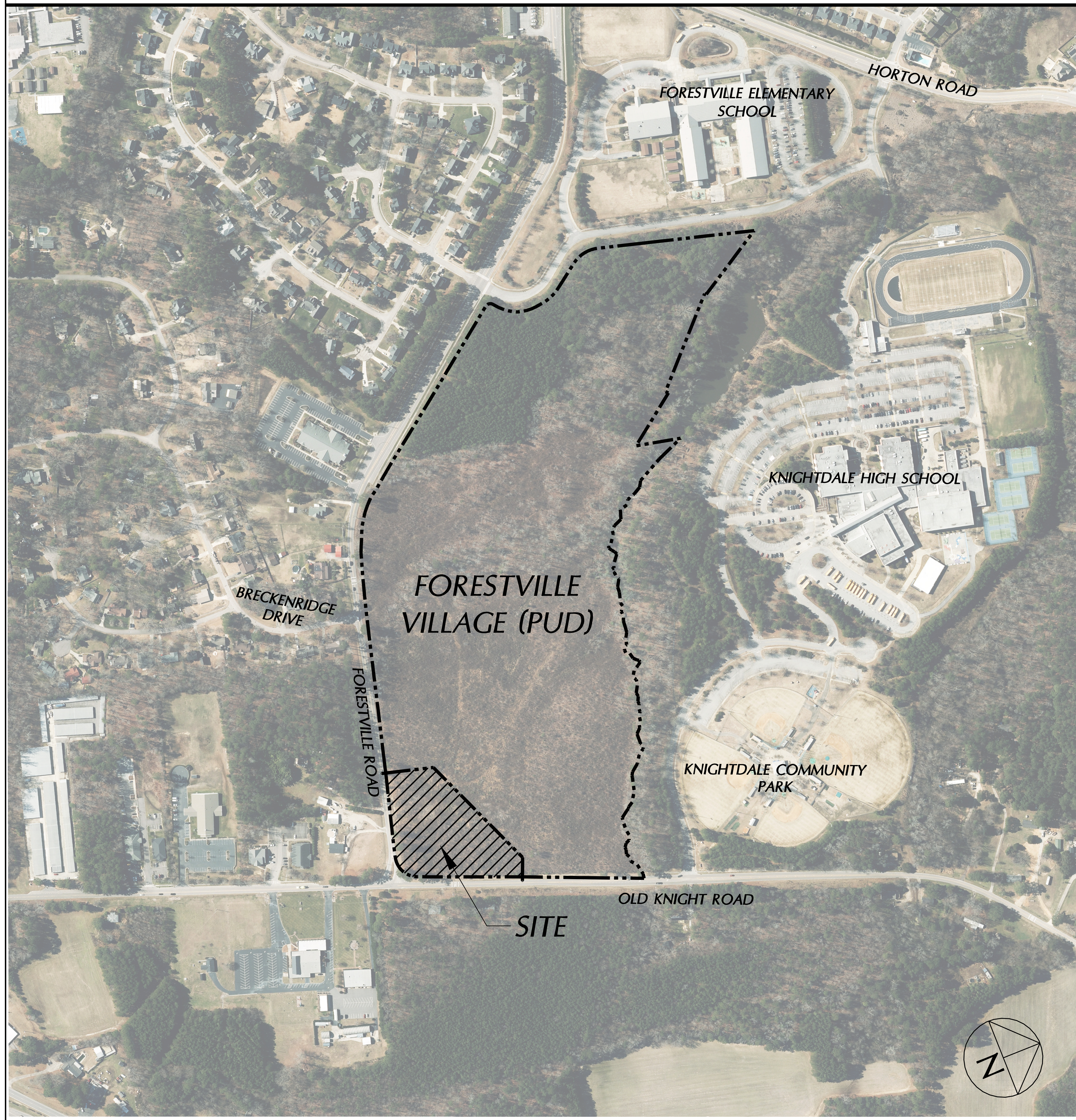
CONSTRUCTION DRAWING
KNIGHTDALE FIRE STATION #1
ZCP-10-22

7477 FORESTVILLE ROAD
KNIGHTDALE, NC

KNIGHTDALE
start something



VICINITY MAP (NTS)

SITE DATA

PROJECT:	KNIGHTDALE FIRE STATION #1
OWNER:	TOWN OF KNIGHTDALE 967 STEEPLE SQUARE CT KNIGHTDALE, NC 27545
OWNER CONTACT:	CHIEF LOREN CONE TOWN OF KNIGHTDALE 967 STEEPLE SQUARE CT KNIGHTDALE, NC 27545 PHONE: 919-217-2294 LOREN.CONE@KNIGHTDALENC.GOV
DESIGNER CONTACT:	CLH DESIGN, PA TROY OLSON, PLA 400 REGENCY FOREST DRIVE, STE 120 CARY, NC 27518 PHONE: 919-319-6716 FAX: 919-319-7516 TOLSON@CLHDESIGNPA.COM
PROJECT ADDRESS:	7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
PIN:	1754680519
PID:	0491286
REFERENCE:	DB 018857 PG 687
ZONING:	NMX PUD
PERMITTED USE:	PUBLIC SAFETY FACILITY
WATERSHED:	NEUSE RIVER
BUILDING SETBACKS:	FRONT = 10-FT SIDE YARD = 10-FT REAR YARD = 30-FT
TOTAL PARCEL AREA:	3.64 AC
EXISTING IMPERVIOUS:	0.00 AC (0.0%)
PROPOSED IMPERVIOUS:	1.23 AC (36.7%)

PARKING: REQUIRED
PROVIDED = (2 VISITOR + 1 ADA) + 26 STAFF = 29 TOTAL
BASED ON 13 EMPLOYEES PER SHIFT
26 SPACES ACCOMMODATE FULL SHIFT CHANGE
(2) BIKE PARKING REQUIRED AND PROVIDED

TREE COVER AREA
TOTAL SITE: 0.00 AC
REQUIRED 10%: 0.37 AC
SEE C601 FOR LOCATIONS OF TREES USED TO MEET

TRASH TO BE ROLL OUT CONTAINERS

NOTE: STORMWATER CONTROLS TO BE SERVED THROUGH FORESTVILLE VILLAGE PUD. SEE APPROVED TOWN OF KNIGHTDALE PROJECT NO. ZMA-8-20. EROSION CONTROLS REVIEWED AND APPROVED THROUGH NCDEQ.

INDEX OF DRAWINGS

PUBLIC IMPROVEMENT QUANTITY TABLE

PUBLIC WATER	0 LF
PUBLIC SEWER	0 LF
PUBLIC STREET – FULL	0 LF
PUBLIC STREET – PARTIAL	0 LF
PUBLIC SIDEWALK – FULL	0 LF
PUBLIC SIDEWALK – PARTIAL	0 LF
STREET SIGNS	0
WATER SERVICE STUBS	2
SEWER SERVICE STUBS	3

PROJECT TEAM

CIVIL ENGINEERING AND LANDSCAPE ARCHITECTURE
CLH DESIGN, PA
400 REGENCY FOREST DR., STE. 120
CARY, NC 27518

ARCHITECTURAL
DUNN & DALTON ARCHITECTS
401 NORTH HERRITAGE STREET
KINSTON, NORTH CAROLINA 28501

TOWN OF KNIGHTDALE CERTIFICATION STATEMENTS

TOWN APPROVED STANDARDS SHALL CONTROL. IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN THESE CONSTRUCTION DRAWINGS AND THE TOWN OF KNIGHTDALE'S APPROVED STANDARDS FOR THIS PROJECT, THE APPROVED STANDARDS SHALL CONTROL. TOWN OF KNIGHTDALE APPROVED STANDARDS SHALL MEAN ALL DEVELOPMENT DOCUMENTS NECESSARY FOR APPROVAL FOR THE PROPERTY INCLUDING, BUT NOT LIMITED TO, ANY SPECIAL USE PERMIT, SUBDIVISION PLAN, SITE PLAN, SUBDIVISION PLAT(S), PHASING SCHEDULE, DEVELOPMENT AGREEMENT, UTILITY ALLOCATION AGREEMENT, ANNEXATION AGREEMENT, THE TOWN OF KNIGHTDALE STANDARD SPECIFICATION AND DETAILS MANUAL AND APPLICABLE PROVISIONS OF THE NORTH CAROLINA STATE BUILDING CODE.

PROFESSIONAL DESIGN ENGINEER CERTIFICATION. THESE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING DRAWINGS AND WITH THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

I, ____________________, PE, CERTIFY THAT THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE HAVE BEEN THOROUGHLY CHECKED AND FOUND TO BE APPLICABLE TO THIS PROJECT. ALL EXCEPTIONS TO THE APPLICABLE TOWN STANDARDS HAVE BEEN PREVIOUSLY APPROVED BY THE TOWN OF KNIGHTDALE AND SAID EXCEPTIONS ARE SHOWN ON SHEET(S) __________ OF THESE DRAWINGS.

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 054704 ENGINEER POLLARD F. LAWSON
4-05-23

BY: ____________________, PE
DATE: ____________________

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY: ____________________ DATE: __________
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: ____________________ DATE: __________
ADMINISTRATOR

CORPUD CERTIFICATION STATEMENTS

From: FOG
To: Pollard Lawson
Cc: FOG; Sanders, Courtney
Subject: 7477 Forestville Rd FOG Application - Knightdale Fire Station #1
Date: Tuesday, April 4, 2023 10:22:10 AM
Attachments: Plumbing Sheets.pdf
Utility Plan.pdf
OWS Detail.pdf
S 40 a detail oil water separator.pdf
S-41.pdf
S-25 (1) manhole.pdf

Pollard,

Raleigh Water Fats, Oil, and Grease offers no objection **Knightdale Fire Station #1 located at 7477 Forestville Rd, Knightdale, NC 27545** installing the proposed 1000 gallon oil water separator. The oil water separator shall conform to S40,41 and 25 detail. All oil/water separators that are constructed of porous material must be coated with corrosion resistant epoxy to ensure that the tank will not leak. (Concrete oil separators must be coated with corrosion resistant epoxy.)

C. DeCarlo Sanders
Utilities Analyst
City of Raleigh
Public Utilities | Raleigh Water
Sewer Maintenance Division
Raleigh, NC 27604
919-996-2334 (office) | 919-280-1300 (mobile)
Courtney.Sanders@raleighnc.gov

PRIVATE
SEWER COLLECTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION TO ITS PUBLIC SEWER SYSTEM AND EXTENSION OF THE PRIVATE SEWER COLLECTION SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-5209(P)

AUTHORIZATION TO CONSTRUCT __________

DATE ____________________

ATTENTION CONTRACTORS

The Contruction Contractor responsible for the extension of water, sewer, and/or reuse, as approved in these plans, is responsible for contacting the *Public Utilities Department* at (919) 996-4540 at least twenty four hours prior to beginning any of their construction.

Failure to notify both *City Dpartments* in advance of beginning construction, will result in the issuance of *monetary fines*, and require reinstallation of any water or sewer facilities not inspected as a result of this notification failure.

Failure to call for *Inspection, Install a Downstream Plug*, have *Permitted Plans* on the *Jobsite*, or any other *Violation of City of Raleigh Standards* will result in a *Fine and Possible Exclusion* from future work in the *City of Raleigh*.

CONDITIONS OF APPROVAL

ALL WATER, SANITARY SEWER AND REUSE FACILITIES SHALL BE INSTALLED, INSPECTED, TESTED AND ACCEPTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT FOR OPERATIONS AND MAINTENANCE.

CONSTRUCTION DRAWINGS MUST BE APPROVED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT FOR ALL PUBLIC WATER, PUBLIC SEWER AND/OR PRIVATE SEWER EXTENSIONS PRIOR TO MAP RECORDATION.

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval ______________________________

City of Raleigh Review Officer

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE
start something

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT No.2045 TROY R. OLSON
4-05-23
SEALS

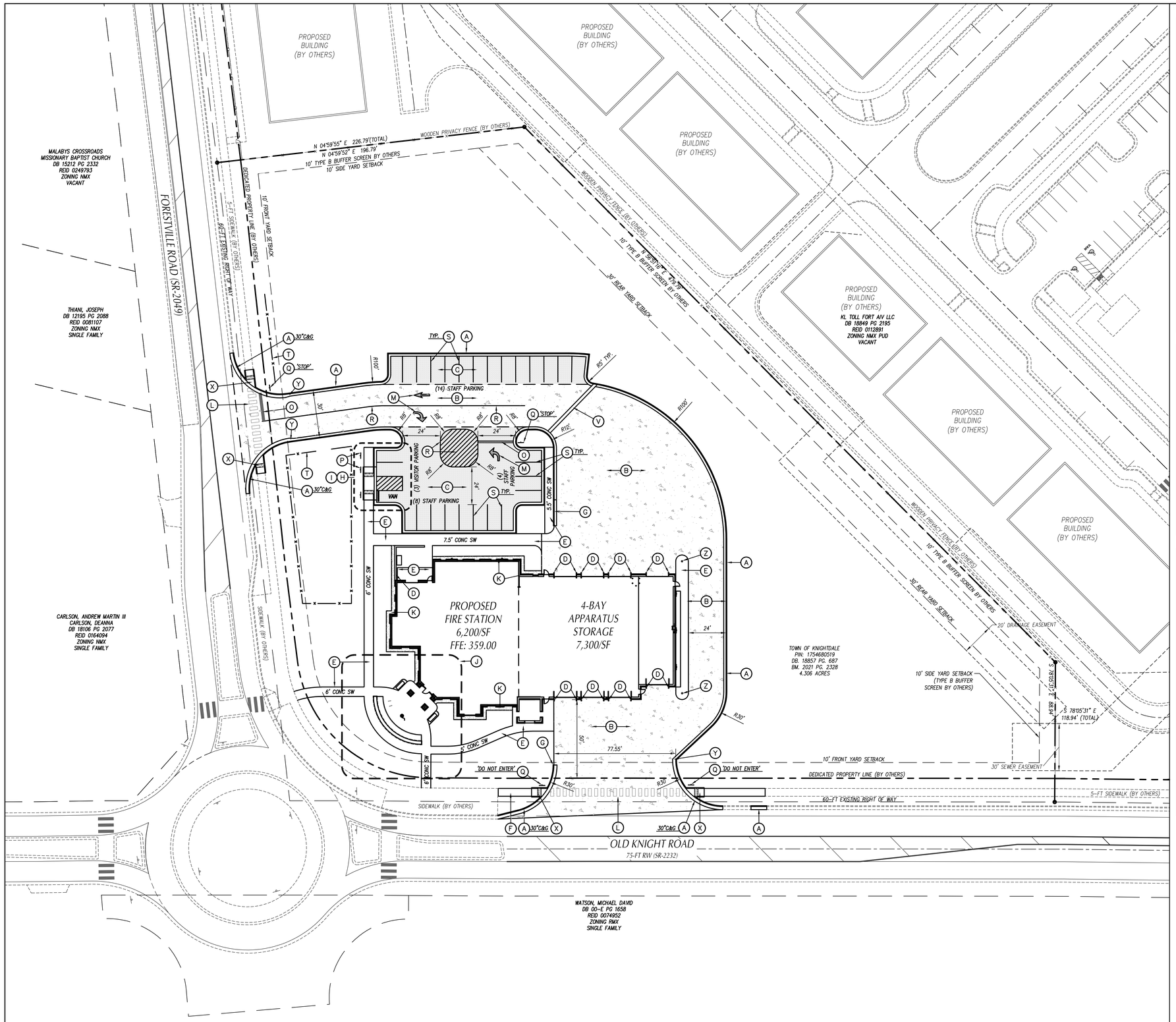
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

COVER SHEET

C000



KEY NOTES

- (A) CURB & GUTTER, SEE DETAIL SHEET C801.
- (B) HEAVY DUTY CONCRETE PAVEMENT, SEE DETAIL SHEET C801.
- (C) 'HEAVY' DUTY ASPHALT PAVEMENT, SEE DETAIL SHEET C801.
- (D) SEE ARCHITECTURAL PLANS FOR BOLLARDS, PATIO WALL AND ETC.
- (E) ONSITE CONCRETE SIDEWALK, SEE DETAIL SHEET C801.
- (F) TOWN OF KNIGHTDALE CONCRETE SIDEWALK, SEE DETAIL SHEET C802.
- (G) STANDARD CURB & GUTTER TERMINUS, SEE DETAIL SHEET C801.
- (H) ACCESSIBLE CURB RAMP, SEE DETAIL SHEET C801.
- (I) ACCESSIBLE PARKING STALL WITH STRIPING, WHEEL STOP AND SIGNAGE, SEE DETAILS SHEET C801 AND BELOW.
- (J) SEE ENTRY ENLARGEMENT ON SHEET C102.
- (K) SPLASH PAD / MOW STRIP, SEE DETAIL SHEET C803.
- (L) HI-VIS CROSS WALK, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (M) DIRECTIONAL ARROW, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (N) N/A
- (O) STOP BAR, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (P) SPECIAL PARKING SIGNAGE, SEE DETAIL SHEET C801.
- (Q) TRAFFIC CONTROL SIGNAGE, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (R) SOLID YELLOW, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (S) PARKING SPACE STRIPING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (T) WOODEN SPLIT RAIL FENCE, SEE DETAIL SHEET C801.
- (U) NOT USED
- (V) DUAL TRENCH DRAIN (TRUCK WASH WASTE TO SEWER / STORM WATER TO BMP), SEE DETAIL SHEET C901.
- (W) NOT USED
- (X) CITY OF RALEIGH STANDARD CURB RAMP, SEE DETAIL SHEET C803.
- (Y) 30" TO 24" CURB TRANSITION.
- (Z) BOLLARD, SEE DETAIL SHEET C802.

GENERAL STAKING NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, RALEIGH WATER, AND NCDOT STANDARDS AND SPECIFICATIONS.
2. ALL DIMENSIONS SHOWN ARE TO FACE OF CURB AND FACE OF BUILDING WALL, UNLESS OTHERWISE SHOWN.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS SHOWN AND CONTACT THE ARCHITECT IF ANY DISCREPANCIES OCCUR.
4. CONSTRUCTION STAKE OUT IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL PAVEMENT MARKINGS AND SIGNAGE SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
6. ALL FACE OF RADIUS' ARE 4 FT UNLESS OTHERWISE SHOWN.
7. ALL PARKING SPACES SHALL BE 10' WIDE X 18 FT DEEP MIN.
8. (AC) DENOTES ACCESSIBLE PARKING SPACE.
9. (VAN) DENOTES VAN ACCESSIBLE PARKING SPACE.
10. ANY AND ALL LANDSCAPING, EXISTING TREES OR SHRUBS TO REMAIN WHICH ARE DAMAGED DURING DEMOLITION OR CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR UTILIZING A LICENSED LANDSCAPE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
11. CONTRACTOR SHALL SUBMIT SCALED PLANS OF ALL SCORING/JOINTS FOR APPROVAL BY ARCHITECT 30 DAYS MINIMUM PRIOR TO INSTALLATION.
12. THE CROSS-SLOPE ON ALL SIDEWALKS SHALL BE A MAXIMUM OF 2.0%
13. NO WORK SHALL BE PERFORMED ON RIGHT-OF-WAYS OR ADJACENT PROPERTIES UNTIL THE OWNER NOTIFIES CONTRACTOR IN WRITING OF PROCUREMENT OF APPROPRIATE PERMITS, EASEMENTS, AGREEMENTS, OR RIGHTS-OF-WAY.

TRAFFIC CONTROL NOTES

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

SIGN	MUTCD STD.	SIZE
STOP	R1-1	30"x30"
DO NOT ENTER (DNE)	R5-1	30"x30"

2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT DEEP x 12-IN DIA. CONCRETE FOOTING.
3. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MUTCD AND NCDOT STANDARDS AND THE PROJECT SPECIFICATIONS.

MARKING	NCDOT STD.	SIZE	COLOR
PARKING SPACES		4-IN	WHT.
CROSSWALK	1205.07(HI-VIS)	24-IN	WHT.
CROSSWALK	1205.07(STANDARD)	8-IN	WHT.
DIRECTIONAL ARROWS	1205.08	STD.	WHT.
NO PARKING - FIRE LANE *	-	4-IN	YEL.
SOLID	1205.01	4-IN	YELLOW
DIAGONAL	1205.09	4-IN	YEL.
STOP BAR		24-IN	WHT.

* NO PARKING - FIRE LANE MARKING SHALL BE THERMOPLASTIC AND CONFORM TO TOWN OF KNIGHTDALE STANDARD DETAIL 3.31 FIRE LANE MARKING AND CONSIST OF A 4" SOLID YELLOW STRIPE AND 8" HIGH YELLOW TEXT "NO PARKING - FIRE LANE" AT 40' INTERVALS.

4. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC TYPE EXCEPT FOR PARKING SPACE LINES WHICH SHALL BE ALK1D-RESIN TYPE PAINT.
5. ALL SIGNAGE SHALL BE FIELD STAKED AND THE LOCATIONS APPROVED BY CLH DESIGN PRIOR TO SIGN INSTALLATION.
6. CENTER ALL DIRECTIONAL ARROWS WITHIN TRAVEL LANE.
7. COORDINATE FIRE LANE MARKINGS WITH TOWN OF KNIGHTDALE FIRE MARSHAL AND SEE DETAIL ON C802
8. ALL SIGNS SHALL USE PRISMATIC SHEETING THAT MEETS MINIMUM REFLECTIVITY STANDARDS FOUND IN THE LATEST EDITION OF THE MUTCD.

GRAPHIC SCALE

MAGNETIC

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY:_____ DATE:_____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY:_____ _____ DATE:_____
ADMINISTRATOR

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT No.2045 Roy R. Clegg SEAL 2045

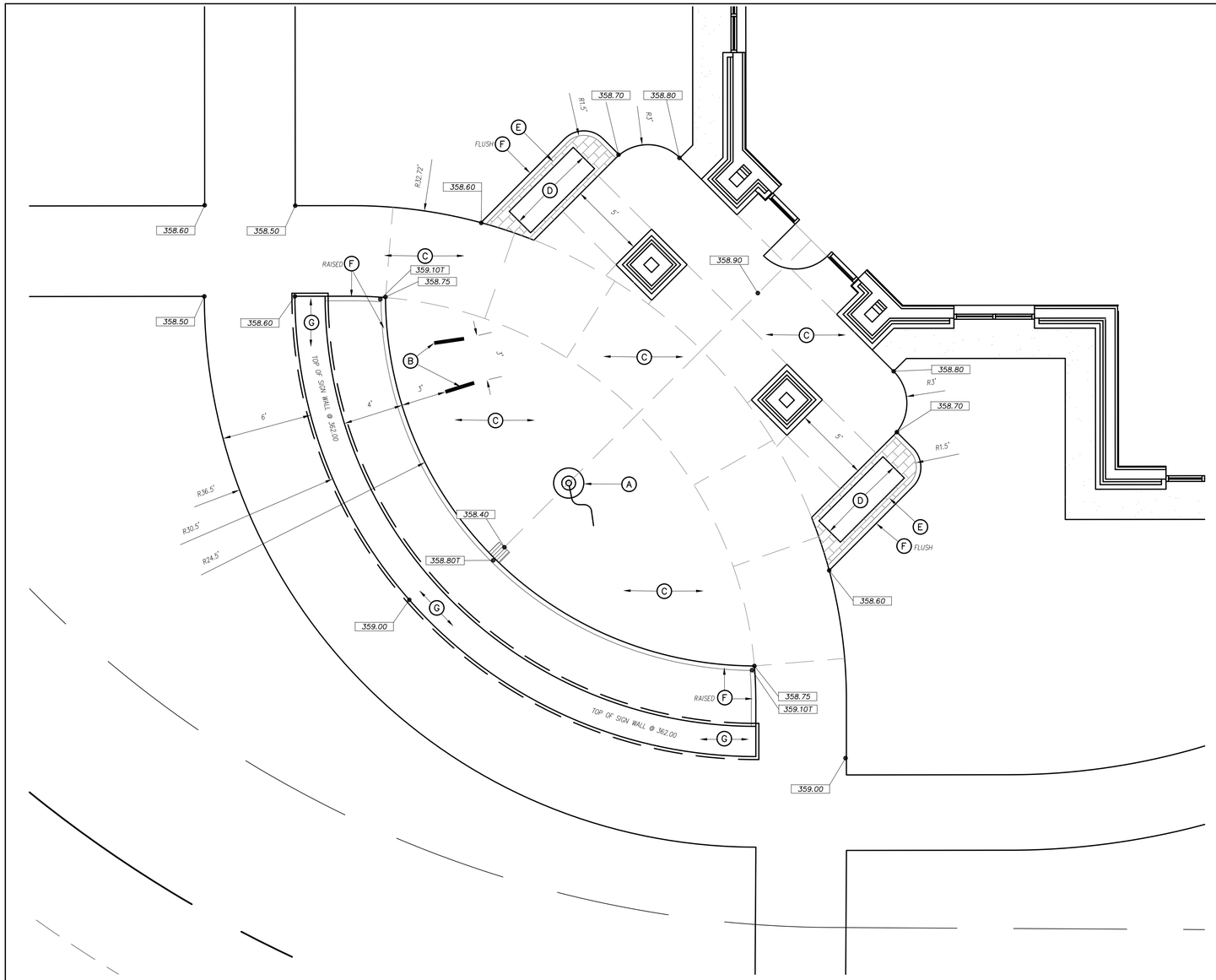
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

STAKING & PAVEMENT MARKING PLAN

C101



KEY NOTES

- (A) FLAGPOLE, SEE DETAIL SHEET C801.
- (B) BIKE RACK BY MAGLIN (150 MODEL) COLOR SILVER. SEE DETAIL SHEET C803.
- (C) CONCRETE SIDEWALK, SEE DETAIL SHEET C801.
- (D) BACKLESS STEEL BENCH ON PAVERS (510 BACKLESS IN BLACK), SEE DETAIL SHEET C801 & C803.
- (E) BRICK PAVERS TO MATCH BUILDING, SEE DETAIL SHEET C801.
- (F) BRICK BAND (SOLDIER), SEE DETAIL SHEET C801.
- (G) TOWN FIRE STATION SIGN, SEE DETAIL SHEET C802.

SCORE JOINT

12X12 DRAIN INLETS
SEE C300 AND C500 SERIES
FOR ADDITIONAL INFO.

GRAPHIC SCALE

4 0 2 4 8 16

(IN FEET)
1 inch = 4 ft.

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY:_____ DATE:_____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY:_____ DATE:_____
ADMINISTRATOR

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT No.2045 TROY R. OLSON SEAL 12-05-22

KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545

TOWN OF KNIGHTDALE
22-150

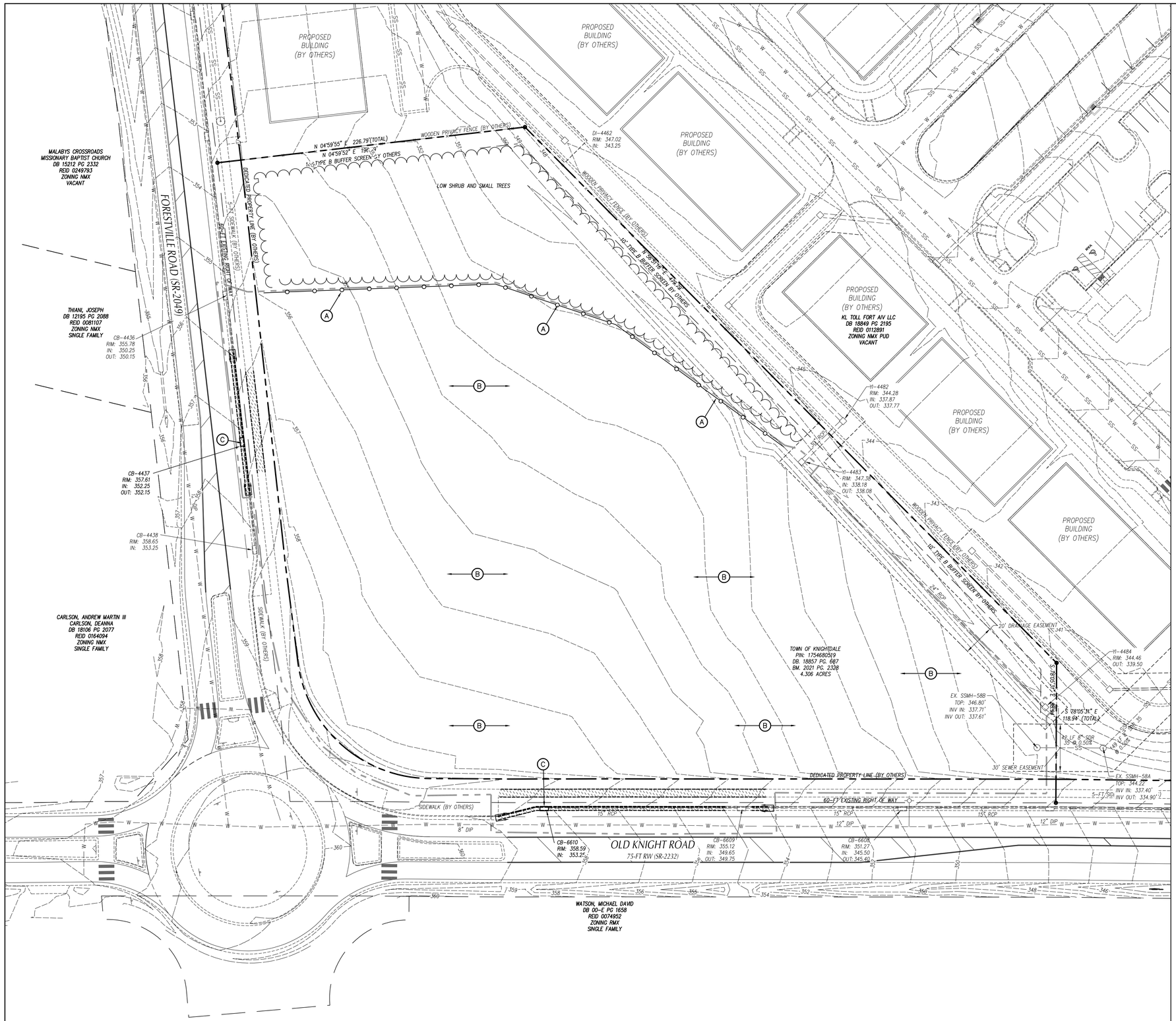
REVISIONS

NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

STAKING PLAN ENLARGEMENT

C102



DEMOLITION LEGEND

STRUCTURES/UTILITIES TO BE REMOVED		STRUCTURES/UTILITIES TO REMAIN	
OVERHEAD ELECTRICAL	-------E-------	OVERHEAD ELECTRICAL	-------E-------
UNDERGROUND ELECTRICAL	-------UE-------	UNDERGROUND ELECTRICAL	-------UE-------
FIRE PROTECTION	-------FP-------	FIRE PROTECTION	-------FP-------
GAS	-------G-------	GAS	-------G-------
SANITARY SEWER	-------SS-------	SANITARY SEWER	-------SS-------
TELEPHONE	-------T-------	TELEPHONE	-------T-------
UNDERGROUND TELEPHONE	-------UT-------	UNDERGROUND TELEPHONE	-------UT-------
FIBER OPTIC	-------FO-------	FIBER OPTIC	-------FO-------
WATER	-------W-------	WATER	-------W-------
FORCE MAIN	-------FM-------	FORCE MAIN	-------FM-------
STORM DRAIN	=======	STORM DRAIN	=======
INDIVIDUAL TREE TO BE REMOVED.		INDIVIDUAL TREE TO REMAIN.	
LIGHT POLE	LP	LIGHT POLE	LP
UTILITY POLE	PP	UTILITY POLE	PP
MANHOLE	MH	MANHOLE	MH
CLEAN OUT	CO	CLEAN OUT	CO
DROP INLET,CATCH BASIN	DI, CB	DROP INLET,CATCH BASIN	DI, CB
FIRE HYDRANT	FH	FIRE HYDRANT	FH
WATER VALVE	WV	WATER VALVE	WV
CONSTR./CLEARING LIMITS		PAVEMENT, S/W, C&G TO BE REMOVED.	
TREE PROTECTION FENCE			

DEMOLITION KEY NOTES

(A) TEMPORARY TREE PROTECTION FENCE, SEE DETAIL SHEET C701.

(B) CLEAR AND GRUB, STRIP TOPSOIL WITHIN CONSTRUCTION LIMITS.

(C) REMOVE STRUCTURE/UTILITY.

(D) EXISTING UTILITY LINE/STRUCTURE TO BE REMOVED/RELOCATED BY LOCAL UTILITY COMPANY. LOCAL UTILITY COMPANY SHALL DETERMINE THE LIMITS AND EXTENT OF REMOVAL/RELOCATION OF UTILITIES REQUIRED FOR NEW CONSTRUCTION. COORDINATE SCHEDULE AND WORK WITH LOCAL UTILITY COMPANY AND ARCHITECT/OWNER.

DEMOLITION GENERAL NOTES

1. ALL EXISTING STRUCTURES AND UTILITIES SHALL BE REMOVED AS NEEDED TO ALLOW NEW CONSTRUCTION. IN GENERAL, FEATURES INDICATED IN BOLD ON THIS PLAN SHALL BE REMOVED.
2. ALL PAVEMENT OR CONCRETE TO BE REMOVED SHALL BE SAW CUT TO PROVIDE A STRAIGHT AND UNIFORM JOINT FOR NEW PAVEMENT, SIDEWALK, OR CURB AND GUTTER, ETC. ANY EXISTING PAVEMENT, SIDEWALK, CURB AND GUTTER, ETC. THAT MUST BE REMOVED TO ALLOW NEW CONSTRUCTION SHALL BE REMOVED AND REPAIRED PER THE SPECIFICATIONS AND DETAILS OR TO MATCH PRE-CONSTRUCTION CONDITIONS (WHETHER OR NOT SHOWN ON THE DRAWINGS TO BE REMOVED).
3. ALL UTILITIES OR STRUCTURES NOT INDICATED FOR REMOVAL OR MODIFICATION ARE TO REMAIN AND BE PROTECTED FROM DAMAGE.
4. ALL WASTE MATERIAL GENERATED FROM DEMOLITION ACTIVITIES SHALL BE DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL APPLICABLE RULES AND REGULATIONS.
5. EXISTING SITE BOUNDARY AND TOPOGRAPHIC SURVEY INFORMATION WAS TAKEN FROM SURVEY BY BNK, PERFORMED 01/04/21 AND ADJACENT DEVELOPMENT PLANS BY BGE 08/22/22 THESE PLANS DO NOT ASSUME ANY LIABILITY FOR ANY EXISTING INFORMATION BOTH SHOWN AND NOT SHOWN ON THE SURVEY AND ANY CHANGES TO THE EXISTING CONDITIONS THAT MAY HAVE OCCURRED AFTER THE SURVEY WAS ISSUED. CONTRACTOR SHALL VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION.
6. INSTALL TREE PROTECTION FENCING PRIOR TO BEGINNING CLEARING OPERATIONS. CLEAR AND GRUB ALL AREAS AS SHOWN AND REQUIRED TO PERMIT INSTALLATION OF NEW CONSTRUCTION PER SPECIFICATIONS AND DRAWINGS. EXISTING TREES, SHRUBS OR OTHER LANDSCAPE MATERIAL WHICH WILL CONFLICT WITH NEW CONSTRUCTION SHALL BE REMOVED (WHETHER OR NOT SHOWN ON THE DRAWINGS). ALL CONTRACTORS SHALL VISIT THE SITE AND OBSERVE EXISTING CONDITIONS PRIOR TO BIDDING.
7. TO MINIMIZE DAMAGE TO EXISTING TREES NEAR THE INTERIOR EDGE OF CLEARING LIMITS, THE CONTRACTOR SHALL CUT 2-FT DEEP TRENCHES ALONG THE LIMITS OF DISTURBANCE, SO AS TO CUT, RATHER THAN TEAR ROOTS.
8. PRIOR TO DEMOLISHING EXISTING STRUCTURES, MAKE AN INSPECTION FOR ANY HAZARDOUS MATERIALS. CONTACT ARCHITECT IMMEDIATELY IF ANY HAZARDOUS MATERIALS ARE DISCOVERED. CAP AND REMOVE UTILITY SERVICES, FUEL TANKS AND SEPTIC SYSTEMS. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
9. VERIFY ALL ILLUSTRATED UNDERGROUND ELEMENTS/UTILITIES. EXERCISE REASONABLE EFFORTS TO PROTECT ANY UNKNOWN UNDERGROUND ELEMENTS/UTILITIES. NOTIFY THE ARCHITECT IMMEDIATELY IF UNKNOWN ELEMENTS/UTILITIES ARE DISCOVERED THAT WOULD NECESSITATE MODIFICATION TO THE PROPOSED DESIGN.
10. CONTACT UTILITY LOCATING SERVICE AT LEAST 48-HRS PRIOR TO EXCAVATION.
11. PROTECT ALL ADJACENT PROPERTIES, THE GENERAL PUBLIC AND ALL OF THE OWNER'S FACILITIES. SHOULD DAMAGES OCCUR, REPAIR IMMEDIATELY AS DIRECTED BY THE ARCHITECT. AREAS TO BE PROTECTED, REPAIRED AND CLEANED SHALL ALSO INCLUDE ANY STAGING AREAS, ACCESS ROUTES AND OTHER EXISTING IMPROVEMENTS WITHIN THE CONSTRUCTION LIMITS THAT ARE TO REMAIN.
12. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, CITY OF RALEIGH AND/OR NCDOT STANDARDS AND SPECIFICATIONS.
13. ALL EXISTING VAULTS, MANHOLES, STORM DRAIN STRUCTURES, CLEANOUTS, ETC. SHALL BE ADJUSTED AS NEEDED TO MATCH FINISH GRADE.
14. DEMOLITION AND PATCHING OF PAVEMENT, SIDEWALK, CURB AND GUTTER AND OTHER EXISTING PAVED SURFACES IN ADDITION TO THAT INDICATED ON THIS PLAN SHALL BE PERFORMED AS REQUIRED TO CONSTRUCT AND INSTALL NEW UTILITIES. ALL SUCH DEMOLITION AND PATCHING SHALL BE INCLUDED IN THE BASE BID SCOPE OF WORK. SEE SHEET C802 FOR PAVEMENT REPAIR DETAILS.
15. THIS SITE IS/IS NOT LOCATED WITHIN SPECIAL FLOOD HAZARD AREAS AS DETERMINED BY FEMA AND DEPICTED ON F.I.R.M. MAP, 3720177540OJ DATED 5/2/2006 AS BEING WITHIN ZONE "X-OTHER AREA".
16. NO WORK SHALL BE PERFORMED ON RIGHT-OF-WAYS OR ADJACENT PROPERTIES UNTIL THE OWNER NOTIFIES CONTRACTOR IN WRITING OF PROCUREMENT OF APPROPRIATE PERMITS, EASEMENTS, AGREEMENTS, OR RIGHTS-OF-WAY.

