAWN: HDB
 CHECKED: AC
 DATE: _____
 SCALE: 1" = 10'

ENGINEERED BY:

 P.O. BOX 981
 3601 Page Road
 City of Raleigh Case # ASR-0015-2022
 Cell: (919) 922-5453
 acesandme1978@gmail.com

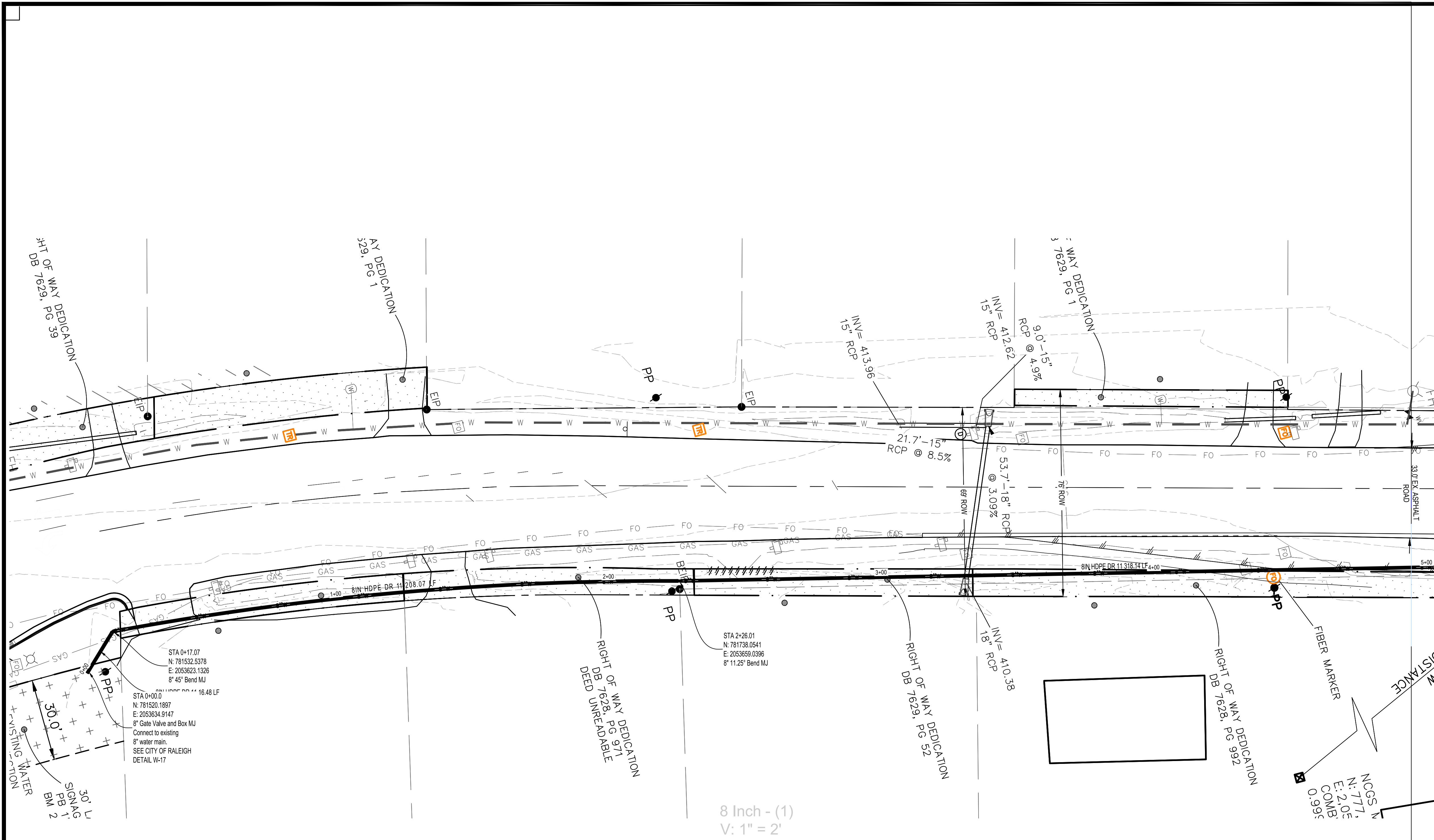
PREPARED BY:

 STARM Engineering Support
 Civil Design & Drafting
 Durham, NC 27610
 Cell: (360) 870-3218
 hboutwell@st-arm.com

PROJECT LEGAL:
 2.16 AC
 DB 5766, PG 984
 PIN: 0758.03-32-9153
 Triangle Township
 Durham County, NC

PROJECT LOCATION:
 3601 Page Road
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022
 SHEET TITLE:
 ONSITE SEWER LATERAL PLAN
 AND PROFILE
 SHEET NO. _____

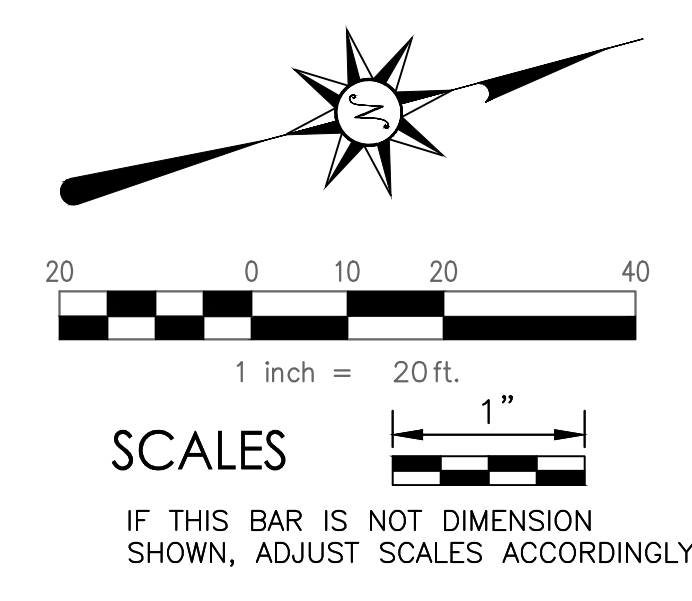
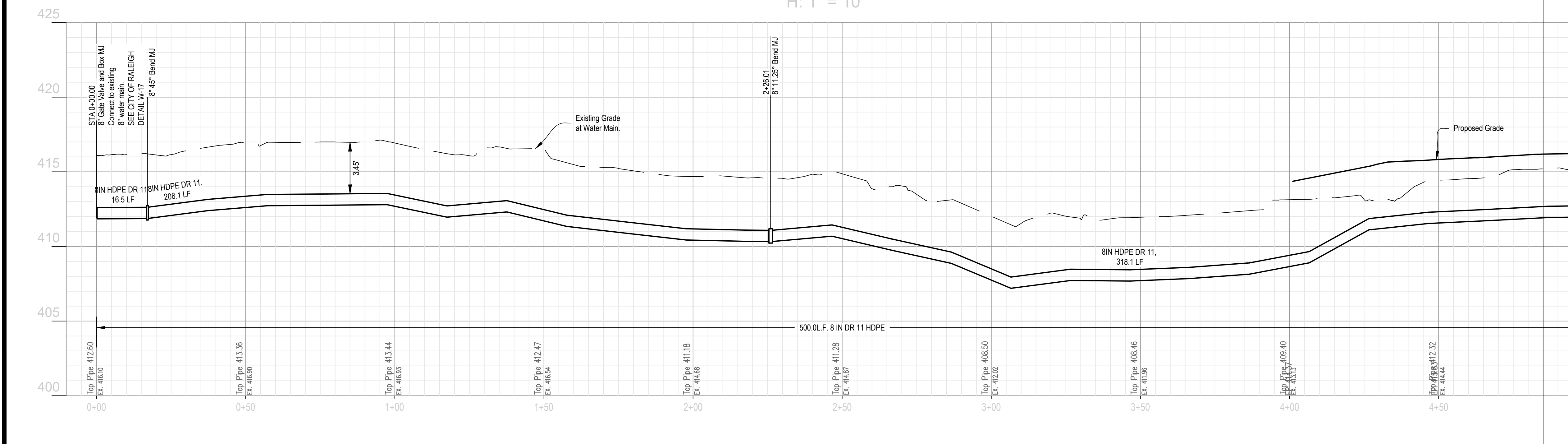
C4.1
 PROJECT NO.
 2023121402



- Legend**
- Proposed Building Area
 - Driveway Chip Seal
 - Parking Stall Count Total
 - Proposed Sewer Cleanout/Hookup
 - Proposed Yard Hydrant
 - Proposed Water Meter
 - Proposed Water Hookup
 - Proposed Electrical Hookup
 - Proposed Privacy /Fence
 - Existing Contours
 - Proposed Contours
 - Proposed Swale
 - Proposed Storm Headwall
 - Proposed Storm Piping
 - Limits of Construction

FLOOD STATEMENT: According to Community Panel No. 3720075800K, dated July 19, 2022, of the Federal Emergency Management Agency, National Flood Insurance Program Map. This property is within several flood zones, Flood Zone "X" (areas determined to be outside 500-year floodplain), which is not a special flood hazard area. This statement shall not create liability on the part of the Surveyor.

Survey Notes:
 Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
 Benchmarks
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 N: 782230.4116
 E: 2053789.7322



REVISIONS:
 New Submittal - ASR City comments 06/30/2022

DESIGNED	HDB/AC
DRAWN	HDB
CHECKED	AC
DATE	1" = 20'
SCALE	

ENGINEERED BY
 STAR
 P.O. BOX 984
 RICEVILLE, NC 27560
 Cell: (919) 922-5453
 acesandmel1978@gmail.com

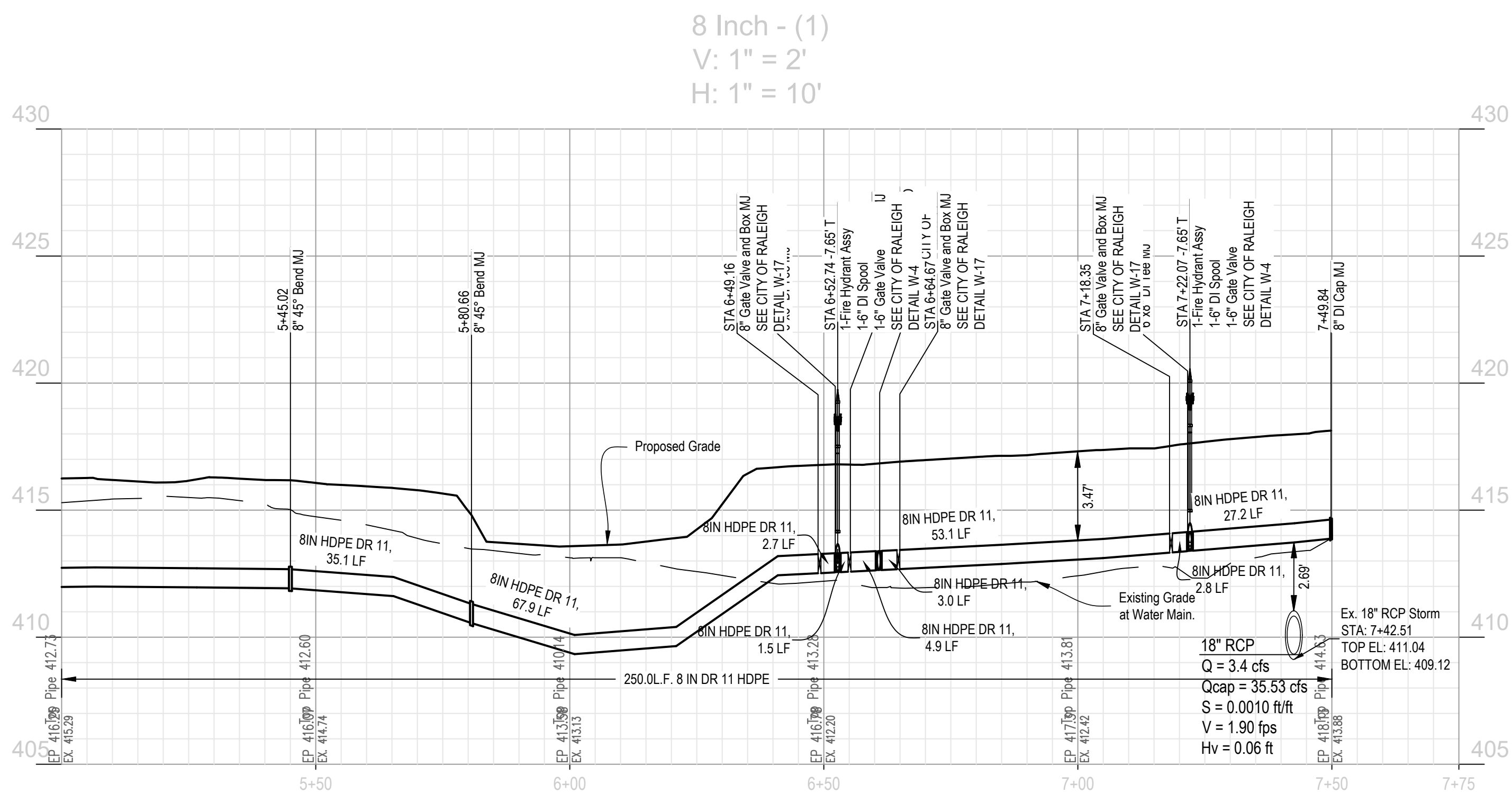
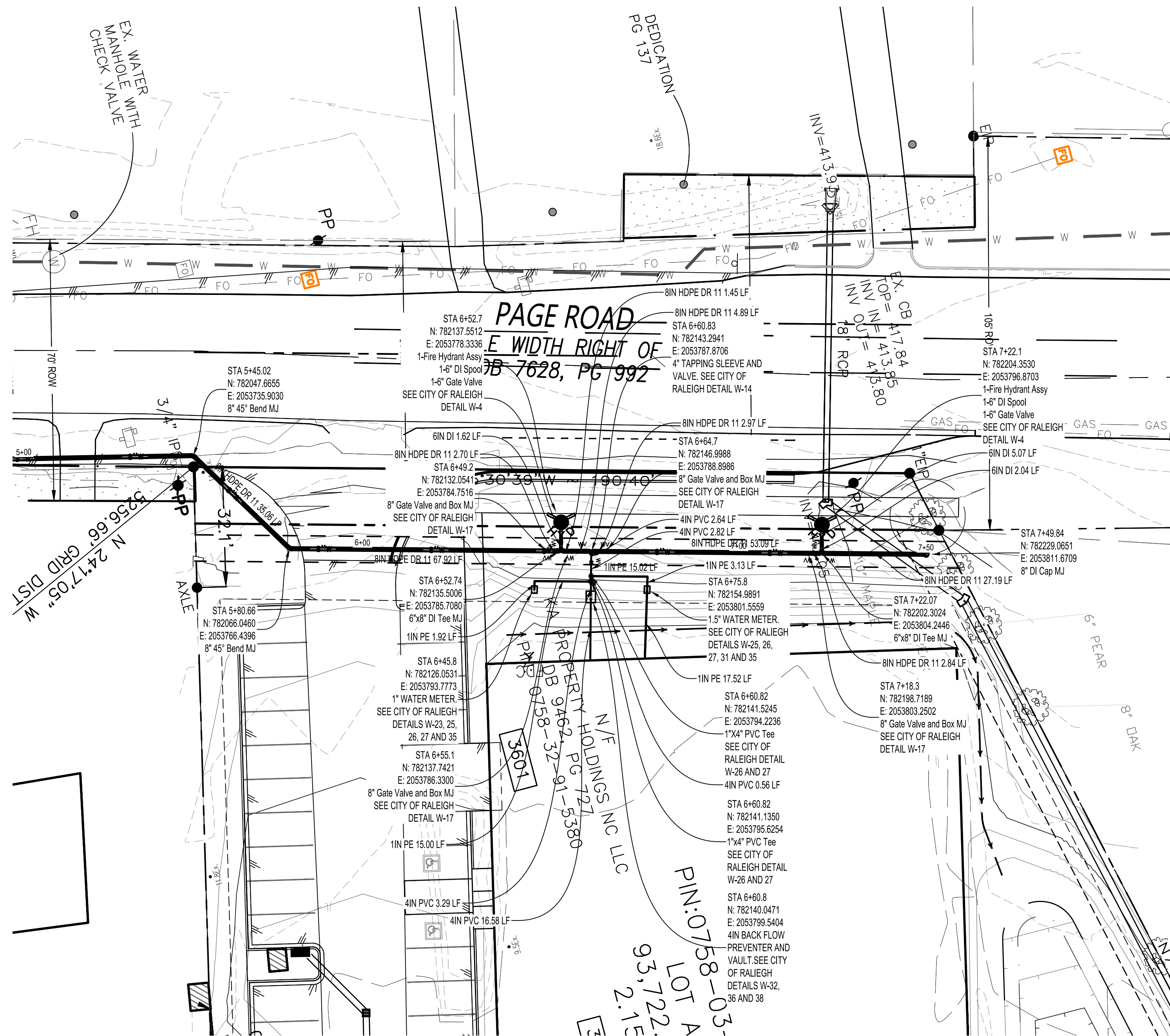
PREPARED BY
 STRONG ARM CONSULTING
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27710
 Cell: (360) 870-3218
 hboutwell@st-arm.com

PROJECT LOCATION
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

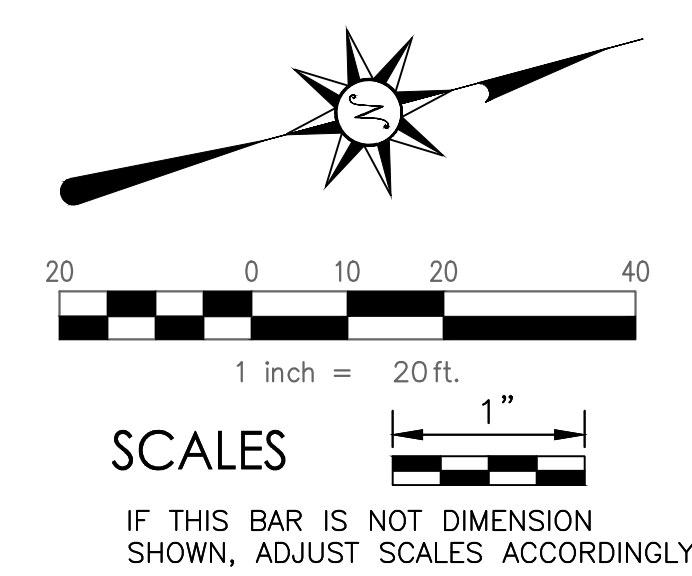
PROJECT LOCATION
3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022
 SHEET TITLE
PAGE ROAD WATER MAIN
EXTENSION PLAN AND PROFILE 1

SHEET NO.
C4.2
 OF 37
 PROJECT NO.
2023121402

3601 Page Road



8 Inch - (1)
 V: 1" = 2'
 H: 1" = 10'



- Legend**
- Proposed Building Area
 - Driveway Chip Seal
 - Parking Stall Count Total
 - Proposed Sewer Cleanout/Hookup
 - Proposed Yard Hydrant
 - Proposed Water Meter
 - Proposed Water Hookup
 - Proposed Electrical Hookup
 - Proposed Privacy /Fence
 - Existing Contours
 - Proposed Contours
 - Proposed Swale
 - Proposed Storm Headwall
 - Proposed Storm Piping
 - Limits of Construction

FLOOD STATEMENT: According to Community Panel No. 3720075800K, dated July 19, 2022, of the Federal Emergency Management Agency, National Flood Insurance Program Map. This property is within several flood zones, Flood Zone "X" (areas determined to be outside 500-year floodplain), which is not a special flood hazard area. This statement shall not create liability on the part of the Surveyor.

Survey Notes:
 Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
 Benchmarks
 Bearing based on North Carolina Grid North, NAD83/2011 (VRS), Vertical datum NAVD-88 (VRS); US survey feet, derived from GPS observations.
 BM #1 - NCGS Monument "WAK 114"
 N: 777259.39
 E: 2055900.75
 Scale factor: 0.99993364
 BM #2 - 1" Existing Iron Pin, Northwest property corner. El. 416.00'
 N: 782230.4116
 E: 2053789.7322

REVISIONS
 New Submittal - ASR City comments 06/30/2022

DESIGNED	HDB/AC
DRAWN	HDB
CHECKED	AC
DATE	11/20/22
SCALE	1" = 20'

ENGINEERED BY

 P.O. BOYBRI
 No. 19225493
 State of North Carolina
 aceandme1978@gmail.com

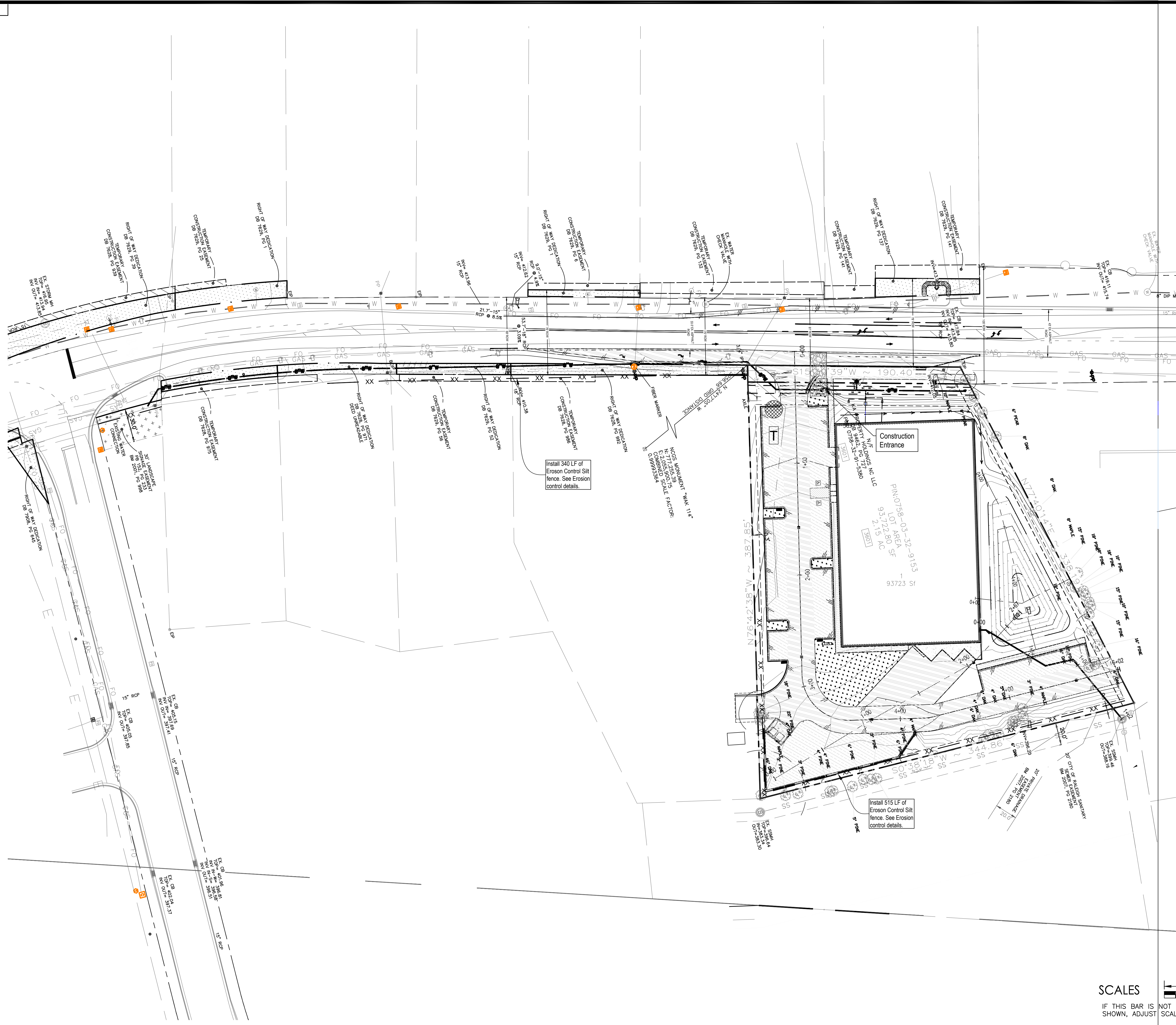
PREPARED BY

 STARM Consulting
 Engineering Support
 Civil Design & Drafting
 Durham, NC 27210
 Cell: (360)870-3218
 hboutwell@st-arm.com

PROJECT LOCATION
 2.16 AC
 DB 5766, PG 984
 PIN: 0758.03-32-9153
 Triangle Township
 Durham County, NC

PROJECT TITLE
 3601 Page Road
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022
 SHEET TITLE
 PAGE ROAD WATER MAIN
 EXTENSION PLAN AND PROFILE 2
 SHEET NO.

C4.3
 OF 37
 PROJECT NO.
 2023121402



Survey Notes:
 Onsite project Survey and topography provided by Angle Right Land Surveying, PLLC on 03/07/2022
 Benchmarks
 Bearing based on North Carolina Grid North, NAD83/2011 (VRS), Vertical datum NAVD-88 (VRS); US survey feet, derived from GPS observations.

BM #1 - NCGS Monument "WAK 114"
 N: 777259.39
 E: 2055900.75
 Scale factor: 0.99993364

BM #2 - 1" Existing Iron Pin, Northwest property corner. El. 416.00'
 N: 782230.4116
 E: 2053789.7322

Legend

- Building Area
- Constr. Ent.
- Existing Flow Arrow
- Proposed Flow Arrow
- Silt Fence
- Trash Bin
- Storage Area
- Hay Bale Silt Check Dam
- Culvert Sediment Barrier

Erosion Control Notes:

All erosion control devices shall be constructed and maintained in compliance with City Standard Erosion Control Construction Details.

Construction dumpster will be located on SE corner of property. The contractor shall police the area regularly and be responsible for keeping all debris picked up from lot daily and placed in dumpster.

70% grass coverage of all disturbed areas shall be required before construction activities will be accepted.

Project site will be covered with Bermuda seed and fertilizer and water heavily until a heavy stand of grass is established 80% of the disturbed area with no bald spots.

Bermuda or St. Augustine sod may be utilized near house foundation and on top of retaining walls.

Silt fence to remain until 80% ground cover has been established.

Swale
 Minimum Earth Grade - 0.50%
 Maximum Earth Grade - 25.00%

Disturbed Area
 Approximately 2.11 Acres will be disturbed.

Storage
 A storage and stage area will be provided as shown.

FLOOD STATEMENT: According to Community Panel No. 3720075800K, dated July 19, 2022, of the Federal Emergency Management Agency, National Flood Insurance Program Map.

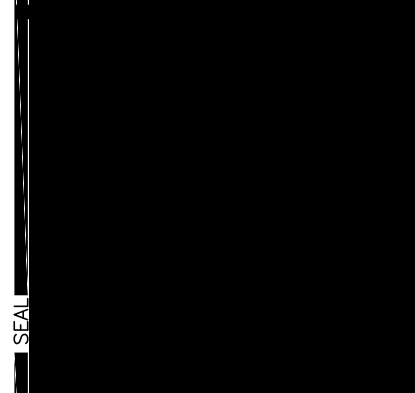
This property is within several flood zones, Flood Zone "X" (areas determined to be outside 500-year floodplain), which is not a special flood hazard area. This statement shall not create liability on the part of the Surveyor.

SCALES



REVISIONS
 New Submittal - ASR City comments 06/30/2022

DESIGNED	HDB/AC	HDB
DRAWN	AC	AC
CHECKED	AC	AC
DATE	02/01/2024	
SCALE	1" = 40'	



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2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

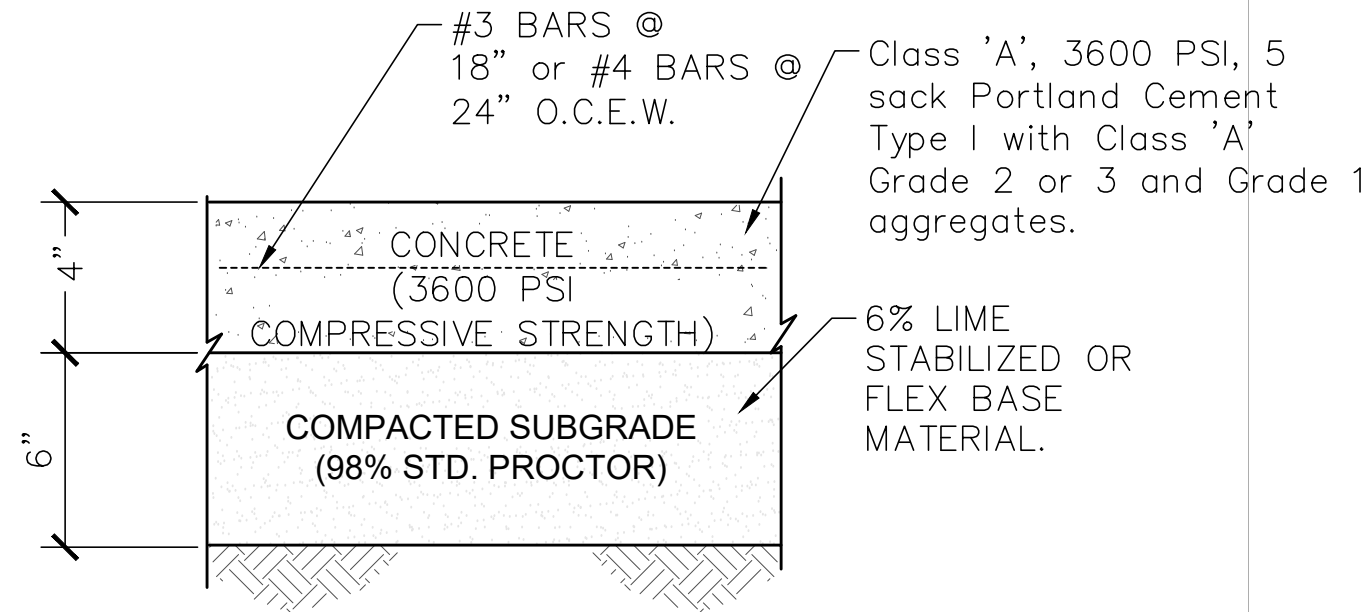
3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

PROJECT LOCATION

SHEET TITLE
EROSION CONTROL PLAN

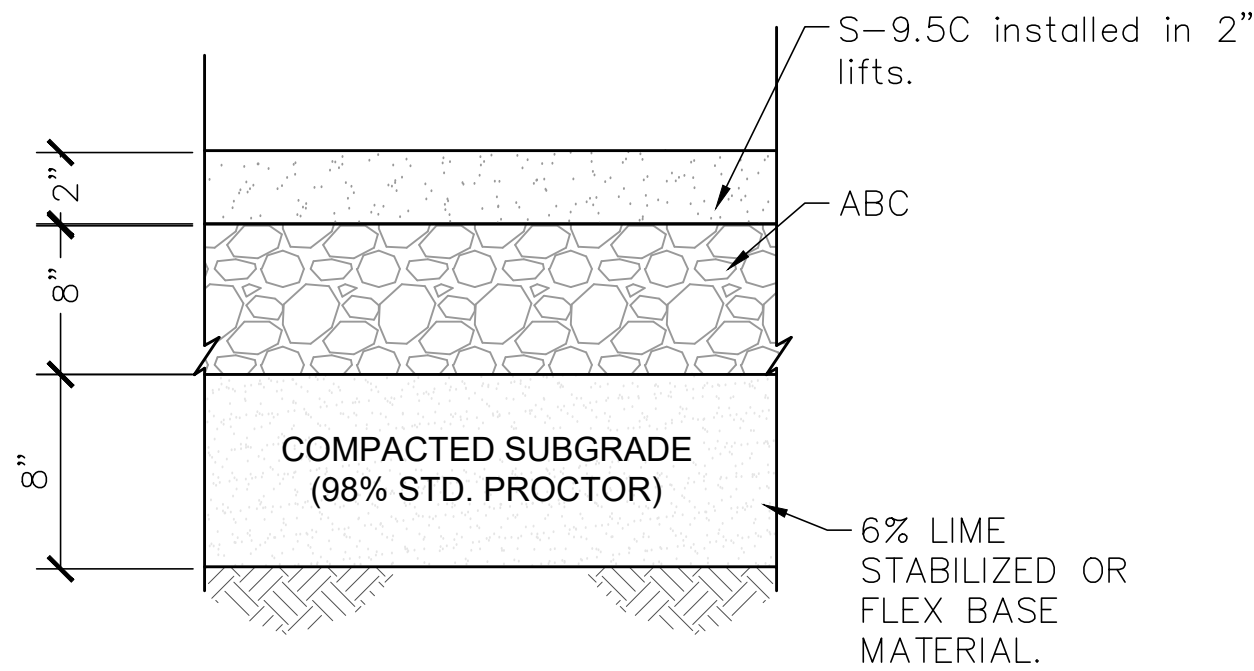
SHEET NO.

C5.0
PROJECT NO.
2023121402

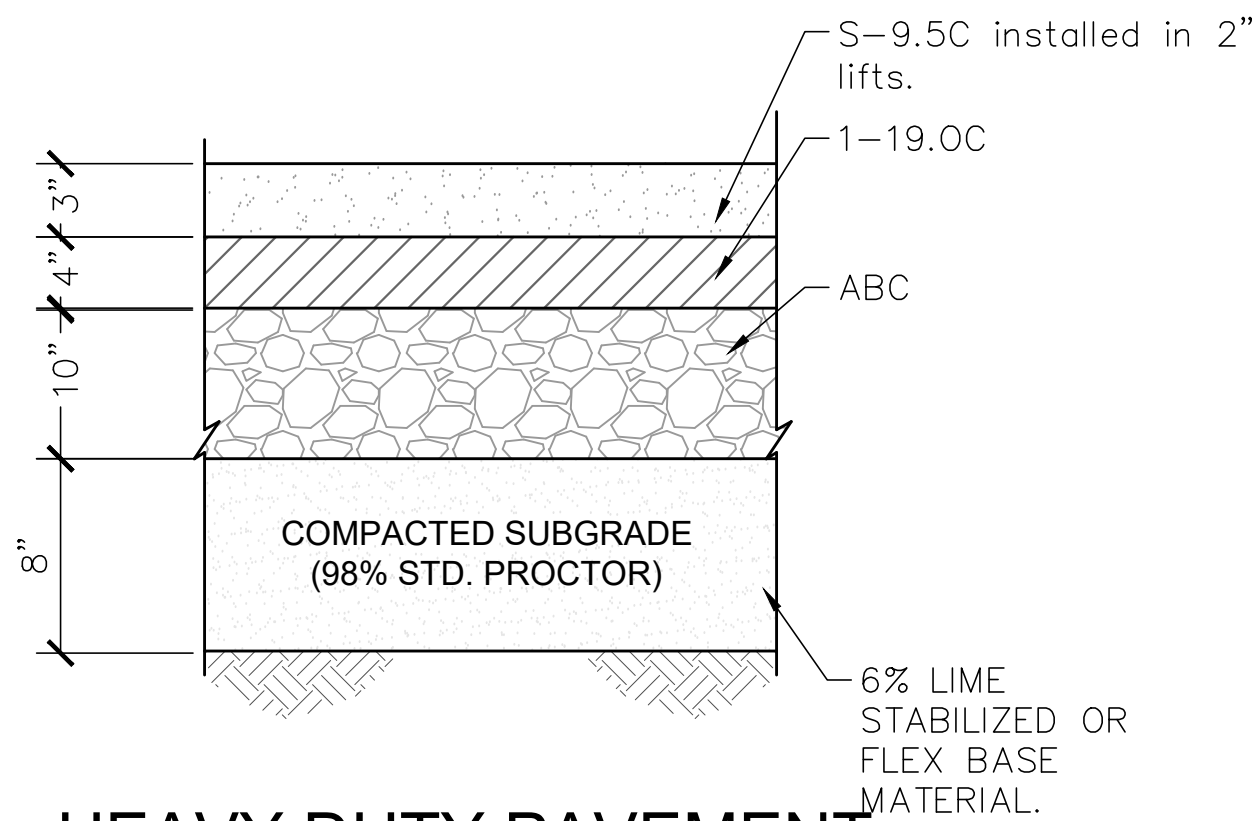


LIGHT DUTY CONCRETE PAVEMENT DETAIL

N.T.S.

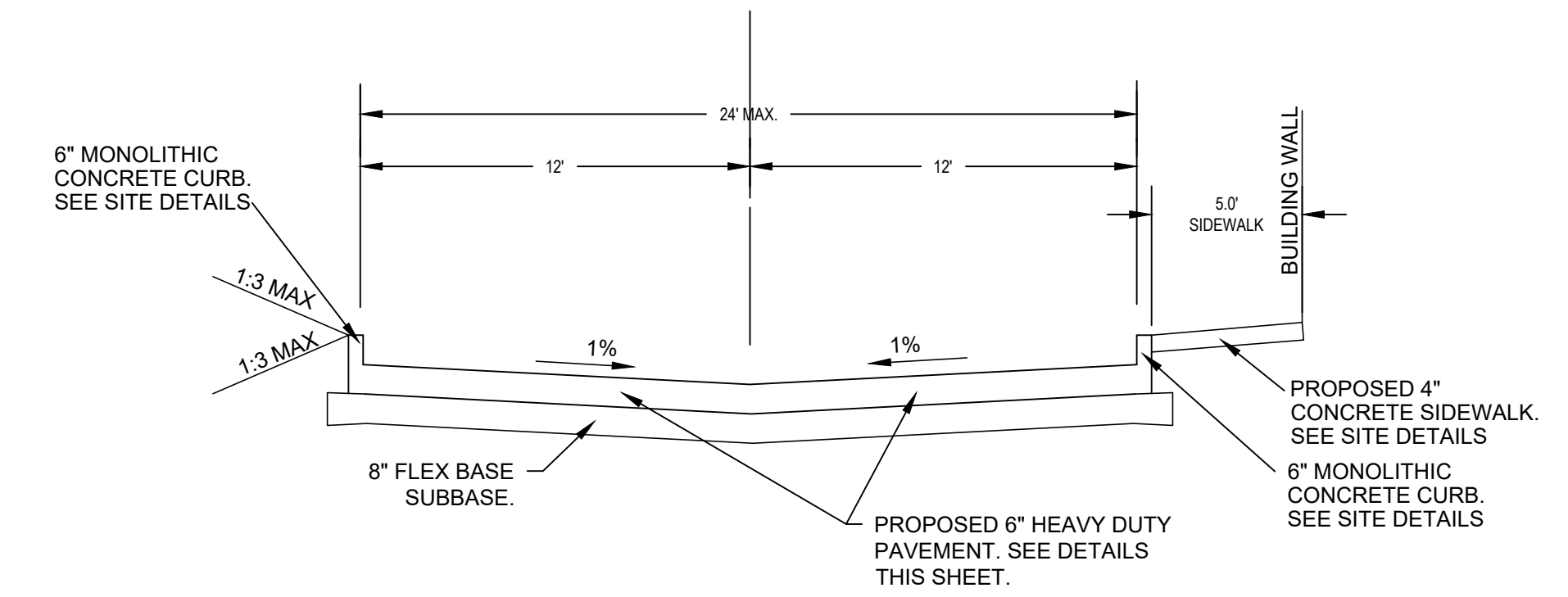


STANDARD DUTY CONCRETE PAVEMENT DETAIL

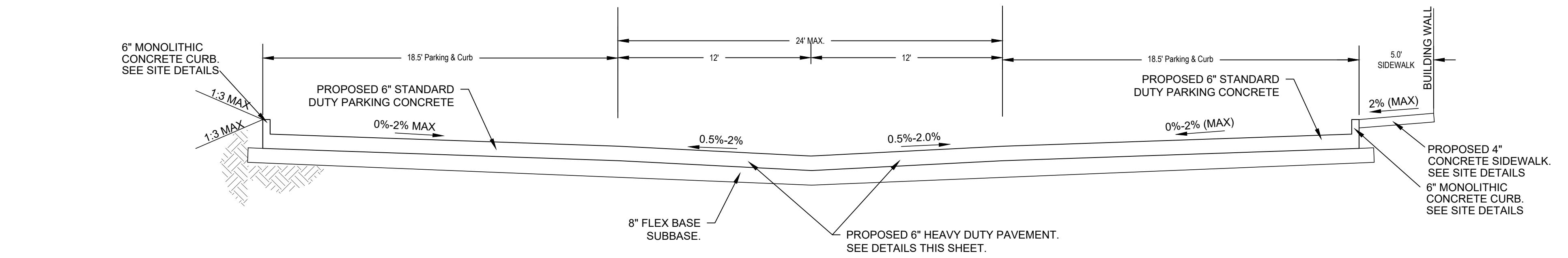


HEAVY DUTY PAVEMENT DETAIL

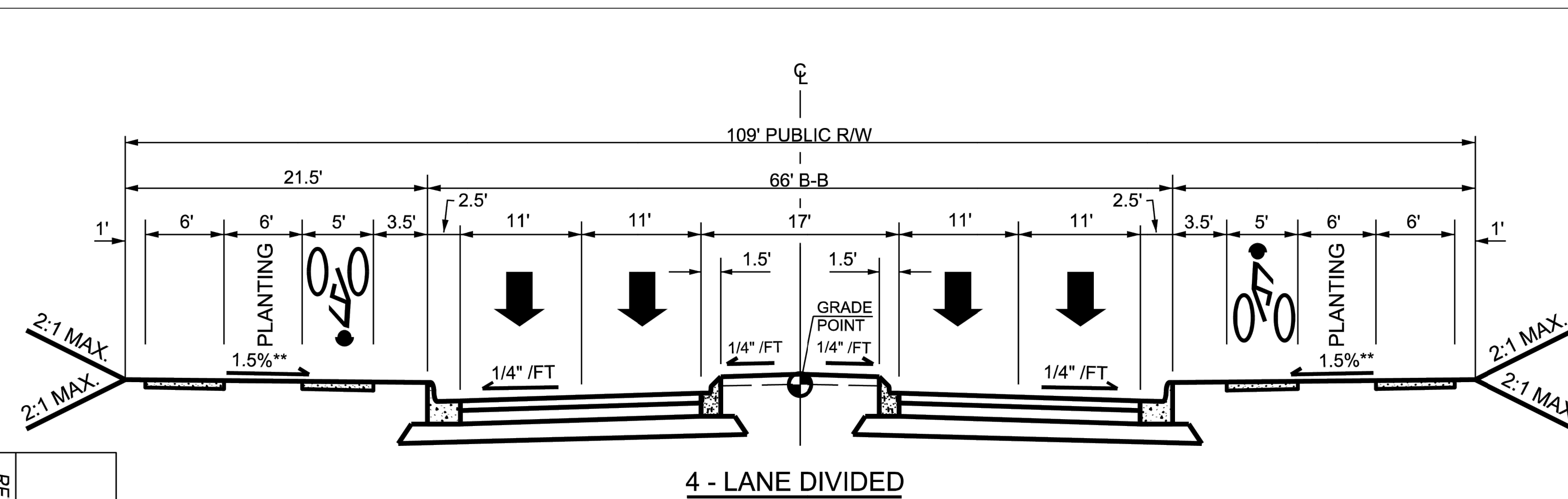
N.T.S.



