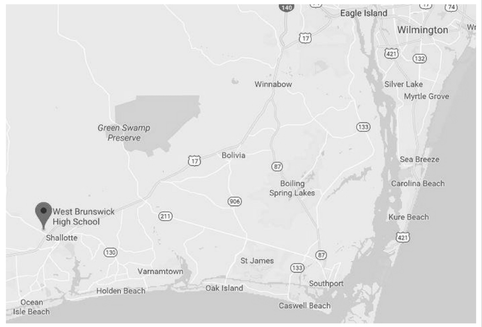
VICINITY MAP



ABBREVIATIONS

ACT	ACOUSTIC CEILING TILE	F.E.C.	FIRE EXTINGUISHER CABINET	PT., PTD.	PAINTED
AC.	ACOUSTIC	FIN.F.,F.F.	FINISHED FLOOR	P.R.V.	POWER ROOF VENTILATOR
AL., ALUM.	ALUMINUM	F.OF S.	FACE OF STUD	R.D.	ROOF DRAIN
A.P.	ACCESS PANEL	FRP	FIREGLASS REINFORCED PLASTIC	REC.	RECESSED
A.R.GWB	ABUSE RESISSTANT GWB	F.R.T.	FIRE RETARDANT TREATED	RECPT.	RECEPTIONIST
A.F.F.	ABOVE FINISHED FLOOR	FTG.	FOOTING	REF.	REFRIGERATOR
BD.	BOARD	FURR.	FURRING	REQD.	REQUIRED
BLDG.	BUILDING	F.V.	FIELD VERIFY	R.L.	RAIN LEADER
B.M.	BENCH MARK	FVC	FIRE VALVE CABINET	RM.	ROOM
BRG.	BEARING	GA.	GAUGE	R.O.	ROUGH OPENING
CAB.	CABINET	G.B.	GRAB BAR	RUB.	RUBBER (WALL BASE)
CB, C.B.	CHALKBOARD	G.W.B, GWB	GYPSUM WALL BOARD	S.D.	SOAP DISPENSER
C.T.	CERAMIC TILE	GYP.BD.	GYPSUM BOARD	SECT.	SECTION
C.H.	CEILING HEIGHT	H., HT.	HEIGHT	S.G.F.T.	STRUCT. GLAZED FACING TILE
CJ, C.J.	CONTROL JOINT	H.C.	HANDICAPPED	S.H.	SHOWER HEAD
C.L.	CENTER LINE	HDW.	HARDWARE	SHT.	SHEET
CLG.	CEILING	H.M.	HOLLOW METAL	SIM.	SIMILAR
CLO., C.	CLOSET	HR.	HOUR	S.M.	SURFACE MOUNTED
CLR.	CLEAR	H.P.	HIGH POINT	S.P.	STAND PIPE
C.M.U., CMU	CONCRETE MASONRY UNIT	I.D.	INSIDE DIAMETER	S.S.	SERVICE SINK
COL.	COLUMN	INSUL.	INSULATION	S/S	STAINLESS STEEL
CONC.	CONCRETE	J., JAN.	JANITOR	STL.	STEEL
CONST.	CONSTRUCTION	JST.	JOIST	STOR.	STORAGE
CONT.	CONTINUOUS	JNT.	JOINT	STRUCT.	STRUCTURAL
CORR.	CORRIDOR	LAM.	LAMINATE	SUSP.	SUSPENDED
CPT.	CARPET	LAV.	LOW POINT	SYN.FL.	SYNTHETIC FLOOR
C.R.	COLD ROLLED	L.P.	LAVATORY SINK	TB, T.B.	TACKBOARD
D.A.	DISTURBED AREA	M.	MEN	TEL.	TELEPHONE
DET.	DETAIL	MACH.	MACHINE	T.& G.	TONGUE AND GROOVE
D.F.	DRINKING FOUNTAIN	MAINT.	MAINTENANCE	THRESH.	THRESHOLD
DBL	DOUBLE	MAS.	MASONRY	T.O.B.	TOP OF BEARING
DIA.	DIAMETER	MAT.	MATERIALS	T.O.M.	TOP OF MASONRY PARAPET
DIM.	DIMENSION	MAX.	MAXIMUM	T.P.	TOILET PAPER HOLDER
DISP.	DISPENSER	MB, M.B.	MARKER BOARD	T.S.	TACK STRIP.
DR.	DOOR	M.C.	MEDICINE CABINET	T.W.	TEACHING STATION
DW	DRYWALL	MECH.	MECHANICAL	TYP.	TEACHING WALL
DS	DOWNSPOUT	MET., MTL.	METAL	U.L.	TYPICAL
DWG.	DRAWING	MFR.	MANUFACTURER	U.O.N.	UNDERWRITERS LABORATORIES
EA.	EACH	MIN.	MINMUM	U.S.G.	UNLESS OTHERWISE NOTED
E.J., EJ	EXPANSION JOINT	M.O.	MASONRY OPENING	V.A.T.	U.S. GYPSUM COMPANY
ELEC.	ELECTRIC(-AL)	M.S.,	METAL SHELVING	V.C.T.	VINYL ASBESTOS TILE
EP	EPOXY PAINT	MTD	MOUNTED	VERT.	VINYL COMPOSITION TILE
EQ.	EQUAL	N.C., NONCOM	NON COMBUSTIBLE	VEST., V.	VERTICAL
EQUIP, EQPT	EQUIPMENT	N.I.C.	NOT IN CONTRACT	V.R.G.	VESTIBULE
E.W.C.	ELECTRIC WATER COOLER	NO., #	NUMBER	V.T.R.	VINYL REDUCER STRIP
EXG.	EXISTING	N.T.S.	NOT TO SCALE	W.	VENT THROUGH ROOF
EXP.	EXPANSION	O.C.	ON CENTER	W/	WOMEN
EXT.	EXTERIOR	O.D.	OUTSIDE DIAMETER	WAIN.	WITH
F.C.	FIRE CODE	OFF.	OFFICE	WARD.	WAINSCOT
F.C.U.	FAN COIL UNIT	OPPOSITE HAND		W.C.	WARDROBE
F.D.	FLOOR DRAIN	OPNG.	OPENING	WD.	WATER CLOSET
FON.	FOUNDATION	PART.	PARTITION	WDR.	WOOD
F.E.	FIRE EXTINGUISHER	PL.	PLATE	WL.	WARDROBE
		PLAM., P-LAM	PLASTIC LAMINATE	W.M.	WALL
		PLY., PWD	PLYWOOD	W.W.W.	WALL-MOUNTED WELDED WIRE MESH
		PNL.	PANEL		
		PS., P.S.	PROJECTOR SCREEN		

SYMBOLS OF MATERIALS

- ALL METALS-SMALL SCALE
- ACOUSTIC C.M.U. SMALL SCALE
- ACOUSTIC C.M.U. LARGE SCALE
- BATT INSULATION
- BRICK
- CAST STONE
- CONCRETE
- CONCRETE MASONRY UNITS
- EARTH
- GLASS-LARGE SCALE
- GLAZED C.M.U.
- PARTICLE BOARD
- RIGID INSULATION
- SHINGLES
- SOLID CONCRETE MASONRY UNITS
- STEEL-LARGE SCALE
- STUD PARTITION
- WOOD-FINISH
- WOOD BLOCKING

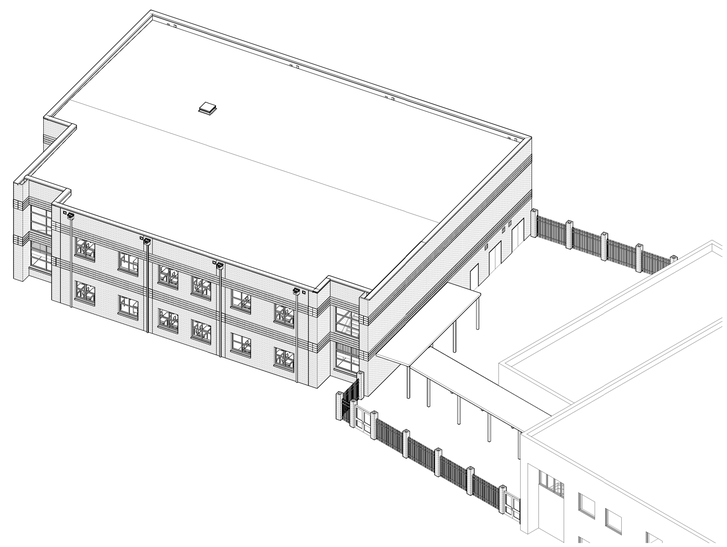
DRAWING KEYS

- 0 — STRUCTURAL GRID LINES
- 1 A101 SIM — SECTION
- 1 A101 SIM — ELEVATION
- 1 A101 SIM — DETAILS IN PLAN, SECTION
- NEW WALL
- 1t — WALL TYPE, SEE A501
- EXISTING WALL TO REMAIN
- Name 101 — ROOM NAME AND NUMBER
- EXISTING WALL TO BE REMOVED
- 1t — WINDOW TAG
- 101 — DOOR TAG

NEW CONSTRUCTION OF

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470



ISSUED FOR BIDDING
NOT FOR CONSTRUCTION

04.16.2020

DESIGN TEAM

BECKER MORGAN GROUP, INC.	ARCHITECTS
WOODS ENGINEERING, P.A.	STRUCTURAL ENGINEERS
CBHF ENGINEERS, PLLC PARAMOUNTE ENGINEERING, INC.	MECHANICAL, PLUMBING AND ELECTRICAL ENGINEERS
W.M. JORDAN COMPANY	CIVIL ENGINEERS
	CONSTRUCTION MANAGERS

DRAWING LIST

SHEET No.	SHEET TITLE
GENERAL	
G001	COVER SHEET
G101	CLASSROOM BUILDING CODE SUMMARY
G200	CAMPUS LIFE SAFETY PLAN AND NEW LIFE SAFETY SYSTEMS
G201	CLASSROOM LIFE SAFETY PLANS
G301	UL DETAILS
G302	UL DETAILS
G303	UL DETAILS
CIVIL	
C-0.0	COVER SHEET
C-1.0	GENERAL NOTES
C-1.1	GENERAL NOTES
C-2.0	DEMOLITION PLAN
C-2.1	DEMOLITION PLAN
C-2.2	DEMOLITION PLAN
C-2.3	OVERALL SITE PLAN
C-2.4	SITE PLAN
C-2.5	SITE PLAN
C-2.6	SITE PLAN
C-3.0	GRADING - DRAINAGE - EC PLAN
C-3.1	GRADING - DRAINAGE - EC PLAN
C-4.0	UTILITY PLAN
C-4.1	UTILITY PLAN
C-5.0	DETAILS
C-5.1	DETAILS
C-5.2	DETAILS
C-5.3	DETAILS
C-5.4	DETAILS
LANDSCAPING	
L-1.0	LANDSCAPE PLAN
STRUCTURAL	
S101	GENERAL NOTES
S102	TYPICAL DETAILS
S200	FOUNDATION AND 2ND FLOOR SLAB PLANS
S201	CLASSROOM BUILDING FOUNDATION PLAN
S202	CLASSROOM BUILDING SECOND FLOOR FRAMING PLAN
S203	CLASSROOM BUILDING ROOF FRAMING PLAN
S301	FOUNDATION SECTIONS AND DETAILS
S401	FRAMING SECTIONS AND DETAILS
S501	BRACE FRAME ELEVATIONS AND CMU SHEAR WALLS
ARCHITECTURAL	
A001	CONSTRUCTION TYPES
A101	CLASSROOM BUILDING FIRST FLOOR PLAN
A102	CLASSROOM BUILDING SECOND FLOOR PLAN
A103	ROOF PLAN
A104	CLASSROOM BLDG FIRST FLOOR REFLECTED CEILING PLAN
A105	CLASSROOM BUILDING SECOND FLOOR REFLECTED CEILING PLAN
A151	FURNITURE PLANS
A201	CLASSROOM BUILDING EXTERIOR ELEVATIONS
A301	CLASSROOM BUILDING BUILDING SECTIONS
A302	CLASSROOM BUILDING WALL SECTIONS
A303	CLASSROOM BUILDING WALL SECTIONS
A401	ENLARGED PLANS AND SECTIONS
A402	TOILET ELEVATIONS
A403	ENLARGED STAIR PLANS AND SECTIONS
A501	PLAN DETAILS
A510	SECTION DETAILS
A520	STAIR / ELEVATOR DETAILS
A530	ROOF DETAILS
A531	CANOPY DETAILS
A540	TYPICAL ROOF MANUFACTURERS DETAILS
A601	FINISH SCHEDULE
A602	DOOR SCHEDULE, TYPES AND WINDOW TYPES
A603	WINDOW DETAILS
A604	DOOR DETAILS
A605	SIGNAGE SCHEDULE AND DETAILS
A701	INTERIOR CASEWORK ELEVATIONS
A702	INTERIOR CASEWORK ELEVATIONS
A703	CASEWORK SECTIONS
A801	FINISH PLANS AND DETAILS
PLUMBING	
P101	CLASSROOM BUILDING PLANS - WASTE VENT
P201	CLASSROOM BUILDING PLANS - DOMESTIC WATER
P301	LP GAS PIPING PLANS AND GAS RISER
P401	ENLARGED PLUMBING PLANS
P501	PLUMBING DETAILS
P601	PLUMBING SCHEDULES
MECHANICAL	
M001	MECHANICAL ABBREVIATIONS, LEGEND, ENERGY AND MECHANICAL SUMMARIES
MH101	CLASSROOM BUILDING FLOOR PLANS - HVAC
MP101	CLASSROOM BUILDING FLOOR PLANS - HYDRONIC
MH102	CLASSROOM BUILDING FLOOR PLAN - HVAC RCP AND T-STAT LOC
MH103	ROOF PLAN - HVAC
MH401	ENLARGED PLANS
M501	HVAC DETAILS
M502	HVAC DETAILS
M503	HVAC DETAILS
M504	HVAC UL DETAILS
M601	MECHANICAL SCHEDULES
M602	MECHANICAL SCHEDULES
M701	MECHANICAL CONTROL DIAGRAMS AND SEQUENCES
M702	MECHANICAL CONTROL DIAGRAMS AND SEQUENCES
M703	HYDRONIC PIPING FLOW DIAGRAM
ELECTRICAL	
E001	ELECTRICAL SYMBOLS AND ABBREVIATIONS
E100	ELECTRICAL SITE PLAN
E101	CLASSROOM BUILDING AND RENOVATION FIRST AND SECOND FLOOR PLANS - POWER
E102	CLASSROOM BUILDING AND RENOVATION FIRST AND SECOND FLOOR PLANS - HVAC POWER
E103	CLASSROOM BUILDING AND RENOVATION ROOF PLAN - POWER
E201	CLASSROOM BUILDING FIRST AND SECOND FLOOR PLANS - LIGHTING
E301	CLASSROOM BUILDING FIRST AND SECOND FLOOR PLANS - SYSTEMS
E401	ENLARGED ELECTRICAL PLANS
E501	ELECTRICAL DETAILS
E502	ELECTRICAL DETAILS
E503	UL DETAILS
E601	ELECTRICAL RISER DIAGRAM AND SCHEDULES
E602	ELECTRICAL PANEL SCHEDULES AND LIGHTING FIXTURE SCHEDULE
E603	ELECTRICAL SYSTEMS RISER DIAGRAM
FIRE PROTECTION	
F101	CLASSROOM BUILDING FIRST AND SECOND FLOOR PLANS - FIRE ALARM
F601	FIRE ALARM RISER DIAGRAM, LEGEND AND NOTES

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302.369.3700

www.beckermorgan.com

ISSUED
FOR BIDDING

NOT FOR CONSTRUCTION
ISSUED: 04.16.2020

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

COVER SHEET

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 1" = 1'-0"
DRAWN BY: LJR PROJ MGR: RMC

G001

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BUILDING CODE SUMMARY - CLASSROOM BUILDING

NAME OF PROJECT: WEST BRUNSWICK HIGH SCHOOL

ADDRESS: 550 WHITEVILLE ROAD NW, SHALLOTTE NC 28407

OWNER OR AUTHORIZED AGENT: CRAIG ECKERT PHONE #: 910.253.1078 E-Mail: ceckert@bcswan.net

OWNED BY: ☐ City ■ County ☐ State ☐ Private

CODE ENFORCEMENT JURISDICTION: ☐ City ■ County ☐ State

CONTACT:

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	EMAIL ADDRESS
ARCHITECTURAL	Becker Morgan Group, Inc.	Frederick M. Collins	4537	910.341.7600	rcollins@beckermorgan.com
CIVIL	Paramounte Engineering, Inc.	Robert Ballard		910.791.6707	rballard@paramounte-eng.com
ELECTRICAL	CBHF ENGINEERS, PLLC	W. Allen Cribb	23311	910.791.4000	acribb@cbhfengineers.com
FIRE ALARM					
PLUMBING	CBHF ENGINEERS, PLLC	David M. Hahn	23551	910.791.4000	dhahn@cbhfengineers.com
MECHANICAL	CBHF ENGINEERS, PLLC	David M. Hahn	23551	910.791.4000	dhahn@cbhfengineers.com
SPRINKLER-STANDPIPE					
STRUCTURAL	Woods Engineering, PA	Don R. Woods	19475	910.343.8007	donwoods@woodseng.com
RETAINING WALL >5' HIGH					
OTHER					

2018 NC BUILDING CODE:

■ New Building ☐ Addition ☐ 1st Time Interior Completion

☐ Phased Construction - Shell/Core - Contact the local inspection jurisdiction for possible additional precedures and requirements

☐ Shell/Core - Contact the local inspection jurisdiction for possible additional precedures and requirements

2018 NC EXISTING BUILDING CODE:

☐ N/A ☐ Chapter 14 ☐ Alteration Level I ☐ N/A ☐ N/A

☐ Prescriptive ☐ Historic Property ☐ Alteration Level II ☐ Repair ☐ Change of Use

☐ Repair ☐ Change of Use ☐ Alteration Level III ☐ Historic Property

CONSTRUCTED: .
RENOVATED: .

CURRENT OCCUPANCY(S) (Ch. 3) .
PROPOSED OCCUPANCY(S) (Ch. 3) .

OCCUPANCY CATEGORY (Table 1604.5):

CURRENT ☐ N/A ☐ I ■ II ☐ III ☐ IV

PROPOSED ☐ N/A ☐ I ■ II ☐ III ☐ IV

BASIC BUILDING DATA:

CONSTRUCTION TYPE: ☐ I-A ☐ I-B ☐ II-A ■ II-B ☐ III-A ☐ III-B ☐ IV ☐ V-A ☐ V-B

SPRINKLERS: ■ NO ☐ YES ☐ PARTIAL ☐ NFPA 13 ☐ NFPA 13R ☐ NFPA 13D

STANDPIPES: ■ NO ☐ YES ☐ CLASS I ☐ CLASS II ☐ CLASS III ☐ WET ☐ DRY

PRIMARY FIRE DISTRICT: ■ NO ☐ YES

FLOOD HAZARD AREA: ☐ NO ■ YES (ZONE X)

SPECIAL INSPECTIONS: ■ NO ☐ YES (Contact the local inspection jurisdiction for additional procedures and requirements)

GROSS BUILDING AREA TABLE:

FLOOR	EXISTING (SQ. FT.)	NEW (SQ. FT.)	SUB-TOTAL
6TH FLOOR			
5TH FLOOR			
4TH FLOOR			
3RD FLOOR			
2ND FLOOR		9,738	9,738
MEZZANINE			
1ST FLOOR		9,738	9,738
BASEMENT			
TOTAL		19,476	19,476

ALLOWABLE AREA:

PRIMARY OCCUPANCY CLASSIFICATION(S): EDUCATION

ACCESSORY OCCUPANCY CLASSIFICATION(S): .

INCIDENTAL USES (Table 509): GROUP E; SCIENCE LABORATORY

SPECIAL USES (Chapter 4 - List Code Sections): .

SPECIAL Provisions (Chapter 5 - List Code Sections): TABLE 508.4 - SEPARATION OF FIRE AREA RATINGS

MIXED OCCUPANCY: ■ NO ☐ YES SEPARATION: . HR. EXCEPTION: .

☐ Non-Separated Use (508.3)

☐ Separated Use (508.4) - See below for area calculations for each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1

$$\frac{\text{ACTUAL AREA OF OCCUPANCY A}}{\text{ALLOWABLE AREA OF OCCUPANCY A}} + \frac{\text{ACTUAL AREA OF OCCUPANCY B}}{\text{ALLOWABLE AREA OF OCCUPANCY B}} \leq 1$$

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 506.2[4] AREA		(C) AREA FOR FRONTAGE INCREASE[1,5]	(D) ALLOWABLE AREA PER STORY OR UNLIMITED
			UNSPRINKLERED	SPRINKLERED		
1	EDUCATION	9,738	14,500	N/A	N/A	14,500
2	EDUCATION	9,738	14,500	N/A	N/A	14,500
.	.	.	.	.	.	.
.	.	.	.	.	.	.

1. FRONTAGE AREA INCREASES FROM SECTION 506.2 ARE COMPUTED THUS:
   A. PERIMETER WHICH FRONTS A PUBLIC WAY OR OPEN SPACE HAVING 20 FT MINIMUM WIDTH . (F)
   B. TOTAL BUILDING PERIMETER = . (P)
   C. RATIO (F/P) = . (F/P)
   D. W = MINIMUM WIDTH OF PUBLIC WAY = . (W) (do not exceed 30)
   E. PERCENT OF FRONTAGE INCREASE I r = 100 [F/P - 0.25] x W/30 = . (%)
2. UNLIMITED AREA APPLICABLE UNDER CONDITIONS OF SECTION 507
3. MAXIMUM BUILDING AREA = TOTAL NUMBER OF STORIES IN THE BUILDING x D (MAXIMUM 3 STORIES) (506.2)
4. THE MAXIMUM AREA OF OPEN PARKING GARAGES MUST COMPLY WITH 406.5.4. THE MAXIMUM AREA OF AIR TRAFFIC CONTROL TOWERS MUST COMPLY WITH 412.3.1
5. FRONTAGE INCREASE IS BASED ON THE UNSPRINKLERED AREA VALUE IN TABLE 506.2

ALLOWABLE HEIGHT:

	ALLOWABLE (TABLES 504.3 & 504.4)	SHOWN ON PLANS	CODE REFERENCE
BUILDING HEIGHT IN FEET	55'	30'-8"	.
BUILDING HEIGHT IN STORIES	2	2	.

Provide code reference if the "Shown on Plans" quantity is not based on Table 504.3 or 504.4.

FIRE PROTECTION REQUIREMENTS:

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING REQ'D	RATING PROVIDED* (W/ REDUCTION)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGN # FOR RATED PENETRATION	DESIGN # FOR RATED JOINTS
Structural Frame including columns, girders, trusses	.	N/A	.	.	.	.	.
Bearing Walls	.	N/A	.	.	.	.	.
Exterior	.	N/A	.	.	.	.	.
North	.	N/A	.	.	.	.	.
East	.	N/A	.	.	.	.	.
West	.	N/A	.	.	.	.	.
South	.	N/A	.	.	.	.	.
Interior	.	N/A	.	.	.	.	.
Nonbearing Walls and Partitions	.	N/A	.	.	.	.	.
Exterior	.	N/A	.	.	.	.	.
North	.	0	.	.	.	.	.
East	<5'	1,0	1,0	.	.	.	.
West	.	0	.	.	.	.	.
South	.	0	.	.	.	.	.
Interior walls and partitions	.	0	UNO	.	.	.	.
Floor Construction, including supporting beams and joists		2	2; TABLE 508.4	.	.	.	.
Floor Ceiling Assembly		2	2; TABLE 508.4	.	.	.	.
Columns Supporting Floors		2	2; TABLE 508.4	.	.	.	.
Roof Construction, including supporting beams and joists		0	.	.	.	.	.
Roof Ceiling Assembly		0	.	.	.	.	.
Columns Supporting Roof		0	.	.	.	.	.
Shaft Enclosures - Exit		1	1	.	.	.	.
Shaft Enclosures - Other		1	1	.	.	.	.
Corridor Separation		1	1	.	.	.	.
Occupancy / Fire Barrier Separation		2	2; TABLE 508.4	.	.	.	.
Party / Fire Wall Separation		N/A	.	.	.	.	.
Smoke Barrier Separation		N/A		.	.	.	.
Fire Area Separation		2	2; AT FLR/CLG	.	.	.	.
Incidental Use Separation		1	SCIENCE LAB	.	.	.	.

* Indicate section number permitting reduction

PERCENTAGE OF WALL OPENING CALCULATIONS:

FIRE SEPARATION DISTANCE (FEET) FROM PROPERTY LINES	DEGREE OF OPENINGS PROTECTION (TABLE 705.8)	ALLOWABLE AREA (%)	ACTUAL SHOWN ON PLANS (%)
>10', <15'	UP, NS	15%	10%
>30'	UP, NS	NO LIMIT	NO LIMIT
.	.	.	.

LIFE SAFETY SYSTEM REQUIREMENTS:

EMERGENCY LIGHTING: ☐ NO ■ YES

EXIT SIGNS: ☐ NO ■ YES

FIRE ALARM: ☐ NO ■ YES

SMOKE DETECTION SYSTEMS: ☐ NO ■ YES ☐ PARTIAL

CARBON MONOXIDE DETECTION: ■ NO ☐ YES

LIFE SAFETY PLAN REQUIREMENTS:

LIFE SAFETY PLAN SHEET # G201

- FIRE AND/OR SMOKE RATED WALL LOCATIONS (Chapter 7)
- ASSUMED AND REAL PROPERTY LINE LOCATIONS (if not on the site plan)
- EXTERIOR WALL OPENING AREA WITH RESPECT TO DISTANCE TO ASSUMED PROPERTY LINES (705.8)
- OCCUPANCY TYPES FOR EACH AREA AS IT RELATES TO OCCUPANT LOAD CALCULATION (TABLE 1004.1.2) OCCUPANT LOADS FOR EACH AREA
- EXIT ACCESS TRAVEL DISTANCES (1017)
- COMMON PATH OF TRAVEL DISTANCES (1006.2.1 & 1006.3.2(1))
- DEAD END LENGTHS (1020.4)
- CLEAR EXIT WIDTHS FOR EACH EXIT DOOR
- MAXIMUM CALCULATED OCCUPANT LOAD CAPACITY EACH EXIT DOOR CAN ACCOMMODATE BASED ON EGRESS WIDTH (1005.3)
- ACTUAL OCCUPANT LOAD FOR EACH EXIT DOOR
- A SEPARATE SCHEMATIC PLAN INDICATING WHERE FIRE RATED FLOOR / CEILING AND/OR ROOF STRUCTURE IS PROVIDED FOR PURPOSES OF OCCUPANCY SEPARATION
- LOCATION OF DOORS WITH PANIC HARDWARE (1008.1.10.)
- LOCATION OF DOORS WITH DELAYED EGRESS LOCKS AND THE AMOUNT OF DELAY (1010.1.9.7)
- LOCATION OF DOORS WITH ELECTROMAGNETIC EGRESS LOCKS (1010.1.9.9)
- LOCATION OF DOORS EQUIPPED WITH HOLD-OPEN DEVICES
- LOCATION OF EMERGENCY ESCAPE WINDOWS (1030)
- THE SQUARE FOOTAGE OF EACH FIRE AREA (202)
- THE SQUARE FOOTAGE OF EACH SMOKE COMPARTMENT FOR OCCUPANCY CLASSIFICATION I-2 (407.5)
- NOTE ANY CODE EXCEPTIONS OR TABLE NOTES THAT MAY HAVE BEEN UTILIZED REGARDING THE ITEMS ABOVE

ACCESSIBLE DWELLING UNITS (SECTION 1107) N/A

TOTAL UNITS	ACCESSIBLE UNITS REQUIRED	ACCESSIBLE UNITS PROVIDED	TYPE A UNITS REQUIRED	TYPE A UNITS PROVIDED	TYPE B UNITS REQUIRED	TYPE B UNITS PROVIDED	TOTAL ACCESSIBLE UNITS PROVIDED
.	.	.	.	.	.	.	.

ACCESSIBLE PARKING (SECTION 1106)

PER SECTION 20-6 OF SHALLOTTE UNIFIED DEVELOPMENT CODE
MIN. NO. OF PARKING SPACES N/A
MAX. NO. OF PARKING SPACES N/A

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES		# OF ACCESSIBLE SPACES PROVIDED			TOTAL # ACCESSIBLE PROVIDED
	REQUIRED	PROVIDED	REGULAR WITH 5' ACCESS AISLE	VAN SPACES WITH 132" ACCESS AISLE	VAN SPACES WITH 8' ACCESS AISLE	
.	.	.	.	.	.	.
.	.	.	.	.	.	.
TOTAL	.	.	.	.	.	.

PLUMBING FIXTURE REQUIREMENTS (TABLE 2902.1)

USE		WATERCLOSETS MALE	WATERCLOSETS FEMALE	WATERCLOSETS UNISEX	URINALS	LAVATORIES MALE	LAVATORIES FEMALE	LAVATORIES UNISEX	SHOWERS / TUBS	DRINKING FOUNTAINS REGULAR	DRINKING FOUNTAINS ACCESSIBLE
SPACE	EXIST'G	.	.	.	.	.	.	.	.	.	.
	NEW	4	8	3	4	4	4	3	.	2	2
	REQ'D	4	8	0	3	4	4	0	.	2	2

Special Approval: (Local Jurisdiction, Department of Insurance, OSC, DPI, DHHS, etc., describe below)

.
.
.

ENERGY SUMMARY

ENERGY REQUIREMENTS:

THE FOLLOWING DATA SHALL BE CONSIDERED MINIMUM AND ANY SPECIAL ATTRIBUTE REQUIRED TO MEET THE ENERGY CODE SHALL ALSO BE PROVIDED. EACH DESIGNER SHALL FURNISH THE REQUIRED PORTIONS OF THE PROJECT INFORMATION FOR THE PLAN DATA SHEET. IF PERFORMANCE METHOD, STATE THE ANNUAL ENERGY COST FOR THE STANDARD REFERENCE DESIGN VS ANNUAL ENERGY COST FOR THE PROPOSED DESIGN.

EXISTING BUILDING ENVELOPE COMPLIES WITH CODE: ☐ YES (the remiander of this section is not applicable) ☐ NO

EXEMPT BUILDING: ☐ YES Provide code or statutory reference: . ■ NO

CLIMATE ZONE: 3A

METHOD OF COMPLIANCE:

■ PRESCRIPTIVE (ENERGY CODE)
☐ PERFORMANCE (ENERGY CODE)
☐ PRESCRIPTIVE (ASHRAE 90.1)
☐ PERFORMANCE (ASHRAE 90.1)
☐ PERFORMANCE (OTHER)

If 'Other' specify source here: .

THERMAL ENVELOPE (Prescriptive method only)

ROOF/CEILING ASSEMBLY (each assembly)

DESCRIPTION OF ASSEMBLY: ROOF MEMBRANE OVER POLY ISOCYANURATE INSULATION ON METAL DECK
U-VALUE OF TOTAL ASSEMBLY: 0.04
R-VALUE OF INSULATION: MIN. R-25
SKYLIGHTS IN EACH ASSEMBLY: N/A
U-VALUE OF SKYLIGHT: N/A
TOTAL SQUARE FOOTAGE OF SKYLIGHTS IN EACH ASSEMBLY: N/A

EXTERIOR WALLS (each assembly)

DESCRIPTION OF ASSEMBLY: 5/8" INTERIOR GYP BD OVER 6" STEEL STUDS W/ R-19 FIBERGLASS BATT AND INSULATION , 1/2" EXTERIOR GYP SHEATHING, 2" CONTINUOUS R12.4 SPRAY FOAM INSULATION, AIR SPACE, 4" FACE BRICK
U-VALUE OF TOTAL ASSEMBLY: .05 BATT INSULATION + .08 SPRAY FOAM CONTINUOUS INSULATION
R-VALUE OF INSULATION: R-19 BATT INSULATION + R-12.4 SPRAY FOAM CONTINUOUS INSULATION

OPENINGS (windows or doors with glazing)

U-VALUE OF ASSEMBLY: WINDOW: .45 MAX ENTRY DOOR: .77 HM DOORS: .45
SOLAR HEAT GAIN COEFFICIENT: .4
PROJECTION FACTOR: >0.5
DOOR R-VALUES: WINDOW: R-2.2 ENTRY DOOR: R-1.3 HM DOOR: R-2.2

WALLS BELOW GRADE (each assembly)

DESCRIPTION OF ASSEMBLY: N/A
U-VALUE OF TOTAL ASSEMBLY: .
R-VALUE OF INSULATION: .

FLOORS OVER UNCONDITIONED SPACE (each assembly)

DESCRIPTION OF ASSEMBLY: N/A
U-VALUE OF TOTAL ASSEMBLY: .
R-VALUE OF INSULATION: .

FLOORS SLAB ON GRADE (each assembly)

DESCRIPTION OF ASSEMBLY: N/A
U-VALUE OF TOTAL ASSEMBLY: .
R-VALUE OF INSULATION: .
HORIZONTAL / VERTICAL REQUIREMENT: .
SLAB HEATED: .

STRUCTURAL DESIGN - SEE STRUCTURAL DRAWINGS

DESIGN LOADS:

IMPORTANCE FACTORS: WIND (Iw) . SNOW (Is) . SEISMIC (Ie) .

LIVE LOADS: ROOF . PSF; MEZZANINE . PSF; FLOOR . PSF

GROUND SNOW LOAD: . PSF

WIND LOAD: BASIC WIND SPEED . MPH (ASCE-7-98); EXPOSURE CATEGORY .

SEISMIC DESIGN CATEGORY: .

PROVIDE THE FOLLOWING SEISMIC DESIGN PARAMETERS:

OCCUPANCY CATEGORY (TABLE 1604.5)
SPECTRAL RESPONSE ACCELERATION S_S %g S_1 %g
SITE CLASSIFICATION (ASCE 7) .
DATA SOURCE: .

BASIC STRUCTURAL SYSTEM .

ANALYSIS PROCEDURE: ☐ N/A ☐ SIMPLIFIED ☐ EQUIVALENT LATERAL FORCE ☐ DYNAMIC

ARCHITECTURAL, MECHANICAL, COMPONENTS ANCHORED? ☐ YES ☐ NO

LATERAL DESIGN CONTROL: ☐ N/A ☐ EARTHQUAKE ☐ WIND

SOIL BEARING CAPACITIES:

☐ N/A
☐ FIELD TEST (PROVIDE COPY OF TEST REPORT) . PSF
☐ PRESUMPTIVE BEARING CAPACITY . PSF
PILE SIZE, TYPE AND CAPACITY . PSF

MECHANICAL SUMMARY SEE MECHANICAL DRAWINGS

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

THERMAL ZONE

WINTER DRY BULB .
SUMMER DRY BULB .

INTERIOR DESIGN CONDITIONS

WINTER DRY BULB .
SUMMER DRY BULB .
RELATIVE HUMIDITY .

BUILDING HEATING LOAD .

BUILDING COOLING LOAD .

MECHANICAL SPACING CONDITIONING SYSTEM

UNITARY

DESCRIPTION OF UNIT .
HEATING EFFICIENCY .
COOLING EFFICIENCY .
SIZE CATEGORY OF UNIT .

BOILER

SIZE CATEGORY, IF OVERSIZED, STATE REASON .

CHILLER

SIZE CATEGORY, IF OVERSIZED, STATE REASON .

LIST EQUIPMENT EFFICIENCIES: .

ELECTRICAL SUMMARY SEE ELECTRICAL DRAWINGS

ELECTRICAL SYSTEM AND EQUIPMENT

METHOD OF COMPLIANCE:

ENERGY CODE: ☐ PRESCRIPTIVE ☐ PERFORMANCE
ASHRAE 90.1: ☐ PRESCRIPTIVE ☐ PERFORMANCE

LIGHTING SCHEDULE

- LAMP TYPE REQUIRED IN FIXTURE
- NUMBER OF LAMPS IN FIXTURE
- BALLAST TYPE USED IN THE FIXTURE
- TOTAL WATTAGE PER FIXTURE TOTAL INTERIOR WATTAGE SPECIFIED VS ALLOWED (whole building or space by space)
- TOTAL EXTERIOR WATTAGE SPECIFIED VS ALLOWED

ADDITIONAL PRESCRIPTIVE COMPLIANCE
(When using the 2018 NCECC; not required for ASHRAE 90.1)

- C406.2 MORE EFFICIENT HVAC EQUIPMENT PERFORMANCE C406.3 REDUCED LIGHTING POWER DENSITY
- C406.4 ENHANCED DIGITAL LIGHTING CONTROLS
- C406.5 ON-SITE RENEWABLE ENERGY
- C406.6 DEDICATED OUTDOOR AIR SYSTEM
- C406.7 REDUCED ENERGY USE IN SERVICE WATER HEATING

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ISSUED: 04.16.2020

F. M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 04/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING CODE SUMMARY

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE:
DRAWN BY: LJR PROJ MGR: RMC

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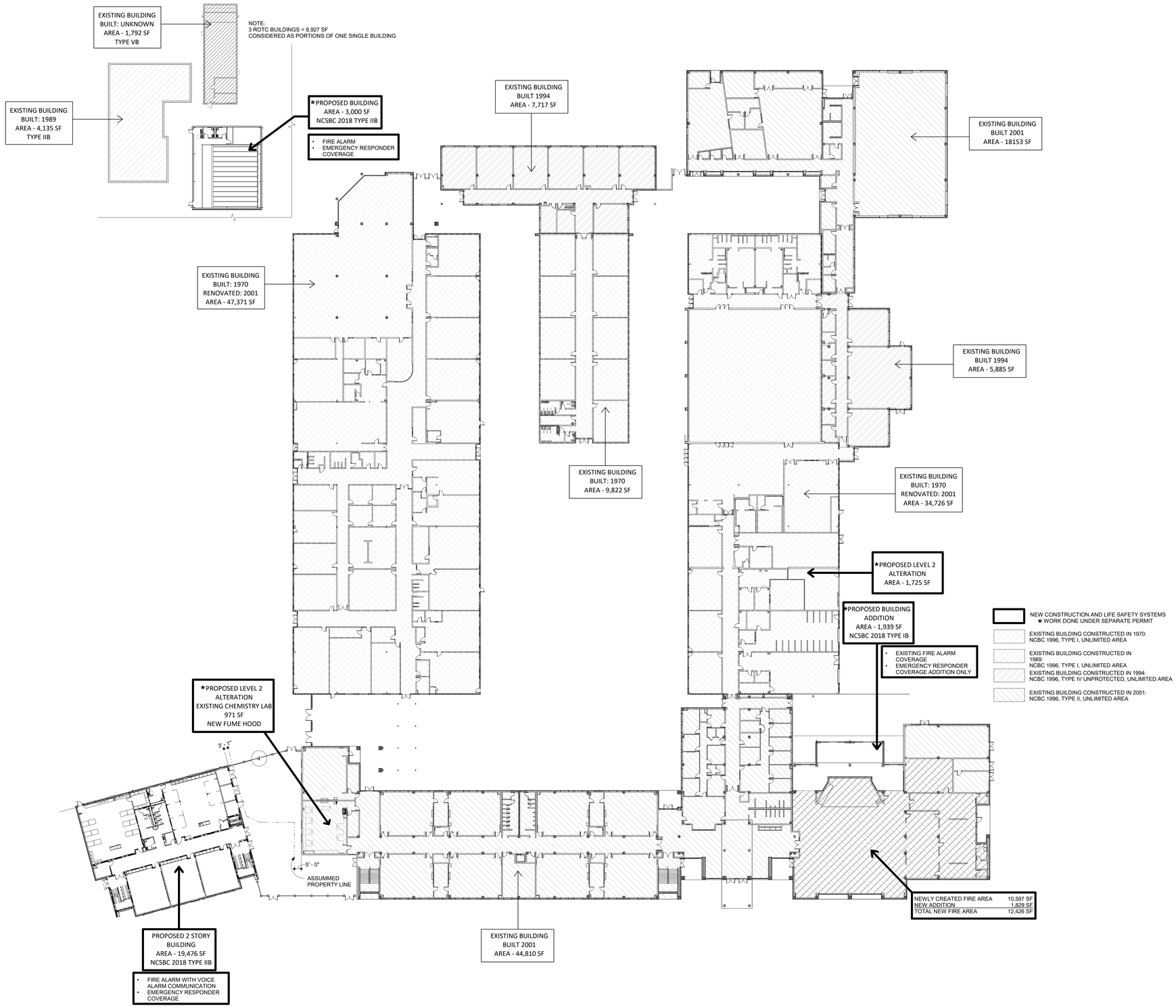

1 CAMPUS LIFE SAFETY PLAN
SCALE: 1" = 30'-0"

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FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 04/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, NC

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CAMPUS LIFE SAFETY PLAN AND NEW LIFE SAFETY SYSTEMS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 1" = 30'-0"
DRAWN BY: LJR PROJ MGR: RMC

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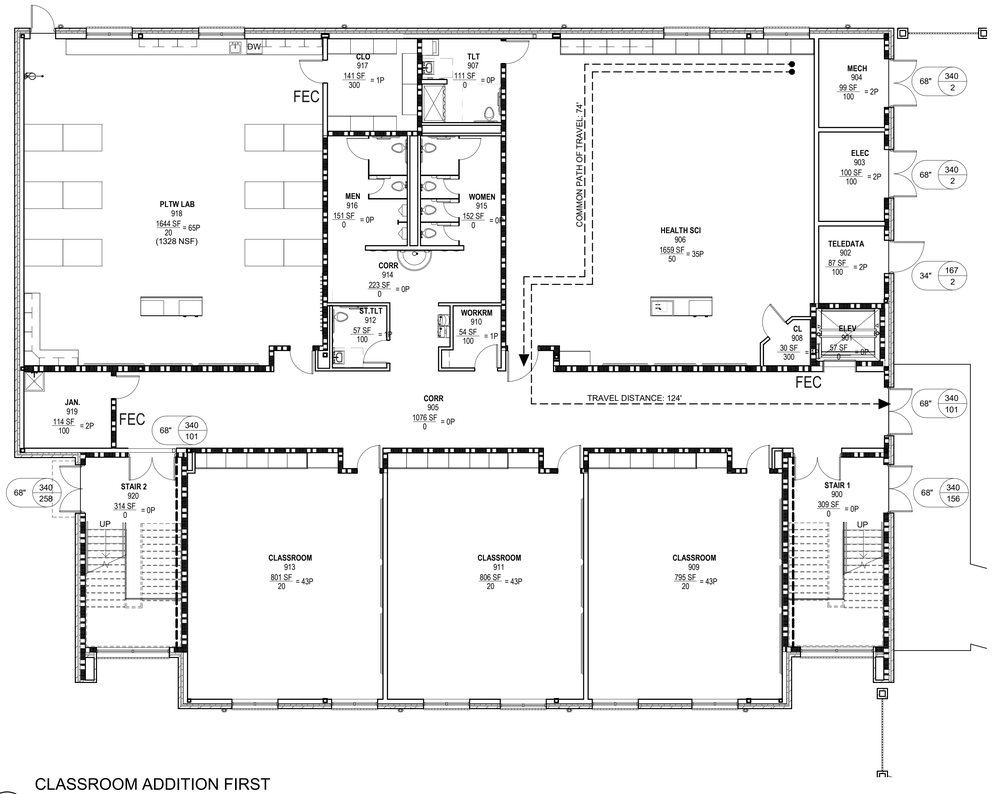
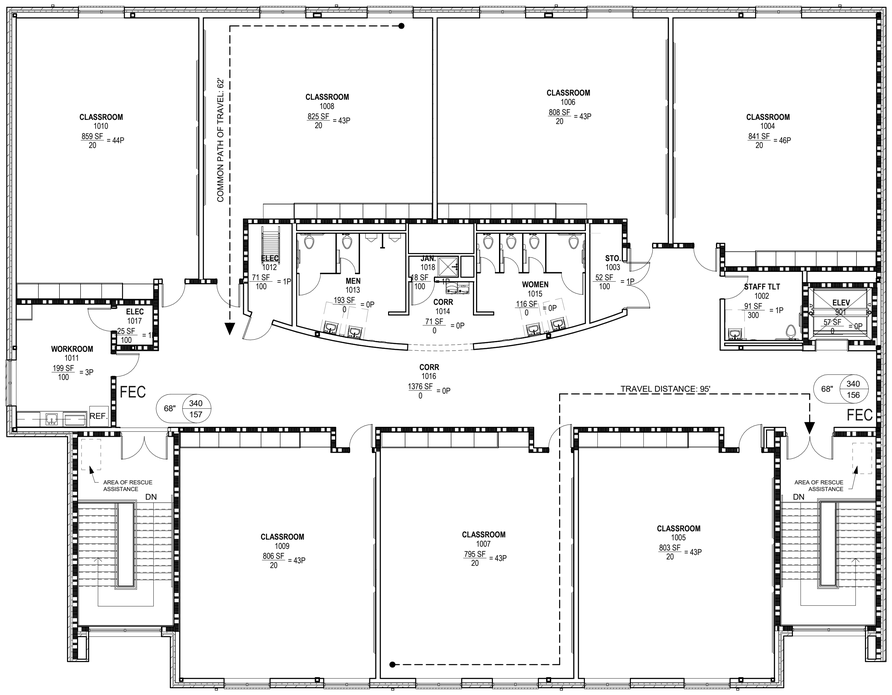


1 CLASSROOM ADDITION FIRST FLOOR LIFE SAFETY PLAN

SCALE: 1/8" = 1'-0"



2 CLASSROOM ADDITION SECOND FLOOR LIFE SAFETY PLAN

SCALE: 1/8" = 1'-0"

CODE LEGEND

	PATH OF EGRESS
	1 HOUR RATED WALL
	2 HOUR RATED WALL
FE / FEC	FIRE EXTINGUISHER LOCATION
ROOM NAME ROOM NUMBER SF / OCC. SF = OCC. #	ROOM TAG / NET SQ. FT. AREA AND OCCUPANCY LOAD

EXIT CAPACITY MARKER

DOOR WIDTH — XX" — XXX / XX — OCC LOAD ALLOWED / OCC LOAD ACTUAL

MAXIMUM COMMON PATH OF TRAVEL
NON-SPRINKLED BUILDING

B - BUSINESS: 75'
E - EDUCATION: 75'
S2 - STORAGE: 100'

MAXIMUM TRAVEL DISTANCE
NON-SPRINKLED BUILDING

B - BUSINESS: 200'
E - EDUCATION: 200'
S2 - STORAGE: 300'

MAXIMUM DEAD END CORRIDOR
NON-SPRINKLED BUILDING

B - BUSINESS: 20'
E - EDUCATION: 20'
S2 - STORAGE: 20'

NOTES

1. PROVIDE NEW FIRE EXTINGUISHERS IN CABINETS (FEC) AND FIRE EXTINGUISHERS ON BRACKETS (FE) AS SHOWN ON PLAN. PROVIDE NEW FIRE EXTINGUISHERS IN KITCHEN (TYPE K), MECHANICAL, ELECTRICAL (TYPE B-C), FIRE PUMP, AND ELEVATOR MACHINE ROOMS, AND AS INDICATED.

2. FIRE EXTINGUISHER SHALL BE MINIMUM 3A-40BC RATING.

3. MARK ALL RATED PARTITIONS AND WALLS IN ACCORDANCE WITH IBC (2012) 703.7, AND AS DETAILED.

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BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

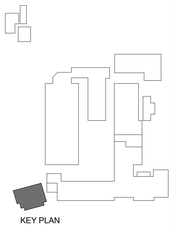
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM LIFE SAFETY PLANS



KEY PLAN

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: As indicated
DRAWN BY: LJR PROJ MGR: RMC

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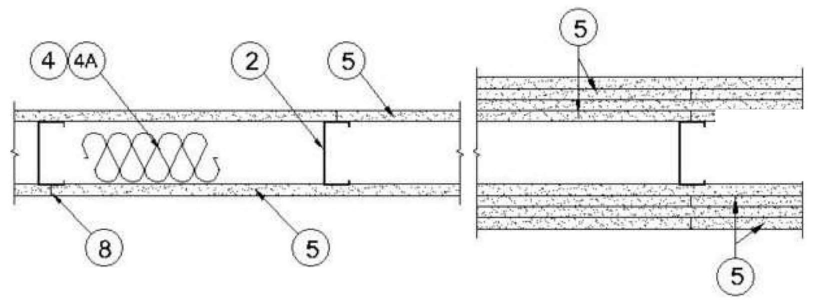
ONLINE CERTIFICATIONS DIRECTORY

Design No. U419
BXUV.U419
Fire Resistance Ratings - ANSI/UL 263

August 06, 2012

Nonbearing Wall Ratings — 1, 2, 3 or 4 Hr (See Items 4 & 5)



1. **Floor and Ceiling Runners —** (Not shown) — For use with Item 2 - Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth to accommodate stud size, with min 1-1/4 in. long legs, attached to floor and ceiling with fasteners 24 in. OC max.

1A. **Framing Members* - Floor and Ceiling Runners —** Not shown - In lieu of Item 1 — For use with Item 2A, proprietary channel shaped, min. 3-5/8 in. deep, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC max. Effective thickness is 0.034 in.

1B. **Framing Members* - Floor and Ceiling Runners —** (Not shown - In lieu of Item 1) — For use with Item 2A, proprietary channel shaped, min. 2-1/2 in. deep, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling fasteners 24 in. OC. max. Effective thickness is 0.034 in.

1C. **Framing Members* - Floor and Ceiling Runner —** Not shown - In lieu of Item 1 — For use with Item 2C, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.

1D. **Framing Members* - Floor and Ceiling Runner —** Not shown - In lieu of Item 1 — For use with Item 2D, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.020 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

1E. **Framing Members*— Floor and Ceiling Runners —** (Not shown) — In lieu of Item 1 - Channel shaped, attached to floor and ceiling with fasteners 24 in. OC. max.

1F. **Floor and Ceiling Runners —** (Not shown)—For use with Item 2B- Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, min depth to accommodate stud size, with min 1 in. long legs, attached to floor and ceiling with fasteners spaced max 24 in. OC.

1G. **Framing Members*— Floor and Ceiling Runners —** (Not shown, As an alternate to Item 1) — For use with Items 2F, 5F or 5G or 5I only, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.

1H. **Framing Members* - Floor and Ceiling Runner —** Not shown - In lieu of Item 1 — For use with Item 2G, proprietary channel shaped runners, minimum width to accommodate stud size, with 1- 1/8 in. long legs fabricated from min 0.015 in. (min bare metal thickness) galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

1I. **Framing Members* - Floor and Ceiling Runner —** For use with Item 2H, proprietary channel shaped runners, minimum width to accommodate stud size attached to floor and ceiling with fasteners 24 in. OC max.

1J. **Floor and Ceiling Runners —** (Not shown) — Channel shaped, fabricated from min 0.02 in. galv steel, min width to accommodate stud size, with min 1 in. long legs, for use with studs specified below and fabricated from min 0.02 in. galv steel or thicker, attached to floor and ceiling with fasteners spaced max 24 in. OC.

1K. **Framing Members*— Floor and Ceiling Runners —** (Not shown, As an alternate to Item 1) — For use with Items 2I, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.

2. **Steel Studs —** Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

2A. **Framing Members* - Steel Studs —** In lieu of Item 2 - Proprietary channel shaped studs, min. depth as indicated under Item 5, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height. Allowable use of studs is shown in the table below. For direct attachment of gypsum board only. Effective thickness is 0.034 in.

2B. **Steel Studs —** (As an alternate to Item 2, For use with Items 5B & 5E) Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, 3-1/2 in. min depth, spaced a max of 16 in. OC. Studs friction-fit into floor and ceiling runners. Studs to be cut 5/8 to 3/4 in. less than assembly height.

2C. **Framing Members* - Steel Studs —** (As an alternate to Item 2, For use with Items 5C or 5I) - Proprietary channel shaped studs, 3-5/8 in. deep spaced a max of 24 in. OC. Studs to be cut 3/4 in less than the assembly height and installed with a ½ in. gap between the end of the stud and track at the bottom of the wall. For direct attachment of gypsum board only.

2D. **Framing Members* - Metal Studs —** Not shown - In lieu of Item 2 — For use with Item 1D, proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.020 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.

2E. **Framing Members*— Steel Studs —** In lieu of Item 2 - For Use with Item 1E- Channel shaped studs, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.

2F. **Framing Members*— Steel Studs —** (Not shown, As an alternate to Item 2) —For use with Items 1G, 5F or 5G or 5I only, channel shaped studs, min depth as indicated under Item 5F, 5G or 5I, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.

2G. **Framing Members* - Metal Studs —** Not shown - In lieu of Item 2 — For use with Item 1H, proprietary channel shaped steel studs, minimum width indicated under Item 5, 1-1/4 in. deep fabricated from min 0.015 in. (min bare metal thickness) galvanized steel. Studs 3/8 in. to 3/4 in. less in lengths than assembly heights.

2H. **Framing Members* - Steel Studs —** Not shown - In lieu of Item 2 - For use with Item 1I. Proprietary channel shaped studs, minimum width indicated under Item 5, Studs to be cut 3/8 to 3/4 in less than the assembly height.

2I. **Framing Members*— Steel Studs —** (Not shown, As an alternate to Item 2) —For use with Items 1K, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.

3. **Wood Structural Panel Sheathing —** (Optional, For use with Item 5 Only.)- (Not Shown) - 4 ft wide, 7/16 in. thick oriented strand board (OSB) or 15/32 in. thick structural 1 sheathing (plywood) complying with DOC PS1 or PS2, or APA Standard PRP-108, manufactured with exterior glue, applied horizontally or vertically to the steel studs. Vertical joints centered on studs, and staggered one stud space from wallboard joints. Attached to studs with flat-head self-drilling tapping screws with a min. head diam. of 0.292 in. at maximum 6 in. OC. in the perimeter and 12 in. OC. in the field. When used, fastener lengths for gypsum panels increased by min. 1/2 in.

4. **Batts and Blankets* —** (Required as indicated under Item 5) — Mineral wool batts, friction fitted between studs and runners. Min nom thickness as indicated under Item 5. See **Batts and Blankets (BKNV or BZJZ) Categories** for names of Classified companies.

4A. **Batts and Blankets* —** (Optional) — Placed in stud cavities, any glass fiber or mineral wool insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance. See **Batts and Blankets (BKNV or BZJZ) Categories** for names of Classified companies.

5. **Gypsum Board* —** Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 1 hr, 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Items 2, 2D, 2E, 2G and 2H	Min Stud Depth, in. Item 2A	No. of Layers & Thkns of Panel	Min Thkns of Insulation (Item 4)
1	3-1/2	3-5/8	1 layer, 5/8 in. thick	Optional
1	2-1/2	3-5/8	1 layer, 1/2 in. thick	1-1/2 in.
1	1-5/8	3-5/8	1 layer, 3/4 in. thick	Optional
2	1-5/8	2-1/2	2 layers, 1/2 in. thick	Optional
2	1-5/8	2-1/2	2 layers, 5/8 in. thick	Optional
2	3-1/2	3-5/8	1 layer, 3/4 in. thick	3 in.
3	1-5/8	2-1/2	3 layers, 1/2 in. thick	Optional
3	1-5/8	2-1/2	2 layers, 3/4 in. thick	Optional
3	1-5/8	2-1/2	3 layers, 5/8 in. thick	Optional
4	1-5/8	2-1/2	4 layers, 5/8 in. thick	Optional
4	1-5/8	2-1/2	4 layers, 1/2 in. thick	Optional
4	2-1/2	2-1/2	2 layers, 3/4 in. thick	2 in.

When Item 7B, Steel Framing Members*, is used, Nonbearing Wall Rating is limited to 1 Hr. Min. stud depth is 3-1/2 in., min. thickness of insulation (Item 4) is 3 in., and two layers of gypsum board panels (1/2 in. or 5/8 in. thick) shall be attached to furring channels as described in Item 6. One layer of gypsum board panels (1/2 in. or 5/8 in. thick) attached to opposite side of stud without furring channels as described in Item 6.

5A. **Gypsum Board* —** (As an alternate to Item 5) — 5/8 in. thick, 24 to 54 in. wide, applied horizontally as the outer layer to one side of the assembly. Secured as described in Item 6.

5B. **Gypsum Board* —** (Not Shown) - As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 in or ¾ in. thick products are specified. For direct attachment only to steel studs Item 2B, (not to be used with Item 3) - Nom 5/8 in. or ¾ in. may be used as alternate to all 5/8 in. or ¾ in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 in. or ¾ in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Gypsum board secured to 20 MSG steel studs Item 2B with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. To be used with Lead Batten Strips (see Item 11) or Lead Discs or Tabs (see Item 12).

5C. **Gypsum Board* —** (For Use With Item 2C) Rating Limited to 1 Hour. 5/8 in. thick, 48 in. wide, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. (Vertical Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. Vertical joints are to be centered over studs and staggered one stud cavity on opposite sides of studs. (Horizontal Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. All horizontal joints are to be backed as outlined under section VI of Volume 1 in the Fire Resistive Directory.

5D. **Gypsum Board* —** (As an alternate to Item 5) — 5/8 in. thick, 48 in. wide, applied vertically or horizontally. Secured as described in Item 6. For use with Items 1 and 2 only.

5E. **Gypsum Board* —** (Not Shown) - (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2B, not to be used with Item 3). Nominal 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 (or No. 6 by 1-1/4 in. long bugle head fine driller) steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.

5F. **Gypsum Board* —** (As an alternate to Item 5) — For use with Items 1G and 2F and limited to 1 Hour Rating only, Gypsum panels with beveled, square or tapered edges, applied vertically, and fastened to the steel studs with 1 in. long Type S screws spaced 8 in. OC along vertical and bottom edges and 12 in. OC in the field. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Steel stud depth shall be a minimum 3-5/8 in.

5G. **Gypsum Board* —** (As an alternate to Item 5) — For use with Items 1G and 2F only, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally, as specified in the table below and fastened to the steel studs as described in Item 6. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Item 2F	No. of Layers & Thickness of Panel	Min Thkns of Insulation (Item 4)
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional

5H. **Gypsum Board* —** (Not Shown) - (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 or 3/4 in thick products are specified. For direct attachment only to steel studs Item 2B, (not to be used with Item 3) - Nom 5/8 or 3/4 in. may be used as alternate to all 5/8 or 3/4 in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Gypsum board secured to 20 MSG steel studs Item 2B with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. For Joint Compound see Item 5. To be used with Lead Batten Strips (see Item 11A) or Lead Discs (see Item 12A).

5I. **Gypsum Board* —** (As an alternate to Item 5) - Nom. 5/8 in. thick gypsum panels with beveled, square or tapered edges installed as described in Item 5. Steel stud minimum depth shall be as indicated in Item 5.

5J. **Gypsum Board* —** (Not Shown) - (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2B, not to be used with Item 3). Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws gypsum panel steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in. placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in. diam by max 0.085 in. thick. Compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

6. **Fasteners —** (Not shown) — For use with Items 2 and 2F - Type S or S-12 steel screws used to attach panels to studs (Item 2) or furring channels (Item 7). **Single layer systems:** 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 8 in. OC when panels are applied horizontally, or 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. **Two layer systems:** First layer- 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC with screws offset 8 in. from first layer. **Three-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in., 5/8 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below. **Four-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 24 in. OC. Fourth layer- 2-5/8 in. long for 1/2 in. thick panels or 3 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below.

6A. **Fasteners —** (Not shown) —For use with Item 2A - Type S or S-12 steel screws used to attach panels to studs (Item 2A). **Single layer systems:** 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 8-1/2 in. OC with additional screws 1 in. and 2-1/2 in. from edges of the board when panels are horizontally. or 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. **Two layer systems applied vertically:** First layer- 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC with screws offset 8 in. from first layer. **Two layer systems applied horizontally:** First layer- 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC starting 8 in. from each edge of the board with an additional screw placed 1-1/4 in. from each edge of the board. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC starting 8 in. from each edge of the board with an additional screw placed 1-1/4 in. from each edge of the board with screws offset 8 in. from first layer. **Three-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in., 5/8 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below. For all layers, an additional screw shall be placed 1-1/4 in. from each edge of the board. **Four-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 24 in. OC. Fourth layer- 2-5/8 in. long for 1/2 in. thick panels or 3 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below. For all layers, an additional screw shall be placed 1-1/4 in. from each edge of the board.

7. **Furring Channels —** (Optional, not shown, for single or double layer systems) — Resilient furring channels fabricated from min 25 MSG corrosion-protected steel, spaced vertically a max of 24 in. OC. Flange portion attached to each intersecting stud with 1/2 in. long Type S-12 steel screws. Not for use with Item 5A and 5E.

7A. **Framing Members* —** (Not Shown) — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:

a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A and 5E.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. RSIC-1 clips secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. RSIC-V clips secured to studs with No. 8 x 9/16 in. minimum self-drilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips.

7B. **Framing Members* —** (Optional, Not Shown) — As an alternate to Item 7, for single or double layer systems, furring channels and Steel Framing Members on only one side of studs as described below:

a. **Furring Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Batts and Blankets placed in stud cavity as described in Item 5. Two layers of gypsum board attached to furring channels as described in Item 5. Not for use with Item 5A and 5E.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Ba) to one side of studs (Item 2) only. Clips spaced 48 in. OC., and secured to studs IIIlith two No. 8 x 2-1/2 in. coarse drywall screws, one through the hole at each end of the clip. Furring channels are friction fitted into clips.

7C. **Framing Members* —** Optional - Not Shown - Used as an alternate method to attach resilient channels (Item 7). Clips attached at each intersection of the resilient channel and the steel studs (Item 2). Resilient channels are friction fitted into clips, and then clips are secured to the steel stud with min. 1 in. long Type S-12 steel screws through the center hole of the clip and the resilient channel flange.

7D. **Framing Members* —** (Not Shown) — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:

a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A and 5E.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. GENIECLIPS secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips.

8. **Joint Tape and Compound —** Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw heads of outer layers. Paper tape, nom 2 in. wide, embedded in first layer of compound over all joints of outer layer panels. Paper tape and joint compound may be omitted when gypsum panels are supplied with a square edge.

9. **Siding, Brick or Stucco —** (Optional, not shown) — Aluminum, vinyl or steel siding, brick veneer or stucco, meeting the requirements of local code agencies, installed over gypsum panels. Brick veneer attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick.

10. **Caulking and Sealants* —** (Optional, not shown) — A bead of acoustical sealant applied around the partition perimeter for sound control.

11. **Lead Batten Strips —** (Not Shown, For Use With Item 5B) - Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. Strips placed on the interior face of studs and attached from the exterior face of the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5B) and optional at remaining stud locations. Required behind vertical joints.

11A. **Lead Batten Strips —** (Not Shown, For Use With Item 5H) Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.140 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grades "A, B, C or D". Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations.

12. **Lead Discs or Tabs —** (Not Shown, For Use With Item 5B) - Used in lieu of or in addition to the lead batten strips (Item 11) or optional at other locations - Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards (Item 5B) underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

12A. **Lead Discs —** (Not Shown, for use with Item 5H) Max 5/16 in. diam by max 0.140 in. thick lead discs compression fitted or adhered over steel screw heads. Lead discs to have a purity of 99.9% meeting the Federal Specification QQ-L-201f, Grades "A, B, C or D".

13. **Lead Batten Strips —** (Not Shown, For Use With Item 5E) Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.142 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5E) and optional at remaining stud locations.

14. **Lead Tabs —** (Not Shown, For Use With Item 5E) 2 in. wide, 5 in. long with a max thickness of 0.142 in. Tabs friction-fit around front face of stud, the stud folded back flange, and the back face of the stud. Tabs required at each location where a screw (that secures the gypsum boards, Item 5E) will penetrate the steel stud. Lead tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead tabs may be held in place with standard adhesive tape if necessary.

ONLINE CERTIFICATIONS DIRECTORY

Design No. U905
BXUV.U905
Fire-resistance Ratings - ANSI/UL 263

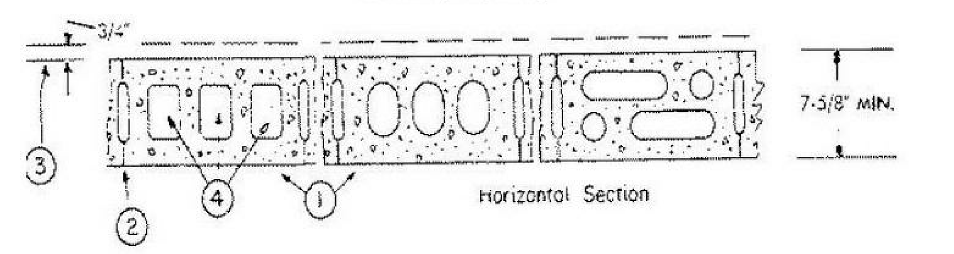
March 11, 2016

Bearing Wall Rating — 2 HR.

Nonbearing Wall Rating — 2 HR

This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**



1. **Concrete Blocks* —** Various designs. Classification D-2 (2 hr).

2. **Mortar —** Blocks laid in full bed of mortar, nom. 3/8 in. thick, of not less than 2-1/4 and not more than 3-1/2 parts of clean sharp sand to 1 part Portland cement (proportioned by volume) and not more than 50 percent hydrated lime (by cement volume). Vertical joints staggered.

3. **Portland Cement Stucco or Gypsum Plaster —** Add 1/2 hr to classification if used. Where combustible members are framed in wall, plaster or stucco must be applied on the face opposite framing to achieve a max. Classification of 1-1/2 hr. Attached to concrete blocks (Item 1).

4. **Loose Masonry Fill —** If all core spaces are filled with loose dry expanded slag, expanded clay or shale (Rotary Kiln Process), water repellant vermiculite masonry fill insulation, or silicone treated perlite loose fill insulation add 2 hr to classification.

5. **Foamed Plastic* —** (Optional-Not Shown) — 1-1/2 in. thick max, 4 ft wide sheathing attached to concrete blocks (Item 1).

5A. **Building Units —** As an alternate to Items 5, min. 1-in thick polyisocyanurate composite foamed plastic insulation boards, nom. 48 by 48 or 96 in.

ONLINE CERTIFICATIONS DIRECTORY

System No. HW-D-0098
XHBN.HW-D-0098
Joint Systems

June 04, 2010

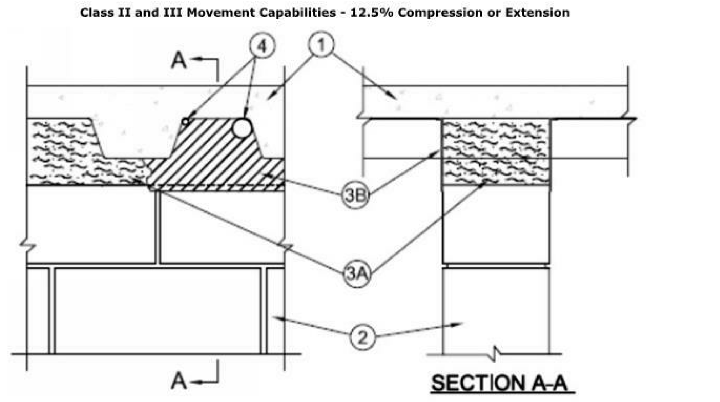
Assembly Rating — 1 and 2 Hr (See Item 4)

Nominal Joint Width - 1 in.

L Rating At Ambient — Less Than 1 CFM/Lin Ft (See Item 4)

L Rating At 400°F — Less Than 1 CFM/Lin Ft (See Item 4)

Class II and III Movement Capabilities - 12.5% Compression or Extension



1. **Floor Assembly —** The fire rated fluted steel unit/concrete floor assembly shall be constructed of the materials and in a manner described in the individual D700 or D900 Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

A. **Steel Floor and Form Units* —** Max 3 in. (76 mm) deep galv steel fluted floor units.

B. **Concrete —** Min 2-1/2 in. (64 mm) thick reinforced concrete as measured from top plane of the floor units.

C. **Spray-Applied Fire Resistive Materials* —** (Optional)—(Not Shown)—Prior to the installation of the forming material and fill, void or cavity material (Items 3A, 3B) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

1A. **Roof Assembly —** (Not Shown) — As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck —** Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Roof Insulation —** Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the floor units.

1B. **Roof Assembly —** As an alternate to Items 1 and 1A, a fire rated protected fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck —** Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray—Applied Fire Resistive Materials* —** (Not Shown)—Prior to the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B), the roof assembly shall be sprayed with the type and thickness of fire resistive material indicated in the individual P700 Series design.

2. **Wall Assembly —** Min 6 in. (152 mm) thick steel-reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m^3) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***.

3. **Joint System — Max separation between bottom of floor or roof and top of wall at time of installation of joint system is 1 in (25 mm) . The joint system is designed to accommodate a max 12.5 percent compression or extension from its installed width.** The joint system shall consist of the following:

A. **Forming Material —** Nom 4 pcf (64 kg/m^3) mineral wool batt insulation compressed and firmly packed to completely fill the flutes and the gap between the top of the wall and bottom of the floor or roof as a permanent form. Batt insulation cut to the shape of the fluted steel deck, approx 33 percent larger than the flutes. Pieces compressed and installed vertically into the flutes above the top of the wall. Additional pieces of batt insulation, min 6 in. wide, installed edge-first into joint opening between bottom of fluted steel deck and top of wall, parallel with joint direction, such that batt sections are compressed min 33 percent in thickness. Compressed batt sections are flush with both surfaces of wall. Adjoining lengths of batt to be tightly butted with butted seams spaced min 48 in. (1.22 m) apart along the length of the joint.

A1. **Forming Material*—Plugs —** (Optional-Not Shown) Performed mineral wool plugs, formed to the shape of the fluted floor units, friction fit to completely fill the flutes above the ceiling runner. The plugs shall be flush with both wall surfaces. Additional forming material, described in Item 3A, to be used in conjunction with the plugs to fill the gap between the top of the wall and the bottom of the steel floor units.

B. **Fill, Void or Cavity Material* —** Min 1/8 in. (3.2 mm) wet thickness (min 1/16 in. or 1.6mm dry thickness) of fill material sprayed or troweled on each side of the wall to completely cover mineral wool forming material and to overlap a min of 1/2 in. (13 mm) onto wall and steel deck on both sides of wall. When spray-applied fire resistive material* is applied to the steel deck, the fill material is to overlap the wall a min of 1/2 in. (14 mm) and to overlap the spray-applied fire resistive material a min of 2 in. (51 mm) on both sides of wall. When through-penetrants (Item 4) are installed within flute, the fill material shall overlap a min 1/2 in. (13 mm) onto the periphery of each penetrant, on both sides of wall.

4. **Through-Penetrants —** Max of two penetrants may be installed parallel with and within the flutes of the steel floor or roof deck. The annular space between penetrants and steel deck or spray-applied fire resistive material on steel deck shall be min 0 in. (point contact) and the annular space between penetrants within the flute shall be min 2 in. (51 mm). Penetrants to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of penetrants may be used:

A. **Polyvinyl Chloride (PVC) Pipe —** Nom 1-1/2 in. (38 mm) diam (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) piping systems.

B. **Rigid Nonmetallic Conduit+ —** Nom 1-1/2 in. (38 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA 70).

C. **Steel Conduit or Tubing —** Nom 1/2 in. (13 mm) diam rigid steel conduit or steel electrical metallic tubing (EMT) installed in accordance with the National Electrical Code (NFPA No. 70).

When Through-Penetrant(s) installed in flute of steel deck, the hourly rating of the joint system is 1 hr.

When Through-Penetrant(s) installed in flute of steel deck, L Ratings do not apply.

ONLINE CERTIFICATIONS DIRECTORY

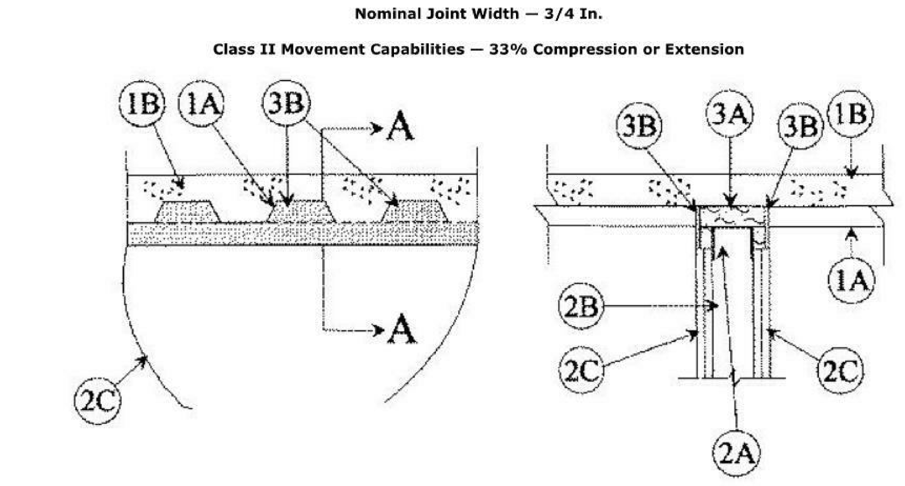
System No. HW-D-0045
XHBN.HW-D-0045
Joint Systems

September 01, 2016

Assembly Rating — 1 and 2 Hr (See Item 2)

Nominal Joint Width — 3/4 In.

Class II Movement Capabilities — 33% Compression or Extension



SECTION A-A

1. **Floor Assembly —** The fire-rated fluted steel floor unit/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the Fire Resistance Directory and shall include the following construction features:

A. **Steel Floor and Form Units* —** Max 3 in. (76 mm) deep galv steel fluted floor units.

B. **Concrete —** Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly —** (Not Shown) — As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck —** Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Roof Insulation —** Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the floor units.

2. **Wall Assembly —** The 1 or 2 hr fire-rated gypsum board /stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. **Steel Floor and Ceiling Runners —** Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width. . Ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners or by welds spaced max 24 in. (610 mm) OC.

A1. **Light Gauge Framing* — Slotted Ceiling Runner —** As an alternate to the ceiling runner in Item 2A, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Slotted ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners or welds spaced max 24 in. (610 mm) OC.

A2. **Light Gauge Framing* — Vertical Deflection Ceiling Runner —** As an alternate to the ceiling runners in Item 2A and 2A1, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips provided with step bushings for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 2B). Vertical deflection ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners or welds spaced max 24 in. (610 mm) OC.

A3. **Light Gauge Framing* — Notched Ceiling Runner —** As an alternate to the ceiling runners in Items 2A through 2A3, notched ceiling runners to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 2B). Notched ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners or welds spaced max 24 in. (610 mm) OC.

B. **Studs —** Steel studs to be min 2-1/2 in. (64 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. (13 mm) long wafer head steel screws at midheight of slot on each side of wall. When vertical deflection ceiling runner (Item 2A2) is used, steel studs secured to slotted vertical deflection clips, through the bushings, with steel screws at midheight of each slot. Stud spacing not to exceed 24 in. (610 mm) OC.

C. **Gypsum Board* —** For 1 hr assembly, one layer of 5/8 in. (16 mm) thick gypsum board is required in the individual Wall and Partition Design. For 2 hr assembly, two layers of 5/8 in. (16 mm) thick gypsum board is required in the individual Wall and Partition Design. For both hourly ratings, a nominal 3/4 in. (19 mm) gap shall be maintained between the top of the gypsum board and the bottom surface of the steel floor units and the top row of screws shall be installed into the studs 3 in. (76 mm) below the valleys of the steel floor units.

The hourly rating of the joint system is dependent on the hourly fire rating of the wall.

3. **Joint System — Max separation between bottom of floor or roof and top of wall is 3/4 in. (19 mm). The joint system is designed to accommodate a max 33 percent compression or extension from its installed width.** The joint system consists of a packing material and a fill material between the top of the gypsum board and the bottom of the floor or roof, as follows:

A. **Forming Material* —** Nom 4 pcf (64 kg/m^3) mineral wool batt insulation, cut to the shape of the fluted deck, approx 20 percent larger than the area of the flutes and compressed into the flutes of the steel deck flutes above the ceiling runner. The mineral wool insulation is to project beyond each side of the ceiling runner, recessed 1/2 in. (13 mm) from both wall surfaces . For 2 hr assembly, an additional 1-1/2 in. (38 mm) thick by 3/4 in. (19 mm) wide sections of mineral wool batt insulation compressed 50 percent and installed cut edge first to fill the 3/4 in. (19 mm) gap between the top of gypsum board and bottom of the steel deck. The forming material shall be recessed 1/2 in. (13 mm) from each side of the wall.

A1. **Forming Material* — Plugs —** (Optional, Not Shown) — Preformed mineral wool plugs, formed to the shape of the fluted floor units, friction fit to completely fill the flutes above the ceiling channel. The plugs shall project beyond each side of the ceiling runner and shall be recessed 1/2 in. (13 mm) from both wall surfaces. Additional forming material, described in Item 3A, to be used in conjunction with the plugs to fill the gap between the top of gypsum board and bottom of steel deck.

B. **Fill, Void or Cavity Material* — Sealant —** Min 1/2 in. (13 mm) thickness of fill material installed on each side of the wall in the flutes of the steel deck and between the top of the gypsum board and the bottom of the steel deck, flush with each surface of the wall.

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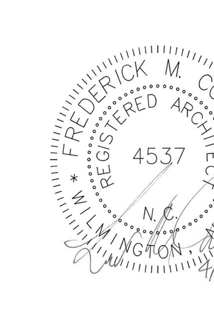

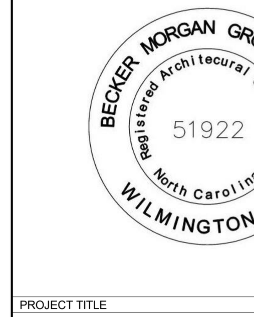

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

UL DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE:
DRAWN BY: LJR PROJ MGR: RMC

G301

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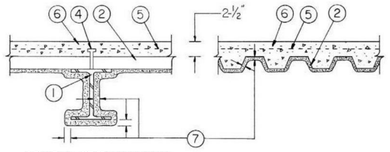
Design No. D795

October 04, 2019

Restrained Assembly Rating — 1, 1-1/2, 2 and 3 Hr.(See Items 2, 7, 9, 9A and 12).

Unrestrained Assembly Rating — 1, 1-1/2, 2 and 3 Hr. (See Items 2, 7, 9, 9A and 12).

Unrestrained Beam Rating — 1, 1-1/2, 2, 3 Hr.(See Item 7).



1. **Steel Beam —** W8x28 steel beam min size.

1A. **Steel Joist —** (Not Shown) Composite or noncomposite welded or bolted to end supports. May be uncoated or provided with a shop coat of paint. Designed per S.J.I. specifications for a max design stress of 30,000 psi. Top chords shall consist of two angles measuring 1-1/2 by 1-1/2 by 0.156 in. thick. Bottom chord shall consist of two round bars measuring 0.675 in. in diam. or two angles measuring 1 by 1 by 0.125 in. thick. The second web member at each end shall consist of a 0.654 in. diam round bar. All remaining web members, including the end web members, shall consist of 0.774 in. diam round bars. Bridging per S.J.I. specifications is required when noncomposite joists are used.

2. **Steel Floor And Form Units* —** 1-1/2, 2 or 3 in. deep galv units. Min gauges are 22 MSG for the fluted and 20/20 MSG for the cellular units. The units may be blended alternating one cellular unit to one or more fluted units.

Spacing of welds attaching units to supports shall be 12 in. OC max unless specified otherwise, adjacent units button-punched or welded together at side joints and unless specified otherwise for specific unit types, spacing of all side joint fastening systems shall not exceed 36 in. OC.

3. **Joint Cover —** (Not Shown) — Burlap tape applied with a bituminous adhesive.

4. **Shear Connector Studs —** Optional — (Not Shown) — Studs, 3/4 in. diam, by 3 in. long for 1-1/2 in. deep form units to 5-1/4 in. deep for 3 in. units, headed type or equivalent per AISC specifications. Welded to top beam flange through steel form units.

5. **Welded Wire Fabric —** 6x6-W1.4xW1.4. When using steel joists, the min welded wire fabric should be 6x6-W2.9xW2.9.

6. **Normal Weight Or Lightweight Concrete —** Normal weight concrete: carbonate or siliceous aggregate, 150 plus or minus 3 pcf unit weight, 3000 psi compressive strength, vibrated. Lightweight aggregate concrete: expanded shale, clay or slate aggregate by rotary-kiln method, 112 plus or minus 3 pcf unit weight, 3000 psi compressive strength, vibrated, 4 to 7 percent entrained air.

7. **Spray-Applied Fire Resistive Materials* —** Applied by mixing with water and spraying in one or more coats to the thicknesses shown below, to steel surfaces which are clean and free of dirt, loose scale and oil. Use of Type PPKC or KC Pre-coat is required on all cellular units when Type PC3C, F3, RS or DS is used. The Type PPKC or KC Pre-coat shall be applied to cover approximately 70 percent of the flat plate surface. Thickness of the Type PPKC or KC Pre-coat is included in the total thickness of the protection material. Min average and min individual density of 17.5 and 16 pcf, respectively for Type PC3C, F3, RS or DS. Min average and min individual density of 22 and 19 pcf, respectively for Type PC4C or F4. For method of density determination, see Design Information Section, Sprayed Material.

Restrained Assembly Rating, Hr	Unrestrained Assembly Rating, Hr	Unrestrained Beam Rating, Hr	Min Thkns Spray Applied Resistive Mtl (in.)				
			Deck Fluted	Deck Cellular	Beam (a)	Beam (b)	Joist
1+	1+	1	3/8	3/8	5/16	5/16	9/16++
1-1/2+	1-1/2+	1-1/2	3/8	3/8	5/8	1/2	1
2+	1+	1	3/8	3/8	5/16	5/16	1-3/8
2+	1-1/2+	1-1/2	3/8	3/8	5/8	1/2	1-3/8
2+	1-1/2+	2	3/8	3/8	13/16	11/16	1-3/8
2+	2+	2+	3/8	3/8	13/16	11/16	1-3/8
3+	1-1/2+	1-1/2	13/16	5/8	5/8	1/2	2-1/4
3+	2+	2+	13/16	5/8	13/16	11/16	2-1/4
3+	3+	3+	13/16	3/4	1-5/16	1-1/16	2-1/4

(a) - Thickness applies when beam supports cellular or blended units.

(b) - Thickness applies when beam supports fluted units only.

+ — When trench headers (Item 9 or 9A) are used, the maximum Restrained and Unrestrained Assembly Rating is 1-1/2 h; when electrical inserts (Item 12) are used, the maximum Restrained and Unrestrained Assembly Rating is 2 h.

++ — When bottom chords consist of 1 by 1 by 0.125 in. thick steel angles, the thickness of spray-applied fire resistive material shall be increased by 1/4 in. on the bottom chord only.

Additional thicknesses are required when trench headers and electrical inserts are used. Refer to Items 9, 9A and 12 for required thicknesses.

When **Mineral and Fiber Boards** (Item 13) is used over the concrete floor (without the use of penetrations), the following thicknesses are to be used:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Thkns Spray Applied Fire Resistive Mtl In.		
			Steel Fluted	Deck Cellular	Beam
2	2	1-1/2	1/2	7/16	15/16
3	3	1-1/2	15/16	7/8	1-1/2

8. **Metal Lath —** (Optional) (Not Shown) — 3/8 in. diamond mesh, expanded steel weighing 1.7 lb per sq yd, secured to one side of joist using No. 16 SWG steel tie wire located at the midheight of every other web.

8A. **Glass Fiber Mesh —** (Not Shown) — As an alternate to metal lath (Item 8), min 3/32 in. square mesh, coated fiberglass scrim fabric, weighing a min of 1.9 oz/sq yd, shall be attached to one side of each joist web member. The method of attachment must be sufficient to hold the mesh and fire protection material during application and curing of the material. An acceptable method of attaching the mesh is by embedding the mesh in min 1/4 in. long beads of hot melted glue. The beads of glue shall be spaced max 12 in. OC along the top chord of the joists. Another method of attachment is by the use of 1-1/4 in. long 1/2 in. wide hairpin clips formed from 0.064 in. diam steel wire, alternating from top to bottom of the joist web member.

9. **Trench Header —** (Bearing the UL Listing Mark) — (Not Shown — Optional) — Constructed of steel and provided with metal edge screeds. When the trench header is located near a support, the load carrying capacity of the span may be based on the allowable moment or shear stress of the floor units at the edge of the trench header away from the support or on the allowable composite moment or shear capacity of the slab at the center of the span, whichever governs.
As an alternate in spans employing min 20/18 MSG cellular floor units and/or min 20 MSG fluted floor units, trench headers (Bearing the UL Listing Mark) without the bottom pan may be used. The allowable superimposed load for spans with a bottomless trench header shall be based on noncomposite design. The bottomless trench header, with a max width of 36 in., consists of two cell closers which conform to the contour of the floor units, placed along the sides of the desired trench header location and welded to the floor units. The side rails, consisting of extruded aluminum screeds secured to galv steel channels (min 18 MSG), are positioned over the cell closers, aligned, and secured to the cell closers and floor units. A separate U-shaped galv steel channel (min 18 MSG), serving as the power compartment, is welded or riveted to the floor units. Steel cover plates, 1/4 in. thick, shall be secured to the side rails. In bottomless trench headers wider than 18 in., each side joint of the steel floor units shall be welded with a 1 in. long weld near the trench header centerline. For QG-GKX-24 or -30 cellular floor units only, a separate KED-PTS (UL Listed) power transition sleeve is secured to power compartment with one rivet or screw.

The use of trench header requires additional protection underneath the trench header; Spray-Applied Fire Resistive Materials thickness shall be increased as shown on the following table:

Restrained & Unrestrained Assembly Rating Hr	Min Thkns of Spray Applied Fire Resistive Mtl		Min Thkns of Spray Applied Fire Resistive Mtl on Metal Lath**
	on Crests	In. & on Valley & Flat Plate *	
1 and 1-1/2	1-3/4	1-5/8	—
2	—	—	1-3/4
3	—	—	2-1/4

*Steel studs with discs (Item 10) must be applied to flat plates of cellular units.

**Spray-Applied Fire Resistive Materials applied to metal lath (Item 11). Thickness measured to bottom plane of metal lath and to extend a min of 4 in. beyond the trench areas.

9A. **Trench Header —** With an intermittent bottom (as an alternate to Item 9) when Walker's Type WDR cellular units are used-(Bearing The UL Listing Mark)-The allowable superimposed load for spans with an intermittent bottom trench header shall be based on noncomposite design. The intermittent bottom trench header, with a maximum width of 36 in., consists of horizontal closure plates, (min No. 16 MSG) with 4 threaded studs pre-

welded on the top side of each plate near its corners. The plates are to be placed over the fluted areas of the floor units and affixed to the floor units by welds at each corner. Concrete is to be vibrated into the voids formed by the plates and the fluted areas of the units beneath the trench header. The upper side rail is extruded aluminum attached to the lower steel side rail clip with an adjusting screw. The lower side rail positioned over the edge of the horizontal closure plates snapped-on the pre-welded threaded studs on top of the plates. Spray-Applied Fire Resistive Materials thickness shall be increased to 1-3/4 in. in crests and 1-5/8 in. on valleys and flat plates for the 1 and 1-1/2 h ratings. Steel studs with discs (Item 10) must be applied to flat plates of cellular units.

10. **Steel Studs With Discs —** (Not Shown) — For use on cellular steel floor and form units under the trench headers. The stud consists of No. 12 SWG steel wire, 1-1/4 in. long with one end welded to 1-1/2 in. diam, No. 28 MSG galvanized steel disc. The total number of studs shall average at least one stud per 250 sq in. The ends of the studs opposite the discs shall be welded to the cellular units in rows parallel with the trench header.The distance between the outer rows of the studs and the edge of the trench header shall not exceed 8-1/2 in. The spacing between the rows shall not exceed 9-1/2 in. The spacing between studs in each row shall not exceed 12 in.

11. **Metal Lath —** (Not shown) — For use on fluted and cellular steel floor and form units under the trench-headers and/or on cellular units when Type PC4C is used — 3/8 in. diamond, expanded steel weighing 3.4 lb per sq yd, secured to the underside of the trench-header. The width of the lath shall extend a min of 1-1/2 in. on either side of the trench-header. The lath is to be placed with the ribs upward and secured with S-12 by 3/8 in. long panhead, self-drilling, self-tapping steel screws spaced max 12 in. O.C. Steel screws to be fitted with 1/2 in. diam steel washers.

12. **Electrical Inserts —** (Not Shown) — Preset and after set electrical inserts Classified as Outlet Boxes and Fittings Classified for Fire Resistance*. Unless specified otherwise for a particular preset electrical insert type, the spacing of the preset electrical inserts shall be not less than 24 in. O.C. along cellular steel floor units with not more than one preset electrical insert in each 8 sq ft of floor area. The required thickness of spray-applied resistive material on the steel floor units with inserts shall cover the entire length and width of the units between supports and shall extend beyond the edge of inserts onto adjacent floor units for a min horizontal width of 12 in. In floor spans (between supports) containing electrical inserts, the entire floor span (fluted and cellular steel floor units) must be sprayed with a min of 1/2 in. thickness of spray-applied resistive materials.
(1) Epic Metals Corp., Installed per accompanying installation instructions over factory-punched holes in EPC2 or EPC3 floor units. Inserts are used in the pre-active, active, or abandoned condition. Required spray-applied resistive material thicknesses on floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Thkns In.
(EPC20-I, EPC30-I)			
2	EPC2 or EPC3	NW	7/8
2	EPC2 or EPC3	LW	1-1/16

The hole cut in insert cover for passage of wires shall be no more than 1/8 in. larger diam than the wire. For abandonment of EPC inserts, see installation instructions.