GRAPHIC SCALE

MAGNETIC

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

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BY:_____ DATE:_____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY:_____ _____ DATE:_____
ADMINISTRATOR

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT No.2045 TROY R. PLESS SEAL 2045

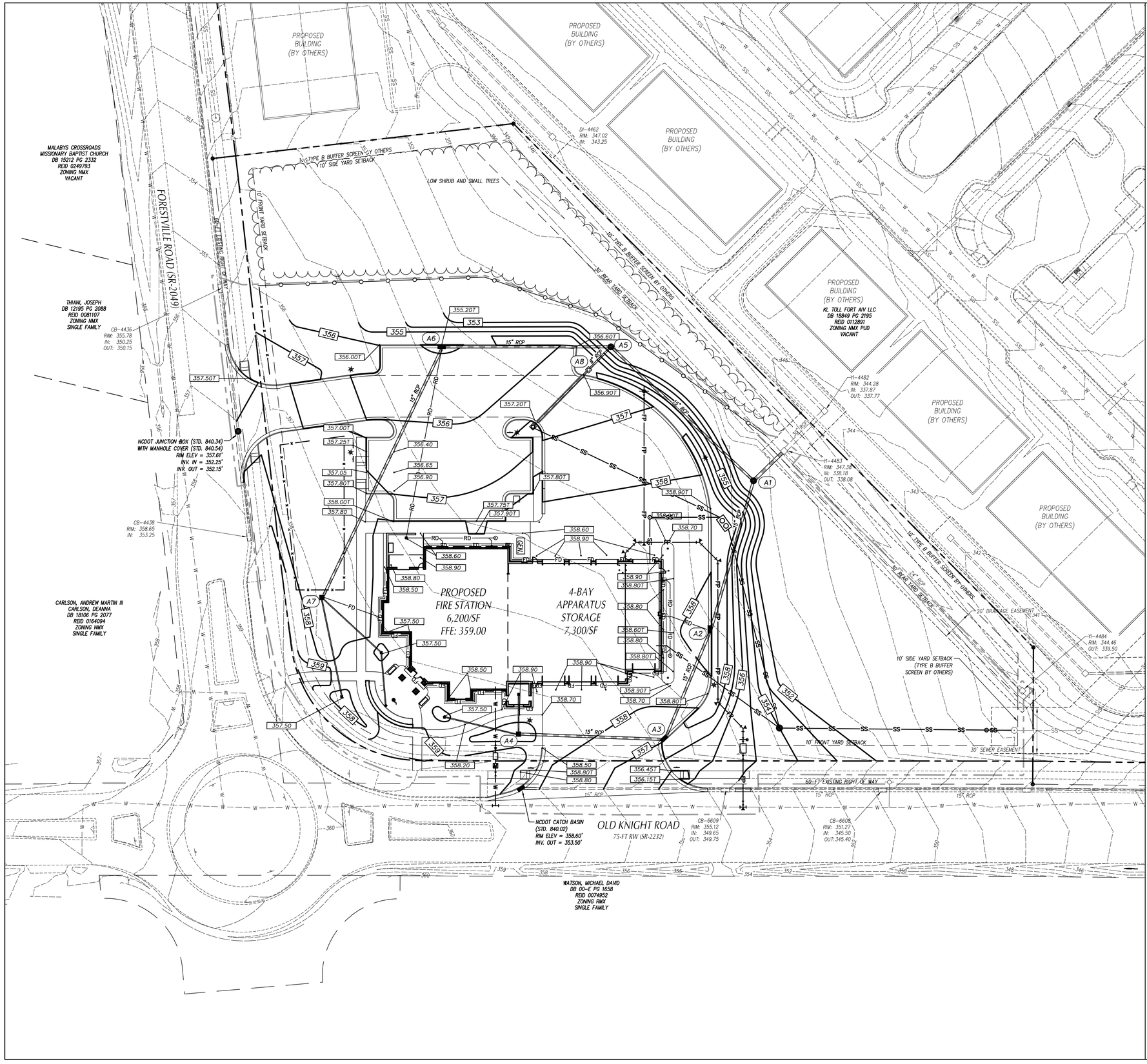
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

EXISTING CONDITOINS & DEMOLITION PLAN

C201



GRADING LEGEND

- EXISTING CONTOURS
- FINAL CONTOURS
- 270.4' + — EXISTING SURVEY SPOT ELEVATION
- 270.50T — PROPOSED TOP OF CURB SPOT ELEVATION
- 270.50 — PROPOSED GROUND/PAVEMENT ELEVATION
- EXISTING STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE
- FD — PROPOSED FOUNDATION DRAIN DISCHARGE LINE. SEE ARCH. PLANS FOR DRAIN PIPE LOCATIONS ALONG BUILDING WALLS.
- RD — PROPOSED ROOF DRAIN
- TREE PROTECTION FENCE

GENERAL GRADING NOTES

1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS AND CONSTRUCTION DETAILS, NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, NCDOT DRIVEWAY PERMITS AND ENCROACHMENT AGREEMENTS, NCDEQ AND NPDES PERMITS, NCBC AND OSHA REQUIREMENTS.
2. ALL SPOT ELEVATIONS INDICATED AT CURB AND GUTTER AND ARE DENOTED TO TOP OF CURB, UNLESS OTHERWISE SHOWN.
3. TOTAL DENUDED AREA = 2.90 AC
4. CONTRACTOR SHALL ADJUST ALL EXISTING VAULTS, MANHOLES, STORM DRAIN STRUCTURES, CLEANOUTS, ETC. AS NEEDED TO MATCH FINISH GRADE.
5. ALL BACKFILL, COMPACTION, SOILS TESTING, ETC. SHALL BE PERFORMED BY THE OWNERS INDEPENDENT TESTING LABORATORY. (SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION)
6. ALL STORM DRAIN PIPES SHALL BE PROTECTED WITH STONE FILTER PROTECTION AFTER STOPPAGE OF WORK EACH DAY. SEE DETAIL ON SHEET C702.
7. EXISTING VEGETATION WITHIN TREE PROTECTION AREAS SHALL REMAIN UNDISTURBED. UNLESS NOTED OTHERWISE.
8. ANY AND ALL LANDSCAPING AND EXISTING TREES & SHRUBS TO REMAIN WHICH ARE DAMAGED DURING DEMOLITION OR CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR UTILIZING A LICENSED LANDSCAPE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
9. THE GRADING CONTRACTOR SHALL COMPLY WITH ALL STATE CODES IN OBSERVING EROSION CONTROL MEASURES BOTH ON AND OFF-SITE.
10. THE GRADING CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES AFTER EACH RAINFALL EVENT OR AS DIRECTED BY STATE AUTHORITIES OR THE ARCHITECT.
11. THE GRADING CONTRACTOR SHALL BE RESPONSIBLE FOR OFF-SITE DISPOSAL OF ALL CLEARING AND GRADING WASTE MATERIALS GENERATED DURING CONSTRUCTION AND FOR OBTAINING ALL APPLICABLE PERMITS FOR OFF-SITE STOCKPILES AND/OR WASTE AREAS.
12. THE CROSS-SLOPE ON ALL SIDEWALKS SHALL BE A MAXIMUM OF 2.0%
13. CONTRACTOR SHALL VERIFY ALL EXISTING ELEVATIONS WHERE NEW CONSTRUCTION JOIN OR CONNECT TO EXISTING PAVEMENT, CURB AND OTHER RIGID STRUCTURES. NOTIFY ARCHITECT IF DISCREPANCIES OCCUR.
14. ALL SUBGRADES AND FILL PLACEMENT SHALL BE MONITORED AND TESTED BY THE OWNER'S INDEPENDENT TESTING AGENCY.
15. FILL SOILS SHALL BE MOISTURE CONDITIONED TO WITHIN 2% OF OPTIMUM MOISTURE CONTENT AND COMPACTED TO NOT LESS THAN 95% OF THE STANDARD PROCTOR MAX DRY DENSITY (MDD) EXCEPT THE FINAL FOOT WHERE COMPACTION SHALL BE NOT LESS THAN 98% MDD IN PAVEMENT, BUILDING AND OTHER STRUCTURAL AREAS. COMPACTION WITHIN THE NCDOT R/W SHALL MEET NCDOT REQUIREMENTS. POND EMBANKMENTS SHALL BE COMPACTED TO NOT LESS THAN 95% MDD. LAWN AND OTHER NON-STRUCTURAL AREAS SHALL BE COMPACTED TO 90% MDD.
16. ON-SITE HIGHLY-PLASTIC SOILS SHALL NOT BE USED AS FILL WITHIN 4-FT OF PROPOSED SUBGRADES IN PAVEMENT, BUILDING OR OTHER STRUCTURAL AREAS.
17. OFF-SITE BORROW SOILS SHALL CONSIST OF SILTY AND CLAYEY SANDS OR LOW PLASTICITY SILTS AND CLAYS HAVING UNIFIED SOIL CLASS OF SM, SC, ML OR CL; SHALL HAVE A PLASTICITY INDEX OF LESS THAN 20 AND SHALL HAVE A STANDARD PROCTOR MAX DRY DENSITY OF AT LEAST 90-PCF.
18. ALL OBJECTIONABLE MATERIALS INCLUDING STONES SHALL BE REMOVED FROM FILL MATERIALS AND TOPSOIL.
19. ALL EARTH SUBGRADES SHALL BE PROOF-ROLLED UNDER THE OBSERVATION OF THE OWNER'S INDEPENDENT TESTING AGENCY. ANY SOILS THAT FAIL TO TIGHTEN UP AFTER PROOF-ROLLING AND CONTINUE TO RUT OR PUMP SHALL BE MOISTURE CONDITIONED AND RECOMPACTED. PROOF-ROLLING AND MOISTURE CONDITIONING SHALL BE REPEATED UNTIL SATISFACTORY TO THE TESTING AGENCY.
20. SOIL MATERIAL THAT IS DEEMED UNSUITABLE TO REMAIN IN PLACE BY THE OWNER'S INDEPENDENT TESTING AGENCY SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE TESTING AGENCY.
21. ALL AREAS OF THE SITE WHERE GRADE IS RAISED BY MORE THAN 6-FT SHALL BE MONITORED FOR SETTLEMENT BY A LICENSED SURVEYOR TO VERIFY THAT FILL INDUCED SETTLEMENTS HAVE SUBSIDED PRIOR TO CONSTRUCTION OF NEW IMPROVEMENTS.

GRAPHIC SCALE

MAGNETIC

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

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KNIGHTDALE start something

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT No.2045 SEAL 10523

KNIGHTDALE FIRE STATION #1

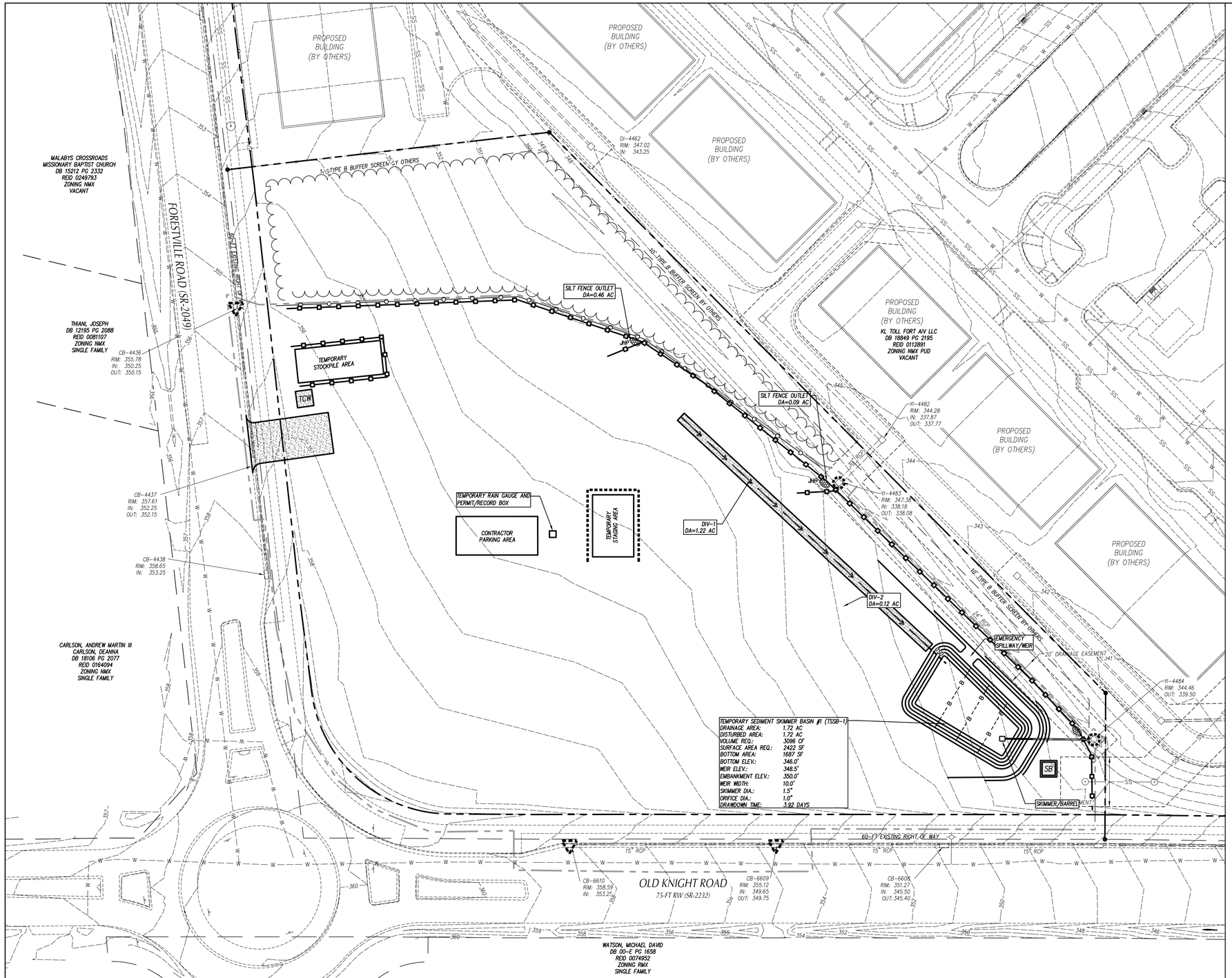
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS	NO.	DATE	DESCRIPTION
	.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

GRADING PLAN

C301



LEGEND

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- FINISHED CONTOUR
- TEMP. CONTOUR (TEMP. GRADES DURING CONSTR.)
- PROPOSED STORM SEWER PIPES
- EXISTING STORM SEWER PIPES
- CONSTRUCTION LIMITS UNLESS OTHERWISE NOTED
- TREE PROTECTION FENCE SEE DETAIL SHEET C701
- TEMP. SILT FENCE SEE DETAIL SHEET C701
- JHP — TEMP. J-HOOK OUTLET PROTECTION SEE DETAIL SHEET C703
- TEMP. GRAVEL CONSTR. ENTRANCE SEE DETAIL SHEET C702
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GENERAL NOTES

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3. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES AFTER EACH RAINFALL EVENT OR AS DIRECTED BY LOCAL AUTHORITIES OR ARCHITECT.
4. TOTAL DISTURBED AREA: 2.90 ACRES.
5. ALL OPEN STORM PIPES SHALL BE PROTECTED WITH STONE FILTER PROTECTION AFTER WORK STOPPAGE EACH DAY. SEE DETAIL SHEET C701.
6. ALL STORM DRAINAGE PIPES SHALL BE THOROUGHLY FLUSHED OF ALL SEDIMENT FOLLOWING SITE STABILIZATION. INTERIOR FLUSHING OF SYSTEM SHALL BE PERFORMED AS NEEDED TO MAINTAIN PROPER FUNCTIONING OF THE DRAINAGE SYSTEM. CLEANING SHALL BE PERFORMED IN A MANNER WHICH PREVENTS SEDIMENT FROM BEING FLUSHED THROUGH PIPES TO THE EXISTING DRAINAGE SYSTEM.
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11. ROADSIDE DITCHES AND CHANNELS SHALL BE STABILIZED DAILY UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
12. INSTALL TEMPORARY MATTING TO TOP OF ALL SIDE SLOPES ON CHANNELS, DIVERSION DITCHES AND TEMPORARY SEDIMENT BASINS. SEE DETAIL SHEET C702 (PERMANENT CHANNEL) AND C702 (TEMPORARY DIVERSION DITCH) FOR TYPE OF MATTING TO USE.
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MAINTENANCE PLAN

1. DURING ALL PHASES OF CONSTRUCTION, GROUNDCOVER ON EXPOSED SLOPES SHALL BE PROVIDED ACCORDING TO GROUND STABILIZATION TABLE (SHEET C701) FOLLOWING COMPLETION OF ANY PHASE OF GRADING.
2. FINAL PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION TABLE (SHEET C701) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
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4. SLOPE EROSION CONTROL MATTING SHALL BE INSTALLED FOR TEMPORARY STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER). REFER TO MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.
5. ALL OTHER SEEDED AREAS SHALL BE MULCHED WITH STRAW AND TACKED WITH ASPHALT.

SELF-INSPECTION RULES

SEE SHEET C701 FOR SELF-INSPECTION REQUIREMENTS.

THE FINANCIALLY RESPONSIBILE PERSON AND/OR HIS AGENT WILL BE PERFORM SELF INSPECTIONS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES USING NCDEMLR'S SELF INSPECTION REPORT (WORKSHEET) AND THIS WILL BE KEPT ONSITE.

SLOPE & SURFACE STABILIZATION

GROUND STABILIZATION SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION NOTES. SEE SHEET C701.

EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE (SECTION II.B(2) (b))

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MAGNETIC

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KNIGHTDALE start something

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034704 RILLARD F. LAWSON
SE 4-05-23

KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
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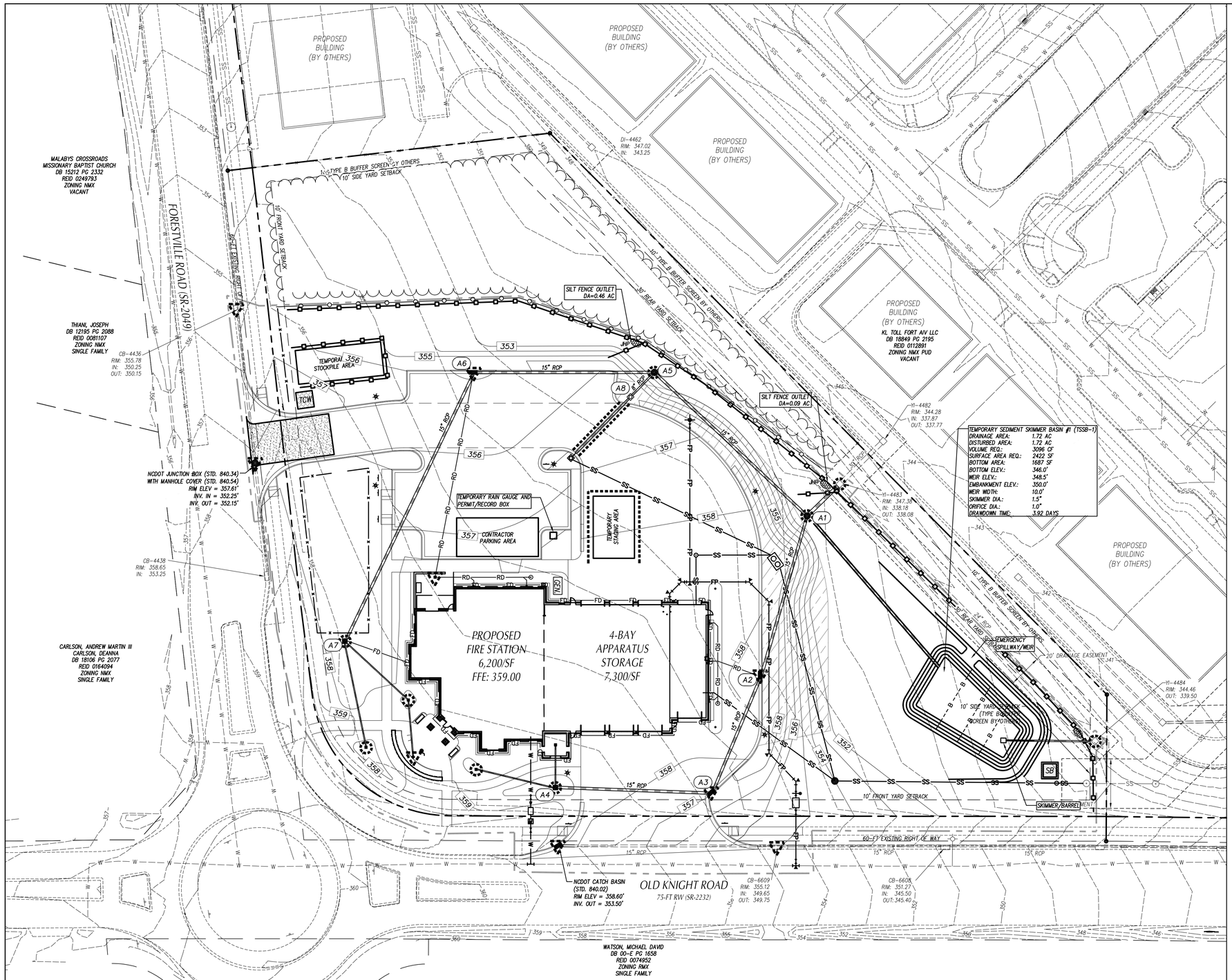
TOWN OF KNIGHTDALE
22-150

REVISIONS	DATE	DESCRIPTION
NO.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

INITIAL ESC PLAN

C401



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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034704 RALLARD F. LAWSON
SE 4-05-23

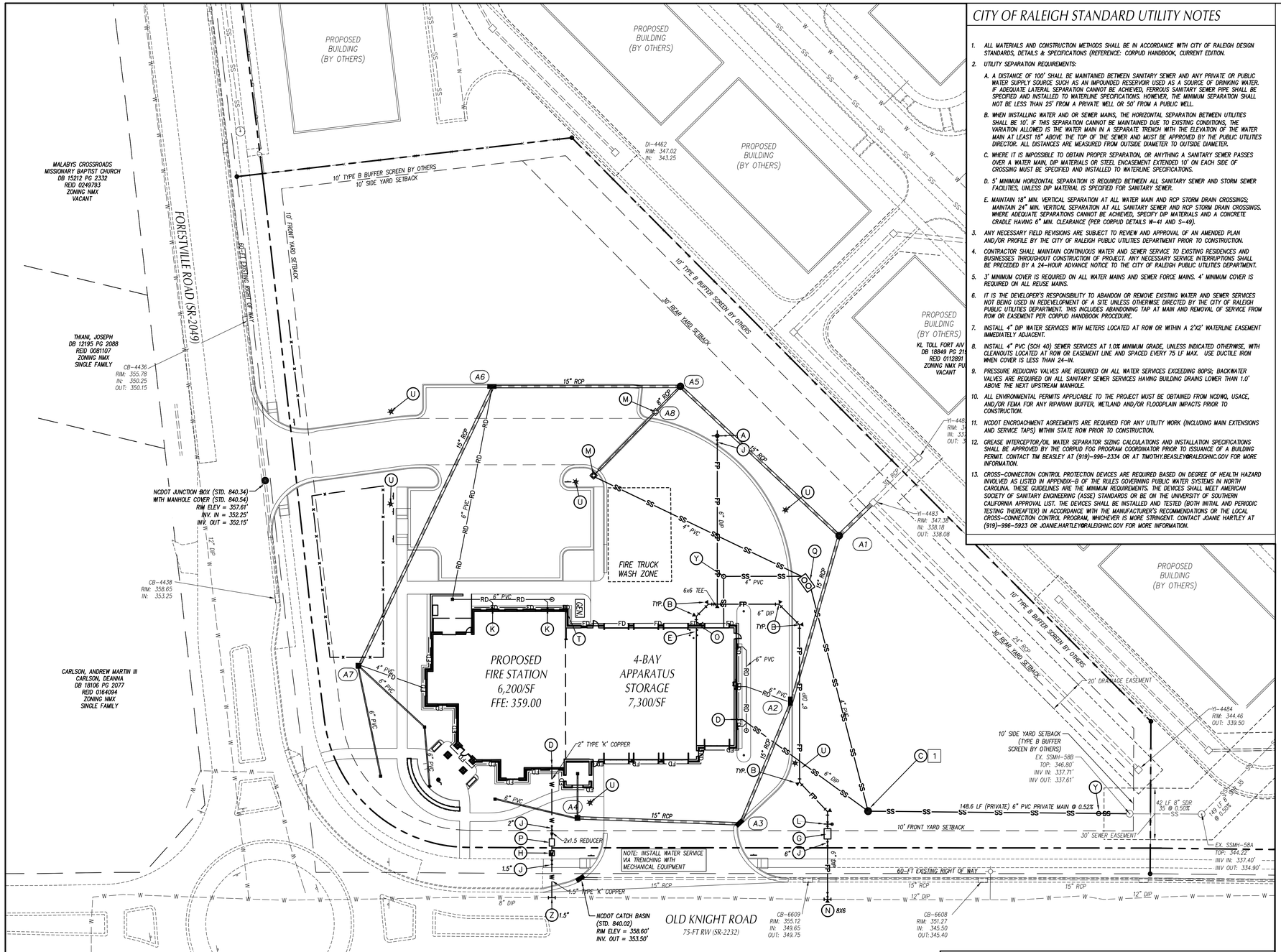
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS	DATE	DESCRIPTION
NO.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

FINAL ESC PLAN

C402



CITY OF RALEIGH STANDARD UTILITY NOTES

1. ALL MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH DESIGN STANDARDS, DETAILS & SPECIFICATIONS (REFERENCE: CORPUD HANDBOOK, CURRENT EDITION.
2. UTILITY SEPARATION REQUIREMENTS:
   - A. A DISTANCE OF 100' SHALL BE MAINTAINED BETWEEN SANITARY SEWER AND ANY PRIVATE OR PUBLIC WATER SUPPLY SOURCE SUCH AS AN IMPOUNDED RESERVOIR USED AS A SOURCE OF DRINKING WATER. IF ADEQUATE LATERAL SEPARATION CANNOT BE ACHIEVED, FERROUS SANITARY SEWER PIPE SHALL BE SPECIFIED AND INSTALLED TO WATERLINE SPECIFICATIONS. HOWEVER, THE MINIMUM SEPARATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL.
   - B. WHEN INSTALLING WATER AND OR SEWER MAINS, THE HORIZONTAL SEPARATION BETWEEN UTILITIES SHALL BE 10'. IF THIS SEPARATION CANNOT BE MAINTAINED DUE TO EXISTING CONDITIONS, THE VARIATION ALLOWED IS THE WATER MAIN IN A SEPARATE TRENCH WITH THE ELEVATION OF THE WATER MAIN AT LEAST 18" ABOVE THE TOP OF THE SEWER AND MUST BE APPROVED BY THE PUBLIC UTILITIES DIRECTOR. ALL DISTANCES ARE MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER.
   - C. WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTHING A SANITARY SEWER PASSES OVER A WATER MAIN, DIP MATERIALS OR STEEL ENCASEMENT EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED AND INSTALLED TO WATERLINE SPECIFICATIONS.
   - D. 5' MINIMUM HORIZONTAL SEPARATION IS REQUIRED BETWEEN ALL SANITARY SEWER AND STORM SEWER FACILITIES, UNLESS DIP MATERIAL IS SPECIFIED FOR SANITARY SEWER.
   - E. MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATER MAIN AND RCP STORM DRAIN CROSSINGS; MAINTAIN 24" MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER AND RCP STORM DRAIN CROSSINGS. WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY DIP MATERIALS AND A CONCRETE CRADLE HAVING 6" MIN. CLEARANCE (PER CORPUD DETAILS W-41 AND S-49).
3. ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW AND APPROVAL OF AN AMENDED PLAN AND/OR PROFILE BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER AND SEWER SERVICE TO EXISTING RESIDENCES AND BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24-HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT.
5. 3' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS AND SEWER FORCE MAINS. 4' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS.
6. IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER AND SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT. THIS INCLUDES ABANDONING TAP AT MAIN AND REMOVAL OF SERVICE FROM ROW OR EASEMENT PER CORPUD HANDBOOK PROCEDURE.
7. INSTALL 4" DIP WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'X2' WATERLINE EASEMENT IMMEDIATELY ADJACENT.
8. INSTALL 4" PVC (SCH 40) SEWER SERVICES AT 1.0% MINIMUM GRADE, UNLESS INDICATED OTHERWISE, WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE AND SPACED EVERY 75 LF MAX. USE DUCTILE IRON WHEN COVER IS LESS THAN 24-IN.
9. PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80PSI; BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE.
10. ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ, USACE, AND/OR FEMA FOR ANY RIPARIAN BUFFER, WETLAND AND/OR FLOODPLAIN IMPACTS PRIOR TO CONSTRUCTION.
11. NCDOT ENCROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS AND SERVICE TAPS) WITHIN STATE ROW PRIOR TO CONSTRUCTION.
12. GREASE INTERCEPTOR/OIL WATER SEPARATOR SIZING CALCULATIONS AND INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE CORPUD FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT TIM BEASLEY AT (919)-996-2334 OR AT TIMOTHY.BEASLEY@RALEIGHNC.GOV FOR MORE INFORMATION.
13. CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX-B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA. THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST. THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT. CONTACT JOANIE HARTLEY AT (919)-996-5923 OR JOANIE.HARTLEY@RALEIGHNC.GOV FOR MORE INFORMATION.

UTILITY LEGEND

	EXISTING	PROPOSED
CHILLED WATER	------CW------	CW
ELECTRICAL (OVERHEAD)	------ E ------	E
ELECTRICAL (UNDERGROUND)	------UE------	UE
FOUNDATION DRAIN (SEE ARCHITECTURAL)	------FD------	FD
GAS	------ G ------	G
SANITARY SEWER	------SS------	SS
TELEPHONE (OVERHEAD)	------ T ------	T
TELEPHONE (UNDERGROUND)	------UT------	UT
WATER	------ W ------	W
ROOF DRAIN	------RD------	RD
FIRE PROTECTION	------FP------	FP
STORM DRAIN	═══════	═══════
TREE PROTECTION FENCING, SEE EROSION CONTROL PLANS		
LIGHT POLE	LP	
UTILITY POLE	PP	
MANHOLE	MH	
CLEAN OUT	CO	
DROP INLET,CATCH BASIN	DI, CB	
FIRE HYDRANT	FH	
WATER VALVE	WV	
POST INDICATOR VALVE (PIV)		
FIRE DEPARTMENT CONNECTION (FDC)		
THRUST BLOCKING		
SANITARY SEWER STRUCTURE IDENTIFICATION		1

GENERAL NOTES-UTILITY

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE AND NCDOT STANDARDS, SPECIFICATIONS AND DETAILS.
2. INSTALL WATERMAINS WITH A COVER OF NO LESS THAN 3-FT.
3. INSTALL SEWER MAINS WITH A COVER OF NO LESS THAN 3-FT TO FINISH GRADE IN NON-TRAFFIC AREAS, 4-FT TO FINISH GRADE IN TRAFFIC AREAS..
4. INSTALL ALL UTILITIES TO PROVIDE REQUIRED CLEARANCES AS INDICATED IN THE SPECIFICATIONS.
5. WATERLINES AND SEWER MAINS SHALL BE INSTALLED WITH A MINIMUM HORIZONTAL CLEARANCE OF 10-FT.
6. SEWER MAINS SHALL BE INSTALLED WITH A MINIMUM VERTICAL CLEARANCE OF 24-IN TO STORM DRAINAGE PIPES.
7. COORDINATE AND SCHEDULE INSTALLATION OF ALL UTILITIES WITH OTHER PRIME CONTRACTORS, UTILITY COMPANIES AND OTHER TRADES INCLUDING BUT NOT LIMITED TO: NATURAL GAS, ELECTRICITY, TELEPHONE AND CATV.
8. VERIFY EXISTING CONDITIONS AND CONNECTIONS TO EXISTING UTILITIES PRIOR TO CONSTRUCTION. NOTIFY ARCHITECT IF ANY DISCREPANCIES ARE DISCOVERED.
9. CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGES DURING CONSTRUCTION AND SHALL MAKE REPAIRS AT NO EXPENSE TO THE OWNER.
10. ALL CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE NCSBC AND OSHA REQUIREMENTS.
11. THE CONTRACTOR SHALL PROVIDE AN AS-BUILT SURVEY OF ALL UTILITY AND STORM DRAINAGE IMPROVEMENTS FOLLOWING CONSTRUCTION.
12. CONTRACTOR SHALL PHASE DEMOLITION AND NEW CONSTRUCTION TO ENSURE UNINTERRUPTED ACCESS AND UTILITY SERVICE TO ADJACENT FACILITIES. COORDINATE SHORT-TERM, OFF-HOUR, TEMPORARY SHUT- DOWNS WITH THE OWNER.
13. SEE GENERAL NOTES ON EXISTING CONDITIONS AND DEMOLITION PLAN FOR REQUIREMENTS FOR REMOVAL AND PATCHING OF PAVEMENT FOR UTILITY INSTALLATION.
14. ALL ROOF DRAINS SHALL BE 6" PVC (SCH 40) @ 1.04% MIN. SLOPE UNLESS INDICATED OTHERWISE. USE DUCTILE IRON WHEN COVER IS LESS THAN 24-IN.
15. ALL SANITARY SEWER SERVICES SHALL BE 4" PVC (SCH 40) @1.04% MIN. SLOPE UNLESS INDICATED OTHERWISE. USE DUCTILE IRON WHEN COVER IS LESS THAN 24-IN.
16. ALL CONDENSATE LINES SHALL BE CONNECTED TO STORM DRAINAGE SYSTEM.
17. NO WORK SHALL BE PERFORMED ON RIGHT-OF-WAYS OR ADJACENT PROPERTIES UNTIL THE OWNER NOTIFIES CONTRACTOR IN WRITING OF PROCUREMENT OF APPROPRIATE PERMITS, EASEMENTS, AGREEMENTS, OR RIGHTS-OF-WAY.
18. ALL WATER SHALL BE TYPE 'K' SOFT COPPER.

UTILITY KEY NOTES

- (A) FIRE HYDRANT ASSEMBLY, SEE DETAIL SHEET C903.
- (B) THRUST BLOCKING, TYP, SEE DETAIL SHEET C904.
- (C) SANITARY SEWER MANHOLE, SEE DETAIL SHEET C904. SEE SANITARY SEWER PLAN AND PROFILE SHEETS FOR ADDITIONAL INFORMATION.
- (D) EXTEND UTILITY TO WITHIN 5'-0" OF BUILDING WALL OR AS INDICATED ON PLUMBING PLANS. REFER TO PLUMBING PLANS FOR LOCATION AND INVERTS.
- (E) EXTEND WATER MAIN TO 12-IN ABOVE FINISH FLOOR FOR FIRE PROTECTION/PLUMBING CONNECTION, SEE DETAIL SHEET C902. REFER TO TO FIRE PROTECTION/PLUMBING PLANS FOR EXACT LOCATION.
- (F) ROOFDRAIN CLEANOUT, SEE DETAIL SHEET C902.
- (G) 6-IN WILKINS 375DA REDUCED PRESSURE DETECTOR ASSEMBLY (RPDA), OR EQUAL FROM CORPUD LIST OF APPROVED ASSEMBLIES, WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C902 FOR ADDITIONAL INFORMATION. PROVIDE TAMPER SWITCHES ON ABOVE GRADE VALVES. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
- (H) 1.5" DOMESTIC WATER METER, SEE DETAIL SHEET C903.
- (J) GATE VALVE AND VALVE BOX, SEE DETAIL SHEET C903.
- (K) DOWNSPOUT CONNECTOR BOOT, SEE DETAIL SHEET C902.
- (L) POST INDICATOR VALVE W/ TAMPER SWITCH, SEE DETAIL SHEET C903 AND SPECS. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
- (M) 4-IN BALL VALVE (TRUCK WASH VALVE) IN CAST IRON BOX, SEE TRENCH DRAIN DETAIL SHEET C901.
- (N) TAPPING SLEEVE, VALVE AND BLOCKING ASSEMBLY SEE SPECIFICATIONS.
- (O) FIRE DEPARTMENT CONNECTION, SEE DETAIL SHEET C903.
- (P) 1.5-IN WILKINS 375A REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA), OR EQUAL FROM CORPUD LIST OF APPROVED ASSEMBLIES, WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C902 AND ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
- (Q) 1000/GAL OIL/WATER SEPARATOR, SEE DETAIL SHEET C904 AND SPECS.
- (T) APPROXIMATE LOCATION GAS METER. SEE MECHANICAL PLANS FOR ADDITIONAL INFORMATION. CONTRACTOR TO COORDINATE WITH GAS COMPANY FOR SERVICE LOCATION
- (U) SITE LIGHT POLE BY DUKE ENERGY (APPROXIMATE LOCATION). COORDINATE INSTALLATION & SCHEDULE WITH DUKE ENERGY.
- (Y) NEW SANITARY SEWER CLEANOUT, TYP. SEE DETAIL SHEET C904.
- (Z) 1.5" SERVICE SADDLE AND VALVE.

DRAINAGE STRUCTURE SCHEDULE

STRUCTURE NO. UP STRM	STRUCTURE NO. DN STRM	PIPE SLOPE (FT/FT)	PIPE DIA. (IN)	PIPE LENGTH (LF)	PIPE MATRL	UPPER INV. (FT)	LOWER INV. (FT)	UPSTREAM STRUCTURE DATA TOP ELEV (FT)	DEPTH (FT)	TYPE	NOTES
A4	A3	0.0110	15.00	91.00	RCP	354.50	353.50	357.70	3.20	DI	
A3	A2	0.0111	15.00	72.00	RCP	353.40	352.60	357.70	4.30	CB	
A2	A1	0.0552	15.00	96.00	RCP	352.50	347.10	358.00	5.50	CB	
A1	YI-4483	0.0830	18.00	26.50	RCP	347.00	344.80	351.50	4.50	MH	
A7	A6	0.0159	15.00	189.00	RCP	354.10	351.10	357.50	3.40	DI	
A6	A5	0.0145	15.00	83.00	RCP	351.00	349.80	355.20	4.20	CB	
A5	A1	0.0205	15.00	127.00	RCP	349.70	347.10	352.80	3.10	MH	
A8 (TD)	A6	0.0984	8.00	19.30	RCP	355.10	353.20	357.20	2.10	MH	

LEGEND		TOP ELEVATION DESCRIPTIONS	
CB	CATCH BASIN, SEE DETAIL SHEET C902	CB:	TOP OF HOOD
DI	DROP INLET, SEE DETAIL SHEET C902	DI, MH, TD:	TOP OF GRATE
MH	MANHOLE, SEE DETAIL SHEET C903		
RCP	REINFORCED CONCRETE PIPE, SEE SPECS		
TD	TRENCH DRAIN, SEE DETAIL SHEET C901		
(A2)	DRAINAGE STRUCTURE I.D. NUMBER		

1. NEW WATER AND SEWER SYSTEMS SHALL BE TESTED AND DISINFECTED IN ACCORDANCE WITH THE CITY OF RALEIGH STANDARD SPECIFICATION AND CONSTRUCTION DETAILS AND THE NC PLUMBING CODE.
2. NEW BACKFLOW PREVENTERS SHALL BE TESTED AND CERTIFIED PRIOR TO BEING PLACED INTO SERVICE.
3. INSTALLATION OF NEW WATER METERS AND PAYMENT OF ALL APPLICABLE FEES SHALL BE BY THE CONTRACTOR.