1 TYPICAL SECTION - ONSITE 24' FIRE LANE AISLE
SCALE: NTS



2 TYPICAL SECTION - ONSITE 24' DRIVE AISLE w/PARKING
SCALE: NTS



4 - LANE DIVIDED

NOTE
1. THE BIKE LANE MATERIAL SHALL BE BLACK-DYED CONCRETE, SEE T-30.01.2.

CITY OF RALEIGH STANDARD DETAIL		REVISIONS	DATE: 12/2022
		DATE: 02/2020	NOT TO SCALE
T-10.19 AVENUE 4 LANE & 6 LANE, DIVIDED		PROJECT LEGAL 2.16 AC DB 5766, PG 984 PIN: 0758.03-32-9153 Triangle Township Durham County, NC	
		PROJECT LOCATION 3601 Page Road 3601 Page Road Morrisville, NC 27560 City of Raleigh Case # ASR-0015-2022	

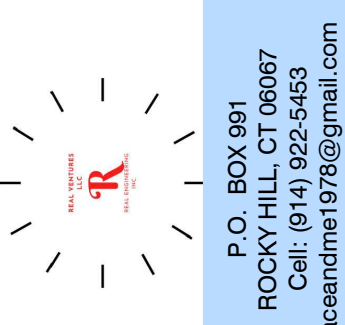
GENERAL	
WALKWAY TYPE	SIDEWALK
BIKEWAY TYPE	CURB-LEVEL BIKE LANE
PLANTING TYPE	TREE / LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	NONE

STREET PAVEMENT DESIGN	
3"	S9.5B
4"	I19.0B
10"	ABC

3 TYPICAL SECTION -PAGE ROAD
SCALE: NTS

REVISIONS
New Submittal - ASF City comments 06/30/2022

DESIGNED	HDB/AC
DRAWN	HDB
CHECKED	AC
DATE	
SCALE	



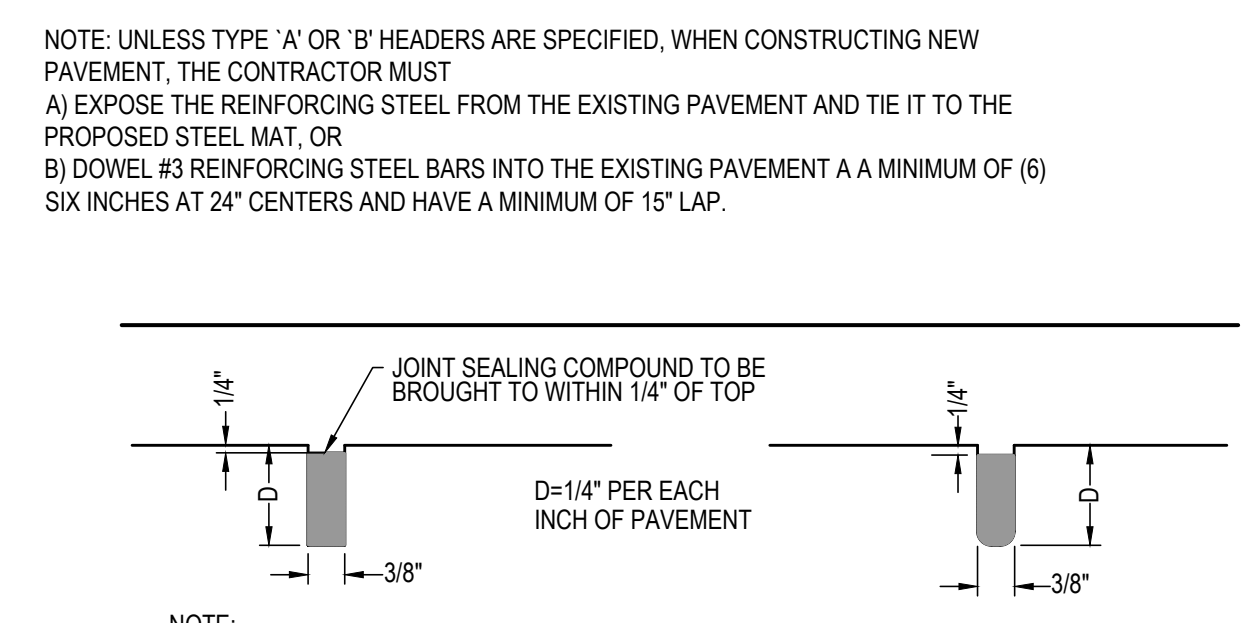
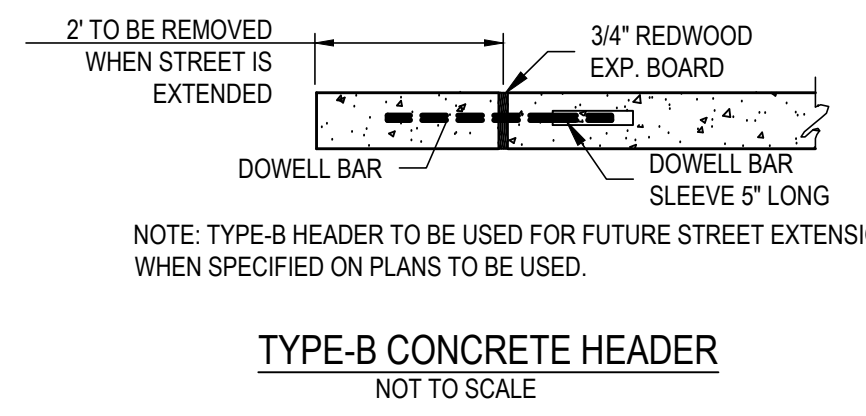
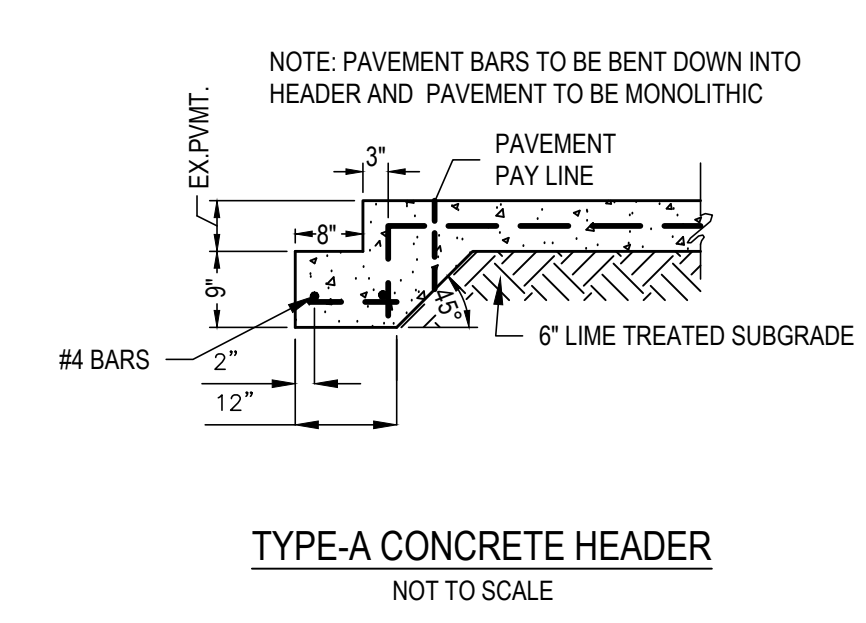
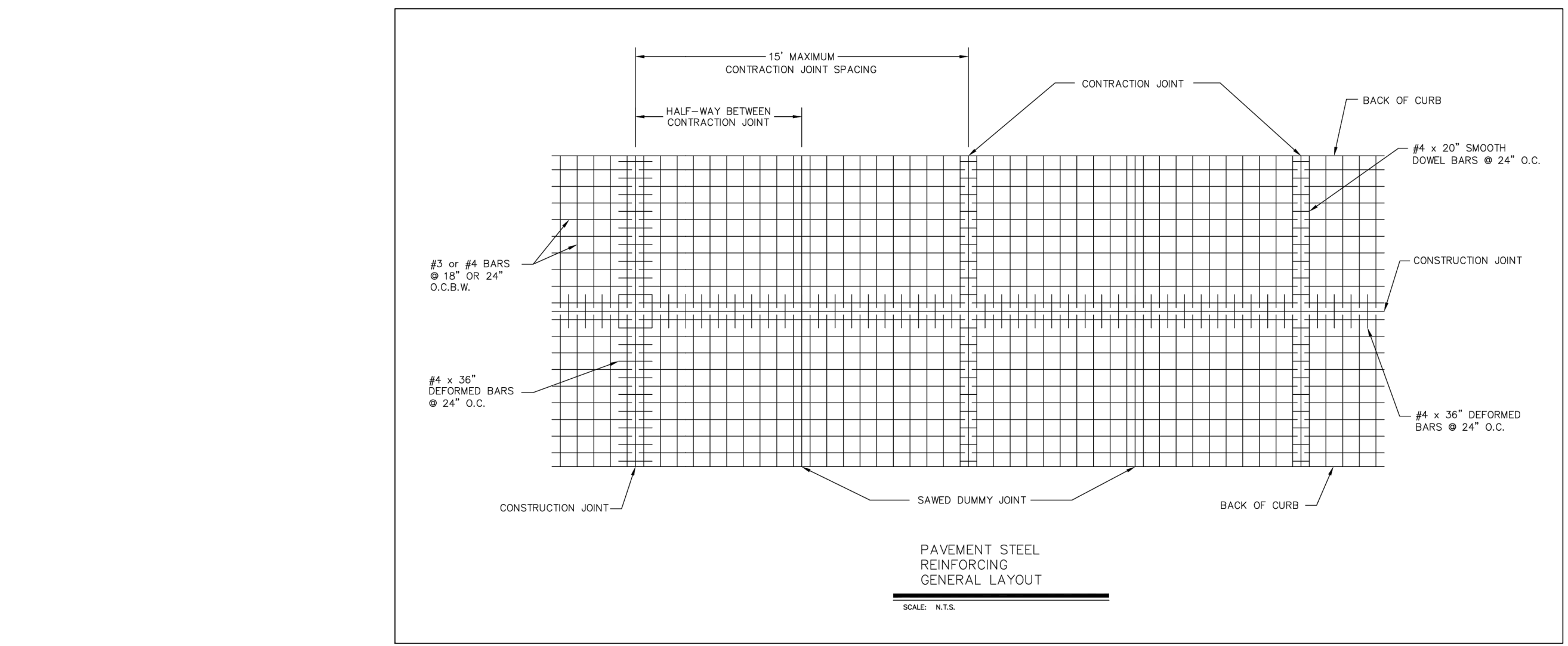
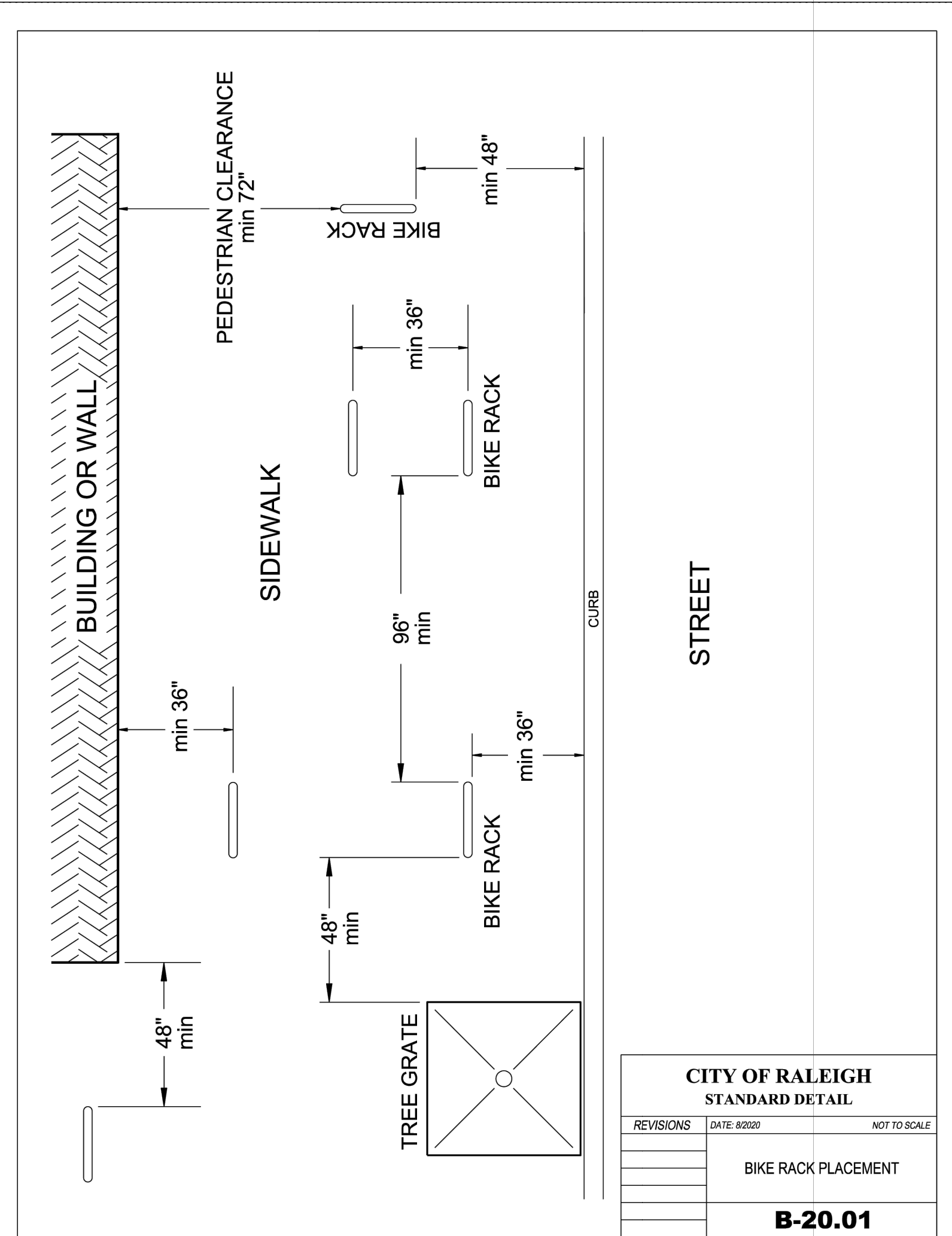
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PROJECT LEGAL
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

PROJECT LOCATION
3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

SHEET TITLE
TYPICAL STREET SECTIONS AND DETAILS
SHEET NO.
C6.0
OF 37
PROJECT NO.
2023121402



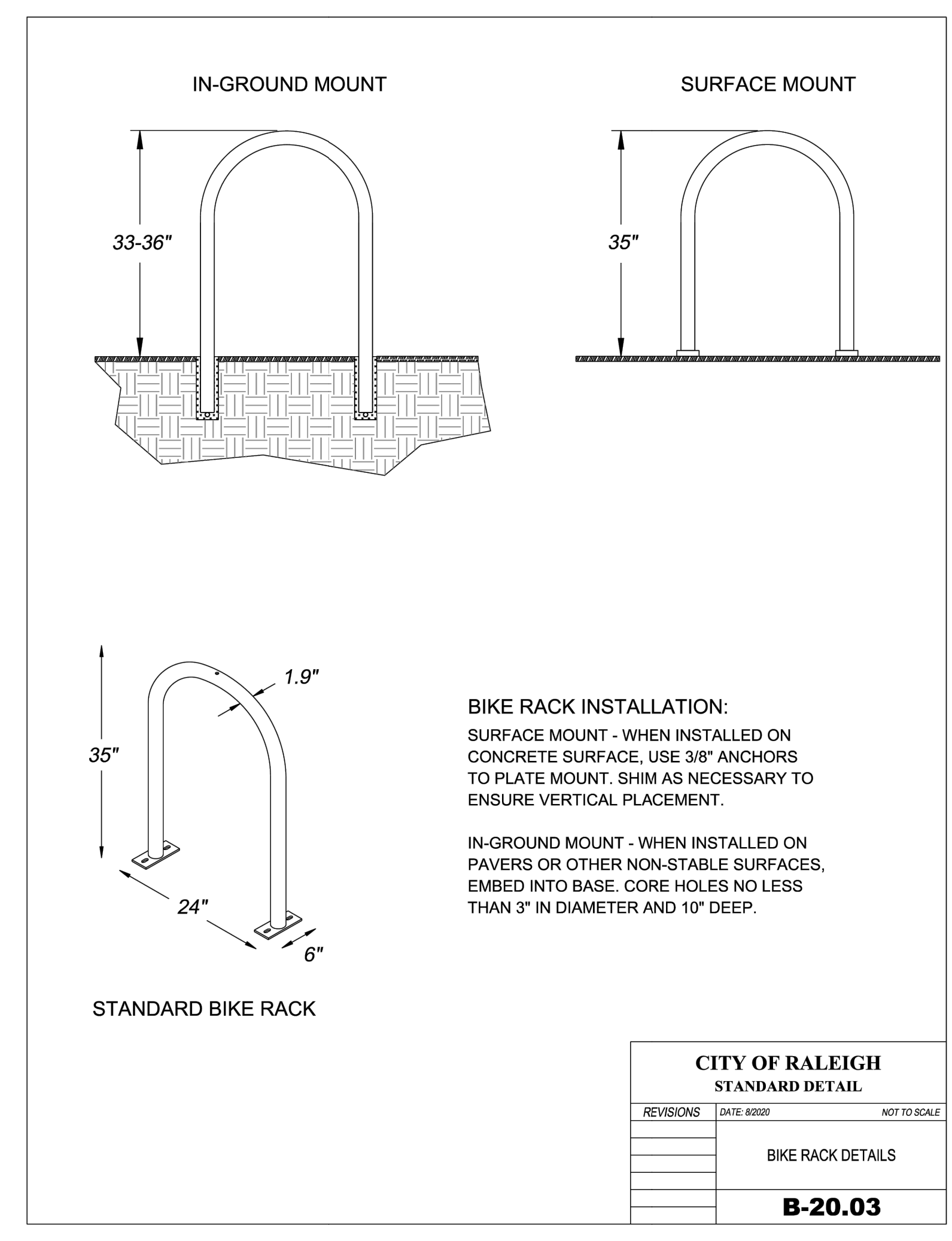
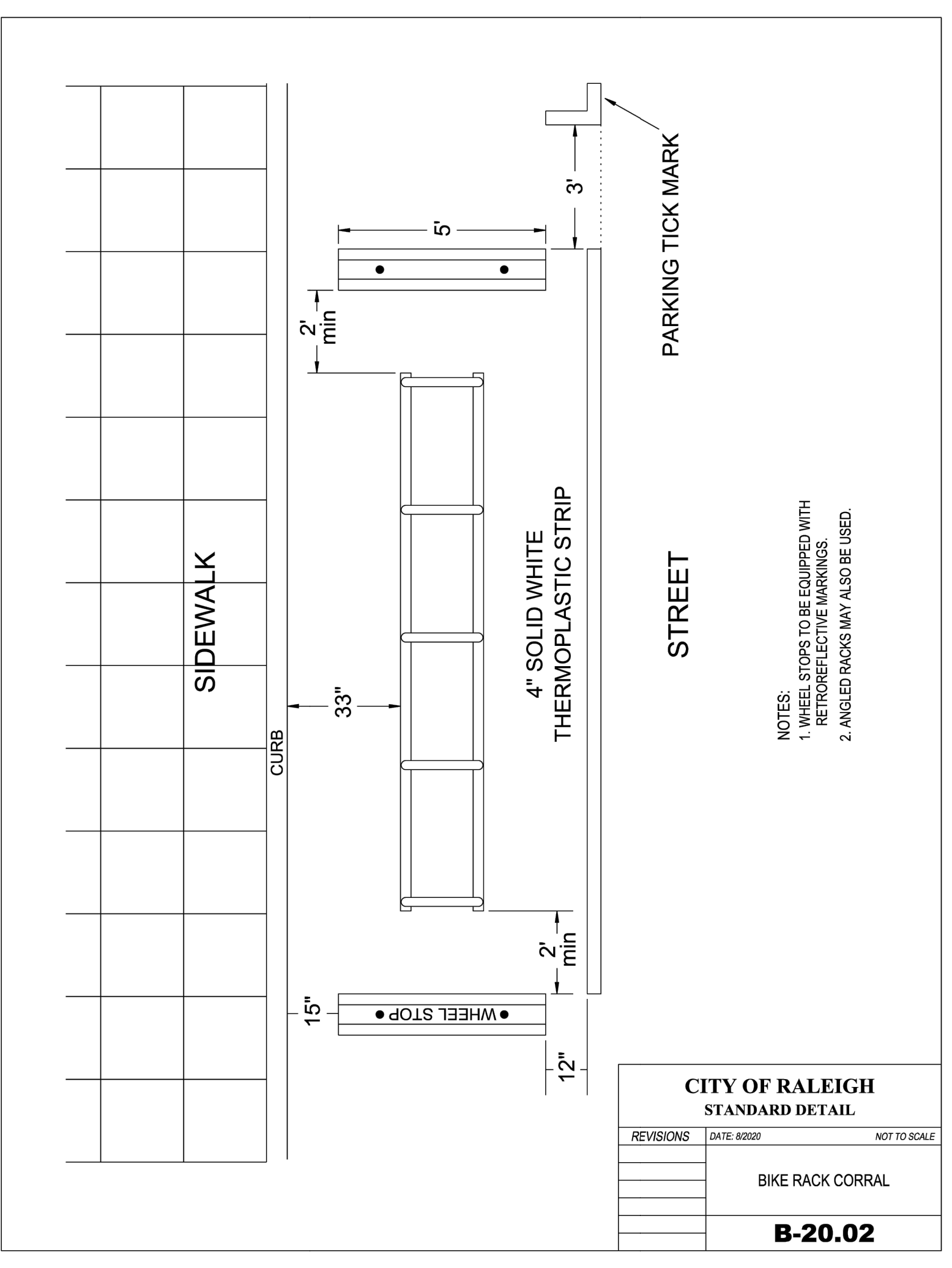
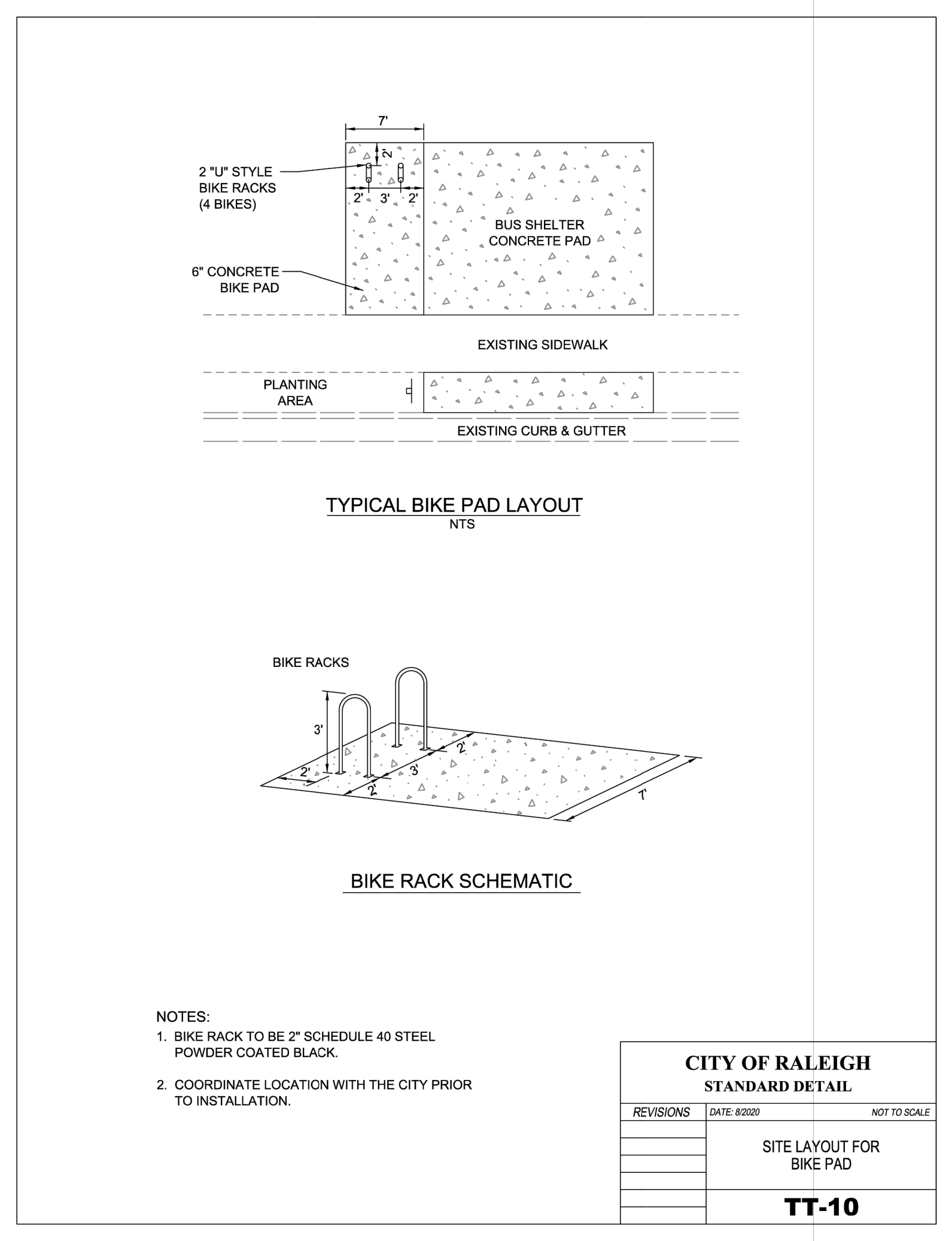
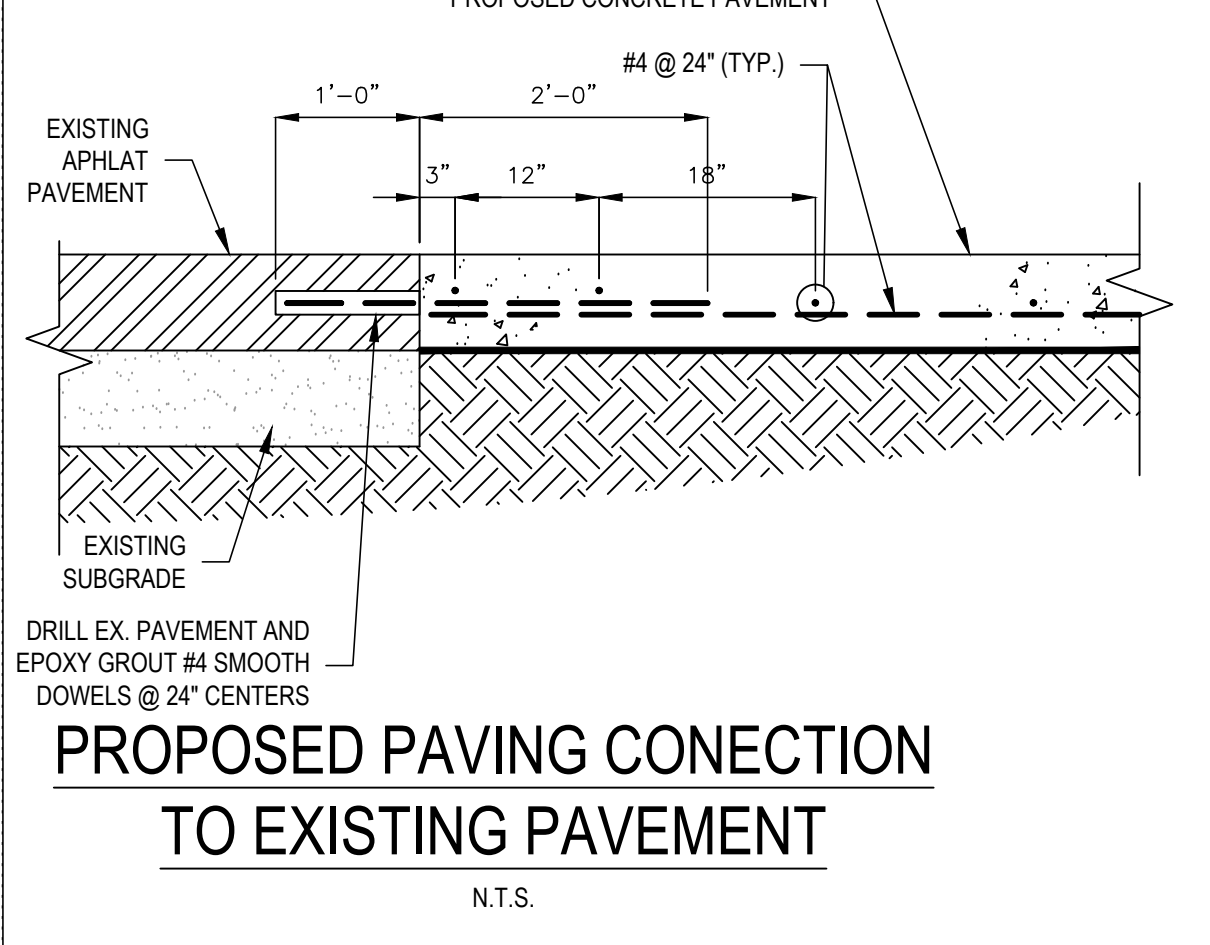
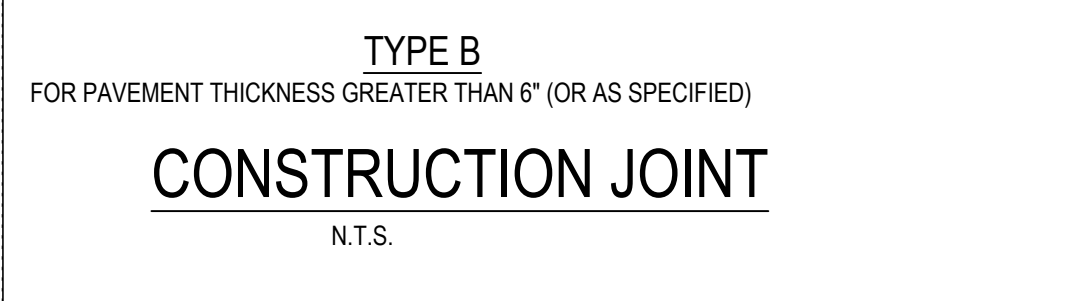
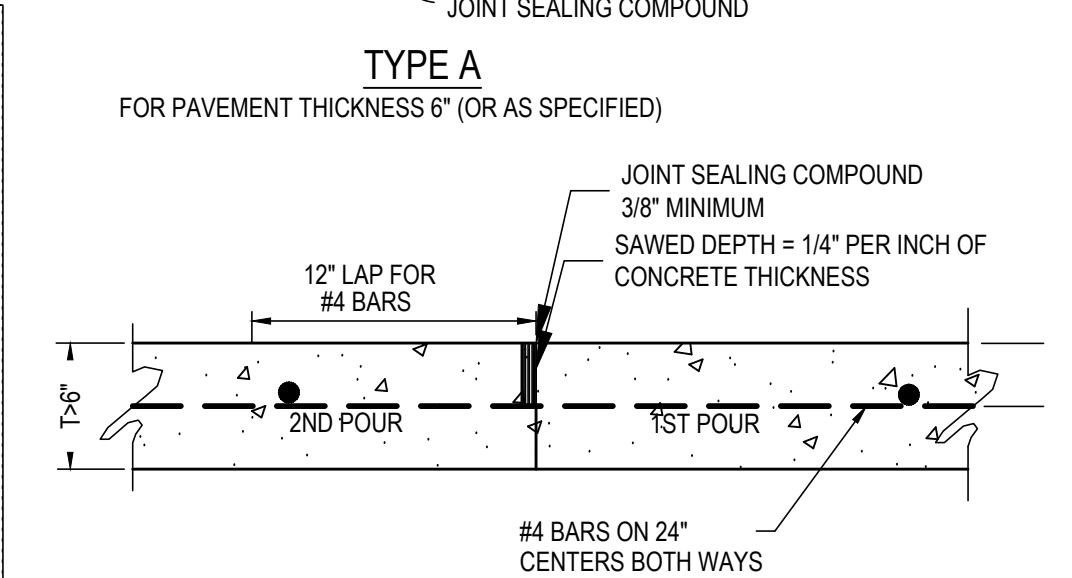
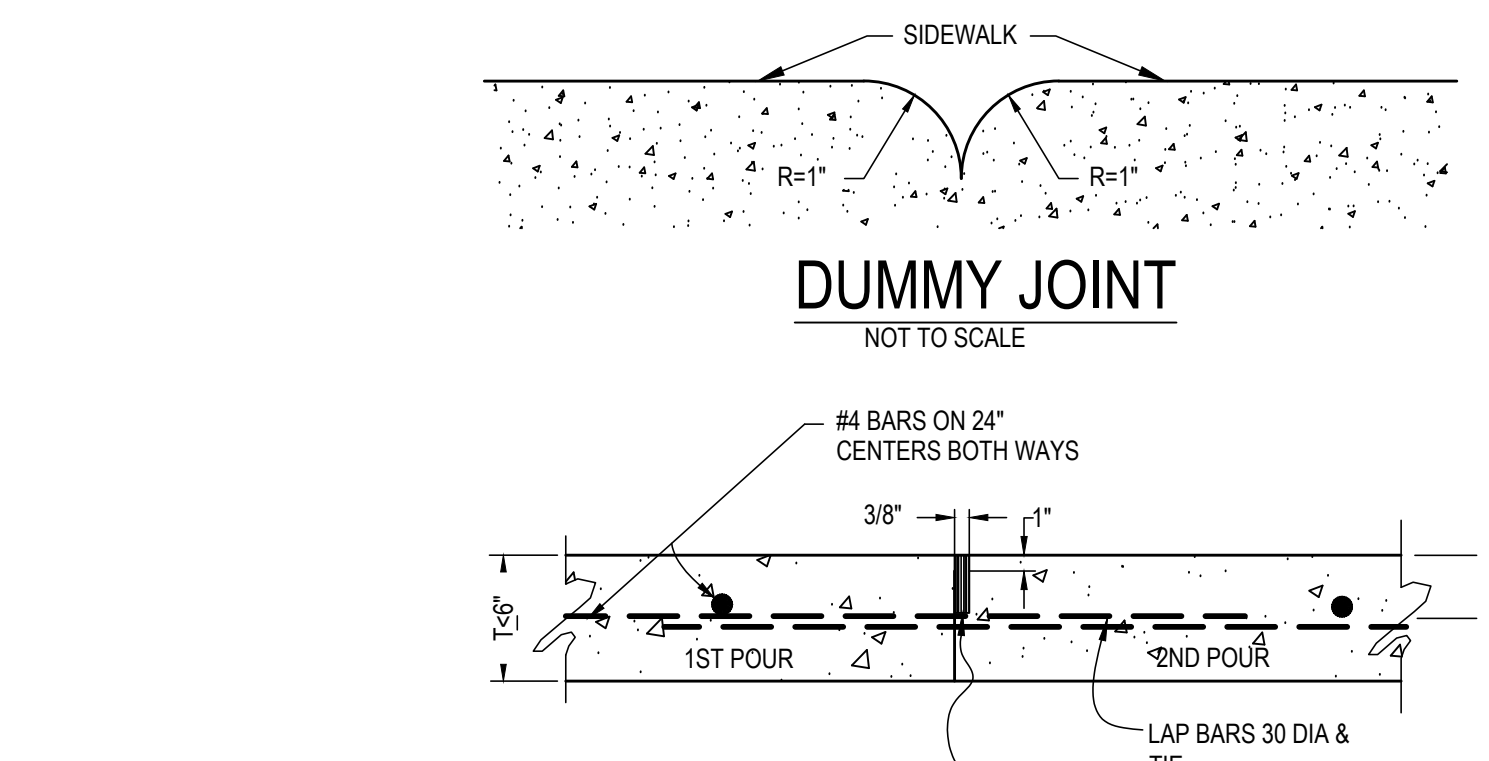
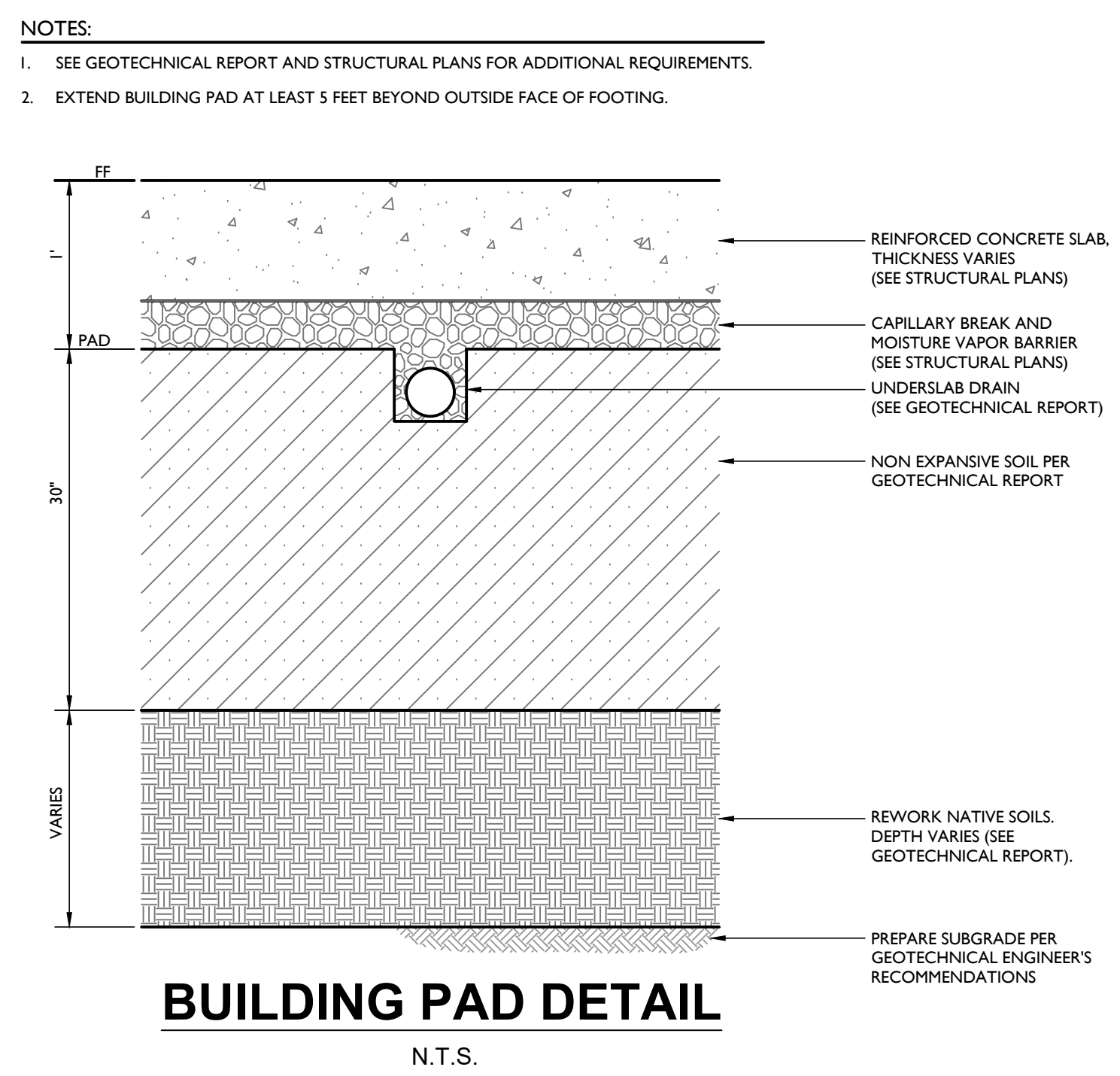
NOTE: UNLESS TYPE 'A' OR 'B' HEADERS ARE SPECIFIED, WHEN CONSTRUCTING NEW PAVEMENT, THE CONTRACTOR MUST:

A) EXPOSE THE REINFORCING STEEL FROM THE EXISTING PAVEMENT AND TIE IT TO THE PROPOSED STEEL MAT, OR

B) DOWEL #3 REINFORCING STEEL BARS INTO THE EXISTING PAVEMENT A MINIMUM OF (6) SIX INCHES AT 24" CENTERS AND HAVE A MINIMUM OF 15" LAP.