Installed per accompanying installation instructions over factory-punched holes in QL-AKX or QL-WKX floor units. Inserts are used in the pre-active, active or abandoned condition. Required spray-applied resistive material thicknesses on floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Thkns In.
(Tapmate II, II-EA)			
2	QL-AKX, -WKX	NW	7/8
2	QL-AKX	LW	1-1/16
2	QL-WKX	LW	15/16
(Tapmate II-FN or II-EAFN)			
2	QL-AKX, -WKX	NW	7/16
2	QL-AKX, -WKX	LW	3/4

The Tapmate II-FN insert may use KEM-HP-1 outlet box fittings in lieu of the KEB-PC flush cover fittings.

(Tapmate II-EAFN-FC1: Series KEB)

Installed per accompanying installation instructions over factory-punched holes in QL-WKX floor units. Inserts are used in the pre-active, active, or abandoned condition. Required spray-applied resistive material thickness on floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Thkns In.
2	QL-WKX	NW	7/16

For abandonment, see installation instructions.

(Tapmate III-FN, III-EAFN: Series KEC)

Installed per accompanying installation instructions over factory-punched holes in QL-AKD or QL-WKD floor units. Inserts are used in the pre-active, active, or abandoned condition. Required spray-applied resistive material mixture thicknesses on floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Thkns In.
(Tapmate III-FN or III-EAFN)			
2	QL-AKD, WKD	NW	1/2
2	QL-AKD, WKD	LW	13/16
(Tapmate III-EAFN-FC1)			
2	QL-WKD	NW	1/2
2	QL-WKD	LW	13/16

The hole cut in insert cover for passage of wires shall be no more than 1/8 in. larger diam than the wire. For abandonment of Tapmate inserts, see installation instructions.

The Tapmate III inserts may use KEB-HP-1, Series KEC outlet box fittings with the same hourly rating and fireproofing thicknesses as specified for the Tapmate II-EAFN electrical inserts.

(Tapmate IV, IV-EA, IV-H, IV-H-M, IV-S)

Installed per accompanying installation instructions over factory-punched holes in QL-GKX-24 or -30 floor units. Inserts are used in the preactive, active or abandoned condition. Required spray-applied resistive material thicknesses on floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Thkns In.
(Tapmate IV, IV-H, IV-H-M, IV-S)			
1	QL-GKX	NW,LW	3/8
1-1/2	QL-GKX	NW	1/2
1-1/2	QL-GKX	LW	9/16
2	QL-GKX	NW	5/8
2	QL-GKX	LW	3/4

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Thkns In.
(Tapmate IV-EA)			
1	QL-GKX	NW, LW	7/16
1-1/2	QL-GKX	NW	9/16
1-1/2	QL-GKX	LW	5/8
2	QL-GKX	NW	3/4
2	QL-GKX	LW	7/8
(Tapmate V)			
1	QL-GKX	NW, LW	3/8
1-1/2	QL-GKX	NW, LW	1/2
2	QL-GKX	NW, LW	5/8

The holes cut in inserts cover for passage of wires shall be no more than 1/8 in. larger diam than the wire. For abandonment of inserts see installation instructions.

Type KED-HP-1 outlet box fittings may be used with Tapmate IV box assemblies or in lieu of Tapmate IV or IV-EA fittings with the same hourly ratings and protection material thicknesses as specified for the above electrical inserts.

(Tapmate IV-FN-S, IV-FN-H, IV-EAFN: Series KED)

Installed per accompanying installation instructions over factory-punched holes in QL-GKX-24 or -30 floor units. Inserts are used in the preactive, active, or abandoned condition. Required spray-applied resistive material thicknesses on floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Thkns In.
(Tapmate IV-FN-S, IV-FN-H, IV-EAFN)			
2	QL-GKX	NW	1/2
2	QL-GKX	LW	3/4

The hole cut in insert cover for passage of wires shall be no more than 1/8 in. larger diam than the wire. For abandonment see installation instructions.

Type KED-HP-1 outlet box fittings may be used with Tapmate IV box assemblies or in lieu of Tapmate IV-FN-S, IV-FN-H, IV-EAFN fittings with the same hourly ratings and protection material thicknesses as specified for the above electrical inserts.

(Tapmate KED-MSA Multi-Service After set Inserts)

Installed per accompanying installation instructions in core-drilled holes over QL-GKX-24 or -30 steel floor units. Spacing of after set inserts shall be not more than one insert per each 7-1/2 sq ft of floor area with not less than 25-1/2 in. between edges of adjacent after set inserts; After set inserts may be installed with either the flip lid plastic cover (KEC-PC3, PC4 and PC5 components) or the Deluxe Cover (KED-NAC type). Required Spray-Applied Fire Resistive Materials thicknesses on steel floor units with inserts are tabulated below:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Thkns In.
1	QL-GKX	NW, LW	3/8
1-1/2	QL-GKX	NW	1/2
1-1/2	QL-GKX	LW	9/16
2	QL-GKX	NW	5/8
2	QL-GKX	LW	3/4

(Types TSAR, TSACR After set Inserts)

After set inserts installed per accompanying installation instructions in holes core drilled through concrete topping to top of cells of the cellular floor units. TSAR and TSACR, for use in 7 in. diam holes . Spacing shall be not more than one insert in each 4 square ft of floor area with not less than 2 ft center to center of adjacent inserts. The required Spray-Applied Fire Resistive Materials thicknesses on floor units with inserts are shown below:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Thkns In.
(Types TSAR, TSACR)			
1	WDR2 or WDR3	NW, LW	1/2
1-1/2	WDR2 or WDR3	NW, LW	3/4
2	WDR2 or WDR3	NW, LW	1-1/4

When spacing is not more than one insert in each 8 square ft of floor area with not less than 2 ft center to center of adjacent inserts, the required Spray-Applied Fire Resistive Materials thicknesses on floor units with inserts are shown below:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Thkns In.
(Types TSAR, TSACR)			
1	WDR2 or WDR3	NW	3/8
1-1/2	WDR2 or WDR3	NW	3/8
2	WDR2 or WDR3	NW	1/2
3	WDR2 or WDR3	NW	3/4

(4) **Asc Steel Deck, div of Asc Profiles Inc** (ASCII Inserts with Normal Weight or Lightweight Concrete)

Installed per accompanying installation instructions over factory pre-punched knockout holes in ASC3 cellular steel floor units. May be used for max 2 hr Restrained Assembly Rating only. The holes in the insert cover for the passage of wires shall be no more than 1/8 in. larger diam than the wire. Internally protected inserts used in pre-active or abandoned condition and activated with the ASC -FM, ASC-RM, ASC-SF and ASC-4-Floor activation fittings are to be protected on the underside of the floor units with 1/2 in. Spray-Applied Fire Resistive Materials. Inserts without internal protection used in pre-active or abandoned condition are to be protected on the underside of the floor units with 5/8 in. Spray-Applied Fire Resistive Materials.

When insert is abandoned, the insert cover is removed, the internal intumescent pad and the protective cap reinstalled and the top of the cap filled with sand-cement grout flush with the concrete surface.

13. **Mineral And Fiber Boards*** — (Optional — Not Shown) — Applied over concrete floor with no penetrations. No restriction on thickness. See **Mineral And Fiber Board*** (CERZ) category for names of manufacturers.

14. **Foamed Plastic*** — (Optional — Not Shown) — Polystyrene insulation applied over concrete floor with no penetrations. No restriction on thickness. Max density of 5 pcf. See **Foamed Plastic*** (CCVW) category for names of manufacturers.

15. **Cellular Concrete — Roof Topping Mixture* —** (Not Shown) — Optional — Foam concentrate mixed with water and Portland cement per manufacturer's application instruction. 28 day compressive strength of min 190 psi as determined in accordance with ASTM C495-86, min 2 in. thick, poured above the foamed plastic (Item 10A). May be covered with any built-up or single ply roof covering materials*.

16. **Roof Covering Materials* —** (Optional — Not Shown) — Consisting of materials compatible with insulations described herein which provide Class A, B or C coverings. See **Built-Up Roof Covering Materials*** in the Building Materials Directory.

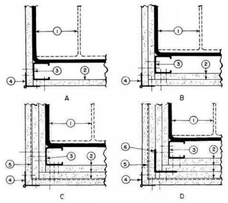
17. **Insulated concrete —** (Optional — Not Shown) — Various type of insulated concrete prepared and applied in the thickness indicated.
A. **Vermiculite Concrete —** Mix consists of 6 cu ft of Vermiculite Aggregate*, 94 lbs of Portland cement and 60 oz of air entraining agent. Thickness to be 2 in. min from the top plane of steel roof deck.

B. **Perlite Concrete —** Mix consists of 6.2 cu ft Perlite Aggregate* to 94 lbs of Portland cement and 1-1/2 pt air entraining agent. Compressive strength 80 psi min.
See Perlite Aggregate (CFHX) category for names of Classified companies.

Design No. X528

February 26, 2020

Ratings — 1, 2 and 3 Hr.



CORNER DETAILS OF WALLBOARD SUPPORT SYSTEMS WITHOUT STEEL COVERS

1. **Steel Column —** Min sizes of W-shaped and tubular steel columns which appear in the AISC Steel Construction Manual as shown under Item 2.

2. **Gypsum Board* — Any 1/2 in. thick UL Classified Gypsum Board that is eligible for use in Design No. X515. Any 5/8 in. thick UL Classified Gypsum Board that is eligible for use in Design Nos. L501, G512 or U305.** Nom 1/2 in. or 5/8 in. thick gypsum board. Applied in layers as noted in the above illustrations. Boards are to be applied vertically without horizontal joints. Min total thickness of layers in inches for the various ratings and min column sizes are as follows:

W Shaped Column Min Column Size	Rating (Hr) 1	2	3	Corner Details For Various Rating 1 Hr	2 Hr	3 Hr
Total thickness (In.)						
W4x13	1	1-1/2	2-1/4	B	C	D
W6x15.5	1	1-1/2	2-1/4	B	C	D
W10x49	1/2	1-1/8	1-7/8	A	B	C
Tube Shaped columns						
TS 4 by 4						
by0.188	1	1-3/4	2-5/8	B	C	D
TS 8 by 8						
by 0.250	5/8	1-1/2	2-1/4	A	C	D

2A. **Gypsum Board* —** As an alternate to Item 2- 3/4 in. thick gypsum wallboard. For 2 Hr rating, 1-1/2 in. total thickness, installed in accordance with corner detail B. For 3 Hr rating, 2-1/4 in. total thickness installed in accordance with corner detail C. Boards are to be applied vertically without horizontal joints.

2B. **Gypsum Board* —** (As an alternate to Items 2 and 2A) — Nominal 5/8 in. thick panels. One of the layers of **Gypsum Board** (Item 2) used to obtain the minimum required thickness in Item 2 may be substituted with one layer and secured as described in Item 2.

2C. **Wall and Partition Facings and Accessories* —** (As an alternate to Item 2 through 2B) — Composite Gypsum Panel — Nominal 5/8 in. thick panels. One of the layers of **Gypsum Board** (Item 2) used to obtain the minimum required thickness in Item 2 may be substituted with one layer of composite gypsum panel and secured as described in Item 2.

3. **Steel Stud —** 1-5/8 in. wide with 1-5/16 and 1-7/16 in. legs having a 1/4- in. folded flange, fabricated from No. 25 MSG galv steel. Length to be 1/2 in. less than the assembly height.

3A. **As an alternate to Item 3 Steel Framing Members* —** galv. steel clips spaced 4 ft OC and 1-1/4 in. from top and bottem of column. A No. 28 MSG galv steel support angle with 1-1/4 in. length shall be placed over clips and secured with screws attaching the wallboard. The angle cut 1 in. less than assembly height splices in angle to occur over clips. The clips for use with wide flange columns only.

4. **Corner Beads —** No. 28 MSG galv steel, 1-1/4 in. legs to be attached to the wallboard with No. 6 by 1 in. screws spaced 12 in. OC max.

5. **Tie Wire —** No. 18 SWG steel wire spaced 24 in. OC used with second layer of wallboard.

6. **Screws —** For attaching first layer of wallboard to steel studs, and third layer of wallboard to 2 in. by 2 in. steel angle (25 Ga) to be No. 6 by 1 in. (or 1-1/4 in. for 3/4 in. thick wallboard) Phillips head self-drilling, self-tapping double lead screws spaced 24 in. OC For attaching second layer of wallboard to steel studs and fourth layer of wallboard to 2 in. by 2 in. steel angle (25 Ga) to be No. 6 by 1-3/4 in. (or 2-1/4 in. for 3/4 in. thick wallboard) steel screws of the same type spaced 12 in. OC For attaching third layer of wallboard to steel studs to be No. 8 by 2-1/4 in. screws of the same type spaced 12 in. OC

7. **Finishing System —** (Not Shown) — Joint compound applied over corner beads to a thickness of 1/16 in.

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Dover, DE 19904
302.734.7950
Rittenhouse Station
250 South Main Street, Suite 109
Newark, DE 19711
302.369.3700

www.beckermorgan.com

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FOR BIDDING

NOT FOR CONSTRUCTION
ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 4/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation North Carolina 51922 WILMINGTON, NC

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

UL DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE:
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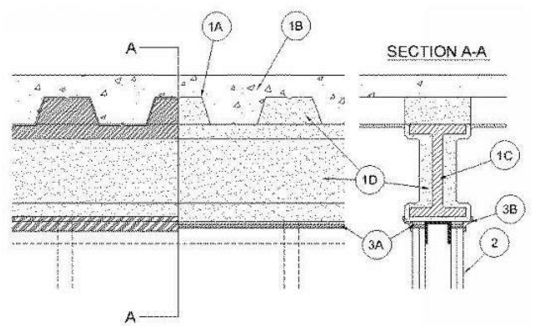
System No. HW-D-0259

September 26, 2019

ANSI/UL2079	CAN/ULC S115
Assembly Ratings — 1 and 2 Hr (See Items 1 and 2)	F Ratings — 1 and 2 Hr (See Items 1 and 2)
Nominal Joint Width - 1-1/2 In.	FT Ratings — 1 and 2 Hr (See Items 1 and 2)
Class II Movement Capabilities — 50% Compression or Extension	FH Ratings — 1 and 2 Hr (See Items 1 and 2)
L Rating At Ambient — Less Than 1 CFM/lin ft	FTH Ratings — 1 and 2 Hr (See Items 1 and 2)
L Rating At 400 F — Less Than 1 CFM/lin ft	Nominal Joint Width - 1-1/2 In.
	Class II Movement Capabilities — 50% Compression or Extension
	L Rating At Ambient — Less Than 1 CFM/lin ft
	L Rating At 400 F — Less Than 1 CFM/lin ft



1. **Floor Assembly —** The fire-rated fluted steel floor unit/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the Fire Resistance Directory and shall include the following construction features:

A. **Steel Floor and Form Units* —** Max 3 in. (76 mm) deep galv steel fluted floor units.

B. **Concrete —** Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.

C. **Structural Steel Support —** Steel beam, as specified in the individual D700 or D900 Series Floor-Ceiling Design, used to support steel floor units. Structural steel support centered over and parallel with wall assembly.

D. **Spray-Applied Fire Resistive Material* —** Steel floor units and structural steel beam to be sprayed with the thickness of material specified in the individual D700 Series Design or the structural steel supports to be sprayed in accordance with the specifications in the individual D900 Series Design. The flutes of the steel floor units are to be filled with material across the entire top flange of the steel beam. Additional material shall be applied to the web of the steel beam on each side of the wall. **For a 1 hr Assembly Rating, the total thickness of material applied to each side of the steel beam web shall be min 13/16 in. (21 mm). For a 2 hr Assembly Rating, the total thickness of material applied to each side of the steel beam web shall be min 1-3/8 in. (35 mm).**

D1. **Spray-Applied Fire Resistive Material* —** Steel floor units and structural steel support to be sprayed with the min thickness of material specified in the individual D700 or D900 Series Design. The flutes of the steel floor units are to be filled with material across the entire top flange of the steel beam. **Additional material shall be applied to the web of the steel beam on each side of the wall. For a 1 hr Assembly Rating, the total thickness of material applied to each side of the steel beam web shall be min 11/16 in. (18 mm). For a 2 hr Assembly Rating, the total thickness of material applied to each side of the steel beam web shall be min 1-1/2 in. (38 mm).**

2. **Wall Assembly* —** The 1 or 2 h fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. **Steel Floor and Ceiling Runners —** Floor and ceiling runners of wall assembly shall consist of min No. 25 gauge galv steel channels sized to accommodate steel studs (Item 2B). Flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width. Ceiling runner centered beneath and parallel with steel beam (Item 1C). Ceiling runner secured to steel beam through spray-applied fire resistive material with steel fasteners spaced max 24 in. (610 mm) OC.

A1. **Light Gauge Framing* —** Slotted Ceiling Runner As an alternate to the ceiling runner in Item 2A, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Slotted ceiling runner centered beneath and parallel with steel beam (Item 1C). Slotted ceiling runner secured to steel beam with steel fasteners, steel fasteners or welds spaced max 24 in. (610 mm) OC.

A2. **Light Gauge Framing* —** Vertical Deflection Ceiling Runner As an alternate to the ceiling runners in Item 2A and 2A1, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips, provided with step bushings, for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 2B). Vertical deflection ceiling runner centered beneath and parallel with steel beam (Item 1C). Vertical Deflection ceiling runner secured to steel beam with steel fasteners, steel fasteners or welds spaced max 24 in. (610 mm) OC.

A3. **Light Gauge Framing*- Notched Ceiling Runner —** As an alternate to the ceiling runners in Items 2A through 2A2, notched ceiling runners to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 2B). Notched ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC.
OLMAR SUPPLY INC — Type SCR

A4. **Light Gauge Framing* — Slotted Ceiling Runner —** As an alternate to the ceiling runner in Item 2A through 2A3, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Flange height of slotted ceiling runner shall be 3-1/4 in. (83 mm) with 2 in. (51 mm) deep slots. Slotted ceiling runner centered beneath and parallel with steel beam (Item 1C). Slotted ceiling runner secured to steel beam with steel fasteners or welds spaced max 24 in. (610 mm) OC.

B. **Studs —** Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 3/4 in. to 1-1/4 in. (19 to 32 mm) less in length than assembly height with bottom nesting in, resting on and fastened to the floor runner and with top nesting in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. (13 mm) long wafer head steel screws at midheight of slot on each side of wall. When vertical deflection runner (Item 2A2) is used, studs secured to vertical clip through slip bushing, supplied, with No.8 by 1/2 in. (13 mm) steel screws at mid-height of slot of each slot. Stud spacing not to exceed 24 in. (610 mm) OC. When slotted ceiling runner (Item 2A4) is used, steel studs cut in lengths 3/4 to 1-3/4 in. (19 to 44 mm) less than floor to ceiling height and secured to slotted ceiling runner with No. 8 by 1/2 (13 mm) long wafer head steel screws at +/- 3/16 in. (5 mm) of the mid-height of slot on each side of wall.

C. **Gypsum Board* —** 5/8 in. (16 mm) thick, 4 ft (1.22 m) wide with square or tapered edges. The gypsum board type, number of layers an sheet orientation shall be as specified in the individual U400 or V400 Series Design in the Fire Resistance Directory, except that a max 1-1/2 in. (38 mm) gap shall be maintained between top edge of the gypsum board and the spray applied fire resistive material on the structural steel support. The top row of screws shall be installed into the studs 1-1/2 in. (38 mm) below the bottom of the ceiling runner.

D. **Steel Attachment Clips —** (Optional - Not Shown) - As an alternate to steel fasteners, ceiling runner secured to steel beam with Z-shaped clips formed from min 1 in. (25 mm) long strips of min 20 ga galv steel. Length of clips should not exceed the width (thickness) of the wall. Clips to be sized to extend through the thickness of the spray-applied fire-resistive material on the bottom flange of the steel beam with 1-1/2 or 2 in. (38 or 51 mm) long upper and lower legs. Legs of clips fastened to bottom of beam (prior to application of spray-applied fire-resistive materials) and top of ceiling runner with steel fasteners or welds. Clips spaced max 24in. (610 mm) OC.
The hourly ratings of the joint system are dependent on the hourly rating of the wall.

3. **Joint System — Max separation between bottom of spray-applied fire resistive material on beam and top of gypsum board at time of installation is 1-1/2 in. (38 mm). The joint system is designed to accommodate a max 50 percent compression or extension from its installed width.** The joint system consists of a forming material and a fill material between the top of the gypsum board and the bottom of the spray-applied fire resistive material on the beam, as follows:

A. **Forming Material* —** Nominal 4 pcf (64 kg/m^3) mineral wool forming material cut into strips to fill the gap between top of the gypsum board and bottom of beam. Width of the strips shall be equal to the total thickness of the gypsum board. The strips of mineral wool shall be compressed 50 percent in thickness and firmly packed into the gap between the top of gypsum board and bottom of beam.

A1. **Forming Material* - Strips —** (Optional) - Nom 5/8 in. (16 mm) and 1-1/4 in. (32 mm) wide by 2 in. (51 mm) high precut mineral wool strips for 1 and 2 hr rated assemblies respectively. The strips are compressed 50 percent and firmly packed, cut edge first, into the gap between the top of the gypsum board and bottom of the steel floor units on both sides of the wall.

B. **Fill, Void or Cavity Material* —** Min 1/16 in. (1.6 mm) dry thickness (min 1/8 in. or 3.2 mm wet thickness) of fill material sprayed or troweled on each side of wall to completely cover mineral wool forming material and to overlap 1/2 in. (13 mm) onto gypsum board and 2 in. (51 mm) onto spray-applied fire resistive material on the structural steel support.

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Dover, DE 19904
302.734.7950

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ISSUED
FOR BIDDING
NOT FOR CONSTRUCTION
ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 4/16/2020

BECKER MORGAN GROUP, INC. Registered Architecural Corporation 51922 North Carolina WILMINGTON, NC

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

UL DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE:
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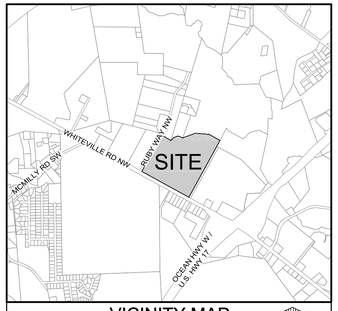
WEST BRUNSWICK HIGH SCHOOL IMPROVEMENTS

550 WHITEVILLE ROAD NW
SHALLOTTE, NORTH CAROLINA 28470

BID DOCUMENTS

APRIL 2020



VICINITY MAP
SCALE: 1" = 1,000'
NORTH

NOTICE REQUIRED

ALL EXISTING UNDERGROUND UTILITIES SHALL BE PHYSICALLY LOCATED PRIOR TO THE BEGINNING OF ANY CONSTRUCTION IN THE VICINITY OF SAID UTILITIES.

CONTRACTORS SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATION AT LEAST TWO WORKING DAYS, BUT NOT MORE THAN TEN WORKING DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION.

CONTRACTORS SHALL CONTACT OVERHEAD ELECTRIC PROVIDER TO COMPLY WITH FEDERAL OSHA 1910.333 MINIMUM APPROACH DISTANCE TO ENERGIZED POWERLINES AND OSH 29 CFR 1926.1407-1411 MUST BE FOLLOWED.

CONTRACTOR SHALL CONTACT AT&T PRIOR TO ANY DEMOLITION TO ALLOW FOR AT&T TO DISCONNECT COMMUNICATIONS CABLES COMING INTO THE SITE.

CONTACT THESE UTILITIES

TOWN OF SHALLOTTE PLANNING & ZONING
ATTN: ROBERT WARING, PLANNING DIRECTOR
PH: 910-754-4032

PIEDMONT NATURAL GAS
ATTN: CATHY PLEASANT
PH: 910-251-2827

EMERGENCY DIAL 911
POLICE - FIRE - RESCUE
ATTN: TOWN OF SHALLOTTE FIRE/RESCUE DEPARTMENT
NON-EMERGENCY PH: 910-754-6008

TOWN OF SHALLOTTE PUBLIC WORKS (SEWER)
ATTN: BILL HALL
PH: 910-754-4032
AFTER HOURS SEWER EMERGENCY
PH: 910-233-5693

BRUNSWICK COUNTY UTILITIES (WATER)
ATTN: BILL PINNIX & AMY AYCOCK
PH: 910-253-2408 & 910-253-2407

DUKE ENERGY
DISTRIBUTION CONSTRUCTION SERVICE
ALLISON WALSH
PH: 910-350-3457

TRANSMISSION AGENT
BILL WILDER
PH: 910-772-4903

AT&T/BELL SOUTH
ATTN: STEVE DAYVAULT (BUILDING ENGINEERING)
PH: 910-341-0741

ATTN: JAMES BATSON, ENGINEERING
PH: 910-341-1621

SPECTRUM
ATTN: STEVE BARNETTE
PH: 910-772-5755

OWNER/DEVELOPER:
BRUNSWICK COUNTY SCHOOLS
35 REFERENDUM DRIVE NE
BOLIVIA, NC 28422

ENGINEER (CIVIL) & LANDSCAPE ARCHITECT:
PARAMOUNTE ENGINEERING, INC.
122 CINEMA DRIVE
WILMINGTON, NORTH CAROLINA 28403
ATTN: ROBERT BALLAND, P.E. (910) 791-6707 - ENGINEER
ATTN: ALLISON ENGEBRETSON, RLA (910) 791-6707 - LANDSCAPE

SURVEYING:
PARAMOUNTE ENGINEERING, INC.
122 CINEMA DRIVE
WILMINGTON, NORTH CAROLINA 28403
ATTN: CHRIS GAGNE, P.L.S. (910) 791-6707

SHEET INDEX

SHEET NUMBER	SHEET TITLE
C-0.0	COVER SHEET
C-1.0 & C-1.1	GENERAL NOTES
C-2.0 - C-2.2	DEMOLITION PLANS
C-2.3 - C-2.6	SITE PLANS
C-3.0 & C-3.1	GRADING-DRAINAGE-EC PLANS
C-4.0 & C-4.1	UTILITY PLAN
C-5.0 - C-5.4	DETAILS
L-1.0	LANDSCAPE PLAN

NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLAND
04/16/20

Know what's below. Call before you dig.

PREPARED BY:

PARAMOUNTE ENGINEERING, INC.
122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846

PROJECT # 19249.PE

FINAL DESIGN - RELEASED FOR BIDDING ONLY

COORDINATION NOTES:

1. THE CONTRACTOR IS REQUIRED TO OBTAIN ANY/ALL PERMITS REQUIRED FOR CONSTRUCTION OF THESE PLANS.
2. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH PERMITS ISSUED AND WITH THE TOWN OF SHALLOTTE, BRUNSWICK COUNTY (WATER), TOWN OF SHALLOTTE PUBLIC WORKS (SEWER), AND THE STATE OF NORTH CAROLINA (NCDOT - STREETS).
3. THE CONTRACTOR IS TO ESTABLISH AND CHECK ALL HORIZONTAL AND VERTICAL CONTROLS TO BE USED WITH THE PROJECT. IN ADDITION, THE CONTRACTOR IS TO COMPUTE THE LAYOUT OF THE ENTIRE SITE PLAN IN ADVANCE OF BEGINNING ANY WORK ASSOCIATED WITH THE SUBJECT PLANS. CONTRACTOR SHALL EMPLOY A PROFESSIONAL SURVEYOR TO PERFORM SITE IMPROVEMENT STAKEOUT(S).
4. ANYTIME WORK IS PERFORMED OFF-SITE OR WITHIN AN EXISTING EASEMENT, THE CONTRACTOR IS TO NOTIFY THE HOLDER OF SAID EASEMENT AS TO THE NATURE OF PROPOSED WORK, AND TO FOLLOW ANY GUIDELINES OR STANDARDS WHICH ARE ASSOCIATED WITH OR REFERENCED IN THE RECORDED EASEMENT.
5. CONTRACTOR SHALL REFER TO ARCHITECTURAL DRAWINGS BY OTHERS FOR ALL BUILDING DIMENSIONS AND DETAILS.

GENERAL NOTES:

1. TREE INVENTORY AND TOPOGRAPHIC SURVEY COMPLETED BY PARAMOUNTE ENGINEERING, INC. THE SURVEY SHALL BE FIELD VERIFIED BY CONTRACTOR AND ANY DISCREPANCIES REPORTED TO THE OWNER AND ENGINEER.
2. REASONABLE CARE HAS BEEN EXERCISED IN SHOWING THE LOCATION OF EXISTING UTILITIES ON THE PLANS. THE EXACT LOCATION OF ALL EXISTING UTILITIES IS NOT KNOWN IN ALL CASES. THE CONTRACTOR SHALL EXPLORE THE AREA AHEAD OF DITCHING OPERATIONS BY OBSERVATIONS, ELECTRONIC DEVICES, HAND DIGGING AND BY PERSONAL CONTACT WITH THE UTILITY COMPANIES. IN ORDER TO LOCATE EXISTING UTILITIES IN ADVANCE OF TRENCHING OPERATIONS SO AS TO ELIMINATE OR MINIMIZE DAMAGE TO EXISTING UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS RESULTING FROM ANY DAMAGE TO THE EXISTING UTILITY LINES INCLUDING LOSS OF UTILITY REVENUES. CONTRACTOR SHALL ARRANGE FOR TEMPORARY SUPPORT OF EXISTING UTILITIES, SUCH AS POLES, CONDUITS, FIBER OPTIC CABLES, TELEPHONE CABLES, WATER LINES, ETC.
3. CONTRACTOR SHALL COMPLY WITH THE LATEST REVISIONS AND INTERPRETATIONS OF THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER THE OCCUPATIONAL SAFETY AND HEALTH ACT.
4. CONTRACTOR SHALL PLAN AND CONSTRUCT WORK SO AS TO CAUSE MINIMUM INCONVENIENCE TO THE OWNER AND THE PUBLIC. THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN AT ALL TIMES DURING WORK PROGRESS OR TEMPORARY SUSPENSION OF WORK, SUITABLE BARRIERS, FENCES, SIGNS OR OTHER ADEQUATE PROTECTION, INCLUDING FLAGMEN AND WATCHMEN AS NECESSARY TO INSURE THE SAFETY OF THE PUBLIC AS WELL AS THOSE ENGAGED IN THE CONSTRUCTION WORK. CONSTRUCTION SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "CONSTRUCTION AND MAINTENANCE OPERATIONS SUPPLEMENT TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" BY THE USDOT.
5. ALL MATERIAL CLEARED OR DEMOLISHED BY THE CONTRACTOR IN ORDER TO CONSTRUCT THE WORK SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE PROPERLY DISPOSED OF OFF-SITE.
6. ALL WORK BY THE CONTRACTOR SHALL BE WARRANTED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR AFTER THE OWNER ACCEPTS THE WORK.
7. CONTRACTOR SHALL CALL THE NORTH CAROLINA ONE-CALL CENTER AT 811 AN ALLOW THE CENTER TO LOCATE EXISTING UTILITIES BEFORE DIGGING.
8. ANY DISCREPANCY IN THIS PLAN AND ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE OWNER PRIOR TO START OF CONSTRUCTION. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL SETBACKS, EASEMENTS AND DIMENSIONS SHOWN HEREON BEFORE BEGINNING CONSTRUCTION.
9. CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKMEN AND PUBLIC SHALL BE PROTECTED FROM INJURY, AND ADJOINING PROPERTY PROTECTED FROM DAMAGE.
10. ACCESS TO UTILITIES, FIRE HYDRANTS, STREET LIGHTING, ETC., SHALL REMAIN UNDISTURBED, UNLESS COORDINATED WITH THE RESPECTIVE UTILITY.
11. DO NOT SCALE THIS DRAWING AS IT IS A REPRODUCTION AND SUBJECT TO DISTORTION.
12. THE GENERAL CONTRACTOR SHALL REMOVE ALL DEBRIS FROM THE SITE UPON COMPLETION OF THE PROJECT AND AT LEAST ONCE A WEEK DURING CONSTRUCTION.
13. THE GENERAL CONTRACTOR SHALL KEEP THE AREA OUTSIDE THE "CONSTRUCTION LIMITS" BROOM CLEAN AT ALL TIMES.
14. ALL STREET SURFACES, DRIVEWAYS, CULVERTS, CURB AND GUTTERS, ROADSIDE DRAINAGE DITCHES AND OTHER STRUCTURES THAT ARE DISTURBED OR DAMAGED IN ANY MANNER AS A RESULT OF CONSTRUCTION SHALL BE REPLACED OR REPAIRED IN ACCORDANCE WITH THE SPECIFICATIONS.
15. CONTRACTOR SHALL MAINTAIN AN "AS-BUILT" SET OF DRAWINGS TO RECORD THE EXACT LOCATION OF ALL PIPING PRIOR TO CONCEALMENT. DRAWINGS SHALL BE GIVEN TO THE OWNER UPON COMPLETION OF THE PROJECT WITH A COPY OF THE TRANSMITTAL LETTER TO THE ENGINEER.
16. IF DEPARTURES FROM THE SPECIFICATIONS OR DRAWINGS ARE DEEMED NECESSARY BY THE CONTRACTOR, DETAILS OF SUCH DEPARTURES AND REASONS THEREOF SHALL BE GIVEN TO THE OWNER FOR REVIEW. NO DEPARTURES FROM THE CONTRACT DOCUMENTS SHALL BE MADE WITHOUT THE PERMISSION OF THE OWNER, THE TOWN OF SHALLOTTE, BRUNSWICK COUNTY (WATER), OR TOWN OF SHALLOTTE PUBLIC WORKS (SEWER), RESPECTIVELY.
17. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES. THE LOCATION OF ALL EXISTING UTILITIES ARE NOT NECESSARILY SHOWN ON PLANS AND WHERE SHOWN ARE ONLY APPROXIMATE. THE CONTRACTOR SHALL ON HIS INITIATIVE AND AT NO EXTRA COST HAVE LOCATED ALL UNDERGROUND LINES AND STRUCTURES AS NECESSARY. NO CLAIMS FOR DAMAGES OR EXTRA COMPENSATION SHALL ACCRUE TO THE CONTRACTOR FROM THE PRESENCE OF SUCH PIPE OTHER OBSTRUCTIONS OR FROM DELAY DUE TO REMOVAL OR REARRANGEMENT OF THE SAME. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO UNDERGROUND STRUCTURES. CONTACT NORTH CAROLINA ONE CALL" TOLL FREE 1-800-632-4949 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL NONSUBSCRIBING UTILITIES.
18. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL INSPECTIONS, CERTIFICATIONS, EQUIPMENT, ETC., THAT MAY BE REQUIRED.
19. THE ENGINEER AND/OR OWNER DISCLAIM ANY ROLE IN THE CONSTRUCTION MEANS AND METHODS ASSOCIATED WITH THE PROJECT AS SET FORTH IN THESE PLANS.
20. ALL LOT STRIPING AND DIRECTIONAL ARROWS TO BE REFLECTIVE MARKINGS AND SHALL CONFORM TO MUTCD. ALL PARKING STALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
21. LANDSCAPE PLANTINGS AT ENTRANCE/ EXITS WILL BE INSTALLED AND MAINTAINED SO AS NOT TO INTERFERE WITH SIGHT DISTANCE NEEDS OF DRIVERS IN THE PARKING AREA AND AT ENTRANCE/EXIT LOCATIONS PER LOCAL STANDARDS.
22. ALL DIMENSIONS AND RADII ARE TO OUTSIDE FACE OF BUILDING OR TO FACE OF CURB UNLESS OTHERWISE NOTED.

TRAFFIC NOTES:

1. ALL PAVEMENT MARKINGS IN PUBLIC RIGHTS-OF-WAY & FOR DRIVEWAY(S) ARE TO BE THERMOPLASTIC & MEET TOWN OF SHALLOTTE AND/OR NCDOT STANDARDS.
2. TRAFFIC CONTROL DEVICES (INCLUDING SIGNS AND PAVEMENT MARKINGS) IN AREAS OPEN TO PUBLIC TRAFFIC ARE TO MEET MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES) STANDARDS.
3. ALL TRAFFIC CONTROL SIGNS AND MARKINGS NOT WITHIN THE PUBLIC RIGHT-OF-WAY ARE TO BE MAINTAINED BY THE PROPERTY OWNER IN ACCORDANCE WITH MUTCD STANDARDS.
4. ALL PARKING STALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
5. ANY OPEN CUTTING OF A TOWN STREET REQUIRES A UTILITY CUT PERMIT. CONTACT TOWN OF SHALLOTTE PLANNING 910-754-4032 FOR MORE DETAILS. IN CERTAIN CASES, AN ENTIRE RESURFACING OF THE AREA BEING OPEN CUT MAY BE REQUIRED. CONTACT NCDOT, DIVISION 3, DIVISION ENGINEER FOR ANY WORK WITHIN NCDOT RIGHT-OF-WAY AT 910-341-2000. PROVIDE MINIMUM OF FORTY-EIGHT (48) HOURS NOTICE TO APPLICABLE AUTHORITY PRIOR TO ANY EXCAVATION IN THE RIGHT OF WAY.
7. ANY BROKEN OR MISSING SIDEWALK PANELS, DRIVEWAY PANELS AND/OR CURBING SHALL BE REPLACED.
8. TACTILE WARNING MATS TO BE INSTALLED AT ALL WHEELCHAIR RAMPS AND CURB CUTS.

GENERAL EROSION AND SEDIMENT CONTROL NOTES:

1. THE EROSION CONTROL PLAN SHALL INCLUDE PROVISIONS FOR GROUNDCOVER ON ALL EXPOSED PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1 WITHIN 7 CALENDAR DAYS FROM THE LAST LAND DISTURBING ACTIVITY. GROUND COVER SHALL BE PROVIDED ON ALL OTHER DISTURBED AREAS WITHIN 14 CALENDAR DAYS FROM THE LAST LAND DISTURBING ACTIVITY.
2. UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL HANDBOOK. (NO SEPARATE PAYMENT).
3. THE CONTRACTOR SHALL NOTIFY PLAN APPROVING AUTHORITY ONE WEEK PRIOR TO THE PRE-CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO FINAL INSPECTION.
4. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO CLEARING AND/OR LAND DISTURBANCE.
5. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN AND PERMIT SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
6. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO OFF-SITE BORROW OR WASTE AREAS STAGING OR STORAGE AREAS), THE CONTRACTOR SHALL PREPARE AND SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND TO THE NEW HANOVER COUNTY FOR APPROVAL. CONTRACTOR SHALL PAY ALL FEES REQUIRED AND SHALL INSTALL NECESSARY MEASURES AT NO SEPARATE PAYMENT. THE CONTRACTOR SHALL PROVIDE THE OWNER AND THE ENGINEER A COPY OF THE AMENDED PERMIT.
7. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY EITHER THE REVIEWING AGENCY OR THE ENGINEER. (NO SEPARATE PAYMENT).
8. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
9. ALL AREAS DISTURBED BY CONSTRUCTION UNLESS OTHERWISE IMPROVED SHALL BE SODDED OR SEEDED AS INDICATED AND STABILIZED.
10. DURING DEWATERING OPERATIONS, WATER SHALL BE PUMPED INTO AN APPROVED FILTERING DEVICE PRIOR TO DISCHARGE TO RECEIVING OUTLET.
11. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.
12. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED BY CONTRACTOR ONCE STABILIZATION OR A SUFFICIENT GROUND COVER HAS BEEN ESTABLISHED OR AS DIRECTED BY THE ENGINEER. (NO SEPARATE PAYMENT). NCDENR'S FINAL APPROVAL IS REQUIRED.
13. TEMPORARY GRAVEL CONSTRUCTION ENTRANCE SHALL BE REQUIRED AT ALL CONSTRUCTION STAGING AREA ENTRANCES AND ALL CONSTRUCTION ACCESS LOCATIONS INTO NON-PAVED AREA. (NO SEPARATE PAYMENT).
14. WHEN CROSSING CREEK OR DRAINAGE-WAY, THE DIVISION OF WATER QUALITY SHALL BE CONTACTED PRIOR TO DISTURBING A CREEK. THE CONTRACTOR SHALL INSTALL RIP-RAP WITH FABRIC ALONG DISTURBED BANKS AND CHANNEL AND RESTORE SLOPES TO ORIGINAL CONTOURS, BUT NOT STEEPER THAN 2:1 MAXIMUM. DISTURBED CREEK AREA SHALL BE STABILIZED IMMEDIATELY.

DEMOLITION NOTES:

1. CONTRACTOR TO COORDINATE WITH THE OWNER TO PROPERLY MAINTAIN OR RELOCATE EXISTING SERVICE CONNECTIONS WHEN NECESSARY.
2. CONTRACTOR IS TO WALK THE SITE AND BECOME FAMILIAR WITH THE SCOPE OF DEMOLITION REQUIRED. ALL DEMOLITION WORK REQUIRED TO CONSTRUCT NEW SITE IMPROVEMENTS WILL BE PERFORMED BY THE CONTRACTOR AND WILL BE CONSIDERED UNCLASSIFIED EXCAVATION.
3. DEMOLITION SHALL INCLUDE BUT IS NOT LIMITED TO THE EXCAVATION, HAULING AND OFFSITE DISPOSAL OF CONCRETE PADS, CONCRETE DITCHES, FOUNDATIONS, SLABS, STEPS, AND STRUCTURES; ABANDONED UTILITIES, BUILDINGS, PAVEMENTS AND ALL MATERIALS CLEARED AND STRIPPED TO THE EXTENT NECESSARY AS DIRECTED BY THE GEOTECHNICAL ENGINEER FOR THE INSTALLATION OF THE NEW IMPROVEMENTS AND WITHIN THE LIMITS OF CLEARING AND GRADING AND AS SHOWN ON THESE PLANS.
4. THE CONTRACTOR SHALL PROTECT ALL ADJACENT PROPERTY, STRUCTURES AND UTILITIES ON THE PROPERTY NOT TO BE DEMOLISHED. DAMAGE TO PROPERTIES OF OTHERS DUE TO THE CONTRACTOR'S ACTIVITIES SHALL BE REPLACED IN KIND BY THE CONTRACTOR AT NO COST TO OWNER.
5. ELECTRIC, TELEPHONE, SANITARY SEWER, WATER AND STORM SEWER UTILITIES THAT SERVICE OFF-SITE PROPERTIES SHALL BE MAINTAINED DURING THE CONSTRUCTION PROCESS BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL PRODUCE A PHOTOGRAPHIC RECORD (DIGITAL) OF DEVELOPMENT COMMENCING WITH A RECORD OF THE SITE AS IT APPEARS BEFORE DEMOLITION HAS BEGUN. AFTERWARDS, A PHOTOGRAPHIC RECORD SHALL BE MAINTAINED WEEKLY DURING CONSTRUCTION AND ENDING WITH A PHOTOGRAPHIC RECORD OF THE DEVELOPMENT AS IT APPEARS AFTER DEMOLITION. THIS RECORD SHALL BE DELIVERED TO THE OWNER.
7. EXISTING CURB AND GUTTER, LIGHTS, SIDEWALK, AND UTILITIES NOT INTENDED FOR DEMOLITION SHALL BE MAINTAINED, PROTECTED AND UNDISTURBED DURING DEMOLITION.
8. ALL EXISTING IMPROVEMENTS INDICATED OR REQUIRED TO BE DEMOLISHED SHALL INCLUDE REMOVAL FROM THE PROPERTY AND PROPER DISPOSAL.
9. CONTRACTOR SHALL COORDINATE RELOCATION OF ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES INCLUDING CABLE, GAS, TELEPHONE AND ELECTRIC AND ANY OTHER UTILITIES THROUGH THE SITE WITH THE RESPECTIVE COMPANIES.
10. CONTRACTOR SHALL MAINTAIN REQUIRED DISTANCES FROM HIGH VOLTAGE OVERHEAD LINES AND REMOVE TREES SO THEY DO NOT FALL TOWARDS OVERHEAD ELECTRICITY.
11. PROVIDE SMOOTH SAW CUT OF EXISTING PAVEMENTS, CURBS AND GUTTERS AND SIDEWALKS TO BE DEMOLISHED.
12. ALL DEMOLITION WORK SHALL BE DONE IN STRICT ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS AS WELL AS OSHA REGULATIONS.
13. EXISTING FIRE HYDRANTS ON OR NEAR THE SITE ARE TO REMAIN IN SERVICE.
14. INFORMATION CONCERNING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS, BUT THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATIONS.

NPDES BUILDING WASTES HANDLING:
1. NO PAINT OR LIQUID WASTES IN STREAM OR STORM DRAINS.
2. DEDICATED AREAS FOR DEMOLITION, CONSTRUCTION AND OTHER WASTES MUST BE LOCATED 50' FROM STORM DRAINS AND STREAMS UNLESS NO REASONABLE ALTERNATIVES AVAILABLE.
3. EARTHEN-MATERIALS STOCKPILES MUST BE LOCATED 50' FROM STORM DRAINS AND STREAMS UNLESS NO REASONABLE ALTERNATIVES AVAILABLE.
4. CONCRETE MATERIALS MUST BE CONTROLLED TO AVOID CONTACT WITH SURFACE WATERS, WETLANDS, OR BUFFERS.

NPDES INSPECTIONS:
1. SAME WEEKLY INSPECTION REQUIREMENTS.
2. SAME RAIN GAUGE & INSPECTIONS AFTER 0.5" RAIN EVENT.
3. INSPECTIONS ARE ONLY REQUIRED DURING "NORMAL BUSINESS HOURS".
4. INSPECTION REPORTS MUST BE AVAILABLE ON-SITE DURING BUSINESS HOURS UNLESS A SITE-SPECIFIC EXEMPTION IS APPROVED.
5. RECORDS MUST BE KEPT FOR 3 YEARS AND AVAILABLE UPON REQUEST.
6. ELECTRONICALLY AVAILABLE RECORDS MAY BE SUBSTITUTED UNDER CERTAIN CONDITIONS.

NPDES SEDIMENT BASINS:
1. OUTLET STRUCTURES MUST WITHDRAW FROM BASIN SURFACE UNLESS DRAINAGE AREA IS LESS THAN 1 ACRE.
2. USE ONLY DWQ-APPROVED FLOCULANTS.

NPDES - SPECIFIC PLAN SHEETS NOTES:
1. THIS PAGE IS SUBMITTED TO COMPLY WITH NPDES GENERAL STORMWATER PERMIT NCG010000.
2. THIS PAGE CAN BE APPROVED BY THE COUNTY PURSUANT TO NPDES GENERAL STORMWATER PERMIT NCG010000 ONLY.
3. THIS PAGE OF THE APPROVED PLANS IS ENFORCEABLE EXCLUSIVELY PURSUANT TO NPDES GENERAL STORMWATER PERMIT NCG010000.
4. THE COUNTY IS NOT AUTHORIZED TO ENFORCE THE NPDES PORTION OF THIS PAGE OF THE PLANS AND THEY ARE NOT A PART OF THE APPROVED PLANS FOR THE PURPOSES OF ENFORCEMENT ACTION UNDER THE COUNTY CODE.

EROSION CONTROL AND SEQUENCE OF CONSTRUCTION NOTES:

NOTE: THESE EROSION CONTROL AND SEQUENCE OF CONSTRUCTION NOTES ARE INTENDED FOR EACH "PHASE" OF CONSTRUCTION. THE ORDER AND STEPS TAKEN MUST BE IMPLEMENTED AS EACH PART OF THE PROJECT IS DEVELOPED; WHETHER AS A WHOLE OR IN PHASES. ANY EROSION CONTROL DEVICES/MEASURES MUST REMAIN IN PLACE UNTIL THE ENTIRE DISTURBANCE IS STABILIZED AND ALL IMPROVEMENTS WITHIN THE DISTURBANCE LIMITS ARE COMPLETE.

1. CONSTRUCT TEMPORARY GRAVEL CONSTRUCTION ENTRANCE(S), ESTABLISH THE LIMITS OF DISTURBANCE, TREE PROTECTION FENCING, AND TEMPORARY SILT FENCE.
2. CLEAR AND REMOVE FROM SITE TREES AS DESIGNATED, ROOTS, ROOT MAT, ETC. FROM THE AREA WITHIN THE DESIGNATED CLEARING LIMITS.
3. CONSTRUCT TEMPORARY SEDIMENT BASIN(S) AND ASSOCIATED SKIMMER, OUTLET PIPE, SPILLWAY, ETC.
4. INSTALL REMAINING EROSION CONTROL MEASURES AS SHOWN ON THE PLANS WITHIN THE AREA DISTURBED. ALL EROSION CONTROL MEASURES MUST BE INSTALLED BEFORE COMMENCING CONSTRUCTION.
5. PLANT GRASS OVER ALL GRADED AREAS WITHIN 14 WORKING DAYS OF CEASE OF ANY GRADING ACTIVITY.
6. IMMEDIATELY UPON THE INSTALLATION OF ANY STORM DRAINAGE CATCH BASIN, DROP INLET, ETC., THE CONTRACTOR SHALL INSTALL INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEM.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING AND RESTORING TO PRE-CONSTRUCTION CONDITIONS ANY AREAS OUTSIDE THE PROJECT LIMITS THAT MAY INADVERTENTLY BE DAMAGED DUE TO THE FAILURE OF THE EROSION CONTROL MEASURES.
8. DURING GRADING AND AFTER GRADING HAS BEEN COMPLETE, THE CONTRACTOR SHALL CONTINUE TO MAINTAIN PERMANENT AND TEMPORARY EROSION CONTROL MEASURES UNTIL FINAL APPROVAL BY ENGINEER OR EROSION CONTROL INSPECTOR.
9. UPON RECEIVING FINAL APPROVAL, THE CONTRACTOR CAN REMOVE TEMPORARY EROSION CONTROL MEASURES.
10. THE CONTRACTOR SHALL CONTINUE TO WATER, FERTILIZE, MOW AND MAINTAIN GRASS & PLANTED AREAS UNTIL ALL CONSTRUCTION IS COMPLETE.

EROSION CONTROL MAINTENANCE PLAN:

1. ALL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CHECKED FOR STABILITY AND OPERATION FOLLOWING EVERY 1/2-INCH OR GREATER RAINFALL BUT IN NO CASE LESS THAN ONCE EVERY WEEK. ANY NEEDED REPAIRS WILL BE MADE IMMEDIATELY TO MAINTAIN ALL PRACTICES AS DESIGNED.
2. ALL CONSTRUCTION ENTRANCES WILL BE PERIODICALLY TOP DRESSED WITH AN ADDITIONAL 2 INCHES OF #4 STONE TO MAINTAIN PROPER DEPTH. ANY SEDIMENT THAT IS TRACKED INTO THE STREET WILL BE IMMEDIATELY REMOVED.
3. SEDIMENT FENCE / SEDIMENT FENCE OUTLETS - SEDIMENT WILL BE REMOVED BEHIND THE SEDIMENT FENCE WHEN IT BECOMES HALF-FILLED. THE SEDIMENT FENCE WILL BE BE REPAIRED AS NECESSARY TO MAINTAIN A BARRIER. STAKES MUST BE STEEL, AND SPACED 6 FEET WITH EXTRA STRENGTH FABRIC AND NO WIRE BACKING. STAKE SPACING CAN BE 8 FEET WHEN STANDARD STRENGTH FABRIC AND WIRE BACKING ARE USED. IF ROCK FILTERS (OR EXCELSIOR WATTLES) ARE DESIGNED AT LOW POINTS IN THE SEDIMENT FENCE THE ROCK OR WATTLE WILL BE REPAIRED OR REPLACED IF IT BECOMES HALF FULL OF SEDIMENT, NO LONGER DRAINS, OR IS DAMAGED.
6. TEMPORARY SEDIMENT BASIN - REMOVE SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN IT ACCUMULATES TO WITHIN ONE HALF OF THE DESIGN DEPTH. PLACE SEDIMENT IN AREA WITH SEDIMENT CONTROLS. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, PIPING, AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE RISER AND POOL AREA.
9. EMERGENCY SPILLWAY / FOREBAY PROTECTION - AFTER EVERY HIGH-WATER EVENT INSPECT THE INTEGRITY OF THE LINED SPILLWAY AND THE ADJACENT EARTHEN BANKS. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE. REPAIR ANY VOIDS IN THE RIP RAP LINED APRONS. RE-ESTABLISH ANY LOOSE STONES, AND FIX GAPS IN THE ADJACENT VEGETATIVE COVER.
10. SKIMMER - INSPECT SKIMMER AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL TO MAKE SURE THAT THE INTAKE MECHANISM, ORIFICE, OR DISCHARGE PIPE IS NOT CLOGGED WITH TRASH OR SEDIMENT. IF THE BASIN IS DRY, MAKE SURE THAT ANY VEGETATION GROWING ON THE BOTTOM IS NOT HOLDING THE SKIMMER DOWN. TAKE SPECIAL PRECAUTION IN WINTER TO PREVENT THE SKIMMER FROM PLUGGING WITH ICE.
9. INLET PROTECTION - SEDIMENT SHALL BE REMOVED FROM HARDWARE CLOTH AND GRAVEL, BLOCK AND GRAVEL, OR ROCK-PIPE INLETS, WHEN IT REACHES HALF-FILLED. ROCK WILL BE CLEANED OR REPLACED WHEN NO LONGER DRAINS. SILT SACKS, BEAVER DAMS, SANDY SACKS, AND SOCKS NEED CHECKING EVERY WEEK AND AFTER RAIN.
10. ALL SEEDED AREAS WILL BE FERTILIZED, RESEEDED AS NECESSARY, AND MULCHED ACCORDING TO SPECIFICATIONS ON THESE PLANS AND CONTRACT SPECIFICATIONS TO MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER.

PERMANENT SEEDING

GRASS TYPE	LBS/ ACRE	TIME OF SEEDING	FERTILIZER LIMESTONE
BERMUDA, HULLED BERMUDA, UNHULLED	10-20 35	MARCH - AUGUST SEPT. - FEB.	BY SOIL TEST
CENTIPEDE	10	MARCH - AUGUST	BY SOIL TEST (NO HIGH PH)
TALL FESCUE (COASTAL CULTIVAR RECOMMENDED)	50	MARCH - AUGUST	300 LB/AC 10-20-20 OR BY SOIL TEST
SLOPES >= 2:1 CENTIPEDE SERICEA LESPEDEZA	5 20	JAN - DEC	BY SOIL TEST

TEMPORARY SEEDING

GRASS TYPE	LBS/ ACRE	TIME OF SEEDING	FERTILIZER LIMESTONE
RYE GRAIN	50	OCT. - APR.	400 LBS/AC. 10-20-20
SWEET SUDAN GRASS	50	JUNE - AUGUST	400 LBS/AC. 10-20-20
GERMAN or BROWNTOP MILLET	50	JUNE - AUGUST	400 LBS/AC. 10-20-20
STRAW MULCH AS NEEDED	4,000		

STABILIZATION TIME FRAMES:
*IN THE EVENT THAT THE GOVERNING AGENCIES TIMEFRAME FOR STABILIZATION VARY, CONTRACTOR SHALL MEET THE MORE STRINGENT REQUIREMENT.

NC ACCESSIBILITY NOTES:

GENERAL NOTES:

1. SPECIAL ATTENTION SHALL BE GIVEN TO COMPLIANCE WITH AMERICANS WITH DISABILITIES ACT (2010 ADA STANDARDS), THE NORTH CAROLINA BUILDING CODE/ANSI A117.1, AND APPLICABLE LOCAL LAWS & REGULATIONS.
2. IT IS ESSENTIAL THAT CONTRACTORS ARE AWARE OF THE SITE ACCESSIBILITY REQUIREMENTS. PARAMOUNTE ENGINEERING HAS DEVELOPED THESE NOTES AND DETAILS TO ASSURE THAT CONTRACTORS ARE AWARE OF THE REQUIREMENTS AT THE POINT IN TIME WHEN THEY ARE BIDDING THE PROJECT. IN ADDITION, PARAMOUNTE ENGINEERING HAS MADE A POINT IN THESE NOTES AND DETAILS, AS WELL AS IN OUR DRAWINGS, TO PROVIDE SLOPES / GRADES AND DIMENSIONS THAT COMPLY WITH THE AMERICANS WITH DISABILITIES ACT (2010 ADA STANDARDS), THE NORTH CAROLINA BUILDING CODE/ANSI A117.1 AND APPLICABLE LOCAL LAWS & REGULATIONS. IF THESE SLOPES / GRADES AND DIMENSIONS ARE NOT ACHIEVABLE, THE CONTRACTOR IS REQUIRED TO CONTACT THE OWNER IMMEDIATELY AND BEFORE MOVING FORWARD WITH THE WORK.
3. THE CONTRACTOR SHALL NOTIFY PARAMOUNTE ENGINEERING IMMEDIATELY OF ANY CONFLICT BETWEEN THESE NOTES AND DETAILS AND OTHER PROJECT DRAWINGS, WHETHER BY PARAMOUNTE ENGINEERING OR OTHERS. THE CONTRACTOR SHALL NOT PROCEED WITH THE WORK FOR WHICH THE ALLEGED CONFLICT HAS BEEN DISCOVERED UNTIL SUCH ALLEGED CONFLICT HAS BEEN RESOLVED. NO CLAIM SHALL BE MADE BY THE CONTRACTOR FOR DELAY OR DAMAGES AS A RESULT OF RESOLUTION OF ANY SUCH CONFLICT(S).
4. THESE ACCESSIBILITY NOTES AND DETAILS ARE INTENDED TO DEPICT SLOPE AND DIMENSIONAL REQUIREMENTS ONLY. REFER TO SIDEWALK, CURBING, AND PAVEMENT DETAILS FOR ADDITIONAL INFORMATION.

ACCESSIBLE ROUTE NOTES:

1. AT LEAST ONE ACCESSIBLE ROUTE SHALL BE PROVIDED WITHIN THE SITE FROM ACCESSIBLE PARKING SPACES AND ACCESSIBLE PASSENGER LOADING ZONES; PUBLIC STREETS OR SIDEWALKS; AND PUBLIC TRANSPORTATION STOPS TO THE ACCESSIBLE BUILDING OR FACILITY ENTRANCE THEY SERVE.
2. AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ACCESSIBLE BUILDINGS, ACCESSIBLE FACILITIES, ACCESSIBLE ELEMENTS, AND ACCESSIBLE SPACES THAT ARE ON THE SAME SITE.
3. WALKING SURFACES THAT ARE PART OF AN ACCESSIBLE ROUTE SHALL HAVE A MAXIMUM RUNNING SLOPE OF 5.0% AND A MAXIMUM CROSS SLOPE OF 2.0%.
4. ANY WALKING SURFACE THAT IS PART OF AN ACCESSIBLE ROUTE WITH A RUNNING SLOPE GREATER THAN 5.0% IS A RAMP AND SHALL COMPLY WITH THE GUIDELINES FOR RAMPS OR CURB RAMPS.
5. TRANSITIONS BETWEEN RAMPS, WALKS, LANDINGS, GUTTERS OR STREETS SHALL BE FLUSHAND FREE OF ABRUPT VERTICAL CHANGES (1/4 INCH MAXIMUM VERTICAL CHANGE IN LEVEL PERMITTED).
6. FLOOR SURFACES SHALL BE STABLE, FIRM AND SLIP RESISTANT.
7. THE MINIMUM CLEAR WIDTH OF EXTERIOR ACCESSIBLE ROUTES SHALL BE FORTY-EIGHT (48) INCHES MINIMUM MEASURED BETWEEN HANDRAILS WHERE HANDRAILS ARE PROVIDED (NC BUILDING CODE 1104.1 & 1104.2).
8. WHERE AN ACCESSIBLE ROUTE MAKES A 180 DEGREE TURN AROUND AN OBJECT THAT IS LESS THAN FORTY-EIGHT (48) INCHES IN WIDTH, CLEAR WI

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

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

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

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

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

GROUND STABILIZATION SPECIFICATION

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

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

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

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

EQUIPMENT AND VEHICLE MAINTENANCE

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

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

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

PAINT AND OTHER LIQUID WASTE

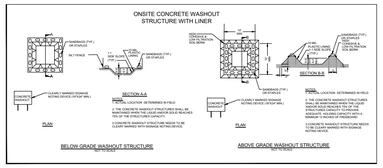
1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled,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

PORTABLE TOILETS

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

EARTHEN STOCKPILE MANAGEMENT

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



CONCRETE WASHOUTS

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

HERBICIDES, PESTICIDES AND RODENTICIDES

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

HAZARDOUS AND TOXIC WASTE

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

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

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

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

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

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

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

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

2. Additional Documentation

In addition to the E&SC Plan documents above, the following items shall be kept on the site

and available for agency inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

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

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

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

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that must be reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

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

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

(b) Anticipated bypasses and unanticipated bypasses.

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

2. Reporting Timeframes and Other Requirements

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

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

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

FINAL DESIGN - RELEASED FOR BIDDING ONLY

REVISIONS:

CLIENT INFORMATION:

BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

PARAMOUNTE ENGINEERING, P.C.
122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846

GENERAL NOTES

W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

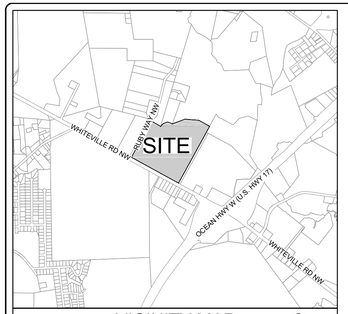
PROJECT STATUS
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
FINAL DESIGN:
RELEASED FOR CONST:

DRAWING INFORMATION
DATE: 04/16/20
SCALE: N.T.S.
DESIGNED: AEC
DRAWN: AEC
CHECKED: RPB

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLAND
04/16/20

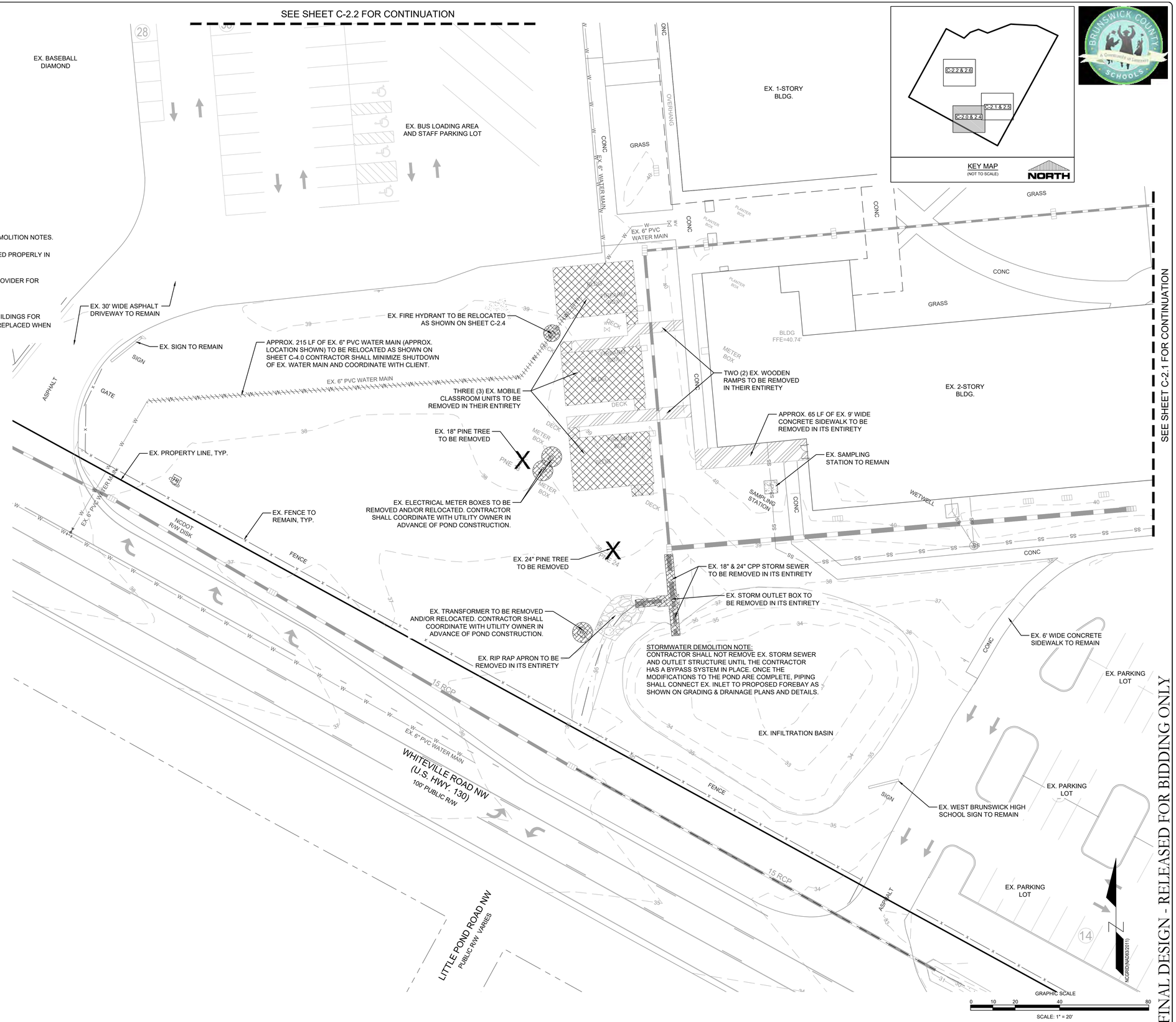
C-1.1

PEI JOB#: 19249.PE



VICINITY MAP
SCALE: 1" = 2,000'
NORTH

KEY MAP
(NOT TO SCALE)
NORTH



DEMOLITION NOTES:

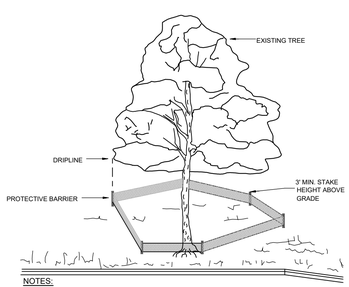
1. CONTRACTOR SHALL REFER TO SHEET C-1.0 GENERAL NOTES FOR DEMOLITION NOTES.
2. ALL UTILITIES SHALL BE ABANDONED AND/OR DEMOLISHED AND CAPPED PROPERLY IN ACCORDANCE WITH THE UTILITY OWNERS RULES AND REGULATIONS.
3. CONTRACTOR SHALL COORDINATE WITH ELECTRIC UTILITY OWNER/PROVIDER FOR DEMOLITION AND/OR REQUIRED RELOCATION.

EX. VEGETATION NOTES:

1. CONTRACTOR SHALL REMOVE SHRUBS AS NECESSARY ALONG THE BUILDINGS FOR CONSTRUCTION AS LONG AS THE SAME QUANTITY AND SPECIES ARE REPLACED WHEN CONSTRUCTION IS COMPLETE.

SYMBOLS LEGEND

	EXISTING CONCRETE TO BE REMOVED
	EXISTING ASPHALT TO BE REMOVED
	EXISTING UTILITY LINE TO BE REMOVED
	EXISTING STORM STRUCTURE TO BE REMOVED
	EXISTING SIGN/LIGHT/UTILITY POLE TO BE REMOVED
	EXISTING FENCE TO BE REMOVED
TP TP	TREE PROTECTION FENCING
X	EXISTING TREE/SHRUBS TO BE REMOVED
	EXISTING BUILDING/STRUCTURE TO BE REMOVED



NOTES:

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  DRIP LINE - THE AREA OF SOIL DIRECTLY BENEATH THE TREE EXTENDING OUT TO THE TIPS OF THE OUTERMOST BRANCHES.
  CRITICAL ROOT ZONE - 1' RADIUS FROM THE TREE TRUNK PER 1" CALIPER

(A) METHOD OF TREE PROTECTION DURING CONSTRUCTI0N
NTS

811 Know what's below. Call before you dig.

REVISIONS:

CLIENT INFORMATION:

BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

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DEMOLITION PLAN

W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

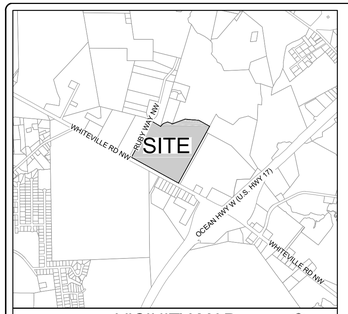
PROJECT STATUS
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
FINAL DESIGN:
RELEASED FOR CONST:

DRAWING INFORMATION
DATE: 04/16/20
SCALE: 1" = 20'
DESIGNED: AEC
DRAWN: AEC
CHECKED: RPB

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

C-2.0

PEI JOB#: 19249.PE



VICINITY MAP
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KEY MAP
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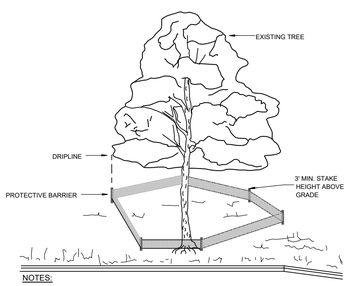

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(A) METHOD OF TREE PROTECTION DURING CONSTRUCTION
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DEMOLITION PLAN

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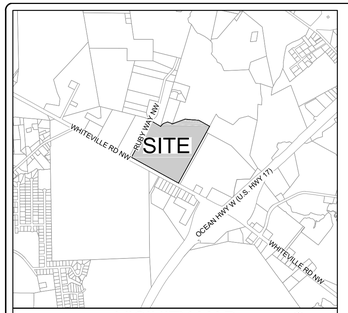
04/16/20

C-2.1

PEI JOB#: 19249.PE



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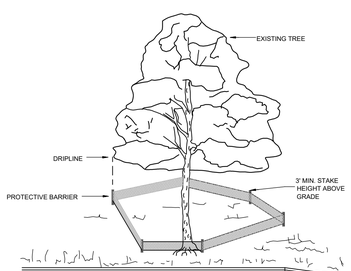

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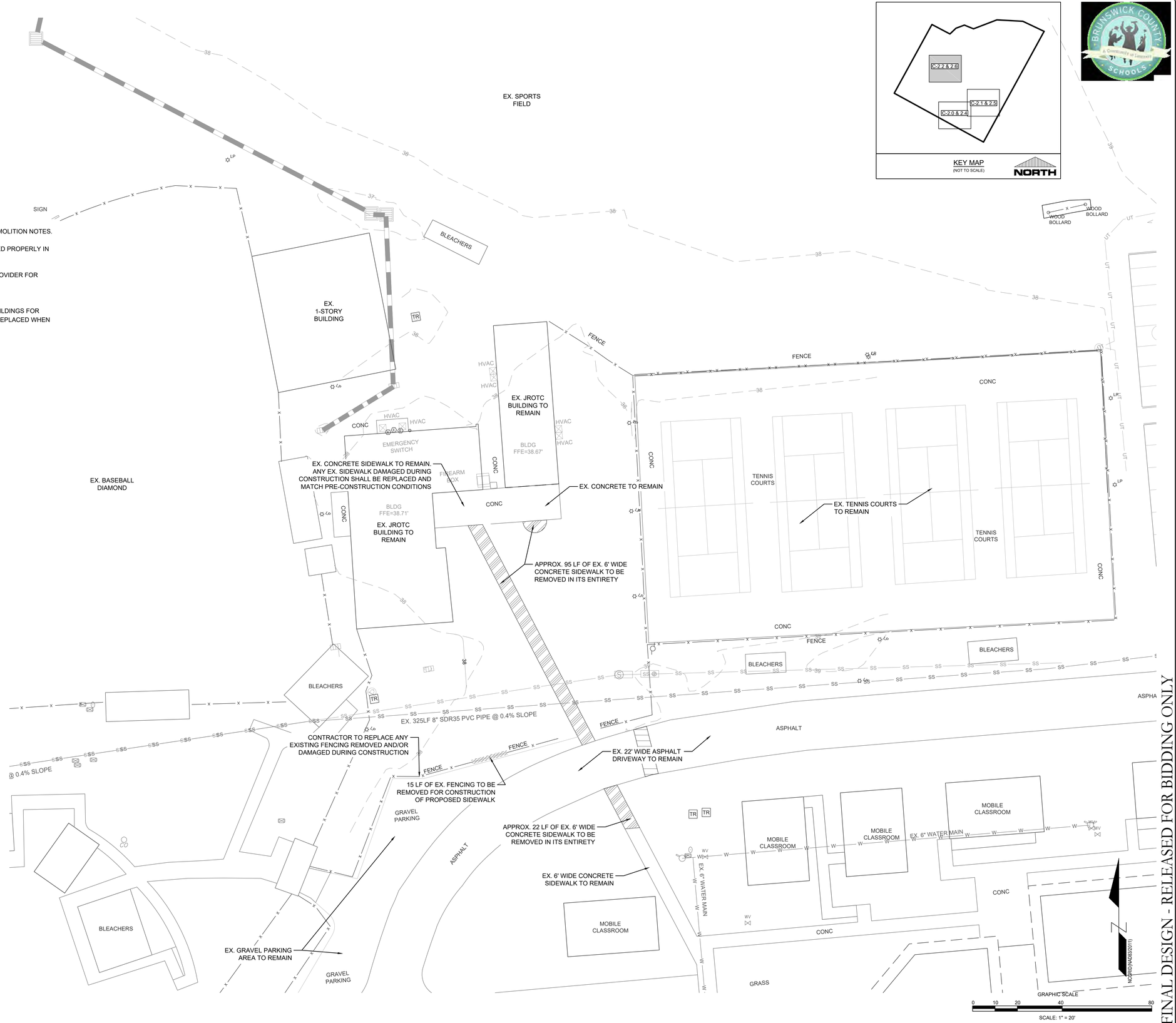

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DEMOLITION PLAN

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BRUNSWICK COUNTY, NC 28470

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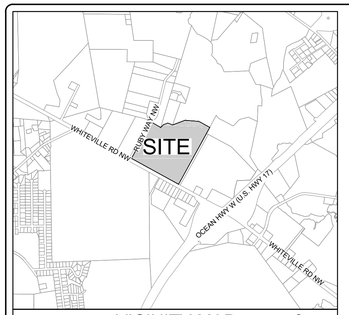
DRAWN: AEC
CHECKED: RPB

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

C-2.2

PEI JOB#: 19249.PE



VICINITY MAP
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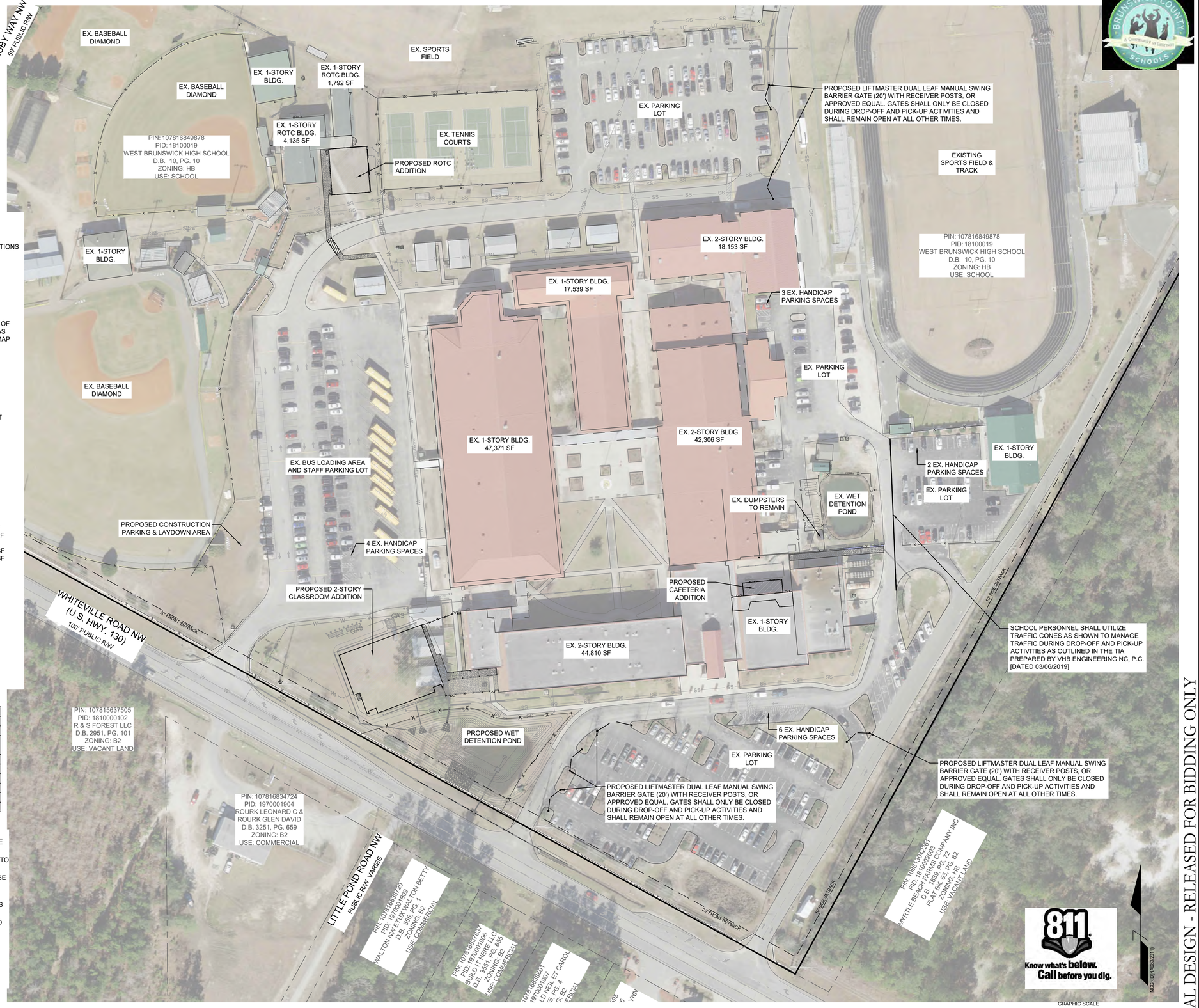
NORTH



SITE INFORMATION

OWNER INFORMATION:	BRUNSWICK COUNTY SCHOOLS 35 REFERENDUM DRIVE NE BOLIVIA, NC 28422
PROJECT NAME:	W. BRUNSWICK HIGH SCHOOL ADDITIONS
PROJECT ADDRESS:	550 WHITEVILLE ROAD N.W. SHALLOTTE, NC 28470
PARCEL ID:	18100019
PARCEL PIN:	107816849878
RECORDED DEED BOOK:	BK 238, PG 458
CURRENT ZONING:	HB
EXISTING USE:	HIGH SCHOOL
PROPOSED USE:	HIGH SCHOOL
TOTAL SITE AREA:	53.58 AC
FLOOD INFORMATION:	THIS PARCEL LIES WITHIN AN AREA OF MINIMAL FLOOD HAZARD (ZONE X) AS INDICATED BY FEMA FLOOD ZONE MAP NUMBER 3720107800K BEARING AN EFFECTIVE DATE OF 08/28/2018.

PARKING INFORMATION

PER SECTION 20-6 OF SHALLOTTE UNIFIED DEVELOPMENT ORDINANCE:

USE TYPE:	SCHOOL & EMPLOYEE BUS TRANS.
MIN. # OF PARKING SPACES REQ'D:	N/A
MAX. # OF PARKING SPACES REQ'D:	N/A
*EX. PARKING PROVIDED:	533 SPACES
HANDICAP PARKING REQ'D:	2% OF TOTAL PARKING IN EACH LOT 11 SPACES TOTAL REQ'D
HANDICAP PARKING PROVIDED:	15 SPACES

*NUMBER OF EX. PARKING IS APPROX. AND ESTIMATED USING AERIAL IMAGES
NO CHANGES TO EX. PARKING PROPOSED

IMPERVIOUS INFORMATION

EXISTING IMPERVIOUS

EX. IMPERVIOUS TOTAL	805,202 SF (18.48 AC)
EX. IMPERVIOUS TO BE REMOVED	9,609 SF (0.22 AC)

PROPOSED IMPERVIOUS WITH THIS PROJECT

	DA #1	DA #4	DA #5
ON-SITE ASPHALT	0 SF	0 SF	0 SF
SIDEWALKS	550 SF	2,530 SF	824 SF
BUILDINGS	3,000 SF	9,738 SF	1,997 SF
FUTURE	4,558 SF	11,500 SF	0 SF
TOTAL PROPOSED	8,108 SF	23,768 SF	2,821 SF
NEW IMPERVIOUS	3,550 SF	23,768 SF	2,821 SF

TOTAL PROPOSED IMPERVIOUS (ENTIRE SITE) = 822,590 SF (18.88 AC)
IMPERVIOUS PERCENTAGE = 822,590 SF / 2,342,016 SF = 35.1%

SEE EXHIBIT DA-MAP FOR BREAKDOWN OF STORMWATER DRAINAGE AREAS

BUILDING SETBACKS

	REQUIRED	PROVIDED
FRONT	20'	29' (SEE PLANS)
SIDE	10'	237'
REAR	20'	705'

(PROVIDED SETBACKS SHOWN HERE ARE FOR PROPOSED ADDITIONS ONLY)

BUILDING COVERAGE

COVERAGE SHOWN HERE IS FOR ENTIRE SITE

ALLOWABLE	80%
PROVIDED	200,835 SF / 2,333,945 SF = 8.60%

BUILDING INFORMATION FOR PROPOSED ADDITIONS*

	CLASSROOM ADDITION	CAFETERIA ADDITION	ROTC ADDITION
BUILDING AREAS			
EXISTING	0 SF	10,597 SF	5,927 SF
PROPOSED	1ST FLOOR - 9,738 SF 2ND FLOOR - 9,738 SF	1,829 SF	3,000 SF
TOTAL GFA	19,476 SF	12,426 SF	8,927 SF
HEIGHTS / STORIES			
ALLOWABLE	55' / 2	55' / 2	55' / 2
PROPOSED	30'-8" / 2	18' / 1	15' / 1
CONSTRUCTION TYPE	II-B	I-B	V-B
SPRINKLER SYSTEM?	NO	NO	NO

*SEE ARCHITECTURAL PLANS FOR INFORMATION OF ALL OTHER EXISTING BUILDINGS

GENERAL NOTES

1. ALL PAVEMENT MARKINGS IN PUBLIC RIGHTS-OF-WAY AND FOR DRIVEWAYS ARE TO BE THERMOPLASTIC AND MEET TOWN AND/ OR NCDOT STANDARDS.
2. ALL SIGNS AND PAVEMENT MARKINGS IN AREAS OPEN TO PUBLIC TRAFFIC ARE TO MEET MUTCD STANDARDS.
3. ALL TRAFFIC CONTROL SIGNS AND MARKINGS OFF THE RIGHT OF WAY ARE TO BE MAINTAINED BY THE PROPERTY OWNER IN ACCORDANCE WITH MUTCD STANDARDS.
4. ALL PARKING STALL MARKINGS AND LANE ARROWS WITHIN THE PARKING AREAS SHALL BE WHITE.
5. NO LANDSCAPE IMPROVEMENTS ARE REQUIRED PER TOWN OF SHALLOTTE UDO ARTICLE 17.
6. REFER TO THE WEST BRUNSWICK HIGH SCHOOL TRAFFIC OPERATIONS STUDY PREPARED BY VHB ENGINEERING [DATED 03/06/2019] FOR SPECIFIC TRAFFIC RELATED IMPROVEMENTS REQUIRED AND THE TRAFFIC IMPACT ANALYSIS.

SOLID WASTE DISPOSAL

EXISTING DUMPSTERS TO REMAIN AS-IS.

FINAL DESIGN - RELEASED FOR BIDDING ONLY

REVISIONS:

CLIENT INFORMATION:

BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

PARAMOUNTE ENGINEERING, P.C.
122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846

OVERALL SITE PLAN

W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

PROJECT STATUS
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
FINAL DESIGN:
RELEASED FOR CONST:

DRAWING INFORMATION

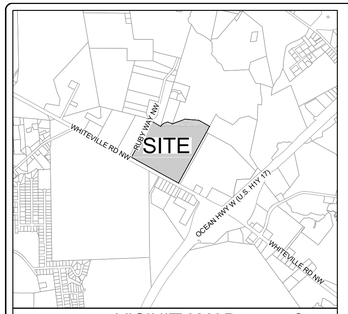
DATE:	04/16/20
SCALE:	1" = 60'
DESIGNED:	AEC
DRAWN:	AEC
CHECKED:	RPB

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

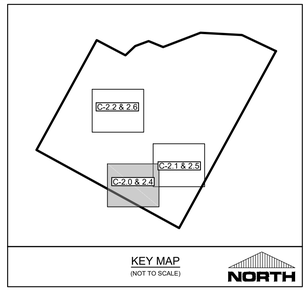
C-2.3

PEI JOB#: 19249.PE

SEE SHEET C-2.6 FOR CONTINUATION



VICINITY MAP
SCALE: 1" = 2,000'
NORTH



KEY MAP
(NOT TO SCALE)
NORTH

Know what's below. Call before you dig.

4 EX. HANDICAP PARKING SPACES

EX. BUS LOADING AREA AND STAFF PARKING LOT

PROPOSED CONSTRUCTION PARKING & LAYDOWN AREA

EX. 1-STORY BLDG.

PROPOSED RELOCATED HYDRANT

PROPOSED 10'x10' CONCRETE PAD FOR ELECTRICAL TRANSFORMER (SEE ELECTRICAL PLANS FOR FURTHER DETAILS)

PROPOSED (2) 20'x5' CONCRETE PADS FOR PROPANE TANKS (SEE PLUMBING & MECHANICAL PLANS FOR FURTHER DETAILS)

PROPOSED FENCING WITH BRICK COLUMN WRAP POSTS. SEE ARCHITECTURAL PLANS FOR DETAILS.

EX. 30' WIDE ASPHALT DRIVEWAY TO REMAIN

EX. SIGN TO REMAIN

EX. 6' WIDE CONCRETE SIDEWALK TO REMAIN AND TIE INTO PROPOSED CONCRETE SIDEWALK

20' FRONT SETBACK

PROPOSED CONCRETE COURTYARD. AMOUNT APPROX. 1,200 SF BID ALTERNATE - PAVERS

PROPOSED 10' WIDE CONCRETE SIDEWALK WITH PRE-ENGINEERED CANOPY ABOVE (DESIGNED BY OTHERS). SEE ARCHITECTURAL PLANS FOR DETAILS.

EX. 2-STORY BLDG.

PROPOSED 2-STORY CLASSROOM ADDITION
1ST FLOOR = 9,738 SF GFA
2ND FLOOR = 9,738 GFA
GROSS SF = 19,476 SF
HEIGHT = 30'-8"
FFE = 40.50

EX. PROPERTY LINE, TYP.

EX. 6' WIDE CONCRETE SIDEWALK TO REMAIN AND TIE INTO PROPOSED CONCRETE SIDEWALK

EX. 18" PINE TREE TO BE REMOVED

EX. 24" PINE TREE TO BE REMOVED

EX. FENCE TO REMAIN, TYP.

PROPOSED FENCING WITH BRICK COLUMN WRAP POSTS. SEE ARCHITECTURAL PLANS FOR DETAILS.

PROPOSED LIFTMASTER DUAL LEAF MANUAL SWING BARRIER GATE (20') WITH RECEIVER POSTS, OR APPROVED EQUAL. GATES SHALL ONLY BE CLOSED DURING DROP-OFF AND PICK-UP ACTIVITIES AND SHALL REMAIN OPEN AT ALL OTHER TIMES.

EX. 6' WIDE CONCRETE SIDEWALK TO REMAIN

PROPOSED WET DETENTION POND

PROPOSED 4' HIGH BLACK VINYL CHAIN LINK FENCE WITH 12' WIDE GATE AND OWNER PROVIDED PADLOCK

EX. 20' WIDE ASPHALT DRIVEWAY TO REMAIN

EX. PARKING LOT

EX. WEST BRUNSWICK HIGH SCHOOL SIGN TO REMAIN

PROPOSED LIFTMASTER DUAL LEAF MANUAL SWING BARRIER GATE (20') WITH RECEIVER POSTS, OR APPROVED EQUAL. GATES SHALL ONLY BE CLOSED DURING DROP-OFF AND PICK-UP ACTIVITIES AND SHALL REMAIN OPEN AT ALL OTHER TIMES.