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval _____

City of Raleigh Review Officer

PRIVATE
SEWER COLLECTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION TO ITS PUBLIC SEWER SYSTEM AND EXTENSION OF THE PRIVATE SEWER COLLECTION SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT #_S-5209(P)_

AUTHORIZATION TO CONSTRUCT _____

DATE _____

GRAPHIC SCALE

MAGNETIC

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY: _____ _____ DATE: _____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: _____ DATE: _____
ADMINISTRATOR

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 36704 ENGINEER PAILLARD F. LAWSON
SE 4052

KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS	NO.	DATE	DESCRIPTION
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DESIGNED BY: TRO/PL
DRAWN BY: TRO
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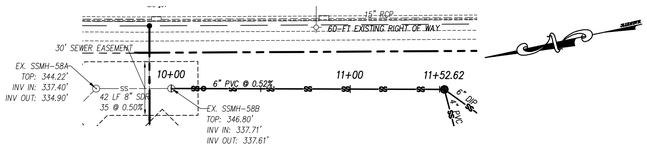
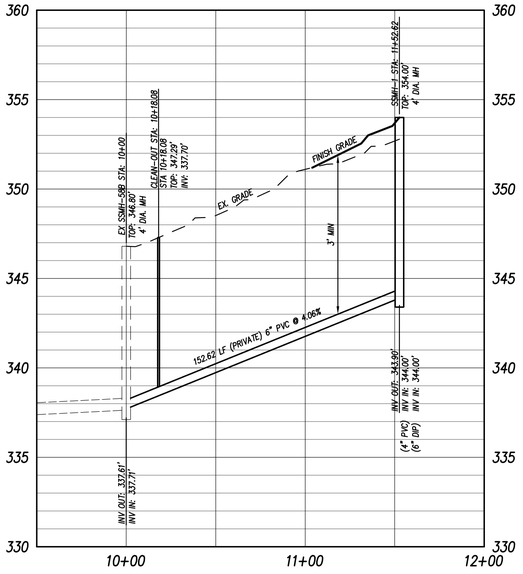
UTILITY PLAN

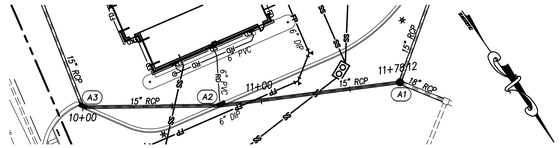
C501



PLAN
SCALE: 1"=40'



PROFILE (EX SSMH-58B TO SSMH-1)
HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'



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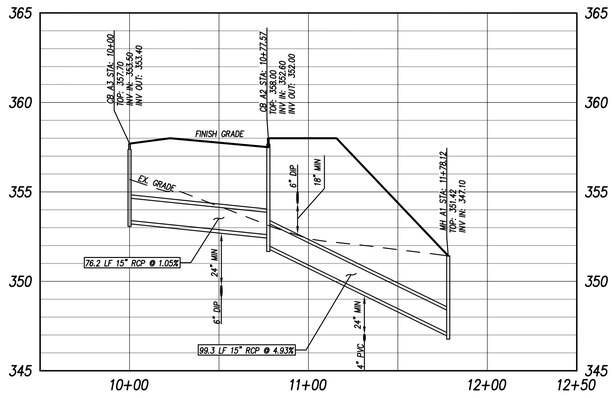

PROFILE (CB-A3 TO MH-A1)
HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

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ADMINISTRATOR

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AUTHORIZATION TO CONSTRUCT _____

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UTILITY LEGEND

	EXISTING	PROPOSED
CHILLED WATER	------CW------	CW
ELECTRICAL (OVERHEAD)	------ E ------	E
ELECTRICAL (UNDERGROUND)	------UE------	UE
FOUNDATION DRAIN (SEE ARCHITECTURAL)	------FD------	FD
GAS	------ G ------	G
SANITARY SEWER	------SS------	SS
TELEPHONE (OVERHEAD)	------ T ------	T
TELEPHONE (UNDERGROUND)	------UT------	UT
WATER	------ W ------	W
ROOF DRAIN	------RD------	RD
FIRE PROTECTION	------FP------	FP
STORM DRAIN	═══════	
TREE PROTECTION FENCING, SEE EROSION CONTROL PLANS		
LIGHT POLE	LP	
UTILITY POLE	PP	
MANHOLE	MH	
CLEAN OUT	CO	
DROP INLET,CATCH BASIN	DI, CB	
FIRE HYDRANT	FH	
WATER VALVE	WV	
POST INDICATOR VALVE (PIV)		
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THRUST BLOCKING		
SANITARY SEWER STRUCTURE IDENTIFICATION		1

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   A. A DISTANCE OF 100' SHALL BE MAINTAINED BETWEEN SANITARY SEWER AND ANY PRIVATE OR PUBLIC WATER SUPPLY SOURCE SUCH AS AN IMPOUNDED RESERVOIR USED AS A SOURCE OF DRINKING WATER. IF ADEQUATE LATERAL SEPARATION CANNOT BE ACHIEVED, FERROUS SANITARY SEWER PIPE SHALL BE SPECIFIED AND INSTALLED TO WATERLINE SPECIFICATIONS. HOWEVER, THE MINIMUM SEPARATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL.
   B. WHEN INSTALLING WATER AND OR SEWER MAINS, THE HORIZONTAL SEPARATION BETWEEN UTILITIES SHALL BE 10'. IF THIS SEPARATION CANNOT BE MAINTAINED DUE TO EXISTING CONDITIONS, THE VARIATION ALLOWED IS THE WATER MAIN IN A SEPARATE TRENCH WITH THE ELEVATION OF THE WATER MAIN AT LEAST 18" ABOVE THE TOP OF THE SEWER AND MUST BE APPROVED BY THE PUBLIC UTILITIES DIRECTOR. ALL DISTANCES ARE MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER.
   C. WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTHING A SANITARY SEWER PASSES OVER A WATER MAIN, DIP MATERIALS OR STEEL ENCASEMENT EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED AND INSTALLED TO WATERLINE SPECIFICATIONS.
   D. 5' MINIMUM HORIZONTAL SEPARATION IS REQUIRED BETWEEN ALL SANITARY SEWER AND STORM SEWER FACILITIES, UNLESS DIP MATERIAL IS SPECIFIED FOR SANITARY SEWER.
   E. MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATER MAIN AND RCP STORM DRAIN CROSSINGS; MAINTAIN 24" MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER AND RCP STORM DRAIN CROSSINGS. WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY DIP MATERIALS AND A CONCRETE CRADLE HAVING 6" MIN. CLEARANCE (PER CORPUD DETAILS W-41 AND S-49).
3. ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW AND APPROVAL OF AN AMENDED PLAN AND/OR PROFILE BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER AND SEWER SERVICE TO EXISTING RESIDENCES AND BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24-HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT.
5. 3' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS AND SEWER FORCE MAINS. 4' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS.
6. IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER AND SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT. THIS INCLUDES ABANDONING TAP AT MAIN AND REMOVAL OF SERVICE FROM ROW OR EASEMENT PER CORPUD HANDBOOK PROCEDURE.
7. INSTALL 4" DIP WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'X2' WATERLINE EASEMENT IMMEDIATELY ADJACENT.
8. INSTALL 4" PVC (SCH 40) SEWER SERVICES AT 1.0% MINIMUM GRADE, UNLESS INDICATED OTHERWISE, WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE AND SPACED EVERY 75 LF MAX. USE DUCTILE IRON WHEN COVER IS LESS THAN 24-IN.
9. PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80PSI; BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE.
10. ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ, USACE, AND/OR FEMA FOR ANY RIPARIAN BUFFER, WETLAND AND/OR FLOODPLAIN IMPACTS PRIOR TO CONSTRUCTION.
11. NCDOT ENCROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS AND SERVICE TAPS) WITHIN STATE ROW PRIOR TO CONSTRUCTION.
12. GREASE INTERCEPTOR/OIL WATER SEPARATOR SIZING CALCULATIONS AND INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE CORPUD FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT TIM BEASLEY AT (919)-996-2334 OR AT TIMOTHY.BEASLEY@RALEIGHNC.GOV FOR MORE INFORMATION.
13. CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX-B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA. THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST. THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT. CONTACT JOANIE HARTLEY AT (919)-996-5923 OR JOANIE.HARTLEY@RALEIGHNC.GOV FOR MORE INFORMATION.

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KNIGHTDALE
start something

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 36704 ENGINEER PAILARD F. LAWSON
SE 40523

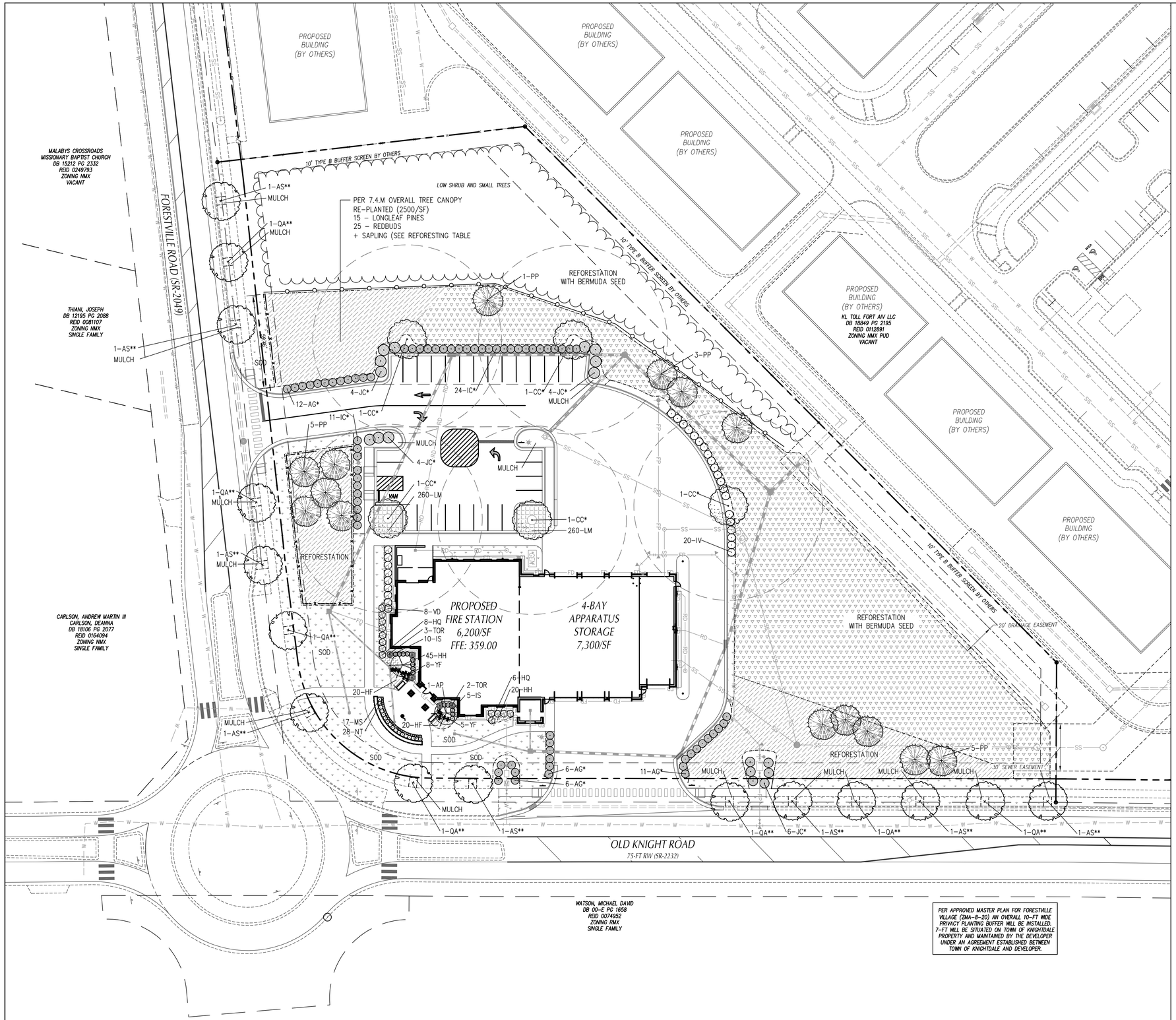
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

UTILITY PROFILES

C502



PER APPROVED MASTER PLAN FOR FORESTVILLE VILLAGE (ZMA-8-20) AN OVERALL 10-FT WIDE PRIVACY PLANTING BUFFER WILL BE INSTALLED. 7-FT WILL BE SITUATED ON TOWN OF KNIGHTDALE PROPERTY AND MAINTAINED BY THE DEVELOPER UNDER AN AGREEMENT ESTABLISHED BETWEEN TOWN OF KNIGHTDALE AND DEVELOPER.

GENERAL NOTES-LANDSCAPING

1. LOCATE ALL EXISTING UTILITIES PRIOR TO INSTALLATION OF PLANT MATERIAL. NOTIFY OWNER OF ANY DISCREPANCIES BETWEEN FIELD CONDITIONS AND THOSE SHOWN ON THE PLAN.
2. VERIFICATION OF TOTAL QUANTITIES AS SHOWN ON THE PLANT LIST SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND THE TOTAL QUANTITIES SHALL BE AS SHOWN ON THE PLAN.
3. ALL PLANT MATERIAL SHALL CONFORM WITH THE STANDARDS SET FORTH BY THE AMERICAN ASSOCIATION OF NURSERYMEN AND THE WRITTEN SPECIFICATIONS.
4. ALL PLANT MATERIAL (SHRUBS/TREES) SHALL BE A MINIMUM DISTANCE OF 4 1/2 FEET FROM BACK OF CURB, EXCEPT ALONG ANY NEW WALLS ADJACENT TO PARKING WHERE CURB STOPS WILL BE USED. ALL PLANTING BEDS TO BE MULCHED WITH A MINIMUM OF 3" OF MULCH
5. ALL PLANT GROUPINGS SHALL BE MULCHED AS ONE BED. 3" OF DYED BROWN DOUBLE SHREDDED HARDWOOD MULCH SHALL BE USED AROUND ALL PLANTINGS WITH THE EXCEPTION OF BUFFER PLANTINGS.
6. APPLY PRE-EMERGENT HERBICIDE TO ALL NEW PLANTING BEDS AT MANUFACTURER'S RECOMMENDED RATE PRIOR TO INSTALLATION OF MULCH.
7. ESTABLISH POSITIVE DRAINAGE IN ALL PLANTING BEDS AND AWAY FROM BUILDINGS.
8. DO NOT INSTALL PLANT MATERIAL IN IMPERVIOUS SOILS, (i.e. HOLES WHICH , WHEN FILLED WITH WATER, DO NOT COMPLETELY DRAIN WITHIN TWO HOURS.) SEE SPECIFICATIONS FOR TOPSOIL REQUIREMENTS.
9. LAWN AREAS SHALL BE SEEDED WITH RIVIERA OR SUNSTAR BERMUDA GRASS 95% COVERAGE (BASED ON A PER SQUARE YARD SAMPLE) SHALL BE ATTAINED PRIOR TO FINAL INSPECTION. SEE DETAIL SHEET FOR RATES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
10. CONTACT THE LANDSCAPE ARCHITECT FOR INSPECTION 48 HOURS IN ADVANCE OF THE SCHEDULED SITE VISIT AND AT THE FOLLOWING INTERVALS.
    - 10.1. REVIEW OF GRADING PRIOR TO PLANT AND LAWN INSTALLATION
    - 10.2. REVIEW OF PLANT MATERIAL PRIOR TO INSTALLATION.
    - 10.3. ONE SUBSTANTIAL COMPLETION MEETING FOR PLANT INSTALLATION.
    - 10.4. ONE FINAL INSPECTION FOR ALL SEEDING/PLANTING OPERATIONS.
11. THE TREE PROTECTION FENCE SHALL BE MAINTAINED ON THE SITE UNTIL ALL SITE WORK IS COMPLETED AND THE FINAL SITE INSPECTION PRIOR TO THE CERTIFICATE OF OCCUPANCY (CO) IS SCHEDULED. THE FENCING SHALL BE REMOVED PRIOR TO FINAL SITE INSPECTION FOR THE CO.
12. LANDSCAPE SUB-CONTRACTOR (UNDER GC CONTRACT) SHALL BE RESPONSIBLE FOR WATERING ALL PLANTS AND LAWN AREAS AT HIS COST FROM HIS OWN WATER SOURCE INCLUDING DURING PERIODS OF DROUGHT UNTIL THE PLANTS AND LAWN MEET FINAL COMPLETION. PLANT MATERIALS OR AREAS OF GRASS WHICH PERISH SHALL BE RE-ESTABLISHED BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
13. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING ALL EQUIPMENT & SUBCONTRACTORS AWAY FROM SEEDED AREAS. IF DAMAGE OCCURS, THROUGH NO FAULT OF THE OWNER, AREAS SHALL BE REGRADED AND RESEEDED IMMEDIATELY AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL WATER AND MAINTAIN THOSE AREAS UNTIL THEY ARE AT 95% COVERAGE AT FINAL COMPLETION.
14. SUBSTITUTIONS OF PLANT MATERIAL SHALL ONLY BE ACCEPTED 60 DAYS PRIOR TO COMMENCEMENT OF PLANTING OPERATIONS. SUBSTITUTION REQUESTS MUST BE IN WRITING AND WILL ONLY BE ACCEPTED FOR LACK OF AVAILABILITY REASONS WHICH CAN BE SUBSTANTIATED OR FOR SUPERIOR STOCK SUBSTITUTIONS.
15. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT TO REVIEW GRADING ONE WEEK PRIOR TO SEEDING. IF THE LANDSCAPE CONTRACTOR AND LANDSCAPE ARCHITECT FIND GRADING UNACCEPTABLE FOR FINAL SEEDING, LANDSCAPE CONTRACTOR SHALL BRING IT TO THE ATTENTION OF THE GENERAL CONTRACTOR. LANDSCAPE CONTRACTOR SHALL NOT PROCEED WITHOUT APPROVAL BY LANDSCAPE ARCHITECT.
16. IF CONFLICTS OCCUR BETWEEN WRITTEN SPECIFICATIONS AND THE DRAWINGS, THE WRITTEN SPECIFICATIONS SHALL PREVAIL.
17. GENERAL LAWN AREAS SHALL BE SEEDED WITH RIVIERA OR SUNSTAR BERMUDA. TIFTUF SOD SHALL BED USED FOR ALL SODDED AREAS. SEE PLAN FOR LIMITS.
18. ALL 3:1 SLOPES SHALL BE STABILIZED WITH "NO-MOW" NATURALIZED SEED MIX AND EROSION CONTROL MATTING.
19. ALL FOUNDATION SHRUBS AND TREES TO BE PLANTED A MINIMUM OF 5'-FT FROM BUILDING WALL. NOTIFY LANDSCAPE ARCHITECT FOR ANY DISCREPANCIES.
20. INSTALL PERMANENT SEEDING ALONG ALL ROADSIDE DITCHES AND CHANNELS WITHIN CONSTRUCTION LIMITS OF PROJECT. SEE EROSION CONTROL PLANS FOR ADDITIONAL INFORMATION.

PLANT LIST

KEY	QTY	PLANT NAME	MIN. SIZE	REMARKS	NATIVE
PARKING LOT SHADE TREES (4) **STREET TREES SP @ 40' O.C. (15) *CREDITED FOR PARKING LOT INTERIORS AND OVERALL TREE CANOPY (***)					
QA**	7	SAWTOOTH OAK *Quercus acutissima*	2.5" CAL. 12'-14' HT MIN.	B&B, STRAIGHT TRUNK FULL TO GROUND	Y
AS**	8	SUGAR MAPLE 'BONFIRE' *Acer saccharum 'Bonfire'*	2.5" CAL. 12'-14' HT	B&B, STRAIGHT TRUNK FULL CROWN	Y
CC*	5	AMERICAN HORNBEAM *Carpinus caroliniana*	2.5" CAL. 12'-14' HT.	B&B, STRAIGHT TRUNK FULL CROWN	Y
PP***	28	LONGLEAF PINE *Pinus palustris*	1.5" CAL. 10' HT.	B&B, STRAIGHT TRUNK FULL CROWN	Y
UNDERSTORY TREES					
AP	2	CORAL BARK MAPLE *Acer palmatum 'Sangu Kaku'*	1.25" CAL. MIN. 6' HT MIN.	FULL CROWN MATCHED SPECIMENS	
CCC***	25	EASTERN REDBUD *Cercis canadensis*	1.25" CAL. MIN. 6' HT MIN.	FULL CROWN MATCHED SPECIMENS	Y
SHRUBS			*SHRUBS REQUIRED FOR SCREENING		
AG*	36	RADIANCE ABELIA *Abelia x grandiflora 'Radiance'*	18" HT.	#03 CONT., FULL AS SHOWN	
JC*	17	SEA GREEN JUNIPER *Juniperus chinensis 'Sea Green'*	18" HT.	#03 CONT., FULL AS SHOWN	
IC*	35	SOFT TOUCH JAPANESE HOLLY *Ilex crenata 'Soft Touch'*	18" HT.	#03 CONT., FULL AS SHOWN	
VD	8	ARROWWOOD VIBURNUM *Viburnum dentatum 'Christom'*	18"-24" SPR.	#3 CONT., FULL AS SHOWN	Y
TOR	5	RHEINGOLD ARBORVITAE *Thuja occidentalis 'Rheingold'*	18"-24" SPR.	#03 CONT., FULL AS SHOWN	Y
HQ	14	OAKLEAF HYDRANGEA *Hydrangea quercifolia 'Pee wee'*	18"-24" SPR.	#03 CONT., FULL AS SHOWN	Y
IS	15	SCORPIO ANISE *Illicium 'Scorpio'*	18" HT.	#03 CONT., FULL AS SHOWN	Y
YF	13	COLOR GUARD YUCCA *Yucca filamentosa 'Color Guard'*	18" HT.	FULL PLANTS	Y
HH	65	HAPPY RETURNS DAYLILY *Hemerocallis Happy Returns*	12" HT.	FULL PLANTS SPACING 12" O.C.	Y
HF	40	SUNBURST ST. JOHN'S WORT *Hypericum frondosum 'Sunburst'*	12" HT.	FULL PLANTS SPACING 18" O.C.	Y
IV	20	HENRY'S GARNET VIRGINIA SWEETSPIRE *Itea virginica 'Henry Garnet'*	18" HT.	FULL PLANTS	Y
GROUNDCOVERS					
LM	520	BIG BLUE LIRIOPE *Liriope muscari 'Big Blue'*	#1 CONT.	SPACING 12" O.C.	
GRASSES (PLANTING BED MUST CONTAIN 18" TO 20" OF TOPSOIL)					
MS	17	MORNING LIGHT MISCANTHIS *Miscanthus sinensis 'Morning Light'*	24" HT.	FULL PLANTS #03 CONTAINER	
NT	28	MEXICAN FEATHER GRASS *Nassella tenuissima*	12" HT.	FULL PLANTS SP 12" O.C. #03 CONTAINER	

REFORESTATION AREA WITH PINE STRAW MULCH	
REFORESTATION AREA WITH BERMUDA SEED	
SOD - TIFTUF	

ALL AREAS DISTURBED BUT NOT DELINEATED SHALL BE SEEDED WITH BERMUDA AS BASE BID WORK. SEE C803 FOR ADDITIONAL INFORMATION.

MAGNETIC

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY:_____ _____ DATE:_____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY:_____ DATE:_____
ADMINISTRATOR

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT No.2045 JOY R. DEESE SEAL 2045

KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

LANDSCAPE PLAN

C601

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during *construction, selecting from the NC DWR List of Approved PAMS/Flocculants.*
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the NC DWR List of Approved PAMS/Flocculants and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

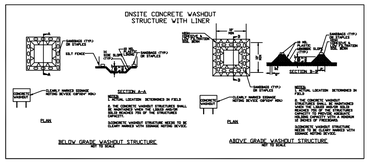
PORTABLE TOILETS

1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

EARTHEN STOCKPILE MANAGEMENT

1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

NORTH CAROLINA Environmental Quality



CONCRETE WASHOUTS

1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those un-attended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDOs)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a) of this permit of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be documented in the manner described:

Item to Document	Documentation Requirements
(a) Each E&SC Measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC Plan.	Initial and date each E&SC Measure on a copy of the approved E&SC Plan or complete, date and sign an inspection report that lists each E&SC Measure shown on the approved E&SC Plan. This documentation is required upon the initial installation of the E&SC Measures or if the E&SC Measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC Plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC Plan.	Initial and date a copy of the approved E&SC Plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC Measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC Measures.	Initial and date a copy of the approved E&SC Plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation

In addition to the E&SC Plan documents above, the following items shall be kept on the site
and available for agency inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This general permit as well as the certificate of coverage, after it is received.

(b) Records of inspections made during the previous 30 days. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

(c) All data used to complete the Notice of Intent and older inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that must be reported

Permittees shall report the following occurrences:
(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(a) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(b) Anticipated bypasses and unanticipated bypasses.

(c) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

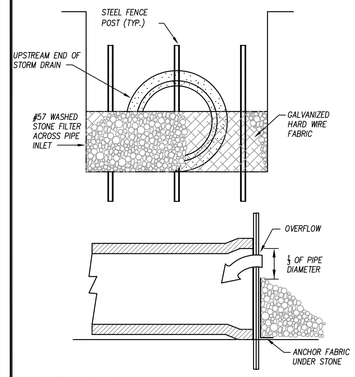
After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Division's Emergency Response personnel at (800) 662-7956, (800) 858-0368 or (919) 733-3300.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours,*** an oral or electronic notification. • ***Within 7 calendar days,*** a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours,*** an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible.*** The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours,*** an oral or electronic notification. • ***Within 7 calendar days,*** a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours,*** an oral or electronic notification. • ***Within 7 calendar days,*** a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

NORTH CAROLINA Environmental Quality

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19



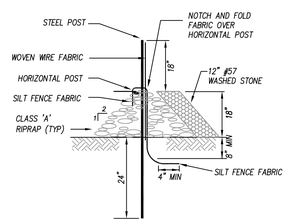
MAINTENANCE NOTES:

1. *ALL OPEN STORM DRAIN PIPES SHALL BE PROTECTED AFTER STOPPAGE OF WORK EACH DAY AS ILLUSTRATED.*
2. *ACCUMULATED SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED OF AND THE TRENCH BOTTOM REGRADED AND COMPACTED IN ACCORDANCE W/ SPECIFICATIONS PRIOR TO CONTINUANCE OF LAYING PIPE.*

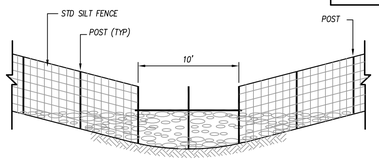
PROTECTION OF STORM DRAIN UNDER CONSTRUCTION

MAINTENANCE NOTES:

1. *REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE/OUTLET. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT. REMOVE & REPLACE STONE AS NECESSARY AS IT BECOMES CLOGGED WITH SEDIMENT.*
2. *REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.*



SECTION

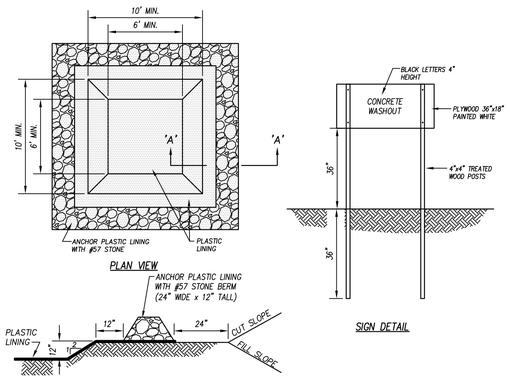


NOTES:

1. *INSTALL SILT FENCE PER STD. SILT FENCE DETAIL.*
2. *LOCATE REINFORCED OUTLET AT LOW POINTS OF SILT FENCE BARRIER.*

ELEVATION

REINFORCED SILT FENCE OUTLET N.T.S.



PLAN VIEW

SIGN DETAIL

SECTION A–A

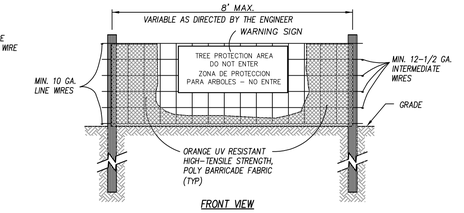
NOTES:

1. *LOCATE WASH-OUT AREA IN LOCATIONS SHOWN ON C4.1 AND AT LEAST 50' FROM OPEN WATERS AND DRAINAGE INLETS.*
2. *LINE WASH OUT PIT WITH LINER OF 8-MIL LAMINATED PLASTIC GEOTEXTILE FABRIC (DURA-SKRIM 8BW OR APPROVED EQUAL).*
3. *PROPERLY DISPOSE OF DRIED CONCRETE AND RESTORE AREA TO FINAL GRADES AND SURFACES AT COMPLETION OF CONSTRUCTION.*

MAINTENANCE NOTES:

1. *INSPECT AREA REGULARLY AND MAKE REPAIRS PROMPTLY.*
2. *ENSURE CONCRETE IS BEING CAPTURED AND LINER REMAINS ANCHORED.*
3. *REMOVE DRIED CONCRETE AND RESTORE PIT BEFORE CAPACITY IS EXCEEDED.*
4. *REPLACE OR PATCH IMPERVIOUS LINER THAT BECOMES DAMAGED. RE-ANCHOR LINER AS NEEDED.*

CONCRETE WASHOUT AREA



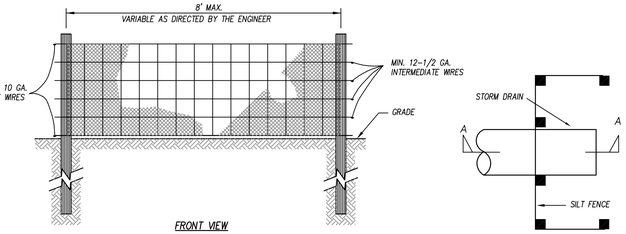
SIDE VIEW *FRONT VIEW*

NOTES:

1. *INSTALL TREE PROTECTION FENCING PRIOR TO PERFORMING ANY CLEARING OF THE SITE.*
2. *WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.*
3. *LETTERS TO BE 3" HIGH MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.*
4. *SIGNS SHALL BE PLACED AT 100' MAXIMUM INTERVALS. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 100' ON CENTER THEREAFTER.*
5. *FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.*
6. *ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.*
7. *MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.*
8. *TREE PROTECTION FENCE MUST BE ON ITS OWN POLE, SEPARATE FROM SILT FENCE.*

WARNING SIGN DETAIL

TEMPORARY TREE PROTECTION FENCE N.T.S.



FRONT VIEW

PLAN

SIDE VIEW

SECTION A–A

SILT FENCE AT PIPE INLET/OUTLET

STANDARD TEMPORARY SILT FENCE N.T.S.

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY:_____ DATE:_____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY:_____ DATE:_____
ADMINISTRATOR

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036704 RILLARD F. LAWSON 04-05-23

KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

EROSION CONTROL DETAILS

C701

CONSTRUCTION SPECIFICATIONS:

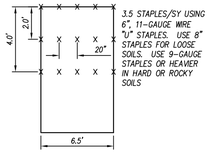
1. REMOVE AND PROPERLY DISPOSE OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIALS.
2. ENSURE THAT THE MINIMUM CONSTRUCTED CROSS SECTION MEETS ALL DESIGN REQUIREMENTS.
3. ENSURE THAT THE TOP OF THE DIKE IS NOT LOWER AT ANY POINT THAN THE DESIGN ELEVATION PLUS THE SPECIFIED SETTLEMENT.
4. PROVIDE SUFFICIENT ROOM AROUND DIVERSIONS TO PERMIT MACHINE REGRADING AND CLEANOUT.
5. VEGETATE THE RIDGE IMMEDIATELY AFTER CONSTRUCTION, UNLESS IT WILL REMAIN IN PLACE LESS THAN 30 WORKING DAYS.
6. APPLY SOLID PLASTIC (BLACK, 20 MIL) LINING ON SURFACE OF DIVERSION DITCH ON ANY SLOPES GREATER THAN 10% ENTERING BASINS/PONDS.

MAINTENANCE NOTES:

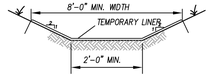
1. INSPECT TEMPORARY DIVERSIONS ONCE A WEEK AND AFTER EVERY RAINFALL.
2. IMMEDIATELY REMOVE SEDIMENT FROM THE FLOW AREA AND REPAIR DIVERSION DITCH.
3. INSPECT AND MAKE TIMELY REPAIRS AS NEEDED.

MATTING INSTALLATION NOTES:

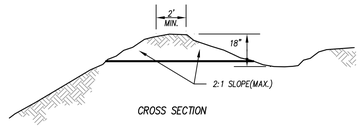
1. INSTALL TEMPORARY CHANNEL MATTING IN ALL DIVERSION SWALES OR OTHER GRASSED AREAS OF CONCENTRATED STORMWATER FLOW DURING BOTH TEMPORARY AND PERMANENT GRASS ESTABLISHMENT. ALL TEMPORARY MATTING SHALL BE EXCELSIOR MATTING UNLESS NOTED OTHERWISE ON THE EROSION CONTROL PLAN.
2. SEE SPECIFICATIONS FOR TEMP. LINING REQUIREMENTS.
3. PREPARE SOIL BEFORE INSTALLING MATS OR NETS, INCLUDING APPLICATION OF LIME, FERTILIZER AND SEED.
4. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE NET OR MAT IN A 6" DEEP TRENCH, BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
5. ROLL CENTER MAT OR NET IN DIRECTION OF WATER FLOW ON BOTTOM OF CHANNEL.
6. PLACE MAT OR NET END OVER END (SHINGLE STYLE) WITH A 6" OVERLAP. USE DOUBLE ROW OF STAGGERED STAPLES 4" APART TO SECURE.
7. FULL LENGTH EDGE OF MAT OR NET AT TOP SIDE SLOPES SHALL BE ANCHORED IN 6" DEEP TRENCH AFTER STAPLING.
8. MATS OR NETS SHALL BE OVERLAPPED 4" OVER THE CENTER BLANKET AND STAPLED.
9. THE TERMINAL END OF THE MAT OR NET MUST BE ANCHORED IN A 6" DEEP TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.



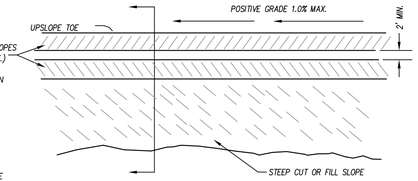
TEMPORARY MAT STAPLE PATTERN
NTS



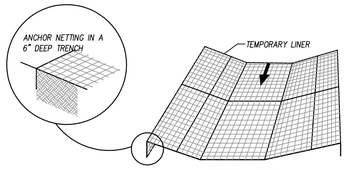
TEMP. PLASTIC LINING
NTS



CROSS SECTION



PLAN VIEW



CHANNEL LINER

DIVERSION DITCH SCHEDULE

CHANNEL	BOTTOM WIDTH (FT)	SIDE SLOPE (h:v)	CHANNEL GRADE	CHANNEL LENGTH	PERM. LINING	TEMP. LINING	MIN. TOP WIDTH OF LINING (FT)	RIPRAP DEPTH (IN)
DIV-1	0	3:1	1.21%	206 LF	GRASS	EXCELSIOR	6	N/A

TEMPORARY DIVERSION DITCH / BERM N.T.S.

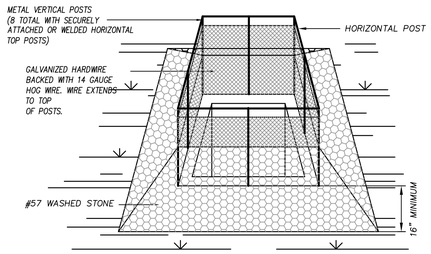
MAINTENANCE NOTES:

1. INSPECT THE BARRIER AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL AND MAKE REPAIRS AS NEEDED.
2. REMOVE SEDIMENT AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR SUBSEQUENT RAINS.
3. APPROPRIATELY STABILIZE ALL BARE AREAS AROUND THE INLET.

NOTE:
TEMPORARY INLET PROTECTION MAY BE SUBSTITUTED WITH A PROPERLY SIZED FILTREXX COMPOST SOCK OR APPROVED EQUAL IN ACCORDANCE WITH STATE AND LOCAL REQUIREMENTS.

NOTES:

1. PLACE CONCRETE BLOCKS LENGTHWISE ON THEIR SIDES IN A SINGLE ROW AROUND THE PERIMETER OF THE INLET WITH THE ENDS OF ADJACENT BLOCKS ABUTTING. THE HEIGHT OF THE BLOCKS SHALL BE 12".
2. WIRE MESH OR HARDWARE CLOTH SHALL BE PLACED OVER THE OUTSIDE VERTICAL FACE (WEBBING) OF THE BLOCKS, TO PREVENT STONE FROM BEING WASHED THROUGH THE HOLES IN THE BLOCKS.
3. #57 WASHED STONE SHALL BE PILED AGAINST THE WIRE TO THE TOP OF THE BLOCK.
4. MAINTAIN DEVICE AFTER EACH RAIN. REPLACE #57 WASHED STONE IF IT CLOGS W/ SEDIMENT.
5. PLACE 1"x4" BOARDS THROUGH THE HOLES OF CORNER BLOCKS.



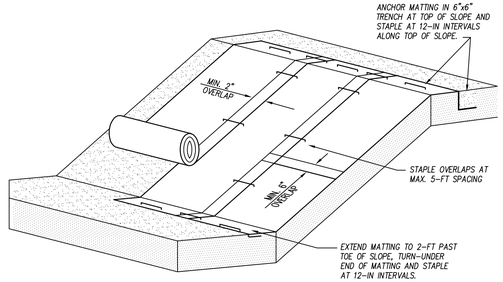
CATCH BASIN AND YARD INLET PROTECTION N.T.S.

MAINTENANCE NOTES:

1. INSPECT MATTING AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2-IN OR GREATER) RAINFALL AND REPAIR IMMEDIATELY AS NEEDED.
2. ENSURE GOOD CONTACT WITH SOIL SURFACE IS MAINTAINED AND EROSION DOES NOT OCCUR BENEATH MATTING.
3. AREAS OF MATTING THAT ARE DAMAGED OR WHERE NOT IN CLOSE CONTACT WITH THE SOIL SHALL BE REPAIRED AND STAPLED.
4. IF EROSION OCCURS DUE TO POORLY CONTROLLED DAMAGE, THE PROBLEM SHALL BE FIXED AND THE ERODED AREAS PROTECTED.
5. MONITOR AND REPAIR MATTING AS NECESSARY UNTIL GROUND COVER IS ESTABLISHED.

NOTES:

1. SLOPE SURFACE SHALL BE SMOOTH PRIOR TO PLACEMENT OF MATTING TO ENSURE PROPER SOIL CONTACT.
2. LIME, FERTILIZE, AND SEED PRIOR TO PLACING MATTING. PLANT SHRUBS, TREES, ETC. FOLLOWING PLACEMENT OF MATTING.
3. ON SLOPES FLATTER THAN 4:1, ROLLS MAY BE PLACED IN HORIZONTAL STRIPS.
4. DO NOT STRETCH MATTING TIGHT. ALLOW ROLLS TO CONFORM TO ANY IRREGULARITIES.
5. INSTALL STAPLES IN PATTERNS AS RECOMMENDED BY MATTING MANUFACTURER.



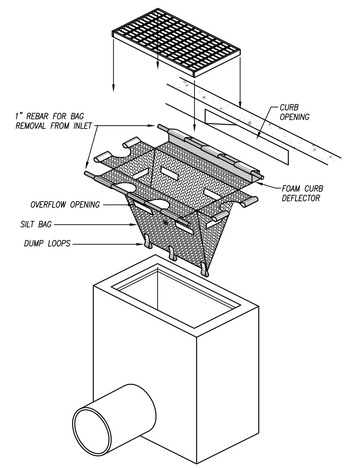
SLOPE PROTECTION MATTING N.T.S.

NOTES:

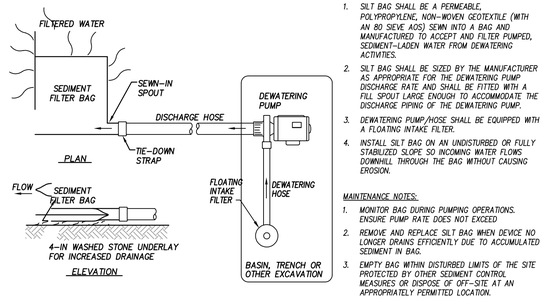
1. CONTRACTOR TO INSPECT SILT BAG EVERY TWO WEEKS OR AFTER EVERY SUBSTANTIAL RAIN EVENT.
2. CONTRACTOR TO REMOVE AND DISPOSE OF COLLECTED SILT AT AN ACCEPTABLE OFF SITE LOCATION.
3. COLLECTED SEDIMENT TO BE REMOVED ROUTINELY TO ENSURE FUNCTIONALITY OF SILT BAG.
4. DEVICE SHALL BE MANUFACTURED FROM WOVEN POLYPROPYLENE GEOTEXTILE TO FIT THE OPENING OF A CATCH BASIN OR DROP INLET TO FILTER SEDIMENT FROM RUNOFF ENTERING THE INLET. DEVICE SHALL BE PROVIDED WITH AN INTEGRAL CURB DEFLECTOR IF INSTALLED AT A CATCH BASIN WITH A VERTICAL OPENING ADJACENT TO A HORIZONTAL GRATE.
5. THE DEVICE SHALL BE A HIGH FLOW "SILTSACK" AS MANUFACTURED BY ACF ENVIRONMENTAL, INC. OR APPROVED EQUAL.
6. INSTALL DEVICE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND INSTALL A CURB DEFLECTOR IF APPROPRIATE.
7. INSPECT DEVICE AFTER EACH RAIN EVENT AND AT INTERVALS NOT EXCEEDING TWO WEEKS DURING CONSTRUCTION. REMOVE, EMPTY, CLEAN, AND REPLACE THE DEVICE AS NEEDED DURING CONSTRUCTION. EMPTY COLLECTED SEDIMENT IN APPROVED, PROTECTED LOCATION. REMOVE AND DISPOSE OF DEVICE FOLLOWING FULL AND PERMANENT STABILIZATION OF THE CONTRIBUTING DRAINAGE AREA.

MAINTENANCE NOTES:

1. INSPECT THE BARRIER AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL AND MAKE REPAIRS AS NEEDED.
2. REMOVE SEDIMENT AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR SUBSEQUENT RAINS.
3. APPROPRIATELY STABILIZE ALL BARE AREAS AROUND THE INLET.



SILT BAG INLET PROTECTION N.T.S.



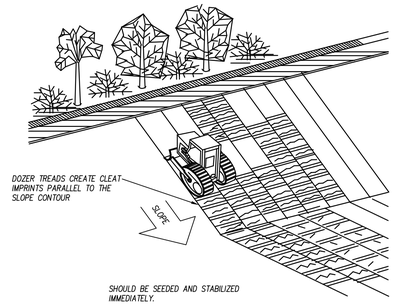
CONSTRUCTION NOTES:

1. SILT BAG SHALL BE A PERMEABLE, POLYPROPYLENE, NON-WOVEN GEOTEXTILE (WITH AN 80 SIEVE AOS) SEWN INTO A BAG AND MANUFACTURED TO ACCEPT AND FILTER PUMPED, SEDIMENT-LADEN WATER FROM DEWATERING ACTIVITIES.
2. SILT BAG SHALL BE SIZED BY THE MANUFACTURER AS APPROPRIATE FOR THE DEWATERING PUMP DISCHARGE RATE AND SHALL BE FITTED WITH A FILL SPOUT LARGE ENOUGH TO ACCOMMODATE THE DISCHARGE PIPING OF THE DEWATERING PUMP.
3. DEWATERING PUMP/HOSE SHALL BE EQUIPPED WITH A FLOATING INTAKE FILTER.
4. INSTALL SILT BAG ON AN UNDISTURBED OR FULLY STABILIZED SLOPE SO INCOMING WATER FLOWS DOWNHILL THROUGH THE BAG WITHOUT CAUSING EROSION.