NOTE: JOINT SEALING COMPOUND SHALL CONFORM TO C.O.G. ITEM 303.2.14 AND SHALL CONSIST OF HOT POURED POLYMER OR READY-MIXED COLD APPLIED SEALANT AS FOLLOWS:

1. CLASS 3-SEALIGHT 3405
2. CLASS 3-HOT POURED RUBBER JOINT SEALANT # 3405
3. CLASS 4-DOW CORNING 888
4. CLASS 5 & 8 SIKASIL 728-SL
5. CLASS 8 - DOW CORNING 890-SL

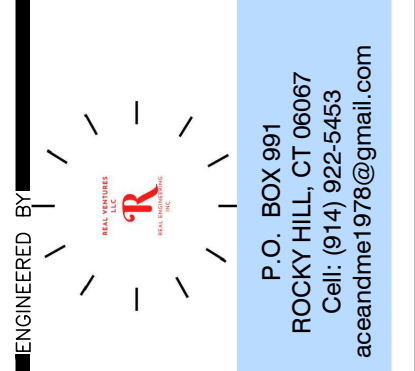


NOTES:

1. SEE GEOTECHNICAL REPORT AND STRUCTURAL PLANS FOR ADDITIONAL REQUIREMENTS.
2. EXTEND BUILDING PAD AT LEAST 5 FEET BEYOND OUTSIDE FACE OF FOOTING.

REVISIONS
New Submittal - ASR City comments 06/30/2022

APPROVALS
DESIGNED: HDB/AC
DRAWN: HDB
CHECKED: AC
DATE: _____
SCALE: _____

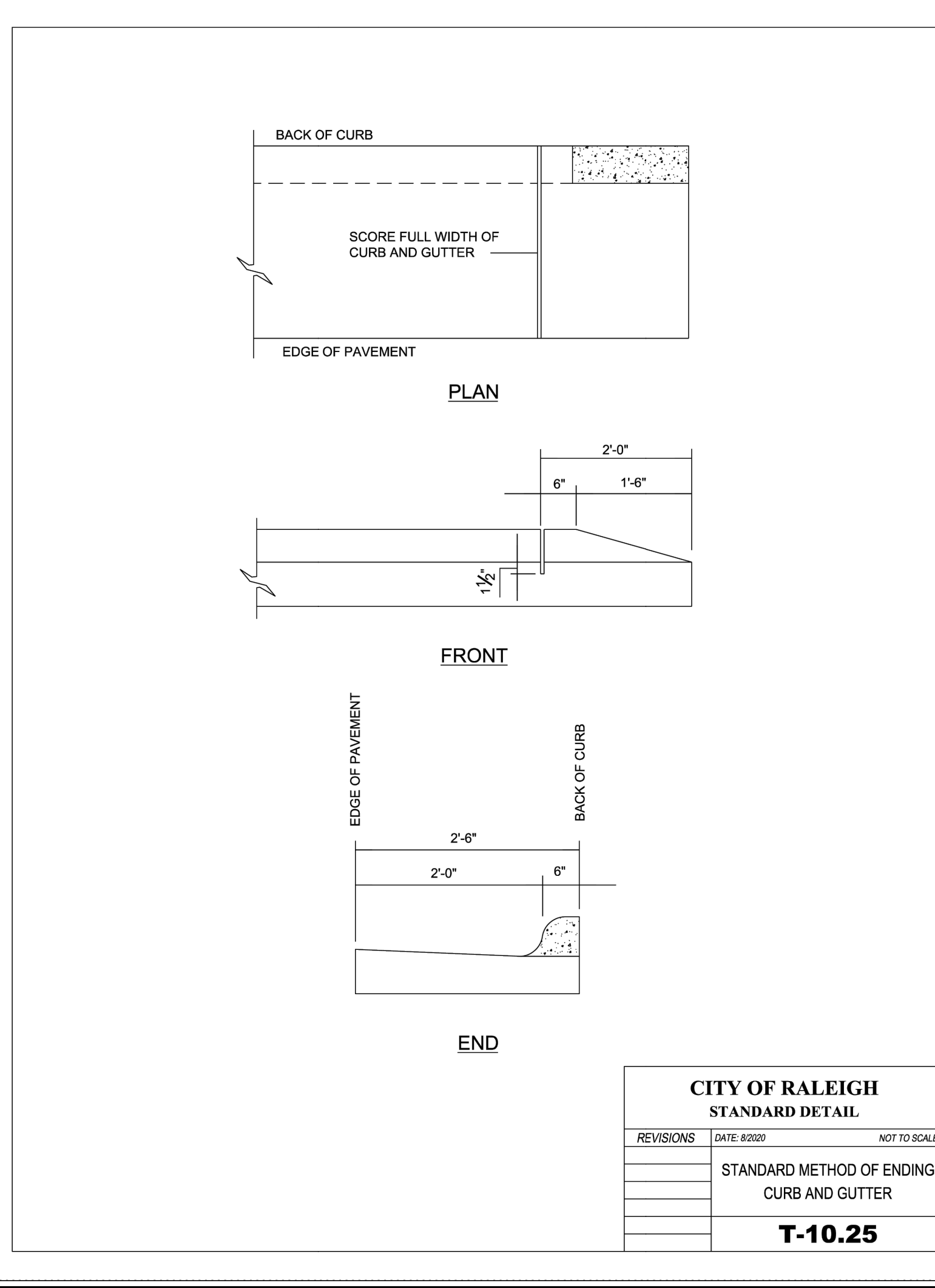
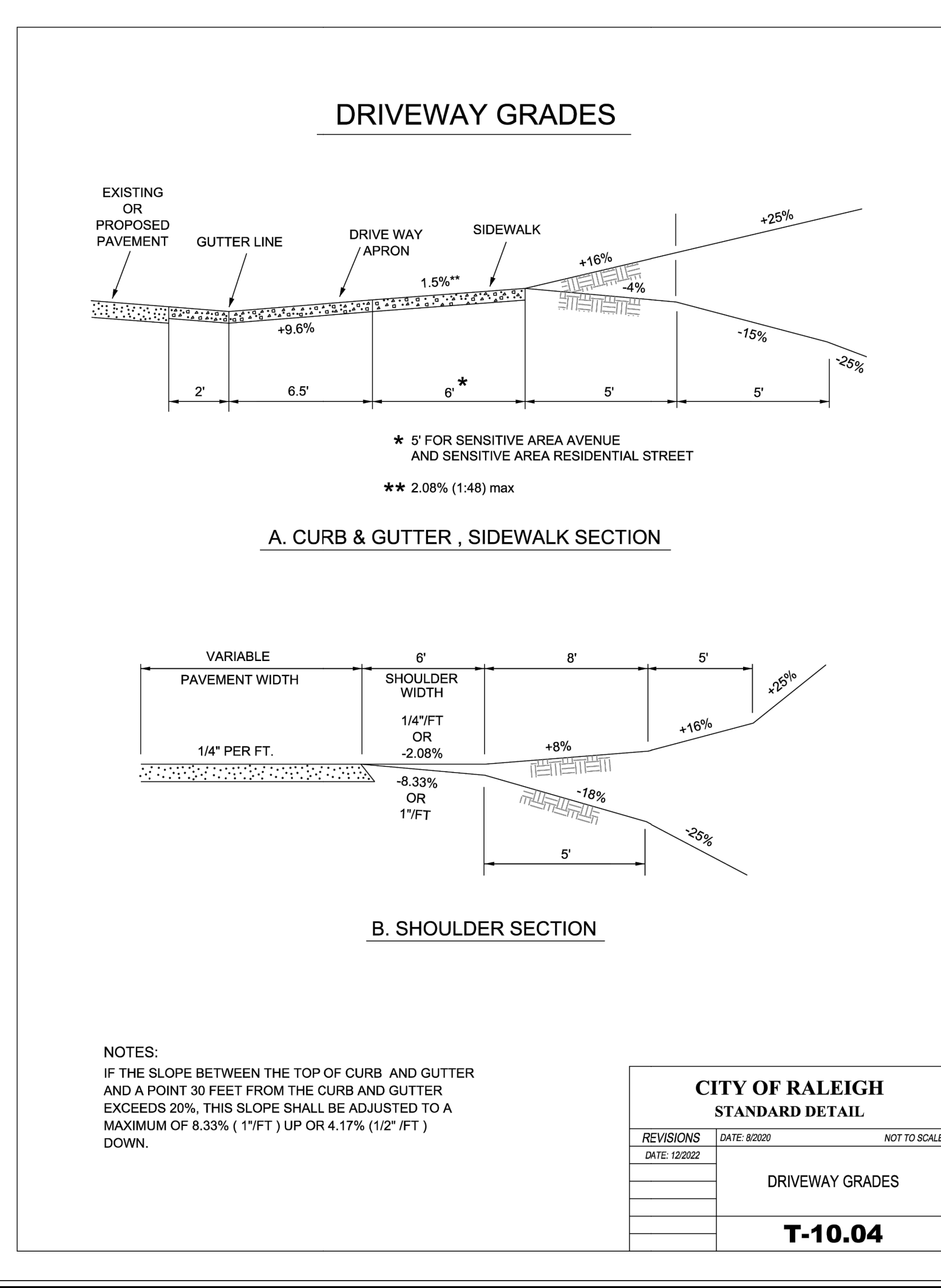
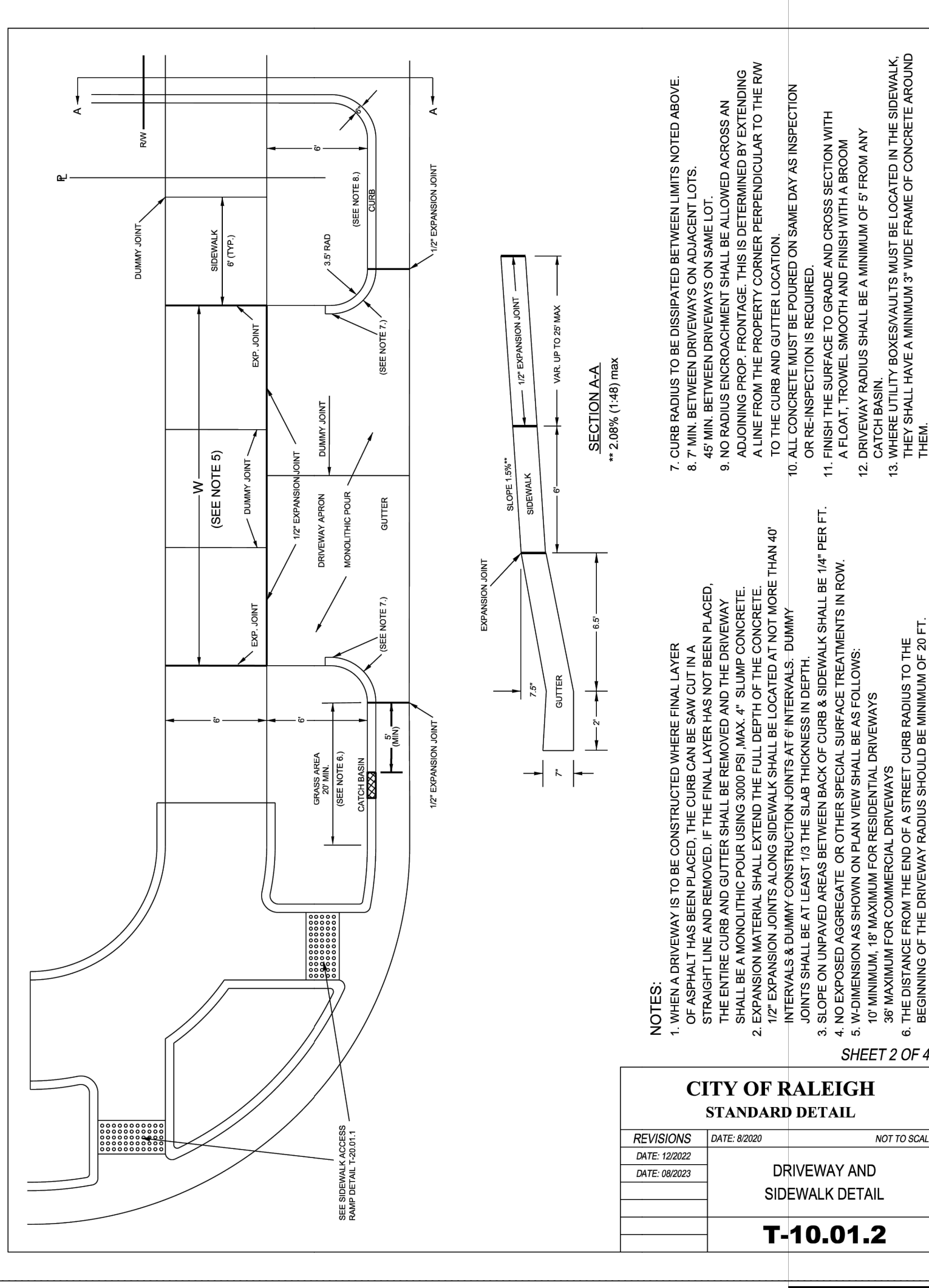
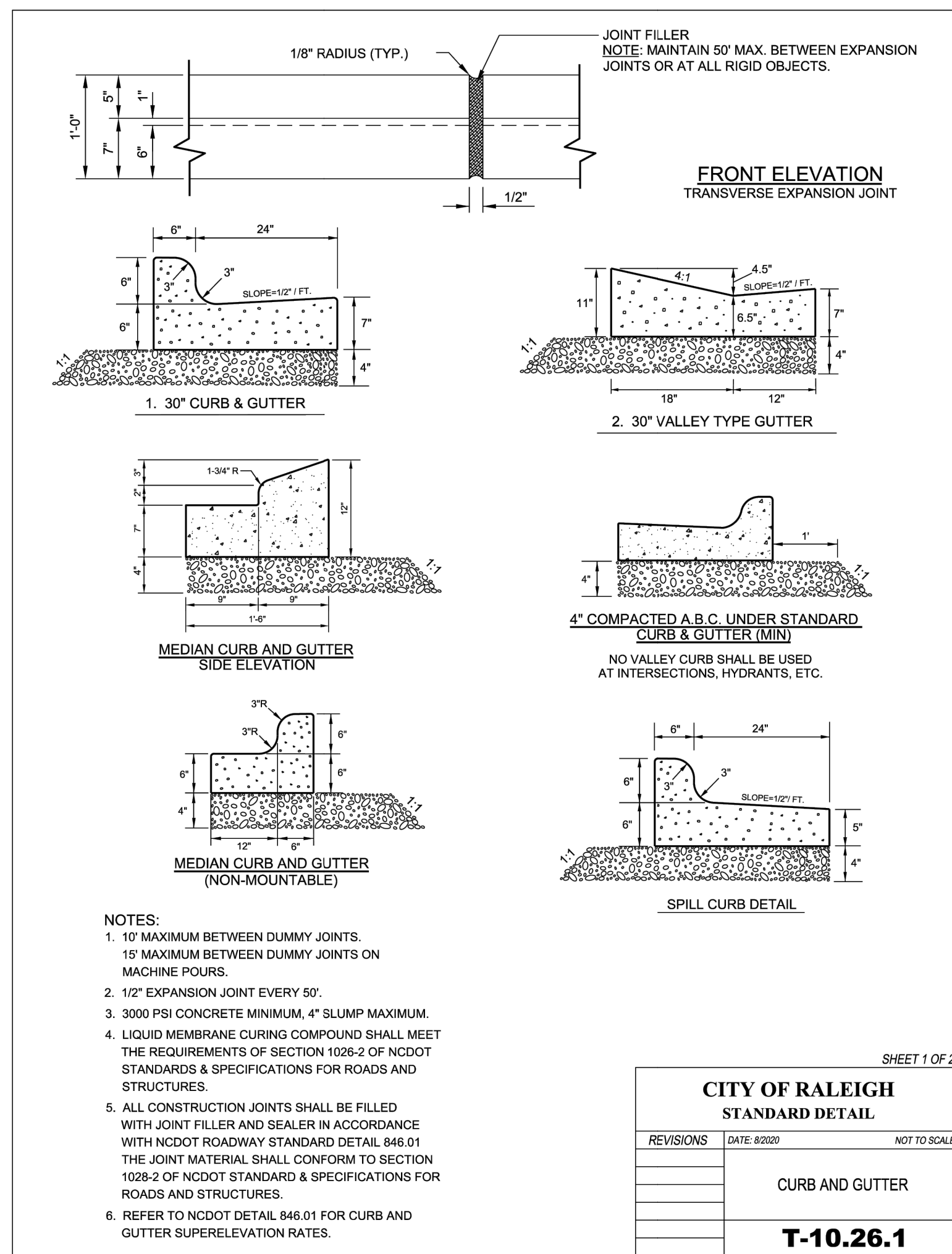
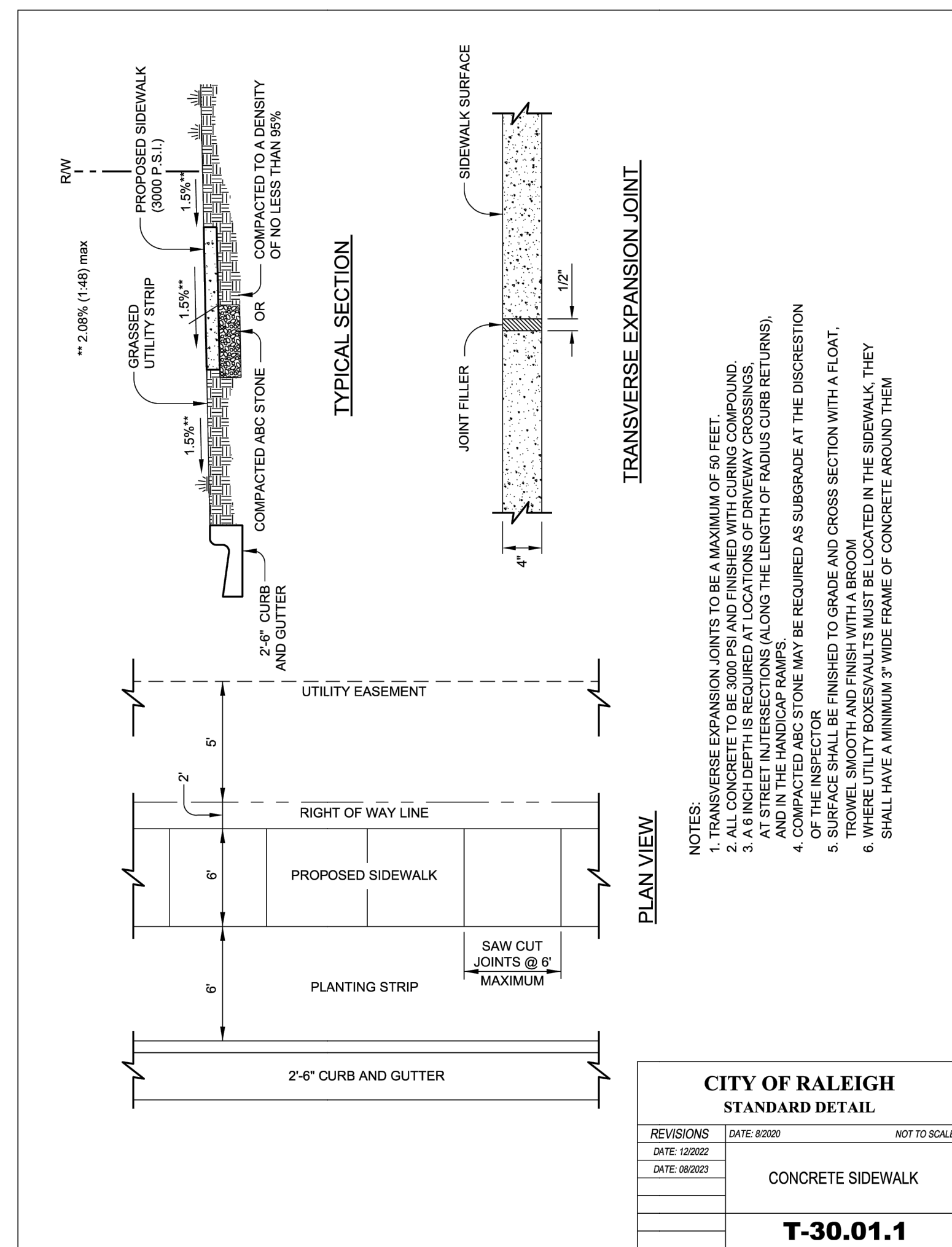
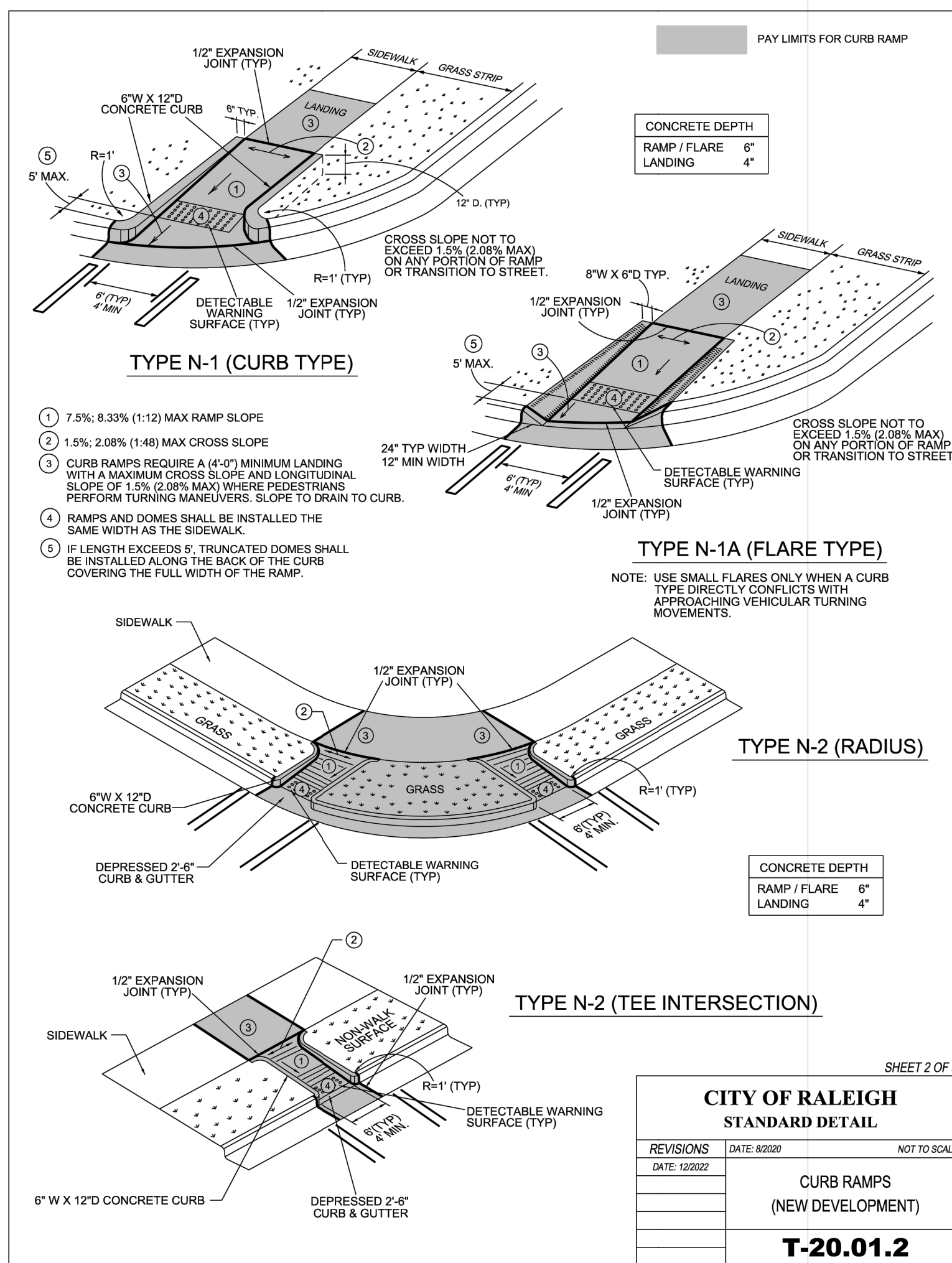


PROJECT LEGAL
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

PROJECT LOCATION
3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

SHEET TITLE
SITE DETAILS
SHEET NO.

C6.1
OF 37
PROJECT NO.
2023121402



APPROVALS:

DESIGNED: HDB/AC

DRAWN: HDB

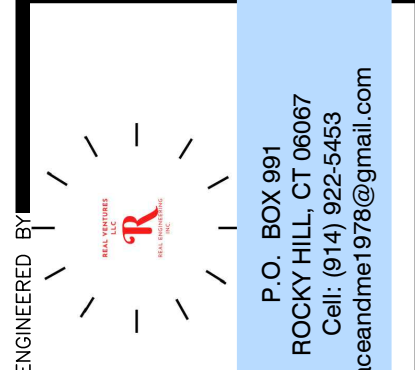
CHECKED: AC

DATE: _____

SCALE: _____

REVISIONS:

New Submittal - ASF City comments 06/30/2022



PREPARED BY:

STARR

Stray ARM Consulting
Engineering Support
Civil Design & Drafting
Denton, TX 76230
Cell: (360)870-3218
aboutwell@st-arr.com

PROJECT LOCATION:

3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

PROJECT LEGAL:

2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

SHEET TITLE:

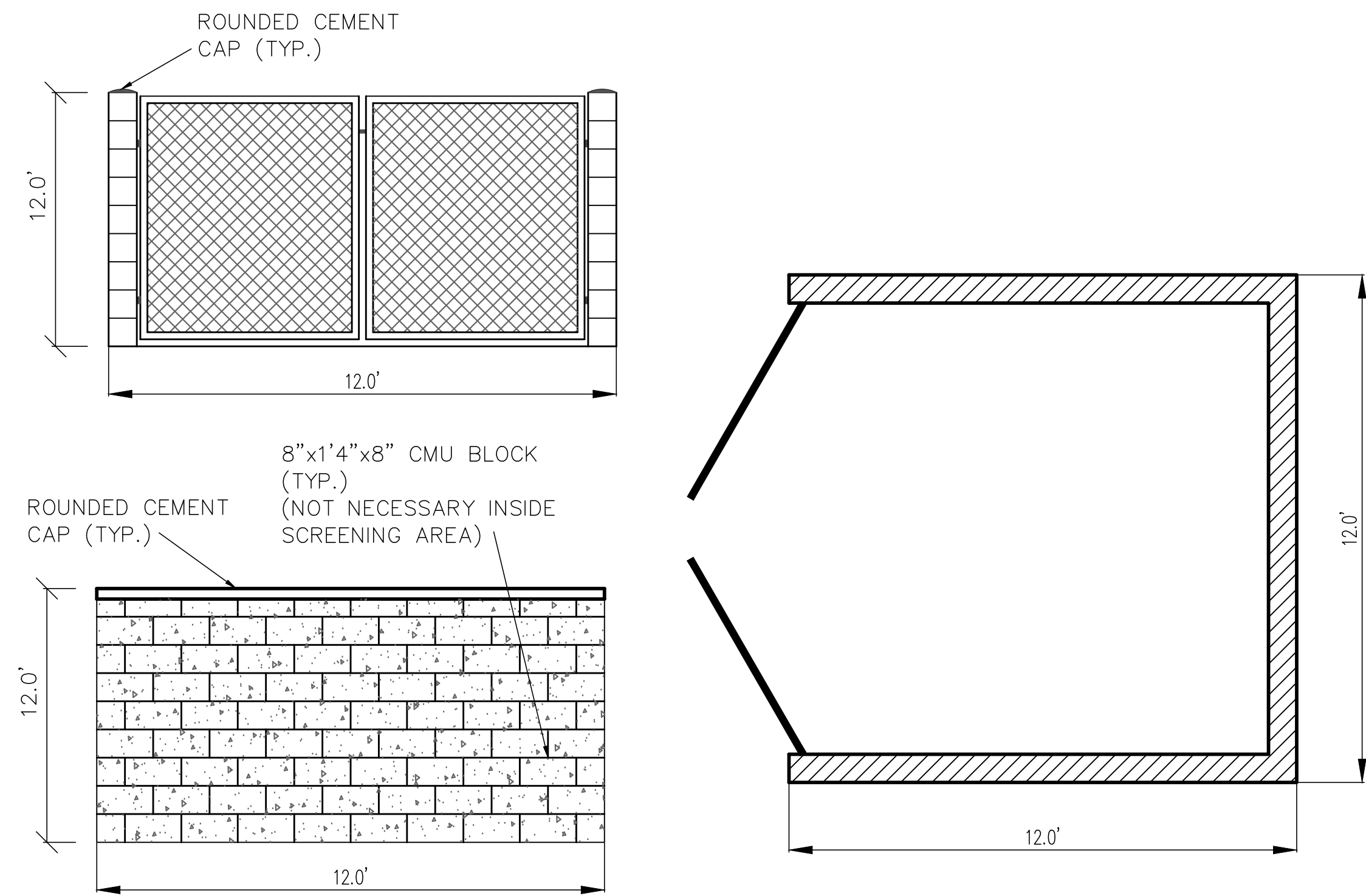
SITE DETAILS 2

SHEET NO:

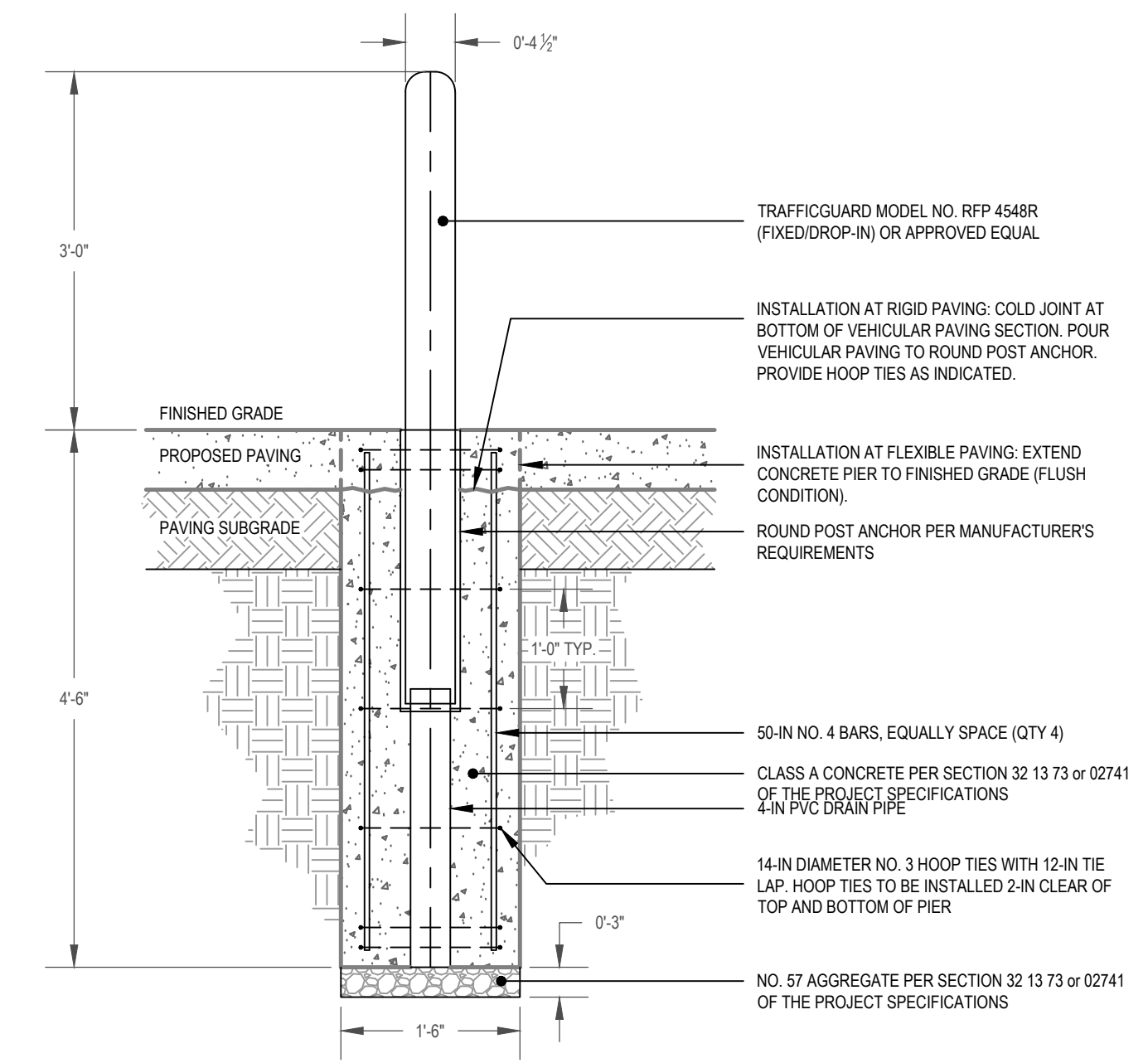
C6.2

OF 37 PROJECT NO.

2023121402



DUMPSTER ENCLOSURE DETAIL
NOT TO SCALE



REVISIONS
New Submittal - ASR City comments 06/30/2022

APPROVALS

DESIGNED	HDB/AC
DRAWN	HDB
CHECKED	AC
DATE	
SCALE	

ENGINEERED BY

P.O. BOX 991
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PREPARED BY

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Engineering Support
Civil Design & Drafting
Denton, TX 76210
Cell: (360) 870-3218
hboutwell@st-arm.com

PROJECT LEGAL

2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

PROJECT LOCATION

3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

SHEET TITLE

SITE DETAILS 3

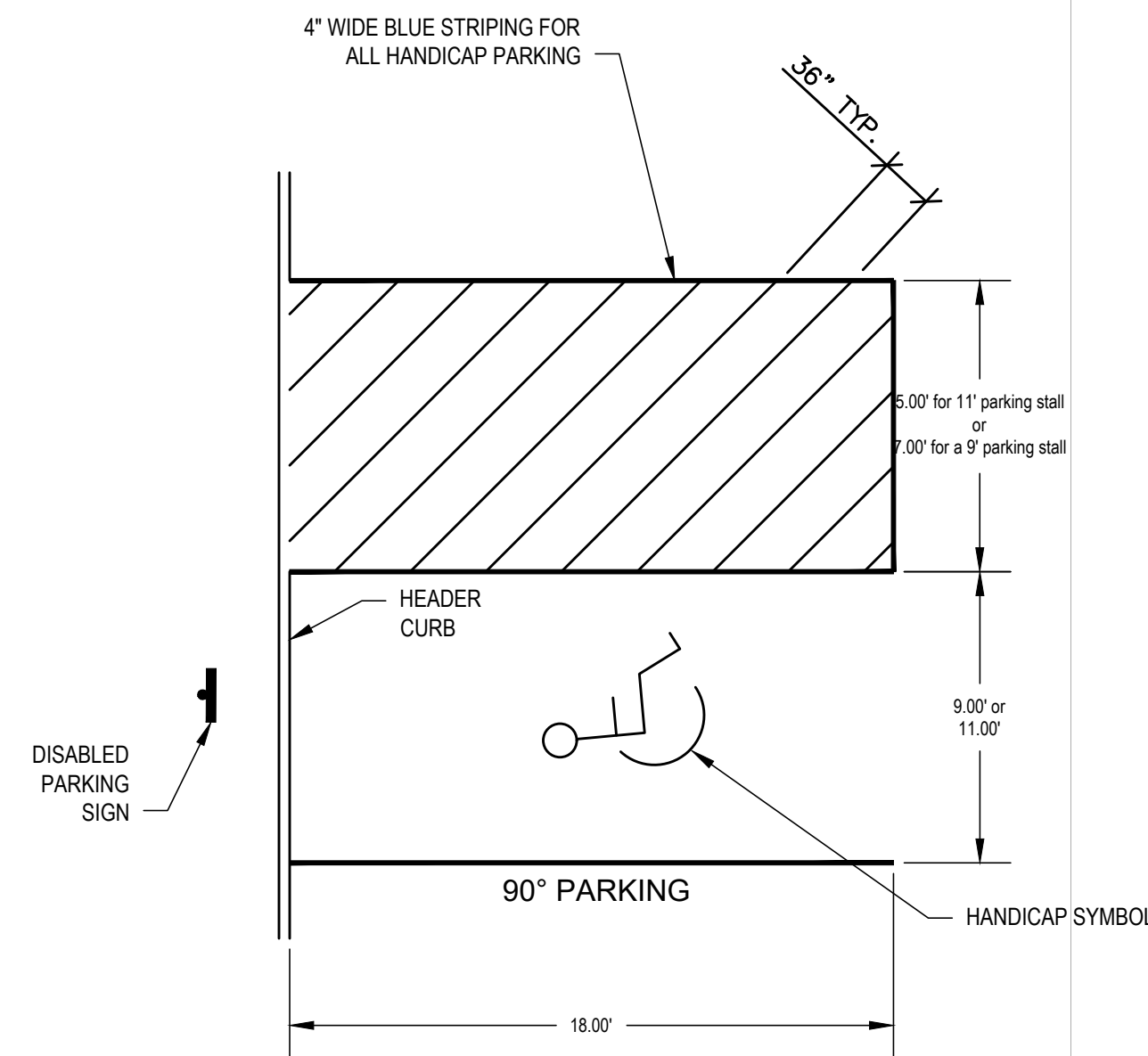
PROJECT NO.

