

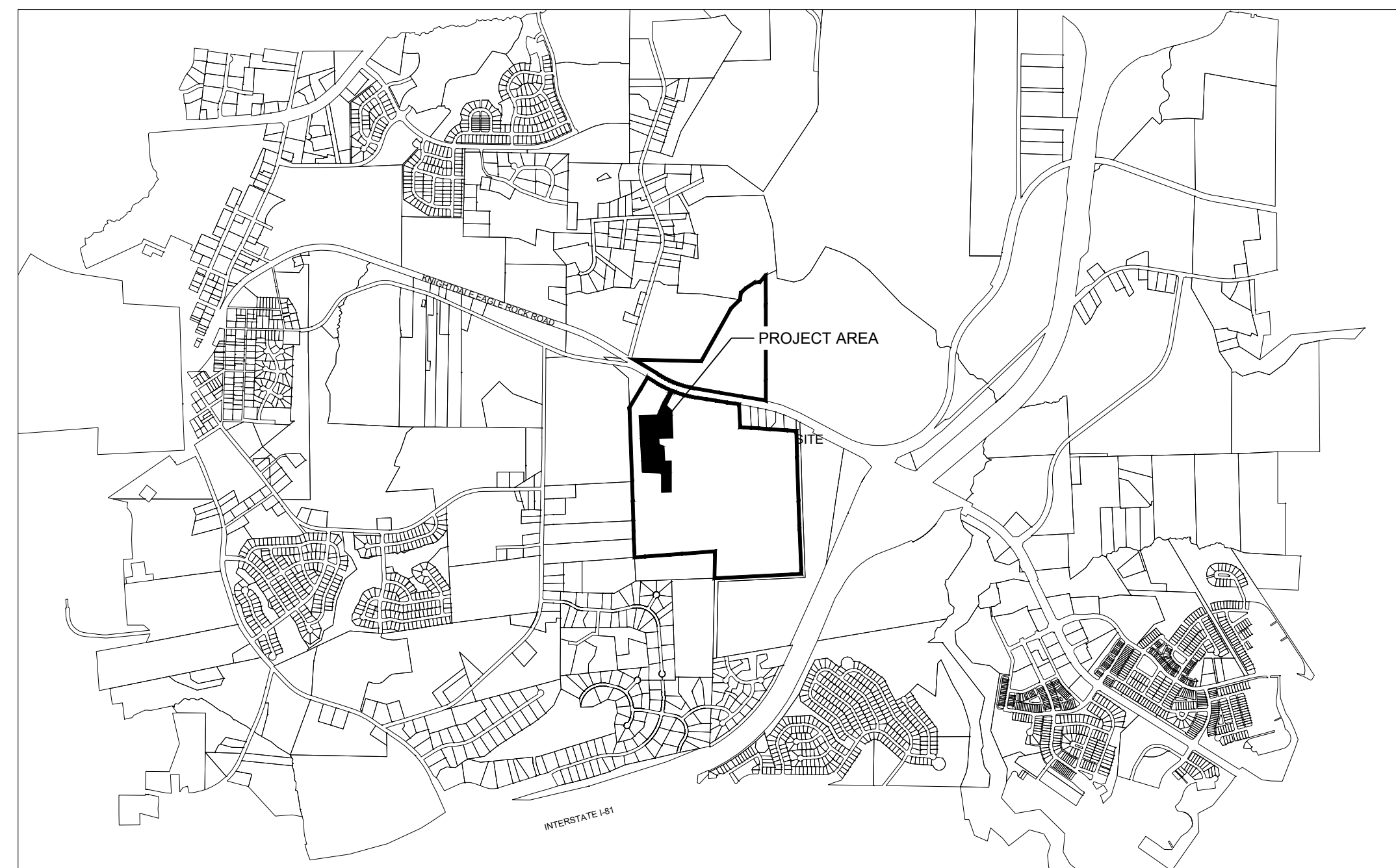
KNIGHTDALE PROPOSED BATTERY ENERGY STORAGE FACILITY

5201 KNIGHTDALE EAGLE ROCK ROAD

KNIGHTDALE, NC 27545

TOK PROJECT # ZCP-3-23

SITE DATA TABLE	
TOTAL SITE AREA	201.3 ACRES
PROJECT LOCATION	5201 KNIGHTDALE EAGLE ROCK ROAD, MARKS CREEK, WAKE COUNTY, NORTH CAROLINA
KNIGHTDALE ZONING	DUKE ENERGY PROGRESS; ZONING: MI
EXISTING ZONING	MI
EXISTING LAND USE	UTILITIES - CLASS 1 & 2 (SUBSTATION)
PROPOSED LAND USES	UTILITIES - CLASS 1 & 2 (BATTERY STORAGE FACILITY)
RIVER BASIN	NEUSE RIVER
RECEIVING WATER	MARK'S CREEK
WATERSHED CLASSIFICATION	C; NSW
PROPOSED BATTERY UNITS	60
INFRASTRUCTURE	TOTAL 201.3 ACRES, BESS FACILITY 11.3 ACRES
IMPERVIOUS AREA	4.7 ACRES
DISTURBED AREA	11.4 ACRES
PROPERTY OWNER 1	DUKE ENERGY PROGRESS INC.
SITE PARKING	SUBSTATION YARD OR OUTSIDE THE GATE
SETBACK TO WEST PROPERTY LINE	150'-0"
SETBACK TO NORTHERN RIGHT OF WAY	450'-0"
PHASING AND TIMETABLE	
TREE CUTTING START DATE	01-NOV-24
SITE CIVIL WORK START DATE	02-DEC-24
PLANNED STATE OF COMPLETION	30-SEP-25



SITE VICINITY MAP

4000' 2000' 0 4000' 8000'
1"=4000'

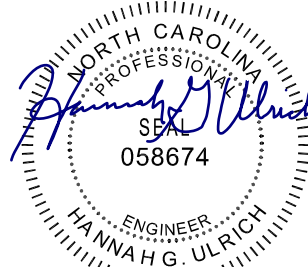
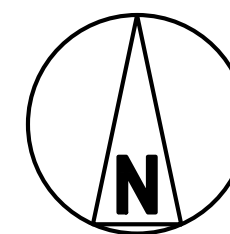
CONTACT LIST		
CONTACTS	NAME	ADDRESS
OWNER	DUKE ENERGY PROGRESS, LLC	7804 FAIRVIEW ROAD, SUITE C BOX 214, CHARLOTTE, NC 28226 ATTN: GREG MCELMURRY, PHONE: 704-264-9879
ELECTRICAL ENGINEER (SUBSTATION)	ETHAN BROWN	175 REGENCY WOODS PLACE, SUITE 300, CARY, NC 24515-0000
ELECTRICAL ENGINEER (BESS)	OLUFEMI OYEBANJO	920 MEMORIAL CITY WAY, SUITE 600, HOUSTON, TX 77024
CIVIL ENGINEER	HANNAH ULRICH	11401 LAMAR AVENUE, OVERLAND PARK, KS 66211

TOWN OF KNIGHTDALE CONSTRUCTION SHEET LIST	
DRAWING NUMBER:	DRAWING NAME:
KND01-CV-C-SI-CS-01	COVER SHEET
KND01-CV-C-SI-PL-02	ENVIRONMENTAL SURVEY
KND01-CV-C-SI-PL-01	SITE PLAN
KND01-AD-A-YD.00.PL-02	LANDSCAPE PLAN
KND01-LT-E-PL-01	BESS ELECTRICAL LIGHTING PLAN
KND01-LT-E-PL-02	ELECTRICAL LIGHTING STUDY OVERALL BESS SITE
KND01-LT-E-SD-01	ELECTRICAL LIGHTING DETAILS
KND00-LT-E-SY.00.PL-01	ELECTRICAL LIGHTING PLAN
KND00-LT-E-SY.00.SD-01	ELECTRICAL LIGHTING DETAILS
KND01-CV-C-FE-PL-01	SURFACING AND FENCING PLAN
KND01-CV-C-FE-SD-01	FENCING DETAILS
KND01-CV-C-GR-SD-01	SURFACING DETAILS
KND01-CV-C-GR-SD-02	GRADING DETAILS
KND01-CV-C-GR-SD-04	GRADING DETAILS
KND01-AD-A-YD.00.PL-01	ARCHITECTURAL PLAN
KND01-AD-A-YD.00.SD-01	ARCHITECTURAL ELEVATION AND SECTIONS
KND01-AD-A-YD.00.SD-02	DIGITAL MATERIALS BOARD
KND01-VEN-LG-E-SD-01	BESS CONTAINER ARCHITECTURAL PLAN
KND01-VEN-LG-E-SD-02	MVT SKID ARCHITECTURAL PLAN
KND01-VEN-LG-AE.00.SD-03	SITE CONTROL CENTER ARCHITECTURAL PLAN
KND00-GA-M-SY.00.EV-01	SUBSTATION CONTROL ENCLOSURE ARCHITECTURAL PLAN
KND01-UG-E-PL-01	ELECTRICAL UNDERGROUND CONDUIT BESS OVERALL
KND01-CV-C-GR-PL-01	STORMWATER MANAGEMENT PLAN
KND01-CV-C-GR-PL-02	STORMWATER MANAGEMENT PLAN
KND01-CV-C-SI-CS-01	COVER SHEET (NCDEQ APPROVED)
KND01-CV-C-SI-PL-02	ENVIRONMENTAL SURVEY (NCDEQ APPROVED)
KND01-CV-C-SI-PL-01	SITE PLAN (NCDEQ APPROVED)
KND01-CV-C-GR-PL-01	GRADING & DRAINAGE PLAN (NCDEQ APPROVED)
KND01-CV-C-GR-PL-02	GRADING & DRAINAGE PLAN (NCDEQ APPROVED)
KND01-CV-C-EC-PL-01	EROSION & SEDIMENT CONTROL PLAN (NCDEQ APPROVED)
KND01-CV-C-EC-PL-02	EROSION & SEDIMENT CONTROL PLAN (NCDEQ APPROVED)
KND01-CV-C-EC-SD-01	EROSION & SEDIMENT CONTROL DETAILS (NCDEQ APPROVED)
KND01-CV-C-EC-SD-02	EROSION & SEDIMENT CONTROL DETAILS (NCDEQ APPROVED)
KND01-CV-C-EC-SD-03	EROSION & SEDIMENT CONTROL NOTES (NCDEQ APPROVED)
KND01-CV-C-EC-SD-04	EROSION & SEDIMENT CONTROL NOTES (NCDEQ APPROVED)
KND01-CV-C-FE-PL-01	FENCING PLAN (NCDEQ APPROVED)

SUPPLEMENTAL REGULATIONS 5.10.H – GRID SCALE BATTERY STORAGE FACILITIES (UNIFIED DEVELOPMENT ORDINANCE)

- NO GRID-SCALE BATTERY STORAGE FACILITY SHALL BE LOCATED WITHIN A ONE HUNDRED (100) FOOT RADIUS OF THE FOOTPRINT OF ANY PRE-EXISTING ADJACENT RESIDENTIAL DWELLING.
- GRID-SCALE BATTERY STORAGE FACILITIES SHALL ONLY BE PERMITTED WHEN CO-LOCATED ON A SITE WITH A SUBSTATION FACILITY.
- A TYPE D BUFFER YARD SHALL BE REQUIRED ON ALL SIDES OF A GRID-SCALE BATTERY STORAGE FACILITY ADJACENT TO A RESIDENTIAL ZONING DISTRICT. ALL OTHER REQUIRED BUFFER YARDS SHALL BE CONSISTENT WITH SECTION 7.4 (1)(1).
- ALL SIDES OF A GRID-SCALE BATTERY STORAGE FACILITY SHALL BE SCREENED FROM OFF-SITE VIEW BY USE OF A FENCE OR MASONRY WALL. THE MATERIALS OF THE FENCE OR MASONRY WALL SHALL BE CONSISTENT WITH THOSE LISTED IN SECTION 7.6 (C). THE HEIGHT OF ANY FENCE OR MASONRY WALL SHALL BE CONSISTENT WITH THE HEIGHT OF THE ENERGY STORAGE CONTAINER. THE MAXIMUM HEIGHT OF SUCH FENCE OR MASONRY WALL SHALL NOT EXCEED 8 FEET IN HEIGHT REGARDLESS OF THE HEIGHT OF THE ENERGY STORAGE CONTAINER.
- THE GRID-SCALE BATTERY STORAGE FACILITY SHALL HAVE AT LEAST ONE ENTRANCE OF SUFFICIENT DESIGN TO ALLOW FOR THE PROVISION OF EMERGENCY SERVICES, AS APPROVED BY THE KNIGHTDALE FIRE DEPARTMENT.
- PRIOR TO CONSTRUCTION DRAWING APPROVAL, A THIRD-PARTY NOISE ANALYSIS SHALL BE SUBMITTED ESTABLISHING THAT THE GRID-SCALE BATTERY STORAGE FACILITY AS DESIGNED WILL NOT EXCEED NOISE LEVEL LIMITS AT THE PROPERTY LINE(S) SET FORTH IN THE APPLICABLE NOISE ORDINANCE.
- THE NOISE LEVEL LIMITS APPLICABLE TO THE GRID-SCALE BATTERY STORAGE FACILITY SHALL BE DETERMINED BY THE LOCATION OF THE FACILITY. IF THE FACILITY IS LOCATED IN TOWN LIMITS, THE NOISE LEVEL LIMITS SET FORTH IN THE TOWN'S CODE OF ORDINANCES (KNIGHTDALE NOISE ORDINANCE) SHALL APPLY. IF THE FACILITY IS LOCATED OUTSIDE OF TOWN LIMITS BUT WITHIN THE TOWN'S EXTRA-TERRITORIAL JURISDICTION, THE NOISE LEVEL LIMITS SET FORTH IN WAKE COUNTY'S CODE OF ORDINANCES SHALL APPLY.
- AN ADDITIONAL NOISE ANALYSIS SHALL BE REQUIRED IF THE FACILITY EXCEEDS THE APPLICABLE NOISE LEVEL LIMITS. IF WARRANTED BY THE NOISE ANALYSIS, NOISE DAMPENING MEASURE SHALL BE INSTALLED IN ANY AREA THAT PRODUCES EXCESSIVE NOISE.

TOWN APPROVED STANDARDS SHALL CONTROL. IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN THESE CONSTRUCTION DRAWING 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- CIVIL
THESE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING DRAWINGS AND WITH THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE. I, HANNAH ULRICH, 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 TOWN STANDARDS HAVE BEEN PREVIOUSLY APPROVED BY THE TOWN OF KNIGHTDALE AND SAID EXCEPTIONS ARE SHOWN ON SHEET(S) _____ OF THESE DRAWINGS.



PROFESSIONAL DESIGN ENGINEER CERTIFICATION- SUBSTATION ELECTRICAL
THESE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING DRAWINGS AND WITH THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE. I, ETHAN BROWN, 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 TOWN STANDARDS HAVE BEEN PREVIOUSLY APPROVED BY THE TOWN OF KNIGHTDALE AND SAID EXCEPTIONS ARE SHOWN ON SHEET(S) _____ OF THESE DRAWINGS.

TOWN CERTIFICATION
THIS DESIGN HAS BEEN REVIEW 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: _____
LAND USE ADMINISTRATOR

ISSUED FOR PERMITTING

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

I	20/DEC/2024	ISSUED FOR PERMITTING	CLC/MJM/HGU/WL	D	24/SEP/2024	ISSUED FOR PERMITTING	CLC/MJM/HGU/SLD
H	21/NOV/2024	90% SUBMITTAL	CLC/MJM/HGU/WL	C	12/SEP/2024	ISSUED FOR PERMITTING	CLC/MJM/HGU/SLD
G	18/NOV/2024	ISSUED FOR PERMITTING	CLC/MJM/HGU/WL	B	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC/MJM/HGU/SLD
F	25/OCT/2024	ISSUED FOR PERMITTING	CLC/MJM/HGU/SLD	A	23/AUG/2024	ISSUED FOR PERMITTING	CLC/MJM/HGU/SLD
E	27/SEP/2024	ISSUED FOR PERMITTING	CLC/MJM/HGU/SLD	NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN/DES/CHK/PDE/APP

BLACK & VEATCH
Building a world of difference®

DESIGNER: MJM DRAWN: CLC
CHECKED: HGU DATE: 20/DEC/2024

DUKE ENERGY
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

COVER SHEET
5201 KNIGHTDALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596	KND01-CV-C-SI-CS-01	I
CODE		
AREA		

NOTES

- THE INFORMATION ON THIS SHEET WAS PREPARED BY ERM NC, INCL. ON 05/09/2023 AND MODIFIED BY BLACK & VEATCH.
- ENTIRE SITE AND WORK AREA IS WITHIN THE EXTRA-TERRITORIAL JURISDICTION OF THE TOWN OF KNIGHTDALE, WAKE COUNTY.
- LANDSCAPED AREAS REQUIRED BY CHAPTER 7 OF THE UDO SHALL NOT CONTAIN ANY DEVELOPMENT, IMPERVIOUS SURFACES, OR SITE FEATURES THAT DO NOT FUNCTION TO MEET THE APPLICABLE STANDARDS FOR THAT AREA OR THAT REQUIRE REMOVAL OF EXISTING SIGNIFICANT VEGETATION [UDO, SEC. 7.4.E.1].
- NO GRADING, DEVELOPMENT, OR LAND-DISTURBING ACTIVITIES SHALL OCCUR WITHIN A BUFFER YARD IF FOREST CANOPY, SPECIMEN TREES, OR SIGNIFICANT VEGETATION EXISTS WITHIN THESE AREAS, UNLESS APPROVED BY THE LAND USE ADMINISTRATOR. IF GRADING WITHIN A BUFFER YARD IS PROPOSED, SLOPES OF 1:3 OR LESS ARE ENCOURAGED TO ENSURE THE PROPER TRANSITION OF GRADES TO THE ADJACENT PROPERTY AND TO FACILITATE LANDSCAPING AND MAINTENANCE [UDO, SEC. 7.4.E.2].
- ALL AREAS WITHIN REQUIRED BUFFER YARDS, STREAM BUFFERS, SLOPE AREAS GREATER THAN 25%, AND WETLANDS ARE TREE SAVE AREAS AND ALL VEGETATION AND SOIL IS TO REMAIN UNDISTURBED [UDO, SEC. 7.4.H.1].
- ALL TREES GREATER THAN 12" DBH WITHIN FRONT SETBACK AREAS, STREET TREE PLANTING STRIP, AND SLOPE AREAS OF 15-25% ARE TO REMAIN UNDISTURBED OR REPLACEMENT TREES ARE REQUIRED AT A RATE OF 1 TREE PER 12" DBH, AND SHOULD BE INCORPORATED INTO OPEN SPACE AMENITIES/PUBLIC GATHERING AREAS/PEDESTRIAN PLAZA WHEREVER POSSIBLE. REQUIRED STREET TREES, PARKING LOT LANDSCAPING, AND BUFFER YARD PLANTINGS ARE NOT TO BE COUNTED TOWARDS REPLACEMENT REQUIREMENTS [UDO, SEC. 7.4.H.1].
- ALL TREES GREATER THAN 24" DBH ON-SITE ARE TO REMAIN UNDISTURBED OR REPLACEMENT TREES ARE REQUIRED AT A RATE OF 1 TREE PER 12" DBH, AND SHOULD BE INCORPORATED INTO OPEN SPACE AMENITIES/PUBLIC GATHERING AREAS/PEDESTRIAN PLAZA WHEREVER POSSIBLE. REQUIRED STREET TREES, PARKING LOT LANDSCAPING, AND BUFFER YARD PLANTINGS ARE NOT TO BE COUNTED TOWARDS REPLACEMENT REQUIREMENTS [UDO, SEC. 7.4.H.1].

LEGEND

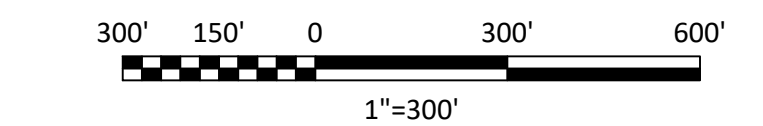
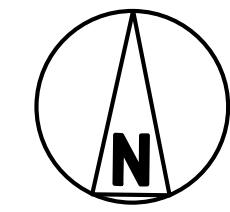
- RIVER AND STREAMS
- PARCELS
- SUBJECT PROPERTY
- PROJECT BOUNDARY
- 300FT PROPERTY BUFFER
- SUBDIVISION

TOWN CERTIFICATION
 THIS DESIGN HAS BEEN REVIEW 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

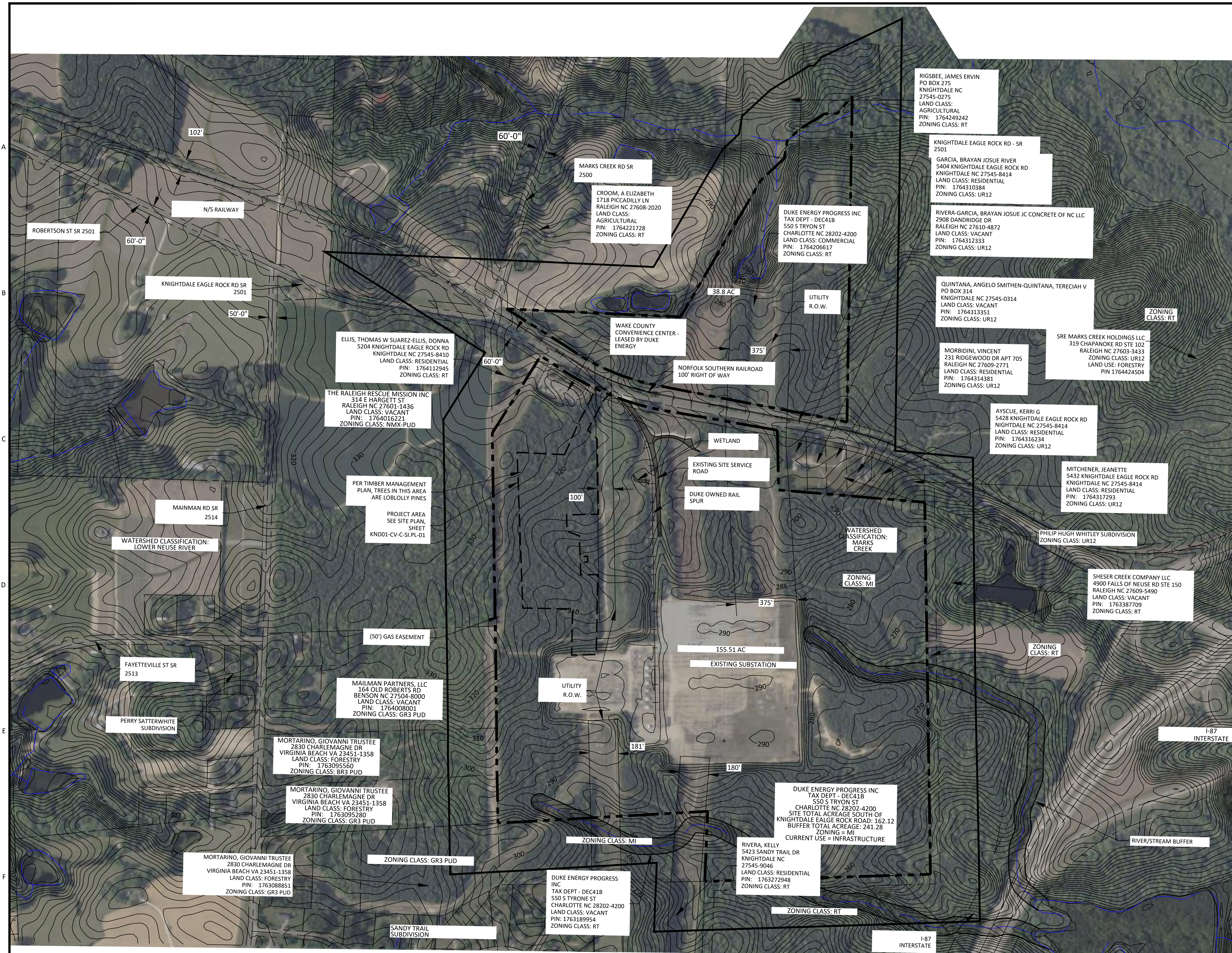
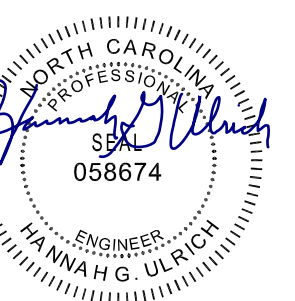
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: _____ DATE: _____
 LAND USE ADMINISTRATOR



ISSUED FOR PERMITTING

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.



Civil 3D 2022 Imperial
 ANS/D 34422
 9/27/2024 4:07 PM
 Cop113378
 9/27/2024 4:07 PM

I	20/DEC/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	WL	D	27/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSL
H	21/NOV/2024	90% SUBMITTAL	CLC	MJM	HGU	WL	C	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSL
G	18/NOV/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	WL	B	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	DSL
F	25/OCT/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSL	A	08/22/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSL
E	27/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSL	NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE

	DUKE ENERGY KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM	PROJECT	DRAWING NUMBER	REV
		419596 KND01-CV-C-SI.PL-02		1
DESIGNER	MJM	DRAWN	CLC	
CHECKED	HGU	DATE	20/DEC/24	
ENVIRONMENTAL SURVEY		CODE		
5201 KNIGHTDALE EAGLE ROCK ROAD		AREA		
KNIGHTDALE, NC 27545				

NOTES

- TREE CLEARING SHALL BE LIMITED TO THE LIMITS OF DISTURBANCE AS SHOWN ON THIS PLAN.
- UPON THE TOWN OF KNIGHTDALE REQUEST, DUKE SHALL MEET TOWN INSPECTORS AT THE SITE AND ACCOMPANY THE INSPECTORS FOR TOWN INSPECTION OF THE SCMs.

HORIZONTAL DATUM: NAD83 NORTH CAROLINA STATE PLANES, US FOOT
 *STATE PLANE COORDINATES WERE ESTABLISHED BASED IN NGS MONUMENTS "ROSE" AND "TOMB".

VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988

BENCHMARK: PROJECT LOCALIZATION POINT 'NAIL'
 N: 740,484.141'
 E: 2,163,003.135'
 ELV: 291.02'

LEGEND

- ADJACENT PARCEL BOUNDARY
- PROPOSED SECURITY FENCE
- EXISTING FENCE
- PROPOSED ROAD
- EXISTING TREE LIMITS
- EXISTING RAILROAD
- EXISTING OVERHEAD LINE
- PROPERTY BOUNDARY
- PROPOSED OVERHEAD ELECTRIC LINES
- HIGH POWERED OVERHEAD ELECTRIC LINES
- EXISTING RIGHT-OF-WAY
- EXISTING FIBER OPTIC CABLE
- LIMITS OF DISTURBANCE
- EXISTING TREE LINE
- PROPOSED PERIMETER WALL
- PROPOSED VEGETATED SWALE
- RIP RAP

TOWN CERTIFICATION

THIS DESIGN HAS BEEN REVIEW 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.

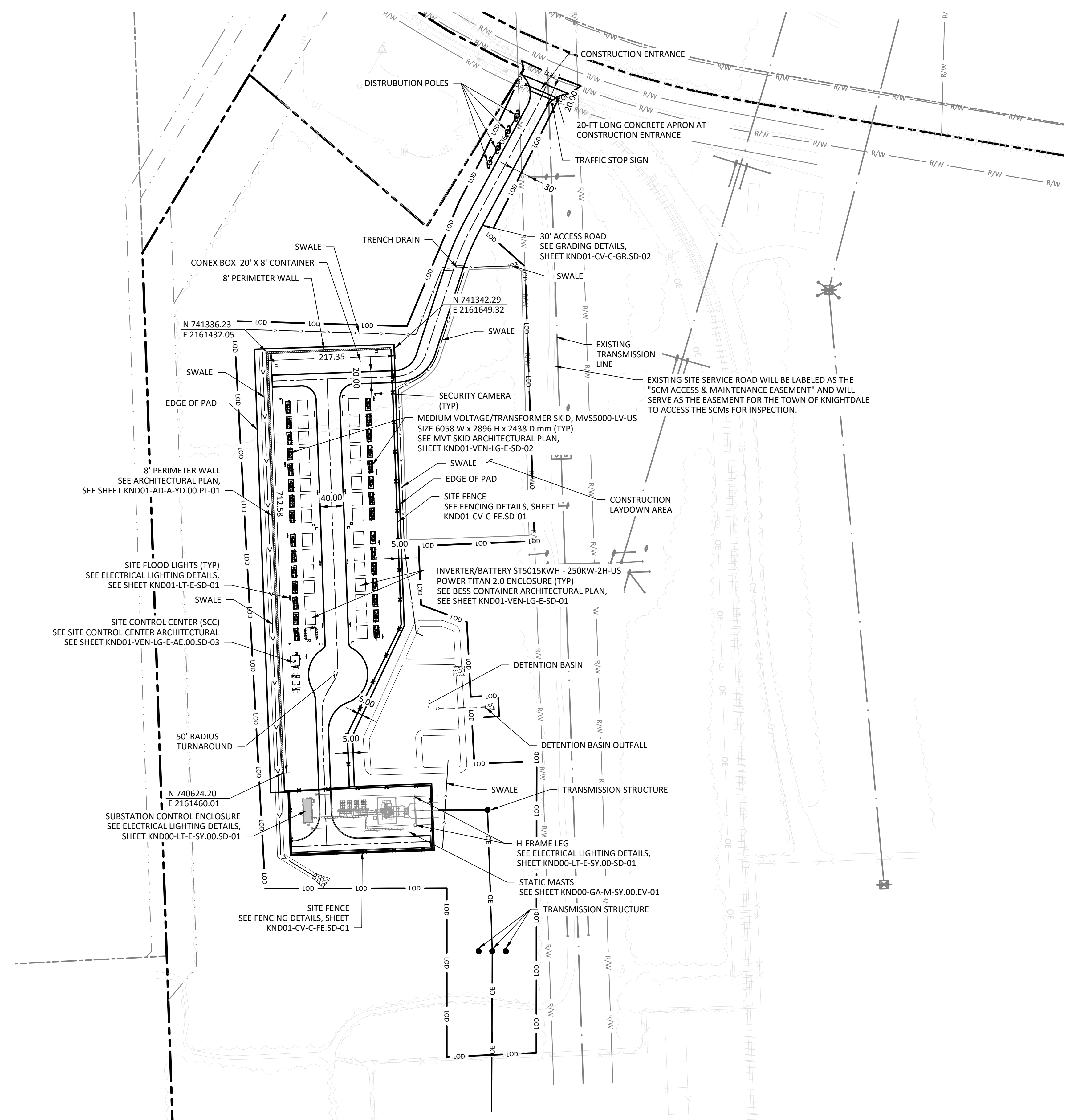
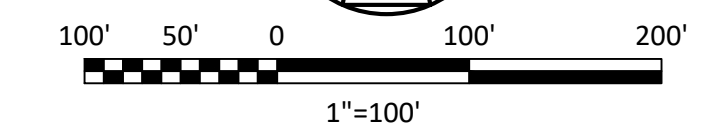
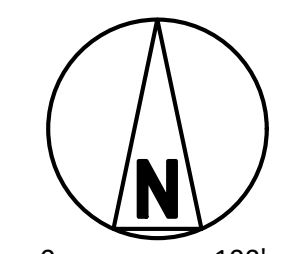
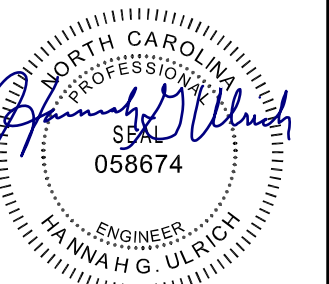
BY: _____ DATE: _____
 TOWN ENGINEER

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

BY: _____ DATE: _____
 LAND USE ADMINISTRATOR

ISSUED FOR PERMITTING

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Civil 3D 2022 Imperial
 ANS I D 344-22
 9/15/2024 7:29 AM
 Cop113378
 9/15/2024 7:29 AM

H	20/DEC/2024	ISSUED FOR PERMITTING					D	24/SEP/2024	ISSUED FOR PERMITTING	CLC MJM HGU SLD
G	18/NOV/2024	ISSUED FOR PERMITTING	CLC MJM HGU WL	C	12/SEP/2024	ISSUED FOR PERMITTING				CLC MJM HGU SLD
F	25/OCT/2024	ISSUED FOR PERMITTING	CLC MJM HGU SLD	B	4/SEP/2024	ISSUED FOR 60% REVIEW				CLC MJM HGU SLD
E	27/SEP/2024	ISSUED FOR PERMITTING	CLC MJM HGU SLD	A	22/AUG/2024	ISSUED FOR PERMIT				CLC MJM HGU SLD
				NO	DATE	REVISIONS AND RECORD OF ISSUE				DRN DES CHK PDE APP

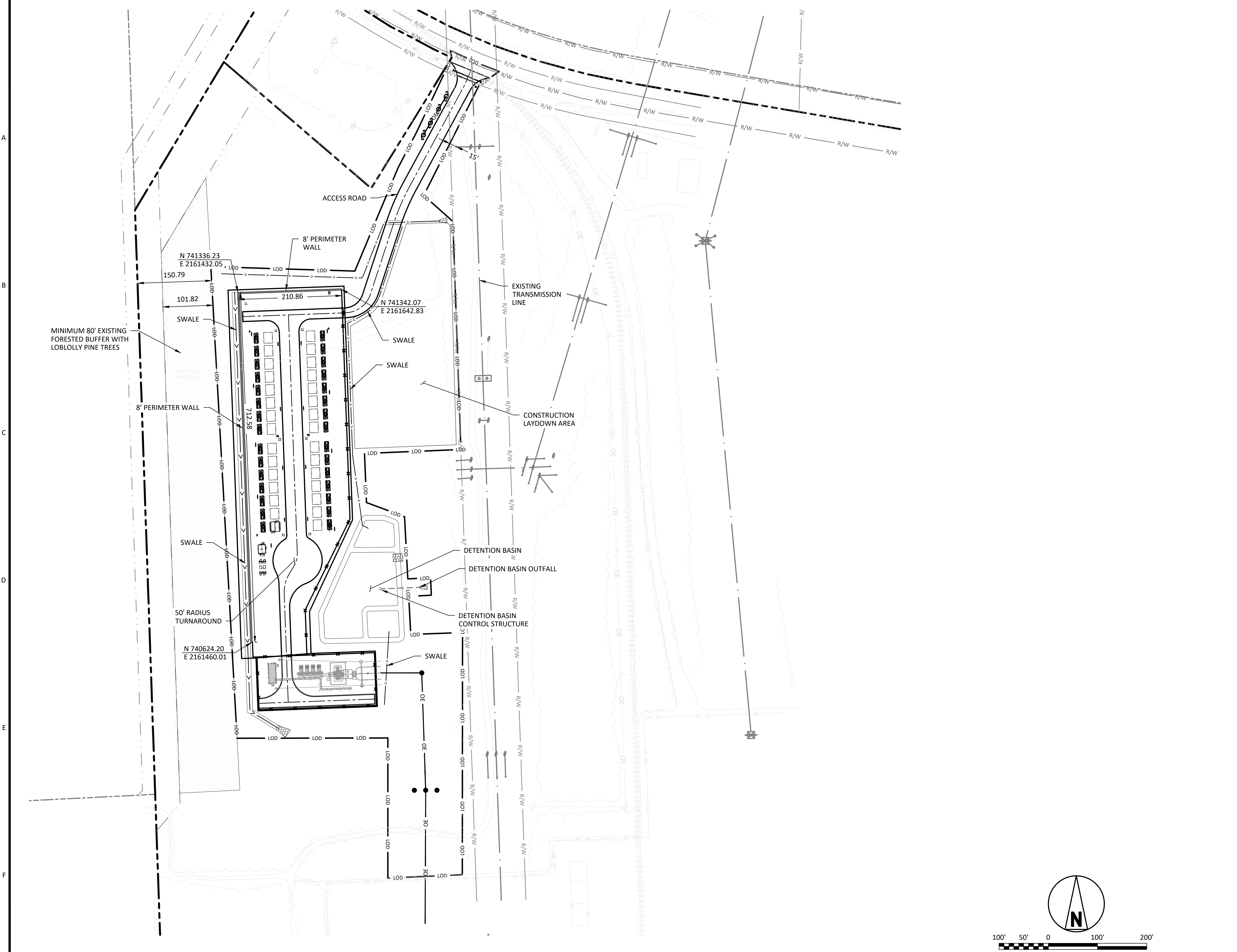
BLACK & VEATCH
 Building a world of difference®

DESIGNER: MJM DRAWN: CLC
 CHECKED: HGU DATE: 20/DEC/2024

DUKE ENERGY
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

SITE PLAN
 5201 KNIGHTDALE EAGLE ROCK ROAD
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
	419596 KND01-CV-C-SI.PL-01	H
CODE		
AREA		



LEGEND

- ADJACENT PARCEL BOUNDARY
- PROPOSED SECURITY FENCE
- EXISTING FENCE
- PROPOSED ROAD
- EXISTING TREE LIMITS
- EXISTING RAILROAD
- EXISTING OVERHEAD LINE
- PROPERTY BOUNDARY
- PROPOSED OVERHEAD ELECTRIC LINES
- HIGH POWERED OVERHEAD ELECTRIC LINES
- EXISTING RIGHT-OF-WAY
- EXISTING FIBER OPTIC CABLE
- LIMITS OF DISTURBANCE
- EXISTING TREE LINE
- PROPOSED PERIMETER WALL
- PROPOSED VEGETATED SWALE
- RIP RAP
- BUFFER AREA

NOTE:
 THE LAND USE ADMINISTRATOR RESERVES THE RIGHT TO REQUIRE ADDITIONAL VEGETATION TO BE PLANTED PRIOR TO CERTIFICATE OF OCCUPANCY TO MEET THE PERFORMANCE STANDARDS OF THE TYPE D BUFFER.

TOWN CERTIFICATION
 THIS DESIGN HAS BEEN REVIEW 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.

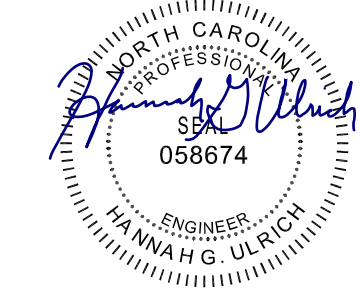
BY: _____ DATE: _____
 TOWN ENGINEER

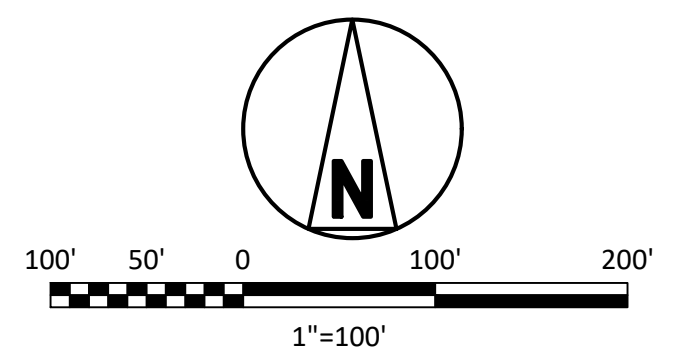
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: _____ DATE: _____
 LAND USE ADMINISTRATOR

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UJ98274
 ANS/D 344-22
 9/15/2024 7:29 AM
 Civil 3d 2022 Imperial
 Full Size 1=1

NO	DATE	REVISIONS AND RECORD OF ISSUE
H	20/DEC/2024	ISSUED FOR PERMITTING
H	21/NOV/2024	90% SUBMITTAL
G	18/NOV/2024	ISSUED FOR PERMITTING
F	25/OCT/2024	ISSUED FOR PERMITTING
E	27/SEP/2024	ISSUED FOR PERMITTING
D	25/SEP/2024	ISSUED FOR PERMITTING
C	12/SEP/2024	ISSUED FOR PERMITTING
B	30/AUG/2024	ISSUED FOR 60% REVIEW
A	22/AUG/2024	ISSUED FOR PERMIT

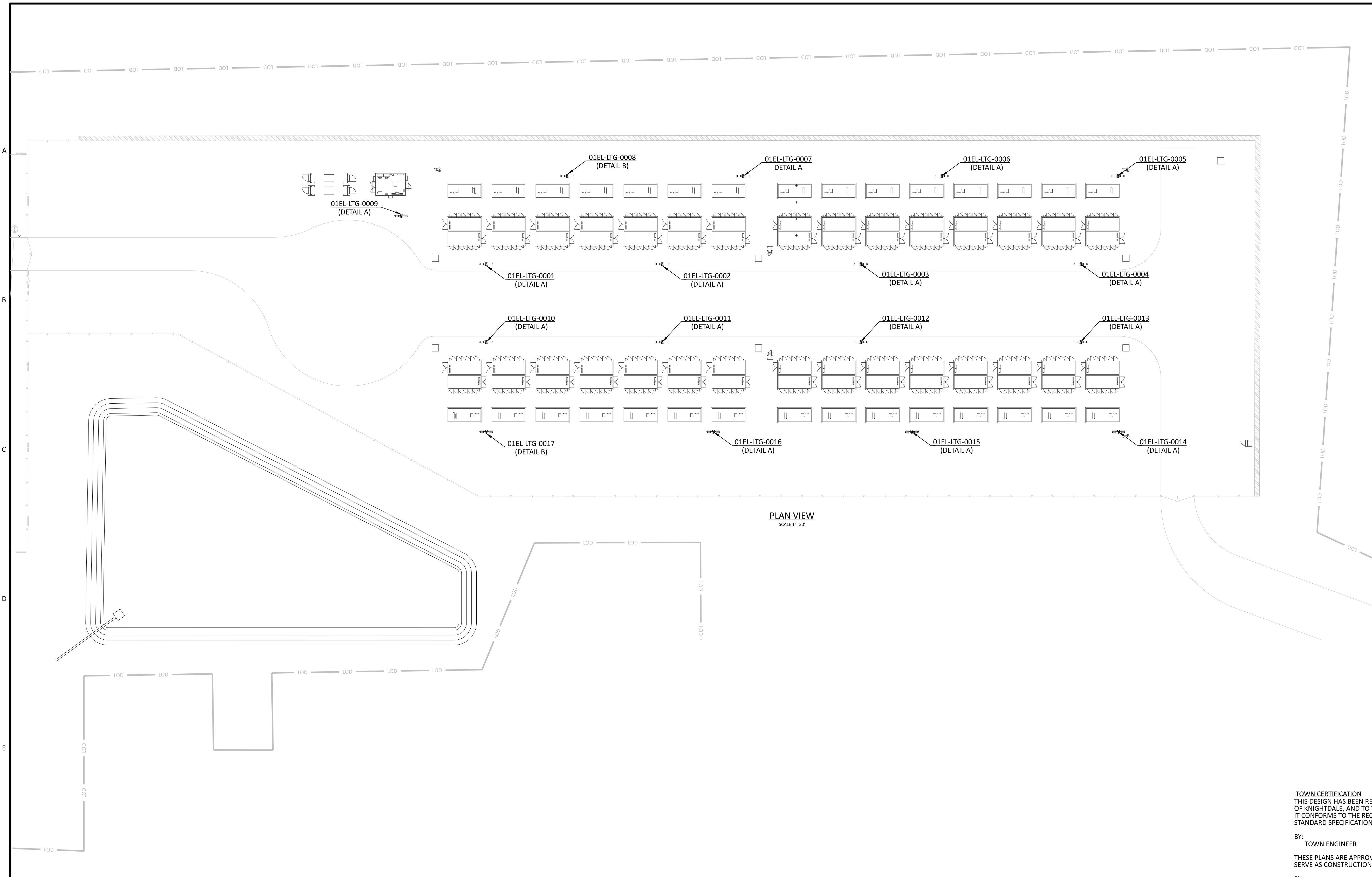
BLACK & VEATCH
 Building a world of difference®

DESIGNER: MJM DRAWN: CLC
 CHECKED: HGU DATE: 20/DEC/2024

DUKE ENERGY
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

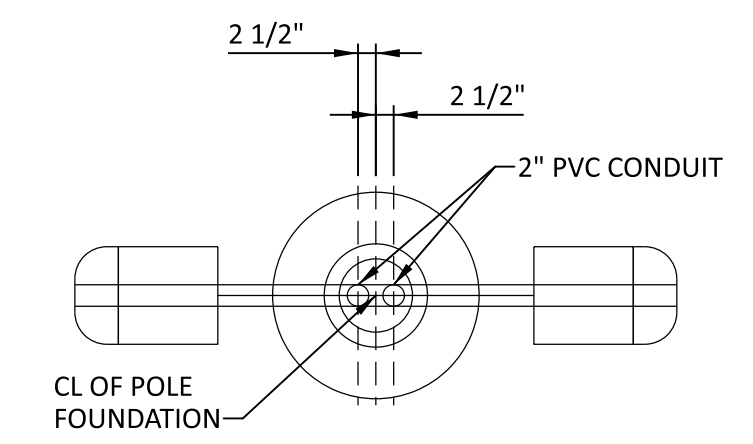
LANDSCAPE PLAN
 5201 KNIGHTDALE EAGLE ROCK ROAD
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
	419596 KND01-AD-A-YD.00.PL-02	1
CODE		
AREA		

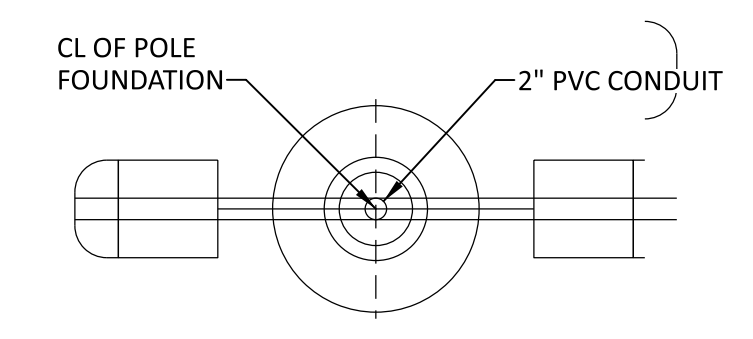


PLAN VIEW
SCALE 1"=30'

- NOTES:
- SEE DWG KND01-CV-C-SI-PL-01 FOR CIVIL SITE PLAN.
 - SEE DWG KND01-CV-C-FD-03 FOR CAMERA & LIGHT POLE FOUNDATION PLAN AND DETAILS.
 - SEE DWG KND01-CV-C-FD-PL-01 AND KND01-CV-C-FD-PL-02 FOR BESS AND MVT STRUCTURAL FOUNDATION LAYOUT.
 - SEE DWG KND01-CV-C-FO-PL-01 FOR OVERALL BESS FOUNDATION ARRANGEMENT OVERALL.
 - SEE DWG KND01-EN-E-EG-01 FOR ELECTRICAL GRAPHIC SYMBOLS AND GENERAL NOTES.
 - SEE SERIES DWG KND01-LG-E-PL-01 FOR BESS ELECTRICAL ARRANGEMENT.
 - SEE SERIES DWG KND01-UG-PL-01 THRU 09 FOR UNDERGROUND CONDUIT.
 - SEE SERIES DWG KND01-GD-E-PL-01 THRU 07 FOR SITE GROUNDING.
 - SEE SERIES DWG KND01-EL-E-CA-01 FOR CIRCUIT LIST AND KND01-EL-E-CA-02 FOR RACEWAY LIST AND DESCRIPTION.



DETAIL A - TYPICAL LIGHT POLE
TWO CONDUITS STUB UP
NOT TO SCALE



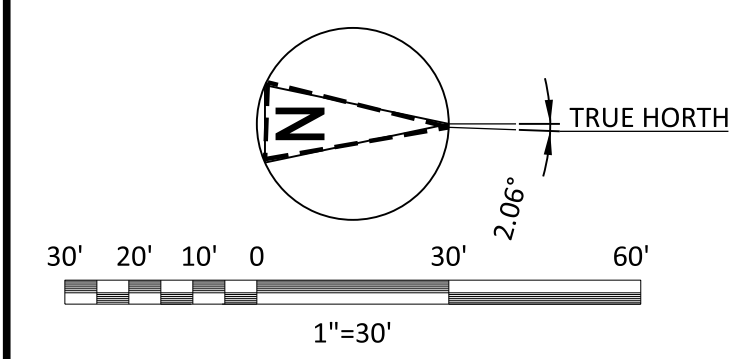
DETAIL B - TYPICAL LIGHT POLE
SINGLE CONDUITS STUB UP
NOT TO SCALE

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: _____
LAND USE ADMINISTRATOR



REFERENCE DRAWINGS:
KND00-LT-E-SY.00.PL-01 34.5KV - 230KV SUBSTATION LIGHTING PLAN
KND01-LT-E-PL-02 BESS ELECTRICAL LIGHTING SURVEY
KND01-LT-E-SD-01 BESS ELECTRICAL LIGHTING DETAILS



ISSUED FOR PERMITTING
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B&V PROJECT NUMBER: 419596

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ANSI D 34622
Full Size 1 = 1
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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
D	25/OCT/24	ISSUED FOR PERMIT	BCA	BCA	OOO	OOO	BC
C	13/SEP/24	ISSUED FOR PERMIT	BCA	BCA	OOO	OOO	BC
B	03/SEP/24	ISSUED FOR CLIENT 60% REVIEW	BCA	BCA	OOO	OOO	BC
A	23/AUG/24	ISSUED FOR PERMIT	BCA	BCA	OOO	OOO	BC

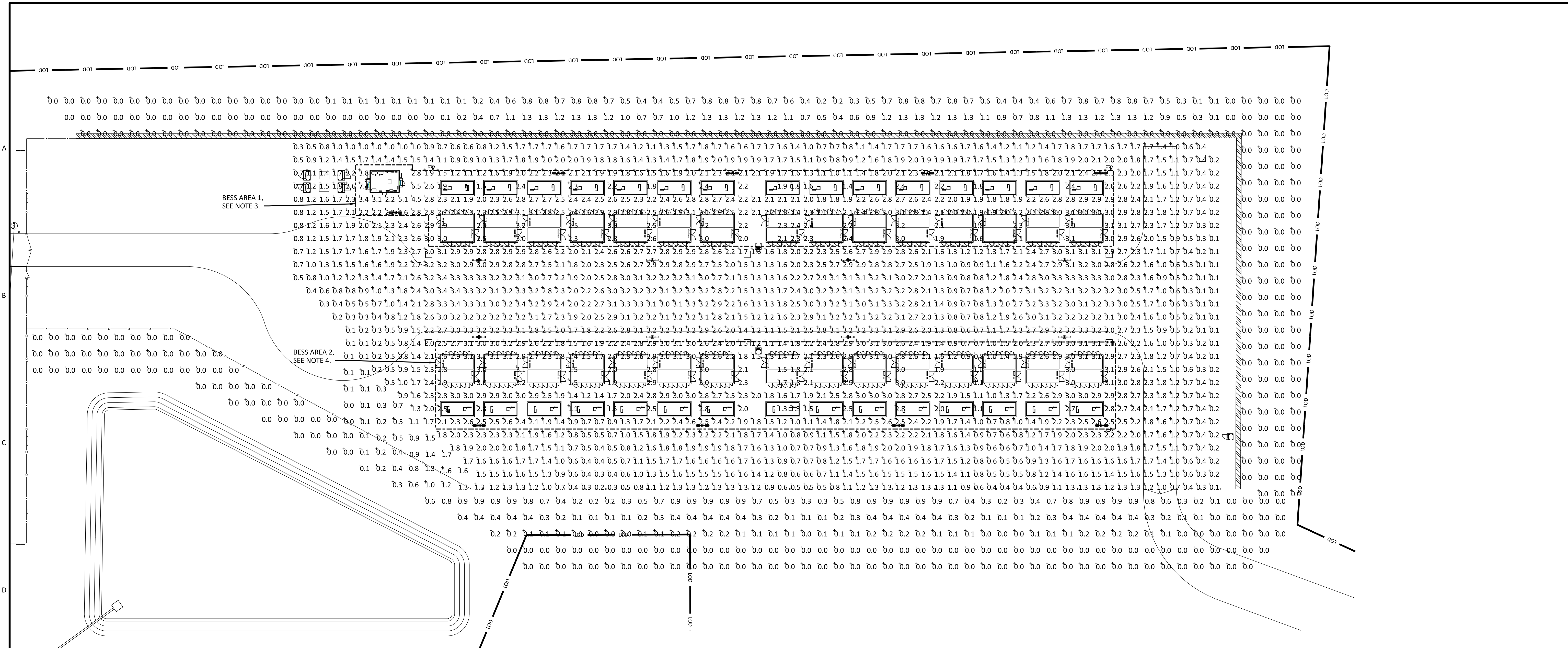
BLACK & VEATCH
11401 LAMAR AVENUE
OVERLAND PARK, KANSAS 66211

DESIGNER: BCA
DRAWN: BCA
CHECKED: OOO
DATE: 03/SEP/24

DUKE ENERGY
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

BESS ELECTRICAL LIGHTING PLAN
5201 KNIGHTDALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
KND01-LT-E-PL-01		G
CODE		
AREA		



PHOTOMETRIC CALCULATION DISCLAIMER:
LIGHTING CALCULATIONS HAVE BEEN PERFORMED IN ACCORDANCE WITH IES RECOMMENDED PROCEDURES USING AGI32-V20.1. DIFFERENCES BETWEEN CALCULATED VALUES AND POST INSTALLATION VALUES MAY OCCUR DUE TO VARIATIONS WITH FINAL INSTALLATION, PHYSICAL AND/OR ENVIRONMENTAL FACTORS.

LIGHT FIXTURE LIST NOTES:

- POLE SHALL BE ROUND TAPERED ALUMINUM 25' TO BE MOUNTED ON SITE BUILT CONC. FOUNDATIONS. NAFCO# VA-RTAA-25-7040-F-AB-FP-BK-PD-NECHH-FST OR ENGINEER APPROVED SIMILAR. POLES REQUIRE A FESTOON BOX LOCATED ON THE SAME SIDE AS THE HAND HOLE, AND 36" ABOVE BASE. PROVIDE GFCl RECEPTACLE AND WATERPROOF IN USE COVER TO FIT HUBBELL #GFRTW20W WITH TAYMAC #HBLSS26WIS COVER OR ENGINEER APPROVED ALTERNATE.

SEE STRUCTURAL DRAWING KND01-CV-C-FD-XX FOR POLE BASE DETAIL.

WIND LOADING SHALL BE CONFIRMED BY MANUFACTURER BEFORE SHIPPING TO SUPPORT LIGHT FIXTURES IN 125 MPH WIND (2) 55 LB 1.2 SQ FT FIXTURES INSTALLED.
- PHOTOMETRIC CALCULATION NUMBERS (WHERE SHOWN, ARE IN FOOTCANDLES (FC) SPACED AT 10' X 10'.
CALCULATION STATISTICS, WITHIN FENCED AREA:
ILLUMINANCE (FC)
AVERAGE = 1.91
MAXIMUM = 7.4
MINIMUM = 0.1
AVG/MIN RATIO = 1.91:0.1
MIN/MAX RATIO = 0.01
MAX/AVG RATIO = 3.87
COEFF. OF VARIATION = 0.46
- CALCULATION STATISTICS, WITHIN BESS AREA 1:
ILLUMINANCE (FC)
AVERAGE = 2.54
MAXIMUM = 7.4
MINIMUM = 1.4
AVG/MIN RATIO = 2.54:1.4
MIN/MAX RATIO = 0.19
MAX/AVG RATIO = 2.91
- CALCULATION STATISTICS, WITHIN BESS AREA 2:
ILLUMINANCE (FC)
AVERAGE = 2.22
MAXIMUM = 3.2
MINIMUM = 0.7
AVG/MIN RATIO = 2.22:0.7
MIN/MAX RATIO = 0.22
MAX/AVG RATIO = 1.44

REFERENCE DRAWINGS:

- KND00-LT-E-SY.00.PL-01 34.5KV - 230KV SUBSTATION LIGHTING PLAN
- KND01-LT-E-PL-01 BESS ELECTRICAL LIGHTING PLAN
- KND01-LT-E-SD-01 BESS ELECTRICAL LIGHTING DETAILS

LIGHTING FIXTURE LIST								
SYMBOL	TYPE	FIXTURE DESCRIPTION / PART NUMBER	INPUT WATTS	VOLTAGE	TOTAL LUMENS	TOTAL LLF	MOUNTING	QTY
		XTOR2B-Y-BK - SITE CONTROL CENTER CROSSTOUR WALL MOUNT LED	18.2	120V THRU 277	1997	0.80	WALL MOUNTED ON SITE CONTROL CENTER	2
	LP1	(2) HOLOPHANE MGLDLM-P14-30K-MVOLT-AR-HSS-US-LT-VT-GRSD-SH (1) HOLOPHANE VERTICAL ARMS BR944 (1) NAFCO# VA-RTAA-25-7040-F-AB-FP-BK-PD-NECHH-FST	105	120V THRU 277	8424	0.80	POLE MOUNTED SEE NOTES	34 FIXTURES 17 POLES

PHOTOMETRIC CALCULATION DISCLAIMER:
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BY: _____ DATE: _____
TOWN ENGINEER

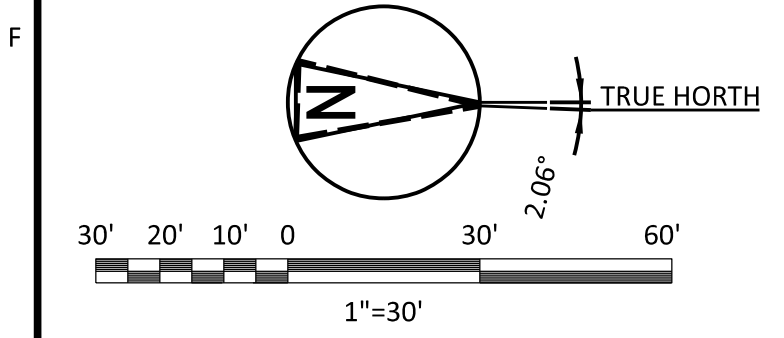
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: _____ DATE: _____
LAND USE ADMINISTRATOR

ISSUED FOR PERMITTING

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B&V PROJECT NUMBER: 419596



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ANSI D 34622
12/19/2024 05:16 PM

DESIGNER	BCA	DRAWN	BCA	PROJECT	KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM	DRAWING NUMBER	KND01-LT-E-PL-02	REV	E
CHECKED	OOO	DATE	22/NOV/24	AREA	ELECTRICAL LIGHTING STUDY OVERALL BESS 5201 KNIGHTDALE EAGLE ROCK ROAD KNIGHTDALE, NC 27545	CODE			
BLACK & VEATCH <small>4741 LAMAR AVENUE OVERLAND PARK, KANSAS 66211</small>				DUKE ENERGY <small>OVERLAND PARK, KANSAS 66211</small>		PROJECT: KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM DRAWING NUMBER: KND01-LT-E-PL-02 REV: E			
REVISIONS AND RECORD OF ISSUE D 22/NOV/24 ISSUED FOR CLIENT 90% REVIEW C 15/NOV/24 ISSUED FOR PERMIT B 25/OCT/24 ISSUED FOR PERMIT A 20/SEP/24 ISSUED FOR PERMIT									



Catalog Number	
Notes	Type

MGLEDM Mongoose Medium LED



The Mongoose Medium LED street lighting fixture provides significant energy and maintenance savings vs. HID luminaires. It offers the ultimate in application flexibility with a uniquely designed advanced optical system and attractive appearance. This combined with multiple lighting distribution mounting options and the ability to tilt the fixture offers unequalled performance in a diverse set of applications ranging from interstates and parking lots.