MAINTENANCE NOTES:

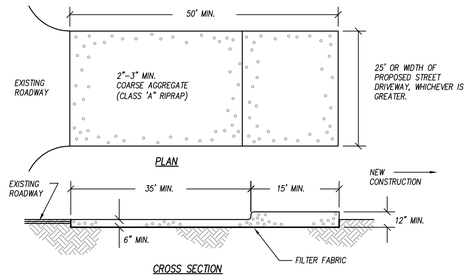
1. MONITOR BAG DURING PUMPING OPERATIONS. ENSURE PUMP RATE DOES NOT EXCEED
2. REMOVE AND REPLACE SILT BAG WHEN DEVICE NO LONGER DRAINS EFFICIENTLY DUE TO ACCUMULATED SEDIMENT IN BAG.
3. EMPTY BAG WITHIN DISTURBED LIMITS OF THE SITE PROTECTED BY OTHER SEDIMENT CONTROL MEASURES OR DISPOSE OF OFF-SITE AT AN APPROPRIATELY PERMITTED LOCATION.

DEWATERING SEDIMENT FILTER BAG N.T.S.



MAINTENANCE NOTE:
PERIODICALLY CHECK THE SEEDED SLOPES FOR RILLS AND WASHES. FILL THESE AREAS SLIGHTLY ABOVE THE ORIGINAL GRADE, THEN RESEED AND MULCH AS SOON AS POSSIBLE.

SLOPE TRACKING N.T.S.



CROSS SECTION

NOTES:

1. ENTRANCE(S) SHALL BE LOCATED TO PROVIDE MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES.
2. TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS SHALL TO BE PROVIDED.
3. ENTRANCES MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY. CONTRACTOR SHALL MAINTAIN AS NECESSARY.
4. ANY MATERIAL WHICH STILL MAKES IT ONTO THE ROAD MUST BE CLEANED UP IMMEDIATELY.
5. FREQUENT CHECKS OF THE ENTRANCE(S) AND TIMELY MAINTENANCE SHALL BE PROVIDED.
6. NOTES ARE APPLICABLE AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED.

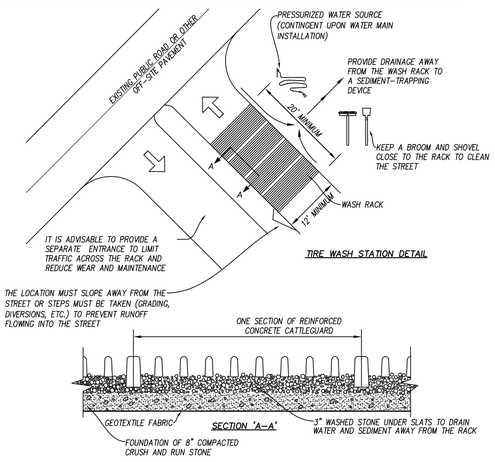
MAINTENANCE NOTES:

1. MAINTAIN THE GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE SITE. MAY REQUIRE PERIODIC TOPDRESSING WITH 2-INCH STONE.
2. AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY.
3. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED OR TRACKED ONTO PUBLIC ROADWAYS.

CONSTRUCTION SPECIFICATIONS:

1. CLEAR THE ENTRANCE AND EXIT AREA OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL AND PROPERLY GRADE IT.
2. PLACE THE GRAVEL TO THE SPECIFIC GRADE AND DIMENSIONS SHOWN ON THE PLANS, AND SMOOTH IT.
3. PROVIDE DRAINAGE TO CARRY WATER TO A SEDIMENT TRAP OR SUITABLE OTHER OUTLET.
4. USE GEOTEXTILE FABRIC TO IMPROVE STABILITY OF THE FOUNDATION IN LOCATIONS SUBJECT TO SEEPAGE OR HIGH WATER TABLE.

CONTRACTOR SHALL USE TIRE WASH STATION TO PREVENT SEDIMENT FROM TRACKING ONTO THE ROAD IF CONSTRUCTION ENTRANCE IS FOUND INSUFFICIENT AT NO ADDITIONAL COST TO OWNER.



TIRE WASH STATION DETAIL

GRAVEL CONSTRUCTION ENTRANCE N.T.S.

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY:_____ DATE:_____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY:_____ DATE:_____
ADMINISTRATOR

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KNIGHTDALE start something

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036704 ENGINEER BALLARD F. LAWSON
SEALED 4-05-23

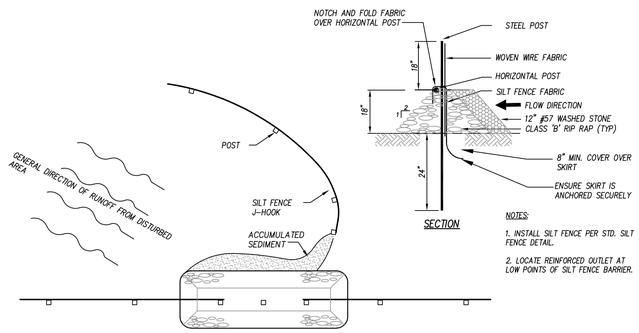
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

EROSION CONTROL DETAILS

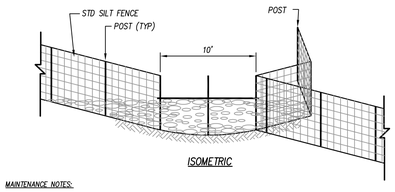
C702



NOTES:

1. INSTALL SILT FENCE PER STD. SILT FENCE DETAIL.
2. LOCATE REINFORCED OUTLET AT LOW POINTS OF SILT FENCE BARRIER.

PLAN VIEW REINFORCED SILT FENCE WITH J-HOOK OUTLET



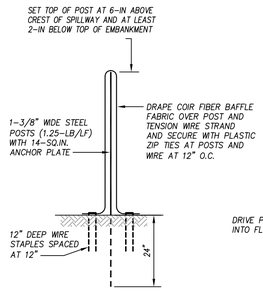
ISOMETRIC

MAINTENANCE NOTES:

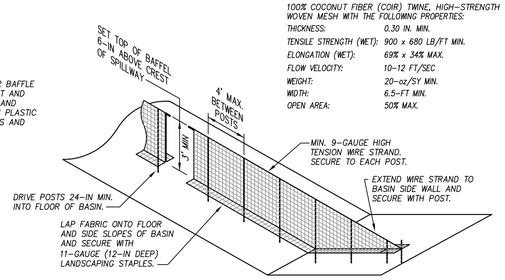
1. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE/OUTLET. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT. REMOVE & REPLACE STONE AS NECESSARY AS IT BECOMES CLOGGED WITH SEDIMENT.

   REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND
2. STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

TEMPORARY REINFORCED SILT FENCE J-HOOK INSTALLATION N.T.S.



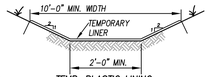
BAFFLE SECTION



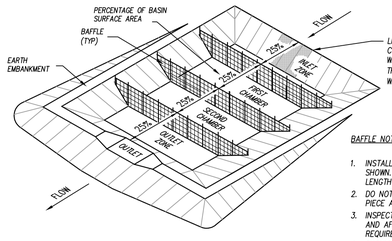
BAFFLE INSTALLATION

BAFFLE FABRIC:
100% COCONUT FIBER (COIR) TWINE, HIGH-STRENGTH WOVEN MESH WITH THE FOLLOWING PROPERTIES:

THICKNESS:	0.30 IN. MIN.
TENSILE STRENGTH (WET):	900 x 680 LB/FT MIN.
ELONGATION (WET):	69% x 34% MAX.
FLOW VELOCITY:	10-12 FT/SEC
WEIGHT:	20-oz/SY MIN.
WIDTH:	6.5-FT MIN.
OPEN AREA:	50% MAX.



TEMP. PLASTIC LINING
NTS



LINE SLOPES WHERE DIVERSION DITCH OR OTHER CONCENTRATED FLOW DISCHARGES INTO BASIN WITH WOVEN UV PROTECTED IMPERMEABLE 10-MIL THICK MIN. GEOTEXTILE FABRIC (10-FT MIN. WIDTH)

BAFFLE NOTES:

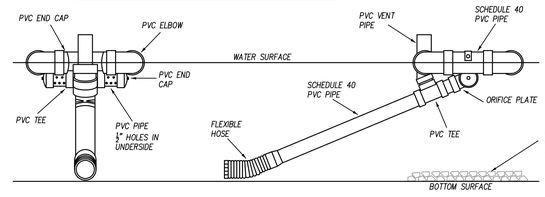
1. INSTALL AT LEAST 3 BAFFLES SPACED AS SHOWN. BASINS LESS THAN 20-FT IN LENGTH MAY USE 2 BAFFLES.
2. DO NOT SPLICE FABRIC. USE CONTINUOUS PIECE ACROSS THE BASIN.
3. INSPECT BAFFLES AT LEAST ONCE PER WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
4. SHOULD BAFFLE FABRIC COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE PROMPTLY.
5. TAKE CARE TO AVOID DAMAGE TO BAFFLES DURING PERIODIC SEDIMENT REMOVAL. REPAIR ANY DAMAGE AS NEEDED.

BAFFLE PLACEMENT

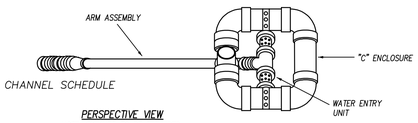
TEMPORARY BASIN BAFFLES N.T.S.

NOTES:

1. SKIMMER IS TO BE A SURFACE DEWATERING DEVICE SUCH AS BMP SKIMMER OR APPROVED DEVICE.
2. SKIMMER SHOULD RISE TO LEVEL OF WEIR HEIGHT IN TEMPORARY BASIN OR TO RISER INLET.
3. ROPE ATTACHED TO SKIMMER TO HELP KEEP CLEAN.

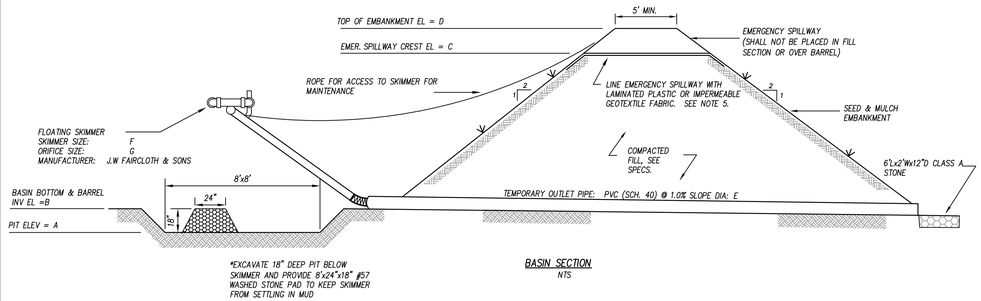


END VIEW FRONT VIEW



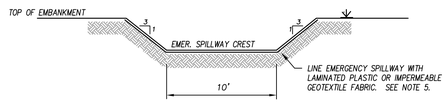
PERSPECTIVE VIEW
NOTE: SKIMMER TO BE TETHERED

TEMPORARY SKIMMER N.T.S.



*EXCAVATE 18" DEEP PIT BELOW SKIMMER AND PROVIDE 8'x24"x18" #57 WASHED STONE PAD TO KEEP SKIMMER FROM SETTLING IN MUD

BASIN SECTION
NTS



EMERGENCY SPILLWAY SECTION

BASIN NUMBER	A (FT) PIT ELEV	B (FT) BASIN BOTTOM	C (FT) EMERG. SPILLWAY	D (FT) EMBANK. TOP	E (IN) OUTLET PIPE DIA.	F (IN) SKIMMER SIZE	G (IN) ORIFICE DIA.
1	249.50	251.00	256.00	258.00	4	1.5	1.5

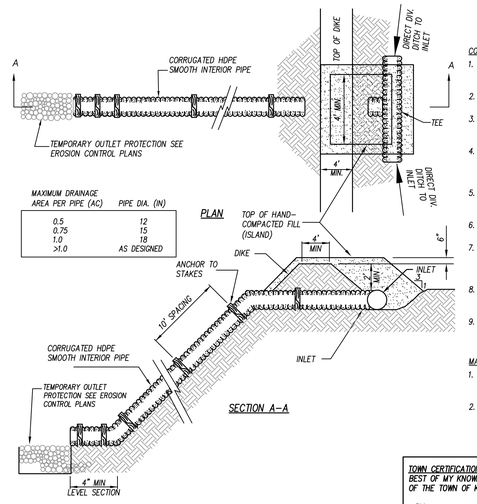
CONSTRUCTION NOTES:

1. PLACE TEMPORARY SEDIMENT CONTROL MEASURES BELOW BASIN AS INDICATED. CLEAR, GRUB AND STRIP THE AREA UNDER THE EMBANKMENT OF ALL VEGETATION AND ROOT MAT. REMOVE ALL SURFACE SOILS CONTAINING HIGH AMOUTS OF ORGANIC MATTER.
2. PLACE OUTLET BARREL ON A FIRM, SMOOTH FOUNDATION OF IMERVIOUS SOIL. DO NOT USE PERVIOUS MATERIAL SUCH AS SAND, GRAVEL OR CRUSHED STONE AS BACKFILL AROUND PIPE. PLACE FILL MAERIAL AROUND PIPE IN 4-IN LAYERS AND COMPACT IT UNDER AND AROUND THE PIPE TO AT LEAST 90% OF THE STANDARD PROCTOR DENSITY. CARE SHALL BE TAKEN TO NOT RAISE THE PIPE FROM FIRM CONTACT WITH ITS FOUNDATION.
3. ASSEMBLE THE SKIMMER IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. ATTACH SKIMMER TO BARREL PIPE WITH FLEXIBLE JOINT AND POSITION THE SKIMMER OVER THE EXCAVATED PIT. ATTACH A ROPE TO THE SKIMMER AND ANCHOR IT TO THE SIDE OF THE BASIN.
4. EMBANKMENT SHALL BE CONSTRUCTED OF CLEAN STRUCTURAL SOIL, FREE OF ROOTS, VEGETATION, ROCKS & OTHER OBJECTIONABLE MATERIAL. SCARIFY SURFACES BEFORE PLACING FILL. PLACE FILL IN 6-8 INCH LOOSE LIFTS. COMPACT TO AT LEAST 90% OF THE STANDARD PROCTOR DENSITY.
5. LINE THE ENTIRE EMERGENCY SPILLWAY WITH LAMINATED PLASTIC OR IMPERMEABLE GEOTEXTILE FABRIC. FABRIC SHALL BE WIDE ENOUGH TO COVER THE BOTTOM AND SIDES OF THE SPILLWAY AND EXTEND ONTO THE TOP OF THE DAM FOR ANCHORING IN A TRENCH. THE EDGES SHALL BE SECURED WITH 8-IN STAPLES OR PINS. THE FABRIC SHALL BE LONG ENOUGH TO EXTEND DOWN THE SLOPE AND EXIT ONTO STABLE GROUND. THE WIDTH OF THE FABRIC SHALL BE ONE PIECE, NOT JOINED OR SPLICED. IF THE LENGTH OF THE FABRIC IS INSUFFICIENT FOR THE ENTIRE LENGTH OF THE SPILLWAY, MULTIPLE SECTIONS, SPANNING THE COMPLETE WIDTH, MAY BE USED. THE UPPER SECTIONS SHALL OVERLAP THE LOWER SECTIONS SO WATER CANNOT FLOW UNDER THE FABRIC. SECURE THE UPPER EDGE AND SIDES OF THE FABRIC IN A TRENCH WITH STAPLES OR PINS.
6. INSTALL BAFFLES ACROSS BOTTOM OF BASIN.

MAINTENANCE NOTES:

1. INSPECT DEVICE AFTER EACH RAINFALL. REMOVE SEDIMENT WHEN SEDIMENT REACHES A DEPTH OF NO MORE THAN ONE-HALF THE HEIGHT OF THE RISER. REPAIR BAFFELS IF THEY ARE DAMAGED.
2. PULL SKIMMER TO SIDE OF BASIN WITH ROPE AND INSPECT REGULARLY. KEEP SKIMMER HEAD, ORIFICE AND PIPE FREE OF DEBRIS. REMOVE SEDIMENT FROM BENEATH SKIMMER AND ENUSRE VEGETATION DOES NOT INTERFERE WITH SKIMMER OPERATION.
3. CHECK FABRIC LINED SPILLWAY FOR DAMAGE AND MAKE ANY REPAIRS WITH FABRIC THAT SPANS THE FULL WIDTH OF THE SPILLWAY.

TEMPORARY SKIMMER SEDIMENT BASIN N.T.S.



SECTION A-A

CONSTRUCTION NOTES:

1. PLACE SLOPE DRAINS ON UNDISTURBED SOIL OR WELL COMPACTED FILL AT LOCATIONS SHOWN ON THE PLANS.
2. SLIGHTLY SLOPE THE SECTION OF PIPE UNDER THE DIKE TOWARDS ITS OUTLET.
3. HAND TAMP THE SOIL UNDER AND AROUND THE ENTRANCE SECTION IN LIFTS NOT TO EXCEED 6-IN.
4. ENSURE THAT FILL OVER THE DRAIN AT THE TOP OF THE SLOPE HAS MINIMUM DIMENSIONS OF 1.5 FT DEPTH, 4 FT TOP WIDTH AND 3:1 SIDE SLOPES.
5. ENSURE THE SETTLED, COMPACTED DIKE RIDGE IS NO LESS THAN 1-FT ABOVE THE PIPE AT ALL LOCATIONS.
6. ENSURE ALL PIPE CONNECTIONS ARE WATER-TIGHT.
7. ENSURE THAT ALL FILL MATERIAL IS WELL COMPACTED. SECURELY FASTEN THE EXPOSED SECTION OF THE DRAIN WITH GROMMETS OR STAKES SPACED NO MORE THAN 10-FT APART.
8. EXTEND THE DRAIN BEYOND THE TOE OF THE SLOPE AND ADEQUATELY PROTECT THE OUTLET FROM EROSION.
9. IMMEDIATELY STABILIZE ALL DISTURBED AREAS FOLLOWING CONSTRUCTION.

MAINTENANCE NOTES:

1. INSPECT THE SLOPE DRAIN AND SUPPORTING DIVERSIONS AFTER EVERY RAINFALL AND MAKE NECESSARY REPAIRS PROMPTLY.
2. CLEAR ACCUMULATED SEDIMENT FROM THE PIPE ENTRANCES AND OUTLET.

TEMPORARY SLOPE DRAIN N.T.S.

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY:_____ DATE:_____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY:_____ DATE:_____
ADMINISTRATOR

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Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036704 PILLARD F. LAWSON SE 4-05-23

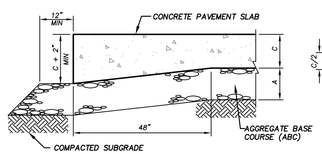
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS	NO.	DATE	DESCRIPTION
	.	.	.

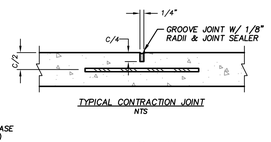
DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

EROSION CONTROL DETAILS

C703

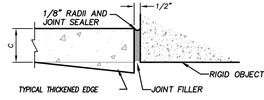


TYPICAL THICKENED EDGE
NTS



TYPICAL CONTRACTION JOINT
NTS

TYPICAL CONSTRUCTION JOINT
NTS



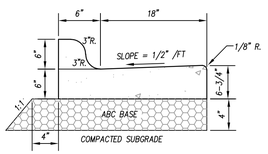
TYPICAL ISOLATION JOINT
NTS

CONCRETE PAVEMENT DIMENSIONS	
CONC SLAB THICKNESS, C =	7.5"
ABC THICKNESS, A =	4"
DOWEL DIAMETER	1-1/4"

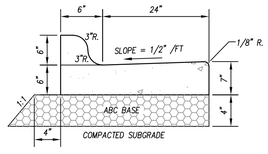
NOTES:

1. ALL CONCRETE SHALL BE OF NCDOT TYPE AA PORTLAND CEMENT CONCRETE WITH A 28-DAY COMPRESSIVE STRENGTH OF 4500 PSI (ASTM C39) AND A MIN. MODULUS OF RUPTURE OF 650-PSI (AASHTO T97/ASTM C78).
2. CONTRACTION JOINTS SHALL BE SPACED AT 15 FT O.C.E.W. MAX.
3. ISOLATION JOINTS SHALL BE PLACED WHERE CONCRETE PAVEMENT ABUTS ANY RIGID OBJECT.
4. JOINTING PLAN IN ACCORDANCE WITH ACI-330R-08 SHALL BE APPROVED BY SITE DESIGN ENGINEER PRIOR TO POURING SLAB.
5. JOINTS IN CURB & GUTTER SHALL BE ALIGNED WITH JOINTS IN ADJOINING CONCRETE PAVEMENT.

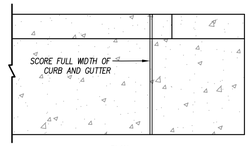
HEAVY DUTY CONCRETE PAVEMENT — N.T.S.



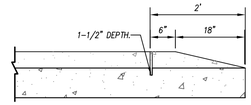
SECTION A-A
24" CURB & GUTTER



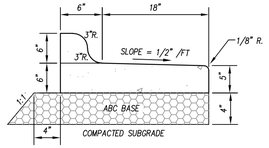
SECTION A-A
30" CURB & GUTTER



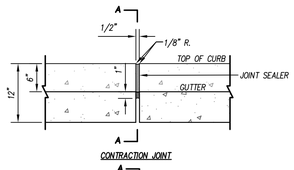
PLAN



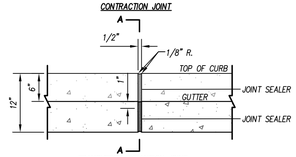
FRONT
STANDARD METHOD OF ENDING CURB AND GUTTER



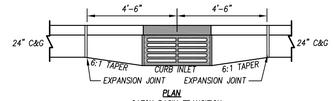
SECTION A-A
24" CURB & GUTTER - SPILL



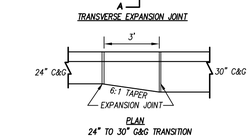
CONTRACTION JOINT



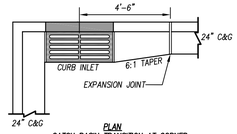
TRANSVERSE EXPANSION JOINT



PLAN
CATCH BASIN TRANSITION



PLAN
24" TO 30" C&G TRANSITION



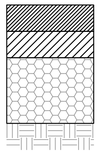
PLAN
CATCH BASIN TRANSITION AT CORNER

NOTES:

1. ALL CONCRETE SHALL BE 4,000 P.S.I. @ 28 DAYS
2. CONTRACTION JOINTS SHALL BE SPACED AT 10' INTERVALS, SPACING MAY BE INCREASED TO 15' IF MACHINE IS USED.
3. CONTRACTION JOINTS SHALL BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1-1/2" SHALL BE OBTAINED.
4. EXPANSION JOINTS SHALL BE SPACED AT 90' MAX INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS.
5. ALL JOINTS SHALL BE FILLED WITH JOINT FILLER AND SEALER.
6. SEE SPECIFICATION SECTION 32 13 13 FOR ADDITIONAL INFOMATION

ONSITE CONCRETE CURB AND GUTTER — N.T.S.

DETAIL IS FOR ON-SITE PAVING OPERATIONS ONLY.



	LIGHT DUTY ASPHALT	HEAVY DUTY ASPHALT
SURFACE COURSE	TYPE S-9.5C 2-IN	TYPE S-9.5C 1.5-IN
BINDER COURSE	–	TYPE I-19.0C 2.5-IN
AGGREGATE BASE COURSE	0-IN	8.5-IN
COMPACTED SUBGRADE	*TWO LIFTS	

SEE SHEET FOR PROOFROLLING, COMPACTION & TESTING REQUIREMENTS.

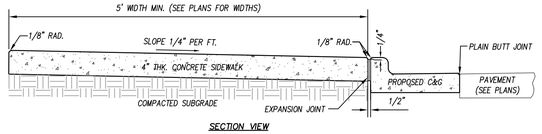
THE CONTRACTOR MAY CHOOSE TO INSTALL INTERMEDIATE COURSES OF PAVEMENT TO STABILIZE THE SITE DURING CONSTRUCTION AT NO ADDITIONAL COST.

THE CONTRACTOR IS REPONSIBLE FOR DETERMINING THE ADEQUATE THICKNESS REQUIRED FOR INTERMEDIATE PAVING. INCREASES IN THE DESIGN PAVEMENT SECTION TO FACILITATE INTERMEDIATE PAVING SHALL BE PROVIDED AT NO ADDITIONAL COST.

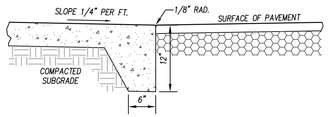
THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGES TO SUBGRADE, INSTALLED BASE COURSE AND/OR INTERMEDIATE PAVING PRIOR TO PLACING SUBSEQUENT PAVEMENT LIFTS AT NO ADDITIONAL COST.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING PAVEMENT DURING ALL PHASES OF WORK. THE FINAL SURFACE OF PAVEMENT SHALL BE FREE OF ALL DEFECTS OR DAMAGE.

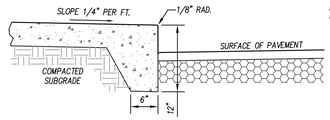
ASPHALT PAVEMENT SECTIONS — N.T.S.



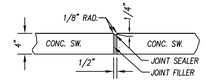
SECTION VIEW



SECTION OF SIDEWALK ABUTTING PAVEMENT



SECTION OF SIDEWALK RAISED

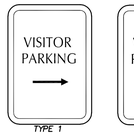


TRANSVERSE EXPANSION JOINT

GENERAL NOTES:

1. A GROOVE JOINT 1" DEEP WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT INTERVALS THE WIDTH OF THE SIDEWALK UNLESS INDICATED OTHERWISE. SEE SPECS FOR ADDITIONAL JOINT SPACING REQUIREMENTS.
2. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 50' INTERVALS.
3. A 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
4. ALL CONCRETE SHALL BE 4,000 P.S.I. @ 28 DAYS
5. PROVIDE BROOM FINISH (SEE SPECS 321313 CONCRETE PAVING) OR AS NOTED ON PLANS AND DETAILS.
6. ALL SIDEWALK SHOULDERS SHALL BE 1" TOLERANCE OF ADJACENT GREEN SPACE.

ONSITE CONCRETE SIDEWALK — N.T.S.



TYPE 1

TYPE 2

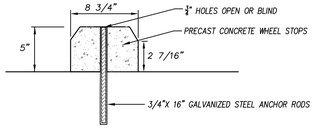
ALL SIGNS SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SPECIFICATIONS AND REQUIREMENTS

NOTE: MAXIMUM PENALTY ($250) IS ESTABLISHED BY LEGISLATURE VIA GENERAL STATUTE 20-37.6

R7-8

R7-8D

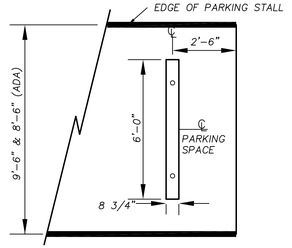
R7-8a
VAN ACCESSIBLE



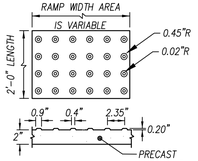
CONCRETE WHEEL STOPS

ACCESSIBLE PARKING NOTES:

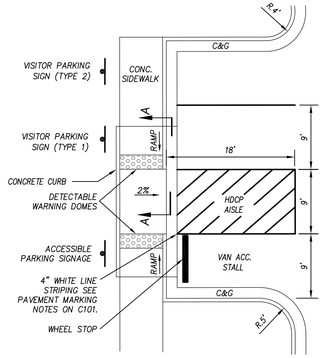
1. DETECTABLE WARNING DOMES SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. REFER TO NCDOT STANDARD DETAIL 848D05 FOR ADDITIONAL INFORMATION.
3. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 50' INTERVALS.
4. WARNING DOMES COLOR AND MATERIAL SHALL CONFORM WITH LOCAL AND FEDERAL ADA STANDARDS.
5. WARNING DOMES SHALL BE INSTALLED PER PLANS OR PER LOCAL AND FEDERAL REQUIREMENTS.
6. ALL GRADES FOR ADA STALLS AND ADA ISLE SHALL NOT EXCEED 2% IN CALL DIRECTION. SEE GRADING PLAN FOR ELEVATIONS.
7. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.



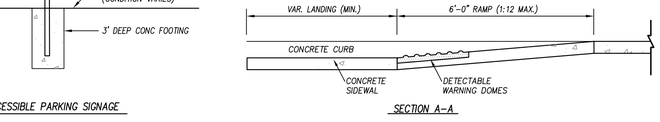
90° PARKING SPACE PLAN VIEW
CONCRETE WHEEL STOP



DETECTABLE WARNING DOMES



PLAN VIEW ENLARGEMENT



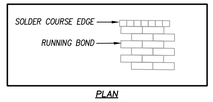
SECTION A-A

ACCESSIBLE PARKING SIGNAGE

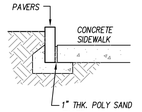
ACCESSIBLE CURB RAMP — N.T.S.

NOTES:

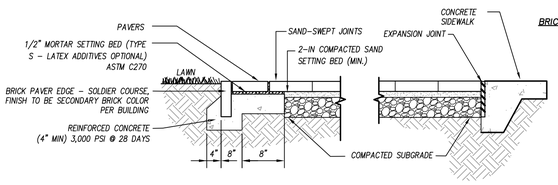
1. PAVERS SHALL HAVE A SRI OF 29 OR GREATER.
2. PAVERS SHALL BE SUBMITTED TO ARCHITECT FOR APPROVAL.
3. CUT PAVERS AS NEEDED.
4. CONTRACTOR TO DEVELOP AND SUBMIT PLAN OF PROPOSED PAVER LAYOUT PATTERNS FOR APPROVAL PRIOR TO INSTALLATION.
5. PAVER TO MATCH BUILDING IN COLORS AND SIZES.
6. PATTERN IS RUNNING BOND



PLAN



BRICK BAND AT SIDEWALK

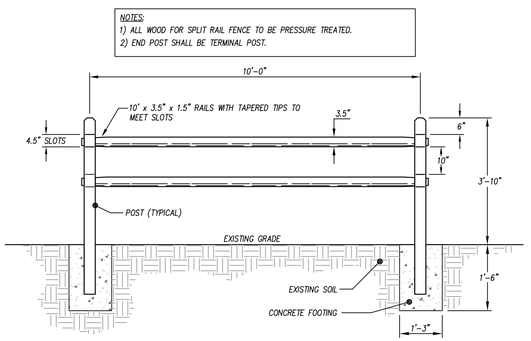


SECTION

BRICK PAVERS — N.T.S

NOTES:

1) ALL WOOD FOR SPLIT RAIL FENCE TO BE PRESSURE TREATED.
2) END POST SHALL BE TERMINAL POST.

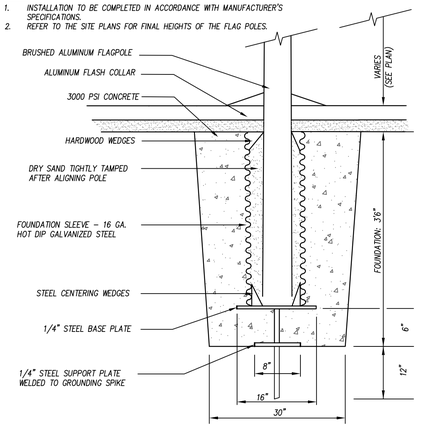


FRONT VIEW

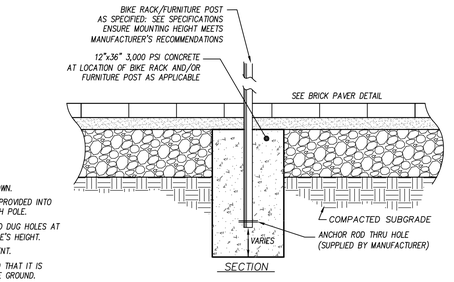
WOODEN SPLIT RAIL FENCE — N.T.S.

NOTES:

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. REFER TO THE SITE PLANS FOR FINAL HEIGHTS OF THE FLAG POLES.



FLAGPOLE — N.T.S.



SECTION

NOTES:

1. PREPARE HOLE AS SHOWN.
2. INSERT ANCHOR RODS PROVIDED INTO HOLES AT END OF EACH POLE.
3. PLACE RACK/POST INTO DUG HOLES AT SPECIFIED MANUFACTURE'S HEIGHT.
4. POUR ANCHORING CEMENT.
5. ADJUST RACK/POST SO THAT IT IS PERPENDICULAR TO THE GROUND.

FURNITURE POST IN GROUND MOUNT WITH BRICK PAVER — N.T.S.

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE
start something

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT No.2045 ROY R. OLSON 4-05-23 SEAL

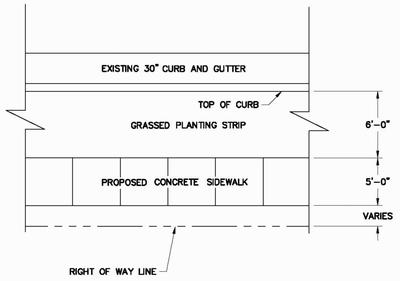
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

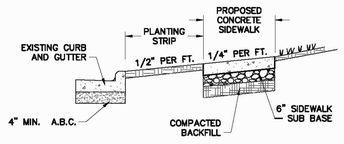
DESIGNED BY:	TRO/PL
DRAWN BY:	TRO
DATE:	DEC 12, 2022
PROJECT NO:	22-150
FILE:	.

SITE DETAILS

C801



PLAN VIEW



TYPICAL SECTION

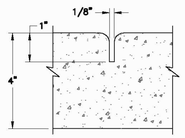
NOTES:

1. TRANSVERSE EXPANSION JOINTS TO BE A MAXIMUM OF 50 FEET APART.
2. CONTROL JOINTS TO BE AT 5 FEET O.C.
3. ALL CONCRETE TO BE FINISHED WITH CURING COMPOUND.
4. SIDEWALK SUB BASE TO BE A MIXTURE OF 70 PERCENT #57 STONE AND ASTM C33 SAND OR EQUAL.

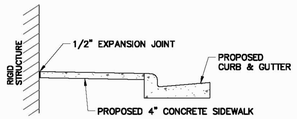
1 of 2

REVISIONS	
DATE	DESCRIPTION

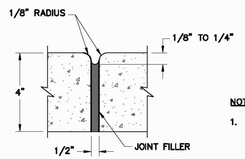
TOWN OF KNIGHTDALE STANDARD DETAILS	CONCRETE SIDEWALKS	STD. NO. 4.04



GROOVE JOINT IN SIDEWALK



DETAILS SHOWING EXPANSION JOINTS IN CONCRETE SIDEWALK



TRANSVERSE EXPANSION JOINT IN SIDEWALK

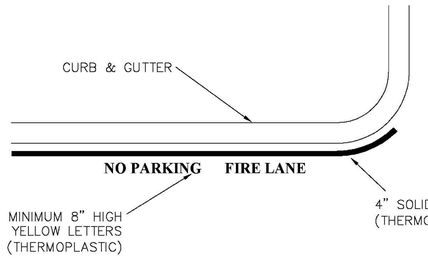
NOTES:

1. A GROOVE JOINT 1" DEEP WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 45' INTERVALS NOT TO EXCEED 50' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
2. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6" THICK.
3. WIDTH OF SIDEWALK ON THOROUGHFARE STREETS SHALL BE A MINIMUM OF 5'. WIDTH OF SIDEWALKS IN THE CENTRAL BUSINESS DISTRICT WILL BE DETERMINED BY THE TOWN ENGINEER.
4. WIDTH OF SIDEWALKS ON NON-THOROUGHFARE STREETS SHALL BE A MINIMUM OF 5' UNLESS OTHERWISE SPECIFIED BY THE TOWN'S UNIFIED DEVELOPMENT ORDINANCE.
5. SIDEWALK TO BE POURED TO END OF RADIUS AT INTERSECTING STREETS.
6. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI IN 28 DAYS.

2 of 2

REVISIONS	
DATE	DESCRIPTION

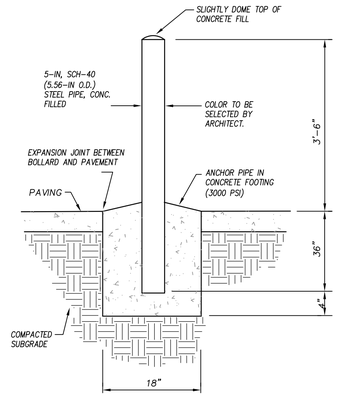
TOWN OF KNIGHTDALE STANDARD DETAILS	CONCRETE SIDEWALKS	STD. NO. 4.04



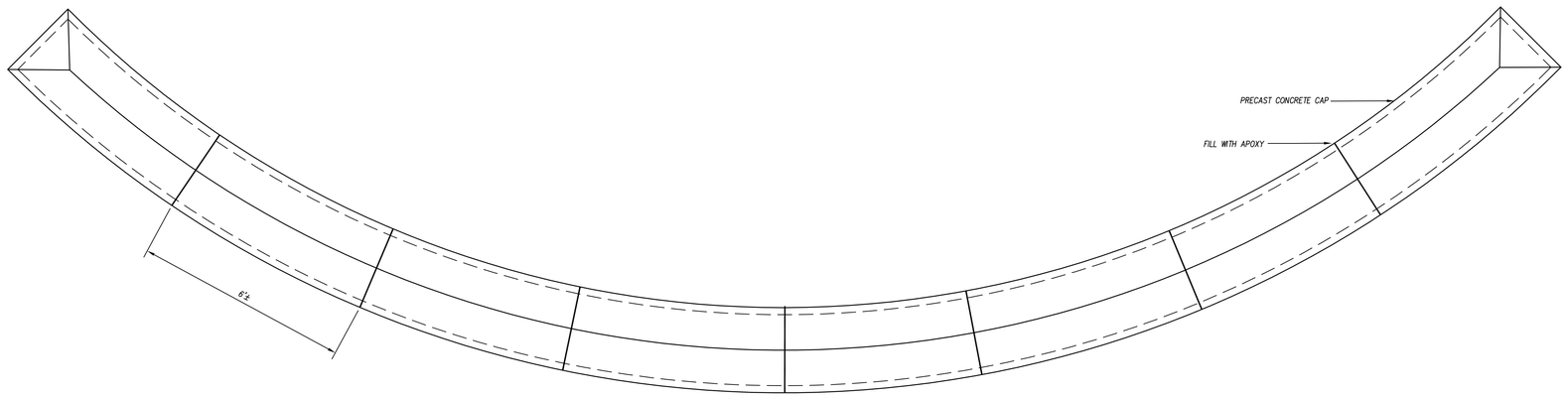
TYPICAL FIRE LANE PAVEMENT MARKING DETAIL

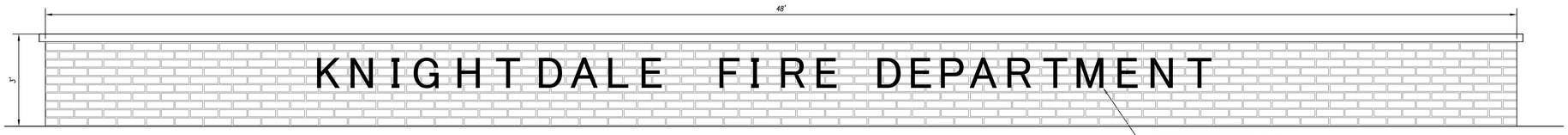
REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	FIRE LANE PAVEMENT MARKING	STD. NO. 3.31



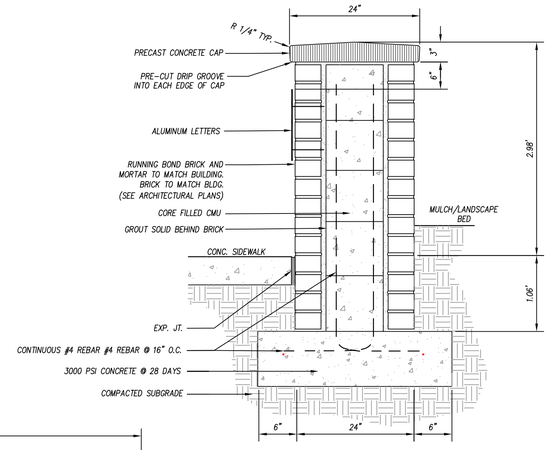
BOLLARD N.T.S.





CAST ALUMINUM (OWNER TO SELECT FONT). NATURAL SATIN 0.75" THICK WITH CAST BOTTOM RAIL. MOUNT TO FACE OF BRICK. FASTENERS TO BE DETERMINED BY LETTER MANUFACTURER

CONTRACTOR TO PROVIDE SHOP DRAWING OF SIGN, LETTERING AND PREFAB CAP FOR SUBMITTAL REVIEW/APPROVAL.



TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY:_____ DATE:_____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY:_____ DATE:_____
ADMINISTRATOR

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT No.2045 TROY R. OLSON SEAL 4-05-23

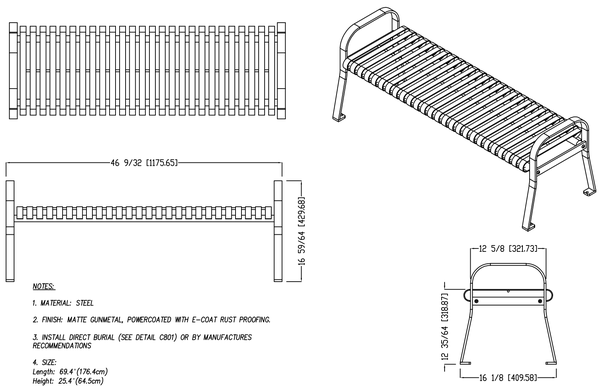
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

SITE DETAILS

C802



NOTES:

1. MATERIAL: STEEL
2. FINISH: MATTE GUNMETAL, POWERCOATED WITH E-COAT RUST PROOFING.
3. INSTALL DIRECT BURIAL (SEE DETAIL C801) OR BY MANUFACTURES RECOMMENDATIONS
4. SIZE:
   Length: 69.4" (176.4cm)
   Height: 25.4" (64.5cm)
   Depth: 24.2" (61.4cm)
   Seat Height: 18.8" (47.8cm)
   Weight: 135.5lbs (61.5kg)

MAGLIN OR APPROVED EQUAL

BACKLESS BENCH N.T.S

1. CHISEL ALL CUT GRADED OR COMPACTED AREAS TO A MINIMUM DEPTH OF 8"
2. DISC ALL AREAS TO RECEIVE GRASS TO A MINIMUM OF 8 INCHES, MIX AND AMEND WITH 3 INCHES OF IMPORTED TOPSOIL. REFER TO SPECIFICATIONS FOR TOPSOIL REQUIREMENTS.
3. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM. CONSTRUCTION EQUIPMENT & TRAFFIC SHALL BE REMOVED PRIOR TO SEEDING.
4. APPLY AGRICULTURAL LIME, FERTILIZER, AND PHOSPHATE UNIFORMLY AS PER SPECIFICATIONS AND MIX WELL WITH SOIL.
5. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM, REASONABLY UNIFORM SEEDBED IS PREPARED TO A 6 INCHES DEPTH.
6. SEED AT RATE SPECIFIED. ACHIEVE AND MAINTAIN MINIMUM 95% COVERAGE PRIOR TO FINAL ACCEPTANCE, AS DETERMINED ON A PER SQUARE YARD SAMPLE BASIS.
7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH. BEGIN THOROUGH WATERING OF GRASSED AREAS IMMEDIATELY UPON INSTALLATION. DO NOT ALLOW GRASSED AREAS TO BECOME EXCESSIVELY DRY.
8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. IF STAND SHOULD BE OVER 60% DAMAGED, REESTABLISH FOLLOWING ORIGINAL LIME, FERTILIZER AND SEEDING RATES.
9. REFER TO WRITTEN SPECIFICATIONS FOR WARRANTY AND MAINTENANCE OF LAWNS PRIOR TO OWNER'S FINAL ACCEPTANCE.
10. IF CONFLICTS OCCUR BETWEEN WRITTEN SPECIFICATIONS AND THE DRAWINGS, THE WRITTEN SPECIFICATIONS SHALL PREVAIL.

SEEDBED PREPARATION

NURSE CROP

DATE	TYPE	PLANTING RATE
MAY 15– AUG 15	BROWNTOP MILLET	10 LBS/ACRE

DATE	TYPE	PLANTING RATE
APR 15– JULY 15**	UNHULLED SUNSTAR BERMUDA	85 LBS/ACRE*
JULY 15– AUG 15	SUNSTAR BERMUDA SPRIGS (WATERING AT CONTRACTORS EXPENSE)	
AUG 15 – APR 15	TEMPORARY SEEDING APPLIES**	5 BUSHELS/1,000 SF

* OR AS REQUIRED TO ACHIEVE 95% COVERAGE AS DETERMINED ON A PER SQUARE YARD BASIS PRIOR TO SUBSTANTIAL COMPLETION.

** WHEN SEEDING MUST TAKE PLACE OUT-OF-SEASON FOR PERMANENT GRASS, APPROPRIATE TEMPORARY SEEDING SHALL BE DONE AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERMANENT SEEDING AS SPECIFIED IN SEASON AT NO ADDITIONAL COST TO OWNER.

LAWN MAINTENANCE:

SEE SPEC SECTION 329000 FOR LAWN MAINTENANCE REQUIREMENTS.

LAWN MUST BE AT 95% COVERAGE AT SUBSTANTIAL COMPLETION REVIEW TO BE ACCEPTED.

IF NOT AT 95%, SUBSTANTIAL COMPLETION WILL BE DELAYED UNTIL THE FOLLOWING GROWING SEASON.

PERMANENT SEEDING SCHEDULE

DATE
MAR 1–JUNE 1
OCT 1–DEC 1

SEEDLINGS TO BE PLACED AT RANDOM. SPACING AT MIN 5' MAX 10' TO BE PLACED IN 'NO-MOW' AREAS ONLY AS INDICTED ON LANDSCAPE SHEETS. ALL SEEDLINGS, SHALL BE TRANSPORTED, STORED AN PLANTED FOLLOWING THE STANDARDS OF THE NORTH CAROLINA FOREST SERVICE TREE PLANTING POCKET GUIDE, 8TH EDITION 2016. SEEDLINGS SHALL BE PLANTED ON A 'SATISFCTORY DAY AS BROADCAST BY THE NORTH CAROLINA FOREST SERVICE.

PLANTING RATE
450 SEEDLING/ACRE

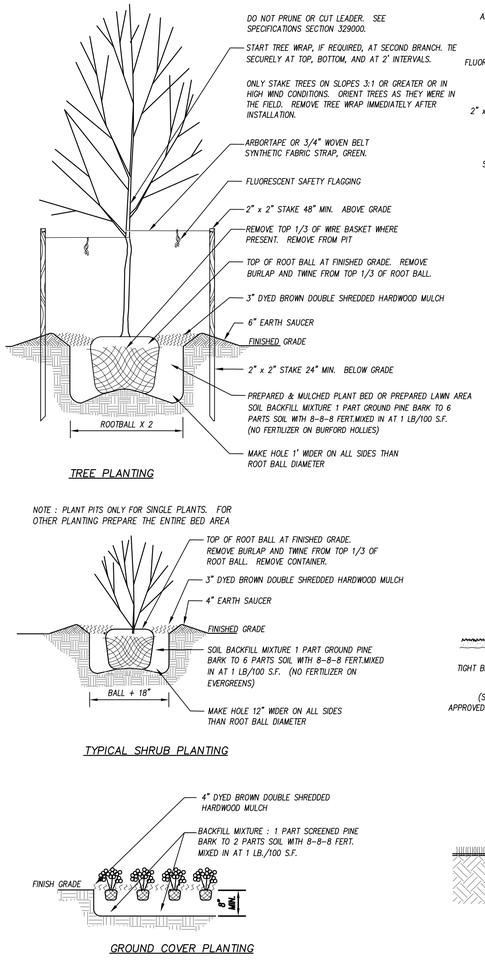
PER/ACRE		
30%	PINUS ENCHINATA	SHORT LEAF PINE
20%	NYSSA SYLVATICA	BLACK GUM
10%	QUERCUS ALBA 'PIEDMONT'	WHITE OAK
10%	QUERCUS RUBRA 'PIEDMONT'	NORTHERN RED OAK
20%	FRAXINUS AMERICANA	WHITE ASH
10%	LIROIDENDRON TULIPIFERA	TULIP TREE

***PROVIDE INVOICE TO LANDSCAPE ARCHITECT UPON PLANTING

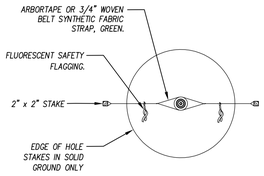
SEEDLING SOURCE
NORTH CAROLINA FOREST SERVICE OR EQUAL

ALL WATERING AN MAINTENANCE SHALL BE INCLUDED IN BASE BID WORK.

REFORESTATION SCHEDULE – (SEEDLINGS)

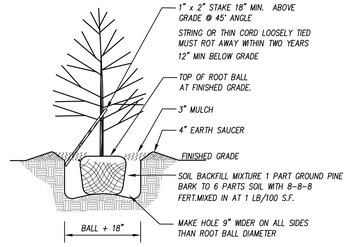


TREE PLANTING



GUYING PLAN

NOTE : PLANT PITS ONLY FOR SINGLE PLANTS. FOR OTHER PLANTING PREPARE THE ENTIRE BED AREA

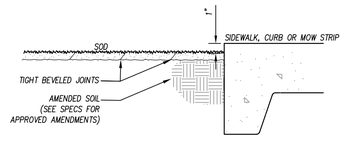


TYPICAL PINE PLANTING

NOTE : PLANT PITS ONLY FOR SINGLE PLANTS. FOR OTHER PLANTING PREPARE THE ENTIRE BED AREA

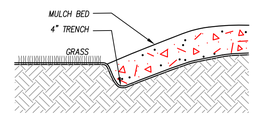
TYPICAL SHRUB PLANTING

REMOVE NETTING PRIOR TO INSTALLATION



SOD INSTALLATION

GROUND COVER PLANTING



TO BE APPLIED TO ALL PLANTING BEDS

PLANTING BED EDGE

PLANTING DETAILS N.T.S.

TEMPORARY SEEDING SCHEDULE (JUNE 1–FEB 28 EROSION CONTROL PHASE)

DATE	TYPE	PLANTING RATE
AUG 15 – APR 15	3-WAY TALL FESCUE BLEND AND WINTER RYE (GRAIN)	125 LBS/ACRE 25 LBS/ACRE
APR 15 – AUG 15	3-WAY TALL FESCUE BLEND AND GERMAN MILLET *** OR SUDANGRASS (SMALL-STEMMED VAR.) ***	120 LBS/ACRE 25 LBS/ACRE 30 LBS/ACRE

CONSULT CONSERVATION ENGINEER OR SOIL CONSERVATION SERVICE FOR ADDITIONAL INFORMATION CONCERNING OTHER ALTERNATIVES FOR VEGETATION OF DENUDED AREAS. THE ABOVE VEGETATION RATES ARE THOSE WHICH DO WELL UNDER LOCAL CONDITIONS; OTHER SEEDING RATE COMBINATIONS ARE POSSIBLE.

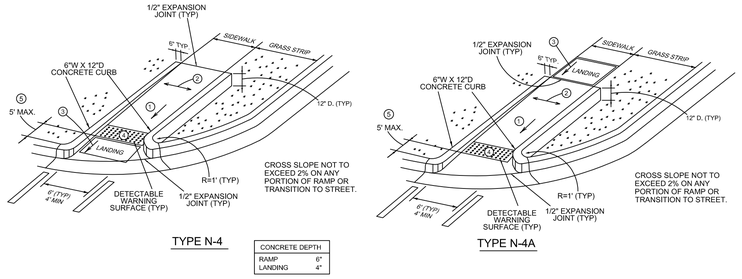
*** TEMPORARY – RESEED ACCORDING TO OPTIMUM SEASON FOR DESIRED PERMANENT VEGETATION. DO NOT ALLOW TEMPORARY COVER TO GROW OVER 12" IN HEIGHT BEFORE MOWING, OTHERWISE FESCUE MAY BE SHADED OUT.

LIME & FERTILIZATION SCHEDULE

APPLY LIME AND FERTILIZER ACCORDING TO SOIL TESTS, OR APPLY A MINIMUM 4,000 LB/ACRE (2 TONS/ACRE) GROUND AGRICULTURAL LIMESTONE IN SANDY SOILS (OR 6,000 LB/ACRE (3 TONS/ACRE) IN CLAY SOILS) AND A MINIMUM 500 LB/ACRE 10-10-10 FERTILIZER, AS NEEDED TO ESTABLISH 95% COVERAGE (AS DETERMINED ON A PER SQUARE YARD BASIS) PRIOR TO SUBSTANTIAL COMPLETION. CONTRACTOR TO SUBMIT A COPY OF ALL SOIL REPORTS TO OWNER UPON RECEIPT.

SURFACE STABILIZATION REQUIREMENTS

1. DURING ALL PHASES OF CONSTRUCTION, GROUNDCOVER ON EXPOSED SLOPES SHALL BE PROVIDED WITHIN 14 CALENDAR DAYS FOLLOWING COMPLETION OF ANY PHASE OF GRADING.
2. FINAL PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS SHALL BE PROVIDED ON ALL DISTURBED AREAS WITHIN 14 CALENDAR DAYS FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
3. USE EXCELSIOR MATTING OR OTHER APPROVED CHANNEL LINING MATERIAL TO COVER THE BOTTOM OF CHANNELS.
4. APPLY 4000 LB/ACRE(2 TONS LB/AC) GRAIN STRAW OVER SEEDED AREAS AND ANCHOR STRAW CRIMPING WITH HAND OR MECHANICAL CRIMPER 8" MAX. SPACING, ASPHALT TACKING OR OTHER APPROVED METHOD. ASPHALT TACKING SHALL BE 400 GAL/ACRE (9 GAL/1000 SF).
5. MULCH AND ANCHORING MATERIALS MUST NOT BE ALLOWED TO WASH DOWN SLOPES AND CLOG DRAINAGE DEVICES.



TYPE N-4

TYPE N-4A

CONCRETE DEPTH	
RAMP	6"
LANDING	4"

1. SLOPE TO MEET GRADE, 15' MAXIMUM.
2. CROSS SLOPE: 2.00%
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
4. RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
5. IF LENGTH EXCEEDS 5', TRUNCATED DOMES SHALL BE INSTALLED ALONG THE BACK OF THE CURB COVERING THE FULL WIDTH OF THE RAMP.

SHEET 4 OF 8

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/1/18	NOT TO SCALE
	CURB RAMPS (NEW DEVELOPMENT)	
	T-20.01.4	

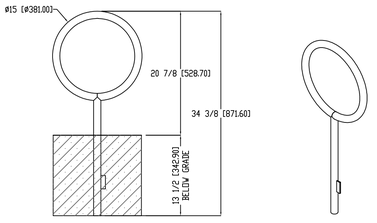
CITY OF RALEIGH STANDARD CURB RAMP N.T.S.

PLAN VIEW

NOTES:

1. MATERIAL: H.S. STEEL TUBE AND STEEL MOUNTING PLAT
2. FINISH: MATTE GUNMETAL, POWERCOATED WITH E-COAT RUST PROOFING.
3. INSTALL DIRECT BURIAL
4. SIZE:
   Height: 27.8" (70.5cm)
   Height Above Grade: 27.8" (70.5cm)
   Height Below Grade: 18" (45.7cm)
   Diameter: 20" (50.8cm)
   Weight: 14.1lbs (6.4kg)

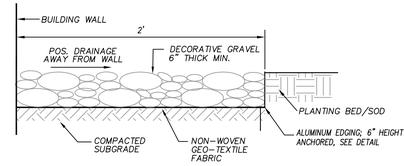
MAGLIN OR APPROVED EQUAL



SECTION VIEW

ISOMETRIC VIEW

BIKE RACK N.T.S



PERMALOC (800-356-9660)
WWW.PERMALOC.COM
CLEANLINE-XL ALUMINUM EDGING, 3/16" X 6", OR APPROVED EQUAL; INSTALL PER MANUFACTURER SPECIFICATIONS

NOTES:

1. DECORATIVE GRAVEL, SUBMIT SAMPLE TO DESIGN TEAM PRIOR TO INSTALLATION.

TYPE: DELAWARE CHALET RIVER ROCK 3/4"

GRAVEL SPLASH PAD / MOW STRIP N.T.S.

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY:_____ DATE:_____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY:_____ DATE:_____
ADMINISTRATOR

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT No.2045 TRO ROBSON 4-05-23 SEALS

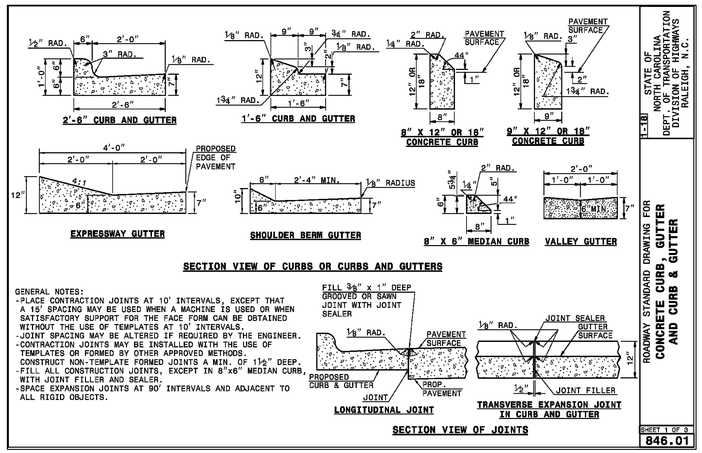
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS	NO.	DATE	DESCRIPTION
	.		.
	.		.
	.		.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

SITE DETAILS

C803



CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT No.2045 TROY R. OLSON SEAL
1-05-23

KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

SITE DETAILS

C804

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

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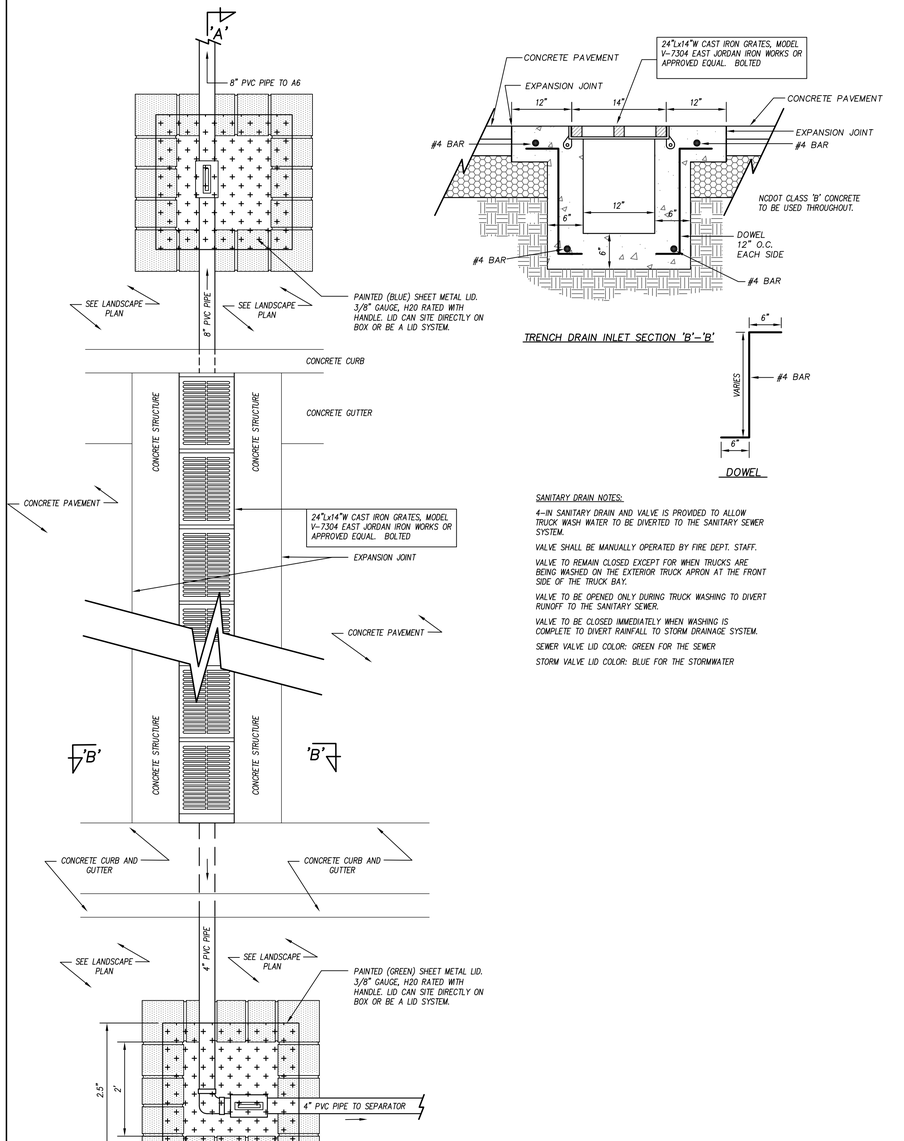
ADMINISTRATOR



TRUCK WASHING – PLAN VIEW

TRENCH DRAIN INLET SECTION 'B'–'B'

DOWEL

SANITARY DRAIN NOTES:

4–IN SANITARY DRAIN AND VALVE IS PROVIDED TO ALLOW TRUCK WASH WATER TO BE DIVERTED TO THE SANITARY SEWER SYSTEM.

VALVE SHALL BE MANUALLY OPERATED BY FIRE DEPT. STAFF.

VALVE TO REMAIN CLOSED EXCEPT FOR WHEN TRUCKS ARE BEING WASHED ON THE EXTERIOR TRUCK APRON AT THE FRONT SIDE OF THE TRUCK BAY.

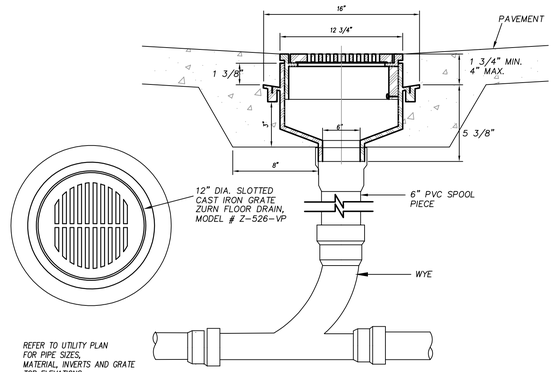
VALVE TO BE OPENED ONLY DURING TRUCK WASHING TO DIVERT RUNOFF TO THE SANITARY SEWER.

VALVE TO BE CLOSED IMMEDIATELY WHEN WASHING IS COMPLETE TO DIVERT RAINFALL TO STORM DRAINAGE SYSTEM.

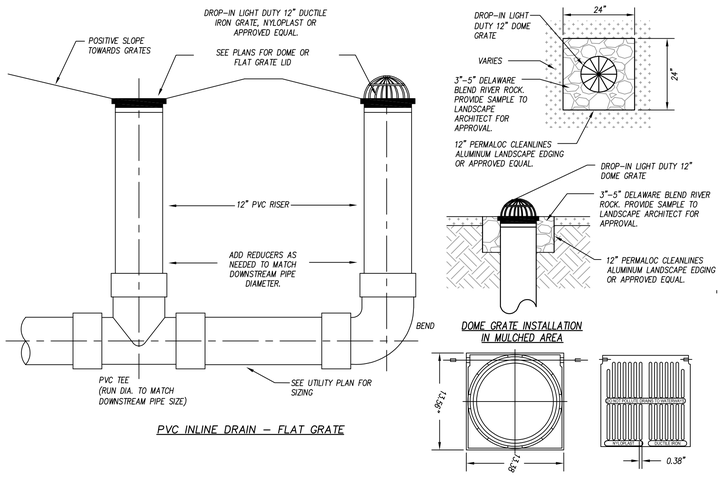
SEWER VALVE LID COLOR: GREEN FOR THE SEWER

STORM VALVE LID COLOR: BLUE FOR THE STORMWATER

TRUCK WASHING TRENCH DRAIN N.T.S.



FLOOR DRAIN N.T.S.

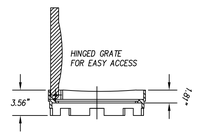


PVC INLINE DRAIN – FLAT GRATE

DOME GRATE INSTALLATION IN MULCHED AREA

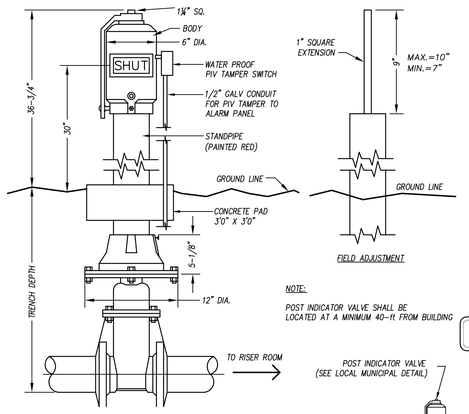
NOTES:

1. PIPE AND FITTINGS SHALL BE PVC, SMOOTH INTERIOR AND EXTERIOR.
2. INLINE DRAINS SHALL BE AS MANUFACTURED BY ADS, INC. OR APPROVED EQUAL.
3. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
4. IF INLINE DRAIN IS IN PAVED OR SODDED AREAS USE FLAT GRATE. IF INLINE DRAIN IS IN MULCHED AREAS USE DOME GRATE.



PEDESTRIAN 12" GRATE

INLINE DRAIN DETAIL N.T.S.



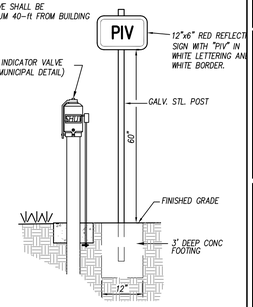
FIELD ADJUSTMENT

FIELD ADJUSTMENT INSTRUCTIONS

1. REMOVE THE BODY FROM THE TOP OF THE INDICATOR POST ASSEMBLY.
2. CUT THE REQUIRED LENGTH OFF THE BOTTOM OF THE STANDPIPE FOR THE GROUND LINE TO MATCH UP WITH STANDPIPE GROUND LINE MARK.
3. CUT THE 1" SQ. EXTENSION AT A DISTANCE OF 9" ABOVE THE TOP OF THE STANDPIPE.
4. SET THE "OPEN" AND "SHUT" TARGETS FOR THE APPROPRIATE VALVE SIZE.
5. RE-ATTACH THE BODY TO THE TOP OF THE INDICATOR POST ASSEMBLY.
6. ALL PIV(s) SHALL BE INSTALLED WITH AN ELECTRONICALLY CONTROLLED TAMPER SWITCH.

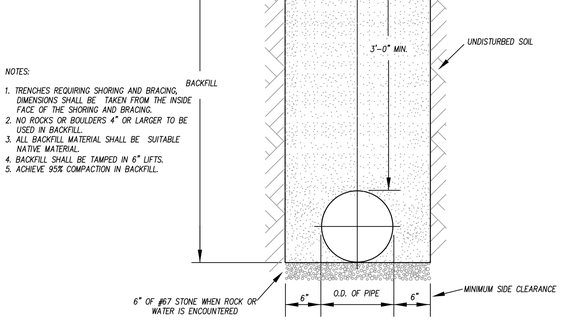
NOTE:

POST INDICATOR VALVE SHALL BE LOCATED AT A MINIMUM 40–ft FROM BUILDING



SIGN LOCATED NEXT TO PIV

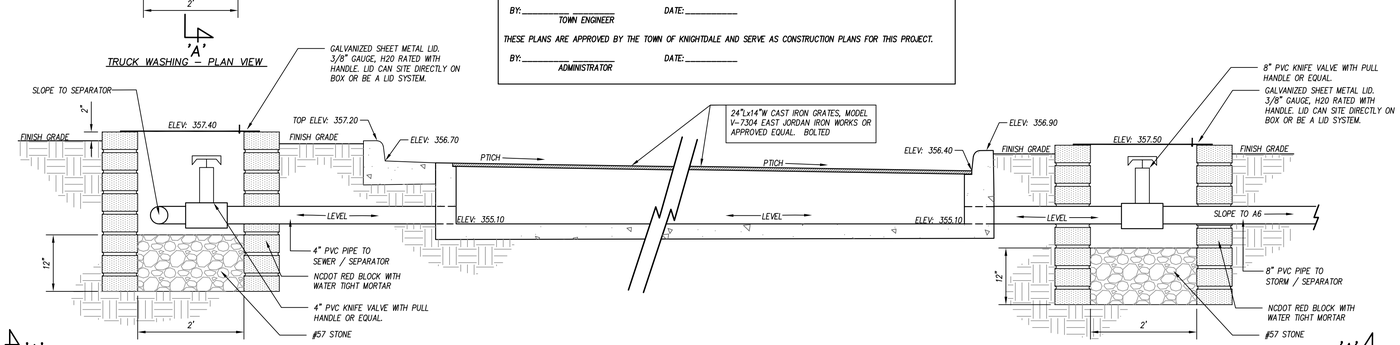
POST INDICATOR VALVE N.T.S.



NOTES:

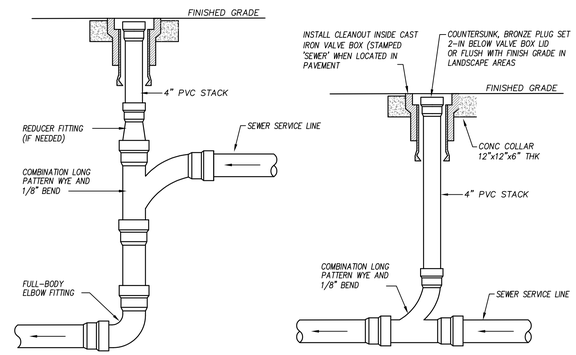
1. TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACKFILL SHALL BE TAMPED IN 6" LIFTS.
5. ACHIEVE 95% COMPACTION IN BACKFILL.

TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON PIPE N.T.S.



PAVEMENT INSTALLATION 'TYPE–1'

TRUCK WASHING TRENCH DRAIN N.T.S.



DROP CLEANOUT N.T.S.

STANDARD CLEANOUT N.T.S.

SEWER CLEANOUT N.T.S.

TOWN CERTIFICATION: THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY: _____ DATE: _____
TOWN ENGINEER

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BY: _____ DATE: _____
ADMINISTRATOR

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C–106 PE: C–1595

KNIGHTDALE start something

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 36404 RILLARD F. LAWSON SE 4-05-23

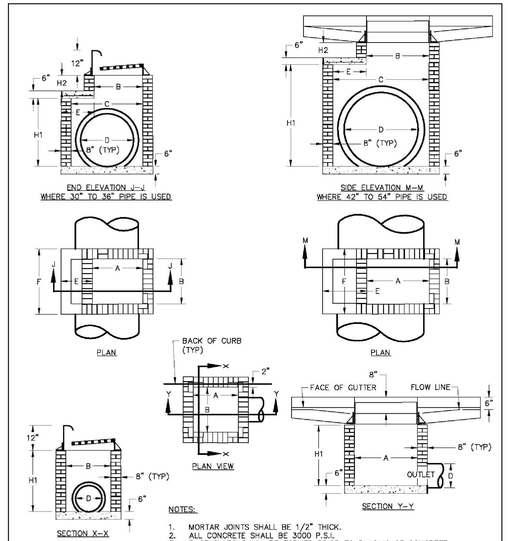
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22–150
FILE: .

UTILITY DETAILS

C901



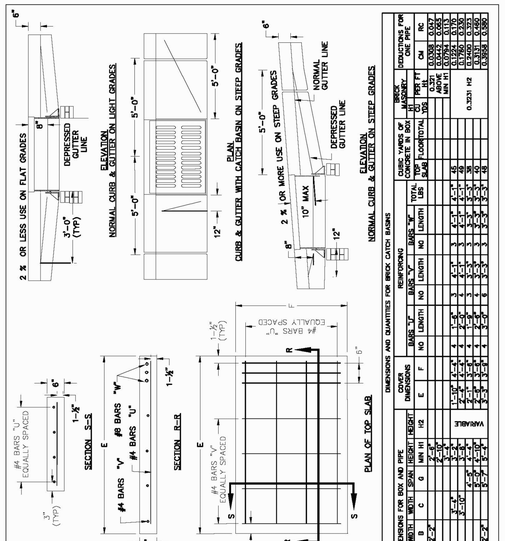
NOTES:

1. MORTAR JOINTS SHALL BE 1/2" THICK.
2. ALL CONCRETE SHALL BE 3000 P.S.I.
3. BASE SLABS SHALL BE FORMED PRIOR TO PLACING OF CONCRETE.
4. USE TYPE "A" GRATE AT SAG POINTS, OTHERWISE USE TYPE "B" OR "C" FOR THE APPROPRIATE FLOW DIRECTION.
5. MASONRY UNITS MAY BE JUMBO BRICK, CONCRETE BRICK OR SOLID CONCRETE BLOCK.
6. ALL WALLS GREATER THAN 6' IN DEPTH SHALL BE CONSTRUCTED 12" THICK

REVISIONS	
DATE	DESCRIPTION

1 of 2

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD CURB INLET	STD. NO. 5.05



DIMENSION AND QUANTITIES FOR PRECAST CATCH BASINS

DIMENSIONS FOR BOX AND PIPE							DIMENSIONS OF BOX														BRICK MASONRY	REDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	HEIGHT																		CUBIC YARDS OF CONCRETE IN BOX	PER FT FLOOR/CONTROL	PER PIT
D	SPAN	WIDTH	HEIGHT	SPAN	HEIGHT		A	B	H1	H2	E	F	BARS "A" NO	BARS "A" LENGTH	BARS "B" NO	BARS "B" LENGTH	BARS "C" NO	BARS "C" LENGTH	TOTAL LBS	TOP SLAB	FLOOR	CONTROL
				MIN	MIN																		
12"	3'-0"	2'-0"	2'-8"	3'-0"	3'-0"		3'-0"	2'-0"	2'-8"	VARIABLE	1'-3"	0'-6"	3	4'-1"	3	4'-1"	3	4'-1"	0.3231	0.3231	0.3231	H2	
15"			3'-0"		3'-0"				3'-0"														
18"			3'-5"		3'-5"				3'-5"														
24"			4'-0"		4'-0"				4'-0"														
30"	3'-0"	2'-0"	4'-3"	3'-0"	4'-3"		3'-0"	2'-0"	4'-3"														

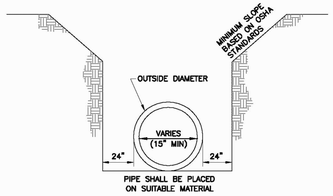
REVISIONS	
DATE	DESCRIPTION

2 of 2

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD CURB INLET	STD. NO. 5.05

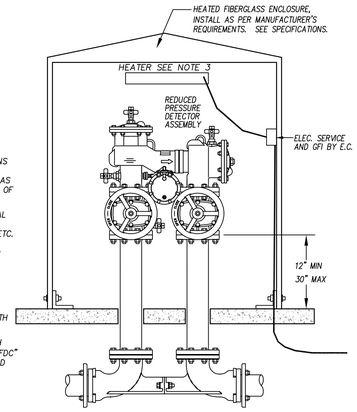
NOTES:

1. A MINIMUM OF 24" FROM OUTSIDE DIAMETER OF PIPE TO SIDE OF TRENCH MUST BE ALLOWED FOR COMPACTION OF FILL MATERIAL. BACKFILLING OF TRENCHES SHALL BE ACCOMPLISHED IMMEDIATELY AFTER THE PIPE IS LAID. THE FILL AROUND THE PIPE SHALL BE PLACED IN LAYERS NOT TO EXCEED 6". UNDER NO CIRCUMSTANCES SHALL WATER BE PERMITTED TO RISE IN UNBACKFILLED TRENCHES AFTER THE PIPE HAS BEEN PLACED. COMPACTION REQUIREMENTS SHALL BE ATTAINED BY THE USE OF MECHANICAL TAMPS ONLY. EACH AND EVERY LAYER OF BACKFILL SHALL BE PLACED LOOSE AND THOROUGHLY COMPACTED INTO PLACE.
2. ALL BACKFILL MATERIAL SHALL HAVE AN IN PLACE COMPACTED DENSITY OF AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DENSITY.
3. THE FINAL 24" OF BACKFILL MATERIAL SHALL BE COMPACTED TO 100% OF THE STANDARD PROCTOR MAXIMUM DENSITY.
4. ALL TRENCHING OPERATIONS SHALL MEET OSHA STANDARDS.
5. BACKFILL MATERIAL BENEATH ROADWAY SHALL BE SELECT BACKFILL MATERIAL.



REVISIONS	
DATE	DESCRIPTION

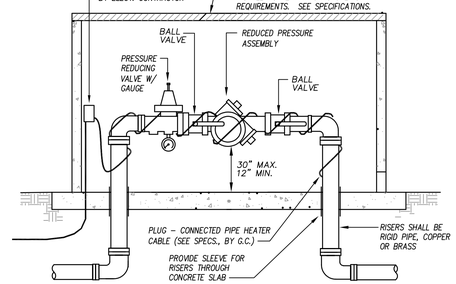
TOWN OF KNIGHTDALE STANDARD DETAILS	TRENCH FOR STORM DRAIN PIPES	STD. NO. 5.02



NOTES:

1. REDUCED PRESSURE DETECTOR ASSEMBLY (RPDA) SHALL BE WILKINS 375DA OR APPROVED EQUAL. ALL BACKFLOW PREVENTERS SHALL BE AS LISTED AS APPROVED BY THE CITY OF RALEIGH.
2. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS OF BACKFLOW PREVENTER, VALVES, ENCLOSURE, ETC.
3. HEATER AND POWER CORD BY G.C., SEE SPECIFICATIONS INSTALL PER MANUFACTURES INSTRUCTIONS.
4. PROVIDE PVC SLEEVES AT PIPE PENETRATIONS OF CONCRETE BASE SLAB.
5. PROVIDE TAMPER SWITCHES ON BOTH GATE VALVES.
6. INSTALL STORZ TYPE FDC THROUGH WALL OF ENCLOSURE AND APPLY "FDC" SIGN ON ENCLOSURE PER STANDARD CITY OF RALEIGH DETAILS.

REDUCED PRESSURE DETECTOR ASSEMBLY IN HEATED ENCLOSURE N.T.S.



NOTES:

1. REDUCED PRESSURE ASSEMBLY SHALL BE WILKINS 375A OR APPROVED EQUAL. ALL BACKFLOW PREVENTERS SHALL BE AS APPROVED BY THE CITY OF RALEIGH.
2. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS OF BACKFLOW PREVENTER, VALVES, ENCLOSURE, ETC.
3. HEATER AND POWER CORD BY G.C., SEE SPECIFICATIONS INSTALL PER MANUFACTURES INSTRUCTIONS.

REDUCED PRESSURE ASSEMBLY IN HEATED ENCLOSURE N.T.S.

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
SEAL 36404
PHILLARD F. LAWSON
SE 4-05-23

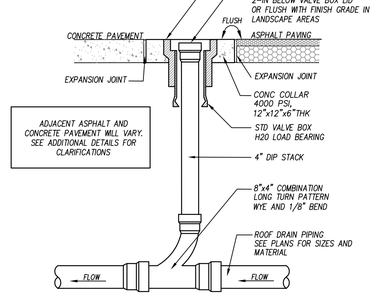
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

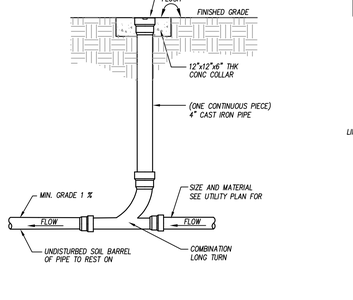
DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

UTILITY DETAILS

C902



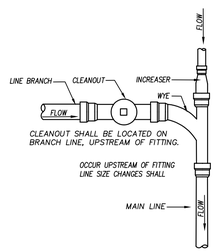
PAVEMENT INSTALLATION 'TYPE-1'



NOTES:
THE FULL LENGTH OF THE SERVICE DITCH BE COMPACTED IN 6" LAYERS WITH MECHANICAL TAMP.

(SEE UTILITY PLAN FOR PIPE MATERIAL AND SIZE)

LANDSCAPE INSTALLATION 'TYPE-2'

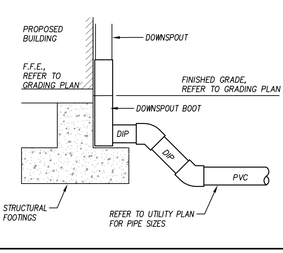


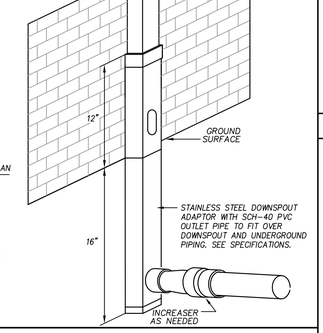
PLAN VIEW AT FITTINGS

ROOF DRAIN CLEANOUT N.T.S.

NOTES:

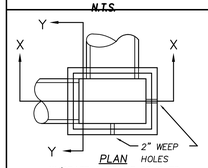
1. ALL BELOW GRADE ROOF DRAINAGE PIPING SHALL BE 6" PVC @ 1.04% MIN. SLOPE UNLESS NOTED OTHERWISE.
2. PIPE SHALL BE DIP WHEN LESS THAN 24-IN OF COVER IS PROVIDED.
3. VERIFY DOWNSPOUT DIMENSIONS MATCH SHOE DIMENSIONS PRIOR TO ORDERING OR INSTALLING ADAPTOR.



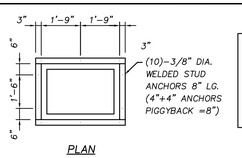


DOWNSPOUT CONNECTION N.T.S.

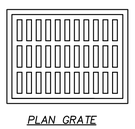
N.T.S.