C6.3

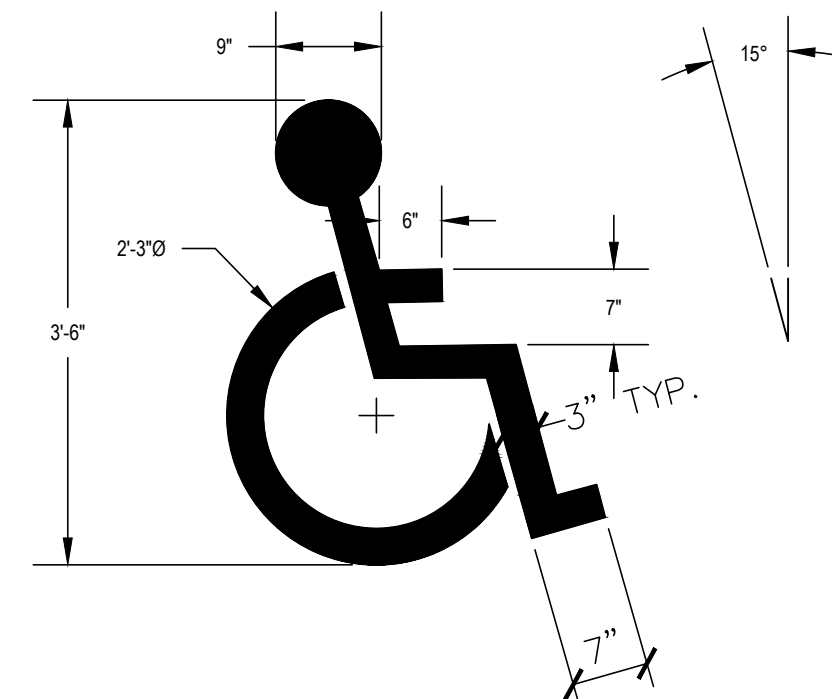
OF 37

2023121402

- NOTES:
1. MINIMUM WIDTH OF END PARKING STALLS ADJACENT TO CURB & GUTTER OR PRECAST CURB SHALL BE A MINIMUM 9'-0" OR AS SHOWN ON PLAN.
 2. USE 4" WIDE WHITE STRIPING FOR ALL HANDICAP PARKING
 3. USE 4" WIDE WHITE STRIPING FOR ALL NON-ADA PARKING



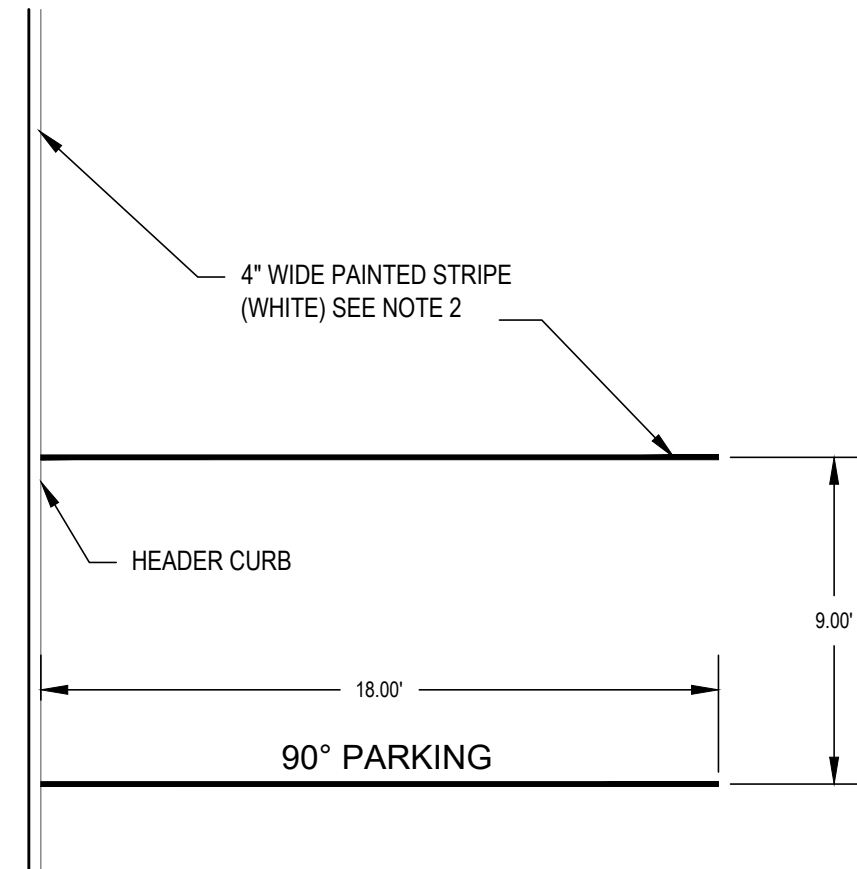
HANDICAPPED PARKING DETAIL
N.T.S.



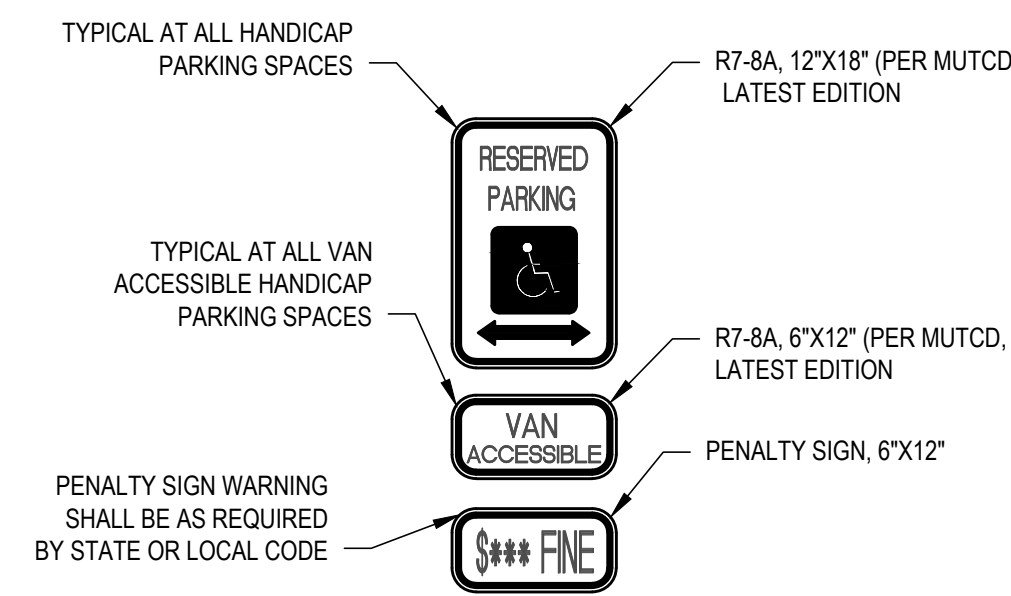
- NOTES:
- SYMBOL COLOR SHALL COMPLY WITH ALL LOCAL REGULATIONS.

HANDICAP SYMBOL DETAIL
N.T.S.

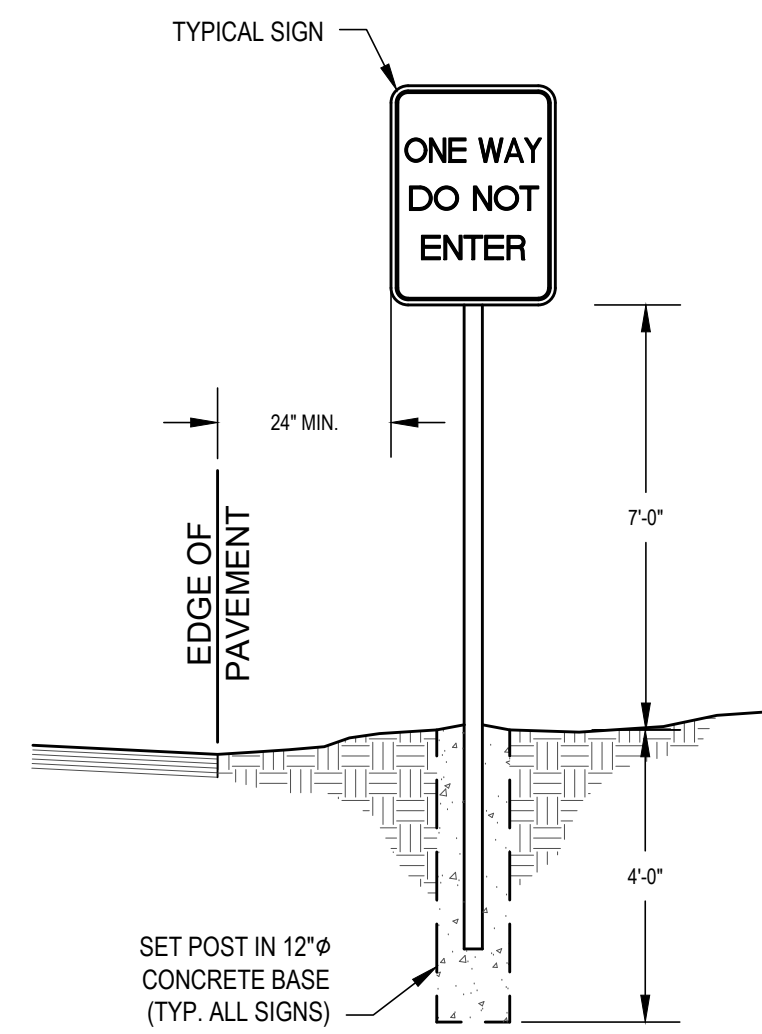
- NOTES:
1. MINIMUM WIDTH OF END PARKING STALLS ADJACENT TO CURB & GUTTER OR PRECAST CURB SHALL BE A MINIMUM 9'-0" OR AS SHOWN ON PLAN.
 2. WHITE PAINT FOR PARKING STALLS AND TRAFFIC CONTROL SHALL BE SHERWIN WILLIAMS S-W TRAFFIC MARKING SERIES B-29Y2 OR APPROVED EQUAL.



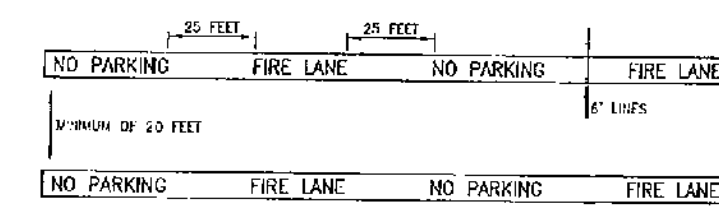
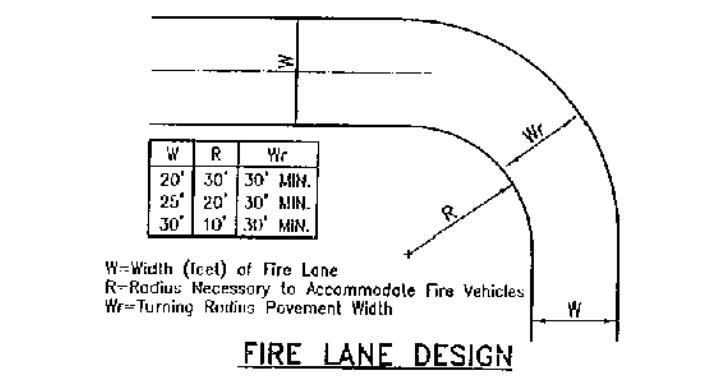
STANDARD PARKING DETAILS
N.T.S.



1. ALL SIGN BACKGROUNDS SHALL BE WHITE (RETROREFLECTIVE).
2. ALL SIGN LEGENDS AND BORDERS SHALL BE GREEN (RETROREFLECTIVE).



HANDICAP SIGN INSTALLATION DETAIL
N.T.S.

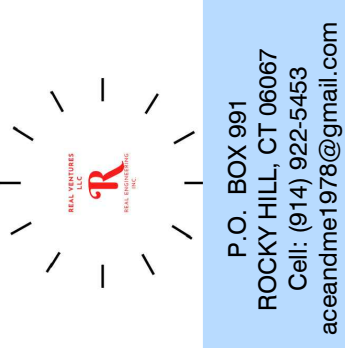


1. THE FIRE CHIEF IS AUTHORIZED TO DESIGNATE FIRE LANES.
2. FIRE LANES SHALL BE MARKED BY SIX INCH (6") HIGH LINES USING RED THERMATIC PAINT WITH THE WORDING "NO PARKING" AND "FIRE LANE" PAINTED ON THE LINES AT INTERVALS OF 10 FEET (10'). THIS LETTERING SHALL BE 108mm HIGH (4") HIGH WITH A ONE INCH (1") WIDE STROKE PAINTED WITH WHITE PAVEMENT PAINT.
3. FIRE LANES SHALL BE A MINIMUM OF TWENTY FEET (20') IN WIDTH.

FIRE LANE MARKING DETAIL
N.T.S.

REVISIONS
New Submittal - ASF City comments 06/30/2022

APPROVALS
DESIGNED: HDB/AC
DRAWN: HDB
CHECKED: AC
DATE: _____
SCALE: _____

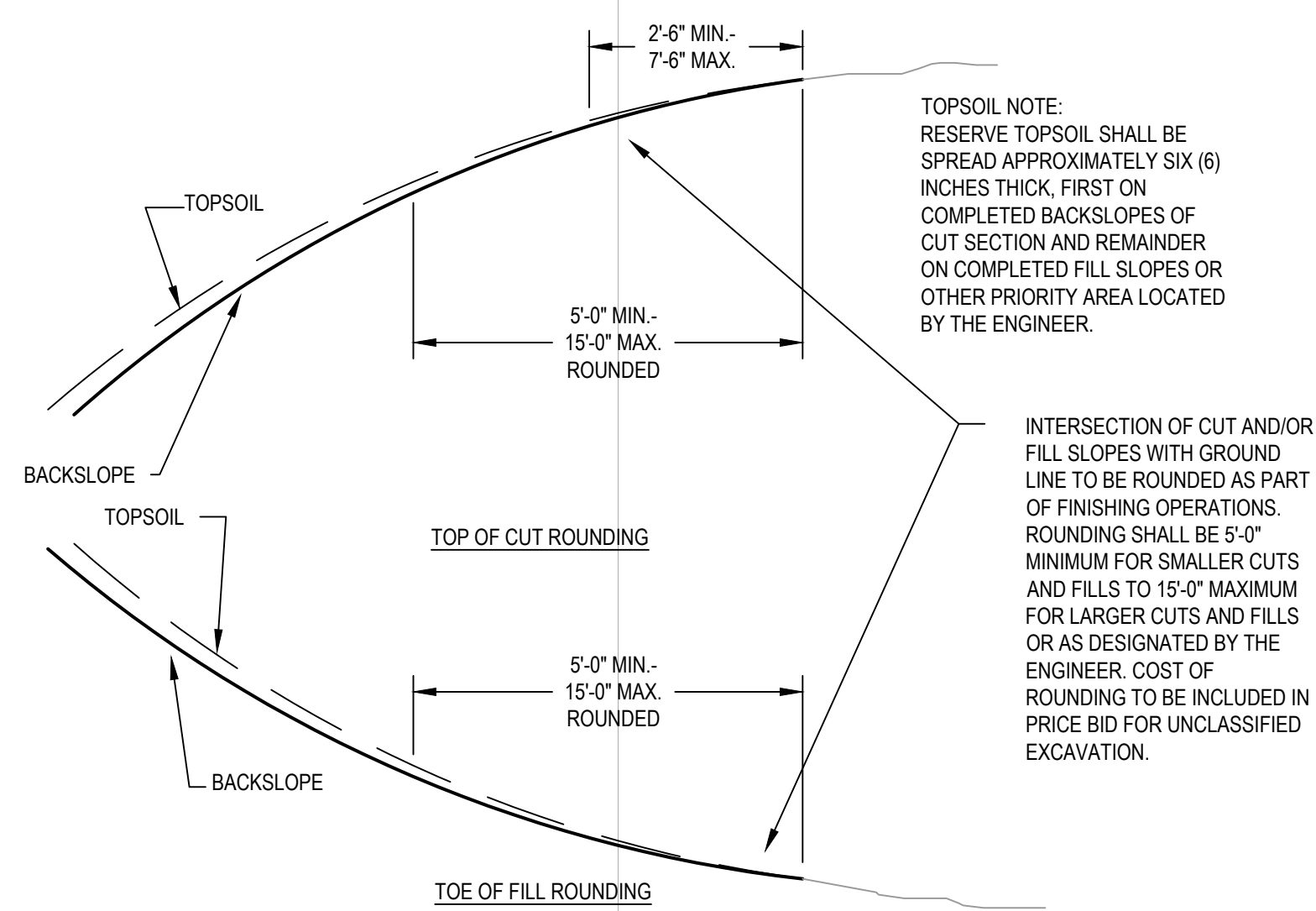


ENGINEERED BY
STARM
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Engineering Support
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10000
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hboutwell@st-arm.com

PROJECT LEGAL
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

PROJECT LOCATION
3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022
SHEET TITLE
PARKING DETAILS
SHEET NO.

C6.4
OF 37
PROJECT NO.
2023121402

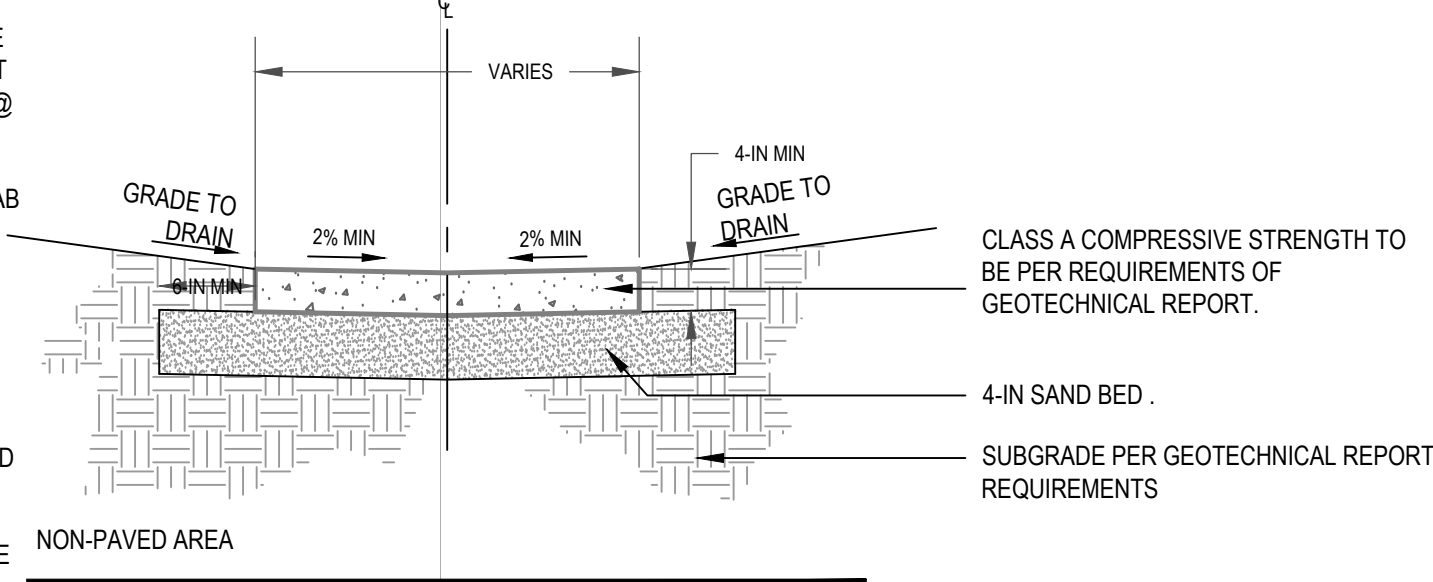


- NOTES
- 1) TO BE BACKFILLED AND COMPACTED AS PART OF THE FINISHING OPERATIONS. COST TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS OF WORK.
 - 2) PRIME COAT IS TO BE APPLIED IMMEDIATELY AFTER AGGREGATE BASE.
 - 3) EXISTING GRASSED AREA DISTURBED SHALL BE SLAB SODDED TO RIGHT-OF-WAY LINE.
 - 4) TEMPORARY CONSTRUCTION SURFACE:
- AGGREGATE BASE
PERMANENT FLEXIBLE PAVING TO BE CONSTRUCTED ON TOP OF AGGREGATE BASE.

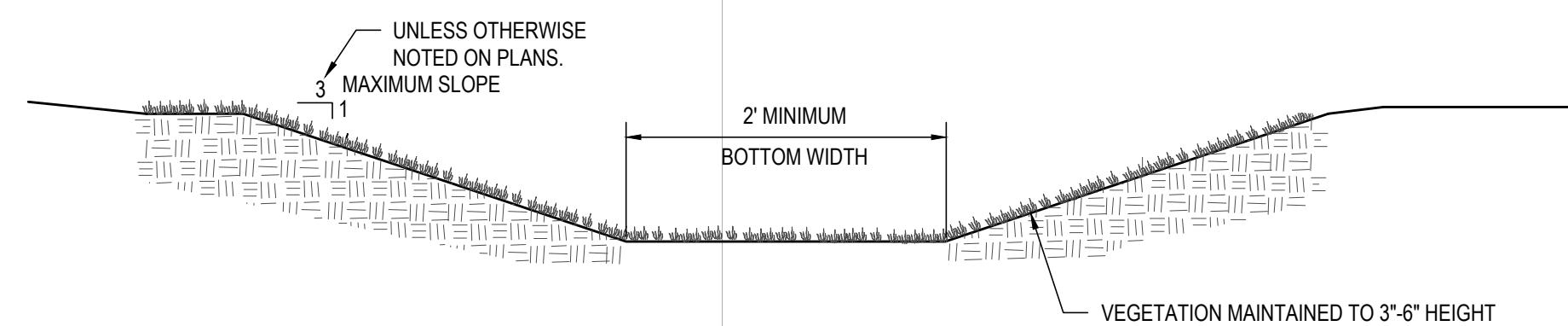
TYP. SLOPE ROUNDING DETAIL
N.T.S.

NOTES:

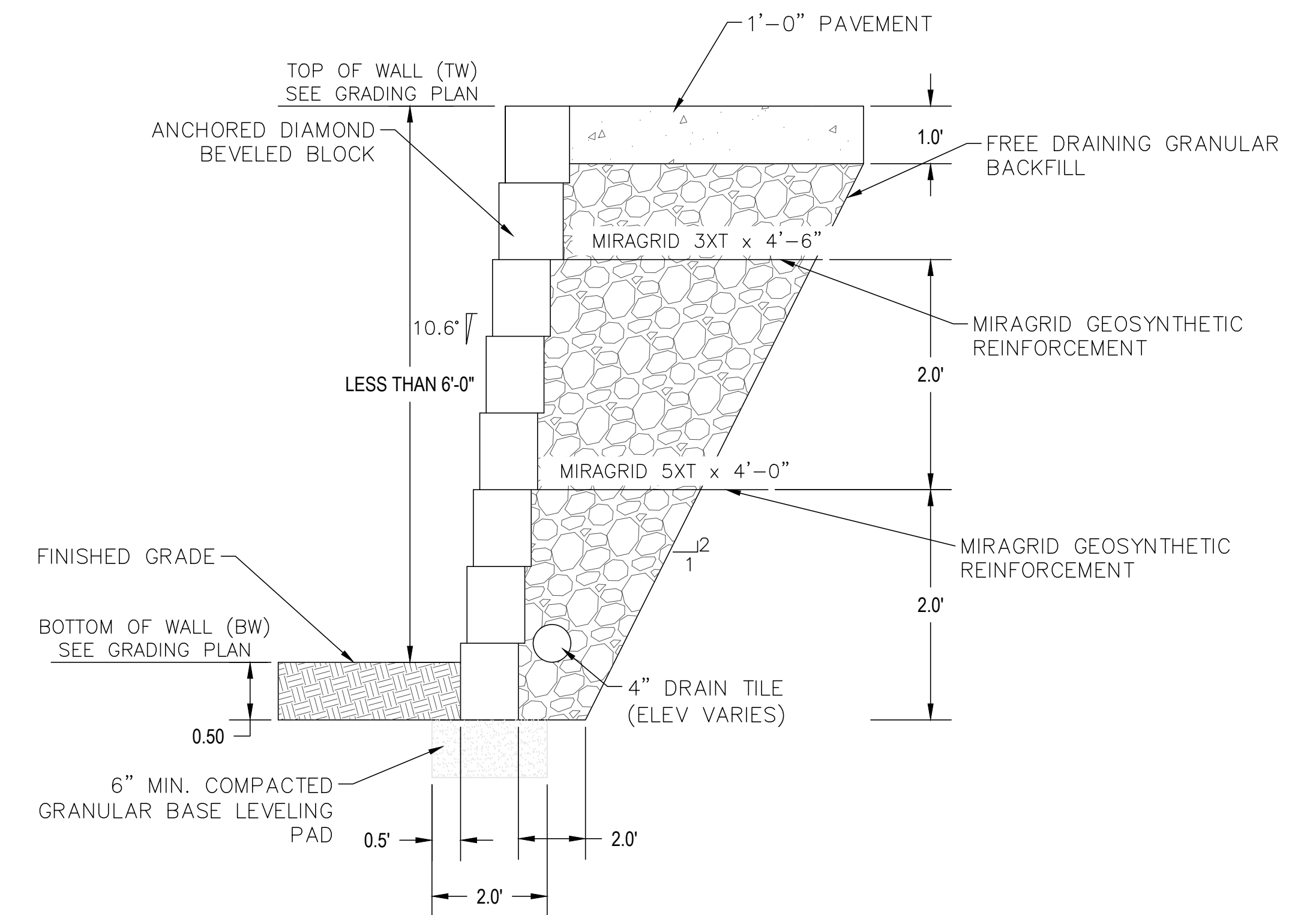
1. CONTRACTOR SHALL PROVIDE CONTRACTION JOINTS @ 20-FT O.C. AND EXPANSION JOINTS @ 100-FT O.C.
2. A MINIMUM OF 24-IN SOLID SLAB SOD SHALL BE PROVIDED ON EITHER SIDE OF TRICKLE CHANNEL. SODDING TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
3. CONTRACTOR RESPONSIBLE FOR REMOVAL OF ALL SILT AND SEDIMENT FROM TRICKLE CHANNEL PRIOR TO FINAL INSPECTION AND ACCEPTANCE BY OWNER.
4. CONTRACTOR RESPONSIBLE FOR PROVIDING DRY, SUITABLE BASE FOR INSTALLATION OF TRICKLE CHANNEL SUBGRADE.



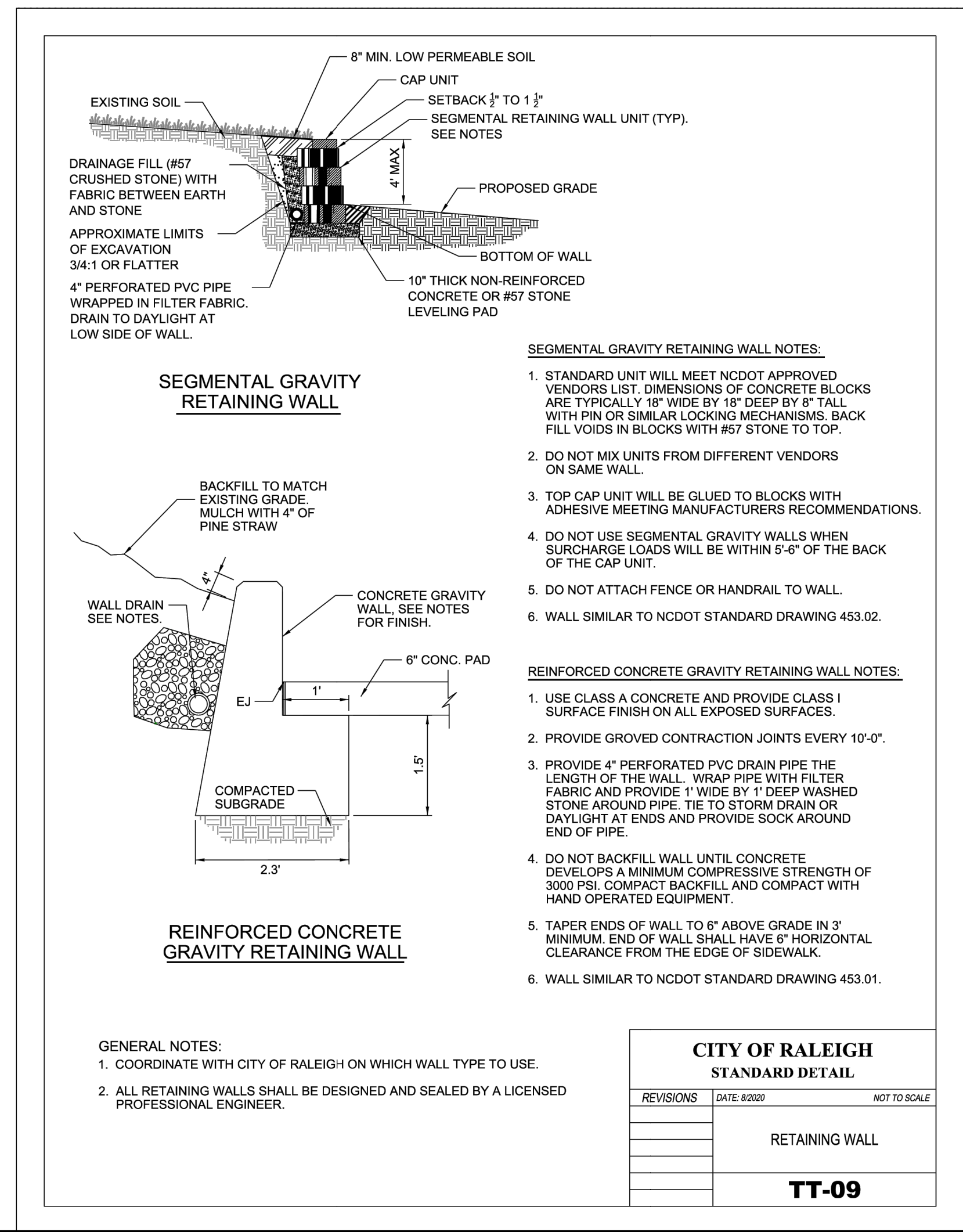
TYP. CONCRETE VALLEY DETAIL
N.T.S.



TYP. SWALE DETAIL
N.T.S.

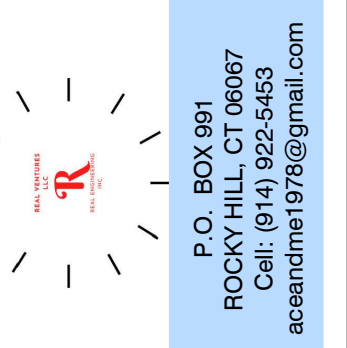


RETAINING WALL DETAIL 6' OR LESS
N.T.S.



REVISIONS
New Submittal - ASR City comments 06/30/2022

DESIGNED	HDB/AC
DRAWN	HDB
CHECKED	AC
DATE	
SCALE	



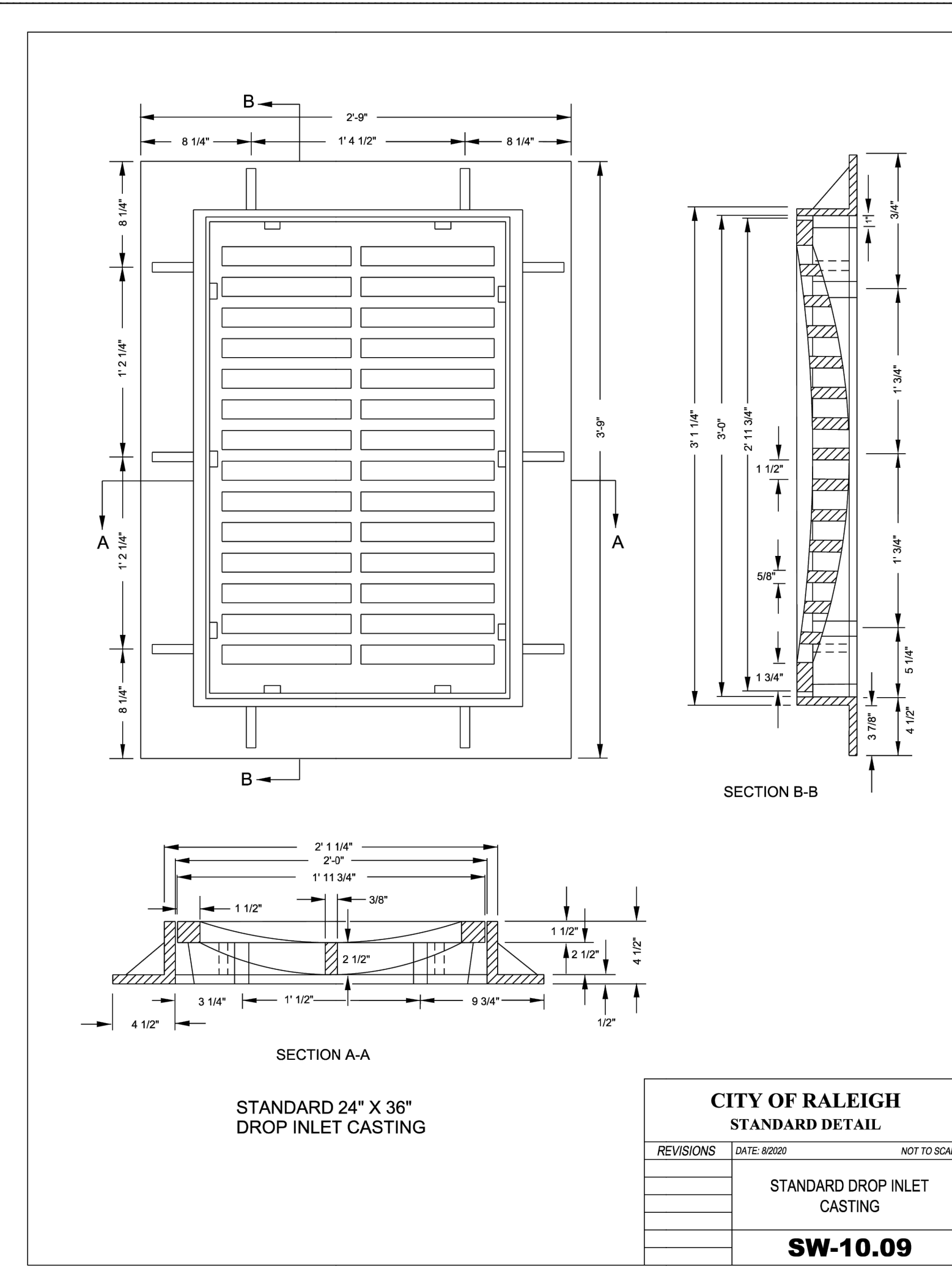
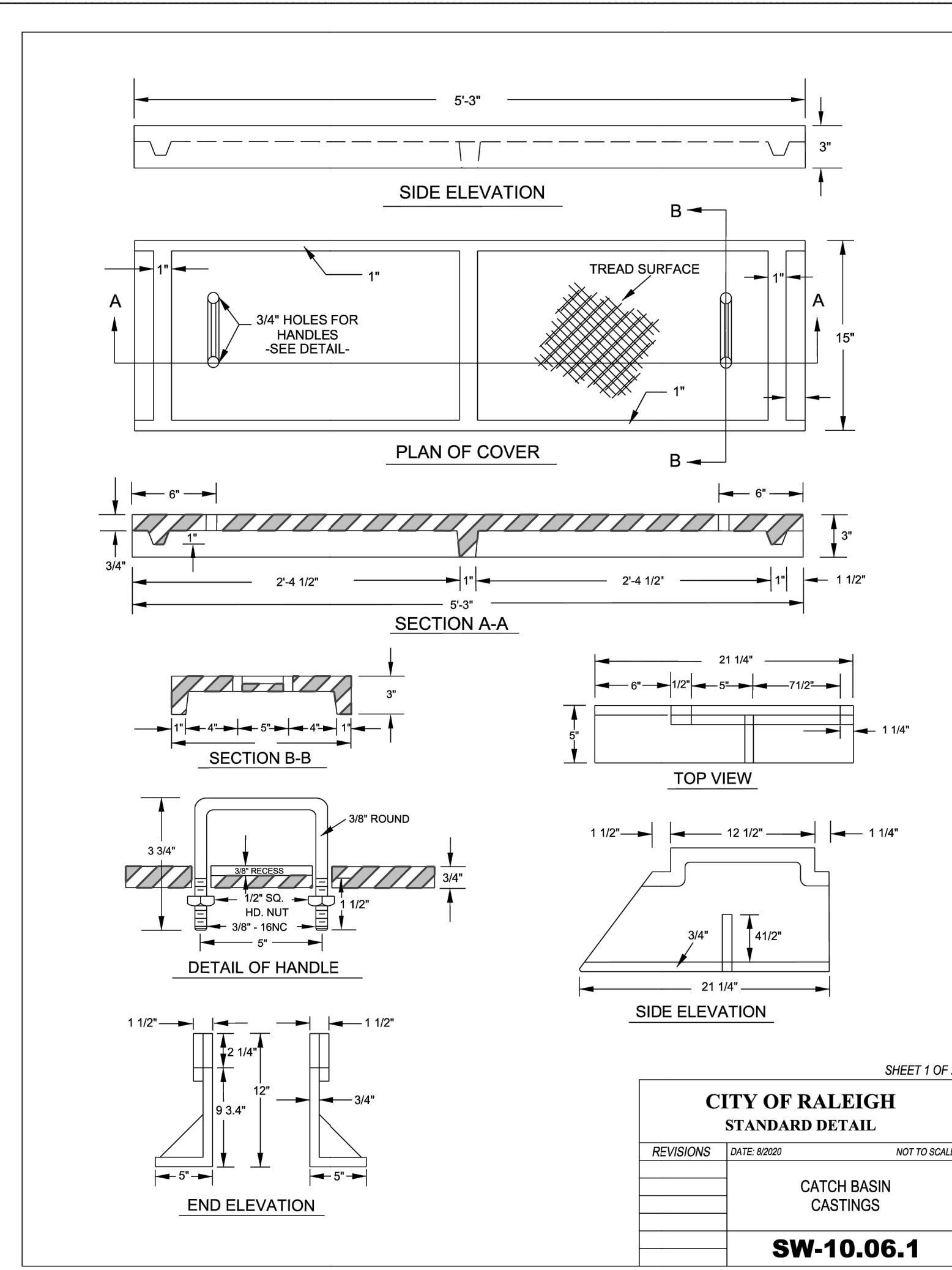
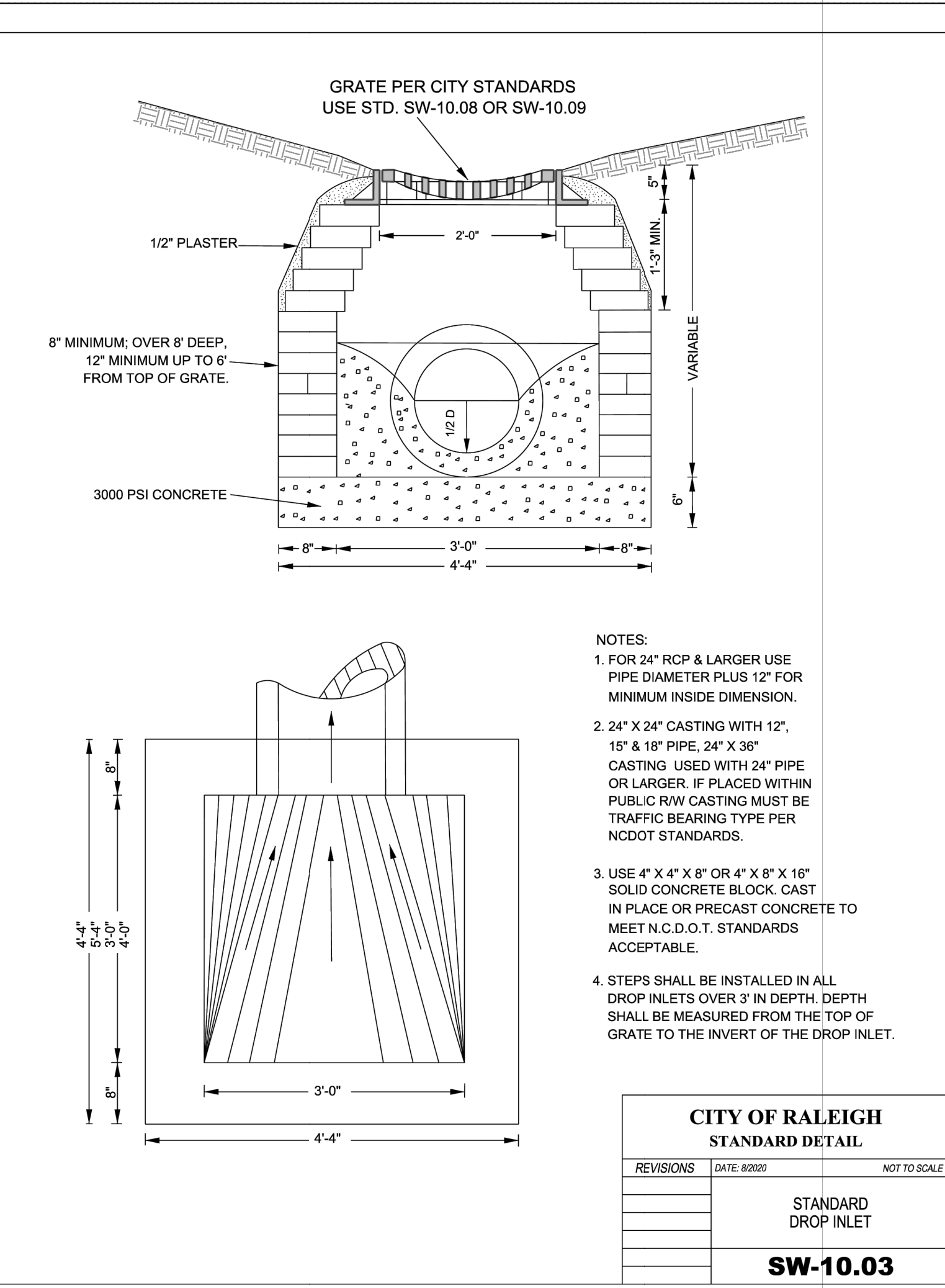
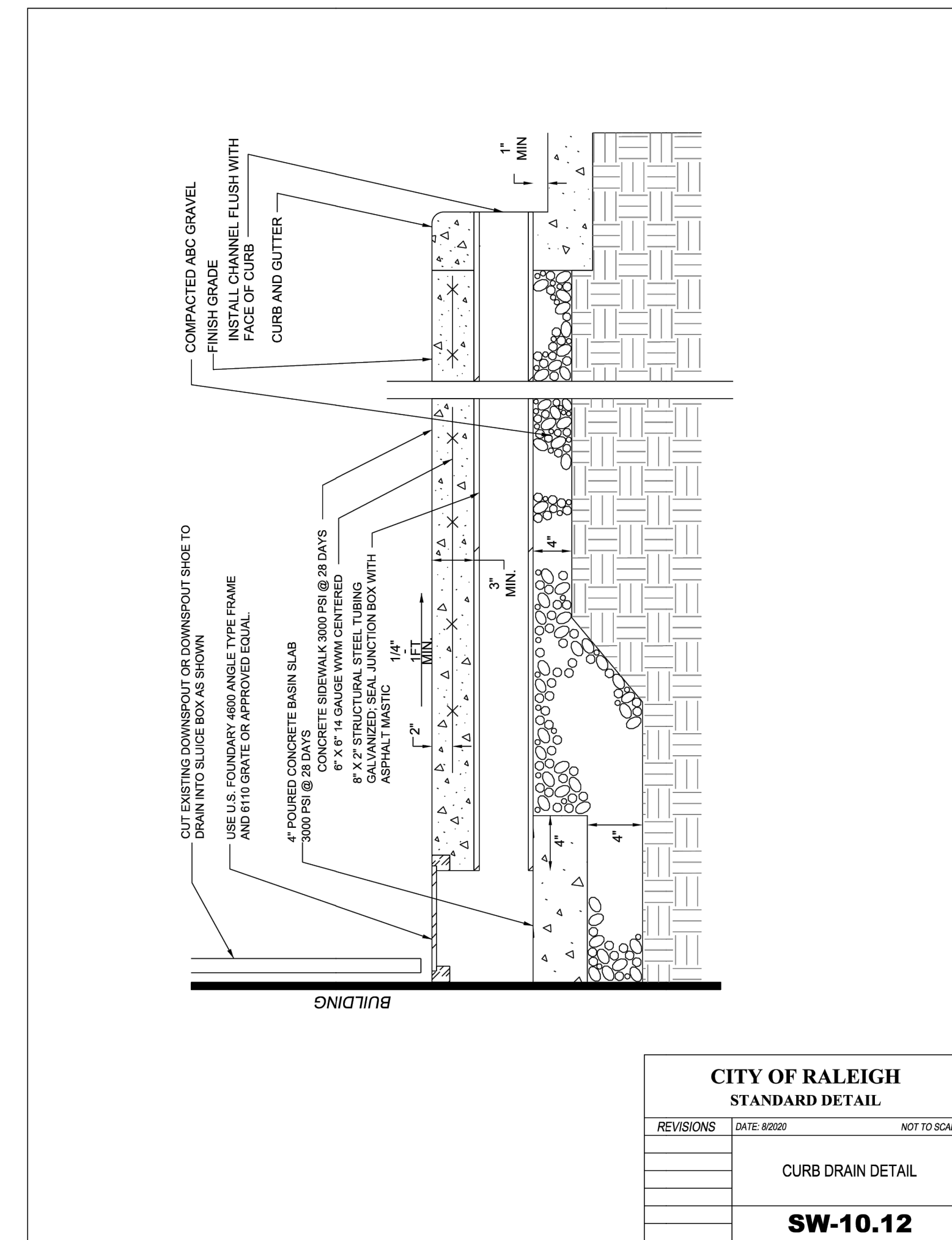
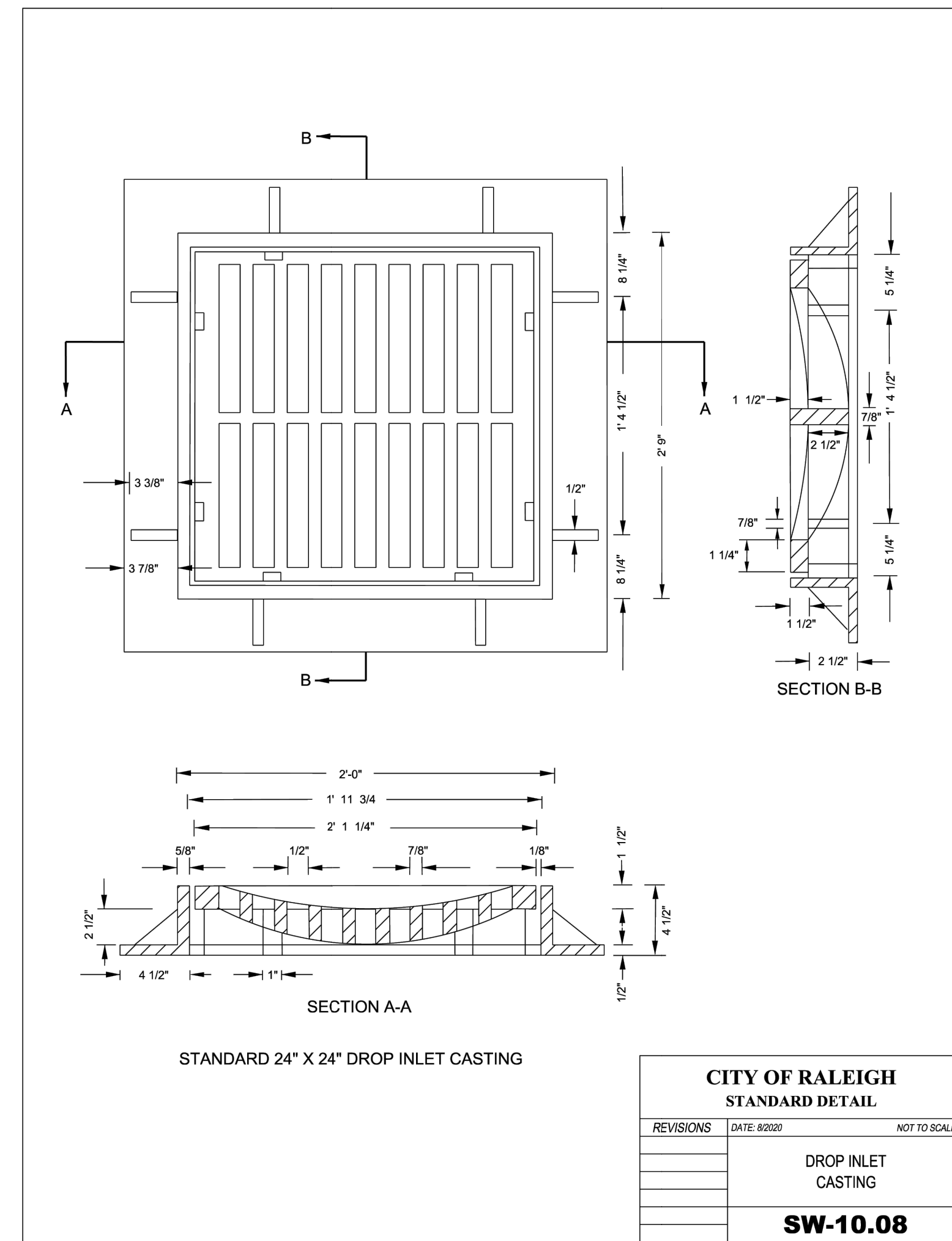
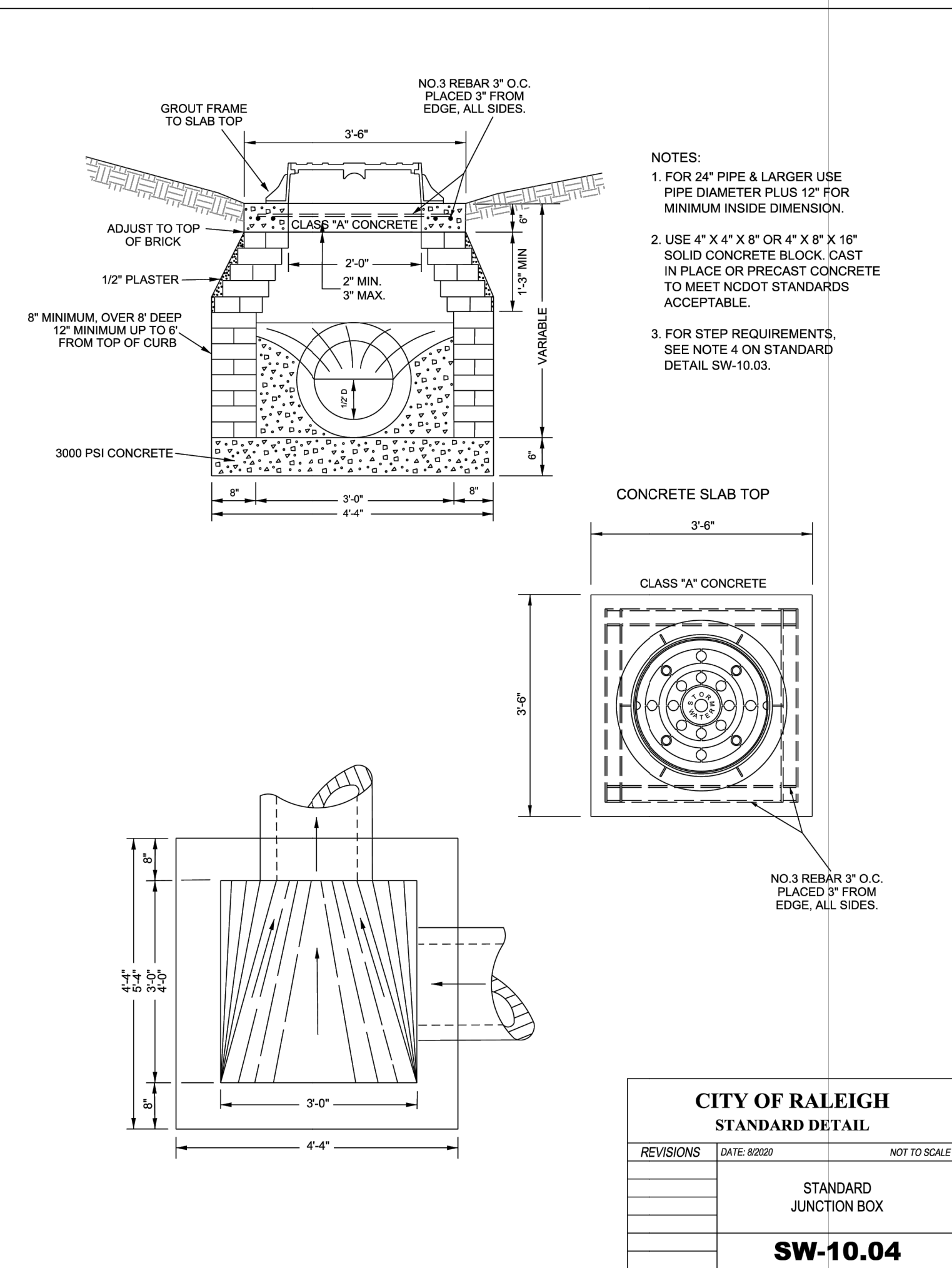
PREPARED BY
STARM
Stray ARM Consulting
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Civil Design & Drafting
Denton, TX 76210
Cell: (360)870-3218
aboutwell@st-arm.com