EX. PARKING LOT

WHITEVILLE ROAD NW (U.S. HWY. 130)
100' PUBLIC R/W

LITTLE POND ROAD NW
PUBLIC R/W VARIES

20' FRONT SETBACK

GRAPHIC SCALE
0 10 20 40 80
SCALE: 1" = 20'

SEE SHEET C-2.5 FOR CONTINUATION

FINAL DESIGN - RELEASED FOR BIDDING ONLY

KEY NOTES:

1. LIGHT DUTY ASPHALT PAVING: REFER TO DETAILS
2. CONCRETE SIDEWALK: REFER TO DETAILS
3. STRIPING: PROVIDE 4" WIDE PARKING LOT STRIPING AS SHOWN. USE HIGHWAY MARKING PAINT - WHITE (2 COATS).
4. PROPOSED 4' BLACK VINYL CHAIN LINK FENCE: AS NOTED. SEE DETAILS.
5. PROPOSED 4" CONCRETE BOLLARDS SEE DETAILS

LEGEND:

- PROPOSED ASPHALT OVERLAY
- PROPOSED ASPHALT SECTION
- PROPOSED BUILDING
- PROPOSED ROOF OVERHANG
- PROPOSED CONCRETE
- EXISTING CONCRETE
- PROPOSED FENCE
- PROPOSED TREE PROTECTION FENCE
- EXISTING CONTOURS

REVISIONS:

CLIENT INFORMATION:
BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

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122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846

SITE PLAN

W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

PROJECT STATUS
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PRELIMINARY LAYOUT:
FINAL DESIGN:
RELEASED FOR CONST:

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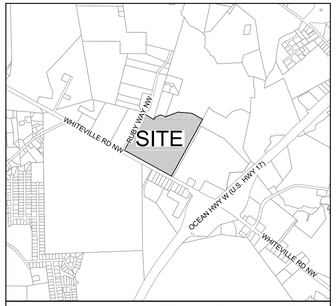
DATE: 04/16/20
SCALE: 1" = 20'
DESIGNED: AEC
DRAWN: AEC
CHECKED: RPB

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

C-2.4

PEI JOB#: 19249.PE



VICINITY MAP
SCALE: 1" = 2,000'
NORTH

LEGEND:

- PROPOSED ASPHALT OVERLAY
- PROPOSED ASPHALT SECTION
- PROPOSED BUILDING
- PROPOSED ROOF OVERHANG
- PROPOSED CONCRETE
- EXISTING CONCRETE
- PROPOSED FENCE
- TP — PROPOSED TREE PROTECTION FENCE
- 20 — EXISTING CONTOURS

KEY NOTES:

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2. CONCRETE SIDEWALK: REFER TO DETAILS
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5. PROPOSED 4" CONCRETE BOLLARDS SEE DETAILS

KEY MAP
(NOT TO SCALE)
NORTH

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DATE: 04/16/20
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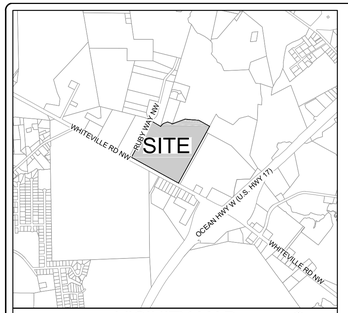
DRAWN: AEC
CHECKED: BJS

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLAND
04/16/20

C-2.5

PEI JOB#: 19249.PE



VICINITY MAP
SCALE: 1" = 2,000'
NORTH

KEY MAP
(NOT TO SCALE)
NORTH

LEGEND:

- PROPOSED ASPHALT OVERLAY
- PROPOSED ASPHALT SECTION
- PROPOSED BUILDING
- PROPOSED ROOF OVERHANG
- PROPOSED CONCRETE
- EXISTING CONCRETE
- PROPOSED FENCE
- PROPOSED TREE PROTECTION FENCE
- EXISTING CONTOURS

KEY NOTES:

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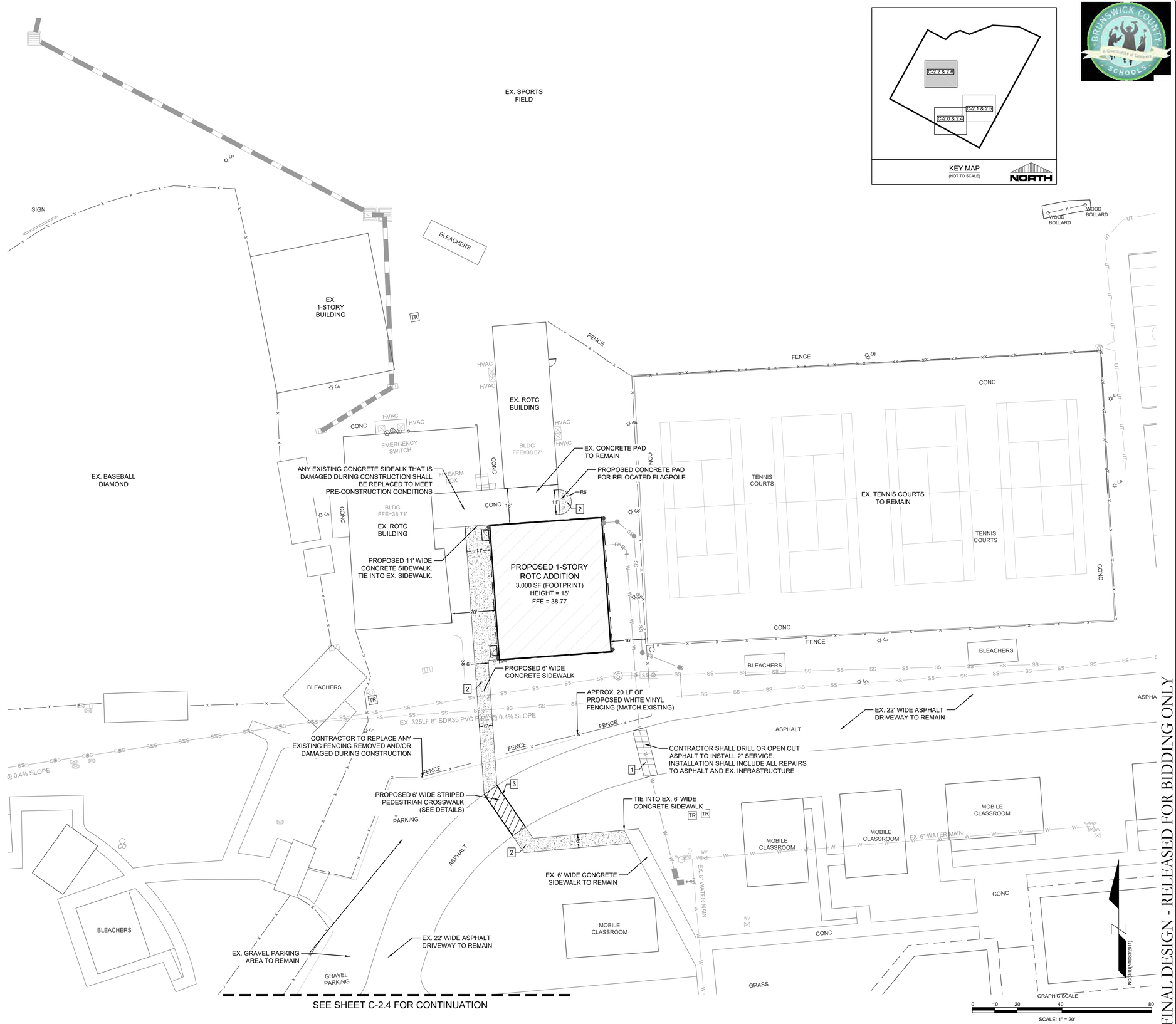

SEE SHEET C-2.4 FOR CONTINUATION

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SITE PLAN

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BRUNSWICK COUNTY, NC 28470

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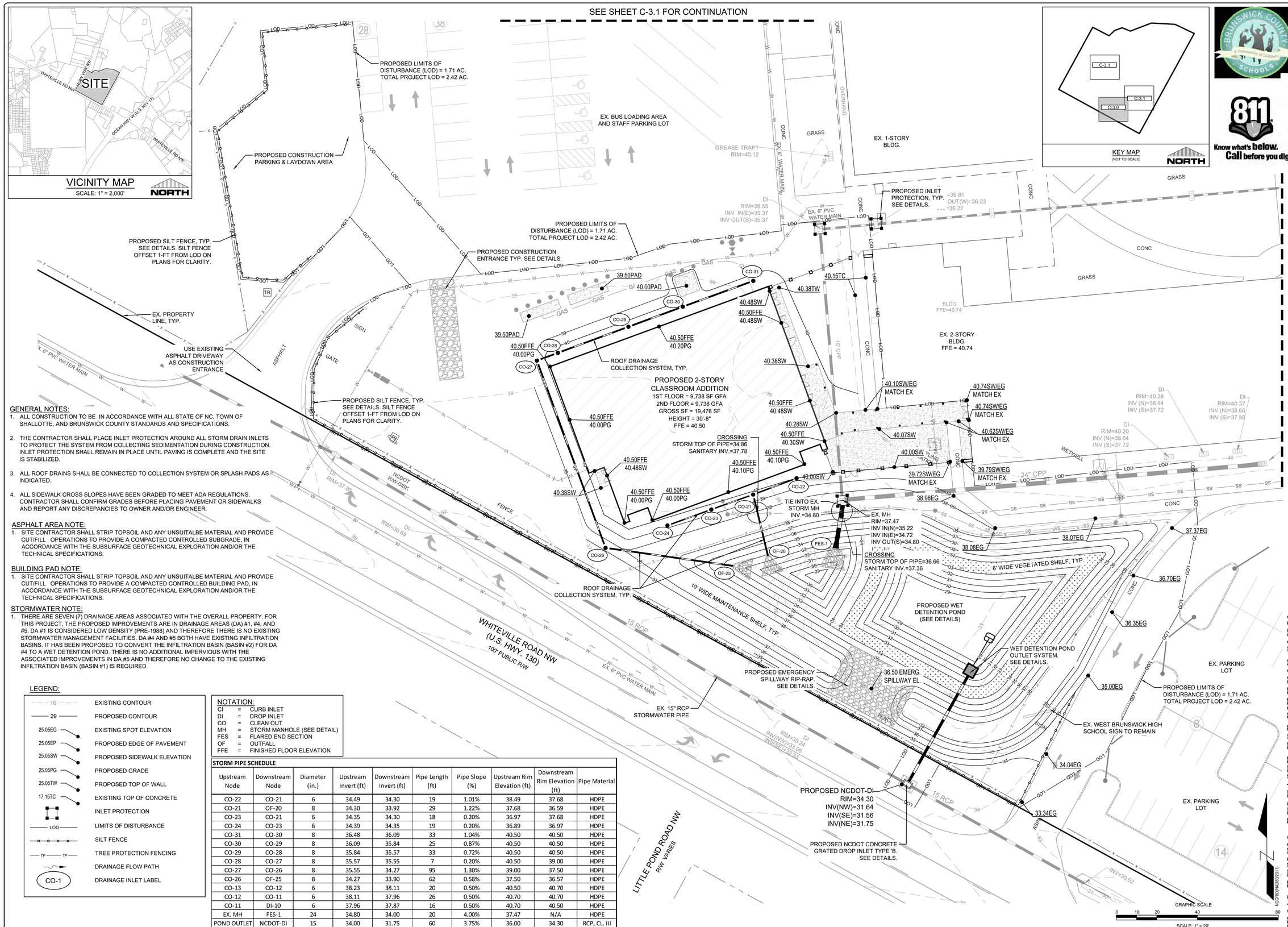
DESIGNED: AEC
DRAWN: AEC
CHECKED: RPB

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

C-2.6

PEI JOB#: 19249.PE



GENERAL NOTES:

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2. THE CONTRACTOR SHALL PLACE INLET PROTECTION AROUND ALL STORM DRAIN INLETS TO PROTECT THE SYSTEM FROM COLLECTING SEDIMENTATION DURING CONSTRUCTION. INLET PROTECTION SHALL REMAIN IN PLACE UNTIL PAVING IS COMPLETE AND THE SITE IS STABILIZED.
3. ALL ROOF DRAINS SHALL BE CONNECTED TO COLLECTION SYSTEM OR SPLASH PADS AS INDICATED.
4. ALL SIDEWALK CROSS SLOPES HAVE BEEN GRADED TO MEET ADA REGULATIONS. CONTRACTOR SHALL CONFIRM GRADES BEFORE PLACING PAVEMENT OR SIDEWALKS AND REPORT ANY DISCREPANCIES TO OWNER AND/OR ENGINEER.

ASPHALT AREA NOTE:

1. SITE CONTRACTOR SHALL STRIP TOPSOIL AND ANY UNSUITALBE MATERIAL AND PROVIDE CUT/FILL OPERATIONS TO PROVIDE A COMPACTED CONTROLLED SUBGRADE, IN ACCORDANCE WITH THE SUBSURFACE GEOTECHNICAL EXPLORATION AND/OR THE TECHNICAL SPECIFICATIONS.

BUILDING PAD NOTE:

1. SITE CONTRACTOR SHALL STRIP TOPSOIL AND ANY UNSUITALBE MATERIAL AND PROVIDE CUT/FILL OPERATIONS TO PROVIDE A COMPACTED CONTROLLED BUILDING PAD, IN ACCORDANCE WITH THE SUBSURFACE GEOTECHNICAL EXPLORATION AND/OR THE TECHNICAL SPECIFICATIONS.

STORMWATER NOTE:

1. THERE ARE SEVEN (7) DRAINAGE AREAS ASSOCIATED WITH THE OVERALL PROPERTY. FOR THIS PROJECT, THE PROPOSED IMPROVEMENTS ARE IN DRAINAGE AREAS (DA) #1, #4, AND #5. DA #1 IS CONSIDERED LOW DENSITY (PRE-1988) AND THEREFORE THERE IS NO EXISTING STORMWATER MANAGEMENT FACILITIES. DA #4 AND #5 BOTH HAVE EXISTING INFILTRATION BASINS. IT HAS BEEN PROPOSED TO CONVERT THE INFILTRATION BASIN (BASIN #2) FOR DA #4 TO A WET DETENTION POND. THERE IS NO ADDITIONAL IMPERVIOUS WITH THE ASSOCIATED IMPROVEMENTS IN DA #5 AND THEREFORE NO CHANGE TO THE EXISTING INFILTRATION BASIN (BASIN #1) IS REQUIRED.

LEGEND:

16	EXISTING CONTOUR
29	PROPOSED CONTOUR
25.05EG	EXISTING SPOT ELEVATION
25.05EP	PROPOSED EDGE OF PAVEMENT
25.05SW	PROPOSED SIDEWALK ELEVATION
25.05PG	PROPOSED GRADE
25.05TW	PROPOSED TOP OF WALL
17.15TC	EXISTING TOP OF CONCRETE
	INLET PROTECTION
LOD	LIMITS OF DISTURBANCE
	SILT FENCE
TP TP	TREE PROTECTION FENCING
	DRAINAGE FLOW PATH
CO-1	DRAINAGE INLET LABEL

NOTATION:

CI	=	CURB INLET
DI	=	DROP INLET
CO	=	CLEAN OUT
MH	=	STORM MANHOLE (SEE DETAIL)
FES	=	FLARED END SECTION
OF	=	OUTFALL
FFE	=	FINISHED FLOOR ELEVATION

STORM PIPE SCHEDULE

Upstream Node	Downstream Node	Diameter (in.)	Upstream Invert (ft)	Downstream Invert (ft)	Pipe Length (ft)	Pipe Slope (%)	Upstream Rim Elevation (ft)	Downstream Rim Elevation (ft)	Pipe Material
CO-22	CO-21	6	34.49	34.30	19	1.01%	38.49	37.68	HDPE
CO-21	OF-20	8	34.30	33.92	29	1.22%	37.68	36.59	HDPE
CO-23	CO-21	6	34.35	34.30	18	0.20%	36.97	37.68	HDPE
CO-24	CO-23	6	34.39	34.35	19	0.20%	36.89	36.97	HDPE
CO-31	CO-30	8	36.48	36.09	33	1.04%	40.50	40.50	HDPE
CO-30	CO-29	8	36.09	35.84	25	0.87%	40.50	40.50	HDPE
CO-29	CO-28	8	35.84	35.57	33	0.72%	40.50	40.50	HDPE
CO-28	CO-27	8	35.57	35.55	7	0.20%	40.50	39.00	HDPE
CO-27	CO-26	8	35.55	34.27	95	1.30%	39.00	37.50	HDPE
CO-26	OF-25	8	34.27	33.90	62	0.58%	37.50	36.57	HDPE
CO-13	CO-12	6	38.23	38.11	20	0.50%	40.50	40.70	HDPE
CO-12	CO-11	6	38.11	37.96	26	0.50%	40.70	40.70	HDPE
CO-11	DI-10	6	37.96	37.87	16	0.50%	40.70	40.50	HDPE
EX. MH	FES-1	24	34.80	34.00	20	4.00%	37.47	N/A	HDPE
POND OUTLET	NCDOT-DI	15	34.00	31.75	60	3.75%	36.00	34.30	RCP, CL. III

FINAL DESIGN - RELEASED FOR BIDDING ONLY

REVISIONS:

CLIENT INFORMATION:

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3333 JAECKLE DRIVE, SUITE 120
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GRADING-DRAINAGE-EC PLAN

W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

PROJECT STATUS
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
FINAL DESIGN:
RELEASED FOR CONST:

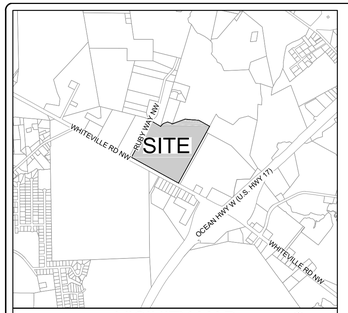
DRAWING INFORMATION

DATE:	04/16/20
SCALE:	1" = 20'
DESIGNED:	AEC
DRAWN:	AEC
CHECKED:	RPB

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

C-3.0

PEI JOB#: 19249.PE



VICINITY MAP
SCALE: 1" = 2,000'

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3. ALL ROOF DRAINS SHALL BE CONNECTED TO COLLECTION SYSTEM OR SPLASH PADS AS INDICATED.
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NOTATION:
CI = CURB INLET
DI = DROP INLET
CO = CLEAN OUT
MH = STORM MANHOLE (SEE DETAIL)
FES = FLARED END SECTION
FFE = FINISHED FLOOR ELEVATION

LEGEND:
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- 29 — PROPOSED CONTOUR
- 25.05EG — EXISTING SPOT ELEVATION
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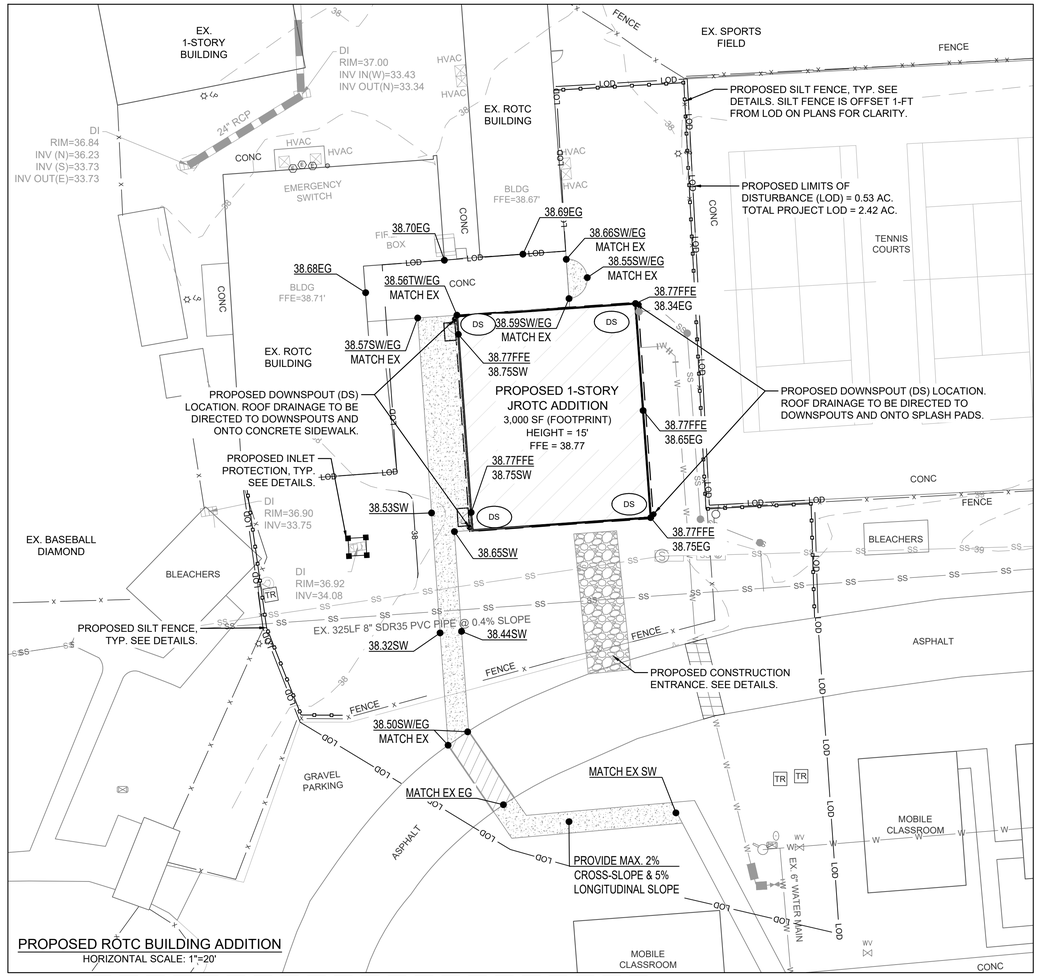
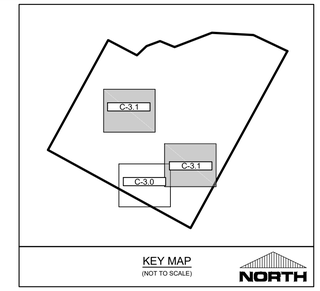
- 25.05PG — PROPOSED GRADE
- 25.05TW — PROPOSED TOP OF WALL
- 17.15TC — EXISTING TOP OF CONCRETE
- INLET PROTECTION
- LOD — LIMITS OF DISTURBANCE
- SILT FENCE
- TP — TREE PROTECTION FENCING
- DRAINAGE FLOW PATH
- CO-1 — DRAINAGE INLET LABEL



PROPOSED ROTC BUILDING ADDITION
HORIZONTAL SCALE: 1"=20'

SEE SHEET C-3.0 FOR CONTINUATION

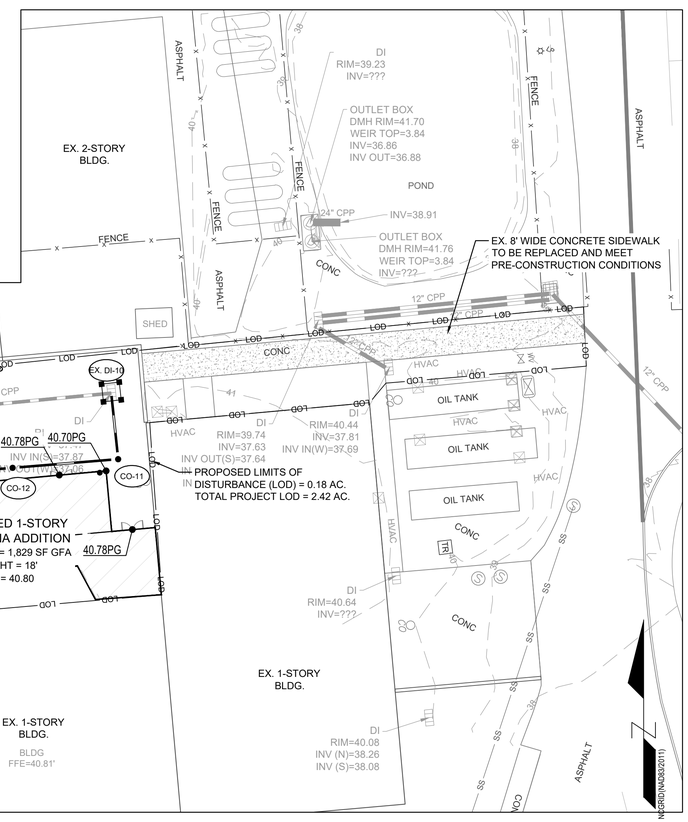


KEY MAP
(NOT TO SCALE)

Know what's below. Call before you dig.

STORM PIPE SCHEDULE

Upstream Node	Downstream Node	Diameter (in.)	Upstream Invert (ft)	Downstream Invert (ft)	Pipe Length (ft)	Pipe Slope (%)	Upstream Rim Elevation (ft)	Downstream Rim Elevation (ft)	Pipe Material
CO-22	CO-21	6	34.49	34.30	19	1.01%	38.49	37.68	HDPE
CO-21	OF-20	8	34.30	33.92	29	1.22%	37.68	36.59	HDPE
CO-23	CO-21	6	34.35	34.30	18	0.20%	36.97	37.68	HDPE
CO-24	CO-23	6	34.39	34.35	19	0.20%	36.89	36.97	HDPE
CO-31	CO-30	8	36.48	36.09	33	1.04%	40.50	40.50	HDPE
CO-30	CO-29	8	36.09	35.84	25	0.87%	40.50	40.50	HDPE
CO-29	CO-28	8	35.84	35.57	33	0.72%	40.50	40.50	HDPE
CO-28	CO-27	8	35.57	35.55	7	0.20%	40.50	39.00	HDPE
CO-27	CO-26	8	35.55	34.27	95	1.30%	39.00	37.50	HDPE
CO-26	OF-25	8	34.27	33.90	62	0.58%	37.50	36.57	HDPE
CO-13	CO-12	6	38.23	38.11	20	0.50%	40.50	40.70	HDPE
CO-12	CO-11	6	38.11	37.96	26	0.50%	40.70	40.70	HDPE
CO-11	DI-10	6	37.96	37.87	16	0.50%	40.70	40.50	HDPE
EX. MH	FES-1	24	34.80	34.00	20	4.00%	37.47	N/A	HDPE
POND OUTLET	NCDOT-DI	15	34.00	31.75	60	3.75%	36.00	34.30	RCP, CL. III



SEE SHEET C-3.0 FOR CONTINUATION

PROPOSED CAFETERIA ADDITION
HORIZONTAL SCALE: 1"=20'

GRAPHIC SCALE
0 10 20 40 80
SCALE: 1" = 20'

FINAL DESIGN - RELEASED FOR BIDDING ONLY

REVISIONS:

CLIENT INFORMATION:
BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

PARAMOUNTE ENGINEERING, P.A.
122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846

GRADING-DRAINAGE-EC PLAN
W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

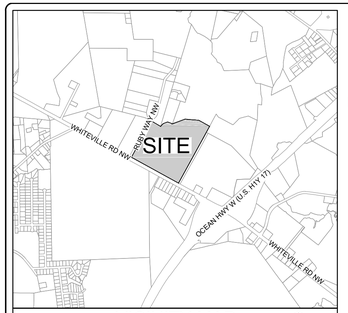
PROJECT STATUS
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
FINAL DESIGN:
RELEASED FOR CONST:

DRAWING INFORMATION
DATE: 04/16/20
SCALE: 1" = 20'
DESIGNED: AEC
DRAWN: AEC
CHECKED: RPB

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

C-3.1

PEI JOB#: 19249.PE



VICINITY MAP
SCALE: 1" = 2,000'
NORTH

811 Know what's below. Call before you dig.

SEE SHEET C-4.1 FOR CONTINUATION

KEY MAP
(NOT TO SCALE)
NORTH

SITE INFORMATION

OWNER INFORMATION:	BRUNSWICK COUNTY SCHOOLS 35 REFERENDUM DRIVE NE BOLIVIA, NC 28422
PROJECT NAME:	W. BRUNSWICK HIGH SCHOOL ADDITIONS
PROJECT ADDRESS:	550 WHITEVILLE ROAD N.W. SHALLOTTE, NC 28470
PARCEL ID:	18100019
PARCEL PIN:	107816849878
RECORDED DEED BOOK:	BK 00010, PG 0010
CURRENT ZONING:	HB
EXISTING USE:	HIGH SCHOOL
PROPOSED USE:	HIGH SCHOOL
TOTAL SITE AREA:	53.58 AC (2,333,945 SF)
FLOOD INFORMATION:	THIS PARCEL LIES WITHIN AN AREA OF MINIMAL FLOOD HAZARD (ZONE X) AS INDICATED BY FEMA FLOOD ZONE MAP NUMBER 3720107800K BEARING AN EFFECTIVE DATE OF 08/28/2018.

UTILITY INFORMATION

CONTRACTOR SHALL INSTALL WATER AND SEWER SERVICES IN ACCORDANCE WITH TOWN OF SHALLOTTE AND BRUNSWICK COUNTY STANDARD DETAILS AND SPECIFICATION.

SANITARY SEWER

THIS PROJECT IS PROPOSING A 4" SANITARY SEWER SERVICE FOR BOTH THE ROTC AND CLASSROOM ADDITIONS. THESE SERVICES WILL BE CONNECTING TO THE EXISTING MAINS AND/OR SERVICES AS SHOWN. THERE ARE NO PROPOSED SANITARY SEWER MAINS WITH THIS PROJECT. THERE ARE NO PROPOSED SANITARY SERVICES FOR THE CAFETERIA ADDITION. ALL SANITARY SEWER ALLOCATION PROVIDED BY TOWN OF SHALLOTTE.

WATER

THIS PROJECT IS PROPOSING A 2" DOMESTIC SERVICE FOR THE ROTC BUILDING ADDITION AND A 2" DOMESTIC SERVICE FOR THE CLASSROOM ADDITION. THESE SERVICES WILL BE CONNECTING TO EXISTING WATER MAINS AND/OR SERVICES AS SHOWN. THIS PROJECT IS ALSO PROPOSING TO RELOCATE A PORTION OF AN EX. 6" PVC WATER MAIN AS SHOWN. THERE ARE NO PROPOSED WATER SERVICES FOR THE CAFETERIA ADDITION. ALL DOMESTIC WATER ALLOCATION PROVIDED BY BRUNSWICK COUNTY.

CONTRACTOR TO CONTACT BRUNSWICK COUNTY UTILITIES (WILLIAM PINNIX OR AMY AYCOCK) TO SCHEDULE PRE-CONSTRUCTION MEETING. PRE-CON MUST BE SCHEDULED AND COMPLETED PRIOR TO CONSTRUCTION START. CONTRACTOR TO COORDINATE SHUT DOWN AND RELOCATION OF EX. WATER MAIN WITH BRUNSWICK COUNTY UTILITIES AND BRUNSWICK COUNTY SCHOOLS.

UTILITY NOTES: (NCAC 15A.02T.0305 / T15A.18C.0906)

1. WATER MAINS SHALL BE LAID SO AS TO PROVIDE A MINIMUM HORIZONTAL SEPARATION OF 10 FEET FROM SEWERS. IF CONDITIONS EXIST SUCH THAT THIS SEPARATION CANNOT BE ACHIEVED, THE WATER MAIN CAN BE INSTALLED AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, EITHER IN A SEPARATE TRENCH, OR IN THE SAME TRENCH ON A BENCH OF UNDISTURBED EARTH.
2. WHEN CROSSING A WATER MAIN OVER A SEWER, THE WATER MAIN SHALL BE LAID AT LEAST 18 INCHES ABOVE THE SEWER. IF CONDITIONS EXIST SUCH THAT THIS SEPARATION CANNOT BE ACHIEVED, BOTH THE WATER MAIN AND SEWER SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE WITH JOINTS THAT MEET WATER MAIN STANDARDS. THE DUCTILE IRON PIPE SHALL EXTEND 10 FEET ON EACH SIDE OF THE CROSSING WITH A SECTION OF WATER MAIN PIPE CENTERED ON THE CROSSING.
3. CROSSING A WATER MAIN UNDER A SEWER. WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS UNDER A SEWER, BOTH THE WATER MAIN AND THE SEWER SHALL BE CONSTRUCTED OF FERROUS MATERIALS AND WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A SECTION OF WATER MAIN PIPE SHALL BE CENTERED AT THE POINT OF CROSSING.
4. WHERE VERTICAL CLEARANCE IS LESS THAN 24" BETWEEN SANITARY SEWER AND STORM DRAIN, SANITARY SEWER SHALL BE DUCTILE IRON PIPE FOR A MINIMUM OF 10' EITHER SIDE OF CROSSING AND STORM DRAIN SHALL BE RC PIPE.
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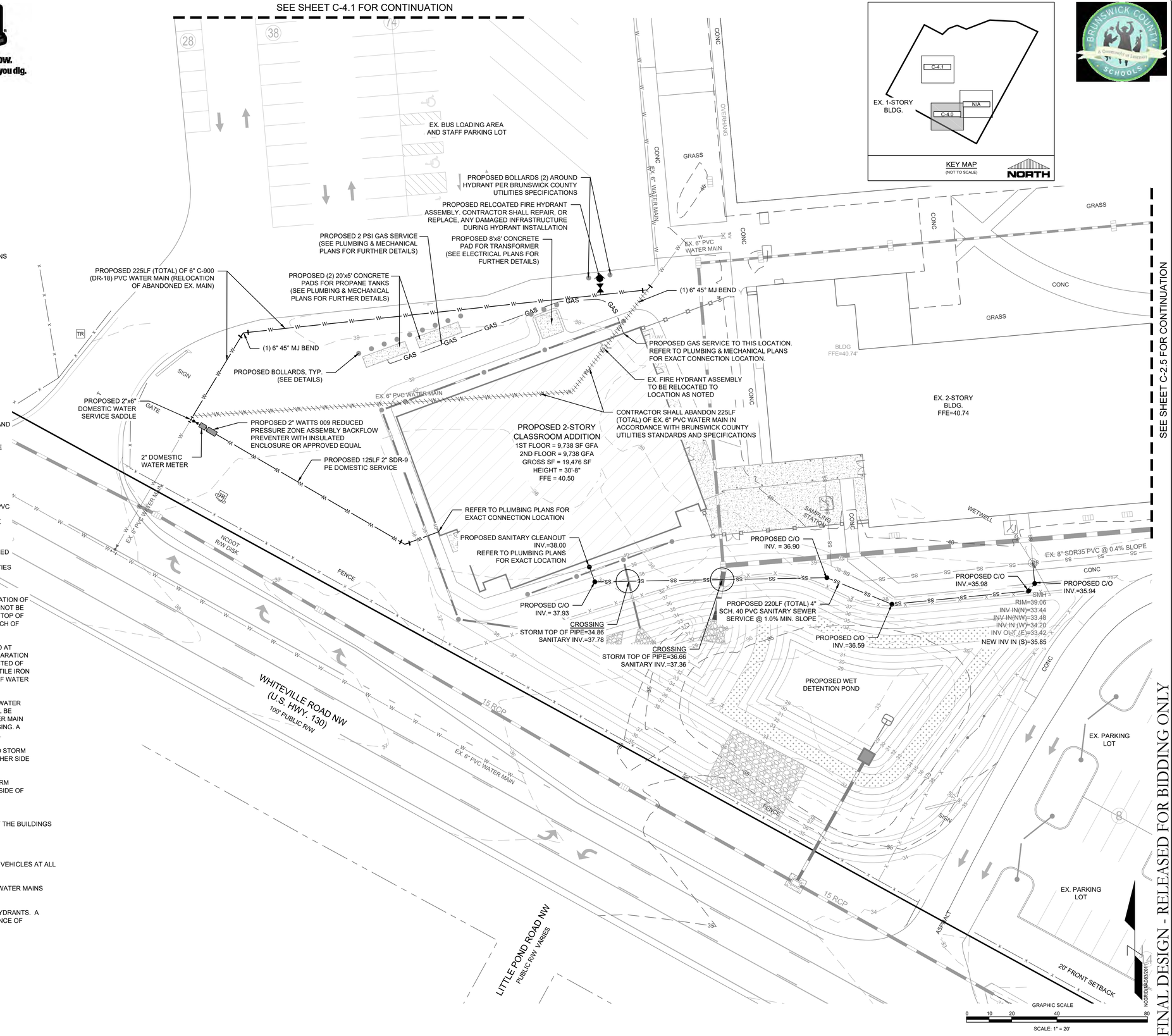
FIRE & LIFE SAFETY NOTES:

1. NEW HYDRANTS MUST BE AVAILABLE FOR USE PRIOR TO CONSTRUCTION OF THE BUILDINGS WITHIN ANY DEVELOPMENT.
2. HYDRANTS MUST BE LOCATED WITHIN 8' OF THE CURB.
3. CONTRACTOR SHALL MAINTAIN AN ALL WEATHER ACCESS FOR EMERGENCY VEHICLES AT ALL TIMES DURING CONSTRUCTION.
4. A MINIMUM OF 4' SHALL SEPARATE UNDERGROUND FIRE LINES OR PRIVATE WATER MAINS FROM OTHER UNDERGROUND UTILITIES.
5. LANDSCAPING OR PARKING CAN NOT BLOCK OR IMPEDE THE FDC OR FIRE HYDRANTS. A 3-FOOT (3') CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF HYDRANTS AND FDC.



SEE SHEET C-2.5 FOR CONTINUATION

FINAL DESIGN - RELEASED FOR BIDDING ONLY

REVISIONS:

CLIENT INFORMATION:
BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

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122 Cinema Drive
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(910) 791-6707 (O) (910) 791-6760 (F)
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UTILITY PLAN

W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

PROJECT STATUS
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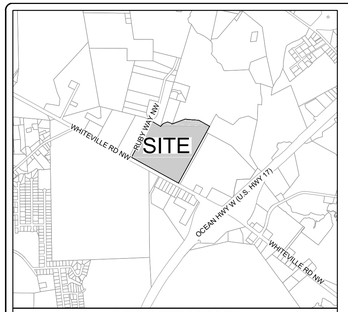
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

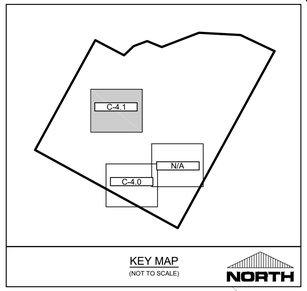
C-4.0

PEI JOB#: 19249.PE



VICINITY MAP
SCALE: 1" = 2,000'
NORTH

811 Know what's below. Call before you dig.



KEY MAP
(NOT TO SCALE)
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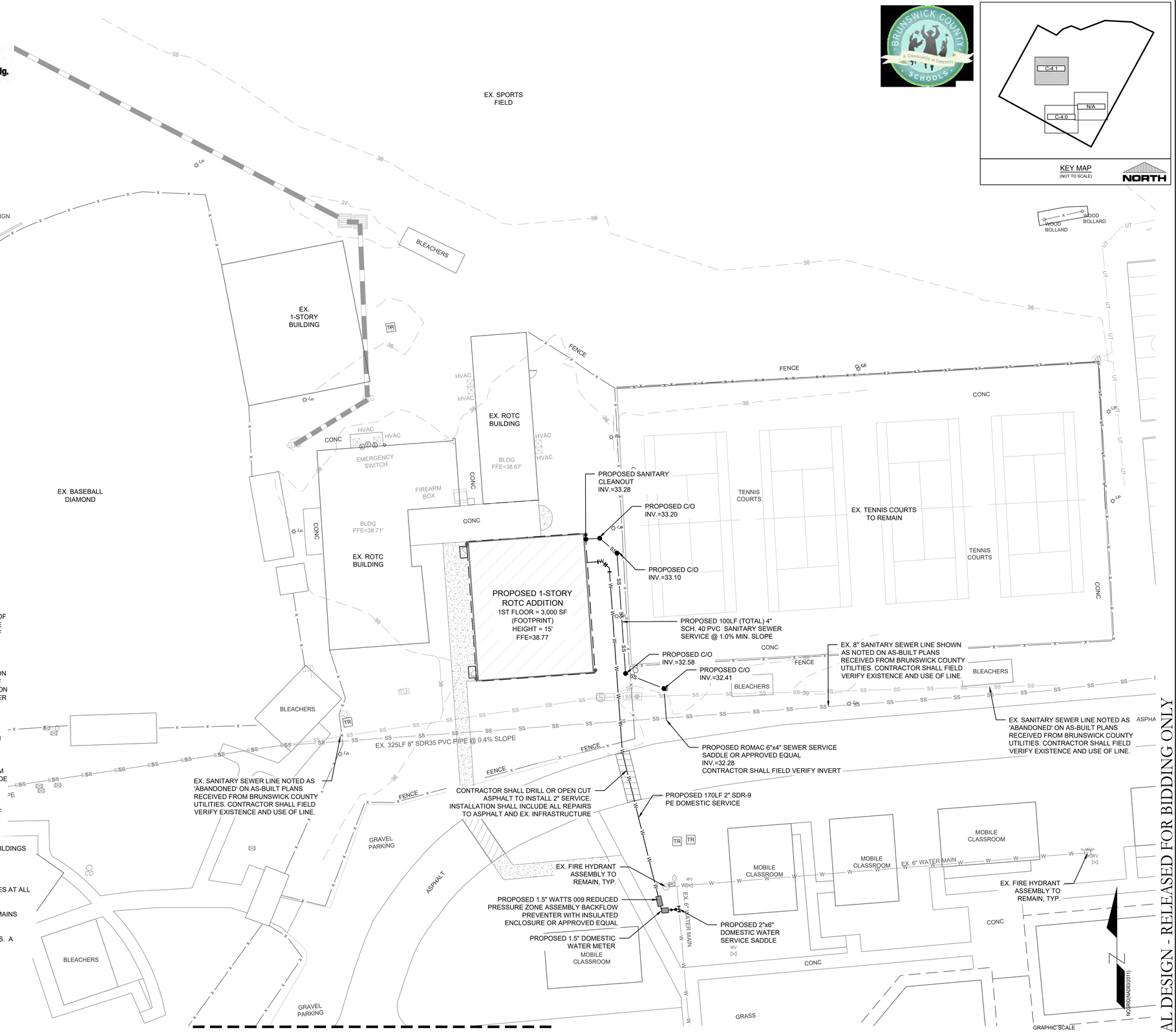

SEE SHEET C-4.0 FOR CONTINUATION

FINAL DESIGN - RELEASED FOR BIDDING ONLY

REVISIONS:

CLIENT INFORMATION:
BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

PARAMOUNTE ENGINEERING
122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846

UTILITY PLAN

W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

PROJECT STATUS
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FINAL DESIGN:
RELEASED FOR CONST.:

DRAWING INFORMATION
DATE: 04/16/20
SCALE: 1" = 20'
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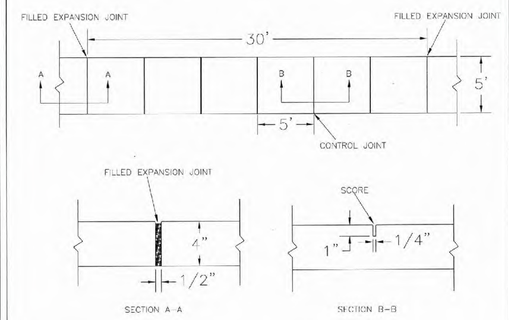
DRAWN: AEC
CHECKED: RPB

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

C-4.1

PEI JOB#: 19249.PE

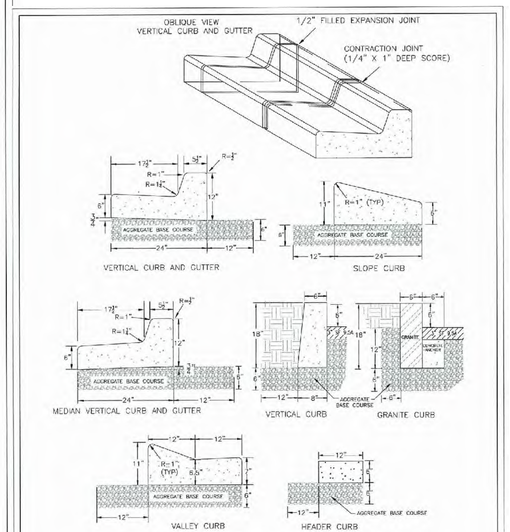


NOTES:

1. JOINT MATERIAL TO COMPLY WITH CURRENT NCDOT STANDARDS.
2. SANITARY SEWER CLEAN-OUTS, WATER METERS, MANHOLES, AND VALVE LIDS TO BE LOCATED OUTSIDE SIDEWALK WHERE FEASIBLE.
3. MINIMUM SIDEWALK WIDTH TO BE 6' MINIMUM IF PLACED AT BACK OF CURB.
4. CONCRETE FOR ALL SIDEWALKS (EXCEPT ANY PORTION CONTAIN WITHIN A DRIVEWAY APRON) SHALL BE CLASS "A" – 3,000 PSI.
5. MINIMUM REPLACEMENT FOR REPAIRS IS A 5' X 5' PANEL
6. 4" STONE BASE MAY BE REQUIRED FOR POOR SOIL CONDITIONS
7. MINIMUM DEPTH FOR TUNNELING BELOW SIDEWALK IS 12"
8. MAX ADJACENT GROUND SLOPE WITHOUT RAILING IS 2:1
9. MIN GRADE FOR PROPER DRAINAGE IS 1% IN AT LEAST 1 DIRECTION. MAX CROSS SLOPE IS 2%. MAX LONGITUDINAL SLOPE IS 8.3%, 10% IF LIMITED BY EXISTING CONDITIONS, OR NO GREATER THAN THE SLOPE OF THE EXISTING ADJACENT ROAD.

TYPICAL SIDEWALK DETAIL

NOT TO SCALE



NOTES:

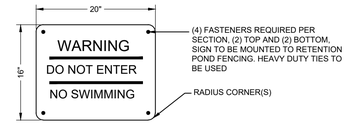
1. EXPANSION JOINT MATERIAL TO COMPLY WITH CURRENT NCDOT STANDARDS
2. 50' MAX. EXPANSION JOINT SPACING, 10' MAX CONTRACTION JOINT SPACING
3. MINIMUM INSTALLATION LENGTH IS 9 FT.
4. CONCRETE TO BE 3000 PSI MIN
5. VERTICAL CURB AND GUTTER BASE CAN BE SLOPED 3/4" OR USE A FLAT BASE

TYPICAL CURBING DETAIL

NOT TO SCALE

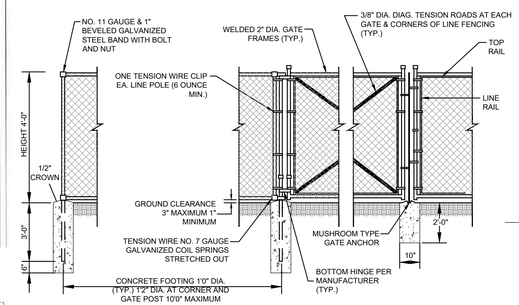
DIMENSIONS AND WEIGHTS: NOMINAL DIAMETER AND MINIMUM WEIGHTS FOR ALL CHAIN LINK POSTS, FRAMES AND GATES SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE:

USE AND SECTION	OUTSIDE DIAMETER NOMINAL INCHES	MINIMUM WT. PER FOOT NOMINAL LBS.
END CORNER AND PULL POST (TUBULAR FABRIC HEIGHTS, 6'0" AND LESS: ROUND	2.375	3.65
OVER 6'0": ROUND	2.875	5.79
INTERMEDIATE POST FOR FABRIC HEIGHTS (TUBULAR) 6'0" AND LESS	1.90	2.72
OVER 6'0"	2.375	3.65
RAILS AND POST BRACES	1.66	1.35
GATE POSTS FOR NOMINAL WIDTH OF GATE SINGLE OR ONE LEAF OF DOUBLE GATE WIDTH 6'0" OR LESS: ROUND	2.875	5.79
13'0" OR LESS: ROUND	4.00	9.10
13'0" TO 18'0": ROUND	6.625	18.97
OVER 18'-0"	6.625	24.70
GATE FRAMES 6'0" OR LESS IN HEIGHT 8'0" OR LESS IN WIDTH: ROUND	1.660	1.806
GATE FRAMES OVER 6'0" IN HEIGHT OVER 8'0" IN WIDTH: ROUND	1.90	2.72



GENERAL SPECIFICATIONS:
.080" SINGLE FACE FLAT ALUMINUM DOUBLE PANEL LINEAR WALL SIGN WITH VINYL GRAPHICS IN COLORS AS SHOWN

COLORS:
BACKGROUND - GREEN (TBD)
LETTERING - WHITE



FENCING

A. FENCING SHALL CONFORM TO DETAIL SHOWN AND THE CURRENT STANDARDS ESTABLISHED BY THE CHAIN LINK FENCE MANUFACTURERS INSTITUTE.

B. FRAMES SHALL CONSIST OF CLFMI TYPE 1 MATERIALS SIZED TO ACCOMMODATE THE SPANS REQUIRED POSTS SHALL BE OF STANDARD WEIGHT, HOT DIPPED GALVANIZED PIPE CONFORMING TO ASTM A-120 SCHEDULE 40 FOR CORNER AND GATE POSTS, AND SCHEDULE 20 FOR LINE AND TOP RAILS.

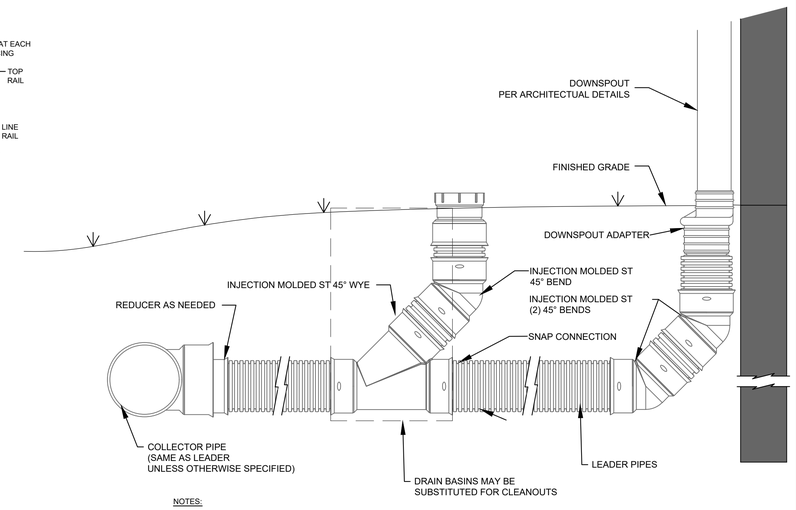
C. GATE FRAMES SHALL BE FABRICATED OF GALVANIZED STEEL AND SIZED TO ACCOMMODATE SPANS REQUIRED. GATES SHALL BE SWING TYPE, SUPPORTED WITH TENSION BARS AND BRACING AS REQUIRED. GATE POSTS SHALL BE SIZED TO ADEQUATELY SUPPORT THE GATE OVER THE SPAN SHOWN ON THE PLANS. GATE POSTS, GATE HINGES, GATE STOPS AND LATCHES SHALL BE OF ADEQUATE STRENGTH FOR THE GATE PROVIDED AND LATCHES SHALL BE SUITABLE FOR SECURING WITH A PADLOCK PROVIDED BY CLIENT.

D. EACH SWING GATE WITHIN ASPHALT AREA SHALL INCLUDE A GALVANIZED WHEEL ASSEMBLY CAPABLE OF SUPPORTING THE SWING GATE AND A GALVANIZED DROP ROD FOR SECURING THE GATE IN THE OPEN AND CLOSED POSITON.

E. FENCE FABRIC SHALL BE 2 INCH MESH, 9-GAUGE CHEMICALLY CLEANED AND ZINC COATED, BLACK VINYL, CONFORMING TO ASTM A-392 FOR CLASS 2 FABRIC.

CHAIN LINK FENCE DETAIL

NOT TO SCALE



NOTES:

1) FOR ALL DEPTHS OF COVER LESS THAN TWO (2) FEET, PIPE MUST BE SCHEDULE 40 PVC. FOR DEPTHS OF COVER GREATER THAN TWO (2) FEET, FLEXIBLE PIPE MAY BE USED.

2) THE DOWNSPOUT COLLECTOR DRAIN SHALL BE INSTALLED BEFORE THE DOWNSPOUTS ARE INSTALLED ON THE BUILDING. SITE WORK CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE PIPE LOCATIONS WITH DOWNSPOUTS PER THE ARCHITECTURE PLANS. BUILDING CONTRACTOR IS NORMALLY RESPONSIBLE FOR FOR EXTENDING DOWNSPOUT THROUGH CAP.

3) INSTALL PIPES CLEAR OF PORCHES, BOLLARDS, AND OTHER BUILDING APPURTENANCES.

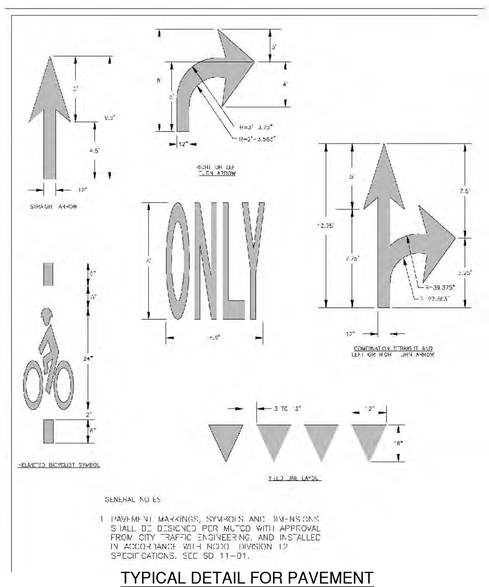
4) POP-UP DRAIN EMITTERS MAY BE USED AT THE END OF LEADER PIPES AS LONG AS WATER DRAINS TOWARD THE PERMITTED STORMWATER DEVICE AFTER SURFACING.

5.) STONE MAY BE ADDED AROUND PIPES FOR SOIL DRAINAGE AS WELL AS PIPE STRUCTURAL STABILITY.

Schedule	
Downspout	Leader Pipe
2" x 3"	6" Dia.
3" x 4"	6" Dia.
4" x 5"	8" Dia.
5" x 5"	8" Dia.
6" x 6"	12" Dia.
3"/4" Dia.	6" Dia.
5"/6" Dia.	8" Dia.

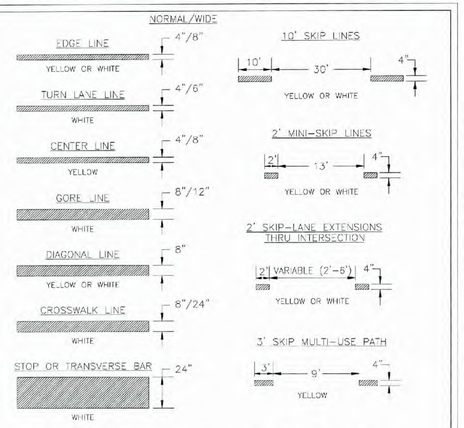
TYPICAL ROOF DRAINAGE WITH CLEANOUT

NOT TO SCALE



TYPICAL DETAIL FOR PAVEMENT MARKINGS & SYMBOLS

NOT TO SCALE



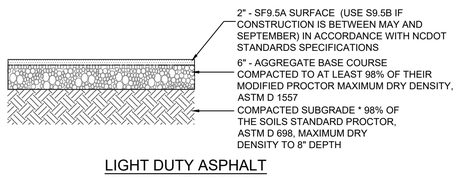
1-PAVEMENT MARKINGS AND SYMBOLS SHALL BE DESIGNED PER MUTCD WITH APPROVAL FROM CITY TRAFFIC ENGINEERING, AND INSTALLED IN ACCORDANCE WITH NCDOT DIVISION 12 SPECIFICATIONS.

2-GENERALLY, PERMANENT MARKINGS WILL BE UNIFORM AND SMOOTH AND WILL CONSIST OF 120MIL OF THERMOPLASTIC FOR ALL LINES AND SYMBOLS; TEMPORARY MARKINGS SHALL CONSISTS OF 15 MIL PAINT, EVERY 6 MONTHS.

3-DURING APPLICATION THE EXISTING PAVEMENT SHALL NOT SHOW SIGNS OF MOISTURE AND BE CLEAN, FREE OF DIRT AND OIL, ETC. THERMOPLASTIC SHALL ONLY BE INSTALLED WHERE PAVEMENT IS 50° F AND RISING. PAINT SHALL ONLY BE INSTALLED WHERE PAVEMENT IS 40° F AND RISING.

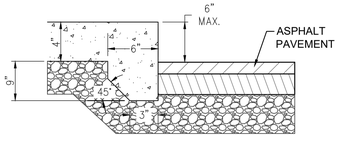
TYPICAL DETAIL FOR PAVEMENT MARKINGS LINE TYPES

NOT TO SCALE



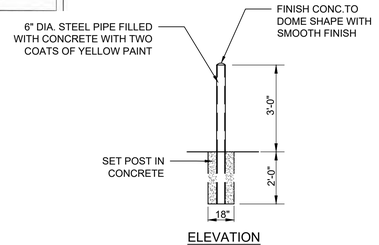
LIGHT DUTY ASPHALT PAVEMENT SECTION

N.T.S.



EXPOSED FACE CONCRETE WALK TO ASPHALT DETAIL

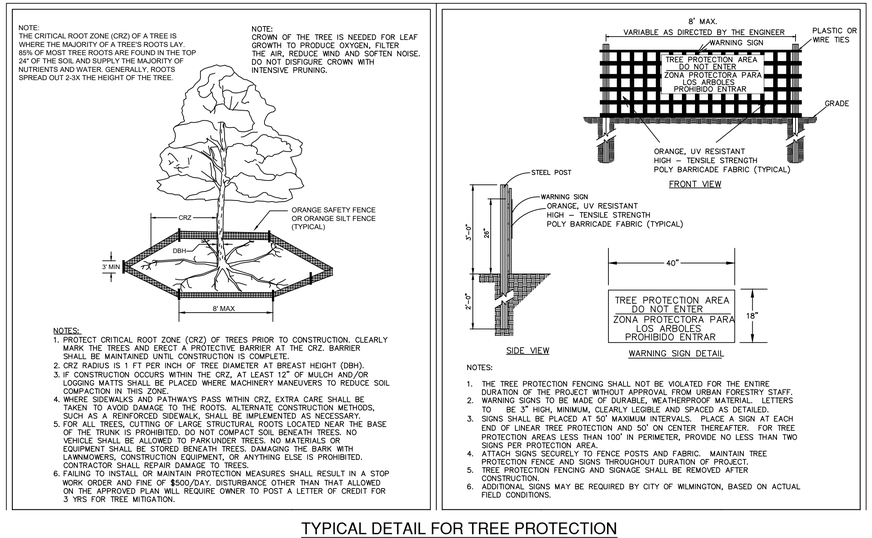
NOT TO SCALE



ELEVATION

CONCRETE BOLLARD DETAIL

NOT TO SCALE



NOTES:

1. PROTECT CRITICAL ROOT ZONE (CRZ) OF TREES PRIOR TO CONSTRUCTION. CLEARLY MARK THE TREES AND ERECT A PROTECTIVE BARRIER AT THE CRZ. BARRIER SHALL BE MAINTAINED UNTIL CONSTRUCTION IS COMPLETE.
2. CRZ RADIUS IS 1 FT PER INCH OF TREE DIAMETER AT BREAST HEIGHT (DBH).
3. IF CONSTRUCTION OCCURS WITHIN THE CRZ, AT LEAST 12" OF MULCH AND/OR LOGGING MATTS SHALL BE PLACED WHERE MACHINERY MANEUVERS TO REDUCE SOIL COMPACTION IN THIS ZONE.
4. WHERE SIDEWALKS AND PATHWAYS PASS WITHIN CRZ, EXTRA CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE ROOTS. ALTERNATE CONSTRUCTION METHODS, SUCH AS A REINFORCED SIDEWALK, SHALL BE IMPLEMENTED AS NECESSARY.
5. FOR ALL TREES, CUTTING OF LARGE STRUCTURAL ROOTS LOCATED NEAR THE BASE OF THE TRUNK IS PROHIBITED. DO NOT COMPACT SOIL BENEATH TREES. NO VEHICLE SHALL BE ALLOWED TO PARKUNDER TREES. NO MATERIALS OR EQUIPMENT SHALL BE STORED BENEATH TREES. DAMAGING THE BARK WITH LAWNMOWERS, CONSTRUCTION EQUIPMENT, OR ANYTHING ELSE IS PROHIBITED. CONTRACTOR SHALL REPAIR DAMAGE TO TREES.
6. FAILING TO INSTALL OR MAINTAIN PROTECTION MEASURES SHALL RESULT IN A STOP WORK ORDER AND FINE OF $500/DAY. DISTURBANCE OTHER THAN THAT ALLOWED ON THE APPROVED PLAN WILL REQUIRE OWNER TO POST A LETTER OF CREDIT FOR 3 YRS FOR TREE MITIGATION.

NOTES:

1. THE TREE PROTECTION FENCING SHALL NOT BE VIOLATED FOR THE ENTIRE DURATION OF THE PROJECT WITHOUT APPROVAL FROM URBAN FORESTRY STAFF.
2. WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL. LETTERS TO BE 3" HIGH, MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.
3. SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER THEREAFTER. FOR TREE PROTECTION AREAS LESS THAN 100' IN PERIMETER, PROVIDE NO LESS THAN TWO SIGNS PER PROTECTION AREA.
4. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC. MAINTAIN TREE PROTECTION FENCE AND SIGNS THROUGHOUT DURATION OF PROJECT.
5. TREE PROTECTION FENCING AND SIGNAGE SHALL BE REMOVED AFTER CONSTRUCTION.
6. ADDITIONAL SIGNS MAY BE REQUIRED BY CITY OF WILMINGTON, BASED ON ACTUAL FIELD CONDITIONS.

TYPICAL DETAIL FOR TREE PROTECTION DURING CONSTRUCTION

NOT TO SCALE

Know what's below. Call before you dig.

FINAL DESIGN - RELEASED FOR BIDDING ONLY

REVISIONS:

CLIENT INFORMATION:

BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

PARAMOUNTE ENGINEERING
122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846

DETAILS

W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

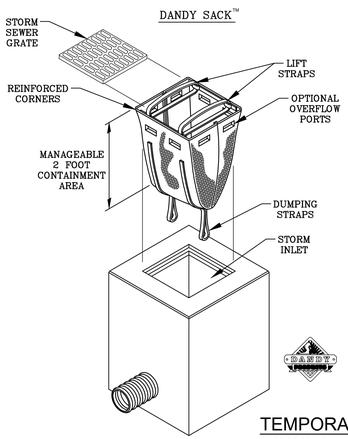
PROJECT STATUS
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
FINAL DESIGN:
RELEASED FOR CONST:

DRAWING INFORMATION
DATE: 04/16/20
SCALE: N.T.S.
DESIGNED: AEC
DRAWN: AEC
CHECKED: RPB

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

C-5.0

PEI JOB#: 19249.PE



DANDY SACK™ SPECIFICATIONS

NOTE: THE DANDY SACK™ WILL BE **MANUFACTURED IN THE U.S.A.** FROM A WOVEN MONOFILAMENT FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS:

REGULAR FLOW DANDY SACK™ (BLACK)

Mechanical Properties	Test Method	Units	MARV
Grab Tensile Strength	ASTM D 4632	kN (lbs)	1.78 (400) x 1.40 (315)
Grab Tensile Elongation	ASTM D 4632	%	15 x 15
Puncture Strength	ASTM D 4833	kN (lbs)	0.67 (150)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	5506 (800)
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.67 (150) x 0.73 (165)
UV Resistance	ASTM D 4355	%	90
Apparent Opening Size	ASTM D 4751	Mm (US Std Sieve)	0.425 (40)
Flow Rate	ASTM D 4491	l/min/m²(gal/min/ft²)	2852 (70)
Permittivity	ASTM D 4491	Sec⁻¹	0.90

HI-FLOW DANDY SACK™ (SAFETY ORANGE)

Mechanical Properties	Test Method	Units	MARV
Grab Tensile Strength	ASTM D 4632	kN (lbs)	1.62 (365) X 0.89 (200)
Grab Tensile Elongation	ASTM D 4632	%	24 X 10
Puncture Strength	ASTM D 4833	kN (lbs)	0.40 (90)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	3097 (450)
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.51 (115) X 0.33 (75)
UV Resistance	ASTM D 4355	%	90
Apparent Opening Size	ASTM D 4751	Mm (US Std Sieve)	0.425 (40)
Flow Rate	ASTM D 4491	l/min/m²(gal/min/ft²)	5907 (145)
Permittivity	ASTM D 4491	Sec⁻¹	2.1

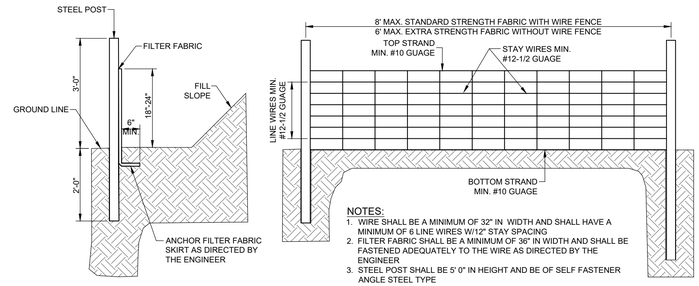
*Note: All Dandy Sacks™ can be ordered with our optional oil absorbent pillows

TEMPORARY DANDY SACK® INLET PROTECTION

NOT TO SCALE

NOTE

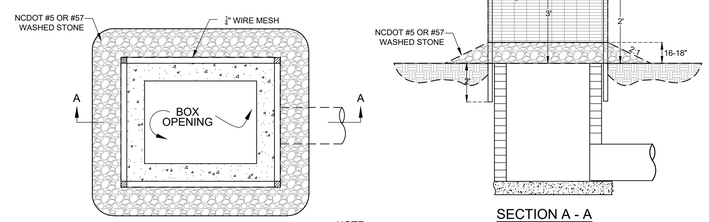
CONTRACTOR SHALL PROPERLY DISPOSE OF SEDIMENT IN A DESIGNATED DISPOSAL AREA AND NOT WITHIN LIMITS OF DISTURBANCE. SEDIMENT SHALL BE REMOVED FROM HARDWARE CLOTH AND GRAVEL, BLOCK AND GRAVEL, OR ROCK-PIPE INLETS, WHEN IT REACHES HALF-FILLED. ROCK WILL BE CLEANED OR REPLACED WHEN NO LONGER DRAINS. SILT SACKS, BEAVER DAMS, SANDY SACKS, AND SOCKS NEED CHECKING EVERY WEEK AND AFTER RAIN.



NOTES:
1. WIRE SHALL BE A MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES W/12" STAY SPACING
2. FILTER FABRIC SHALL BE A MINIMUM OF 36" IN WIDTH AND SHALL BE FASTENED ADEQUATELY TO THE WIRE AS DIRECTED BY THE ENGINEER
3. STEEL POST SHALL BE 5' 0" IN HEIGHT AND BE OF SELF FASTENER ANGLE STEEL TYPE

GUIDELINES FOR TEMPORARY SILT FENCE DETAIL

NOT TO SCALE

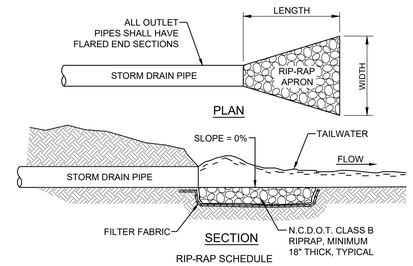


SECTION A - A

NOTE:
FOR CURB INLETS AND DROP INLETS

INLET PROTECTION

NOT TO SCALE

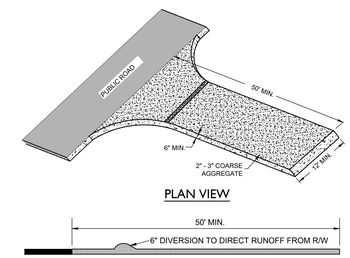


RIP-RAP SCHEDULE

ID	PIPE DIA. (IN.)	LENGTH (FT.)	UPSTREAM WIDTH (FT.)	DOWNSTREAM WIDTH (FT.)
OF-20	(1) 8"	9	2	11
OF-25	(1) 8"	9	2	11
FES-1	(1) 24"	10	6	12

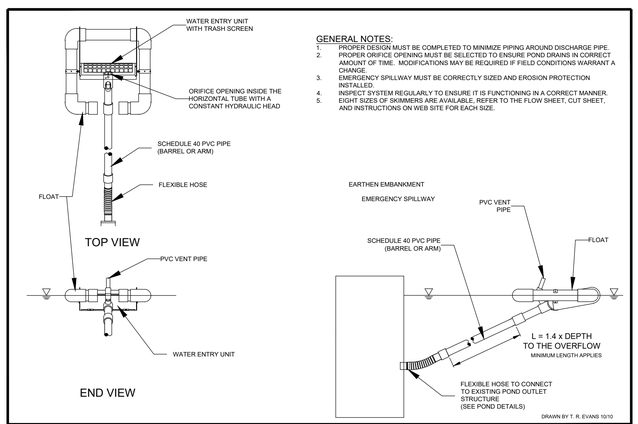
RIP-RAP APRON

NOT TO SCALE



TEMPORARY CONSTRUCTION ENTRANCE

NOT TO SCALE



GENERAL NOTES:
1. PROPER DESIGN MUST BE COMPLETED TO MINIMIZE PIPING AROUND DISCHARGE PIPE.
2. PROPER ORIFICE OPENING MUST BE SELECTED TO ENSURE POND DRAINS IN CORRECT AMOUNT OF TIME. MODIFICATIONS MAY BE REQUIRED IF FIELD CONDITIONS WARRANT A CHANGE.
3. EMERGENCY SPILLWAY MUST BE CORRECTLY SIZED AND EROSION PROTECTION INSTALLED.
4. INSPECT SYSTEM REGULARLY TO ENSURE IT IS FUNCTIONING IN A CORRECT MANNER.
5. EIGHT SIZES OF SKIMMERS ARE AVAILABLE. REFER TO THE FLOW SHEET, CUT SHEET, AND INSTRUCTIONS ON WEB SITE FOR EACH SIZE.

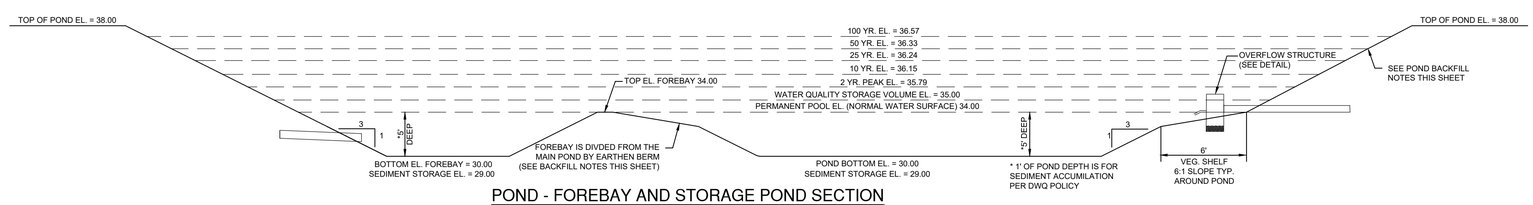
FAIRCLOTH SKIMMER TO POND OUTLET BOX

J. W. FAIRCLOTH & SON INC.
WWW.FAIRCLOTHSKIMMER.COM
TELEPHONE: (919) 732-1244
FAX: (919) 732-1266
EMAIL: WARREN@FAIRCLOTHSKIMMER.COM

BASIN #	SKIMMER SIZE (IN.)	SKIMMER ORIFICE (IN.)
TSB 1	2.0	1.8

TEMPORARY FAIRCLOTH SKIMMER DETAIL

NOT TO SCALE



POND - FOREBAY AND STORAGE POND SECTION

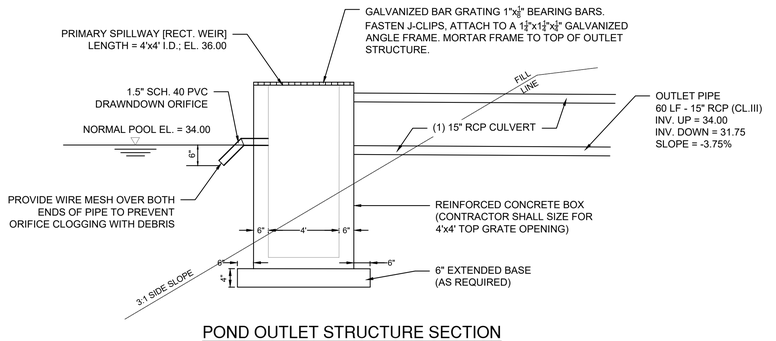
NOT TO SCALE

POND BACKFILL WITH SATISFACTORY SOILS SPECIFICATION

CLEAN SOILS WITH ORGANICS LESS THAN 2% WITH BETWEEN 40 AND 60% PASSING THE NO. 200 SIEVE WITH A PLASTICITY INDEX AND LIQUID LIMIT OF LESS THAN 20 AND 50 PERCENT, RESPECTIVELY; FREE OF ROCK OR GRAVEL LARGER THAN 2" IN ANY DIMENSION, ROOTS, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER AS INDICATED BY ENGINEER. COMPACT TO MIN. 95% M.D.D. PER ASTM D 698.

NOTE

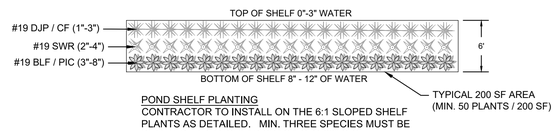
-POND TO BE USED AS TEMPORARY SEDIMENT BASIN DURING CONSTRUCTION. REFERENCE C-1.0 GENERAL NOTES FOR MAINTENANCE INFORMATION.



POND OUTLET STRUCTURE SECTION

NOT TO SCALE

NOTE: ALL HDPE OUTFALL PIPES SHALL BE PROPERLY ANCHORED FROM FLOTATION FOR SUBMERGED CONDITIONS



POND SHELF PLANTING

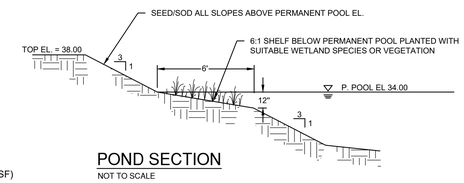
CONTRACTOR TO INSTALL ON THE 6:1 SLOPED SHELF PLANTS AS DETAILED. MIN. THREE SPECIES MUST BE PLANTED. TRIANGULAR SPACING @ 20" O.C.

SUITABLE PLANTS (PLANT SIZE = 2" PLUGS)
PIC - PICKERELWEED (PONTEDERIA CORDATA)
DJP - DWARF JOE PYE WEED (EUPATORIADELPHUS DUBIOUS)
SWR - SWAMP ROSE (HIBISCUS MOSHEUTOS)
BLF - BLUE FLAG (IRIS VIRGINICA)
CF - CARDINAL FLOWER (LOBELIA CARDINALIS)

POND VEGETATIVE SHELF PLANTINGS

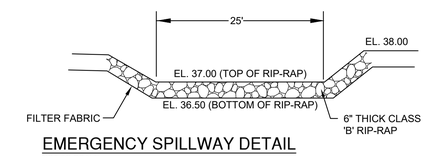
NOT TO SCALE

NOTE: DO NOT PLANT WETLAND PLANTS 10-FT ON EITHER SIDE OF OUTLET STRUCTURE



POND SECTION

NOT TO SCALE



EMERGENCY SPILLWAY DETAIL

NOT TO SCALE

Know what's below. Call before you dig.

FINAL DESIGN - RELEASED FOR BIDDING ONLY

REVISIONS:

CLIENT INFORMATION:
BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

PARAMOUNTE ENGINEERING
122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846

DETAILS

W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

PROJECT STATUS
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
FINAL DESIGN:
RELEASED FOR CONST:

DRAWING INFORMATION
DATE: 04/16/20
SCALE: N.T.S.
DESIGNED: AEC
DRAWN: AEC
CHECKED: RPB

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

C-5.1

PEI JOB#: 19249.PE

GENERAL NOTES

1. Pipe shall be laid in accordance with manufacturers' recommendations and the Project Drawings and Technical Specifications. Should a discrepancy exist between the manufacturers recommendations and the Project Drawings and Technical Specifications, the more stringent requirement shall control.

2. Trench shall be dug when laying pipe and ends plugged when laying is discontinued. Any water from the excavation shall be disposed of in such a manner that the natural drainage of the area shall not be disturbed.

3. Trench backfill is to be free of stones and any foreign material, and shall be placed in six (6) inch layers compacted in accordance with the Technical Specifications.

4. Detectable Terra Tape D is to be installed approximately one (1) foot below finished grade and directly over all pipe. All pipe and valves shall be affixed with #12 gauge copper locating wire.

5. The contractor is responsible for locating all underground utilities prior to digging, whether or not they are shown on the plans. Underground utility locations, if shown on the plans, are based upon the best available information and should be considered only as approximate.

6. Waterlines shall be installed at locations as shown on the Project Drawings unless otherwise approved by the Town and the Engineer in advance of installation.

7. The minimum depth of bury shall be three (3) feet from the top of pipe unless otherwise noted on the plans.

8. All fittings including reducers shall be blocked as specified and as shown on the Details and within the Project Technical Specifications.

9. Absolutely no work shall be performed on private property beyond any area which easements are to be provided by the Owner and dedicated to the Town of Shallotte.

10. Concrete thrust blocking shall not obstruct weep holes on any fire hydrant assembly, steel casing pipe, or bolts on any fittings.

11. Water in excess of that required to pressure test, flush, chlorinate and reflush more than allowed by the Technical Specifications shall be paid for by the contractor. Excess quantities shall be estimated by the Engineer.

12. The work shall be arranged in a manner that will cause a minimum of disturbance to vehicular and pedestrian traffic. Adequate ingress and egress to both private and public property shall be provided by the contractor during all stages of construction. Without written approval from the Town or utility company, existing services shall not be interrupted by the construction work. Any paved areas utilizing open-cut and patch shall be repaired the same day as construction occurs. Absolutely no open trenches shall be left overnight.

13. The Developer's Contractor shall install a water service assembly to each lot as shown on the details. The Town shall provide the water service meter.

14. The Contractor shall contact the Town of Shallotte Utilities Department (910/754-4032) and the Town Engineer (910/755-6526) a minimum of five (5) working days prior to the beginning of construction. Connection to the existing Town waterline shall be performed by the Contractor under the supervision of the Town of Shallotte Utilities Department and the Engineer's representative.

15. The Contractor shall keep the Engineer informed relative to the progress of the construction. The Engineer shall observe construction activities as required by North Carolina General Statutes 130A – 317. Failure of the Contractor to keep the Engineer informed may require uncovering of work to verify compliance with plans and specifications. Any cost associated with uncovering work and/or verifying compliance shall be borne by the Contractor.

15. Traffic control shall be in accordance with Section 150 of the NCDOT Standard Specifications for Roads and Structures.

No.	Revision	Date	Town of Shallotte PO Box 2287 Shallotte, NC 28459

4" PVC GRAVITY CLEANOUT WITH 45° BENDS FOR NON-TRAFFIC AREAS

NOT TO SCALE

No.	Revision	Date	Town of Shallotte PO Box 2287 Shallotte, NC 28459

NOTES:
1. VERTICAL PIPE AND ALL FITTINGS TO BE SCH. 40 PVC UNLESS OTHERWISE NOTED.
2. SLOPE FINISH GRADE TO DRAIN AWAY FROM BOX.

TYPICAL SEWER CLEANOUT AT END OF LINE

NOT TO SCALE

No.	Revision	Date	Town of Shallotte PO Box 2287 Shallotte, NC 28459

NOTES:

1. CONSTRUCTION SHALL ENSURE NO FROM OR BENCH IS SUITABLE FOR INSTALLATION AND DOES NOT REQUIRE FOUNDATION CONDITIONING STONE.
2. FILL SHALL BE SUITABLE MATERIAL THAT IS FREE FROM HEAVY CLAY, GUMBOS, DEBRIS, ORGANICS AND LITTLE TO NO EXPANSIVE MOISTURE.
3. SELECT BACKFILL MAY BE SUBSTITUTED OR REQUIRED BY CITY TO ACHIEVE COMPACTION. (I.E. #57, ABC, CRUSHED LIMESTONE, CLEAN SAND, FLOWABLE FILL, ETC).
4. SOIL SHALL BE INSTALLED IN 6"-8" LIFTS AND COMPACTED BY A VIBRATORY TAMPER (NOT JUMPING JACK), CONVENTIONAL VIBRATORY ROLLERS OR BY WATER MAY BE USED FOR LARGER EXCAVATIONS. THE PLATE TAMP METHOD SHALL NOT BE USED.
5. ALL APPROVED CASINGS SHALL BE SET FLUSH TO GRADE AND SUPPORTED PER APPROVED.
6. COMPACT MATERIALS TO MINIMUM % DENSITY SHOWN IN DIAGRAM AS DETERMINED BY THE STANDARD PROCTOR METHOD ASTM D 698 A FOR SOILS, AND ASTM D 698 C FOR ABC STONE, AND BY NUCLEAR GAUGE OR CORE SAMPLE FOR ASPHALT.
7. CUTBACKS OF ASPHALT SHALL BE PREPARED ON EDGE OF EXCAVATION OVER TOP OF UNDISTURBED SOIL.

TYPICAL DETAIL FOR PAVEMENT REPAIRS-UTILITY CUTS

NOT TO SCALE

Know what's below. Call before you dig.

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3333 JAECKLE DRIVE, SUITE 120
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BRUNSWICK COUNTY, NC 28470

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PER REVIEW:
RELEASED FOR CONST:

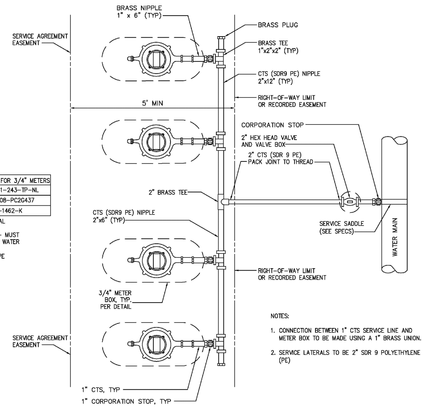
DRAWING INFORMATION
DATE: 04/14/20
SCALE: N.T.S.
DESIGNED: AEC
DRAWN: AEC
REVIEWED: RPB
CHECKED:

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
04/16/20

C-5.2

PEI JOB#: 19249.PE

811 Know what's below. Call before you dig.



APPROVED SINGLE METER BOXES FOR 3/4" METERS	
FORD	LYLV-141-243-TP-NL
McDONALD	776-208-PC20437
MUELLER	H-1462-K

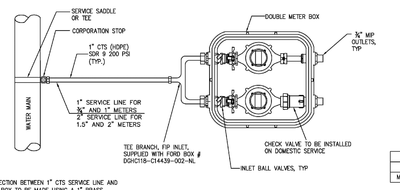
* OR APPROVED EQUAL

1. OR APPROVED EQUAL – MUST ACCOMMODATE SENSUS WATER METER WITH AMR/AMI.
2. LID TO BE LOCKING TYPE

NOTES:

1. CONNECTION BETWEEN 1" CTS SERVICE LINE AND METER BOX TO BE MADE USING A 1" BRASS UNION.
2. SERVICE LATERALS TO BE 2" SDR 9 POLYETHYLENE (PE)

STANDARD GANG METER ASSEMBLY
DETAIL W-5



**NOTE:
BACKFLOW PROTECTION DEVICE IS REQUIRED ON ALL IRRIGATION WATER METERS AND ON ALL COMMERCIAL/INDUSTRIAL WATER METERS

NOTES:

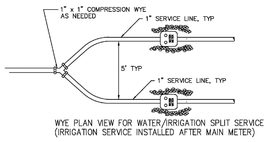
1. CONNECTION BETWEEN 1" CTS SERVICE LINE AND YOKE BOX TO BE MADE USING A 1" BRASS UNION.
2. ALL WATER SERVICE LATERALS SHALL HAVE A TRACER WIRE INSTALLED PER BRUNSWICK COUNTY WATER DISTRIBUTION TECHNICAL SPECIFICATIONS.

ACCEPTABLE DOUBLE METER BOXES	
FORD	DGHC118-C14439-002-NL
McDONALD	77360208DCGF 434TCKDD1

* OR APPROVED EQUAL

1. OR APPROVED EQUAL – MUST ACCOMMODATE TWO (2) SENSUS WATER METERS WITH AMR/AMI
2. LID TO BE LOCKING TYPE
3. DOUBLE METER BOX IS FOR (2) 3/4" METERS ONLY

PLAN VIEW FOR WATER/IRRIGATION SPLIT SERVICE
(WATER/IRRIGATION SERVICES INSTALLED CONCURRENTLY)

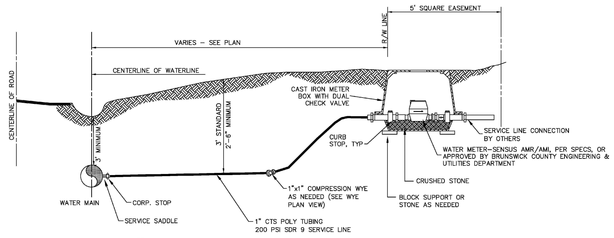


WYE PLAN VIEW FOR WATER/IRRIGATION SPLIT SERVICE
(IRRIGATION SERVICE INSTALLED AFTER MAIN METER)

APPROVED SINGLE METER BOXES FOR 3/4" METERS	
FORD	LYLV-141-243-TP-NL
McDONALD	776-208-PC20437
MUELLER	H-1462-K

* OR APPROVED EQUAL

1. OR APPROVED EQUAL – MUST ACCOMMODATE SENSUS WATER METER WITH AMR/AMI
2. LID TO BE LOCKING TYPE



NOTE:

1) CONTRACTOR SHALL PLACE METER BOX IN NON-TRAFFIC AREA AT LOCATION SPECIFIED BY BRUNSWICK COUNTY ENGINEERING DEPARTMENT.
2) METER BOXES SHALL BE CAST IRON WITH DUAL CHECK VALVES.
3) 1-1/2" AND 2" METERS WILL REQUIRE 2" CTS POLY TUBING.
4) 1, 1-1/2" AND 2" METERS WILL REQUIRE A METER BOX SIZED ADEQUATELY TO HOUSE A 1, 1-1/2" OR 2" SENSUS METER, HORIZONTAL BYPASS SETTER, AND MXU. ALL REQUIRED ITEMS TO BE PROVIDED BY INSTALLER.
5) 1, 1-1/2" AND 2" METER BOXES SHALL BE MARKED WATER AND HAVE A HOLE FOR INSTALLATION OF THE MXU AND TOUCH PAD TO BE PROVIDED BY INSTALLER.
6) NO PLASTIC BOXES FOR 1 1/2" AND 2" METERS. BOX MUST BE DUCTILE IRON OR QUAZITE.
7) ALL WATER SERVICE LATERALS SHALL HAVE A TRACER WIRE INSTALLED PER BRUNSWICK COUNTY WATER DISTRIBUTION TECHNICAL SPECIFICATIONS.

3/4" – 2" STANDARD WATER TAP
INSTALLATION
DETAIL W-6

(FOR METERS LARGER THAN 2", REFER TO DETAIL ON PAGE 3 OF 5)

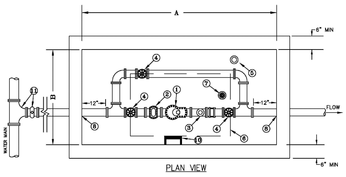
Revisions
1.1 - DATED 3/7/2013 - Modified double meter box
1.2 - DATED 4/5/2013 - Corrected meter box #'s
1.3 - DATED 7/15/2014 - Updated meter box #'s
1.4 - DATED 10/27/2015 - Modified W-7
1.5 - DATED 12/8/2016 - Revised Detail Numbers
1.6 - DATED 1/6/2017 - Revise Detail W-4
1.7 - DATED 3/22/2017 - Revise Detail W-6
1.8 - DATED 10/29/2018 - Updated acceptable double meter boxes

COUNTY OF BRUNSWICK

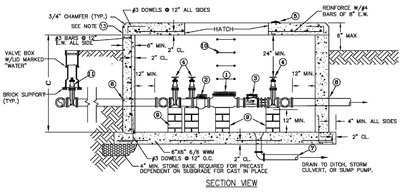
GENERAL WATER DETAILS FOR BRUNSWICK COUNTY NORTH CAROLINA

Date: 05.29.12
Scale: NTS
Drawn By: HW
Checked By: WLF

2 OF 5



PLAN VIEW



SECTION VIEW

WATER METER VAULTS (3" TO 10")
DETAIL W-7

CONSTRUCTION NOTES:

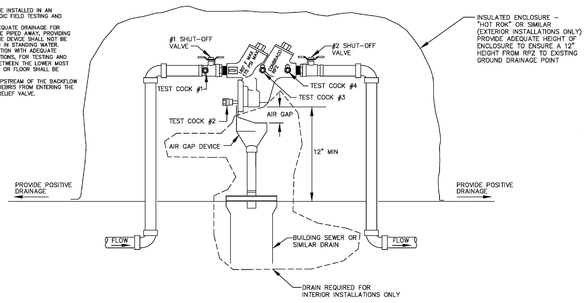
1. CONCRETE SHALL HAVE 4,000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS.
2. REINFORCING BARS SHALL BE GRADE 60 DEFORMED STEEL.
3. METERS SHALL BE APPROVED BY BRUNSWICK COUNTY.
4. WHERE WALL MOUNTED STEPS ARE NOT ACCESSIBLE FROM HATCH, A PERMANENTLY MOUNTED LADDER MEETING O.S.H.A. STANDARDS SHALL BE PROVIDED.
5. RELOCATE REINFORCEMENT AROUND HATCH TO PROVIDE EQUIVALENT STEEL CROSS-SECTION.
6. ALL PIPING SHALL BE DUCTILE IRON.

MIN. VAULT DIMENSIONS			
METER SIZE	A	B	C
3"	6'-6"	5'-6"	5'-0"
4"	8'-0"	5'-6"	5'-0"
6"	11'-0"	5'-6"	5'-0"
8"	12'-0"	6'-0"	5'-0"
10"	14'-0"	8'-0"	6'-0"

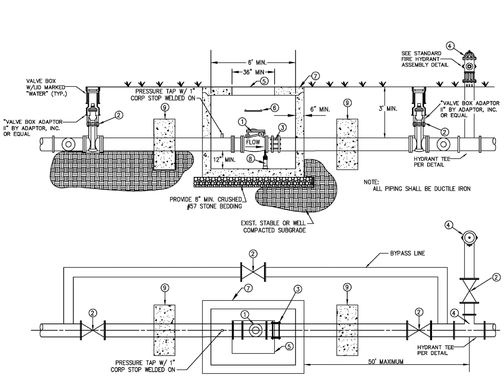
1. AWWA C701 TURBINE METER OR AWWA C702 COMPOUND METER w/ENCODING REGISTER FOR REMOTE READING (SENSUS OR APPROVED EQUAL) METER MUST BE SUBMITTED FOR REVIEW AND APPROVAL BY BRUNSWICK COUNTY ENGINEER
2. STRAINER BY METER MANUFACTURER
3. AS DETERMINED BY BRUNSWICK COUNTY, AWWA C508 SWING CHECK VALVE WITH LEVER & WEIGHT, OR SPRING, OR FLOMATIC MODEL 845/955 SPLIT DISC
4. AWWA C509 GATE VALVE w/HAND WHEEL
5. AMR-TRON SOW-2 PIT EXT WITH COMPATIBLE REGISTER OR EQUIVALENT-MUST BE APPROVED BY BRUNSWICK COUNTY
6. SINGLE OR DOUBLE LEAF ALUMINUM HATCH
7. GRAVITY DRAIN TO DAYLIGHT OR SUMP PUMP WITH FORCE MAIN TO STORM DRAINAGE
8. WATERTIGHT GASKET w/HYDRAULIC CEMENT SEAL
9. SOLID MASONRY PIER FIXTURE SUPPORTS
10. STEPS SPACED AT 16" O.C.
11. IN-LINE TEE OR TAPPING SLEEVE w/VALVE AND BOX TO GRADE WITH LID MARKED "WATER"
12. ALL WATER METER VAULTS MUST BE SUBMITTED TO BRUNSWICK COUNTY ENGINEERING DEPARTMENT AS A SHOP SUBMITTAL FOR REVIEW AND APPROVAL.
13. METER VAULT LID SHALL REST ON TOP OF VAULT WALLS– NO JOINTS ARE ALLOWED IN VAULT WALLS– VAULT BOTTOM AND SIDES MAY BE PRECAST BUT TOP SHALL BE PLACED ON TOP OF WALLS.