Mechanical

- Rugged grade A360 diecast aluminum (<1% copper)
- Tool-less access with stainless steel latches
- Terminal block in arm
- Rigorous 5-stage pretreatment polyester topcoat to ensure maximum durability that achieves a scribe creepage rating of 8 after 5,000 hours of salt spray
- Removable "power tray" facilitates maintenance
- Corrosion resistant stainless steel latches ensure secure closure over the long fixture life
- Horizontal mast arms or vertical tenon (VH) and universal mounting to round and square poles (UN) options
- Universal mount mates to all major manufacturer's hole patterns
- All Mountings are 3G vibration rated per ANSI C136.31
- Adjustable fixture tilt from 0-45 degrees provides flexibility to optimize lighting performance

Electrical

- Standard surge protection is 20kV/10kA "Extreme Level" per ANSI C136.2
- LED light engines are rated > 100,000 at 25°C, L70
- Electronic driver has an expected life of > 100,000 hours at 25°C
- Rated for -40°C / (-40°F) minimum ambient
- Programmable electronic driver with > 100 control leads
- Driver voltage options: 120-277V 50/60 Hz and 347 50/60 Hz and 480V 50/60 Hz
- Luminaire ship with a 0-10v dimmable driver. Luminaire is continuous and step dimming capable via AO option or controls installed on P7 photocontrol receptacle option.
- Performance is comparable to 150-400 watt HPS or 175-1,000 watt MH
- IP65 rated borosilicate glass optics ensure longevity and minimize dirt degradation
- Modded Silicone optics: Area (Type S) (AR), Forward Throw (FT), Medium Roadway (MR), Narrow Roadway (NR) and Wide Roadway (WR)
- Borosilicate glass refractor optics: Area (AG), Forward Throw (FG), Medium Roadway (MG), Narrow Roadway (NG) and Wide Roadway (WG)
- 2700K, 3000K, 4000K and 5000K CCT, 70 CRI
- Optional UpLight Skirt (US) when used with refractor ensures zero uplight above 90°
- House side shield (HSS), light trespass shield and option available
- Wire guard kit option available

Optical

- 5-year limited warranty. This is the only warranty provided and in no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.holophane.com/support/warranty/terms-and-conditions

Control

- The Acuity designed ANSI 7-pin receptacle is available which supports traditional locking style photocontrols such as the Extreme long-life solid-state locking style photocontrol - PCLL (20-year rated life)
- Optional onboard Adjustable Output module allows the light output and input voltage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.
- The DC Connect option is a factory embedded low voltage dusk to dawn photocontrol that increases longevity vs. line voltage controls and also eliminates the need to separately inventory controls.
- Integral NIGHT CSGR control is also available to provide local or network on/off dim control plus robust outdoor motion detection and response at up to 40' mounting heights.
- The LocalConnect option provides a simple means to collect luminaire attribute data, asset location information and create point-to-point on/off dim commands via secure Bluetooth link using smartphone platforms.
- The GlobalConnect option enabled thru selection of receptacles and controls provides a smart city enabled solution utilizing long range network nodes to enable remote monitoring and control. Additionally, it can be equipped with sensor-ready technology to support Zhang standard sensors.
- Cell Connect is an embedded network photocontrol with cellular communication. It provides digital switching, precise dimming, and revenue grade metrology. Cell Connect leverages 4G LTE drivers to communicate real time data to Ubiquiti, a cloud-based asset management system.

Certification & Standards

- CSA Certified to US and Canadian standards
- Suitable for operation in an ambient temperature up to 40°C

Government Procurement

- BAA - Buy American(n) Act: Product qualifies as a domestic end product under the Buy American Act as implemented in the FAR and DFARS. Product also qualifies as manufactured in the United States under DOT Buy America regulations.
- BABA - Build America Buy America: Product qualifies as produced in the United States under the definitions of the Build America, Buy America Act.

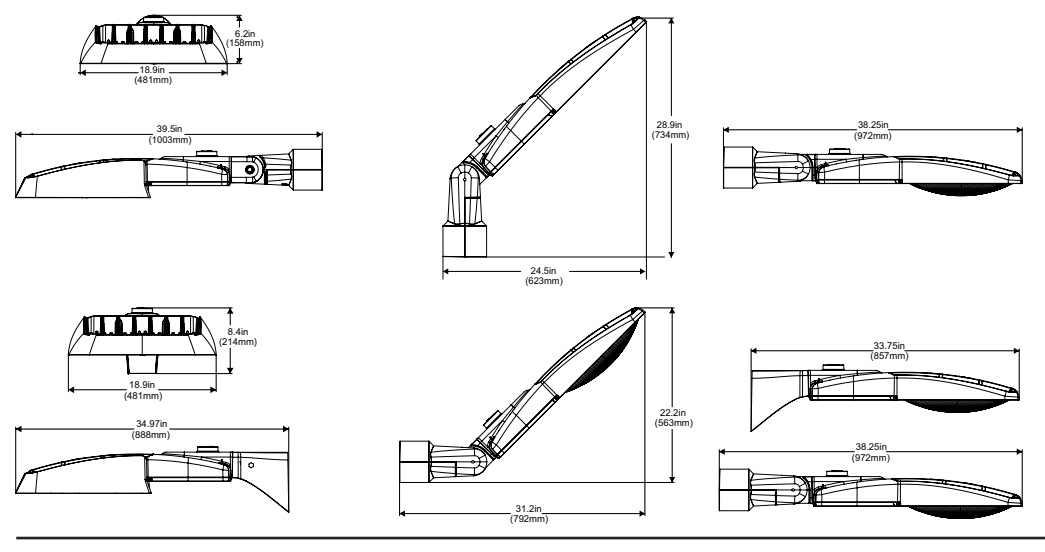
Warranty

Please refer to www.acuitybrands.com/resources/buy-america for additional information.

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25°C

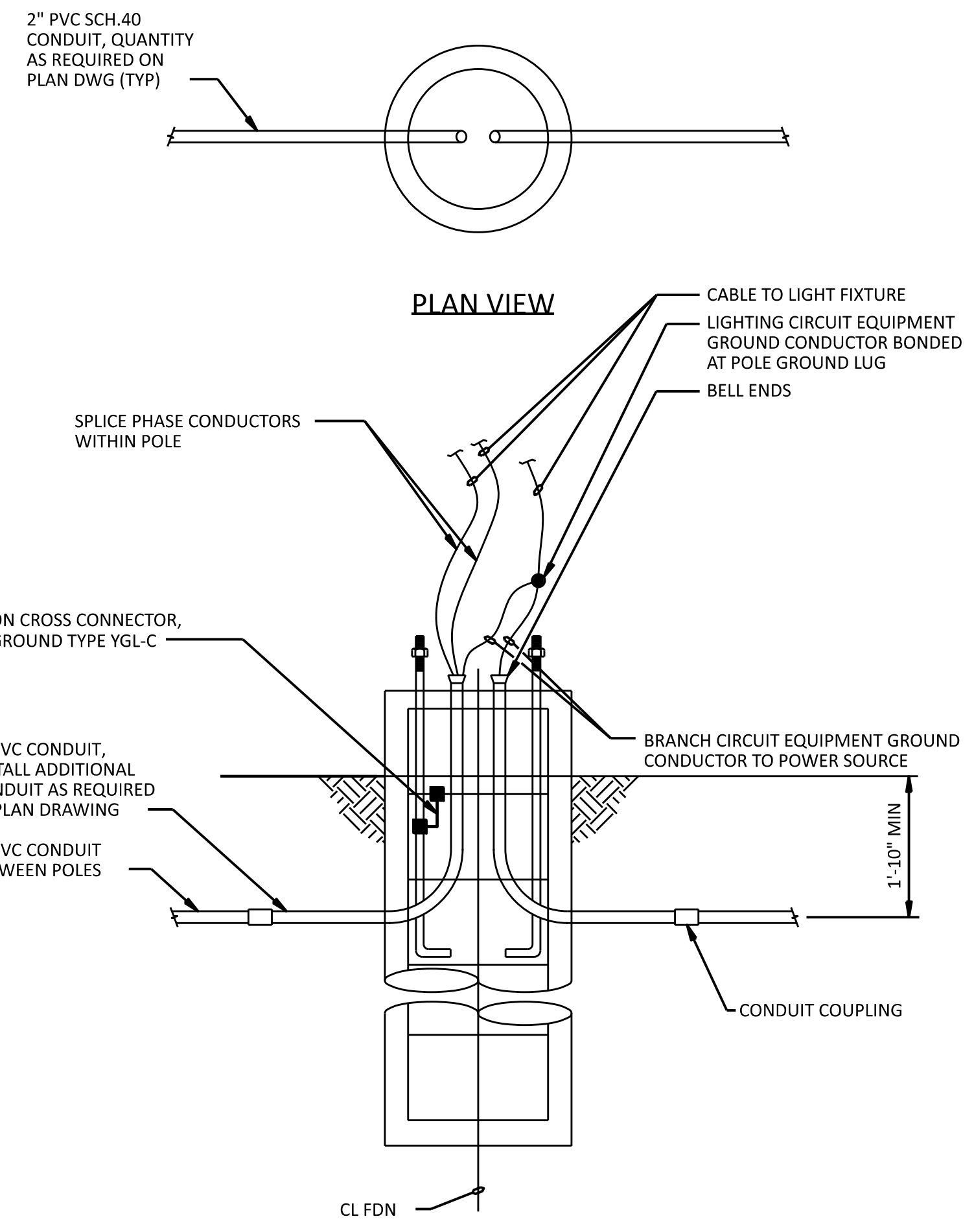


DIMENSIONAL DATA



Mounting/Optic	Tilt	Weight	EPA
VH	0°	35 lbs.	1.64 sq. ft.
VH with Reflector & US	0°	44 lbs.	2.85 sq. ft.
VH	45°	35 lbs.	2.85 sq. ft.
VH with Reflector & US	45°	44 lbs.	4.14 sq. ft.
UN	0°	31 lbs.	1.64 sq. ft.
UN with Reflector & US	0°	38 lbs.	2.85 sq. ft.

Acuity Brands | Holophane | One Lithonia Way, Conyers, GA 30012 | Phone: 866-HOLOPHANE | www.holophane.com
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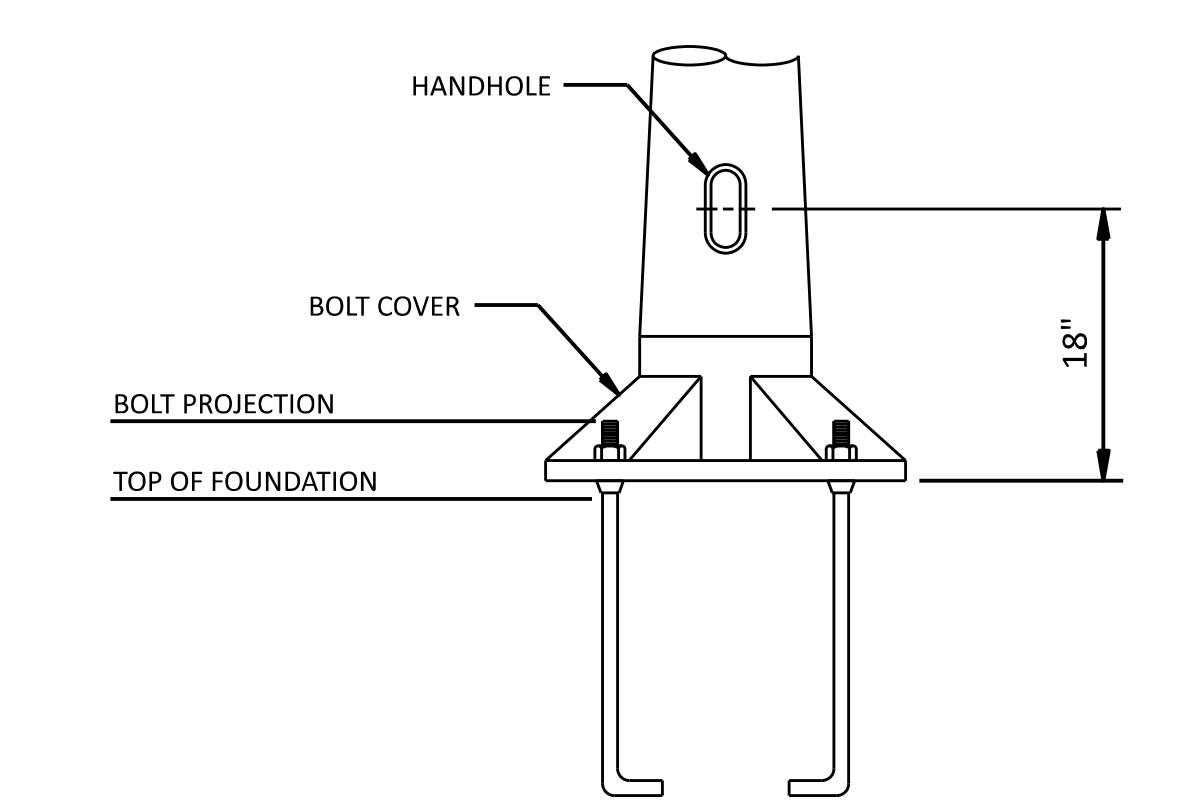
PLAN VIEW

ELEVATION

DETAIL A

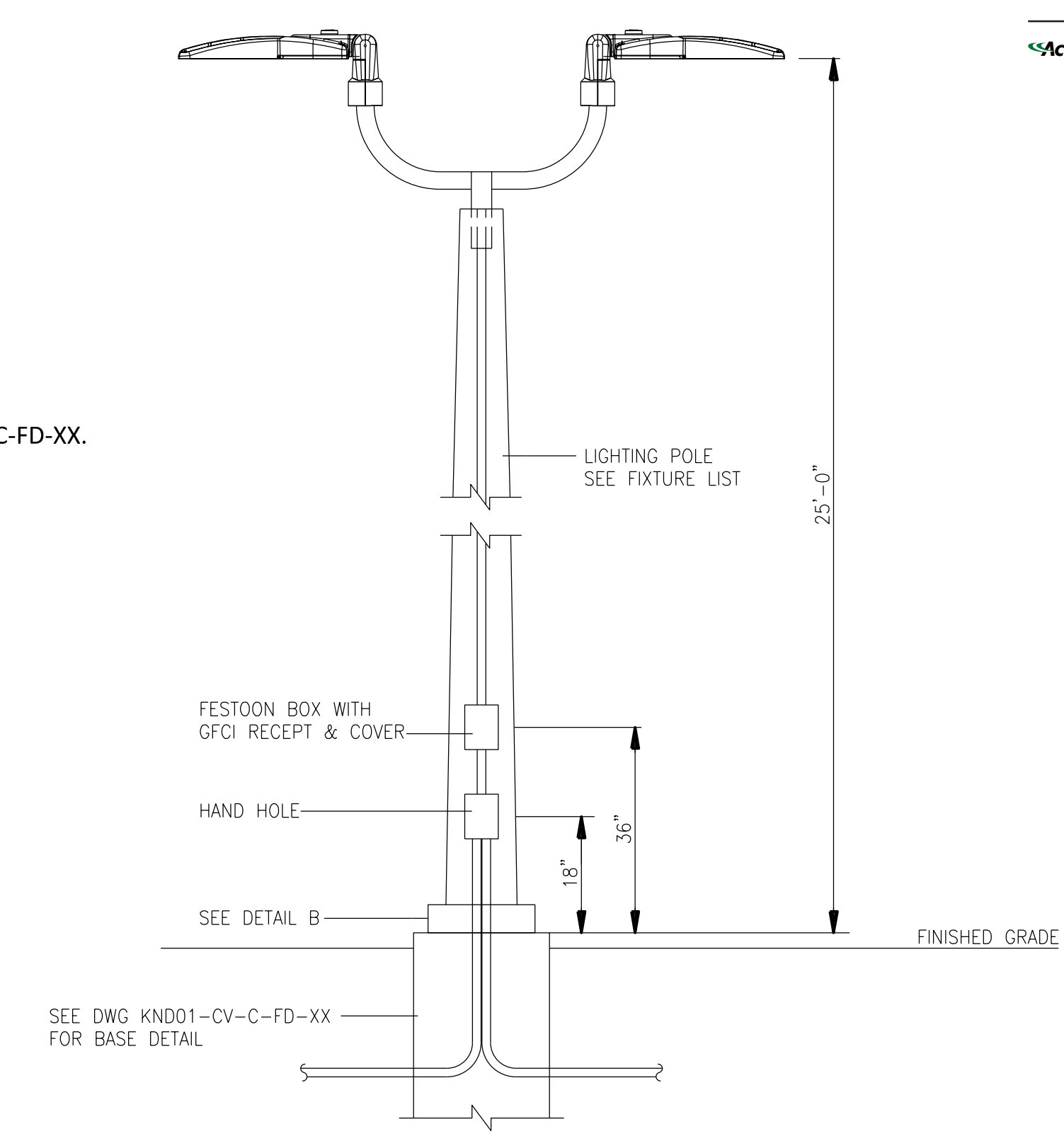
TYPICAL SITE LIGHTING POLE CONCRETE FOUNDATION NO SCALE

NOTES:
1. FOR FOUNDATION INSTALLATION SEE CIVIL DRAWING KND01-CV-C-FD-XX.



DETAIL B

TYPICAL SITE LIGHTING POLE - HANDHOLE NO SCALE



DETAIL C

TAPERED ALUMINUM POLE FOR LIGHTING NO SCALE

NOTES:

- FOR ELECTRICAL GRAPHIC SYMBOLS, SEE DRAWING KND01-EN-E-EG-01.
- ALL ELEVATIONS REFER TO THE BOTTOM OF THE LIGHTING FIXTURE.
- ALL LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND SECTION 7.7 OF THE TOWN OF KNIGHTDALE UDO.
- ALL ABOVE GRADE CONDUITS SHALL BE RIGID GALVANIZED STEEL. ALL BELOW GRADE CONDUITS SHALL BE PVC SCHEDULE 40.
- ALL ABOVE GRADE LIGHTING CONDUITS SHALL BE FIELD ROUTED BY THE CONTRACTOR. ALL BELOW GRADE LIGHTING CONDUITS WERE INSTALLED UNDER THE UNDERGROUND RACEWAY DRAWING AND ARE LABELED IN LIGHTING PLAN DRAWING.
- ALL SL FIXTURE BRANCH CIRCUIT CONDUCTORS SHALL BE SIZE #10 AWG, UNLESS OTHERWISE NOTED.
- ALL SWL FIXTURE CONDUCTORS BETWEEN POLES AND CONTACTOR SHALL BE #10 AWG MINIMUM, UNLESS OTHERWISE NOTED. ALL LIGHTING CIRCUIT CONDUCTORS WITHIN THE LIGHTING POLES SHALL BE #12 AWG MINIMUM, UNLESS OTHERWISE NOTED.
- CONNECTIONS BETWEEN THE UNDERGROUND LIGHTING CONDUCTORS AND THE LIGHTING CONDUCTORS WITHIN THE LIGHTING POLES SHALL BE INSTALLED, SIZE AS RECOMMENDED BY THE FIXTURE MANUFACTURER.
- ALL GROUNDING CONDUCTORS SHALL BE GREEN.
- ONLY HOME RUNS TO PANEL ARE SHOWN ON THE DRAWING. THE CONTRACTOR SHALL INSTALL ALL LIGHTING CIRCUITING TO LIGHTING FIXTURES AND RECEPTACLES FOR AN OPERATING SYSTEM. ALL AC CIRCUITS SHALL HAVE A GROUND CONDUCTOR.
- THE SITE LUMINAIRE SELECTED HAS BEEN CHANGED TO MGLEDM-30K-NVOLT-AR-HSS-US-LT-VT-GRD-SH-A AND THE ADDITION OF UP-SKIRT SHIELDING REDUCES THE SOURCE LUMEN FROM 16,415 TO 8,424 WHICH IS BELOW 9000 LUMEN THRESHOLD.

REFERENCE DRAWINGS:
KND01-LT-E-PL-01 SITE LIGHTING PLAN



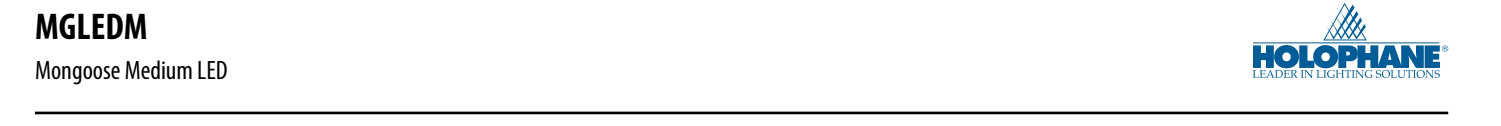
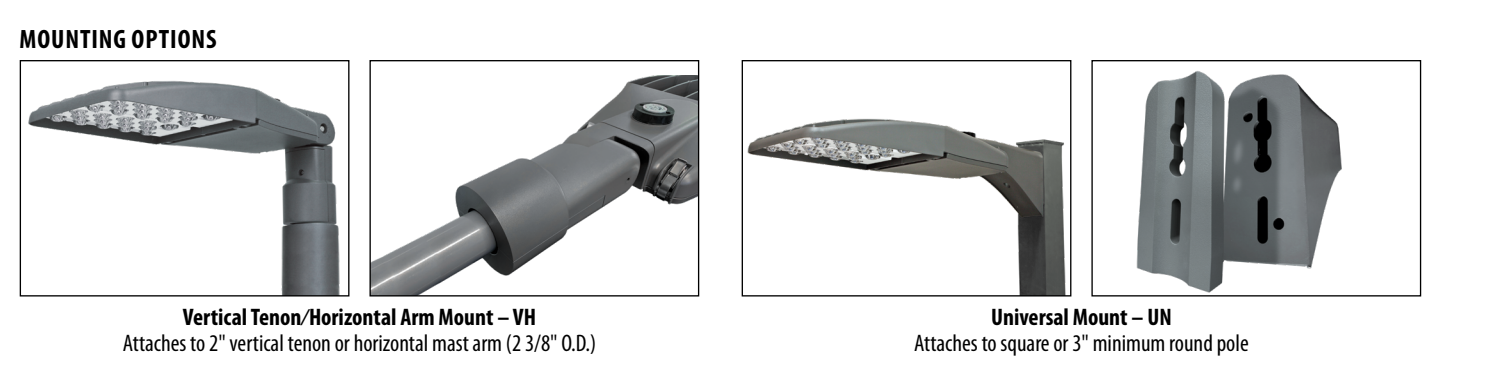
ORDERING INFORMATION

Series	LED performance package	Color temperature	Voltage	Driver	
MGLEDM Mongoose Medium	P11 9500 Lumen Package	P21 19000 Lumen Package	27K 2700K CCT	NVOLT Auto-sensing voltage (120 thru 277)	ZT Zero to Ten Driver
	P12 11500 Lumen Package	P22 22000 Lumen Package	30K 3000K CCT	HVOL1347 HVOLT 347 Volt	D41 D41 Driver
	P13 13000 Lumen Package	P23 25000 Lumen Package	40K 4000K CCT	HVOL460 HVOLT 460 Volt	
	P14 15200 Lumen Package	P24 28000 Lumen Package	50K 5000K CCT	XVOL1277 XVOL 1277 Volt	
	P15 18500 Lumen Package	P25 31000 Lumen Package		XVOL1347 XVOL 1347 Volt	
	P16 22000 Lumen Package	P26 34000 Lumen Package		XVOL1480 XVOL 1480 Volt	
	P17 26000 Lumen Package	P27 37000 Lumen Package		XVOL1480 XVOL 1480 Volt	
		P28 40500 Lumen Package			
		P29 44000 Lumen Package			
		P30 51000 Lumen Package			

Optics	Mounting	Super Durable Paint	Options
AG Area with Reflector	VH Vertical Tenon/Horizontal Arm	GRSD Gray	Top Receptacle
AR Reflector	UN Universal (Rd. & Sq)	GRSD Graphite	ZBT Zhaga receptacle on top of fixture
FG Forward Throw with Reflector		BRSD Black	PRZ 7 pin photocontrol receptacle
FT Forward Throw		GRSD Green	NTR No top receptacle
WG Wide Roadway with Reflector		WHSD White	Receptacle Bottom
MG Medium Roadway with Reflector		BRSD Bronze	ZBS Zhaga receptacle on bottom of fixture
MR Medium Roadway with Reflector		DBSD Dark Bronze	NBR No bottom receptacle
NG Narrow Roadway with Reflector			Adjustable/Programmable Options
NR Narrow Roadway with Reflector			AD Field Adjustable Output
WR Wide Roadway with Reflector			Control Options
			PCLL DTL Extreme Long Life Twilight Photocontrol for Solid State (20-year rated life)
			DOP Low Voltage Zhaga photocontrol
			Embedded Control
			DOC DC Connect photocontrol. Requires D41 Driver and NBR
			RSGR Light Air Circ. and daylight sensor
			ALEB Local Connect Basic. Requires D41 driver & NBR
			ALCF Local Connect Full. Requires D41 driver & NBR
			ALCC Local Connect Custom. Requires D41 driver & NBR
			UBC Cellular Network Lighting Control. Requires D41 driver & NTR

Accessories: Order as separate catalog number.

Accessories	Control Training
Wire Guard Kit	Local Connect Remote Training: 1 day training provided by Acuity Services Team
MGLEDM WG Mongoose Medium Wire Guard Kit	
Light Trespass Shield	
MGLEDM US Mongoose Medium Light Trespass Shield	
UpLight Skirt	
MGLEDM US GRSD Mongoose Medium UpLight Skirt, Gray	
MGLEDM US BRSD Mongoose Medium UpLight Skirt, Graphite	
MGLEDM US BKSD Mongoose Medium UpLight Skirt, Black	
MGLEDM US GNSD Mongoose Medium UpLight Skirt, Green	
MGLEDM US WHSD Mongoose Medium UpLight Skirt, White	
MGLEDM US BRSD Mongoose Medium UpLight Skirt, Bronze	
MGLEDM US DBSD Mongoose Medium UpLight Skirt, Dark Bronze	
MGLEDM HSS LE Mongoose Medium House Side Shield, 1 Light Engine	
MGLEDM HSS 2LE Mongoose Medium House Side Shield, 2 Light Engine	



PERFORMANCE DATA

Performance Package	Distribution	Input Watts	27K (2700K CCT, 70 CRI)				30K (3000K CCT, 70 CRI)				40K (4000K CCT, 70 CRI)				50K (5000K CCT, 70 CRI)				LLD @ 25°C		
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours	100k Hours	
P14	AG	105	14,783	141.2	4	2	2	15,443	147.5	4	2	2	16,008	152.9	4	2	2				
			15,714	150.1	4	0	2	16,415	156.8	4	0	2	17,015	162.5	4	0	2				
	FG	105	12,888	123.1	2	3	3	13,462	128.6	2	3	3	13,955	133.2	2	3	3				
			13,705	130.9	2	0	3	14,317	136.8	2	0	3	14,840	141.8	2	0	3				
	MG	105	14,000	133.7	2	2	2	14,625	139.7	2	2	2	15,160	144.8	2	2	2				
			14,830	141.7	2	0	2	15,491	148.0	2	0	2	16,058	153.4	2	0	2	0.96	0.95	0.94	
	MR	105	14,098	134.7	3	2	2	14,726	140.7	3	2	2	15,265	145.8	3	2	2				
			14,802	141.4	3	0	2	15,462	147.3	3	0	2	16,027	153.1	3	0	2				
	WG	105	13,235	126.4	3	2	3	13,825	132.1	3	2	3	14,331	136.9	3	2	3				
			13,908	132.8	3	0	2	14,528	138.8	3	0	3	15,059	143.8	3	0	3				

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: _____
LAND USE ADMINISTRATOR

ISSUED FOR PERMITTING
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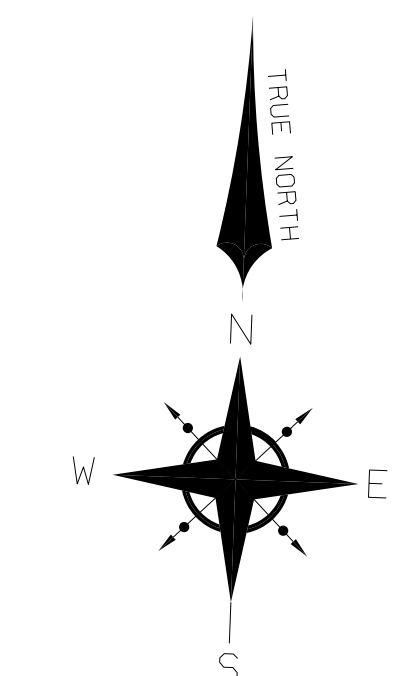
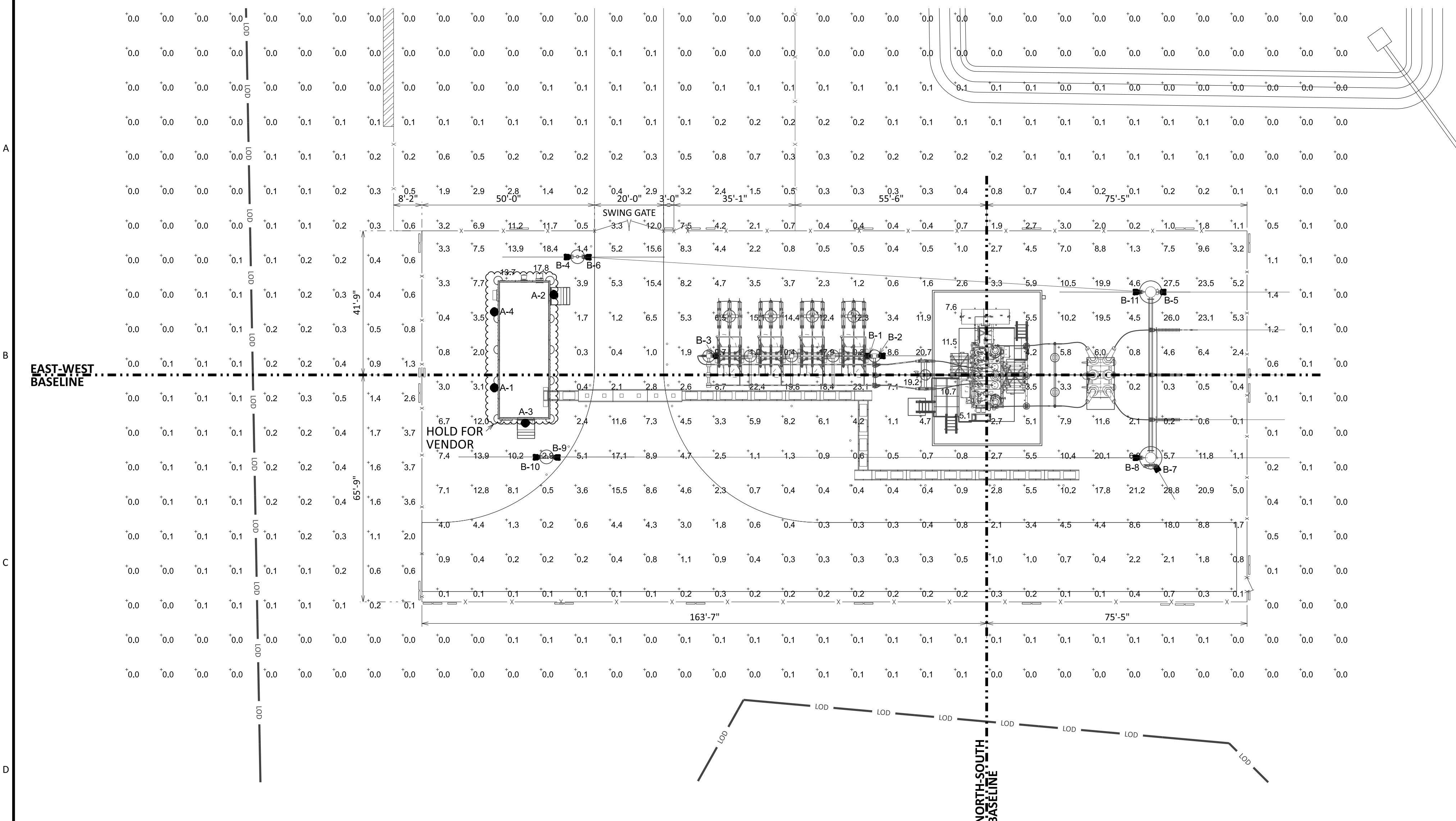
SEAL 058363
NORTH CAROLINA PROFESSIONAL ENGINEER
O'FEMI OYEBAWA

B&V PROJECT NUMBER: 419596

MicroStation v23.0.01.44
ANSI D 34622
Full Size 1 = 1
23/SEP/2024 05:59 PM

NO	DATE	ISSUED FOR 90% REVIEW	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
D	15/NOV/24	ISSUED FOR PERMIT		BCA	BCA	OOO	OOO	BC
C	20/SEP/24	ISSUED FOR PERMIT		BCA	BCA	OOO	OOO	BC
B	03/SEP/24	ISSUED FOR CLIENT 60% REVIEW		BCA	BCA	OOO	OOO	BC
A	23/AUG/24	ISSUED FOR PERMIT		BCA	BCA	OOO	OOO	BC

DESIGNER BCA	DRAWN BCA	BLACK & VEATCH 7510 LAMAR AVENUE OVERLAND PARK, KANSAS 66211	DUKE ENERGY KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM	PROJECT KND01-LT-E-SD-01	DRAWING NUMBER KND01-LT-E-SD-01	REV E
CHECKED OOO	DATE 03/SEP/24		BESS ELECTRICAL LIGHTING DETAILS 5201 KNIGHTDALE EAGLE ROCK ROAD KNIGHTDALE, NC 27545	CODE AREA		



Luminaire Locations			
No.	Label	MH	Tilt
1	A	10'-6"	0.00
2	A	10'-6"	0.00
3	A	10'-6"	0.00
4	A	10'-6"	0.00
1	B	23'-6"	30.00
2	B	23'-6"	30.00
3	B	23'-6"	25.00
4	B	23'-9"	40.00
5	B	23'-0"	20.00
6	B	23'-9"	45.00
7	B	23'-0"	25.00
8	B	23'-0"	45.00
9	B	23'-9"	45.00
10	B	23'-9"	45.00
11	B	23'-0"	45.00

Schedule													
Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Number Lamps	Filename	Lumens Per Lamp	Lumen Multiplier	Light Loss Factor	Efficiency	Wattage	Distribution
	A	4	COOPER LIGHTING SOLUTIONS - LUMARK (FORMERLY EATON)	XTOR2B-Y	CROSSTOUR WALL MOUNT LED	1	XTOR2B-Y.ies	1997	1	0.85	100%	18.2	
	B	11	American Electric Lighting	ACPOLED P40 XXXXX 55 ACPOLEDFV	ACP Small LED Floodlight with P40 Performance Package, Flood (5x5) (formally FL), 4000K CCT, 70CRI with Full Visor	1	ACPOLED P40 XXXXX 55 ACPOLEDFV.ies	Absolute	1	0.85	100%	154	5 X 5

Statistics					
Description	Symbol	Max	Min	Avg	AVERAGE TO MINIMUM FC RATIO
Substation	+	28.8 fc	0.1 fc	5.2 fc	52
Perimeter	+	12.0 fc	0.0 fc	0.4 fc	-

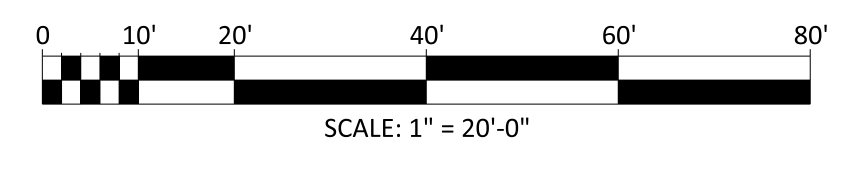
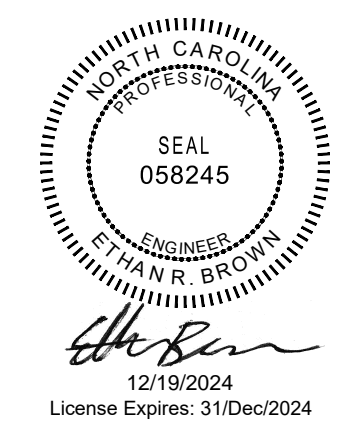
NOTE:
1. FIELD TO CONFIRM SUFFICIENT LIGHT ORIENTATION AND ILLUMINATION LEVELS WITH DUKE PERSONNEL.

TOWN CERTIFICATION
THIS DESIGN HAS BEEN REVIEW 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: _____
LAND USE ADMINISTRATOR



A1122837
 ANS D 34622
 12/18/2024 12:17 PM
 MicroStation v23.00.01.44
 Full Size 1 = 1

				PROJECT: KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM DRAWING NUMBER: KND00-LT-E-SY.00.PL-01	
DESIGNER: BCA CHECKED: VC		DRAWN: BCA DATE: 23/AUG/24		ELECTRICAL LIGHTING PLAN 5201 KNIGHTDALE EAGLE ROCK ROAD KNIGHTDALE, NC 27545	
REVISIONS AND RECORD OF ISSUE		REVISIONS AND RECORD OF ISSUE		CODE: _____ AREA: _____	

Project	Type
Comments	Date
Prepared by	

Lumark

DESCRIPTION
The patented Lumark Crosstour™ LED Wall Pack Series of luminaires provides an architectural style with super bright, energy efficient LEDs. The low profile, rugged die-cast aluminum construction, universal back box, stainless steel hardware along with a sealed and gasketed internal compartment make the Crosstour impervious to contaminants. The Crosstour luminaire is ideal for walkways, inverted mount for facade/canopy illumination, post/bollard site lighting, floodlight and low level pathway illumination including stairs. Typical applications include building entrances, multi-use facilities, apartment buildings, institutions, schools, stairways and loading docks.

CONSTRUCTION
Slim, low-profile LED design with rugged one-piece, die-cast aluminum housing. The low-profile LED design with rugged one-piece, die-cast aluminum housing. The low-profile LED design with rugged one-piece, die-cast aluminum housing. The low-profile LED design with rugged one-piece, die-cast aluminum housing.

OPTICAL
Silicone sealed optical LED chamber incorporates a custom engineered mirrored anodized and back box. Matching housing styles incorporate both a small and medium design. The small housing is available in 12W, 18W and 26W. The medium housing is available in the 36W model. Patented secure lock hinge feature allows for safe and easy tool-less electrical connections with the supplied push-in connectors. Back box includes three half-inch, NPT threaded conduit entry points. The universal back box supports both the small and medium forms and mounts to standard 3-1/2" to 4" round and octagonal, 4" square, single gang and masonry junction boxes. Key hole gasket allows for adaptation to junction box or wall. External fin design extracts heat from the fixture surface. One-piece silicone gasket seals door and back box. Minimum 5" wide pool for site lighting application. Not recommended for car wash applications.

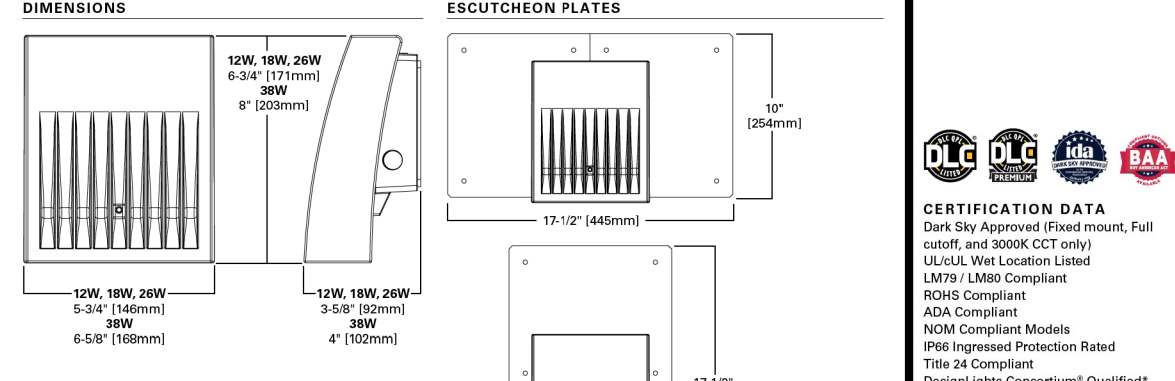
ELECTRICAL
LED driver is mounted to the die-cast housing for optimal heat sinking. LED thermal management system incorporates both conduction and natural convection to transfer heat rapidly away from the LED source. 12W, 18W, 26W and 36W series operate in -40°C to 40°C (40°F to 104°F). High ambient 50°C models available. Crosstour luminaires maintain greater than 88% of initial light output after 72,000 hours of operation. Three half-inch NPT threaded conduit entry points allow for thru-branch wiring. Back box is an authorized applications.

FINISH
Crosstour is protected with a Super durable TIG carbon bronze or summit white polyester powder coat paint. Super durable TIG powder coat paint finishes withstand extreme climate conditions while providing optimal color and gloss retention of the installed life. Options to meet Bay American and other domestic preference requirements.

WARRANTY
Five-year warranty.

XTOR CROSSTOUR LED

APPLICATIONS:
WALL / SURFACE
POST / BOLLARD
LOW LEVEL
FLOODLIGHT
INVERTED
SITE LIGHTING



CERTIFICATION DATA
Dark Sky Approved (Floor Mount, Full Cutoff, and 5000K CCT only)
ULCUL, WUL (Location Listed)
LM79, LM80 Compliance
RoHS Compliant
ADA Compliant
IP68 Ingress Protection Rated
Title 24 Compliant
DesignLights Consortium® Qualified*

TECHNICAL DATA
40°C Maximum Ambient Temperature
External Supply Wiring 90°C Minimum
EPA Effective Projected Area (See P.1)
XTOR18, XTOR26, XTOR36-34
XTOR48-44
SHIPPING DATA:
Approximate Net Weight:
3.3 - 5.25 lbs. (1.7 - 2.4 kg)

POWER AND LUMENS BY FIXTURE MODEL

LED Information	XTOR18	XTOR18-W	XTOR18-Y	XTOR26	XTOR26-W	XTOR26-Y	XTOR36	XTOR36-W	XTOR36-Y	XTOR48	XTOR48-W	XTOR48-Y
Delivered Lumens (Wall Mount)	1,418	1,396	1,327	2,136	2,103	1,997	2,751	2,710	2,575	4,269	4,205	3,995
Delivered Lumens (Walkway Mount)	1,005	980	940	1,495	1,472	1,395	2,099	2,068	1,965	3,168	3,121	2,945
B.U.G. Rating	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B2-U0-G0	B2-U0-G0	B2-U0-G0
CCT (KlmK)	5,000	4,000	3,000	5,000	4,000	3,000	5,000	4,000	3,000	5,000	4,000	3,000
CRI (Color Rendering Index)	70	70	70	70	70	70	70	70	70	70	70	70
Power (Watts)	12W	12W	12W	18W	18W	18W	26W	26W	26W	36W	36W	36W

ORDERING INFORMATION
Sample Number: XTOR26-W-WT-PC1

Series	LED Kelvin Color	Housing Color	Options (Add as Suffix)	Accessories (Order Separately)*
XTOR18	Small Door, 12W	Black	PC1-Photocontrol 120V PC2-Photocontrol 208-277V+1 347V-347V MA-50°C High Ambient	WUL-Universal Mount XTOR18D-KNC-Knockout Floodlight Kit* XTOR18D-KNC-WT-Knockout Floodlight Kit, Summit White XTOR18D-T8W-WT-T8-Translucent Floodlight Kit, Summit White EWP-XTOR-Escutcheon Wall Plate, Carbon Bronze EWP-XTOR-WT-Escutcheon Wall Plate, Summit White
XTOR18-W	Small Door, 12W	White		
XTOR18-Y	Small Door, 12W	Yellow		
XTOR26	Medium Door, 18W	Black		
XTOR26-W	Medium Door, 18W	White		
XTOR26-Y	Medium Door, 18W	Yellow		
XTOR36	Small Door, 26W	Black		
XTOR36-W	Small Door, 26W	White		
XTOR36-Y	Small Door, 26W	Yellow		
XTOR48	Small Door, 36W	Black		
XTOR48-W	Small Door, 36W	White		
XTOR48-Y	Small Door, 36W	Yellow		

NOTES:
1. DesignLights Consortium® Qualified and classified for both DLC Standard and DLC Premium, refer to www.designlights.org for details.
2. Photocontrols are factory installed.
3. One PC1 may be used.
4. This search wiring not available with MA option or with 347V. XTOR26 not available with MA and 347V or 120V combination.
5. WUL option not available with MA option.
6. Floodlight kit accessories supplied with brackets (PC1) or transoms (PC2) base, small and large to view and small and large mount brackets.
7. WUL option not available with MA option.
8. This product configurations with these designated prefixes are built to be compliant with the Buy American Act of 1919 (BAA) or Trade Agreements Act of 1919 (TAA), respectively. Please refer to www.designlights.org website for more information. Components shipped separately may be separately analyzed under domestic preference requirements.
9. Accessories with separate WUL may be separately analyzed under domestic preference requirements. Contact factory for further information.

STOCK ORDERING INFORMATION

Domestic Preference	12W Series	18W Series	26W Series	36W Series
(BAA)-Standard	XTOR18-12W, 5000K, Carbon Bronze	XTOR26-18W, 5000K, Carbon Bronze	XTOR36-26W, 5000K, Carbon Bronze	XTOR48-36W, 5000K, Carbon Bronze
BAA-Buy American Act	XTOR18B-12W, 5000K, Summit White	XTOR26B-18W, 5000K, Carbon Bronze	XTOR36B-W-26W, 5000K, Carbon Bronze	XTOR48B-W-36W, 5000K, Carbon Bronze
TAA-Trade Agreements Act	XTOR18A-12W, 5000K, 120V PC, Carbon Bronze	XTOR26A-WT-18W, 5000K, Sum. 18W White	XTOR36A-WT-26W, 5000K, Summit White	XTOR48A-WT-36W, 5000K, Summit White
(BAA)-Standard	XTOR18-12W, 4000K, Carbon Bronze	XTOR26-18W, 4000K, Carbon Bronze	XTOR36-26W, 4000K, Carbon Bronze	XTOR48-36W, 4000K, Carbon Bronze
BAA-Buy American Act	XTOR18B-12W, 4000K, Summit White	XTOR26B-18W, 4000K, Carbon Bronze	XTOR36B-W-26W, 4000K, Carbon Bronze	XTOR48B-W-36W, 4000K, Carbon Bronze
TAA-Trade Agreements Act	XTOR18A-12W, 4000K, 120V PC, Carbon Bronze	XTOR26A-WT-18W, 4000K, 120V PC, Carbon Bronze	XTOR36A-WT-26W, 4000K, 120V PC, Carbon Bronze	XTOR48A-WT-36W, 4000K, 120V PC, Carbon Bronze
(BAA)-Standard	XTOR18-12W, 5000K, Carbon Bronze	XTOR26-18W, 5000K, Carbon Bronze	XTOR36-26W, 5000K, Carbon Bronze	XTOR48-36W, 5000K, Carbon Bronze
BAA-Buy American Act	XTOR18B-12W, 5000K, Summit White	XTOR26B-18W, 5000K, Carbon Bronze	XTOR36B-W-26W, 5000K, Carbon Bronze	XTOR48B-W-36W, 5000K, Carbon Bronze
TAA-Trade Agreements Act	XTOR18A-12W, 5000K, 120V PC, Carbon Bronze	XTOR26A-WT-18W, 5000K, Sum. 18W White	XTOR36A-WT-26W, 5000K, Summit White	XTOR48A-WT-36W, 5000K, Summit White

NOTES:
1. Only product configurations with these designated prefixes are built to be compliant with the Buy American Act of 1919 (BAA) or Trade Agreements Act of 1919 (TAA), respectively. Please refer to www.designlights.org website for more information. Components shipped separately may be separately analyzed under domestic preference requirements.

ACPOLED Series

American Compact LED Floodlight



Features:
Mechanical
Low copper content die cast aluminum housings has integral heat sink fins to optimize thermal management through conductive and convective cooling. Bolt-on or optional stainless steel latch disengages electrical cover for easy access to LED driver, surge protection, and terminal block. Luminaires is vibration rated to 3G per ANSI C136.31-2001 and rated IP66 per IEC60529-2-3.
Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe crevice rating of 8 (per ASTM D1654) after over 5,000 hours exposure to salt fog chamber per ASTM B117.
Yoke shall be painted steel or galvanized steel. Knuckle mount shall be adjustable to fit 2-3/8 inch to 2-7/8 inch tenon.

Electrical
LED light engine is rated for > 100,000 hours at 25C, 70. Electronic driver has an expected life of 100,000 hours at a 25C ambient.
Robust surge protection: 20kV/10kA surge protection per ANSI C136.2 is the default, with 10kV/5kA surge optional.
Driver power factor is 90% minimum. Driver meets maximum total harmonic distortion (THD) of 20% and is RoHS compliant.
0-10V continuous dimming functionality is standard. Step dimming is available with the DALI driver option. Dimming control can be accomplished via AO, RSBR option integrally or via photocontrol installed on P1 receptacle option.

Optical
Three multi-die LEDs combined with highly specular reflectors provide superior field to beam ratios, uniformity, and spacing.
NEMA optical pattern choice of medium flood (4x4), flood (5x5) wide flood (6x6), and wide flood rectangle (6x5). The luminaire is available with 3000K, 4000K, and 5000K CCT with minimum CRI of 70.
Optional shielding available to control light trespass and uplight. Optical enclosure shall be glass lens.

Controls
3 pin and 7 pin rotatable NEMA photocontrol receptacles available.
Optional premium solid state locking-style photocontrol - OSS (10 year rated life).
Optional extreme long life solid state locking-style photocontrol - DLL (20 year rated life).
Optional onboard adjustable output module (AO) allows the light output and input wattage to be modified to meet site specific requirements.

Standards
Suitable for ambient temperature -40C to 40C.
UL/CUL Listed.
DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/DLC to confirm which versions are qualified.
GOVERNMENT PROCUREMENT - BAA - Buy American (h) Act: Product with the BAA option qualifies as a domestic end product under the Buy American Act as implemented in the FAR and DFARS. Product with the BAA option also qualifies as manufactured in the United States under DOT Buy America regulations.
BABA - Buy American Buy America: Product with the BAA option also qualifies as produced in the United States under the definitions of the Buy America, Buy American Act.
Please refer to www.acuitybrands.com/buy-american for additional information.