PROJECT LEGAL
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

PROJECT LOCATION
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

SHEET TITLE
RETAINING WALL AND GRADING
DETAILS

SHEET NO.
C6.5
OF 37
PROJECT NO.
2023121402



PROJECT LOCATION: **3601 Page Road**
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022

PROJECT LEGAL: **2.16 AC**
 DB 5766, PG 984
 PIN: 0758.03-32-9153
 Triangle Township
 Durham County, NC

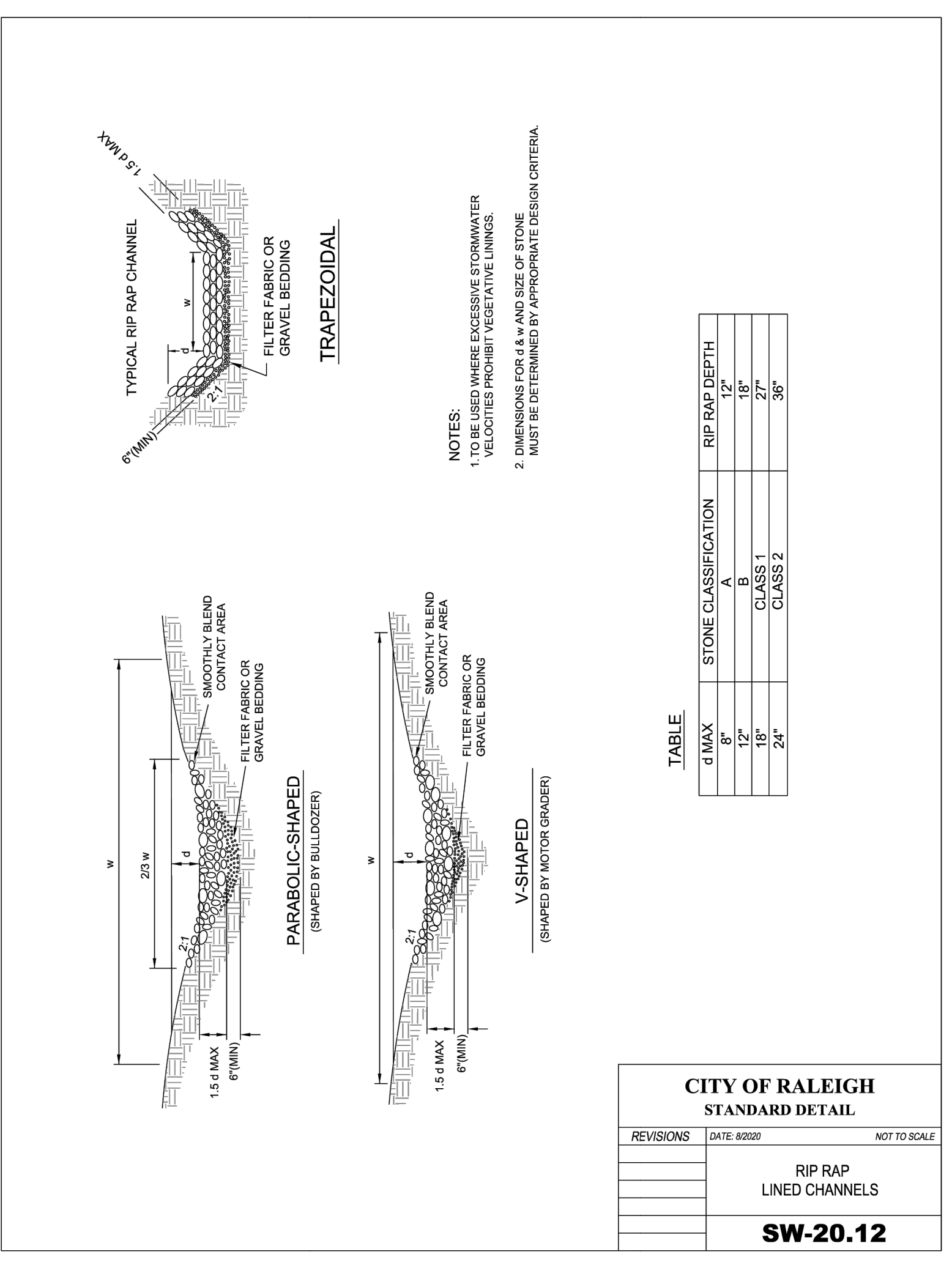
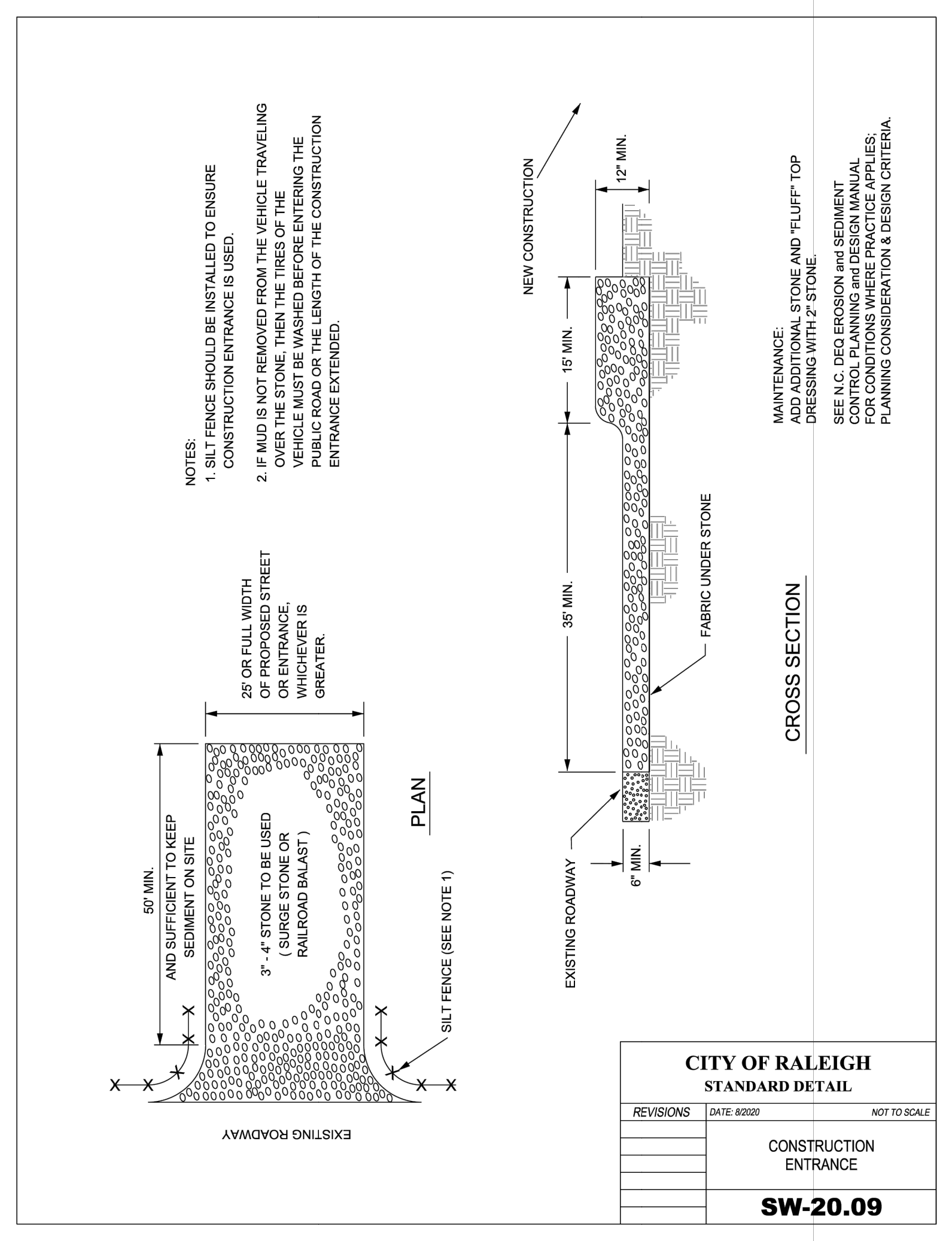
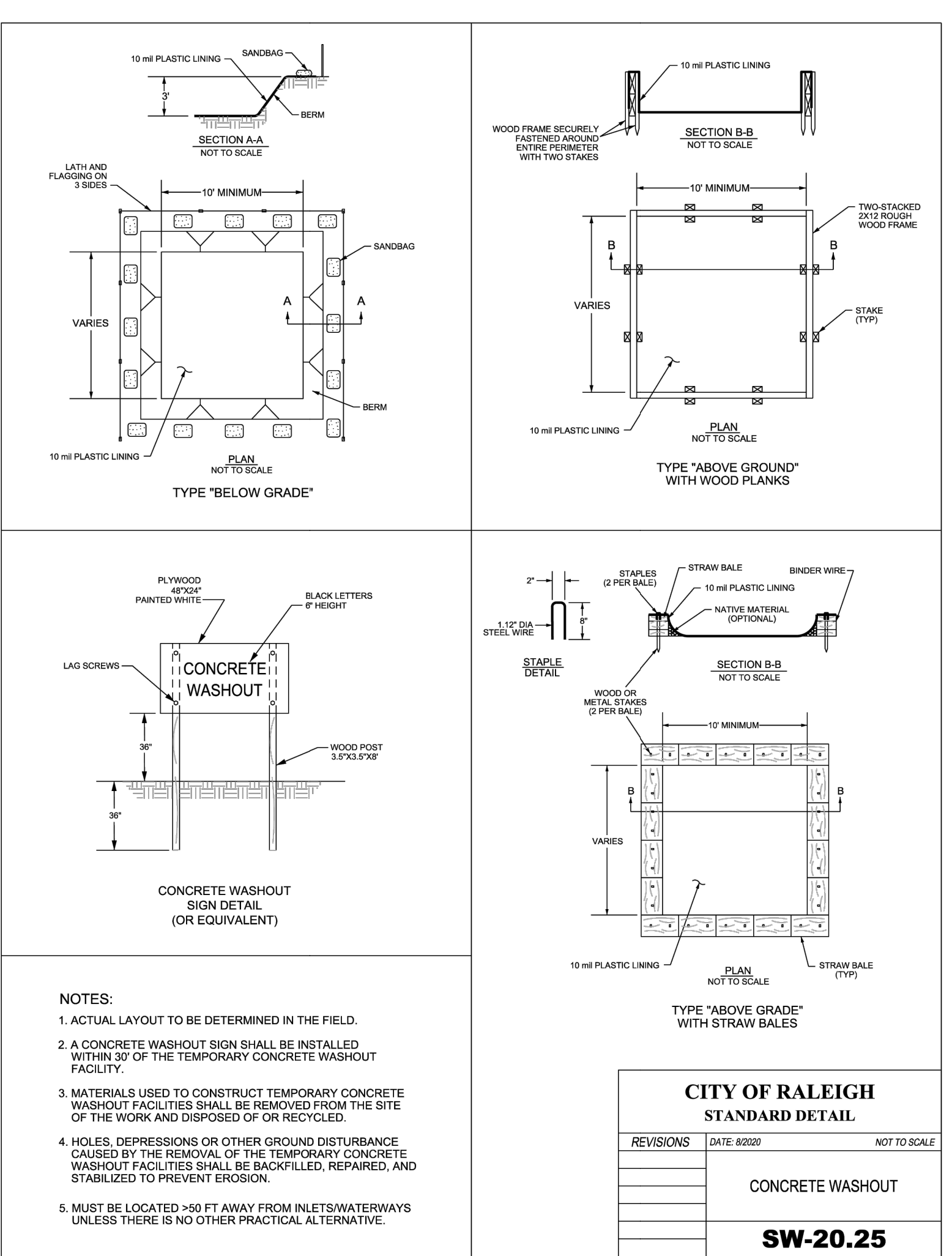
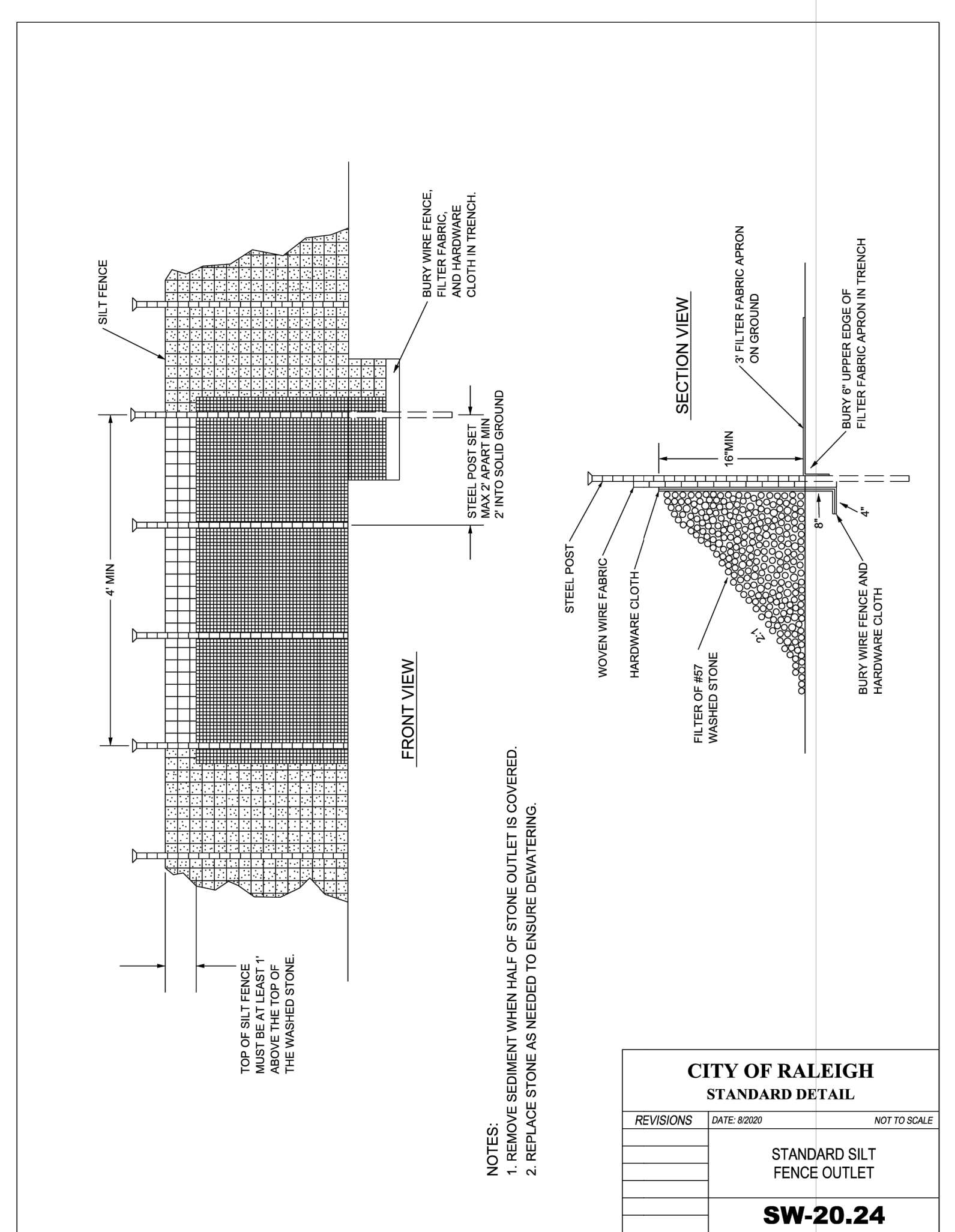
PROJECT TITLE: **STORMWATER DETAILS 1**

DATE: 06/30/2022
 SHEET NO. **C6.6**
 OF 37
 PROJECT NO. **2023121402**

DESIGNED: HDB/AC
 DRAWN: HDB
 CHECKED: AC
 DATE: _____
 SCALE: _____

REVISIONS: New Submittal - ASF City comments 06/30/2022

ENGINEERED BY: **STARM**
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ESTABLISHMENT OF GROUND COVER

- EIGHTY PERCENT (80%) EVENLY DISTRIBUTED GROUND COVER, WITHOUT LARGE BARE AREAS, SHALL BE ESTABLISHED AFTER THE DESIGNATED AREAS HAVE BEEN COMPLETED TO THE LINES, GRADES AND CROSS SECTIONS SHOWN ON THE PLANS AND PRIOR TO FINAL ACCEPTANCE BY THE CITY ENGINEER.
- GROUND COVER SHALL BE ESTABLISHED AS PER A COPY OF THE CONTRACT DOCUMENTS, PLANS AND SPECIFICATIONS SHALL BE AVAILABLE ON-SITE AT ALL TIMES BY THE CONTRACTOR.
- PRIOR TO PLANTING, CONTRACTOR SHALL PROVIDE THE CITY ENGINEER, OR HIS DESIGNEE, WITH THE STATE OF NORTH CAROLINA CERTIFICATE STATING ANALYSIS OF PURITY AND GERMINATION OF SEED.
- PLANTING SEASON AND APPLICATION RATES. ALL PLANTING SHALL BE DONE BETWEEN THE DATES SPECIFIED IN TABLE 1, FOR EACH GRASS TYPE EXCEPT WHEN SPECIFICALLY AUTHORIZED IN WRITING. THE SEEDS PLANTED PER ACRE SHALL BE OF A TYPE SPECIFIED WITH THE MIXTURE, RATE AND PLANTING DATES AS SHOWN IN THE TABLE 1, OR AS SPECIFIED BY THE ENGINEER.

TABLE 1. SEEDING TURFGRASS

PLANTING SEASON	SEED AND RATE
MARCH THROUGH SEPTEMBER	BERMUDA GRASS, HULLED 50-LB (22.7-KG) PLS* PER ACRE
OCTOBER THROUGH FEBRUARY	RYE GRASS, 100-LB (45.4-KG) PLS PER ACRE COMBINED WITH BERMUDA GRASS, HULLED 20-LB (9.1-KG) PLS* PER ACRE
AS SPECIFIED ON PLANS	AS SPECIFIED ON PLANS

*PLS - Pure Live Seed is determined by multiplying the gross weight times purity times the germination [For example, a 100-lb bag with 85% purity and 80% germination, (PLS=pounds in bag x Purity x germination) 100 x 0.85 x 0.8 = 60.8 -lbs of pure live seed.

- SEEDING AREAS SHALL BE MAINTAINED, INCLUDING WATERING AND MOWING, AT SUCH TIME AND IN A MANNER AND QUALITY TO ESTABLISH A MINIMUM 80% EVENLY DISTRIBUTED HEAVY GROUND COVER, WITHOUT LARGE BARE AREAS, UNTIL COMPLETION AND FINAL ACCEPTANCE OF THE PROJECT BY THE CITY ENGINEER.
- IN LIEU OF SILT FENCES, THE CONTRACTOR MAY USE TEMPORARY EROSION CONTROL MATTING AND/OR MULCHING PERIMETER GRAD BY ERTEC (OR EQUAL) TO STABILIZE DISTURBED SOIL AREA. EROSION CONTROL MATTING AND MULCHING SHALL BE INSTALLED IN COMPLIANCE WITH PROPRIETARY PRODUCTS SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS. EROSION CONTROL MATS USED AGAINST PAVED AREAS SHALL HAVE A WIDTH OF NO LESS THAN 10 FEET. NO HAY PRODUCTS SHALL BE USED.
- ALL MATERIAL INCORPORATED IN THE CONSTRUCTION SHALL BE NEW.

GENERAL NOTES

- INSPECTIONS SHALL BE PERFORMED EVERY 7 DAYS AND ANY REPAIR OR MAINTENANCE ON EROSION CONTROLS AND BEST MANAGEMENT PRACTICES WILL BE MADE PROMPTLY AS NEEDED.
- NO EXCAVATION OR CURB CUT-BACKS WILL BE ALLOWED WITHIN 18 INCHES OF THE STREET OR CURB WITHOUT APPROVAL FROM THE CITY ENGINEER.
- STREETS WILL BE KEPT FREE FROM MUD OR EARTH MATERIALS DURING THE CONSTRUCTION.
- USE OF ALTERNATE EROSION CONTROL DEVICES MUST BE APPROVED IN ADVANCE BY CITY ENGINEER AND SHOWN CLEARLY ON THE EROSION CONTROL PLANS PRIOR TO ANY EARTH DISTURBING ACTIVITIES.
- THE REQUIREMENTS OF NCTCOG BEST MANAGEMENT PRACTICES STANDARDS SHALL APPLY TO ALL ALTERNATE EROSION CONTROL DEVICES AS AMENDED BY THE CITY.
- CONCRETE WASH-OUT AREA (FOR PROJECTS WITH CONCRETE POURS) SHALL BE MAINTAINED AND SHALL HAVE SIGNAGE AND BE SHOWN ON EROSION CONTROL DRAWINGS.

REVISIONS
 HDB/AC
 HDB
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 AC

DESIGNED
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 DATE
 SCALE

APPROVALS
 HDB/AC
 HDB
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 AC

ENGINEERED BY
 PREPARED BY

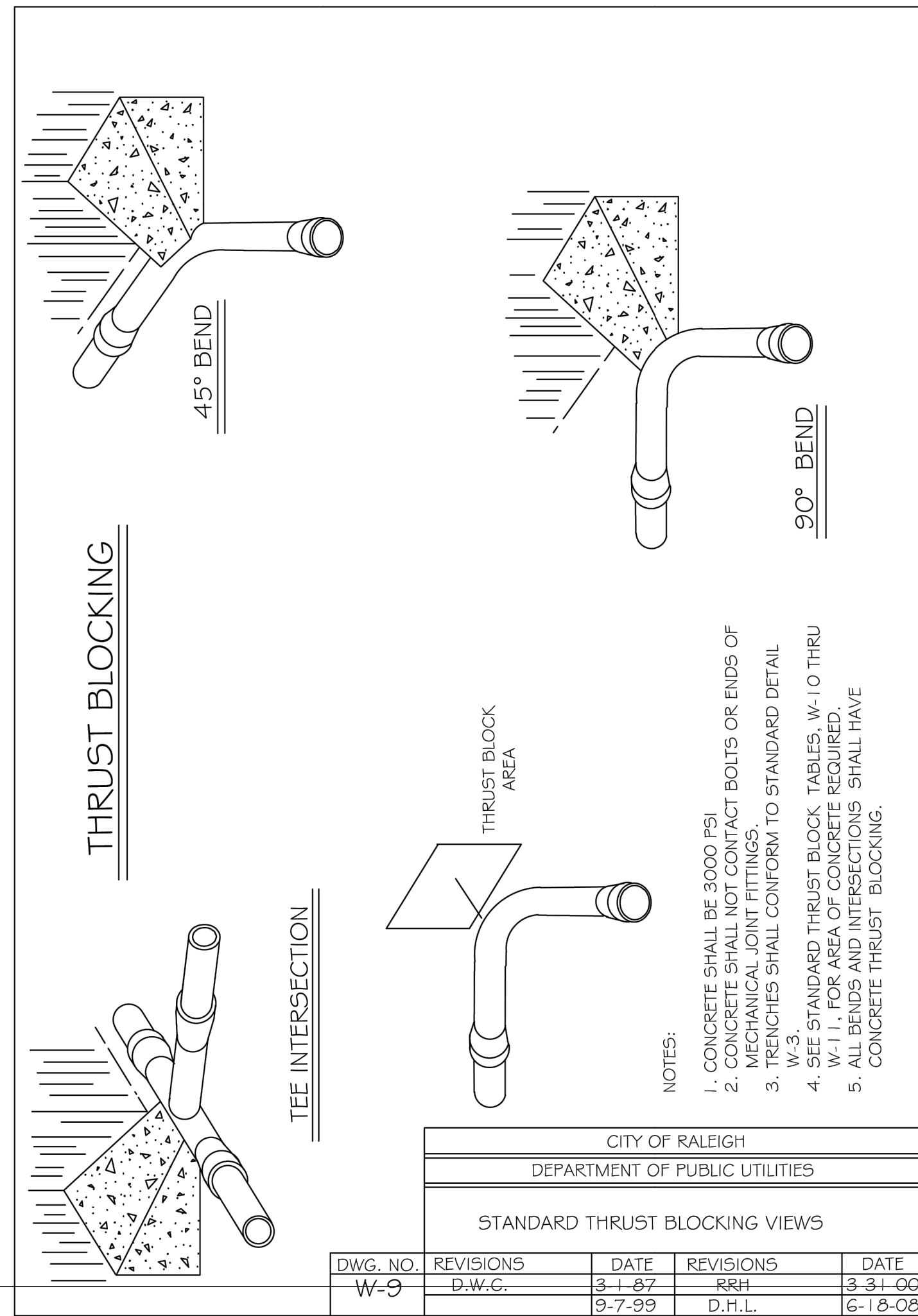
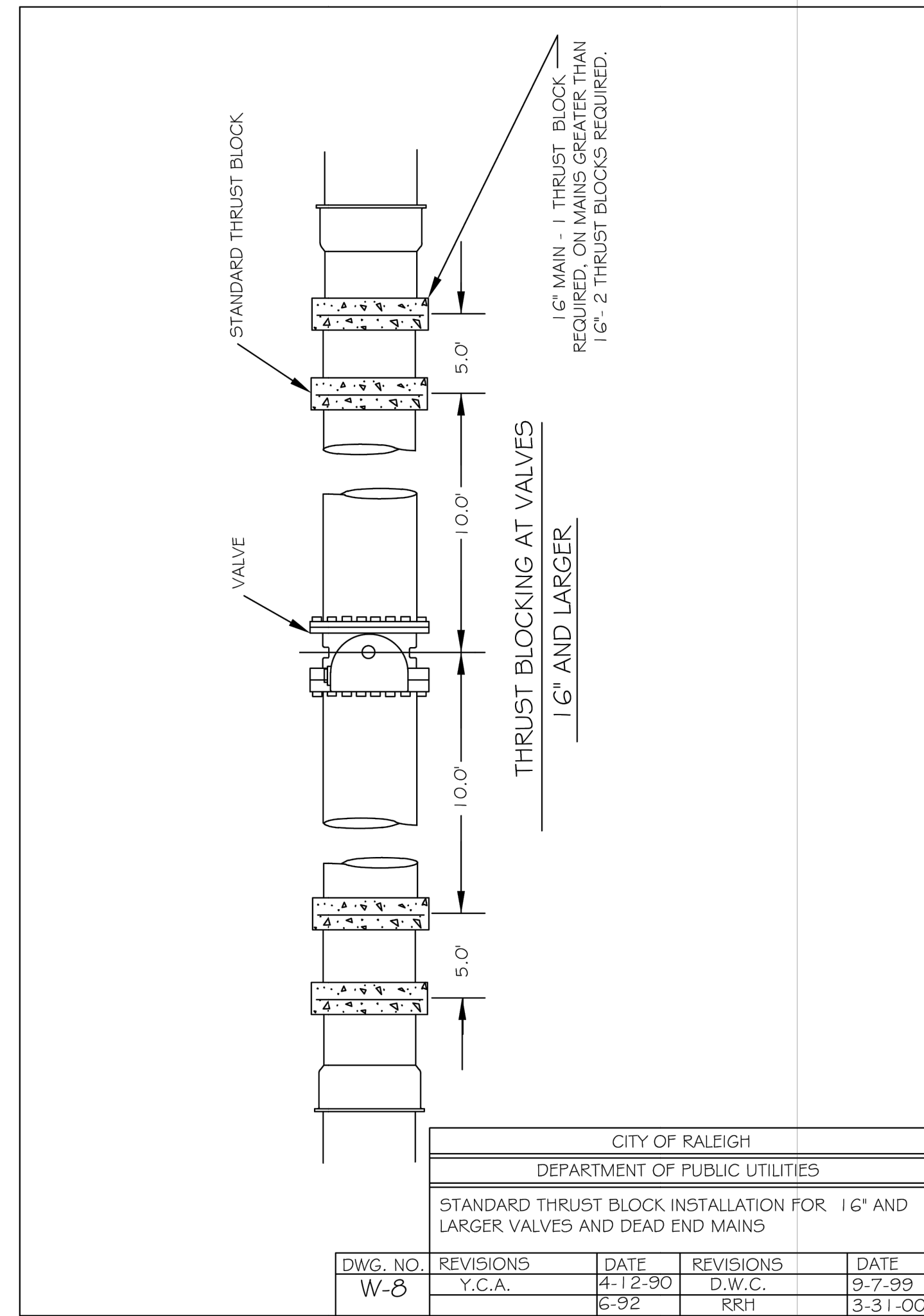
PROJECT LEGAL
 PROJECT LOCATION

2.16 AC
 DB 5766, PG 984
 PIN: 0758.03-32-9153
 Triangle Township
 Durham County, NC

3601 Page Road
 3601 Page Road Morrisville, NC 27560
 City of Raleigh Case # ASR-0015-2022

C6.8
 OF 37
 PROJECT NO.
 2023121402





REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS
BASED ON TEST PRESSURE OF 200 P.S.I.