NOTES:

1. THE BACKFLOW PREVENTION DEVICE MUST BE INSTALLED IN AN ACCESSIBLE LOCATION TO FACILITATE PERIODIC FIELD TESTING AND MAINTENANCE.
2. THE LOCATION SELECTED SHOULD HAVE ADEQUATE DRAINAGE FOR RELIEF VALVE DISCHARGE. DRAINAGE MAY BE PIPED AWAY, PROVIDING AN APPROVED AIR GAP DEVICE IS USED. THE DEVICE SHALL NOT BE PLACED WHERE IT MAY BECOME SUBMERGED IN STANDING WATER.
3. INSTALLATION TO BE MADE WITH ADEQUATE SPACE FOR TESTING AND CLEARANCE FROM WALLS AND/OR OBSTRUCTIONS, FOR TESTING AND MAINTENANCE. A 12" TO 30" CLEARANCE BETWEEN THE LOWER MOST PORTION OF THE DEVICE AND FLOOD GRADE OR FLOOR SHALL BE PROVIDED.
4. A STRAINER MAY BE INSTALLED JUST UPSTREAM OF THE BACKFLOW PREVENTION ASSEMBLY TO ELIMINATE ANY DEBRIS FROM ENTERING THE DEVICE AND FOULING THE CHECK AND/OR RELIEF VALVE.
5. NO UNDERGROUND INSTALLATIONS ALLOWED.

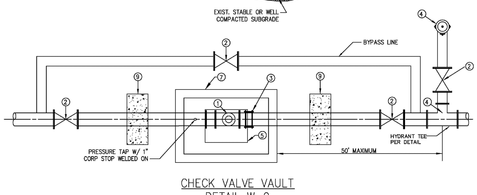


STANDARD BACKFLOW PREVENTION DEVICE
DETAIL W-8



NOTE:
ALL PIPING SHALL BE DUCTILE IRON

1. AS DETERMINED BY BRUNSWICK COUNTY, AWWA C508 SWING CHECK VALVE WITH LEVER & WEIGHT OR SPRING OR FLOMATIC MODEL 845/955 SPLIT DISC.
2. GATE VALVE WITH VALVE BOX MARKED "WATER".
3. FLANGED COUPLING ADAPTER
4. HYDRANT ASSEMBLY INSTALLED ON DOWNSTREAM SIDE WITHIN 50' OF CHECK VALVE.
5. ALUMINUM HATCH W/ COMPRESSION GASKET OPERATORS OR APPROVED EQUAL
6. STEPS SPACED AT 16" O.C.
7. PRECAST REINFORCED CONCRETE VAULT WITH H20 LOAD RATING AND MIN. INSIDE DIMENSIONS: 6' L x 5' W x 4' D
8. STANDOM MODEL SB9 OR APPROVED EQUAL FIXTURE SUPPORT
9. CONCRETE THRUST COLLAR PER SPECIFICATIONS.



CHECK VALVE VAULT
DETAIL W-9

Revisions
1.1 - DATED 12/8/2016 - Revise Detail Numbers
1.2 - DATED 3/10/2017 - Revise Detail W-9

COUNTY OF BRUNSWICK

GENERAL WATER DETAILS FOR BRUNSWICK COUNTY NORTH CAROLINA

Date: 06.01.12
Scale: NTS
Drawn By: HW
Checked By: WLF

3 OF 5

FINAL DESIGN - RELEASED FOR BIDDING ONLY

PEI JOB#: 19249.PE

C-5.3

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031591 ROBERT P. BRAND JR. 04/16/20

PROJECT STATUS
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
FINAL DESIGN:
RELEASED FOR CONST:

DRAWING INFORMATION
DATE: 04/16/20
SCALE: N.T.S.
DESIGNED: AEC
DRAWN: AEC
CHECKED: RPB

DETAILS

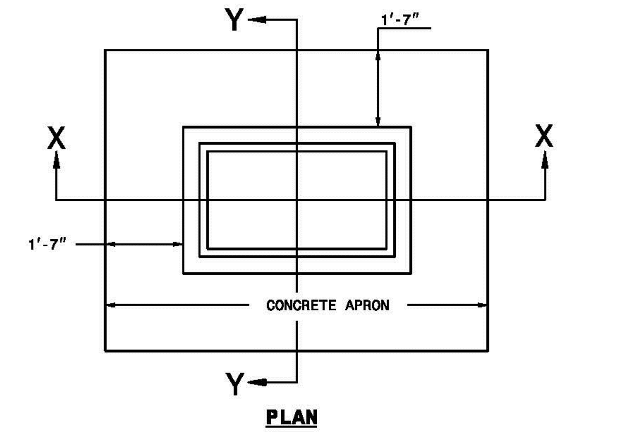
W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

PARAMOUNTE ENGINEERING, INC.
122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846

CLIENT INFORMATION:

BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

REVISIONS:



GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL GRATED DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

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

CONSTRUCT WITH PIPE CROWNS MATCHING.

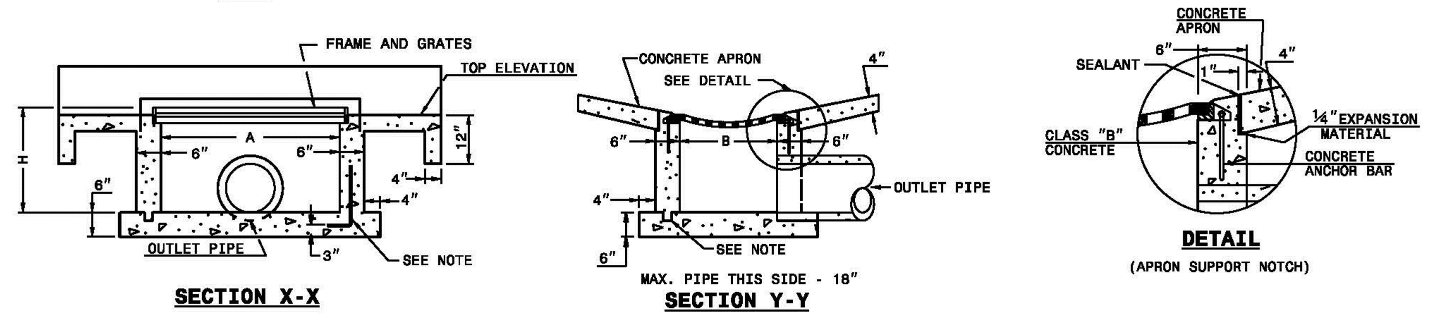
MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.

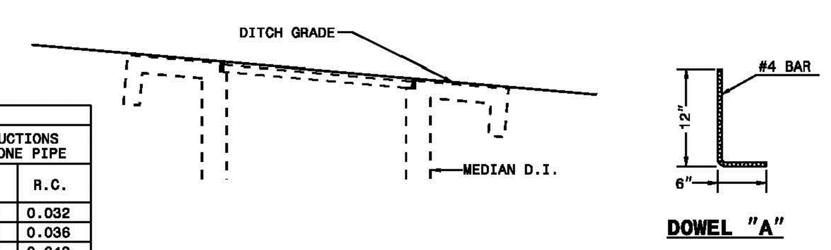
USE STANDARD FRAMES AND GRATES 840.22 (SHOWN), 840.24(SHOWN), 840.20, 840.29, AND 840.33.

SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.

CHAMFER ALL EXPOSED CORNERS 1".

DRAWING NOT TO SCALE.



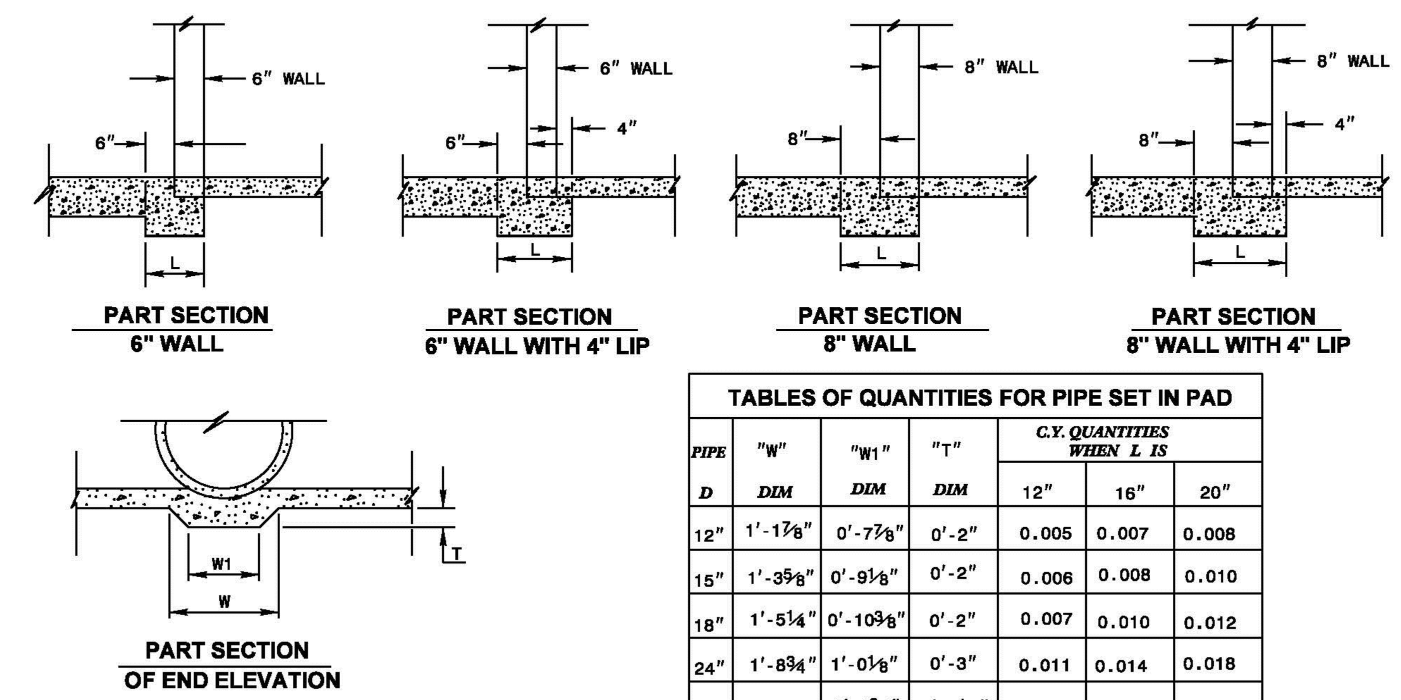


MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE GRATED DROP INLET									
PIPE	SPAN	WIDTH	HEIGHT	CUBIC YARDS OF CONCRETE IN BOX				DEDUCTIONS FOR ONE PIPE	
D	A	B	H	BOTTOM SLAB	H PER FT. HT.	H MIN. TOTAL	TOTAL	C.S.	R.C.
12"	3'-8"	2'-0"	2'-6"	0.362	0.247	0.597	0.958	0.020	0.032
15"	3'-8"	2'-0"	2'-9"	0.362	0.247	0.659	1.021	0.023	0.036
18"	3'-8"	2'-0"	3'-0"	0.362	0.247	0.720	1.082	0.033	0.049
24"	3'-8"	2'-0"	3'-6"	0.362	0.247	0.865	1.227	0.059	0.085
30"	3'-8"	2'-0"	4'-0"	0.362	0.247	0.988	1.350	0.092	0.127
36"	3'-8"	2'-0"	4'-6"	0.362	0.247	1.112	1.474	0.132	0.178

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR **CONCRETE GRATED DROP INLET TYPE 'B'** 12" THRU 36" PIPE

SHEET 1 OF 1 **840.18**



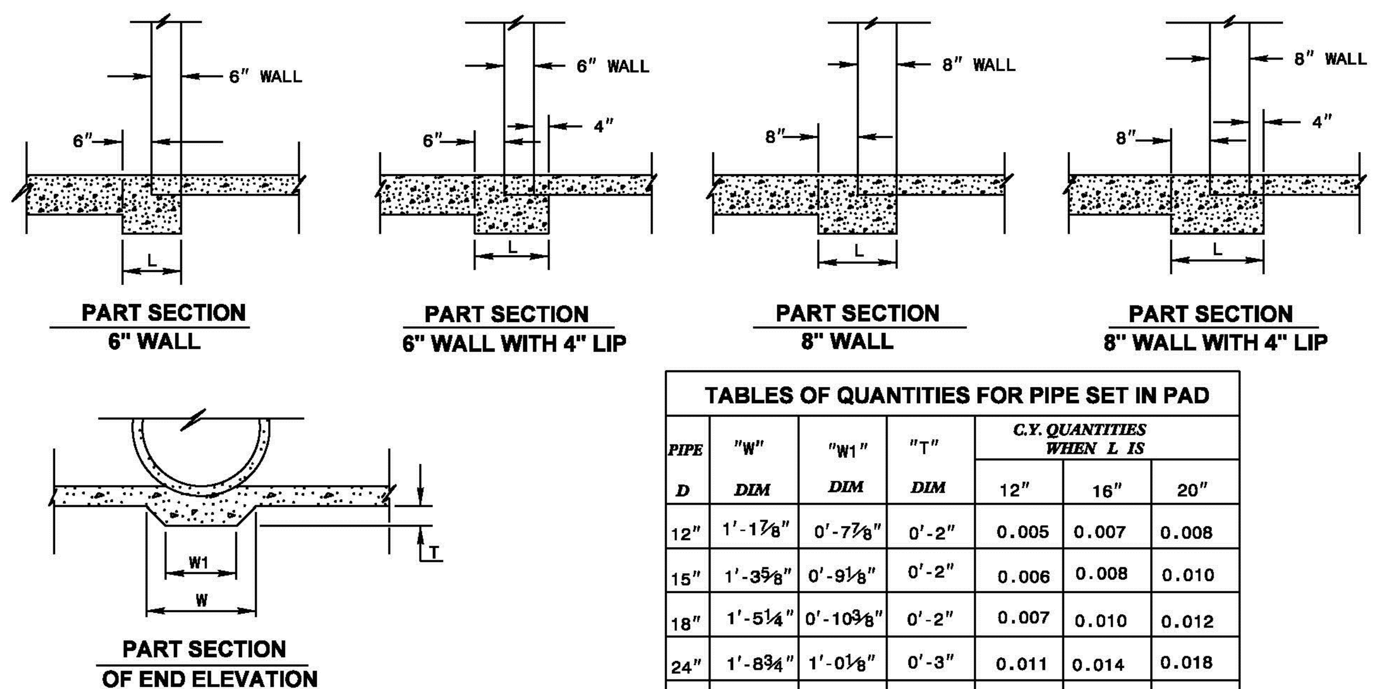
TABLES OF QUANTITIES FOR PIPE SET IN PAD						
PIPE	"W"	"W1"	"T"	C.Y. QUANTITIES WHEN L IS		
D	DIM	DIM	DIM	12"	16"	20"
12"	1'-1⅞"	0'-7⅞"	0'-2"	0.005	0.007	0.008
15"	1'-3⅝"	0'-9⅛"	0'-2"	0.006	0.008	0.010
18"	1'-5¼"	0'-10⅜"	0'-2"	0.007	0.010	0.012
24"	1'-8¾"	1'-0⅛"	0'-3"	0.011	0.014	0.018
30"	2'-0¼"	1'-2¾"	0'-3½"	0.014	0.018	0.023
36"	2'-3¾"	1'-5⅜"	0'-4"	0.017	0.023	0.025
42"	2'-7⅛"	1'-7"	0'-5¼"	0.025	0.030	0.038
48"	2'-10⅝"	1'-8¾"	0'-5¾"	0.028	0.038	0.047
54"	3'-2⅛"	1'-10½"	0'-6¼"	0.035	0.047	0.058
60"	3'-5⅝"	2'-0¼"	0'-6¾"	0.042	0.056	0.071
66"	3'-9"	2'-2¼"	0'-7¼"	0.050	0.067	0.084
72"	4'-0½"	2'-3¾"	0'-7¾"	0.059	0.078	0.098

GENERAL NOTES:
USE THIS STANDARD WITH ALL DRAINAGE STRUCTURES USING REINFORCED CONCRETE PIPE SET IN BASE SLAB.

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR **CONCRETE BASE PAD FOR DRAINAGE STRUCTURES**

SHEET 1 OF 1 **840.00**



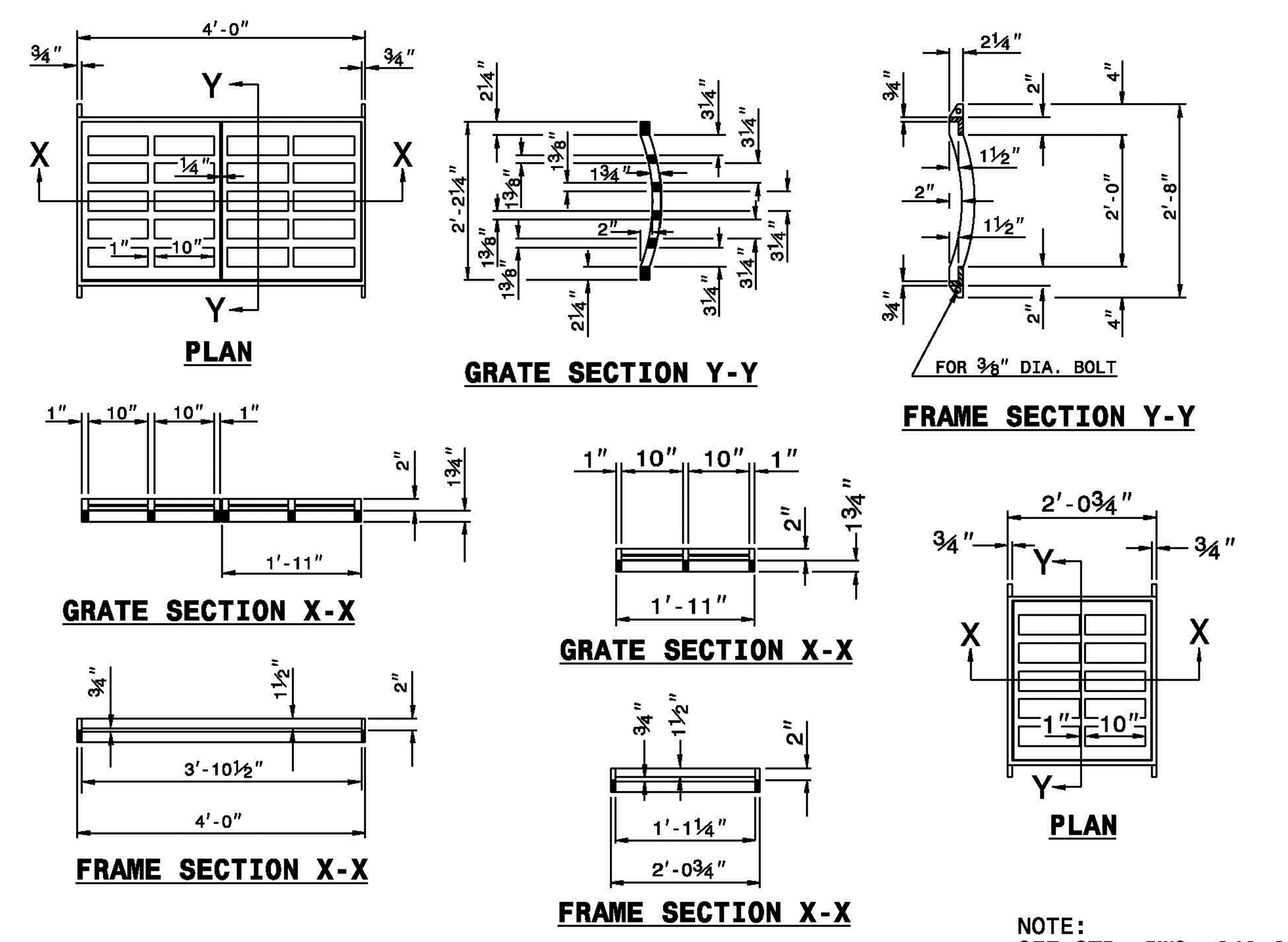
TABLES OF QUANTITIES FOR PIPE SET IN PAD						
PIPE	"W"	"W1"	"T"	C.Y. QUANTITIES WHEN L IS		
D	DIM	DIM	DIM	12"	16"	20"
12"	1'-1⅞"	0'-7⅞"	0'-2"	0.005	0.007	0.008
15"	1'-3⅝"	0'-9⅛"	0'-2"	0.006	0.008	0.010
18"	1'-5¼"	0'-10⅜"	0'-2"	0.007	0.010	0.012
24"	1'-8¾"	1'-0⅛"	0'-3"	0.011	0.014	0.018
30"	2'-0¼"	1'-2¾"	0'-3½"	0.014	0.018	0.023
36"	2'-3¾"	1'-5⅜"	0'-4"	0.017	0.023	0.025
42"	2'-7⅛"	1'-7"	0'-5¼"	0.025	0.030	0.038
48"	2'-10⅝"	1'-8¾"	0'-5¾"	0.028	0.038	0.047
54"	3'-2⅛"	1'-10½"	0'-6¼"	0.035	0.047	0.058
60"	3'-5⅝"	2'-0¼"	0'-6¾"	0.042	0.056	0.071
66"	3'-9"	2'-2¼"	0'-7¼"	0.050	0.067	0.084
72"	4'-0½"	2'-3¾"	0'-7¾"	0.059	0.078	0.098

GENERAL NOTES:
USE THIS STANDARD WITH ALL DRAINAGE STRUCTURES USING REINFORCED CONCRETE PIPE SET IN BASE SLAB.

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR CONCRETE BASE PAD FOR DRAINAGE STRUCTURES

SHEET 1 OF 1 **840.00**

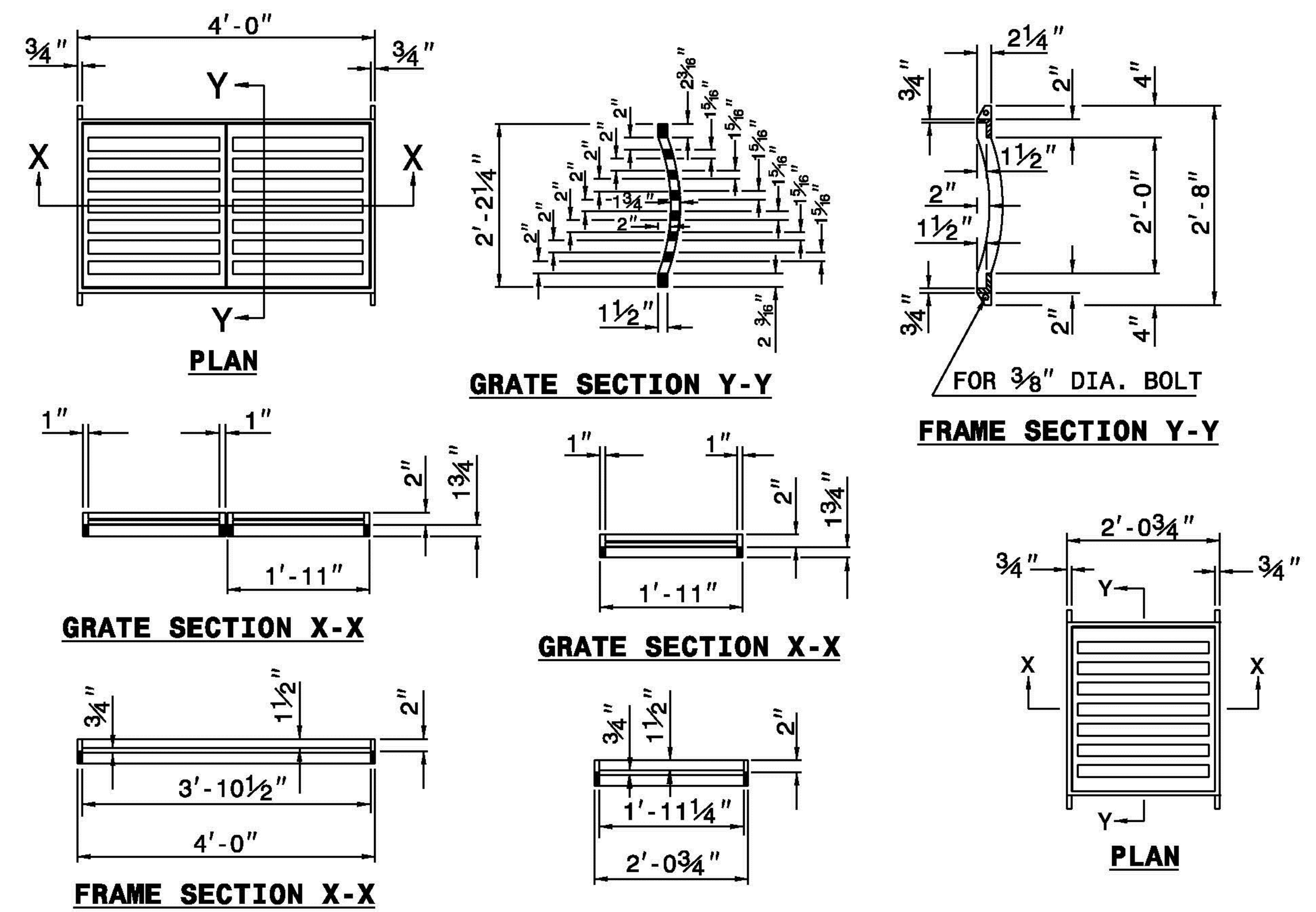


NOTE:
SEE STD. DWG. 840.25 FOR FRAME ANCHORAGE.

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR **FRAMES AND WIDE SLOT SAG GRATES**

SHEET 1 OF 1 **840.22**

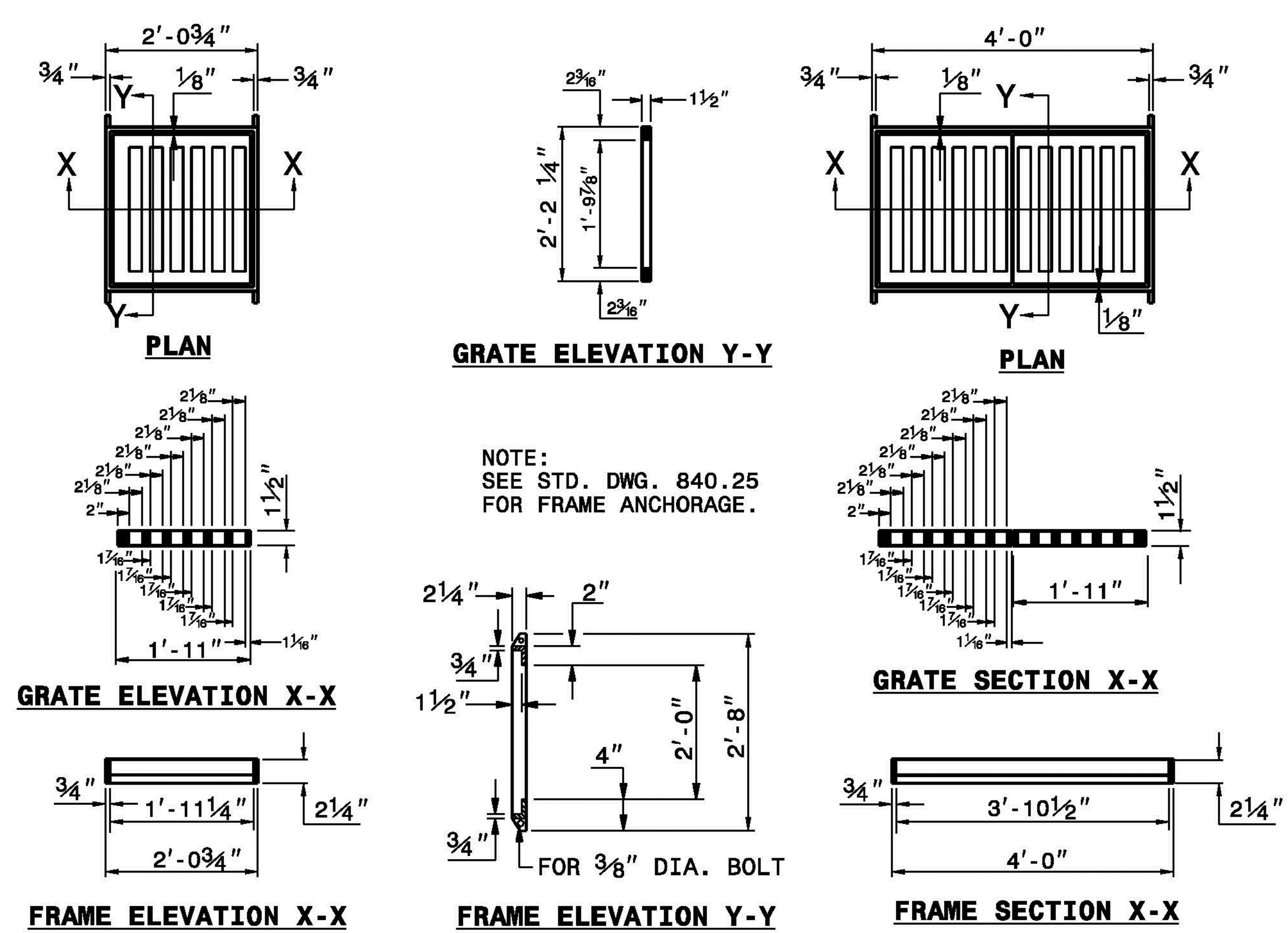


NOTE:
SEE STD. DWG. 840.25 FOR FRAME ANCHORAGE.

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR **FRAMES AND NARROW SLOT SAG GRATES**

SHEET 1 OF 1 **840.24**



NOTE:
SEE STD. DWG. 840.25 FOR FRAME ANCHORAGE.

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

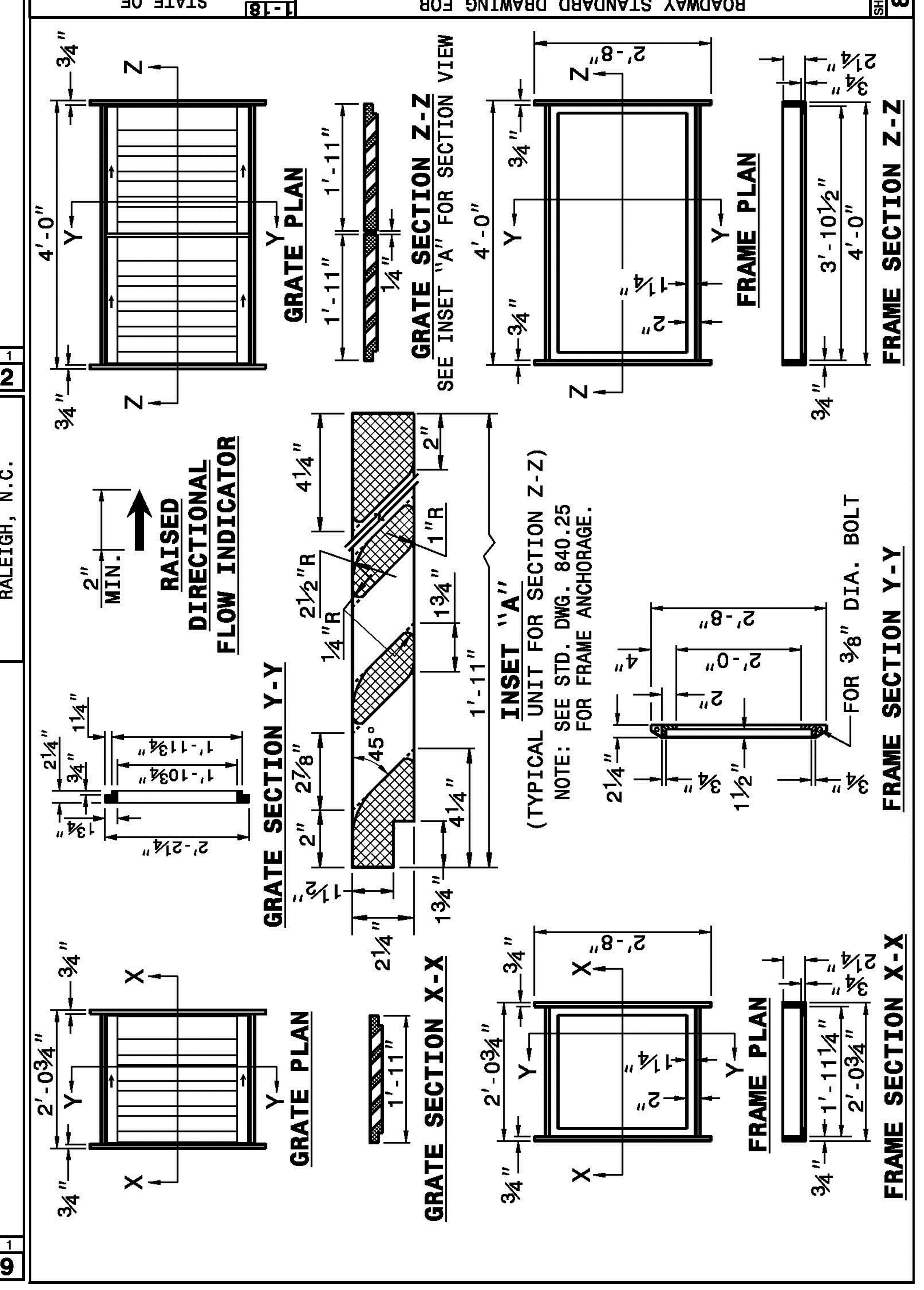
ROADWAY STANDARD DRAWING FOR **FRAMES AND NARROW SLOT FLAT GRATES**

SHEET 1 OF 1 **840.29**

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR **ANGLED VANE GRATES AND FRAMES**

SHEET 1 OF 1 **840.33**



Know what's below. Call before you dig.

FINAL DESIGN - RELEASED FOR BIDDING ONLY

REVISIONS:

CLIENT INFORMATION:
BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

PARAMOUNTE ENGINEERING, INC.
122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846

DETAILS

W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

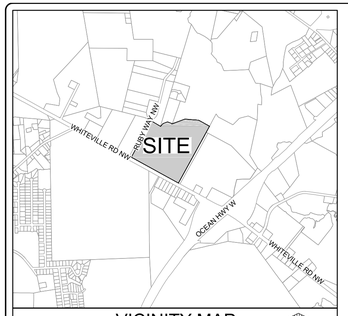
PROJECT STATUS
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
FINAL DESIGN:
RELEASED FOR CONST:

DRAWING INFORMATION
DATE: 04/16/20
SCALE: N.T.S.
DESIGNED: AEC
DRAWN: AEC
CHECKED: RPB

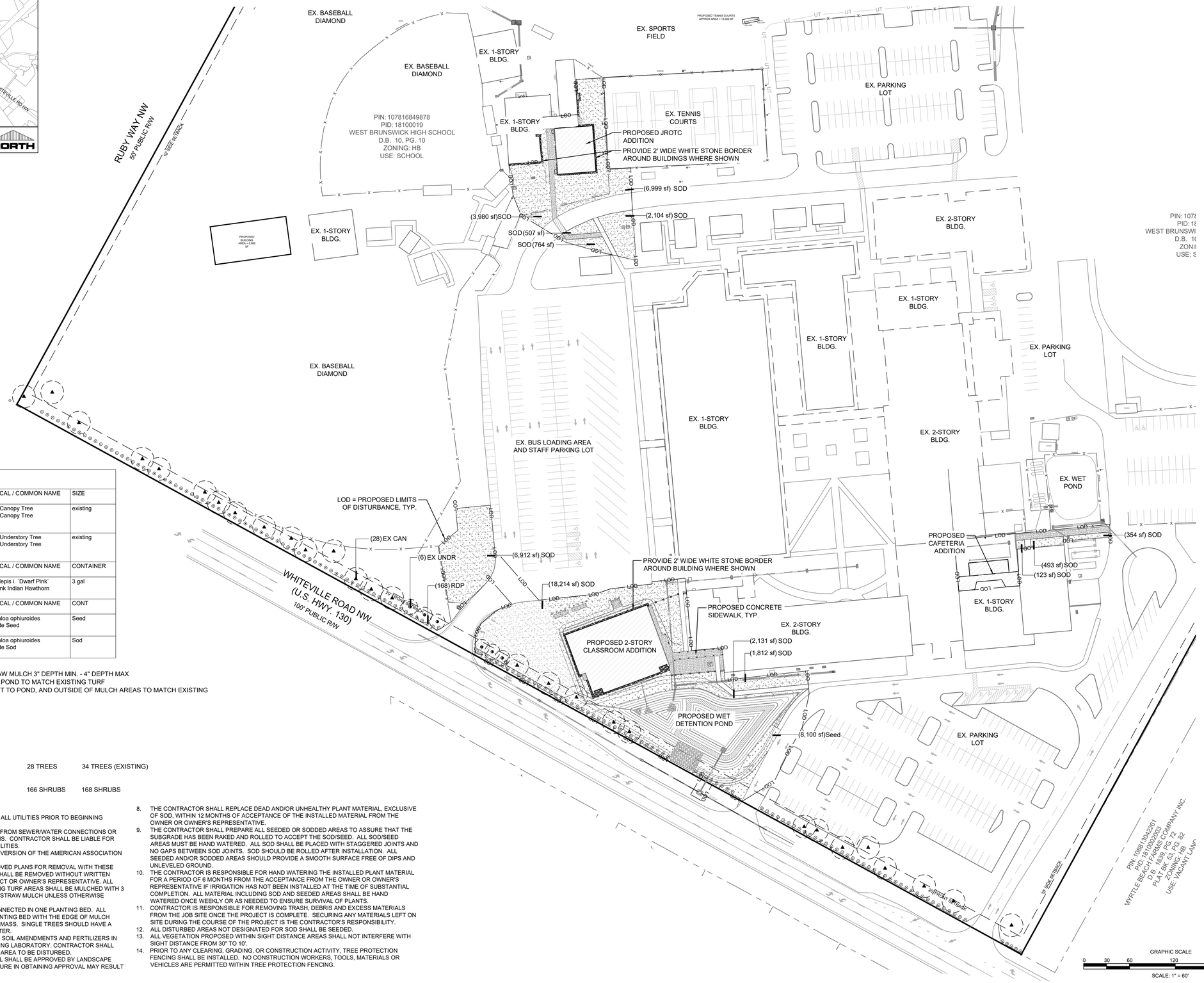
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031591 ROBERT P. BALLAND
04/16/20

C-5.4

PEI JOB#: 19249.PE



VICINITY MAP
SCALE: 1" = 2,000'
NORTH



PLANT SCHEDULE

EXISTING TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
	EX CAN	28	Existing Canopy Tree Existing Canopy Tree	existing
	EX UNDR	6	Existing Understory Tree Existing Understory Tree	existing
SHRUBS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**CONTAINER**
	RDP	168	Rhaphiolepis i. 'Dwarf Pink' Dwarf Pink Indian Hawthorn	3 gal
SOD/SEED	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**CONT**
	Seed	8,100 sf	Eremochloa ophiuroides Centipede Seed	Seed
	SOD	44,393 sf	Eremochloa ophiuroides Centipede Sod	Sod

PLANTING NOTES:
1. ALL PLANT BEDS SHALL RECEIVE PINE STRAW MULCH 3" DEPTH MIN. - 4" DEPTH MAX
2. PROVIDE SOD ADJACENT TO STORMWATER POND TO MATCH EXISTING TURF
3. SEED ALL DISTURBED AREAS NOT ADJACENT TO POND, AND OUTSIDE OF MULCH AREAS TO MATCH EXISTING ADJACENT TURF

LANDSCAPE REQUIREMENTS
STREET BUFFERS (SECTION 17-13)

ROAD FRONTAGE - WHITEVILLE ROAD = 1,378 LF
(1,500 LF - 122' LF DRIVEWAYS)

PLANTING REQUIRED:
1 TREE / 50 LF OF ROAD FRONTAGE — 28 TREES — 34 TREES (EXISTING)
1,378 / 50 = 27.56

6 SHRUBS / 50 LF OF ROAD FRONTAGE — 166 SHRUBS — 168 SHRUBS
1,378 / 50 = 27.56 * 6 = 165.36

LANDSCAPE NOTES:
1. CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION.
2. TREES SHALL BE LOCATED A MINIMUM OF 5 FEET FROM SEWER/WATER CONNECTIONS OR AS OTHERWISE DICTATED BY LOCAL REGULATIONS. CONTRACTOR SHALL BE LIABLE FOR DAMAGE TO ANY AND ALL PUBLIC OR PRIVATE UTILITIES.
3. ALL PLANT MATERIAL SHALL MEET THE CURRENT VERSION OF THE AMERICAN ASSOCIATION OF NURSERYMEN'S STANDARDS.
4. NO TREE, OTHER THAN THOSE SHOWN ON APPROVED PLANS FOR REMOVAL WITH THESE PLANS AND/ OR TREE REMOVAL PERMIT PLANS, SHALL BE REMOVED WITHOUT WRITTEN AUTHORIZATION FROM THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE. ALL SHRUB BEDS AND/OR PLANTING AREAS EXCLUDING TURF AREAS SHALL BE MULCHED WITH 3 INCH MINIMUM AND 4 INCH MAXIMUM DEPTH PINE STRAW MULCH UNLESS OTHERWISE NOTED.
5. ALL PLANTS, 4 FEET OR LESS APART, WILL BE CONNECTED IN ONE PLANTING BED. ALL GROUPS OF PLANTS SHOULD BE WITHIN ONE PLANTING BED WITH THE EDGE OF MULCH EXTENDING 2 FEET BEYOND THE EDGE OF PLANT MASS. SINGLE TREES SHOULD HAVE A CIRCLE OF MULCH NOT LESS THAN 5 FEET DIAMETER.
6. PLANTING SOIL MIX: MIX EXISTING SOIL WITH THE SOIL AMENDMENTS AND FERTILIZERS IN THE QUANTITIES RECOMMENDED BY A SOIL TESTING LABORATORY. CONTRACTOR SHALL PROVIDE LABORATORY SOIL SAMPLES FOR EACH AREA TO BE DISTURBED.
7. ANY AND ALL SUBSTITUTIONS OF PLANT MATERIAL SHALL BE APPROVED BY LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE. FAILURE IN OBTAINING APPROVAL MAY RESULT IN LIABILITY TO THE CONTRACTOR.
8. THE CONTRACTOR SHALL REPLACE DEAD AND/OR UNHEALTHY PLANT MATERIAL, EXCLUSIVE OF SOD, WITHIN 12 MONTHS OF ACCEPTANCE OF THE INSTALLED MATERIAL FROM THE OWNER OR OWNER'S REPRESENTATIVE.
9. THE CONTRACTOR SHALL PREPARE ALL SEEDED OR SODDED AREAS TO ASSURE THAT THE SUBGRADE HAS BEEN RAKED AND ROLLED TO ACCEPT THE SOD/SEED. ALL SOD/SEED AREAS MUST BE HAND WATERED. ALL SOD SHALL BE PLACED WITH STAGGERED JOINTS AND NO GAPS BETWEEN SOD JOINTS. SOD SHOULD BE ROLLED AFTER INSTALLATION. ALL SEEDED AND/OR SODDED AREAS SHOULD PROVIDE A SMOOTH SURFACE FREE OF DIPS AND UNLEVELED GROUND.
10. THE CONTRACTOR IS RESPONSIBLE FOR HAND WATERING THE INSTALLED PLANT MATERIAL FOR A PERIOD OF 6 MONTHS FROM THE ACCEPTANCE FROM THE OWNER OR OWNER'S REPRESENTATIVE IF IRRIGATION HAS NOT BEEN INSTALLED AT THE TIME OF SUBSTANTIAL COMPLETION. ALL MATERIAL INCLUDING SOD AND SEEDED AREAS SHALL BE HAND WATERED ONCE WEEKLY OR AS NEEDED TO ENSURE SURVIVAL OF PLANTS.
11. CONTRACTOR IS RESPONSIBLE FOR REMOVING TRASH, DEBRIS AND EXCESS MATERIALS FROM THE JOB SITE ONCE THE PROJECT IS COMPLETE. SECURING ANY MATERIALS LEFT ON SITE DURING THE COURSE OF THE PROJECT IS THE CONTRACTOR'S RESPONSIBILITY.
12. ALL DISTURBED AREAS NOT DESIGNATED FOR SOD SHALL BE SEEDED.
13. ALL VEGETATION PROPOSED WITHIN SIGHT DISTANCE AREAS SHALL NOT INTERFERE WITH SIGHT DISTANCE FROM 30" TO 10'.
14. PRIOR TO ANY CLEARING, GRADING, OR CONSTRUCTION ACTIVITY, TREE PROTECTION FENCING SHALL BE INSTALLED. NO CONSTRUCTION WORKERS, TOOLS, MATERIALS OR VEHICLES ARE PERMITTED WITHIN TREE PROTECTION FENCING.

FINAL DESIGN - RELEASED FOR BIDDING ONLY

REVISIONS:

CLIENT INFORMATION:

BECKER MORGAN GROUP
3333 JAECKLE DRIVE, SUITE 120
WILMINGTON, NC 28403

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122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6707 (O) (910) 791-6760 (F)
NC License #: C-2846

LANDSCAPE PLAN

W. BRUNSWICK HIGH SCHOOL IMPROVEMENTS
550 WHITEVILLE RD NW, SHALLOTTE
BRUNSWICK COUNTY, NC 28470

PROJECT STATUS
CONCEPTUAL LAYOUT:
PRELIMINARY LAYOUT:
PERMIT SET:
RELEASED FOR CONST:

DRAWING INFORMATION
DATE: 4/16/20
SCALE: 1" = 60'
DESIGNED: JRC
DRAWN: JRC
CHECKED: AE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 1449 ENGINEER JAMES R. CIRELLO
04/16/20

L-1.0

PEI JOB#: 19249.PE

1.1 "2018 North Carolina State Building Code" and "International Building Code", 2015.

1.2 "Minimum Design Loads for Buildings and other Structures" SEI/ASCE 7–10.

1.3 "Building Code Requirements for Structural Concrete (ACI 318–14)" American Concrete Institute 2014.

1.4 "Manual of Standard Practice", Concrete Reinforcing Steel Institute, latest edition.

1.5 "Specification for Structural Steel Buildings (AISC 360–10)" American Institute of Steel Construction, 2011 – 14th Edition

1.6 "Structural Welding Code – Steel (AWS D1.1)" and "Structural Welding Code – Reinforcing Steel (AWS D1.4)", American Welding Society.

1.7 "Building Code Requirements for Masonry Structures", ACI 530–13, ASCE 5–13, TMS 402–13.

1.8 "Design Manual For Floor Decks and Roof Decks", Steel Deck Institute, latest edition.

1.9 "Standard Specifications for Joist Girders (JG–10)", "Standard Specifications for Open Web Steel Joists, K–Series (k–10)", "Standard Specifications for Long Span Steel Joist, LH Series and Deep Longspan Steel Joists, DLH Series (LH/DLH–1.1)", Steel Joist Institute

2.0 DESIGN LOADS:
Project Located in: Town of Shallotte, County of Brunswick, State of North Carolina.

2.1 Gravity Loads: (Reduced where allowed)

GRAVITY LOADS		
Location	Uniform (psf)	Concentrated (lbs) (Over 2.5'x2.5')
Roof Loads:		
Dead Load	20	
Live Load	20	300
Soffit Dead Load	7	
Floor Loads:		
Dead Loads:	67	
Floor Live Loads:		
First Floor	100	2,000
Classrooms	40	1000
Second Floor Corridor	80	1000
Stairs	100	
Media Center	150	1000
Light Storage	125	

2.2 Drifting Snow Loads per N.C. Building Code.

Pg = 10 psf
I = 1.1
Ce = 0.9
Ct = 1.0

2.3 Risk Category = III

2.4 Wind Loads per N.C. State Building Codes, 2018 edition (IBC 2015) & ASCE 7–10 (3–second gust)

Main Wind Force Resisting System:
V= 156 mph
Exposure Category "B"

Building is enclosed & Internal Pressure coefficient (GCpi) = +0.18 & –0.18
Topographic Factor Kzt = 1.0
Wind Directionality Factor, Kd = 0.85

Calculated Wind Base Shear (For MWFRS)
Vx = 106K Vy = 131K

Components and Cladding:
V 156 mph
Exposure Category "B"

Components and Cladding Wind Pressure (psf)

Walls	Area < 10ft²		< 20ft²		Area < 50ft²		Area < 100ft²		Area < 500ft²	
Zone 4	43.9	-47.5	41.9	-45.6	39.2	-43.0	37.3	-41.0	32.7	-36.4
Zone 5	43.9	-58.7	41.9	-54.7	39.2	-49.5	37.3	-45.6	32.7	-36.4
Roof	**Area < 10ft²**		**Area < 20ft²**		**Area < 50ft²**		**Area < 100ft²**		**Area < 500ft²**	
Zone 1	17.8	-43.9	16.7	-42.7	15.3	-41.3	14.1	-40.1	14.1	-40.1
Zone 2	17.8	-73.6	16.7	-65.7	15.3	-55.3	14.1	-47.5	14.1	-47.5
Zone 3	17.8	-110.7	16.7	-91.7	15.3	-66.6	14.1	-47.5	14.1	-47.5

Notes:
1. Areas noted are effective wind areas as per ASCE 7–10, 26.2 definitions.
2. See figures below for Zone locations.
3. Plus and minus signs signify pressures acting toward and away from surfaces, respectively.
4. Design pressures shown in table are strength design wind pressures. Allowable stress design wind pressures may be calculated by factoring the pressures by 0.6.
5. Design pressures for effective wind areas between those noted in schedule may be interpolated.
6. Tributary area = greater of LxW or LxL/3.
7. Deflections may be calculated based on 42% of these loads.

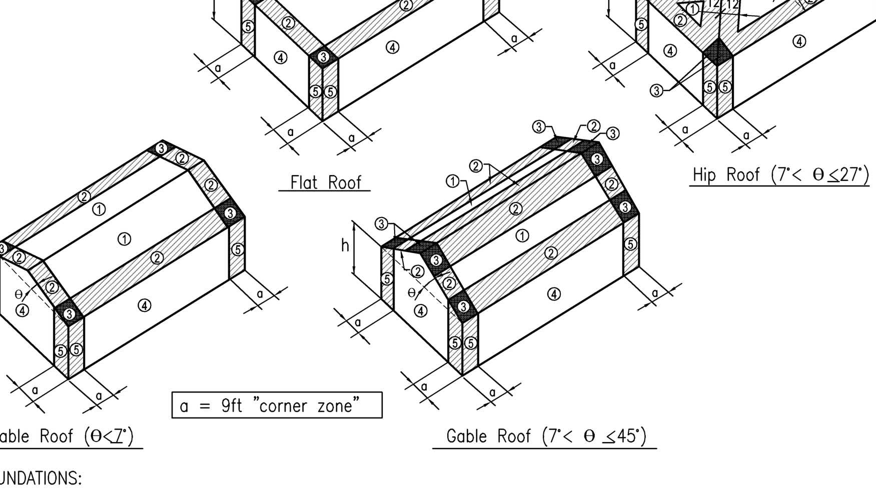
2.5 Seismic Loads per 2018 North Carolina State Building Code (IBC 2015) & ASCE 7–10

Risk Category = III
Site class = "F" (Per Geotechnical Report – spectral response based on site class 'D' per IBC 2015 exception.)
Spectral Response Coefficients:
SDS = 0.311g
SD1 = 0.182g

Seismic Design Category = C
Seismic Importance Factor = 1.25
Basic Seismic – Force – Resisting System
Steel systems not specifically designed for seismic resistance and intermediate reinforced masonry shear walls
RX=RY=3.0, ΩY=3.0, CDY=3.0
Cs = 0.130
Design Base Shear Vx = Vy =118k
Building Height Limit = NL
Analysis Procedure – 12.8.1 ASCE 7–10
Equivalent Lateral Force Procedure

2.6 Guardrail designed per North Carolina State Building Code, Section 1607.8
Guardrail:
Uniform load = 50 plf, any direction – per 1607.8.1
Concentrated load = 200 lbs, any direction – per 1607.8.1.1
Intermediate Rail: (all those expect handrail) per 1607.8.1.2

2.7 Flood Loads:
Project is not located in a flood zone.



3.0 FOUNDATIONS:

3.1 Foundation design is based on geotechnical report #1306–19–016 by SM&E Inc, Wilmington, NC dated August 21, 2019. This report is available in the project specifications book. The recommendations contained in this report are herein made part of the requirements of these contract documents.

3.2 Based on the Geotechnical Report by SM&E Inc, this site has a low to moderate risk of liquifaction during the maximum considered earthquake (MCE). The MCE has a 2% probability of excedance in 50 years or once every 2,500 years. Based on the estaimated total and differential settlements of less than 4 inches and less than 3 inches, respectively, the structure should not collapse. During the design seismic event, the structure should not collapse, however extensive unrepairable damage should be expected unless liquifaction mitigation (i.e earthquake drains) are implemented. The owner should be made aware of the risk associated and determine if liquifaction mitigation should be implemented.

3.3 New footings shall bear on strata capable of sustaining a minimum bearing pressure of 2,500 psf. The bearing capacity shall be verified by a qualified Geotechnical Engineer.

3.4 Top of footing (T/FTG) elevations are shown on the drawings or are to be determined by the Contractor in the field in accordance with the guidelines set forth in the drawings.

3.5 Bottom of exterior footings, grade beams and walls shall bear at a minimum depth of 1'–6" below final grade for frost protection.

3.6 Testing and Inspection:
a. All areas to have slabs on grade shall be proof rolled in accordance with and under observation fo the Geotechnical Engineer and approved prior to preparation for concrete placement.
b. All foundation bearing strata shall be inspected and approved by the Geotechnical Engineer prior to any concrete placement.
c. Geotechnical Engineer shall be the sole judge as to suitability of all foundation and/or slab bearing strata.
d. Footing bearing elevations shall be adjusted in the field as required to meet the design bearing pressures by additional excavation or compaction and/or backfilling or by other means acceptable to the Geotechnical Engineer.

3.7 Undercutting to remove existing fill beneath footings and slab shall be performed at the direction of the Geotechnical Engineer.

3.8 Engineered Fill: All fill material shall be selected in accordance with the Geotechnical Report Material shall be a clean, low plastic soil with a plasticity index less than 30 (less than 15 is preferred), liquid limit less than 50, and unit weight of 120 pcf (+ 5 pcf)

3.9 Compaction: All fill shall be placed in loose lifts not exceeding 8 inches in thickness and compacted to a minimum of 96 percent Standard Proctor (ASTM D–698) except that the top 12 inches shall be compacted to a minimum of 98 percent Standard Proctor. Moisture shall be controlled to within 3 percent above or below optimum content.

3.10 Remove all topsoil and organic materials. The stripping should extend at least 10' beyond the proposed construction limits.

3.11 Subsurface Water: Due to the relatively shallow groundwater encountered, (2'–3' noted during boring) temporary construction dewatering may be necessary to facilitate efficient below–grade construction. Dewatering operations for the majority of the site can be handled by the use of conventional submersible pumps directly in the excavation or temporary trenches or French drains.

3.12 Protection of Foundation Excavations: Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for too long a time. Therefore, foundation concrete should be placed the same day that excavations are made. If the bearing soils are softened by the surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, a 2 to 3–inch "mud mat" of "lean" concrete should be placed on the bearing soils before the placement of reinforcing steel.

4.0 CONCRETE:

4.1 Concrete Strength:
All concrete shall be in accordance with the American Concrete Institute (ACI) 301 and 318.

4.2 Concrete shall have a 28 day compressive strength and density as follows:
a. Footings..........3,000psi, Density = ±145pcf
b. Interior Slab on Grade..........3,000psi, Density = ±145pcf
c. Slab on Deck..........3,000psi, Density = ±145pcf
d. CMU Grout Fill..........3,000psi, Density = ±145pcf, Slump 8"–11" or per structural masonry note 6.5

e. Exterior Slab on Grade..........4,000psi, Density = ±145pcf

4.3 Concrete Mix Designs:
d. Submittals: Submit written reports of each proposed concrete mix not less than 15 days prior to the start of work.
e. Mix designs, including water, cement ratios and slumps, shall be prepared in accordance with ACI 301–05, Section 4, Cement shall conform to ASTM C 150 Type 1 or at contractor's option, ASTM C 595 Type IP where fly ash is permitted. Normal weight aggregate shall conform to ASTM C 33 and light weight aggregate shall conform to ASTM C 330. No admixtures containing calcium chloride shall be permitted in any concrete.
f. Aggregate size shall be #67 stone for supported slabs or other formed concrete elements; #57 stone for slabs on grade and footings or other concrete elements formed from and poured against earth; #89 stone for masonry grout.
g. Water reducing admixture shall be used in all concrete.
h. Air entraining admixture in accordance with ACI 301 shall be used in all concrete exposed freezing and thawing during construction or service conditions.
i. Concrete subjected to freezing/thawing shall have a maximum water/cement ratio of 0.45 and shall contain the amount of air entraining agent specified in ACI 301–05 Section 4.

4.4 Curing:
See specifications for curing method options and apply within two (2) hours after completion of finishing to all concrete flatwork and walls, U.N.O., other than footings and grade beams.

4.5 Use a non–corrosive, non–chloride accelerating admixture in concrete exposed to temperatures below 40 degrees. Uniformly heat the water and aggregates to a temperature of not less than 50 degrees. Place and cure concrete in accordance with ACI 306.

4.6 When hot weather conditions exist, place and cure concrete in accordance with ACI 301. Cool ingredients before mixing to maintain concrete temp. at time of placement below 90 degrees.

4.7 Reinforcing in all abutting concrete, including footings shall be continuous through or around all corners or intersections. Dowels or splices shall be equal in size and spacing to the reinforcing in the abutting members.

4.8 Refer to architectural drawings for door and window openings, drips, reglets, washes, masonry anchors, brick ledge elevations, slab depressions and miscellaneous embedded plates, bolts, anchors, angles, etc.

4.9 Refer to plumbing, mechanical and electrical drawings for underfloor, perimeter and other drains and for sleeves, outlet boxes, conduit, anchors, etc. The various trades are responsible for their items.

4.10 Base plates, anchor rods, support angles and other steel exposed to earth or granular fill shall be covered with a minimum of 3" of concrete.

4.11 Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values equal to ⅗ of the overall flatness and levelness values.
b. The composite F(F) and F(L) numbers shall be measured and reported within 72 hours after completion of slab concrete finishing operations and before removal of any supporting shores.

4.12 Non–shrink grout shall be pre–mixed, non–corrosive, non–metallic, non–staining containing silica sands, Portland cement, shrinkage compensating and water reducing agents. Product shall only require the addition of water. Minimum compressive strength shall be 2500 psi after one day and 7000 psi after 28 days. Grout shall be free of gas producing or air releasing and oxidizing agents and contain no corrosive iron, aluminum or gypsum.

4.13 Provide concrete grout – not mortar – for reinforced masonry lintel and bond beams where indicated on drawing or as scheduled.

4.14 Tolerance for anchor rods and other embedded items shall be per the AISC Code of Standard Practice Section 7.5.

4.15 Unless otherwise shown in the architectural drawings, provide 3/4–inch chamfers at all column, wall, slab or beam edges that are exposed to view in the finished structure.

4.16 Concrete cover for cast–in–place concrete reinforcement:
Concrete cast against & permanently exposed to earth:..........3 Inches
Concrete exposed to earth or weather:
No. 6 through No. 18 Bars:..........2 Inches
No. 5 Bar and smaller:..........1½" Inches
Concrete not exposed to weather or in contact with ground:
Slabs:
No. 11 Bar and smaller:..........¾" Inches

5.0 REINFORCING STEEL:

5.1 Reinforcing shall be domestic new billet steel conforming to ASTM A615, Grade 60 or 60S including stirrups and ties, except that reinforcing which is required to be welded shall conform to ASTM A706.

5.2 Field bending of concrete reinforcing steel is not permitted.

5.3 Welded wire mat and fabric shall conform to ASTM A184 and A185 respectively and shall be provided in flat sheets. Welded wire mat/fabric shall be lapped 0'–6" at all splices.

5.4 Bar Splices:

	f'c = 3,000psi		f'c = 4,000psi		f'c = 5,000psi	
Bar Size	**Ld (in)**	**Class "B" Lap Splice (in)**	**Ld (in)**	**Class "B" Lap Splice (in)**	**Ld (in)**	**Class "B" Lap Splice (in)**
#3	17	22	15	19	13	17
#4	22	29	19	25	17	23
#5	28	36	24	31	22	28
#6	33	43	29	37	26	34
#7	48	63	42	54	38	49
#8	55	72	48	62	43	56

1. Values are based on normal weight concrete.
2. Ld = minimum embed of rebar
3. Class "B" lap splice refers to minimum distance bars must be lapped for a full tension splice.

6.0 STRUCTURAL MASONRY:

6.1 All structural masonry shall conform to ACI 530 standards as appropriate to the material.

6.2 Concrete Masonry Units (CMU):
a. Units shall be lightweight cellular units conforming to ASTM C 90, Grade N–2. Concrete masonry net area unit strength shall be no less than 2000 psi in accordance with ASTM C 140, with a unit weight not exceeding 95 pcf.
b. Design compressive strength of CMU (fm) = 2000 psi.

6.3 Mortar shall conform to ASTM C 270. Mortar shall be type "S" and shall conform to the ASTM C270 proportion requirements.

6.4 Neither type "N" mortar nor masonry cement shall be used as part of the lateral force resisting system.

6.5 Grouting:
a. Grout shall conform to ASTM C476 as specified by proportion. Masonry grout shall conform to the ASTM proportion requirements for coarse grout with a slump of 8 to 11 inches. Contractor may substitute grout with pea gravel concrete masonry fill, see note 4.2 this sheet.
b. All bond beams shall be filled with grout and reinforced as indicated on the drawings (details or schedules). Mortar fill is not permitted.
c. All masonry wall cells or cavities indicated as reinforced shall be grouted for the full height of the wall, unless specifically noted otherwise on the drawings. Unreinforced walls indicated as grouted shall be grouted full height, unless specifically noted otherwise. Mortar fill is not permitted.
d. All masonry cells or cavities below grade shall be grouted solid unless specifically noted otherwise on the drawings. Mortar fill is not permitted.
e. Vertical grouting shall be low lift or high lift as follows:
(1) Low lift grouting shall be used for all cavity walls and may be used for all walls at the option of the Contractor. Lifts shall not exceed 4'–0" in height.
(2) High lift grouting is permissible only for filling of cellular masonry units and shall not exceed 12'–8" in height. Clean out holes shall be provided at the base of each grouted cell.
f. Grouting shall be stopped 1–1/2" below the top of a course to form a key at the joint.
g. Grouting of masonry beams or lintels shall be done in one continuous operation.

6.6 Masonry Reinforcing:
a. Foundation dowels may slope a maximum of 1:6 to align with wall cavities or vertical CMU cores. Greater slopes will require replacement of the foundation dowels.
b. Spliced reinforcing shall be lapped a length calculated per IBC 2107.5 OR 15" OR as shown on drawings, whichever is greatest. All splices shall be wired together.
c. Vertical reinforcing bars shall have a minimum clearance of ¾" from masonry and shall be held in position top and bottom and at intervals not exceeding 4'–0". Accessories for such support shall be used. Provide "AA Wire Products Company" (or approved equal) Rebar Positioner AA225 or AA239 for vertical bars and AA238 for horizontal bars or approved equal products from other suppliers.
d. Horizontal joint reinforcing shall be lapped no less than 6" all splices, including corners and tees where no control joint is used.
e. All horizontal joint reinforcing shall stop at control joints.
f. Horizontal reinforcing in bond beams shall be continuous through control joints.
g. All CMU walls shall have joint reinforcing @ 16"o.c. All joint reinforcing shall have (2) 9 gauge (0.148"ø or W1.7) side rods and cross rods @ 16"o.c.

6.7 Masonry contractor shall provide for and coordinate with other trades for placement of all items to be embedded or built into the masonry.

MINIMUM SPLICING LENGTH (L_d) FOR MASONRY	
BAR SIZE	SPLICE LENGTH
#3	16"
#4	22"
#5	26"
#6	43"
#7	60"

7.0 STRUCTURAL STEEL:

7.1 All structural steel shall be of the grades indicated below, unless noted otherwise on plans or details.
Rolled shapes ASTM A992 Gr. 50
Steel pipe ASTM A53, Type E or S, Grade B, Fy–35ksi
Structural tubing ASTM A500, Grade B, Fy–46ksi
Plates and bars ASTM A36 U.N.O.
Anchor rods ASTM F1554, Grade 36 U.N.O.
Miscellaneous ASTM A36 U.N.O.

7.2 All structural steel shall be detailed, fabricated and erected in accordance with the AISC Code of Standard Practice. The fabricator is responsible for the design of connections not shown on the structural drawings. For the purpose of the connection design, the fabricator shall retain a professional engineer registered in the state where the project is located. The engineer shall seal and sign each shop drawing containing connection design. A note shall accompany the drawings stating that the seal is for "connection Design Only".

7.3 Connection Design:
a. Generally, connections shown on the drawings are schematic and are intended to show the relationship of the members.
b. Connections shall be designed for one–half (1/2) the allowable uniform load on the member, as defined in Part 3, "Allowable Loads on Beams" tables in the AISC "Manual of Steel Construction", 13th Edition, Allowable Stress Design or for the reactions as shown on the drawings or a minimum of 10 kips, whichever is greatest.

7.4 Bolted connections:
a. Bearing type connections shall be snug tight with A325N or A490N bolts, U.N.O. Oversized and long–slotted holes are NOT permitted U.N.O. At single shear plate connections, provide bearing type fasteners with horizontal short slotted holes. All bolts shall be snug tight. DO NOT over torque bolts.
b. Protruding bolt heads, shafts or nuts shall not extend nor prohibit the application of architectural finishes or placement of steel deck at its correct location and elevation.
c. Connection designer is responsible for verifying the axial capacity after a section is reduced for bolt holes. Member size may be increased or plates added to maintain required capacity.
d. Bolted connections shall be assembled and inspected in accordance with RCSC–2009 (Specification for Structural Joints Using High–Strength Bolts).

7.5 Welded connections:
a. All welding shall be in accordance with the "Structural Welding Code – Steel" (AWS D1.1) of the American Welding Society, Latest Edition.
b. Electrodes for welding shall comply with the requirements of Table 4.1.1 of the AWS code.
c. At Moment Connections and Braced Frames Provide filler Metal that has a minimum CVN Toughness of 20 ft–lbs at minus 20 degrees F, As determined by AWS classification or Manufacturer Certification.
d. Proof of welder certification shall be available at the job site during times of inspection.

7.6 Minimum plate thickness shall be 3/8" U.N.O.; minimum bolt diameter shall be 3/4–inch U.N.O.; minimum shop weld shall be 3/16" and minimum field weld shall be 1/4–inch U.N.O.

7.7 All re–entrant corners (such as copes and blocks) shall be cut and shaped notch free with a radius of at least 1/2–inch.

8.0 COMPOSITE BEAMS:

8.1 Composite beams and girders DO NOT require temporary shoring for construction loads (wet concrete + 20 psf) U N O on the drawings. Contractor is responsible for verifying the construction load imposed on the structure. Where questions as to capacity arise, Contractor shall inform the Structural Engineer prior to proceeding with any work.

8.2 See details on S1.02 for typical stud layouts.

8.3 The number of shear connectors (studs) shown is based upon obtaining the full horizontal shear capacity indicated on the AISC "Load and Resistance Factor Design Specification for Steel Buildings" (LRFD) Chapter "I" for each stud for the strength and density of concrete where used. See composite steel deck notes also.

8.4 Studs shall be 3/4–inch diameter and shall extend not less than 1–1/2 inches above the top of the steel deck and shall not have less than 1/2–inch concrete cover above top of stud after welding and shall conform to ASTM A108.

8.5 The number of studs on a beam or between any two connections along a beam is shown on the drawings. Spacing of studs within the length shown shall be as uniform as possible.

8.6 No shop paint shall be applied to any studs nor to top flanges or surfaces of members receiving field welds.

8.7 Stud capacity varies with the type and length of the stud and with the properties of the composite deck. The deck supplier shall provide deck with a configuration that does not reduce the stud capacity per AISC requirements.

8.8 Stud type, length, shear value and detailed layout shall be submitted with the composite metal deck shop drawings.

8.9 Break ceramic ferrules (arc shields) loose and remove from deck.

8.10 A stud shear connector welded through the metal deck may take the place of a 3/4–inch puddle weld in order to secure the deck to the steel framing. Do not weld shear connectors through two layers (lapped ends) of deck units.

9.0 STEEL DECK:

9.1 Steel roof deck shall be galvanized, Type B, 1 1/2" deep, 20 gauge, U.N.O.

9.2 For steel roof deck spans, mechanically fasten side laps at mid–span using "Buildex", self–tapping TEKS No. 10 or larger machine screws or as noted on plan.
Provide additional sidelap fasteners where noted on plan.
Fasten roof deck to supporting members as noted on plan.

9.3 Do not hang pipes or ducts from steel roof deck. Fasten roof deck to supporting members as noted on plan.

9.4 COMPOSITE FLOOR DECK:

a. Deck shall be 2" – 20 gauge, galvanized, composite floor deck. Vulcraft 2VLI20 or approved equal.
b. Deck shall be galvanized per ASTM A924–94 (G60)
c. Fasten composite floor deck to supporting members by not less than 3/4–inch puddle welds or elongated welds of equal perimeter, spaced not more than 12" o.c. with a minimum 2 welds per unit at each support.

10.0 LIGHT GAUGE STEEL FRAMING (DIETRICH):

10.1 All members shall be designed in accordance with the American Iron and Steel Institute (AISI) "Specifications for the Design of Cold–formed Steel Structural Members", Latest Edition.

10.2 All framing members shall be formed from corrosion–resistant steel corresponding to the requirements of ASTM A446, with a minimum yield strength of 33 ksi for joists and studs and 33 ksi for runners. All exterior tracks, studs and roof trusses to have G90 Galvanization.

10.3 All members shown are standard designations of "Dietrich Industries, Inc."

10.4 Design of members indicated in structural drawings is based on minimum properties of products produced by "Dietrich Industries." No substitution of materials is acceptable for use without prior approval of the structural engineer. Substitutions shall meet or exceed all properties produced by "Dietrich Industries, Inc."

10.5 All shop drawing submittals shall show layout, spacing, sizes, thicknesses and types of cold–formed metal framing, fabrication, and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details and attachment to adjoining work.

10.6 Shop drawings, design calculations and other structural data shall be prepared and sealed by a qualified engineer. The Structural Engineer shall be legally qualified to practice in the jurisdiction where the project is located and shall be experienced in providing engineering services of the kind indicated.

10.7 All framing components shall be cut squarely for attachment to perpendicular members or as required for an angular fit tight against abutting members. All load bearing stud/walls shall be factory assembled into panels with studs bearing squarely and fully in top and bottom tracks.

10.8 Fastening components shall be by self–drilling screws or by welding as defined below UNO on the drawings.

10.9 Screwed connections:
a. Screws shall be type S–12 or type S–4 for all framing members per manufacturer's recommendations.
b. A minimum of three (3) exposed threads shall penetrate through at joined materials.
c. Corrosion–resistant cadmium–plated screws shall be used for screws attaching metal lath, masonry ties, and other exterior materials.

10.10 Welded connections:
a. Gas metal arc welding (GMAW) shall be used for 20 ga. Or lighter members. AWSE–705–3, E–705–E, E–705–6 wire electrodes .030"–.035" diameter shall be used with carbon dioxide, argon–oxygen or argon–carbon dioxide shielding. Welding equipment 60–100 amperes at 25 volts using 220–volt 3–phase electric service.
b. Shielded metal arc welding (SMAW) shall be used for 18 ga' and heavier members. AWS E–6012, E–6013, or E–7014 electrodes of 3/32" or 1/8" diameter shall be used. Welding equipment heat setting shall be varied dependent on material thickness.
c. All welds shall be touched up with zinc rich paint, or paint similar to that used by the framing member manufacturer.

10.11 Alignment of studs (plumbness) and walls (straightness) shall be within 1/960 of their respective heights and lengths.

10.12 Studs shall be plumbed, aligned, and securely attached to top and bottom runners. Splices in studs are not permitted.

10.13 Where manufacturer's recommendations for erection, attachment, assembly, bracing, alignment, or other installation, or assembly requirements are more stringent than indicated in these drawings, the manufacturer's recommendations shall apply.

STEEL THICKNESS						
Gauge:	Mils	Design Thickness		Minimum Thickness		Yield Strength
		Inches	mm	Inches	mm	ksi
20	33	0.0346	0.879	0.0329	0.836	33
18	43	0.0451	1.146	0.0428	1.087	33
16	54	0.0566	1.438	0.0538	1.367	50
14	68	0.0713	1.811	0.0677	1.720	50
12	97	0.1017	2.583	0.0966	2.454	50

11.0 POST–INSTALLED ANCHORS:

11.1 Except where indicated on the drawings, post–installed anchors shall consist of the following anchor types as provided by HILTI, Inc. Contact HILTI at (800) 879–8000 for product related questions.

Anchorage to Concrete
a. Adhesive anchors for cracked and uncracked concrete use:
1. HILTI HIT–HY 200 Safe Set System with HILTI HIT–Z Rod per ICC ESR–3187 (pending).
2. HILTI HIT–HY 200 Safe Set System with HILTI Hollow Drill Bit System with HAS–E threaded rod per ICC ESR–3187.
3. HILTI HIT–RE 500–SD Epoxy Adhesive Anchoring system with HAS–E threaded rod per ICC ESR–2322 for slow cure applications.

b. Medium duty mechanical anchors for cracked and uncracked concrete use:
1. HILTI KWIK HUS EZ and KWIK HUS EZ–I Screw Anchors per ICC ESR–3027
2. HILTI KWIK BOLT–TZ Expansion Anchors per ICC ESR–1917
3. HILTI KWIK Bolt 3 Expansion Anchors (uncracked concrete only) per ICC ESR–2302

c. Heavy duty mechanical anchors for cracked and uncracked concrete use:
1. HILTI HDA Undercut Anchors per ICC ESR 1546
2. HILTI HSL–3 Expansion Anchors per ICC ESR 1545

Rebar Doweling into Concrete
a. Adhesive anchors for cracked and uncracked concrete use:
1. HILTI HIT–HY 200 Safe Set System with HILTI Hollow Drill Bit System with continuously deformed rebar per ICC ESR–3187.
2. HILTI HIT–RE 500–SD Epoxy Adhesive Anchoring System with continuously deformed rebar per ICC ESR–2322.

Anchorage to Solid Grouted Masonry
a. Adhesive Anchors use:
1. HILTI HIT–HY 70 Masonry Adhesive Anchoring System (ICC pending).
2. Steel anchor element shall be HILTI HAS–E continuously threaded rod or continuously deformed steel rebar.
b. Mechanical Anchors use:
1. HILTI KWIK BOLT–3 Expansion Anchors per ICC ESR 1385.

Anchorage to Hollow/Multi–wythe Masonry
a. Adhesive Anchors use:
1. HILTI HIT–HY 70 Masonry Adhesive Anchoring System per ICC ESR–3342.
2. Steel anchor element shall be HILTI HAS–E continuously threaded rod or continuously deformed steel rebar.
3. The appropriate size screen tube shall be used per adhesive manufacturer's recommendation.

11.2 Anchor capacity used in design shall be based on the technical data published by HILTI or such other method as approved by the Structural Engineer of record. Substitution requests for alternate products must be approved in writing by the Structural Engineer of record prior to use. Contractor shall provide calculations demonstrating that the substituted product is capable of achieving the performance values of the specified product. Substitutions will be evaluated by their having and ICC ESR showing compliance with the relevant building code for seismic uses, load resistance, installation category, and availability of comprehensive installation instructions. Adhesive anchor evaluation will also consider creep, in–service temperature and installation temperature.

11.3 Install anchors per the manufacturer instructions, as included in the anchor packaging.

11.4 Overhead adhesive anchors must be installed using the HILTI PROFI System.

11.5 The contractor shall arrange an anchor manufacturer's representative to provide onsite installation training for all of their anchoring products specified. The Structural Engineer of record must receive documented confirmation that all of the contractor's personnel who install anchors are trained prior to the commencement of installing anchors.

11.6 Anchor capacity is dependant upon spacing between adjacent anchors and proximity of anchors to edge of concrete. Install anchors in accordance with spacing and edge clearances indicated on the drawings.

11.7 Existing reinforcing bars in the concrete structure may conflict with specific anchor locations. Unless noted on the drawings that the bars can be cut, the contractor shall review the existing structural drawings and shall undertake to locate the position of the reinforcing bars at the locations of the concrete anchors, by HILTI FERROSCAN, GPR, X–ray, chipping or other means.

12.0 CONSTRUCTION AND SAFETY:

12.1 Woods Engineering P.A.'s responsibility is limited to the details and information shown on these drawings. It is the responsibility of the Contractor to provide adequate safety measures required by local codes as well as OSHA Standards for the Construction Industry.
This should include, but not be limited to the following:
Shoring to protect new as well as existing structures.
Necessary Scaffolding.
Material Handling Equipment.
Trench Boxing.

13.0 SPECIAL INSPECTIONS:

13.1 Refer to Specification Section 014533 for all Special Inspections requirements.

14.0 SHOP DRAWING SUBMITTAL:

14.1 See Project Manual

14.2 Contractor shall submit Electronic copies (PDF format) of each shop drawing for review. Shop drawings shall be reviewed by the Contractor prior to submission to the Engineer. The Contractor shall allow 10 working days for shop drawing approval.

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ABBREVIATIONS

@	AT
&	AND
AB	ANCHOR BOLTS
ACI	AMERICAN CONCRETE INSTITUTE
ADDL	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
ALT	ALTERNATE
ARCH	ARCHITECTS – ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
B, BOTT	BOTTOM
BCX	BOTTOM CHORD EXTENSION
BFF	BELOW FINISHED FLOOR
BLDG	BUILDING
BM	BEAM
BOS	BOTTOM OF STEEL
BRG	BEARING
BTWN	BETWEEN
CJ	CONTRACTION JOINT
CL	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNITS
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST JT	CONSTRUCTION JOINT
CONT	CONTINUOUS
CONTR	CONTRACTOR
CSJ	COMPOSITE STEEL JOIST
CTRD	CENTERED
DBA	DEFORMED BAR ANCHOR
DD	DELEGATED DESIGN
DEFL	DEFLECTION
DEPR	DEPRESSION – DEPRESSED
DET	DETAIL
DIAG	DIAGONAL
ø	DIAMETER
DIM	DIMENSION
DIST	DISTANCE
DWG(S)	DRAWING(S)
DWL(S)	DOWEL(S)
EA	EACH
ELEV	ELEVATION
EMBED	EMBEDDED – EMBEDMENT
ENG	ENGINEER
EOR	ENGINEER OF RECORD
EQ	EQUAL
EQUIP	EQUIPMENT
EF	EACH FACE
EJ	EXPANSION JOINT
EOD	EDGE OF DECK
EOS	EDGE OF SLAB
EOW	EDGE OF WALL
EW	EACH WAY
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
FDN	FOUNDATION
FFE	FINISHED FLOOR ELEVATION
FS	FAR SIDE
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GT	GIRDER TRUSS
HD	HEADED
HI	HIGH
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL SECTION
HT	HIP TRUSS
IFM	INSIDE FACE OF MASONRY
INT	INTERIOR
JBE	JOIST BEARING ELEVATION
JT	JOINT
K	KIP–S
KB	KICKER BRACE
KSI	KIPS PER SQUARE INCH
(L)	LONG SIDE REINFORCEMENT
LB	LONG BAR
LBS	POUNDS
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LO	LOW
LOC	LOCATION
LWC	LIGHT WEIGHT CONCRETE
MAX	MAXIMUM
MC	MOMENT CONNECTION
MECH	MECHANICAL
MFR	MANUFACTURER
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MOW	MIDDLE OF WALL
MP	MASONRY PILASTER
d	NAILS – PENNY
No	NUMBER
NS	NEAR SIDE
NTS	NOT TO SCALE
NWC	NORMAL WEIGHT CONCRETE
OC	ON CENTER
OFB	OUTSIDE FACE OF BRICK
OFM	OUTSIDE FACE OF MASONRY
OFS	OUTSIDE FACE OF STUD
OPNG	OPENING
OPP	OPPOSITE HAND
PEBS	PRE–ENGINEERED BUILDING SUPPLIER
PED	PEDESTAL
PL	PLATE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSL	PARALLEL STRAND LUMBER
PLF	POUNDS PER LINEAR FOOT
PT	PRESSURE TREATED
REF	REFERENCE
REINF	REINFORCING
REQD	REQUIRED
(S)	SHORT SIDE REINFORCEMENT
SB	SHORT BAR
SCHD	SCHEDULE
SF	STEP FOOTING
SIM	SIMILAR
SOG	SLAB ON GRADE
SPEC(S)	SPECIFICATION(S)
SPF	SPRUCE PINE FUR
SQ	SQUARE
STD	STANDARD
STIFF	STIFFENER
STIRR	STIRRUP
STL	STEEL
STR	STRUCTURAL
SW	SHEAR WALL
SYP	SOUTHERN YELLOW PINE
T	TOP
TCX	TOP CHORD EXTENSION
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TOW	TOP OF WALL
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VB	VEHICLE BARRIER
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WITH
WWF	WELDED WIRE FABRIC

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FOR BIDDING
NOT FOR CONSTRUCTION
ISSUED: 04.16.2020

WOODS ENGINEERING, P.A. CORPORATE SEAL No. C-1806 NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 041563 ENGINEER ADAM L SISK

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD, N.W.
SHALLOTTE, N.C. 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

GENERAL NOTES

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 1 1/2" = 1'-0"
DRAWN BY: Author PROJ MGR: Checker

S101

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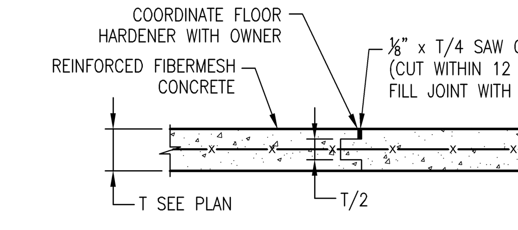

CONSTRUCTION JOINT
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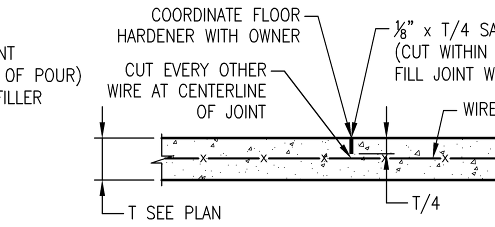

CONTRACTION JOINT
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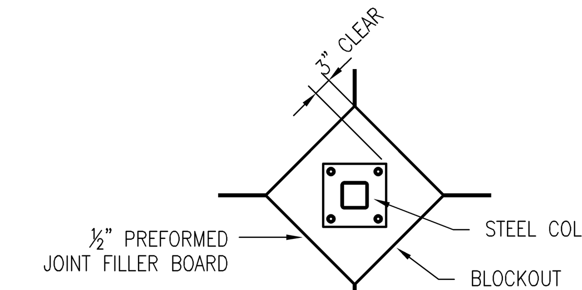
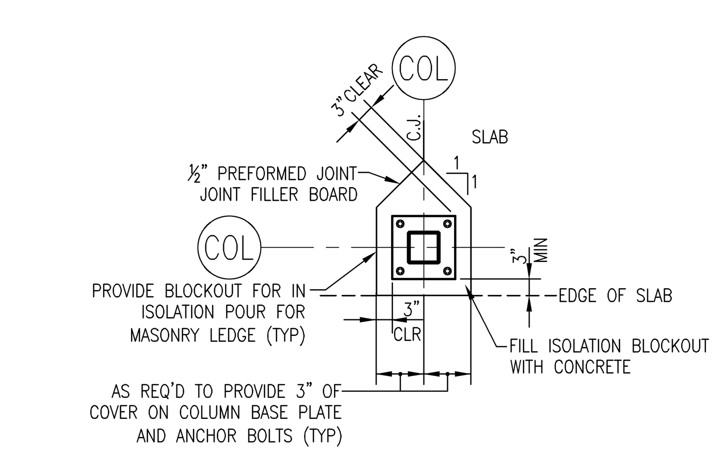
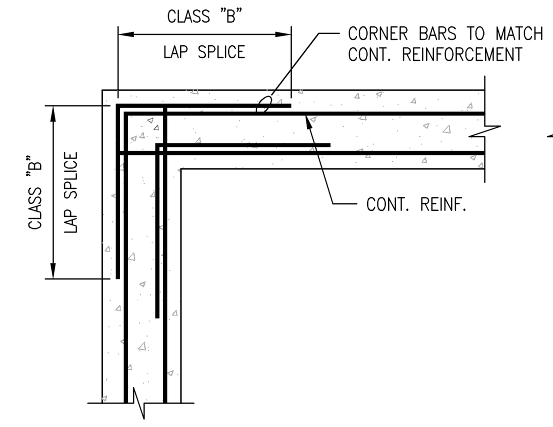


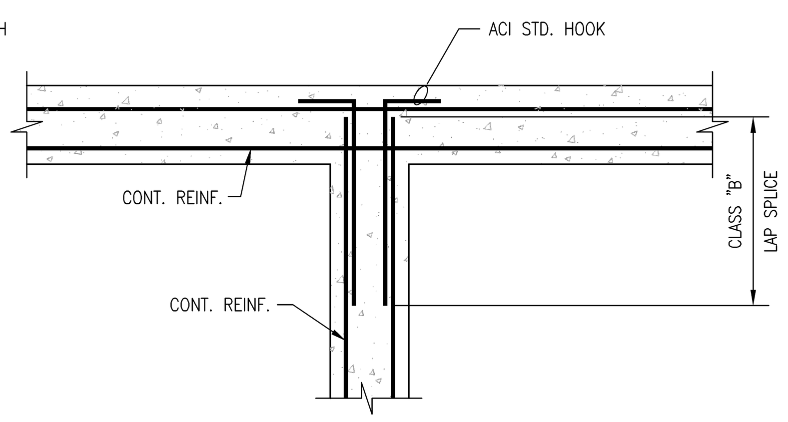
ISOLATION JOINT DETAIL
NOT TO SCALE



TYPICAL ISOLATION JOINT AT SLAB EDGE
NOT TO SCALE

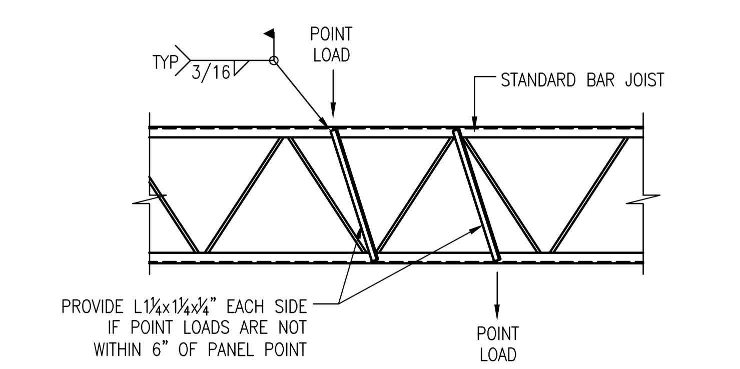


@ FOOTING CORNERS

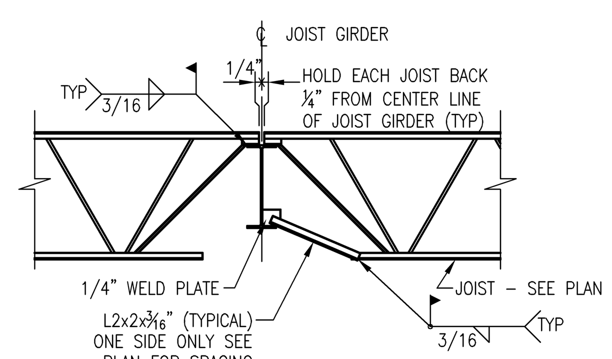


@ FOOTING INTERSECTION

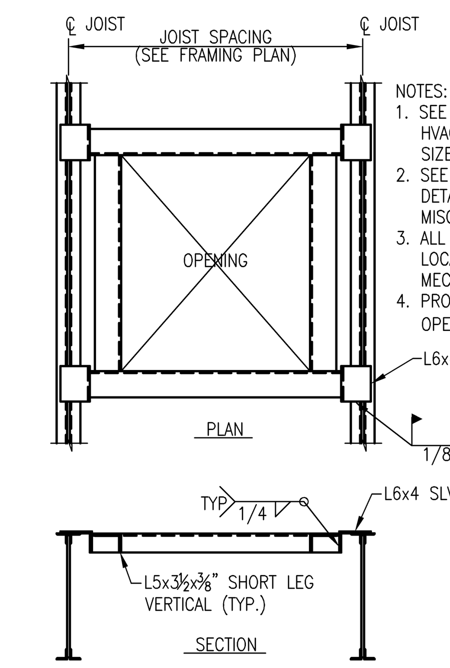
TYPICAL CORNER REINFORCING FOR CONCRETE FOOTINGS
SCALE: 3/4" = 1'-0"



DETAIL OF TYPICAL JOIST REINFORCEMENT
NOT TO SCALE

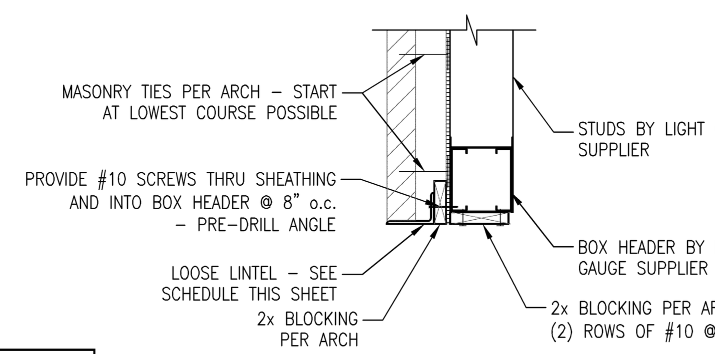


SECTION "A"
SCALE: 1/2" = 1'-0"
GIRDER BOTTOM FLANGE (BRACE TYP.)