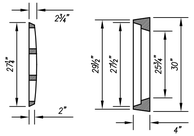
PLAN
W/GRATE & FRAME REMOVED

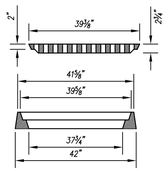


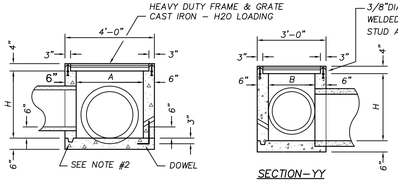
PLAN
SHOWING POSITION OF BOLTS



PLAN GRATE







SECTION–YY

DOWEL

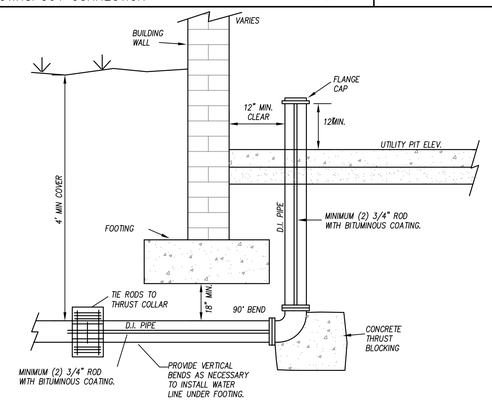
DIMENSIONS FOR DROP INLET			
DIMENSIONS OF BOX & PIPE			
PIPE	SPAN	WIDTH	HEIGHT
D	A	B	H
12"	3'–0"	2'–0"	2'–8"
15"			3'–0"
18"			3'–5"
24"			4'–0"
30"	3'–0"	2'–0"	4'–3"

DIMENSIONS FOR CHANNELS			
NO.	SIZE	LENGTH	TOTAL LIN. FT.
2	3"x4.1"	4'–0"	8'–0"
2	3"x4.1"	2'–6"	5'–0"

GENERAL NOTES:

1. CLASS "B" CONCRETE TO BE USED THROUGHOUT.
2. OPTIONAL CONSTRUCTION – MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTER, AS DIRECTED BY THE DESIGNER.
3. TWO 2" PIPE WEEP HOLES TO BE PLACED AS DIRECTED BY DESIGNER.
4. FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
5. IF REINFORCED CONCRETE PIPE IS SET IN BASE OF BOX, ADD TO BASE AS SHOWN ON N.C.D.O.T. STANDARD 840.00.
6. A STONE DRAIN CONSISTING OF 1 CUBIC FOOT OF NO. 78M STONE CONTAINED IN A BAG OF POROUS FABRIC SHALL BE PLACED AT EACH WEEP HOLE.
7. ALL DROP INLETS OVER 3'–6" IN DEPTH TO BE PROVIDED WITH STEPS 1'–2" ON CENTERS. STEPS SHALL BE IN ACCORDANCE WITH N.C.D.O.T. STANDARD 840.66.
8. ADA RATED HEAVY DUTY GRATE TO BE INSTALLED PEDESTRIAN AREAS.

DROP INLET N.T.S.



STANDARD FIRE SERVICE INSTALLATION AT BUILDING N.T.S.

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY:_____ DATE:_____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY:_____ DATE:_____
ADMINISTRATOR

GENERAL NOTES:

MORTAR JOINTS ½" ± ⅛" THICK.

CONCAVE TOOL ALL EXPOSED JOINTS.

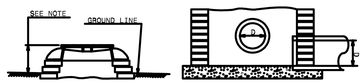
USE CLASS "B" CONCRETE THROUGHOUT.

USE FORMS TO CONSTRUCT THE BASE SLAB.

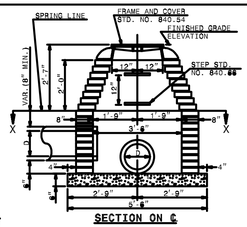
JUMBO BRICK WILL BE PERMITTED. CONCRETE BRICK OR 4" SOLID CONCRETE BLOCKS MAY BE USED IN LIEU OF CLAY BRICK. IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN IN STD. NO. 840.00.

WHERE THE MANHOLE IS EXPOSED TO ROAD TRAFFIC, CONSTRUCT THE TOP OF THE MANHOLE FLUSH WITH THE GROUND. AT OTHER LOCATIONS CONSTRUCT A MINIMUM OF 9" ABOVE THE GROUND.

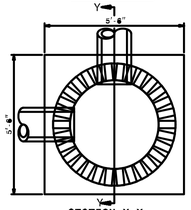
PROVIDE MANHOLES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTERS IN ACCORDANCE WITH STD. NO. 840.66.



PART SECTION Y-Y



SECTION ON ℄



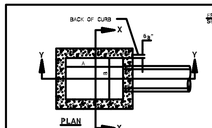
SECTION X-X

MINIMUM DIMENSIONS AND QUANTITIES FOR MANHOLE					
PIPE DIM.	CU. YDS. CONCRETE	TOTAL BRICK MASONRY CU. YDS.	CU. YDS. BRICK MASONRY PER FT. HT.	DEDUCTIONS FOR ONE PIPE (CU.YD.)	
D	BASE	ABOVE S-1	BELOW S-1	C.M	R.C.
12"	0.560	0.530	0.323	0.020	0.032
15"	0.560	0.530	0.323	0.031	0.037
18"	0.560	0.530	0.323	0.044	0.065
24"	0.560	0.530	0.323	0.078	0.113
30"	0.560	0.530	0.323	0.122	0.170
36"	0.560	0.530	0.323	0.176	0.238

ROADWAY STANDARD DRAWING FOR
BRICK MANHOLE
12" THRU 36" PIPE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

SHEET 1 OF 1
840.51



SECTION X-X

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL CATCH BASINS OVER 5'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION : MONOLITHIC POUR, 9" KEYWAY, ON #4 BAR DOWELS AT 18" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

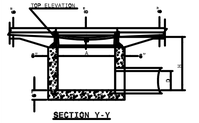
USE TYPE "1", "7" AND "8" GRATES UNLESS OTHERWISE INDICATED.

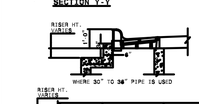
FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.

CONSTRUCT WITH PIPE OPENING MATCHING.

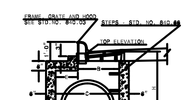
CHAMFER ALL EXPOSED CORNERS 1".

DRAWING NOT TO SCALE.

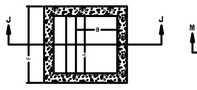




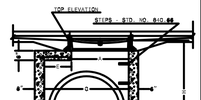
DETAIL SHOWING METHOD OF RISER CONSTRUCTION



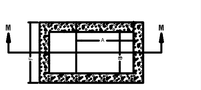
SECTION J-J



PLAN



SECTION M-M

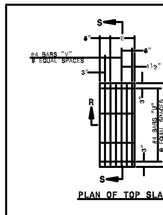


PLAN

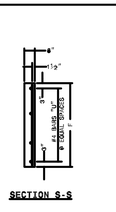
ROADWAY STANDARD DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

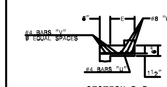
SHEET 1 OF 2
840.02



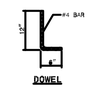
PLAN OF TOP SLAB



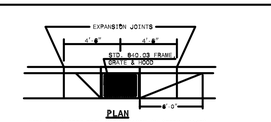
SECTION S-S



SECTION R-R



DOWEL

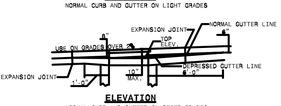


PLAN

CURB AND GUTTER WITH CATCH BASIN ON STEEP GRADES

ELEVATION

NORMAL CURB AND GUTTER ON LIGHT GRADES



ELEVATION

NORMAL CURB AND GUTTER ON STEEP GRADES

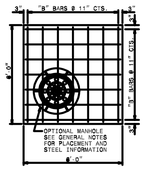
MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *																				
DIMENSIONS OF BOX AND PIPE							COVER DIMENSION									CU.YDS. CONC. IN BOX		DEDUCTIONS ONE PIPE	
PIPE	SPAN	RISE	WIDTH	H	WALL HEIGHT		E	F	NO.	BARS U LENGTH	NO.	BARS V LENGTH	NO.	BARS W LENGTH	TOTAL LBS.	TOP SLAB	BOTTOM SLAB	C.M.	R.C.
D	A	B	C																
12"	3'-0"	2'-3"		1'-0"	2'-9"											0.286	0.722	0.015	0.026
15"	3'-0"	2'-3"			3'-0"											0.286	0.829	0.023	0.036
18"	3'-0"	2'-3"			3'-3"											0.286	0.887	0.033	0.059
24"	3'-0"	2'-3"			3'-9"											0.286	1.001	0.059	0.089
30"	3'-0"	2'-3"	3'-0"		4'-3"		1'-3"	1'-0"	4	1'-3"	2	1'-9"	3	3'-8"	38	0.333	1.227	0.087	0.137
36"	3'-0"	2'-3"	3'-0"		4'-9"		1'-6"	1'-0"	4	1'-11"	3	2'-3"	3	3'-8"	45	0.381	1.333	0.123	0.178
42"	3'-0"	2'-3"	3'-0"		5'-3"		1'-9"	1'-0"	4	2'-3"	3	2'-9"	3	3'-11"	52	0.429	1.439	0.166	0.224
48"	3'-0"	2'-3"	3'-0"		5'-9"		2'-0"	1'-0"	4	2'-6"	3	3'-3"	3	4'-2"	59	0.476	1.545	0.214	0.280
54"	3'-0"	2'-3"	3'-0"		6'-3"		2'-3"	1'-0"	4	2'-9"	3	3'-6"	3	4'-5"	66	0.524	1.651	0.267	0.337

* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

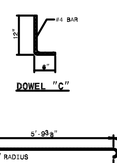
ROADWAY STANDARD DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

SHEET 2 OF 2
840.02

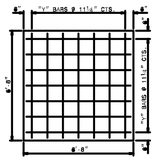


PLAN OF TOP SLAB

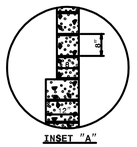


"Y" BARS

BAR DIMENSIONS ARE OUT TO OUT

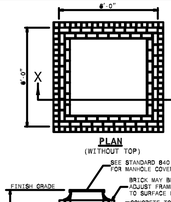


PLAN OF BOTTOM SLAB



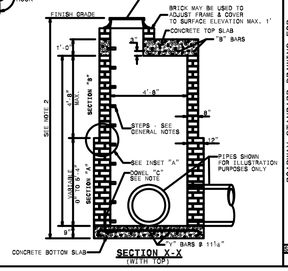
INSET "A"

CONCRETE BLOCK



PLAN

(WITHOUT TOP)



SECTION X-X
(WITH TOP)

NOTE 1: CONSTRUCT SECTION "B" OF THE PROPOSED WALL 8" THICK. AND SECTION "A" 12" THICK.

NOTE 2: IF PROPOSED STRUCTURE EXCEEDS 12'-0" VERTICAL HEIGHT A DESIGN WILL BE REQUIRED FOR APPROVAL.

NOTE 3: USE SINGLE MAT REINFORCING STEEL. EXCEPT DOUBLE MAT STEEL MAY BE USED IN LIEU OF HOOK BARS IN BASE SLAB.

ROADWAY STANDARD DRAWING FOR
TRAFFIC BEARING JUNCTION BOX
FOR USE WITH PIPES 42" AND UNDER

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

SHEET 1 OF 2
840.34

GENERAL NOTES:

USE STANDARD OR JUMBO BRICK FOR WALL CONSTRUCTION. SOLID CONCRETE BRICK OR BLOCK ARE OPTIONAL WALL CONSTRUCTION MATERIAL

INCLUDE ALL ADJUSTMENTS TO WALLS, SLABS OR REINFORCING MATERIAL IN THE UNIT PRICE BID FOR EACH UNIT.

INSTALL OPTIONAL MANHOLE IN POSITION AS DIRECTED BY THE ENGINEER. CUT OR BEND ALL REBAR CROSSING THIS OPENING TO ALLOW 3" MINIMUM CONCRETE COVERAGE. ENCLOSE THE OPENING WITH 8 "A" BARS TIED TO TO THE REBAR MAT AND SET SO A MINIMUM OF 3" CONCRETE COVER IS ATTAINED. REFERENCE STD. NO. 840.54 FOR MANHOLE INFORMATION.

PROVIDE JUNCTION BOXES WITH MANHOLES OVER 3'-6" IN DEPTH WITH STEPS PLACED ON 12" CENTERS. REFERENCE STD. NO. 840.66.

SPACE DOWEL "C" BARS AT A MAXIMUM OF 12" CENTERS.

MAXIMUM DEPTH OF THIS UNIT AS SHOWN IS 12'.

CONSTRUCT THE JUNCTION BOX IN ACCORDANCE WITH SECTIONS 830, 832, 834 AND 840 OF THE STANDARD SPECIFICATIONS.

BILL OF MATERIAL

BAR	QTY.	SIZE	LNGTH	WEIGHT
A	8	#5	1'-2"	9.7
B	56	#5	5'-6"	80.3
C	28	#4	1'-6"	28.1
Y	14	#5	8'-11"●	101.5
STEEL TOTAL WEIGHT				219.6
CU. YDS. CLASS "AA" CONC				3.6
CU. YDS. BRICK/FT. HT.			18"	0.03
CU. YDS. BRICK/FT. HT.			12"	0.81

ROADWAY STANDARD DRAWING FOR
TRAFFIC BEARING JUNCTION BOX
FOR USE WITH PIPES 42" AND UNDER

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

SHEET 2 OF 2
840.34

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 054704 RILLARD F. LAWSON
SE 4-05-23

KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

UTILITY DETAILS

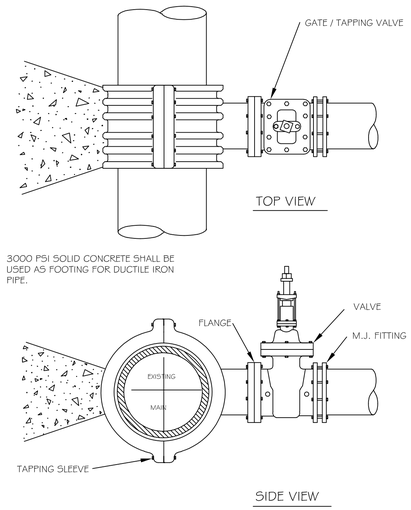
C903

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY:_____ _____ DATE:_____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY:_____ DATE:_____
ADMINISTRATOR

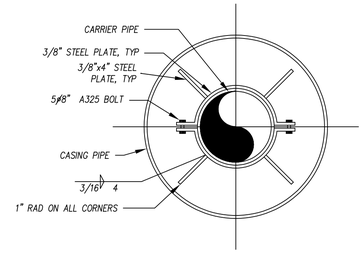


NOTES:
1. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
2. SEE STANDARD REACTION BLOCK TABLES, W-10 AND W-11 FOR AREA OF CONCRETE REQUIRED.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

4" - 24" STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-14	Y.C.A.	2-21-91	RRH	3-31-00
	D.W.C.	9-7-99	J.P.S.	11-1-10



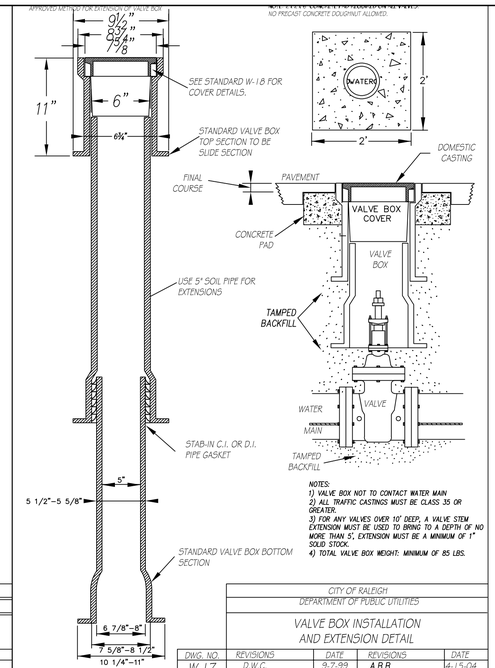
NOTE:

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
S-39	RRH	5-31-00		
	A.B.B.	4-16-04		

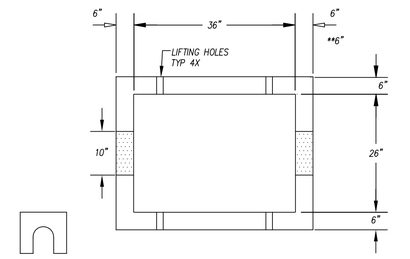


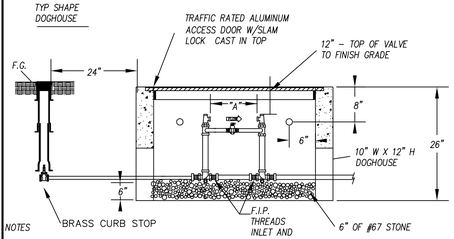
NOTES:
1) VALVE BOX NOT TO CONTACT WATER MAIN
2) ALL TRAFFIC CASTINGS MUST BE CLASS 35 OR GREATER.
3) FOR ANY VALVES OVER 10' DEEP, A VALVE STEM EXTENSION MUST BE USED TO BRING TO A DEPTH OF NO MORE THAN 5'. EXTENSION MUST BE A MINIMUM OF 1" SOLID STOCK.
4) TOTAL VALVE BOX WEIGHT: MINIMUM OF 85 LBS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

VALVE BOX INSTALLATION AND EXTENSION DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-17	D.W.C.	9-7-99	A.B.B.	4-15-04
	RRH	3-31-00	DHL	5-16-07





NOTES
1. METER AS MANUFACTURED BY SENSUS OR NEPTUNE.
2. BACKFILL TAMPED IN 6" LIFTS.
3. REINFORCEMENT: #4 @ 6" OCEW.
4. CONCRETE: 4,000 PSI @ 28 DAYS
5. ALL RPZ BACKFLOW PREVENTION DEVICES MUST BE INSTALLED PRIOR TO METER BEING SET.
6) ALL COPPER SETTERS ARE TO HAVE A BALL TYPE SHUT OFF VALVE ON BOTH SIDES OF COPPER SETTER WITH HIGH RISE BYPASS THAT IS MANUFACTURED BY FORD, MUELLER, OR AY McDONALD. (NO EXCEPTIONS)

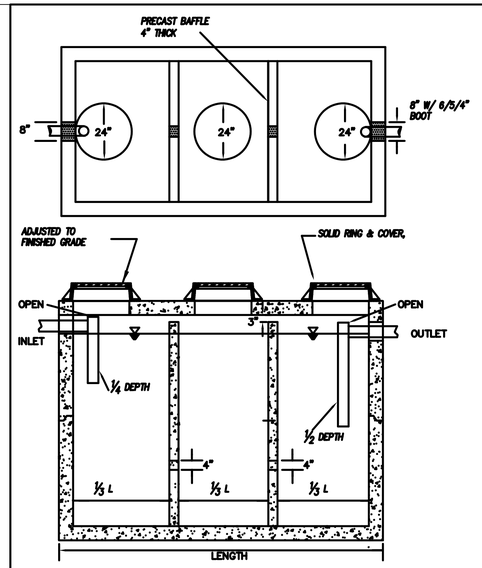
DIMENSION "A"	
1½" METER	13 ¼"
2" METER	17 ¼"

** TRAFFIC RATED VAULT WALL THICKNESS

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

TYPICAL 1 1/2"- 2" WATER METER BOX INSTALLATION

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: H-20 BRIDGE LOADING (TRAFFIC RATED)
2. CONCRETE: 4000 PSI @28 DAYS

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

1000 GALLON OIL-WATER-SAND SEPARATOR

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-40a	RRH	3/9/00	D.H.L	6/18/08
	ABB	3/19/04		

LOCALLY AVAILABLE SIZES	
INTERCEPTORS CAPACITY (GAL.)	SEPARATORS CAPACITY (GAL.)
300	1000
550	1200
750	1600
1000	
1200	
1500	
2000	
2500	
3000	
4000	
5000	
6000	
8000	

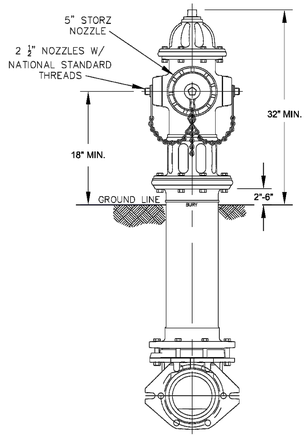
NOTES:

1. BAFFLE WALL LOCATED AT A DISTANCE FROM INLET WALL ⅔ TO ¾ OF THE TOTAL LENGTH OF THE INTERCEPTOR OR SEPARATOR AS SHOWN ON DETAIL S-40. BAFFLE WALLS LOCATED AT A DISTANCE APPROXIMATELY OF ½ OF THE TOTAL LENGTH OF THE SEPARATOR AS SHOWN ON DETAIL S-40.01.
2. EACH INTERCEPTOR OR SEPARATOR SHALL HAVE INLET AND OUTLET TEES. THE OUTLET TEE SHALL EXTEND 30% INTO THE LIQUID DEPTH. THE INLET TEE SHALL EXTEND 20% INTO THE LIQUID DEPTH. INLET AND OUTLET TEES MUST BE OPEN TO ALLOW THE COLLECTION OF F.O.G. SAMPLE.
3. ACCESS OPENINGS OVER EACH COMPARTMENT WITHIN THE INTERCEPTOR OR SEPARATOR SHALL BE 24 INCHES IN DIAMETER AND CONTAIN PICK HOLES. ALL COVERS SHALL BE CONSTRUCTED OF CAST IRON OR EQUIVALENT TRAFFIC BEARING MATERIAL. MANHOLE COVERS MUST EXTEND TO FINISH GRADE AND BE INSTALLED TO EXCLUDE THE ENTRANCE OF STORMWATER INTO THE INTERCEPTOR OR SEPARATOR.
4. FULL SIZE SWAN, SWEEP CLEANOUTS SHALL BE INSTALLED ON THE INLET AND OUTLET SIDES OF THE INTERCEPTOR OR SEPARATOR.
5. INTERCEPTORS AND SEPARATORS MUST BE VENTED IN ACCORDANCE WITH THE NC STATE PLUMBING CODE.
6. CONCRETE: 4000 PSI @ 28 DAYS.
7. DESIGN: ACI 318 BUILDING CODE
   ASTM C913-08 FOR GREASE INTERCEPTORS
   ASTM C913-02 FOR WATER AND WASTEWATER STRUCTURES
   ASTM C890-06 FOR MINIMAL STRUCTURAL DESIGN LOADING
8. INTERCEPTORS AND SEPARATORS SHALL BE DESIGNED TO WITHSTAND AN H-20 WHEEL LOAD.
9. INTERCEPTORS OR SEPARATORS MADE OF POLYETHYLENE OR FIBERGLASS SHALL INCLUDE A MINIMUM 12,000 PSI TENSILE STRENGTH, 19,000 PSI FLEXURAL STRENGTH, AND 800,000 PSI FEDURAL MODULUS.
10. ALL INTERCEPTORS AND SEPARATORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

DIMENSIONS: GREASE INTERCEPTORS OIL-WATER-SAND SEPARATORS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-41	RRH	5/9/00	D.H.L	6/18/08
	ABB	3/19/04		



NOTES:
1. ALL PUBLIC FIRE HYDRANTS IN THE CITY OF RALEIGH AND THE MERGER TOWNS OF GARNER, ROLESVILLE, WAKE FOREST, KNIGHTDALE, WENDELL AND ZEBULON SHALL BE PAINTED CHROME YELLOW WITH HIGH REFLECTIVE ALUMINUM SILVER CAPS, BONNETS AND OPERATING NUTS.
2. ALL PRIVATE FIRE HYDRANTS SHALL BE RED.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
RALEIGH, GARNER, KNIGHTDALE, ROLESVILLE, WAKE FOREST, WENDELL & ZEBULON

STANDARD FIRE HYDRANT WITH 5" STORZ PUMPER NOZZLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-5	MAB	6-30-16		
	KAT	9-15-17		

PRIVATE
SEWER COLLECTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION TO ITS PUBLIC SEWER SYSTEM AND EXTENSION OF THE PRIVATE SEWER COLLECTION SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-5209(P)

AUTHORIZATION TO CONSTRUCT _____

DATE _____

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval _____

City of Raleigh Review Officer

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY: _____ *DATE:* _____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: _____ *DATE:* _____
ADMINISTRATOR

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
Cary, NC 27518
Phone: 919.319.6716
Fax: 919.319.7516
LA: C-106 PE: C-1595

KNIGHTDALE start something

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 36404 ENGINEER ROLLAND F. LAWSON
4-05-23

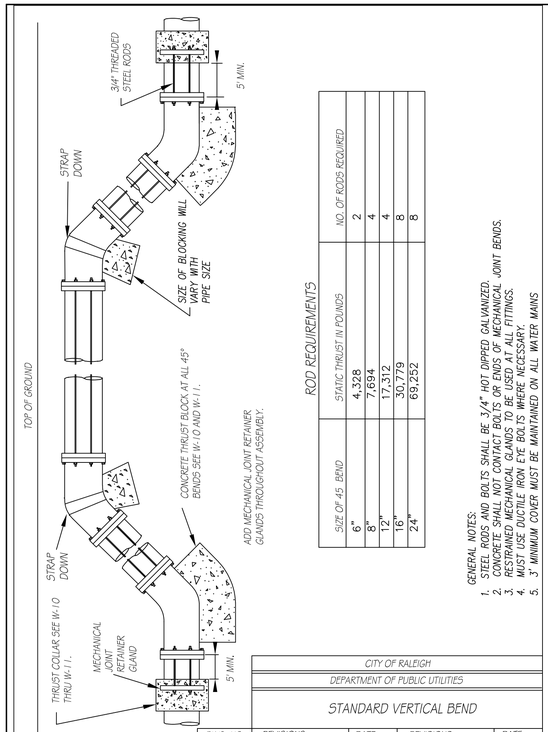
KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS	NO.	DATE	DESCRIPTION
	.	.	.

DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

UTILITY DETAILS

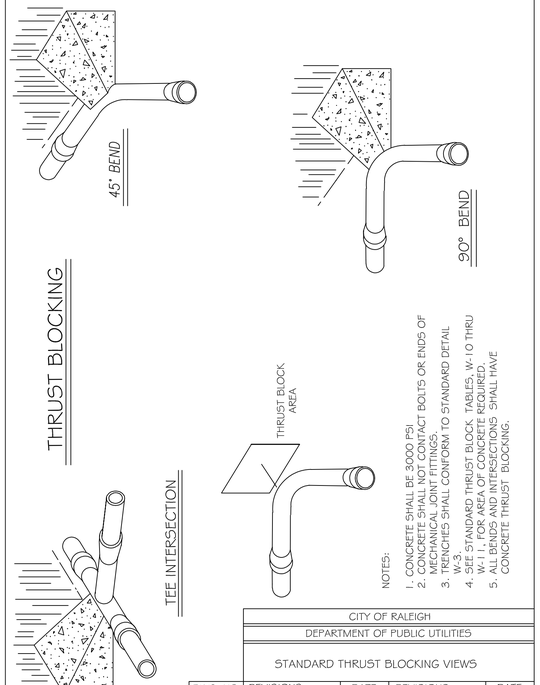
C904



ROD REQUIREMENTS		
SIZE OF 45° BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	2
8"	7,694	4
12"	17,312	4
16"	30,779	8
24"	69,252	8

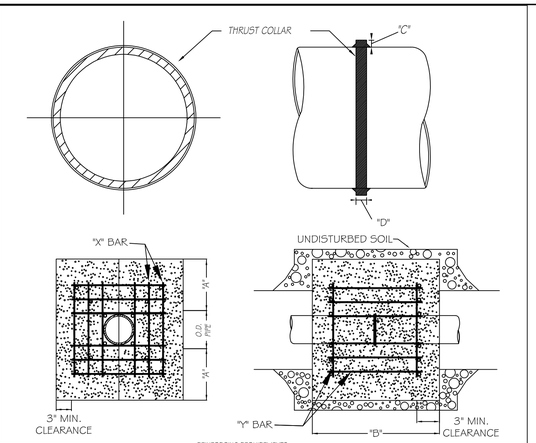
GENERAL NOTES:
1. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
2. CONCRETE SHALL NOT CONTACT BOLTS, OR ENDS OF MECHANICAL JOINT BENDS.
3. EXTERIOR MANUAL CLASS TO BE USED ON ALL FITTINGS.
4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.
5. 3' MINIMUM COVER MUST BE MAINTAINED ON ALL WATER MAINS

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD VERTICAL BEND				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-12	ABB	4-6-04	J.P.S.	11-1-10
	D.H.L.	6-18-08		



NOTES:
1. CONCRETE SHALL BE 3000 PSI.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. TRENCHES SHALL CONFORM TO STANDARD DETAIL W-3.
4. SEE STANDARD THRUST BLOCK TABLES, W-10 THRU W-11. FOR AREA OF CONCRETE REQUIRED.
5. ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

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



REINFORCING REQUIREMENTS

I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	NO. REQUIRED
6" –	#5	2'-2"+ O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	X-24, Y-12
48"& greater	#6	3'-0"+ O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X-24, Y-12

THRUST COLLAR AND THRUST SCHEDULE

I.D. PIPE	"A"	"B"	"C"	"D"
6" - 16"	1'-4"	1'-7"	2"	3/8"
20" - 24"	1'-4"	1'-7"	3"	1/2"
30" - 36"	1'-4"	1'-7"	4"	5/8"
48" & greater	1'-8"	1'-9"	6"	7/8"

NOTES:
1. SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
2. CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
3. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
4. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.
5. BACKFILL TAMPED IN 6" LIFTS PER STANDARD DETAIL W-3.
6. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
THRUST BLOCKING DESIGN DATA FOR WATER MAINS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-7	RRH	1-21-00	J.P.S.	
	D.H.L.	6-18-08	11-1-10	

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

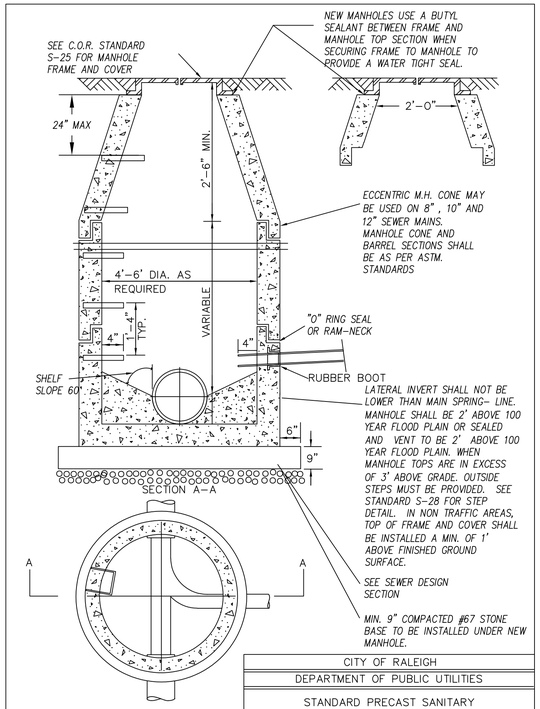
ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS/FT²	SOFT CLAY 2000 LBS/FT²	1600 LBS/FT² GRAVEL / COARSE SAND	2000 LBS/FT² DRY CLAY - ALWAYS DRY	SAND - COMPACT FIRM 8000 LBS/FT²	SAND - CLEAN DRY 4000 LBS/FT²	SOIL 1000 LBS/FT² QUICKSAND - VERY POOR	ROCK - POOR 10,000 LBS/FT²
6"									
11 1/4°	1,108	1	1	1	1	1	1	2	1
22 1/2°	2,207	1	2	2	1	1	1	3	1
45°	4,328	2	3	3	1	1	2	5	1
90°	7,996	2	4	5	1	1	2	8	1
PLUG	5,655	2	3	4	1	1	2	6	1
8"									
11 1/4°	1,970	1	1	2	1	1	1	2	1
22 1/2°	3,922	1	2	3	1	1	1	4	1
45°	7,694	2	4	5	1	1	2	8	1
90°	14,215	4	8	9	2	2	4	15	2
PLUG	10,053	3	5	6	2	2	3	10	1
12"									
11 1/4°	4,433	2	3	3	1	1	2	5	1
22 1/2°	8,826	3	5	6	2	2	3	9	1
45°	17,312	5	9	11	3	3	5	18	2
90°	31,983	8	16	19	4	4	8	32	4
PLUG	22,619	6	12	14	3	3	6	23	3
16"									
11 1/4°	7,881	2	4	5	1	1	2	8	1
22 1/2°	15,691	4	8	10	2	2	4	16	2
45°	30,779	8	16	19	4	4	8	31	4
90°	56,861	15	29	35	8	8	15	57	6
PLUG	40,213	10	21	25	5	5	10	41	5

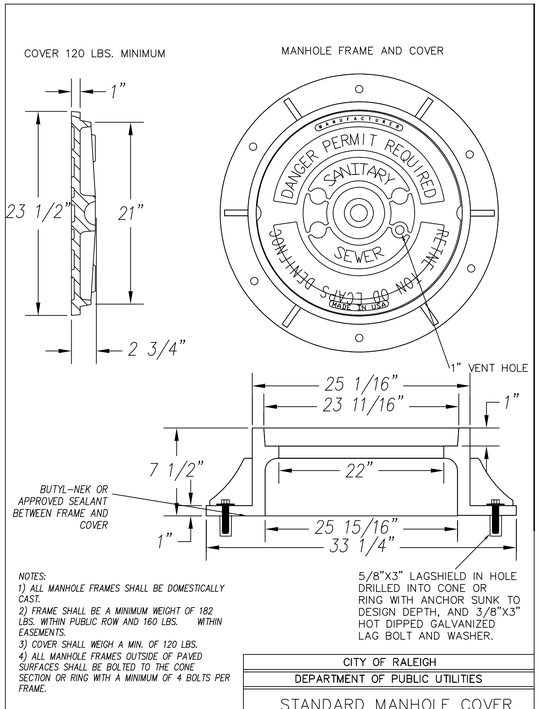
REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.

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

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
THRUST BLOCKING DESIGN QUANTITY TABLE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-10	D.W.C.	6-23-99		



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD PRECAST SANITARY SEWER MANHOLE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-20	Y.C.A.	12-31-92	ABB	2-21-05
	RRH	3-30-00	D.H.L.	6-16-08



NOTES:
1) ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
2) FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.
3) COVER SHALL WEIGH A MIN. OF 120 LBS.
4) ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF 4 BOLTS PER FRAME.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD MANHOLE COVER				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-25	3-1-87	3-1-87	A.B.B.	2-9-05
	RRH	3-30-00	D.H.L.	6-18-08

PRIVATE
SEWER COLLECTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION TO ITS PUBLIC SEWER SYSTEM AND EXTENSION OF THE PRIVATE SEWER COLLECTION SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-5209(P)

AUTHORIZATION TO CONSTRUCT _____

DATE _____

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval _____

City of Raleigh Review Officer

TOWN CERTIFICATION. THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY: _____ DATE: _____
TOWN ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: _____ DATE: _____
ADMINISTRATOR

CLH DESIGN
CLH Design, PA
400 Regency Forest Dr.
Suite 120
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KNIGHTDALE start something

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034704 RICHARD F. LAWSON
SEAL 4-05-23

KNIGHTDALE FIRE STATION #1
NEW FIRE STATION
7477 FORESTVILLE ROAD KNIGHTDALE, NC 27545
TOWN OF KNIGHTDALE
22-150

REVISIONS		
NO.	DATE	DESCRIPTION
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DESIGNED BY: TRO/PL
DRAWN BY: TRO
DATE: DEC 12, 2022
PROJECT NO: 22-150
FILE: .

UTILITY DETAILS

C905

GENERAL ELECTRICAL NOTES:

ADMINISTRATIVE:

1. THE FOLLOWING ABBREVIATIONS SHALL APPLY TO NOTES AND PLANS:
   PC - PLUMBING CONTRACTOR, EC - ELECTRICAL CONTRACTOR,
   MC - MECHANICAL CONTRACTOR, GC - GENERAL CONTRACTOR,
   FASC - FIRE ALARM SYSTEM CONTRACTOR.
2. "PROVIDE" MEANS TO FURNISH AND INSTALL. THE ELECTRICAL CONTRACTOR SHALL ALSO INSTALL MATERIALS AND EQUIPMENT FURNISHED BY OTHERS AND THE GENERAL CONTRACTOR AS REQUIRED.
3. EC SHALL PROVIDE LABOR, MATERIALS, EQUIPMENT, AND SERVICES NECESSARY AND REASONABLY INCIDENTAL TO INSURE A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS. MINOR ITEMS, ACCESSORIES, AND DEVICES REASONABLY INFERABLE AS NECESSARY FOR THE COMPLETION AND PROPER OPERATION OF ANY ELECTRICAL SYSTEM SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
4. WORKMANSHIP SHALL BE IN ACCORDANCE WITH NECA 1 "STANDARD PRACTICE FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING."
5. ALL MATERIALS AND EQUIPMENT SHALL BE DELIVERED TO THE SITE AND UNLOADED BY THE ELECTRICAL CONTRACTOR AT AN APPROVED LOCATION. THE ELECTRICAL CONTRACTOR SHALL PROTECT ALL MATERIALS AND EQUIPMENT FROM BREAKAGE, THEFT, AND THE ELEMENTS. ALL MATERIALS AND EQUIPMENT SHALL REMAIN THE PROPERTY OF THE ELECTRICAL CONTRACTOR UNTIL THE PROJECT HAS BEEN COMPLETED AND TURNED OVER TO THE OWNER.
6. THE ELECTRICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, FEES, AND INSPECTIONS NECESSARY FOR THE COMPLETION OF THE WORK UNDER THIS CONTRACT.
7. DO NOT SCALE THESE DRAWINGS-REFER TO ARCHITECTURAL SHEETS FOR DIMENSIONS.
8. TRADE NAMES AND MANUFACTURERS ARE SPECIFIED TO ESTABLISH A QUALITY STANDARD. SUBSTITUTIONS SHALL BE PERMITTED IF APPROVED BY THE ENGINEER AND/OR OWNER PRIOR TO INSTALLATION. ALL LISTED MODEL NUMBERS SHALL BE VERIFIED WITH THE MANUFACTURER FOR PROPER APPLICATION OF EQUIPMENT.
9. THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO BECOME FAMILIAR WITH EXISTING CONDITIONS. THE ELECTRICAL CONTRACTOR SHALL CONTACT THE ENGINEER TO RESOLVE ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THESE PLANS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OTHER TRADES PRIOR TO THE START OF CONSTRUCTION.
10. GROUNDING AND BONDING SHALL BE PER NEC ARTICLE 250. THE RACEWAY SYSTEM SHALL NOT BE RELIED UPON FOR GROUNDING CONTINUITY. A GREEN EQUIPMENT GROUNDING CONDUCTOR, SIZED PER NEC TABLE 250-122, SHALL BE RUN IN ALL POWER RACEWAYS. FOR NON-ISOLATED GROUND CIRCUITS PROVIDE ONE EQUIPMENT GROUNDING CONDUCTOR PER CONDUIT RUN. FOR ISOLATED GROUND CIRCUITS, PROVIDE ONE NEUTRAL AND ONE ISOLATED GROUND WIRE FOR EACH CIRCUIT; IN ADDITION, PROVIDE ONE EQUIPMENT GROUNDING CONDUCTOR PER CONDUIT RUN. MAIN BONDING JUMPERS AND SYSTEM BONDING JUMPERS SHALL BE INSTALLED IN ACCORDANCE WITH 250.28 OF THE NEC. FOR BUILDINGS OR STRUCTURES SUPPLIED BY FEEDERS OR BRANCH CIRCUITS, GROUNDING AND BONDING SHALL BE IN ACCORDANCE WITH 250.32. SEPARATELY DERIVED AC SYSTEMS SHALL BE GROUNDED IN ACCORDANCE WITH 250.30. RESISTANCE TO GROUND SHALL NOT EXCEED 25 OHMS; ADDITIONAL GROUNDING ELECTRODES SHALL BE INSTALLED PER 250.56 AS NECESSARY.
11. ALL MATERIALS AND EQUIPMENT SHALL COMPLY WITH THE UNDERWRITERS' LABORATORIES, INC. STANDARDS OR HAVE UL APPROVAL, OR BEAR UL RE-EXAMINATION LISTING WHERE SUCH APPROVAL HAS BEEN ESTABLISHED FOR THE TYPE OF DEVICE IN QUESTION.
12. CONDUCTORS, FUSES, CIRCUIT BREAKERS, AND DISCONNECT SWITCHES SHOWN ON THESE PLANS HAVE BEEN SIZED FOR THE SPECIFIED EQUIPMENT. BEFORE ORDERING ELECTRICAL EQUIPMENT, THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OTHER CONTRACTORS ON THE SITE AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES SHOULD CONDUCTOR, CIRCUIT BREAKER, OR FUSE SIZES REQUIRE CHANGE.
13. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR TO ENSURE THE FOLLOWING MATERIALS ARE RECYCLED DURING THE CONSTRUCTION PHASE OF THE PROJECT: LIGHT FIXTURES, INCLUDING PROPER DISPOSAL OF BALLASTS, FLUORESCENT LIGHT BULBS, AND TRANSFORMERS, WIRING AND ELECTRICAL EQUIPMENT, AND INSULATION. WASTE MATERIALS CONTAINING LEAD, ASBESTOS, PCBs (FLUORESCENT LAMP BALLASTS), OR OTHER HARMFUL SUBSTANCES SHALL BE HANDLED AND DISPOSED OF IN ACCORDANCE WITH FEDERAL AND STATE LAWS AND REQUIREMENTS CONCERNING HAZARDOUS WASTE.
14. ALL WORK SHALL CONFORM TO 2020 NATIONAL ELECTRIC CODE, 2020 STATE BUILDING CODE, AND ALL APPLICABLE LOCAL CODES.