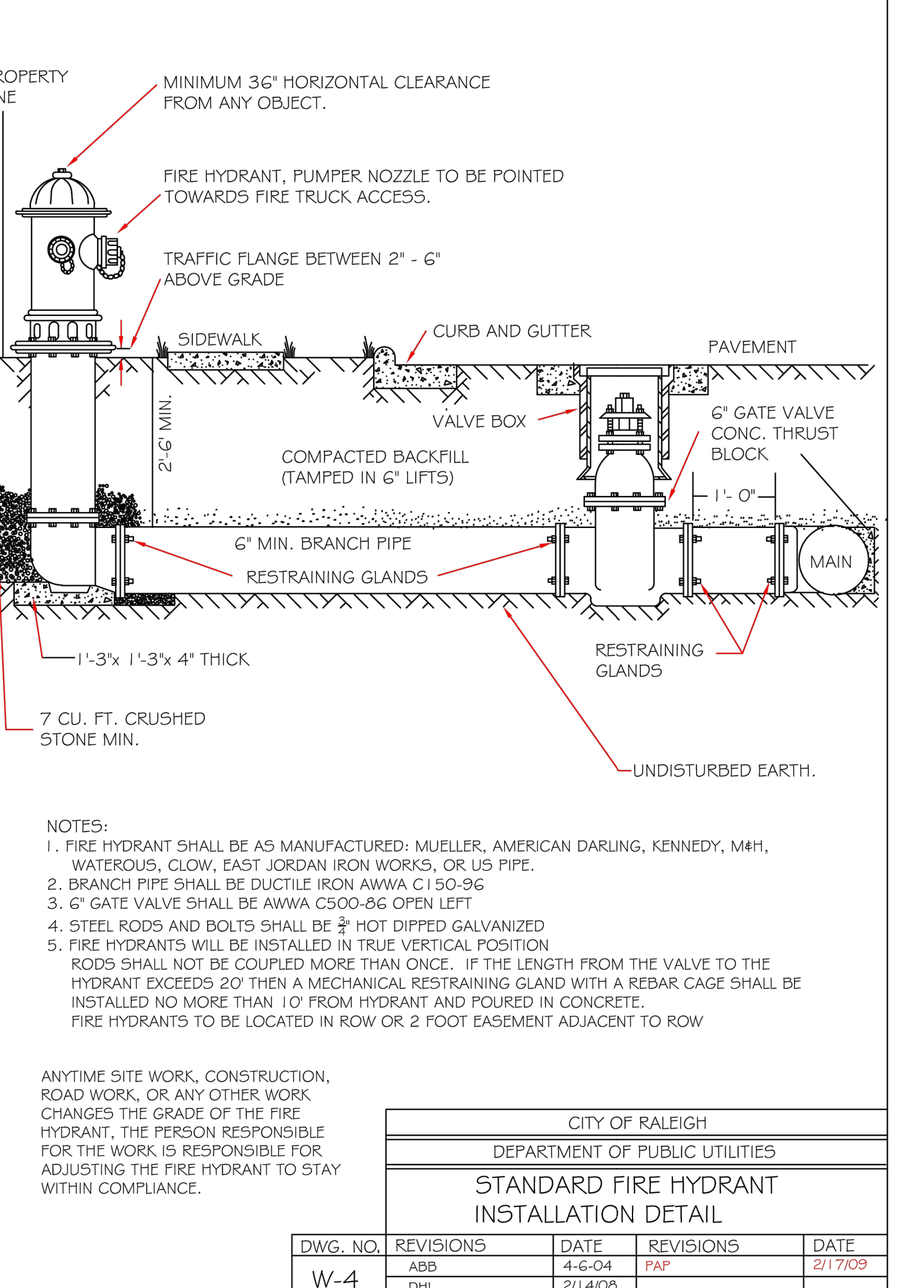
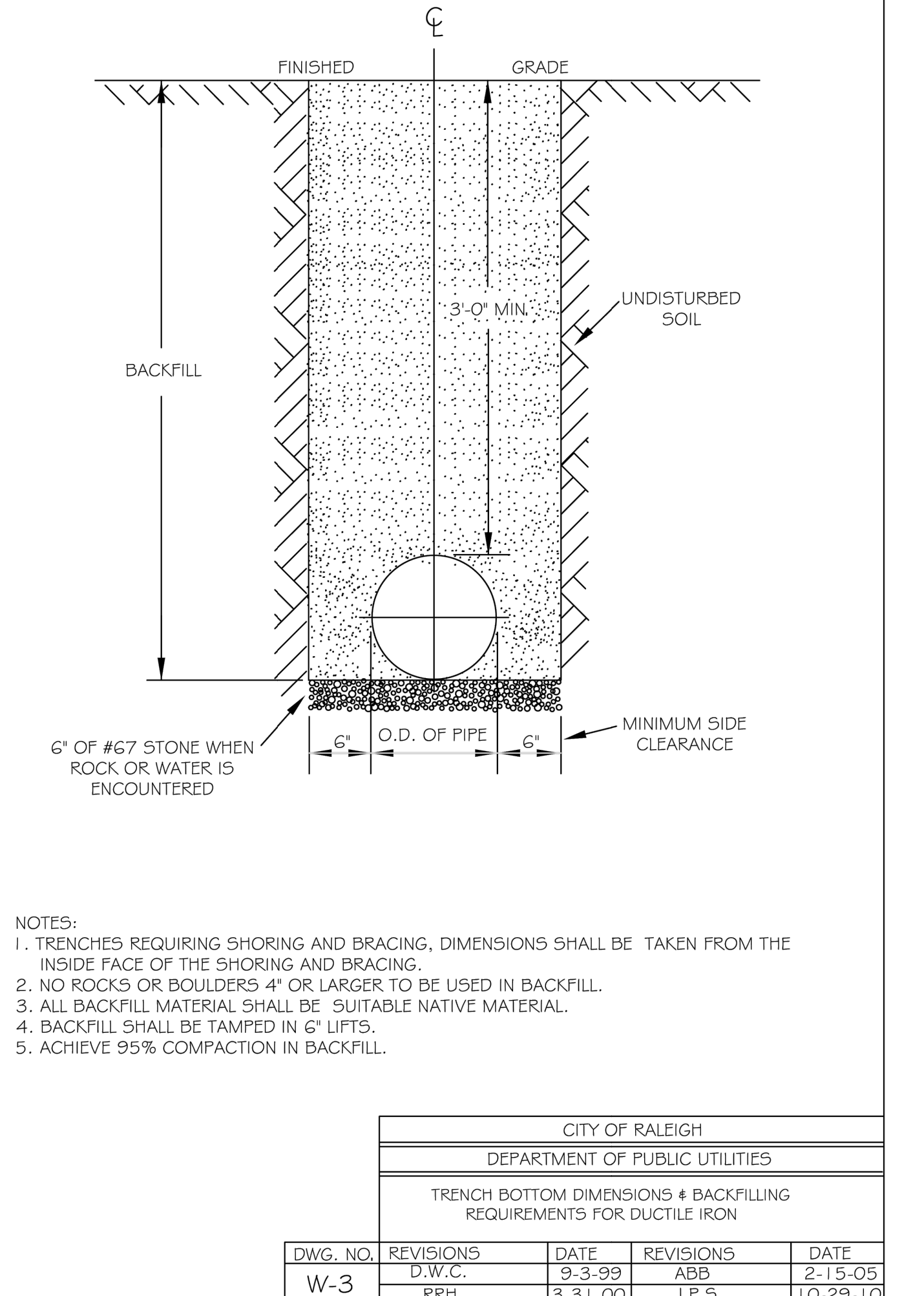
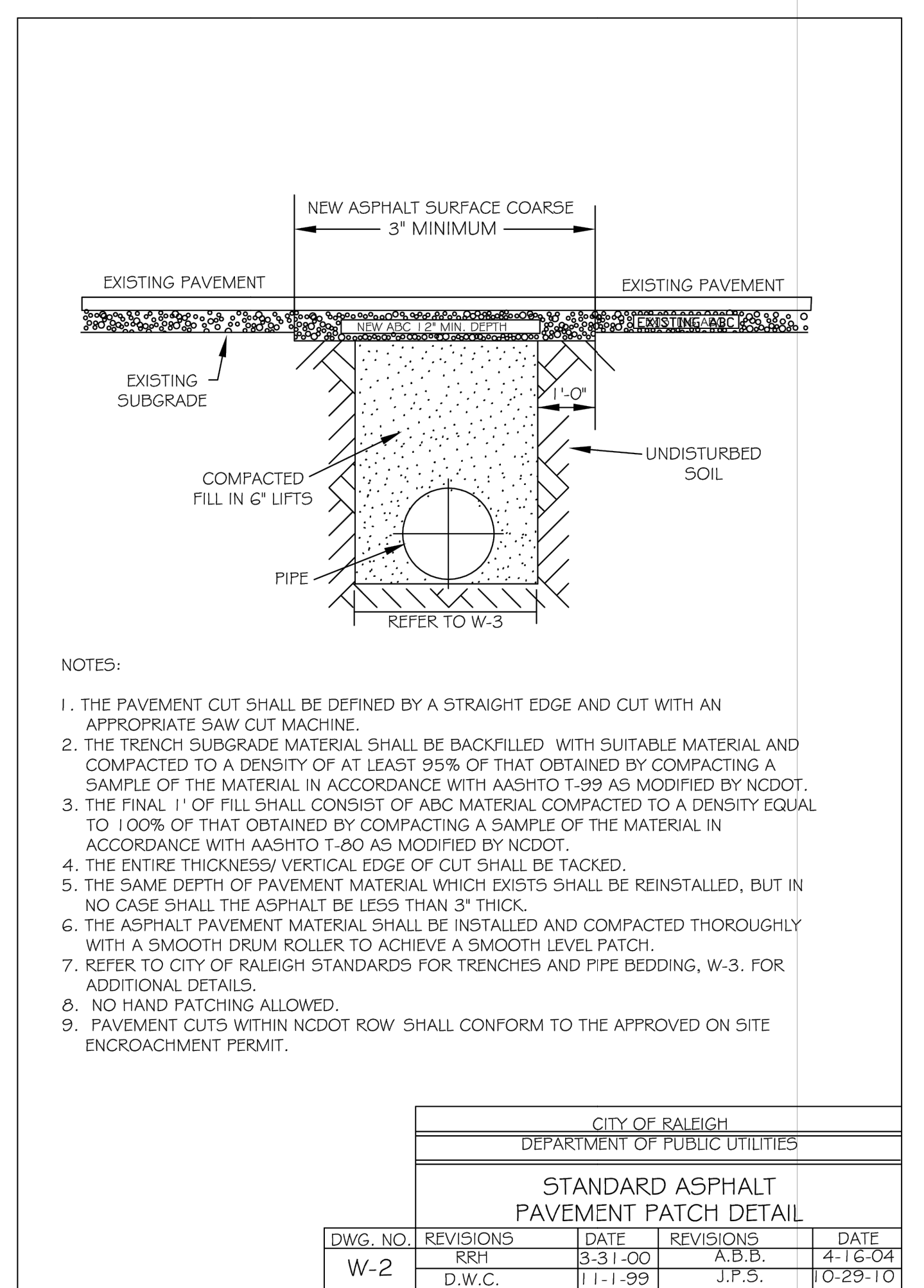
ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MORTAR/CLAY 4000 LBS/FT ²	SOFT CLAY 2000 LBS/FT ²	LEO LBS/FT ² GRAVEL/COARSE SAND ALWAYS DRY	SOIL LBS/FT ² CONCRECT FIRM 2000 LBS/FT ²	SAND CLEAN DRY 7000 LBS/FT ²	SOIL 1000 LBS/FT ² QUICK SAND - VERY POOR	ROCK - POOR TO GOOD LBS/FT ²
6"								
1 1/4"	1,108	1	1	1	1	1	2	1
2 1/2"	2,207	1	2	2	1	1	3	1
45°	4,328	2	3	3	1	1	5	1
90°	7,996	2	4	5	1	1	8	1
PLUG	5,655	2	3	4	1	1	6	1
8"								
1 1/4"	1,970	1	1	2	1	1	2	1
2 1/2"	3,922	1	2	3	1	1	4	1
45°	7,694	2	4	5	1	1	8	1
90°	14,215	4	8	9	2	2	15	2
PLUG	10,053	3	5	6	2	2	10	1
12"								
1 1/4"	4,433	2	3	3	1	1	5	1
2 1/2"	8,826	3	5	6	2	2	9	1
45°	17,312	5	9	11	3	3	18	2
90°	31,983	8	16	19	4	4	32	4
PLUG	22,619	6	12	14	3	3	23	3
16"								
1 1/4"	7,881	2	4	5	1	1	8	1
2 1/2"	15,691	4	8	10	2	2	16	2
45°	30,779	8	16	19	4	4	31	4
90°	56,861	15	29	35	8	8	57	6
PLUG	40,213	10	21	25	5	5	41	5

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.

USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-10	D.W.G.	6-23-89		



WATER SERVICE NOTES:

- ALL PROPERTY CORNERS SHALL BE STAKED WITH IRON RODS PRIOR TO THE INSTALLATION OF ANY WATER SERVICES. THE LOCATIONS OF THE SERVICE SHALL BE STAKED ACCORDING TO THE PLANS.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FURNISH AND INSTALL THE CORPORATION, WATER SERVICE PIPE, CUT-OFF ANGLE VALVE, THE CONNECTOR PIPE, AND METER BOX, AS PER THE DETAILS ON THIS SHEET.
- DIRECT TAPS ARE NOT ALLOWED. SADDLES SHALL BE USED.
- CUTTER FOR TAPS TO BE OF THE DOUBLE SLOTTED TYPE.
- TAPS SHALL HAVE BRASS OR STAINLESS STEEL SADDLES WITH A MINIMUM WIDTH OF 2" TO PROVIDE FULL SUPPORT AND SHALL BE CLOW VEGA 3407 & 3408, ROMAC 101-N & 102-N OR APPROVED EQUAL.
- ALL SERVICE TAPS LARGER THAN 2" SHALL BE MADE USING TAPPING TEES WITH RESILIENT WEDGE GATE VALVE IN BOX OR APPROVED EQUAL.
- 4" TO 2" TAPS SHALL BE A MINIMUM OF 1' APART WITH TAPS NO CLOSER THAN 1' FROM THE END OF THE PIPE.
- HOUSE SERVICES ON COMMON LOT LINES SHALL BE 1' WITH BULLHEAD. ALL OTHERS SHALL BE 3/4'.
- 3/4" THROUGH 2" WATER SERVICES SHALL BE:
 - TYPE "K" SOFT DRAWN COPPER.
 - BLUE HD POLYETHYLENE TUBING PER AWWA C901 AND C904 PE SERVICE LINE WITH COMPRESSION COUPLING NUT AND INTERNAL STIFFENER DESIGNED FOR PE CONNECTION (ASTM F1949).
- CONTRACTOR MAY USE EITHER FLARED OR COMPRESSION BRASS FITTINGS WITH RESTRAINED UNIONS. (USE FORD OR MUELLER "Q" COUPLING OR APPROVED EQUAL)
- NO SPLICES OF WATER SERVICES SHALL BE PERMITTED UNDER PAVEMENT UNLESS APPROVED BY THE CITY ENGINEER.
- CONTRACTOR SHALL USE A 3 PART UNION COPPER TO COPPER, MUELLER H-15405 COMPRESSION FITTING WITH RESTRAINED UNION, OR EQUAL WHERE SPLICES ARE PERMITTED. ADDITIONALLY, STIFFENERS WILL BE REQUIRED FOR HD POLYETHYLENE SERVICES.
- USE 3/4" OR 1" CORPORATION, MUELLER H-15008 COMPRESSION CORPORATION, OR EQUAL.
- USE 3/4" X 3/4" X 1" BULLHEAD TEE MUELLER H-15381 COMPRESSION FITTING, OR EQUAL.
- METER BOX SHALL BE SET AT THE BACK OF CURB, OUTSIDE OF DRIVEWAYS AND PAVED AREAS.
- ALL METER BOXES SHALL BE AS SPECIFIED AS BELOW:
 - 5/8" TO 1" METERS (NON TRAFFIC AREAS); BASS & HAYES P34P18D1S WITH 3LID-2 LID 5/8" TO 1" METERS (DIRECT TRAFFIC AREAS); BASS & HAYES P34P18SET BOX AND LID NOTE: REQUIRES PRIOR WRITTEN CITY APPROVAL 1-1/2" TO 2" METERS: DFW2818-IPLCIR-IIRON BOX AND LID
- ALL WATER SERVICES TO BE MARKED BY "W" STAMPED OR CUT ON THE CURB AND PAINTED BLUE.
- ALL COPPER AND HDPE FITTINGS SHALL BE COMPRESSION FITTINGS.
- INSTALL 2" PIPE AND TAP FOR 1-1/2" AND 2" METER INSTALLATIONS.
- 1" MAX BULLHEAD SERVICE ON A 2" TAP.
- MINIMUM 6" TAPS REQUIRED ON ALL WATER MAINS 16" AND LARGER.
- METERS AND TAPS SHALL BE LOCATED ON SAME SIDE OF MAIN.
- CONTRACTOR SHALL REMOVE ALL SAND OVER FITTINGS & INSTALL METER BOX PROVIDED BY CITY PRIOR TO REQUESTING METER INSTALLATION.
- USE 2" X 1-1/2" FLANGED REDUCER IF REDUCING TO 1-1/2" METER.
- ALL METER BOXES SHALL BE SET LEVEL AND THE TOP OF THE METER BOX SHALL BE SET 2% ABOVE THE TOP OF CURB WITHIN THE PARKWAY OR AS DIRECTED BY THE CITY ENGINEER, HIS DESIGNEE OR PUBLIC WORKS DEPARTMENT REPRESENTATIVE.
- FLARED CORPORATIONS FOR POLYETHYLENE SERVICE LINES SHALL BE AS FOLLOWS:
 - 1-1/2" FLARED CORPORATIONS MUELLER H15071N1 ADAPTORS OR APPROVED EQUAL.
 - 2" FLARED CORPORATIONS MUELLER H15071NK ADAPTORS OR APPROVED EQUAL.

FIRE DEPARTMENT CONNECTION DETAIL

4" X 2-1/2" X 2-1/2" SIEMENSE CONNECTION WITH CLAPPER INTERNAL CHECK VALVE (POTTER - ROEMER #9731)

36" MIN

FINISH GRADE

4" X 4" M.F.P. TEE OR ELBOW AS NEEDED

4" SCH 40 GALVANIZED STEEL PIPE

4" GALV COMPRESSION FLANGE

4" CSO GLASS 200 PVC

UNDISTURBED EARTH.

RESTRAINING GLANDS

6" MIN. BRANCH PIPE RESTRAINING GLANDS

7 CU. FT. CRUSHED STONE MIN.

1-3/4" X 1-3/4" X 4" THICK

UNDISTURBED SOIL

3'-0" MIN

UNDISTURBED SOIL

BACKFILL

FINISHED GRADE

PROPERTY LINE

MINIMUM 36" HORIZONTAL CLEARANCE FROM ANY OBJECT.

FIRE HYDRANT, PUMPER NOZZLE TO BE POINTED TOWARDS FIRE TRUCK ACCESS.

TRAFFIC FLANGE BETWEEN 2" - 6" ABOVE GRADE

SIDEWALK

CURB AND GUTTER

PAVEMENT

VALVE BOX

6" GATE VALVE CONC. THRUST BLOCK

RESTRAINING GLANDS

RESTRAINING GLANDS

UNDISTURBED EARTH.

NOTES:

- FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M&H, WATERLOO, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
- BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-86
- 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT
- STEEL RODS AND BOLTS SHALL BE 3/8" HOT DIPPED GALVANIZED
- FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION
- RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
- FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW

ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK CHANGES THE GRADE OF THE FIRE HYDRANT, THE PERSON RESPONSIBLE FOR THE WORK IS RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANT TO STAY WITHIN COMPLIANCE.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

STANDARD FIRE HYDRANT CONNECTION DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4	ABB	4-6-04	PAP	2/17/09
	DHL	2/14/06		

FIRE DEPARTMENT CONNECTION DETAIL

1. STEAMER FIRE HYDRANTS SHALL BE WITHIN 100 FEET OF THE FIRE DEPARTMENT CONNECTION (FDC).

2. FDC SHALL HAVE A MINIMUM 36" CLEARANCE ALL AROUND.

3. FDC SHALL BE LOCATED SO AS NOT TO BE BLOCKED BY LANDSCAPING, PARKING STALLS, LOADING ZONES, ETC.

4. BOLLARDS MAY BE REQUIRED.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

STANDARD FIRE HYDRANT CONNECTION DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4	ABB	4-6-04	PAP	2/17/09
	DHL	2/14/06		

2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

WATER DETAILS 1

C6.9
OF 37
PROJECT NO.
2023121402

APPROVALS: DESIGNED: HDB/AC, DRAWN: HDB, CHECKED: AC, DATE: SCALE:

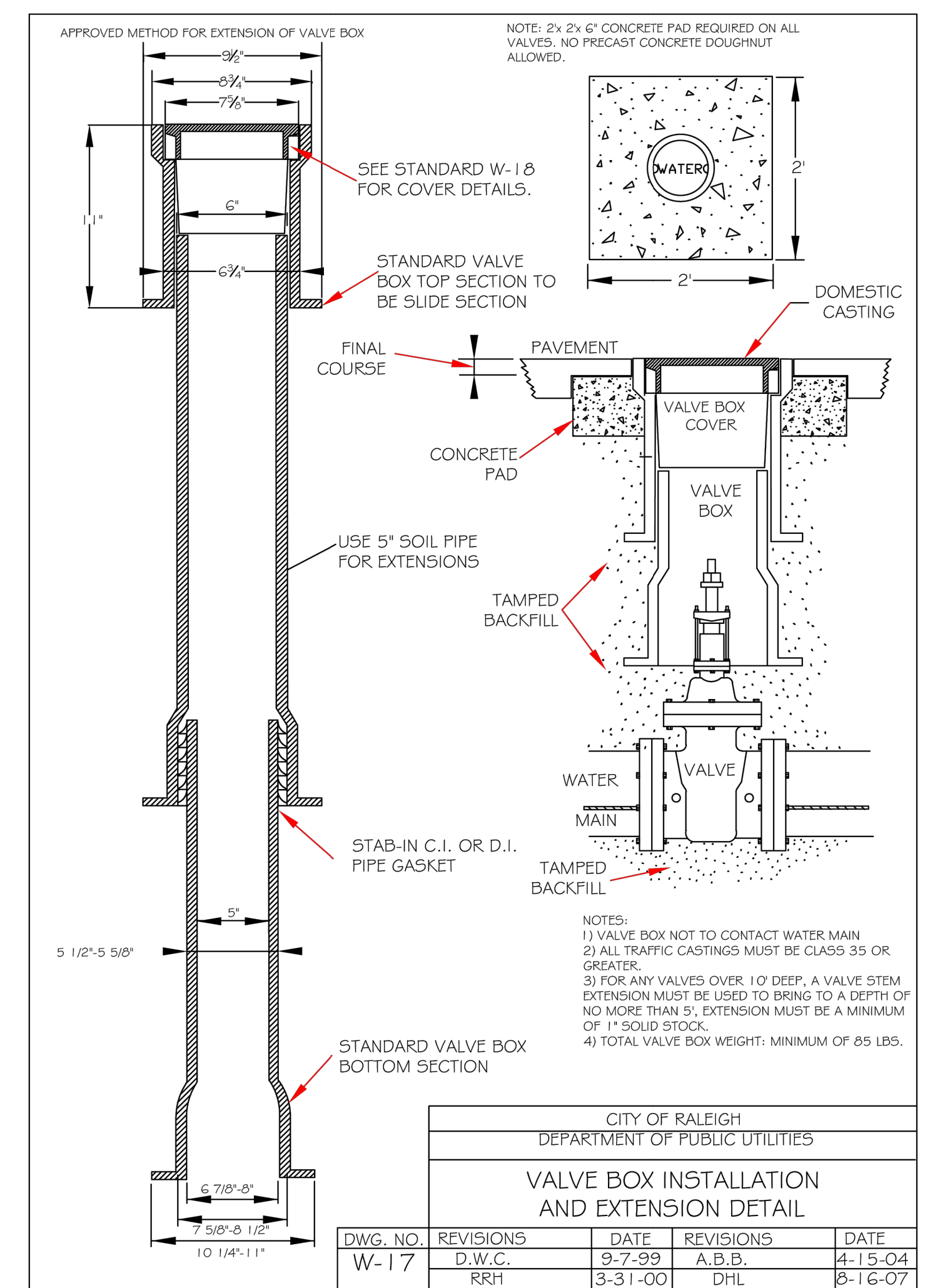
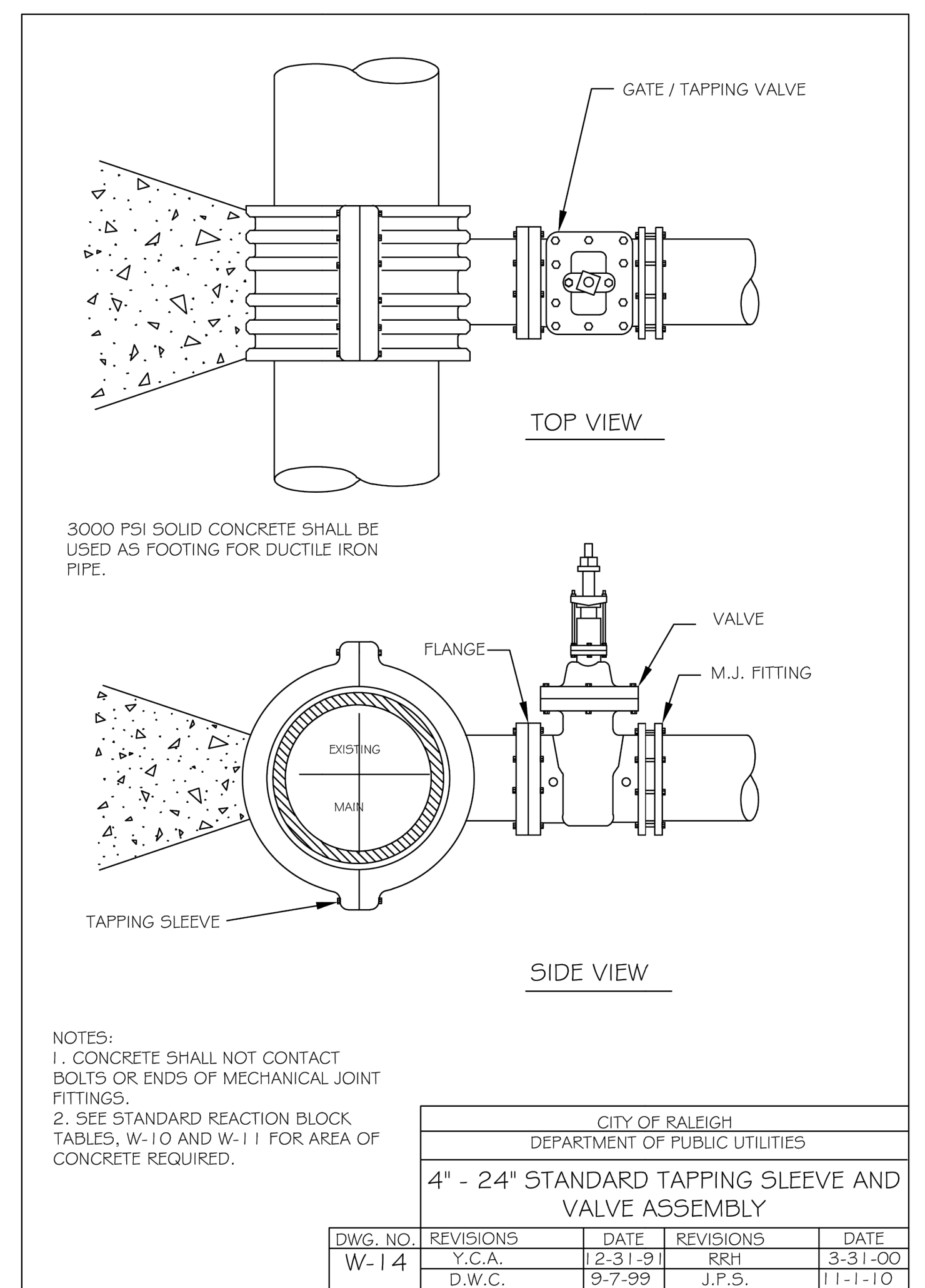
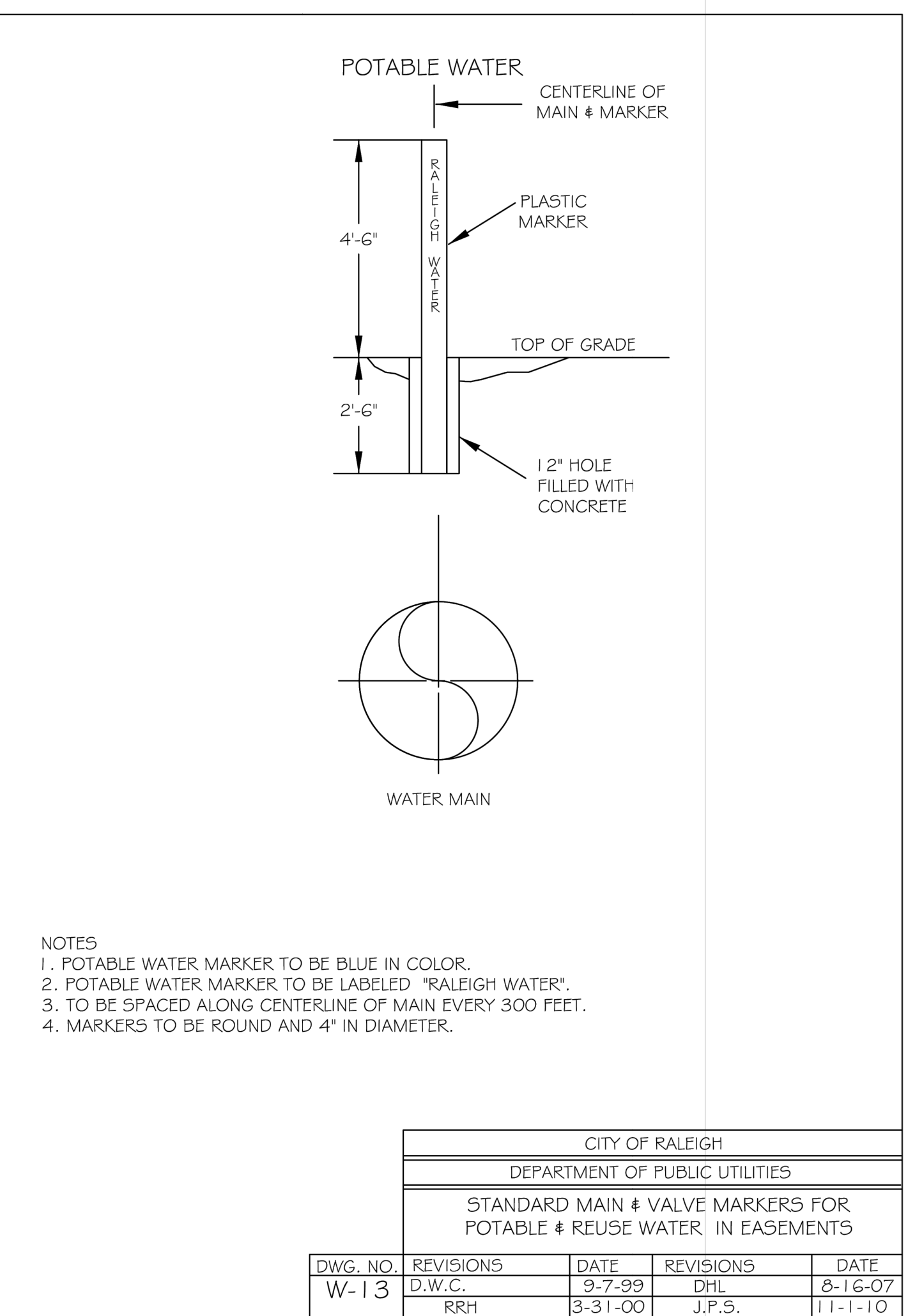
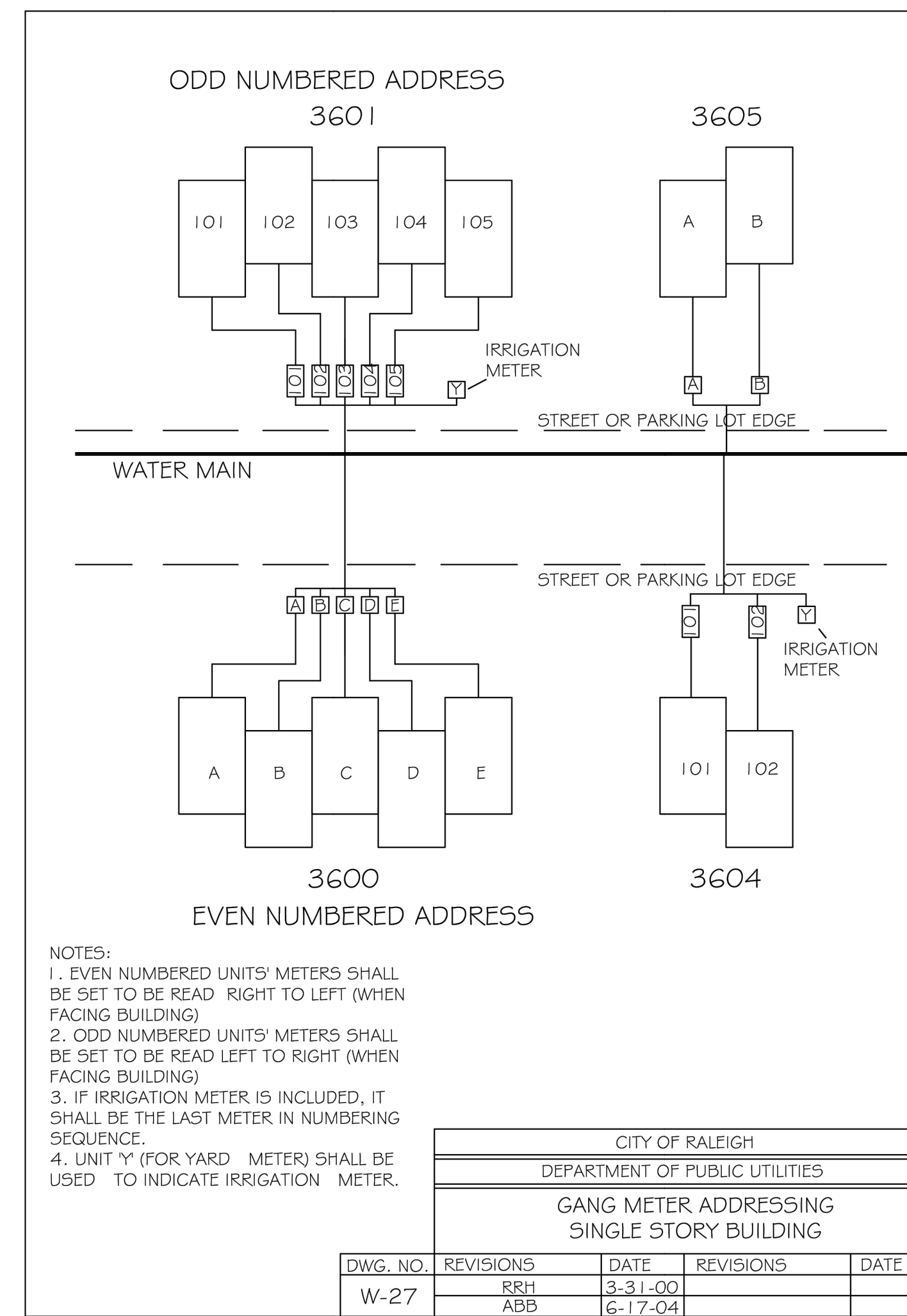
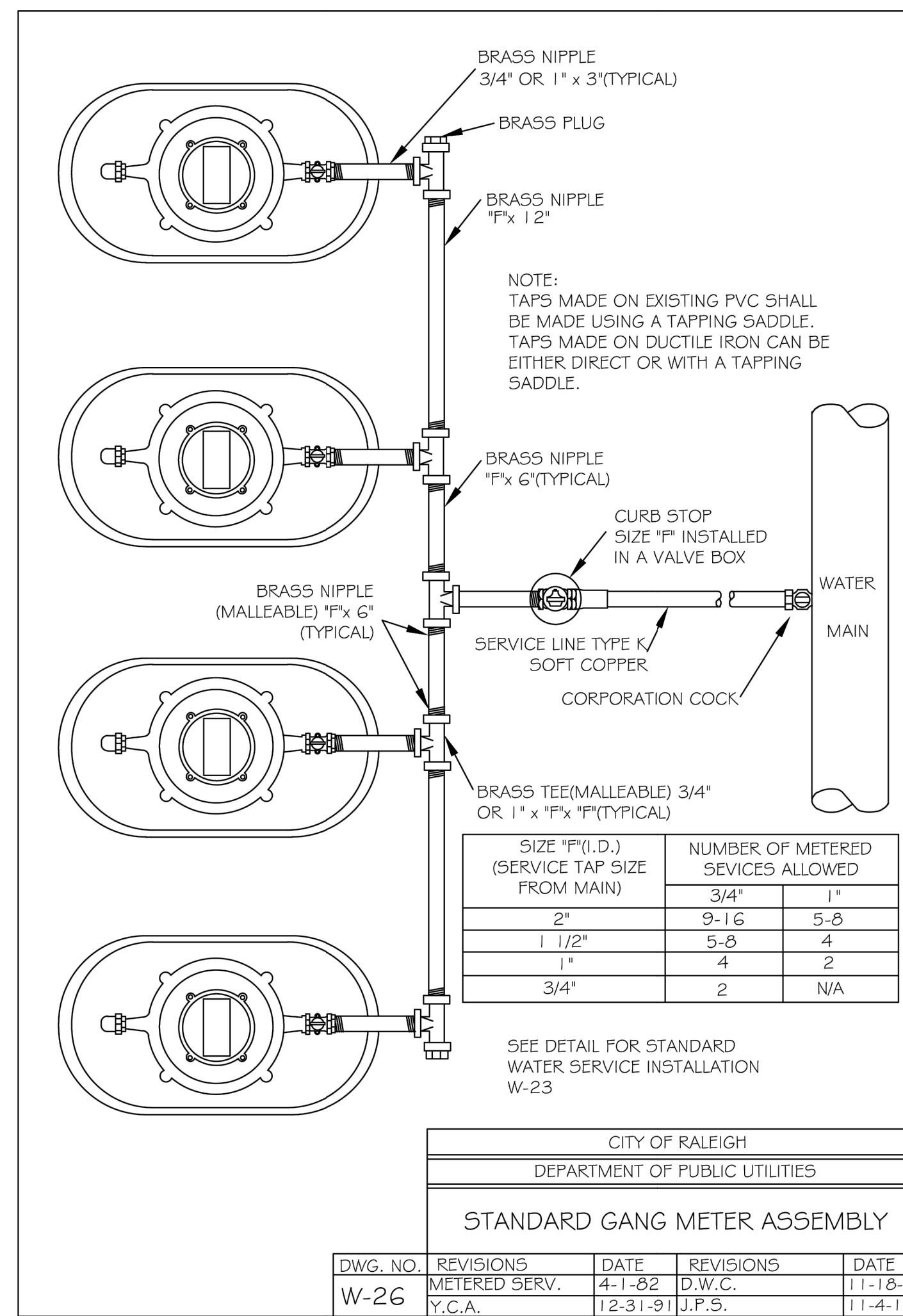
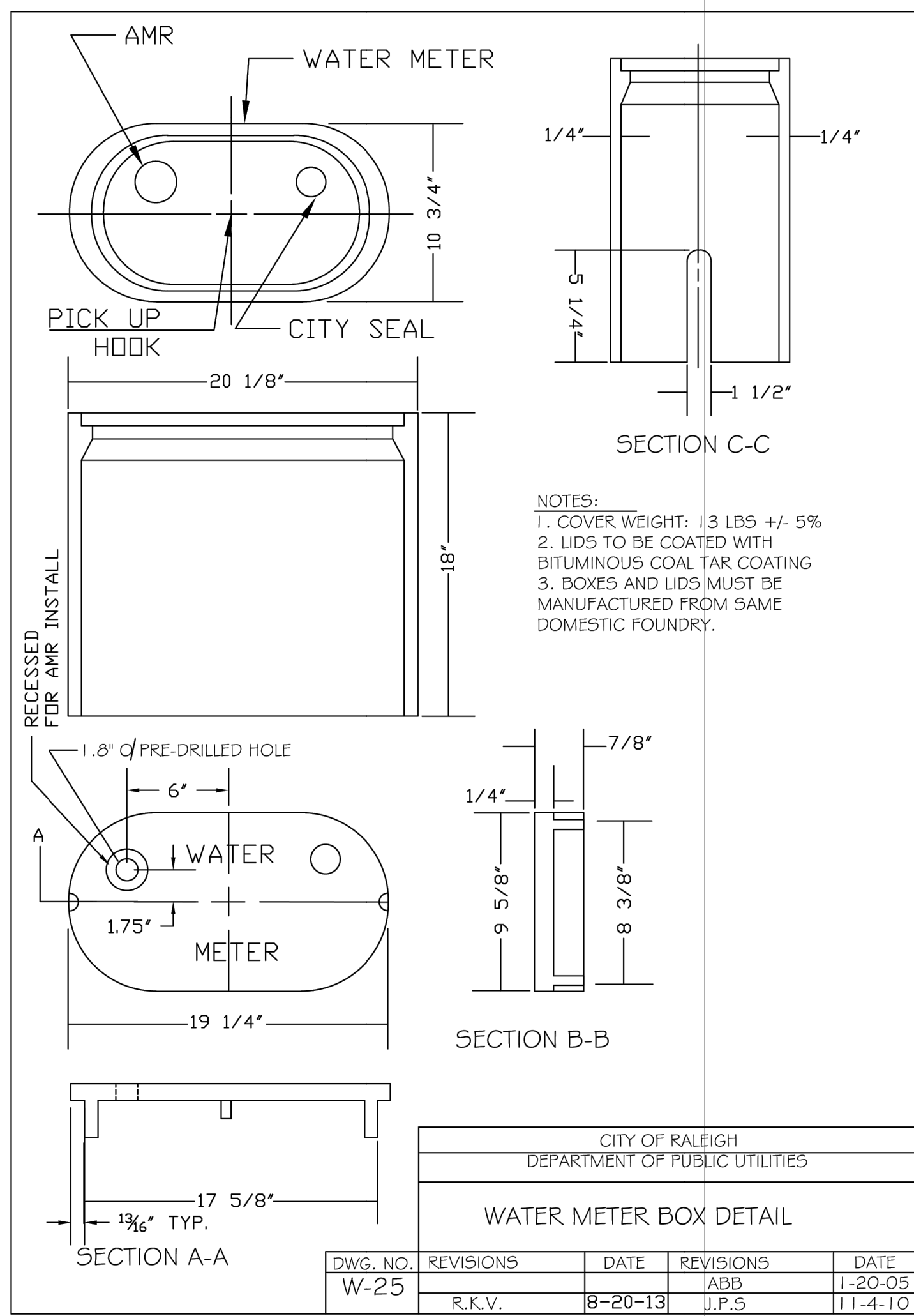
REVISIONS: New Submittal - ASR City comments 06/30/2022