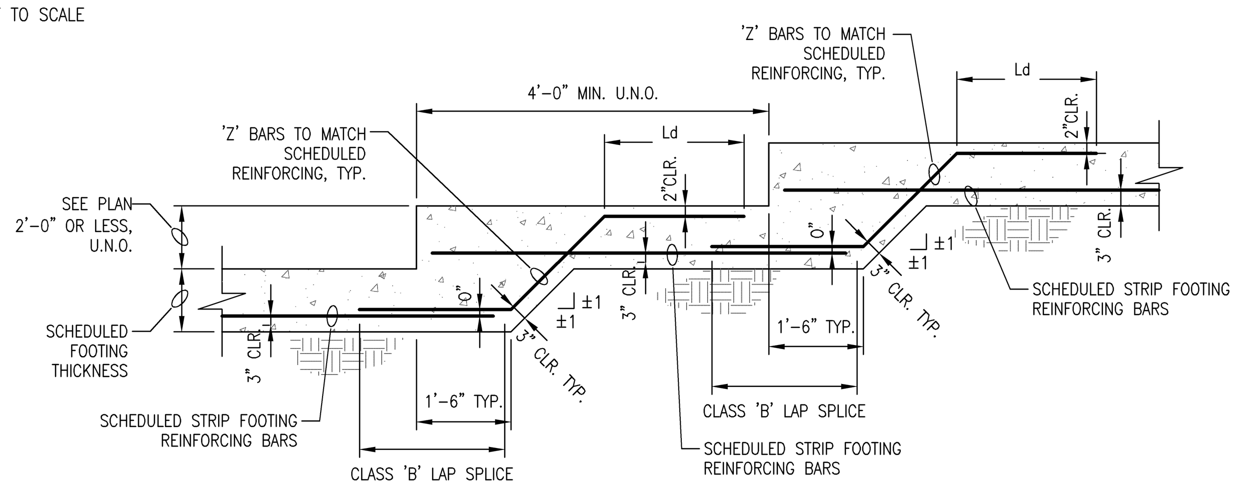


NOTES:
1. SEE ARCHITECTURAL, MECHANICAL AND HVAC DRAWINGS FOR ROOF OPENING SIZES AND LOCATIONS.
2. SEE ARCHITECTURAL DRAWINGS FOR DETAILS OF CURBING AND MISCELLANEOUS STEEL.
3. ALL ROOF OPENING SIZES AND LOCATIONS SHALL BE VERIFIED WITH MECHANICAL CONTRACTOR.
4. PROVIDE SUPPORT FRAMING FOR ROOF OPENINGS 12"x12" AND LARGER.

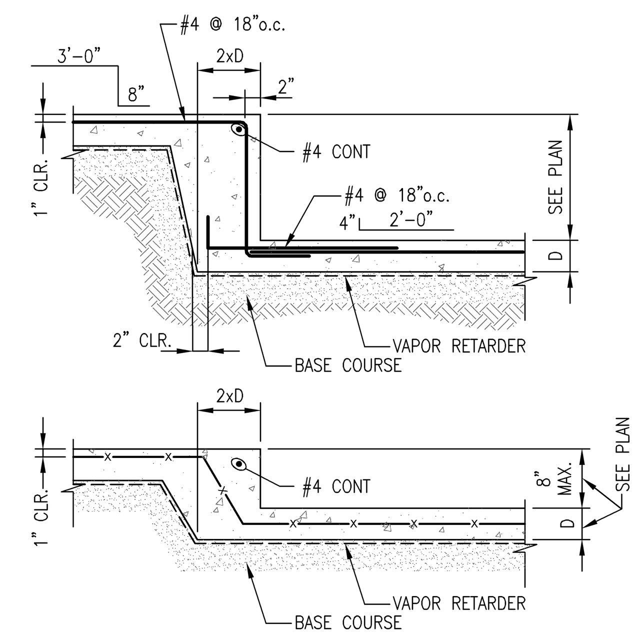
DETAIL OF TYPICAL ROOF OPENING
NOT TO SCALE



LOOSE LINTEL DETAIL
SCALE: 3/4" = 1'-0"



STEP FOOTING DETAIL
SCALE: 1/2" = 1'-0"



TYPICAL SLAB STEP
SCALE: 3/4" = 1'-0"

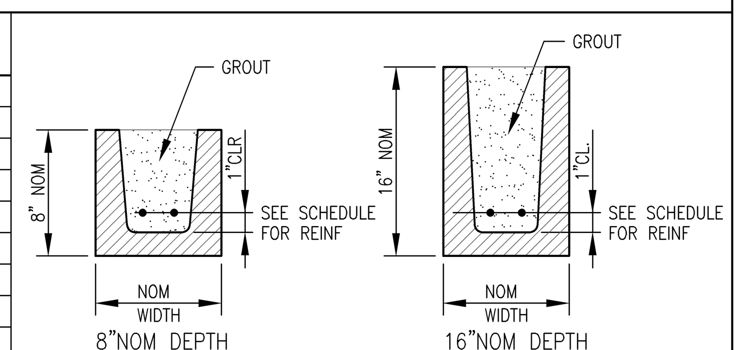
STEEL LINTEL SCHEDULE

CLEAR OPENING	ONE ANGLE FOR EA 4"WYTHE	MIN BRG	MAX. HEIGHT OF BRICK
0'-8" TO 6'-0"	∠6" x 4" x 5/16" LLH	8"	9'-0"
6'-0" TO 8'-0"	∠6"x6"x5/16"	8"	9'-0"
8'-0" TO 12'-0"	∠8"x6"x7/16" LLV	8"	9'-0"

NOTES:
1. WHERE LINTELS BEAR ON HOLLOW MASONRY UNITS FILL ALL CORES UNDER BEARING WITH GROUT FROM BOTTOM OF LINTEL TO 16" MINIMUM BELOW.
2. THESE LINTELS ARE NOT DESIGNED FOR MASONRY WALLS THAT CARRY FLOOR OR ROOF LOAD.
3. LINTELS ARE DESIGNED TO CARRY THE MAXIMUM HEIGHT OF BRICK LISTED IN SCHEDULE. IF STACKED BRICK HEIGHT EXCEEDS LISTED VALUE, THEN CONTACT STRUCTURAL ENGINEER FOR ALTERNATE DESIGN.
4. ALL STEEL LINTELS SHALL BE HOT DIP GALVANIZED AND PAINTED.
5. SEE LOOSE LINTEL DETAIL THIS SHEET FOR REQUIREMENTS

NON LOAD BEARING CMU LINTEL SCHEDULE

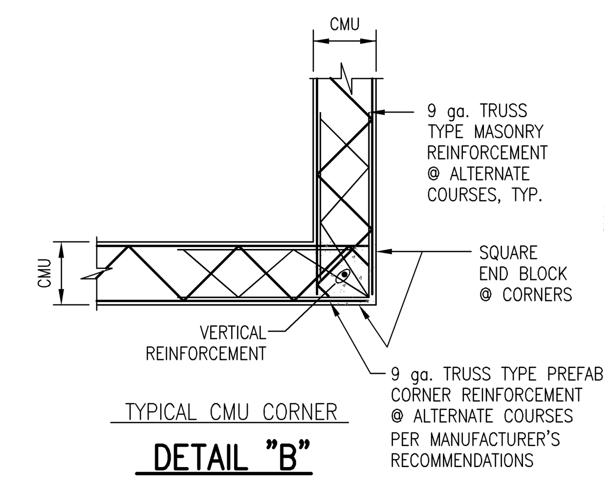
CLEAR OPENING	DEPTH	REINFORCING 6" CMU	8" CMU	12" CMU	MIN. BRG.
0'-8" TO 3'-4"	8"	1#4	1#4	2#5	8"
3'-4" TO 4'-8"	8"	1#4	1#4	2#5	8"
4'-8" TO 6'-0"	8"	1#4	1#5	2#5	8"
6'-0" TO 8'-0"	8"	1#4	2#5	2#5	8"
8'-0" TO 10'-0"	16"	1#4	2#5	2#5	12"
10'-0" TO 12'-0"	16"	–	–	2#5	12"



NOTES:
1. BEAR REINFORCING 4" (MIN) EACH END.
2. FILL BLOCK CORES WITH GROUT TO A DEPTH OF 48"(MIN) BELOW LINTEL BEARING.
3. SEE BEAM SCHEDULE FOR LINTELS FOR CLEAR SPANS OVER 12' AND LINTELS SUPPORTING FLOOR OR ROOF LOADS.
4. THESE LINTELS ARE NOT DESIGNED FOR MASONRY WALLS THAT CARRY FLOOR OR ROOF LOAD.

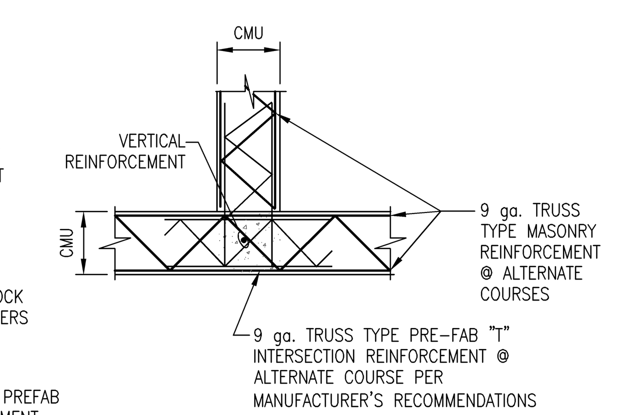
LOCATE CMU CONTROL JOINTS AS FOLLOWS:

1. AT MAXIMUM SPACING OF 25' OR 3 TIMES THE WALL HEIGHT. COORDINATE CONTROL JOINT LOCATIONS W/ ARCHITECTURAL PLANS.
2. AT ALL ABRUPT CHANGES IN WALL HEIGHT.
3. AT ALL CHANGES IN WALL THICKNESS, SUCH AS AT PIPE AND DUCT CHASES AND ADJACENT TO COLUMNS OR PILASTERS.
4. CENTERED OVER JOINTS IN FOUNDATIONS AND FLOORS.
5. CENTERED BELOW JOINTS IN ROOFS AND FLOORS THAT BEAR ON CMU WALLS.
6. AT A DISTANCE NOT OVER ONE-HALF THE REQUIRED JOINT SPACING FROM BONDED WALL INTERSECTIONS, CORNERS OR CHANGES IN WALL DIRECTION.
7. DO NOT PROVIDE CONTROL JOINTS IN CMU SHEAR WALLS.



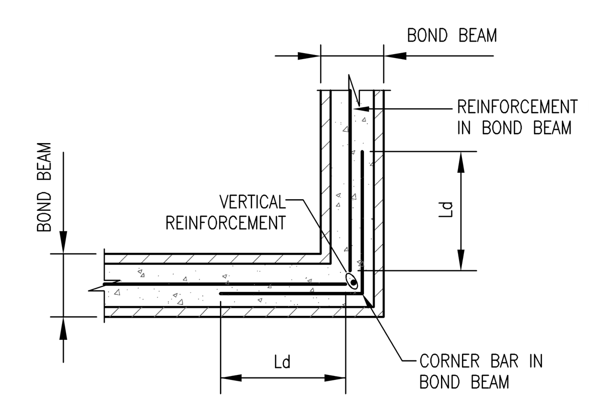
TYPICAL CMU CORNER

DETAIL "B"
SCALE: 3/4" = 1'-0"



TYPICAL CMU INTERSECTION

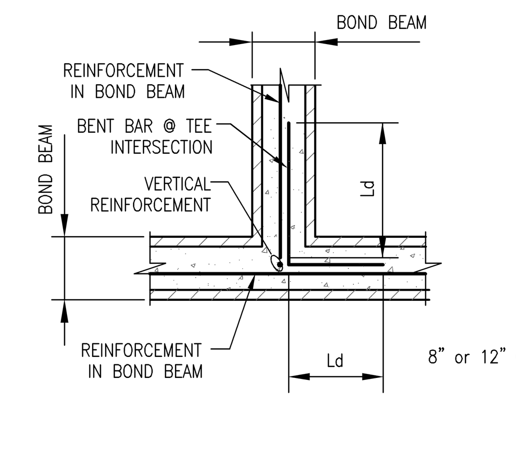
DETAIL "C"
SCALE: 3/4" = 1'-0"



TYPICAL BOND BEAM REINFORCING

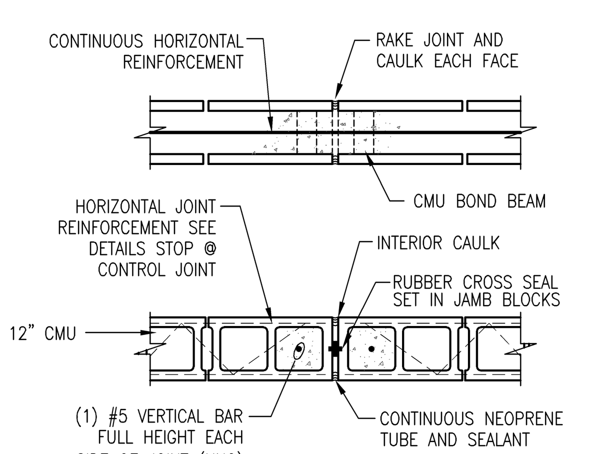
DETAIL "D"
SCALE: 3/4" = 1'-0"

NOTE: TRUSS TYPE REINFORCEMENT SHOWN, HOWEVER LADDER OR TRUSS TYPES ARE ACCEPTABLE.



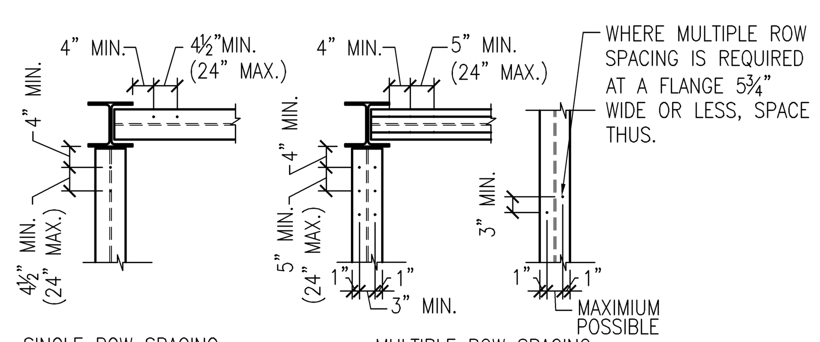
TYPICAL BOND BEAM INTERSECTION REINFORCING

DETAIL "E"
SCALE: 3/4" = 1'-0"



TYPICAL CONTROL JOINT

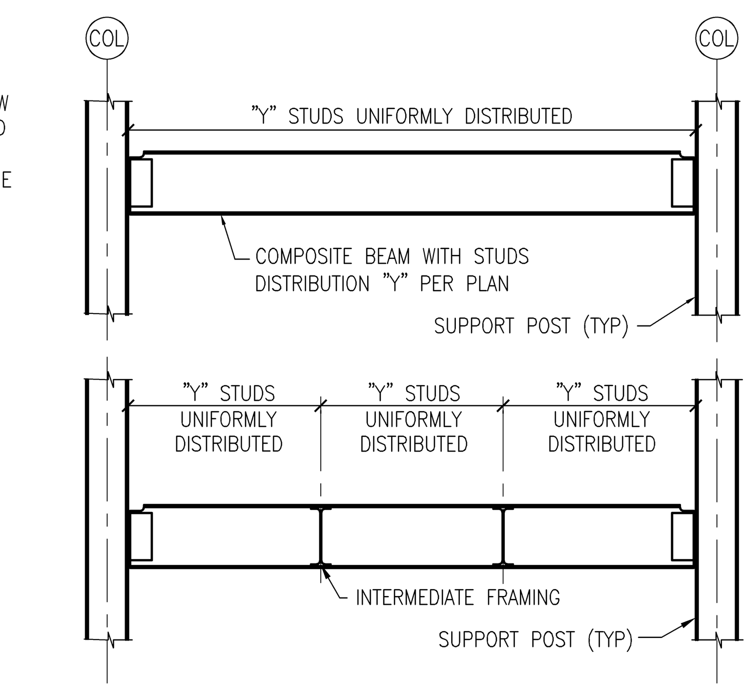
DETAIL "F"
SCALE: 3/4" = 1'-0"



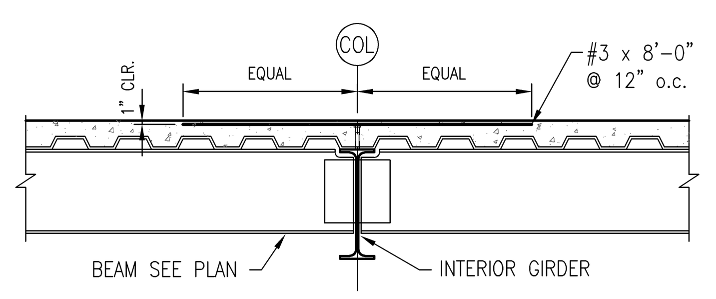
SINGLE ROW SPACING
USE SINGLE ROW SPACING EXCEPT WHEN REQUIRED BY FIELD CONDITIONS.

MULTIPLE ROW SPACING
NOTE: WHERE DECK IS CONTINUOUS OVER THE BEAMS THE DECK VALLEYS MAY CONTROL & POSSIBLY DICTATE SPACING. DECK SUPPLIER SHALL COMPLY W/ STUD CAPACITY REDUCTIONS REQUIRED TO EQUAL ORIGINAL CAPACITY.

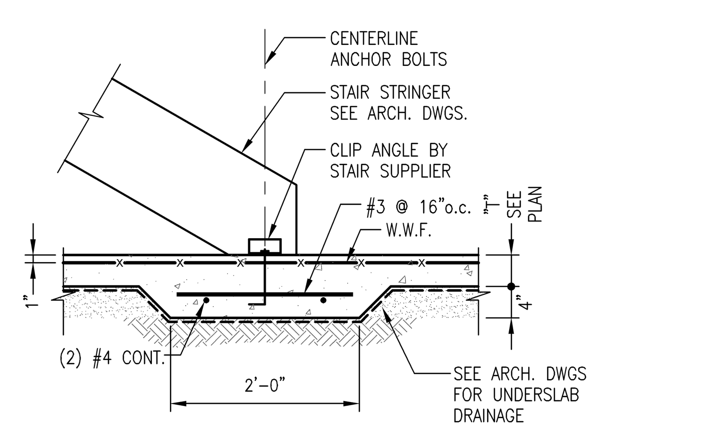
TYPICAL SHEAR STUD DETAIL
SCALE: 1/2" = 1'-0"



TYPICAL COMPOSITE BEAM STUD DISTRIBUTION
SCALE: 1/2" = 1'-0"

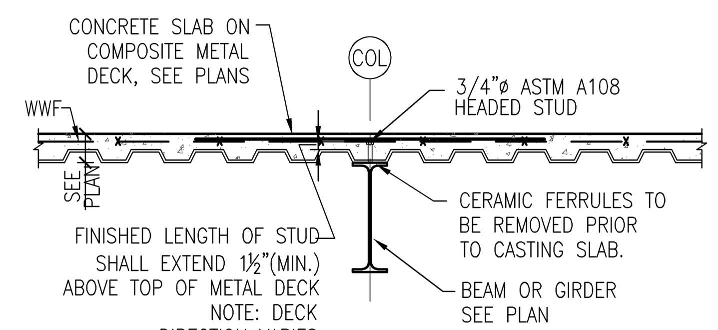


TYPICAL COMPOSITE SLAB REINFORCEMENT
SCALE: 1/2" = 1'-0"

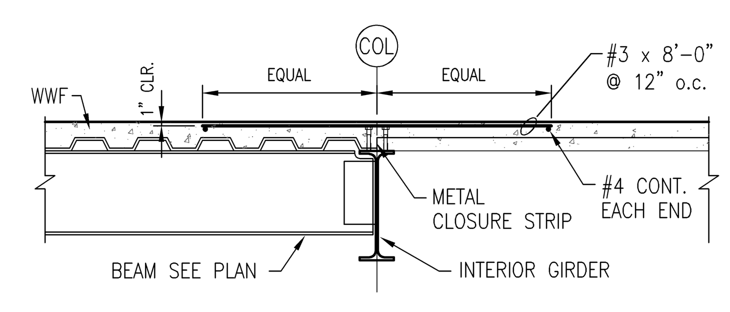


NOTE: EXTEND THICKENED SLAB BETWEEN STAIR STRINGERS AND 1'-0" BEYOND EACH

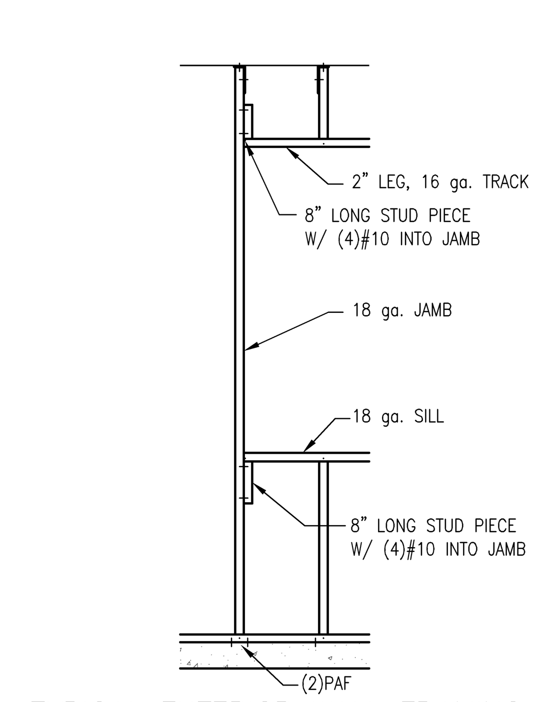
TYPICAL THICKENED SLAB
SCALE: 3/4" = 1'-0"



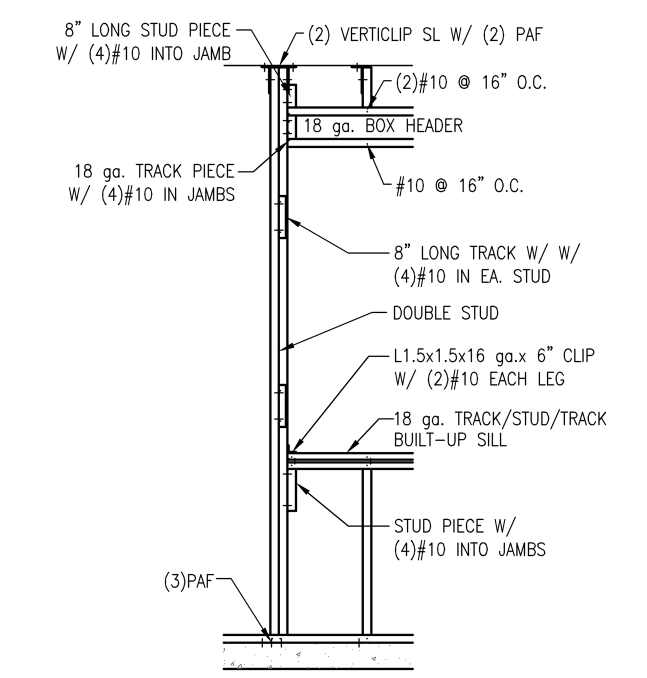
TYPICAL SHEAR STUD DETAIL
SCALE: 1/2" = 1'-0"



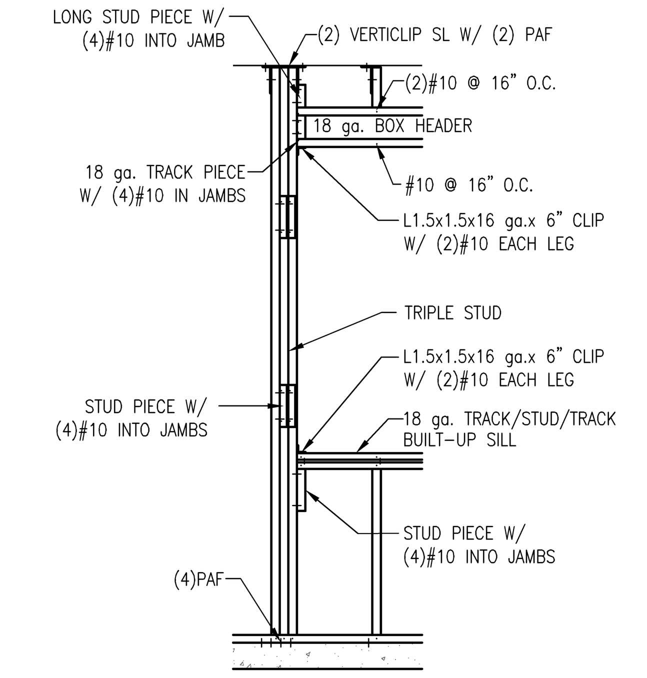
TYPICAL COMPOSITE SLAB REINFORCEMENT @ DECK SPAN CHANGE
SCALE: 1/2" = 1'-0"



TYPICAL EXTERIOR WALL FRAMING AT WINDOW OPENING UP TO 3'-4"
SCALE: 1/2" = 1'-0"



TYPICAL EXTERIOR WALL FRAMING AT WINDOW OPENING UP TO 6'-4"
SCALE: 1/2" = 1'-0"



TYPICAL EXTERIOR WALL FRAMING AT WINDOW OPENING UP TO 8'-8"
SCALE: 1/2" = 1'-0"

TYPICAL LIGHT GAUGE CONSTRUCTION DETAILS FOR NON-LOAD BEARING EXTERIOR WALLS

NOTE: THESE DETAILS ARE GENERIC AND ARE FOR GENERAL INFORMATION AND BUDGET PRICING. ACTUAL DESIGN BY LIGHT GAUGE SUPPLIER AND ENGINEER.

GENERAL NOTE:
DETAILS SHOWN ON THIS SHEET ARE GENERIC IN NATURE AND MAY NOT PORTRAY EXACT CONDITIONS. THESE DETAILS ARE INTENDED TO PROVIDE GENERAL GUIDELINES FOR TYPICAL CONSTRUCTION CONDITIONS.

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WOODS ENGINEERING, P.A. CORPORATE SEAL No. C-1806 NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 041563 ENGINEER ADAM L SISK

PROJECT TITLE
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD, N.W.
SHALLOTTE, N.C. 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE
TYPICAL DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO:	2019082.00
DATE:	04.16.2020
SCALE:	1 1/2" = 1'-0"
DRAWN BY Author	PROJ MGR Checker

S102

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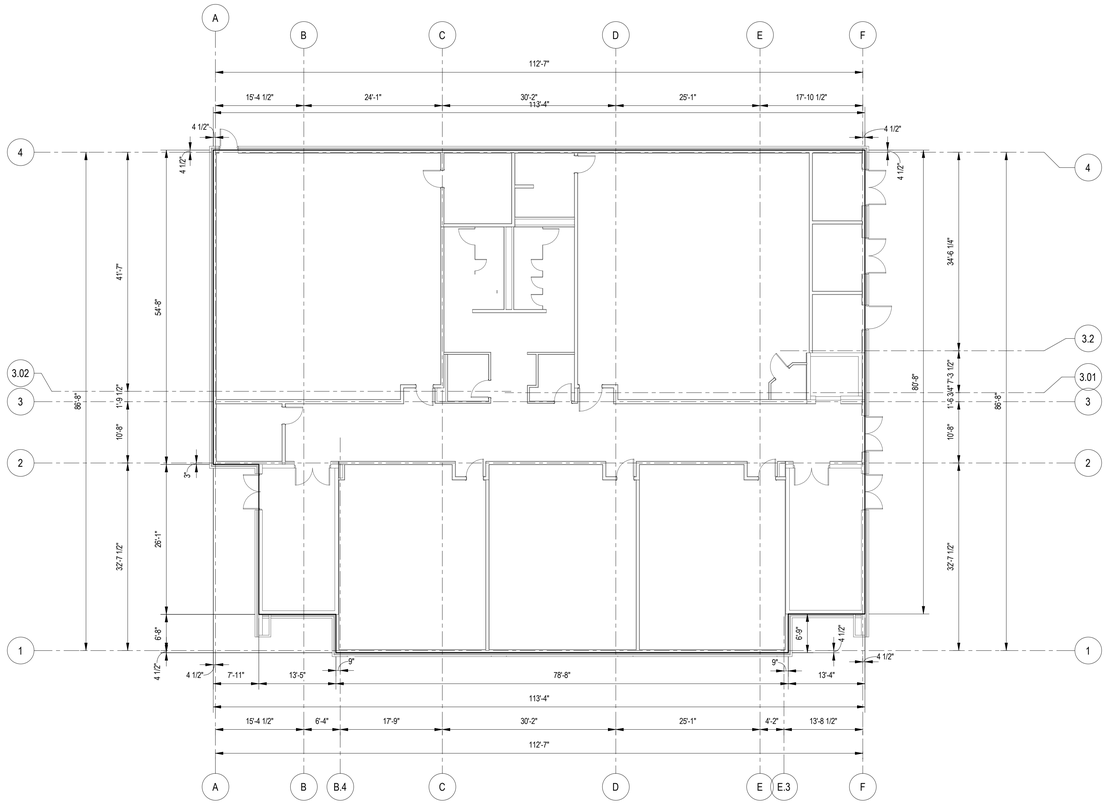
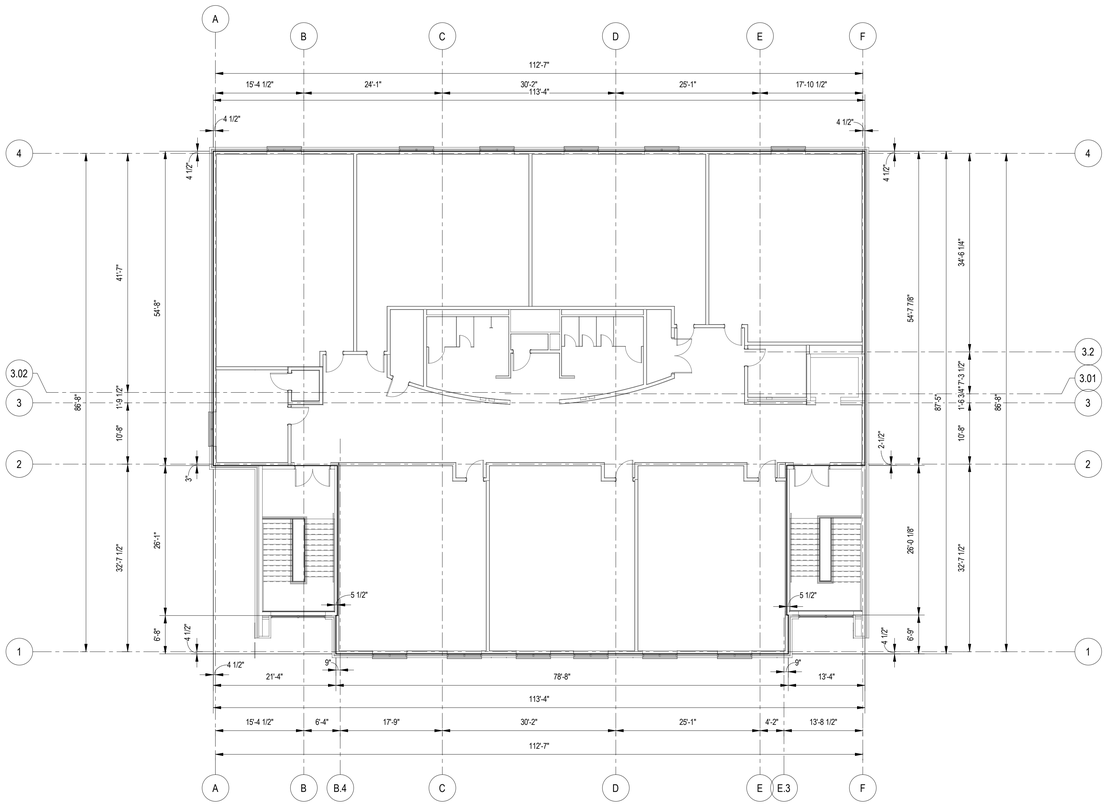


FOUNDATION SLAB PLAN

SCALE: 3/32" = 1'-0"



CLASSROOM SECOND FLOOR SLAB PLAN

SCALE: 3/32" = 1'-0"

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WOODS ENGINEERING, P.A.
CORPORATE SEAL
No. C-1806
NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041563 ADAM M. SISK

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

FOUNDATION AND SECOND FLOOR SLAB PLANS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO:
DATE: 04.16.2020
SCALE: 3/32" = 1'-0"
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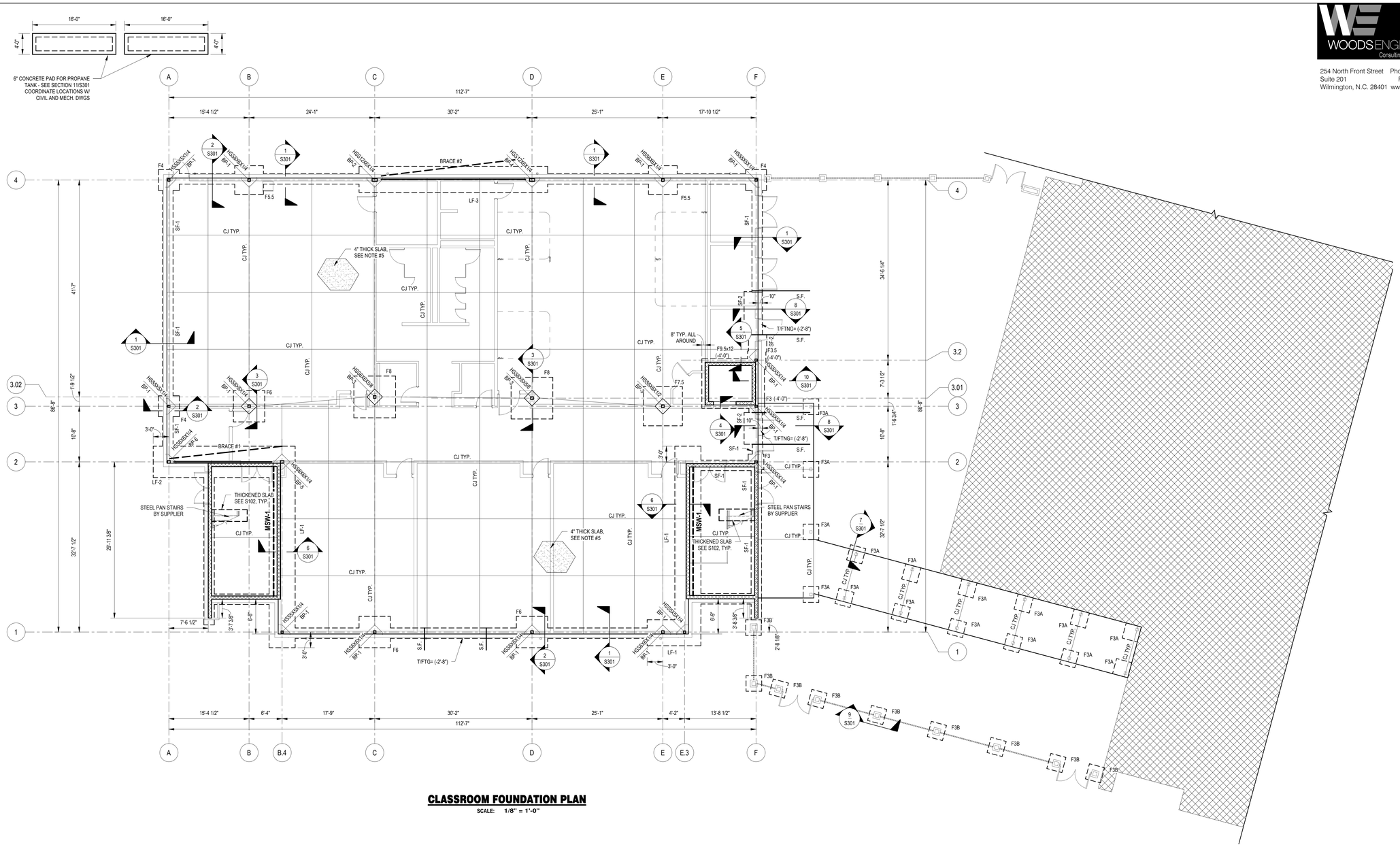

CLASSROOM FOUNDATION PLAN

SCALE: 1/8" = 1'-0"

STRIP FOOTING (SF-x) SCHEDULE				
		REINFORCEMENT		
MARK	WIDTH x THICKNESS x LENGTH	TOP BARS	BOTTOM BARS	COMMENTS
SF-1	2'-0" x 1'-0" x CONT.	N/A	(3) #4	
SF-2	3'-6" x 1'-4" x CONT.	N/A	(4) #5	

LATERAL FOOTING (LF-x) SCHEDULE				
		REINFORCEMENT		
MARK	WIDTH x THICKNESS x LENGTH	TOP BARS	BOTTOM BARS	COMMENTS
LF-1	5'-0" x 2'-0" x CONT.	(6) #7 LONG & #5 @12"o.c. SHORT	(8) #8 LONG & #5 @12"o.c. SHORT	
LF-2	6'-0" x 2'-0" x CONT.	(6) #7 LONG & #5 @12"o.c. SHORT	(8) #8 LONG & #5 @12"o.c. SHORT	
LF-3	5'-0" x 2'-0" x CONT.	(8) #7 LONG & #5 @12"o.c. SHORT	(8) #7 LONG & #5 @12"o.c. SHORT	

SPREAD FOOTING (Fx) SCHEDULE				
		REINFORCEMENT		
MARK	WIDTH x LENGTH x THICKNESS	TOP BARS EACH WAY (U.N.O.)	BOTTOM BARS EACH WAY (U.N.O.)	COMMENTS
F3	3'-0" x 3'-0" x 1'-0"	N/A	(4) #5	
F3.5	3'-6" x 3'-6" x 1'-0"	N/A	(4) #5	
F3A	3'-0" x 3'-0" x 1'-8"	(4) #4	(4) #4	
F3B	3'-0" x 3'-0" x 1'-4"	N/A	(4) #5	
F4	4'-0" x 4'-0" x 1'-0"	N/A	(4) #5	
F5.5	5'-6" x 5'-6" x 1'-1"	N/A	(6) #5	
F6	6'-0" x 6'-0" x 1'-2"	N/A	(7) #5	
F7.5	7'-6" x 7'-6" x 1'-6"	N/A	(7) #6	
F8	8'-0" x 8'-0" x 1'-7"	N/A	(6) #7	
F9.5x12	9'-6" x 12'-0" x 1'-0"	N/A	#5 @12"o.c.	

LEGEND - FOUNDATION

- INDICATES 8" CMU WALL WITH #5 @ 48"o.c. TYP., U.N.O.
- MSW-X — INDICATES 8" CMU SHEARWALL - SEE S501
- FX — SPREAD FOOTING DESIGNATION SEE SCHEDULE THIS SHEET
- SF-X — STRIP FOOTING DESIGNATION SEE SCHEDULE THIS SHEET
- CJ — INDICATES CONCRETE SLAB CONTRACTION JOINTS, SEE S1.02 FOR TYPICAL DETAILS.
- COL. — INDICATES STEEL COLUMN,
- 0 — GRID DESIGNATION FOR CENTERLINE OF COLUMN
- S.F. — INDICATES STEP FOOTING - SEE S102

NOTES - FOUNDATION PLAN

1. SEE SHEET S1.01 FOR ADDITIONAL GENERAL NOTES, FOUNDATION NOTES, CONCRETE NOTES, AND REINFORCING STEEL NOTES. ALSO, SEE SHEET S1.02 FOR TYPICAL DETAILS. TYPICAL DETAILS ARE GENERALLY NOT SHOWN ON PLAN BUT RATHER ARE INTENDED TO DEFINE TYPICAL CONSTRUCTION CONDITIONS.
2. DATUM ELEVATION = TOP OF SLAB ELEVATION = ASSUMED 0'-0". OTHER ELEVATIONS ARE NOTED AS (+ OR -) FROM DATUM ELEVATION.
3. TOP OF FOOTINGS SHALL BE (-1'-4") FROM DATUM ELEVATION, U.N.O. ON PLAN AS (+/- X'-X") FROM DATUM ELEVATION.
4. RELOCATE ANY UTILITY LINES THAT CONFLICT WITH THE FOUNDATIONS OR DROP THE FOUNDATIONS TO AN ELEVATION BELOW THE PROPOSED UTILITIES. RELOCATE ANY GRAVITY FLOW LINES THAT CONFLICT WITH SPREAD FOOTINGS AS SHOWN ON STRUCTURAL FOUNDATION PLANS. IF A GRAVITY FLOW LINE TRAVELS UNDER A CONTINUOUS STRIP FOOTING EITHER
   a. DROP THE FOOTING ELEVATION BELOW THE PROPOSED LINE
   b. ENCASE THE LINE IN A STEEL PIPE 2" LARGER IN DIAMETER THAN THE LINE AND EXTEND THE PIPE 1'-0" PAST EACH SIDE OF THE CONCRETE FOOTING. BACKFILL THE TRENCH WITH #57 STONE. THE BEARING CAPACITY OF THIS AREA MUST MEET OR EXCEED THE ALLOWABLE SOIL BEARING CAPACITY.
5. SLAB-ON-GRADE SHALL BE 4" THICK (SEE PLAN) 3000 psi CONCRETE WITH WWM 6x6xW2.0xW2.0 ON SUPPORT CHAIRS ON 15 mil VAPOR BARRIER, ON 6" COMPACTED SELECT GRANULAR MATERIAL ON WELL COMPACTED SUB GRADE. SEE S1.01 FOUNDATION NOTES FOR COMPACTION REQUIREMENTS, VERIFY COMPACTION w/QUALIFIED GEOTECHNICAL ENGINEER.
6. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND OTHER DISCIPLINE DRAWINGS FOR OPENINGS AND DEPRESSIONS NOT SHOWN ON THESE DRAWINGS.
7. G.C. TO COORDINATE STEPS IN FOUNDATION FOR PLUMBING, ELECTRICAL, AND MECHANICAL.
8. PROVIDE STEEL SLEEVE FOR PLUMBING LINES UNDER FOUNDATIONS. SLEEVE SHALL BE 2" LARGER IN DIAMETER THAN PLUMBING LINE AT THAT LOCATION.
9. DIMENSIONS ARE FROM EDGE OF SLAB (E.O.S.) AND OUTSIDE FACE OF STUD (O.F.S.) / CURTAINWALL (O.F.CW.) TO COLUMN CENTERLINE UNLESS NOTED OTHERWISE.

8' 4' 0' 8'
SCALE : 1/8" = 1'-0"

PLAN NORTH
N

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CORPORATE SEAL No. C-1806 — WOODS ENGINEERING, P.A. — NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 041563 ENGINEER ADAM L. KISER

PROJECT TITLE

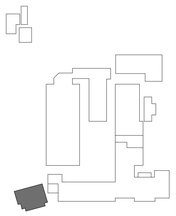
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM FOUNDATION PLAN



KEY PLAN

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO:
DATE: 04.16.2020
SCALE: 1/8" = 1'-0"
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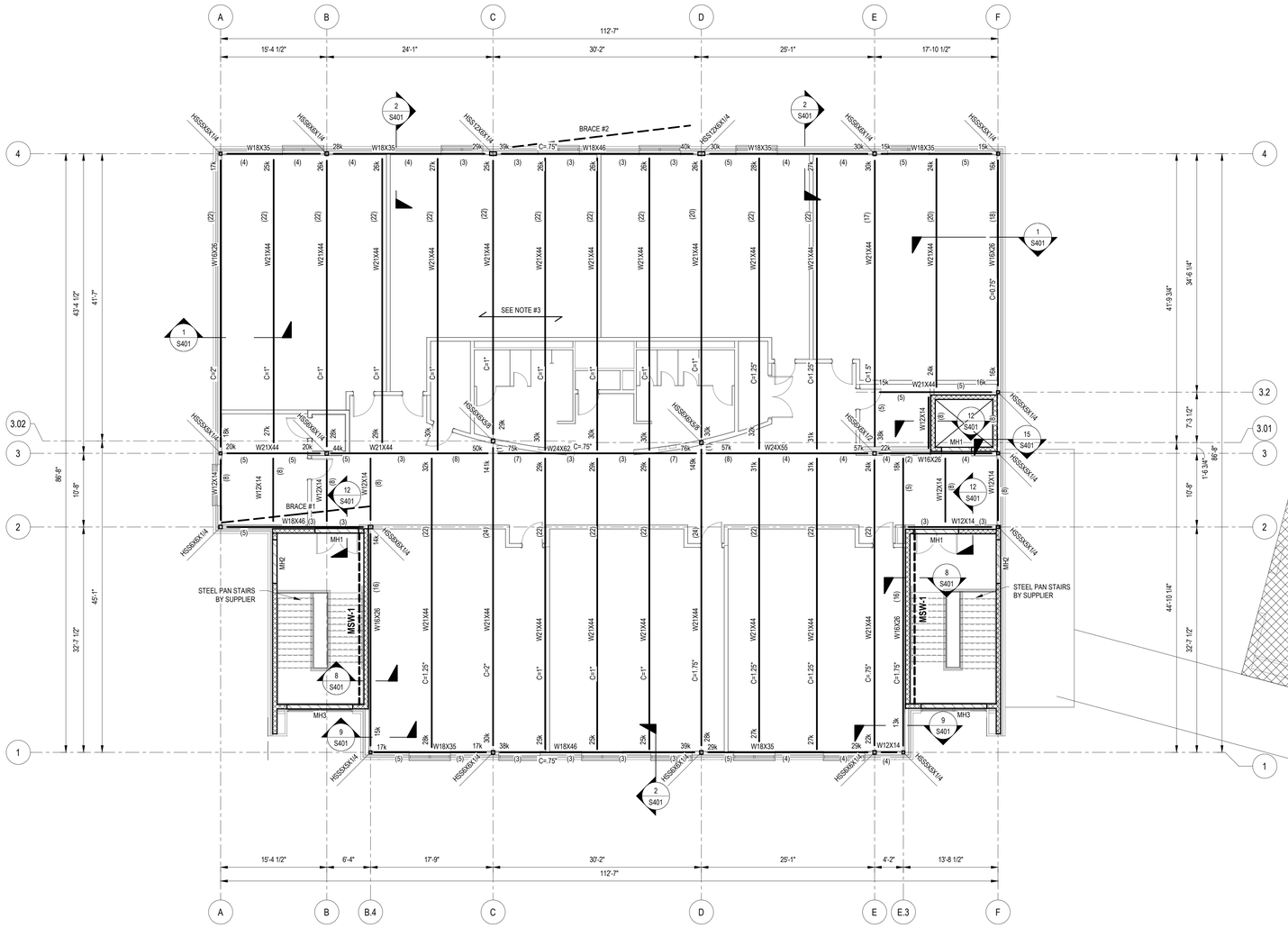
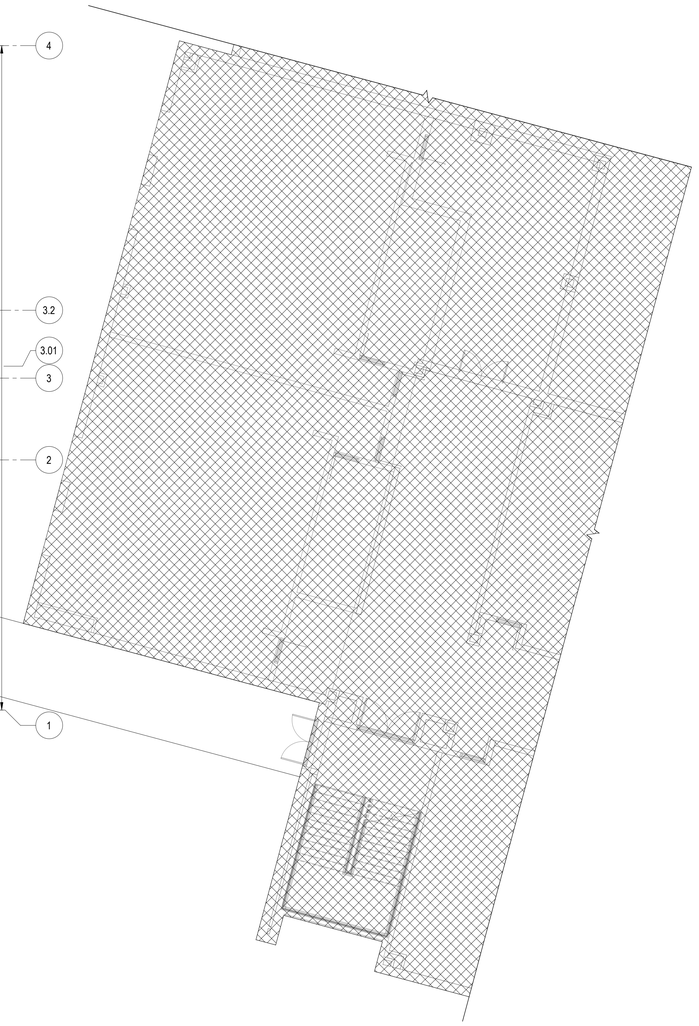


CLASSROOM SECOND FLOOR FRAMING PLAN

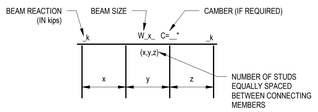
SCALE: 1/8" = 1'-0"



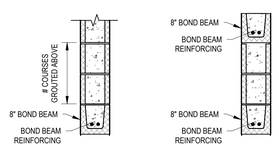
NOTES - FLOOR FRAMING PLAN

1. SEE SHEET S1.0 SERIES SHEETS FOR ADDITIONAL GENERAL NOTES, FOUNDATION NOTES, CONCRETE NOTES, REINFORCING STEEL, STEEL FRAMING, JOIST, DECK AND LIGHT GAUGE FRAMING NOTES AND TYPICAL DETAILS. TYPICAL DETAILS ARE GENERALLY NOT SHOWN ON PLAN BUT RATHER ARE INTENDED TO DEFINE TYPICAL CONSTRUCTION CONDITIONS.
2. TYPICAL SLAB ELEVATION IS 14" ABOVE DATUM ELEVATION (ASSUMED 0'-0", SEE S2.01). TYPICAL TOP OF STEEL IS 5 1/2" BELOW TOP OF SLAB U.N.O.
3. TYPICAL FLOOR SLAB IS 3 1/2" - 3,000 psi NORMAL WEIGHT CONCRETE TOPPING WITH 4lb/cy OF SYNTHETIC MICROFIBER ON 2" VLI, 20 GAUGE GALVANIZED COMPOSITE DECK BY VULCRAFT (2.0VLI20) OR APPROVED EQUAL. TOTAL FLOOR SLAB SYSTEM IS 5 1/2" THICK.
4. ALL BEAMS, GIRDERS AND COLUMNS SHALL BE ASTM A992, GRADE 50.
5. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND OTHER DISCIPLINE DRAWINGS FOR OPENINGS AND DEPRESSIONS NOT SHOWN ON THESE DRAWINGS. MECHANICAL UNIT WEIGHTS ARE FOR DESIGN PURPOSES ONLY. VERIFY ACTUAL OPERATING WEIGHT WITH PURCHASED EQUIPMENT MANUFACTURER SPECIFICATIONS.
6. DESIGNATIONS ON PLAN FOR BEAM REACTIONS, CAMBERS AND COMPOSITE BEAM SHEAR STUDS AS INDICATED BELOW. SEE "TYPICAL DETAILS" SHEET S1.02 FOR STUD PLACEMENT DETAILS. ALL SHEAR STUDS SHALL BE 3/4"Ø x 4" LONG HEADED STUDS AND SHALL COMPLY WITH ASTM A108.

   STUDS EQUALLY PLACED ALONG MEMBER.....(xx)
   (MAXIMUM SPACING = 24" o.c.)
   STUDS EQUALLY PLACED BETWEEN CONNECTING MEMBERS.....(xx/YY/ZZ)
   CAMBER AT MID SPAN (UNO).....C=xx
   REACTIONS AT EACH END (KIPS).....xxK-LRFD
   (MINIMUM REACTION = 16k IF NOT SHOWN ON PLAN) (LRFD)



7. ALL SECOND FLOOR STEEL BEAMS ARE TO BE SPRAY FIREPROOFED AND MUST BE LEFT UNPRIMED



DETAIL A-A DETAIL B-B

LEGEND - FLOOR FRAMING

- INDICATES 8" CMU WALL WITH #5 @ 48"o.c. TYP. U.N.O.
- Bx — INDICATES STEEL BEAM, SEE PLAN FOR SIZE AND LOCATION
- COL — INDICATES STEEL COLUMN,
- MHx — MASONRY HEADER - SEE SCHEDULE
- MSW-X — INDICATES 8" CMU SHEARWALL - SEE S501
- 0 — GRID DESIGNATION FOR CENTERLINE OF COLUMN

Alt. MASONRY HEADER (MHx) SCHEDULE

MARK	WALL THICKNESS	BOND BEAM REINF.	JAMB REINF.	#COURSES GROUTED ABOVE	REMARKS
MH1	8" CMU	(1) #5	(2) #5 INT. / (2) #5 EXT.	(2)	DETAIL A-A
MH2	8" CMU	(2) #5	(2) #5 INT. / (3) #5 EXT.	(2)	DETAIL A-A
MH3	8" CMU	(4) #5	(3) #5 EXT.	(3)	DETAIL B-B

SCALE : 1/8" = 1'-0"

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CORPORATE SEAL No. C-1806 WOODS ENGINEERING, P.A. NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 041563 ENGINEER DAM. G. ELSIK

PROJECT TITLE

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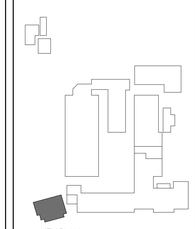
550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM SECOND FLOOR FRAMING PLAN



KEY PLAN

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO:
DATE: 04.16.2020
SCALE: As indicated
DRAWN BY: MBK PROJ MGR: ALS

S202

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410.546.9100
Delaware
309 S Governors Ave
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302.734.7950
Rittenhouse Station
250 South Main Street, Suite 109
Newark, DE 19711
302.369.3700
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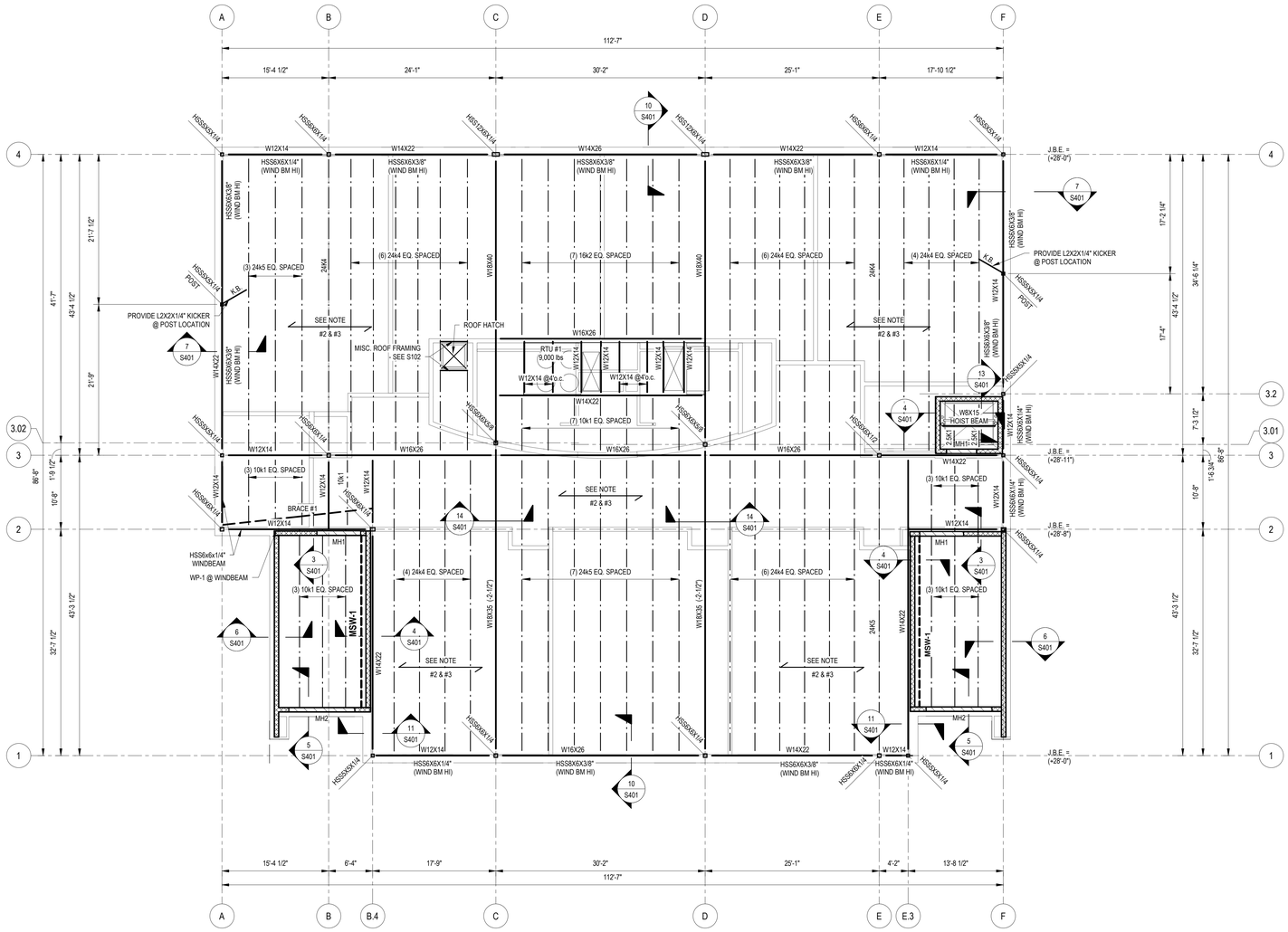


CLASSROOM ROOF FRAMING PLAN

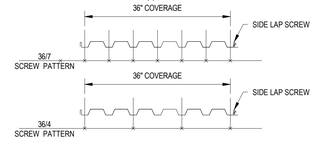
SCALE: 1/8" = 1'-0"

LEGEND - ROOF FRAMING

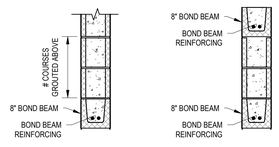
- MSW — INDICATES 8" CMU WALL WITH #5 @ 48"o.c. TYP., U.N.O.
- MSW — INDICATES CMU MASONRY SHEAR WALLS BELOW, SEE S5.01 FOR REINFORCING DETAILS
- Bx — INDICATES STEEL BEAM, SEE PLAN FOR SIZE AND LOCATION
- INDICATES STEEL ROOF JOISTS - SEE PLAN FOR SIZE AND SPACING
- C20 — INDICATES STEEL COLUMN,
- MHx — MASONRY HEADER MH1: (1)#5 - GROUT (2) COURSES ABOVE MH2: (2)#5 - GROUT (2) COURSES ABOVE
- 0 — GRID DESIGNATION FOR CENTERLINE OF COLUMN
- WP-X — INDICATES MASONRY WALL PLATE - SEE S301

NOTES - ROOF FRAMING

1. SEE SHEET S1.0 SERIES SHEETS FOR GENERAL STEEL, JOIST, DECK, LIGHT GAUGE FRAMING NOTES AND TYPICAL DETAILS NOT SHOWN ON PLAN.
2. TYPICAL ROOF DECK IS 1 1/2" DEEP, 20 ga., GALVANIZED, TYPE 'B' METAL ROOF DECK.
3. METAL ROOF DECK SHALL BE ATTACHED TO STEEL SUPPORTING MEMBERS WITH HILTI X-HSN 24 FOR STEEL THICKNESS EQUAL TO OR LESS THAN 3/8" AND HILTI X-ENP 19 OTHERWISE IN A 36/4 PATTERN EXCEPT IN CORNER ZONES (ZONE 3 - SEE S1.0 SERIES SHEETS) - PROVIDE FASTENERS IN A 36/7 PATTERN. PROVIDE (1)#10 SIDELAP PER SPAN.



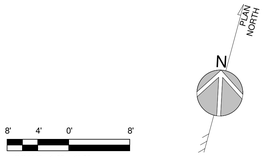
4. ALL JOISTS SHALL BE DESIGNED FOR A NET UPLIFT PRESSURE OF 30 psf.
5. PROVIDE JOIST BRIDGING PER SJI RECOMMENDATIONS.
6. ALL BEAMS, GIRDERS AND COLUMNS SHALL BE ASTM A992, GRADE 50.
7. J.B.E. = JOIST BEARING ELEVATION
8. T/STL = TOP OF STEEL



DETAIL A-A DETAIL B-B

Alt. MASONRY HEADER (MHx) SCHEDULE

MARK	WALL THICKNESS	BOND BEAM REINF.	JAMB REINF.	#COURSES GROUTED ABOVE	REMARKS
MH1	8" CMU	(1) #5	(2) #5 INT. / (2) #5 EXT.	(2)	DETAIL A-A
MH2	8" CMU	(2) #5	(2) #5 INT. / (3) #5 EXT.	(2)	DETAIL A-A
MH3	8" CMU	(4) #5	(3) #5 EXT.	(3)	DETAIL B-B



8' 4' 0' 8'
SCALE : 1/8" = 1'-0"

ISSUED
FOR BIDDING
NOT FOR CONSTRUCTION
ISSUED: 04.16.2020

WOODS ENGINEERING, P.A. CORPORATE SEAL No. C-1806 NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 041563 ENGINEER DAM. K. SISKI

PROJECT TITLE

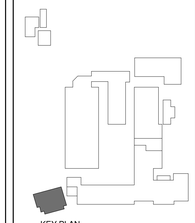
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM ROOF FRAMING PLAN



KEY PLAN

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO:
DATE: 04.16.2020
SCALE: As indicated
DRAWN BY: MBK PROJ MGR: ALS

S203

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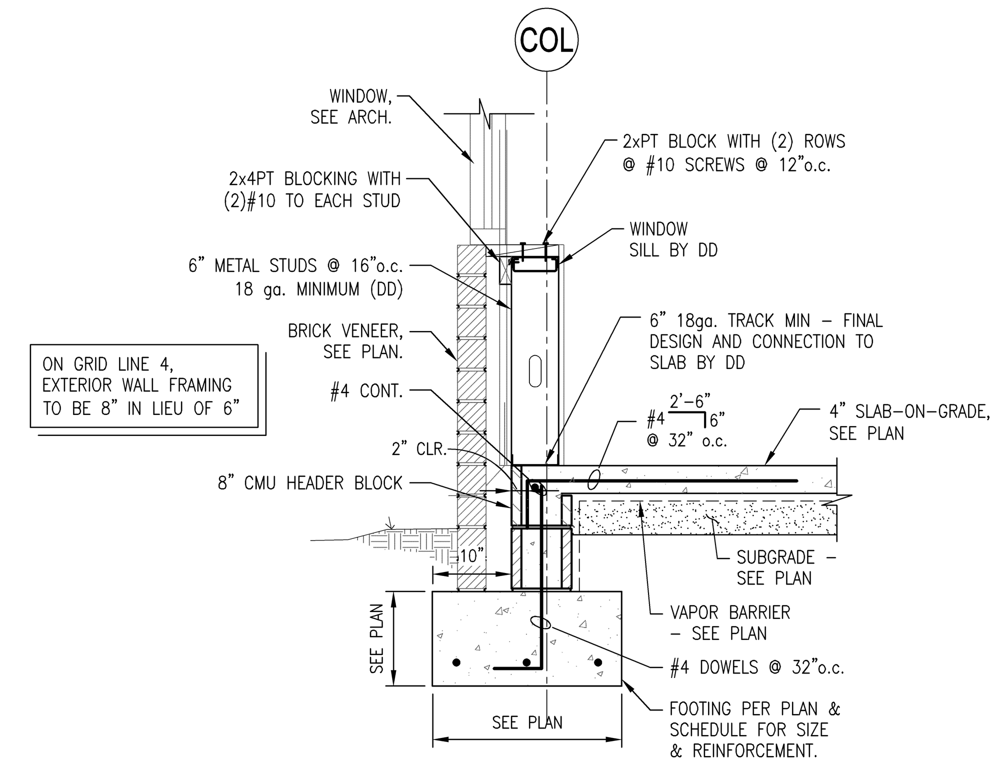
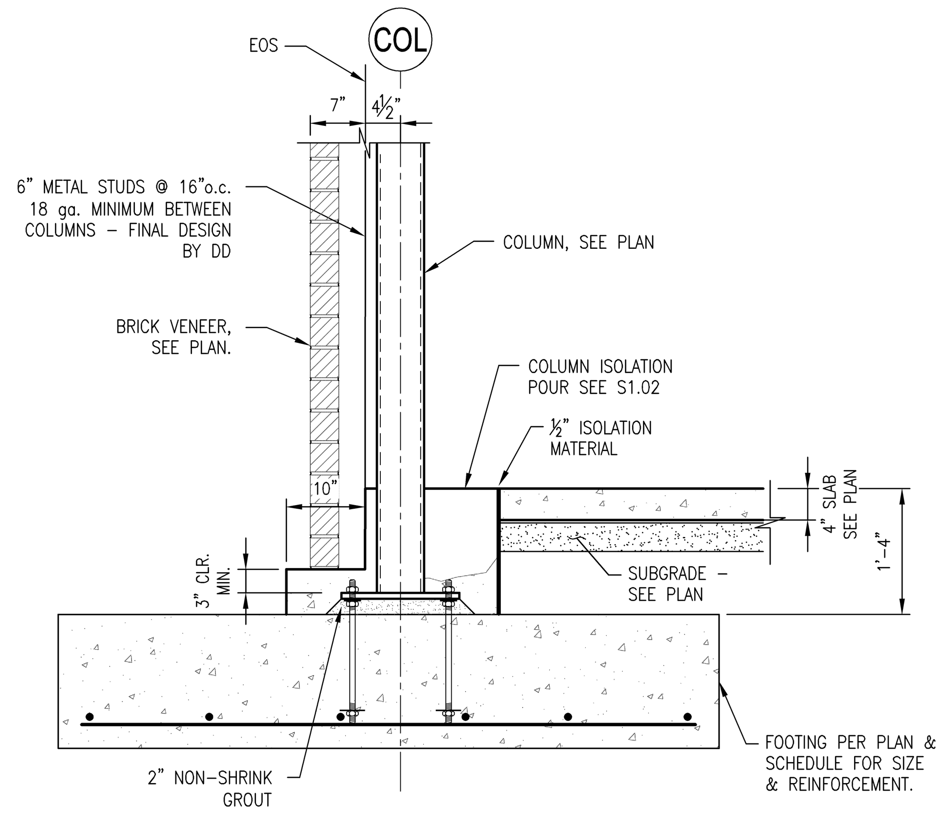


SECTION 1-1
SCALE: 3/4" = 1'-0"



SECTION 2-2
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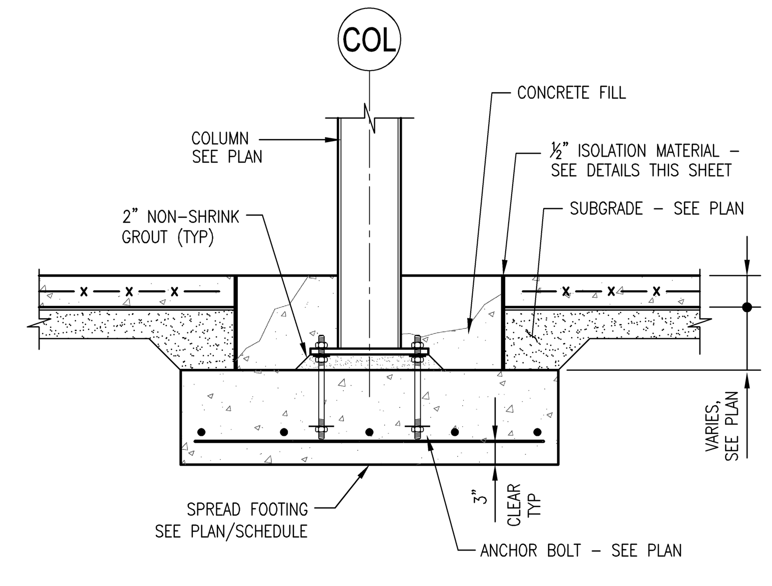

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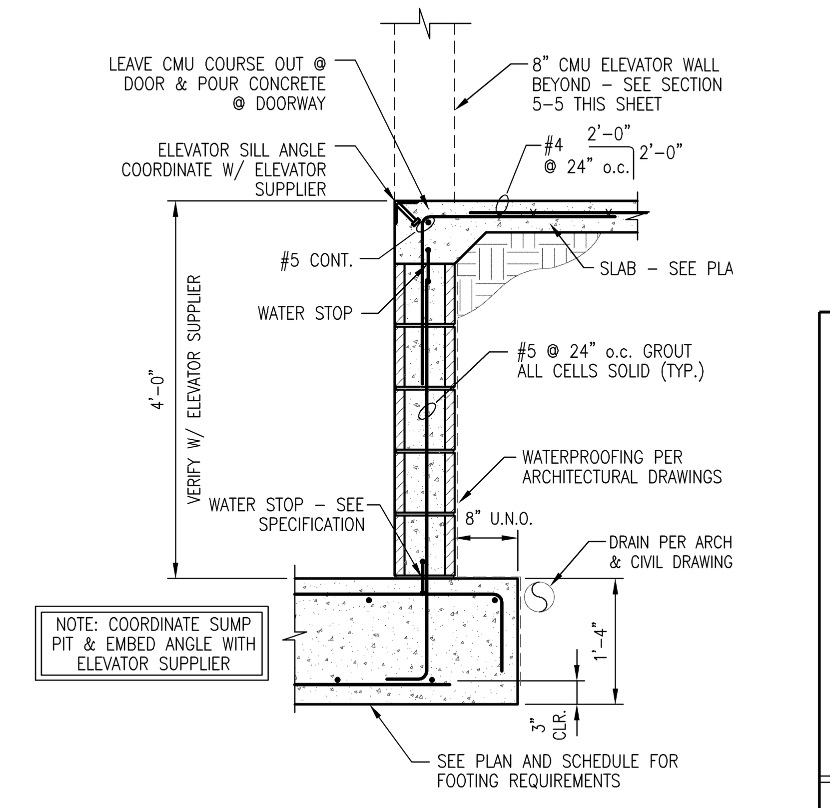

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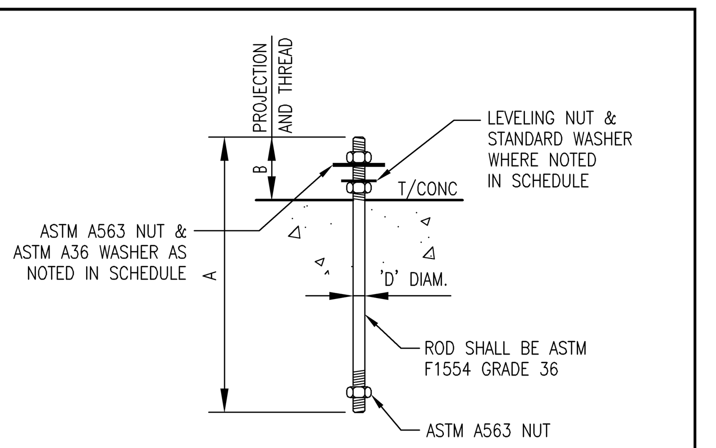
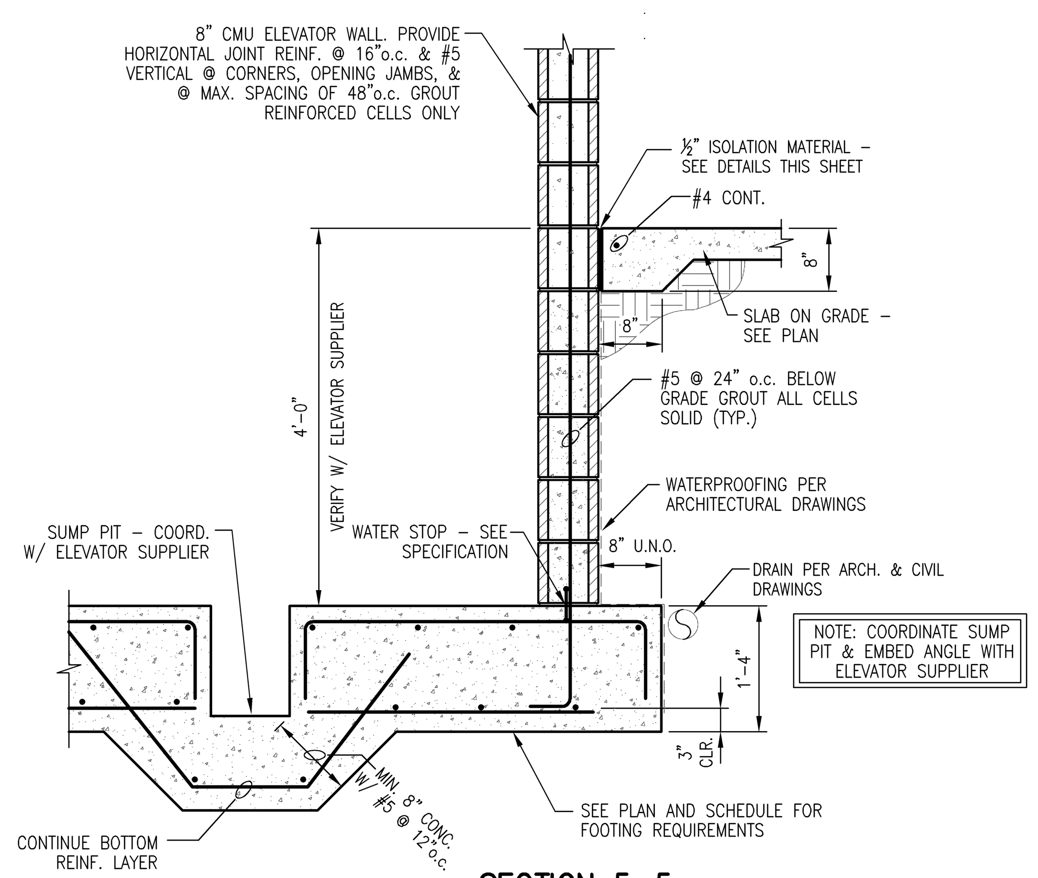


ANCHOR BOLT SCHEDULE

MARK	BOLT DIAM. D	HOLE DIAMETER	A	B	TOP WASHER O.D. x t	LEVELING NUT	REMARKS
AB-1	¾"	1⁵⁄₁₆"	1'-2"	5"	2" x ¼"	YES	2" LEVELING GROUT
AB-2	1½"	2⁵⁄₁₆"	1'-10"	8"	3½" x ½"	YES	2" LEVELING GROUT
AB-3	1¼"	2¹⁄₁₆"	1'-9"	7"	3" x ½"	YES	2" LEVELING GROUT

NOTE: ALL ANCHOR BOLTS GREATER OR EQUAL TO 1½"ø NEED TO HAVE HEAVY HEX HEAD NUTS.