GRADING INFORMATION

Performance Package	Distribution	Typical Width	3K (3000K CCT, 70 CRI)		4K (4000K CCT, 70 CRI)		5K (5000K CCT, 70 CRI)		LLD @ 25°C		
			Lumens	LPW	Lumens	LPW	Lumens	LPW	50k Hours	75k Hours	100k Hours
P40	44	154	21,540	138	21,965	141	22,362	143	0.92	0.89	0.85
	55	154	22,476	144	22,919	147	23,333	150			
	66	154	20,777	133	21,186	136	21,569	138			
			21,932	141	22,364	143	22,768	146			

Options Matrix

Series	LED Performance Package	Voltage	Optics	Color Temperature
ACPOLED	P05 5,000lumens P10 7,500lumens P20 12,800lumens P30 18,000lumens P40 22,500lumens P50 27,700lumens P60 33,500lumens	120V 240V 480V 277V-480V	44 Medium Flood (4x4) 55 Flood (5x5) 66 Wide Flood (6x6) 65 Wide Flood Rectangle (6x5)	Blank 4000K CCT 3K 3000K CCT 5K 5000K CCT

Mounting Methods

Mounting Method	Color	Surge Protection	Options/Controls	Cord Length
TW Tenon Signlight - Knuckle (and lock with bottom signlight)	Blank Gray Paint BK Black Paint RZ Bronze Paint GI Graphite Paint WH White Paint	Blank 4000V/10kA W/Inrush Limit W/Inrush Limit (All Opt)	Blank 3 pin rotatable NEMA receptacle P7 7 pin rotatable NEMA receptacle NR No PFI receptacle PCL Solid State Locking Style Photocontrol PSS Solid State Photocontrol	04 4 ft cord length 05 5 ft cord length 06 6 ft cord length 08 8 ft cord length 10 10 ft cord length
YS Yoke Mounted Signlight - Knuckle (and lock with bottom signlight)		Blank 4000V/10kA W/Inrush Limit W/Inrush Limit (All Opt)	Blank 3 pin rotatable NEMA receptacle P7 7 pin rotatable NEMA receptacle NR No PFI receptacle PCL Solid State Locking Style Photocontrol PSS Solid State Photocontrol	04 4 ft cord length 05 5 ft cord length 06 6 ft cord length 08 8 ft cord length 10 10 ft cord length
YS Yoke Mounted Signlight - Knuckle (and lock with bottom signlight)		Blank 4000V/10kA W/Inrush Limit W/Inrush Limit (All Opt)	Blank 3 pin rotatable NEMA receptacle P7 7 pin rotatable NEMA receptacle NR No PFI receptacle PCL Solid State Locking Style Photocontrol PSS Solid State Photocontrol	04 4 ft cord length 05 5 ft cord length 06 6 ft cord length 08 8 ft cord length 10 10 ft cord length

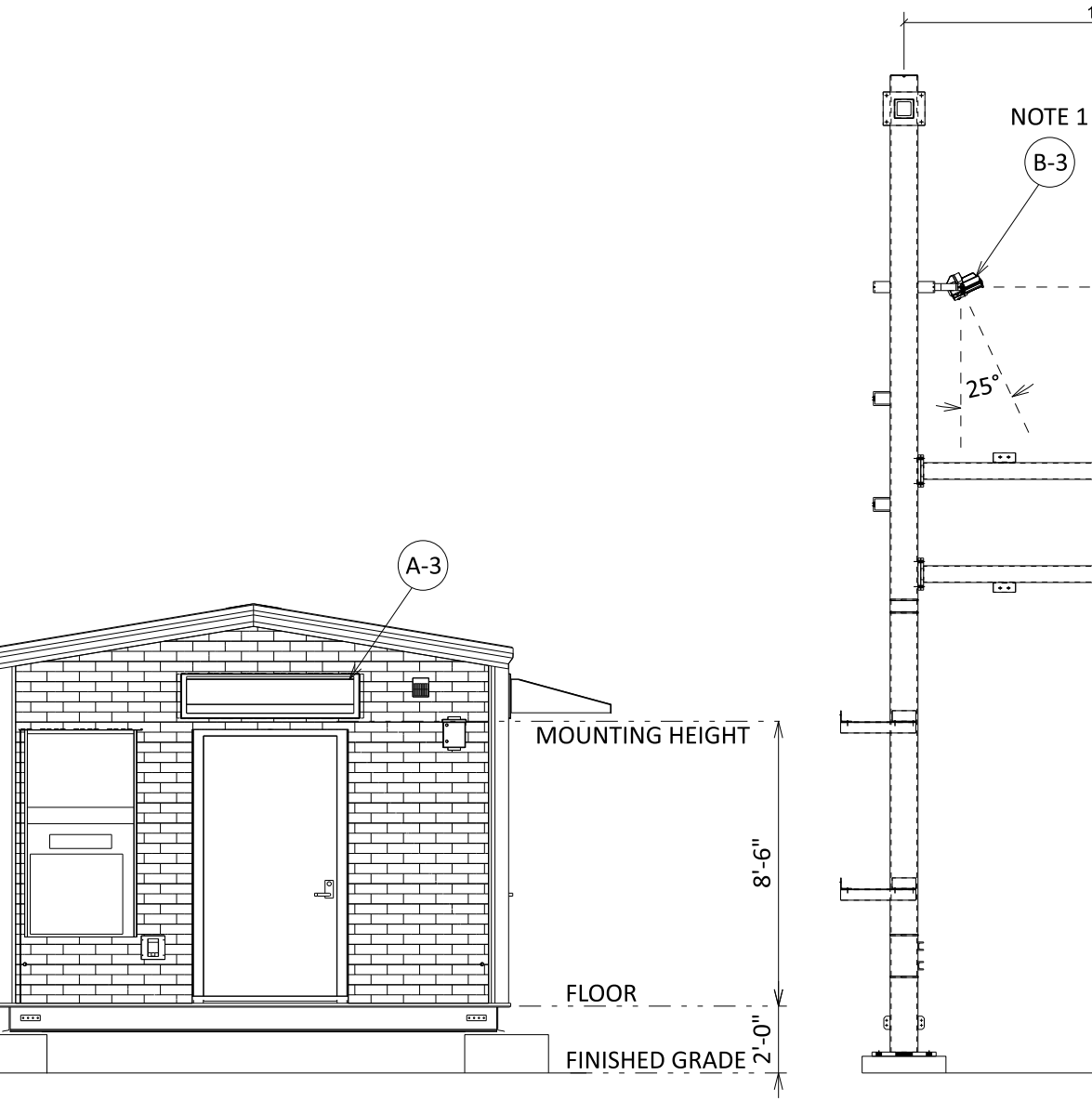
Accessories (Shipped Separately)

Code Type	Microfiches
23 23 page, 3 conductor	TL Tool-less entry with latches
43 43 page, 3 conductor	NL Nema Label
63 63 page, 3 conductor	KL Keypad lock cover and not certified
	BAA Buy American (h) Act and/or BABA Buy American Buy America Qualified

Accessories (Shipped Separately)

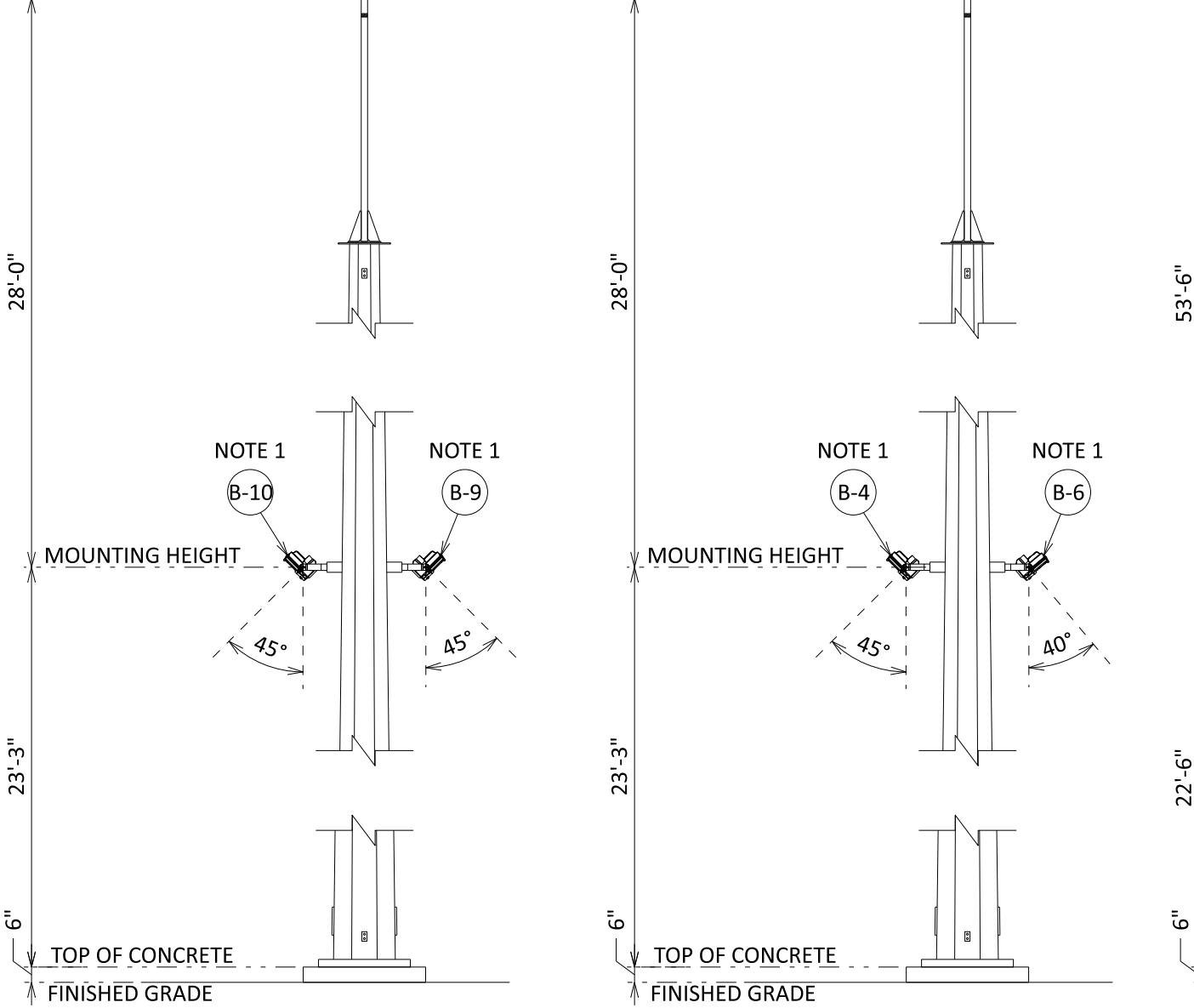
Code Type	Microfiches
ACPOLEDV-BSDP Full View - Black Paint	
ACPOLEDV-BSDP Full View - Bronze Paint	
ACPOLEDV-BSDP Full View - Graphite Paint	
ACPOLEDV-BSDP Full View - Gray Paint	
ACPOLEDV-BSDP Full View - White Paint	
ACPOLEDV-BSDP Upper/Bottom View - Black Paint	
ACPOLEDV-BSDP Upper/Bottom View - Bronze Paint	
ACPOLEDV-BSDP Upper/Bottom View - Graphite Paint	
ACPOLEDV-BSDP Upper/Bottom View - Gray Paint	
ACPOLEDV-BSDP Upper/Bottom View - White Paint	
ACPOLEDV-WG Guard	
ACPOLEDV-WG Guard	

Note: Check the OPTIONS MATRIX on Page 3 for compatibility & restrictions.
1. Requires 1MTR selection.
2. WUL option only available with P30 and P40 performance packages.



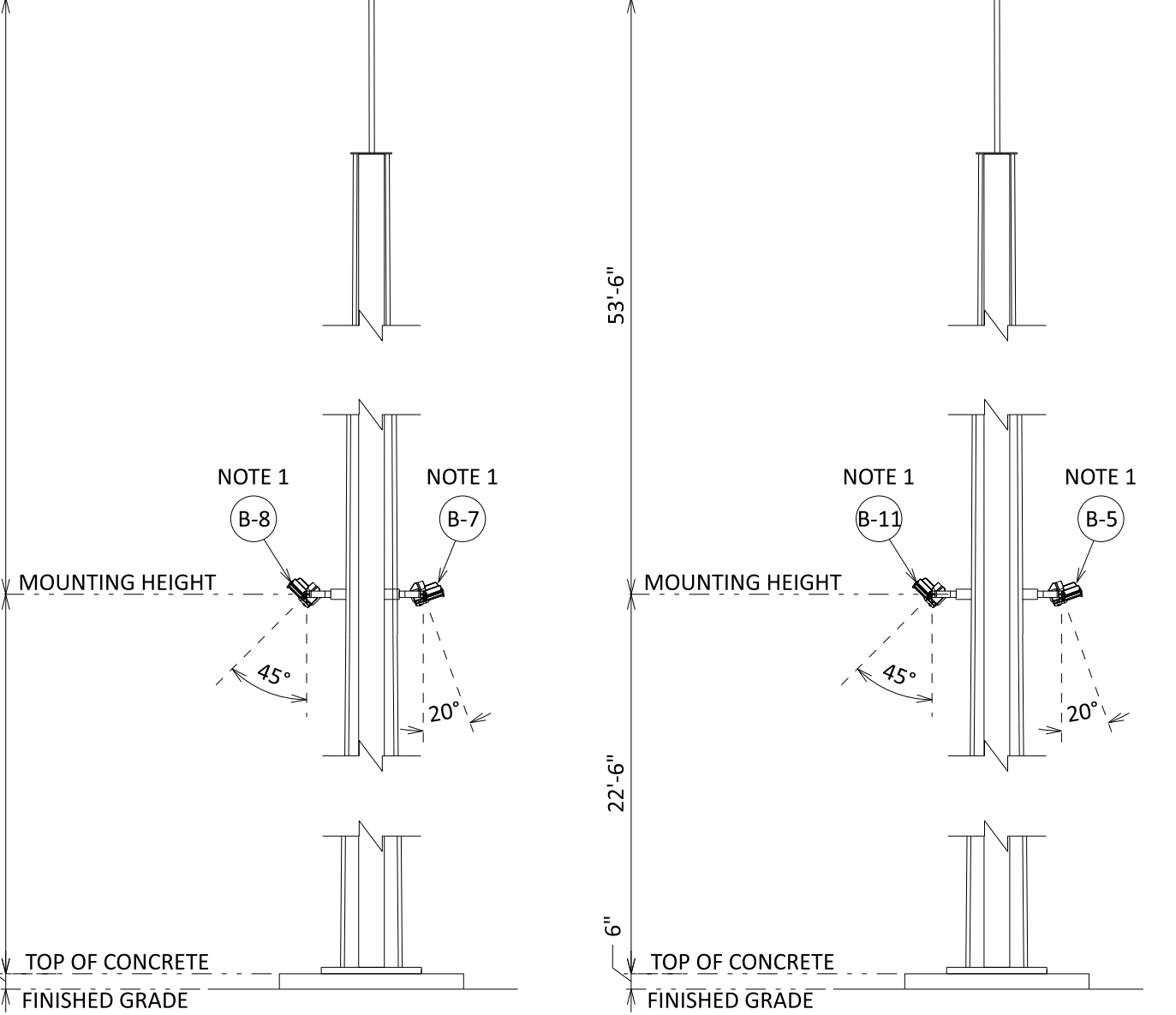
CONTROL ENCLOSURE DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01

34.5kV BAY DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01



SOUTH STATIC MAST DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01

NORTH STATIC MAST DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01

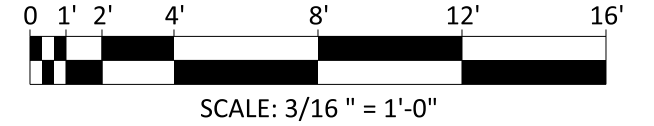


SOUTH H-FRAME LEG DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01

NORTH H-FRAME LEG DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01

LEGEND:
XX LIGHT NO. SEE DWG KND00-LT-E-SY.00.PL-01

NOTES:
1. FLOODLIGHTS TO BE INSTALLED WITH FULL VISORS.
2. ALL FIXTURES ARE AIMED FACING DOWN AT LEAST 45 DEGREES FROM HORIZONTAL.



BY: TOWN ENGINEER DATE: _____
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.
BY: LAND USE ADMINISTRATOR DATE: _____

ISSUED FOR PERMITTING
THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
D 5/DEC/24	ISSUED FOR 90% REVIEW	BCA	BCA	FSA	BCA	ERB
C 15/NOV/24	ISSUED FOR PERMIT	BCA	BCA	FSA	BCA	ERB
B 20/SEP/24	ISSUED FOR PERMIT	BCA	BCA	FSA	BCA	ERB
A 23/AUG/24	ISSUED FOR PERMIT	BCA	BCA	FSA	BCA	ERB
E 18/DEC/24	ISSUED FOR PERMIT	BCA	BCA	FSA	BCA	ERB

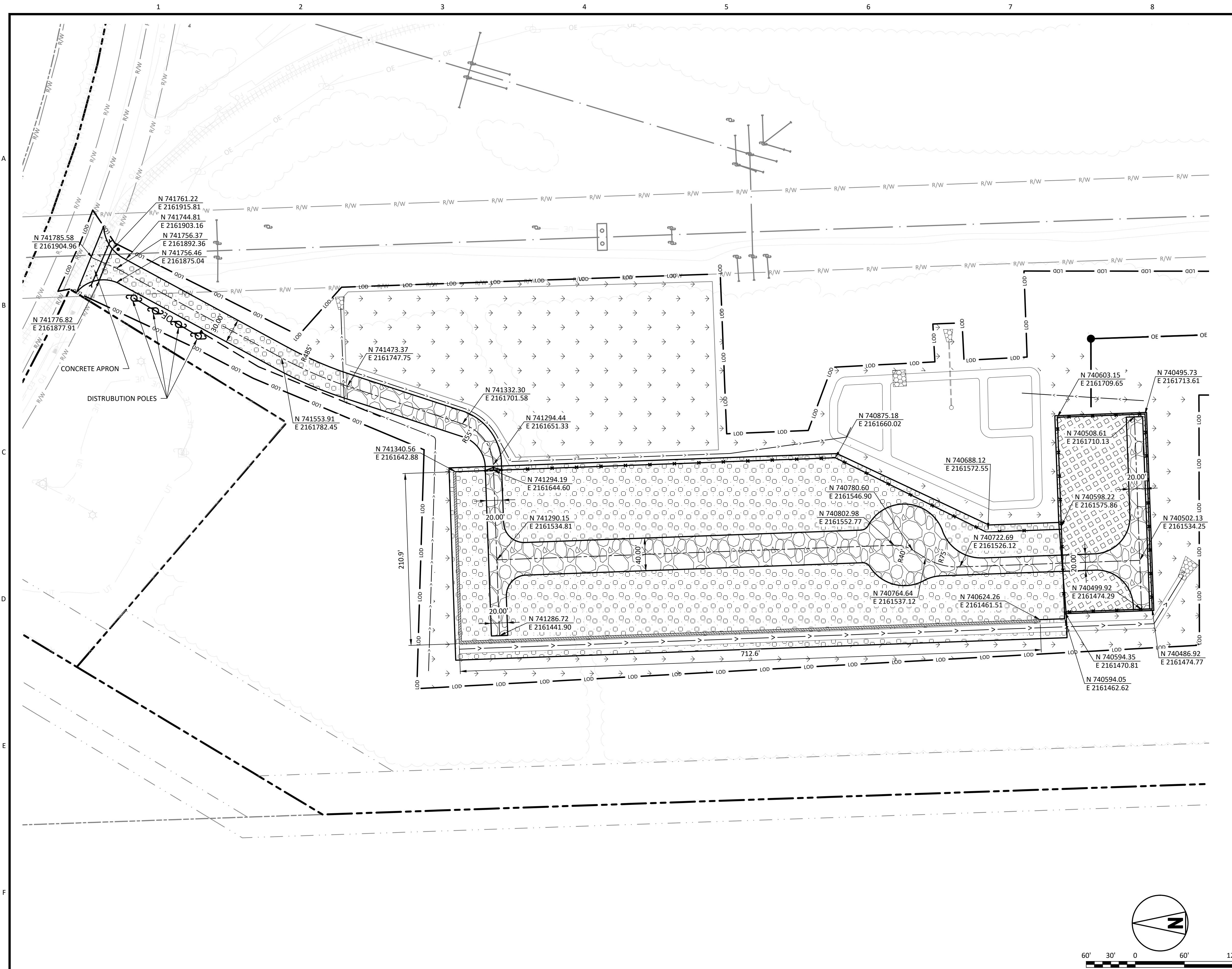
BLACK & VEATCH | **DUKE ENERGY** | **KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM**

DESIGNER: BCA | DRAWN: BCA | CHECKED: FSA | DATE: 23/AUG/24

DUKE ENERGY
ELECTRICAL LIGHTING DETAILS
5201 KNIGHTDALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

PROJECT: KND00-LT-E-SY.00.SD-01 | DRAWING NUMBER: KND00-LT-E-SY.00.SD-01 | REV: E

MicroStation v23.00.01.44
ANSI D 3622
12/28/2024 04:36 PM
Ari122837



NOTES

1. BARBED WIRE OR CHAIN LINK FENCES ARE RESTRICTED TO THE REAR YARD, SHALL NOT BE VISIBLE FROM A STREET RIGHT-OF-WAY, AND SHALL NOT BE ADJACENT TO ANY LOT IN OR ZONED FOR RESIDENTIAL USE PER SECTION 7.6.C OF THE UDO.

LEGEND

	ADJACENT PARCEL BOUNDARY
	PROPOSED SECURITY FENCE
	EXISTING FENCE
	PROPOSED ROAD
	EXISTING TREE LIMITS
	EXISTING RAILROAD
	EXISTING OVERHEAD LINE
	PROPERTY BOUNDARY
	PROPOSED OVERHEAD ELECTRIC LINES
	EXISTING RIGHT-OF-WAY
	EXISTING FIBER OPTIC CABLE
	LIMITS OF DISTURBANCE
	EXISTING TREE LINE
	PROPOSED PERIMETER WALL
	PROPOSED VEGETATED SWALE
	RIP RAP
	GRASS SURFACING
	ABC PER SECTION 2 SHEET KND01-CV-C-FE-SD-01
	#57 STONE PER SECTION 3 SHEET KND01-CV-C-FE-SD-01
#57 Stone pattern symbol"/>	#57 STONE PER SECTION 4 SHEET KND01-CV-C-FE-SD-01

TOWN CERTIFICATION
 THIS DESIGN HAS BEEN REVIEW 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

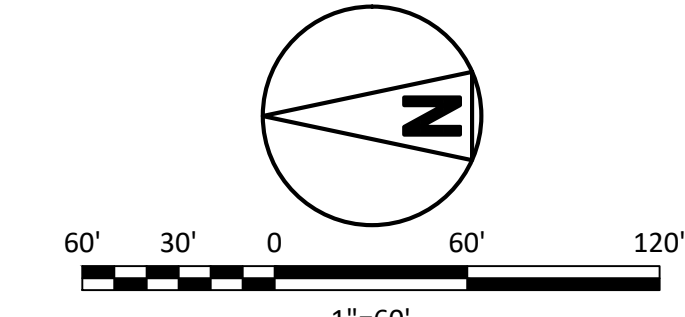
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: _____ DATE: _____
 LAND USE ADMINISTRATOR

ISSUED FOR PERMITTING

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

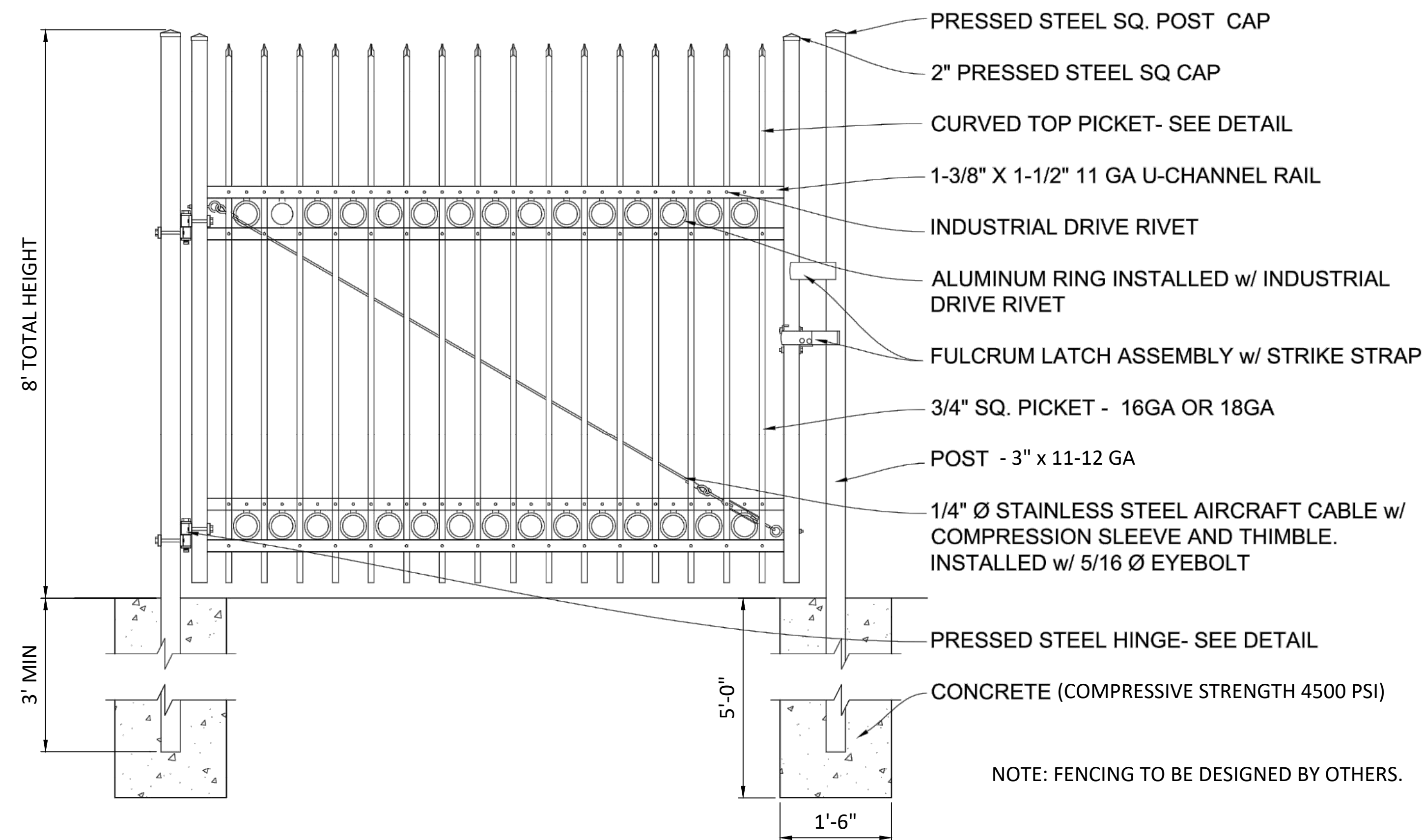
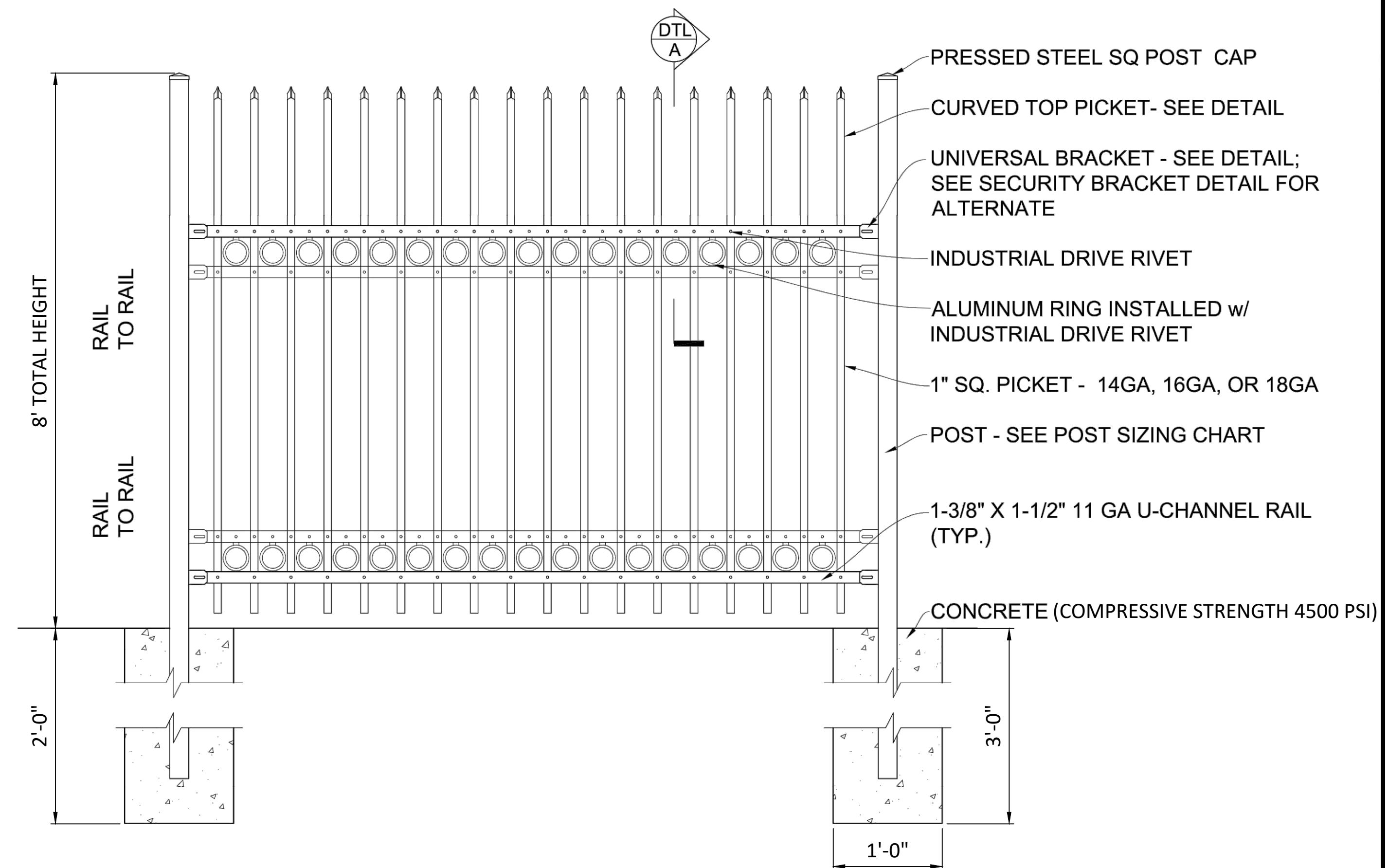
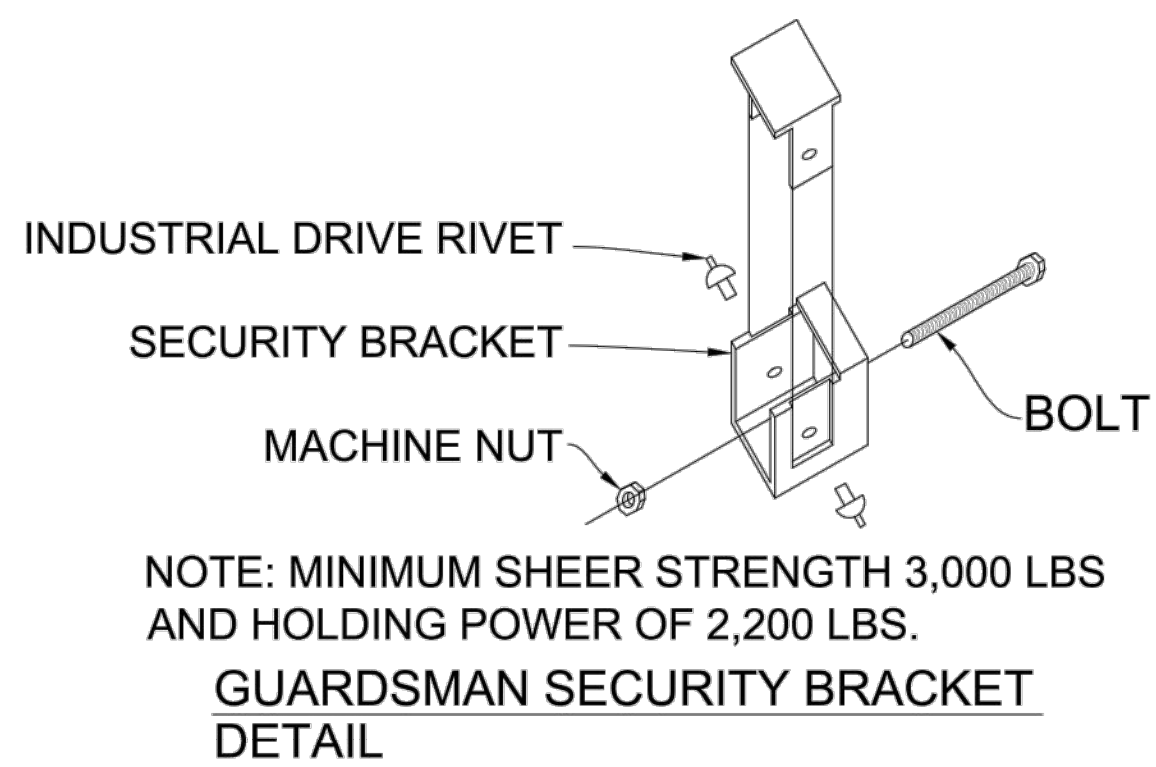
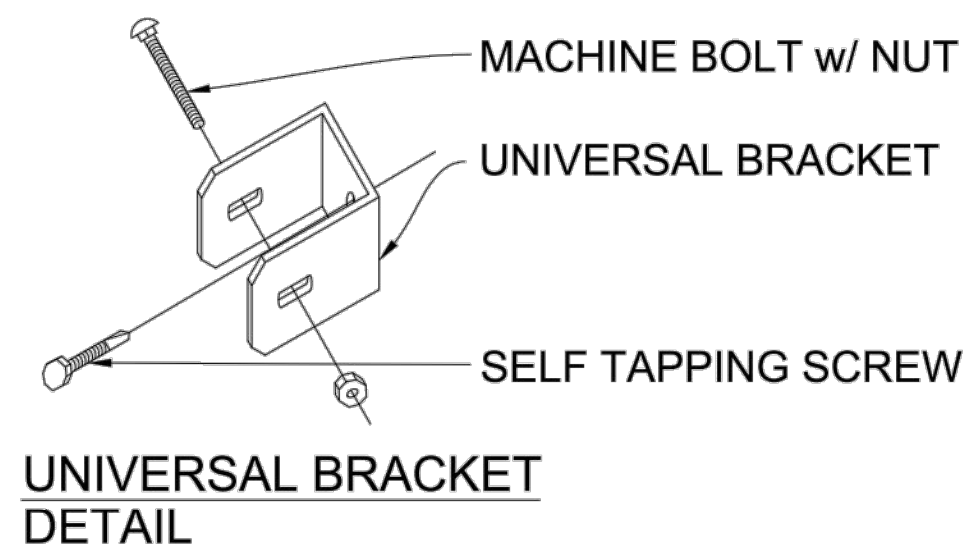
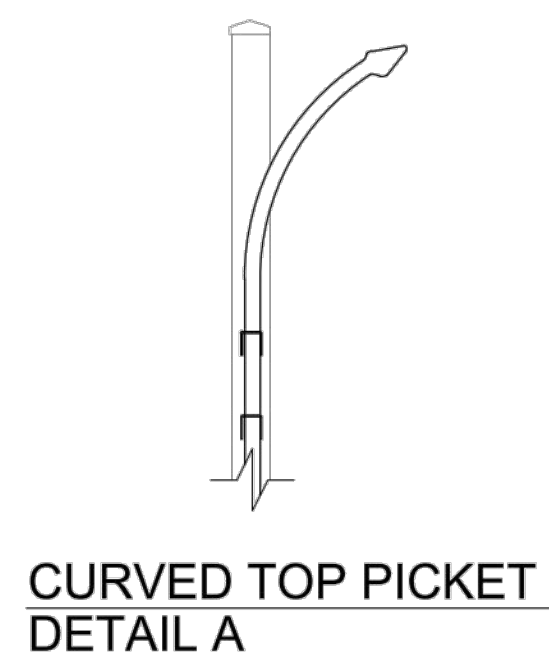
[Signature]
 058674
 ENGINEER
 NORTH CAROLINA PROFESSIONAL SOCIETY



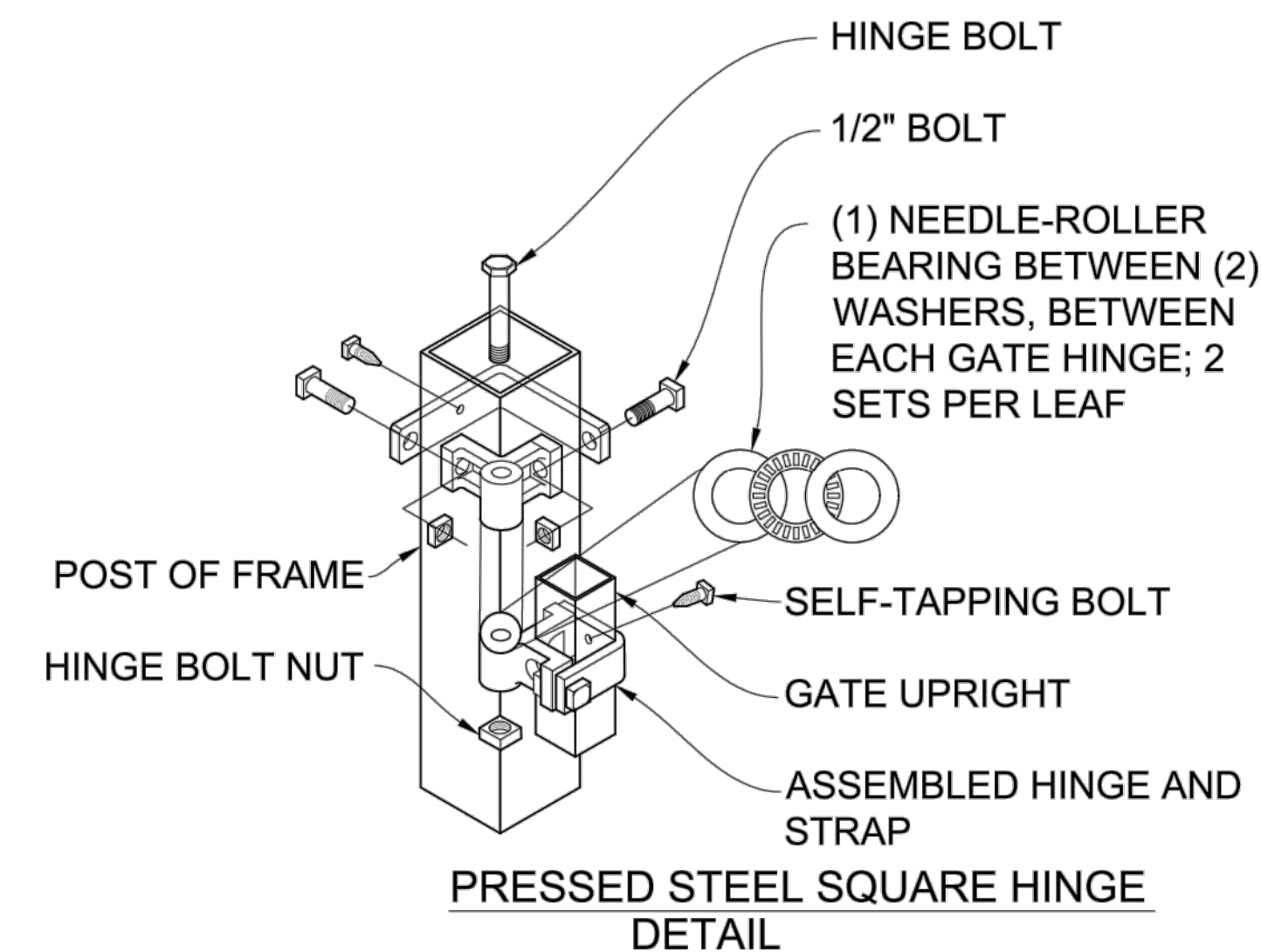
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 2/14/2022 4:09 PM
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C	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SLD	
B	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	SLD	
A	22/AUG/2024	ISSUED FOR PERMIT	CLC	MJM	HGU	SLD	
G	20/DEC/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	WL	
F	18/NOV/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	WL	
E	27/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SLD	

 Building a world of difference®	 DUKE ENERGY KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM	PROJECT	DRAWING NUMBER	REV
		419596 KND01-CV-C-FE.PL-01		G
DESIGNER	MJM	DRAWN	CLC	
CHECKED	HGU	DATE	20/DEC/2024	
SURFACING AND FENCING PLAN		5201 KNIGHTDALE EAGLE ROCK ROAD		
KNIGHTDALE, NC 27545				



NOTE: FENCING TO BE DESIGNED BY OTHERS.



TOWN CERTIFICATION
THIS DESIGN HAS BEEN REVIEW 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.

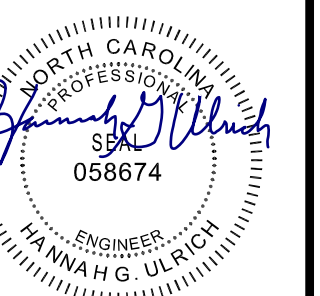
BY: _____ DATE: _____
TOWN ENGINEER

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

BY: _____ DATE: _____
LAND USE ADMINISTRATOR

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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
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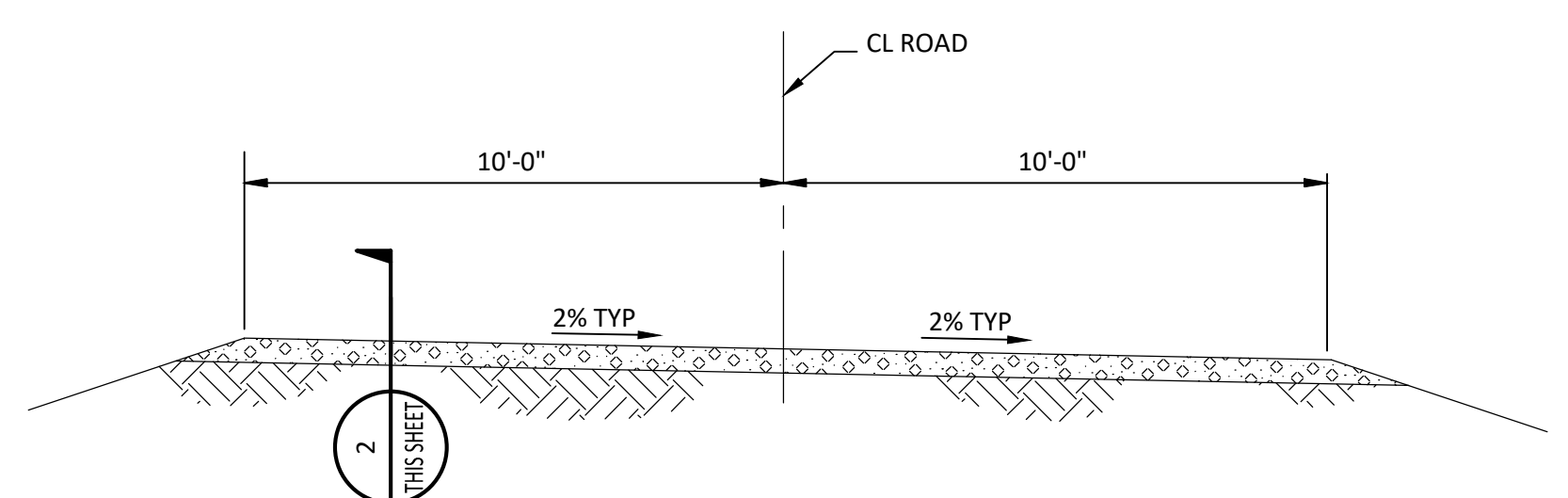
BLACK & VEATCH
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DESIGNER: MJM
DRAWN: CLC
CHECKED: HGU
DATE: 20/DEC/2024

DUKE ENERGY
KIGHTDALE BATTERY ENERGY STORAGE SYSTEM

FENCING DETAILS
5201 KNIGHTDALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

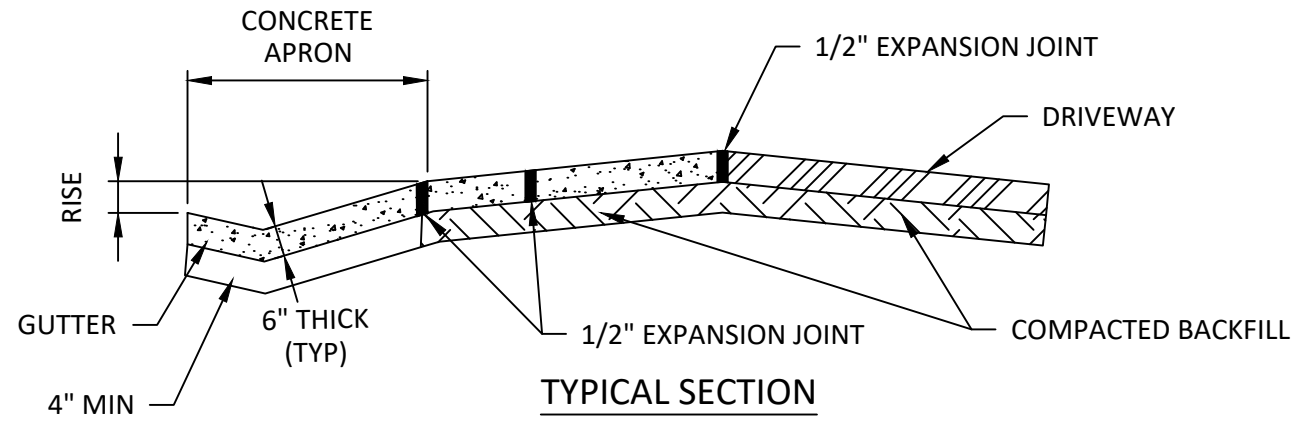
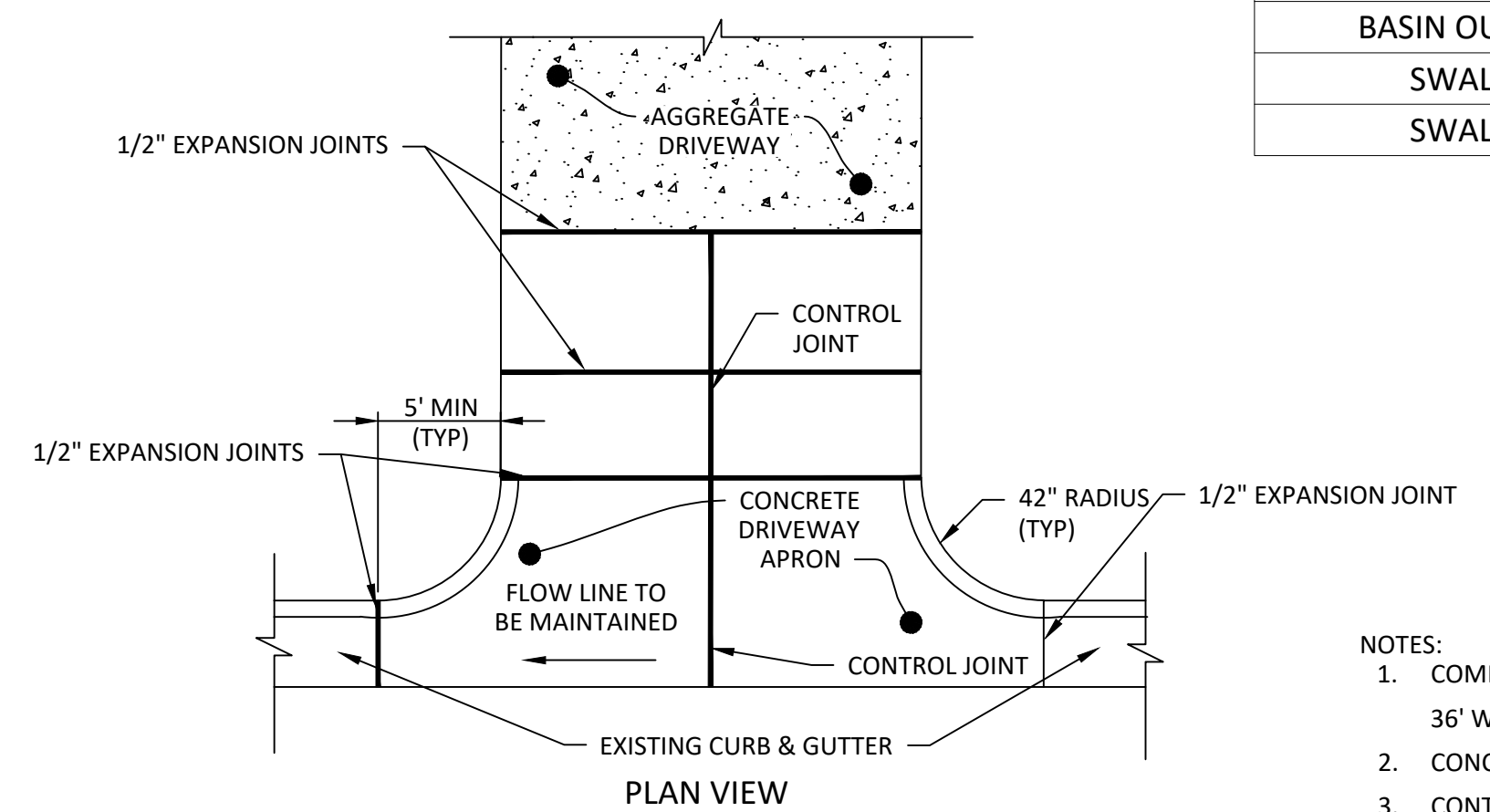
PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-FE.SD-01		E
CODE	-	
AREA	-	



SECTION 1 - TRANSVERSE AGGREGATE SURFACE ROAD SECTION
NO SCALE

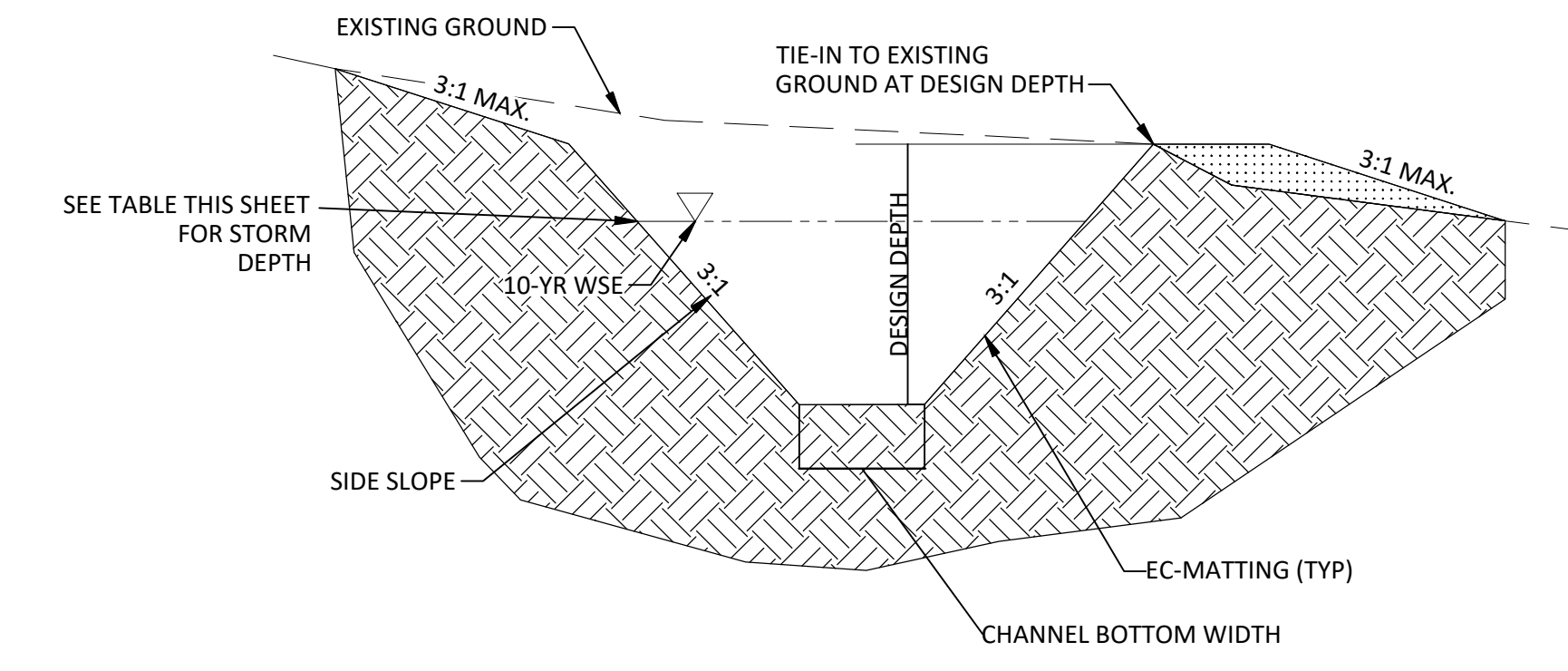
DITCH NO.	COORDINATES				LENGTH (FT)	START INV ELV	END INV ELV	SLOPE (FT/FT)	LINING	DESIGN LIFE	REMARKS
	START		END								
	NORTHING	EASTING	NORTHING	EASTING							
S-1	741373.79	2161398.82	741481.42	2161843.09	518	327.15	319.19	VARIES		PERMANENT	OFFSITE DIVERSION
S-2	741336.08	2161426.57	740448.39	2161516.95	916	317.17	313.17	0.005	GRASS	PERMANENT	OFFSITE DIVERSION
S-3	741469.83	2161766.32	740851.99	2161706.11	736	320.67	305.46	0.005	GRASS	PERMANENT	CONVEYANCE
S-4A	740495.88	2161719.25	740649.74	2161713.76	110	316.20	315.82	0.003	GRASS	PERMANENT	CONVEYANCE
S-4B	740497.37	2161730.03	740650.30	2161739.52	44	311.87	305.38	0.237	RIPRAP	PERMANENT	CONVEYANCE
D-1	741471.43	2161846.77	740863.24	2161711.88	763	318.00	305.38	0.010	EC BLANKET	TEMPORARY	CONVEYANCE
D-2	740415.74	2161746.18	740204.10	2161744.09	212	309.00	303.00	0.005	EC BLANKET	TEMPORARY	OFFSITE DIVERSION

RIPRAP SCHEDULE							
OUTLET	SHEET	L (FT)	T (FT)	W1 (FT)	W2 (FT)	D50 (FT)	REMARKS
BASIN OUTFALL	GR.PL-02	14	0.5	4.5	16.0	0.5	
SWALE 1	GR.PL-01	8	0.5	3.0	9.0	0.5	
SWALE 2	GR.PL-02	14	0.5	4.0	16.0	0.5	



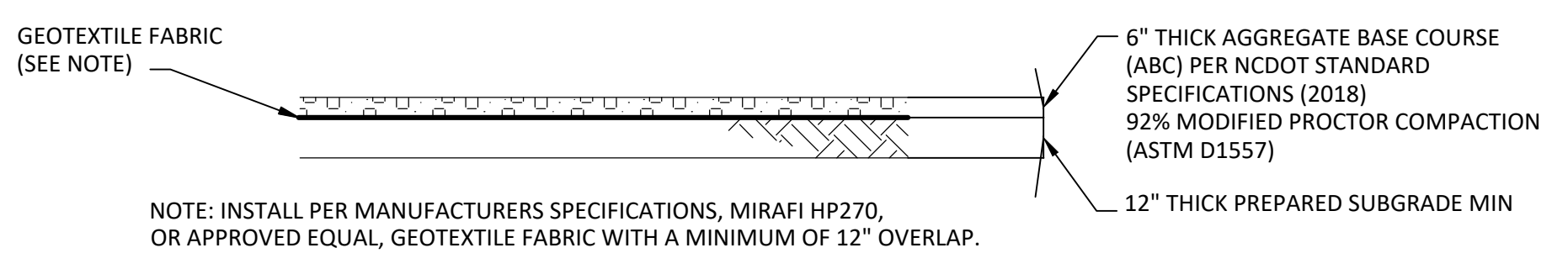
STANDARD DRIVEWAY APRON
NO SCALE

- NOTES:
1. COMMERCIAL DRIVEWAYS TO BE A MAXIMUM OF 36' WIDE AT RIGHT-OF-WAY.
 2. CONCRETE SHALL BE 3000 PSI.
 3. CONTROL JOINTS NOT TO EXCEED 10' ON CENTER.
 4. CURB RADIUS SHALL NOT RISE MORE THAN 1-INCH.

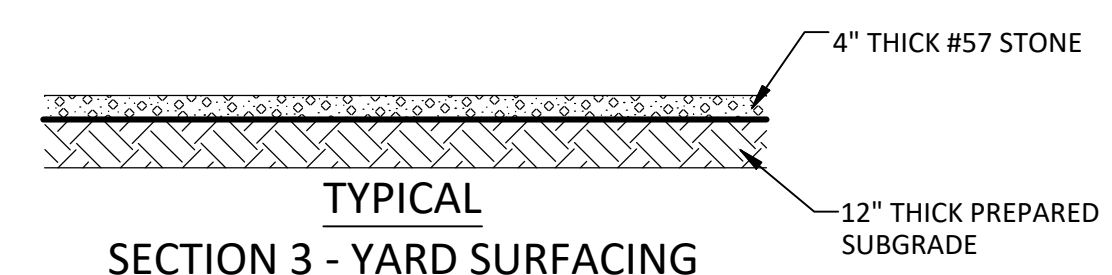


STORMWATER CONVEYANCE CHANNEL/GRASS CHANNEL
NO SCALE

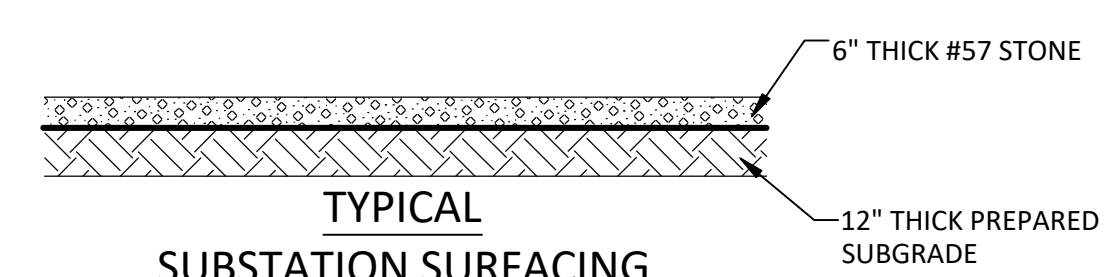
NOTE: SEE DITCH SCHEDULE THIS SHEET



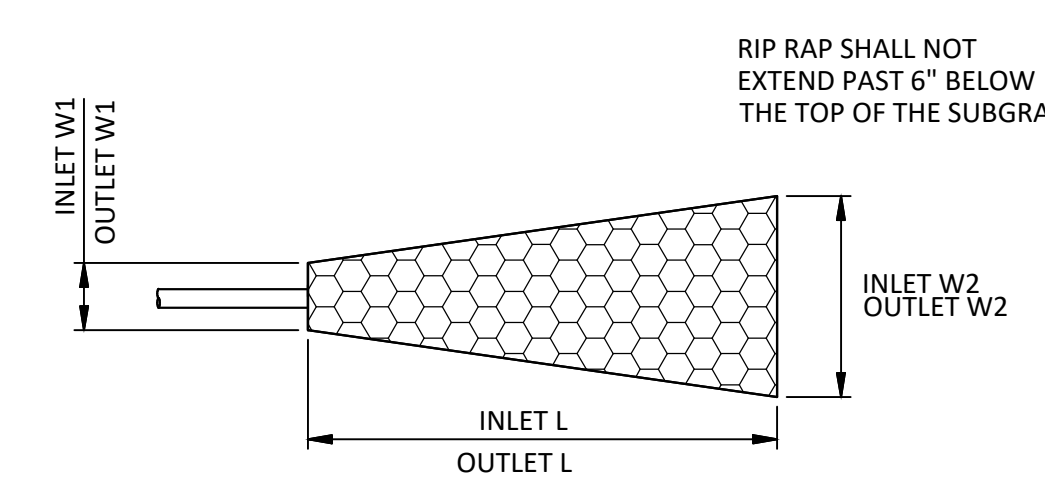
SECTION 2
SEE THIS DWG
NO SCALE



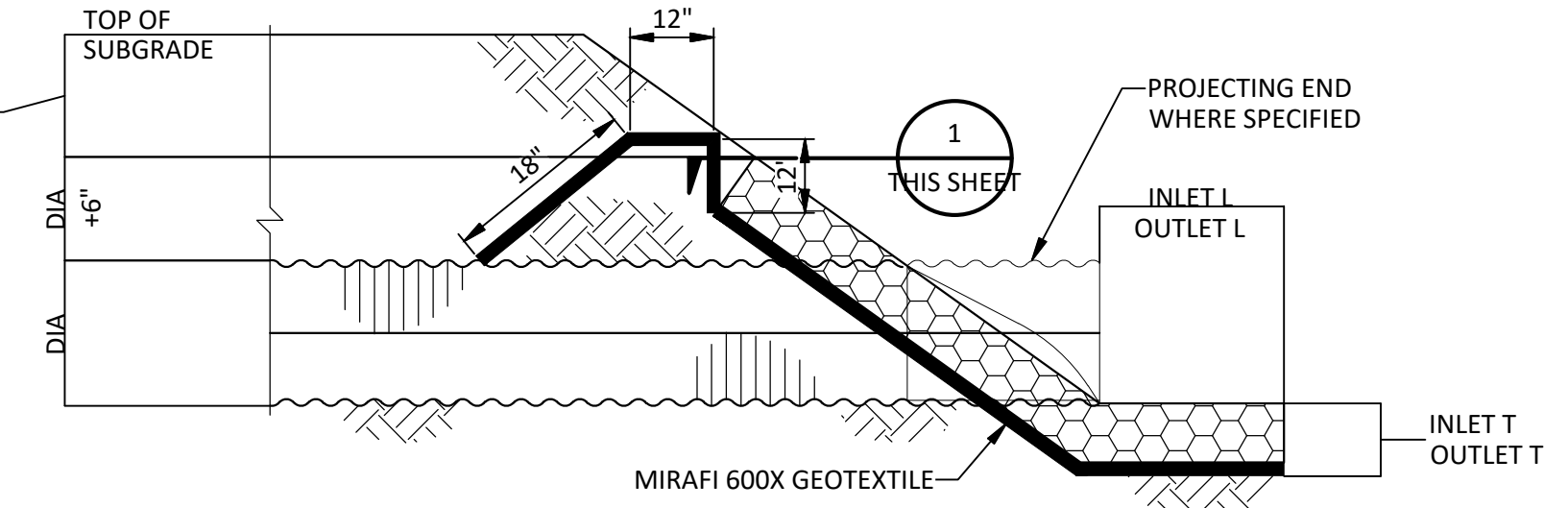
TYPICAL SECTION 3 - YARD SURFACING
SEE THIS DWG
NO SCALE



TYPICAL SUBSTATION SURFACING
SEE THIS DWG
NO SCALE



SECTION 1
NO SCALE



TYPICAL CULVERT RIP RAP INLET/OUTLET END
NO SCALE
SEE RIP RAP TABLE

TOWN CERTIFICATION
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BY: _____ DATE: _____
TOWN ENGINEER

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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
C	20/DEC/24	ISSUED FOR PERMITTING	CLC	MJM	HGU	WL	
B	21/NOV/2024	90% SUBMITTAL	CLC	MJM	HGU	WL	
A	15/NOV/2024	ISSUED FOR PERMIT	CLC	MJM	HGU	PSLD	-

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DESIGNER: MJM DRAWN: CLC
CHECKED: HGU DATE: 20/DEC/24

DUKE ENERGY
KNIGHTDALE BATTERY ENERGY STORAGE FACILITY

SURFACING DETAILS
5201 KNIGHTDALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-GR.SD-01	C	
CODE	AREA	

LEGEND

- ADJACENT PARCEL BOUNDARY
- PROPOSED SECURITY FENCE
- EXISTING FENCE
- PROPOSED ROAD
- EXISTING TREE LIMITS
- EXISTING RAILROAD
- EXISTING OVERHEAD LINE
- PROPERTY BOUNDARY
- PROPOSED OVERHEAD ELECTRIC LINES
- EXISTING RIGHT-OF-WAY
- EXISTING FIBER OPTIC CABLE
- LIMITS OF DISTURBANCE
- EXISTING TREE LINE
- PERIMETER WALL
- PROPOSED UNDERGROUND ELECTRIC LINES
- RIGHT OF WAY

HORIZONTAL DATUM: NAD83 NORTH CAROLINA STATE PLANES, US FOOT
 *STATE PLANE COORDINATES WERE ESTABLISHED BASED IN NGS MONUMENTS "ROSE" AND "TOMB".

VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988

BENCHMARK: PROJECT LOCALIZATION POINT 'NAIL'
 N: 740,484.141'
 E: 2,163,003.135'
 ELV: 291.02'

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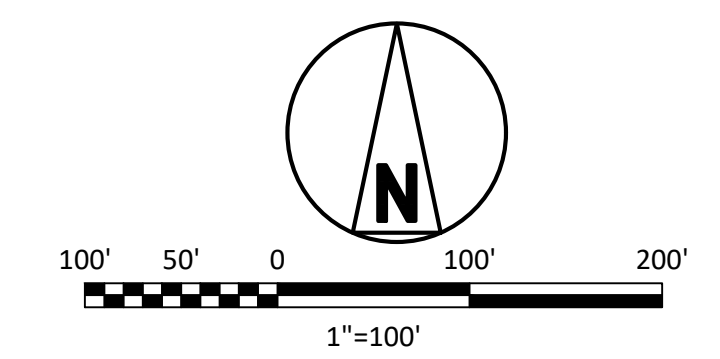
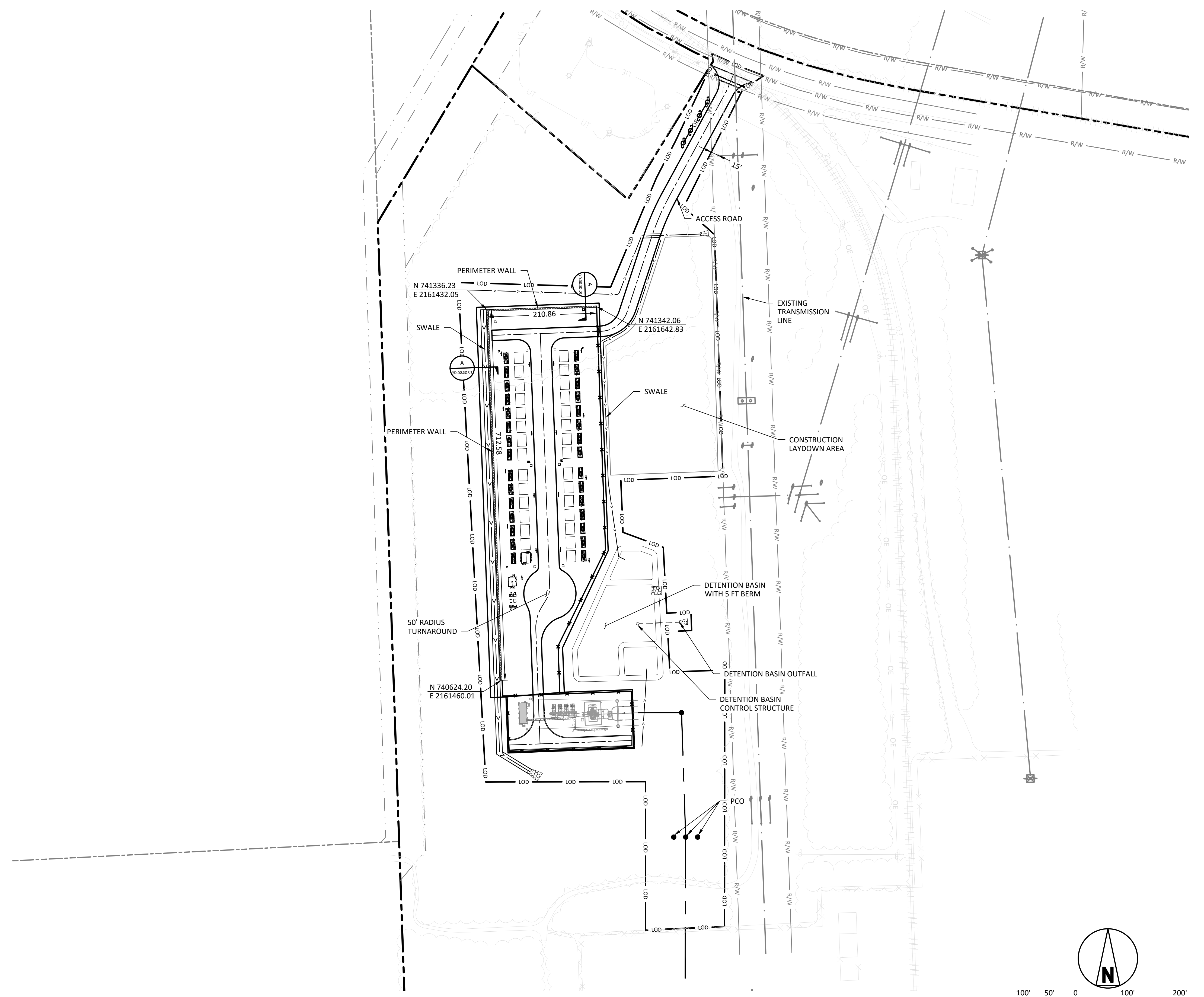
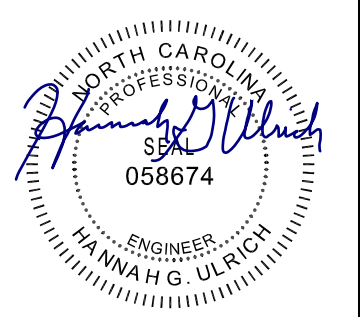
BY: _____ DATE: _____
 TOWN ENGINEER

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NO	DATE	REVISIONS AND RECORD OF ISSUE	CLC	DSD	HGU	WL	
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C	25/OCT/2024	ISSUED FOR PERMITTING	CLC	DSD	HGU	WL	-
B	27/SEP/2024	ISSUED FOR PERMITTING	CLC	DSD	HGU	DSD	-
A	26/AUG/2024	ISSUED FOR PERMITTING	CLC	DSD	HGU	DSD	-
F	20/DEC/24	ISSUED FOR PERMITTING	CLC	DSD	HGU	WL	-
E	21/NOV/2024	90% SUBMITTAL	CLC	MJM	HGU	WL	NO

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SIGNED _____ DATE _____ REG. NO. _____

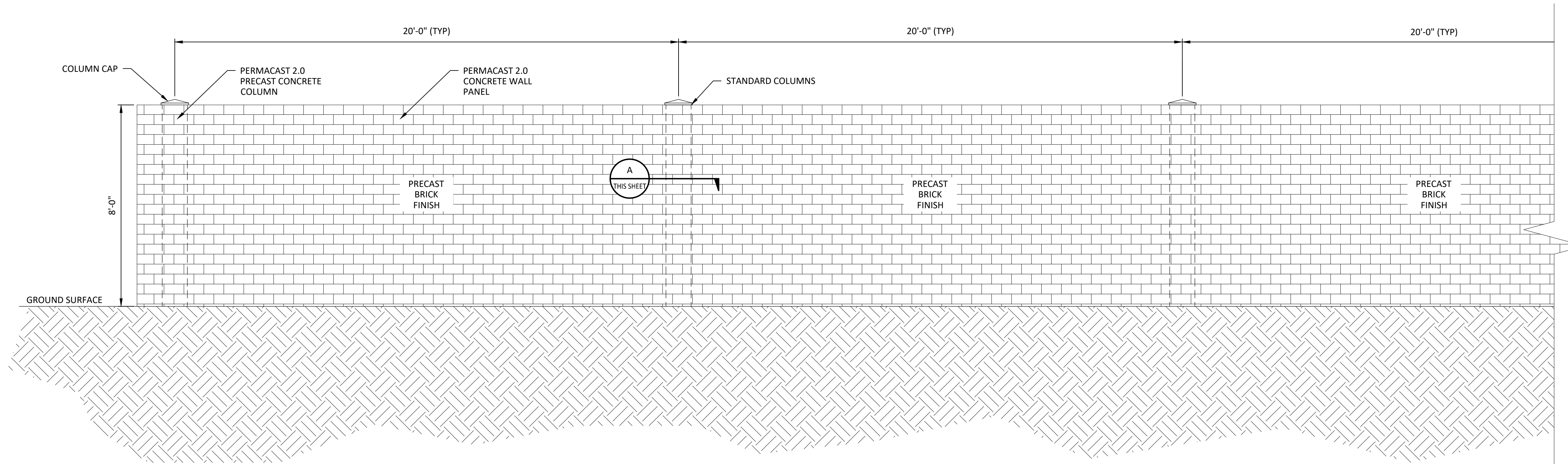
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DESIGNER: _____ DRAWN: CLC
 CHECKED: DSD DATE: 20/DEC/24

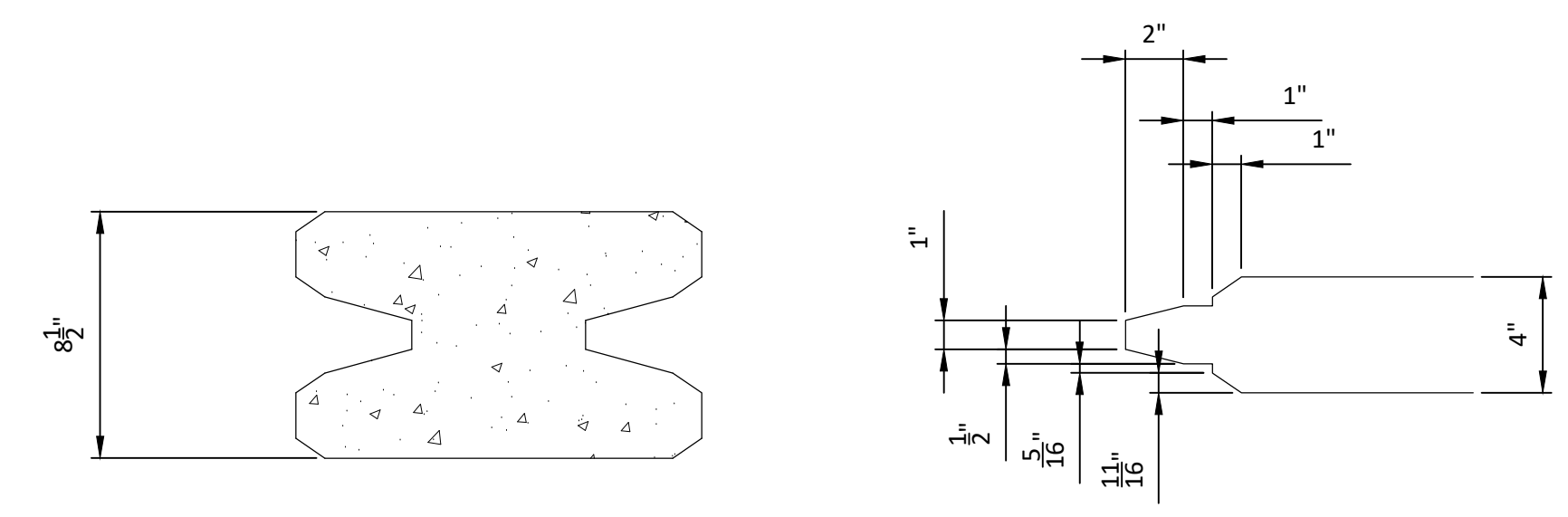
DUKE ENERGY
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

ARCHITECTURAL PLAN
 5201 KNIGHTDALE EAGLE ROCK ROAD
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-AD-A-YD.00.PL-01	F	
CODE	AREA	

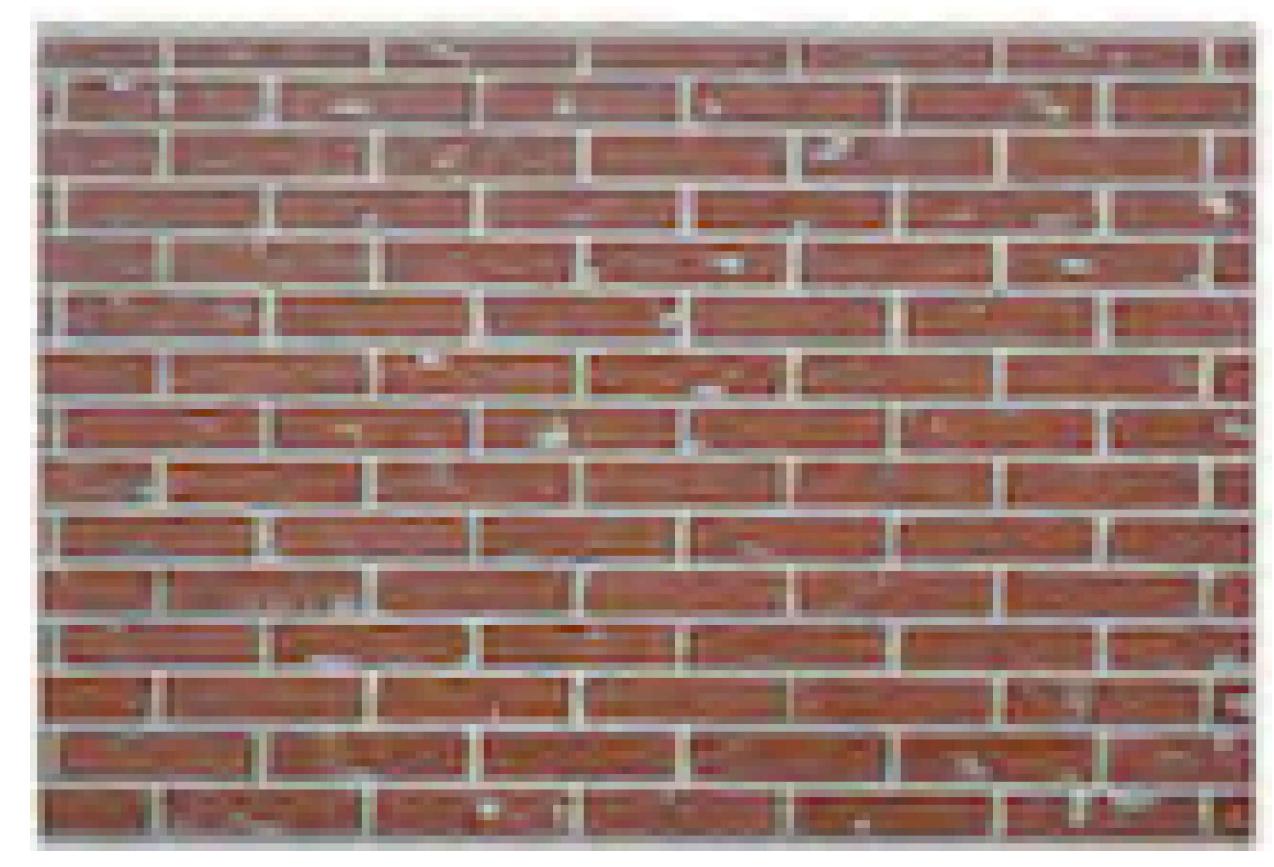


ELEVATION A - TYPICAL 8 FT. X 20 FT WALL ELEVATION
SCALE: 1" = 30'-0"



SECTION A
TYPICAL PANEL / POST CONNECTION
SCALE: 1" = 6"

NOTE: PRECAST WALL, COLUMNS AND FOUNDATION TO BE DESIGNED BY OTHERS.



BRICK FINISH

TOWN CERTIFICATION
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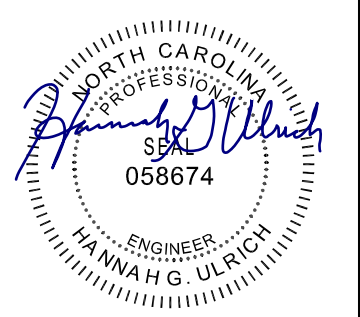
BY: _____ DATE: _____
TOWN ENGINEER

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BY: _____ DATE: _____
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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
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B	21/NOV/24	90% SUBMITTAL	JCB	WL	-	-	-
A	26/AUG/24	ISSUE FOR PERMITTING	DCV	-	DSD	DSD	-

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SIGNED _____
DATE _____ REG. NO. _____

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DESIGNER - DRAWN DCV
CHECKED DSD DATE 20/DEC/2024

DUKE ENERGY
DUKE ENERGY
KNIGHTDALE EPC

ARCHITECTURAL ELEVATION AND SECTIONS

PROJECT	DRAWING NUMBER	REV
419596 KND01-AD-A-YD.00.SD-01		C
CODE	AREA	

ST5015UX-2H-US ST5015UX-4H-US

PowerTitan 2.0 Liquid Cooled Energy Storage System

NEW



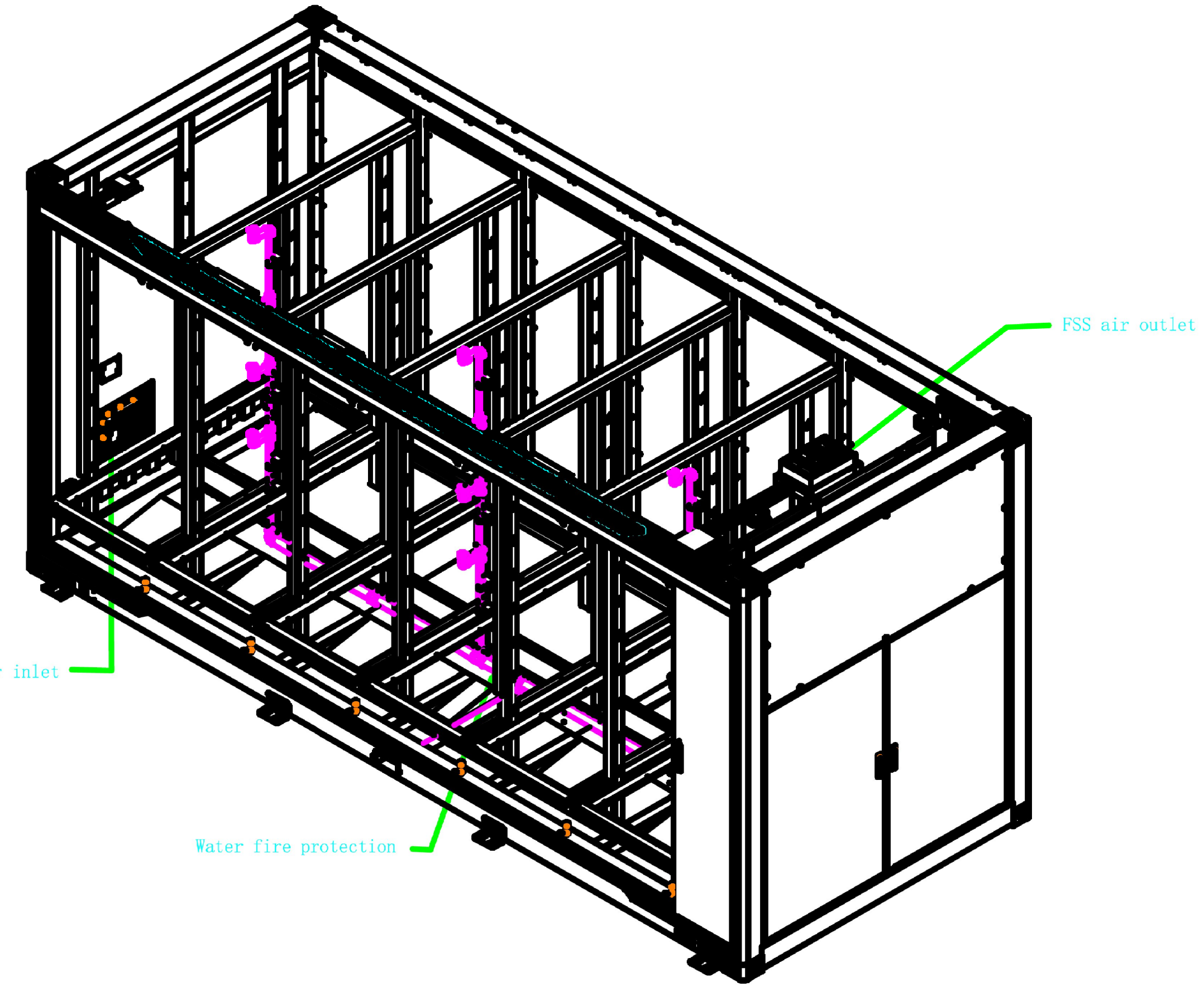
Product name	ST5015UX-2H-US	ST5015UX-4H-US
DC side		
Cell type	LFP	
Battery configuration	3.2 V / 314 AH	
Nominal capacity	48632P	
Nominal voltage range	5015 kWh	
AC side		
Nominal AC power	210 kVA * 12	210 kVA * 6
AC current distortion rate	< 3% (Nominal Power)	
DC component	< 0.5%	
Nominal AC voltage	690 V	
AC voltage range	607 V ~ 759 V	
Termination (LV)	352 A * 3 Phase * 6	352 A * 3 Phase * 3
Power factor	> 0.99 (Nominal Power)	
Adjustable range of reactive power	-100% ~ 100%	
Nominal frequency	60 Hz	
Isolation method	Transformerless	
System parameter		
Dimension (W * H * D)	6058 mm * 2896 mm * 2438 mm	
Weight	42500 kg / 93696.5 lbs	42000 kg / 92594.0 lbs
Degree of protection	Type 3S	
Anti-corrosion degree	C4	
Operation temperature range	-30 °C ~ 50 °C (> 45 °C Derating)	
Operation humidity range	-22 °F ~ 122 °F (> 113 °F Derating)	
Max. operation altitude	3090 m / 9842.5 ft	
Temperature control method	Intelligent Liquid Cooling	
Fire suppression system	Default: NFPA 68 compliance vent panel, smoke and heat, detectors, Mini FACP Optional: Sprinkler, sound beacon, NFPA 69, compliance ventilation system, Flammable gas detector	
Communication	Ethernet	
Standard	UL 9540A, NFPA 855, NFPA 68, NFPA 69 (optional) IEEE 1547, UL 1973, UL 1741SB, UL 9540	



Front View

- OPTIMAL COST**
 - Intelligent liquid-cooled temperature control system to optimize the auxiliary power consumption
 - Pre-assembled, no battery module handling on site, transportation of complete system
- EFFICIENT AND FLEXIBLE**
 - High-efficiency heat dissipation, increase battery life and system discharge capacity
 - Front single-door-open design, supporting back to back layout drawing
 - Function test in factory, limited on-site work, accelerate commissioning process
- SAFE AND RELIABLE**
 - Electrical safety management, overcurrent fast breaking and arc extinguishing protection
 - The electrical cabinet and battery cabinet are separated to prevent thermal runaway
- CONVENIENT O&M**
 - One-click system upgrade
 - Automatic coolant refilling design
 - Online intelligent monitoring

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BY: _____ DATE: _____
TOWN ENGINEER

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BY: _____ DATE: _____
LAND USE ADMINISTRATOR

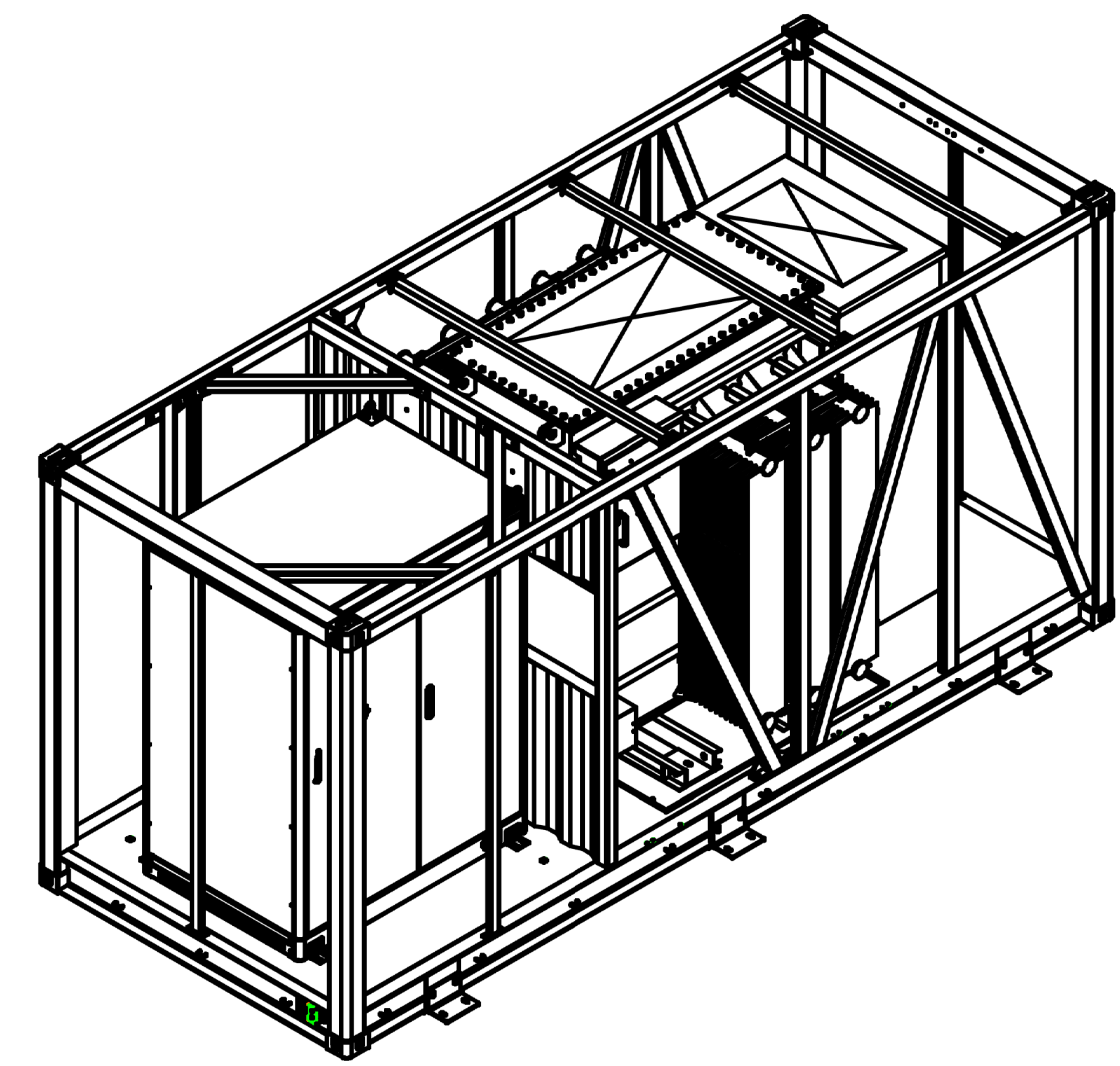
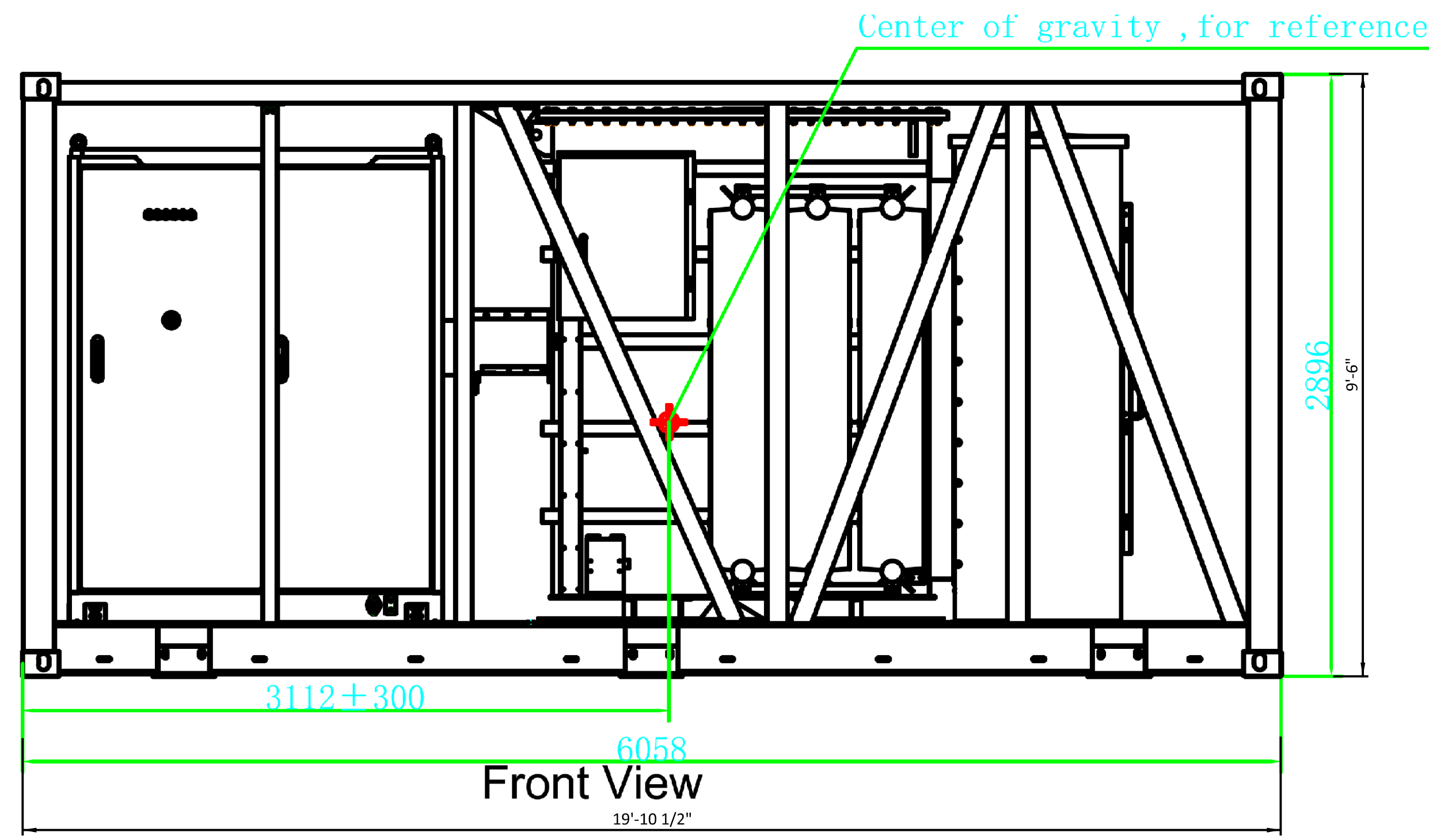


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B&V PROJECT NUMBER: 419596

MicroStation v23.00.01.44
ANSI D 34622
Full Size 1 = 1
2/23/2024 03:30 PM

DESIGNER BCA		DRAWN RSN		BLACK & VEATCH 17401 LAMAR AVENUE OVERLAND PARK, KANSAS 66211		DUKE ENERGY KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM		PROJECT KND01-VEN-LG-E-SD-01		DRAWING NUMBER B	
CHECKED OOO		DATE 23/AUG/24		BESS CONTAINER ARCHITECTURAL PLAN 5201 KNIGHTDALE EAGLE ROCK ROAD KNIGHTDALE, NC 27545		CODE		AREA		REV	
NO		DATE		REVISIONS AND RECORD OF ISSUE		DRN		DES		CHK	
B		15/NOV/24		ISSUED FOR PERMIT		RSN		BCA		OOO	
A		23/AUG/24		ISSUED FOR PERMIT		RSN		BCA		OOO	



SUNGROW
Clean power for all

MVS5140-LS-US

MV Turnkey Solution for **PowerTitan 2.0** MVS Liquid Cooling Energy Storage System

NEW

Product Name	MVS5140-LS-US
MV transformer	
Rated power	5140 kVA
MV / LV voltage	34.5 kV / 0.69 kV
Transformer vector	Dy1
Windings	2 windings
Rated frequency	60 Hz
Impedance	9 % (± 7.5 % , IEEE tolerance)
Efficiency standard	99 % @ 100 % load
Material of winding (MV / LV)	Aluminum / Aluminum
Legged core design	3 Legged core Design
High voltage configuration	Loop-feed, Dead Front
Overcurrent protection	Expulsion fuses in series with Partial-Range Current-Limiting Fuses
Cooling method	KNAN
Insulation fluid	Degradable oil
Smart control cabinet	
Protection	AC Breaker
Surge protection	Type II
AC Insulation detection	Support
Cooling Method	Air cooling and HVAC
UPS	15 min (Default) 2 / 3 / 4 h (Optional)
General data	
Dimensions (W * H * D)	6058 mm * 2896 mm * 2438 mm 238.5" * 114.0" * 96.0"
Weight	15300 kg 33730 lbs
Cable entry	Bottom entry
Degree of protection	Type 3S
Anti-corrosion degree	C4
Operation temperature range	-40 °C ~ 60 °C -40 °F ~ 140 °F
Operation humidity range	> 40 °C (104 °F) derating (Default) > 45 °C (113 °F) derating (Optional)
Max. operating altitude	3000 m 9842.5 ft
Communication	Ethernet, Optical fiber, RS485
Standard	UL 891, IEEE C57.12.00, IEEE C57.12.80, IEEE C57.12.90

* 15min UPS only supplies power for the control and communication devices in the MVS
 ** 2 / 3 / 4 h UPS supplies power for the control and communication devices in the the MVS, and the ventilation system in the battery container

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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: _____
LAND USE ADMINISTRATOR

ISSUED FOR PERMITTING

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

B&V PROJECT NUMBER: 419596

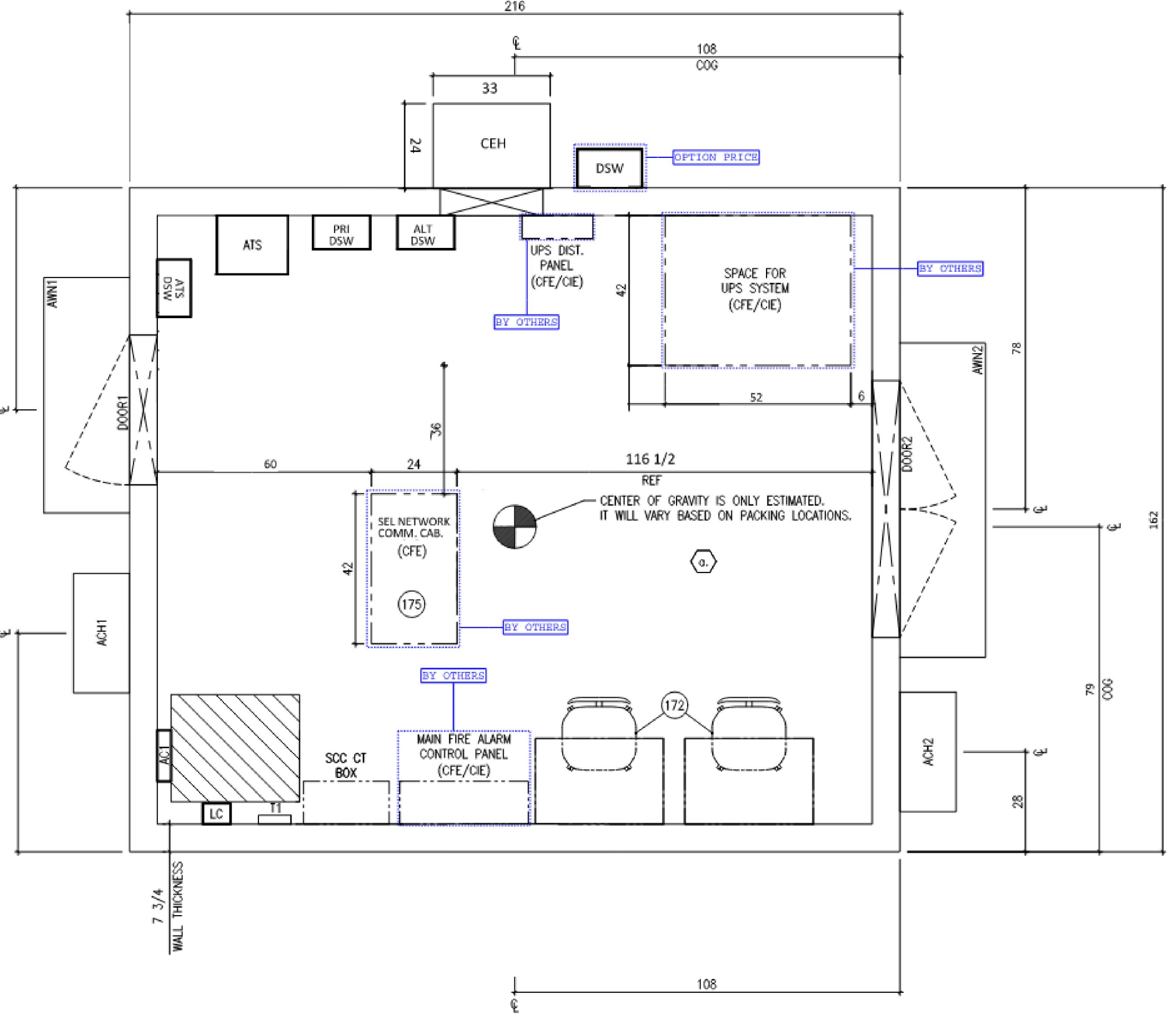
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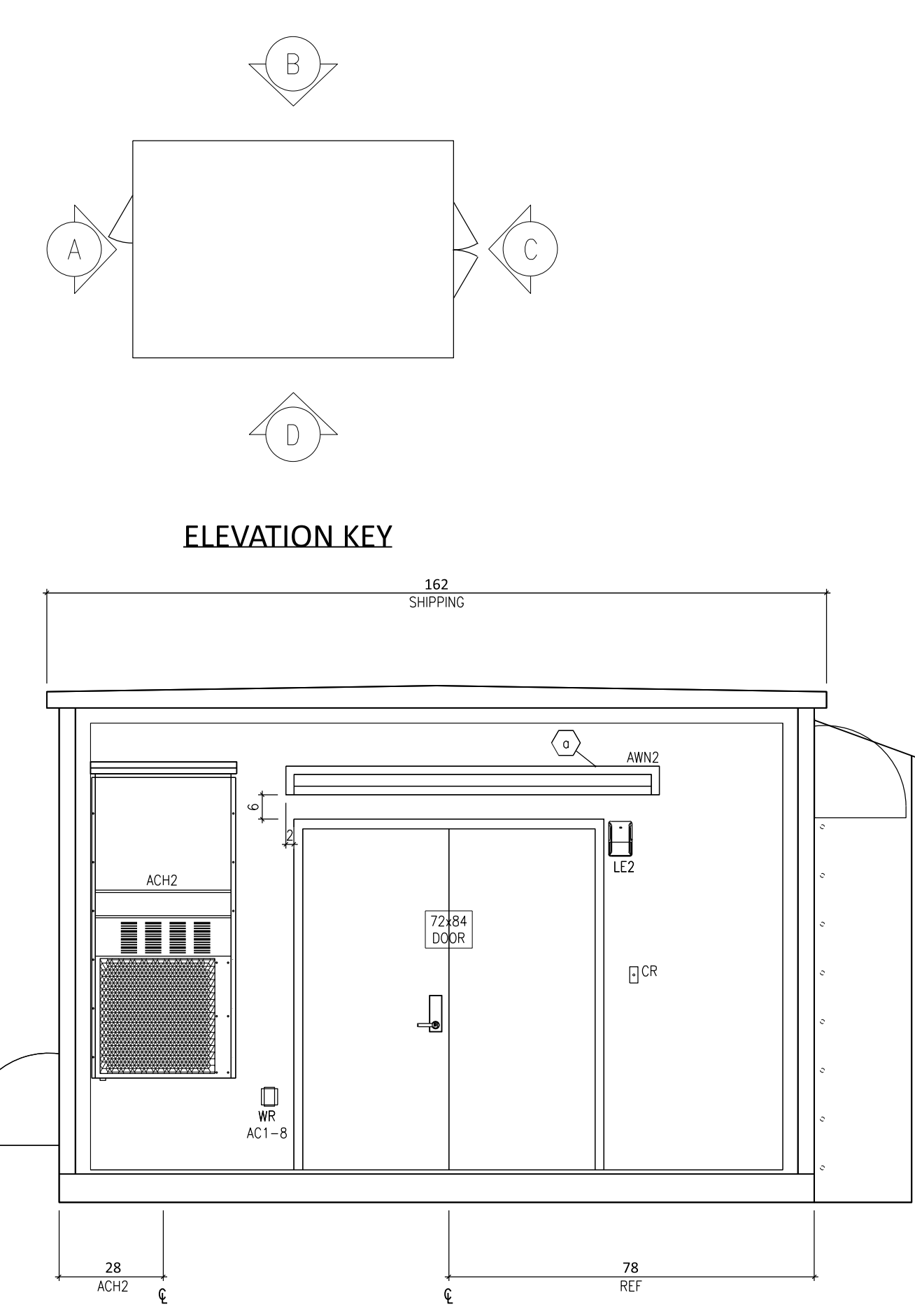
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DESIGNER	BCA	DRAWN	RSN
CHECKED	000	DATE	23/AUG/24

DUKE ENERGY	
MVT SKID LAYOUT	
MVT SKID ARCHITECTURAL PLAN	
5201 KNIGHTDALE EAGLE ROCK ROAD	
KNIGHTDALE, NC 27545	

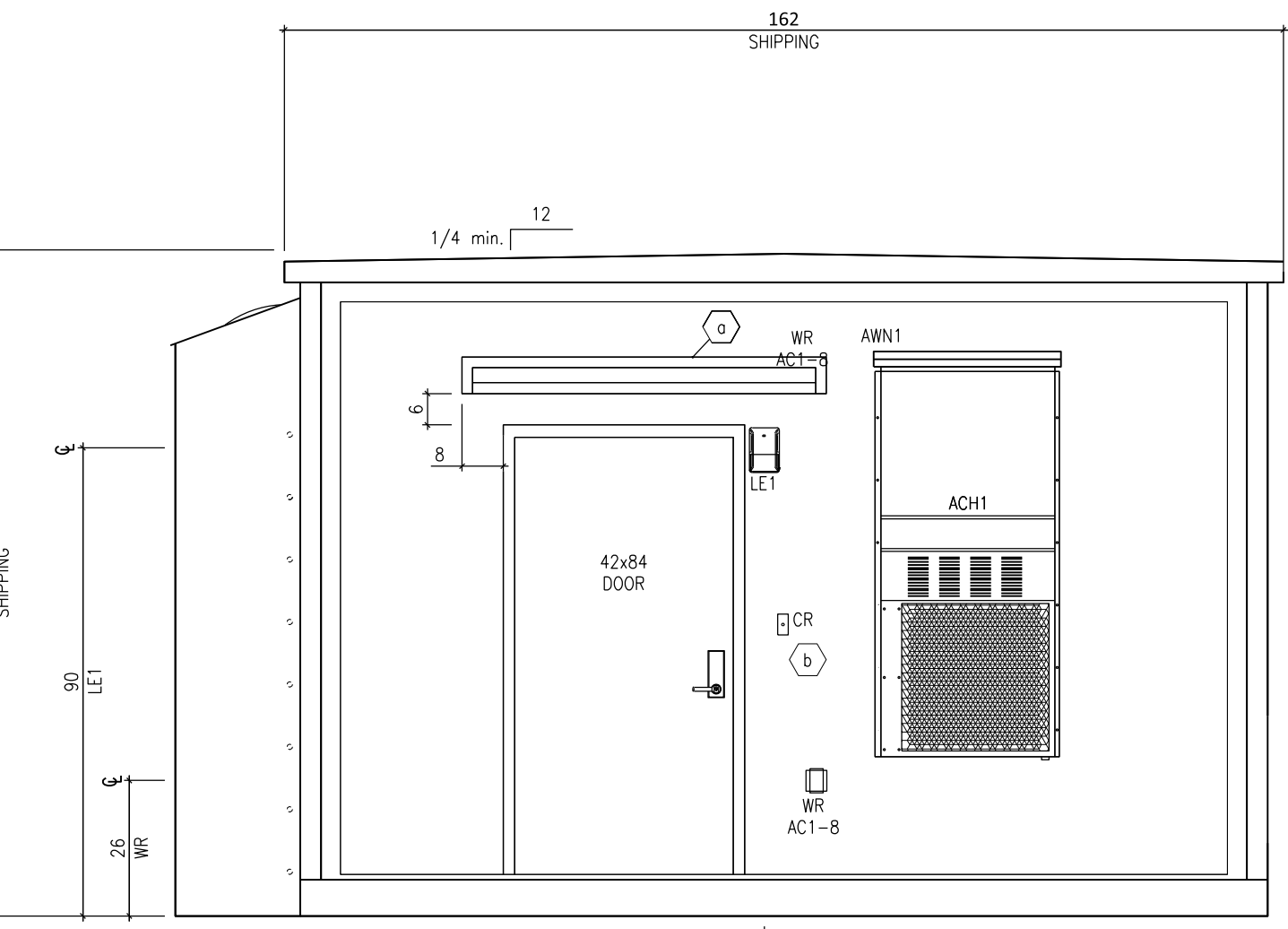
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KND01-VEN-LG-E-SD-02		B
CODE	AREA	



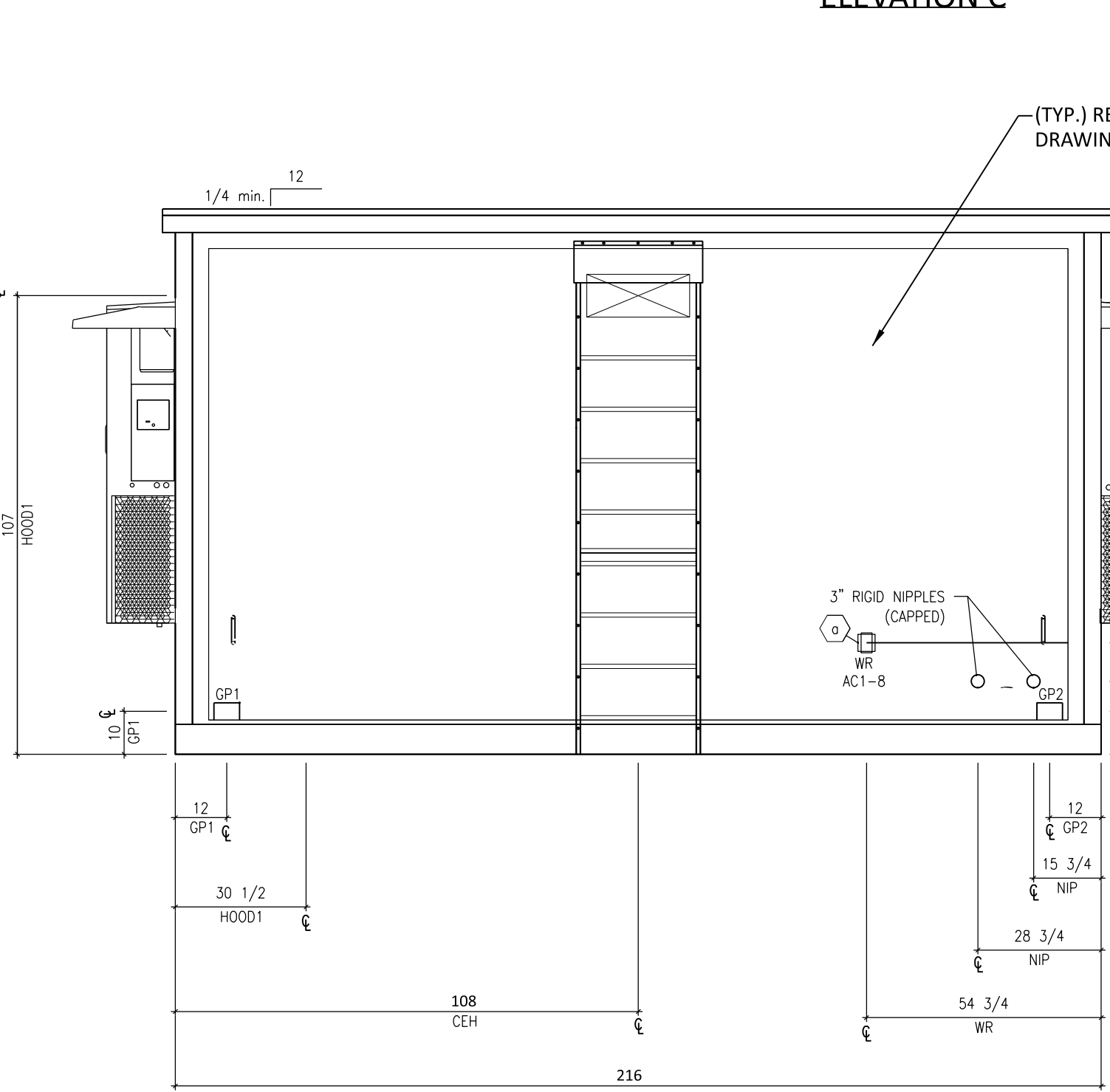
PLAN VIEW



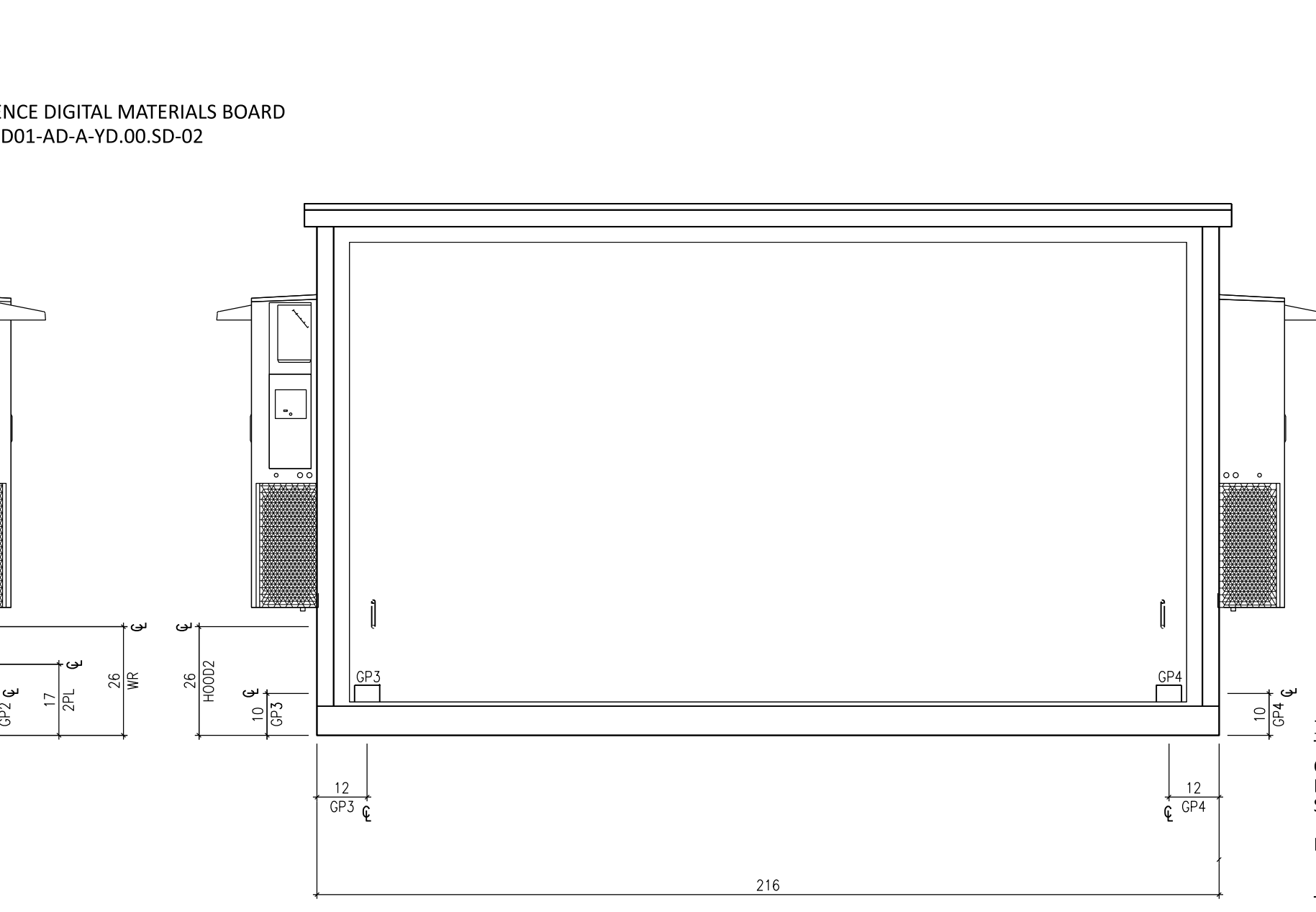
ELEVATION KEY



ELEVATION A



ELEVATION B



ELEVATION C



ELEVATION D

DESCRIPTION

The patented Lumark Crosstour™ LED Wall Pack Series of luminaires provides an architectural style with super bright, energy efficient LEDs. The low profile, rugged die-cast aluminum construction, universal back box, stainless steel hardware along with a sealed and gasketed optical compartment make the Crosstour™ impervious to contaminants. The Crosstour™ wall luminaire is ideal for walkways, inverted mount for facade/interior illumination, post/bollard, site lighting, floodlight and low level pathway illumination including stairs. Typical applications include building entrances, multi-use facilities, apartment buildings, institutions, schools, stairways and loading docks test.

CONSTRUCTION FEATURES

Construction
Slim, low profile LED design with rugged one-piece, die-cast aluminum hinged removable door and back box. Matching housing styles incorporate both a small and medium design. The small housing is available in 12W, 18W and 26W. The medium housing is available in the 36W model. Patented secure lock hinge feature allows for safe and easy tool-less electrical connections with the supplied push-in connectors. Back box includes three half-inch NPT threaded conduit entry points. The universal back box supports both the small and medium forms and mounts to standard 3-1/2" to 4" round and octagonal, 4" square, single gang and masonry junction boxes. Key hole gasket allows for adaptation to junction box or wall. External fin design extracts heat from the fixture surface. One-piece silicone gasket seals door and back box. Minimum 5" wide pole for site lighting application. Not recommended for car wash applications.

Optical
Silicone sealed optical LED chamber incorporates a custom engineered mirrored anodized reflector providing high-efficiency illumination. Optical assembly includes impact-resistant tempered glass and meets ESNA requirements for full cutoff compliance. Available in seven lumen packages: 5000K, 4000K and 3000K CCT.

Electrical
LED driver is mounted to the die-cast housing for optimal heat sinking. LED thermal management system incorporates both conduction and natural convection to transfer heat rapidly away from the LED source. 12W, 18W, 26W and 36W series operate in -40°C to 40°C (-40°F to 104°F). High ambient 50°C models available. Crosstour luminaires maintain greater than 80% of initial light output after 72,000 hours of operation. Three half-inch NPT threaded conduit entry points allow for three branch wiring. Back box is an authorized electrical wiring compartment. Integral LED electronic driver is standard 0-10V dimming, 120-277V 50/60Hz or 347V 60Hz models.

Finish
Crosstour is protected with a Super durable TGIC carbon bronze or summit white polyester powder coat paint. Super durable TGIC powder coat paint finishes withstand extreme climate conditions while providing optimal color and gloss retention of the installed life. Options to meet Buy American and other domestic preference requirements.

Warranty
Five-year warranty.