ENGINEERED BY: [Signature]

PREPARED BY: [Signature]

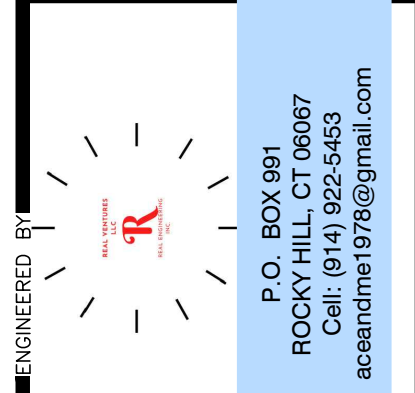
PROJECT LEGAL: [Signature]

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REVISIONS
New Submittal - ASR City comments 06/30/2022

APPROVALS
DESIGNED: HDB/AC
DRAWN: HDB
CHECKED: AC
DATE: _____
SCALE: _____



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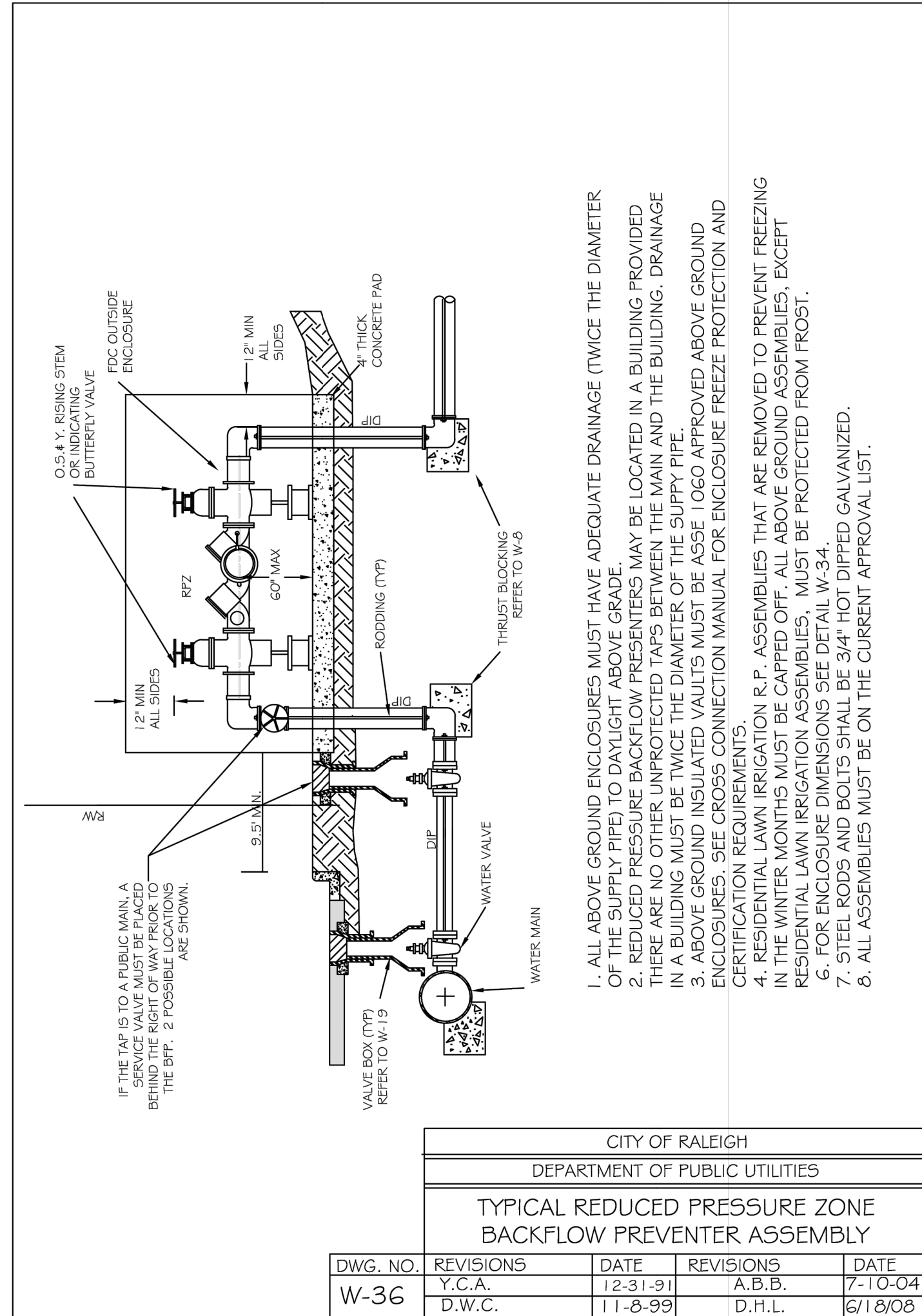
PREPARED BY
ST-ARM Consulting, Inc.
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

PROJECT LEGAL LOCATION
3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

SHEET TITLE
WATER DETAILS 2

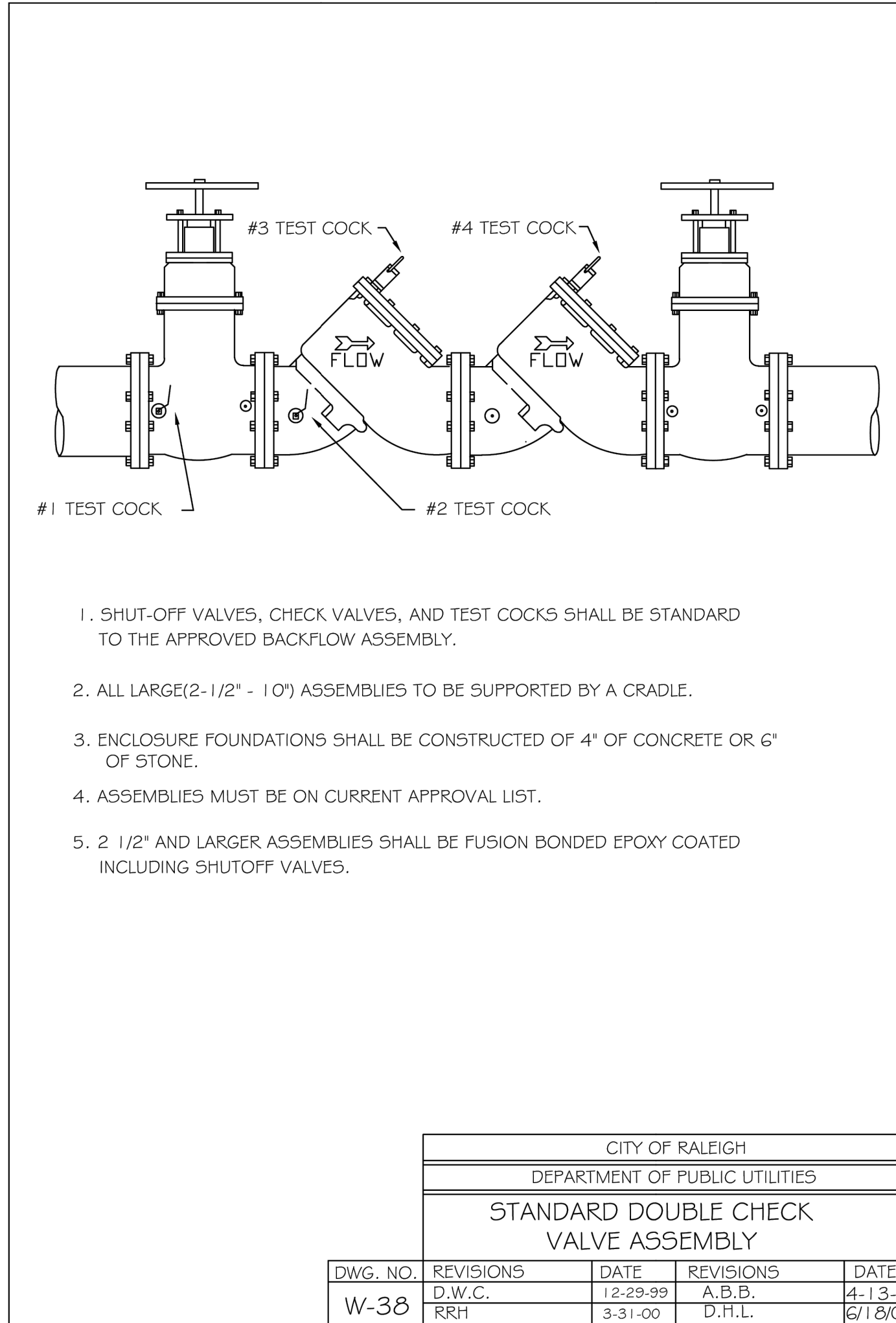
SHEET NO.
C6.10

PROJECT NO.
2023121402



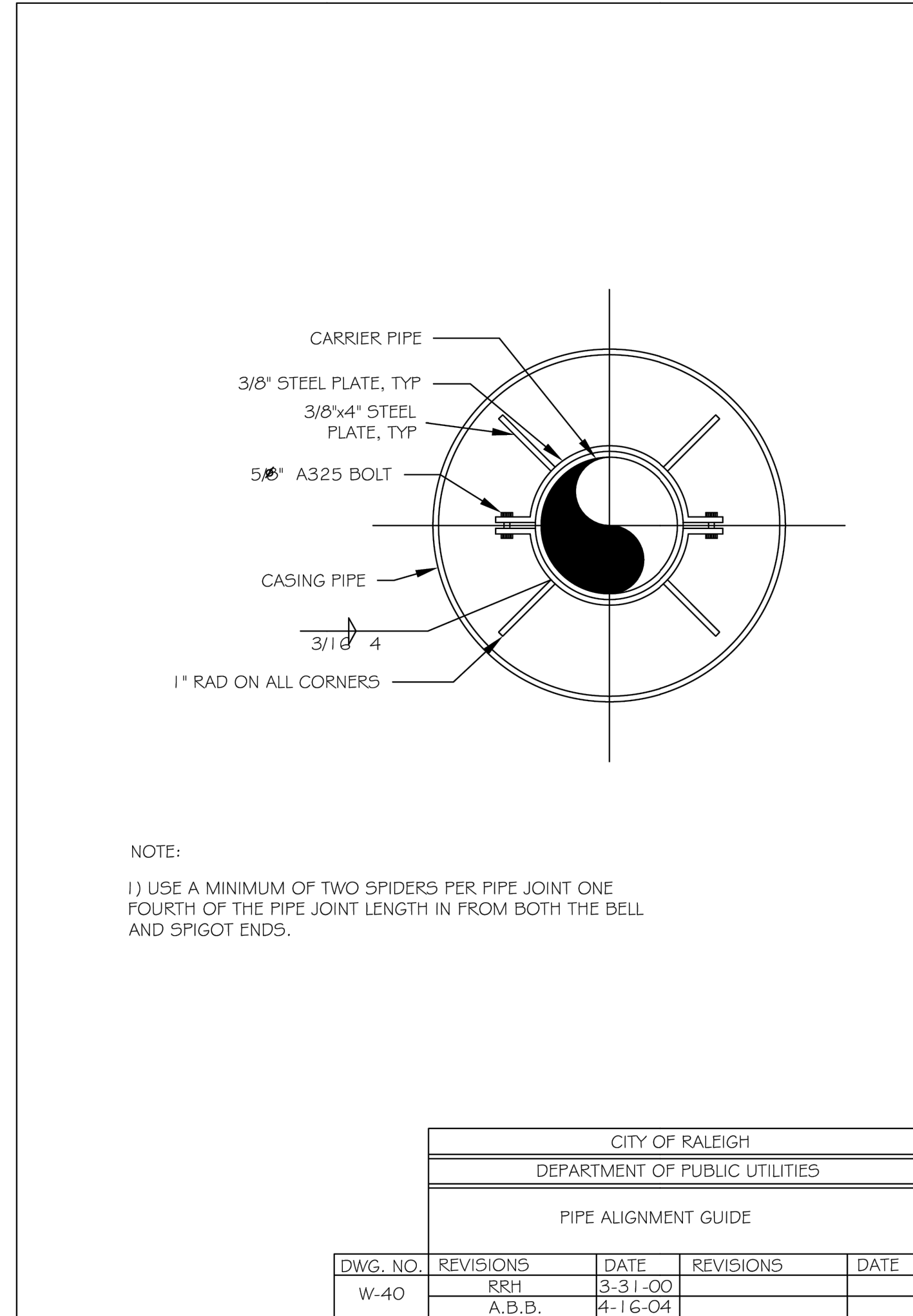
1. ALL ABOVE GROUND ENCLOSURES MUST HAVE ADEQUATE DRAINAGE (TWICE THE DIAMETER OF THE MAIN) TO PREVENT FLOODING.
2. REDUCED PRESSURE BACKFLOW PREVENTERS MAY BE LOCATED IN A BUILDING PROVIDED THERE ARE NO OTHER UNPROTECTED TAPS BETWEEN THE MAIN AND THE BUILDING. DRAINAGE IN A BUILDING MUST BE TWICE THE DIAMETER OF THE SUPPLY PIPE.
3. ABOVE GROUND INSULATED VAULTS MUST BE ASSE 1 060 APPROVED ABOVE GROUND ENCLOSURES. SEE CROSS CONNECTION MANUAL FOR ENCLOSURE FREEZE PROTECTION AND CERTIFICATION REQUIREMENTS.
4. RESIDENTIAL LAWN IRRIGATION R.P. ASSEMBLIES THAT ARE REMOVED TO PREVENT FREEZING IN THE WINTER MONTHS MUST BE CAPTED OFF, ALL ABOVE GROUND ASSEMBLIES, EXCEPT REDUCED PRESSURE BACKFLOW PREVENTERS, MUST BE PROTECTED FROM FROST.
5. FOR ENCLOSURE DIMENSIONS SEE DETAIL W-34.
6. STEEL RODS AND BOLTS SHALL BE 3/4\"/>

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TYPICAL REDUCED PRESSURE ZONE BACKFLOW PREVENTER ASSEMBLY				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-36	Y.C.A.	12-31-91	A.B.B.	1-10-04
	D.W.C.	11-8-99	D.H.L.	6/18/08



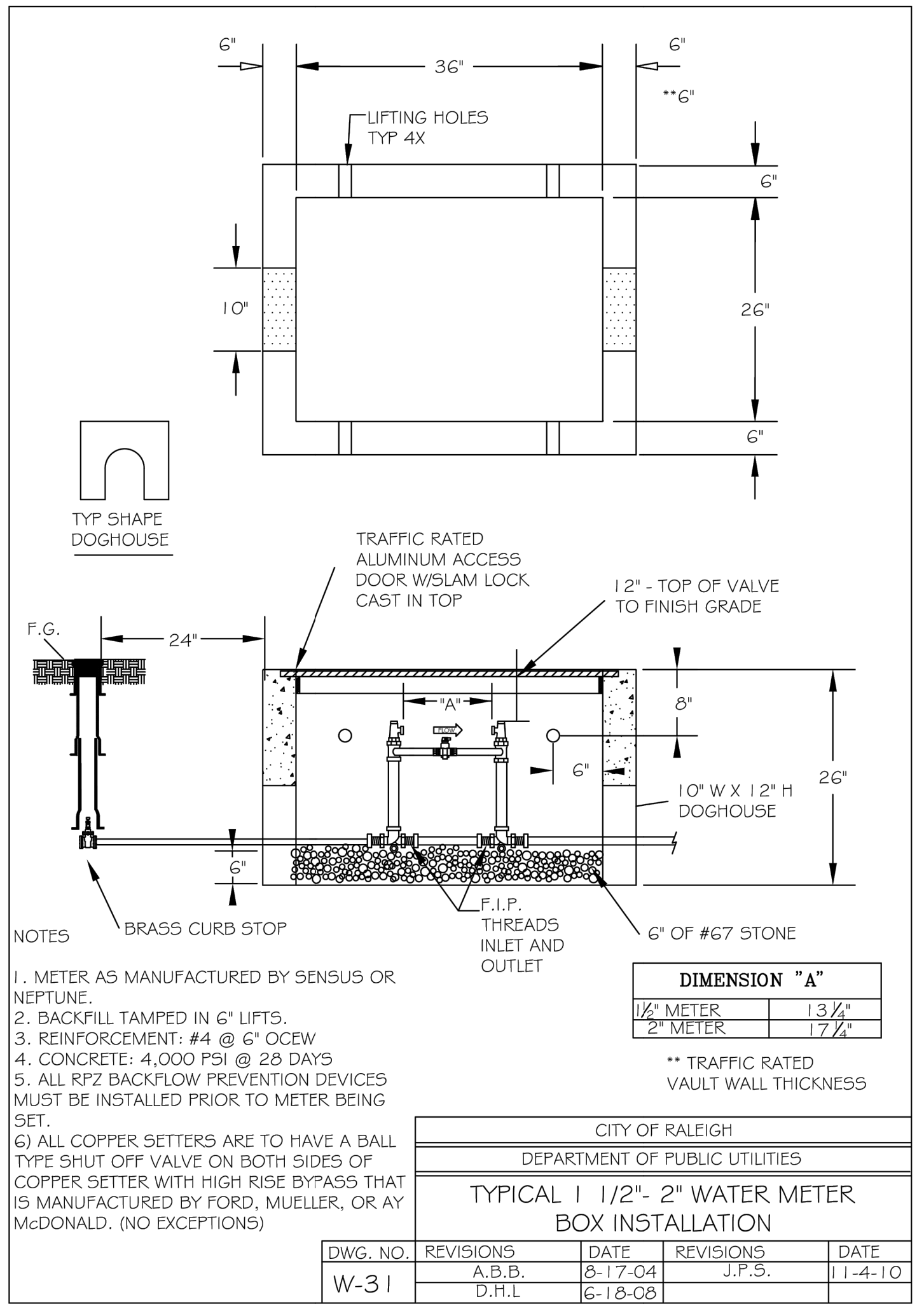
1. SHUT-OFF VALVES, CHECK VALVES, AND TEST COCKS SHALL BE STANDARD TO THE APPROVED BACKFLOW ASSEMBLY.
2. ALL LARGE(2-1/2\"/>

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD DOUBLE CHECK VALVE ASSEMBLY				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-38	D.W.C.	12-29-99	A.B.B.	4-13-04
	RRH	3-31-00	D.H.L.	6/18/08



NOTE:
1) USE A MINIMUM OF TWO SPIDERS PER PIPE JOINT ONE FOURTH OF THE PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT ENDS.

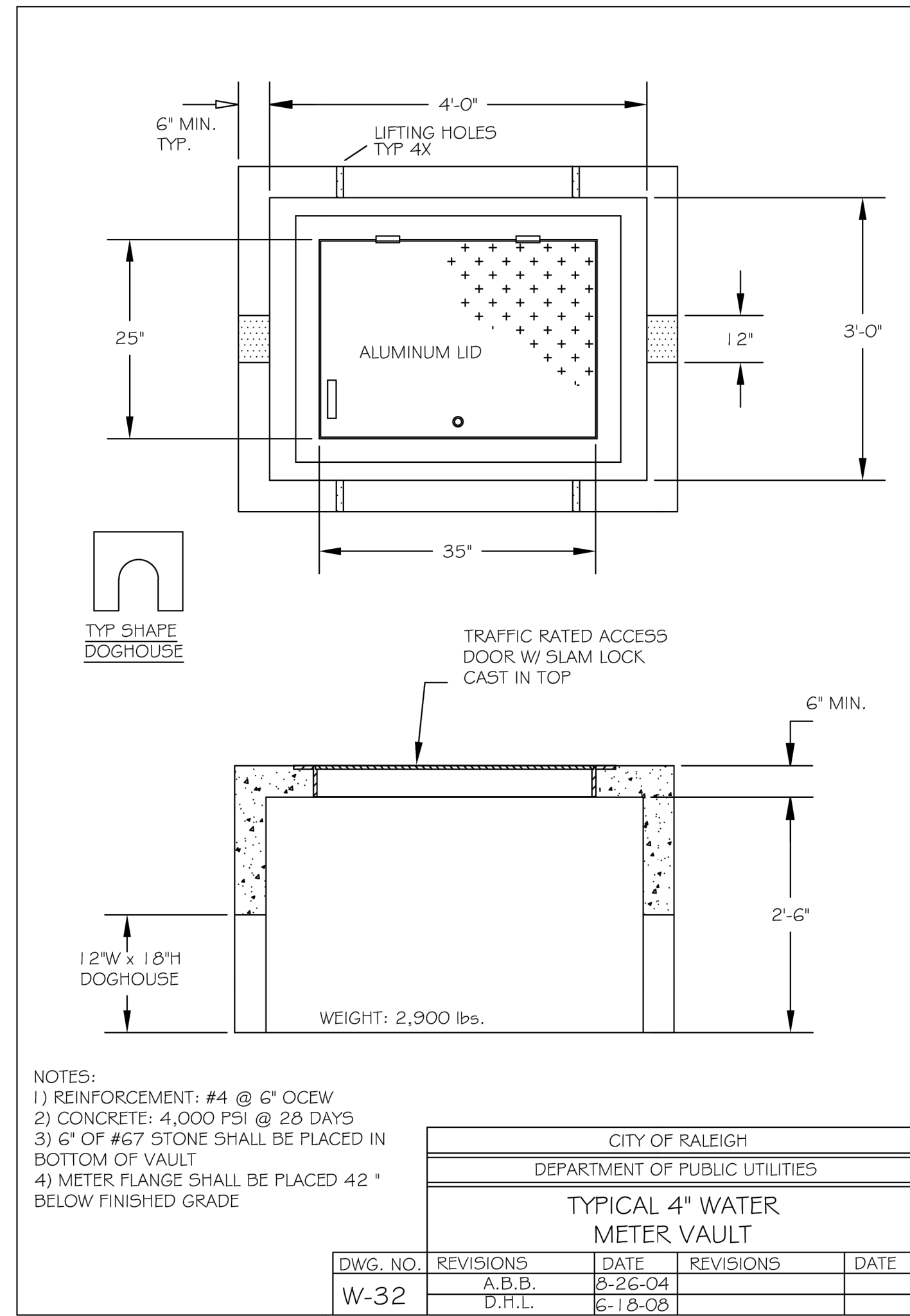
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
PIPE ALIGNMENT GUIDE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-40	RRH	3-31-00		
	A.B.B.	4-16-04		



- NOTES:
1. METER AS MANUFACTURED BY SENSUS OR NEPTUNE.
 2. BACKFILL TAMPED IN 6\"/>

DIMENSION "A"	
1 1/2\"/>	

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TYPICAL 1 1/2\"/>				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-31	A.B.B.	8-17-04	J.P.S.	11-4-10
	D.H.L.	6-18-08		

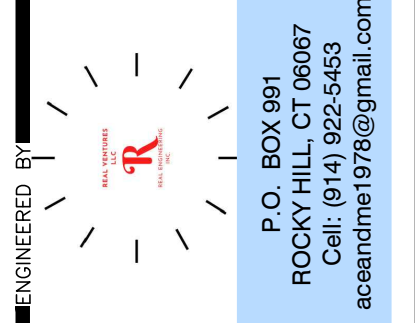


- NOTES:
- 1) REINFORCEMENT: #4 @ 6\"/>

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TYPICAL 4\"/>				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-32	A.B.B.	8-26-04		
	D.H.L.	6-18-08		

REVISIONS
New Submittal - ASR City comments 06/30/2022

APPROVALS	HDB/AC	HDB	AC	SCALE
DESIGNED				
DRAWN				
CHECKED				
DATE				



ENGINEERED BY
STARM
Stray ARM Consulting
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Civil Design & Drafting
Denton, TX 76210
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hboutwell@st-arm.com

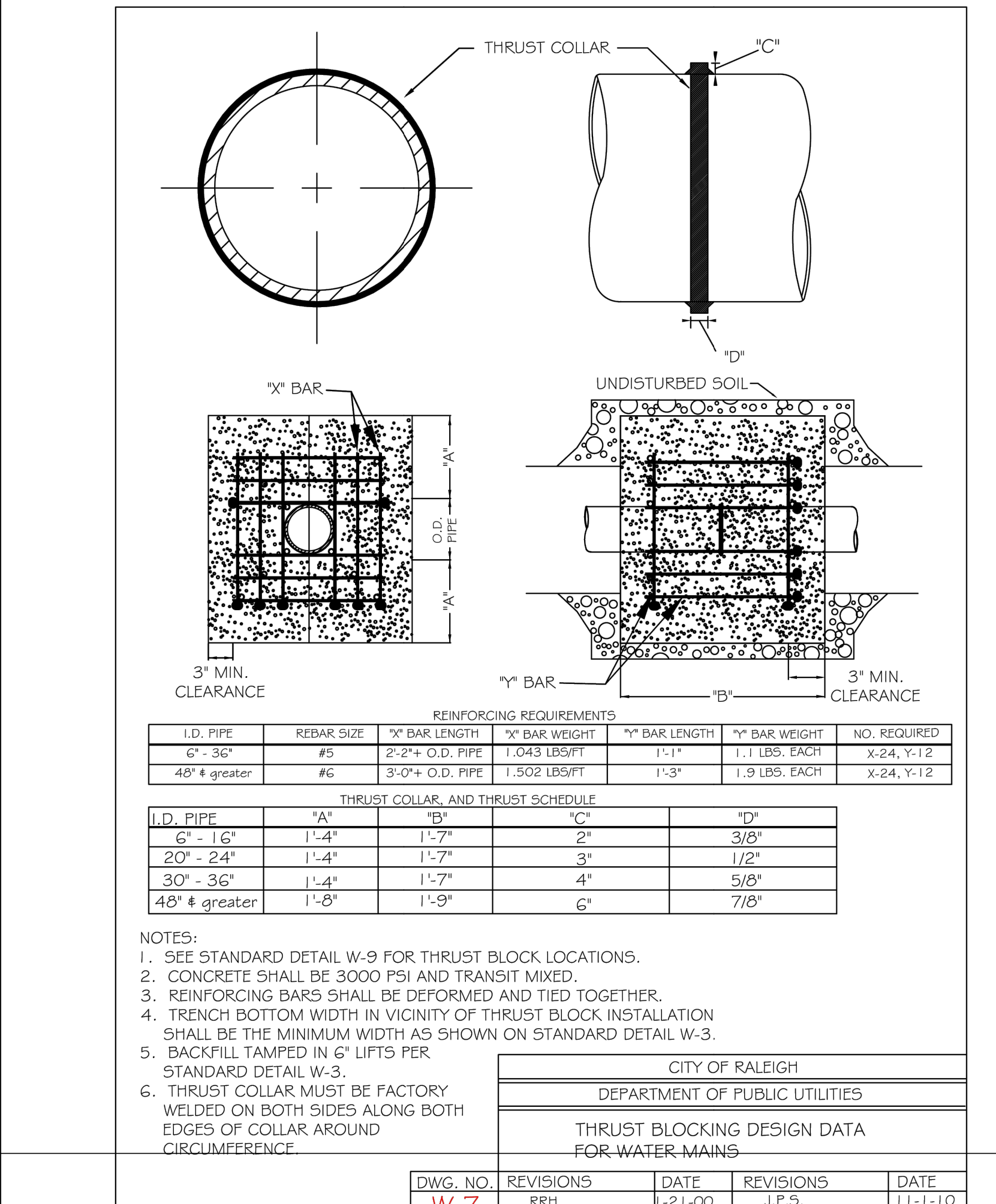
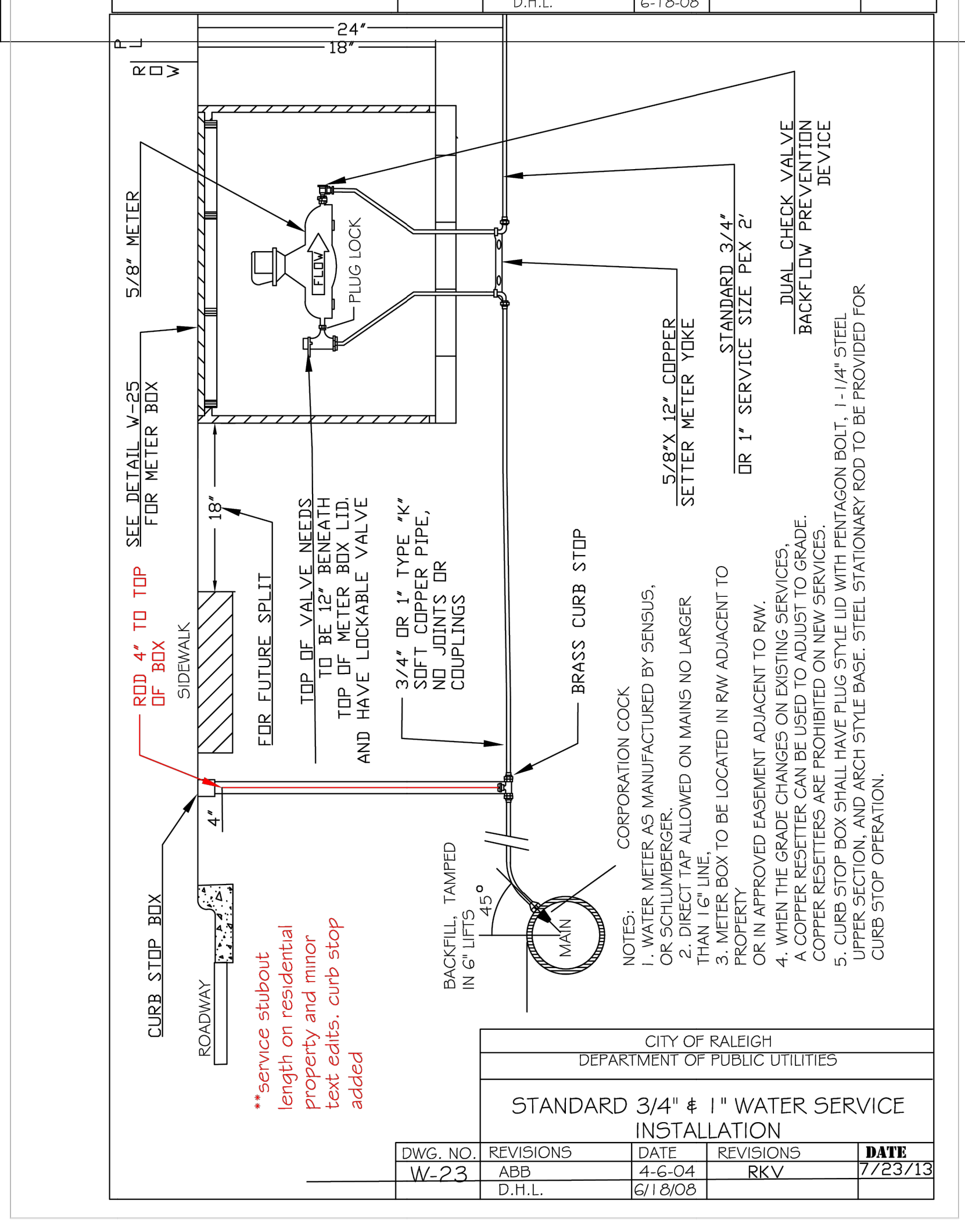
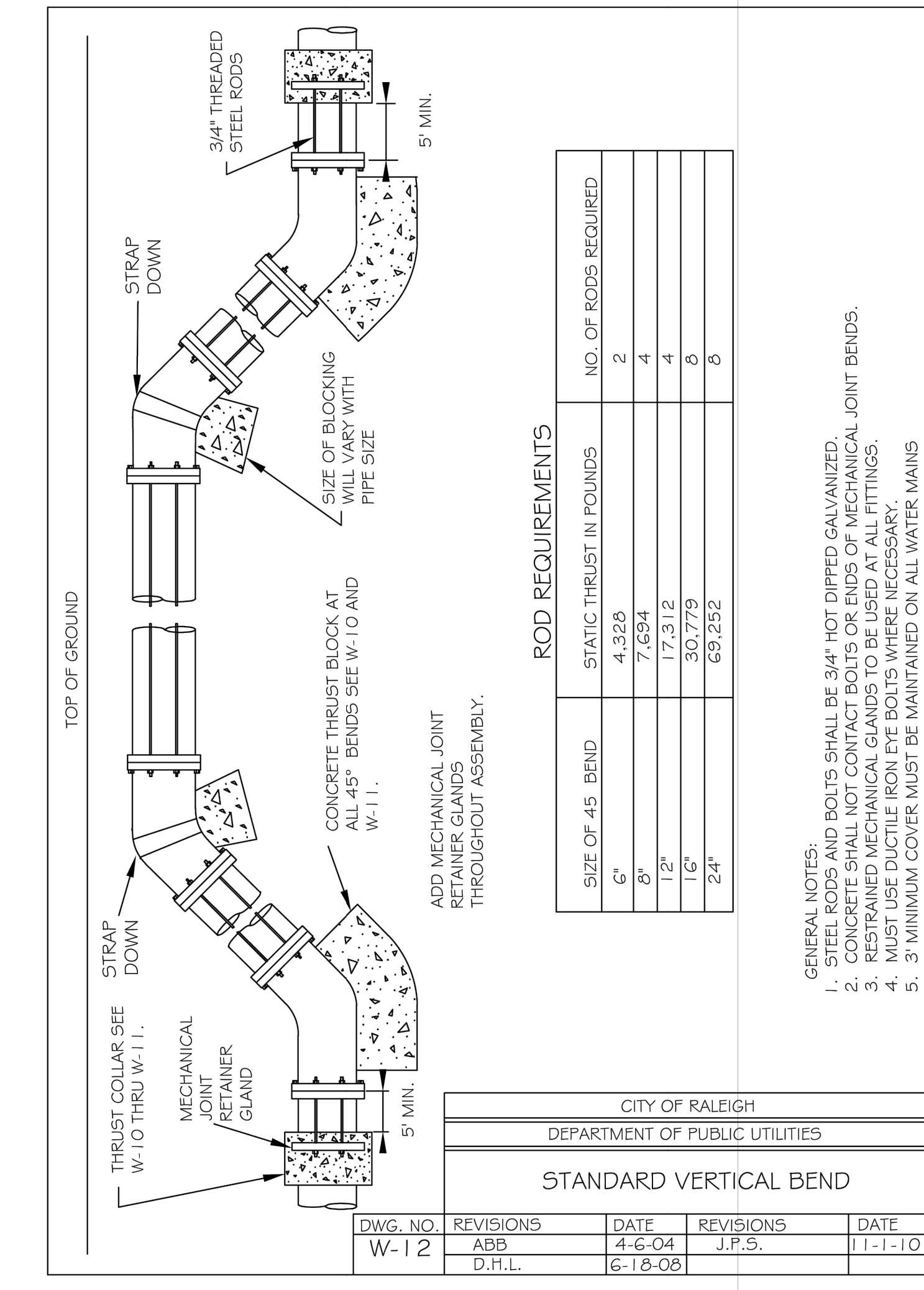
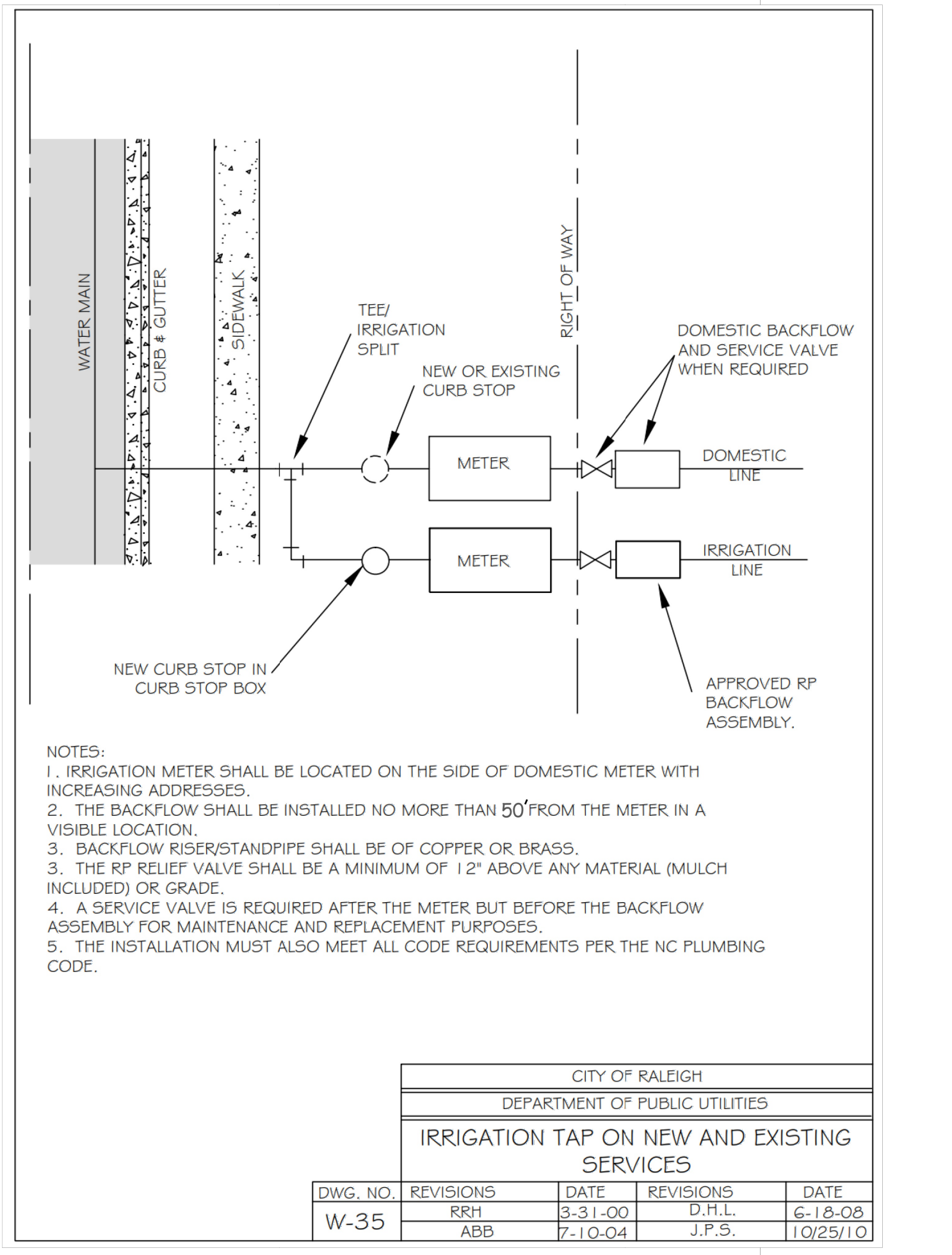
PROJECT LEGAL
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

PROJECT LOCATION
3601 Page Road
Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

SHEET TITLE
WATER DETAILS 3

SHEET NO.
C6.11

PROJECT NO.
2023121402



APPROVALS:
DESIGNED: HDB/AC
DRAWN: HDB
CHECKED: AC
DATE: _____
SCALE: _____

REVISIONS:
New Submittal - ASF City comments 06/30/2022

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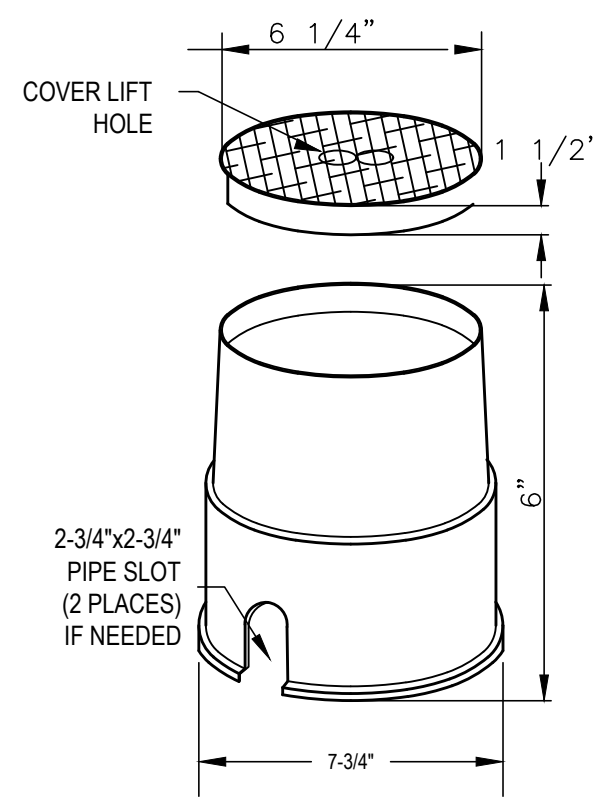
PROJECT LOCATION
3601 Page Road
Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

PROJECT LEGAL
2.16 AC
DB 5766, PG 984
PIN: 0758.03-32-9153
Triangle Township
Durham County, NC

SHEET TITLE
WATER DETAILS 4

SHEET NO.
C6.12

PROJECT NO.
2023121402



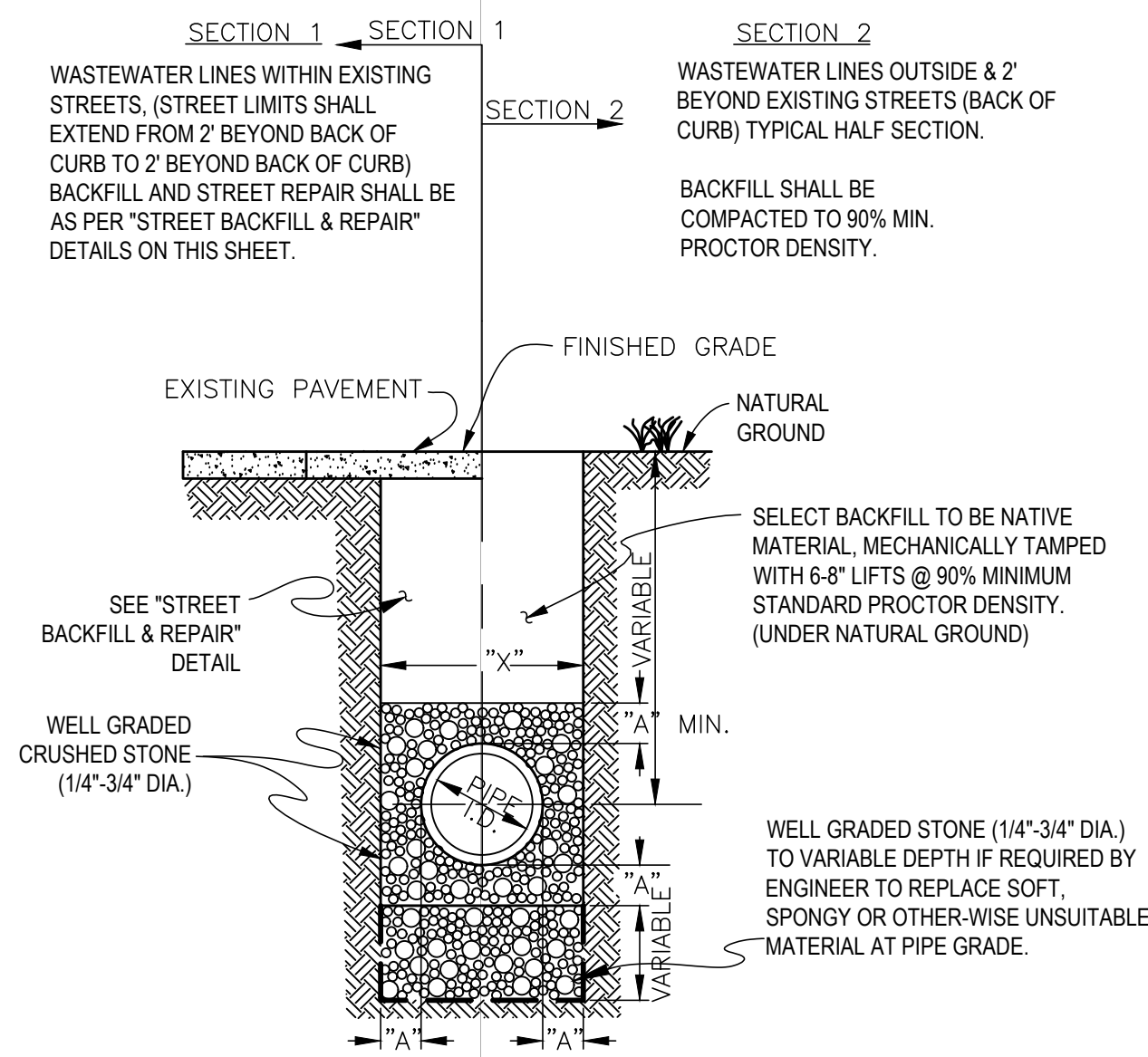
- SPECIFICATIONS:**
1. SNAP IN GREEN LID
 2. LOWER BODY BLACK ONLY
 3. CAN BE NESTED, IS EXTENDABLE TO ANY DEPTH BY USE OF 8" PVC PIPE FOR EXTENSION.
 4. DALLAS SPECIALTY DS-108 OR EQUAL.