SECTION 5-5
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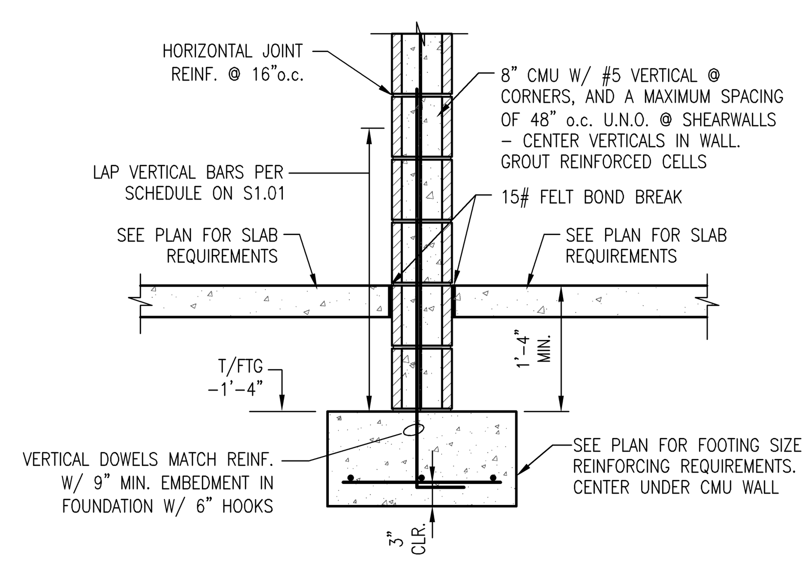

SECTION 6-6
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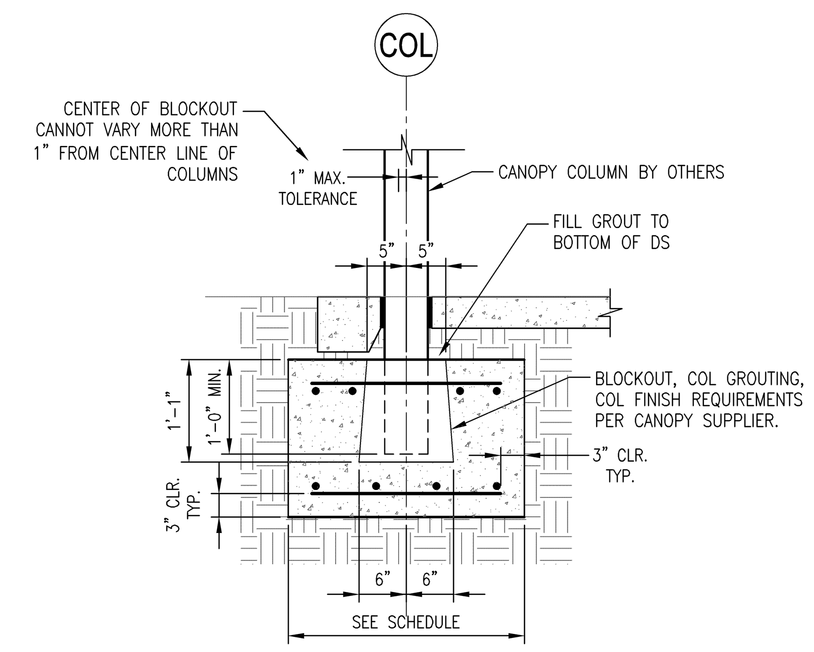

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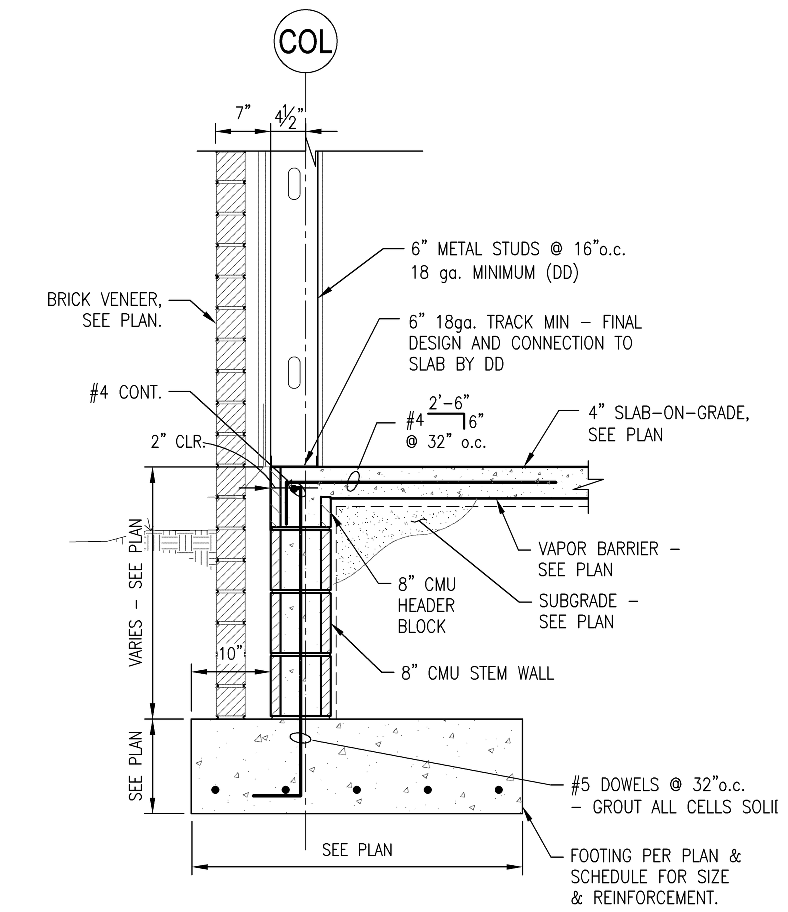

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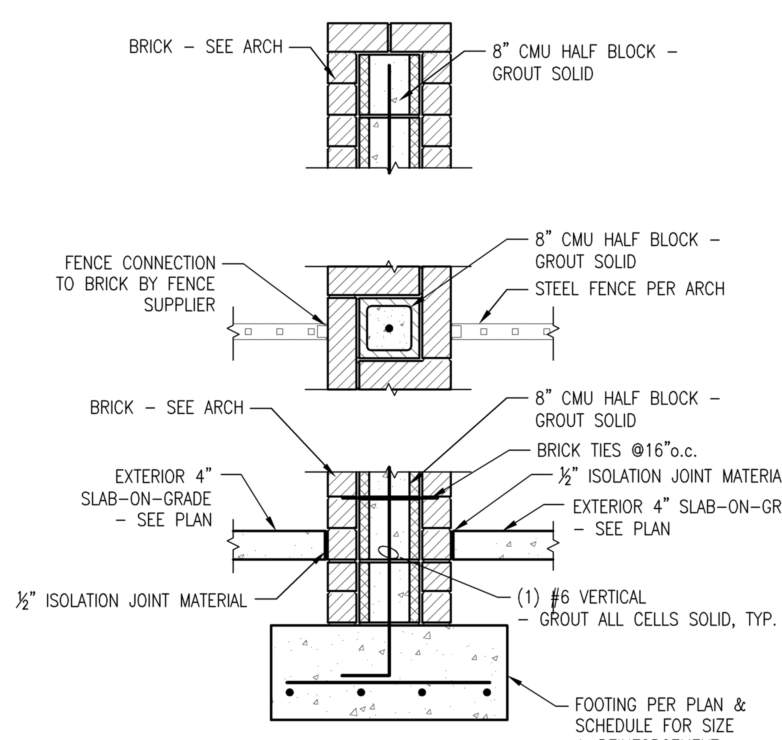

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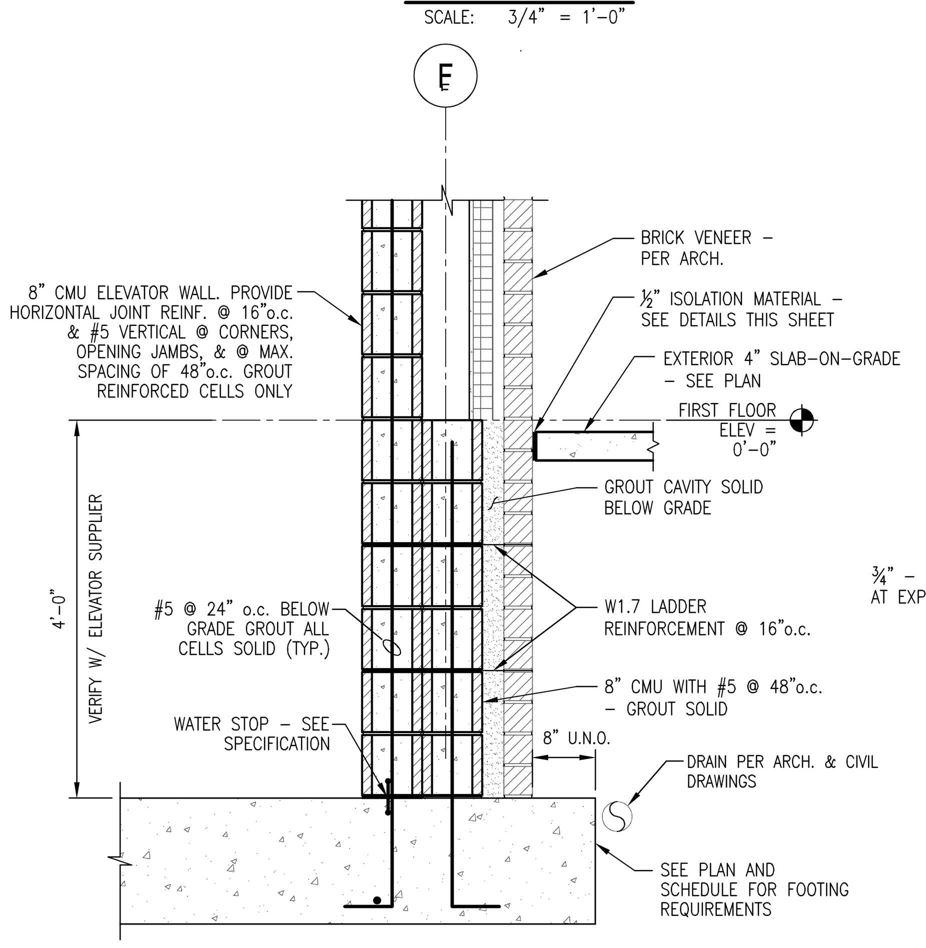

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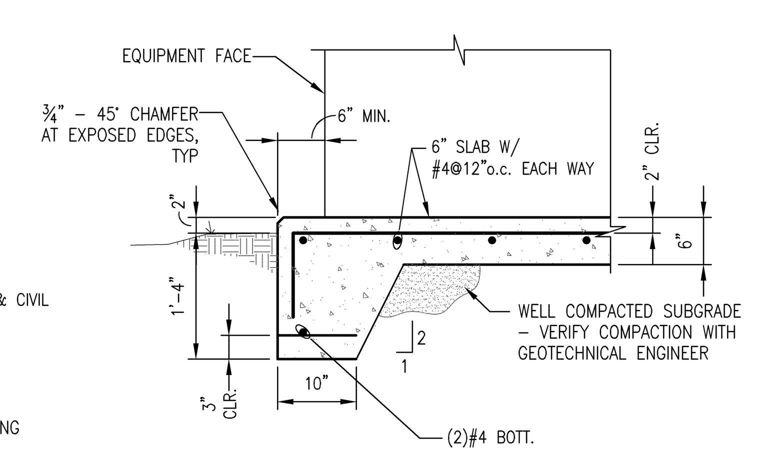

SECTION 11-11
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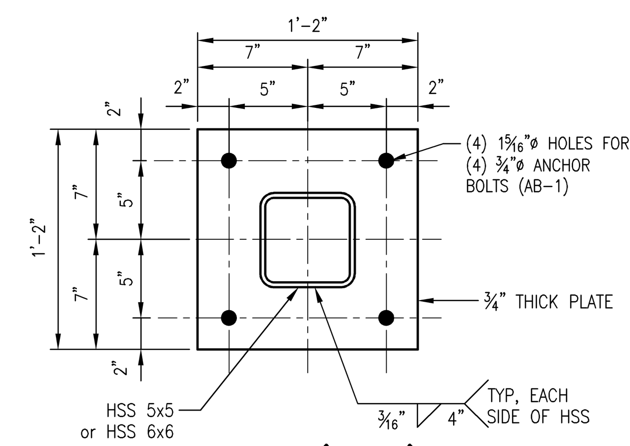
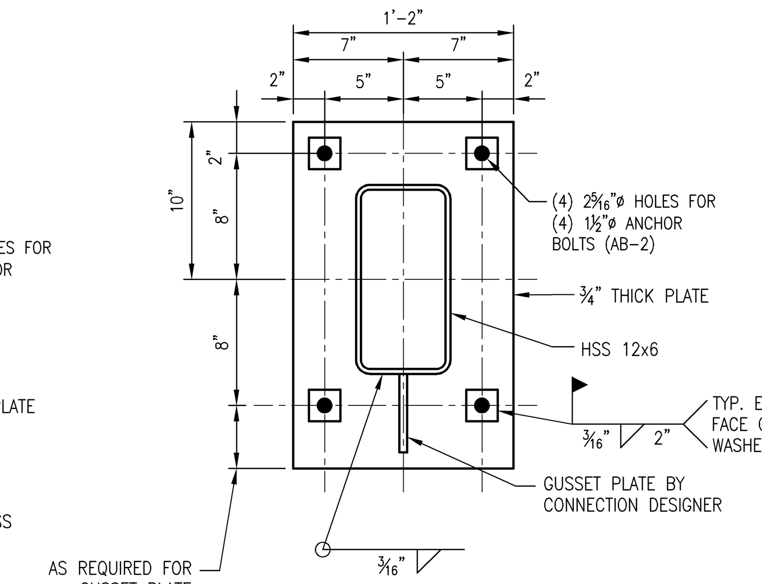
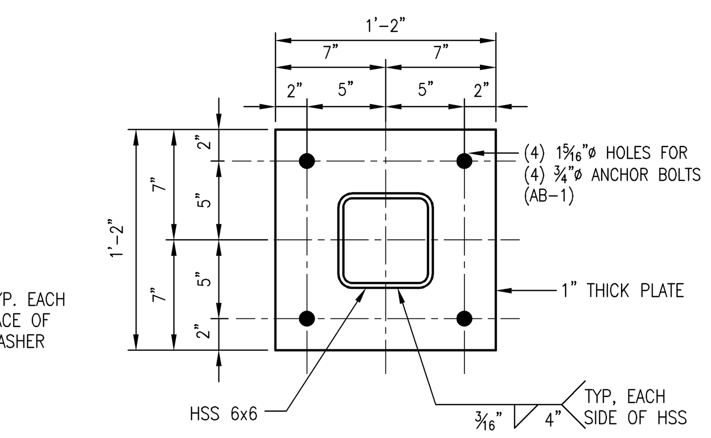


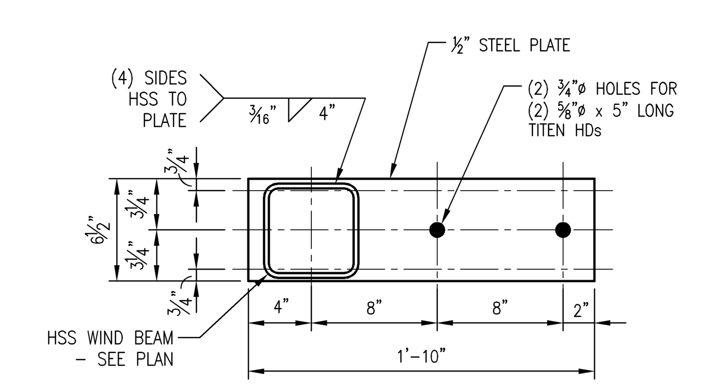
DETAIL 'BP-1'
SCALE: 1 1/2" = 1'-0"
(HSS 5x5 & 6x6 BASEPLATE)



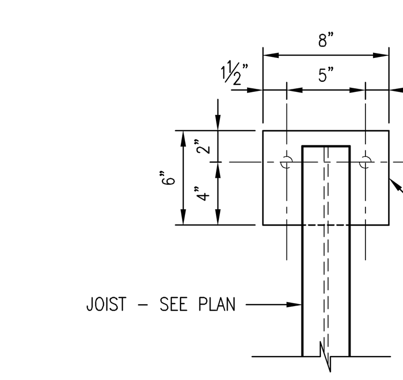
DETAIL 'BP-2'
SCALE: 1 1/2" = 1'-0"
(HSS 12x6 BASEPLATE)



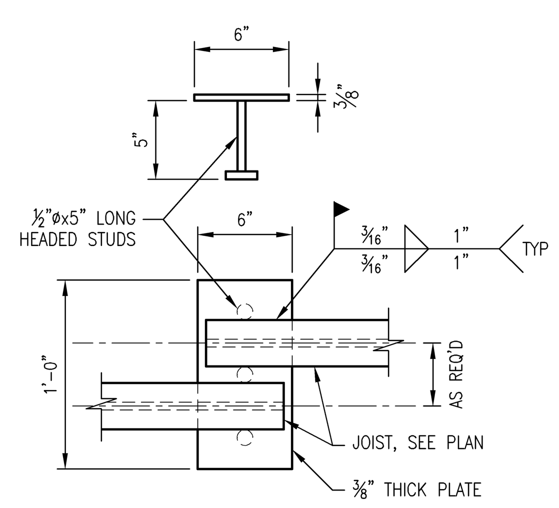
DETAIL 'BP-3'
SCALE: 1 1/2" = 1'-0"
(HSS 6x6 BASEPLATE)



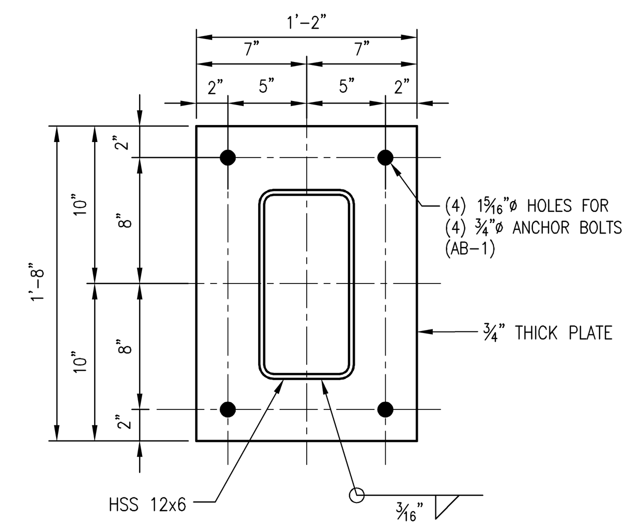
DETAIL 'WP-1'
SCALE: 1 1/2" = 1'-0"



TYPICAL JOIST BEARING PLATE (FOR "K" SERIES JOIST)
SCALE: 1 1/2" = 1'-0"



TYPICAL MASONRY BEARING PLATE
SCALE: 1 1/2" = 1'-0"
@ INTERIOR DOUBLE JOIST CONDITIONS



DETAIL 'BP-4'
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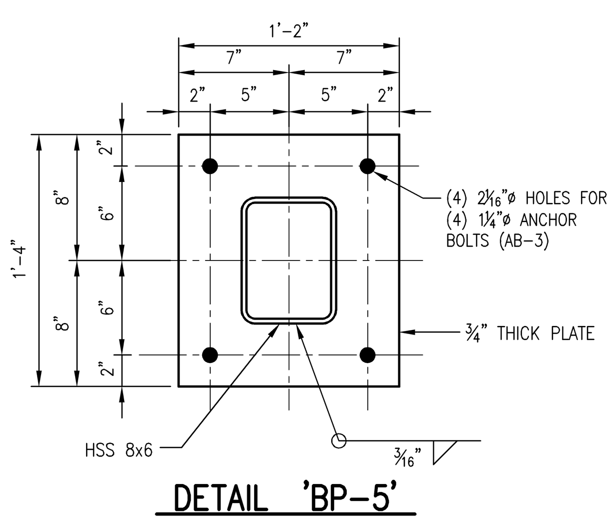
(HSS 12x6 BASEPLATE)



DETAIL 'BP-5'
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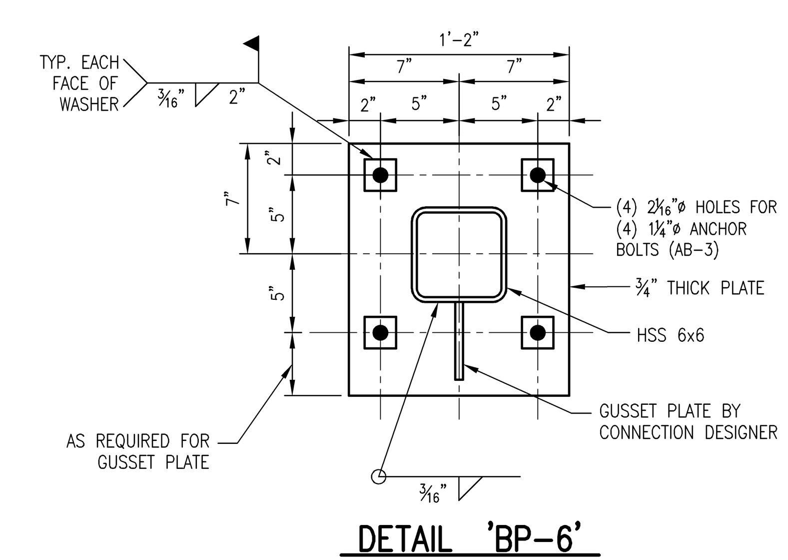
(HSS 8x6 BASEPLATE)



DETAIL 'BP-6'
SCALE: 1 1/2" = 1'-0"
(HSS 6x6 BASEPLATE)

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ISSUED: 04.16.2020

WOODS ENGINEERING, P.A. CORPORATE SEAL No. C-1806 NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 041563 ENGINEER ADAM L SISK

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD, N.W.
SHALLOTTE, N.C. 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

FOUNDATION SECTIONS AND DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 1 1/2" = 1'-0"
DRAWN BY Author | PROJ MGR Checker

S301

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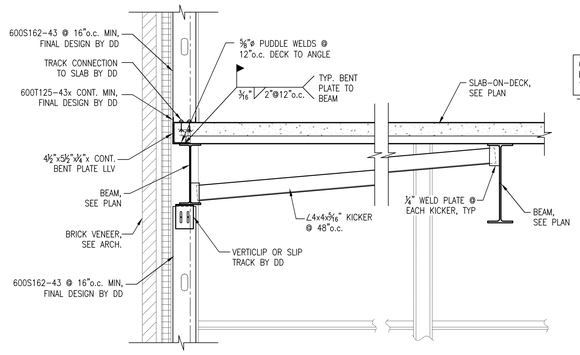
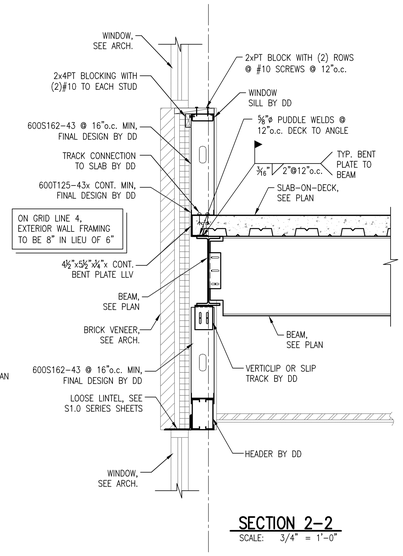


SECTION 1–1
SCALE: 3/4" = 1'-0"



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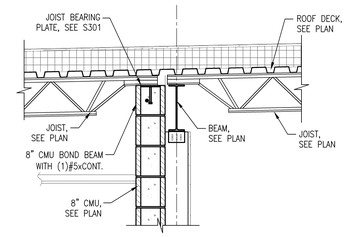

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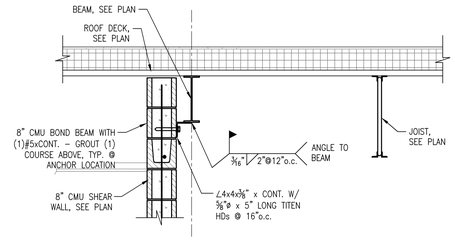

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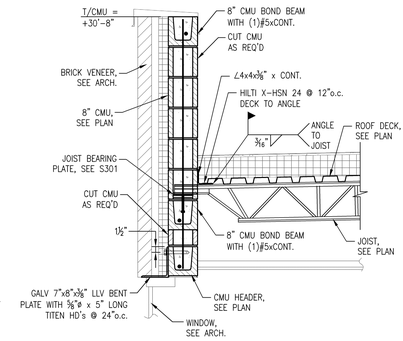

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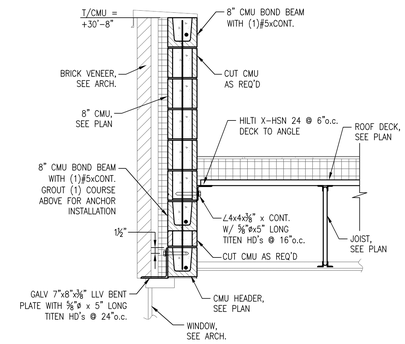

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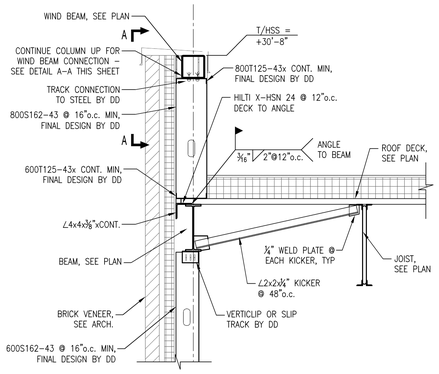

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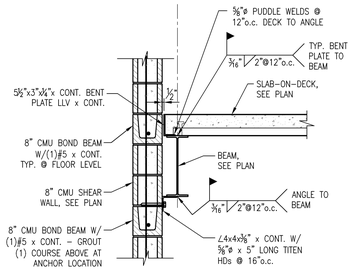

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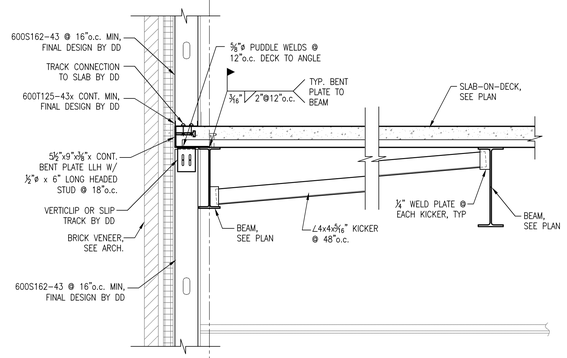

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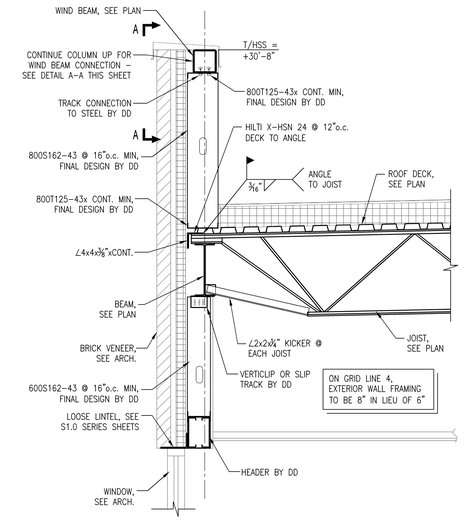

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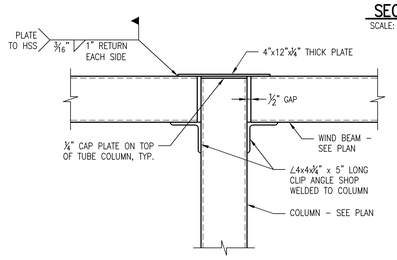

DETAIL A–A
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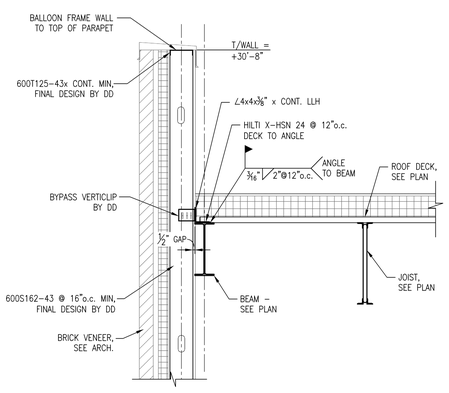
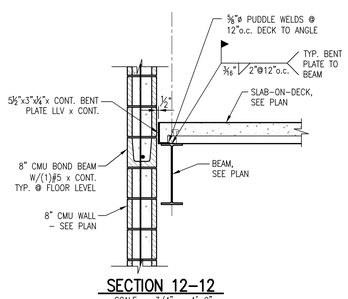
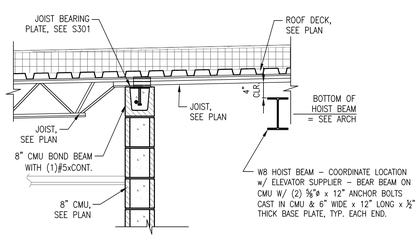


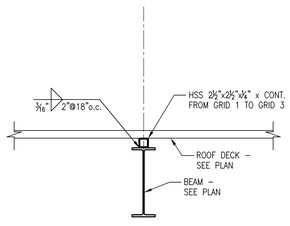
SECTION 11–11
SCALE: 3/4" = 1'-0"



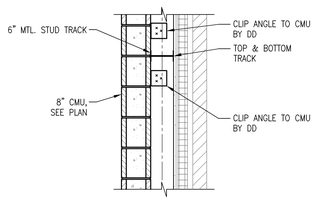
SECTION 12–12
SCALE: 3/4" = 1'-0"



SECTION 13–13
SCALE: 3/4" = 1'-0"



SECTION 14–14
SCALE: 3/4" = 1'-0"



SECTION 15–15
SCALE: 3/4" = 1'-0"

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CORPORATE SEAL No. C-1805 — WOODS ENGINEERING P.A. — NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 041563 ENGINEER ADAM L. SISK

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD, N.W.
SHALLOTTE, N.C. 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

FRAMING SECTIONS AND DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BICDING
	03.20.20	100% REVIEW SUBMISSION
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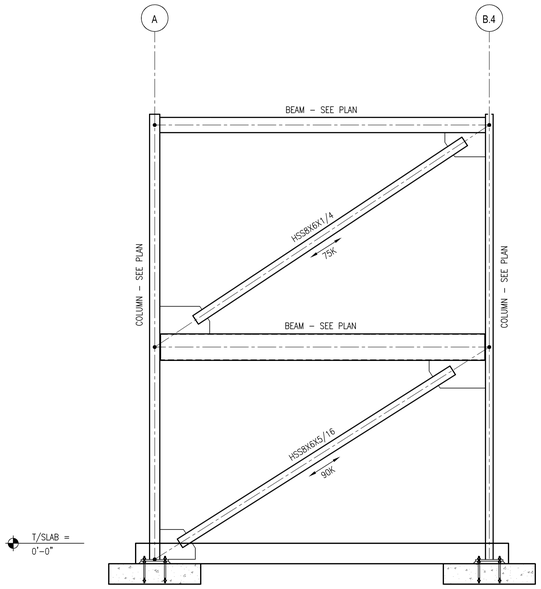
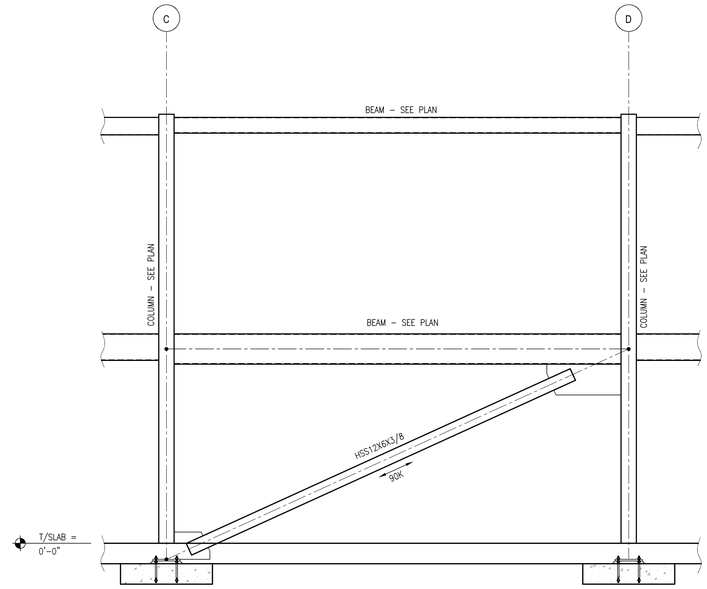
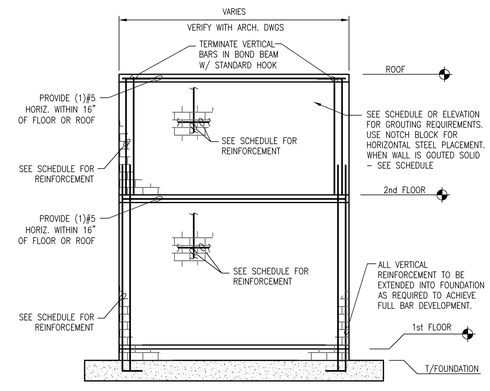


BRACE FRAME #1 ELEVATION
SCALE: 1/4" = 1'-0"

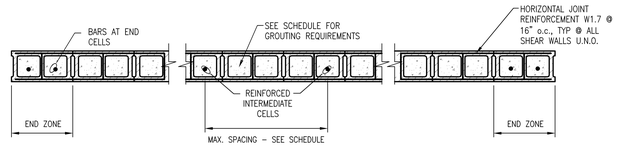


BRACE FRAME #2 ELEVATION
SCALE: 1/4" = 1'-0"

MASONRY SHEAR WALL (MSW) SCHEDULE				
MSW–1				
MARK	REINF. @ MOST OUTER CELLS EACH END OF WALL	REINF. IN REMAINING CELLS	HORIZONTAL BARS	GROUT REINFORCING
2nd TO ROOF	(2) #5	#5 @ 48"o.c.	NOT REQ'D.	GROUT REINFORCED CELLS
1st TO 2nd	(4) #5	#5 @ 48"o.c.	NOT REQ'D.	GROUT REINFORCED CELLS



GENERIC ELEVATION
ORDINARY REINFORCEMENT
SCALE: 3/16" = 1'-0"
(SEE PLAN FOR SW LOCATIONS)



TYPICAL REINFORCED CMU SHEAR
WALL SECTION WITH HORIZONTAL JOINT REINFORCEMENT
SCALE: 3/4" = 1'-0"

CMU SHEAR WALL NOTES:

1. SHEAR WALLS 8" CMU, U.N.O. PROVIDE (2) #5 BAR AT EACH WALL CORNER & AT EACH WALL INTERSECTION – U.N.O. ON WALL SCHEDULE OR ELEVATIONS. GROUT ALL REINFORCED CELLS. U.N.O. IN SCHEDULE.
2. EXTEND HORIZONTAL REINFORCEMENT AS INDICATED ON SHEAR WALL ELEVATIONS OR SCHEDULE BUT NOT LESS THAN Ld PER CODE.
3. SPLICING BETWEEN VERTICAL BARS SHALL BE NO LESS THAN INDICATED BY TABLE. SEE THIS SHEET FOR REQUIRED SPLICE LENGTH ACCORDING TO BAR SIZE
5. T & B = TOP & BOTTOM
6. ANY EMBED DOWELS REQUIRED THAT ARE NOT SHOWN ON PLANS OR ELEVATIONS SHALL BE SAME SIZE AND SPACING AS REINFORCEMENT FOR THE NEXT FLOOR. MATCH REINFORCED CELLS ON THE FLOOR BELOW WHERE POSSIBLE.
7. ALL WALL DIMENSIONS SHOWN ON THE ELEVATIONS AND ASSOCIATED SECTIONS ARE FOR REFERENCE ONLY. COORDINATE ALL FINAL DIMENSIONS WITH ARCHITECTURAL PLANS. IF SIGNIFICANT CONFLICT EXISTS, CONTACT STRUCTURAL ENGINEER AND ARCHITECT FOR RESOLUTION.
8. PLACE HORIZ. REINFORCEMENT IN NOTCHED BLOCK – OR BOND BEAMS.
9. 48"o.c. MAX SPACING OF VERT. REINFORCEMENT OR AS INDICATED ON SW SCHEDULE OR ELEVATIONS. REINFORCEMENT THAT STOPS AT OPENINGS OR DOESN'T CONTINUE ON THE FLOOR ABOVE SHALL BE TERMINATED & FULLY ENGAGED IN BOND BEAM.
10. CMU WALLS NOT INDICATED AS SHEAR WALLS SHALL HAVE A VERTICAL #5 @ EACH CORNER, @ EACH OPENING, AND @ 48"o.c. MAX. GROUT REINFORCED CELLS. PROVIDE W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c.
11. CMU SHEAR WALLS SHALL HAVE W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16" o.c. U.N.O. PLACE HORIZ. BARS IN NOTCHED BLOCK WHERE NOTED IN ELEVATION (HORIZ BARS REPLACE JOINT REINFORCEMENT)..
12. GROUT SHALL BE HELD DOWN 1½" BELOW TOP OF A COURSE TO FORM A KEY AT THE JOINT. SEE STRUCTURAL MASONRY NOTES ON S1.01 FOR ADDITIONAL INFORMATION.
13. DOWELS SHALL BE DEVELOPED FOR THE FULL TENSION CAPACITY PER TABLE THIS SHEET.

MINIMUM SPLICING LENGTH (L) FOR MASONRY	
BAR SIZE	SPLICE LENGTH
#3	16"
#4	22"
#5	26"
#6	43"
#7	60"

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DPI SCHOOL # : 1167

SHEET TITLE
BRACE FRAME ELEVATIONS AND CMU SHEAR WALLS

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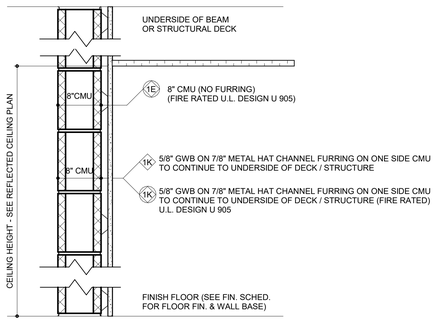
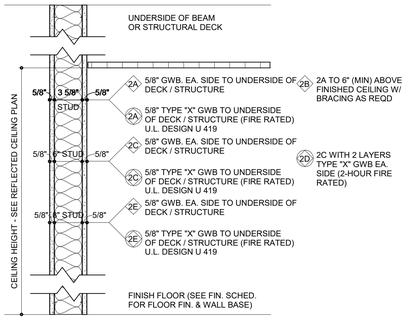
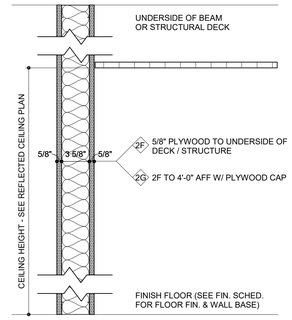


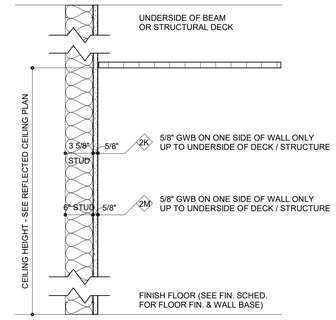
WALL TYPES 1E 1K 1K



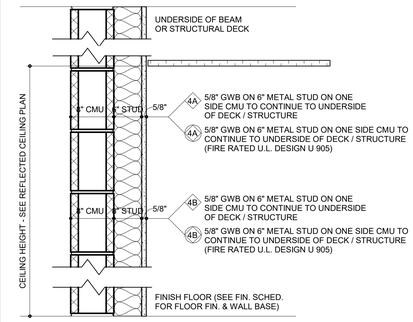
WALL TYPES 2A 2A 2B 2C 2C 2D 2E 2E



WALL TYPES 2F 2G



WALL TYPES 2K 2M



WALL TYPES 4A 4A

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WALL TYPE GENERAL NOTES

1. SEE CODE SHEETS, G100 AND G200 SERIES, FOR REQUIRED FIRE RATINGS OF ALL WALL ASSEMBLIES. MULTIPLE LAYERS OF GWB MAY BE REQUIRED AT RATED PARTITIONS.

2. PROVIDE SOUND-ATTENUATING FIRE BATT INSULATION IN METAL STUD PARTITIONS, U.O.N.

3. PROVIDE MOLD AND MOISTURE RESISTANT GWB AT ALL METAL STUD FRAMED PARTITIONS AT WET LOCATIONS, INCLUDING TOILET ROOMS, AND AT SINKS AND LAVATORIES. EXTEND TO END OF CASEWORK RUN, INCLUDING SIDEWALLS WHERE ADJACENT TO SINKS. SEE SPECIFICATIONS.

4. BRACE METAL STUD PARTITIONS, WHERE REQUIRED. SEE SPECIFICATIONS AND STRUCTURAL DRAWINGS.

5. SEE STRUCTURAL FOR BRACING OF PART-HEIGHT MASONRY PARTITIONS, INCLUDING PARTITIONS WITH GWB AND METAL STUD CONTINUING ABOVE.

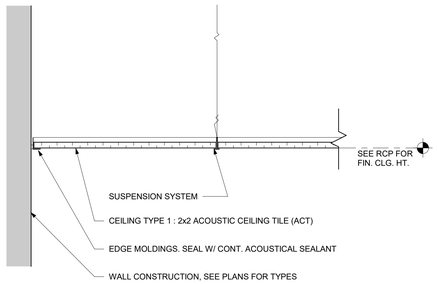
6. SEE SPECIFICATIONS AND STRUCTURAL FOR MASONRY TIES IN MULTIPLE WYTHE MASONRY WALLS AND PARTITIONS. CORRUGATED TIES ARE NOT ACCEPTABLE, U.O.N.

7. PROVIDE BULLNOSE MASONRY UNITS AT LOCATIONS NOTED IN SPECIFICATIONS.

9. FILL ALL CORES IN MASONRY UNITS AT THE FOLLOWING LOCATIONS: ALL MECHANICAL ROOMS AND MEZZANINES. SEE SPECIFICATIONS.

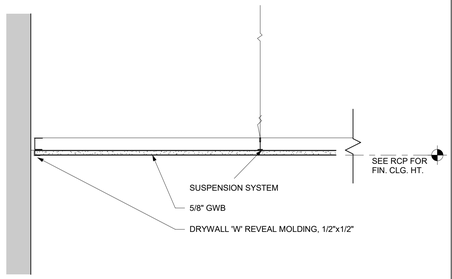
10. PROVIDE ACOUSTICAL SEALANT AT PARTITIONS IN THE FOLLOWING LOCATIONS: ALL MECHANICAL ROOMS AND MEZZANINES. SEE SPECIFICATIONS.

11. PROVIDE CONTROL JOINTS IN MASONRY WALLS AS INDICATED ON PLANS, ELEVATIONS, AND DETAILS, AND AS SPECIFIED. WHERE JOINTS ARE NOT SHOWN, PROVIDE ACCORDING TO B.I.A AND N.C.M.A. TEK NOTES.



1 CEILING TYPE 1 - ACT

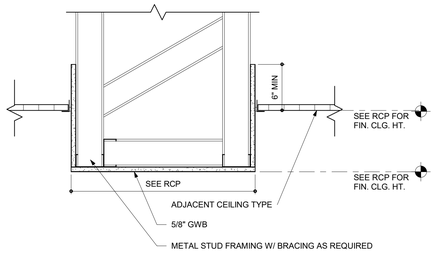
SCALE : 1 1/2" = 1'-0"



TYPICAL FOR ROOMS W/ GWB CEILINGS, UNLESS OTHERWISE NOTED

2 CEILING TYPE 2 - GWB ON SUSPENSION SYSTEM

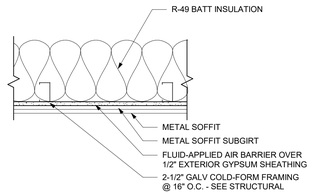
SCALE : 1 1/2" = 1'-0"



TYPICAL FOR GWB BULKHEADS, UNLESS OTHERWISE NOTED

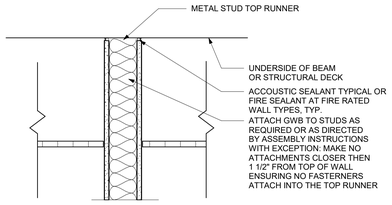
3 TYPICAL BULKHEAD DETAIL

SCALE : 1 1/2" = 1'-0"



4 TYPICAL SOFFIT DETAIL

SCALE : 1 1/2" = 1'-0"

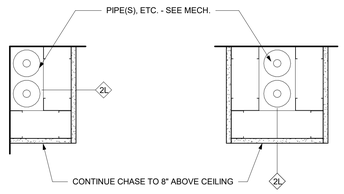


NOTE: DO NOT ATTACH STEEL STUDS TO TOP RUNNERS

MTL STUDS TO BE CUT A MINIMUM OF 3/8" (MAX. 1/2") SHORTER THAN UNDERSIDE OF DECK - GWB TO BE CUT A MINIMUM OF 1/2" (MAX. 5/8") SHORTER THAN UNDERSIDE OF DECK

5 TYPICAL STUD WALL DETAIL

SCALE : 1 1/2" = 1' 0"



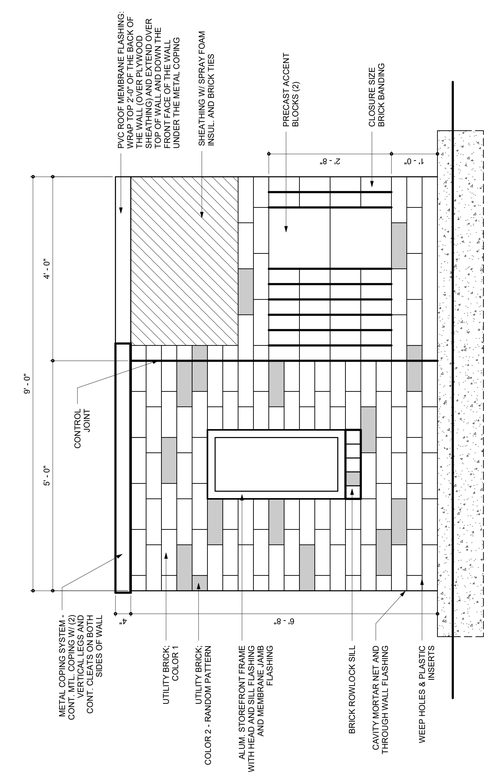
A. TYPICAL CHASE IN CORNER

B. TYPICAL FREE STANDING CHASE

NOTE: COORDINATE CHASE SIZES WITH MECHANICAL/PLUMBING & STRUCTURAL REQUIREMENTS
AND WITH DIMENSIONS INDICATED ON FLOOR PLANS. ALIGN CHASE WITH ADJACENT WALLS AS INDICATED ON PLANS.

6 TYPICAL CHASE DETAILS

SCALE : 1 1/2" = 1' 0"



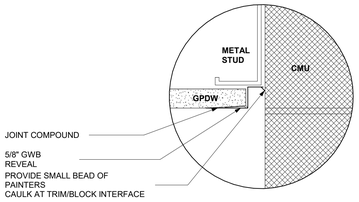
9 MOCK-UP WALL DETAIL

SCALE : 3/4" = 1' 0"

10 JOB SIGN DETAIL

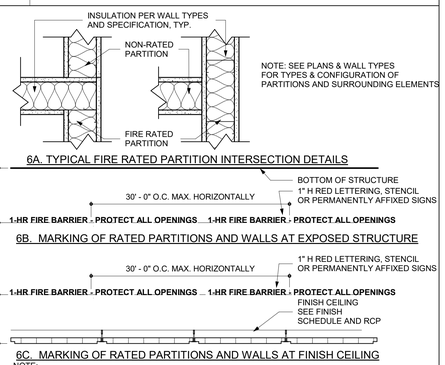
SCALE : 3/4" = 1' 0"

NOTE:
TYPICAL HORIZONTAL TRANSITIONS
WHERE CMU BLOCK AND GYPSUM
DRYWALL ALIGN



7 TYPICAL REVEAL DETAIL

SCALE : N.T.S.



NOTE:
1. PROVIDE MARKING ON BOTH SIDES OF RATED WALLS AND PARTITIONS.
2. WHERE CHANGE IN WALL OR PARTITION DIRECTION OCCURS, MARK EACH SEGMENT INDIVIDUALLY.
3. LOCATE MARKINGS TO BE VISIBLE ABOVE CEILING.
4. LETTERING SHALL READ AS FOLLOWS:
SMOKE PARTITION: " SMOKE PARTITION - PROTECT ALL OPENINGS "
1-HR FIRE BARRIER: " 1-HR FIRE BARRIER - PROTECT ALL OPENINGS "
2-HR FIRE WALL: " 2-HR FIRE WALL - PROTECT ALL OPENINGS "

8 TYPICAL RATED PARTITION DETAILS

SCALE : N.T.S.

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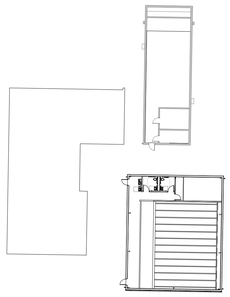

1 PHASING AND CONSTRUCTION PLAN

SCALE: 1/32" = 1'-0"

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FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 4/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, NC

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GENERAL NOTES

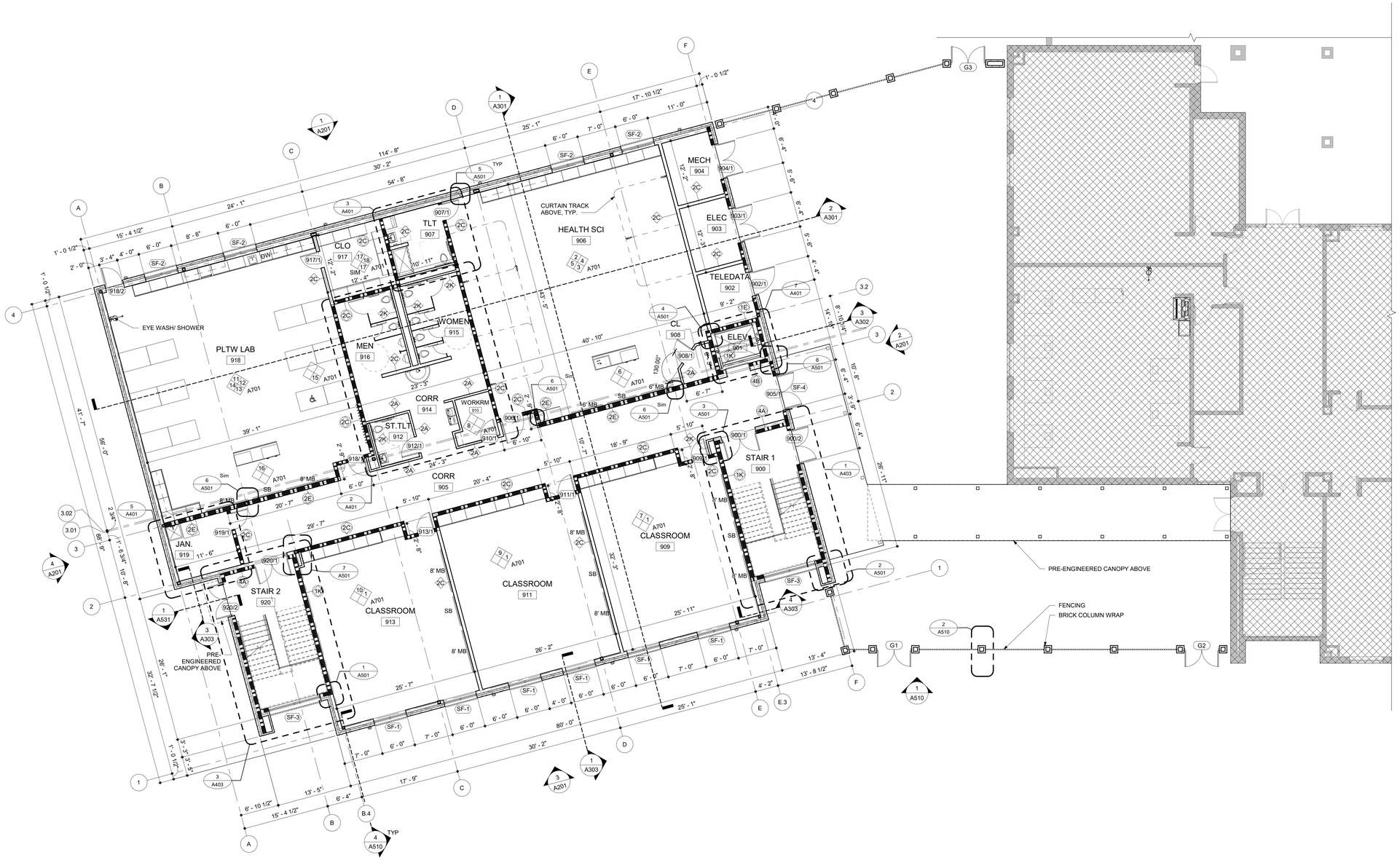
1. DIMENSIONS ARE TO EXTERIOR FACE OF CONCRETE, MASONRY, OR METAL STUD UNLESS OTHERWISE NOTED.
2. REFER TO A000-SERIES DRAWINGS FOR SLAB AND OTHER CONSTRUCTION TYPES, PARTITON TYPES AND TYPICAL DETAILS.
3. SEE A103 FOR ROOF PLAN.
4. SEE A400-SERIES FOR ENLARGED PLANS AND SECTIONS.
5. SEE A601 FOR FINISH SCHEDULE AND LEGEND.
6. SEE A602-A603 FOR DOOR SCHEDULE, DOOR TYPES AND HOLLOW METAL, CURTAINWALL, AND STOREFRONT TYPES.
7. COORDINATE REQUIREMENTS OF WORK WITH ALL OTHER TRADES.
8. SEE A501 FOR TYPICAL CORNER GUARD AND END WALL GUARD DETAILS.

LEGEND

AREA N.I.C.

MB MARKERBOARD. CONTRACTOR FURNISHED & INSTALLED

SB SMARTBOARD. OWNER FURNISHED, CONTRACTOR INSTALLED



1 CLASSROOM BUILDING FIRST FLOOR PLAN

SCALE: 1/8" = 1'-0"

SCALE : 1/8" = 1'-0"

PLAN NORTH

BECKER MORGAN GROUP

ARCHITECTURE PLANNING

North Carolina
3333 Jaeckle Drive, Suite 120
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FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 04/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

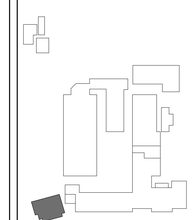
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING FIRST FLOOR PLAN



KEY PLAN

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 1/8" = 1'-0"
DRAWN BY: EEM | PROJ MGR: RMC

A101

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GENERAL NOTES

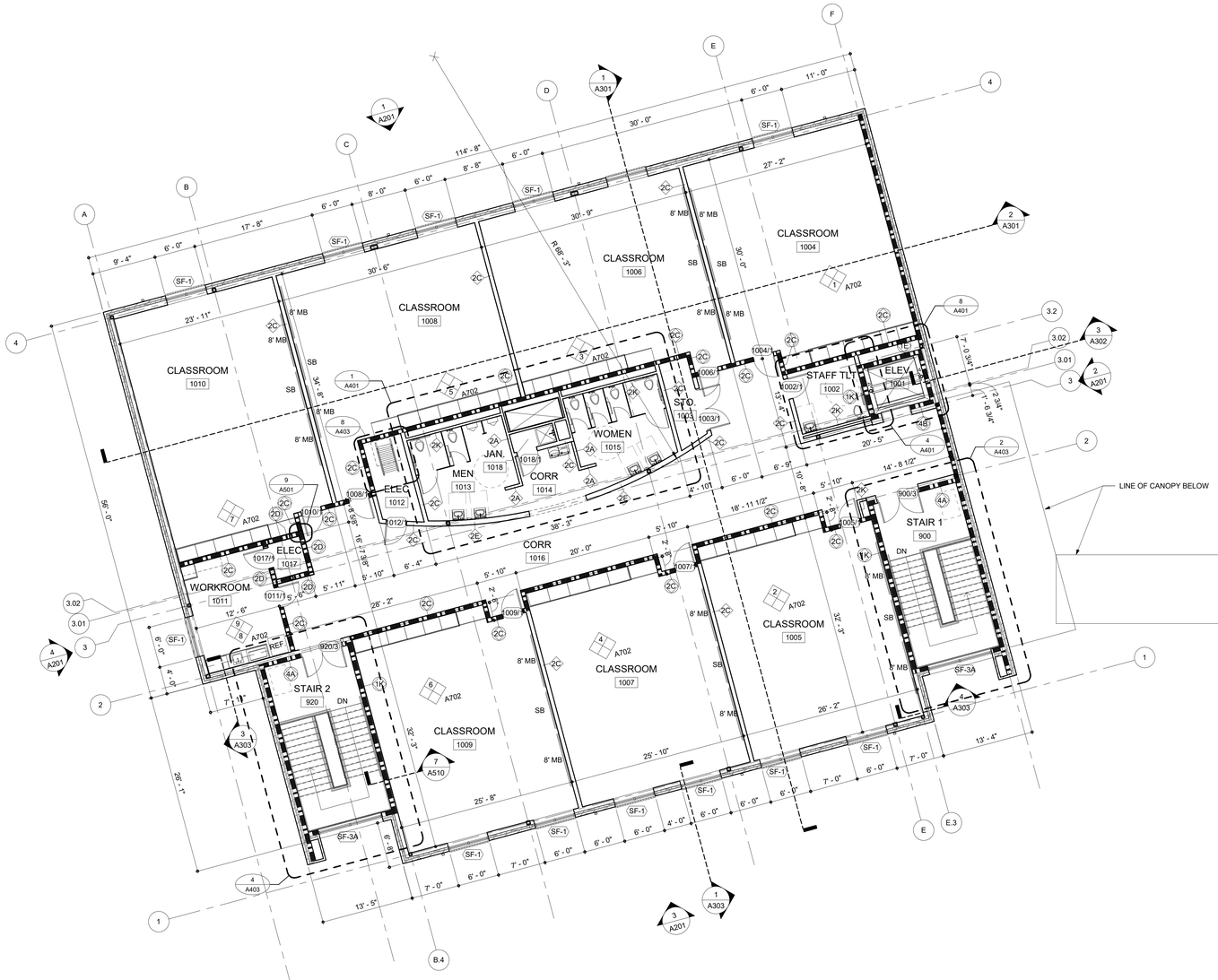
1. DIMENSIONS ARE TO EXTERIOR FACE OF CONCRETE, MASONRY, OR METAL STUD UNLESS OTHERWISE NOTED.
2. REFER TO A000-SERIES DRAWINGS FOR SLAB AND OTHER CONSTRUCTION TYPES, PARTITON TYPES AND TYPICAL DETAILS.
3. SEE A103 FOR ROOF PLAN.
4. SEE A400-SERIES FOR ENLARGED PLANS AND SECTIONS.
5. SEE A601 FOR FINISH SCHEDULE AND LEGEND.
6. SEE A602-A603 FOR DOOR SCHEDULE, DOOR TYPES AND HOLLOW METAL, CURTAINWALL, AND STOREFRONT TYPES.
7. COORDINATE REQUIREMENTS OF WORK WITH ALL OTHER TRADES.
8. SEE A501 FOR TYPICAL CORNER GUARD AND END WALL GUARD DETAILS.

LEGEND

AREA N.I.C.

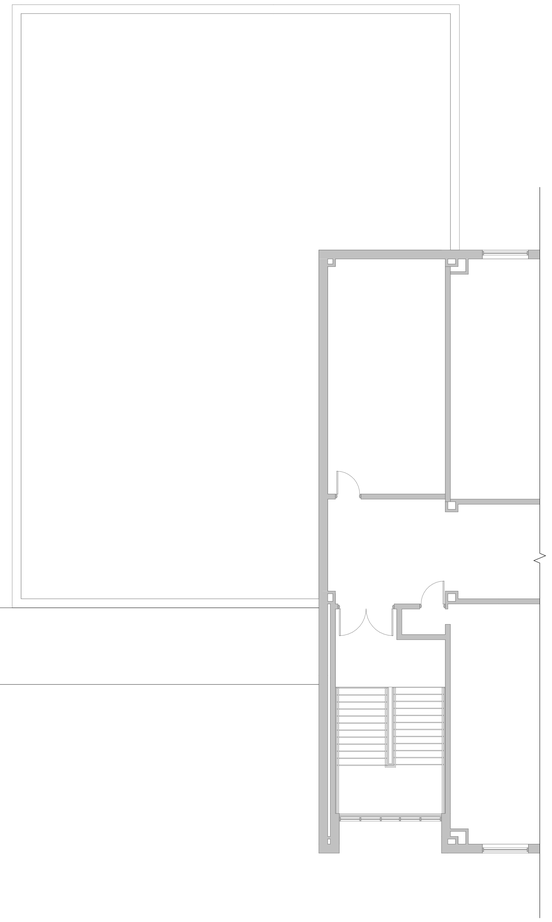
MB MARKERBOARD. CONTRACTOR FURNISHED & INSTALLED

SB SMARTBOARD. OWNER FURNISHED, CONTRACTOR INSTALLED



1 CLASSROOM BUILDING SECOND FLOOR PLAN

SCALE: 1/8" = 1'-0"



PLAN NORTH

N

8' 4' 0' 8'

SCALE : 1/8" = 1'-0"

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BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, NC

PROJECT TITLE

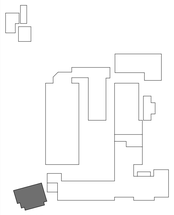
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING SECOND FLOOR PLAN



KEY PLAN

ISSUE BLOCK

Mark	Date	Description
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	7.11.19	NCDPI SD SUBMISSION

PROJECT NO:	2019082.00
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SCALE:	1/8" = 1'-0"
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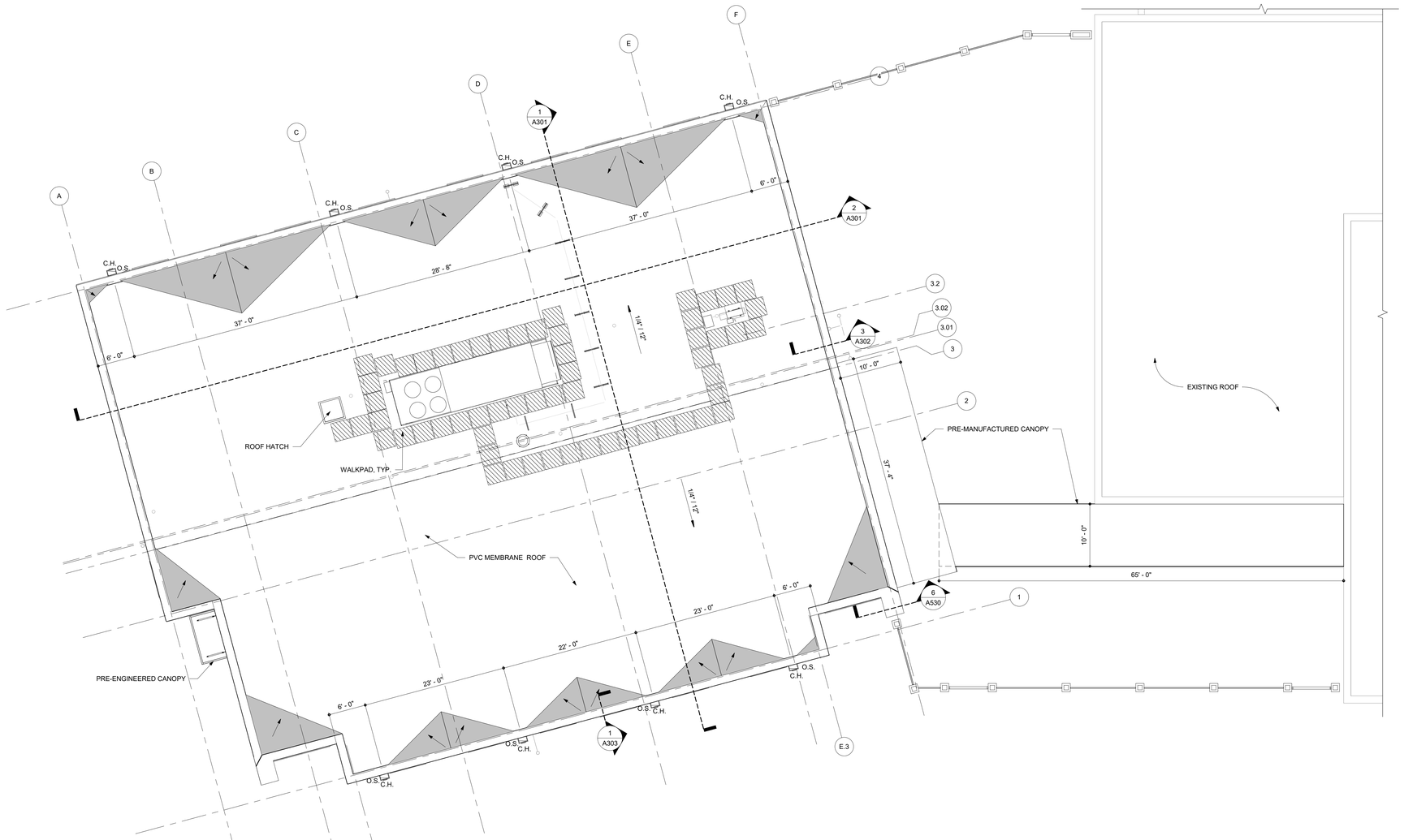
ROOF LEGEND

	PVC ROOFING SYSTEM OVER RIGID INSULATION
	STANDING SEAM METAL ROOF
	WALKPADS
	CRICKET
	ROOFTOP VENTILATOR
VTR	VENT THROUGH ROOF - SEE PLUMB.
C.H.	CONDUCTOR HEAD
D.S.	DOWNSPOUT
S.B.	SPLASHBLOCK
LDR	LADDER

ROOF NOTES

1. SLOPE ALL CRICKETS 1/2" / 12" MINIMUM, EXCEPT WHERE REQUIRED TO MAINTAIN MINIMUM 8" ROOFING/FLASHING TURN-UP HEIGHT.
2. TIE DOWNSPOUTS INTO BOOT AT GRADE AND CONNECT TO STORMWATER SYSTEM, UNLESS OTHERWISE NOTED. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
3. PROVIDE CRICKETS AT ALL ROOF TOP EQUIPMENT, FIRE VENTS, EXHAUST FANS, CURBS, ETC. AS REQUIRED TO MAINTAIN POSITIVE DRAINAGE.
4. PROVIDE WALKWAY PADS AROUND MECHANICAL EQUIPMENT, BASE AND TOP OF LADDERS AND AT DOORS.
5. REFER TO MECHANICAL FOR ROOFTOP EQUIPMENT.
6. REFER TO A530-SERIES DRAWINGS FOR ROOF DETAILS.
7. DOWNSPOUTS SHALL BE 4"x3" PLAIN RECTANGULAR UNLESS OTHERWISE NOTED.



1 CLASSROOM BUILDING ROOF PLAN (B.4)

SCALE: 1/8" = 1'-0"

8' 4' 0' 8'

SCALE : 1/8" = 1'-0"

PLAN NORTH

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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

ROOF PLAN

KEY PLAN

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
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	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

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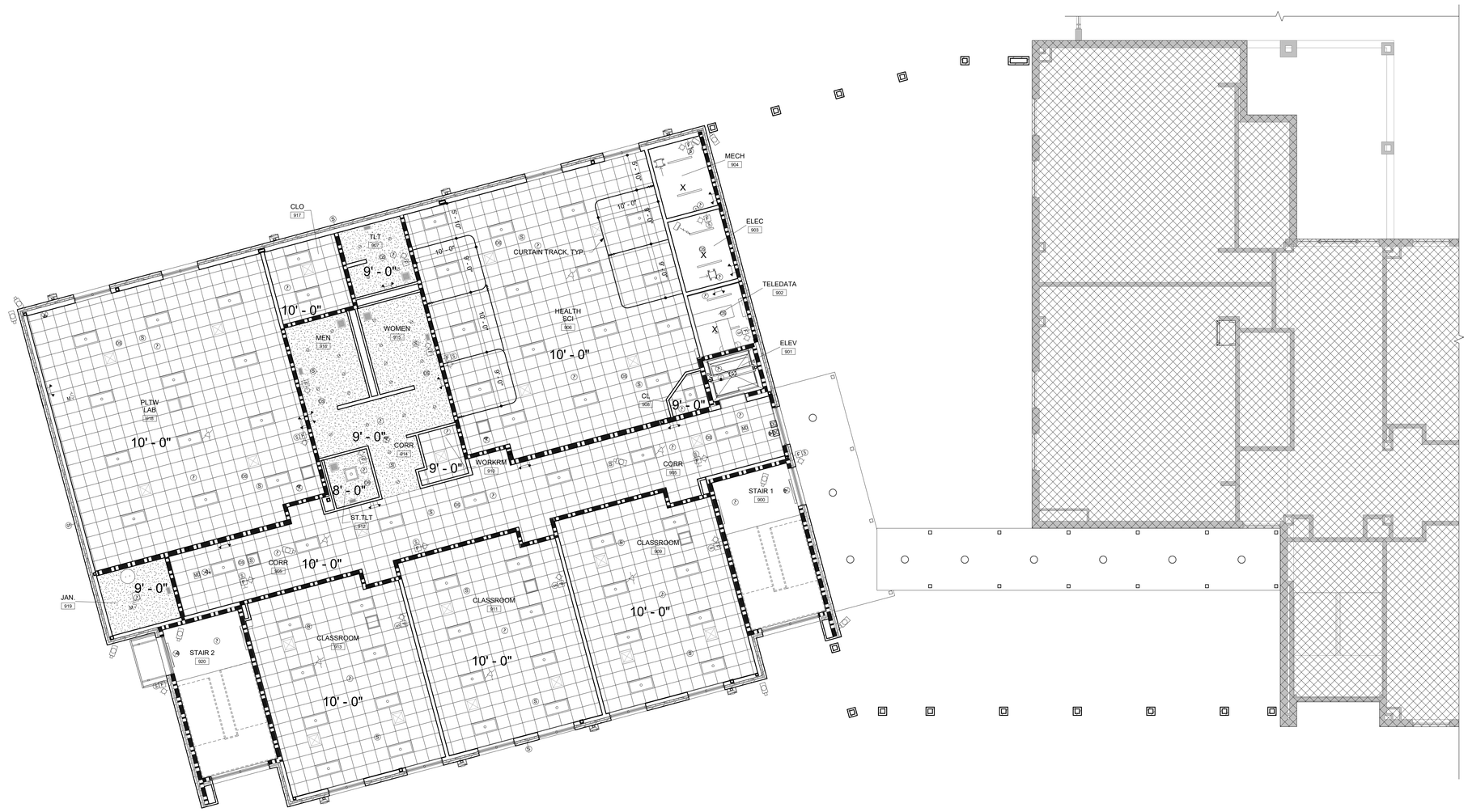
CEILING LEGEND		CEILING NOTES
2x2 ACT CEILING ACT-1	VRF UNIT - SEE MECH.	1. SEE FINISH SCHEDULE FOR ACT TYPES.
INTERIOR - GWB CEILINGS /BULKHEADS	RADIANT HEAT PANEL - SEE MECH.	2. SEE MECHANICAL DRAWINGS FOR G.R.D. TYPES, LOCATIONS, AND ADDITIONAL WORK.
X EXPOSED	SUPPLY/RETURN/EXHAUST DIFFUSER OR REGISTER - SEE MECH.	3. SEE ELECTRICAL DRAWINGS FOR LIGHT FIXTURE TYPES AND LOCATIONS.
N.I.C.	LIGHT FIXTURE - SEE ELEC.	4. CEILING HEIGHTS INDICATED ARE FROM FINISH FLOOR. CEILINGS AT LANDINGS REFER TO NEAREST FLOOR LEVEL.
		5. ALL EXPOSED LINTELS SHALL BE PAINTED.
		6. ALIGN BULKHEADS TO FACE OF WALL / OPENING, U.O.N.



1 CLASSROOM BUILDING FIRST FLOOR REFLECTED CEILING PLAN

SCALE: 1/8" = 1'-0"

8' 4' 0' 8'

SCALE : 1/8" = 1'-0"

PLAN NORTH

N

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BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

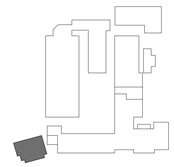
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BLDG FIRST FLOOR REFLECTED CEILING PLAN



KEY PLAN

ISSUE BLOCK

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CEILING LEGEND		CEILING NOTES
2x2 ACT CEILING ACT-1	VRF UNIT - SEE MECH.	1. SEE FINISH SCHEDULE FOR ACT TYPES.
INTERIOR - GWB CEILINGS /BULKHEADS	RADIANT HEAT PANEL - SEE MECH.	2. SEE MECHANICAL DRAWINGS FOR G.R.D. TYPES, LOCATIONS, AND ADDITIONAL WORK.
X EXPOSED	SUPPLY/RETURN/EXHAUST DIFFUSER OR REGISTER - SEE MECH.	3. SEE ELECTRICAL DRAWINGS FOR LIGHT FIXTURE TYPES AND LOCATIONS.
N.I.C.	LIGHT FIXTURE - SEE ELEC.	4. CEILING HEIGHTS INDICATED ARE FROM FINISH FLOOR. CEILINGS AT LANDINGS REFER TO NEAREST FLOOR LEVEL.
		5. ALL EXPOSED LINTELS SHALL BE PAINTED.
		6. ALIGN BULKHEADS TO FACE OF WALL / OPENING, U.O.N.

1 CLASSROOM BUILDING SECOND FLOOR REFLECTED CEILING PLAN

SCALE: 1/8" = 1'-0"

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BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, NC

PROJECT TITLE

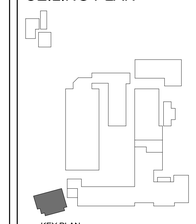
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING SECOND FLOOR REFLECTED CEILING PLAN



KEY PLAN

ISSUE BLOCK

Mark	Date	Description
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	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PLAN NORTH

N

PROJECT NO:	2019082.00
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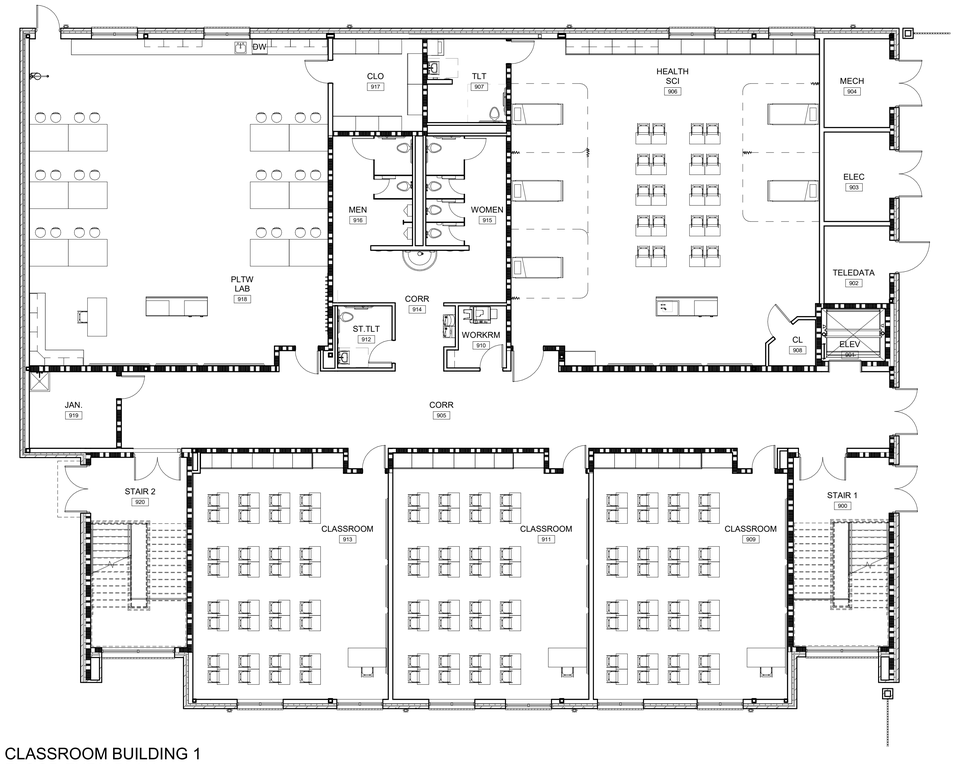
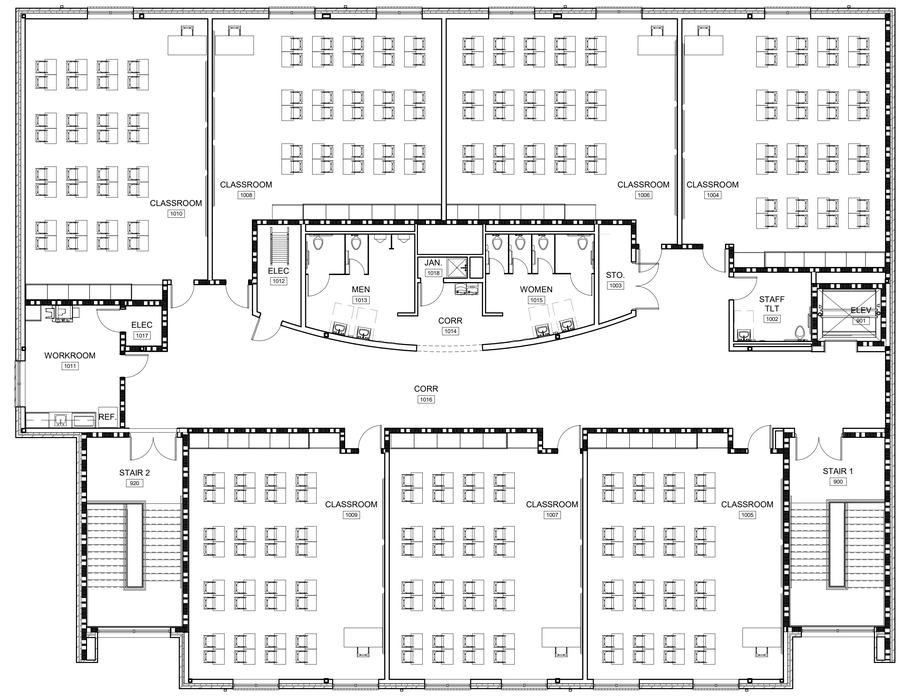
GENERAL FURNITURE NOTES

1. FURNITURE IS UNDER SEPARATE CONTRACT AND SHOWN FOR INFORMATION ONLY



1 CLASSROOM BUILDING 1
FLOOR FURN PLAN
SCALE: 1/8" = 1'-0"



2 CLASSROOM BUILDING
SECOND FLOOR FURNITURE
PLAN
SCALE: 1/8" = 1'-0"

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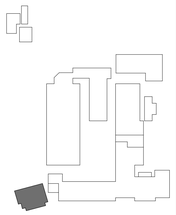
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

FURNITURE PLANS



KEY PLAN

ISSUE BLOCK

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	7.11.19	NCDPI SD SUBMISSION

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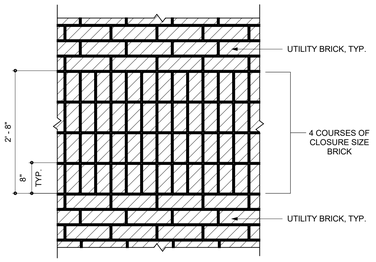
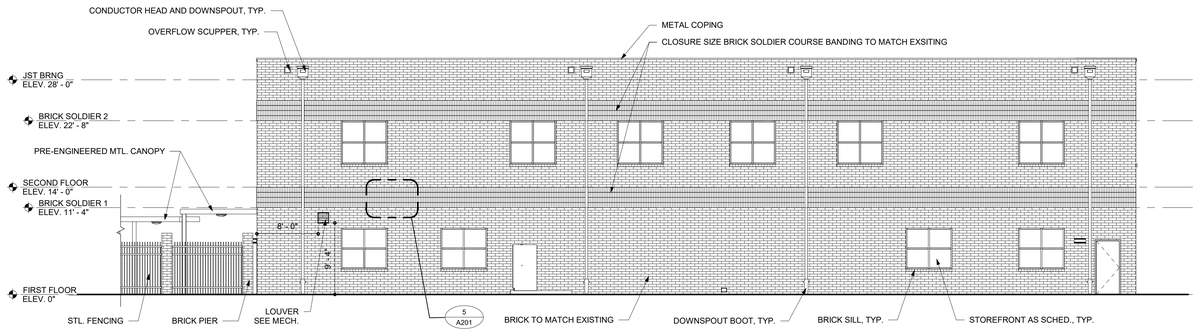
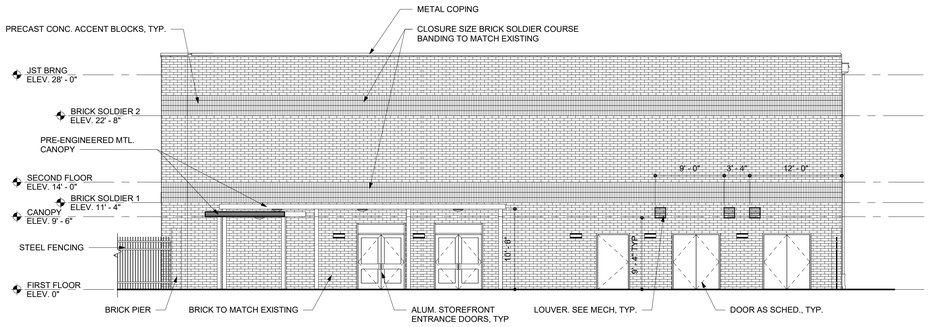


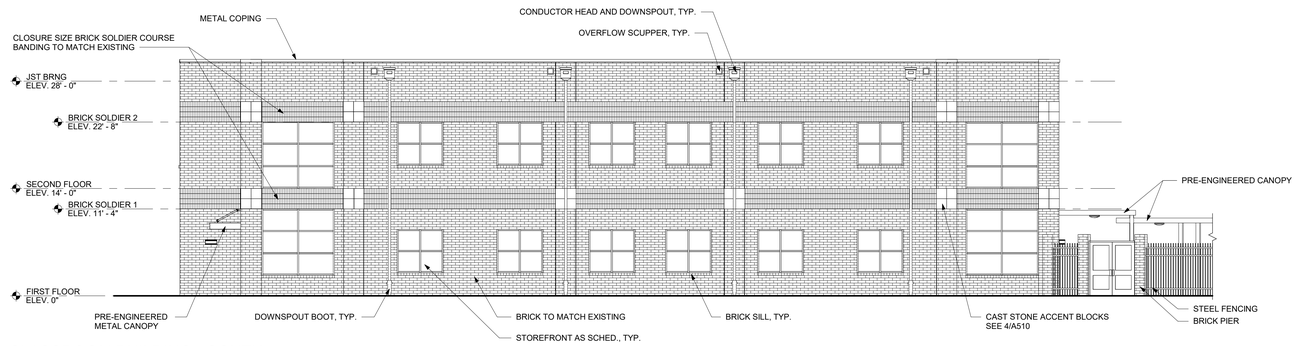
5 BRICK ELEVATION DETAIL
SCALE: 3/4" = 1'-0"



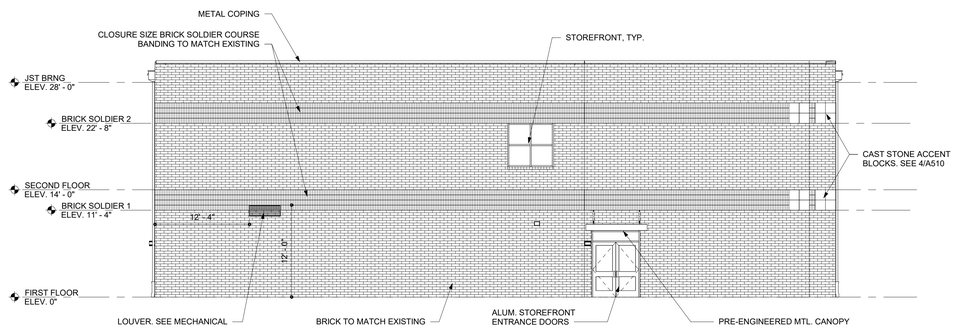
1 CLASSROOM BUILDING - NORTH ELEVATION
SCALE: 1/8" = 1'-0"



2 CLASSROOM BUILDING - EAST ELEVATION
SCALE: 1/8" = 1'-0"



3 CLASSROOM BUILDING - SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



4 CLASSROOM BUILDING - WEST ELEVATION
SCALE: 1/8" = 1'-0"

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PROJECT TITLE

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550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING EXTERIOR ELEVATIONS

ISSUE BLOCK

Mark	Date	Description
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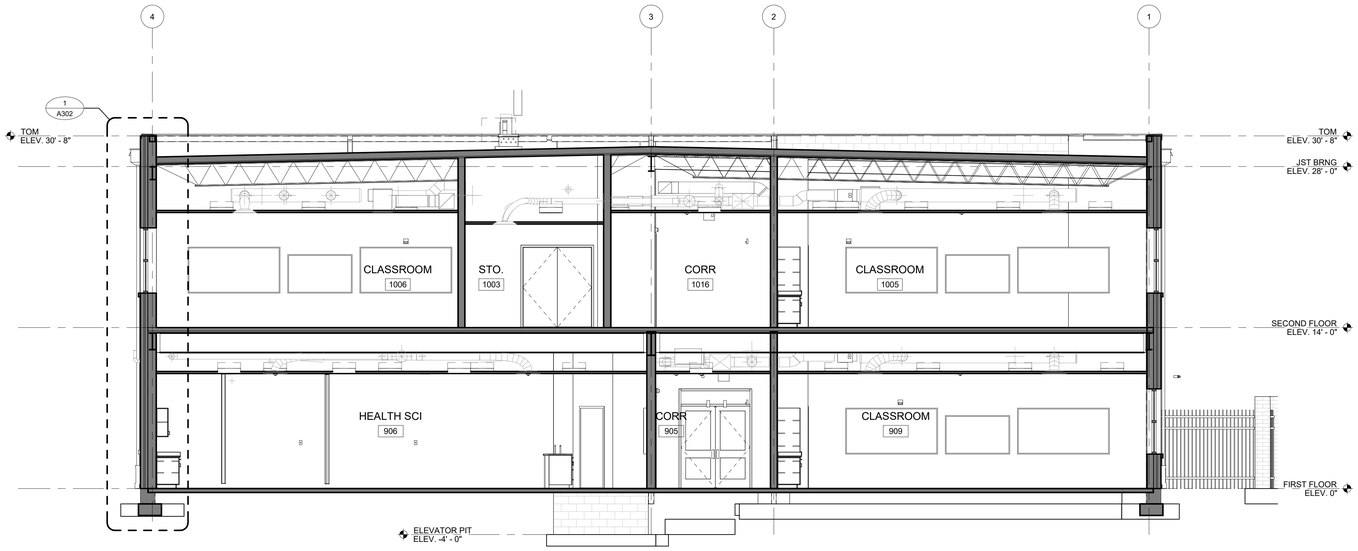
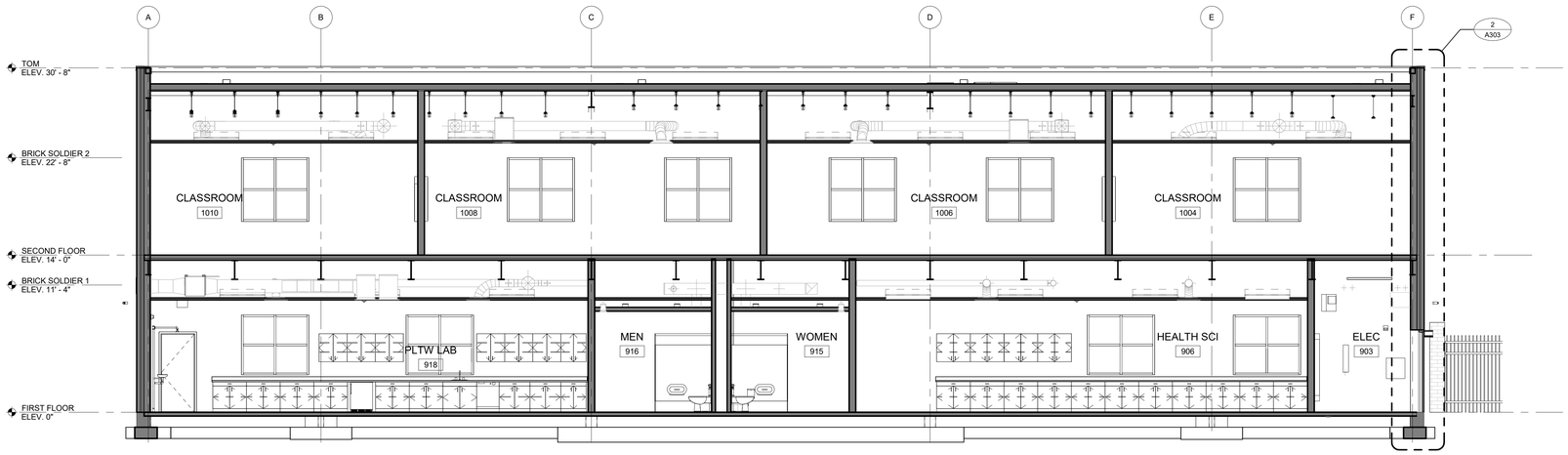


1 CLASSROOM BUILDING N/S BUILDING SECTION

SCALE: 3/16" = 1'-0"



2 CLASSROOM BUILDING W/E BUILDING SECTION

SCALE: 3/16" = 1'-0"

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3333 Jaeckle Drive, Suite 120
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ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 4/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING BUILDING SECTIONS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 3/16" = 1'-0"
DRAWN BY: LJR | PROJ MGR: RMC

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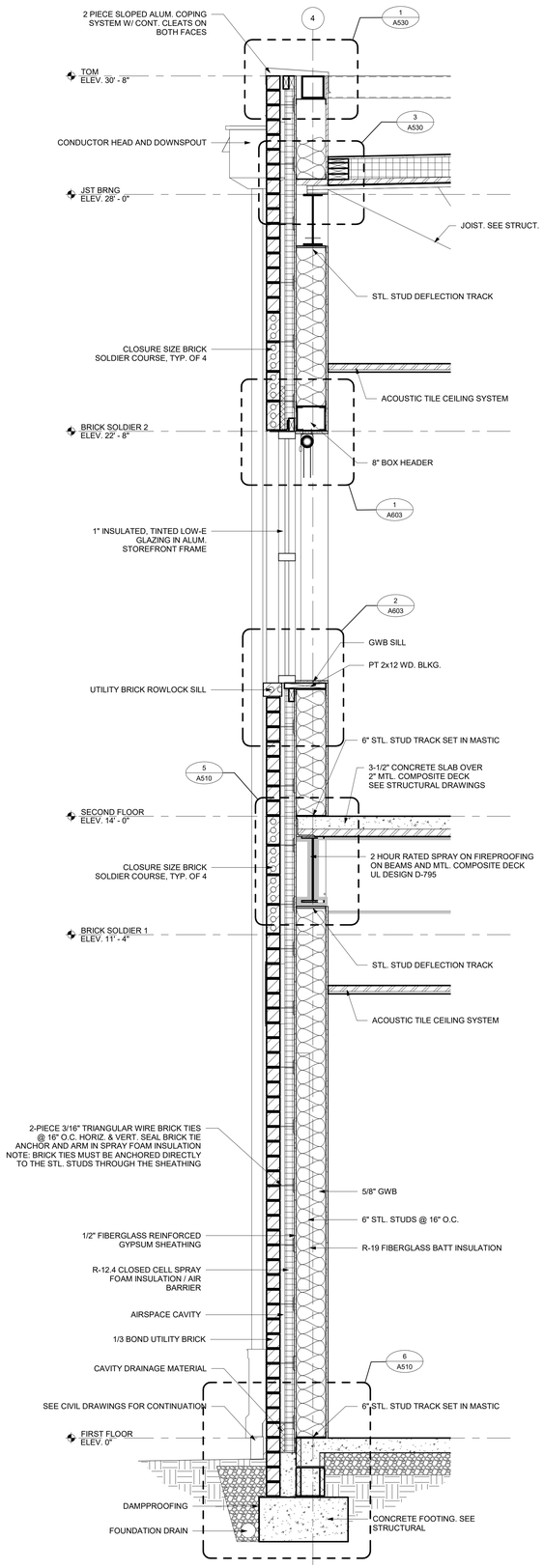
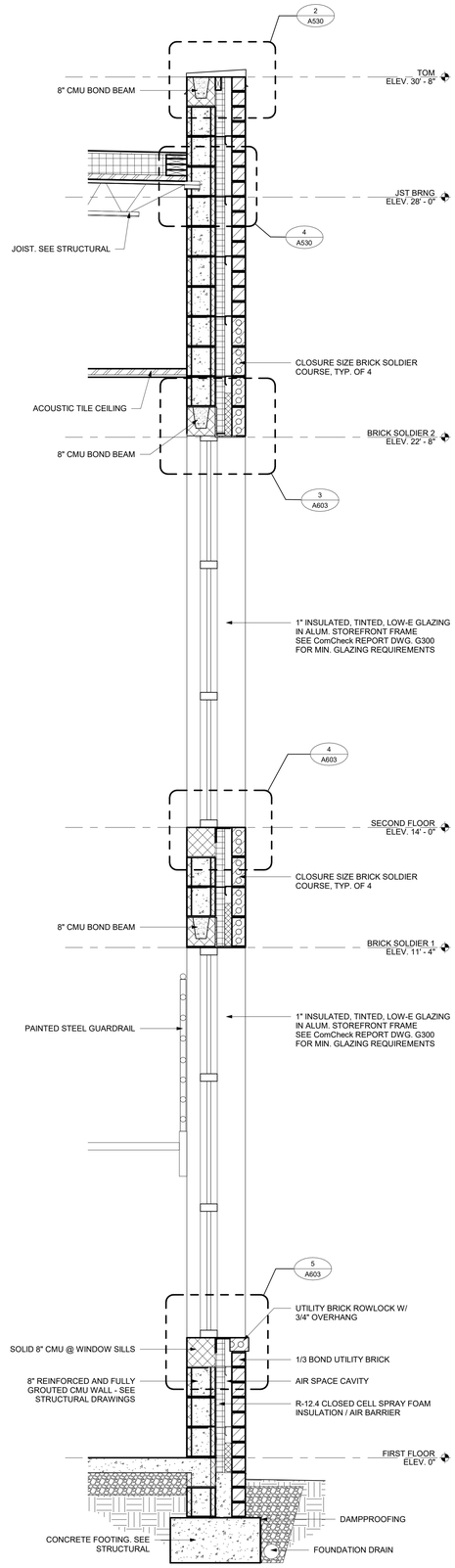


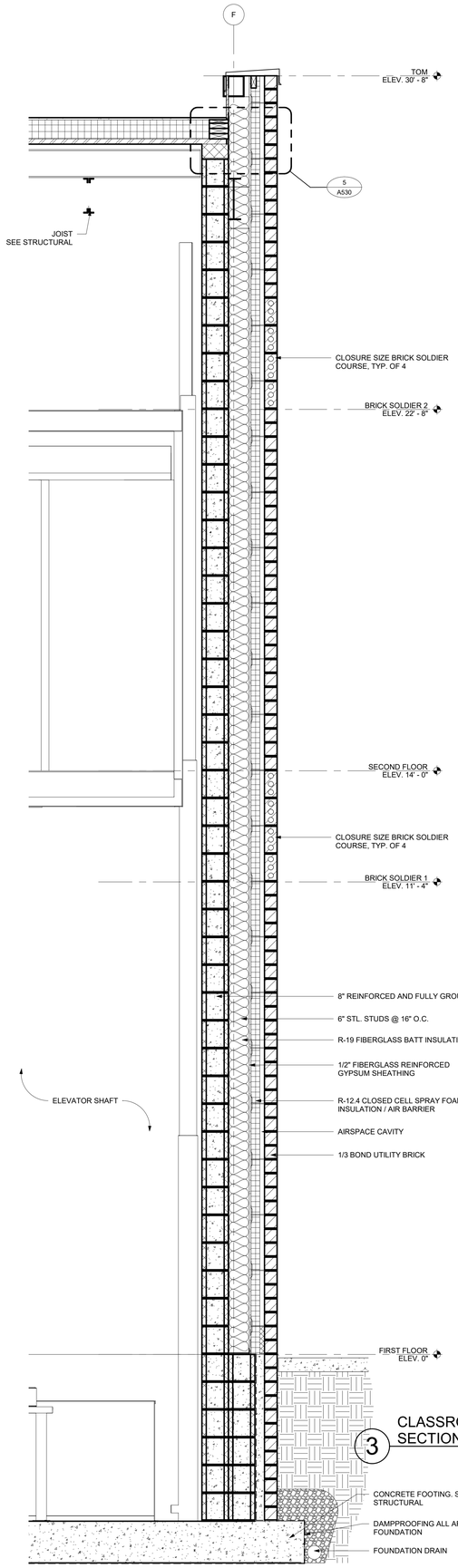
1 CLASSROOM BUILDING WALL SECTION @ NORTH WALL

SCALE: 3/4" = 1'-0"



2 CLASSROOM BUILDING WALL SECTION @ STAIR

SCALE: 3/4" = 1'-0"



3 CLASSROOM BUILDING WALL SECTION @ ELEVATOR

SCALE: 3/4" = 1'-0"

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FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 4/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, NC

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING WALL SECTIONS

ISSUE BLOCK

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	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 3/4" = 1'-0"
DRAWN BY: LJR | PROJ MGR: RMC

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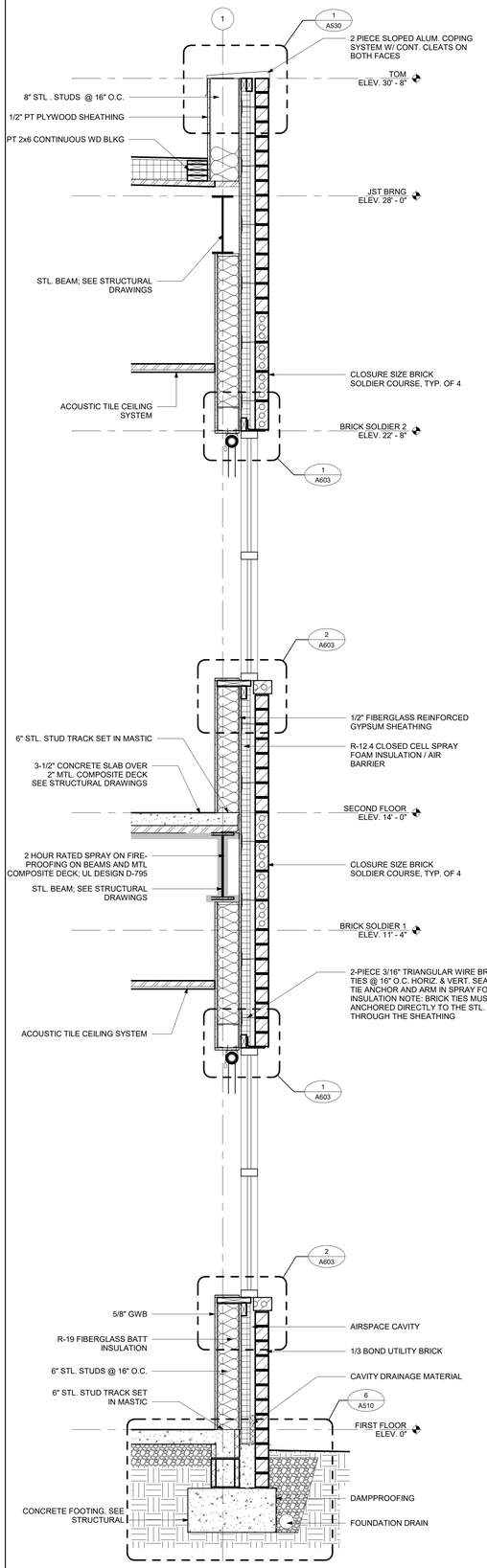
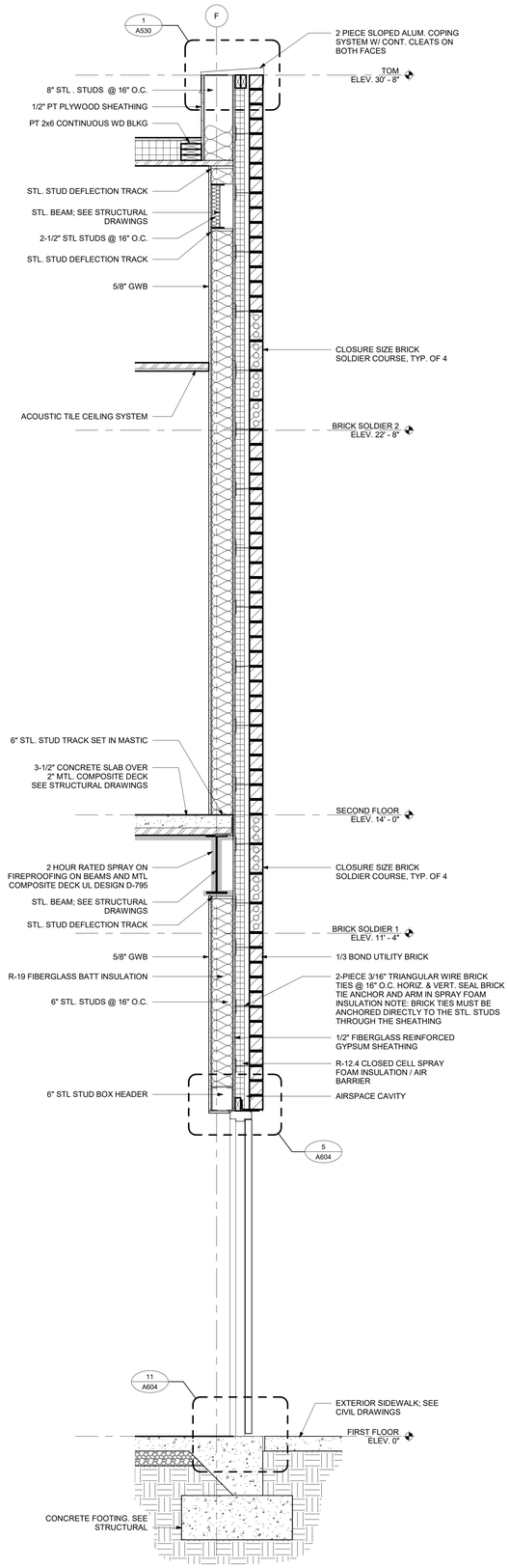