MATERIALS:

1. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY DISCONNECTS, SWITCHES, RECEPTACLES, TERMINALS, ETC, UNDER THE ELECTRICAL BID AND SHALL INCLUDE ALL NECESSARY CIRCUITS AND CONNECTIONS TO THE EQUIPMENT PROVIDED BY ALL SUPPLIERS, UNLESS NOTED OTHERWISE BY OTHER DISCIPLINES.
2. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL SERVICE ENTRANCE EQUIPMENT, SUB PANELS, AND OTHER ELECTRICAL DISTRIBUTION EQUIPMENT AS NECESSARY FOR A COMPLETE INSTALLATION. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH UTILITY REGARDING SERVICE AND METERING DETAILS. PANEL BOARDS AND SWITCH BOARDS SHALL BE SQUARE D, CUTLER-HAMMER, SIEMENS, OR GE. BUSES SHALL BE COPPER UNLESS OTHERWISE APPROVED BY THE ENGINEER. RECESSED PANEL BOARDS SHALL BE INSTALLED FLUSH WITH THE WALL FINISH. METER BASES SHALL COMPLY WITH THE UTILITY'S SPECIFICATIONS AND SHALL BE MOUNTED AT A HEIGHT APPROVED BY THE UTILITY. ALL EQUIPMENT IDENTIFIED FOR SERVICE ENTRANCE USE SHALL BE SO LABELED AND UL LISTED FOR SUCH USE. ELECTRICAL CONTRACTOR SHALL INSTALL ALL ELECTRICAL EQUIPMENT WITH CLEARANCES PER NEC 110.26. ELECTRICIAN SHALL PERMANENTLY LABEL EQUIPMENT PER NEC 110.24.
3. ENCLOSED SAFETY SWITCHES SHALL BE HEAVY DUTY TYPE BY SQUARE D, EATON, OR GE. ENCLOSED SWITCHES SHALL HAVE A HANDLE LOCKABLE IN THE OFF POSITION AND SHALL HAVE A HANDLE INTERLOCKED TO PREVENT OPENING THE FRONT COVER WHILE IN THE ON POSITION. ENCLOSED SWITCHES OF THE FUSIBLE TYPE SHALL BE FUSED IN ACCORDANCE WITH NAMEPLATE DATA WITH DUAL ELEMENT TYPE FUSES BY BUSSMAN, LITTELFUSE, OR MERSEN.
4. OCCUPANCY SENSORS SHALL BE BY WATTSTOPPER, LUTRON, LEVITON, SENSOR SWITCH, HUBBELL, OR APPROVED EQUAL.
5. CIRCUIT BREAKERS SHALL BE MOLDED-CASE, THERMAL MAGNETIC TYPE WITH QUICK-MAKE, QUICK-BREAK MECHANISM, COMMON TRIP ON MULTI-POLE BREAKERS, AND UL LISTED FOR BOTH COPPER AND ALUMINUM CONDUCTORS. CIRCUIT BREAKERS IN PANELS SHALL BE SERIES RATED WITH THE MAIN BREAKER, FULLY RATED FOR THE SYSTEM, OR SERIES RATED WITH THE BREAKER FEEDING THE PANEL FROM THE FACTORY.
6. ALL WIRE, CONNECTORS, TERMINALS, AND LUGS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. WHERE CONDUCTORS ARE RUN IN PARALLEL, LUGS SHALL BE LISTED FOR PARALLEL CONDUCTORS. PUSH WIRE CONNECTORS ARE NOT ALLOWED FOR BUILDING WIRE. PUSH CONNECTORS ARE ONLY ALLOWED, WHEN APPROVED, AS PART OF MANUFACTURED LISTED PRODUCTS. ALL WIRE SHALL BE INSTALLED IN CONDUIT UNLESS SPECIFICALLY NOTED OTHERWISE.
7. THE INSULATION TYPE FOR INTERIOR WIRING SHALL BE DUAL RATED THHN/THWN OR XHHW; ALL WIRING INSTALLED BELOW GRADE OR IN MOIST OR WET LOCATIONS SHALL HAVE TYPE THWN OR XHHW INSULATION. INSULATION VOLTAGE RATING SHALL BE 600 VOLTS AND A MINIMUM TEMPERATURE RATING OF 75°C. CONDUCTORS SHALL BE SOLID OR STRANDED COPPER FOR #10 AWG AND #12 AWG, AND STRANDED COPPER FOR #8 AWG AND LARGER SIZES. ALL WIRING AND CABLE SHALL BE UL LISTED. ALL TERMINATIONS AND DEVICES SHALL BE RATED FOR USE WITH 75°C CONDUCTORS. FINAL CONNECTIONS TO ALL MOTORS AND EQUIPMENT SUBJECT TO VIBRATION OR MOVEMENT SHALL BE MADE WITH STRANDED COPPER CONDUCTORS. CONDUCTORS SHALL BE BY CERRO WIRE, INC, INDUSTRIAL WIRE & CABLE, INC, OR SOUTHWIRE COMPANY.
8. JOINTS IN SOLID CONDUCTORS SHALL BE SPLICED USING IDEAL "WIRE NUTS", 3M "SCOTCH LOCK", OR T&B "PIGGY" CONNECTORS IN JUNCTION BOXES, OUTLET BOXES, AND LIGHTING FIXTURES. JOINTS IN STRANDED CONDUCTORS SHALL BE SPLICED BY APPROVED MECHANICAL CONNECTORS AND GUM RUBBER TAPE OR FRICTION TAPE. SOLDERLESS MECHANICAL CONNECTORS FOR SPLICES AND TAPS, PROVIDED WITH UL APPROVED INSULATING COVERS, MAY BE USED INSTEAD OF MECHANICAL CONNECTORS PLUS TAPE. IN ALL CASES, CONDUCTORS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET AND NO SPLICING SHALL BE MADE EXCEPT WITHIN OUTLET OR JUNCTION BOXES, TROUGHS, OR GUTTERS. WHERE CONCENTRIC, ECCENTRIC, OR OVERSIZED KNOCKOUTS ARE ENCOUNTERED, A GROUNDING TYPE INSULATED BUSHING SHALL BE PROVIDED.
9. ALL LUMINAIRES SHALL BE LISTED. LUMINAIRES IN WET OR DAMP LOCATIONS SHALL BE MARKED AS SUITABLE FOR THE RESPECTIVE USE. EMERGENCY LIGHTING SHALL BE INSTALLED AS SHOWN. FINAL LOCATIONS OF ALL EXIT AND EMERGENCY LIGHTS SHALL BE VERIFIED WITH THE BUILDING INSPECTOR PRIOR TO INSTALLATION. ALL FLUORESCENT FIXTURES SHALL HAVE ELECTRONIC BALLASTS MEETING ANSI C82.11 FOR ELECTRONIC BALLAST PERFORMANCE. ALL BALLASTS SHALL BE UL LISTED AND MEET FEDERAL AND STATE EFFICIENCY REQUIREMENTS.
10. ALL CONDUIT, FITTINGS, COUPLINGS, AND SUPPORTS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. CONDUIT FITTINGS AND COUPLINGS SHALL BE BY APPLETON, RACO, OR O-Z/GEDNEY. COUPLINGS SHALL BE THREADED, SET-SCREW, OR COMPRESSION TYPE. INDENTER OR CRIMP TYPE ARE NOT PERMITTED. CONDUIT FITTINGS AT ALL ELECTRICAL BOXES INCLUDING PULL, JUNCTION, AND OUTLET BOXES, SHALL HAVE INSULATED THROATS TO PREVENT INSULATION SCORING. DIE CAST FITTINGS ARE NOT PERMITTED
11. EMT SHALL BE MANUFACTURED IN ACCORDANCE WITH AMERICAN NATIONAL STANDARDS INSTITUTE-AMERICAN NATIONAL STANDARD FOR STEEL ELECTRICAL METALLIC TUBING (EMT), ANSI C80.3 AND UL 797. RIGID METAL CONDUIT SHALL BE MANUFACTURED IN ACCORDANCE WITH ANSI-AMERICAN NATIONAL STANDARD FOR ELECTRICAL RIGID STEEL CONDUIT (ERSC), ANSI C80.1 AND UL 6. INTERMEDIATE METAL CONDUIT SHALL BE MANUFACTURED IN ACCORDANCE WITH ANSI-AMERICAN NATIONAL STANDARD FOR INTERMEDIATE METAL CONDUIT ANSI C80.6 AND UL 1242.
12. METAL CONDUIT SHALL BE BY ALLIED TUBING & CONDUIT, BECK MANUFACTURING, INC, OR WHEATLAND TUBE COMPANY. FLEXIBLE METAL CONDUIT, LIQUID-TIGHT FLEXIBLE METAL CONDUIT, AND NONMETALLIC CONDUIT SHALL BE BY AFC CABLE SYSTEMS, INC, ELECTRI-FLEX COMPANY, OR INTERNATIONAL METAL HOSE.

METHODS:

1. EC SHALL REVIEW THE MECHANICAL PLANS TO ESTABLISH POINTS OF CONNECTION AND THE EXTENT OF THE ELECTRICAL WORK TO BE PROVIDED IN THE CONTRACT.
2. ALL CIRCUIT BREAKERS FEEDING HVAC EQUIPMENT SHALL BE HACR BREAKERS. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE MINIMUM #12 AWG IN 3/4 in CONDUIT. EACH MULTI-WIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS TO SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE SOURCE PER NEC 210.4(B). GROUP ALL CONDUCTORS OF EACH MULTI-WIRE BRANCH CIRCUIT PER 210.4(D) WITH WIRE TIES OR SIMILAR MEANS. DO NOT EXCEED THREE HOMERUNS PER CONDUIT. DO NOT INSTALL ISOLATED GROUND AND NON-ISOLATED GROUND CIRCUITS IN THE SAME CONDUIT. INSTALL CONDUCTORS OF DIFFERENT VOLTAGES IN SEPARATE CONDUITS.
3. COLOR CODE CONDUCTORS PER NEC. FEEDERS SHALL BE IDENTIFIED IN ACCORDANCE WITH NEC 215.12. USE BLACK, RED, AND BLUE FOR PHASES A, B, AND C RESPECTIVELY ON 208Y/120 VOLT THREE-PHASE Y SYSTEMS AND WHITE FOR THE NEUTRAL. ISOLATED GROUND WIRES SHALL BE GREEN WITH YELLOW BANDS OR STRIPES. THIS IDENTIFICATION SHALL BE MADE AT EACH POINT WHERE A CONNECTION IS MADE COLORS SHALL BE FACTORY APPLIED FOR CONDUCTORS #6 AWG AND SMALLER. ALL EQUIPMENT GROUNDING CONDUCTORS SHALL BE GREEN IN COLOR AND MINIMUM #12 AWG. THE EC SHALL PROVIDE PLENUM RATED CABLE FOR ANY ELECTRICAL, TELEPHONE, COMMUNICATION, OR OTHER CABLE THAT ENTERS CEILING RETURN PLENUMS.
4. ALL LIGHT FIXTURES SHALL BE SUPPORTED INDEPENDENTLY OF THE SUSPENDED CEILING. COORDINATE LIGHTING LAYOUT WITH CEILING GRID, MECHANICAL EQUIPMENT, DUCTWORK AND SPRINKLER HEADS AS NECESSARY. SEE REFLECTED CEILING PLAN FOR DETAILS. FLUORESCENT FIXTURES UTILIZING DOUBLE-ENDED LAMPS MUST HAVE A DISCONNECTING MEANS COMPLYING WITH NEC 410.130(G).
5. MOUNT LIGHT SWITCHES AT 48 in AFF. MULTIPLE SWITCHES AT SAME LOCATION SHALL BE UNDER ONE WALL PLATE. VERIFY WALL PLATE COLOR AND MATERIAL WITH THE ARCHITECT/OWNER. INSTALL SWITCHES WITH off POSITION DOWN. ALL SWITCHES SHALL BE HEAVY DUTY, IVORY PLASTIC WITH TOGGLE HANDLE, RATED 120-277V AC, AND COMPLYING WITH NEMA WD 6 AND WD 1. SWITCHES SHALL BE BY COOPER WIRING DEVICES, LEVITON MANUFACTURING, PASS & SEYMOUR, OR HUBBELL. PROVIDE BOX DEVICE PARTITION/DIVIDERS FOR MULTI-GANG BOXES FOR COMPLIANCE WITH NEC 404.8(B).
6. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE-STOPPING AT ALL ELECTRICAL PENETRATIONS OF RATED FLOORS AND WALLS TO PRESERVE OR RESTORE THE FIRE-RESISTANCE RATING. SEAL PENETRATIONS USING A UL LISTED SYSTEM FOUND IN THE UL DIRECTORY SPECIFIC TO THE UL LISTING OF THE ASSEMBLY BEING PENETRATED. SEE ARCHITECTURAL PLANS FOR UL RATED ASSEMBLIES SPECIFIC TO THIS PROJECT.
7. ELECTRICAL CONTRACTOR SHALL PROVIDE GFCI RECEPTACLES IN KITCHENS, RESTROOMS, OUTDOORS, AND IN SHOP AREAS AS REQUIRED BY NEC. REFRIGERATORS AND WATER COOLERS MUST HAVE A DEDICATED GFCI BREAKER. EACH OUTDOOR HVAC UNIT MUST HAVE A GFCI RECEPTACLE WITHIN 25 FEET FOR SERVICING. GFCI RECEPTACLES SHALL CONFORM TO UL 943 CLASS A AND UL 498 STANDARDS. RECEPTACLES SHALL BE BY COOPER WIRING DEVICES, LEVITON MANUFACTURING, PASS & SEYMOUR, OR HUBBELL. ALL RECEPTACLES SHALL BE 125V RATED, HEAVY DUTY, AND COMPLY WITH NEMA WD 6 AND WD 1.
8. LOCATIONS AND HEIGHTS OF ALL WALL-MOUNTED DEVICES SHALL BE COORDINATED WITH THE ARCHITECT PRIOR TO INSTALLATION.
9. CONCEAL ALL CONDUIT EXCEPT IN MECHANICAL ROOMS OR UNFINISHED AREAS AS NOTED. USE EMT CONDUIT FOR ALL BRANCH CIRCUITS AND FEEDERS INSIDE THE BUILDING. TYPE MC CABLE AND TYPE AC CABLE MAY BE INSTALLED WITHIN WALLS IF ALL NEUTRAL WIRES, ISOLATED GROUND WIRES, AND EQUIPMENT GROUND WIRES AS LISTED ABOVE ARE CONTAINED IN THE CABLE. FLEXIBLE CONNECTIONS TO MOTORS AND OTHER EQUIPMENT SHALL BE MADE USING WEATHERPROOF FLEXIBLE CONDUIT. FOR LAY-IN LIGHT FIXTURES, USE MAXIMUM OF SIX (6) FEET OF FLEXIBLE MC CABLE (OR THE FLEXIBLE CONDUIT PROVIDED BY THE FIXTURE MANUFACTURER). SCHEDULE 40 PVC CONDUIT MAY BE USED FOR THE SECONDARY UNDERGROUND SERVICE, UNDERGROUND TELEPHONE SERVICE, AND BRANCH AND FEEDER CIRCUITS UNDER SLAB OR EXTERIOR TO THE BUILDING. EXPOSED EXTERIOR CONDUIT SHALL BE SCHEDULE 80 PVC. ALL UNDERGROUND RACEWAYS SHALL BE IDENTIFIED WITH UNDERGROUND LINE MARKING TAPE 6-8 in BELOW GRADE DIRECTLY ABOVE THE RACEWAY. PROVIDE PULL WIRE IN EMPTY CONDUITS. UPSIZE CONDUIT FROM MINIMUM SIZE AS NECESSARY FOR LONGER PULLS. UNDERGROUND RACEWAYS THAT STUB INTO THE BOTTOM OF SWITCHBOARDS, OUTDOOR TRANSFORMERS, GENERATORS, ETC., SHALL RISE AT LEAST 2 in ABOVE THE FINISHED SLAB TO PREVENT WATER FROM DRAINING INTO THE RACEWAYS. RACEWAYS THAT PENETRATE EXTERIOR WALLS OR INTERIOR PARTITIONS SEPARATING SPACES THAT WILL BE AT SIGNIFICANTLY DIFFERENT TEMPERATURES SHALL BE SEALED IN ACCORDANCE WITH 300.5(G), 300.7(A), AND 300.50(E) OF THE NEC. ROUTE CONDUIT IN AND UNDER SLAB FROM POINT-TO-POINT. ROUTE EXPOSED CONDUIT AND CONDUIT INSTALLED ABOVE ACCESSIBLE CEILINGS PARALLEL AND PERPENDICULAR TO WALLS. COMPLETELY AND THOROUGHLY SWAB ALL RACEWAYS BEFORE INSTALLING WIRE. PULL ALL CONDUCTORS INTO EACH RACEWAY AT ONE TIME. USE A SUITABLE WIRE PULLING LUBRICANT FOR BUILDING WIRE #4 AWG AND LARGER.
10. CABLES, RACEWAYS, OR BOXES, INSTALLED IN EXPOSED OR CONCEALED LOCATIONS UNDER METAL-CORRUGATED SHEET ROOF DECKING, SHALL BE INSTALLED AND SUPPORTED SO THERE IS NOT LESS THAN 1-1/2 in MEASURED FROM THE LOWEST SURFACE OF THE ROOF DECKING TO THE TOP OF THE CABLE, RACEWAY, OR BOX. A CABLE, RACEWAY, OR BOX SHALL NOT BE INSTALLED IN CONCEALED LOCATIONS IN METAL-CORRUGATED, SHEET DECKING-TYPE ROOF. SEE NEC 300.4(E).
11. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL OUTLET, JUNCTION, PULL BOXES, FITTINGS, AND SUPPORTS. ALL OUTLET AND JUNCTION BOXES SHALL BE GALVANIZED STEEL TYPE BY APPLETON, STEEL CITY, OR RACO. EXTERIOR BOXES SHALL BE TYPE FS. VAPORTITE BOXES SHALL BE TYPE GS. WHERE SURFACE MOUNTED BOXES ARE USED, THOSE BOXES AND THEIR FACEPLATES SHALL HAVE ROUNDED CORNERS. BOXES INSTALLED IN FLOORS SHALL BE RATED FOR THE APPLICATION. MOUNT JUNCTION AND OUTLET BOXES FLUSH WITH FINISH SURFACES UNLESS OTHERWISE NOTED. WHERE MOUNTING HEIGHTS ARE GIVEN, THEY SHALL BE MEASURED FROM THE FINISHED FLOOR TO THE CENTER OF THE BOX. ALL BOXES SHALL BE SIZED PER NEC ARTICLE 314. ALL OUTLET AND JUNCTION BOXES SHALL HAVE A COVER PLATE, PROVIDED BY THE ELECTRICAL CONTRACTOR. OUTLET BOXES IN RATED WALLS SHALL BE INSTALLED IN ACCORDANCE WITH NORTH CAROLINA BUILDING CODE 712.3.2 (MAXIMUM BOX SIZE IS 16 SQUARE in AND MAXIMUM OF SIX (6) BOXES PER 100 SQUARE FEET). INSTALL OUTLET BOXES IN RATED WALLS SUCH THAT OPENINGS OCCUR IN ONE SIDE ONLY WITHIN ANY GIVEN STUD SPACE. ALL CLEARANCES BETWEEN THE OUTLET BOX AND THE GYPSUM BOARD SHALL BE FILLED WITH JOINT COMPOUND OR OTHER APPROVED FIRE STOP MATERIAL. FLUSH MOUNTED JUNCTION BOXES IN ADJACENT ROOMS SHALL NOT BE MOUNTED BACK-TO-BACK. SURFACE MOUNTED FIXTURES SHALL BE FED THROUGH FLUSH MOUNTED 4X4 OCTAGONAL OR SQUARE BOXES.
12. ALL CONDUIT, BOXES, AND ELECTRICAL EQUIPMENT SHALL BE FIRMLY AND SECURELY FASTENED TO OR SUPPORTED FROM THE BUILDING STRUCTURAL MEMBERS OR EMBEDDED IN CONCRETE OR MASONRY. ELECTRICAL SUPPORTS SHALL NOT BE ATTACHED TO DUCTWORK, PIPING, OR THEIR SUPPORTS. HANGERS SHALL BE CATALOG ITEMS COMPATIBLE WITH AND SUITABLE FOR THE INTENDED USE. FOR METAL ROOF DECK INSTALLATIONS, 1 in EMT CONDUIT MAXIMUM AND 4 in JUNCTION BOXES MAXIMUM MAY BE SUPPORTED BY DECKING. THE SUSPENDED CEILING SYSTEM SHALL NOT BE USED FOR THE SUPPORT OF ELECTRICAL RACEWAY SYSTEMS OR SUPPORT OF COMMUNICATIONS OR DATA SYSTEMS WIRING. CONTRACTOR SHALL COMPLY WITH 1613 OF THE NORTH CAROLINA GENERAL CONSTRUCTION BUILDING CODE.
13. ABANDONED CONDUIT AND BOXES SHALL HAVE ALL ELECTRICAL WIRING REMOVED COMPLETELY AND NOT JUST "MADE SAFE." CONDUIT AND BOXES SHALL BE REMOVED WHERE PRACTICAL WITHOUT CREATING ADDITIONAL DEMOLITION/RESTITUTION WORK FOR OTHER TRADES.
14. WHERE CONDUCTORS ARE RUN IN PARALLEL, THE EC SHALL COMPLY WITH NEC 310.4.
15. ALL TELEPHONE AND COMMUNICATIONS OUTLETS AND RACEWAYS ARE ROUGH-INS ONLY. EACH TELEPHONE AND COMMUNICATIONS OUTLET SHALL BE A 4 in SQUARE BY 2-1/8 in DEEP BOX WITH 3/4 in KNOCK-OUTS AND A 3/4 in CONDUIT STUBBED FROM THE OUTLET BOX TO ABOVE THE CEILING. PROVIDE A NON-METALLIC INSULATING BUSHING ON ALL CONDUITS STUBBED ABOVE THE CEILING. PROVIDE A BLANK COVER PLATE ON ALL OUTLET BOXES.
16. ELECTRICAL CONTRACTOR SHALL INSTALL DISCONNECT SWITCHES IN SIGHT OF ALL HARDWIRED EQUIPMENT AND APPLIANCES OR PROVIDE BREAKERS CAPABLE OF BEING LOCKED IN THE OPEN POSITION PER NEC 422.31. FOR MOTOR DRIVEN APPLIANCES, PROVIDE A DISCONNECTING MEANS PER NEC 422.31 AND 430 PART IX. WHERE AN INDIVIDUAL DISCONNECT SWITCH, CIRCUIT BREAKER, STARTER, ETC, IS SHOWN ON THE PLANS ADJACENT TO ITS LOAD AND NOT LOCATED ON A WALL, PROVIDE NECESSARY MATERIALS AND LABOR TO SUPPORT THE DEVICE.
17. ELECTRICAL CONTRACTOR SHALL FIELD IDENTIFY ALL SWITCH BOARD, PANEL BOARDS, CONTROL PANELS, METER SOCKETS, ETC., TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRICAL ARC FLASH HAZARDS PER 110.16 OF NEC.
18. ELECTRICAL CONTRACTOR SHALL PROVIDE NAMEPLATES FOR IDENTIFICATION OF ALL EQUIPMENT, SWITCHES, PANELS, ETC. THE NAMEPLATES SHALL BE LAMINATED PHENOLIC PLASTIC, BLACK FRONT, AND BACK WITH WHITE CORE, WHITE ENGRAVED LETTERS (1/4 in MINIMUM) ETCHED INTO THE WHITE CORE. ELECTRICAL CONTRACTOR SHALL PROVIDE A TYPE WRITTEN DIRECTORY CARD THAT ACCURATELY IDENTIFIES CIRCUITS INSIDE EACH PANEL. HANDWRITTEN LABELS ARE NOT ACCEPTABLE.

ELECTRICAL NOTES | 1

ELECTRICAL DESIGNER'S STATEMENT			
ELECTRICAL SYSTEM AND EQUIPMENT METHOD OF COMPLIANCE PRESCRIPTIVE _X_ PERFORMANCE ___ ENERGY COST BUDGET ___			
LIGHTING SCHEDULE:			
LAMP TYPE REQUIRED IN FIXTURE:		SEE LIGHTING LEGEND	
NUMBER OF LAMPS PER FIXTURE:		SEE LIGHTING LEGEND	
BALLAST TYPE USED IN FIXTURE:		SEE LIGHTING LEGEND	
NUMBER OF BALLASTS IN FIXTURE:		SEE LIGHTING LEGEND	
TOTAL WATTAGE PER FIXTURE:		SEE LIGHTING LEGEND	
TOTAL INTERIOR WATTAGE SPECIFIED VS ALLOWED:		WATTS SPECIFIED	WATTS ALLOWED
		6935.59	9189.05
OCCUPANCY	AREA (sf)	ALLOWANCE (W/sf)	WATTAGE ALLOWED
FIRE STATION	13518	0.67	9057.06
TOTAL	13518		9057.06
EQUIPMENT SCHEDULES WITH MOTORS (NOT USED FOR MECHANICAL SYSTEMS) MOTOR HORSEPOWER: N/A NUMBER OF PHASES: N/A MINIMUM EFFICIENCY: N/A MOTOR TYPE: N/A NUMBER OF POLES: N/A			
DESIGNER STATEMENT: TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE 2018 NORTH CAROLINA ENERGY CONSERVATION CODE.			

FOR THE ADDITIONAL PRESCRIPTIVE REQUIREMENT REQUIRED BY C406 OF 2018 NORTH CAROLINA ENERGY CONSERVATION CODE, WE ARE CHOOSING C406.3 - REDUCED LIGHTING POWER DENSITY.

6935.59 W SPECIFIED <= 8151.35 W (9057.06 W ALLOWED X 90%)

WALL TYPE:
— - — - — 1 HOUR FIRE RATED WALL

LIGHT FIXTURE SCHEDULE

MARK	DESCRIPTION	LOUVER/LENS	TYPE	CCT	VOLTAGE	INPUT WATTAGE	MOUNTING	REMARKS	MFG	MODEL
A1	2x4 LED TROFFER	ACRYLIC	LED	3500K	120	39.29	LAY-IN	2	LITHONIA	CPX-2X4-4000LM-80CRI-35K-SWL-MIN10
A2	2x4 LED TROFFER (IN DORMS)	ACRYLIC	LED	3500K	120	39.29	LAY-IN	2	LITHONIA	CPX-2X4-4000LM-80CRI-35K-SWL-MIN1
B	2X2 LED TROFFER	ACRYLIC	LED	3500K	120	31	LAY-IN	2	LITHONIA	CPX-2X2-3200LM-80CRI-35K-SWL
C	6"Ø ROUND LED CAN	ACRYLIC	LED	3500K	120	22.5	SURFACE	2	LITHONIA	LDN6-35/20-L06AR-LSS-MVOLT-GZ10
D	16' SUSPENDED LINEAR LED	ACRYLIC	LED	3500K	120	101	SURFACE	2,3	LITHONIA	LL16-12000LM-80CRI-35K-EPD-MIN10-ZT-MVOLT
F	4' LINEAR SURFACE MOUNT	ACRYLIC	LED	3500K	120	49	RECESSED	2	LITHONIA	FML4W-48-AL06-SEF-835-MVOLT
G	MINI LED PENDANT	ACRYLIC	LED	2700K	120	13	RECESSED	2,3	LITHONIA	11536-BN
H	LED HIGH BAY	ACRYLIC	LED	3500K	120	102	RECESSED	2	LITHONIA	CPHB-15000LM-SEF-GCL-MD-MVOLT-GZ10-35K-80CRI
J	4' LED WALL PACK	ACRYLIC	LED	3500K	120	28.2	SURFACE	2,3	LITHONIA	WDGE1-LED-P1-40K-80CRI-VF-MVOLT
W1	LED WALL SCONCE	ALUMINIUM	LED	3000K	120	32	SURFACE	3	DETACALCO	232011-30-BL
W2	LED WALL PACK	ACRYLIC	LED	4000K	120	32	SURFACE	2	LITHONIA	WDGE2-LED-P3-40K-80CRI-T3M-MVOLT
OE	EXTERIOR EM LIGHT	GLASS	LED	5000K	120	5	SURFACE	1,2	LIGHT ALARMS	CAM-SD-DB
EX	LED EXIT SIGN W/ BATTERY BACKUP	ACRYLIC	LED	N/A	120	1	SURFACE	1,2	LIGHT ALARMS	GRAN-ND-R-W
EXH	LED EXIT/COMBO W/ BATTERY BACKUP	ACRYLIC	LED	N/A	120	3	SURFACE	1,2	LIGHT ALARMS	GR1224-R-1-W-2-LD9
EM	DUAL HEAD EMERGENCY FIXTURE	ACRYLIC	LED	N/A	120	2	SURFACE	1,2	LIGHT ALARMS	2-GR12N4-LD9-M

1. FIXTURE SHALL HAVE BATTERY BACKUP FOR 90 MINUTE ILLUMINATION.
2. OR EQUAL BY COOPER, PHILLIPS
3. VERIFY FIXTURE STYLE/COLOR WITH OWNER/ARCHITECT

LIGHTING DEVICE LEGEND

SYMBOL	DESCRIPTION	REMARKS
$	SINGLE POLE WALL SWITCH	HEAVY DUTY, AC ONLY, COMMERCIAL GRADE GENERAL USE SNAP SWITCH COMPLYING WITH NEMA WD 6 AND WD 1. IVORY PLASTIC BODY WITH TOGGLE HANDLE. 120-277V, 20A. MEET FEDERAL SPECIFICATION W-S-896.
$ D	DIMMER SWITCH	COMMERCIAL GRADE, 120V, 1500W
$ M	WALL MOUNTED OCCUPANCY SENSOR	GREENGATE; ONW-D-1001-MV-W, LINE VOLTAGE OCCUPANCY SENSOR. ULTRA SONIC AND INFRARED.
DT	CEILING OCCUPANCY SENSOR	GREENGATE, OAC-DT-2000, LOW VOLTAGE OCCUPANCY SENSOR. 360° ULTRA SONIC AND INFRARED.
P	SWITCH PACK	GREENGATE, SP20-MV, LOW VOLTAGE SWITCH PACK FOR CEILING PACK SENSORS.
SP	SWITCHING PHOTOCELL	INTERMATIC, EK4236S, CONSULT OWNER FOR FOOT-CANDLE SET POINT.
J	JUNCTION BOX	GALVANIZED METAL BOX CONSTRUCTED IN ACCORDANCE WITH 314.40 OF THE NEC.

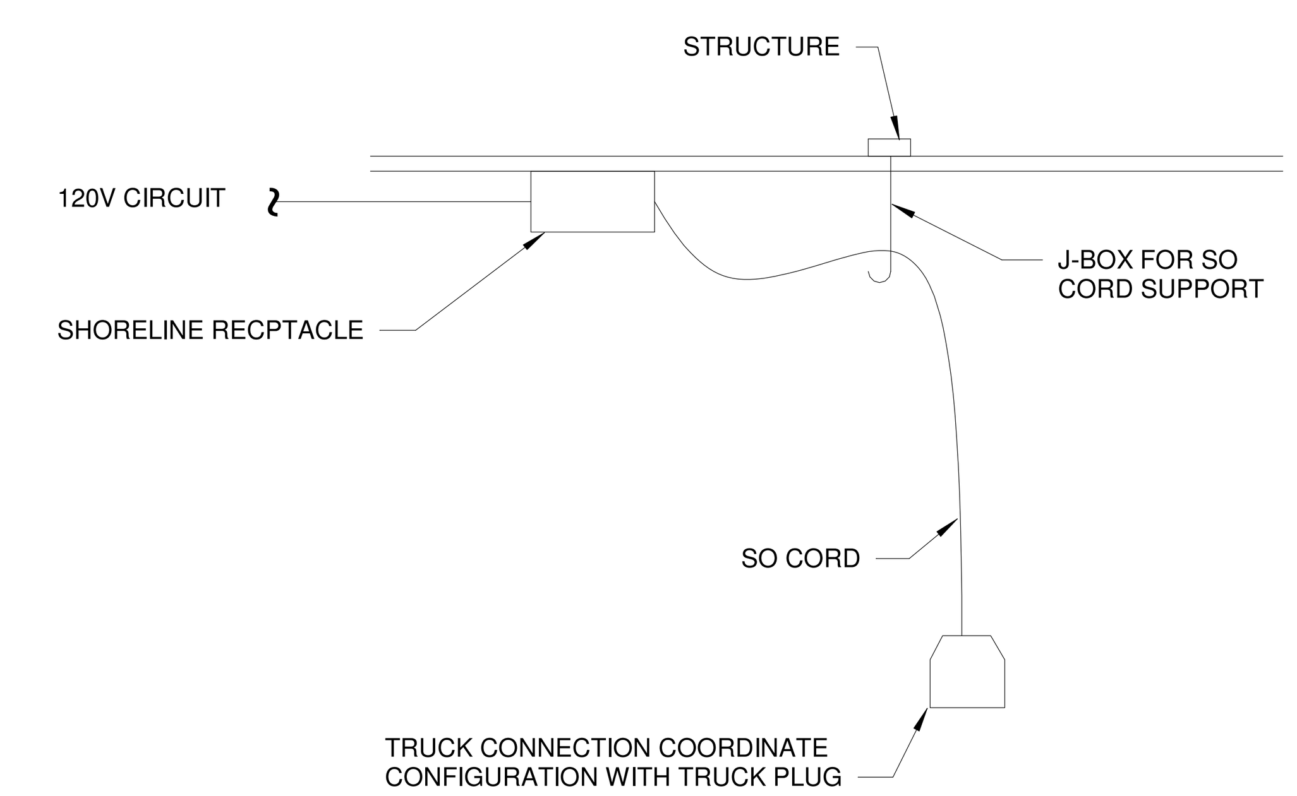
NOTES FOR EMERGENCY FIXTURES

1. FOR INTERIOR FIXTURES WITH EMERGENCY BATTERIES, WIRE THE BATTERY CHARGER ON THE SAME CIRCUIT AS THE FIXTURE AHEAD OF ALL SWITCHES, SENSORS, ETC.
2. FOR EXTERIOR FIXTURES WITH EMERGENCY BATTERIES, WIRE THE BATTERY CHARGER ON THE SAME CIRCUIT AS THE NORMAL EXTERIOR LIGHTS OR AS SHOWN ON PLANS AHEAD OF ALL CONTACTORS, PHOTOCELLS, ETC.
3. IN BOTH CASES, EMERGENCY POWER SHOULD INITIATE ONLY IN THE EVENT OF THE LOSS OF NORMAL POWER. ALL BATTERIES SHALL BE RATED TO POWER EMERGENCY ILLUMINATION FOR 90 MINUTES MINIMUM.

ELECTRICAL SCHEDULES | 3

NOTE:
1.PROVIDE CEILING MOUNTED TWIST LOCK TYPE RECEPTACLES. LOCATION OF RECEPTACLES SHALL BE COORDINATED WITH OWNER PRIOR TO INSTALLATION. TYPICAL EACH BAY.

2. PROVIDE 3#12 SO CORD WITH PLUGS. PROVIDE 3#12 IN 3/4"C FROM 20A "SHORELINE" RECPTACLE TO NEW 20A/1P CIRCUIT BREAKER IN PANEL



EMS BAY SHORELINE RECECPTACALE DETAIL- NO SCALE | 4

LIGHTING DEVICE LEGEND

SYMBOL	DESCRIPTION	REMARKS
$	SINGLE POLE WALL SWITCH	HEAVY DUTY, AC ONLY, COMMERCIAL GRADE GENERAL USE SNAP SWITCH COMPLYING WITH NEMA WD 6 AND WD 1. IVORY PLASTIC BODY WITH TOGGLE HANDLE. 120-277V, 20A. MEET FEDERAL SPECIFICATION W-S-896.
J	JUNCTION BOX	GALVANIZED METAL BOX CONSTRUCTED IN ACCORDANCE WITH 314.40 OF THE NEC.

POWER DEVICE LEGEND

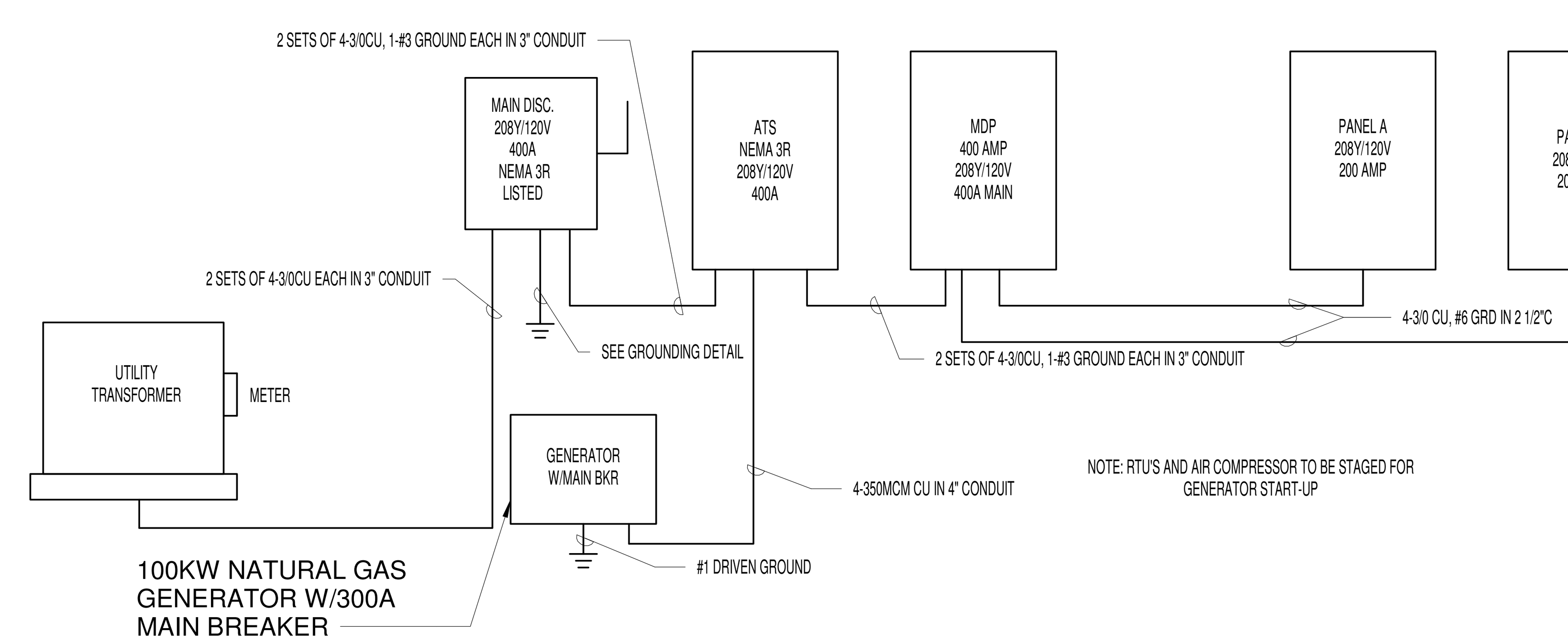
SYMBOL	DESCRIPTION	REMARKS
▶	DATA AND TELEPHONE JACK	PHONE/DATA OUTLET. EC TO INSTALL 3/4"C WITH PULL-STRING FROM OUTLET BOX TO ABOVE CEILING FOR FUTURE USE. JACKS AND COMMUNICATION CABLING BY OTHERS.
	DUPLEX RECEPTACLE	NEMA 5-20R, HEAVY DUTY, COMMERCIAL GRADE, 125V, 20A COMPLYING WITH NEMA WD 6 AND WD 1. GFCI OR AFCI IF NOTED. 'WP' DENOTES WEATHERPROOF COVER. 'CH' DENOTES COUNTER HEIGHT. LISTED TAMPERPROOF IF NOTED. MEET FEDERAL SPECIFICATION W-C-596.
	QUAD RECEPTACLE	QUAD RECEPTACLE OF SAME CHARACTERISTICS AS DUPLEX TYPE ABOVE.
	208V RECEPTACLE	240V RECEPTACLE FOR EQUIPMENT, VERIFY NEMA CONFIGURATION WITH EQUIPMENT MFG.
	DEDICATED RECEPTACLE	NEMA 5-20R, HEAVY DUTY, COMMERCIAL GRADE, 125V, 20A COMPLYING WITH NEMA WD 6 AND WD 1 UNLESS OTHERWISE NOTED ON PLANS. VERIFY PLUG TYPE PRIOR TO PURCHASE & INSTALLATION. GFCI OR AFCI IF NOTED. 'WP' DENOTES WEATHERPROOF COVER. 'CH' DENOTES COUNTER HEIGHT. LISTED TAMPERPROOF IF NOTED. MEET FEDERAL SPECIFICATION W-C-596. MAY BE EITHER SIMPLEX, DUPLEX, OR QUAD.
	FUSIBLE DISCONNECT SWITCH	HEAVY DUTY TYPE. TYPE 1 ENCLOSURE IN INTERIOR APPLICATIONS, TYPE 3R ENCLOSURE IN EXTERIOR APPLICATIONS, FUSE ACCORDING TO NAMEPLATE DATA.
	DISCONNECT SWITCH	HEAVY DUTY TYPE. TYPE 1 ENCLOSURE IN INTERIOR APPLICATIONS, TYPE 3R ENCLOSURE IN EXTERIOR APPLICATIONS.
J	JUNCTION BOX	GALVANIZED METAL BOX CONSTRUCTED IN ACCORDANCE WITH 314.40 OF THE NEC.