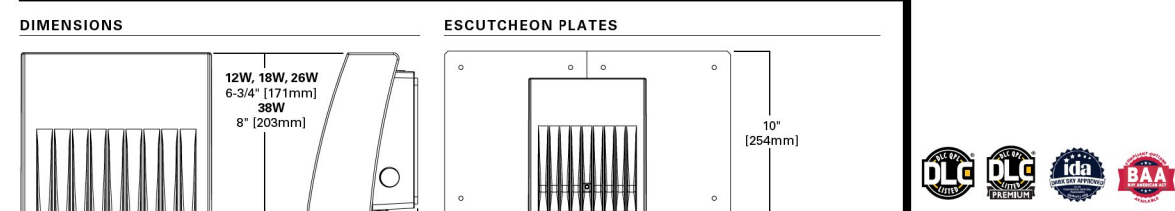
Lumark

Category #	Type
Project	Date
Comments	
Prepared by	



XTOR CROSSTOUR LED

APPLICATIONS:
WALL / SURFACE
POST / BOLLARD
LOW LEVEL
FLOODLIGHT
INVERTED
SITE LIGHTING



CERTIFICATION DATA
Dark Sky Approved (Fixed mount, Full cutoff) and 5000K CCT only
UL Listed, Wet Location Listed
ULC
ULC
ULC
BAA

TECHNICAL DATA
40°C Maximum Ambient Temperature
External Supply Wiring 90°C Minimum

EPA
Electro Protected Area (EPA, FL):
XTOR-B, XTOR-B, XTOR-B-0.34
XTOR-B-0.45

SHIPPING DATA:
Approximate Net Weight:
37 - 529 lbs. (17 - 24 kg)



www.designlights.org

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December 14, 2011 5:27 PM

page 2

POWER AND LUMENS BY FIXTURE MODEL

LED Information	XTOR-B	XTOR-B-W	XTOR-B-Y	XTOR-B	XTOR-B-W	XTOR-B-Y	XTOR-B-W	XTOR-B-Y	XTOR-B	XTOR-B-W	XTOR-B-Y	
Delivered Lumens (90° Mount)	1,410	1,286	1,327	2,135	2,103	1,997	2,751	2,710	2,575	4,269	4,205	3,995
Delivered Lumens (90° Mount) Accessory Kit ¹	1,000	900	940	1,465	1,472	1,320	2,090	2,068	1,905	3,168	3,121	2,945
B.L.U.G. Rating ²	B1-UG-G5	B1-UG-G5	B1-UG-G5	B1-UG-G5	B1-UG-G5	B1-UG-G5	B1-UG-G5	B1-UG-G5	B1-UG-G5	B2-UG-G5	B2-UG-G5	B2-UG-G5
CCT (Kelvin)	5,000	4,000	3,000	5,000	4,000	3,000	5,000	4,000	3,000	5,000	4,000	3,000
Beam Spread (Index)	70	70	70	70	70	70	70	70	70	70	70	70
Power Consumption (Watt)	12W	12W	12W	18W	18W	18W	26W	26W	26W	36W	36W	36W

NOTES: ¹ Includes shield and views. ² B.L.U.G. Rating does not apply to floodlights.

page 3

ORDERING INFORMATION

Sample Number: XTOR-B-W-T-C1

Series ¹	LED Kelvin Color	Housing Color	Options (Add as Suffix)	Accessories (Order Separately) ¹
XTOR-B-Standard Door, 12W	(Blank)-Bright White	(Blank)-Carbon Bronze	PC1-Photocontrol 12W ¹	WG-XTOR-Wire Guard ¹
XTOR-B-Standard Door, 18W	(Blank)-Bright White	(Blank)-Carbon Bronze	PC2-Photocontrol 18W 277V ¹	XTOR-F-ACC-Acces Floodlight Kit ¹
XTOR-B-Standard Door, 26W	(Blank)-Bright White	(Blank)-Carbon Bronze	PC3-Photocontrol 26W 277V ¹	XTOR-F-TN-Transom Floodlight Kit ¹
XTOR-B-Standard Door, 36W	(Blank)-Bright White	(Blank)-Carbon Bronze	PC4-Photocontrol 36W 277V ¹	XTOR-F-KC-WT-Krudzie Floodlight Kit, Summit White ¹
XTOR-B-Standard Door, 12W	W-Neutral White, 4000K	W-Neutral White, 4000K	W-Neutral White, 4000K	XTOR-F-TN-Transom Floodlight Kit, Summit White ¹
XTOR-B-Standard Door, 18W	W-Neutral White, 4000K	W-Neutral White, 4000K	W-Neutral White, 4000K	XTOR-F-TN-Transom Floodlight Kit, Summit White ¹
XTOR-B-Standard Door, 26W	W-Neutral White, 4000K	W-Neutral White, 4000K	W-Neutral White, 4000K	XTOR-F-TN-Transom Floodlight Kit, Summit White ¹
XTOR-B-Standard Door, 36W	W-Neutral White, 4000K	W-Neutral White, 4000K	W-Neutral White, 4000K	XTOR-F-TN-Transom Floodlight Kit, Summit White ¹
XTOR-B-Standard Door, 12W	W-Neutral White, 4000K	W-Neutral White, 4000K	W-Neutral White, 4000K	XTOR-F-TN-Transom Floodlight Kit, Summit White ¹
XTOR-B-Standard Door, 18W	W-Neutral White, 4000K	W-Neutral White, 4000K	W-Neutral White, 4000K	XTOR-F-TN-Transom Floodlight Kit, Summit White ¹
XTOR-B-Standard Door, 26W	W-Neutral White, 4000K	W-Neutral White, 4000K	W-Neutral White, 4000K	XTOR-F-TN-Transom Floodlight Kit, Summit White ¹
XTOR-B-Standard Door, 36W	W-Neutral White, 4000K	W-Neutral White, 4000K	W-Neutral White, 4000K	XTOR-F-TN-Transom Floodlight Kit, Summit White ¹

NOTES:
1. DesignLights Consortium[®] Qualified and classified for both DCC Standard and DCC Premium, refer to www.designlights.org for details.
2. Photocontrols are factory installed.
3. Color PC2 for 347V needed.
4. This luminaire is not suitable with 144 series or with 347V. XTOR-B not available with 144 series or 347V combination.
5. Wire guard for walkway mount. Not for use with Floodlight Kit.
6. Floodlight kit accessories required with standard (S) or medium (M) lens, small and large top caps and small and large impact shields.
7. Only product configurations with these designated prefixes are built to comply with the Buy American Act of 1930 (BAA) or Trade Agreements Act of 1974 (TAA), respectively. Please refer to DOMESTIC PREFERENCE website for more information. Components shipped separately may be separately analyzed under domestic preference requirements.
8. Accessories sold separately will be separately analyzed under domestic preference requirements. Consult factory for further information.

STOCK ORDERING INFORMATION

Domestic Preference ¹	12W Series	18W Series	26W Series	36W Series
(Blank)-Standard	XTOR-B-12W, 5000K, Carbon Bronze	XTOR-B-18W, 5000K, Carbon Bronze	XTOR-B-26W, 5000K, Carbon Bronze	XTOR-B-36W, 5000K, Carbon Bronze
BAA-Buy American Act	XTOR-B-W-12W, 5000K, Summit White	XTOR-B-W-18W, 4000K, Carbon Bronze	XTOR-B-W-26W, 4000K, Carbon Bronze	XTOR-B-W-36W, 4000K, Carbon Bronze
TAA-Trade Agreements Act	XTOR-B-PC1-12W, 5000K, 120V PC, Carbon Bronze	XTOR-B-PC1-18W, 5000K, 120V PC, Carbon Bronze	XTOR-B-PC1-26W, 5000K, 120V PC, Carbon Bronze	XTOR-B-PC1-36W, 5000K, 120V PC, Carbon Bronze
	XTOR-B-W-PC1-12W, 4000K, 120V PC, Carbon Bronze	XTOR-B-W-PC1-18W, 4000K, 120V PC, Carbon Bronze	XTOR-B-W-PC1-26W, 4000K, 120V PC, Carbon Bronze	XTOR-B-W-PC1-36W, 4000K, 120V PC, Carbon Bronze
	XTOR-B-W-PC1-12W, 5000K, 120V PC, Carbon Bronze	XTOR-B-W-PC1-18W, 5000K, 120V PC, Carbon Bronze	XTOR-B-W-PC1-26W, 5000K, 120V PC, Carbon Bronze	XTOR-B-W-PC1-36W, 5000K, 120V PC, Carbon Bronze

NOTES:
1. Only product configurations with these designated prefixes are built to comply with the Buy American Act of 1930 (BAA) or Trade Agreements Act of 1974 (TAA), respectively. Please refer to DOMESTIC PREFERENCE website for more information. Components shipped separately may be separately analyzed under domestic preference requirements.

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: _____
LAND USE ADMINISTRATOR



ISSUED FOR PERMITTING
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B&V PROJECT NUMBER: 419596

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ANSI D 34622
12/28/2024 11:55 AM

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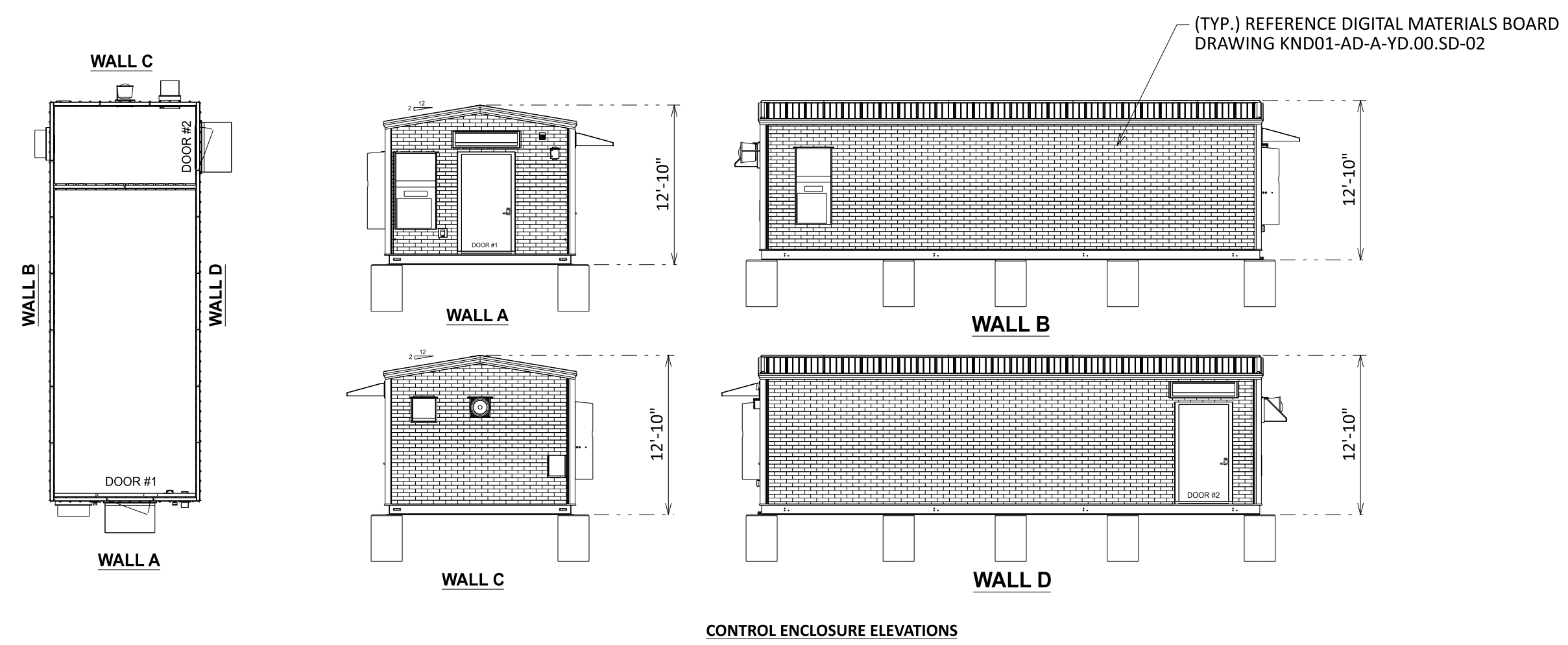
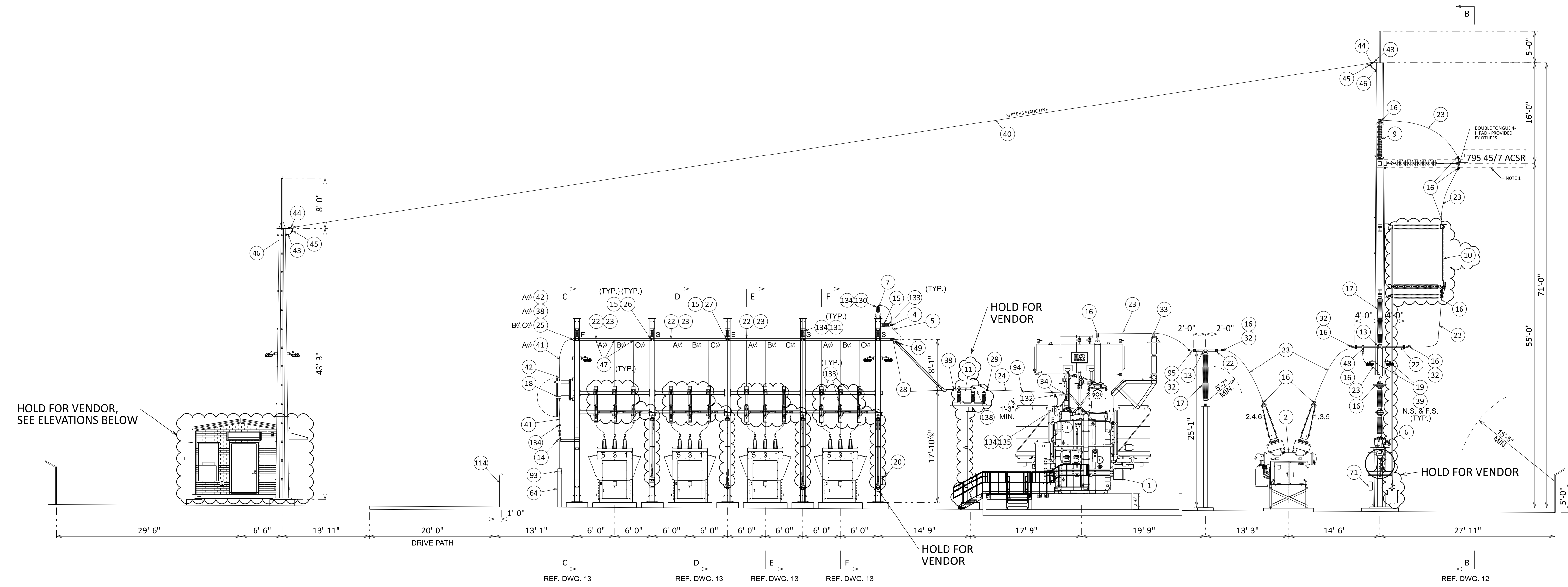
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DESIGNER	BCA	DRAWN	RSN
CHECKED	OOO	DATE	23/AUG/24

BLACK & VEATCH
17401 LAMAR AVENUE
OVERLAND PARK, KANSAS 66211

DUKE ENERGY
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM
SITE CONTROL CENTER ARCHITECTURAL PLAN
5201 KNIGHTDALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM	KND01-VEN-LG-E-SD-03	C



- LEGEND:**
- (XX) BOM ITEM NO. SEE REFERENCE DWG #7, #8 AND #9
 - F FIXED BUS SUPPORT
 - S SLIP BUS SUPPORT
 - E EXPANSION BUS SUPPORT
 - N.S. NEAR SIDED
 - F.S. FAR SIDED

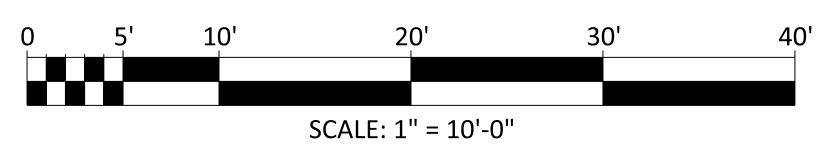
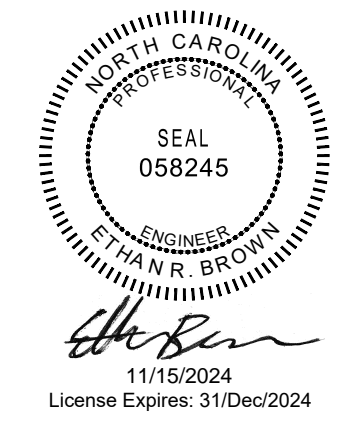
- NOTES:**
1. INCOMING LINE AND DEAD END EQUIPMENT PROCURED AND INSTALLED BY OTHERS.
 2. ALL VERTICAL DIMENSIONS ARE FROM BOTTOM OF STEEL.
 3. MAINTAIN 8'-6" CLEARANCE FROM THE BOTTOM OF BREAKER BUSHING TO THE TOP OF CONCRETE.

TOWN CERTIFICATION
 THIS DESIGN HAS BEEN REVIEW 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: _____
 LAND USE ADMINISTRATOR



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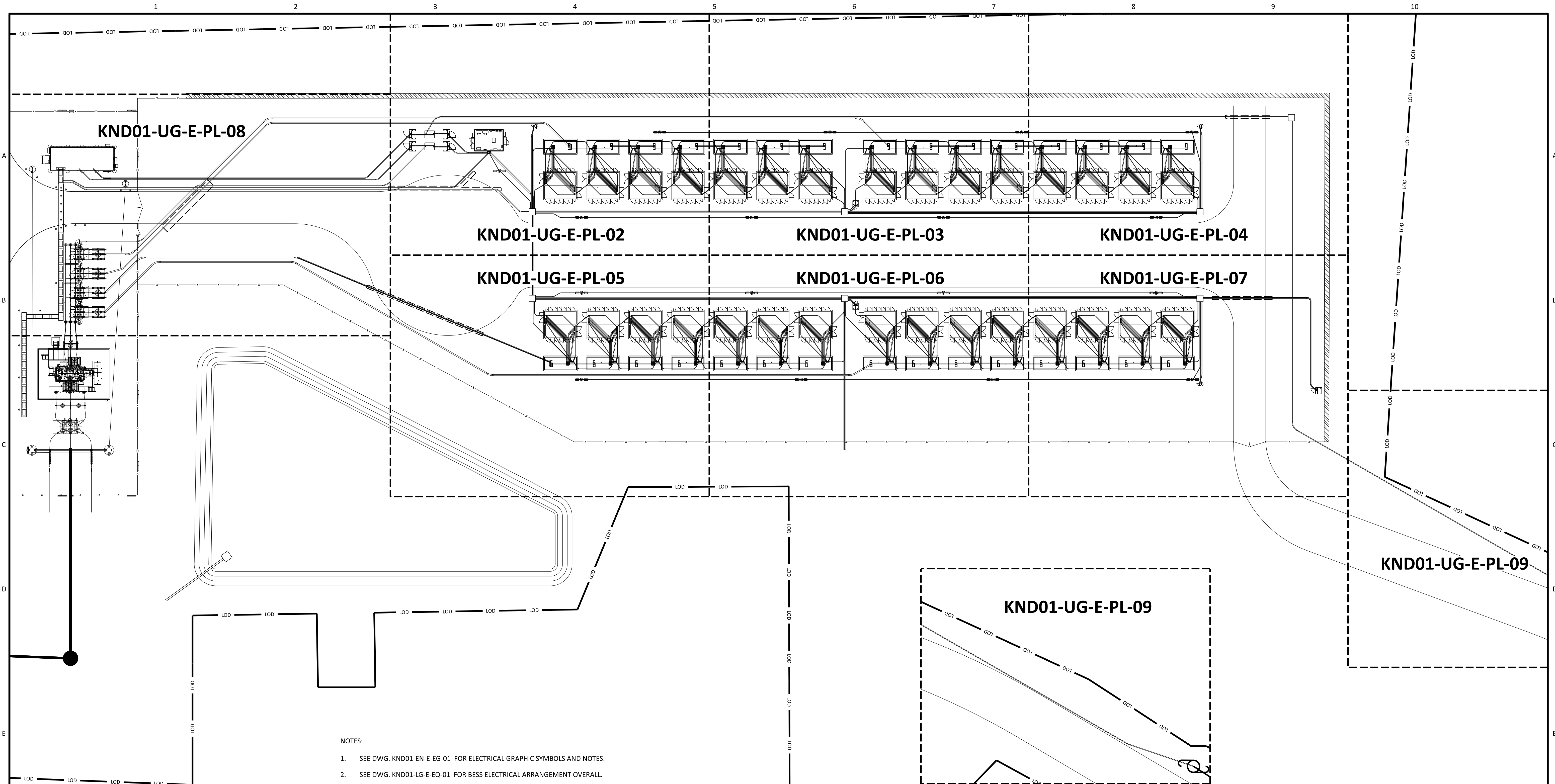
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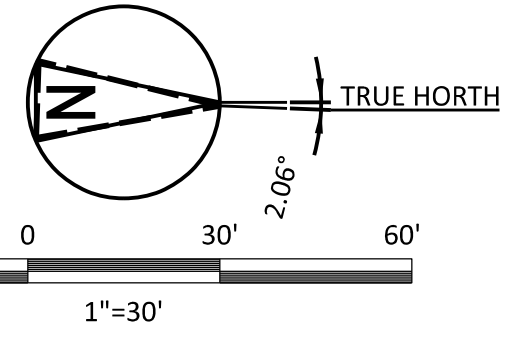
DUKE ENERGY
 KNIGHTDALE BESS

STATION CONTROL ENCLOSURE ARCHITECTURAL PLAN
 5201 KNIGHTDALE EAGLE ROCK ROAD
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND00-GA-M-SY.00.EV-01		C
CODE	AREA	



- NOTES:
- SEE DWG. KND01-EN-E-EG-01 FOR ELECTRICAL GRAPHIC SYMBOLS AND NOTES.
 - SEE DWG. KND01-LG-E-EQ-01 FOR BESS ELECTRICAL ARRANGEMENT OVERALL.
 - SEE DWG. KND01-GD-E-PL-01 FOR GROUNDING BESS PLANT OVERALL.
 - SEE DWG. KND01-CV-C-FD-XX FOR EQUIPMENT FOUNDATION PLAN AND DETAILS.
 - ALL CONDUITS CROSSING THE ROADWAY SHALL BE COVERED IN CONCRETE PRIOR TO BACKFILL. CONCRETE ENCASEMENT SHALL EXTEND 5' FROM EACH SIDE OF THE ROAD AND INCLUDE THE WIDTH OF THE TRENCH.
 - POLYWATER J LUBRICANT SHALL BE USED FOR ALL MEDIUM VOLTAGE CABLE PULL WITHIN UNDERGROUND CONDUITS.



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 BY: _____ DATE: _____
 LAND USE ADMINISTRATOR

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B&V PROJECT NUMBER: 419596

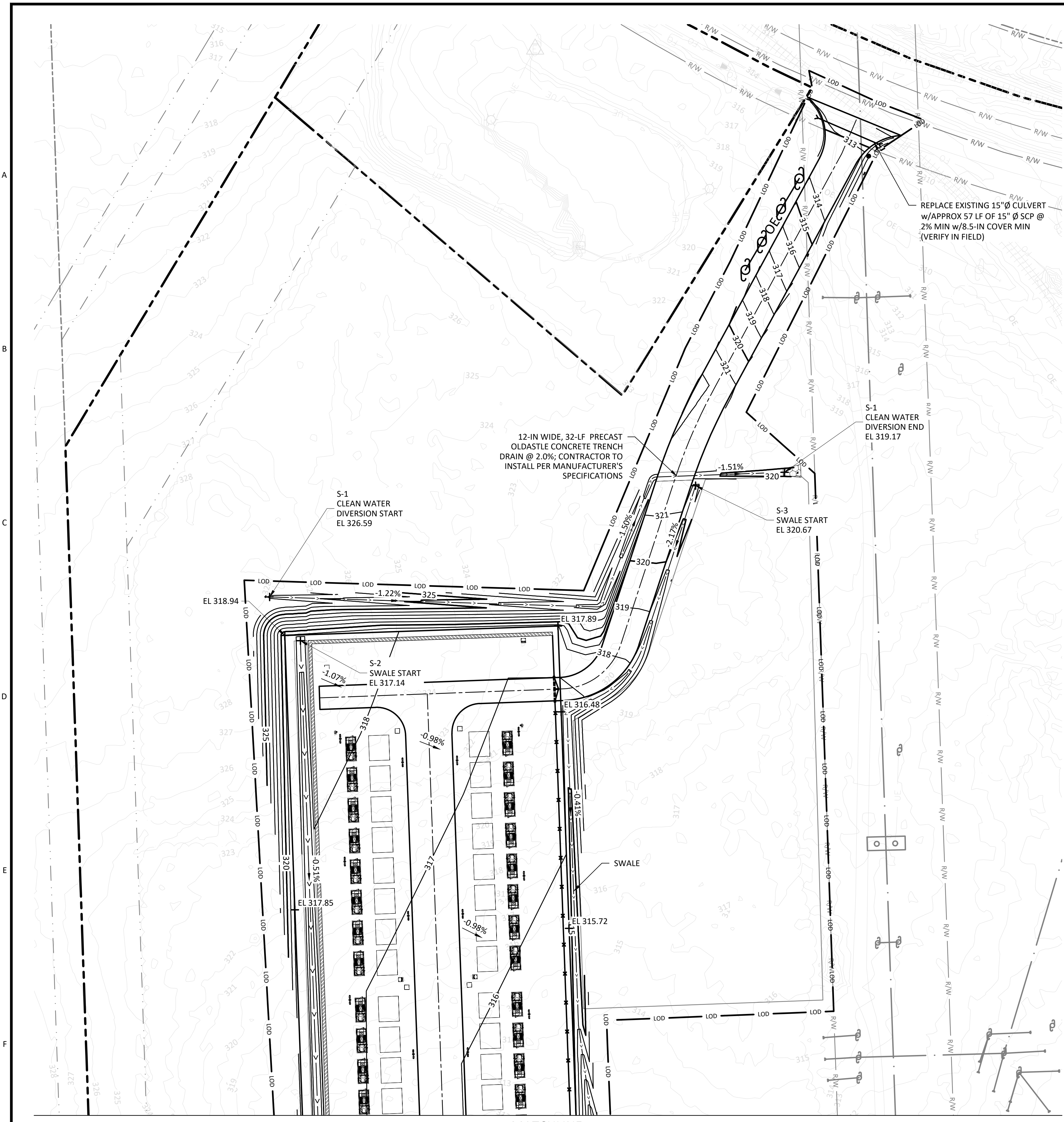
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C	13/SEP/24	ISSUED FOR PERMIT	RSN	RSN	OOO	OOO	BC
B	03/SEP/24	ISSUED FOR CLIENT 60% REVIEW	RSN	RSN	OOO	OOO	BC
A	23/AUG/24	ISSUED FOR PERMIT	RSN	RSN	OOO	OOO	BC

BLACK & VEATCH		DUKE ENERGY	
DESIGNER	RSN	DRAWN	RSN
CHECKED	OOO	DATE	03/SEP/24

DUKE ENERGY
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM
 ELECTRICAL UNDERGROUND CONDUIT BESS
 5201 KNIGHTDALE EAGLE ROCK ROAD
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
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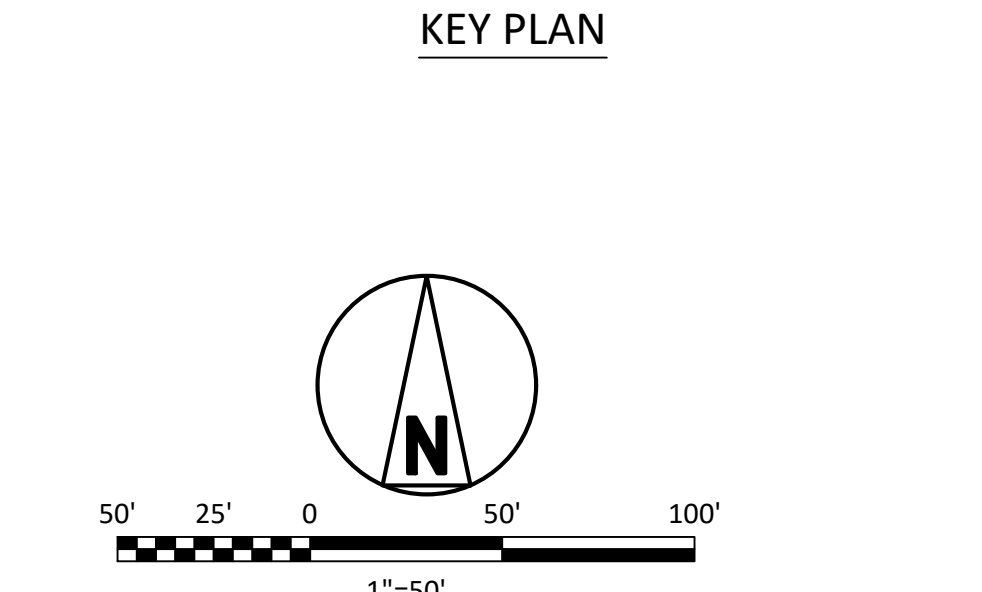
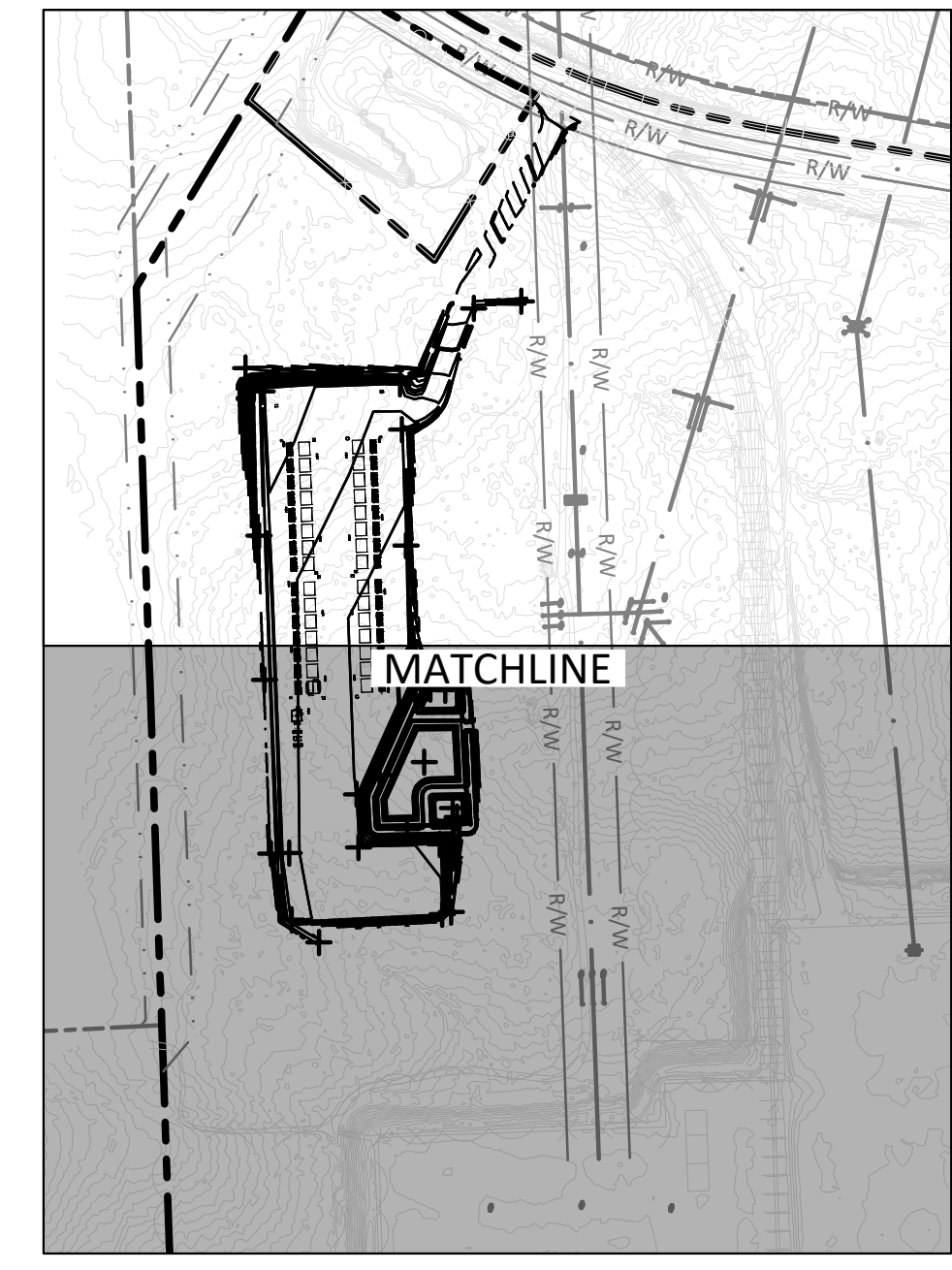


- CONSTRUCTION SEQUENCE:**
- FOR EROSION CONTROL CONSTRUCTION SEQUENCE, SEE SHEET KND01-CV-C-EC-SD-01.
 - SCHEDULE AND ONSITE PRE-CONSTRUCTION MEETING WITH THE TOWN OF KNIGHTDALE TO INSPECT THE INSTALLED PERIMETER CONTROLS PER THE EROSION CONTROL PLAN.
 - CALL TOWN OF KNIGHTDALE EROSION CONTROL INSPECTOR TO SCHEDULE AN ONSITE INSPECTION AND OBTAIN A CERTIFICATE OF COMPLIANCE.
 - BEGIN CLEARING AND GRUBBING. ALL EROSION CONTROL DEVICES SHALL BE MAINTAINED PER THE EROSION AND SEDIMENT CONTROL PLAN.
 - INSTALL STORMWATER CONVEYANCE MEASURES. PERFORM MASS GRADING ACTIVITIES.
 - STABILIZE SITE AS AREAS ARE BROUGHT UP TO FINISH GRADE ELEVATIONS IN ACCORDANCE WITH THE EROSION CONTROL PLAN.
 - WHEN CONSTRUCTION IS COMPLETE AND ALL AREAS ARE STABILIZED COMPLETELY, CALL EROSION CONTROL INSPECTOR FOR AN INSPECTION.
 - IF SITE IS APPROVED, REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES. CONVERT SEDIMENT BASIN TO WET POND. SEE SHEET KND01-CV-C-SD.04 FOR CONVERSION SEQUENCE.
 - WHEN VEGETATION HAS BECOME ESTABLISHED, CALL FOR A FINAL INSPECTION BY THE EROSION CONTROL INSPECTOR. OBTAIN A CERTIFICATE OF COMPLETION.

- NOTES**
- SPOT ELEVATIONS AND CONTOURS ON THESE DRAWINGS ARE TOP OF FINAL SURFACE GRADE (SEE TYPICAL AGGREGATE SURFACING SECTIONS ON KND01-CV-C-GR-SD-01). SUBTRACT AGGREGATE SURFACING THICKNESS TO OBTAIN TOP OF CONSTRUCTION WORKING SURFACE AND TOP OF SUBGRADE.
 - GRADE PLANS SHALL SLOPE UNIFORMLY BETWEEN FINISH SPOT ELEVATIONS AND CONTOURS SHOWN ON THE PLANS.
 - UNLESS NOTED OTHERWISE, SLOPES SHALL BE 3:1 (H:V).
 - SLOPE GRADE TO DRAIN IN DIRECTION OF FLOW ARROWS.
 - PERFORM FIELD IN-PLACE DENSITY TESTS ACCORDING TO ASTM D695 (NUCLEAR METHOD), 98% STANDARD PROCTOR MAXIMUM DRY DENSITY FOR STRUCTURAL/SUBBASE AND BASE BACKFILL, 95% STANDARD PROCTOR MAXIMUM DRY DENSITY FOR NON-STRUCTURAL/ON-SITE FILL MATERIAL BACKFILL.
 - PREVENT SURFACE WATER AND SUBSURFACE OR GROUNDWATER FROM ENTERING EXCAVATIONS, FROM PONDING ON PREPARED SUBGRADES, AND FROM FLOODING PROJECT SITE & SURROUNDING AREA. PROTECT SUBGRADES AND FOUNDATION SOILS FROM SOFTENING AND DAMAGE BY RAIN OR WATER ACCUMULATION.
 - PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY APPROPRIATE COMPACTION EQUIPMENT AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND OPERATED TAMPERS.
 - FILL MATERIALS SHALL BE IMPORTED FROM A MINE OR SITE APPROVED BY THE NCDEQ FOR PROPER EROSION CONTROL.
 - HORIZONTAL CONTROL IS BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NAD83. VERTICAL CONTROL IS BASED ON NAVD88.
 - SURVEY PROVIDED BY THE JOHN R. MCADAMS COMPANY, INC ON 03/26/2024. BEYOND LIMITS OF SURVEY. ELEVATION DATA SHOWN IS BASED ON PUBLICLY AVAILABLE DATA. CONTRACTOR TO FIELD VERIFY ELEVATIONS BEYOND LIMITS OF SURVEY.
 - DEMOLISH EXISTING CULVERT AT NEW CONSTRUCTION ENTRANCE, REPLACE WITH N-12 WT 15 INCH CULVERT PIPE, WITH MINIMUM 1' OF COVER. COVER TO BE CLASS III MATERIAL TO 95% PROCTOR DENSITY OR CLASS II BACKFILL MATERIAL TO 90% STANDARD PROCTOR DENSITY AROUND THE PIPE AND STRUCTURAL BACKFILL TO THE CROWN OF THE PIPE
- **REQUIRED SCM INSPECTION NOTE:**
THE TOWN OF KNIGHTDALE REQUIRES THAT ALL INFRASTRUCTURE INSTALLATION BE OBSERVED BY SOMEONE OPERATING UNDER THE DESIGN ENGINEERS AUTHORITY, A LICENSED GEOTECH, AND A REPRESENTATIVE FROM THE TOWN OF KNIGHTDALE. REFERENCE THE DETAILED SCM INSPECTIONS SEQUENCE.

LEGEND

	ADJACENT PARCEL BOUNDARY
	PROPOSED SECURITY FENCE
	EXISTING FENCE
	PROPOSED ROAD
	EXISTING TREE LIMITS
	EXISTING RAILROAD
	EXISTING OVERHEAD LINE
	PROPERTY BOUNDARY
	PROPOSED OVERHEAD ELECTRIC LINES
	HIGH POWERED OVERHEAD ELECTRIC LINES
	EXISTING RIGHT-OF-WAY
	EXISTING FIBER OPTIC CABLE
	LIMITS OF DISTURBANCE
	PROPOSED PERIMETER WALL
	PROPOSED VEGETATED SWALE
	EXISTING MINOR CONTOUR LINES
	EXISTING MAJOR CONTOUR LINES
	MINOR CONTOUR LINES
	MAJOR CONTOUR LINES
	RIP RAP



TOWN CERTIFICATION
THIS DESIGN HAS BEEN REVIEW 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: _____
LAND USE ADMINISTRATOR

ISSUED FOR PERMITTING
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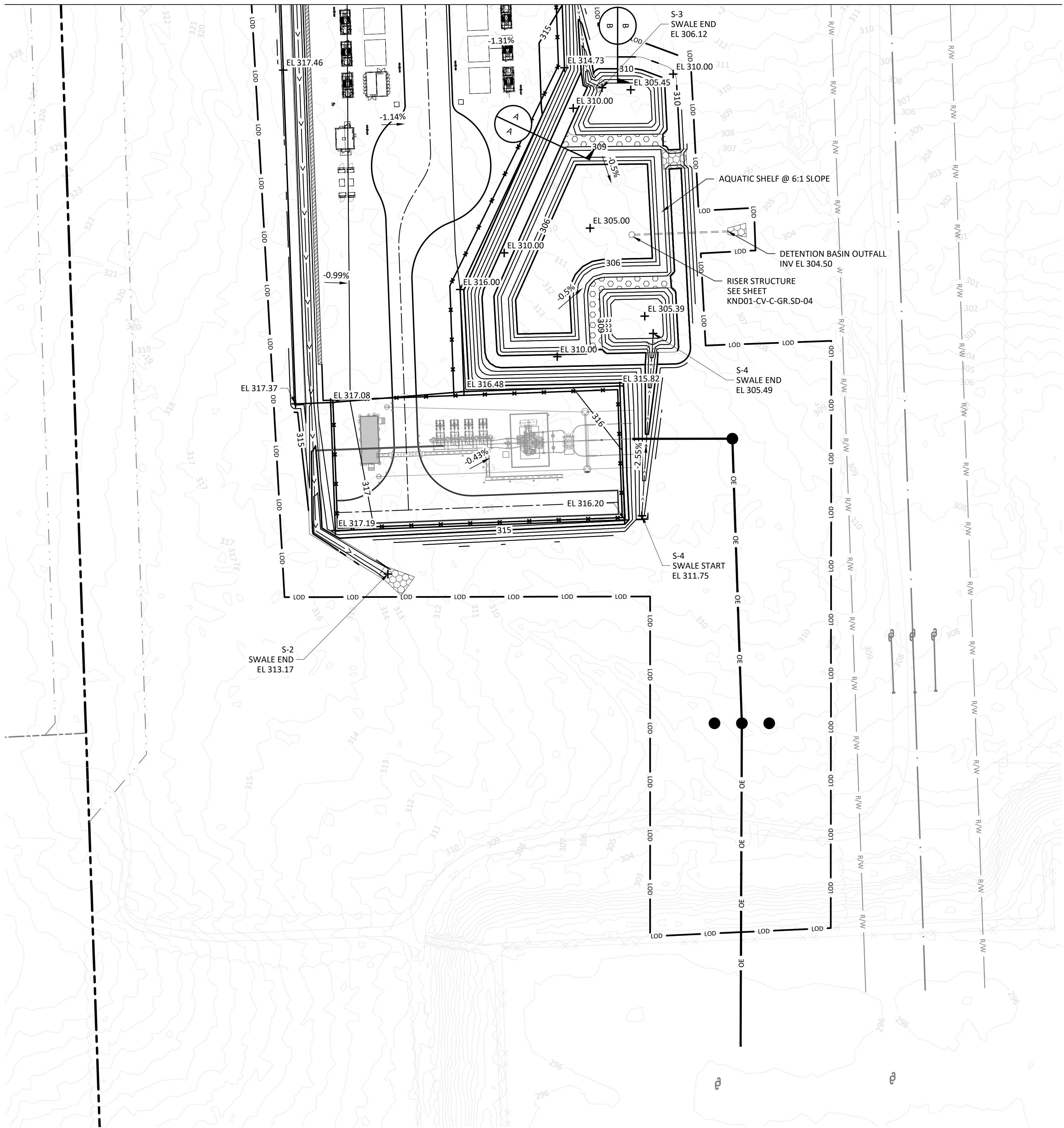
[Professional Engineer Seal]

Civil 3D 2022 Imperial
Full Size 1=1
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NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
D	25/sep/24	ISSUED FOR PERMITTING	CLC	MJM	HGU	WL	
C	12/sep/24	ISSUED FOR PERMITTING	CLC	MJM	HGU	SLD	
B	30/AUG/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	SLD	
A	22/AUG/2024	ISSUED FOR PERMIT	CLC	MJM	HGU	SLD	
NO							

		DUKE KNIGHTDALE EPC KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM	PROJECT	DRAWING NUMBER	REV
			419596 KND01-CV-C-GR.PL-01	I	
DESIGNER	MJM	DRAWN	CLC	STORMWATER MANAGEMENT PLAN	
CHECKED	HGU	DATE	20/DEC/24	5201 KNIGHTALE EAGLE ROCK ROAD	
			KNIGHTDALE, NC 27545		
			CODE		
			AREA		

MATCHLINE



CONSTRUCTION SEQUENCE:

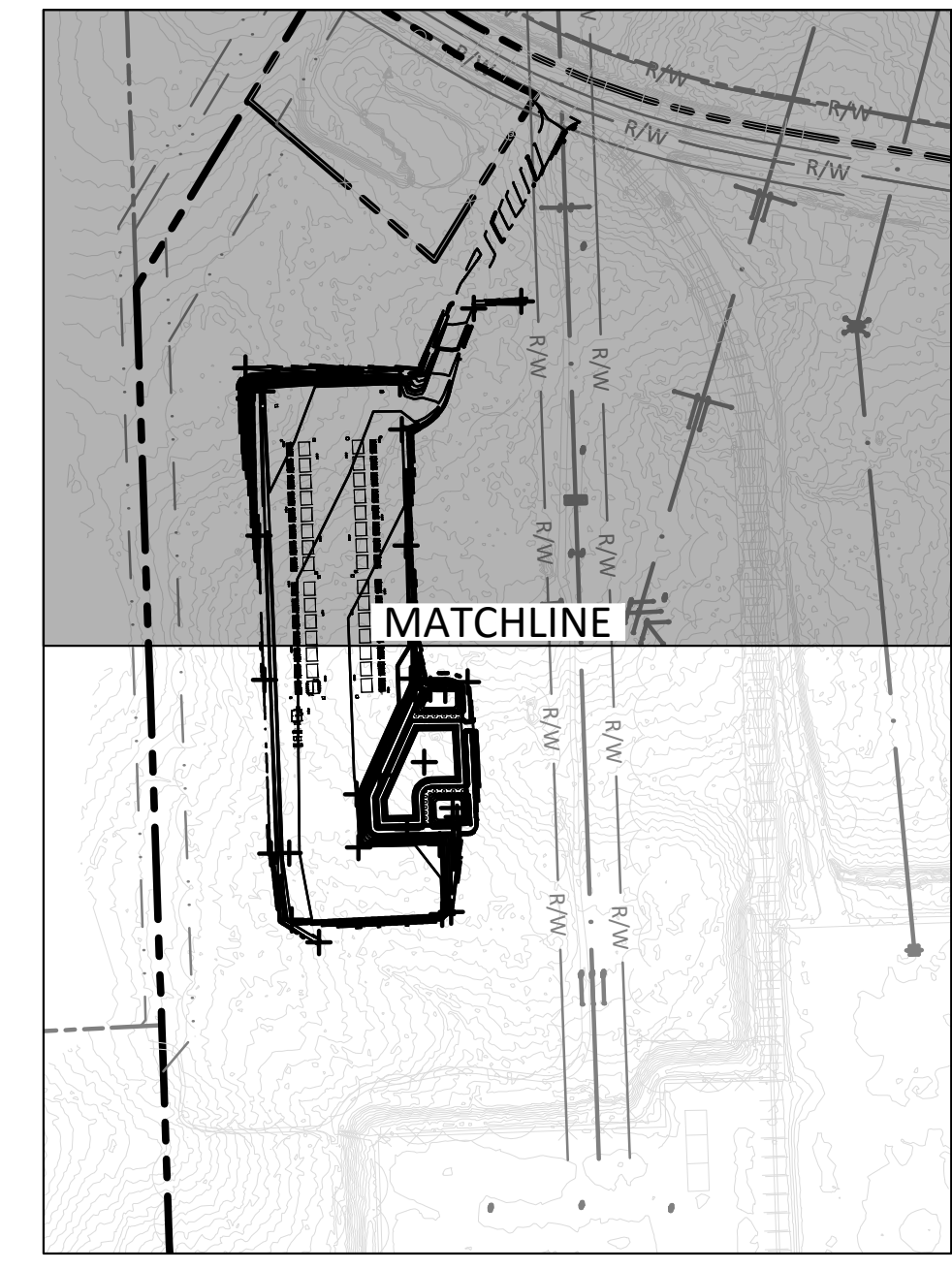
1. FOR EROSION CONTROL CONSTRUCTION SEQUENCE, SEE SHEET KND01-CV-C-EC-SD-01.
2. SCHEDULE AND ONSITE PRE-CONSTRUCTION MEETING WITH THE TOWN OF KNIGHTDALE TO INSPECT THE INSTALLED PERIMETER CONTROLS PER THE EROSION CONTROL PLAN.
3. CALL TOWN OF KNIGHTDALE EROSION CONTROL INSPECTOR TO SCHEDULE AN ONSITE INSPECTION AND OBTAIN A CERTIFICATE OF COMPLIANCE.
4. BEGIN CLEARING AND GRUBBING. ALL EROSION CONTROL DEVICES SHALL BE MAINTAINED PER THE EROSION AND SEDIMENT CONTROL PLAN.
5. INSTALL STORMWATER CONVEYANCE MEASURES. PERFORM MASS GRADING ACTIVITIES.
6. STABILIZE SITE AS AREAS ARE BROUGHT UP TO FINISH GRADE ELEVATIONS IN ACCORDANCE WITH THE EROSION CONTROL PLAN.
7. WHEN CONSTRUCTION IS COMPLETE AND ALL AREAS ARE STABILIZED COMPLETELY, CALL EROSION CONTROL INSPECTOR FOR AN INSPECTION.
8. IF SITE IS APPROVED, REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES. CONVERT SEDIMENT BASIN TO WET POND. SEE SHEET KND01-CV-C-SD-04 FOR CONVERSION SEQUENCE.
9. WHEN VEGETATION HAS BECOME ESTABLISHED, CALL FOR A FINAL INSPECTION BY THE EROSION CONTROL INSPECTOR. OBTAIN A CERTIFICATE OF COMPLETION.

NOTES

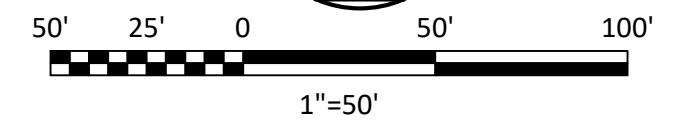
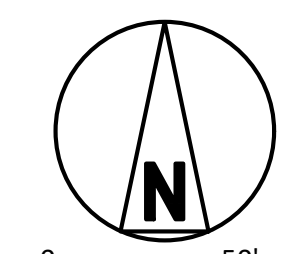
1. SPOT ELEVATIONS AND CONTOURS ON THESE DRAWINGS ARE TOP OF FINAL SURFACE GRADE (SEE TYPICAL AGGREGATE SURFACING SECTIONS ON KND01-CV-C-GR-SD-01). SUBTRACT AGGREGATE SURFACING THICKNESS TO OBTAIN TOP OF CONSTRUCTION WORKING SURFACE AND TOP OF SUBGRADE.
 2. GRADE PLANS SHALL SLOPE UNIFORMLY BETWEEN FINISH SPOT ELEVATIONS AND CONTOURS SHOWN ON THE PLANS.
 3. UNLESS NOTED OTHERWISE, SLOPES SHALL BE 3:1 (H:V).
 4. SLOPE GRADE TO DRAIN IN DIRECTION OF FLOW ARROWS.
 5. PERFORM FIELD IN-PLACE DENSITY TESTS ACCORDING TO ASTM D695 (NUCLEAR METHOD), 98% STANDARD PROCTOR MAXIMUM DRY DENSITY FOR STRUCTURAL/SUBBASE AND BASE BACKFILL, 95% STANDARD PROCTOR MAXIMUM DRY DENSITY FOR NON-STRUCTURAL/ON-SITE FILL MATERIAL BACKFILL.
 6. PREVENT SURFACE WATER AND SUBSURFACE OR GROUNDWATER FROM ENTERING EXCAVATIONS, FROM PONDING ON PREPARED SUBGRADES, AND FROM FLOODING PROJECT SITE & SURROUNDING AREA. PROTECT SUBGRADES AND FOUNDATION SOILS FROM SOFTENING AND DAMAGE BY RAIN OR WATER ACCUMULATION.
 7. PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY APPROPRIATE COMPACTION EQUIPMENT AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND OPERATED TAMPERS.
 8. FILL MATERIALS SHALL BE IMPORTED FROM A MINE OR SITE APPROVED BY THE NCDEQ FOR PROPER EROSION CONTROL.
 9. HORIZONTAL CONTROL IS BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NAD83. VERTICAL CONTROL IS BASED ON NAVD88.
 10. SURVEY PROVIDED BY THE JOHN R. MCADAMS COMPANY, INC ON 03/26/2024. BEYOND LIMITS OF SURVEY. ELEVATION DATA SHOWN IS BASED ON PUBLICLY AVAILABLE DATA. CONTRACTOR TO FIELD VERIFY ELEVATIONS BEYOND LIMITS OF SURVEY.
 11. DEMOLISH EXISTING CULVERT AT NEW CONSTRUCTION ENTRANCE, REPLACE WITH N-12 WT 15 INCH CULVERT PIPE, WITH MINIMUM 1' OF COVER. COVER TO BE CLASS III MATERIAL TO 95% PROCTOR DENSITY OR CLASS II BACKFILL MATERIAL TO 90% STANDARD PROCTOR DENSITY AROUND THE PIPE AND STUCTURAL BACKFILL TO THE CROWN OF THE PIPE
- **REQUIRED SCM INSPECTION NOTE:**
THE TOWN OF KNIGHTDALE REQUIRES THAT ALL INFRASTRUCTURE INSTALLATION BE OBSERVED BY SOMEONE OPERATING UNDER THE DESIGN ENGINEERS AUTHORITY, A LICENSED GEOTECH, AND A REPRESENTATIVE FROM THE TOWN OF KNIGHTDALE. REFERENCE THE DETAILED SCM INSPECTIONS SEQUENCE.

LEGEND

- ADJACENT PARCEL BOUNDARY
- X-X- PROPOSED SECURITY FENCE
- X-X-X- EXISTING FENCE
- PROPOSED ROAD
- EXISTING TREE LIMITS
- EXISTING RAILROAD
- EXISTING OVERHEAD LINE
- PROPERTY BOUNDARY
- PROPOSED OVERHEAD ELECTRIC LINES
- HIGH POWERED OVERHEAD ELECTRIC LINES
- R/W --- EXISTING RIGHT-OF-WAY
- FO --- EXISTING FIBER OPTIC CABLE
- LOD --- LIMITS OF DISTURBANCE
- PROPOSED PERIMETER WALL
- PROPOSED VEGETATED SWALE
- 800 --- EXISTING MINOR CONTOUR LINES
- 800 --- EXISTING MAJOR CONTOUR LINES
- 800 --- MINOR CONTOUR LINES
- 800 --- MAJOR CONTOUR LINES
- RIP RAP



KEY PLAN



TOWN CERTIFICATION
THIS DESIGN HAS BEEN REVIEW 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.

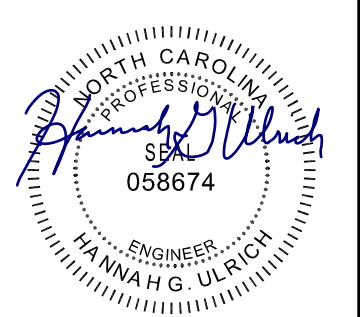
BY: _____ DATE: _____
TOWN ENGINEER

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BY: _____ DATE: _____
LAND USE ADMINISTRATOR

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I	20/DEC/2024	ISSUED FOR PERMITTING	CLC MJM/HGU WL	D	18/NOV/2024	ISSUED FOR PERMITTING	CLC MJM/HGU WL
H	21/NOV/2024	90% SUBMITTAL	CLC MJM/HGU WL	C	25/OCT/2024	ISSUED FOR PERMITTING	CLC MJM/HGU/SLD
G	15/NOV/2024	ISSUED FOR PERMITTING	CLC MJM/HGU WL	B	30/AUG/2024	ISSUED FOR 60% REVIEW	CLC MJM/HGU/SLD
F	30/OCT/2024	ISSUED FOR 90% CLIENT REVIEW	CLC MJM/HGU/SLD	A	22/AUG/2024	ISSUED FOR PERMIT	CLC MJM/HGU/SLD -
E	27/SEP/2024	ISSUED FOR PERMITTING	CLC MJM/HGU/SLD	NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN/DES/CHK/PDE/APP

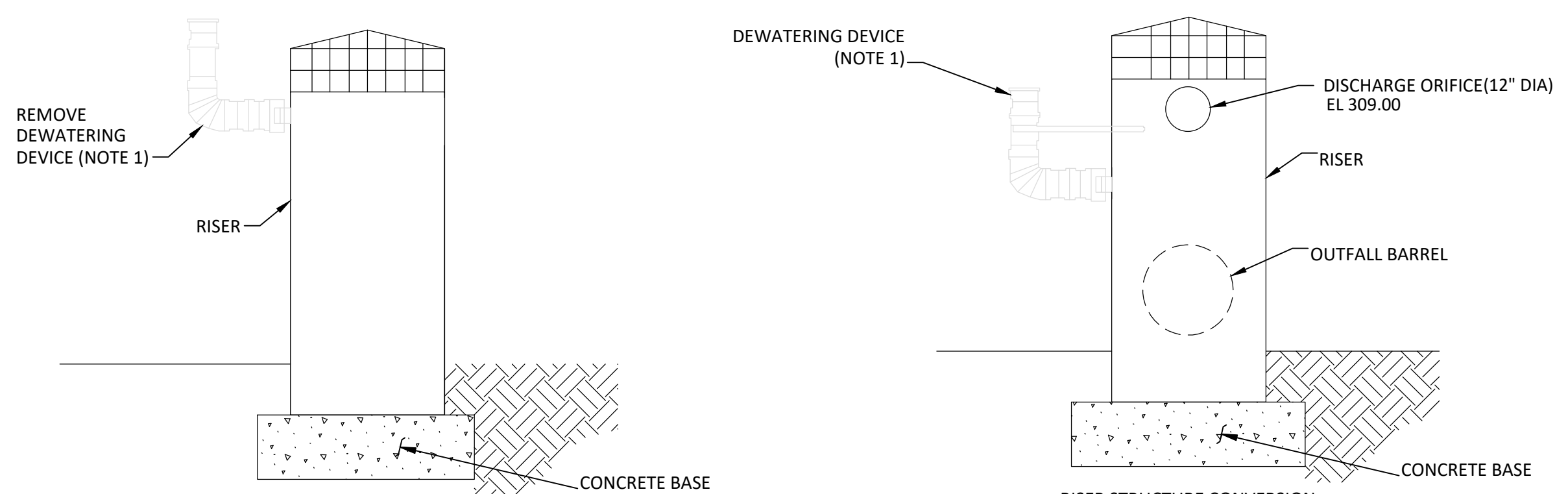
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DESIGNER: MJM DRAWN: CLC
CHECKED: HGU DATE: 20/DEC/24

DUKE ENERGY DUKE KNIGHTDALE EPC
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

STORMWATER MANAGEMENT PLAN
5201 KNIGHTALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-GR.PL-02	I	
CODE	AREA	

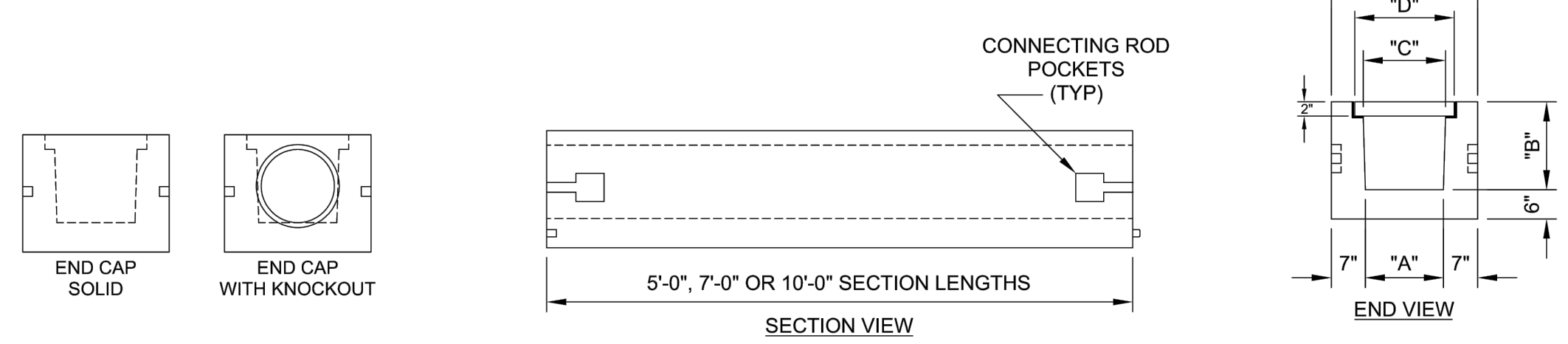


RISER STRUCTURE CONVERSION FROM SEDIMENT POND TO PERMANENT WET POND

NOTE
 1. REMOVE DEWATERING DEVICE FROM SEDIMENT BASIN AND PROVIDE WATER TIGHT PLUG TO HOLE.
 2. REMOVE PLATE AND INSTALL DOWN-TURN ELBOW PER THE METAL ORIFICE PLATE DETAIL. FILL PLATE MOUNTING HOLES WITH NON-SHRINK GROUT.