1 CLASSROOM BUILDING WALL SECTION @ SOUTH WALL

SCALE: 3/4" = 1'-0"



2 CLASSROOM BUILDING WALL SECTION @ EAST WALL

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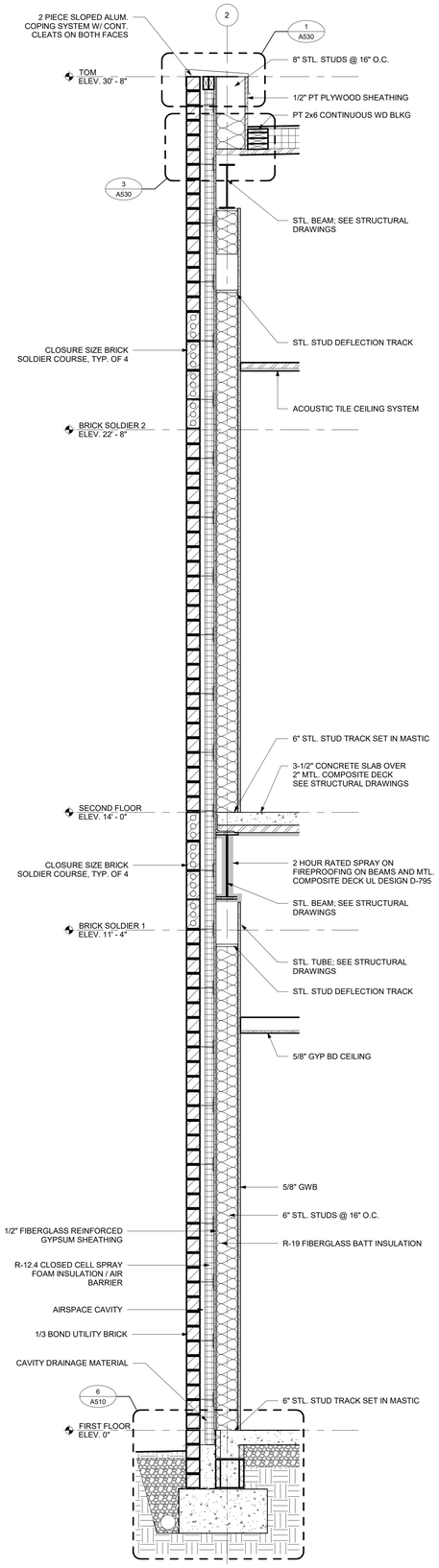
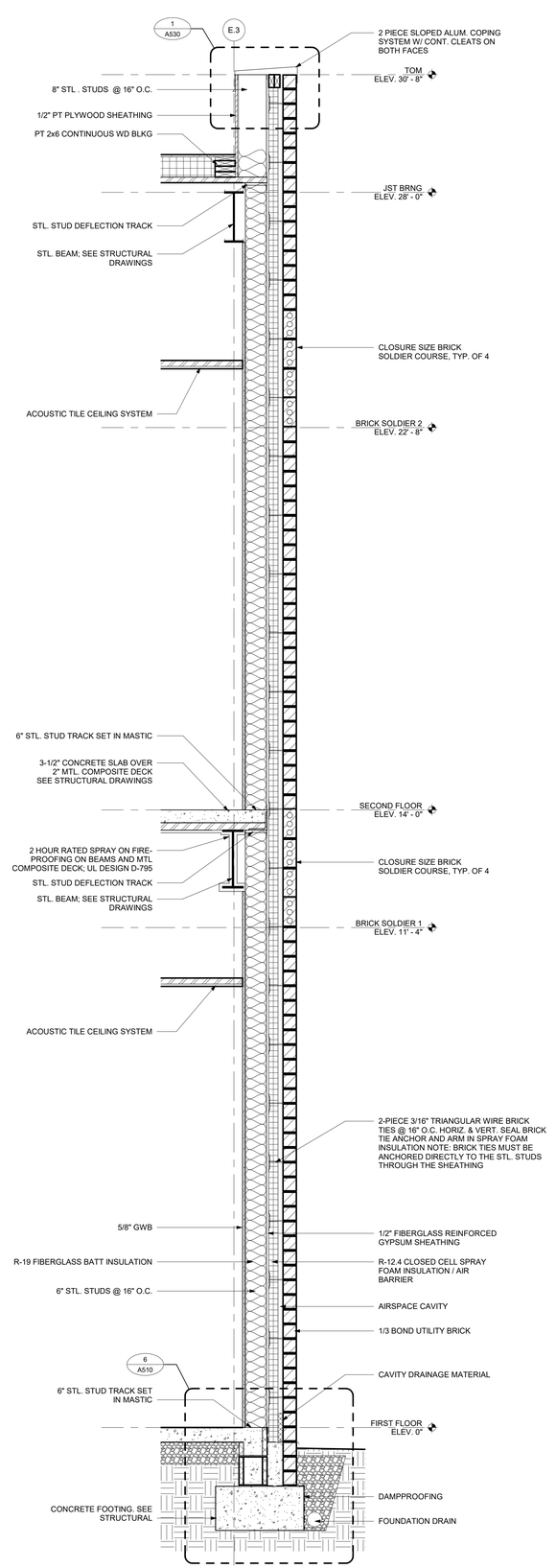


3 WALL SECTION @ SW CORNER

SCALE: 3/4" = 1'-0"



4 SECTION @ SE CORNER

SCALE: 3/4" = 1'-0"

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BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, NC

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING WALL SECTIONS

ISSUE BLOCK

Mark	Date	Description
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	7.11.19	NCDPI SD SUBMISSION

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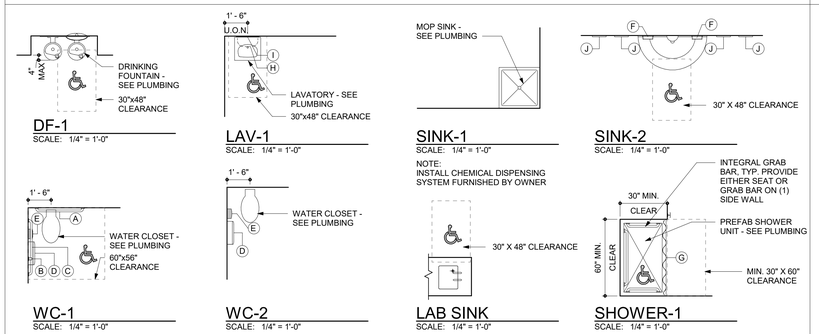
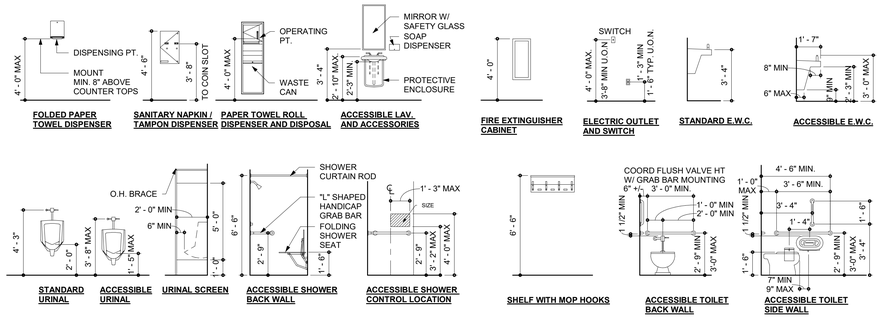
TOILET ACCESSORY SCHEDULE

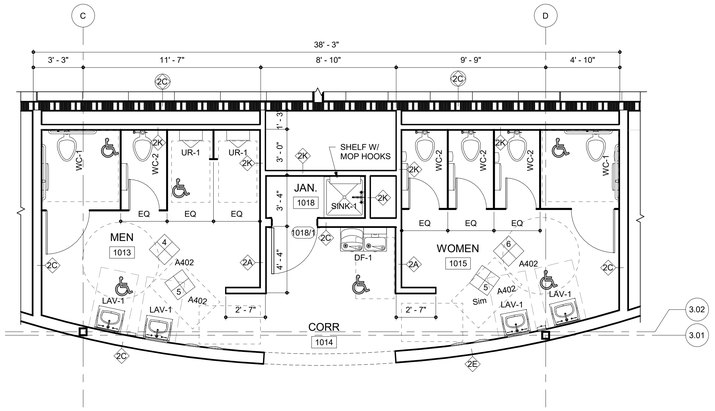
A	36" GRAB BAR - HORIZONTAL	
B	18" GRAB BAR - VERTICAL	
C	42" GRAB BAR - VERTICAL	
D	TOILET PAPER DISPENSER	PROVIDED BY OWNER, INSTALLED BY CONTRACTOR
E	SANITARY NAPKIN DISPOSAL	
F	SOAP DISPENSER	PROVIDED BY OWNER, INSTALLED BY CONTRACTOR
G	NOT USED	
H	UNDER LAVATORY SHIELD	
I	18"x36" FRAMED MIRROR	
J	ELECTRIC HAND DRYER	

PLUMBING TYPES

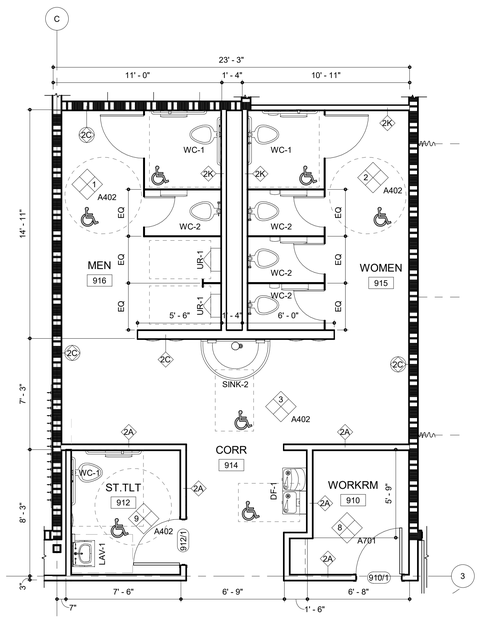


STANDARD MOUNTING HEIGHTS

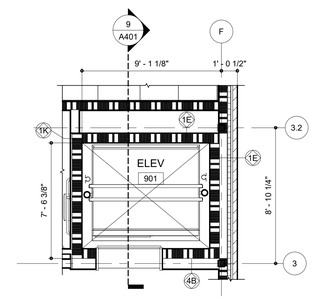




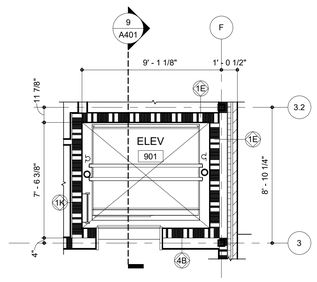
1 SECOND FLOOR GANG TOILET - ENLARGED PLAN
SCALE: 1/4" = 1'-0"



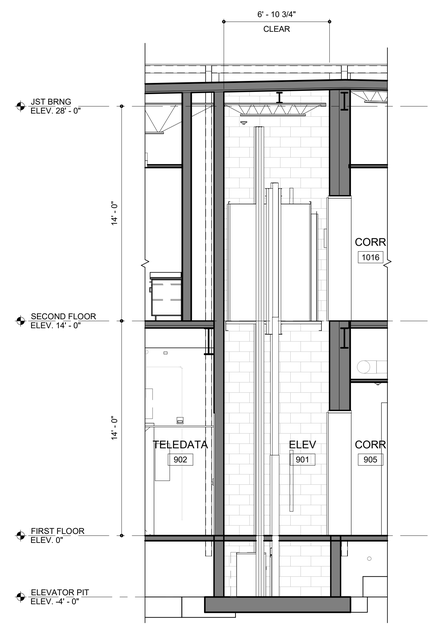
2 FIRST FLOOR GANG TOILET- ENLARGED PLAN
SCALE: 1/4" = 1'-0"



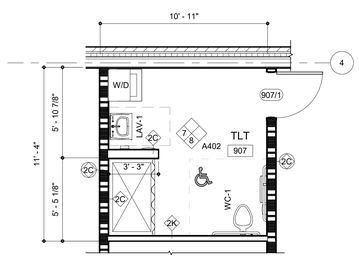
8 ELEV 1001 - SECOND FLOOR ENLARGED PLAN
SCALE: 1/4" = 1'-0"



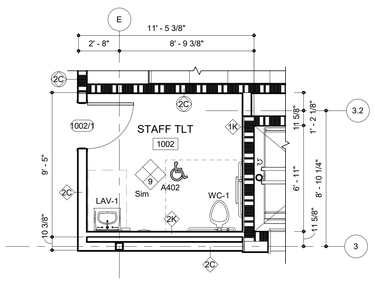
7 ELEV 901 - FIRST FLOOR ENLARGED PLAN
SCALE: 1/4" = 1'-0"



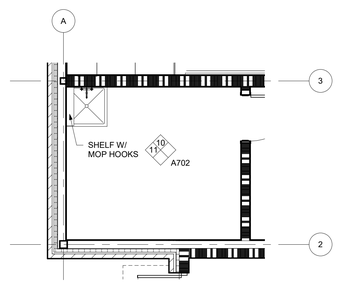
9 ENLARGED SECTION THRU ELEVATOR
SCALE: 1/4" = 1'-0"



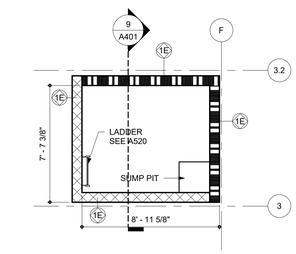
3 TOILET 907 - ENLARGED PLAN
SCALE: 1/4" = 1'-0"



4 STAFF TLT 1002 - ENLARGED PLAN
SCALE: 1/4" = 1'-0"



5 JANITOR 919 ENLARGED PLAN
SCALE: 1/4" = 1'-0"



6 ELEVATOR PIT
SCALE: 1/4" = 1'-0"

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BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

ENLARGED PLANS AND SECTIONS

ISSUE BLOCK

Mark	Date	Description
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	7.11.19	NCDPI SD SUBMISSION

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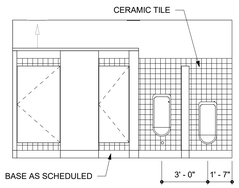
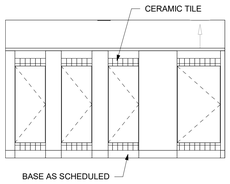
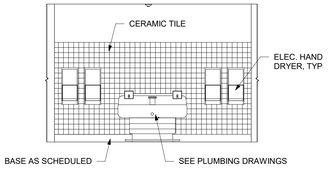


1 MEN 916 ELEVATION
SCALE: 1/4" = 1'-0"



2 WOMEN 915 ELEVATION
SCALE: 1/4" = 1'-0"



3 CORR 914 ELEVATION
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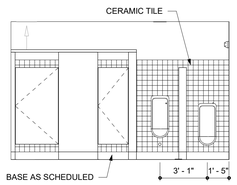
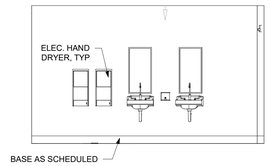
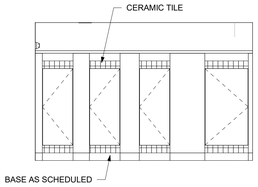


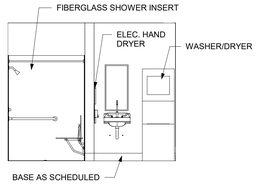
4 MEN 1013 ELEVATION
SCALE: 1/4" = 1'-0"



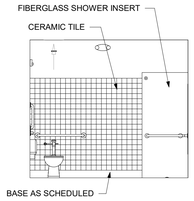
5 MEN 1013 CURVED WALL ELEVATION / WOMEN 915 SIM
SCALE: 1/4" = 1'-0"



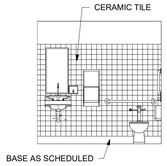
6 WOMEN 1015 ELEVATION
SCALE: 1/4" = 1'-0"



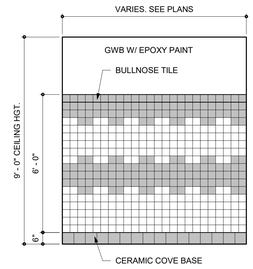
7 TOILET 907 WEST ELEVATION
SCALE: 1/4" = 1'-0"



8 TOILET 907 SOUTH ELEVATION
SCALE: 1/4" = 1'-0"



9 STAFF TLT 912 WEST ELEVATION / 1002 SIM
SCALE: 1/4" = 1'-0"



10 RESTROOM WALL TILE PATTERN
SCALE: 3/8" = 1'-0"

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BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

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DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

TOILET ELEVATIONS

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PROJECT NO: 2019082.00
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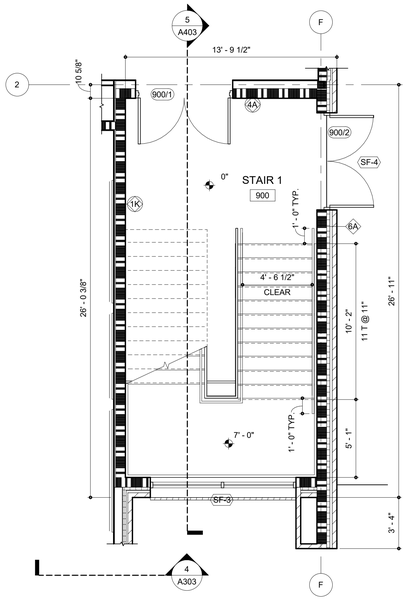
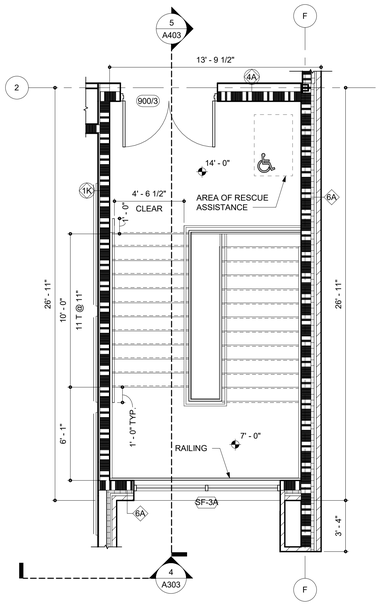


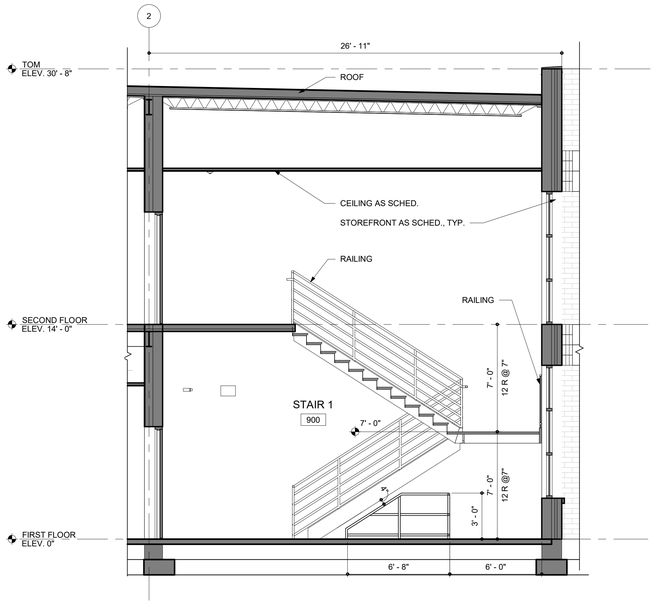
1 STAIR 1 - FIRST FLOOR ENLARGED PLAN

SCALE: 1/4" = 1'-0"



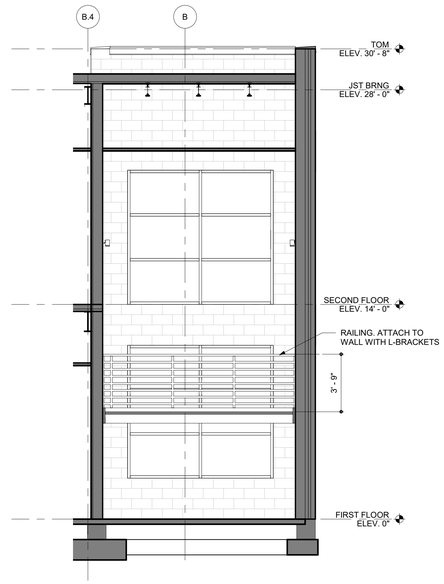
2 STAIR 1 - SECOND FLOOR ENLARGED PLAN

SCALE: 1/4" = 1'-0"



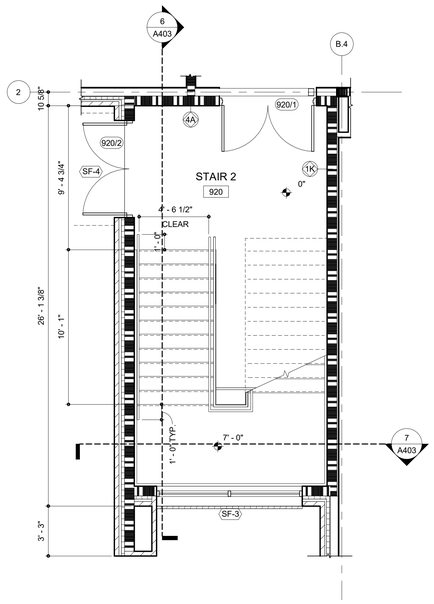
5 ENLARGED SECTION THRU STAIR 1

SCALE: 1/4" = 1'-0"



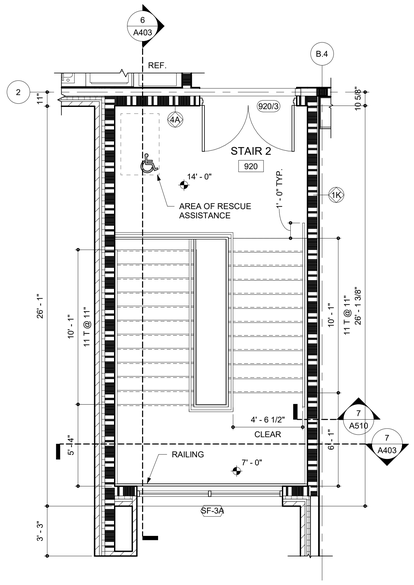
7 SECTION THRU STAIRS

SCALE: 1/4" = 1'-0"



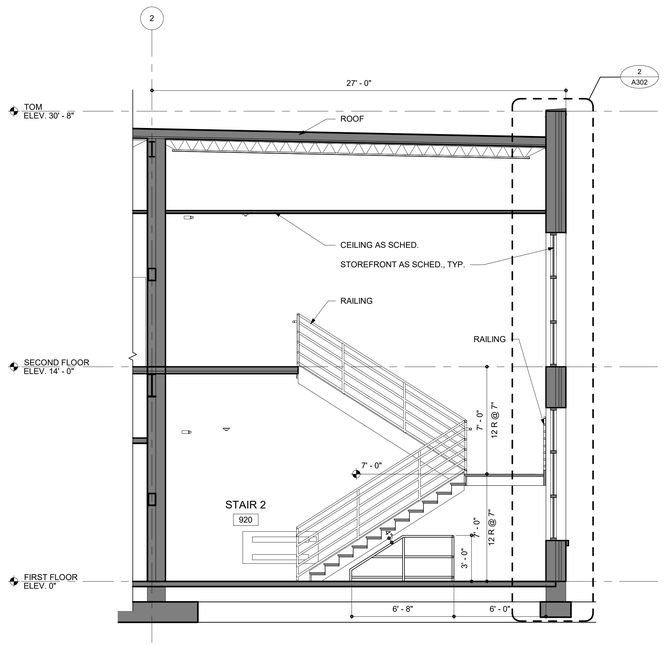
3 STAIR 2 - FIRST FLOOR ENLARGED PLAN

SCALE: 1/4" = 1'-0"



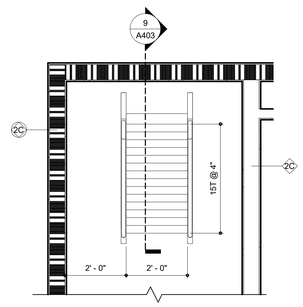
4 STAIR 2 - SECOND FLOOR ENLARGED PLAN

SCALE: 1/4" = 1'-0"



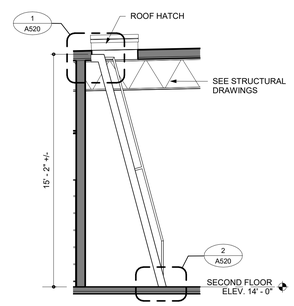
6 ENLARGED SECTION THRU STAIR 2

SCALE: 1/4" = 1'-0"



8 ENLARGED SHIPS LADDER PLAN

SCALE: 1/2" = 1'-0"



9 SHIPS LADDER SECTION

SCALE: 1/4" = 1'-0"

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Rittenhouse Station
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302.369.3700

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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

SHEET TITLE

ENLARGED STAIR PLANS AND SECTIONS

ISSUE BLOCK

Mark	Date	Description

PROJECT NO:	2019082.00
DATE:	04.16.2020
SCALE:	As indicated
DRAWN BY: KMS	PROJ MGR: RMC

A403

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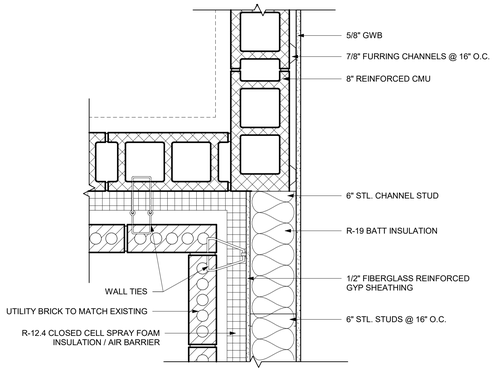
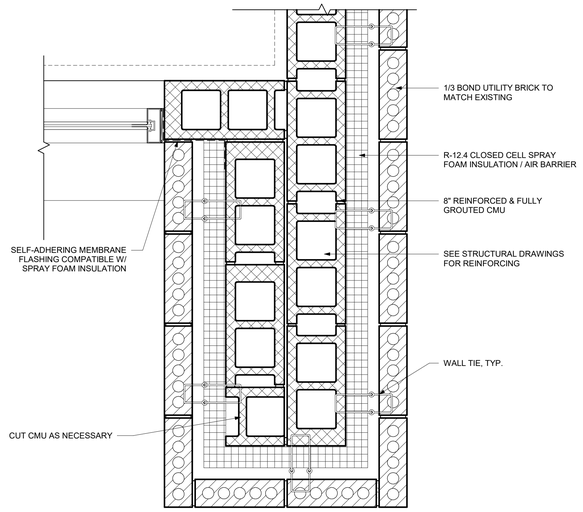


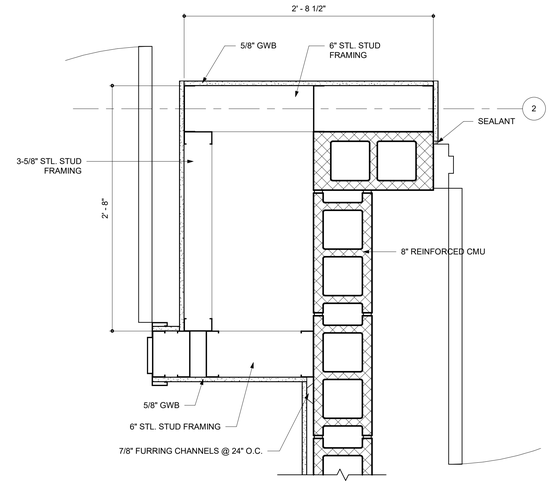
1 EXTERIOR PLAN DETAIL @ STAIR

SCALE: 1 1/2" = 1'-0"



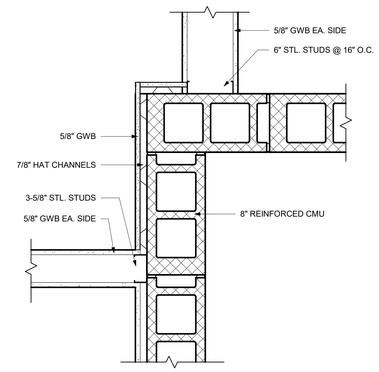
2 EXTERIOR PLAN DETAIL

SCALE: 1 1/2" = 1'-0"



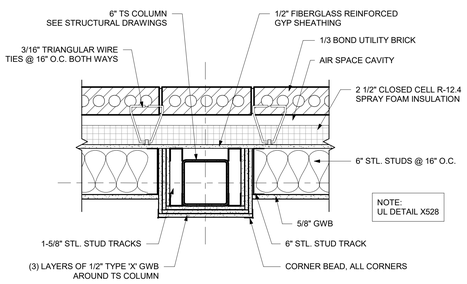
3 INTERIOR PLAN DETAIL @ STAIR

SCALE: 1 1/2" = 1'-0"



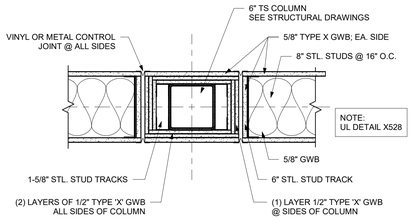
4 PLAN DETAIL @ ELEVATOR

SCALE: 1 1/2" = 1'-0"



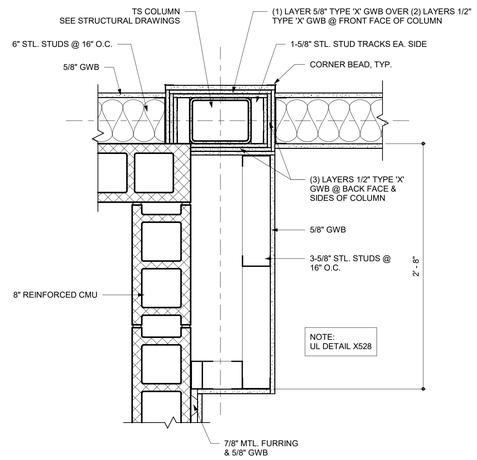
5 TYPICAL EXTERIOR COLUMN WRAP DETAIL

SCALE: 1 1/2" = 1'-0"



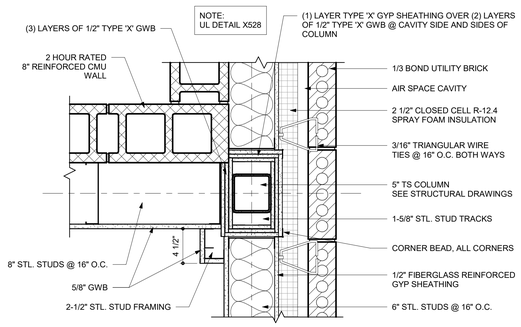
6 TYPICAL INTERIOR COLUMN WRAP DETAIL

SCALE: 1 1/2" = 1'-0"



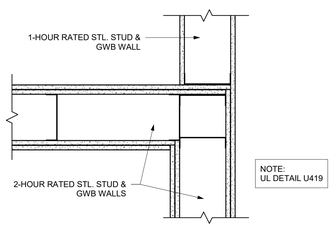
7 COLUMN WRAP DETAIL @ STAIR

SCALE: 1 1/2" = 1'-0"



8 COLUMN WRAP DETAIL @ ELEVATOR

SCALE: 1 1/2" = 1'-0"



9 PLAN DETAIL @ RATED WALL

SCALE: 1 1/2" = 1'-0"

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ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 4/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, NC

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

PLAN DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 1 1/2" = 1'-0"
DRAWN BY: Author | PROJ MGR: RMC

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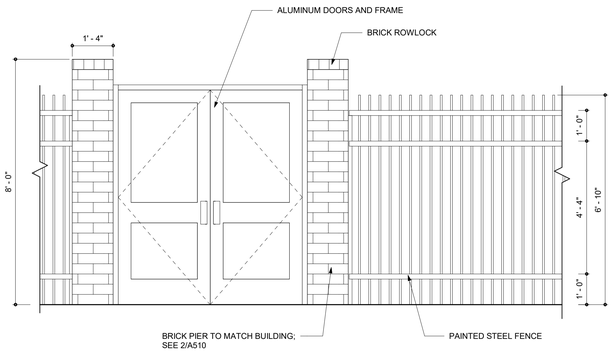
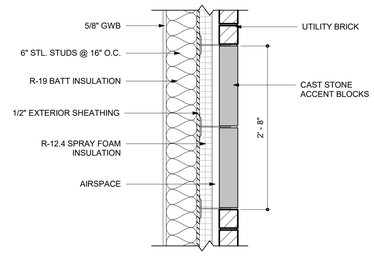
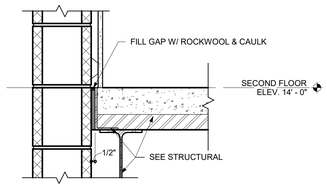


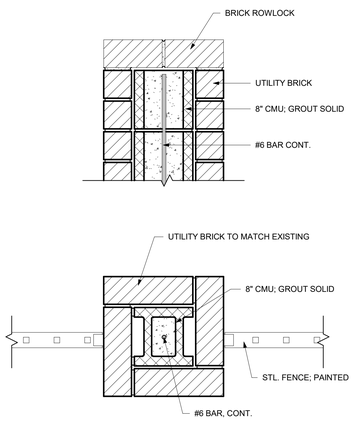
1 FENCE ELEVATION
SCALE: 1/2" = 1'-0"

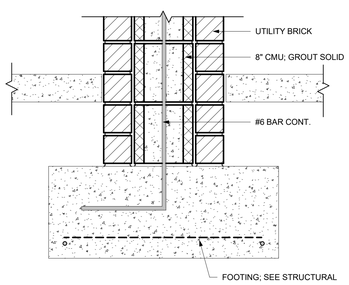


4 SECTION THRU ACCENT BLOCKS
SCALE: 1" = 1'-0"

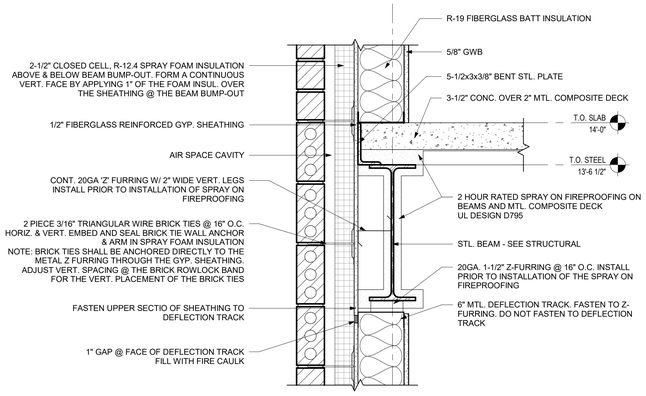


7 TYP. SLAB EDGE @ CMU WALL
SCALE: 1 1/2" = 1'-0"

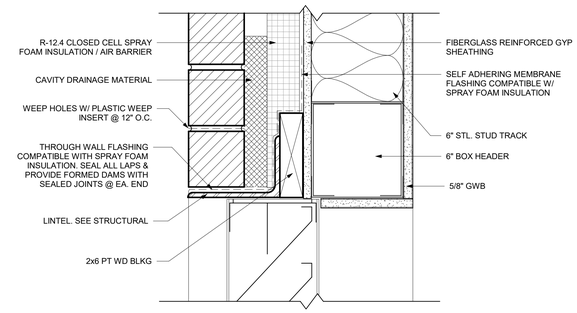


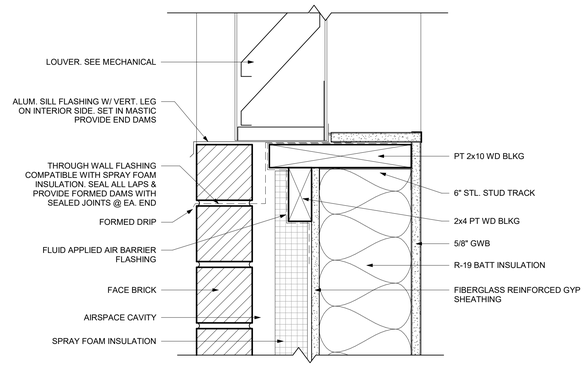


2 FENCE DETAIL
SCALE: 1 1/2" = 1'-0"

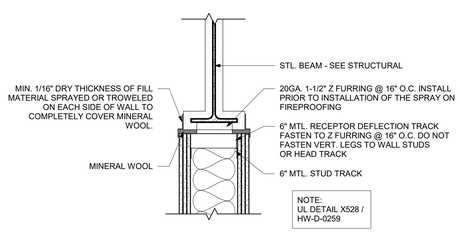


5 BEAM FIREPROOFING DETAIL
SCALE: 1 1/2" = 1'-0"

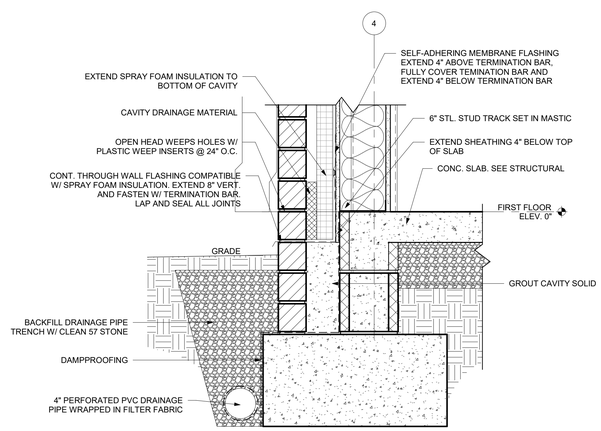




8 LOUVER DETAIL
SCALE: 3" = 1'-0"



3 WALL TO BEAM DETAIL
SCALE: 1 1/2" = 1'-0"



6 SECTION @ FOUNDATION
SCALE: 1 1/2" = 1'-0"

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ISSUED: 04.16.2020

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

SECTION DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: As indicated
DRAWN BY: LJR PROJ MGR: RMC

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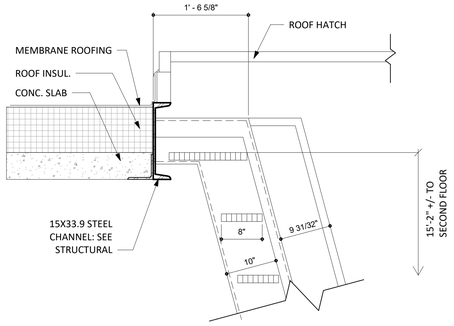
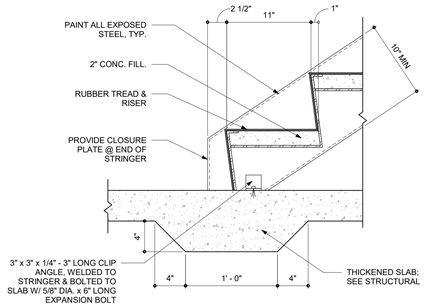


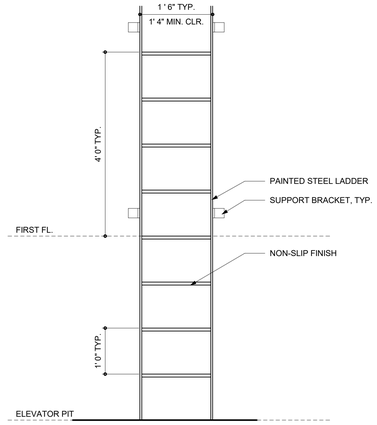
1 SHIPS LADDER HEAD

SCALE: 1" = 1'-0"



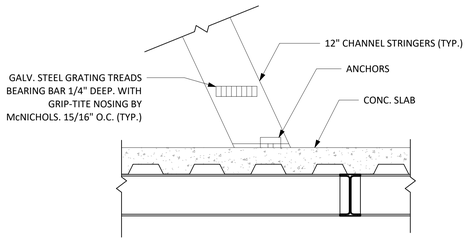
4 STRINGER TERMINATION @ BOTTOM

SCALE: 1 1/2" = 1'-0"



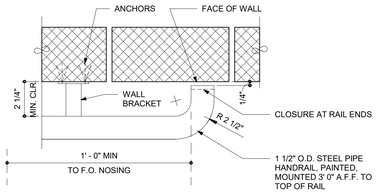
7 ELEVATOR LADDER DETAIL

SCALE: 1 1/2" = 1'-0"



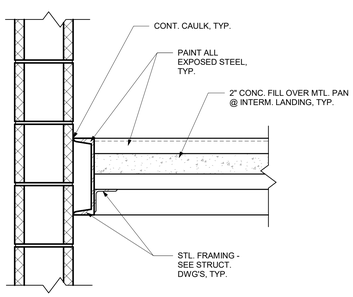
2 SHIPS LADDER SILL

SCALE: 1" = 1'-0"



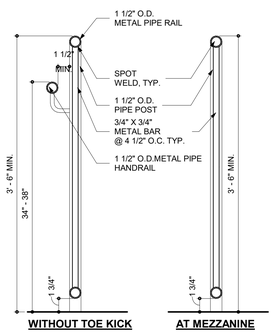
5 WALL-MOUNTED HANDRAIL DETAIL

SCALE: 3" = 1'-0"



3 STAIR LANDING DETAIL

SCALE: 1 1/2" = 1'-0"



6 GUARDRAIL DETAIL

SCALE: 1 1/2" = 1'-0"

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ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 04/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

STAIR / ELEVATOR DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
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	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: As indicated
DRAWN BY: LJR PROJ MGR: RMC

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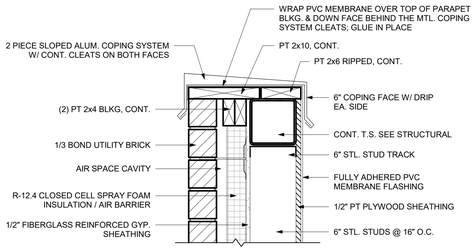
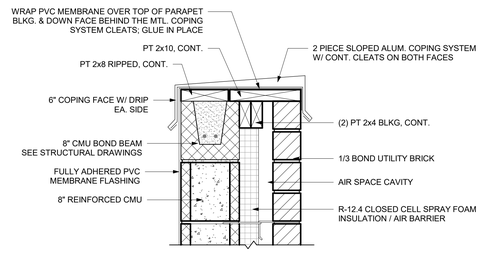


1 PARAPET DETAIL 1

SCALE: 1 1/2" = 1'-0"



2 PARAPET DETAIL 2

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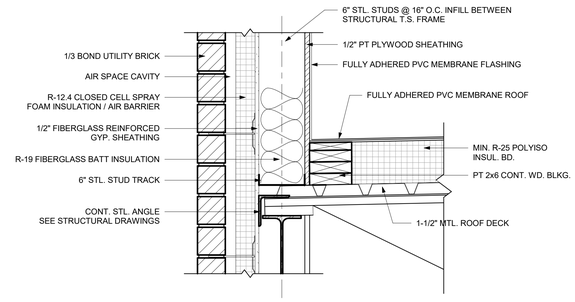
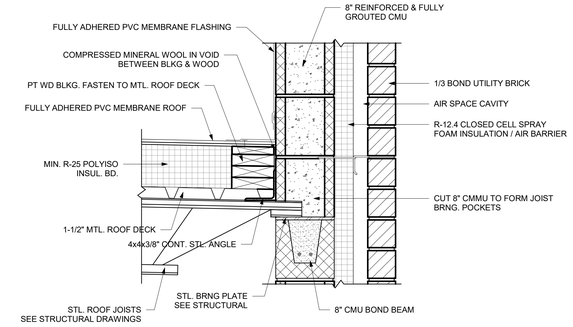


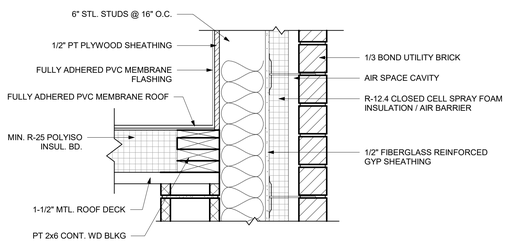
3 ROOF DETAIL 1

SCALE: 1 1/2" = 1'-0"



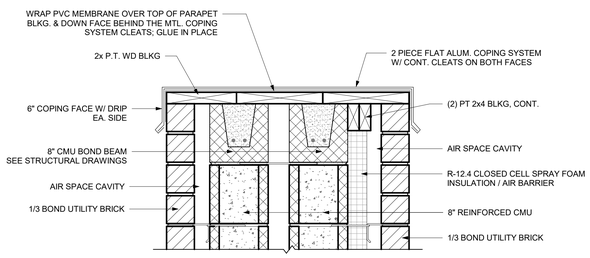
4 ROOF DETAIL 2

SCALE: 1 1/2" = 1'-0"



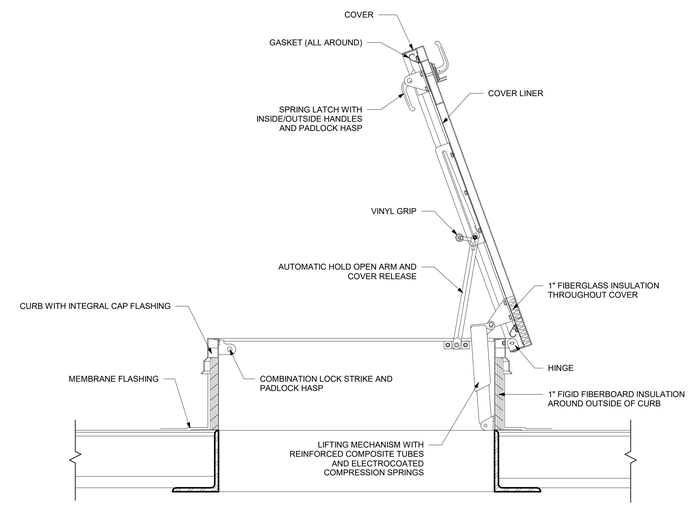
5 ROOF DETAIL 3

SCALE: 1 1/2" = 1'-0"



6 PARAPET SECTION AT STAIR

SCALE: 1 1/2" = 1'-0"



7 ROOF HATCH DETAIL

SCALE: 1 1/2" = 1'-0"

BECKER MORGAN GROUP

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910.341.7600

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Dover, DE 19904
302.734.7950
Rittenhouse Station
250 South Main Street, Suite 109
Newark, DE 19711
302.369.3700
www.beckermorgan.com

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FOR BIDDING

NOT FOR CONSTRUCTION
ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 04/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, NC

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

ROOF DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 1 1/2" = 1'-0"
DRAWN BY: LJR PROJ MGR: RMC

A530

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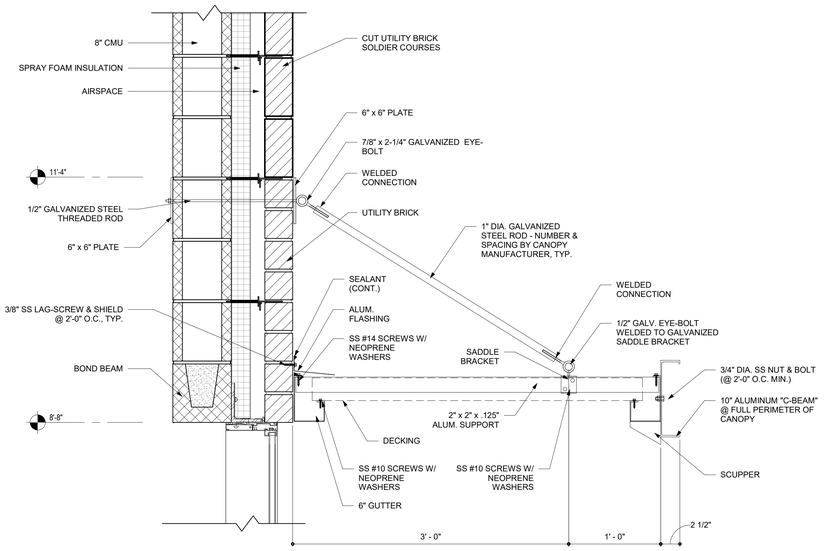
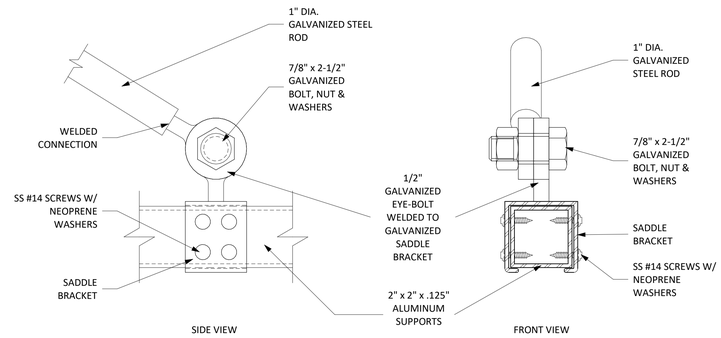


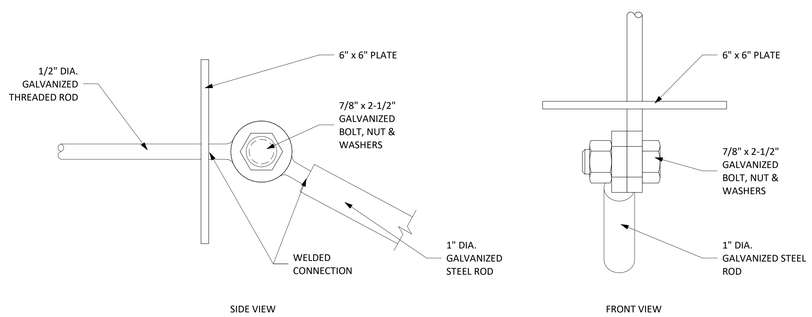
1 ENTRY CANOPY SECTION

SCALE: 1 1/2" = 1'-0"



2 ENTRY CANOPY SADDLE BRACKET DETAIL

SCALE: 3" = 1'-0"



3 ENTRY CANOPY UPPER BRACKET DETAIL

SCALE: 3" = 1'-0"

BECKER MORGAN GROUP

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Rittenhouse Station
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ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 4/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CANOPY DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: As indicated
DRAWN BY: LJR PROJ MGR: RMC

A531

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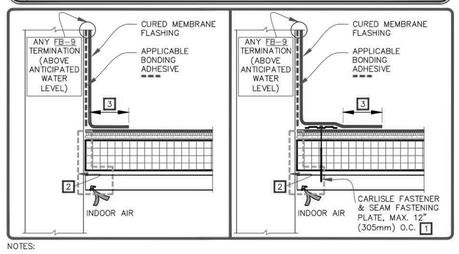
THERMOSET / THERMOPLASTIC MEMBRANE — FB

CAUTION
- EPDM MEMBRANE SPLICES SHALL INCORPORATE 6" (152mm) WIDE FIELD APPLIED SecurTAPE FOR PROJECTS WITH 20, 25 & 30-YEAR WARRANTIES.
- REFER TO DETAIL FB-12C WHEN USING AQUA BASE 120 ADHESIVE OR HYDROBOND.



NOTES:

1. MECHANICALLY FASTENED BASE SECUREMENT IS REQUIRED WHEN ANY ONE OF THE FOLLOWING MAY OCCUR:
   1.1. SPECIFIED WARRANTIES GREATER THAN 20-YEARS.
   1.2. WARRANTY WIND SPEEDS GREATER THAN 90MPH.
   1.3. PROJECTS WITH CONTROL OR EXPANSION JOINTS OR ANTICIPATED BUILDING MOVEMENT.
2. REFER TO SPECIAL CONDITION SPEC. SUPPLEMENTS G-01-18 OR G-08-19:
   2.1. TO BLOCK INDOOR AIR INFILTRATION AND HUMIDITY AT THE JUNCTION (G-01-18).
   2.2. WHERE ROOF SYSTEM IS DESIGNED WITH A VAPOR RETARDER (G-08-19).
3. SPLICES SHALL BE COMPLETED USING MINIMUM 3" (76mm) WIDE SecurTAPE/ PRIMER WITH EPDM MEMBRANE AND MINIMUM 1-1/2" (38mm) HOT AIR WELD WITH TPO/PVC/KEE HP.
4. APPROXIMATELY 1/8" (3mm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.
5. WHEN USING 60 OR 80-MIL REINFORCED THERMOPLASTIC MEMBRANE FLASHING, APPLY A 4-1/2" DIAMETER THERMOPLASTIC "T-JOINT" COVER AT ALL FIELD SPLICE INTERSECTIONS.
6. ALL EPDM SPLICE INTERSECTIONS REFER TO FB-2 DETAILS.

FleeceBACK MEMBRANE FLEX FAST/AQUABASE APPROVED SUBSTRATE O SEE NOTE(S)	PARAPET/CURB WITH SEPARATE MEMBRANE – FULL COVERAGE For additional information, refer to Specifications	DETAIL NO. FB-12A FLEECEBACK ADHERED

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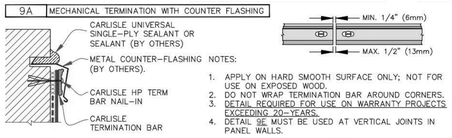
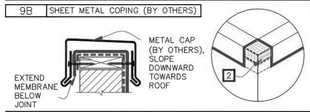
THERMOSET MEMBRANE — EPDM

9A MECHANICAL TERMINATION WITH COUNTER FLASHING



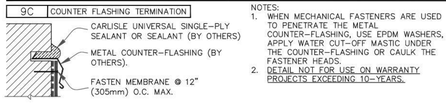
NOTES:
1. APPLY ON HARD SMOOTH SURFACE ONLY; NOT FOR USE ON EXPOSED WOOD.
2. DO NOT WRAP TERMINATION BAR AROUND CORNERS.
3. DETAIL REQUIRED FOR USE ON WARRANTY PROJECTS EXCEEDING 20-YEARS.
4. DETAIL 9E MUST BE USED AT VERTICAL JOINTS IN PANEL WALLS.

9B SHEET METAL COPING (BY OTHERS)



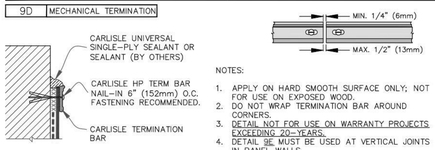
NOTES:
1. FOR CARLISLE SecurEdge COPING, REFER TO INSTALLATION INSTRUCTIONS PUBLISHED SEPARATELY.
2. MEMBRANE MUST BE EXTENDED TO CORNERS TO PROVIDE COMPLETE COVERAGE OF THE TOP WALL SURFACE.

9C COUNTER FLASHING TERMINATION



NOTES:
1. WHEN MECHANICAL FASTENERS ARE USED TO PENETRATE THE METAL COUNTER-FLASHING, USE EPDM WASHERS, APPLY WATER CUT-OFF MASTIC UNDER THE COUNTER-FLASHING OR CAULK THE FASTENER HEADS.
2. DETAIL NOT FOR USE ON WARRANTY PROJECTS EXCEEDING 10-YEARS.

9D MECHANICAL TERMINATION



NOTES:
1. APPLY ON HARD SMOOTH SURFACE ONLY; NOT FOR USE ON EXPOSED WOOD.
2. DO NOT WRAP TERMINATION BAR AROUND CORNERS.
3. DETAIL NOT FOR USE ON WARRANTY PROJECTS EXCEEDING 20-YEARS.
4. DETAIL 9E MUST BE USED AT VERTICAL JOINTS IN PANEL WALLS.

APPLICABLE BONDING ADHESIVE — XXX WATER CUT-OFF MASTIC- MUST BE HELD UNDER CONSTANT COMPRESSION.

EPDM APPROVED SUBSTRATE O SEE NOTE(S)	MEMBRANE TERMINATIONS PAGE 1 OF 2 For additional information, refer to Specifications	DETAIL NO. U-9 THERMOSET UNIVERSAL

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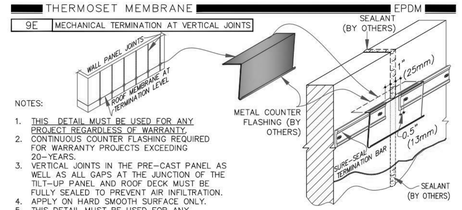
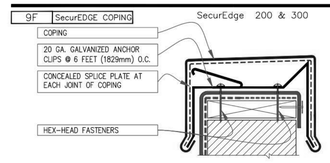
THERMOSET MEMBRANE — EPDM

9E MECHANICAL TERMINATION AT VERTICAL JOINTS



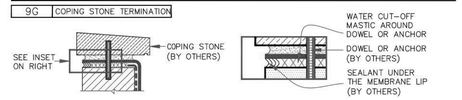
NOTES:
1. THIS DETAIL MUST BE USED FOR ANY PROJECT REGARDLESS OF WARRANTY.
2. CONTINUOUS COUNTER FLASHING REQUIRED FOR WARRANTY PROJECTS EXCEEDING 20-YEARS.
3. VERTICAL JOINTS IN THE PRE-CAST PANEL AS WELL AS ALL GAPS AT THE JUNCTION OF THE TILT-UP PANEL AND ROOF DECK MUST BE FULLY SEALED TO PREVENT AIR INFILTRATION.
4. APPLY ON HARD SMOOTH SURFACE ONLY.
5. THIS DETAIL MUST BE USED FOR ANY PROJECT REGARDLESS OF WARRANTY.

9F SecurEDGE COPING



NOTES:
1. MEMBRANE MUST BE EXTENDED AT CORNERS TO PROVIDE COMPLETE COVERAGE OF THE TOP WALL SURFACE. REFER TO DETAIL U-9B.
2. REFER TO SecurEdge COPING INSTALLATION INSTRUCTION MANUAL FOR STEP-BY-STEP INSTRUCTION PROCEDURES.

9G COPING STONE TERMINATION



APPLICABLE BONDING ADHESIVE — XXX WATER CUT-OFF MASTIC- MUST BE HELD UNDER CONSTANT COMPRESSION.

EPDM APPROVED SUBSTRATE O SEE NOTE(S)	MEMBRANE TERMINATIONS PAGE 2 OF 2 For additional information, refer to Specifications	DETAIL NO. U-9 THERMOSET UNIVERSAL

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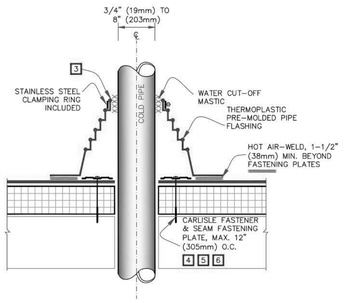
THERMOPLASTIC MEMBRANE — PVC/TPO



NOTES:
1. REMOVE ALL EXISTING LEAD AND FLASHING MATERIAL BEFORE INSTALLING PRE-MOLDED PIPE FLASHING.
2. TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 140°F (60°C) WHEN USING PVC AND 160°F (71°C) WHEN USING TPO FLASHING.
3. PRE-MOLDED PIPE FLASHING MUST HAVE INTACT RIB AT THE TOP EDGE REGARDLESS OF PIPE DIAMETER.
4. INSTALL A MINIMUM OF 4 FASTENERS AND PLATES AROUND THE PIPE, EQUALLY SPACED. IF FASTENERS AND PLATES CANNOT BE INSTALLED AS SHOWN, THEY MAY ALSO BE POSITIONED OUTSIDE THE PIPE MAXIMUM 12" (305mm) O.C. AND FLASHED WITH THERMOPLASTIC REINFORCED MEMBRANE / TPO CUT-EDGE SEALANT. REFER TO DETAIL U-8B.
5. FASTENERS AND PLATES ARE NOT REQUIRED ON ADHERED SYSTEMS UNLESS PIPE DIAMETER EXCEEDS 18" (457mm).
6. ON MECHANICALLY FASTENED SYSTEMS, HP-X FASTENERS AND PIRANHA PLATES OR HP-XTRA FASTENERS AND PIRANHA XTRA PLATES ARE REQUIRED OVER STEEL AND WOOD DECKS. ON CONCRETE DECKS, CD-10 OR HD 14-10 FASTENERS ARE USED WITH PIRANHA PLATES.

THERMOPLASTIC REINFORCED MEMBRANE APPROVED INSULATION O SEE NOTE(S)	PRE-MOLDED PIPE FLASHING For additional information, refer to Specifications	DETAIL NO. U-8A THERMOPLASTIC UNIVERSAL

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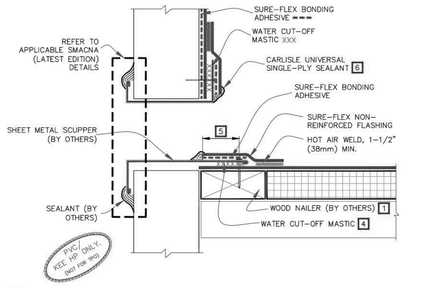
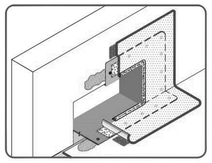
THERMOPLASTIC MEMBRANE — PVC/KEE HP



NOTES:
1. WOOD NAILERS ARE INSTALLED ONLY AT SCUPPERS TO SECURE METAL SLEEVE AND MUST EXTEND PAST THE WIDTH OF METAL SLEEVE FLANGE.
2. INSTALL WALL FLASHING PRIOR TO SCUPPER INSTALLATION.
3. METAL SCUPPER BOX MUST HAVE CONTINUOUS FLANGES WITH ROUNDED CORNERS, SOLDER ALL SCUPPER SEAMS WATER-TIGHT.
4. WATER CUT-OFF MASTIC UNDER SCUPPER FLANGE MUST BE UNDER CONSTANT COMPRESSION.
5. SCUPPER FLANGES MUST BE TOTALLY COVERED BY NON-REINFORCED PVC/KEE HP FLASHING WITH MINIMUM 2" (51mm) COVERAGE PAST NAIL HEAD.
6. UNIVERSAL SINGLE-PLY SEALANT IS REQUIRED AT FLASHING EDGES ON SCUPPER EDGE.



PVC OR KEE HP MEMBRANE APPROVED SUBSTRATE O SEE NOTE(S)	SCUPPER WITH SURE-FLEX NON-REINFORCED PVC/KEE HP FLASHING For additional information, refer to Specifications	DETAIL NO. U-18C THERMOPLASTIC PVC

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BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

TYPICAL ROOF MANUFACTURERS DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE:
DRAWN BY: LJR PROJ MGR: RMC

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FINISH SCHEDULE

#	ROOM NAME	FLOOR MAT	FLOOR PAT	BASE MAT	WALL NORTH MAT	WALL NORTH FIN	WALL EAST MAT	WALL EAST FIN	WALL SOUTH MAT	WALL SOUTH FIN	WALL WEST MAT	WALL WEST FIN	CEILING MAT	CEILING FIN	COMMENTS
CLASROOM BUILDING															
FIRST FLOOR															
900	STAIR 1	VCT / RUB		R	CMU	PT	CMU	PT	CMU	PT	CMU	PT	ACT-1	-	
901	ELEV	-		-	CMU	-	CMU	-	CMU	-	CMU	-	EXPO	-	
902	TELEDATA	S. CONC		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	EXPO	-	
903	ELEC	S. CONC		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	EXPO	-	
904	MECH	S. CONC		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	EXPO	-	
905	CORR	VCT		R	H. GWB	PT	H. GWB	PT	H. GWB	PT	H. GWB	PT	ACT-1	-	
906	HEALTH SCI	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
907	TLT	QT		QT	GWB	EPT	GWB	EPT	GWB	CT/EPT	GWB	EPT	GWB	PT	
908	CL	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
909	CLASSROOM	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
910	WORKRM	LVT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
911	CLASSROOM	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
912	ST.TLT	QT		QT	GWB	EPT	GWB	EPT	GWB	EPT	GWB	CT/EPT	GWB	PT	
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918	PLTW LAB	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
919	JAN.	VCT		R	GWB	FRP/EPT	GWB	EPT	GWB	EPT	GWB	FRP/EPT	ACT-1	-	
920	STAIR 2	VCT / RUB		R	CMU	PT	CMU	PT	CMU	PT	CMU	PT	ACT-1	-	
SECOND FLOOR															
1001	ELEV	VCT		-	CMU	-	CMU	-	CMU	-	CMU	-	EXPO	-	
1002	STAFF TLT	QT		QT	GWB	EPT	GWB	EPT	GWB	CT/EPT	GWB	EPT	GWB	PT	
1003	STO.	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
1004	CLASSROOM	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
1005	CLASSROOM	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
1006	CLASSROOM	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
1007	CLASSROOM	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
1008	CLASSROOM	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
1009	CLASSROOM	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
1010	CLASSROOM	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
1011	WORKROOM	LVT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
1012	ELEC	S. CONC		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	EXPO	-	
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1014	CORR	QT		QT	GWB	PT	GWB	PT	GWB	PT	GWB	PT	GWB	PT	
1015	WOMEN	QT		QT	H. GWB	CT/EPT	H. GWB	EPT	H. GWB	EPT	H. GWB	EPT	GWB	PT	
1016	CORR	VCT		R	GWB	PT	GWB	PT	GWB	PT	GWB	PT	ACT-1	-	
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1018	JAN.	VCT		R	GWB	FRP/EPT	GWB	FRP/EPT	GWB	FRP/EPT	GWB	EPT	GWB	PT	

FINISH SCHEDULE LEGEND

KEY NAME	DESCRIPTION
FLOOR	
-	NOT APPLICABLE / EXISTING TO REMAIN
CONC	CONCRETE. NOT SEALED. EPOXY PAINTED
CPT-1	CARPET
CPT-2	CARPET
CT	CERAMIC TILE FLOORING
LVT	LUXURY VINYL PLANK TILE
PFT	PORCELAIN FLOOR TILE
QT	QUARRY TILE
RES	RESINOUS FLOORING
RT	RUBBER TILE
RUB	RUBBER FLOORING / STAIR TREAD & RISER
S. CONC	CONCRETE WITH SEALER/HARDENER
VCT	VINYL COMPOSITION TILE
VS	VINYL SHEET
WD	WOOD FLOORING
BASE	
-	NOT APPLICABLE / EXISTING TO REMAIN
PCMU	PREFACED CONCRETE MASONRY UNIT BASE
QT	QUARRY TILE BASE
R	RESILIENT WALL BASE
RES	INTEGRAL RESINOUS FLOORING COVE BASE
SGT	STRUCTURAL GLAZED TILE BASE
VS	INTEGRAL VINYL SHEET FLOORING BASE
WD	WOOD BASE
WALL	
-	NOT APPLICABLE / EXISTING TO REMAIN
BRK	BRICK
CMU	CONCRETE MASONRY UNIT
DCMU	DECORATIVE CONCRETE MASONRY UNIT
EP	HIGH-PERFORMANCE COATING
EPT	EPOXY PAINT
EXPO	EXPOSED STRUCTURE
FRP	FIBERGLASS REINFORCED PLASTIC
GWB	GYPSUM WALL BOARD
H. GWB	HIGH IMPACT GYPSUM WALL BOARD
PCMU	PREFACED CONCRETE MASONRY UNIT
PLY	PLYWOOD
PT	PAINT
CEILING	
-	NOT APPLICABLE / EXISTING TO REMAIN
ACT-1	2x2 ACOUSTICAL CEILING TILE
EXPO	EXPOSED STRUCTURE, FIRE PROTECTOIN, PLUMBING, MECHANICAL, ELECTRICAL, TECHNOLOGY
GWB	GYPSUM BOARD CEILING
PT	PAINT
ORIENTATION	
	ON PLANS NORTH WALL IS UP, EAST IS RIGHT, SOUTH IS DOWN, WEST IS LEFT
GENERAL NOTES	
1	WALLS AND CEILINGS MAY CONTAIN MORE THAN ONE MATERIAL OR FINISH AS INDICATED. COORDINATE WITH CONSTRUCTION TYPE AND FINISH SIMILAR TO ADJACENT MATERIALS
2	SEE REFLECTED CEILING PLANS & CEILING NOTES FOR CEILING HEIGHTS, MATERIAL EXTENTS, LOCATIONS AND HEIGHTS OF BULKHEADS, SOFFITS, ETC.
3	PLAN WALL TYPES TAKE PRECEDENCE OVER SCHEDULED WALL FINISH. PROVIDE APPROPRIATE WALL FINISH TO CORRESPOND TO WALL TYPES.
4	MOLD AND MOISTURE RESISTANT GYPSUM BOARD SHALL BE USED AT ALL KITCHEN AREAS, TOILET ROOMS AND CUSTODIAN SERVICE CLOSETS SCHEDULED TO HAVE GYPSUM BOARD FINISHES
5	WALL AND CEILING FINISHES SHALL INCLUDE ALL PROJECTIONS, BEAM ENCLOSURES, RECESSES, BULKHEADS, MATERIAL CHANGES, OR OTHER ENCLOSURES. REFER TO REFLECTED CEILING PLANS
6	PROVIDE SEALANT/CAULK AT INTERSECTIONS OF DISSIMILAR MATERIALS AND AS RECOMMENDED BY MANUFACTURERS' GUIDELINES.
7	ALL NEW PARTITIONS AND WALLS SHALL BE PAINTED. PROVIDE PRICING TO REPAINT EXISTING WALLS

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ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 4/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

FINISH SCHEDULE

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE:
DRAWN BY: LJR | PROJ MGR: RMC

A601

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DOOR SCHEDULE

MARK	DOOR SIZE WIDTH	HT	THICK	MATL	TYPE	FIN	GLAZ	UNDER CUT	FRAME MATL	TYPE	FIN	DETAIL HEAD	JAMB	SILL	FIRE RATING	HDW E SET	COMMENTS
FIRST FLOOR																	
G1	6' - 0"	7' - 0"	1 3/4"	ALUM	C	-	IG	0"	ALUM	AL-1	-				-	12	gate
G2	6' - 0"	7' - 0"	1 3/4"	ALUM	C	-	IG	0"	ALUM	AL-1	-				-	12	gate
G3	6' - 0"	7' - 0"	1 3/4"	ALUM	C	-	IG	0"	ALUM	AL-1	-				-	12	gate
CLASSROOM BUILDING FIRST FLOOR																	
900/1	6' - 0"	7' - 2"	1 3/4"	SCWD	B	ST	FPGL	0"	HM	HM-1	PT	3/A604	4/A604	11/A604	60 MIN	03	
900/2	6' - 0"	7' - 2"	1 3/4"	ALUM	C	-	IG	0"	ALUM	SF-4	-	7/A604	8/A604	12/A604	60 MIN	02	
902/1	4' - 0"	7' - 0"	1 3/4"	HM	A	PT	-	0"	HM	HM-1	PT	5/A604	6/A604	11/A604	45 MIN	04	
903/1	6' - 0"	7' - 2"	1 3/4"	HM	A	PT	-	0"	HM	HM-1	PT	5/A604	6/A604	11/A604	45 MIN	05	
904/1	6' - 0"	7' - 2"	1 3/4"	HM	A	PT	-	0"	HM	HM-1	PT	5/A604	6/A604	11/A604	45 MIN	05	
905/1	6' - 0"	7' - 2"	1 3/4"	ALUM	C	-	IG	0"	ALUM	SF-4	-	9/A604	10/A604	12/A604	45 MIN	01	
906/1	4' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		45 MIN	09	
907/1	3' - 0"	7' - 0"	1 3/4"	SCWD	A	ST	-	0"	HM	HM-1	PT	1/A604	2/A604		45 MIN	08	
908/1	3' - 0"	7' - 0"	1 3/4"	SCWD	A	ST	-	0"	HM	HM-1	PT	1/A604	2/A604		-	07	
909/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	10	
910/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		-	07	
911/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	10	
912/1	3' - 0"	7' - 0"	1 3/4"	SCWD	A	ST	-	0"	HM	HM-1	PT	1/A604	2/A604		-	08	
913/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	10	
917/1	3' - 0"	7' - 0"	1 3/4"	SCWD	A	ST	-	0"	HM	HM-1	PT	1/A604	2/A604		-	07	
918/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		45 MIN	09	
918/2	3' - 0"	7' - 0"	1 3/4"	HM	A	PT	-	0"	HM	HM-1	PT	5/A604	6/A604		-	06	
919/1	3' - 0"	7' - 0"	1 3/4"	SCWD	A	ST	-	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	07	
920/1	6' - 0"	7' - 2"	1 3/4"	SCWD	B	ST	FPGL	0"	HM	HM-1	PT	3/A604	4/A604	11/A604	60 MIN	03	
920/2	6' - 0"	7' - 2"	1 3/4"	ALUM	C	-	IG	0"	ALUM	SF-4	-	9/A604	10/A604	12/A604	60 MIN	02	
SECOND FLOOR																	
900/3	6' - 0"	7' - 2"	1 3/4"	SCWD	B	ST	FPGL	0"	HM	HM-1	PT	3/A604	4/A604	11/A604	60 MIN	03	
920/3	6' - 0"	7' - 2"	1 3/4"	SCWD	B	ST	FPGL	0"	HM	HM-1	PT	3/A604	4/A604	12/A604	60 MIN	03	
1002/1	3' - 0"	7' - 0"	1 3/4"	SCWD	A	ST	-	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	08	
1003/1	6' - 0"	7' - 0"	1 3/4"	SCWD	A	ST	-	0"	HM	HM-1	PT	1/A604	2/A604		-	11	
1004/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	10	
1005/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	10	
1006/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	10	
1007/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	10	
1008/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	10	
1009/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	10	
1010/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	10	
1011/1	3' - 0"	7' - 0"	1 3/4"	SCWD	B	ST	TEMP	0"	HM	HM-1	PT	1/A604	2/A604		20 MIN	07	
1012/1	3' - 0"	7' - 0"	1 3/4"	SCWD	A	ST	-	0"	HM	HM-1	PT	1/A604	2/A604		-	07	
1017/1	3' - 0"	7' - 0"	1 3/4"	SCWD	A	ST	-	0"	HM	HM-1	PT	1/A604	2/A604		90 MIN	07	
1018/1	3' - 0"	7' - 0"	1 3/4"	SCWD	A	ST	-	0"	HM	HM-1	PT	1/A604	2/A604		-	07	

DOOR SCHEDULE LEGEND

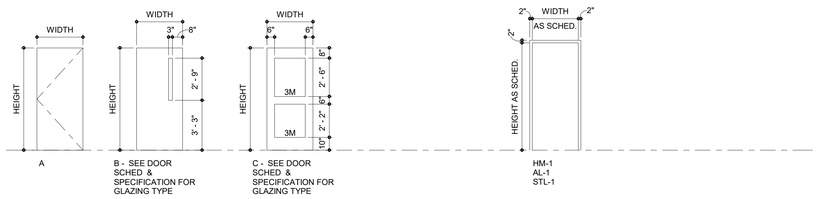
-	NONE (IE., NOT APPLICABLE OR FACTORY FINISHED)
ALUM, AL	ALUMINUM
CW	CURTAINWALL
FG	FIRE PROTECTION/FIRE-RESISTANCE RATED GLAZING
HM	HOLLOW METAL
IG	INSULATED GLAZING
LAM	LAMINATED GLAZING
PT	PAINTED
SCWD	SOLID CORE WOOD DOOR
SF	STOREFRONT
SST	STAINLESS STEEL
ST	STAINED
STL	STEEL
TEMP	TEMPERED GLAZING

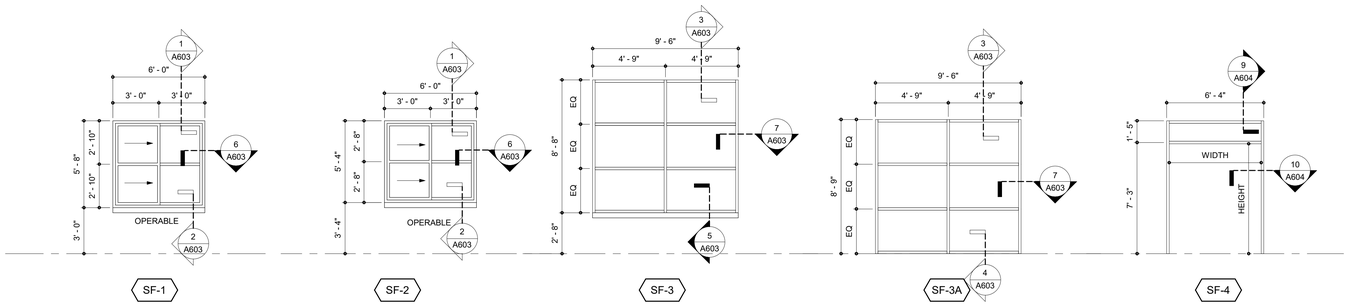
GLAZING LEGEND

1. GLAZING SHALL BE TEMPERED IN DOORS, SIDE LIGHTS, AND AS REQUIRED BY CODE AND AS INDICATED.
2. GLAZING SHALL BE SAFETY LAMINATED AS REQUIRED BY CODE, AND AS INDICATED.
3. PROVIDE FIRE-PROTECTION AND FIRE-RESISTANCE RATED GLAZING AS REQUIRED BY CODE.
4. EXTERIOR GLAZING SHALL BE INSULATED.
5. GLAZING MARKED "3M" TO HAVE 3M SAFETY AND SECURITY WINDOW FILM APPLIED. FILM PROVIDED BY ALLOWANCE.