NEC ELECTRIC DEMAND SUMMARY 208Y/120V,3P,4W

EQUIPMENT	DEMAND FACTOR	kVA A	kVA B	kVA C	LOAD kVA	NEC REFERENCE	NOTES/CALCULATIONS
LIGHTING	125%	7.43	7.43	7.43	22.29	220.12	13715 SF X 1.3 VA/SF X 1.25
RECEPTACLES	100%	3.33	3.33	3.33	10.0	220.44	
RECEPTACLES	50%	2.08	2.08	2.08	6.25	220.44	
HVAC	100%	13.14	13.14	10.74	37.02	--	BASED ON MCA
WATER HEATER	125%	0.00	0.48	0.00	0.48	422.13	STORAGE TANK <120 GAL @ 125%
KITCHEN EQUIPMENT	SEE CODE	5.00	0.00	5.00	10.0	220.56	
AIR COMPRESSOR	SEE CODE	3.86	3.86	3.86	11.59	430.24	
DEMAND kVA PER PHASE		40.90	36.38	38.50		--	
DEMAND AMPS PER PHASE		341	303	321			

THE CALCULATED LIGHTING LOAD EXCEEDS THE CONNECTED LIGHTING LOAD.

ELECTRICAL SCHEDULES | 2



NOTE: RTU'S AND AIR COMPRESSOR TO BE STAGED FOR GENERATOR START-UP

POWER RISER - NO SCALE | 5

Kilian Engineering, Inc.
PO Box 3301, Henderson, NC 27536 | www.kilianengineering.com
(P) 252.438.8778 | CORPORATE LICENSE C-2277

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048012 JACOB L. HAMILTON 01.30.2023 SEAL

KILIAN ENGINEERING, INC. CORPORATE SEAL NORTH CAROLINA SEAL

CONSTRUCTION FOR:
KNIGHTDALE FIRE STATION#1
774 FORESTVILLE RD.

REVISION:

NO.	DATE	DESCRIPTION

ISSUED:

NO.	DATE	DESCRIPTION
0	01-30-23	ISSUED FOR CONSTRUCTION

DRAWN BY: CLS
CHECKED BY: JLH

ELECTRICAL NOTES AND SCHEDULES

SHEET NO.
E1

PROJECT NO: 21684

LIGHTING PLAN - SCALE: 1/8"=1' | 1

Kilian Engineering, Inc.
PO Box 3301, Henderson, NC 27536 | www.kilianengineering.com
(P) 252.438.8778 | CORPORATE LICENSE C-2277

NORTH CAROLINA PROFESSIONAL SEAL 048012 ENGINEER JOB L. HAMM
03.30.2023 SEAL

KILIAN ENGINEERING CORPORATE INC. SEAL NORTH CAROLINA
SEAL

CONSTRUCTION FOR:
KNIGHTDALE FIRE STATION#1
774 FORESTVILLE RD.

REVISION:

NO	DATE	DESCRIPTION

ISSUED:

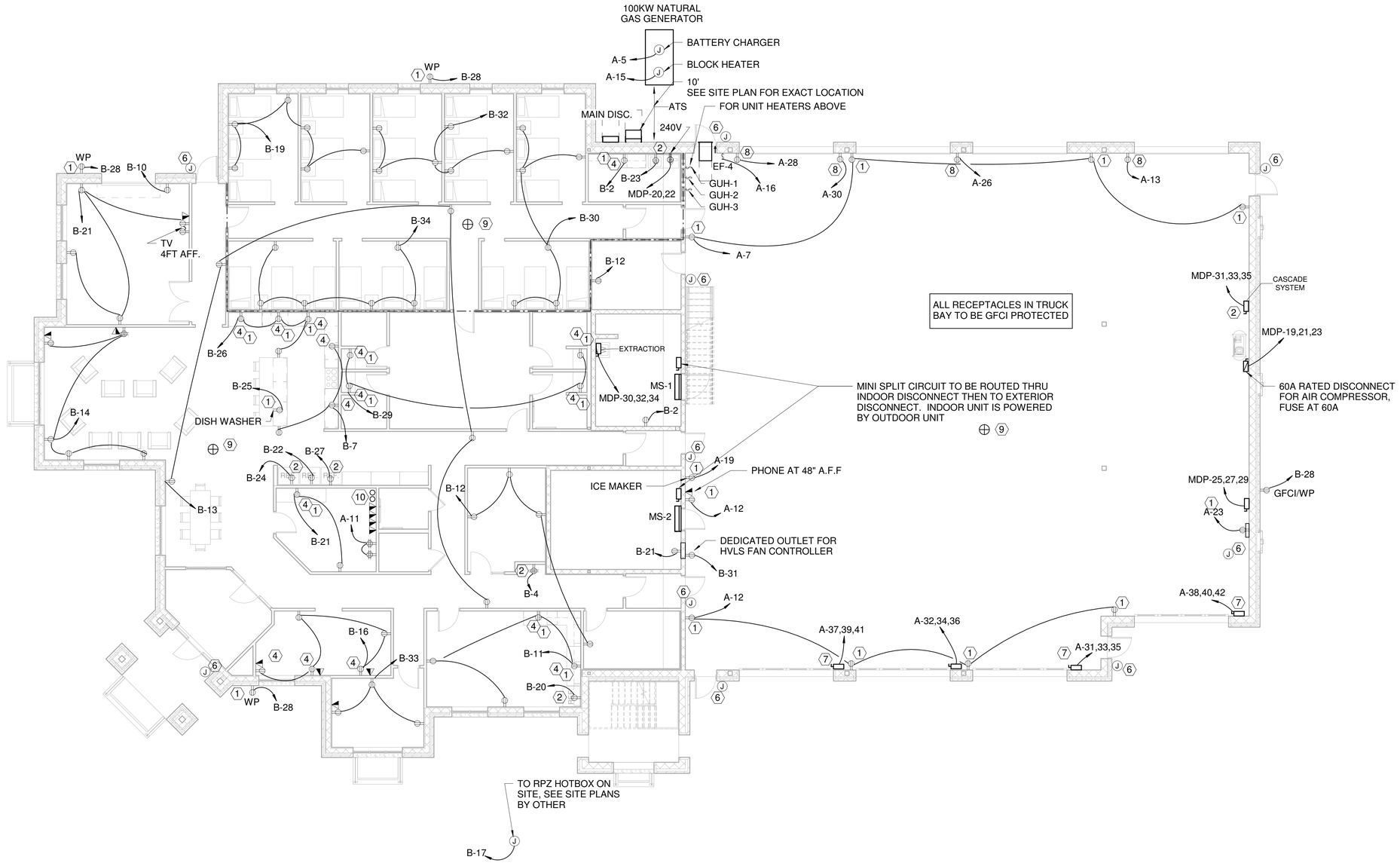
NO	DATE	DESCRIPTION
0	03.30.23	ISSUED FOR CONSTRUCTION

DRAWN BY: CLS
CHECKED BY: JLH

FIRST FLOOR LIGHTING PLAN

SHEET NO.
E3

PROJECT NO: 21684



Greg,

It is my opinion the fire department or any part of the building used to contain the fire department and its equipment, sleeping areas, or food preparation would not meet the definition of a dwelling unit.

With that being the case then section 210.52 would not have to be complied with. In reviewing section 406.12 regarding tamper-resistant receptacles I do not see any of the 8 items listed under this section requiring tamper-resistant receptacles in these areas of the fire department. The only one that could impact this requirement would be item (7), dormitory units which you have already ruled out.

Daniel J. (Danny) Thomas Jr.
State Electrical Inspector
Chief Electrical Code Consultant

N.C. Department of Insurance
Office of State Fire Marshal
1202 Mail Service Center
Raleigh, NC 27699-1202
919.647.0062
919.500.9492

POWER PLAN HEX NOTES

1. GFCI RECP.
2. VERIFY LOCATION OF CASCADE SYSTEM WITH OWNER TO VERIFY
3. PROVIDE 2" CONDUIT FROM CABLE BOX TO ELECTRICAL ROOM WITH PULL STRING FOR DATA PHONE
4. COUNT HEIGHT RECP.
5. RECP. FOR FACP. VERIFY TYPE/CONNECTION METHOD WITH FASC
6. SINGLE GANG J-BOX FOR CARD READER, PROVIDE 3/4" CONDUIT TO ABOVE CEILING. WIRING AND INSTALL BY OTHERS
7. DOOR CONTROLLER IN BALLARDS. EC TO REVIEW DOOR SHOP DRAWING AND PROVIDE ALL NECESSARY J-BOX & EQUIPMENT NEEDED
8. DOOR CONTROLLER IN BALLARDS. EC TO REVIEW DOOR SHOP DRAWING AND PROVIDE ALL EQUIPMENT NEEDED
9. WAP
10. PROVIDE 2X2" CONDUITS FOR TELECOM TO POINT OF DELIVERY

Kilian Engineering, Inc.
PO Box 3301, Henderson, NC 27536 | www.kilianengineering.com
(P) 252.438.8778 | CORPORATE LICENSE C-2277

NORTH CAROLINA PROFESSIONAL SEAL 048012 ENGINEER JOSEPH L. HAMM 01.30.2023 SEAL

KILIAN ENGINEERING CORPORATE SEAL NORTH CAROLINA SEAL

CONSTRUCTION FOR:
KNIGHTDALE FIRE STATION#1
774 FORESTVILLE RD.

REVISION:

DESCRIPTION	DATE	BY

ISSUED:

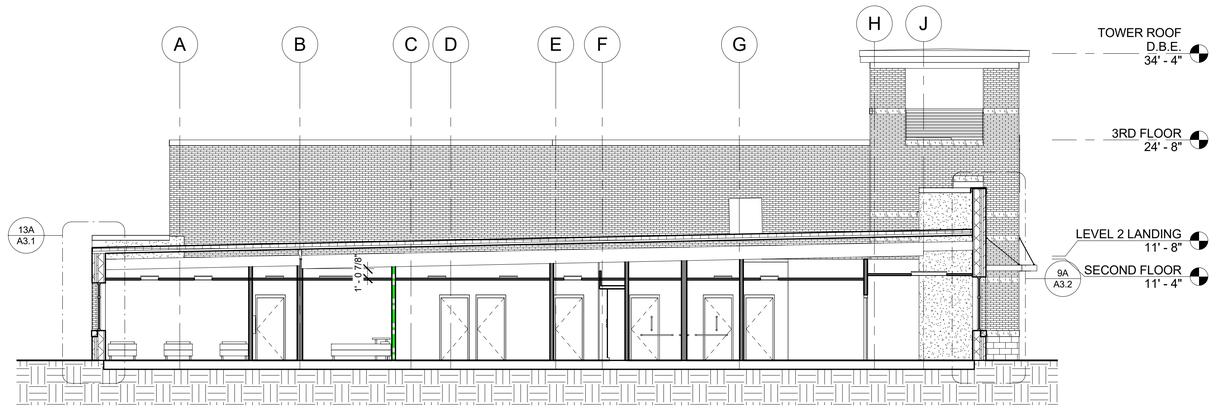
DESCRIPTION	DATE	BY
ISSUED FOR CONSTRUCTION	01.30.23	CLS

DRAWN BY: CLS
CHECKED BY: JLH

FIRST FLOOR POWER PLAN

SHEET NO.
E5

FIRST FLOOR POWER PLAN - SCALE: 1/8"=1' | 1 | PROJECT NO: 21684



1J — BUILDING SECTION

1/8" = 1'-0"

MATERIAL NOTES:

M-1	BRICK VENEER: PALMETTO BRICK COLOR: MEDIUM RED WIRECUT
M-2	GROUND FACE CMU VENEER: MESASTONE BY ECHELON MASONRY COLOR: 4304
M-3	SPLIT FACE CMU SILL COURSE: MESASTONE BY ECHELON MASONRY COLOR: 4304
M-4	GROUND FACE CMU VENEER: MESASTONE BY ECHELON MASONRY COLOR: 4106 (MASONRY SET BACK 3/4" FROM TYP. FACE OF VENEER)
M-5	SPLIT FACE CMU WINDOW SILL COURSE: MESASTONE BY ECHELMASONRY (SEE 1G/A3.2) COLOR: 4304
M-6	SPLIT FACE CMU SILL COURSE: MESASTONE BY ECHELON MASONRY (SEE 14K/A3.2) COLOR: 4304
M-7	SPLIT FACE CMU VENEER BAND: MESASTONE BY ECHELON MASONRY COLOR: 4304
AL-1	ALUMINUM STOREFRONT: COLOR: CLEAR ANODIZED
AL-2	METAL COPING: COLOR: BLACK
FC-1	FIBER CEMENT FASCIA / SOFFIT COLOR: TAN

CONSTRUCTION NOTES:

1. BUILDING SIGNAGE, RED, TBD.
2. EXTERIOR LIGHTING FIXTURE, SEE ELC.
3. 14'-0" x 4'-0" PREFINISHED METAL CANOPY, INTERNALLY DRAINED W/ 8"x8" PRE-FINISHED METAL MOUNTING PLATES @ CABLES
4. 9'-4" x 4'-0" PREFINISHED METAL CANOPY, INTERNALLY DRAINED W/ 8"x8" PRE-FINISHED METAL MOUNTING PLATES @ CABLES
5. 5'-4" x 4'-0" PREFINISHED METAL CANOPY, INTERNALLY DRAINED W/ 8"x8" PRE-FINISHED METAL MOUNTING PLATES @ CABLES
6. 6'-0" x 2'-0" PREFINISHED METAL CANOPY, INTERNALLY DRAINED W/ 8"x8" PRE-FINISHED METAL MOUNTING PLATES @ CABLES
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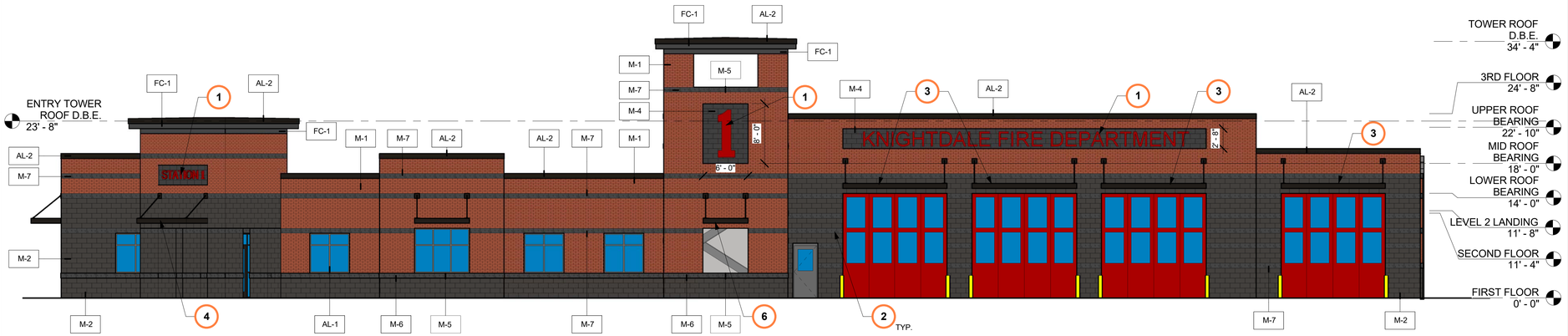
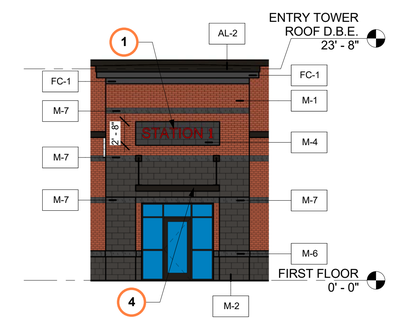
9. MECHANICAL ROOF TOP UNIT, SEE MECH. DRAWINGS FOR SIZE AND LOCATION.
10. METAL GUARDRAIL 42" HEIGHT. SEE FLOOR PLANS FOR SWING GATE LOCATIONS AND SWING DIRECTION
11. PRE-FINISHED ALUMINUM ROOF SCUPPER AND DOWNSPOUT
12. GREEN WALL SYSTEM
13. BREAK METAL HEADER. BREAK METAL OVER 2-1/2" MTL. STUDS WITH RIGID INSULATION OVER CMU WALL. BREAK METAL ATTACHED TO STUDS AND WRAPPED UNDER BOTTOM TO CMU WALL.



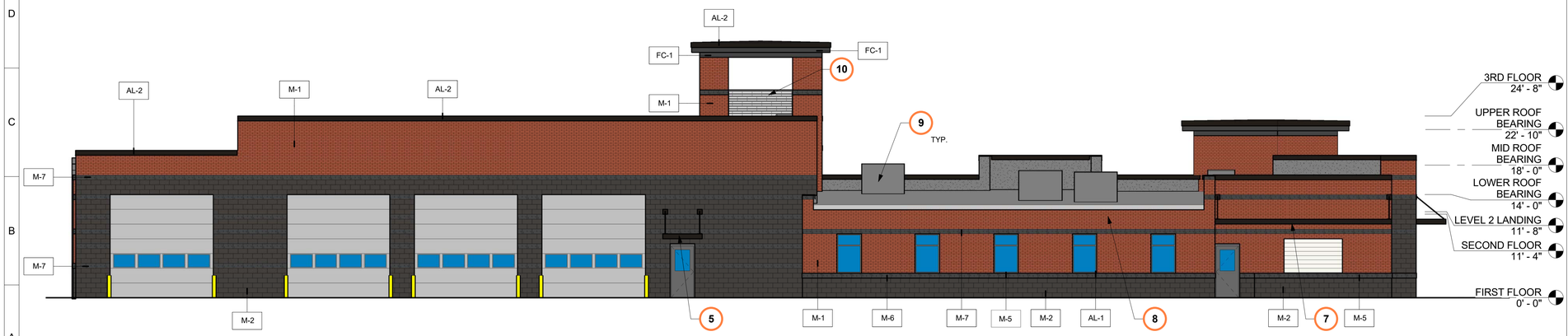
1 — SOUTH ELEVATION

1/8" = 1'-0"



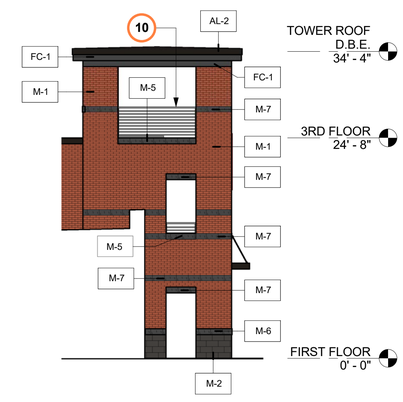
14E — ENTRANCE ELEVATION

1/8" = 1'-0"



2 — NORTH ELEVATION

1/8" = 1'-0"



14A — WEST TOWER ELEVATION

1/8" = 1'-0"

PRELIMINARY

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PROJECT NORTH

TRUE NORTH

KNIGHTDALE FIRE STATION #1

Enter address here

Project Number: JAC-22047

401 North Heritage Street
Kinston, North Carolina 28501
p. 252-527-1523 | f. 252-527-0049

DUNN & DALTON ARCHITECTS

Issue Date: 1/24/23

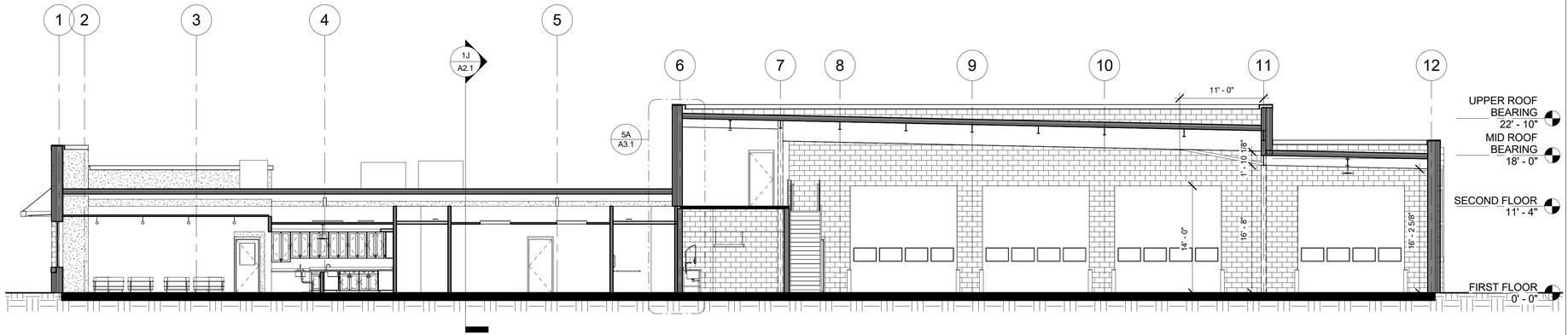
Revisions:

No.	Description	Date

BUILDING ELEVATIONS

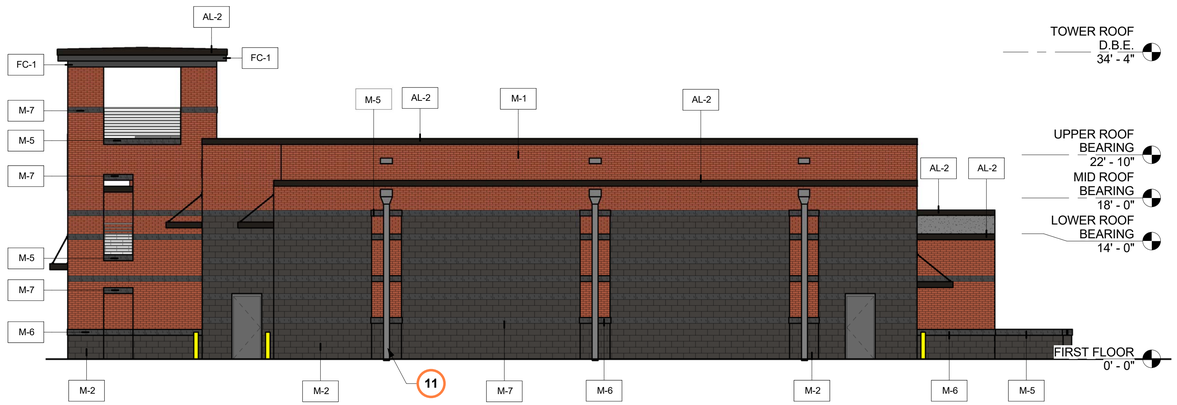
A2.1

P:\JAC-22047 Knightdale Fire Station #1\04-CD\Knightdale Fire Station #1.rvt
1/25/2023 4:00:14 PM



1J BUILDING SECTION

1/8" = 1'-0"

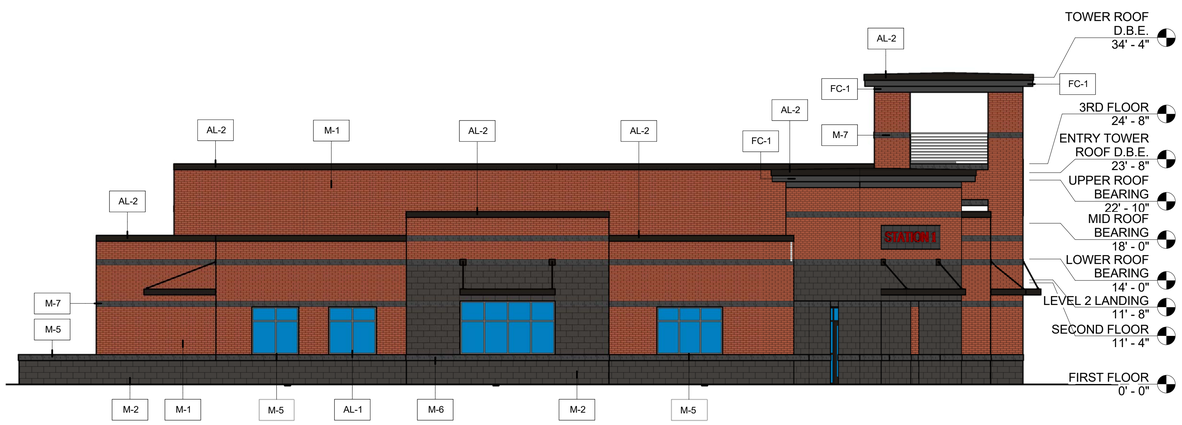


1E EAST ELEVATION

1/8" = 1'-0"

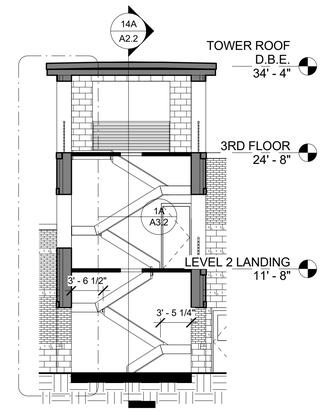
10E TOWER SECTION

1/8" = 1'-0"



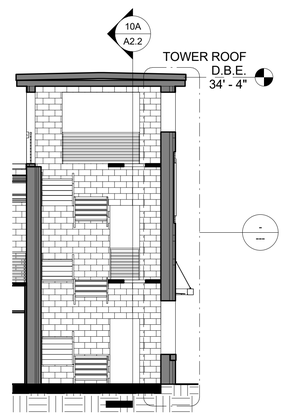
1A WEST ELEVATION

1/8" = 1'-0"



10A TOWER SECTION

1/8" = 1'-0"



14A TOWER SECTION

1/8" = 1'-0"

CONSTRUCTION NOTES:

1. BUILDING SIGNAGE, RED, TBD.
2. EXTERIOR LIGHTING FIXTURE, SEE ELC.
3. 14'-0" x 4'-0" PREFINISHED METAL CANOPY, INTERNALLY DRAINED W/ 8"x8" PRE-FINISHED METAL MOUNTING PLATES @ CABLES
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12. GREEN WALL SYSTEM
13. BREAK METAL HEADER. BREAK METAL OVER 2-1/2" MTL. STUDS WITH RIGID INSULATION OVER CMU WALL. BREAK METAL ATTACHED TO STUDS AND WRAPPED UNDER BOTTOM TO CMU WALL.

MATERIAL NOTES:

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PRELIMINARY

FOR REVIEW ONLY
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PROJECT NORTH

TRUE NORTH

KNIGHTDALE FIRE STATION #1

Enter address here

Project Number: JAC-22047

401 North Heritage Street
Kinston, North Carolina 28501
p. 252-527-1523 | f. 252-527-0049

DUNN & DALTON
ARCHITECTS

Issue Date: 1/24/23

Revisions:

No.	Description	Date

BUILDING ELEVATIONS

A2.2

P:\JAC-22047 Knightdale Fire Station #1\04-CD\Knightdale Fire Station #1.rvt
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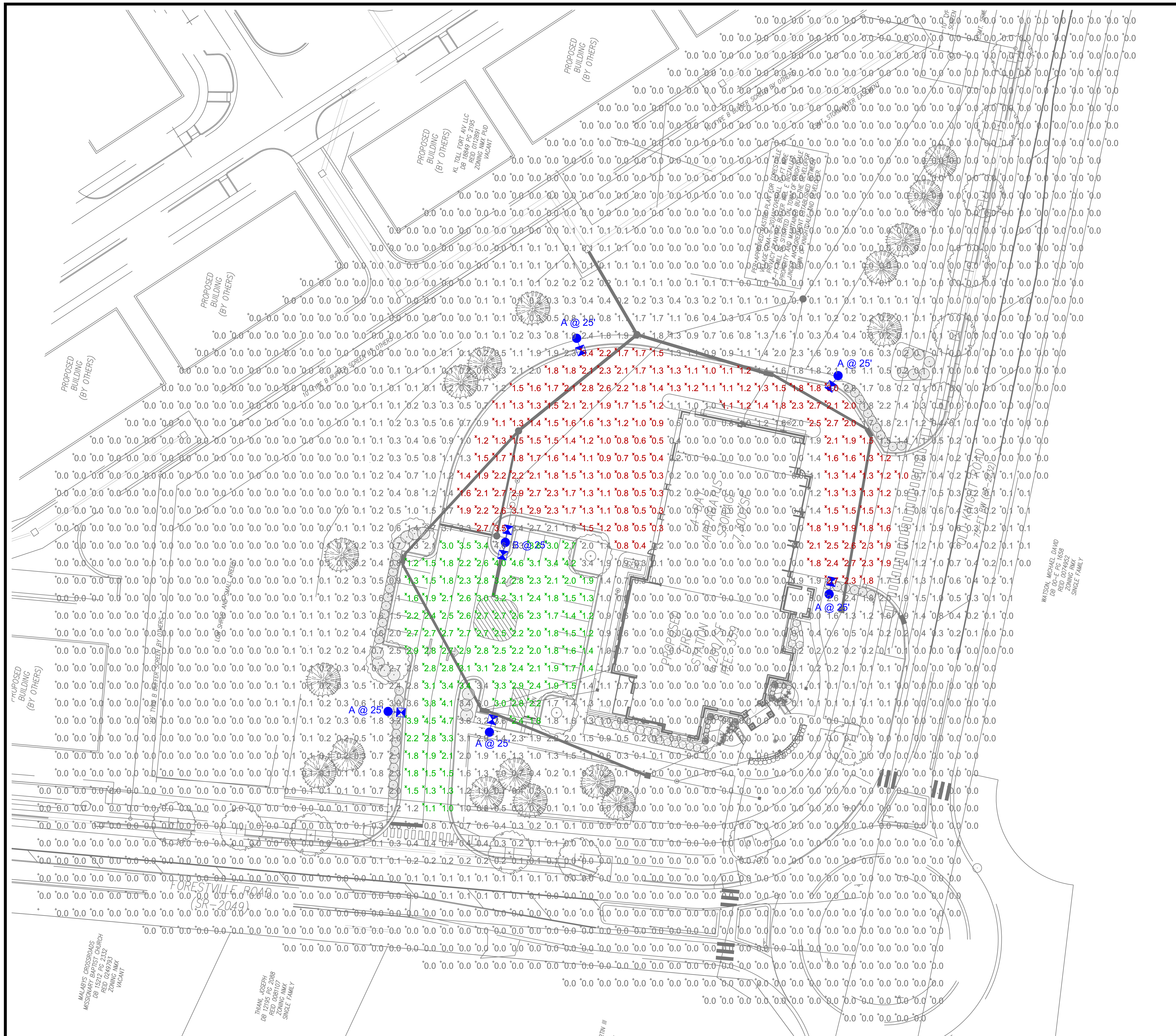
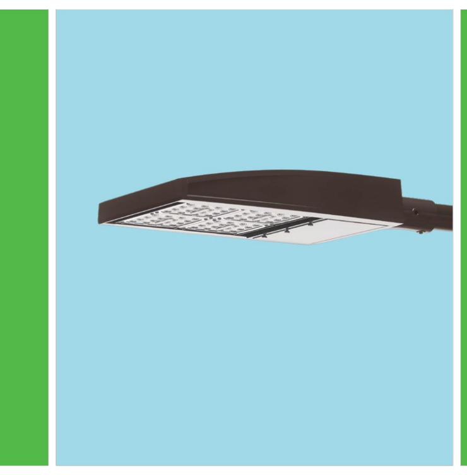


Outdoor Lighting

Shoebox LED



The energy-efficient Shoebox LED combines a decorative, contemporary style with versatility and ample lighting effect that is perfect for streets, parking lots, commercial buildings and residential communities. The Shoebox LED provides excellent color rendition along with a controlled light pattern that reduces glare and keeps the light directed only where you want it. Available in black, dark bronze, gray or white with one to four fixtures per pole.

LED (Light Emitting Diode)	150, 220, 420, 530 watts
Mounting heights	25', 30', 35'
Colors	Black Bronze Gray White
Poles	Fiberglass *(1 or 2 fixtures per pole)* Decorative tapered metal Decorative square metal

Note: 35' pole available in black or bronze only.

For additional information, visit us at **duke-energy.com/OutdoorLighting** or call us toll free at **866.769.6417**.

DUKE ENERGY PROGRESS

BUILDING A SMARTER ENERGY FUTURE®

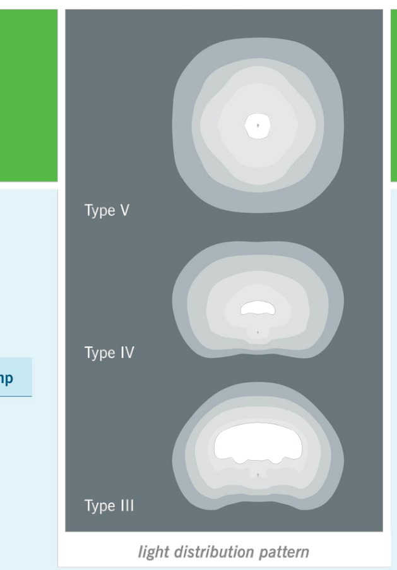
Outdoor Lighting

Shoebox LED

Light source: LED *(white)*
Replacement for:* LED Wattage 150 – 250-watt HPS and metal halide;
LED Wattage 205 – up to 400-watt metal halide;
LED Wattage 530 – 1,000-watt metal halide
Warm-up and restrike time: Instant on *(no warm-up or restrike time)*

Wattage	BUG Rating	Light Pattern	Lumens	Color Temp
LED 150	B5-U0-G3	IESNA Type V (circular)	19580	4,000K
LED 150	B3-U0-G4	IESNA Type IV (forward throw)	18459	
LED 150	B2-U0-G3	IESNA Type III (oval)	19006	
LED 220	B5-U0-G3	IESNA Type V (circular)	25870	
LED 220	B3-U0-G4	IESNA Type IV (forward throw)	24390	
LED 220	B2-U0-G4	IESNA Type III (oval)	25114	
LED 420	B5-U0-G5	IESNA Type V (circular)	48514	
LED 420	B3-U0-G5	IESNA Type IV (forward throw)	43765	
LED 530	B5-U0-G5	IESNA Type V (circular)	60296	
LED 530	B3-U0-G5	IESNA Type IV (forward throw)	54395	

** These are approximate replacement suggestions; actual conditions could be different.*



light distribution pattern

Poles available:

Name	Mounting height	Color
Round tapered decorative metal*	35'	Black Bronze
Decorative square metal*	25' and 30'	Black Gray Bronze White
Fiberglass	30'	Black *(1 or 2 fixtures per pole)* Gray *(1 or 2 fixtures per pole)*

Features	Benefits
Little or no installation cost	Frees up capital for other projects
Design services by lighting professionals included	Meets industry standards and lighting ordinances
Maintenance included	Eliminates high and unexpected repair bills
Electricity included	Less expensive than metered service
Warranty included	Worry-free
One low monthly cost on your electric bill	Convenience and savings for you
Turnkey operation	Provides hassle-free installation and service
Backed by over 40 years of experience	A name you can trust today … and tomorrow

**2' raised foundation available when required on metal poles only.*

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Bay Area	✳ (red)	1.6 fc	3.5 fc	0.3 fc	11.7:1	5.3:1
Parking	✳ (green)	2.4 fc	4.7 fc	1.0 fc	4.7:1	2.4:1

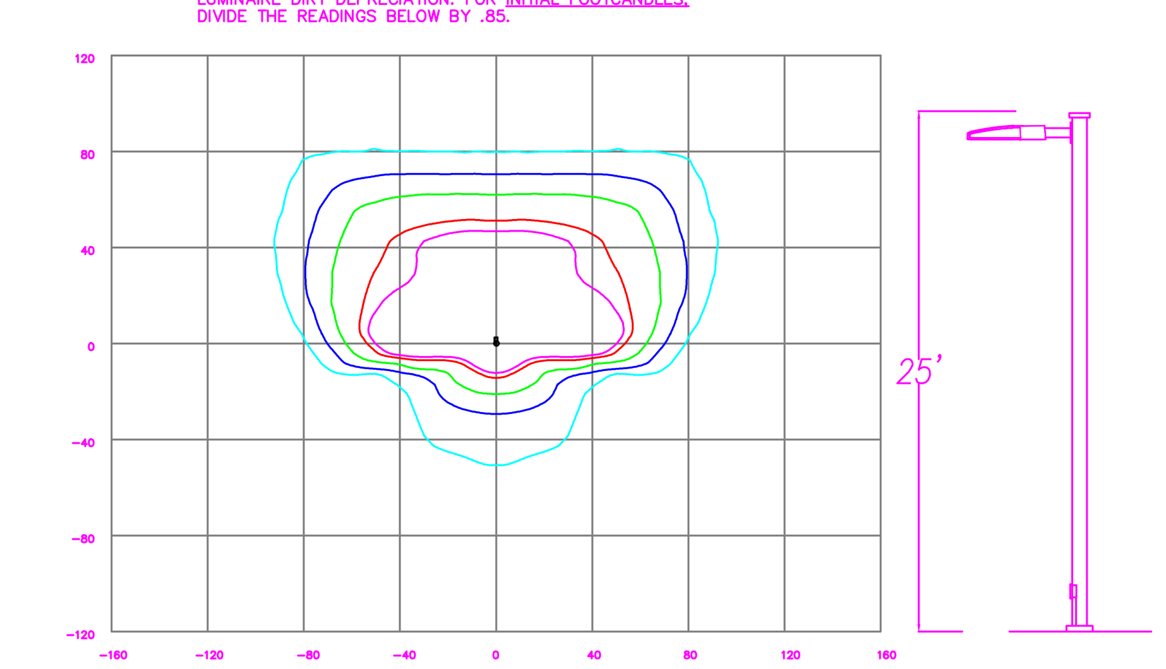
Schedule

Symbol	Label	QTY	Description	Number Lamps	Lumens per Lamp	LLF
	A	5	LED 150w Shoebox - Type IV - 4000K	48	385	0.85
	B	1	LED 150w Shoebox - Type IV - 4000K	48	385	0.85

ISOFOOTCANDLE CURVES

FIXTURE: LED150W SHOEBOX
MOUNTING HEIGHT: 25 FT
LIGHT SOURCE: LED'S, 4000K, 70 CRI
LUMENS – 18459
PATTERN: TYPE IV B3–U0–G4 (zero light at or above 90 degrees)
NOTE: THE FOOTCANDLE READINGS BELOW ARE MAINTAINED AND HAVE BEEN DEPRECIATED FOR LED LUMEN DEPRECIATION AND LUMINAIRE DIRT DEPRECIATION. FOR INITIAL FOOTCANDLES, DIVIDE THE READINGS BELOW BY .85.

ASSY# LFIX–SBX–LED–150–BLK–IV–MULTIV–____–P
POLE ASSY# LPOLE–AB–STL–25FT–BLK–SQ–____–P (BLACK)
BRACKET ASSY# LBKT–SIDE–12IN–BLK–UNV–STL–____–P (BLACK)



LEGEND (OUTER to INNER): 0.10 , 0.25 , 0.50 , 1.00 , 1.25

NO.	DATE	REVISION	BY

LIGHTING DESIGN TOLERANCE

The calculated footcandle light levels in this lighting design are predicted values and are based on specific information that has been supplied to Duke Energy. Any inaccuracies in the supplied information, differences in luminaire installation, lighted area geometry including elevation differences, reflective properties of surrounding surfaces, obstructions (foliage or otherwise) in the lighted area, or lighting from sources other than listed in this design may produce different results from the predicted values. Normal tolerances of voltage, lamp output, and ballast and luminaire manufacture will also affect results.

DUKE ENERGY® PROGRESS

PROPRIETARY & CONFIDENTIAL

TOWN OF KNIGHTDALE FIRE STATION
Knightdale, NC
SITE LIGHTING ARRANGEMENT
Designed by DUKE ENERGY PROGRESS LIGHTING SOLUTIONS
Reviewed by N. Johnson — Scale 1" = 30'
Date 11/16/2022 — Size Drawing size "D"
Description LED Shoebox
Drawing No. 22-0443A — Sht. 1 OF 1