RISER STRUCTURE CONVERSION FROM SEDIMENT POND TO PERMANENT WET POND

NOTE
 1. REMOVE DEWATERING DEVICE FROM SEDIMENT BASIN, REUSE EXISTING ORIFICE FOR PRIMARY DEWATERING DEVICE AND INSTALL A DOWN-TURN LONG RADIUS 90 DEGREE. INSPECT DEWATERING DEVICE FROM DAMAGE OR EXCESSIVE WEAR, REPLACE IF NEEDED.



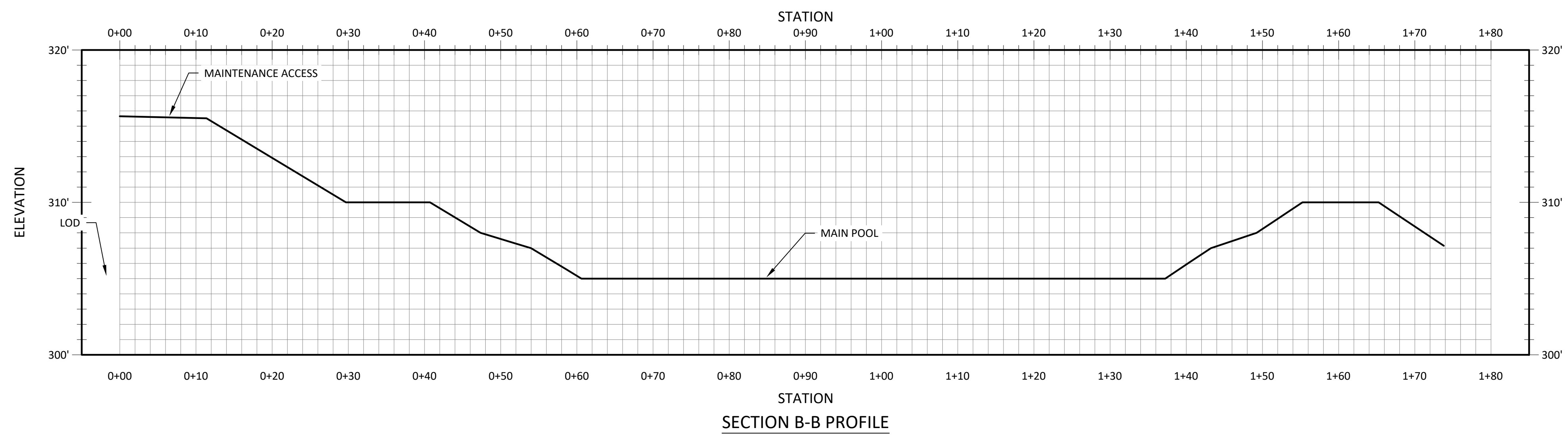
TRENCH DRAIN DETAIL
NOT TO SCALE

"A"	"B"	"C"	"D"	"E"
12"	16"	13"	16-5/8"	26"
16"	18"	16-7/8"	20-3/4"	30"
16"	24"	17-1/4"	20-3/4"	30"
24"	18"	24-7/8"	28-3/4"	38"
24"	24"	25-1/4"	28-3/4"	38"
26"	18"	26-7/8"	30-3/4"	40"
26"	24"	27-1/4"	30-3/4"	40"

"D" = GRATE WIDTH

NOTES:
 1. CONCRETE STRENGTH: 4000 PSI MIN @ 28 DAYS
 2. REINFORCING CONFORMS TO ASTM A615 & A185
 3. DESIGN: HS-25 TRAFFIC LOADING
 4. GRATE DESIGN: HS-25 TRAFFIC LOADING

RISER CONVERSION FROM TEMPORARY SEDIMENT BASIN TO PERMANENT POND
NOT TO SCALE



SECTION B-B PROFILE

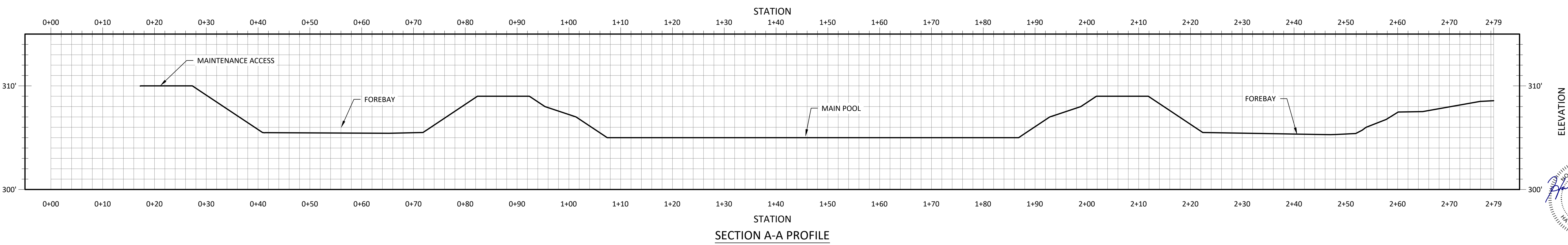
TOWN CERTIFICATION
 THIS DESIGN HAS BEEN REVIEW BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY: _____ DATE: _____
 TOWN ENGINEER

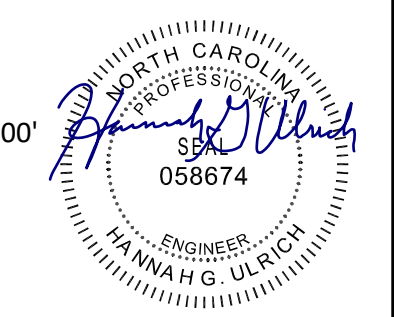
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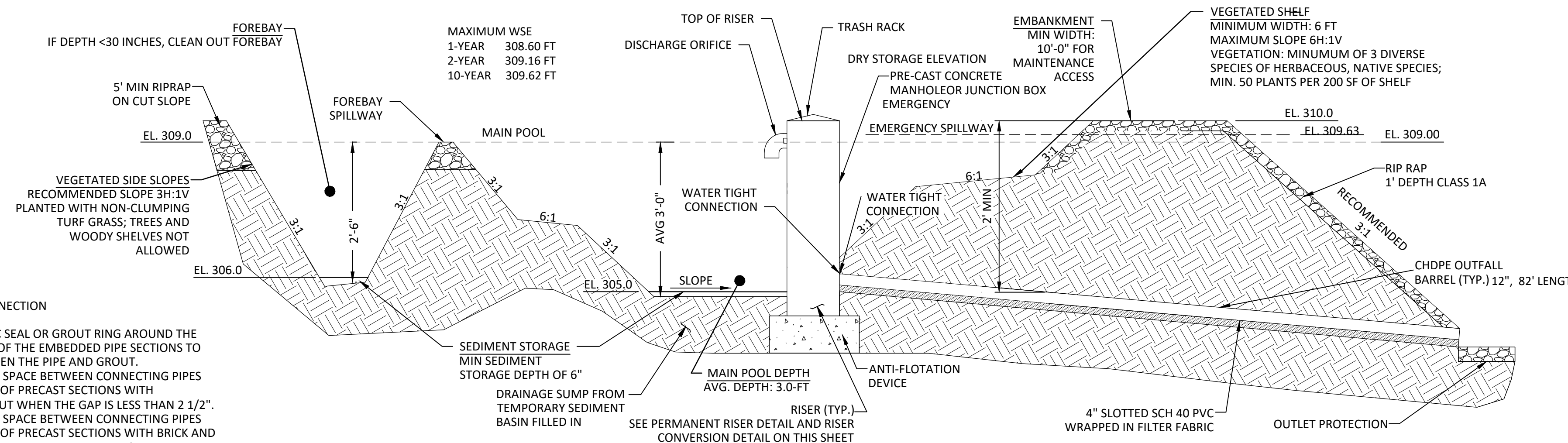


SECTION A-A PROFILE



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DESIGNER	MJM	DRAWN	RAR	PROJECT	DUKE KNIGHTDALE EPC KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM	DRAWING NUMBER	419596 KND01-CV-C-GR.SD-02	REV	D
CHECKED	HGU	DATE	20/DEC/24	CODE		AREA			
I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF _____ SIGNED _____ DATE _____ REG. NO. _____				GRADING DETAILS 5201 KNIGHTDALE EAGLE ROCK ROAD KNIGHTDALE, NC 27545					
BLACK & VEATCH Building a world of difference®				DUKE ENERGY					
REVISIONS AND RECORD OF ISSUE D 20/DEC/24 ISSUED FOR PERMITTING C 18/NOV/24 ISSUED FOR PERMITTING B 30/OCT/24 ISSUED FOR 90% CLIENT REVIEW A 20/JUN/24 ISSUED FOR PERMITTING									



WET POND CROSS-SECTION DETAIL
NOT TO SCALE

- NOTES:
1. WATERTIGHT RIGID CONNECTION
 - A. PLACE A HYDROPHILIC SEAL OR GROUT RING AROUND THE OUTSIDE PERIMETER OF THE EMBEDDED PIPE SECTIONS TO ACT AS A SEAL BETWEEN THE PIPE AND GROUT.
 - B. COMPLETELY FILL THE SPACE BETWEEN CONNECTING PIPES AND THE RISER WALL OF PRECAST SECTIONS WITH NON-SHRINKING GROUT WHEN THE GAP IS LESS THAN 2 1/2".
 - C. COMPLETELY FILL THE SPACE BETWEEN CONNECTING PIPES AND THE RISER WALL OF PRECAST SECTIONS WITH BRICK AND GROUT WHEN THE GAP IS GREATER THAN 2 1/2".
 2. POND DRAIN VALVE TO REMAIN CLOSED WITH THE EXCEPTION FOR DRAINING THE POND FOR MAINTENANCE PURPOSES.

TEMPORARY SEDIMENT BASIN TO PERMANENT STORMWATER POND CONVERSION NARRATIVE:

1. BASINS MAY NOT BE CONVERTED TO PERMANENT PONDS UNTIL APPROVAL HAS BEEN OBTAINED FROM THE NCDEQ EROSION CONTROL INSPECTOR.
 2. EXISTING EROSION CONTROL MEASURES TO REMAIN IN PLACE AND BE RE-INSTALLED IF IN NEED OF REPAIR.
 3. CONVERT TEMPORARY SEDIMENT BASIN INTO PERMANENT POND PER DETAILS BELOW:
- OBTAIN APPROVAL FROM THE NCDEQ EROSION CONTROL INSPECTOR.
- A. CONTRACTOR TO NOTIFY NCDEQ EROSION CONTROL INSPECTOR PRIOR TO PUMPING DOWN THE BASIN. PUMPING METHOD MUST BE DEEMED ACCEPTABLE BY THE NCDEQ EROSION CONTROL INSPECTOR PRIOR TO BEGINNING THE PUMPING PROCESS. ANY DISCHARGES FROM ANY PUMPING OPERATION MUST BE DISCHARGED THROUGH AN APPROPRIATE EROSION AND SEDIMENT CONTROL DEVICE.
 - B. TEMPORARY SEDIMENT BASIN SHALL BE DESILTED AND REGRADED AS NECESSARY TO THE PROPOSED DESIGN DIMENSIONS.
 - C. REMOVE TEMPORARY PERFORATED DEWATERING PIPE AND PLUG HOLE WITH NON-SHRINK GROUT AS REQUIRED. ALL PLUG APPLICATIONS SHALL BE WATERTIGHT. REMOVE PLUG FOR PERMANENT ORIFICE TO BE EXPOSED.
 - D. FINE GRADE THE DRY DETENTION BASIN AND APPLY TOPSOIL TO ALL POND AREAS THAT WILL BE STABILIZED WITH VEGETATION AND APPLY PERMANENT SEEDING.
 - E. ALLOW FOR PERMANENT SEEDING TO BECOME ESTABLISHED SUFFICIENT TO DETER EROSION.
 - F. RIPRAP OUTLET PROTECTION IS TO REMAIN IN PLACE FOR THE PERMANENT STORMWATER PONDS. CLEAN SEDIMENT OUT OF RIPRAP OUTLET PROTECTION AND RESTORE TO ORIGINAL DESIGN DIMENSIONS AS NEEDED.
4. NO EROSION CONTROL MEASURES CAN BE REMOVED WITHOUT APPROVAL FROM THE NCDEQ EROSION CONTROL INSPECTOR.

REQUIRED SCM SEQUENCE:

PLANTING NOTES THE DAM STRUCTURE, INCLUDING FRONT AND BACK EMBANKMENT SLOPES, OF THE POND SHALL BE VEGETATED WITH NON-CLUMPING TURF GRASS OR SOD. (CENTIPEDE/HYBRID-BERMUDA) 90% GERMINATION OF NON-CLUMPING TURF WILL BE REQUIRED PRIOR TO FINAL CERTIFICATION FROM THE TOWN. THE VEGETATED SHELF SHALL BE PLANTED WITH A MINIMUM OF THREE DIVERSE SPECIES OF HERBACEOUS, NATIVE VEGETATION AT A MINIMUM DENSITY OF 50 PLANTS PER 200 FEET OF SHELF AREA. CONTRACTOR TO WORK WITH SOILS SCIENTIST TO ENSURE SOILS ARE ADEQUATE TO SUPPORT PROPER ESTABLISHMENT AND GROWTH OF THE AQUATIC PLANTINGS. CONTRACTOR TO AMEND SOILS AND INSTALL SOILS IN PLANT, SHRUB, AND TREE AREAS PER DETAILS, SOIL SPECIFICATIONS, NCDENR SPECIFICATION, AND SOIL SCIENTIST RECOMMENDATIONS. ALL AQUATIC PLANTINGS ARE TO BE INSTALLED DURING THE APPROPRIATE TIME OF YEAR TO ENSURE SURVIVABILITY. (LAST SPRING FROST AND THE FIRST FALL FROST) ALL DISTURBED AREAS AROUND THE OUTSIDE OF THE DEVICE SHALL BE SEEDED WITH A LAWN AREA SEED MIX (PER SEEDING SPECIFICATIONS) NATIVE GRASSES, LEGUMES, CLOVERS, AND WILDFLOWERS. IF THE DEVICE WAS USED DURING CONSTRUCTION AS A SEDIMENT BASIN OR TRAP, THE BASIN MUST BE CLEANED OUT, GRADED, APPROPRIATE AREAS COVERED WITH 4" OF TOPSOIL AS SPECIFIED IN NOTE #2 ABOVE, AND VEGETATED WITHIN 14 DAYS OF THE COMPLETION OF CONSTRUCTION. CONTRACTOR SHALL WATER ALL VEGETATION AND GRASS ON A WEEKLY BASIS AS NEEDED TO ENSURE GRASS AND PLANT SURVIVAL UNTIL AFTER THE SCM IS CERTIFIED AND ACCEPTED BY THE TOWN.

REQUIRED SCM INSPECTIONS SEQUENCE:

SCM INSTALLATION WHEN SCHEDULING INSPECTIONS, PLEASE CALL THE PUBLIC WORKS ADMINISTRATIVE ASSISTANT AT (919) 217-2250. PLEASE NOTE: THE FOLLOWING PERSONNEL MUST BE PRESENT AT ALL INSPECTIONS: 1) SITE SUPERVISOR 2) GEOTECH 3) AS-BUILT CERTIFYING ENGINEER OR SOMEONE UNDER THEIR SUPERVISION THE FOLLOWING ITEMS MUST BE INSPECTED BY TOK STAFF DURING THE INSTALLATION OF ANY SCM WITH DAM: KEY TRENCH EXCAVATION PRINCIPAL SPILLWAY PIPE AND ASSOCIATED COMPONENTS: CONCRETE CRADLE ANTI-SEEP COLLAR SEEPAGE DIAPHRAGM OUTLET STRUCTURE ANTI-FLOTATION BALLAST ANY SITE-CONSTRUCTED REINFORCED CONCRETE STRUCTURES THE FOLLOWING ITEMS MUST BE INSPECTED BY TOK STAFF DURING THE INSTALLATION OF ANY SAND FILTERS OR BIORETENTION DEVICES SUBGRADE OR CONSTRUCTED FOUNDATION OUTLET OR RISER IN COMBINATION WITH CONNECTING UNDERDRAINS FILTER MEDIA DAM ITEMS ON PREVIOUS LIST IF APPLICABLE GEOTECHNICAL TESTING AND CERTIFICATION ALL REPORTS ARE TO BE SUBMITTED WITHIN 30-DAYS OF DAM COMPLETION REQUIRED GEOTECHNICAL RECORDS INCLUDE: DAM EMBANKMENT MATERIAL COMPOSITION AND DENSITY TESTING WITH A PASSING COMPACTION OF 95% OR GREATER MAP THAT LABELS ALL POINTS WHERE THE DAM AND DAM FOUNDATION AREAS WERE TESTED DIGITAL PHOTOS SHOWING THE DAM FOUNDATION AREAS, THE RISER, THE PRINCIPLE SPILLWAY PIPE, THE CONCRETE CRADLE, THE SEEPAGE DIAPHRAM, RELIEF DRAINS, ETC., BEING INSTALLED.

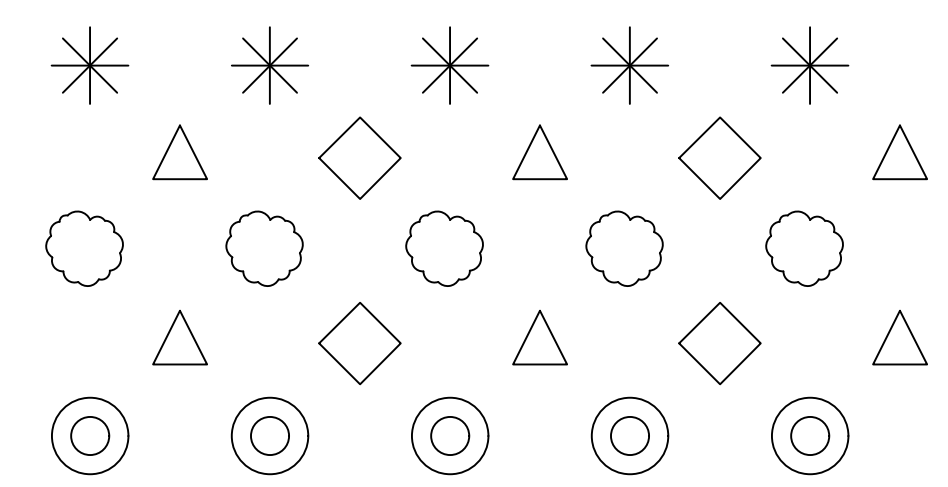
TOWN CERTIFICATION
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BY: _____ DATE: _____
TOWN ENGINEER

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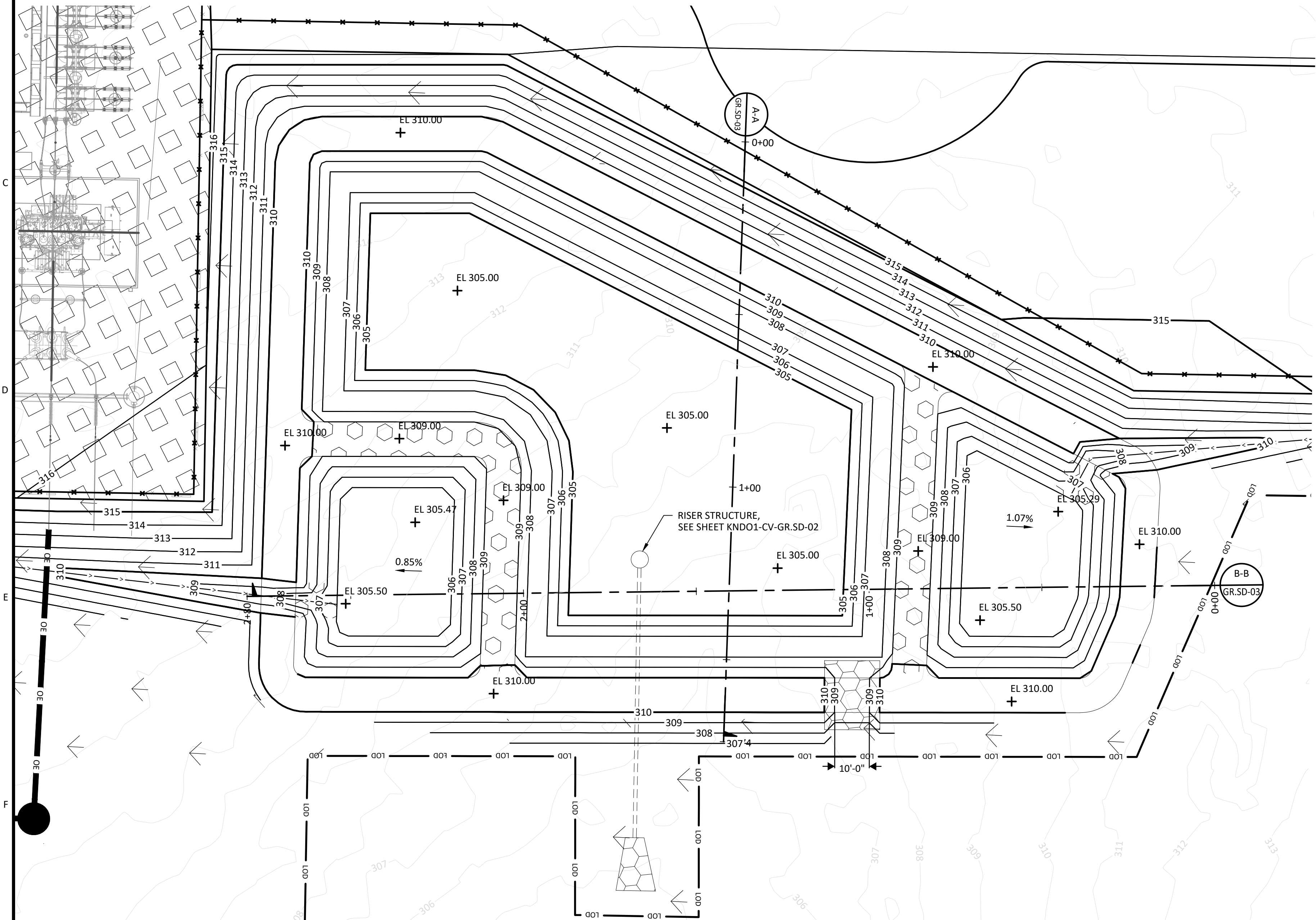
BY: _____ DATE: _____
LAND USE ADMINISTRATOR

AQUATIC SHELF PLANTINGS			
SYMBOL	TOTAL	BOTANICAL NAME	COMMON NAME
△	165	JUNCUS EFFUSUS	SOFT RUSH
⊙	165	LOBELIA CARDINALIS	CARDINAL FLOWER
◇	165	ROSA PALUSTRIS	SWAMP ROSE
*	165	EUPATORIUM PURPUREUM	JOE-PYE WEED
⊗	165	HIBISCUS COCCINEUS	SCARLET ROSE MALLOW



AREA OF SHELF	3300 SF
REQUIRED PLANTING RATE	50 PLANTS PER 200 SF OF SHELF AREA
PLANTINGS REQUIRED	825

NOTES:
ALL PLUGS SHALL BE SPACED 2 FT APART; QUART SIZE CONTAINERS (4 INCH) SHALL BE SPACED 3 FT APART; GALLON SIZE CONTAINERS SPACED 5 FT APART. RECOMMEND SOIL ANALYSIS BE CONDUCTED PRIOR TO PLANTING. RECOMMENDED THAT AQUATIC SHELF VEGETATION BE PLANTED BETWEEN MARCH 15 - JUNE 30.

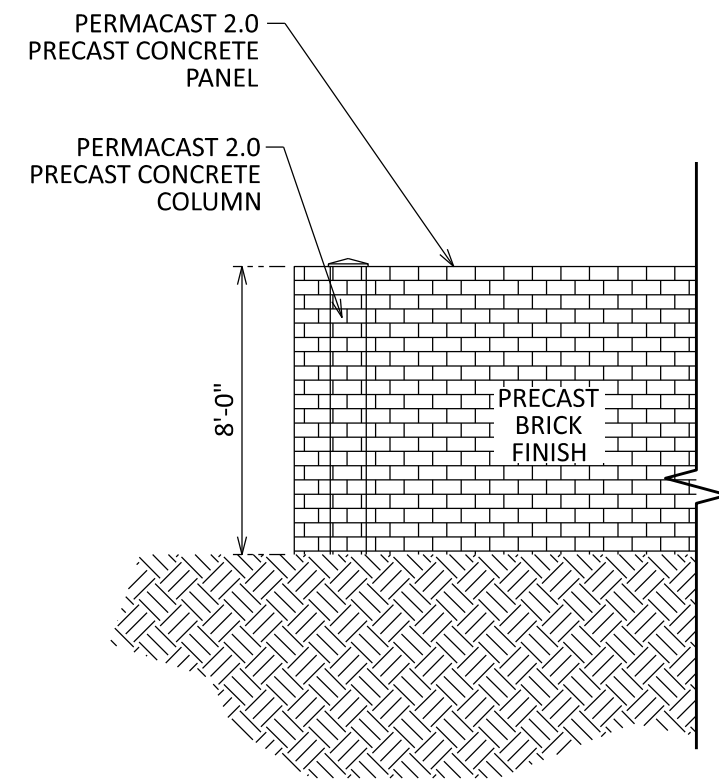


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Full Size 1=1
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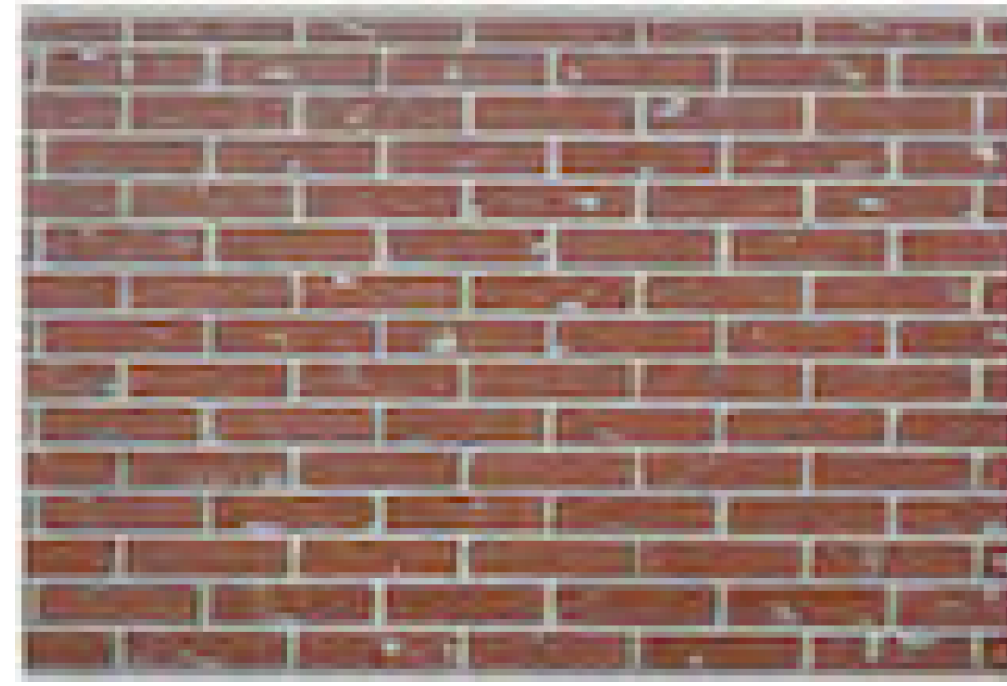
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DESIGNER	MJM	DRAWN	BAR	GRADING DETAILS		5201 KNIGHTDALE EAGLE ROCK ROAD		CODE		AREA	
CHECKED	HGU	DATE	20/DEC/24	REVISIONS AND RECORD OF ISSUE		KNIGHTDALE, NC 27545		NO		DATE	
A		20/DEC/24		ISSUED FOR 30% REVIEW		RARMJIMHGU WL		NO		DATE	
NO		DATE		REVISIONS AND RECORD OF ISSUE		DRNDESCHKPDEAPP		NO		DATE	

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[Signature]
058674
ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER

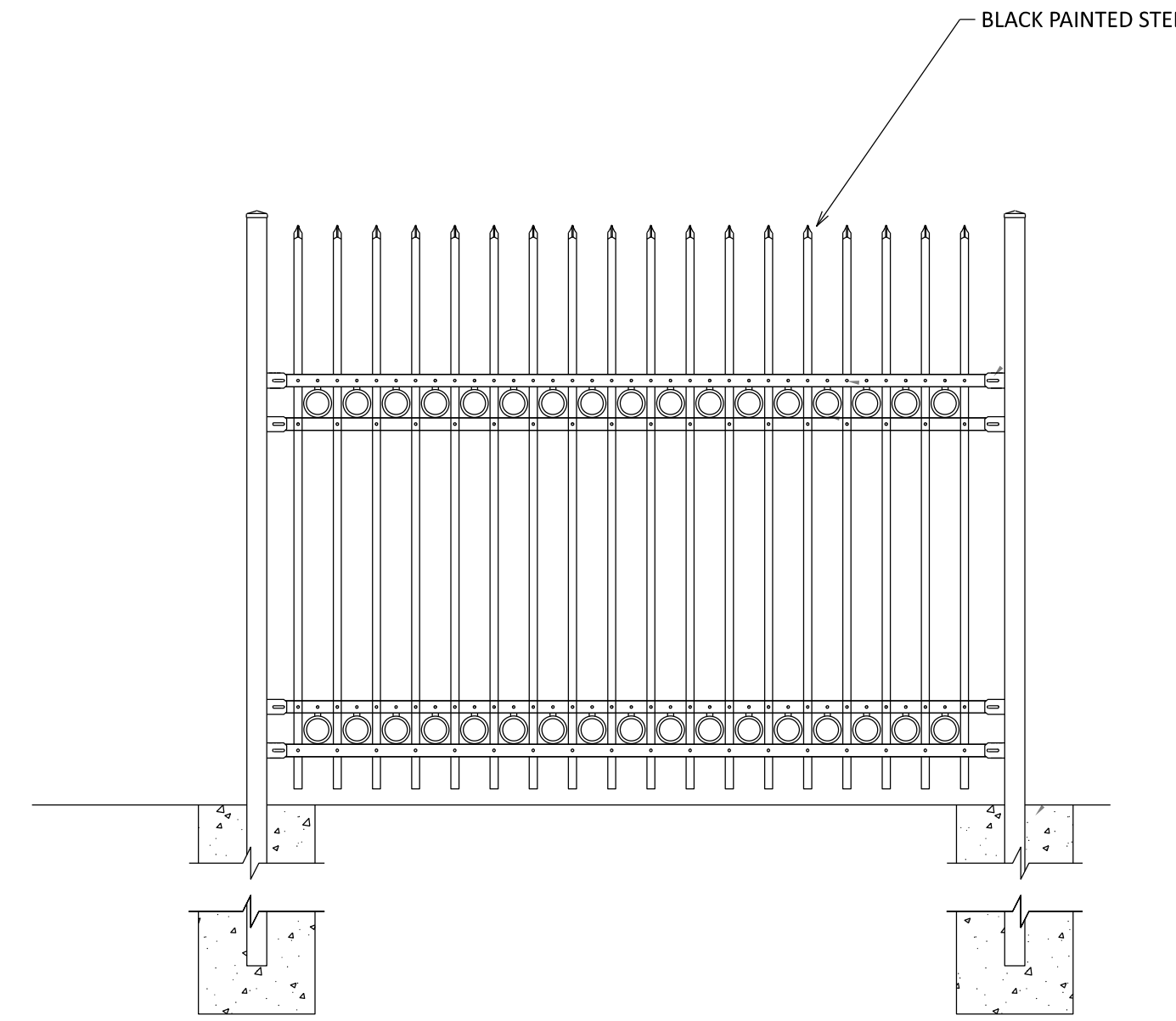


WALL ELEVATION

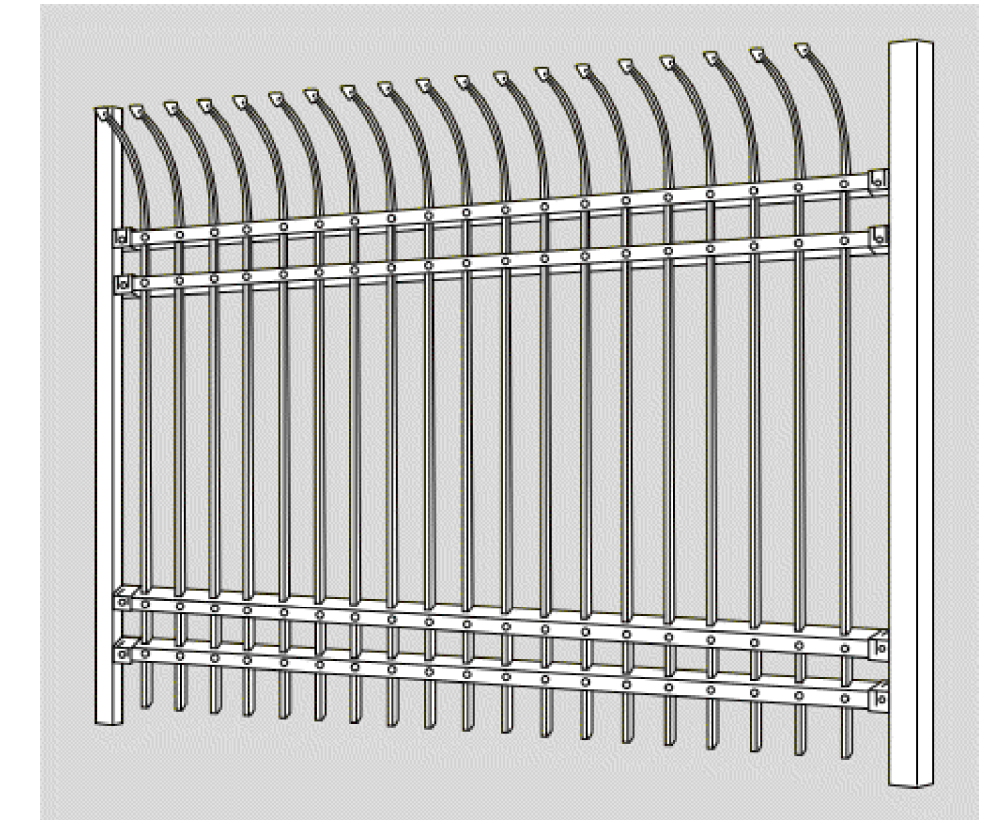


BRICK FINISH

WALL INFO:
MANUFACTURER: PERMACAST
PRODUCT: 8' HIGH PERMAWALL 2.0

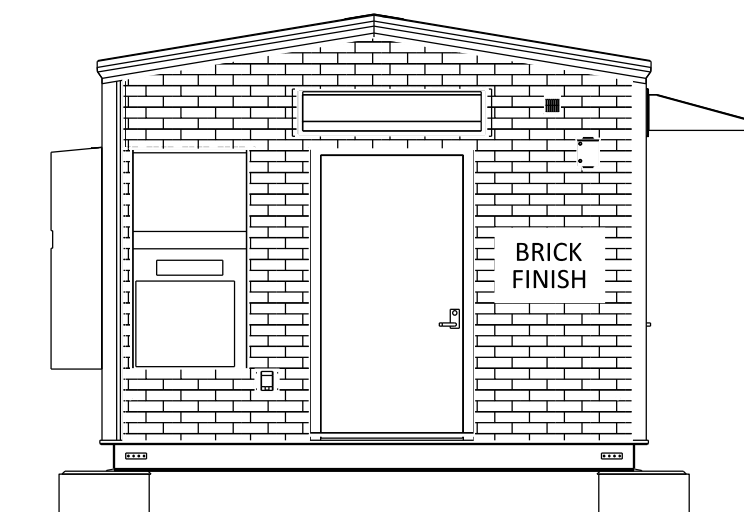


GUARDSMAN PANEL - CURVE TOP ELEVATION

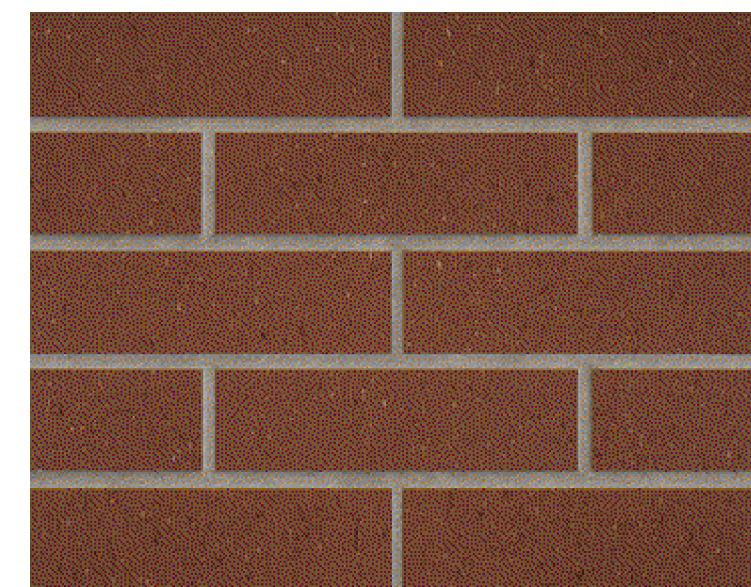


BLACK PAINTED FENCE

FENCE INFO:
MANUFACTURER: GUARDSMAN
PRODUCT: 4 RAIL CURVED TOP
COLOR: BLACK
OPTION: WITH DECORATIVE RINGS

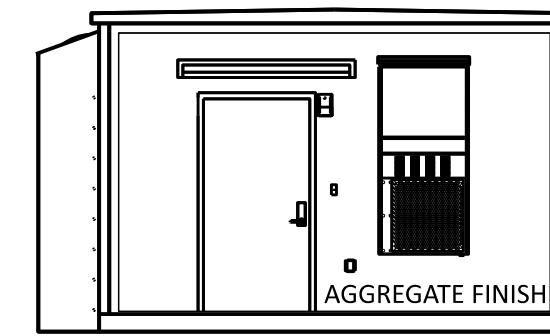


CONTROL ENCLOSURE ELEVATION



BRICK FINISH

BRICK FINISH INFO:
MANUFACTURER: SUMMITVILLE
PRODUCT: THIN BRICK
COLOR: 14 ALEXANDRIA
SIZE: 3 5/8" x 11 5/8" x 9/16"



SITE CONTROL CENTER ELEVATION



AGGREGATE FINISH

AGGREGATE FINISH INFO:
COMPOSITION: CONCRETE
COLOR: TAN

VOLUMETRIC MIX APPROXIMATE RATIO:
STONE: 37%
SAND: 31%
WATER: 16%
CEMENT: 10%
ENTRAPPED AIR: 6%



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: _____
LAND USE ADMINISTRATOR

ISSUED FOR PERMITTING

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Ari122837
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8/9/2020 04:08 PM
MicroStation v23.00.01.44
Full Size 1 = 1

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
A	15/NOV/24	ISSUED FOR PERMIT	BCA	BCA	HGU	BCA	BC

BLACK & VEATCH	
DESIGNER BCA	DRAWN BCA
CHECKED HGU	DATE 15/NOV/24






DUKE ENERGY
DUKE ENERGY KNIGHTDALE BESS
DIGITAL MATERIALS BOARD 5201 KNIGHTDALE EAGLE ROCK ROAD KNIGHTDALE, NC 27545

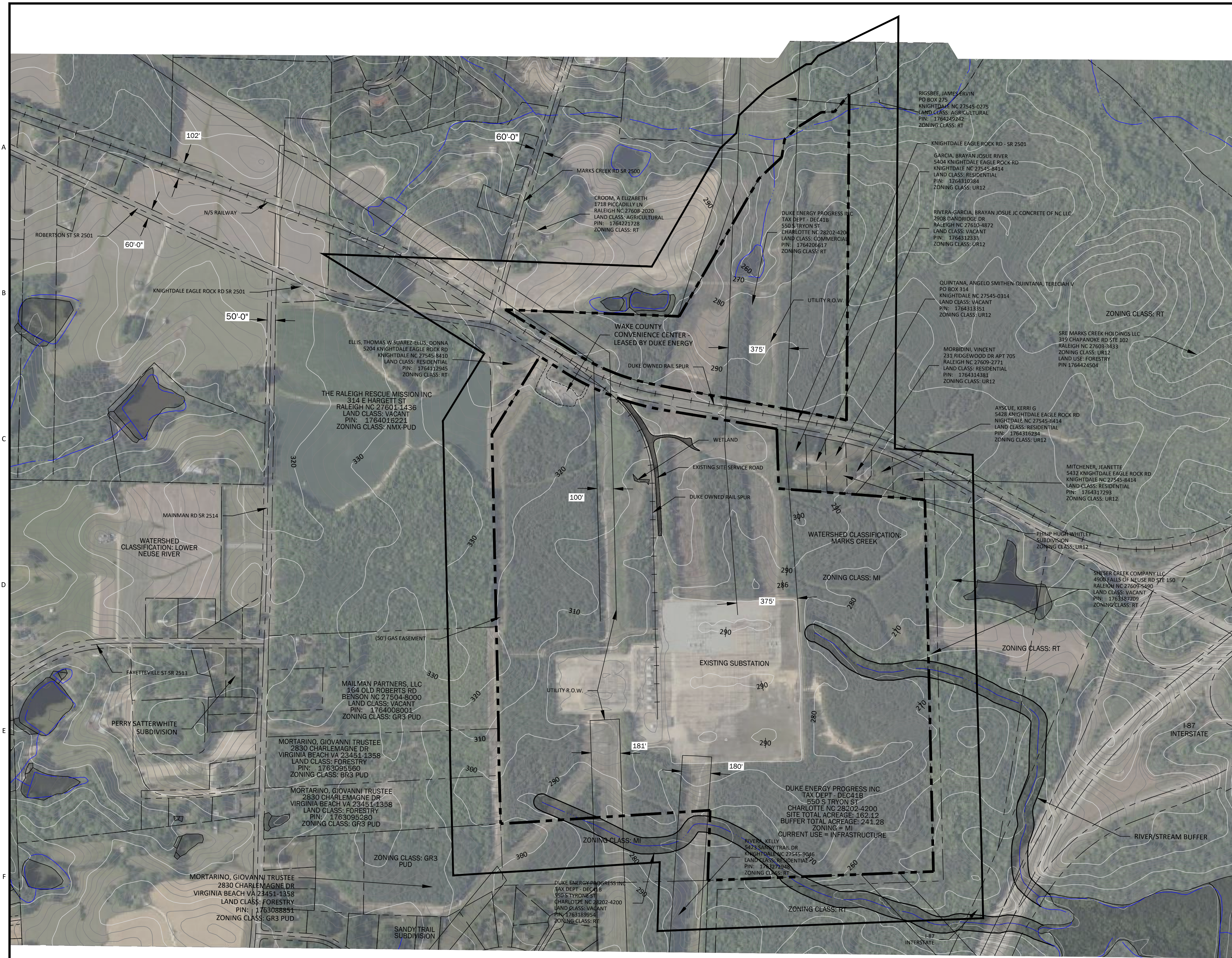
PROJECT 419596 KND01-AD-A-YD.00.SD-02	DRAWING NUMBER A
CODE	REV
AREA	

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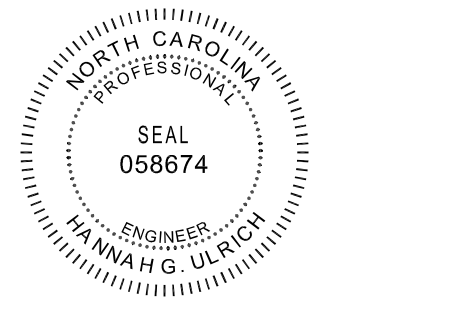
1. THE INFORMATION ON THIS SHEET WAS PREPARED BY ERM NC, INCL. ON 05/09/2023 AND MODIFIED BY BLACK & VEATCH.
2. ENTIRE SITE AND WORK AREA IS WITHIN THE EXTRA-TERRITORIAL JURISDICTION OF THE TOWN OF KNIGHTDALE, WAKE COUNTY.

LEGEND

-  RIVER AND STREAMS
-  PARCELS
-  SUBJECT PROPERTY
-  300FT PROPERTY BUFFER
-  SUBDIVISION



ISSUED FOR PERMITTING
 THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.



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 ANSI D 34x22
 9/22/2024 4:07 PM

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
C	12/SEP/2024	ISSUED FOR PERMITTING					
B	4/SEP/2024	ISSUED FOR 60% REVIEW					
A	08/22/2024	ISSUED FOR PERMITTING					

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DESIGNER: MJM DRAWN: CLC
 CHECKED: HGU DATE: 12/SEP/24

DUKE ENERGY
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

ENVIRONMENTAL SURVEY
 5201 KNIGHTDALE EAGLE ROCK ROAD
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-SI.PL-02		C
CODE		
AREA		

NOTES



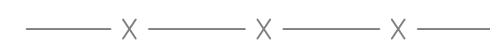





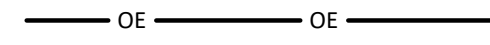






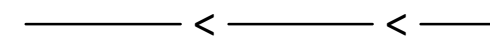
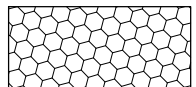
1. TREE CLEARING SHALL BE LIMITED TO THE LIMITS OF DISTURBANCE AS SHOWN ON THIS PLAN.

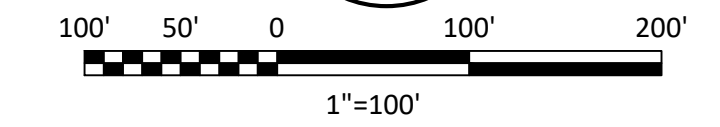
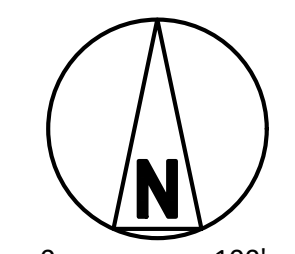
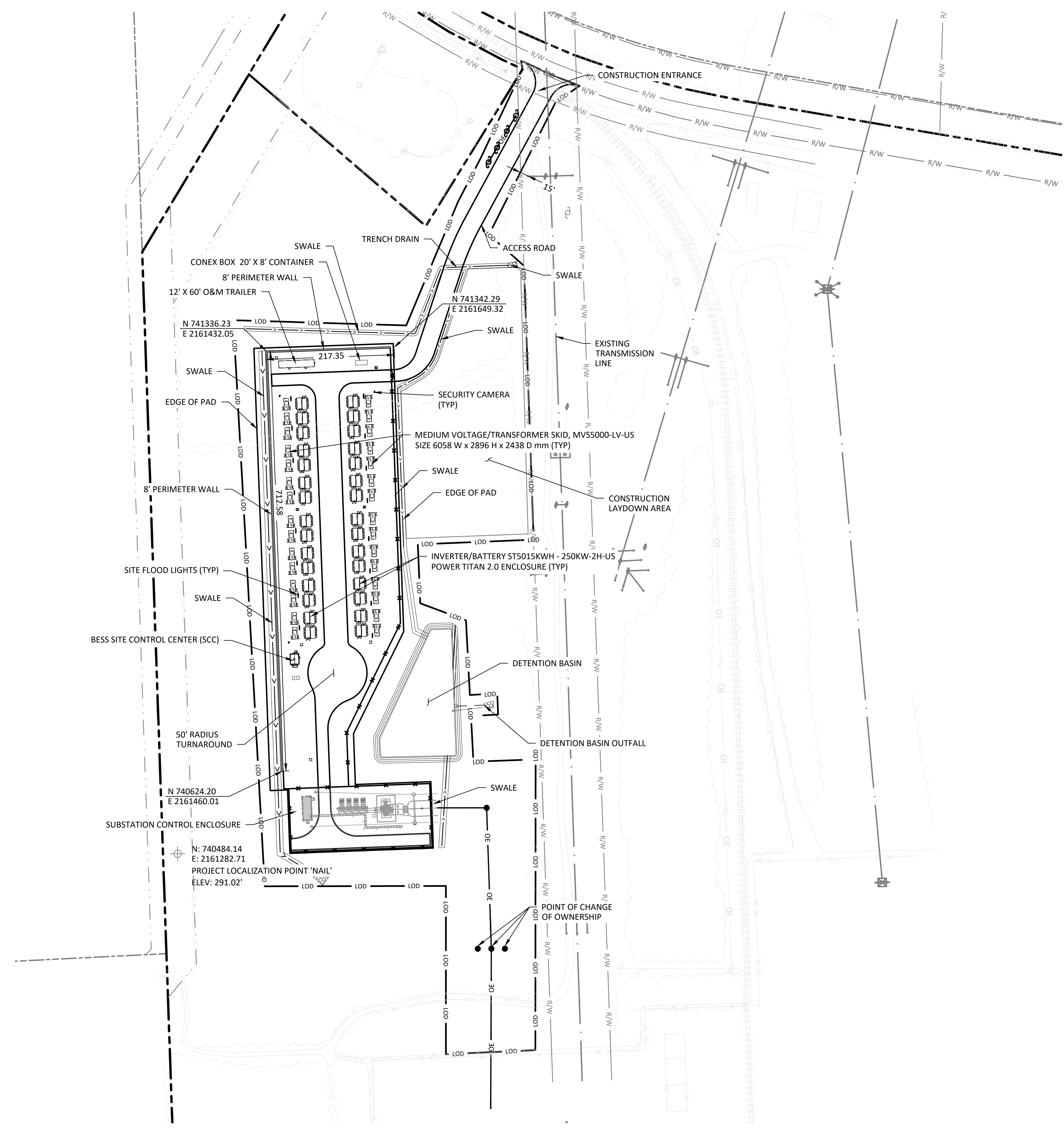
HORIZONTAL DATUM: NAD83 NORTH CAROLINA STATE PLANES, US FOOT
 *STATE PLANE COORDINATES WERE ESTABLISHED BASED IN NGS MONUMENTS "ROSE" AND "TOMB".

VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988

BENCHMARK: PROJECT LOCALIZATION POINT 'NAIL'
 N: 740,484.141'
 E: 2,163,003.135'
 ELV: 291.02'

LEGEND

-  ADJACENT PARCEL BOUNDARY
-  PROPOSED SECURITY FENCE
-  EXISTING FENCE
-  PROPOSED ROAD
-  EXISTING TREE LIMITS
-  EXISTING RAILROAD
-  EXISTING OVERHEAD LINE
-  PROPERTY BOUNDARY
-  PROPOSED OVERHEAD ELECTRIC LINES
-  HIGH POWERED OVERHEAD ELECTRIC LINES
-  EXISTING RIGHT-OF-WAY
-  EXISTING FIBER OPTIC CABLE
-  LIMITS OF DISTURBANCE
-  EXISTING TREE LINE
-  PROPOSED PERIMETER WALL
-  PROPOSED VEGETATED SWALE
-  RIP RAP



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Cop113378
 ANS1 D 344-22
 9/15/2024 7:29 AM

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
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C	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSLD	
B	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	DSLD	
A	22/AUG/2024	ISSUED FOR PERMIT	CLC	MJM	HGU	DSLD	

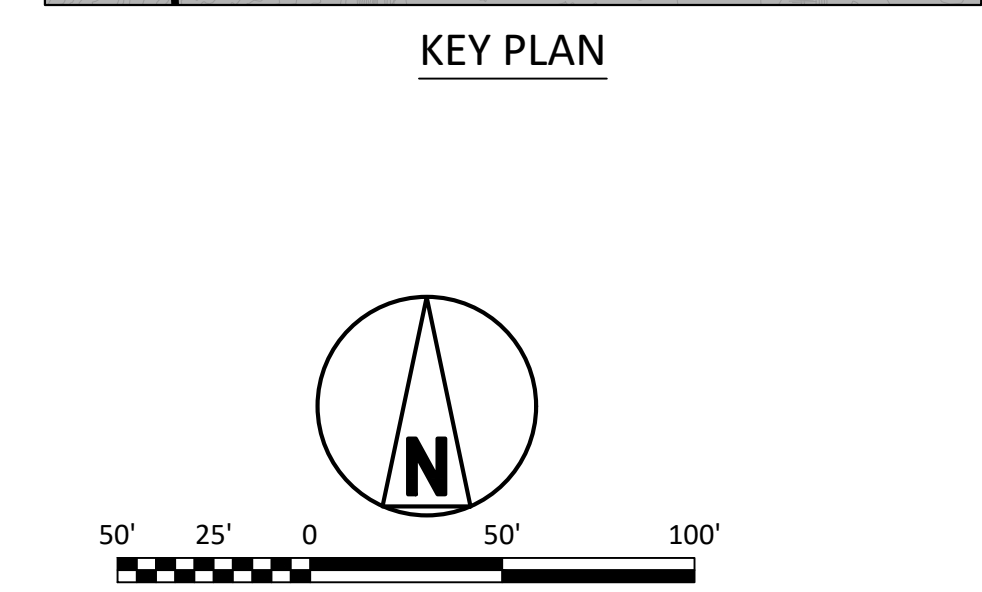
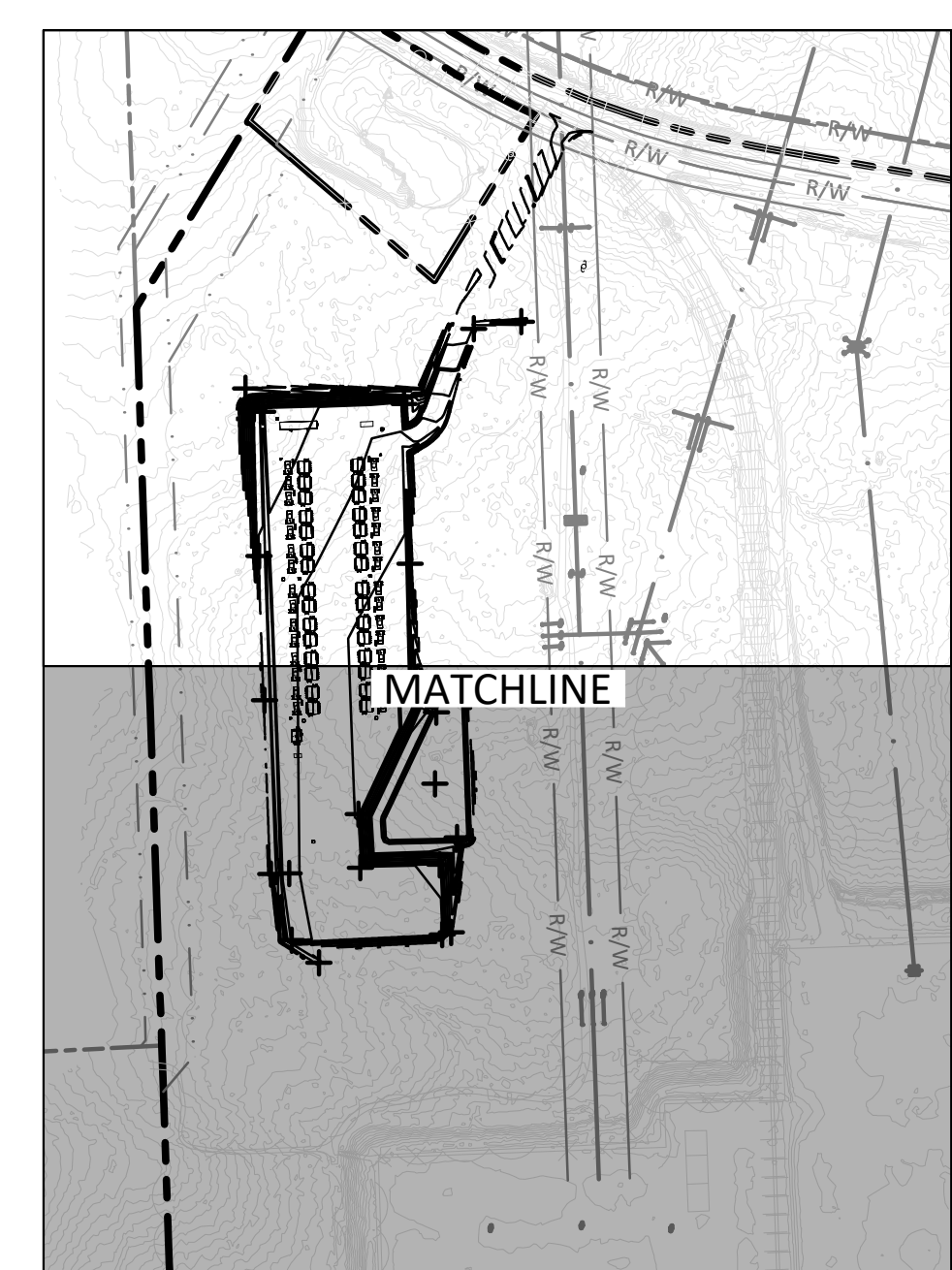
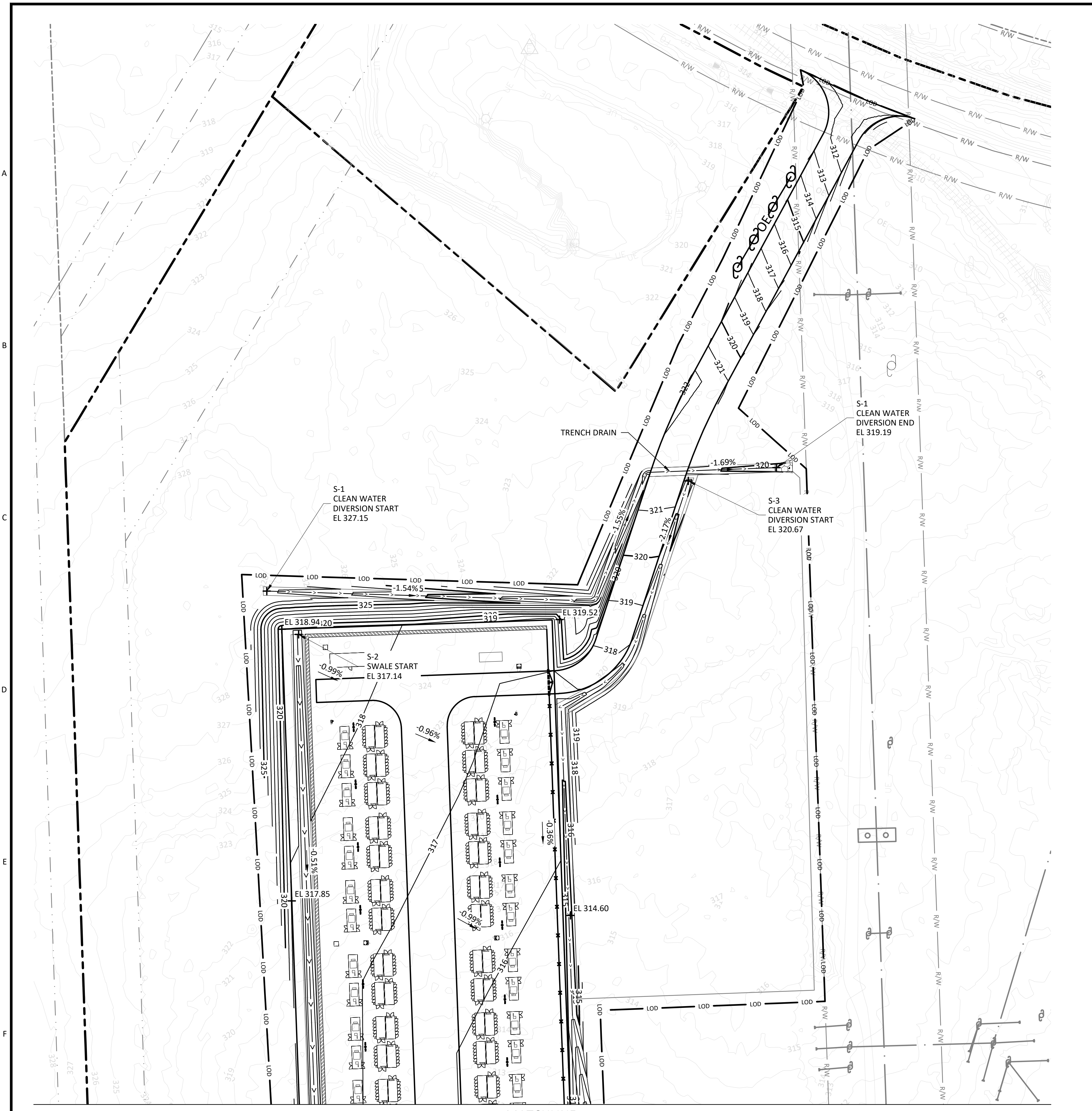
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DESIGNER: MJM DRAWN: CLC
 CHECKED: HGU DATE: 25/SEP/24

DUKE ENERGY
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

SITE PLAN
 5201 KNIGHTDALE EAGLE ROCK ROAD
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-SI.PL-01	D	
CODE	AREA	



NOTES

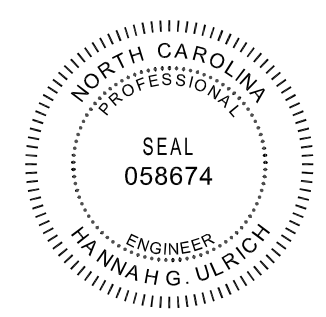
- SPOT ELEVATIONS AND CONTOURS ON THESE DRAWINGS ARE TOP OF FINAL SURFACE GRADE (SEE TYPICAL AGGREGATE SURFACING SECTIONS ON KND01-CV-C-GR.SD-01). SUBTRACT AGGREGATE SURFACING THICKNESS TO OBTAIN TOP OF CONSTRUCTION WORKING SURFACE AND TOP OF SUBGRADE.
- GRADE PLANS SHALL SLOPE UNIFORMLY BETWEEN FINISH SPOT ELEVATIONS AND CONTOURS SHOWN ON THE PLANS.
- UNLESS NOTED OTHERWISE, SLOPES SHALL BE 3:1 (H:V).
- SLOPE GRADE TO DRAIN IN DIRECTION OF FLOW ARROWS.
- PERFORM FIELD IN-PLACE DENSITY TESTS ACCORDING TO ASTM D695 (NUCLEAR METHOD), 98% STANDARD PROCTOR MAXIMUM DRY DENSITY FOR STRUCTURAL/SUBBASE AND BASE BACKFILL, 95% STANDARD PROCTOR MAXIMUM DRY DENSITY FOR NON-STRUCTURAL/ON-SITE FILL MATERIAL BACKFILL.
- PREVENT SURFACE WATER AND SUBSURFACE OR GROUNDWATER FROM ENTERING EXCAVATIONS, FROM PONDING ON PREPARED SUBGRADES, AND FROM FLOODING PROJECT SITE & SURROUNDING AREA. PROTECT SUBGRADES AND FOUNDATION SOILS FROM SOFTENING AND DAMAGE BY RAIN OR WATER ACCUMULATION.
- PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY APPROPRIATE COMPACTION EQUIPMENT AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND OPERATED TAMPERS.
- FILL MATERIALS SHALL BE IMPORTED FROM A MINE OR SITE APPROVED BY THE NCDEQ FOR PROPER EROSION CONTROL.
- HORIZONTAL CONTROL IS BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NAD83. VERTICAL CONTROL IS BASED ON NAVD88.
- SURVEY PROVIDED BY THE JOHN R. MCADAMS COMPANY, INC ON 03/26/2024. BEYOND LIMITS OF SURVEY, ELEVATION DATA SHOWN IS BASED ON PUBLICLY AVAILABLE DATA. CONTRACTOR TO FIELD VERIFY ELEVATIONS BEYOND LIMITS OF SURVEY.

LEGEND

- ADJACENT PARCEL BOUNDARY
- PROPOSED SECURITY FENCE
- EXISTING FENCE
- PROPOSED ROAD
- EXISTING TREE LIMITS
- EXISTING RAILROAD
- EXISTING OVERHEAD LINE
- PROPERTY BOUNDARY
- PROPOSED OVERHEAD ELECTRIC LINES
- HIGH POWERED OVERHEAD ELECTRIC LINES
- EXISTING RIGHT-OF-WAY
- EXISTING FIBER OPTIC CABLE
- LIMITS OF DISTURBANCE
- EXISTING TREE LINE
- PROPOSED PERIMETER WALL
- PROPOSED VEGETATED SWALE
- EXISTING MINOR CONTOUR LINES
- EXISTING MAJOR CONTOUR LINES
- MINOR CONTOUR LINES
- MAJOR CONTOUR LINES
- RIP RAP

ISSUED FOR PERMITTING

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 Civil 3D 2022 Imperial
 Full Site 1=1

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C	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	PSL	CLC
B	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	PSL	CLC
A	22/AUG/2024	ISSUED FOR PERMIT	CLC	MJM	HGU	PSL	CLC

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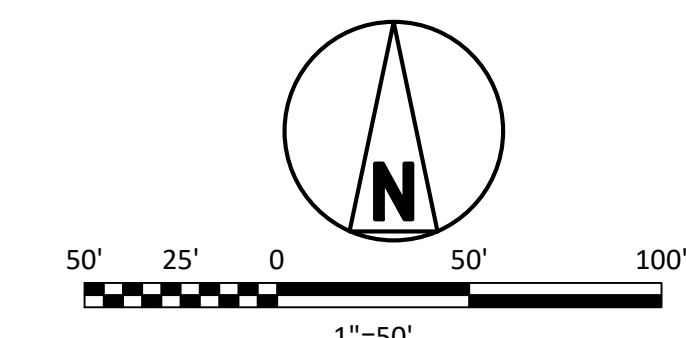
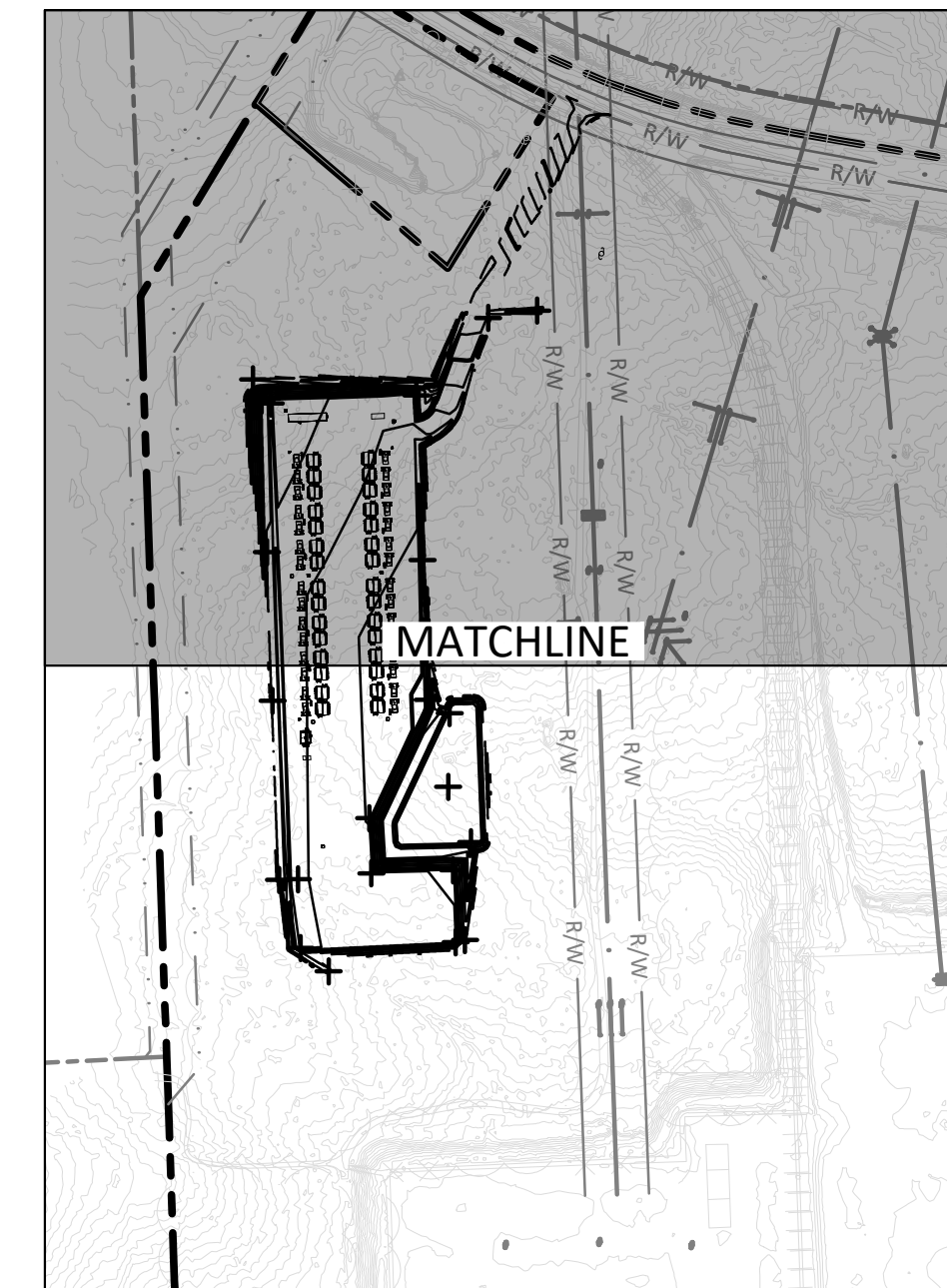
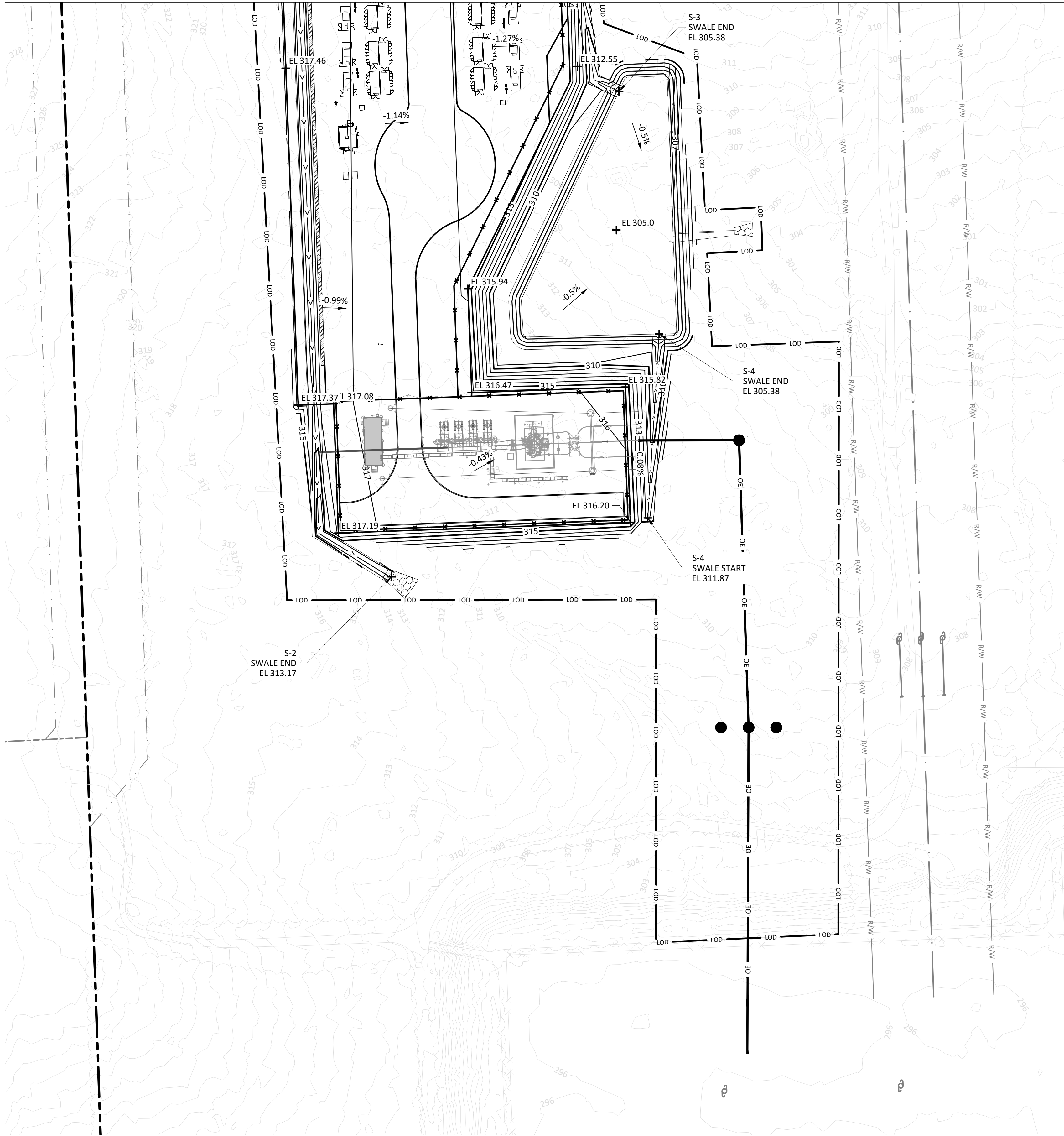
DESIGNER: MJM DRAWN: CLC
CHECKED: HGU DATE: 25/SEP/24

DUKE ENERGY DUKE KNIGHTDALE EPC
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

GRADING AND DRAINAGE PLAN
5201 KNIGHTALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-GR.PL-01	D	
CODE	AREA	

MATCHLINE



NOTES

1. SPOT ELEVATIONS AND CONTOURS ON THESE DRAWINGS ARE TOP OF FINAL SURFACE GRADE (SEE TYPICAL AGGREGATE SURFACING SECTIONS ON KND01-CV-C-GR.SD-01). SUBTRACT AGGREGATE SURFACING THICKNESS TO OBTAIN TOP OF CONSTRUCTION WORKING SURFACE AND TOP OF SUBGRADE.
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4. SLOPE GRADE TO DRAIN IN DIRECTION OF FLOW ARROWS.
5. PERFORM FIELD IN-PLACE DENSITY TESTS ACCORDING TO ASTM D695 (NUCLEAR METHOD), 98% STANDARD PROCTOR MAXIMUM DRY DENSITY FOR STRUCTURAL/SUBBASE AND BASE BACKFILL, 95% STANDARD PROCTOR MAXIMUM DRY DENSITY FOR NON-STRUCTURAL/ON-SITE FILL MATERIAL BACKFILL.
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9. HORIZONTAL CONTROL IS BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NAD83. VERTICAL CONTROL IS BASED ON NAVD83.
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LEGEND

- ADJACENT PARCEL BOUNDARY
- PROPOSED SECURITY FENCE
- EXISTING FENCE
- PROPOSED ROAD
- EXISTING TREE LIMITS
- EXISTING RAILROAD
- EXISTING OVERHEAD LINE
- PROPERTY BOUNDARY
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- PROPOSED PERIMETER WALL
- PROPOSED VEGETATED SWALE
- EXISTING MINOR CONTOUR LINES
- EXISTING MAJOR CONTOUR LINES
- MINOR CONTOUR LINES
- MAJOR CONTOUR LINES
- RIP RAP

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B	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSLD	
A	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	DSLD	

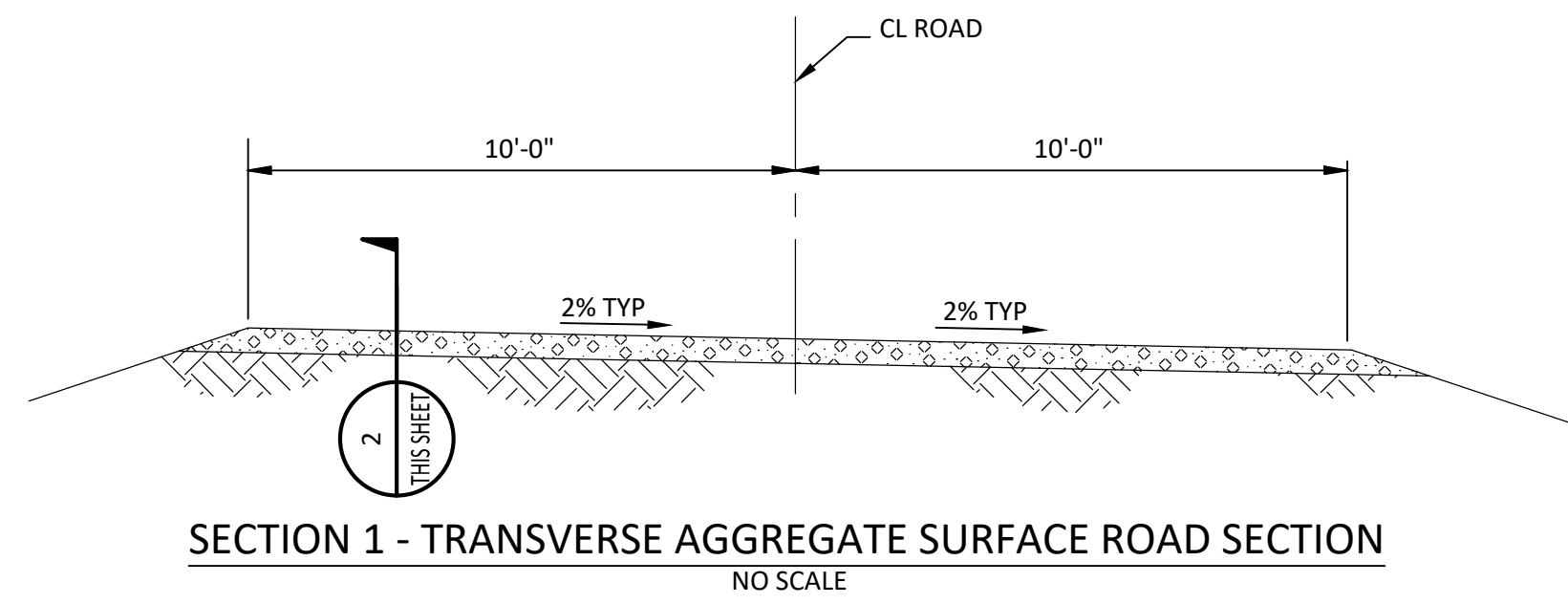
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DESIGNER: MJM DRAWN: CLC
CHECKED: HGU DATE: 25/SEP/24

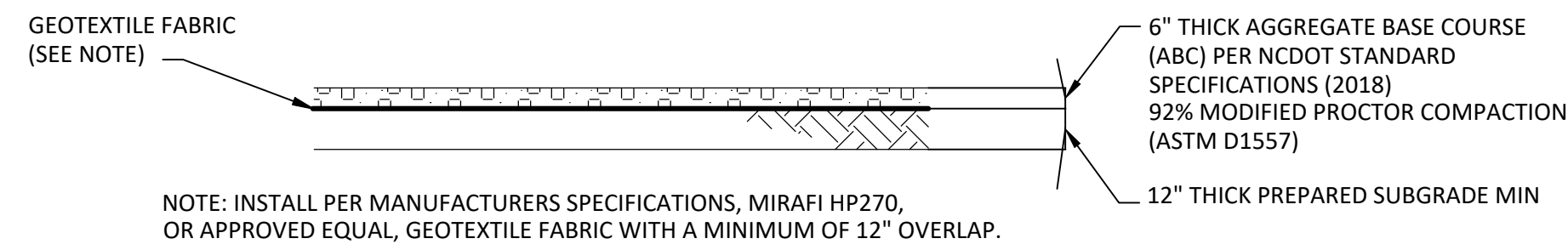
DUKE ENERGY DUKE KNIGHTDALE EPC
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

GRADING AND DRAINAGE PLAN
5201 KNIGHTALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

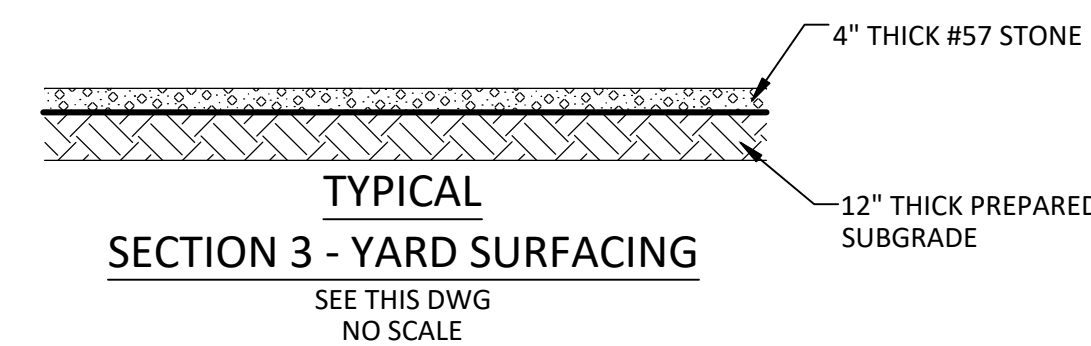
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	419596 KND01-CV-C-GR.PL-02	C
CODE		
AREA		



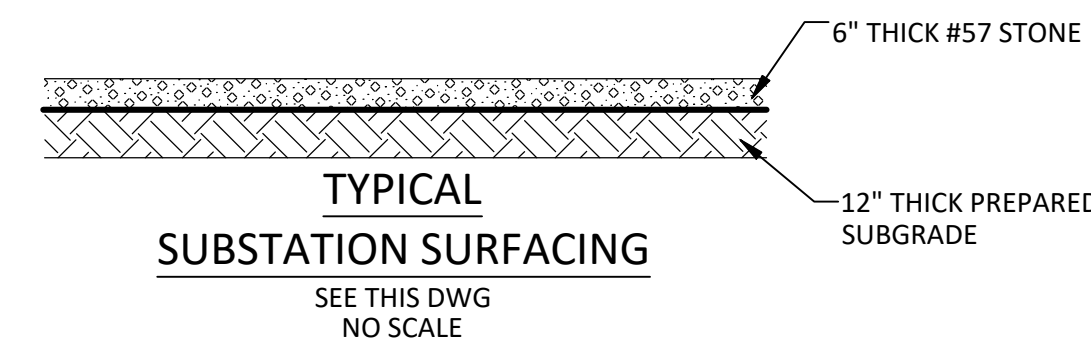
RIPRAP SCHEDULE							
OUTLET	SHEET	L (FT)	T (FT)	W1 (FT)	W2 (FT)	D50 (FT)	REMARKS
BASIN OUTFALL	GR.PL-02	14	0.5	4.5	16.0	0.50	
SWALE 1	GR.PL-01	8	0.5	3.0	9.0	5	
SWALE 2	GR.PL-02	14	0.5	4.0	16.0	0.5	



SECTION 2
SEE THIS DWG
NO SCALE

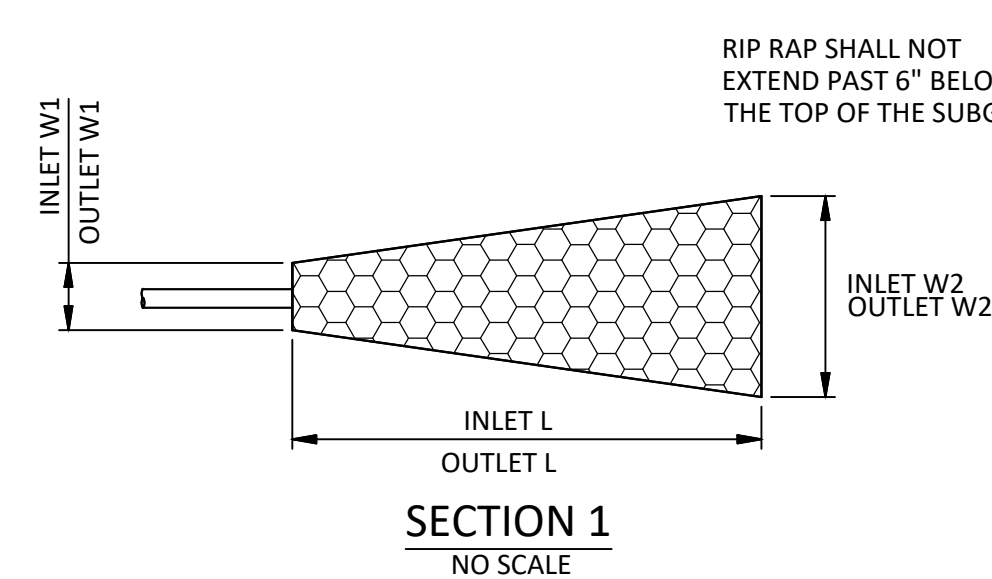


TYPICAL
SECTION 3 - YARD SURFACING
SEE THIS DWG
NO SCALE

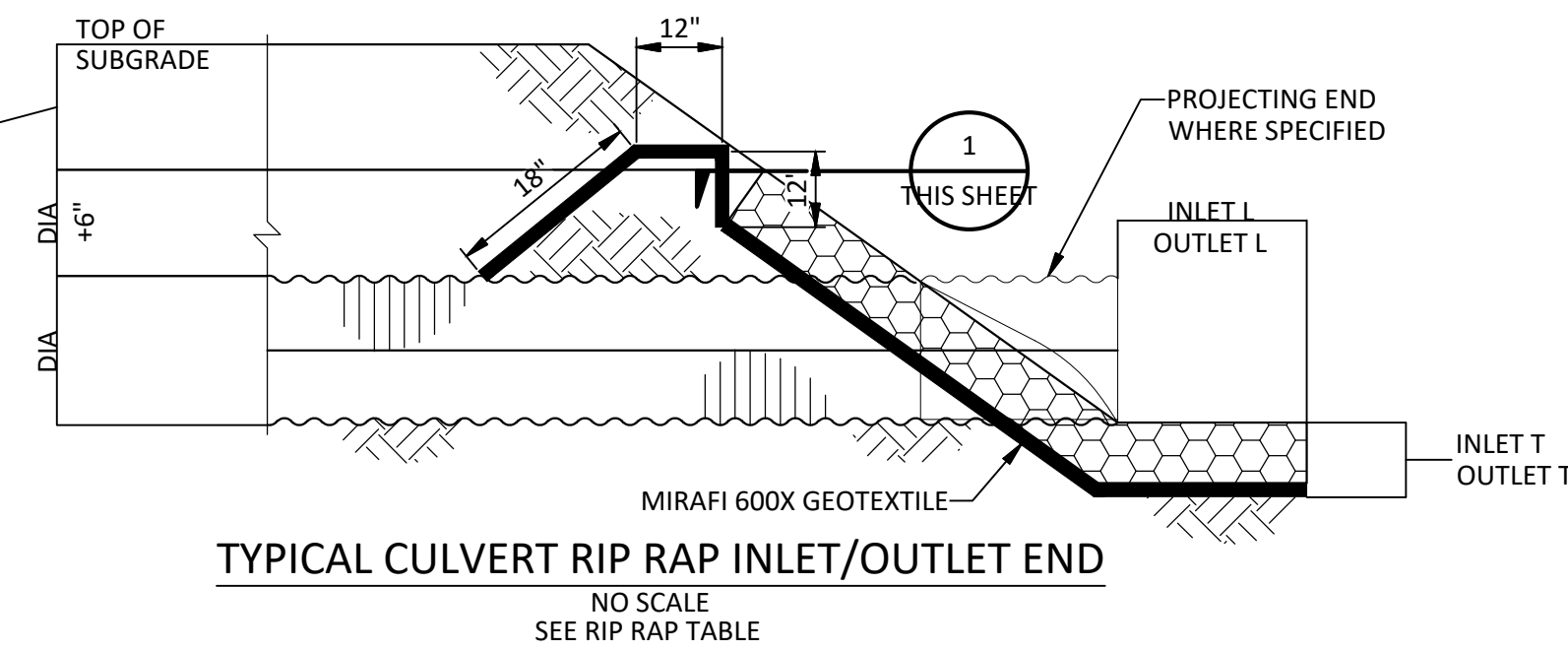


TYPICAL
SUBSTATION SURFACING
SEE THIS DWG
NO SCALE

DITCH NO.	COORDINATES				LENGTH (FT)	START INV ELV	END INV ELV	SLOPE (FT/FT)	LINING	DESIGN LIFE	REMARKS
	START		END								
	NORTHING	EASTING	NORTHING	EASTING							
S-1	741373.79	2161398.82	741481.42	2161843.09	518	327.15	319.19	VARIES		PERMANENT	OFFSITE DIVERSION
S-2	741336.08	2161426.57	740448.39	2161516.95	916	317.17	313.17	0.005	GRASS	PERMANENT	OFFSITE DIVERSION
S-3	741469.83	2161766.32	740851.99	2161706.11	736	320.67	305.46	0.005	GRASS	PERMANENT	CONVEYANCE
S-4A	740495.88	2161719.25	740649.74	2161713.76	110	316.20	315.82	0.003	GRASS	PERMANENT	CONVEYANCE
S-4B	740497.37	2161730.03	740650.30	2161739.52	44	311.87	305.38	0.237	RIPRAP	PERMANENT	CONVEYANCE
D-1	741471.43	2161846.77	740863.24	2161711.88	763	318.00	305.38	0.010	EC BLANKET	TEMPORARY	CONVEYANCE
D-2	740415.74	2161746.18	740204.10	2161744.09	212	309.00	303.00	0.005	EC BLANKET	TEMPORARY	OFFSITE DIVERSION

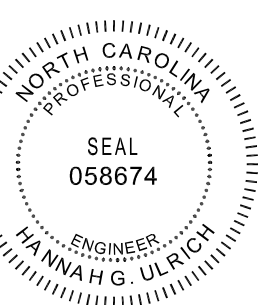


SECTION 1
NO SCALE



TYPICAL CULVERT RIP RAP INLET/OUTLET END
NO SCALE
SEE RIP RAP TABLE

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ANSI D 34x22
2/14/2022 4:09 PM

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
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C	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SDS	LD
B	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	SDS	LD
A	22/AUG/2024	ISSUED FOR PERMIT	CLC	MJM	HGU	SDS	LD

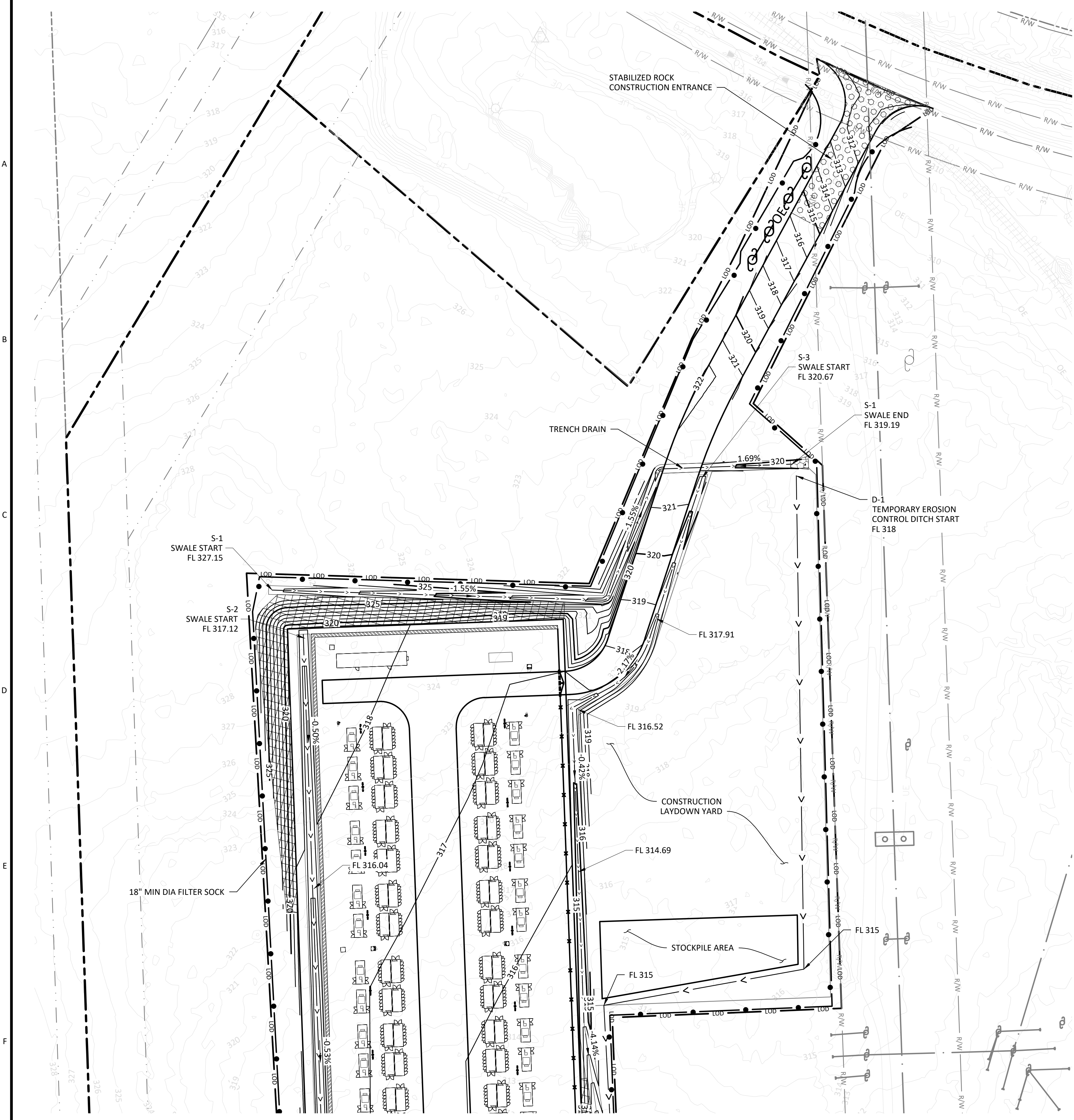
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DESIGNER: MJM, DRAWN: CLC
CHECKED: HGU, DATE: 25/SEP/2024

DUKE ENERGY
KNIGHTDALE BATTERY ENERGY STORAGE FACILITY

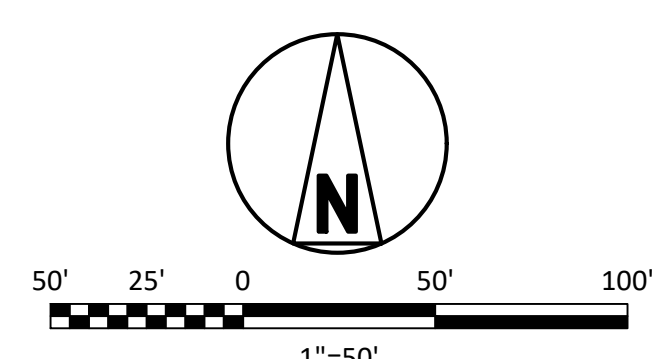
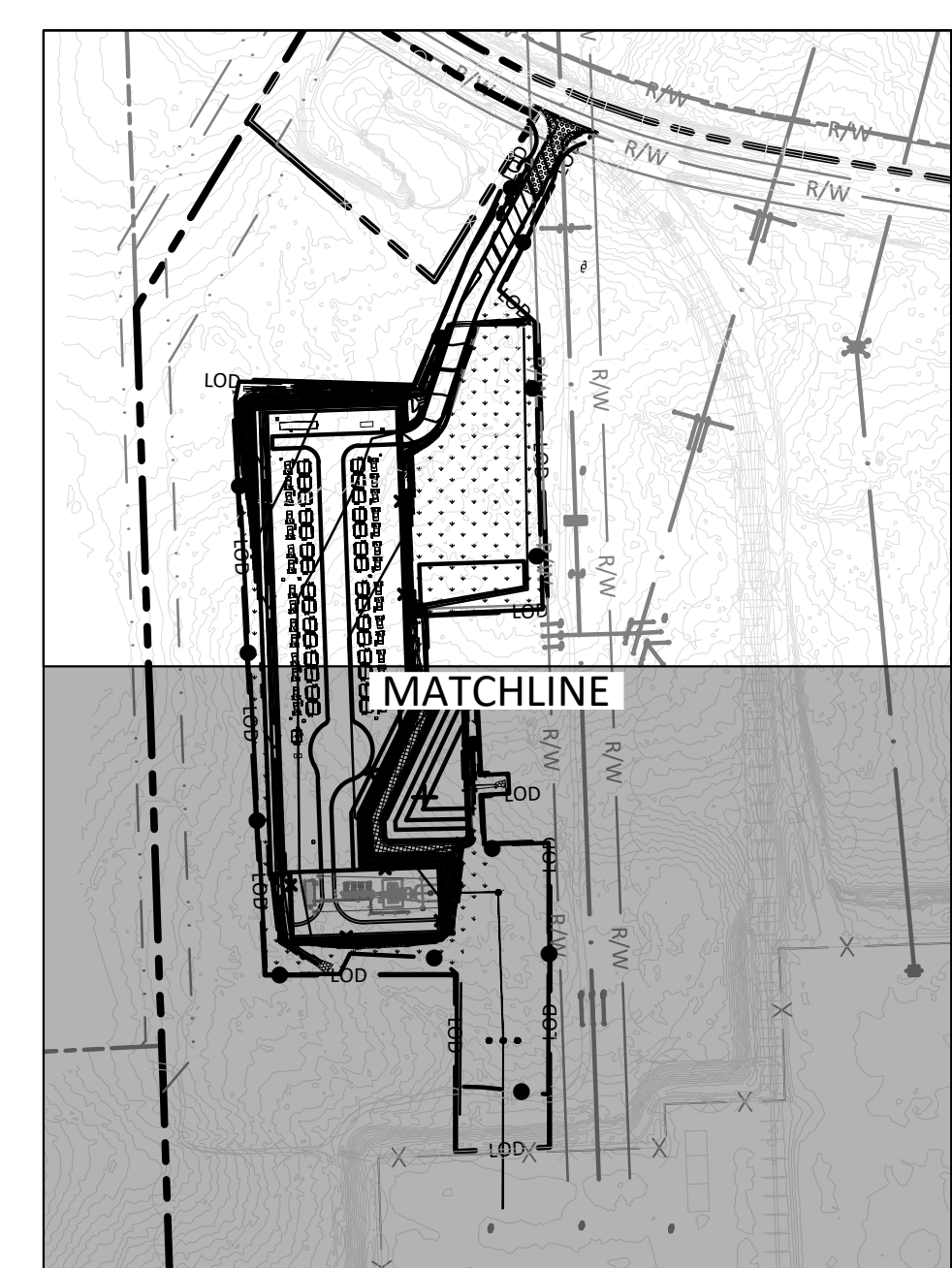
SURFACING DETAILS
5201 KNIGHTDALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
KNND01-CV-C-GR.SD-01		D
CODE	AREA	



- EROSION CHECKS**
- TEMPORARY PERVIOUS BARRIERS USING RIPRAP OR SILT FENCE, SHALL BE INSTALLED AND MAINTAINED AS REQUIRED TO CHECK EROSION AND REDUCE SEDIMENTATION IN AREAS DEEMED APPROPRIATE DURING CONSTRUCTION.
 - ALL EROSION CHECKS SHALL BE MAINTAINED UNTIL ADJACENT AREAS ARE STABILIZED.
- SEDIMENT & EROSION CONTROL PLAN NOTES:**
- GENERAL:**
- THESE GUIDELINES SHALL APPLY TO ALL WORK CONSISTING OF ANY AND ALL TEMPORARY AND/OR PERMANENT MEASURES TO CONTROL WATER POLLUTION AND SOIL EROSION, AS MAY BE REQUIRED, DURING THE CONSTRUCTION OF THE PROJECT.
 - IN GENERAL, ALL CONSTRUCTION ACTIVITIES SHALL PROCEED IN SUCH A MANNER SO AS NOT TO POLLUTE ANY WETLANDS, WATERCOURSE, WATERBODY, AND CONDUIT CARRYING WATER, ETC. THE CONTRACTOR SHALL LIMIT, INSOFAR AS POSSIBLE, THE SURFACE AREA OF EARTH MATERIALS EXPOSED BY CONSTRUCTION METHODS AND IMMEDIATELY PROVIDE PERMANENT AND TEMPORARY POLLUTION CONTROL MEASURES TO PREVENT CONTAMINATION OF ADJACENT WETLANDS, WATERCOURSES, AND WATERBODIES, AND TO PREVENT, INSOFAR AS POSSIBLE, EROSION ON THE SITE.
 - CONTRACTOR SHALL IMPLEMENT AND MAINTAIN BEST MANAGEMENT PRACTICES AT ALL TIMES DURING CONSTRUCTION TO PREVENT SILTATION AND TURBID DISCHARGES IN EXCESS OF THE APPLICABLE PROVISIONS OF THE SITE CERTIFICATION APPLICATION AND THE CONDITIONS OF THE CERTIFICATION. METHODS SHALL INCLUDE, BUT ARE NOT LIMITED TO THE USE OF STAKED HAY BALES, STAKED FILTER SOCK, SODDING, SEEDING, AND MULCHING; STAGED CONSTRUCTION; AND THE INSTALLATION OF TURBIDITY SCREENS AROUND THE IMMEDIATE PROJECT SITE.
 - FILTER SOCK SHALL INITIALLY BE PLACED CONTINUOUSLY ALONG LIMITS OF DISTURBANCE. AFTER RIPRAP APRONS AND SEDIMENT BASINS ARE INSTALLED AND STABILIZED, REMOVE FILTER SOCK ALONG LIMITS OF DISTURBANCE AT THE OUTLETS AND EXTEND ALONG EDGE OF RIPRAP APRONS TO ALLOW DRAINAGE FROM SKIMMER AND EMERGENCY SPILLWAY.
 - SURVEY PROVIDED BY THE JOHN R. MCADAMS COMPANY, INC ON 03/26/2024. BEYOND LIMITS OF SURVEY, ELEVATION DATA SHOWN IS BASED ON PUBLICLY AVAILABLE DATA. CONTRACTOR TO FIELD VERIFY ELEVATIONS BEYOND LIMITS OF SURVEY.
 - SITE MANAGER: DALLAS BIGHAM, 913-458-3915
- SEEDING**
- TEMPORARY AND PERMANENT SEEDING SHALL BE IN ACCORDANCE WITH THE NCDEQ EROSION & SEDIMENT CONTROL MANUAL, SECTION 6.10.1 AND 6.10.2. SEE SHEET KND01-C-CV-EC-SD-03 FOR STABILIZATION NOTES.

LEGEND	
	ADJACENT PARCEL BOUNDARY
	PROPOSED SECURITY FENCE
	EXISTING FENCE
	PROPOSED ROAD
	EXISTING TREE LIMITS
	EXISTING RAILROAD
	EXISTING OVERHEAD LINE
	PROPERTY BOUNDARY
	PROPOSED OVERHEAD ELECTRIC LINES
	HIGH POWERED OVERHEAD ELECTRIC LINES
	EXISTING RIGHT-OF-WAY
	EXISTING FIBER OPTIC CABLE
	LIMITS OF DISTURBANCE
	EXISTING TREE LINE
	PROPOSED PERIMETER WALL
	PROPOSED VEGETATED SWALE
	FILTER SOCK
	EXISTING MINOR CONTOUR LINES
	EXISTING MAJOR CONTOUR LINES
	MINOR CONTOUR LINES
	MAJOR CONTOUR LINES
	RIP RAP
	STABILIZED CONSTRUCTION ENTRANCE/EXIT
	EROSION CONTROL BLANKET



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C	25/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSLD	
B	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSLD	
A	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	DSLD	

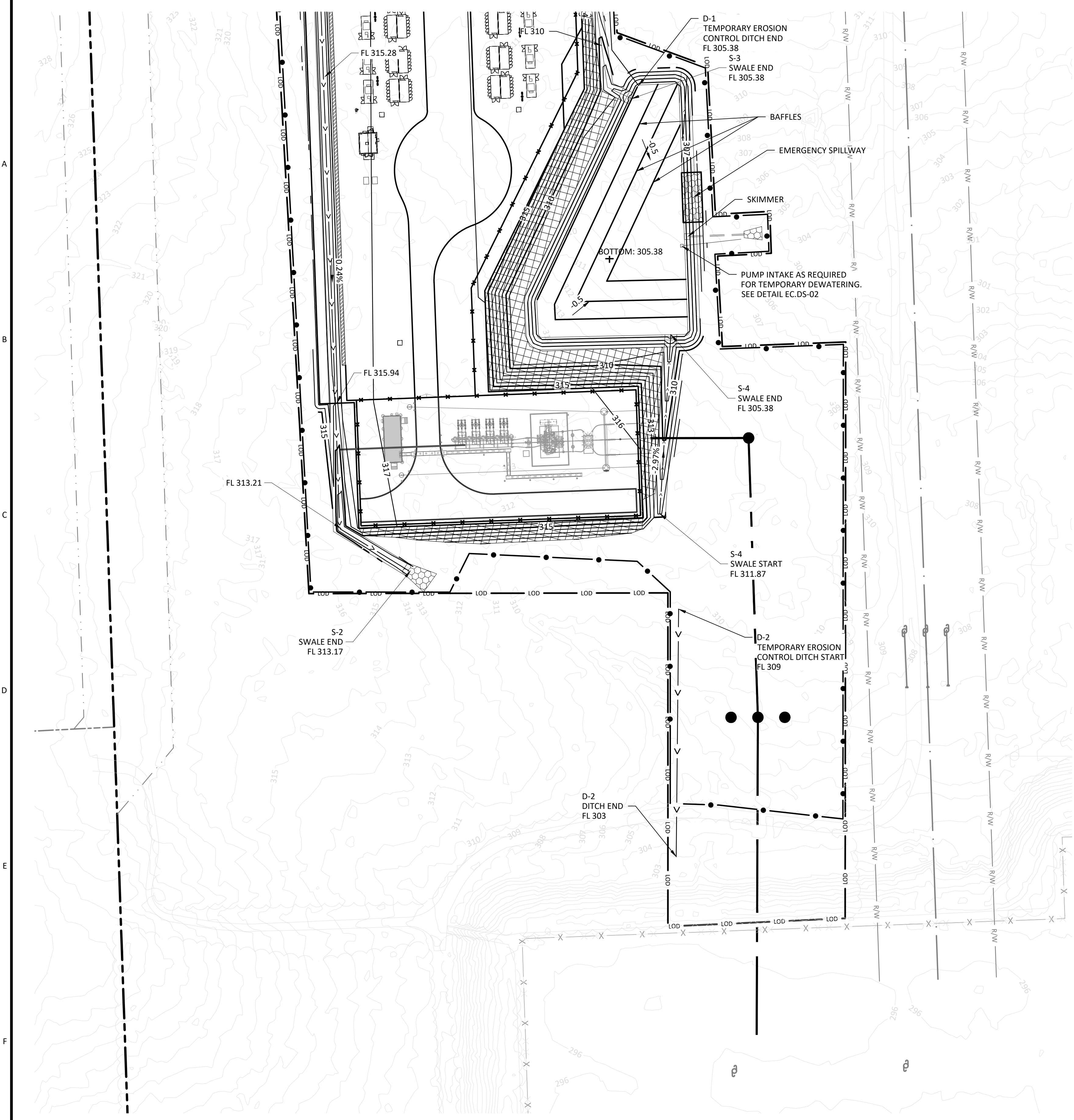
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DESIGNER: MJM, DRAWN: CLC
 CHECKED: HGU, DATE: 25/SEP/24

DUKE ENERGY
 DUKE KNIGHTDALE EPC
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

EROSION CONTROL PLAN
 5201 KNIGHTDALE EAGLE ROCK ROAD
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
	419596 KND01-CV-C-EC.PL-01	C
CODE	AREA	



EROSION CHECKS

- TEMPORARY PERVIOUS BARRIERS USING RIPRAP OR SILT FENCE, SHALL BE INSTALLED AND MAINTAINED AS REQUIRED TO CHECK EROSION AND REDUCE SEDIMENTATION IN AREAS DEEMED APPROPRIATE DURING CONSTRUCTION.
- ALL EROSION CHECKS SHALL BE MAINTAINED UNTIL ADJACENT AREAS ARE STABILIZED.