NOTE: FOR SERVICE CLEAN-OUT USE BASS & HAYS 404C (LATERAL CLEAN-OUT W/GASKET AND TWO BOLTS) OR APPROVED EQUAL.

POLYPROPYLENE CLEAN-OUT BOOT

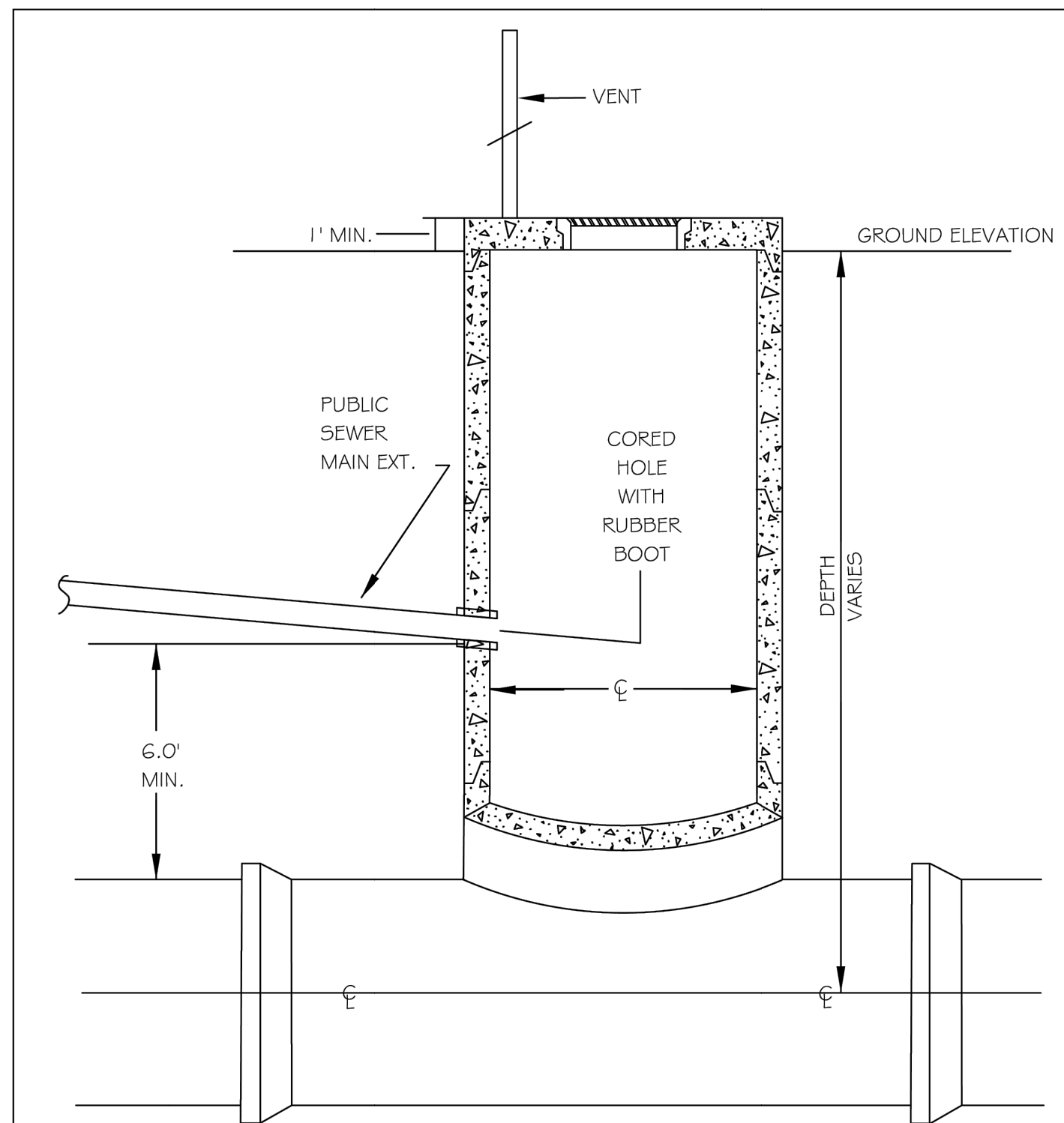
N.T.S.

(TO BE USED UNDER UNPAVED SURFACES ONLY)



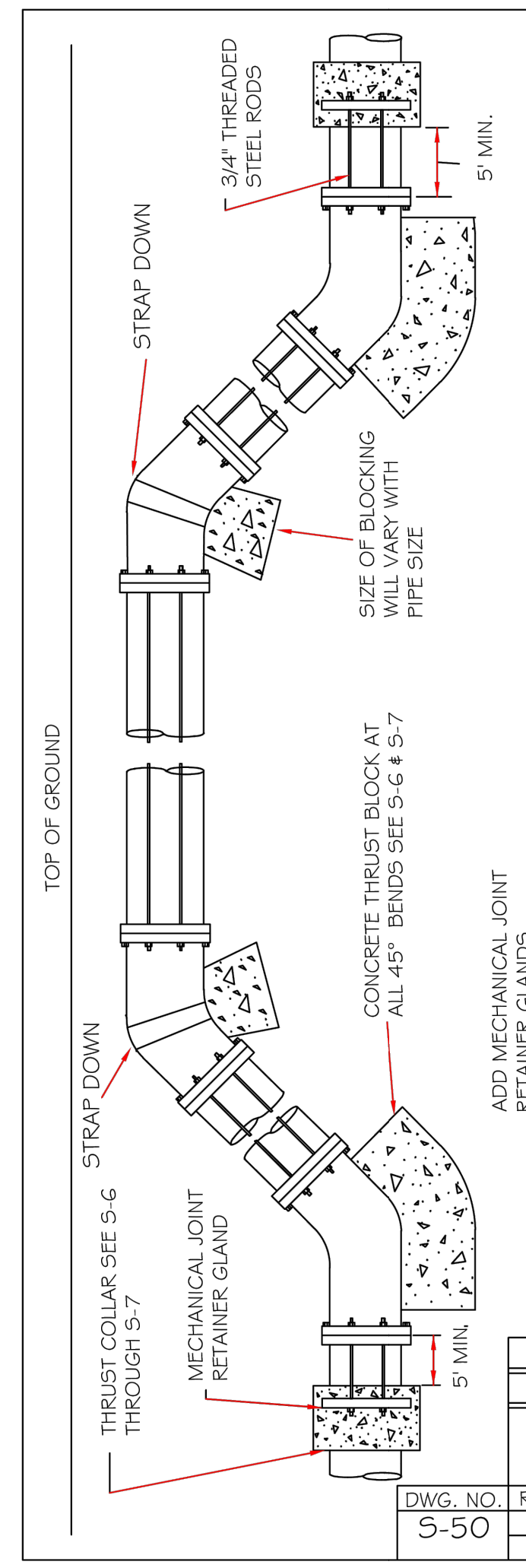
WASTEWATER PIPE EMBEDMENT DETAIL

N.T.S.



1. HOLE SHALL BE CORED IN RISER SECTION FOR PUBLIC SERVICE MAIN EXTENSION.
2. RUBBER BOOT SHALL BE UTILIZED ON ALL CORES
3. CORES SHALL BE IN CENTER OF RISER SECTION
4. CONNECTION TO THE MANHOLE MUST BE MADE BY CONTRACTOR APPROVED BY CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT

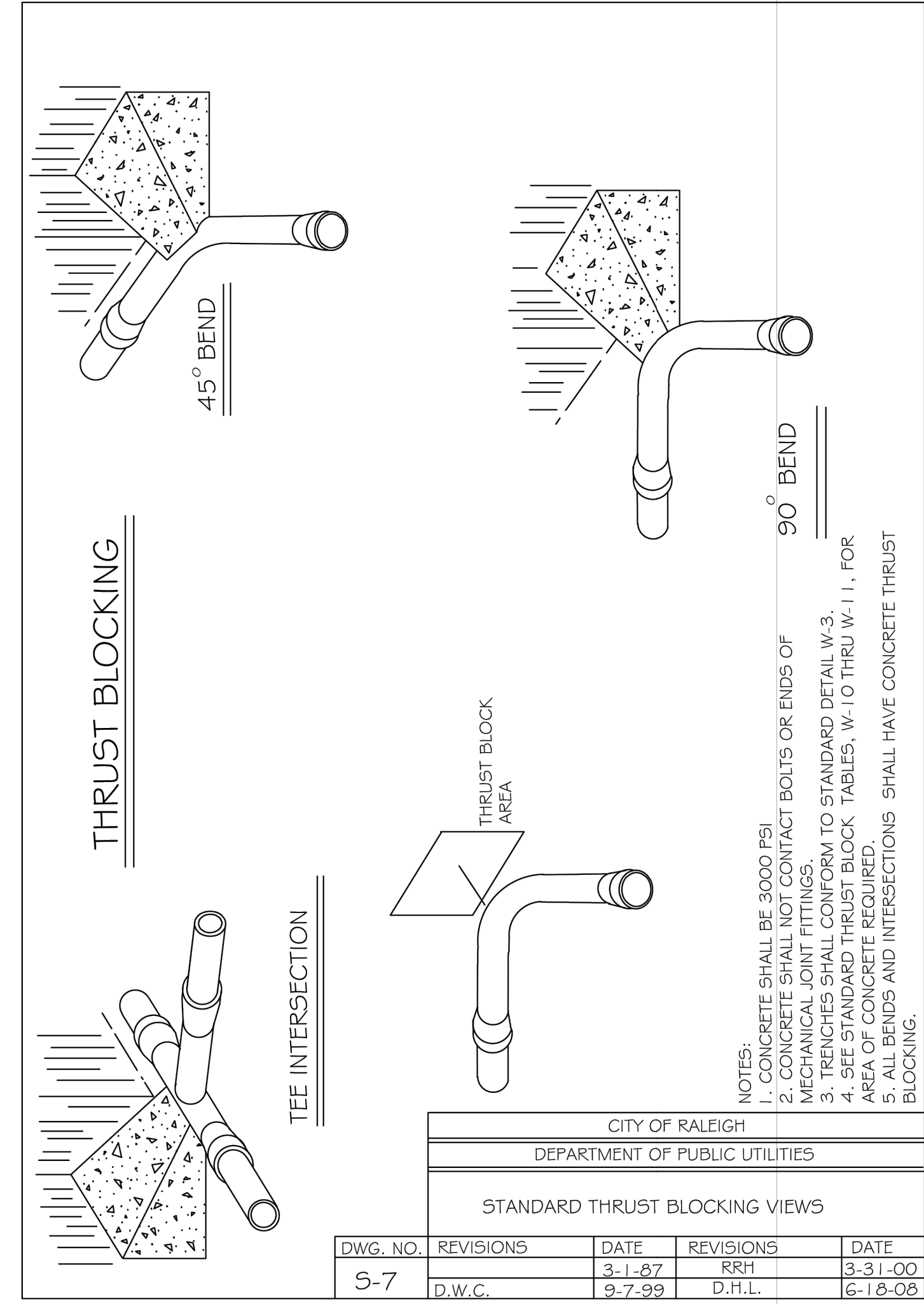
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
MAIN EXTENSION TO TIE INTO TEE MANHOLE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-33	D.W.C.	6-99	ABB	2-14-05
	RRH	3-30-00	D.H.L.	6-18-08



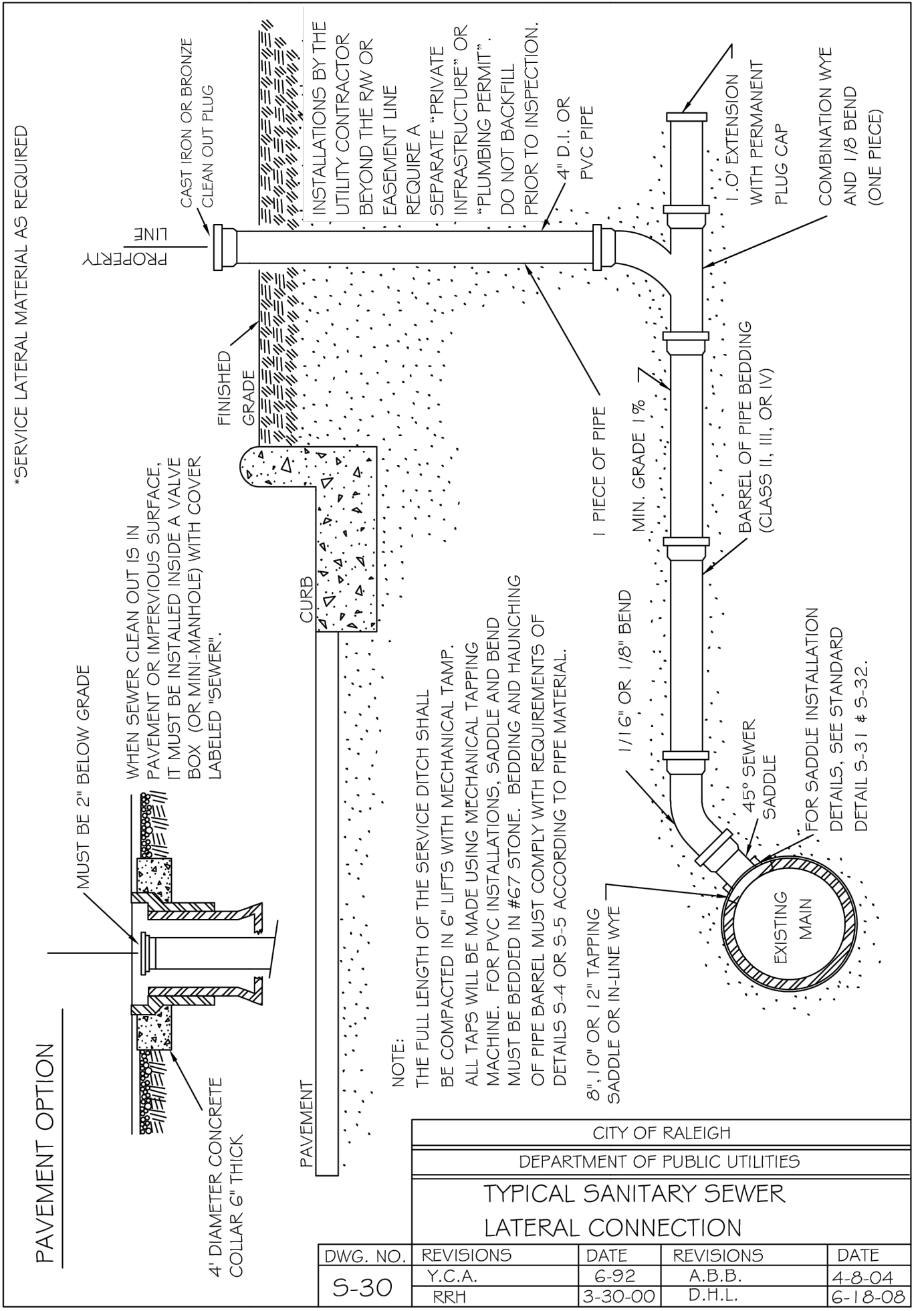
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD VERTICAL BEND				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-50	ABB	4-6-04	J.P.S.	10-19-10
	D.H.L.	6-18-08		

ROD REQUIREMENTS		
SIZE OF 45° BEND	STAT THRU IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	2
8"	7,594	4
12"	17,912	4
16"	30,779	8
24"	69,252	8

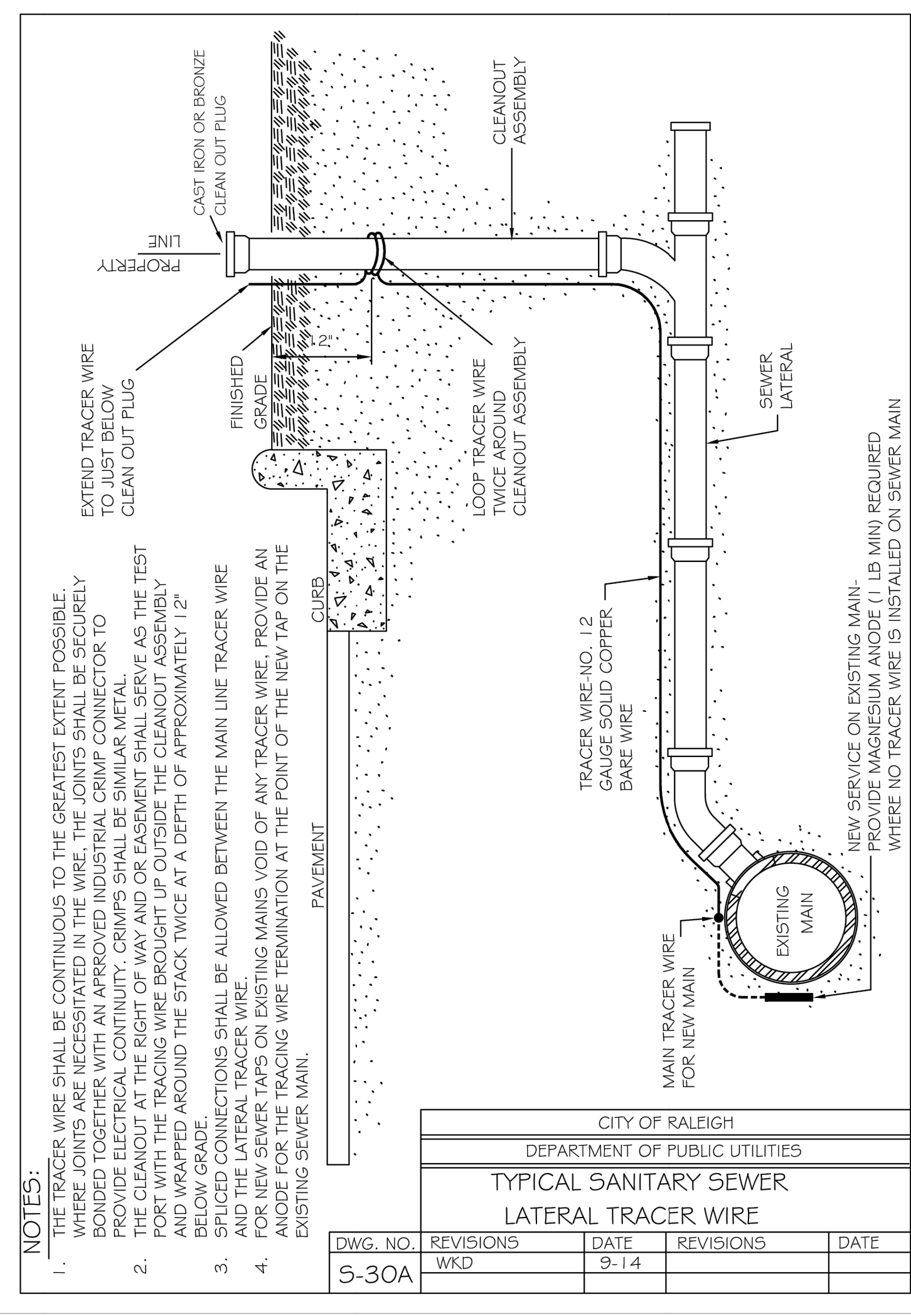
- GENERAL NOTES:**
1. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
 2. CONCRETE THRUST BLOCKS SHALL BE 5' MIN. LONG AND 2' MIN. HIGH.
 3. RESTRAINED MECHANICAL JOINTS TO BE USED ON ALL FITTINGS.
 4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.
 5. ALL PIPING IN VERTICAL BENDS MUST BE DUCTILE IRON.
 6. PIPE SHALL BE DUCTILE IRON A MINIMUM OF ONE JOINT IN EACH DIRECTION.
 7. 3" MINIMUM COVER MUST BE MAINTAINED ON ALL FORCE MAINS



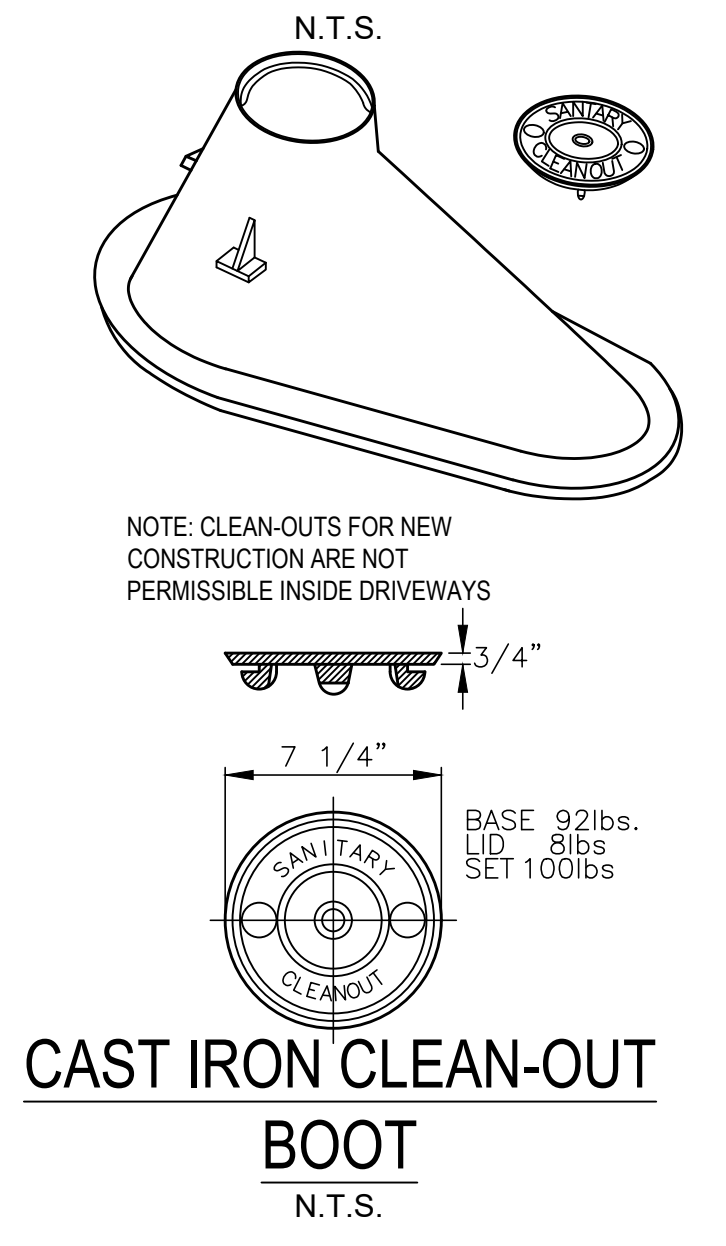
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD THRUST BLOCKING VIEWS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-7	D.W.C.	3-1-87	RRH	3-31-00
		9-7-99	D.H.L.	6-18-08



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TYPICAL SANITARY SEWER LATERAL CONNECTION				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-30	Y.C.A.	6-92	A.B.B.	4-6-04
	RRH	3-30-00	D.H.L.	6-18-08



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TYPICAL SANITARY SEWER LATERAL TRACER WIRE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-30A	W.K.D.	9-14		



CAST IRON CLEAN-OUT BOOT
N.T.S.

NOTE: CLEAN-OUTS FOR NEW CONSTRUCTION ARE NOT PERMISSIBLE INSIDE DRIVEWAYS

REVISIONS
New Submittal - ASR City comments 06/30/2022

DESIGNED	HDB/AC
DRAWN	HDB
CHECKED	AC
DATE	
SCALE	

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD VERTICAL BEND				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-50	ABB	4-6-04	J.P.S.	10-19-10
	D.H.L.	6-18-08		

ENGINEERED BY
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PROJECT LOCATION
3601 Page Road
3601 Page Road Morrisville, NC 27560
City of Raleigh Case # ASR-0015-2022

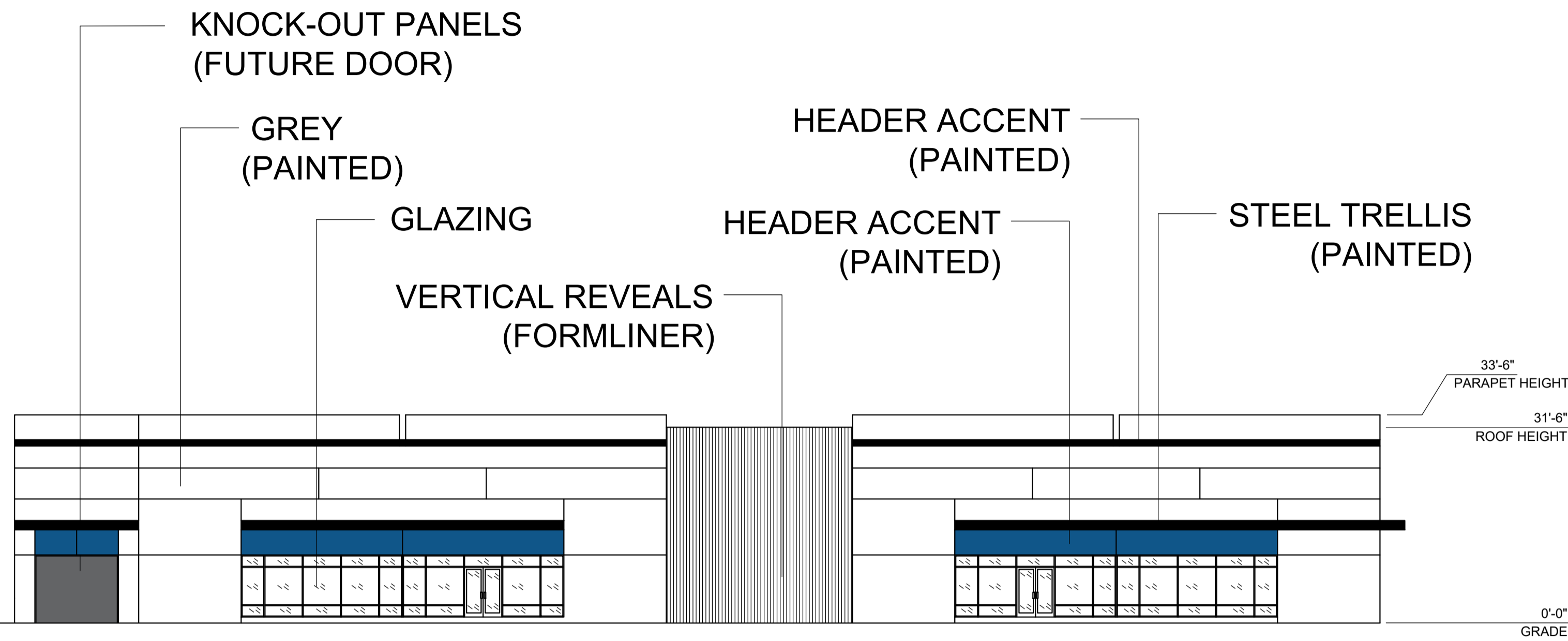
PROJECT LEGAL
2.16 AC
DB 5766, PG 984
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Triangle Township
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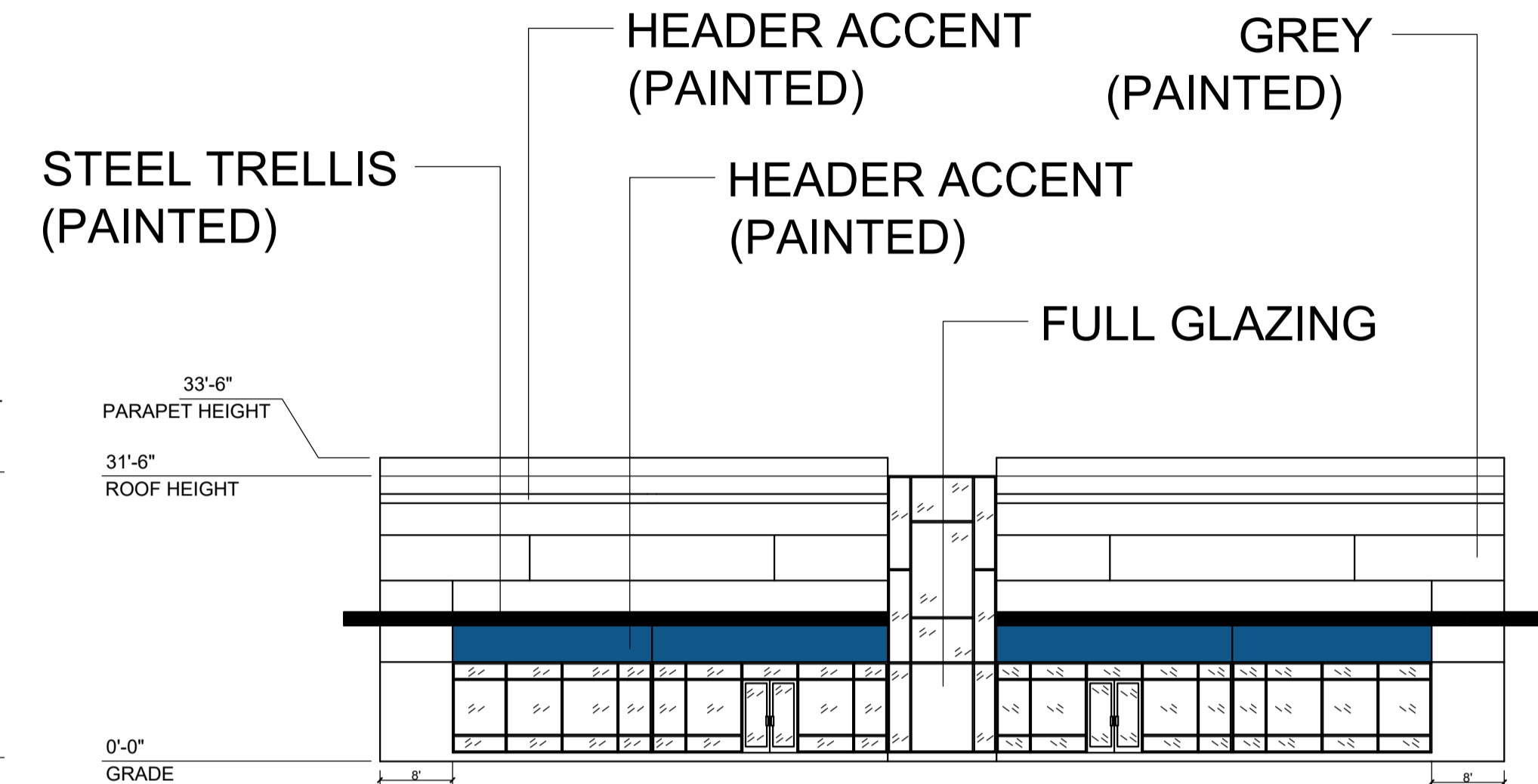
SHEET TITLE
SEWER DETAILS

SHEET NO.
C6.13

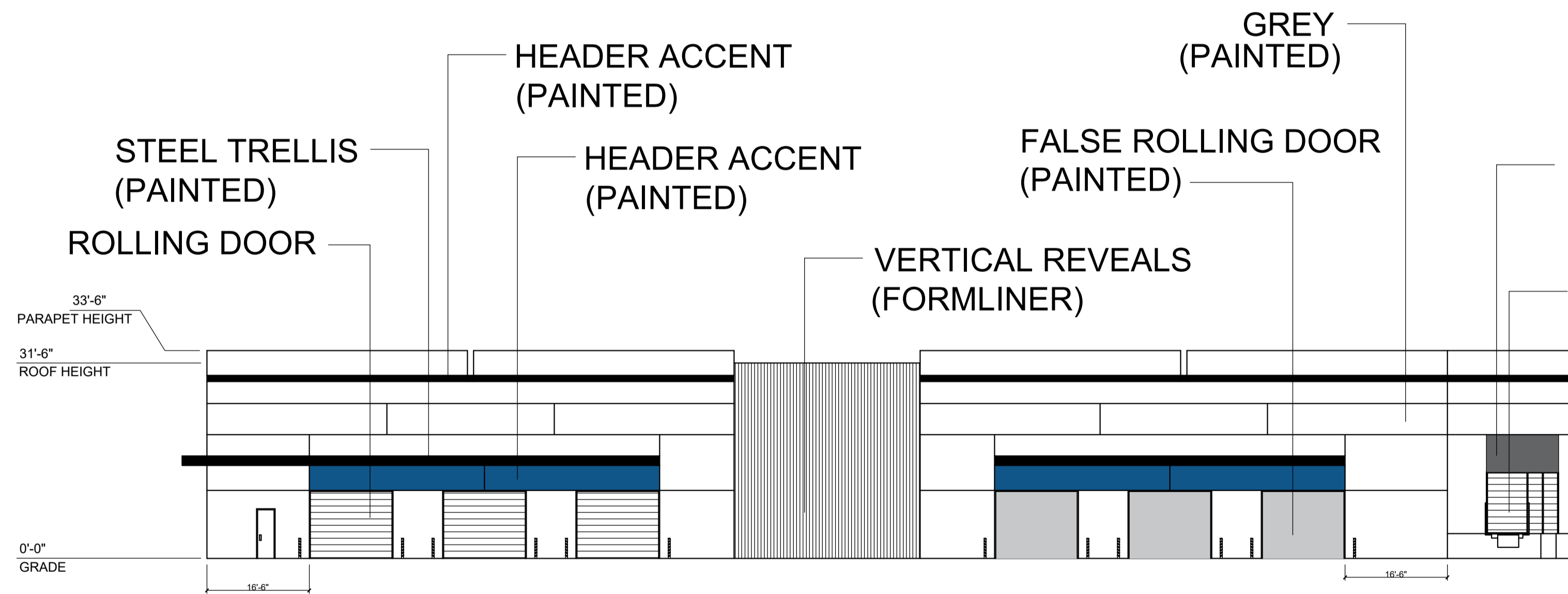
OR 37
PROJECT NO.
2023121402



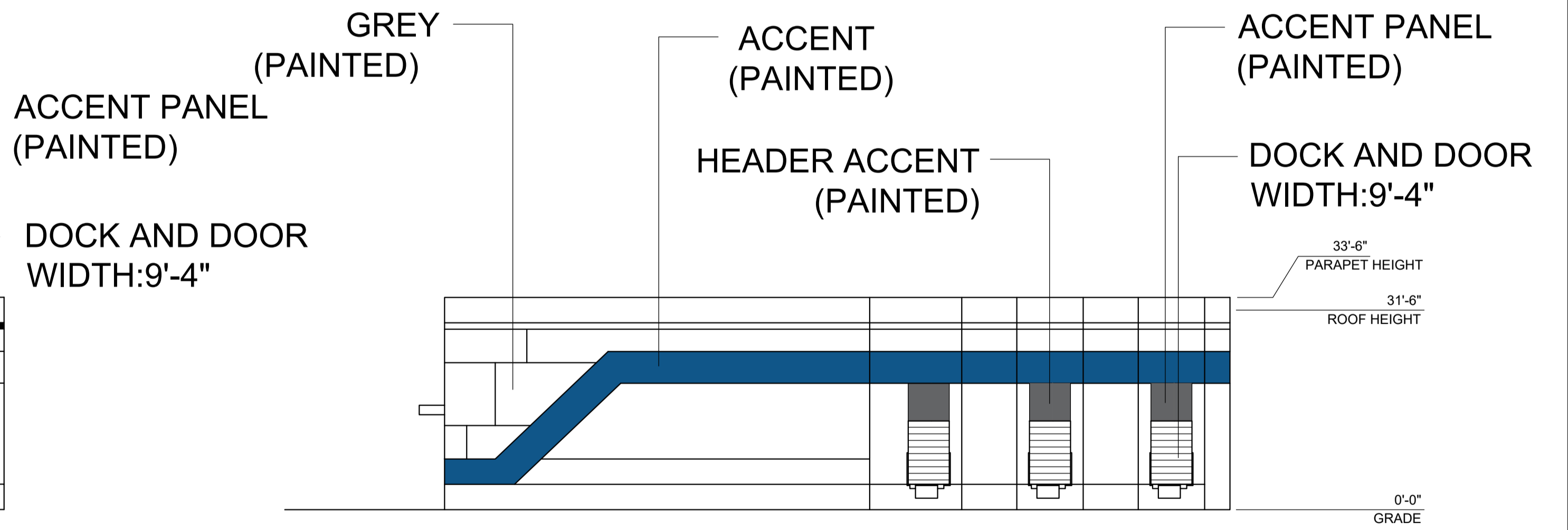
NORTH ELEVATION VIEW



FRONT ELEVATION VIEW



RIGHT ELEVATION VIEW



REAR ELEVATION VIEW