SEDIMENT & EROSION CONTROL PLAN NOTES:

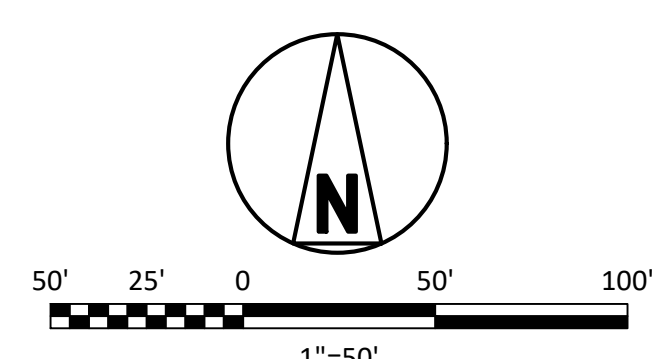
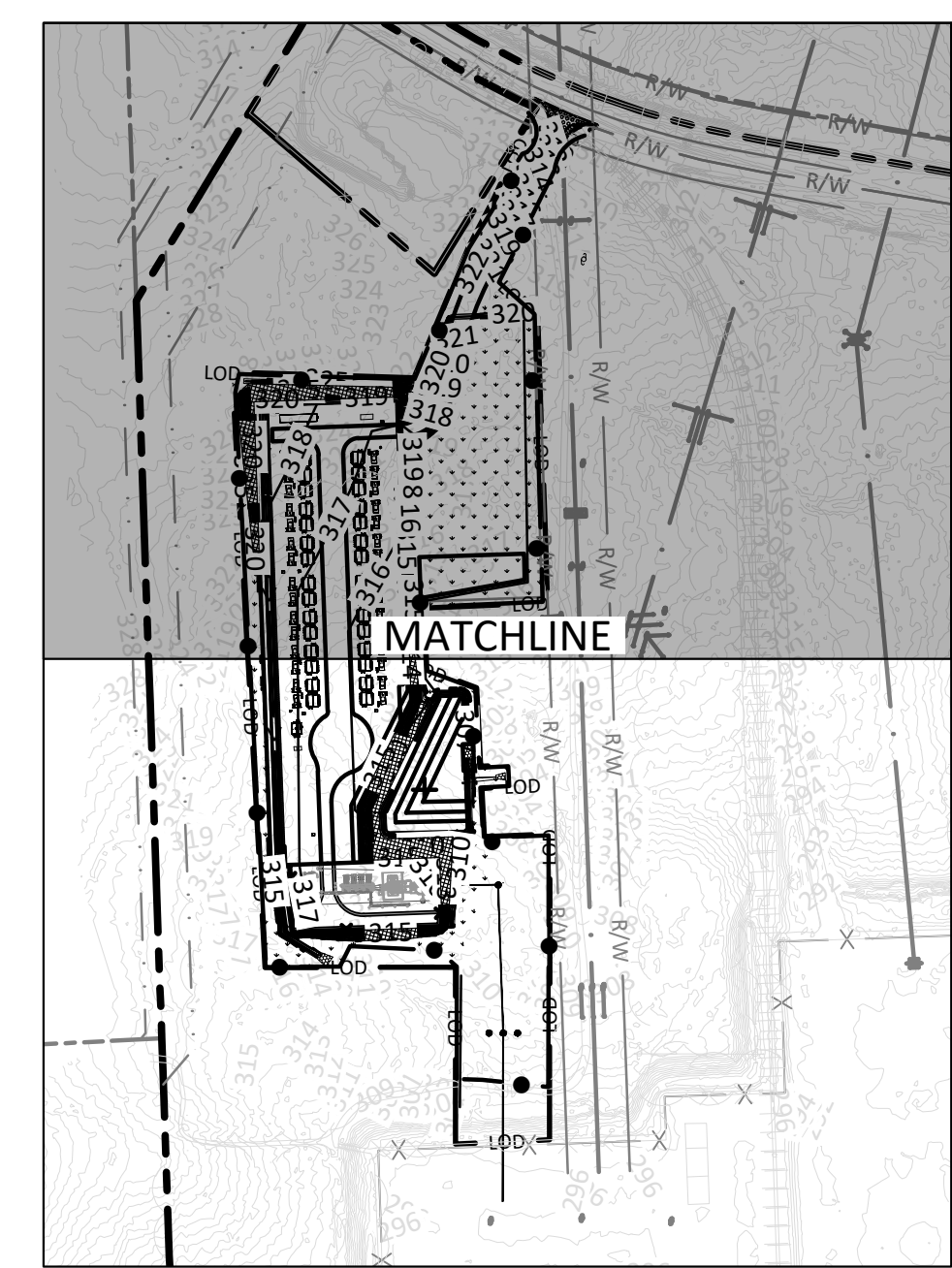
GENERAL:

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- SITE MANAGER: DALLAS BIGHAM, 913-458-3915

SEEDING

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LEGEND	
	ADJACENT PARCEL BOUNDARY
	PROPOSED SECURITY FENCE
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	EXISTING TREE LIMITS
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	RIP RAP
	STABILIZED CONSTRUCTION ENTRANCE/EXIT
	EROSION CONTROL BLANKET



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B	12/SEP/2024	ISSUED FOR PERMITTING					
A	4/SEP/2024	ISSUED FOR 60% REVIEW					

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DESIGNER: MJM DRAWN: CLC
CHECKED: HGU DATE: 25/SEP/24

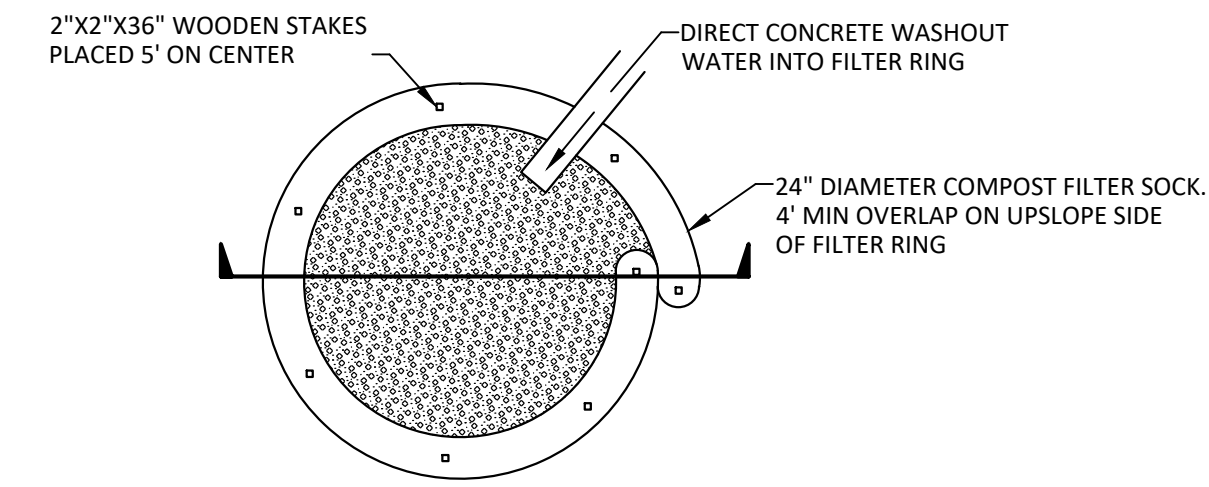
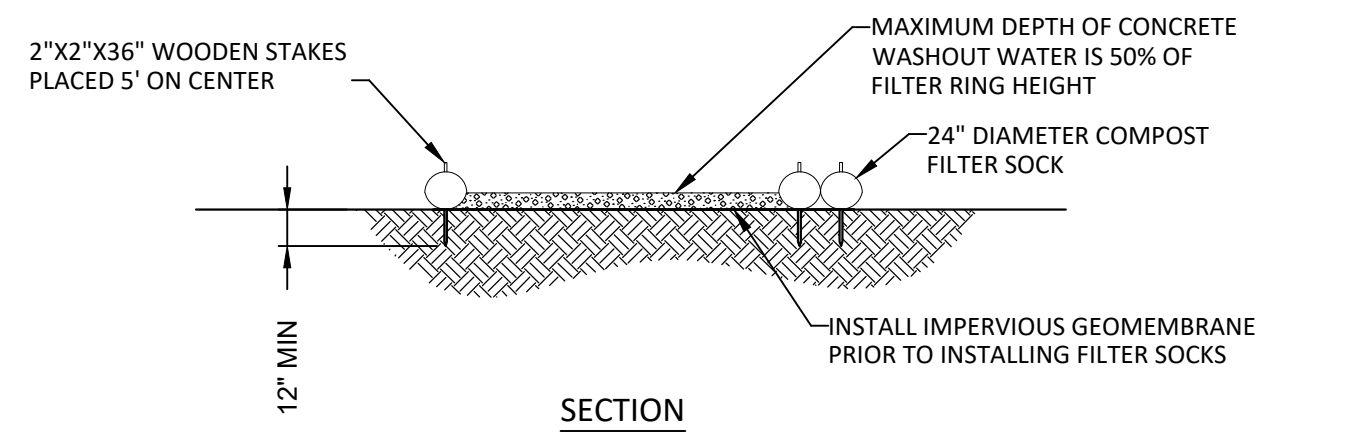
DUKE ENERGY DUKE KNIGHTDALE EPC
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

EROSION CONTROL PLAN
5201 KNIGHTDALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
	419596 KND01-CV-C-EC.PL-02	C
CODE		
AREA		

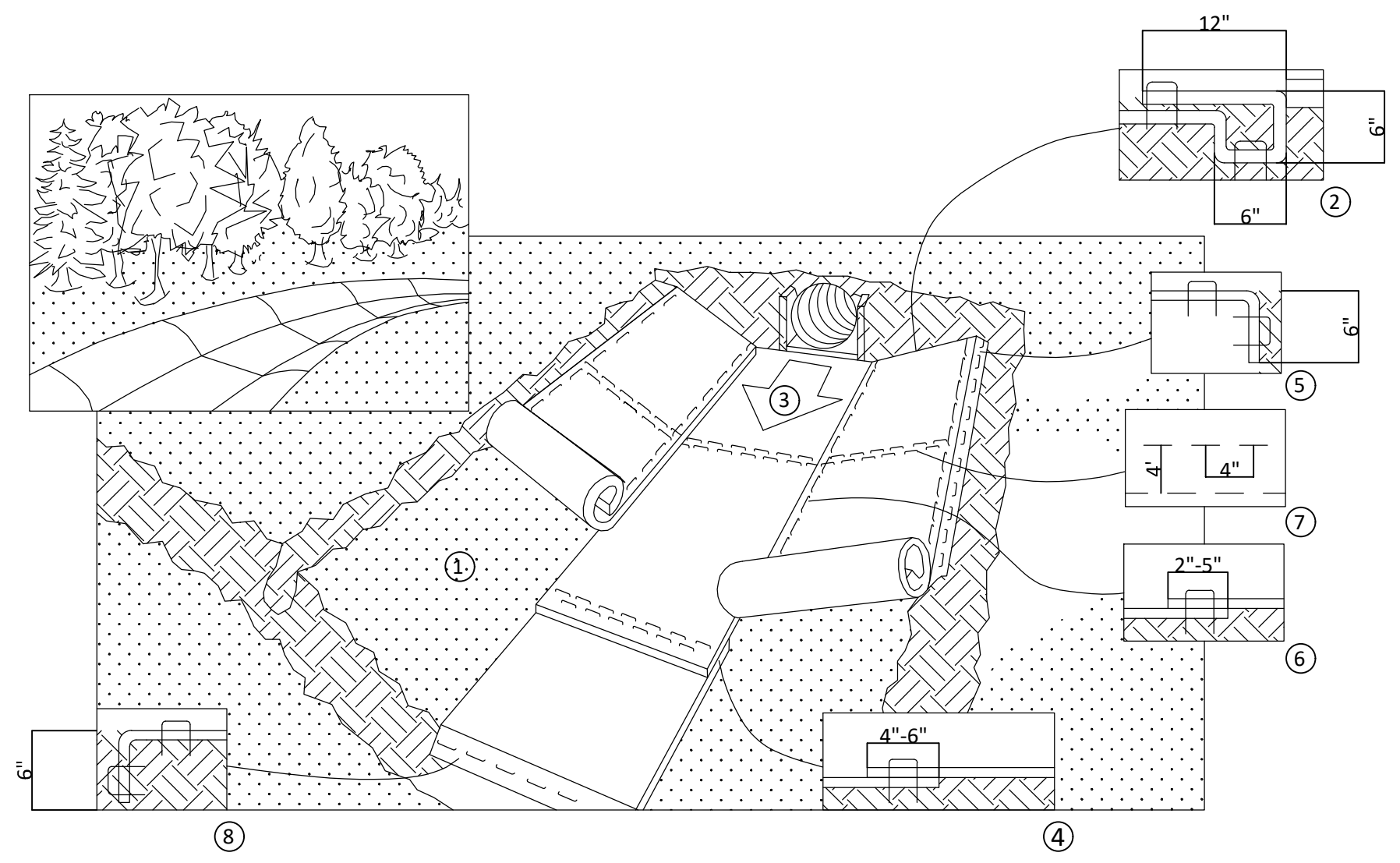
CONSTRUCTION SEQUENCE

1. EROSION CONTROL PLAN IS APPROVED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY (NCDEQ)
2. CONTRACTOR SHALL SUBMIT NOI TO NCDEQ FOR APPROVAL.
3. ONCE THE CERTIFICATE OF COVERAGE IS RECEIVED FROM NCDEQ, THE LIMITS OF DISTURBANCE (LOD) SHALL BE FIELD MARKED PRIOR TO INSTALLATION OF SEDIMENT CONTROL MEASURES, OR OTHER LAND DISTURBING ACTIVITIES.
4. INSTALL STABILIZED CONSTRUCTION ENTRANCE.
5. INSTALL PERIMETER FILTER SOCK PRIOR TO ANY OTHER LAND DISTURBING ACTIVITIES.
6. PERFORM CLEARING AND GRUBBING AS REQUIRED AND INSTALL SEDIMENT BASIN AND EROSION CONTROL DITCHES, INCLUDING OUTLET PIPE AND RIPRAP PADS.
7. PERFORM SITE CLEARING.
INSTALL DIVERSION DITCHES. ONCE ALL DIVERSION DITCHES HAVE BEEN INSTALLED, UPSLOPE FILTER SOCK SHALL NO LONGER BE REQUIRED. CONTRACTOR SHALL MAINTAIN DOWNSLOPE FILTER SOCK UNTIL FINAL STABILIZATION.
8. PERFORM MASS GRADING ACTIVITIES.
9. UPON FINAL STABILIZATION RECEIVE FINAL APPROVAL FROM THE EROSION AND SEDIMENT CONTROL INSPECTOR. CONTRACTOR SHALL SUBMIT N.O.T. AFTER FINAL APPROVAL. ONCE N.O.T. IS APPROVED, CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.

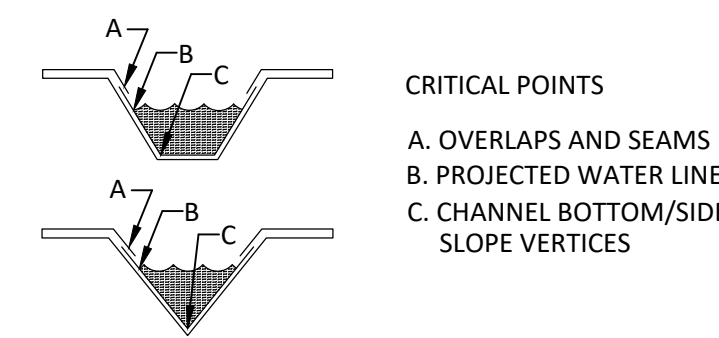


- NOTES:
1. INSTALL IMPERVIOUS GEOMEMBRANE PRIOR TO INSTALLING FILTER SOCKS.
 2. INSTALL ON FLAT GRADE FOR OPTIMAL PERFORMANCE.
 3. 18" DIAMETER FILTER SOCK MAY BE STACKED ONTO DOUBLE 24" DIAMETER SOCKS IN PYRAMIDAL CONFIGURATION FOR ADDED HEIGHT.

COMPOST SOCK WASHOUT INSTALLATION DETAIL
NOT TO SCALE

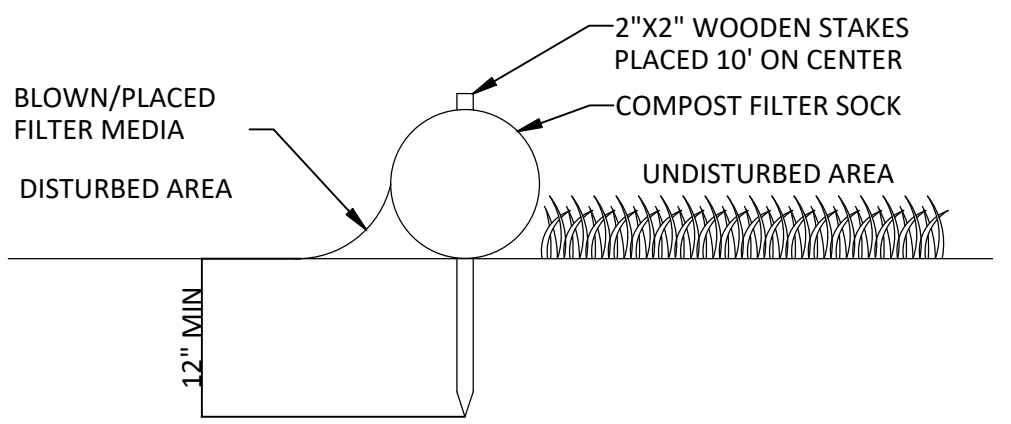


1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED, NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM TM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPE MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2"-5" (DEPENDING ON BLANKET TYPE) AND STAPLED. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE BLANKET BEING OVERLAPPED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.



NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.
** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

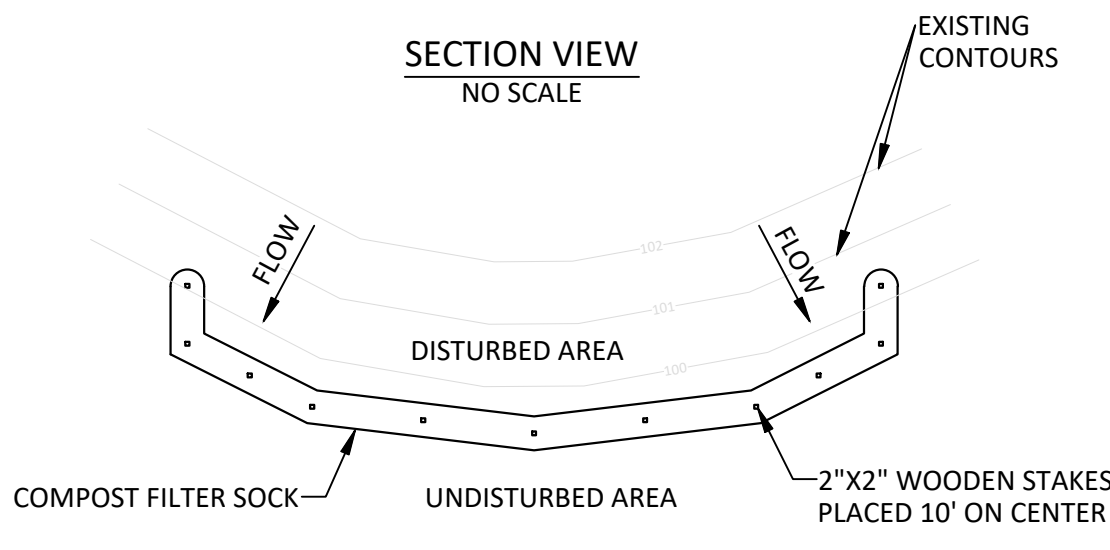
SC150 OR C125 EROSION BLANKET INSTALLATION (DITCH SLOPES ONLY)
NOT TO SCALE



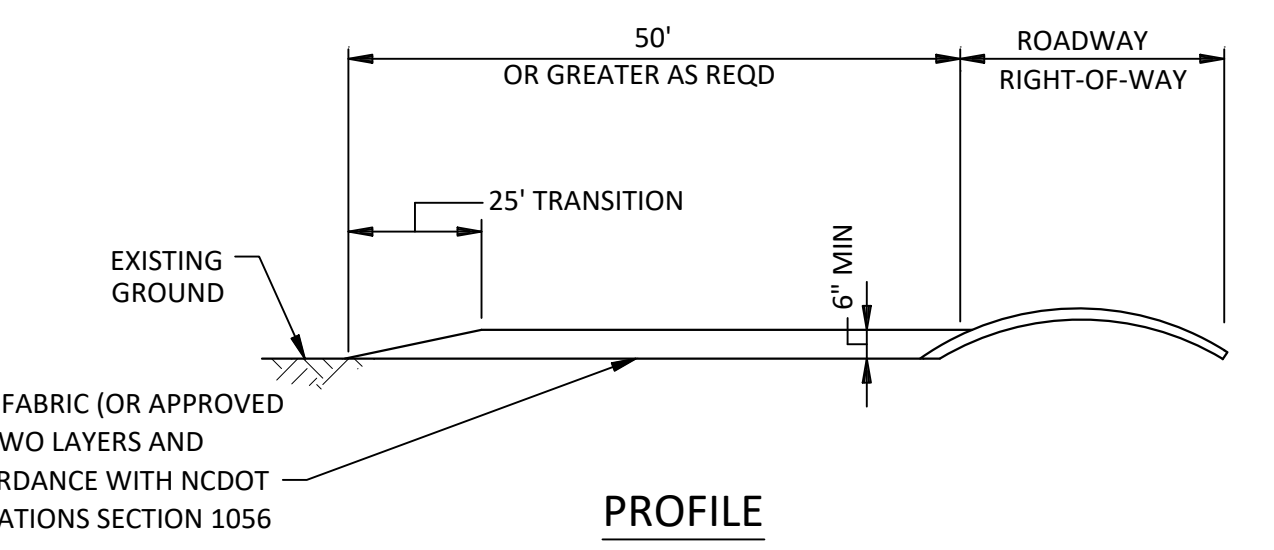
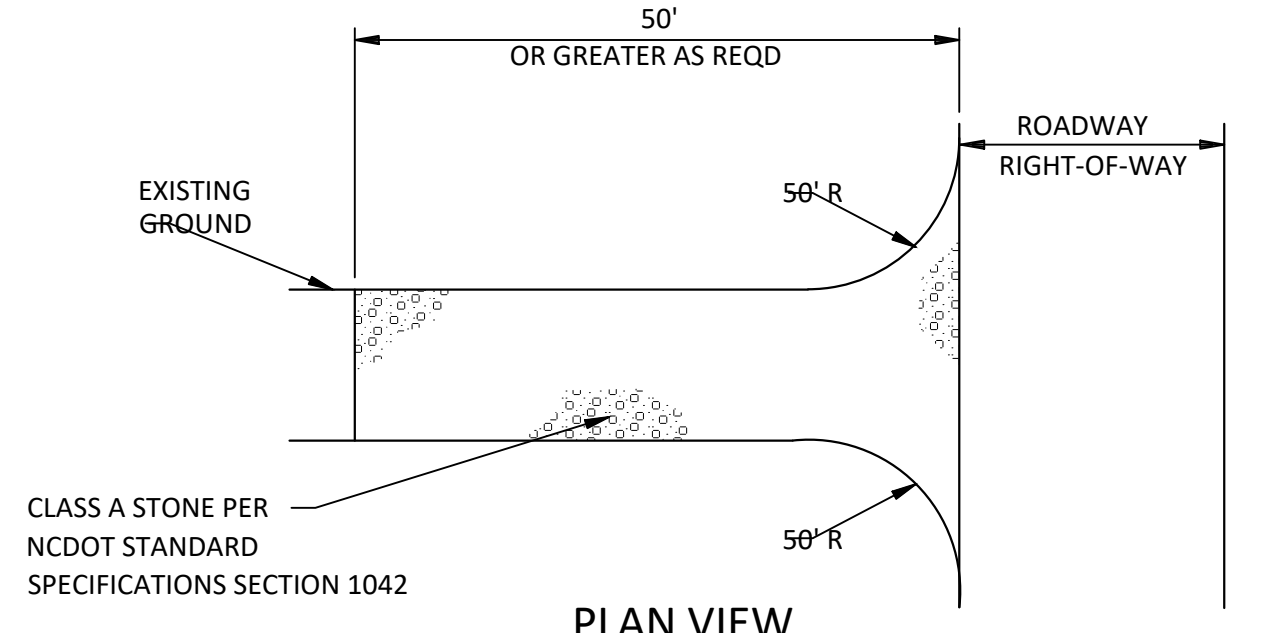
- NOTES:
1. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 15 FEET UP SLOPE AT 45 DEGREES TO THE MAIN SOCK ALIGNMENT.
 2. TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.
 3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN. SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
 4. BIODEGRADABLE FILTER SOCK SHALL BE REPLACED AFTER 6 MONTHS. PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
 5. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

COMPOST STANDARDS

ORGANIC MATTER CONTENT = 80%-100% (DRY WEIGHT BASIS)
PARTICLE SIZE = 98% PASS THROUGH 1" SCREEN
SOLUBLE SALT CONCENTRATION = 5.0 dS MAXIMUM
ORGANIC PORTION = FIBROUS AND ELONGATED
pH = 5.5 - 8.0
MOISTURE CONTENT = 35% - 55%



COMPOST FILTER SOCK INSTALLATION DETAIL
NOT TO SCALE

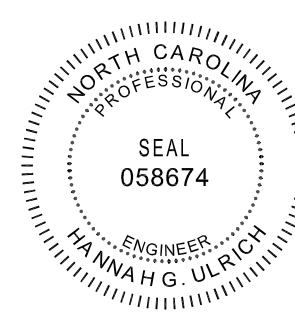


TYPICAL STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE

MIRAFI 140N FILTER FABRIC (OR APPROVED EQUAL) PLACED IN TWO LAYERS AND INSTALLED IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS SECTION 1056

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DESIGNER: MJM DRAWN: CLC
CHECKED: HGU DATE: 25/SEP/24

DUKE ENERGY
KIGHTDALE BATTERY ENERGY STORAGE SYSTEM

EROSION & SEDIMENT CONTROL DETAILS
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KNIGHTDALE, NC 27544

PROJECT	DRAWING NUMBER	REV
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CODE	AREA	
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SKIMMER MAINTENANCE NOTES

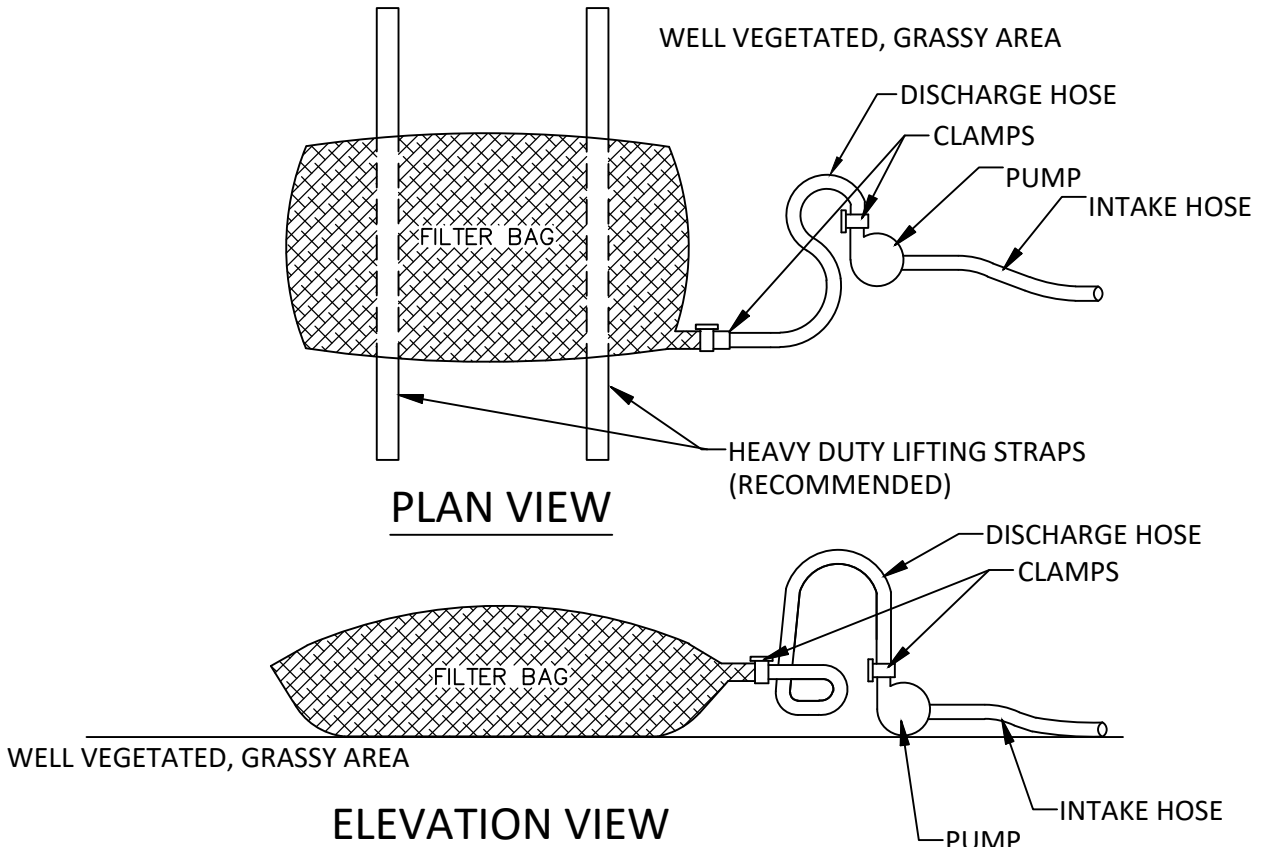
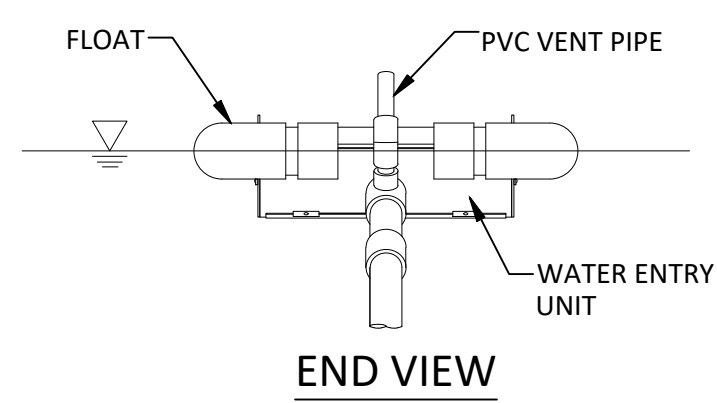
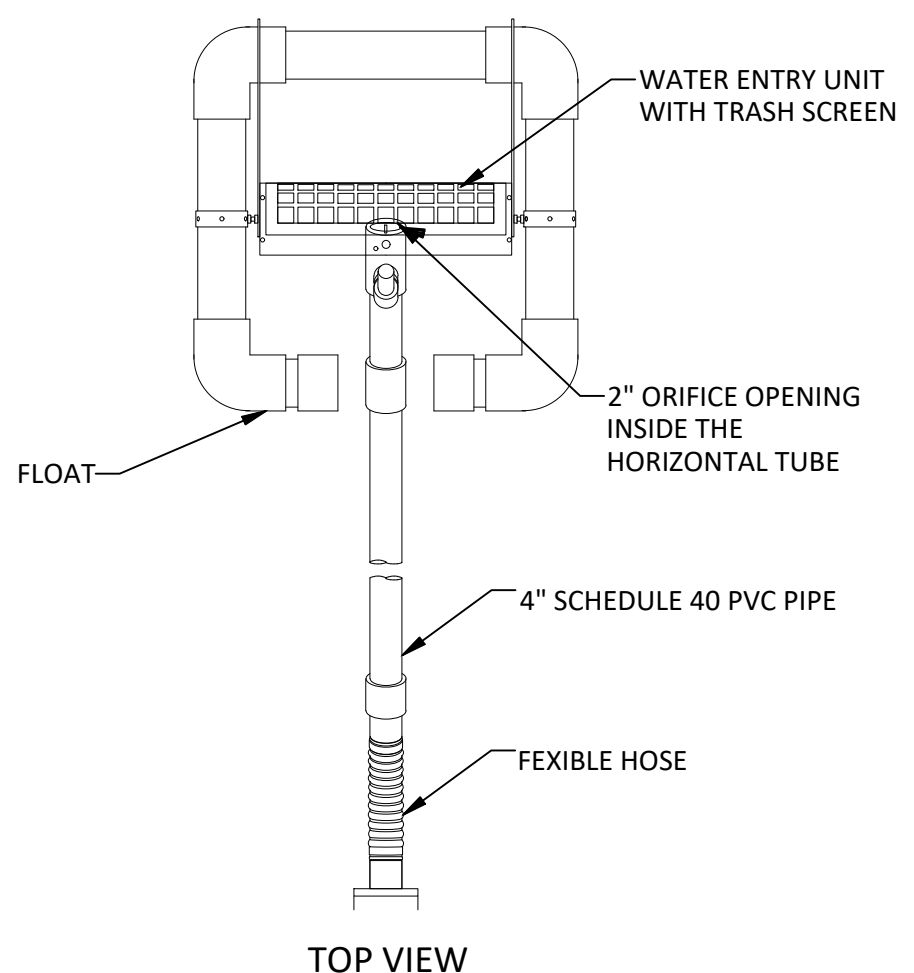
- INSPECT SKIMMER SEDIMENT BASINS WEEKLY AND AFTER EACH SIGNIFICANT (ONE-HALF INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. PULL THE SKIMMER TO ONE SIDE SO THAT THE SEDIMENT UNDERNEATH IT CAN BE EXCAVATED. EXCAVATE THE SEDIMENT FROM THE ENTIRE BASIN, NOT JUST AROUND THE SKIMMER OR THE FIRST CELL. MAKE SURE VEGETATION GROWING IN THE BOTTOM OF THE BASIN DOES NOT HOLD DOWN THE SKIMMER.
- IF THE SKIMMER IS CLOGGED WITH TRASH AND THERE IS WATER IN THE BASIN, USUALLY JERKING ON THE ROPE WILL MAKE SKIMMER BOB UP AND DOWN AND DISLODGE THE DEBRIS AND RESTORE FLOW. IF THIS DOES NOT WORK, PULL THE SKIMMER OVER TO THE SIDE OF THE BASIN TO REMOVE DEBRIS. ALSO CHECK THE ORIFICE INSIDE THE SKIMMER TO SEE IF IT IS CLOGGED; IF SO REMOVE THE DEBRIS.
- IF THE SKIMMER ARM OR BARREL PIPE IS CLOGGED, THE ORIFICE CAN BE REMOVED AND THE OBSTRUCTION CLEARED WITH A PLUMBER'S SNAKE OR BY FLUSHING WITH WATER. BE SURE TO REPLACE THE ORIFICE BEFORE REPOSITIONING THE SKIMMER.
- FREEZING WEATHER CAN RESULT IN ICE FORMING IN THE BASIN. SOME SPECIAL PRECAUTIONS SHOULD BE TAKEN IN THE WINTER TO PREVENT THE SKIMMER FROM PLUGGING WITH ICE.
- CONTROLS MUST BE INSPECTED EVERY 7 CALENDAR DAYS AND WITHIN 24 HOURS OF A 1-INCH RAINFALL IN A 24-HOUR PERIOD.
- INSPECT BAFFLES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
- BE SURE TO MAINTAIN ACCESS TO THE BAFFLES. SHOULD THE FABRIC OF A BAFFLE COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
- REMOVE SEDIMENT DEPOSITS WHEN IT REACHES HALF FULL, TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE BAFFLES. TAKE CARE TO AVOID DAMAGING THE BAFFLES DURING CLEANOUT, AND REPLACE IF DAMAGED DURING CLEANOUT OPERATIONS. SEDIMENT DEPTH SHOULD NEVER EXCEED HALF THE DESIGNED STORAGE DEPTH.
- AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED, REMOVE ALL BAFFLE MATERIALS AND UNSTABLE SEDIMENT DEPOSITS, AND ENSURE THE SEED & EROSION CONTROL MATTING MEET PERMANENT STABILIZATION REQUIREMENTS.
- POND WILL BE DEWATERED VIA A PUMP FOR MAINTENANCE.

SKIMMER REMOVAL NOTES:

- REMOVE SEDIMENT & SCARIFY BOTTOM OF BASIN
- REMOVE TIMBER PAD AND FILL IN SUMP
- REMOVE SKIMMER & ORIFICE PLUGS
- PLUG SKIMMER DISCHARGE PIPE WITH GROUT

NOTES

- PREVENT THE SKIMMING DEVICE FROM SETTLING BY PROVIDING A TIMBER SUPPORT UNDER THE SKIMMER.
- AT THE COMPLETION OF CONSTRUCTION REMOVE SKIMMER AND PLUG DISCHARGE PIPE WITH GROUT.
- ASSEMBLE THE SKIMMER FOLLOWING THE MANUFACTURER'S INSTRUCTIONS. POSITION THE SKIMMER OVER THE TIMBER SUPPORT PAD. BE SURE TO ATTACH A ROPE TO THE SKIMMER AND ANCHOR IT TO THE SIDE OF THE BASIN. THIS WILL BE USED TO PULL THE SKIMMER TO THE SIDE FOR MAINTENANCE.
- GRADE BASIN SO THAT THE BOTTOM IS LEVEL FRONT TO BACK AND SIDE TO SIDE.
- INSTALL THE COIR FIBER BAFFLES IMMEDIATELY UPON EXCAVATION OF THE BASINS.
- STEEL POSTS SHOULD BE DRIVEN TO A DEPTH OF 24 INCHES AND SPACED A MAXIMUM OF 4 FEET APART. THE TOP OF THE FABRIC SHOULD BE A MINIMUM OF 6 INCHES HIGHER THAN THE INVERT OF THE SPILLWAY. TOPS OF BAFFLES SHOULD BE A MINIMUM OF 2 INCHES LOWER THAN THE TOP OF THE EARTHEN EMBANKMENT.
- ATTACH A 9 GAUGE HIGH TENSION WIRE STRAND TO THE STEEL POSTS AT A HEIGHT OF 6 INCHES ABOVE THE SPILLWAY ELEVATION WITH PLASTIC TIES OR WIRE FASTENERS TO PREVENT SAGGING. DO NOT SPLICE THE FABRIC, BUT USE A CONTINUOUS PIECE ACROSS THE BASIN. ADJUSTMENTS MAY BE REQUIRED IN THE STAPLING REQUIREMENTS TO FIT INDIVIDUAL SITE CONDITIONS.
- INSTALL THREE (3) COIR FIBER BAFFLES IN BASINS AT DRAINAGE OUTLETS SPACED AS SHOWN ON LIE02-EC-C-PL-01.
- BUILD RIDGE HIGHER THAN DESIGN AND COMPACT WITH WHEELS OF CONSTRUCTION EQUIPMENT. COMPACTED RIDGE MUST BE AT OR ABOVE DESIGN GRADE AT ALL POINTS.
- VEGETATE DITCH AND BERM IMMEDIATELY AFTER CONSTRUCTION. STABILIZATION METHOD SHALL BE SEED SUPPLEMENTED WITH DEGRADABLE COIR (COCONUT FIBER) BLANKETS.
- INSPECT ROLLED EROSION CONTROL PRODUCTS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH ARE GREATER) RAINFALL EVENT. REPAIR IMMEDIATELY. MONITOR AND REPAIR THE ROLLED EROSION CONTROL BLANKET AS NECESSARY UNTIL GROUND COVER IS ESTABLISHED.
- WHEN WATERSHED AREA HAS BEEN STABILIZED AND ALL CONSTRUCTION DISTURBANCE HAS CEASED, REMOVE RIDGE AND FILL CHANNEL TO BLEND WITH NATURAL GRAND. STABILIZE DISTURBED AREA.



NOTES:

LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 SIEVE

A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.

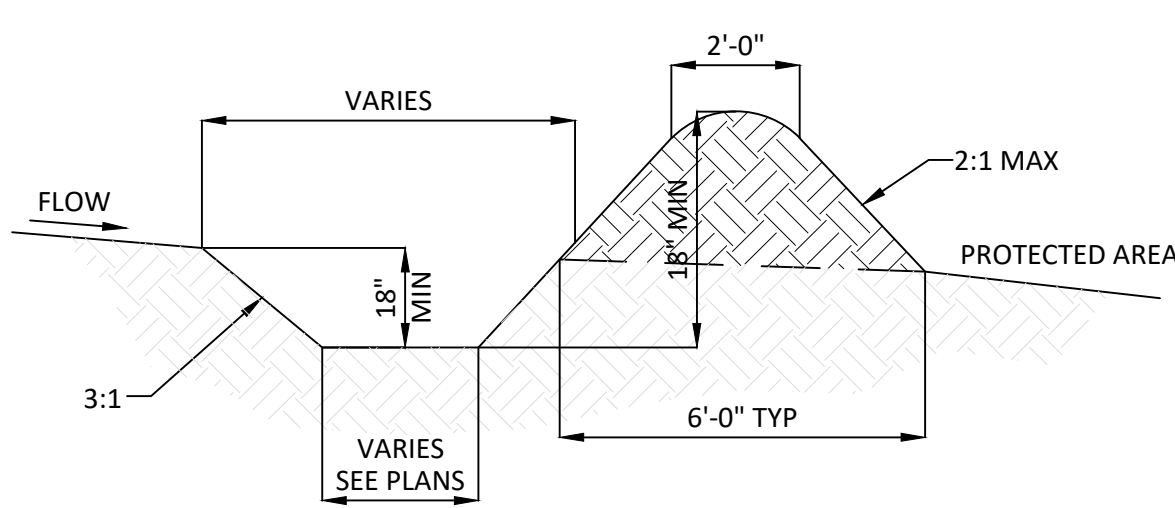
BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.

NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HQ OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.

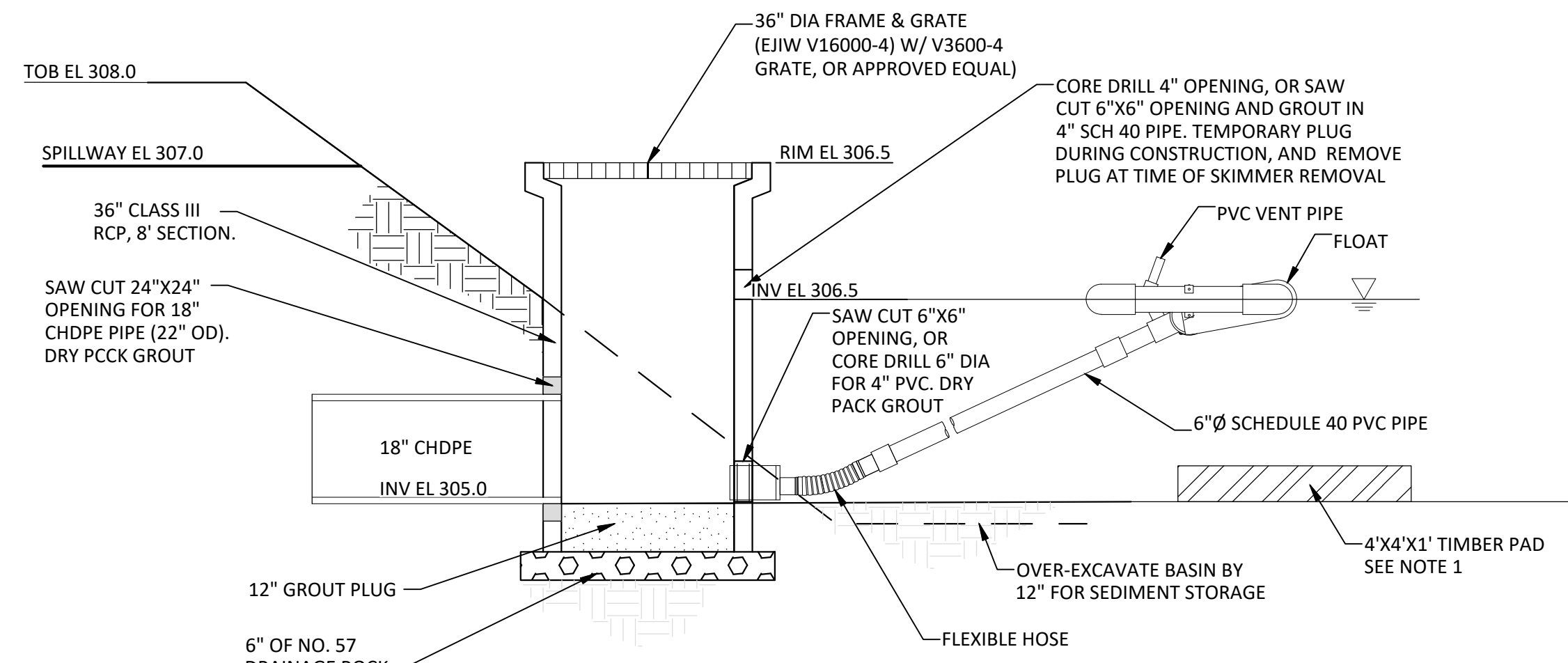
THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.

THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

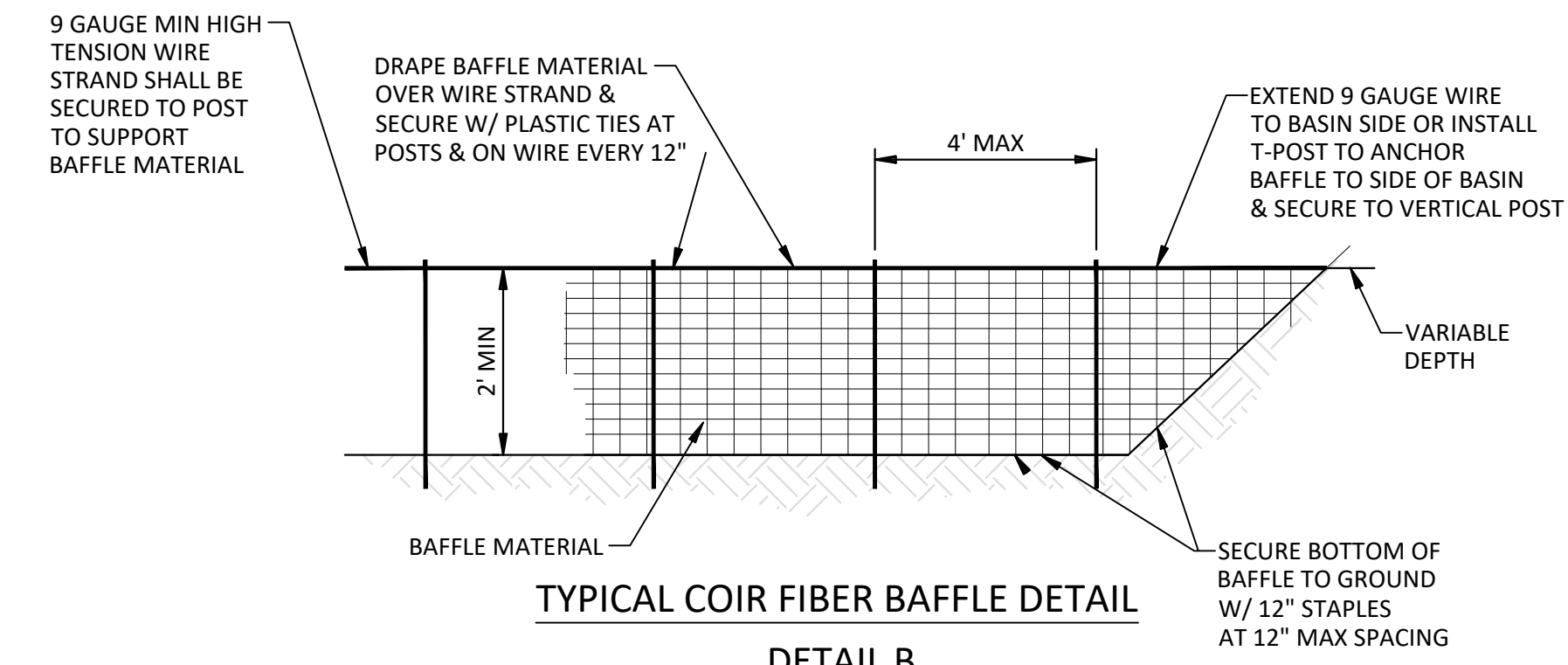


TYPICAL TEMPORARY DIVERSION DITCH
NO SCALE
SEE NOTES 9 - 12



SKIMMER DEWATERING DEVICE
DETAIL A
NO SCALE
SEE MAINTENANCE NOTES 1-4
SEE NOTES 1-3

NOTE: AFTER SAW CUTTING/CORE DRILLING, COAT EXPOSED REINFORCING WITH BITUMASTIC COAL TAR EPOXY

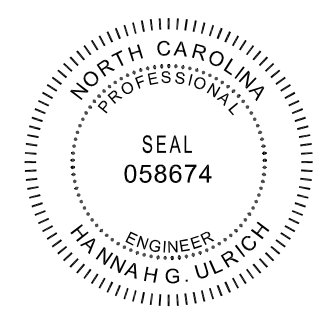


TYPICAL COIR FIBER BAFFLE DETAIL
DETAIL B
NO SCALE
SEE MAINTENANCE NOTES 5-8
SEE NOTES 6-10

COIR FIBER BAFFLE MATERIAL PROPERTY REQUIREMENTS	
THICKNESS	0.30" MINIMUM
TENSILE STRENGTH (WET)	900 X 680 LB/FT MINIMUM
ELONGATION (WET)	69% X 34% MAXIMUM
FLOW VELOCITY	10-12 FT/SEC
WEIGHT	20 OZ/SY MINIMUM
MINIMUM WIDTH	6.5 FEET
OPEN AREA	50% MAXIMUM

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B	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSL	CLC
A	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	DSL	CLC

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DESIGNER: MJM DRAWN: CLC
CHECKED: HGU DATE: 25/SEP/24

DUKE ENERGY
KIGHTDALE BATTERY ENERGY STORAGE SYSTEM

EROSION & SEDIMENT CONTROL DETAILS
5201 KNIGHTDALE EAGEL ROCK ROAD
KNIGHTDALE, NC 27544

PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-EC.SD-02	C	
CODE	AREA	

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
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

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

EQUIPMENT AND VEHICLE MAINTENANCE

- Maintain vehicles and equipment to prevent discharge of fluids.
- Provide drip pans under any stored equipment.
- Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
- Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
- Remove leaking vehicles and construction equipment from service until the problem has been corrected.
- 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

- Never bury or burn waste. Place litter and debris in approved waste containers.
- Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
- Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
- 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.
- Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
- Anchor all lightweight items in waste containers during times of high winds.
- Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
- Dispose waste off-site at an approved disposal facility.
- On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

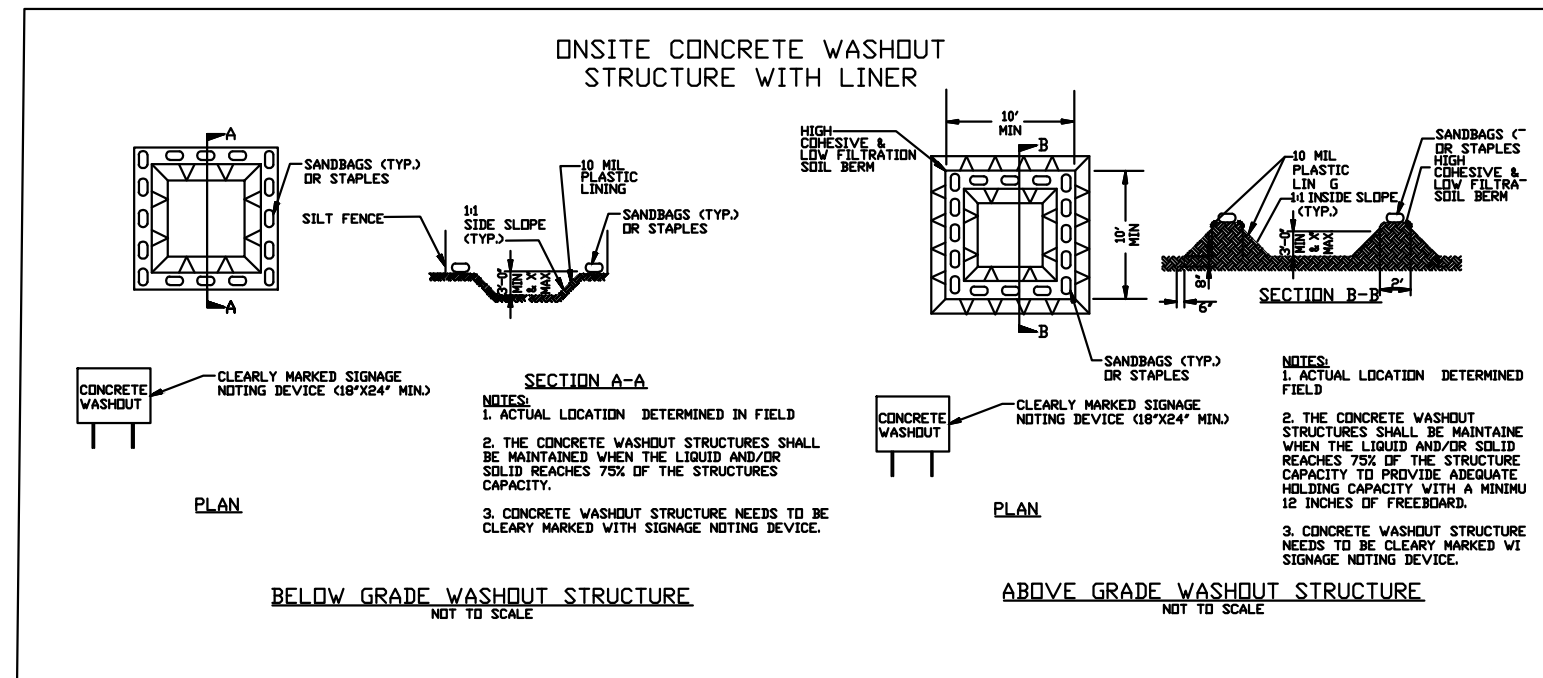
- Do not dump paint and other liquid waste into storm drains, streams or wetlands.
- Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
- Contain liquid wastes in a controlled area.
- Containment must be labeled,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

PORTABLE TOILETS

- 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.
- Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
- 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

- 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.
- Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
- Provide stable stone access point when feasible.
- 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.



CONCRETE WASHOUTS

- Do not discharge concrete or cement slurry from the site.
- Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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

- Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
- 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.
- 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.
- Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

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

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

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A	4/SEP/2024	ISSUED FOR 60% REVIEW					CLC MJM HGU DLS LD

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DUKE ENERGY
KIGHTDALE BATTERY ENERGY STORAGE SYSTEM

EROSION & SEDIMENT CONTROL DETAILS
5201 KNIGHTDALE EAGEL ROCK ROAD
KNIGHTDALE, NC 27544

PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-EC.DS-03	C	
CODE	AREA	

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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.

Table with 3 columns: Inspect, Frequency (during normal business hours), and Inspection records must include. Rows include Rain gauge, E&SC Measures, Stormwater outfalls, Perimeter of site, Streams or wetlands, and Ground stabilization measures.

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.

Table with 2 columns: Item to Document and Documentation Requirements. Rows include E&SC measures, grading phase, ground cover, maintenance/repair, and corrective actions.

2. Additional Documentation to be Kept on Site

In addition to the E&SC plan documents above, the following items shall be kept on the site and available for 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 twelve months. 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.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all 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).
(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act...
(d) Anticipated bypasses and unanticipated bypasses.
(e) 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 Department's Environmental Emergency Center personnel at (800) 858-0368.

Table with 2 columns: Occurrence and Reporting Timeframes (After Discovery) and Other Requirements. Rows include sediment deposition, oil spills, anticipated bypasses, unanticipated bypasses, and noncompliance.



PART II, SECTION G, ITEM (4) DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible.

- (a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur.
(b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit.
(c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin.
(d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above.
(e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
(f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

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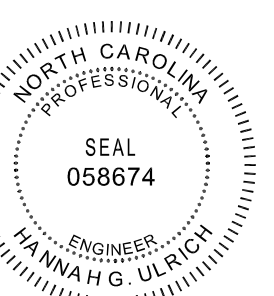
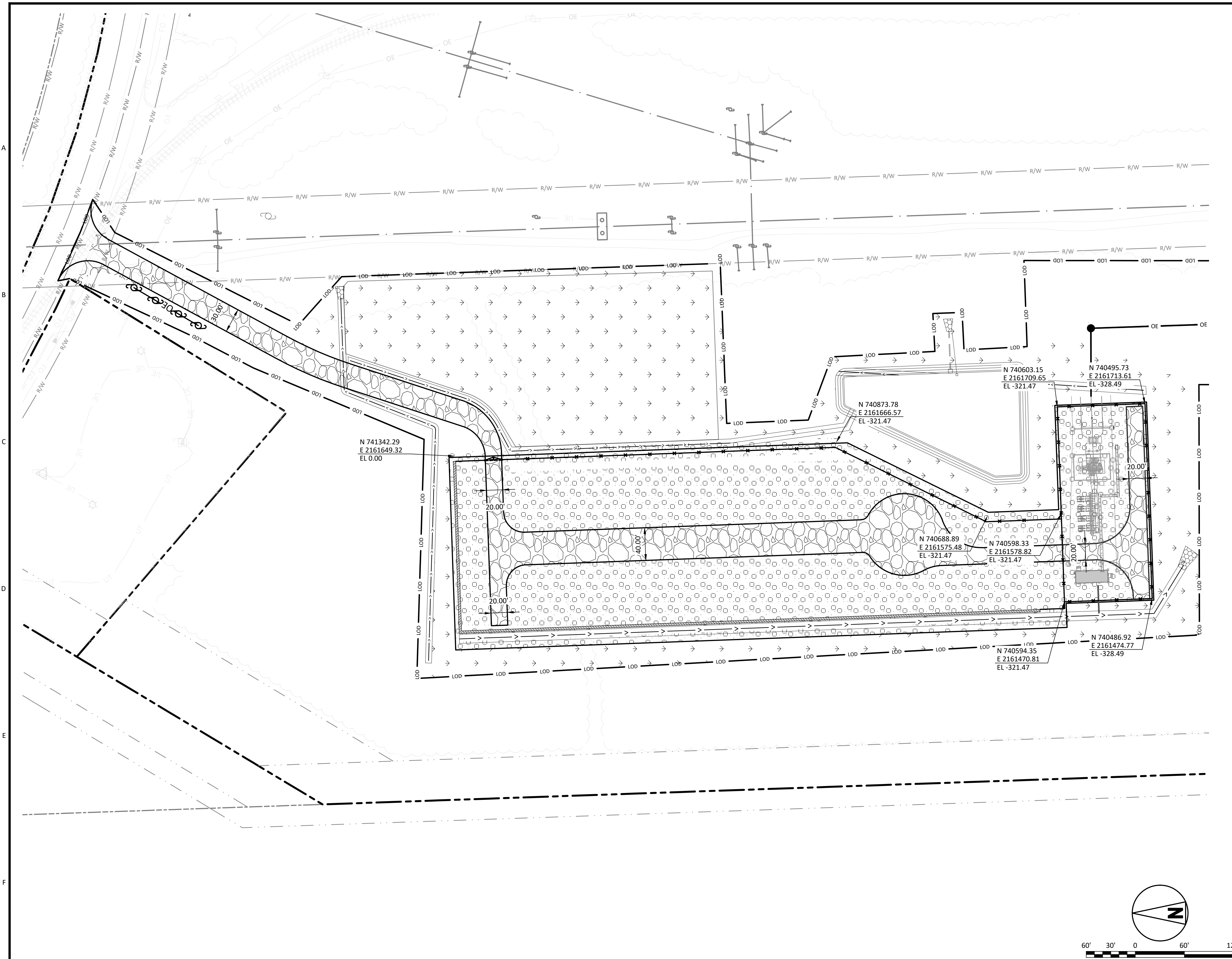


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DUKE ENERGY logo and project information: PROJECT DUKE ENERGY, KIGHTDALE BATTERY ENERGY STORAGE SYSTEM, EROSION & SEDIMENT CONTROL DETAILS, 5201 KNIGHTDALE EAGEL ROCK ROAD, KNIGHTDALE, NC 27544

Table with 3 columns: PROJECT, DRAWING NUMBER, and REV. Values: PROJECT DUKE ENERGY, DRAWING NUMBER 419596 KND01-CV-C-EC.DS-04, REV C

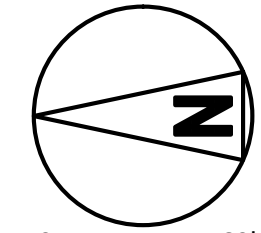


NOTES

1. BARBED WIRE OR CHAIN LINK FENCES ARE RESTRICTED TO THE REAR YARD, SHALL NOT BE VISIBLE FROM A STREET RIGHT-OF-WAY, AND SHALL NOT BE ADJACENT TO ANY LOT IN OR ZONED FOR RESIDENTIAL USE PER SECTION 7.6.C OF THE UDO."

LEGEND

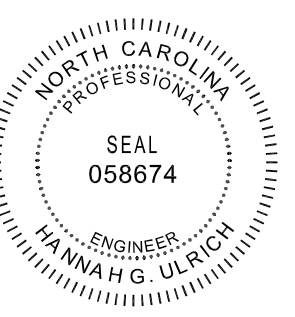
- ADJACENT PARCEL BOUNDARY
- X---X---X--- PROPOSED SECURITY FENCE
- X---X---X--- EXISTING FENCE
- PROPOSED ROAD
- EXISTING TREE LIMITS
- EXISTING RAILROAD
- OE --- OE --- EXISTING OVERHEAD LINE
- --- PROPERTY BOUNDARY
- OE --- OE --- PROPOSED OVERHEAD ELECTRIC LINES
- R/W --- R/W --- EXISTING RIGHT-OF-WAY
- FO --- FO --- EXISTING FIBER OPTIC CABLE
- LOD --- LOD --- LIMITS OF DISTURBANCE
- EXISTING TREE LINE
- PROPOSED PERIMETER WALL
- < --- < --- PROPOSED VEGETATED SWALE
- [Pattern] RIP RAP
- [Pattern] GRASS SURFACING
- [Pattern] ABC PER NCDOT SPECIFICATIONS (2018)
- [Pattern] #57 STONE PER NCDOT SPECIFICATIONS (2018)



60' 30' 0 60' 120'
1"=60'

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B	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	PSL	
A	22/AUG/2024	ISSUED FOR PERMIT	CLC	MJM	HGU	PSL	

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DUKE ENERGY
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

SURFACING AND FENCING PLAN
5201 KNIGHTDALE EAGLE ROCK ROAD
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-FE.PL-01		D
CODE	AREA	