T = TEMPERED GLASS

NOTE: GLAZING SHALL BE TEMPERED IN DOORS, SIDELIGHTS, AND AS REQUIRED BY CODE





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ISSUED: 04.16.2020

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

DOOR SCHEDULE, TYPES AND WINDOW TYPES

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO:	2019082.00
DATE:	04.16.2020
SCALE:	As indicated
DRAWN BY: LJR	PROJ MGR: RMC

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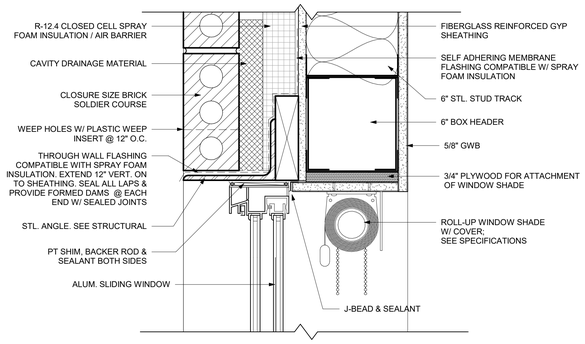
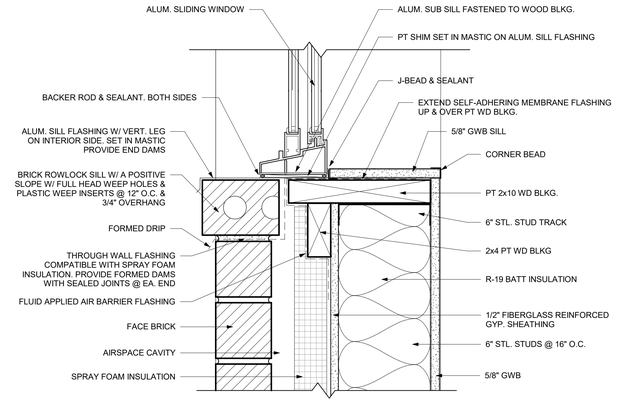


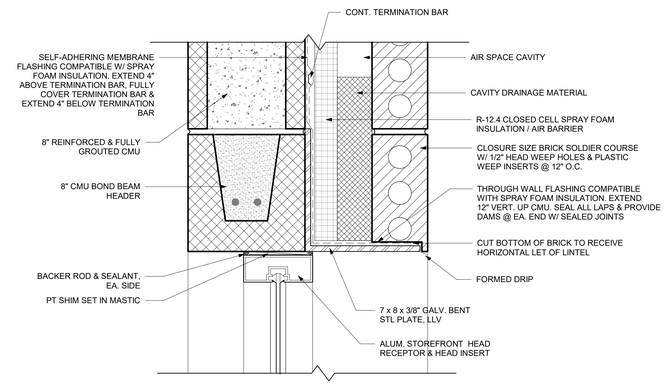
1 WINDOW HEAD DETAIL 1

SCALE: 3" = 1'-0"



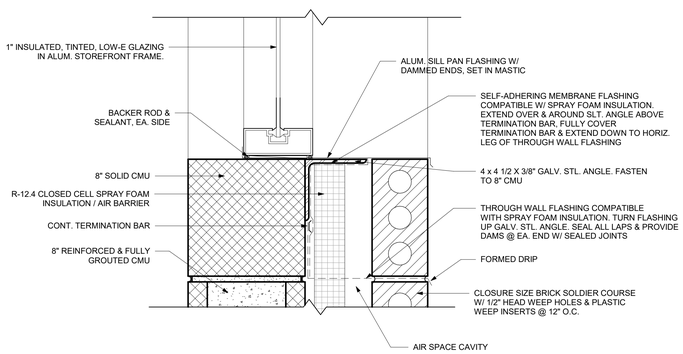
2 WINDOW SILL DETAIL 1

SCALE: 3" = 1'-0"



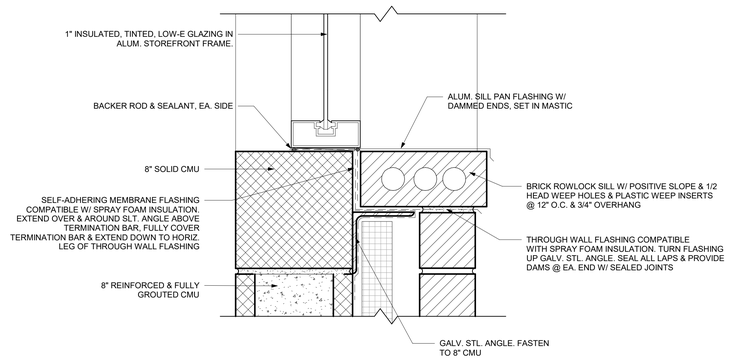
3 WINDOW HEAD DETAIL 2

SCALE: 3" = 1'-0"



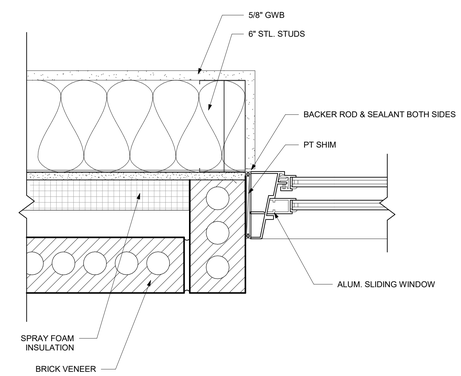
4 WINDOW SILL DETAIL 2

SCALE: 3" = 1'-0"



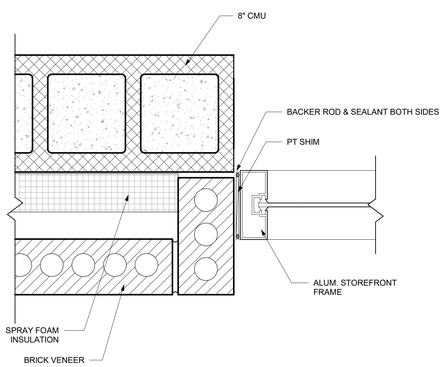
5 WINDOW SILL DETAIL 3

SCALE: 3" = 1'-0"



6 WINDOW JAMB DETAIL 1

SCALE: 3" = 1'-0"



7 WINDOW JAMB DETAIL 2

SCALE: 3" = 1'-0"

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FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 04/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, NC

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

WINDOW DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
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PROJECT NO:	2019082.00
DATE:	04.16.2020
SCALE:	3" = 1'-0"
DRAWN BY: LJR	PROJ MGR: RMC

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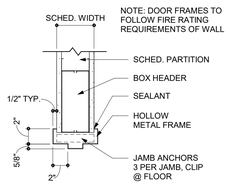
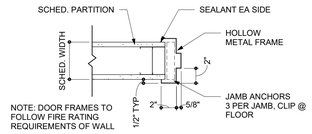
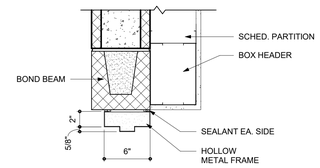


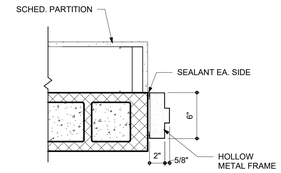
1 TYPICAL INTERIOR DOOR HEAD
SCALE: 1 1/2" = 1'-0"



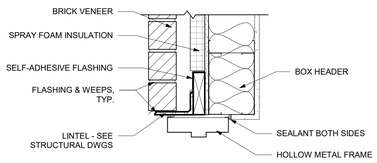
2 TYPICAL INTERIOR DOOR JAMB
SCALE: 1 1/2" = 1'-0"



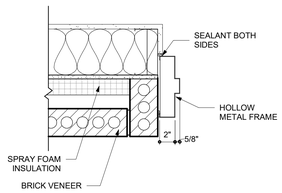
3 INTERIOR DOOR HEAD @ STAIR
SCALE: 1 1/2" = 1'-0"



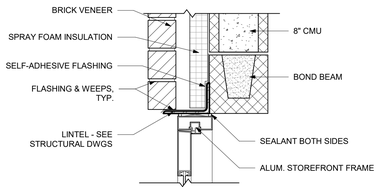
4 INTERIOR DOOR JAMB @ STAIR
SCALE: 1 1/2" = 1'-0"



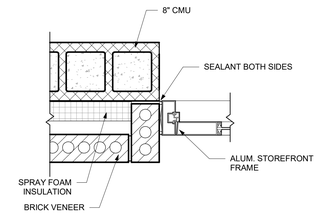
5 TYPICAL EXTERIOR HM DOOR HEAD
SCALE: 1 1/2" = 1'-0"



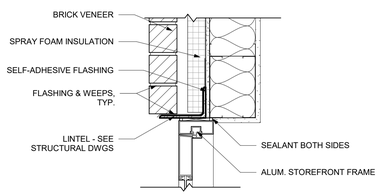
6 TYPICAL EXTERIOR HM DOOR JAMB
SCALE: 1 1/2" = 1'-0"



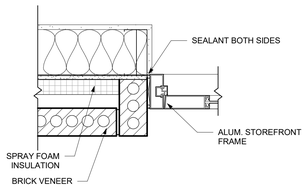
7 EXTERIOR ALUM. DOOR HEAD @ CMU WALL
SCALE: 1 1/2" = 1'-0"



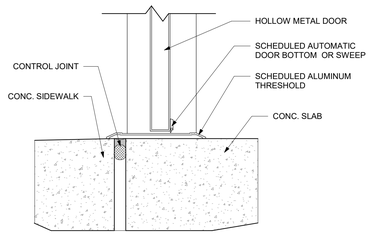
8 EXTERIOR ALUM. DOOR JAMB @ CMU WALL
SCALE: 1 1/2" = 1'-0"



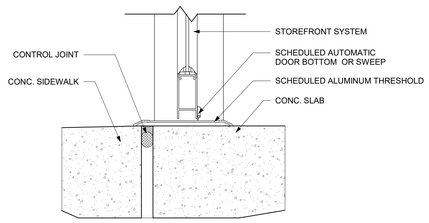
9 EXTERIOR ALUM. DOOR HEAD @ STUD WALL
SCALE: 1 1/2" = 1'-0"



10 EXTERIOR ALUM. DOOR JAMB @ STUD WALL
SCALE: 1 1/2" = 1'-0"



11 THRESHOLD @ HM DOOR
SCALE: 3" = 1'-0"



12 THRESHOLD @ STOREFRONT DOOR
SCALE: 3" = 1'-0"

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ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 4/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

DOOR DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO:	2019082.00
DATE:	04.16.2020
SCALE:	As indicated
DRAWN BY Author	PROJ MG Checker

A604

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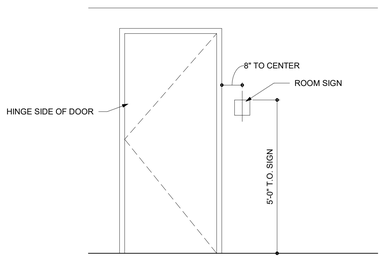
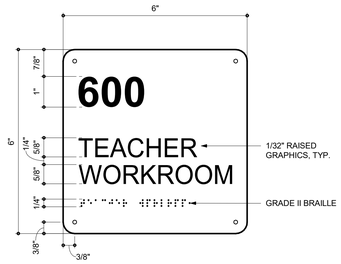


1 TYPICAL SIGN MOUNTING HEIGHT

SCALE : 3" = 1' 0"

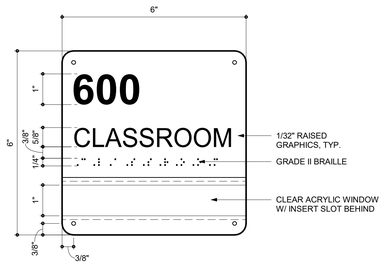


2 SIGN TYPE A

SCALE : 6" = 1' 0"

8 SIGN TYPE G

SCALE : 6" = 1' 0"



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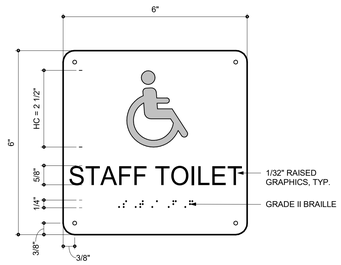

4 SIGN TYPE C

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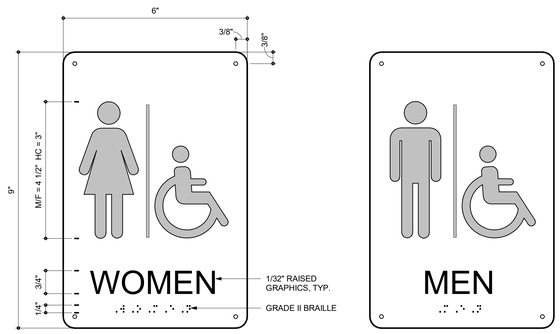
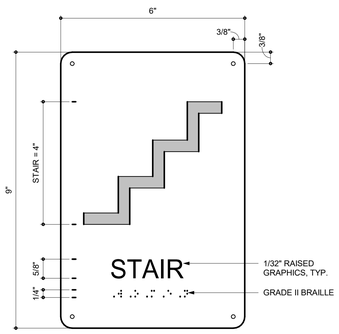


5 SIGN TYPE D

SCALE : 6" = 1' 0"



6 SIGN TYPE E

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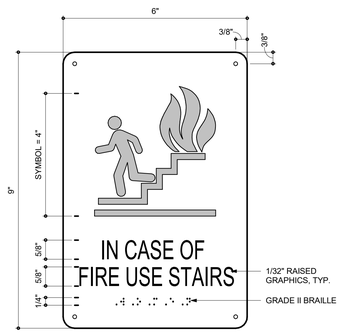

7 SIGN TYPE F

SCALE : 6" = 1' 0"

SIGNAGE SCHEDULE

ROOM NUMBER	ROOM NAME	DOOR NUMBER	SIGN TYPE	COPY ON SIGN
900	STAIR 1 - FIRST FLOOR	900/1	E	-
900	STAIR 1 - SECOND FLOOR	900/3	E	-
900	STAIR 1 - SECOND FLOOR	-	G	-
901	ELEVATOR	-	F	-
902	TELEDATA	902/1	A	902 TELEPHONE / DATA
903	ELECTRICAL ROOM	903/1	A	903 ELECTRICAL
904	MECHANICAL ROOM	904/1	A	904 MECHANICAL
906	HEALTH SCIENCE	906/1	B	906 CLASSROOM
907	TOILET	907/1	A	907 TOILET
908	CLOSET	908/1	A	908 STORAGE
909	CLASSROOM	909/1	B	909 CLASSROOM
910	WORKROOM	910/1	A	910 TEACHER WORKROOM
911	CLASSROOM	911/1	B	911 CLASSROOM
912	STAFF TOILET	912/1	C	STAFF TOILET
913	CLASSROOM	913/1	B	913 CLASSROOM
915	WOMEN	-	D	WOMEN
916	MEN	-	D	MEN
917	CLOSET	917/1	A	917 STORAGE
918	PLTW LAB	918/1	B	918 CLASSROOM
919	JANITOR	919/1	A	919 JANITOR
920	STAIR 2 - FIRST FLOOR	920/1	E	-
920	STAIR 2 - SECOND FLOOR	920/3	E	-
920	STAIR 2 - SECOND FLOOR	-	G	-
1002	STAFF TOILET	1002/1	C	STAFF TOILET
1003	STORAGE	1003/1	A	1003 STORAGE
1004	CLASSROOM	1004/1	B	1004 CLASSROOM
1005	CLASSROOM	1005/1	B	1005 CLASSROOM
1006	CLASSROOM	1006/1	B	1006 CLASSROOM
1007	CLASSROOM	1007/1	B	1007 CLASSROOM
1008	CLASSROOM	1008/1	B	1008 CLASSROOM
1009	CLASSROOM	1009/1	B	1009 CLASSROOM
1010	CLASSROOM	1010/1	B	1010 CLASSROOM
1011	WORKROOM	1011/1	A	1011 TEACHER WORKROOM
1012	ELECTRICAL ROOM	1012/1	A	1012 ELECTRICAL
1013	MEN	-	D	MEN
1014A	JANITOR	1018/1	A	1018 JANITOR
1015	WOMEN	-	D	WOMEN
1017	CLOSET	1017/1	A	1017 STORAGE

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ISSUED: 04.16.2020

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

SIGNAGE SCHEDULE AND DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: As indicated
DRAWN BY: LJR PROJ MGR: RMC

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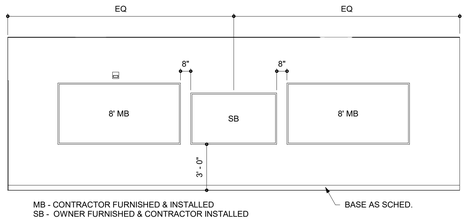
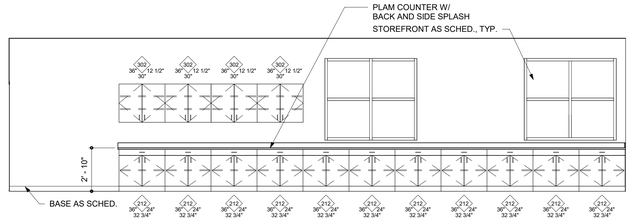
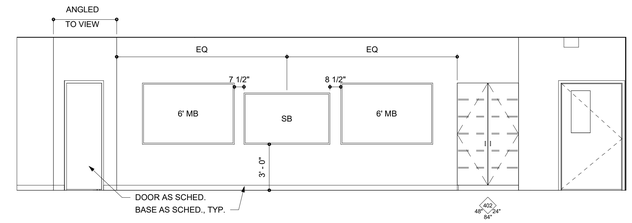


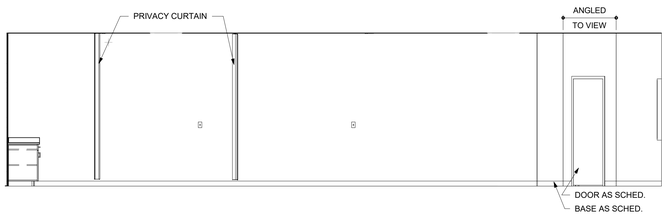
1 TYPICAL TEACHING WALL ELEVATION
SCALE: 1/4" = 1'-0"



2 HEALTH SCI 906 - NORTH
SCALE: 1/4" = 1'-0"



3 HEALTH SCI 906 - SOUTH
SCALE: 1/4" = 1'-0"



4 HEALTH SCI 906 - EAST
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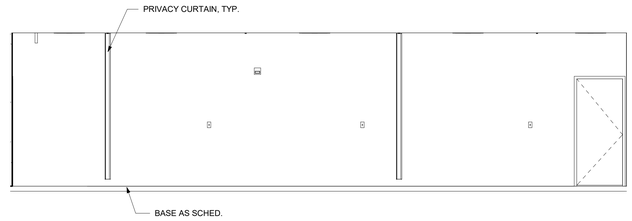
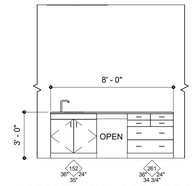
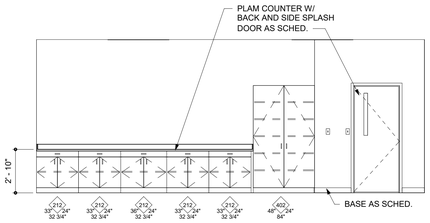


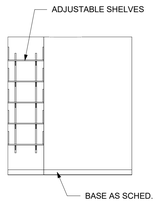
5 HEALTH SCI 906 - WEST
SCALE: 1/4" = 1'-0"



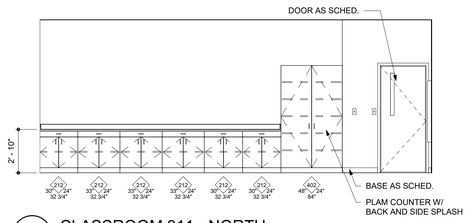
6 HEALTH SCI 906 - TEACHER STATION
SCALE: 1/4" = 1'-0"



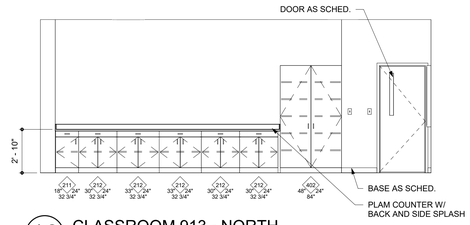
7 CLASSROOM 909 - NORTH
SCALE: 1/4" = 1'-0"



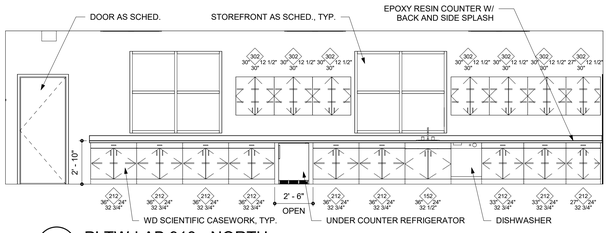
8 WORKROOM 910 - WEST
SCALE: 1/4" = 1'-0"



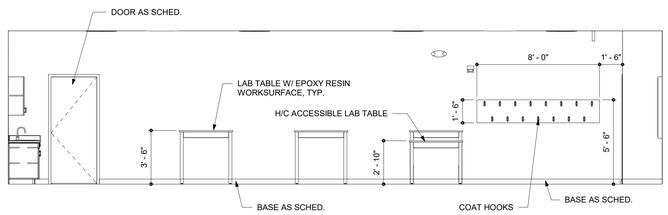
9 CLASSROOM 911 - NORTH
SCALE: 1/4" = 1'-0"



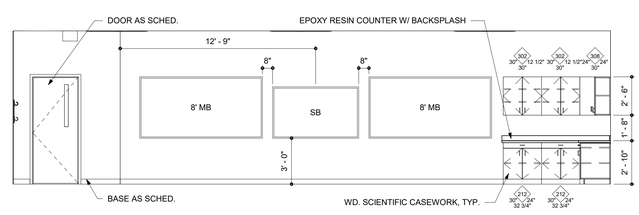
10 CLASSROOM 913 - NORTH
SCALE: 1/4" = 1'-0"



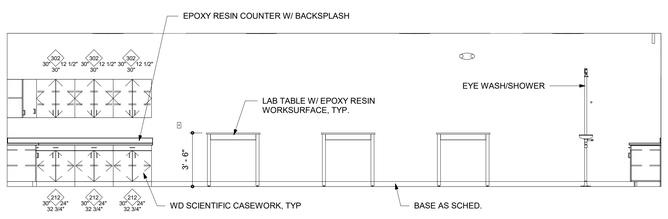
11 PLTW LAB 918 - NORTH
SCALE: 1/4" = 1'-0"



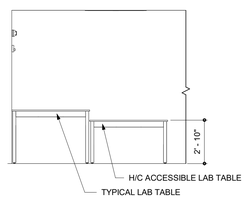
12 PLTW LAB 918 - EAST
SCALE: 1/4" = 1'-0"



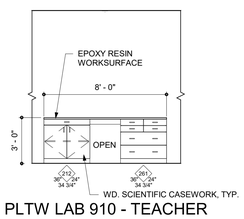
13 PLTW LAB 918 - SOUTH
SCALE: 1/4" = 1'-0"



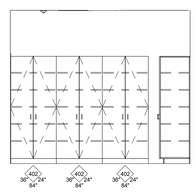
14 PLTW LAB 918 - WEST
SCALE: 1/4" = 1'-0"



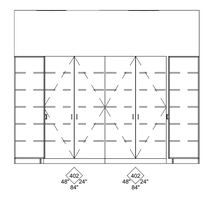
15 PLTW LAB 918 - LAB TABLES
SCALE: 1/4" = 1'-0"



16 PLTW LAB 910 - TEACHER STATION
SCALE: 1/4" = 1'-0"



17 CLOSET 917 - NORTH (SOUTH SIM)
SCALE: 1/4" = 1'-0"



18 CLOSET 917 - EAST
SCALE: 1/4" = 1'-0"

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ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 04/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

INTERIOR CASEWORK ELEVATIONS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 1/4" = 1'-0"
DRAWN BY: LJR PROJ MGR: RMC

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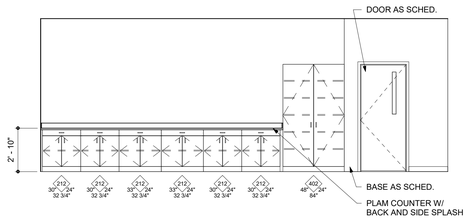
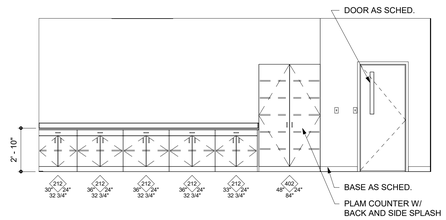
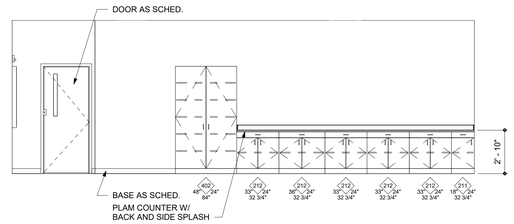


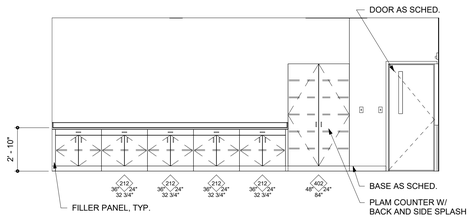
1 CLASSROOM 1004 - SOUTH
SCALE: 1/4" = 1'-0"



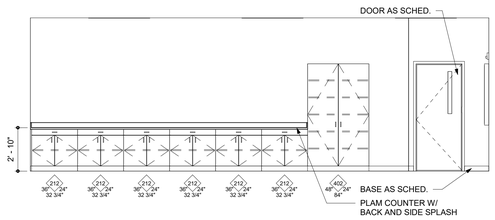
2 CLASSROOM 1005 - NORTH
SCALE: 1/4" = 1'-0"



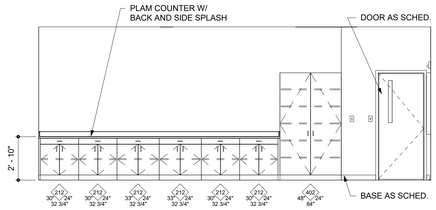
3 CLASSROOM 1006 - SOUTH
SCALE: 1/4" = 1'-0"



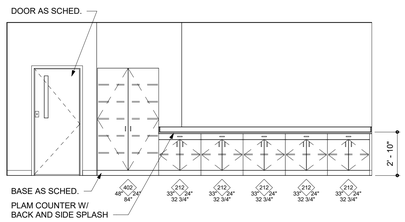
4 CLASSROOM 1007 - NORTH
SCALE: 1/4" = 1'-0"



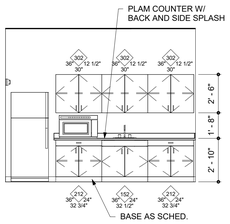
5 CLASSROOM 1008 - SOUTH
SCALE: 1/4" = 1'-0"



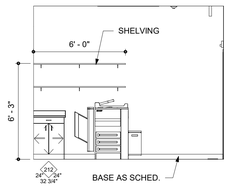
6 CLASSROOM 1009 - NORTH
SCALE: 1/4" = 1'-0"



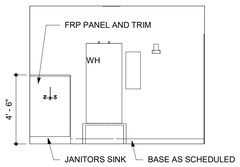
7 CLASSROOM 1010 - SOUTH
SCALE: 1/4" = 1'-0"



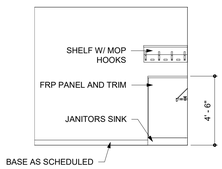
8 WORKROOM 1011 - SOUTH
SCALE: 1/4" = 1'-0"



9 WORKROOM 1011 - NORTH
SCALE: 1/4" = 1'-0"



10 JANITOR 919 - NORTH
SCALE: 1/4" = 1'-0"



11 JANITOR 919 - WEST
SCALE: 1/4" = 1'-0"

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ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 04/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

INTERIOR CASEWORK ELEVATIONS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 1/4" = 1'-0"
DRAWN BY: LJR PROJ MGR: RMC

A702

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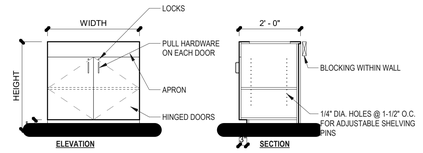
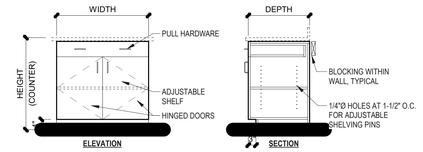


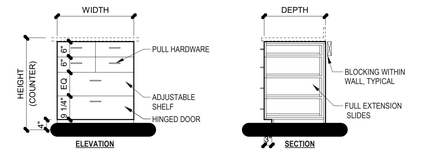
1 CDS 152 - BASE CABINET

SCALE: 1/2" = 1'-0"



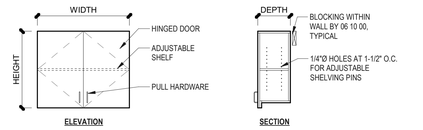
2 CDS 212 BASE CABINET

SCALE: 1/2" = 1'-0"



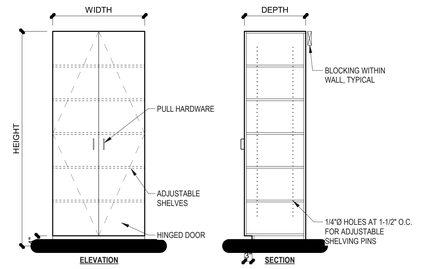
3 CDS 261 BASE CABINET

SCALE: 1/2" = 1'-0"



4 CDS 302 WALL CABINET

SCALE: 1/2" = 1'-0"



5 CDS 402 TALL CABINET

SCALE: 1/2" = 1'-0"

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ISSUED: 04.16.2020

FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 4/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CASEWORK SECTIONS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: 1/2" = 1'-0"
DRAWN BY: LJR | PROJ MGR: RMC

A703

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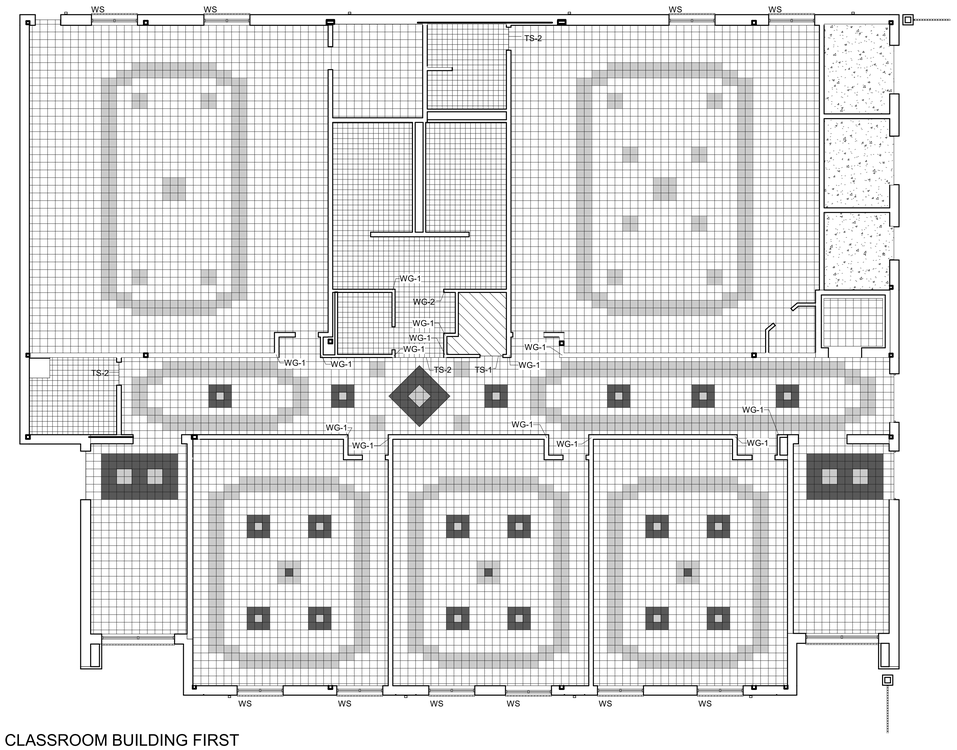
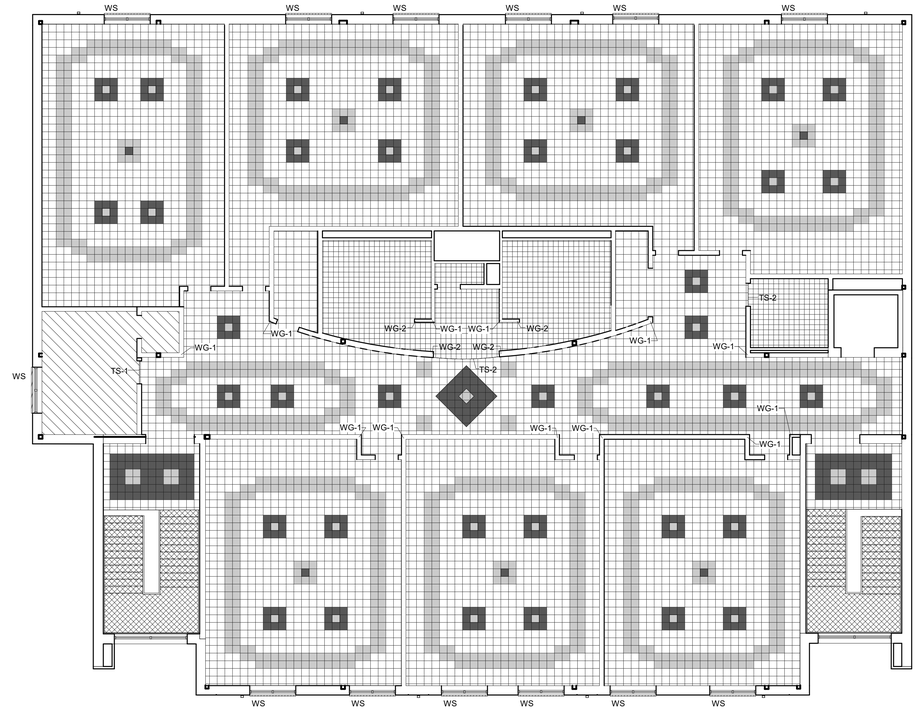


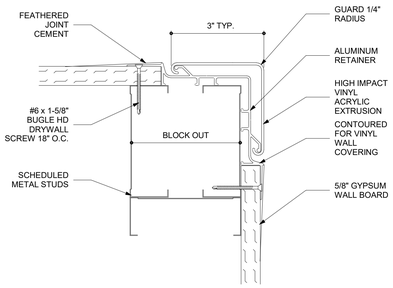
1 CLASSROOM BUILDING FIRST FLOOR FINISH PLAN

SCALE: 1/8" = 1'-0"



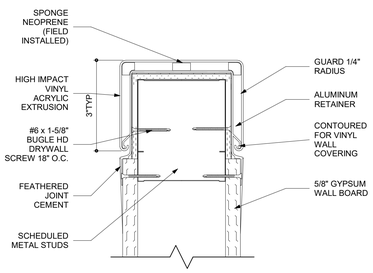
2 CLASSROOM BUILDING SECOND FLOOR FINISH PLAN

SCALE: 1/8" = 1'-0"



3 CORNER GUARD DETAIL

SCALE: 6" = 1'-0"



4 END GUARD DETAIL

SCALE: 6" = 1'-0"

FLOOR LEGEND

- VCT-1
- VCT-2
- VCT-3
- LVT
- QUARRY TILE
- RUBBER STAIR TREADS & RISERS
- CONCRETE

LEGEND

TS-1	VCT TO LVT	
TS-2	VCT TO QUARRY TILE	
WG-1	CORNER GUARD	DETAIL 3/A801
WG-2	END GUARD	DETAIL 4/A801
WS	WINDOW SHADE LOCATION	

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FREDERICK M. COLLINS REGISTERED ARCHITECT 4537 N.C. WILMINGTON, N.C. 04/16/2020

BECKER MORGAN GROUP, INC. Registered Architectural Corporation 51922 North Carolina WILMINGTON, N.C.

PROJECT TITLE

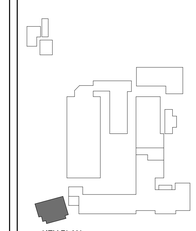
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

FINISH PLANS AND DETAILS



KEY PLAN

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMISSION
	10.14.19	NCDPI DD SUBMISSION
	7.30.19	SD PROGRESS DRAWINGS
	7.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 04.16.2020
SCALE: As indicated
DRAWN BY: LJR PROJ MGR: RMC

A801

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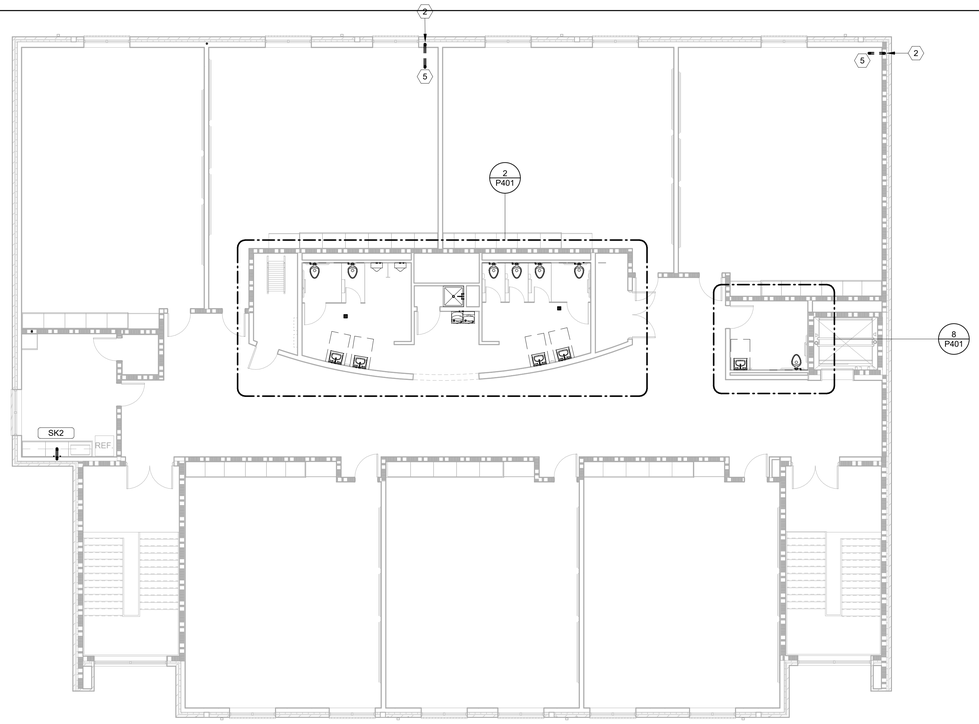
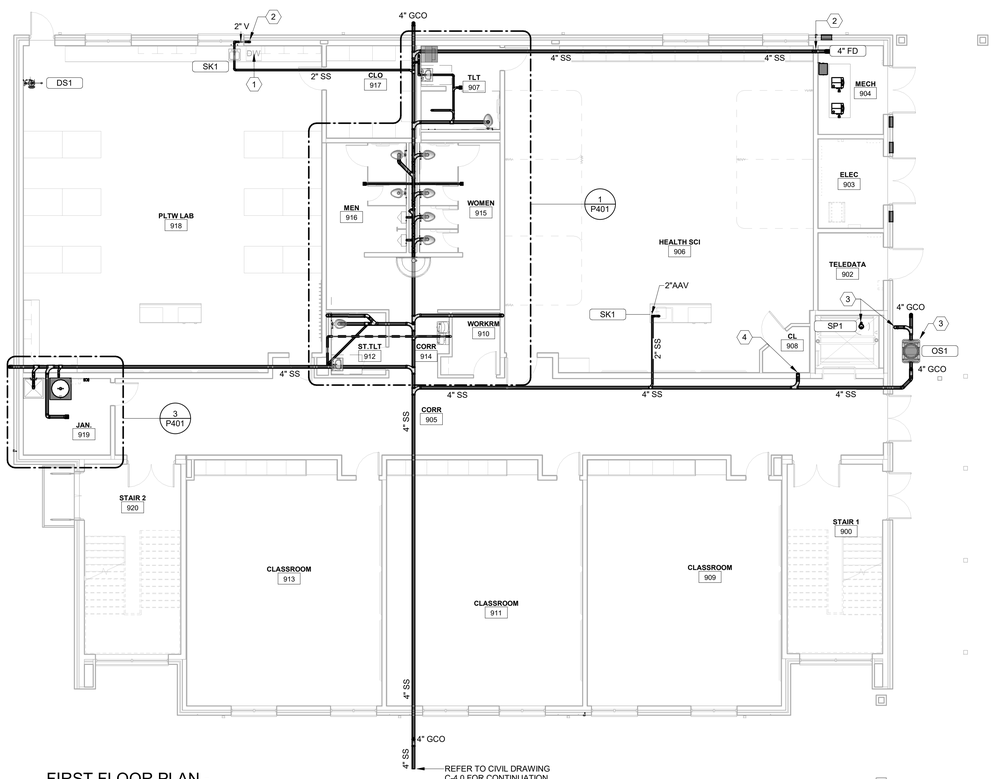


2 SECOND FLOOR PLAN - WASTE-VENT

SCALE: 1/8" = 1'-0"

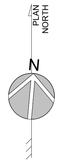


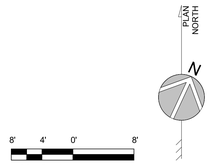
1 FIRST FLOOR PLAN - WASTE-VENT

SCALE: 1/8" = 1'-0"

KEYNOTES THIS SHEET

1	PC SHALL PROVIDE AND INSTALL DISHWASHER CONNECTION KIT.. PC SHALL INSTALL IN ACCORDANCE WITH SECTION 802.1.6 OF THE 2018 NC PLUMBING CODE
2	2" V-STACK
3	REFER TO ELEVATOR SUMP PUMP DETAIL SHEET P501 FOR FURTHER INFORMATION
4	4"W-STACK; WCO
5	2"VTR





8' 4' 0' 8'

SCALE : 1/8" = 1'-0"

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Fax: 910.791.5266
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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING PLANS-WASTE-VENT

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 1/8" = 1'-0"
DRAWN BY: JBS PROJ MGR: DMH

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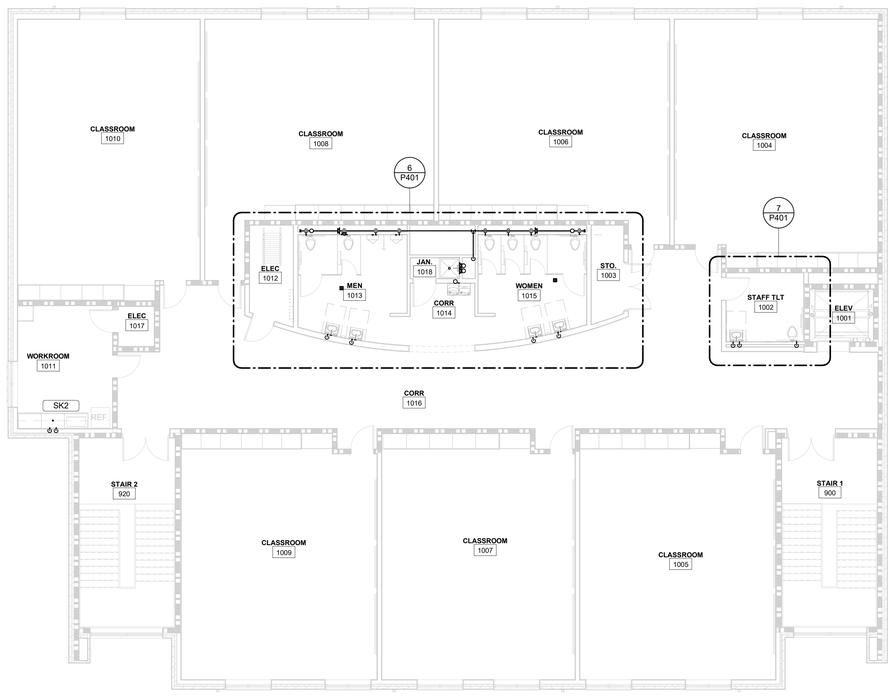
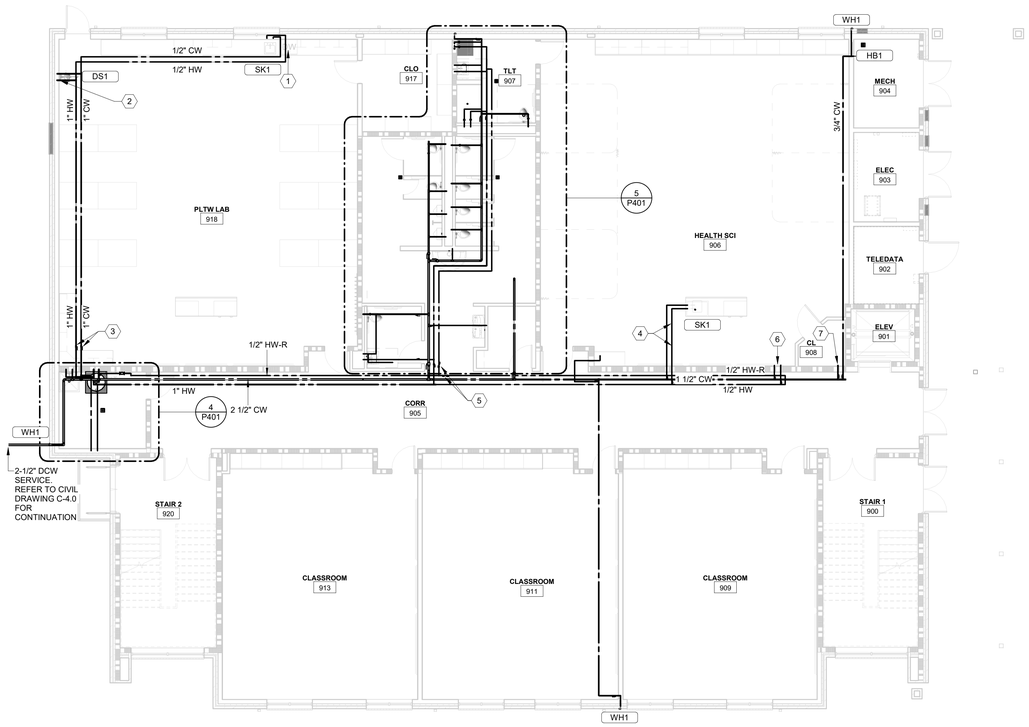


2 SECOND FLOOR PLAN - DOMESTIC WATER

SCALE: 1/8" = 1'-0"

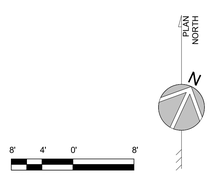


1 FIRST FLOOR PLAN - DOMESTIC WATER

SCALE: 1/8" = 1'-0"

KEYNOTES THIS SHEET

1	PC SHALL PROVIDE AND INSTALL DISHWASHER CONNECTION KIT. PC SHALL INSTALL IN ACCORDANCE WITH SECTION 608.15.1 OF THE 2018 NC PLUMBING CODE
2	PC SHALL PROVIDE AND INSTALL EMERGENCY THERMOSTATIC MIXING VALVE TO PROVIDE TEPID WATER TO DRENCH SHOWER.
3	PC SHALL PROVIDE AND INSTALL SHUT OFF VALVES.
4	ROUTE 1/2" DCW & DHW UNDER SLAB TO ISLAND SINK.
5	PC SHALL PROVIDE AND INSTALL SHUTOFF VALVE AND CIRCUIT SETTER BALANCING VALVE.
6	1/2" DCW & DHW UP TO LAV ABOVE
7	1" DCW UP TO WATER CLOSET ABOVE



8' 4' 0' 8'

SCALE : 1/8" = 1'-0"

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ISSUED: 04.16.20

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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM ADDITION PLANS - DOMESTIC WATER

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 1/8" = 1'-0"
DRAWN BY: JBS PROJ MGR: DMH

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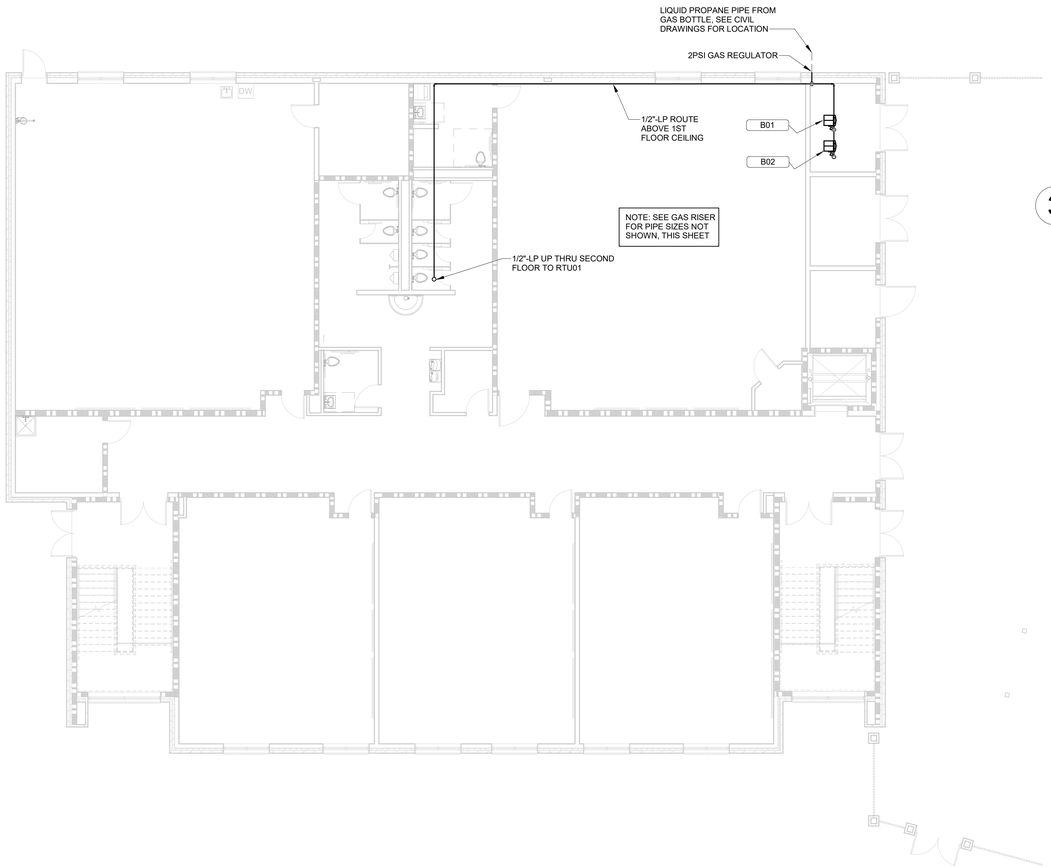
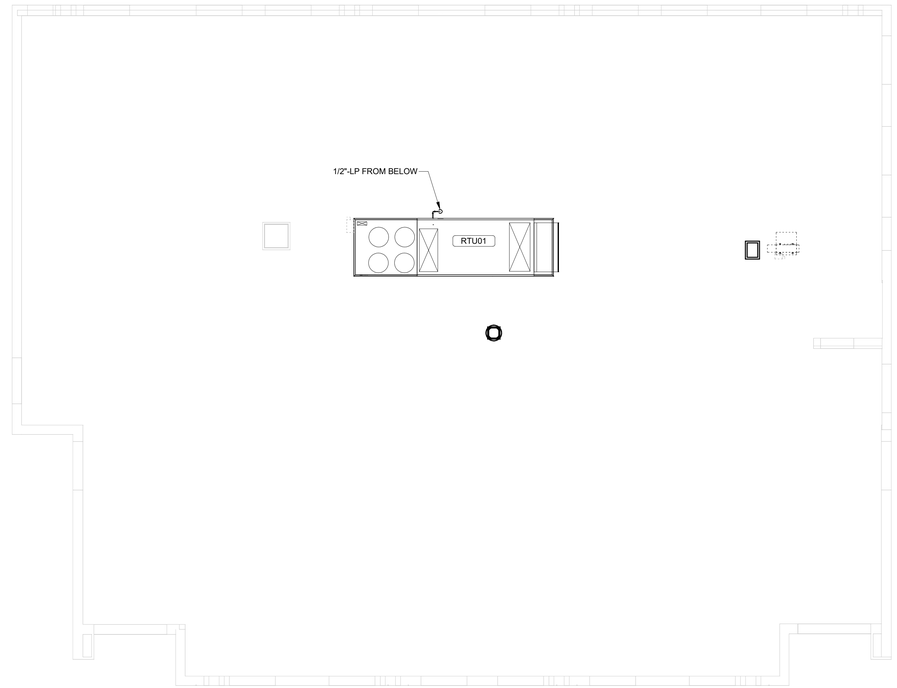


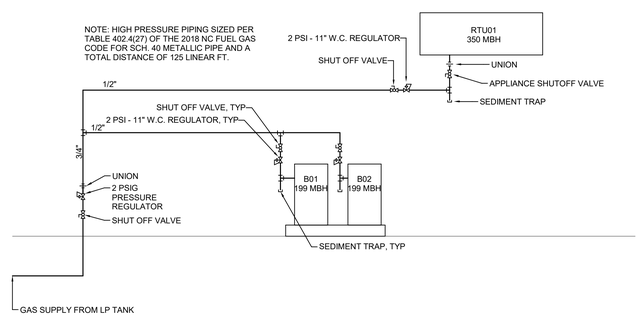
2 LP GAS FIRST FLOOR PLAN

SCALE: 1/8" = 1'-0"



3 LP GAS ROOF PLAN

SCALE: 1/8" = 1'-0"



1 LP GAS RISER DIAGRAM

NO SCALE

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PROGRESS DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1165

SHEET TITLE

LP GAS PIPING PLANS AND GAS RISER

ISSUE BLOCK

Mark	Date	Description
	01.20.20	60% CD PROGRESS DRAWINGS
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO:	2019082.00
DATE:	01.20.2020
SCALE:	As indicated
DRAWN BY: RWC	PROJ MGR: DMH

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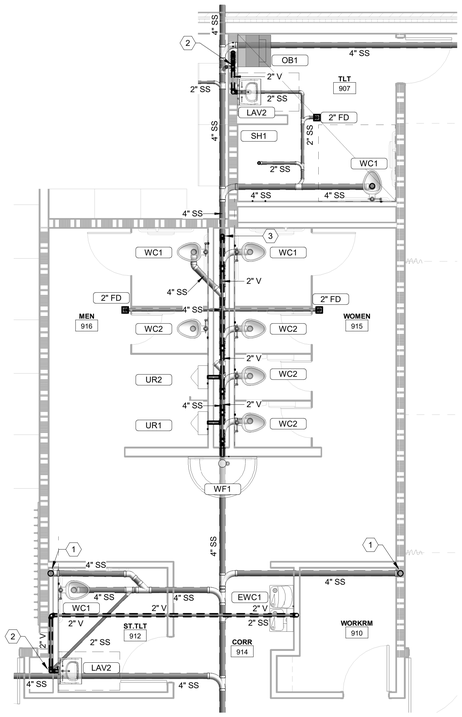
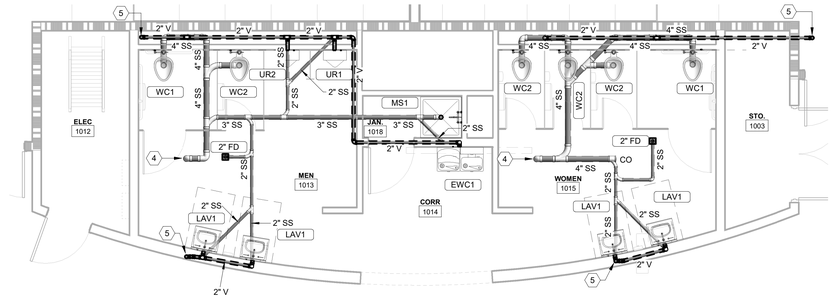
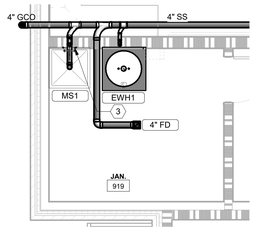
KEYNOTES THIS SHEET	
1	
2	2"W-DOWN. WCO. 2"V-STACK
3	2" V-STACK
4	4"W-STACK.
5	2"V-STACK; 2"VTR
6	PC SHALL PROVIDE AND INSTALL SHUTOFF VALVE AND CIRCUIT SETTER BALANCING VALVE.
7	BRANCH VALVE; TYPICAL
8	REFER TO WATER HEATER DETAIL SHEET P501 FOR FURTHER INFORMATION
9	1/2" SHOCK ARRESTOR
10	3/4" SHOCK ARRESTOR
11	1" SHOCK ARRESTOR
12	2" DCW FROM BELOW
13	1/2" DCW & DHW FROM BELOW
14	1/2" DCW FROM BELOW
15	1" DCW FROM BELOW
16	



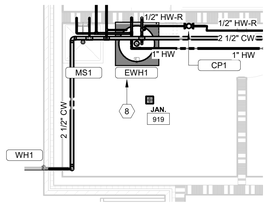
1 ENLARGED FIRST FLOOR GANG TOILET - WASTE-VENT
SCALE: 1/4" = 1'-0"



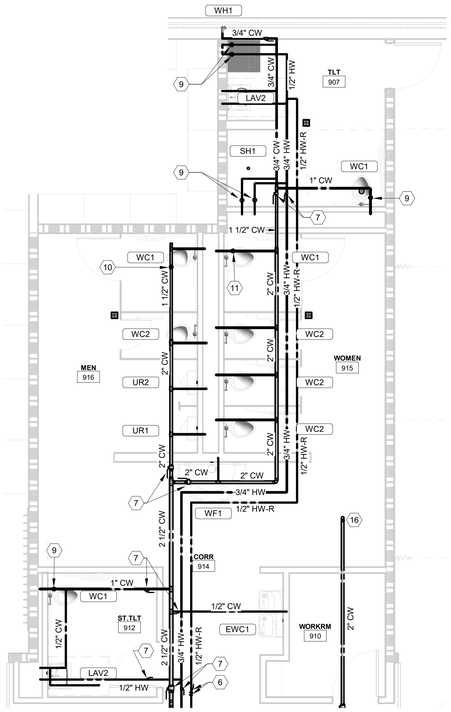
2 ENLARGED SECOND FLOOR GANG TOILETS - WASTE-VENT
SCALE: 1/4" = 1'-0"



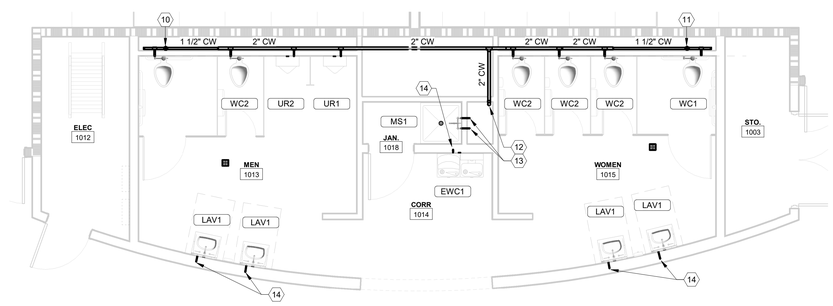
3 ENLARGED FIRST FLOOR JANITORS CLOSET - WASTE-VENT
SCALE: 1/4" = 1'-0"



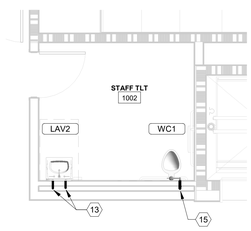
4 ENLARGED FIRST FLOOR JANITORS CLOSET - DOMESTIC WATER
SCALE: 1/4" = 1'-0"



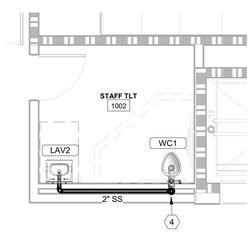
5 ENLARGED FIRST FLOOR GANG TOILET - DOMESTIC WATER
SCALE: 1/4" = 1'-0"



6 ENLARGED SECOND FLOOR GANG TOILETS - DOMESTIC WATER
SCALE: 1/4" = 1'-0"



7 ENLARGED SECOND FLOOR STAFF TOILET - DOMESTIC WATER
SCALE: 1/4" = 1'-0"



8 ENLARGED SECOND FLOOR STAFF TOILET - WASTE-VENT
SCALE: 1/4" = 1'-0"

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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

ENLARGED PLUMBING PLANS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 1/4" = 1'-0"
DRAWN BY: JBS PROJ MGR: DMH

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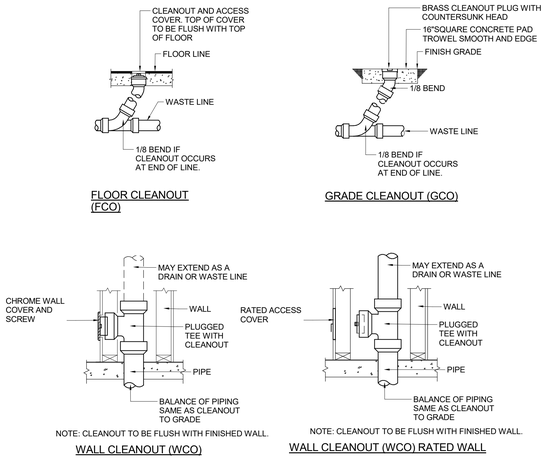
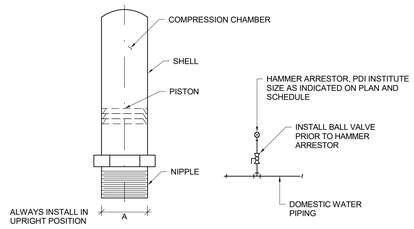
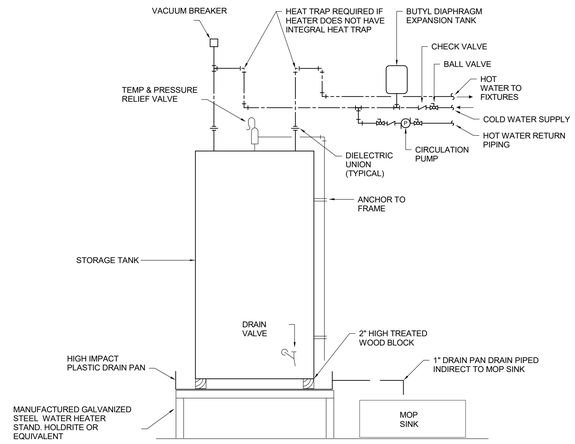


1 CLEANOUT DETAILS
NO SCALE

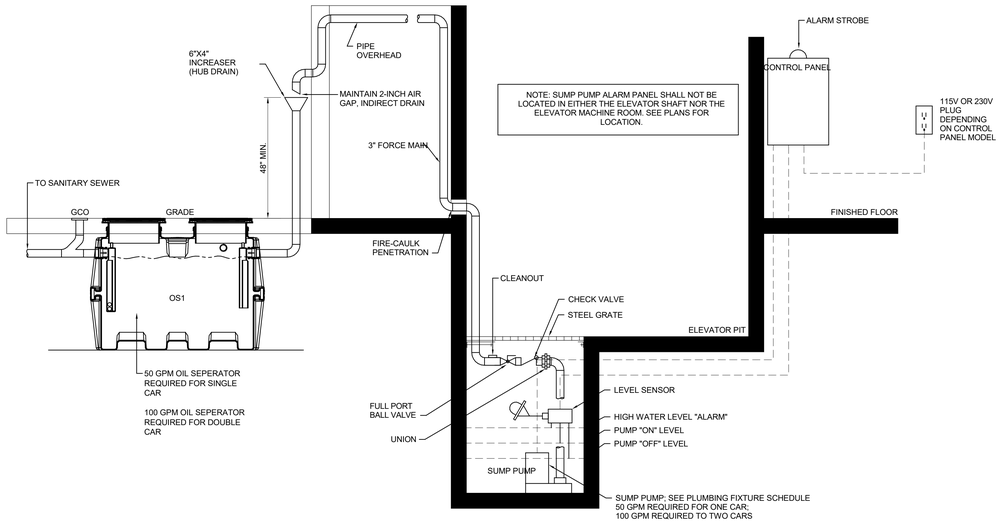


P.D.I. SYMBOL	FIXTURE UNIT RATING	A SIZE
A	1-11	1/2
B	12-32	3/4
C	33-60	1
D	61-113	1 1/4
E	114-154	1 1/2
F	155-330	2

2 HAMMER ARRESTOR DETAIL
NO SCALE



3 ELECTRIC WATER HEATER DETAIL
NO SCALE



NOTE: SUMP PUMP ALARM PANEL SHALL NOT BE LOCATED IN EITHER THE ELEVATOR SHAFT NOR THE ELEVATOR MACHINE ROOM. SEE PLANS FOR LOCATION.

4 ELEVATOR SUMP PUMP DETAIL
NO SCALE

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WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

PLUMBING DETAILS

ISSUE BLOCK

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	07.11.19	NCDPI SD SUBMISSION

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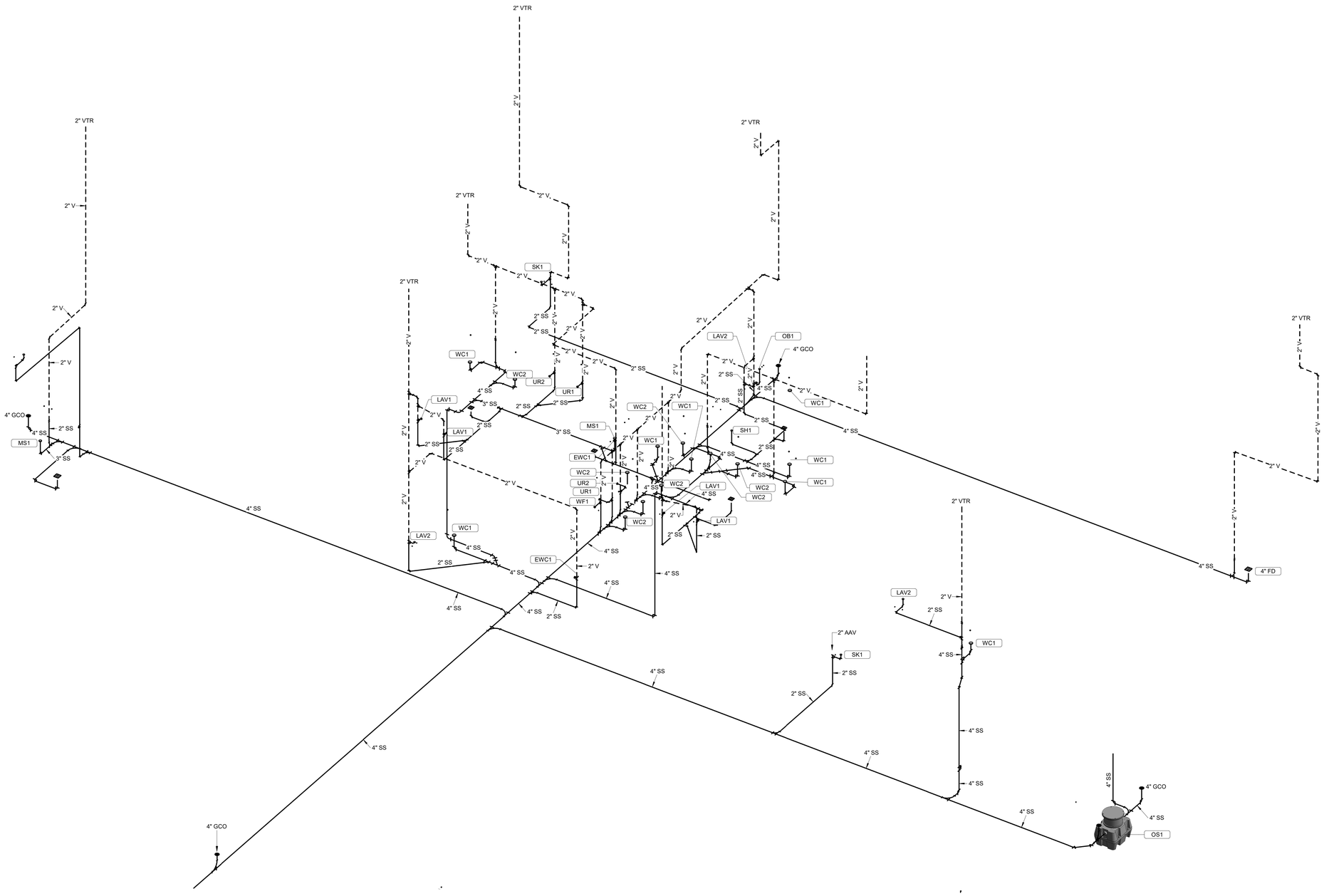

1 WASTE-VENT RISER DIAGRAM
NO SCALE

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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

WASTE & VENT RISER DIAGRAMS

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PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE:
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PLUMBING FIXTURE SCHEDULE

za	ID	DESCRIPTION	MANUFACTURER	MODEL	QTY	MATERIAL DESCRIPTION	FINISH	TRIM MANUFACTURER	TRIM TYPE	Trim Model	Trim has Motion Sensing Control	PIPE CONNECTIONS: WASTE ROUGH-IN PIPE SIZE	VENT PIPE SIZE	COLD WATER ROUGH-IN PIPE SIZE	HOT WATER ROUGH-IN PIPE SIZE	SPECIFICATION	REMARKS
	FD	FLOOR DRAIN	WATTS	FD-100-M	7	EPOXY COATED CAST IRON							2"			EPOXY COATED CAST IRON FLOOR DRAIN WITH ANCHOR FLANGE, REVERSIBLE CLAMPING COLLAR WITH PRIMARY & SECONDARY WEEPHOLES, ADJUSTABLE SQUARE HEEL PROOF NICKEL BRONZE STRAINER, AND NO HUB OUTLET.	
	HB1	WALL MOUNTED HOSE BIBB	WOODFORD	26P-3/4	1											FIELD TESTABLE, BACKFLOW PROTECTED WALL FAUCET, TWO INDEPENDENT CHECK VALVES, AUTOMATIC DRAINING, NO SPRAY BACK	
	OS1	OIL/SAND INTERCEPTOR 50 GPM	STRIEM PRODUCTS	OS-50-CS1	1											50 GPM POLYETHYLENE OIL/SAND SEPARATOR WITH COALESCING MEDIA, MAX FLOW RATE: 50GPM; HOLDING CAPACITY: 57 GAL. LIQUID, 40 GAL. OIL	
	DS1	COMBINATION EYE/FACE WASH DRENCH SHOWER	BRADLEY	S19314DCBF	2	GALVANIZED STEEL	SAFETY YELLOW COATING				No	---	---	1-1/4"		BARRIER FREE COMBINATION DRENCH SHOWER EYE/FACE WASH, 1" SHOWER BALL VALVE AND 1/2" STAY-OPEN EYE/FACE WASH, PLASTIC BOWL AND DUST COVER, ADA	PROVIDE WITH EMERGENCY THERMOSTATIC MIXING VALVE
	EWC1	ELECTRIC WATER COOLER, DUAL HEIGHT, BOTTLE FILLER, NON-FILTERED, ADA	ELKAY	EZSTL8WSLK	2	GALVANIZED STEEL	LIGHT GRAY GRANITE	ELKAY	FLOOR MOUNTED CARRIER	MLP200	Yes	2"	2"	1/2"		TWO LEVEL WALL HUNG WATER COOLER WITH BOTTLE FILLING STATION ON LOW SIDE. THE UNIT SHALL BE COMPLETE WITH CABINET, MOUNTING FRAME, SELF CLOSING EASY TOUCH SIDE AND FRONT PUSHBAR CONTROLS, FLEXIGUARD SAFETY BUBBLER, REFRIGERATING SYSTEM, AIR COOLED, 120 VOLT, 60 CYCLE, SINGLE PHASE POWER CONNECTION, FULLY AUTOMATIC, COMPLETE AND READY TO OPERATE.	
	LAV1	STUDENT WALL HUNG LAVATORY, METERING, CW ONLY, WALL HUNG, ADA	KOHLER	K-2812	4	CAST IRON	ENAMELED	T&S BRASS	MANUAL METERING SINGLE TEMPERATURE	B-0712	No	2"	2"	1/2"		WALL HUNG LAVATORY WITH BACKSPLASH, SINGLE HOLE DRILL. DECK-MOUNTED METERING FAUCET, COLD WATER ONLY. GRID DRAIN, LOOSE KEY ANGLE STOPS AND SUPPLIES. INSULATE WATER AND WASTE WITH INSULATION KIT. MOUNT AT ADA COMPLIANT HEIGHT. INSULATE WATER AND WASTE TO	
	LAV2	STAFF WALL HUNG LAVATORY, ADA	AMERICAN STANDARD	0355.012	3	CHROME	WHITE VITREOUS CHINA	MOEN	SINGLE LEVER, 0.5 GPM	8413F05	No	2"	2"	1/2"	1/2"	VITREOUS CHINA WALL HUNG LAVATORY, 4" CENTERS, DECK-MOUNTED LEVER FAUCET, GRID DRAIN, ANGLE STOPS AND SUPPLIES. MOUNT AT ADA COMPLIANT HEIGHT.	
	MS1	MOP SINK	FIAT	MSB-2424	2	MOLDED STONE	CHROME	MOEN	SERVICE SINK FAUCET	8124	Yes	---	---	3/4"	3/4"	24x24x10 MOLDED STONE w/ GRID STRAINER,BRASS CONSTRUCTION, ROUGH CHROME FINISH, INTEGRAL VACUUM BREAKER, INTEGRAL CHECK STOPS, 3/4"THREADED SPOUT, SERVICE STOPS, WALL MOUNT, VANDAL RESISTANT, LEVER HANDLES	
	OB1	WASHING MACHINE OUTLET BOX	SIOUX CHIEF	696-23	1		WHITE	ELKAY	MANUAL	LK1000	Yes	---	---	1/2"	1/2"	WASHING MACHINE VALVE OR EQUIVALENT OF GUY GRAY WITH RECESSED SUPPLY AND 2" DRAIN. PROVIDE A 2" TRAPPED STANDPIPE IN CONCEALED WALL SPACE.	
	SH1	SHOWER STALL - ADA			1		CHROME	MOEN	MANUAL	8342EP15	Yes	---	---	1/2"	1/2"	60"x30" ACRYLIC-1/2"CURB MAX w/ GRAB BARS, FOLD-UP SEAT, CENTER DRAIN, CURTAIN ROD AND SHOWER CURTAIN, PRESS. BALANCED MIXING VALVE, LEVER HANDLE, DIVERTER, HEAD W/ ARM, FLANGE, WALL/HAND SHOWER, FLEXIBLE METAL HOSE, IN-LINE VAC. BREAKER, 30"SLIDE BAR, 1.5GPM	
	SK1	INTEGRAL SINK	-	-	2			ZURN	MANUAL	Z825B4-XL	No	---	---	1/2"	1/2"	INTEGRAL SINGLE COMPARTMENT, SINGLE LEVER, SINGLE TEMPERATURE LABORATORY FAUCET. , P-TRAP, TAILPIECES, SUPPLIES AND STOPS.	
	SK2	SINK - COUNTER	ELKAY	LRAD2219-55-3	1	WHITE VITREOUS CHINA	CHROME	ELKAY	MANUAL	LK1000	Yes	---	---	1/2"	1/2"	COUNTERTOP LAVATORY, SELF-RIMMING, FAUCET HOLES ON 4" CENTERS. DECK-MOUNTED FAUCET, EXTERNAL THERMOSTATIC MIXING VALVE, GRID DRAIN, LOOSE KEY ANGLE STOPS AND SUPPLIES. INSULATE WATER AND WASTE WITH INSULATION KIT.	
	UR1	WALL MOUNT URINAL, MANUAL FLUSH VALVE, ADA	AMERICAN STANDARD	6002.001	2	WHITE VITREOUS CHINA	CHROME	SLOAN	MANUAL FLUSHOMETER	ROYAL 186-0.125-DBP	No	2"	2"	3/4"		WALL HUNG VITREOUS CHINA URINAL WITH WASHOUT ACTION, 3/4" TOP SPUD, MANUAL 0.125 GPF FLUSHOMETER. INSTALL AT ADA COMPLIANT HEIGHT.	
	UR2	WALL MOUNT URINAL, MANUAL FLUSH VALVE	AMERICAN STANDARD	6002.001	2	WHITE VITREOUS CHINA	CHROME	SLOAN	MANUAL FLUSHOMETER	ROYAL 186-0.125-DBP	No	2"	2"	3/4"		WALL HUNG VITREOUS CHINA URINAL WITH WASHOUT ACTION, 3/4" TOP SPUD, MANUAL 0.125 GPF FLUSHOMETER.	
	WC1	ELONGATED, DUAL FLUSH, VITREOUS CHINA, TOP SPUD, FLOOR MOUNTED WATER CLOSET. ADA	AMERICAN STANDARD	3043.001	8	WHITE VITREOUS CHINA	CHROME	SLOAN	MANUAL DUAL FLUSH FLUSHOMETER	WES-111-1.6/1/1	No	4"	2"	1"		ELONGATED FLOOR MOUNTED, 1-1/2" TOP SPUD, MANUAL DUAL FLUSH FLUSHOMETER, 11-1/2" ROUGH-IN, OPEN FRONT SEAT WITH SELF SUSTAINING, STAINLESS STEEL CHECK HINGES	
	WC2	ELONGATED, DUAL FLUSH, VITREOUS CHINA, TOP SPUD, FLOOR MOUNTED WATER CLOSET	AMERICAN STANDARD	2234.001	8	WHITE VITREOUS CHINA	CHROME	SLOAN	MANUAL DUAL FLUSH FLUSHOMETER	WES 113-1.6/1.1	No	4"	2"	1"		ELONGATED FLOOR MOUNT, 15" RIM HEIGHT, 1-1/2" TOP SPUD, MANUAL DUAL FLUSH FLUSHOMETER, 16" ROUGH-IN, OPEN FRONT SEAT WITH SELF SUSTAINING, STAINLESS STEEL CHECK HINGES	
	WF1	STUDENT, METERING, CW ONLY, SEMI-CIRCLE WASHFOUNTAIN, ADA	BRADLEY	TDB3104	1	TERRAZZO	WHITE MARMORLITE	T&S BRASS	MANUAL METERING SINGLE TEMPERATURE	B-0712	Yes	2"	2"	1/2"		WALL HUNG LAVATORY WITH BACKSPLASH, SINGLE HOLE DRILL. DECK-MOUNTED METERING FAUCET, COLD WATER ONLY. GRID DRAIN, LOOSE KEY ANGLE STOPS AND SUPPLIES. INSULATE WATER AND WASTE WITH INSULATION KIT. MOUNT AT ADA COMPLIANT HEIGHT. INSULATE WATER AND WASTE TO	
	WH1	EXTERIOR WALL HYDRANT	WOODFORD	67	4	BRASS	CHROME				Yes			3/4"		NON-FREEZE TYPE WALL HYDRANT, WITH DOUBLE CHECK BACKFLOW PREVENTER, VALVE ON THE INSIDE OF THE WALL, SPOUT WITH BACKFLOW PREVENTER, AND LOOSE KEY SOCKET ON THE OUTSIDE OF THE WALL. MAKE ARRANGEMENTS WITH THE GENERAL CONTRACTOR TO PROVIDE THE NECESSARY RECESS IN THE WALL. WHERE A RISER TO A WALL HYDRANT OCCURS IN AN OUTSIDE WALL THE CONTRACTOR SHALL INSULATE THE CHASE WITH 2" STYROFOAM INSULATION ON ALL SIDES OF THE CHASE, EXCEPT THE INSIDE WALL OF THE CHASE. PROVIDE SHUTOFF VALVE IN ACCESSIBLE LOCATION.	
Grand total: 52																	

PUMP SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESGIN MODEL	ALTERNATE APPROVED MANUFACTURERS	PUMP TYPE	SERVICE	FLUID	Flow Rate	Pump Head (FT)	INLET	OUTLET	MOTOR ENCLOSURE: TYPE	MOTOR: MATERIALS	SPEED RPM	HP	ELECTRICAL: VOLT	PH	FREQ	WEIGHT	NOTES	ACCESSORIES
CP1	BELL & GOSSETT	ECOCIRC N 19-16		HIGH EFFICIENCY WET ROTOR CIRCULATOR WITH ELECTRONICALLY COMMUTATED MOTOR	DOMESTIC WATER	WATER	0.0 GPM	0							115 V	1	60 Hz			
SP1	LIBERTY PUMPS, INC.	LE51M-2		LE SEWAGE PUMP, 50 SERIES, 0.5 HP, 115 V, 25' CORD	ELEVATOR SUMP	WATER	50.0 GPM	20		2"				0.50 hp	115 V	1	60 Hz	41 lb		IP CONTROL PANEL WITH HIGH WATER ALARM

ELECTRIC WATER HEATER SCHEDULE

Identity Mark	MANUFACTURER	MODEL NO.	TYPE	kW	UNIT WEIGHT	VOLT	PH	Frequency
EWH1	BRADFORD WHITE	LE212073-3	ELECTRIC STORAGE HEATER, 119 GALLON	4.5	305 lb	208 V	1	60 Hz

FIXTURE UNIT SUMMARY

FIXTURE SYMBOL	FIXTURE DESCRIPTION	COUNT	LOCATION: NAME	NO.	PIPE SIZE: WASTE	VENT	CW	HW	FIXTURE UNITS: WFU	CWFU	HWFU
DS1	COMBINATION EYE/FACE WASH DRENCH SHOWER	2			2"		1 1/4"		1	0.5	0
EWC1	ELECTRIC WATER COOLER, DUAL HEIGHT, BOTTLE FILLER, NON-FILTERED, ADA	2			2"		1/2"		1	0.5	0
FD	FLOOR DRAIN	5			2"	2"			0	0	0
FD	FLOOR DRAIN	2			4"	2"			0	0	0
HB1	WALL MOUNTED HOSE BIBB	1							0	0	0
LAV1	STUDENT WALL HUNG LAVATORY, METERING, CW ONLY, WALL HUNG, ADA	4			2"		1/2"		8	4	0
LAV2	STAFF WALL HUNG LAVATORY, ADA	3			2"		1/2"	1/2"	3	4.5	4.5
MS1	MOP SINK	2			3"		3/4"	3/4"	8	4.5	4.5
OB1	WASHING MACHINE OUTLET BOX	1			2"		1/2"	1/2"	3	2.25	2.25
OS1	OIL/SAND INTERCEPTOR 50 GPM	1							0	0	0
SH1	SHOWER STALL - ADA	1			2"		1/2"	1/2"	2	3	3
SK1	INTEGRAL SINK	2			2"		1/2"	1/2"	4	3	3
SK2	SINK - COUNTER	1			2"		1/2"	1/2"	1	1.5	1.5
UR1	WALL MOUNT URINAL, MANUAL FLUSH VALVE, ADA	2			2"		3/4"		4	10	0
UR2	WALL MOUNT URINAL, MANUAL FLUSH VALVE	2			2"		3/4"		4	10	0
WC1	ELONGATED, DUAL FLUSH, VITREOUS CHINA, TOP SPUD, FLOOR MOUNTED WATER CLOSET. ADA	8			4"		1"		32	80	0
WC2	ELONGATED, DUAL FLUSH, VITREOUS CHINA, TOP SPUD, FLOOR MOUNTED WATER CLOSET	8			4"		1"		32	80	0
WF1	STUDENT, METERING, CW ONLY, SEMI-CIRCLE WASHFOUNTAIN, ADA	1			2"		1/2"		2	1	0
WH1	EXTERIOR WALL HYDRANT	4					3/4"		0	12	0
Grand total: 52									105	216.75	18.75

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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

PLUMBING SCHEDULES

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE:
DRAWN BY: JBS PROJ MGR: DMH

P601

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GENERAL MECHANICAL SYMBOLS

- REVISION NUMBER - SHOWN ON PLANS
- POINT WHERE NEW CONNECTS TO EXISTING
- NUMBER OF DETAIL ON SHEET
- NUMBER OF SHEET WHERE DETAIL APPEARS
- KEYNOTE
- CONTINUATION SYMBOL
- Room 1 — ROOM NAME AND NUMBER
- ITEM TO BE DEMOLISHED
- AREA NOT IN CONTRACT

HVAC SYMBOLS

16"x8"	SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
16"/8"	OVAL DUCT SIZE TAG (WIDTH / HEIGHT)
16"Ø	ROUND DUCT SIZE TAG (DIAMETER)
(E)	EXISTING DUCT TAG
	DUCT BEING DEMOLISHED
S/A	SUPPLY AIR
S-O/A	SUPPLY AIR (100% OUTSIDE AIR)
O/A	OUTSIDE AIR
R/A	RETURN AIR
T/A	TRANSFER AIR
E/A	EXHAUST AIR
L/A	RELIEF AIR
GE/A	GREASE EXHAUST AIR
SE/A	SMOKE EXHAUST AIR
FLUE	EXHAUST GAS FLUE
C/A	COMBUSTION AIR
DROP	RECTANGULAR SUPPLY/OUTSIDE AIR DUCT RISE
DROP	ROUND SUPPLY/OUTSIDE AIR DUCT RISE
DROP	RECTANGULAR RETURN/TRANSFER AIR DUCT RISE
DROP	ROUND RETURN/TRANSFER AIR DUCT RISE
DROP	RECTANGULAR EXHAUST/RELIEF AIR DUCT RISE
DROP	ROUND EXHAUST/RELIEF AIR DUCT RISE

SUPPLY OUTLET — RETURN/EXHAUST INLET

S2 / 0 — SECTORIZING BAFFLE OR BLANKOFF PANEL; TYPE (SEE SCHEDULE); GRILLES, REGISTERS, AND DIFFUSERS TAG; CFM

LINEAR DIFFUSER

S6 / 0 — TYPE (SEE SCHEDULE); LINEAR DIFFUSER TAG; CFM

VAV-XX — MECHANICAL EQUIPMENT; MECHANICAL EQUIPMENT TAG

(X)VAV-XX — EXISTING MECHANICAL EQUIPMENT; EXISTING MECHANICAL EQUIPMENT TAG (TYPICAL FOR ALL EXISTING TAGS)

VAV-XX — MECHANICAL EQUIPMENT FOR REFERENCE; MECHANICAL EQUIPMENT TAG (REFER TO OTHER DISCIPLINE FOR ADDITIONAL INFORMATION)

- CO2 — CARBON DIOXIDE SENSOR
- D — DUCT SMOKE DETECTOR
- H — HUMIDITY SENSOR
- E — E-STOP
- T — TEMPERATURE SENSOR

FIRE DAMPER F — MANUAL BALANCING DAMPER B

SMOKE DAMPER S — BACKDRAFT DAMPER D

MOTORIZED DAMPER M — COMBINATION FIRE/SMOKE DAMPER C

PIPING SYMBOLS

2"	PIPE SIZE TAG (DIAMETER)
	ABOVE GROUND PIPING
1/8" / 12" SLOPE	PIPE SLOPE TAG
	BELOW GROUND PIPING
INVERT: -10' - 1"	PIPE INVERT ELEVATION TAG
(E)	EXISTING PIPE TAG
	PIPING BEING DEMOLISHED
CD	CONDENSATE DRAINAGE
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
G	NATURAL GAS
PG	PROPANE GAS
REF-L	REFRIGERANT-LIQUID
REF-S	REFRIGERANT-SUCTION
REF-HG	REFRIGERANT-HOT GAS

PIPE DROP; PIPE RISE; PIPE TEE; CAP

4" 4" 2" — PLUG; REDUCING 45 DEGREE TEE; 45 DEGREE TEE

DOMESTIC WATER METER	MOTORIZED CONTROL VALVE
FLOW MEASURING AND BALANCING DEVICE	THREE WAY MOTORIZED CONTROL VALVE
BALL VALVE	PRESSURE REDUCING VALVE
CHECK VALVE	SOLENOID VALVE
THREE WAY VALVE	BUTTERFLY VALVE

EQUIPMENT ABBREVIATIONS

AC	AIR CONDITIONING UNIT	FP	FIRE PUMP
ACC	AIR COOLED CONDENSER	GI	GREASE INTERCEPTOR
ACCU	AIR COOLING CONDENSING UNIT	GRV	GRAVITY ROOF VENTILATOR
AFMS	AIR FLOW MEASURING STATION	H	HUMIDIFIER
AHU	AIR HANDLING UNIT	HWP	HEATING WATER PUMP
AS	AIR SEPARATOR	HX	HEAT EXCHANGER
B	BOILER	HPU	HEAT PUMP UNIT
CF	CABINET FAN	HRU	HEAT RECOVERY UNIT
CF	CHEMICAL FEEDER	ILC	INLINE CENTRIFUGAL
CFP	CHEMICAL FEEDER PUMP	PF	PROPELLER FAN
CH	CHILLER	PV	POWER VENTILATOR
CRU	CONDENSATE RETURN UNIT	PWF	POWER WALL FAN
CT	COOLING TOWER	RE	RETURN/EXHAUST FAN
CUH	CABINET UNIT HEATER	RTU	ROOFTOP UNIT
CWP	CONDENSER WATER PUMP	SA	SHOCK ABSORBER
CHWP	CHILLED WATER PUMP	SAT	SOUND ATTENUATOR
DAH	DUCTLESS AIR HANDLER	SEP	SEWAGE EJECTOR PUMP
DHP	DUCTLESS HEAT PUMP	SF	SUPPLY FAN
DCP	DOMESTIC WATER CIRCULATING PUMP	SP	SUMP PUMP
EUH	ELECTRIC UNIT HEATER	UH	UNIT HEATER
EDC	ELECTRIC DUCT COIL	US	UTILITY SET
ET	EXPANSION TANK	UV	UNIT VENTILATOR
EWH	ELECTRIC WATER HEATER	VAV	VARIABLE AIR VOLUME
FCU	FAN COIL UNIT	WH	WATER HEATER

RATED WALL LEGEND

- ONE HOUR RATED EXTERIOR WALL
- ONE HOUR RATED INTERIOR WALL

ABBREVIATIONS

&	AND	ID	INDIRECT
Ø	ROUND	IN	INCH
A	AIR	INL	INLET
AB	ABOVE BASE	INSUL	INSULATION
ABV	ABOVE	INT	INTERIOR
AC	AIR CONDITIONING	INV	INVERT
ACOUS	ACOUSTICAL	INWG	INCHES WATER GAUGE
AD	AREA DRAIN	JST SPC	JOIST SPACE
ADD	ADDENDUM	JT	JOINT
ADDL	ADDITIONAL	LAB	LABORATORY
AFF	ABOVE FINISHED FLOOR	LB	POUND
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	LB/HR	POUNDS PER HOUR
AG	ABOVE GROUND	LAT	LEAVING AIR TEMPERATURE
ALT	ALTERNATE	LF	LINEAL FOOT
ALUM	ALUMINUM	LOC	LOCATION
AP	ACCESS PANEL	LP	LOW PRESSURE
APPROX	APPROXIMATE	LPG	LIQUEFIED PETROLEUM GAS
ARCH	ARCHITECT/ARCHITECTURAL	LR	LIQUID REFRIGERANT
AV	ACID RESISTANT VENT	LS	LAWN SPRINKLER
AW	ACID RESISTANT WASTE	L	LOUVER
AUTO	AUTOMATIC	LWT	LEAVING WATER TEMPERATURE
BFF	BELOW FINISHED FLOOR	M/A	MIXED AIR
BLDG	BUILDING	MAN	MANUAL
BLW	BELOW	MATL	MATERIAL
BM	BEAM	MAV	MANUAL AIR VENT
BO	BY OTHER	MAX	MAXIMUM
BOT	BOTTOM	MBD	MOTORIZED BYPASS DAMPER
BSMT	BASEMENT	MBH	ONE THOUSAND BTU PER HOUR
BTU	BRITISH THERMAL UNITS	MCF	ONE THOUSAND CUBIC FEET
BTUH	BRITISH THERMAL UNITS PER HOUR	MCW	MAKE-UP COLD WATER
BTWN	BETWEEN	MD	MOTORIZED DAMPER
CAP	CAPACITY	MECH	MECHANICAL
CB	CATCH BASIN	MFR	MANUFACTURER
CCW	COUNTER CLOCKWISE	MH	MANHOLE
CFCV	CONSTANT FLOW CONTROL VALVE	MIN	MINIMUM
CFM	CUBIC FEET PER MINUTE	MISC	MISCELLANEOUS
CHW	CIRCULATING HOT WATER	MTR	MOTOR
CI	CAST IRON	MU/A	MAKE-UP/AIR
CLG	CEILING	N	NECK
CLG	COOLING	NC	NOISE CRITERIA
CO	CLEAN OUT	NC	NORMALLY CLOSED
COL	COLUMN	NIC	NOT IN CONTRACT
COMB	COMBINATION	NO	NUMBER
CONC	CONCRETE	NO	NORMALLY OPEN
COND	CONDENSATE	NOM	NOMINAL
CONF	CONFERENCE	NTS	NOT TO SCALE
CONN	CONNECT	O	OXYGEN
CONST	CONSTRUCTION	O/A	OUTSIDE AIR
CONT	CONTINUE/CONTINUATION	OC	ON CENTER
CONTR	CONTRACT/CONTRACTOR	OF	OVERFLOW
COORD	COORDINATE	OPNG	OPENING
CTR	CENTER	ORD	OVERFLOW ROOF DRAIN
CUFT	CUBIC FEET	PD	PRESSURE DROP
CV	CHECK VALVE	PIV	POST INDICATOR VALVE
CW	COLD WATER	PLBG	PLUMBING
CW	CLOCKWISE	PR	PAIR
D	DEGREE	PREL	PRELIMINARY
DB	DRY BULB	PRESS	PRESSURE
DET	DETAIL	PRIM	PRIMARY
DIA	DIAMETER	PRV	PRESSURE REDUCING VALVE
DIAG	DIAGONAL	PSI	POUNDS PER SQUARE INCH
DISCH	DISCHARGE	PSIG	POUNDS PER SQUARE INCH GAUGE
DIV	DIVISION	PW	POTABLE WATER
DI	DEIONIZED WATER	PWR	POWER
DMPR	DAMPER	R	DUCT RISER
DN	DOWN	R/A	RETURN AIR
DWG	DRAWING	RCP	RADIANT CEILING PANEL
DW	DISTILLED WATER	RD	ROOF DRAIN
EA	EACH	REC	RECESSED
EAT	ENTERING AIR TEMPERATURE	RED	REDUCER
EL	ELBOW	REFR	REFRIGERATION
ELEC	ELECTRICAL	RH	RELATIVE HUMIDITY
ELEV	ELEVATION	REQD	REQUIRED
EP	EXPLOSION PROOF	REV	REVERSE
EQ	EQUAL	RL/A	RELIEF AIR
EQUIP	EQUIPMENT	RM	ROOM
EWC	ELECTRIC WATER COOLER	RPM	REVOLUTIONS PER MINUTE
EWT	ENTERING WATER TEMPERATURE	RW	RAIN WATER
E/A	EXHAUST AIR	SF	SQUARE FOOT
EAH	EXHAUST HOOD	S/A	SUPPLY AIR
EXIST	EXISTING	SAN	SANITARY
EXP	EXPANSION	SCHED	SCHEDULE
EXP,JT	EXPANSION JOINT	SECT	SECTION
EXT	EXTERIOR	SF	SQUARE FOOT
F	DEGREES FAHRENHEIT	SD	SMOKE DAMPER
FCO	FLOOR CLEAN OUT	SHT	SHEET
FD	FLOOR DRAIN	SIM	SIMILAR
FD	FIRE DAMPER	SLV	SLEEVE
FDV	FIRE DEPARTMENT VALVE	SM	SURFACE MOUNT
FHC	FIRE HOSE CABINET	SP	STANDPIPE
FL	FLOOR	SP	STATIC PRESSURE
FLEX	FLEXIBLE	SPEC	SPECIFICATION
FLG	FLANGE	SPS	STATIC PRESSURE STATION
FO	FUEL OIL	SQ	SQUARE
FOV	FUEL OIL VENT	SR	SUCTION REFRIGERANT
FOR	FUEL OIL RETURN	SSD	SOIL SUBDRAIN
FOS	FUEL OIL SUPPLY	SS	STAINLESS STEEL
FPM	FEET PER MINUTE	STD	STANDARD
FRP	FIBERGLASS REINFORCED PIPE	STM	STEAM
FS	FULL SIZE	STRUCT	STRUCTURAL
FS	FLOOR SINK	SUCT	SUCTION
FT	FOOT/FEET	SUSP	SUSPENDED
FTG	FOOTING	T	THERMOSTAT
FTR	FIN TUBE RADIATION	TCP	TEMPERATURE CONTROL PANEL
FUT	FUTURE	TD	TEMPERATURE DROP
GA	GAGE/GAUGE	TDR	TRENCH DRAIN
GAL	GALLON	TEFC	TOTALLY ENCLOSED FAN COOLED
GALV	GALVANIZED	TEMP	TEMPERATURE
GC	GENERAL CONTRACTOR	TYP	TYPICAL
GEN	GENERATOR	UFD	UNDER FLOOR DUCT
GENL	GENERAL	UG	UNDERGROUND
GPH	GALLONS PER MINUTE	VAC	VACUUM
GR	GRADE	V	VENT
GW	GREASE WASTE	VAV	VARIABLE AIR VOLUME
HB	HOSE BIB	VEL	VELOCITY
HD	HEAD	VENT	VENTILATION
HORZ	HORIZONTAL	VERT	VERTICAL
HP	HORSE POWER	VOL	VOLUME
HP	HIGH PRESSURE	VTR	VENT THROUGH ROOF
HTG	HEATING	W	WASTE
HTR	HEATER	WB	WET BULB
HW	HOT WATER	WCO	WALL CLEAN OUT
HYD	HYDRANT	WH	WALL HYDRANT

ENERGY SUMMARY

ENERGY
THE FOLLOWING DATA SHALL BE CONSIDERED MINIMUM AND ANY SPECIAL ATTRIBUTE REQUIRED TO MEET THE ENERGY CODE SHALL ALSO BE PROVIDED. EACH DESIGNER SHALL FURNISH THE REQUIRED PORTIONS OF THE PROJECT INFORMATION FOR THE PLAN DATA SHEET. IF PERFORMANCE METHOD, STATE THE ANNUAL ENERGY COST FOR THE STANDARD REFERENCE DESIGN VS ANNUAL ENERGY COST FOR THE PROPOSED DESIGN.

CLIMATE ZONE: 3A

METHOD OF COMPLIANCE:
X PRESCRIPTIVE (ENERGY CODE)
PERFORMANCE (ENERGY CODE)
PRESCRIPTIVE (ASHRAE 90.1)
PERFORMANCE (ASHRAE 90.1)

THERMAL ENVELOPE

ROOF CEILING ASSEMBLY (EACH ASSEMBLY)
DESCRIPTION OF ASSEMBLY: INSIDE SURFACE RESISTANCE, METAL DECKING, BOARD INSULATION, EPDM,OUTSIDE SURFACE RESISTANCE
U-VALUE OF TOTAL ASSEMBLY: .04 BTU/HR/SF/F
R-VALUE OF INSULATION: R-25 (HR-SF-F)/BTU
SKYLIGHTS IN EACH ASSEMBLY: -
U-VALUE OF SKYLIGHT: -
TOTAL SQ.FT OF SKYLIGHTS IN EA. ASSEMBLY: -

EXTERIOR WALLS (EACH ASSEMBLY)
DESCRIPTION OF ASSEMBLY: INSIDE SURFACE RESISTANCE, 5/8" GYPSUM BOARD, R-19 BATT INSULATION, 1/2" PLYWOOD SHEATHING, 2" CONTINUOUS R-12.4 SPRAY FOAM INSULATION, AIR SPACE, 4" FACE BRICK, OUTSIDE SURFACE RESISTANCE
U-VALUE OF TOTAL ASSEMBLY: 0.034 BTU/HR/SF/F
R-VALUE OF INSULATION: R-19 + R-12.4 (HR-SF-F)/BTU

OPENINGS (WINDOWS OR DOORS WITH GLAZING)
U-VALUE OF TOTAL ASSEMBLY 0.45 BTU/HR/SF/F
SHADING COEFFICIENT: 0.45
PROJECTION FACTOR: <0.5
DOOR R-VALUES: 1.4 (HR-SF-F)/BTU

WALLS BELOW GRADE (EACH ASSEMBLY)
DESCRIPTION OF ASSEMBLY: N/A
U-VALUE OF TOTAL ASSEMBLY: N/A
R-VALUE OF INSULATION: N/A

FLOORS OVER UNCONDITIONED SPACE (EACH ASSEMBLY)
DESCRIPTION OF ASSEMBLY: N/A
U-VALUE OF TOTAL ASSEMBLY: N/A
R-VALUE OF INSULATION: N/A

FLOORS SLAB ON GRADE
DESCRIPTION OF ASSEMBLY: INSIDE SURFACE RESISTANCE, 4"CONCRETE SLAB
U-VALUE OF TOTAL ASSEMBLY: 0.1 BTU/HR/SF/F
R-VALUE OF INSULATION: 0 (HR-SF-F)/BTU
HORIZONTAL/VERTICAL REQUIREMENT HORIZONTAL
SLAB HEATED: NO

MECHANICAL SUMMARY

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

CLIMATE ZONE 3A - WARM/HUMID
WINTER DRY BULB: 23%DF
SUMMER DRY BULB 95%DF

INTERIOR DESIGN CONDITIONS
WINTER DRY BULB 70%DF
SUMMER DRY BULB 75%DF
RELATIVE HUMIDITY 60% RH*
*DESIGN- NOT CONTROLLED
HEATING LOAD: 198.4 MBH
COOLING LOAD: 499.2 MBH

MECHANICAL SPACING CONDITIONING SYSTEM SEE SCHEDULES
UNITARY
DESCRIPTION OF UNIT: SEE SCHEDULES
HEATING EFFICIENCY: SEE SCHEDULES
COOLING EFFICIENCY: SEE SCHEDULES
SIZE CATEGORY OF UNIT: SEE SCHEDULES
BOILER
SIZE CATEGORY, IF OVERSIZED STATE REASON: N/A
CHILLER
SIZE CATEGORY, IF OVERSIZED STATE REASON: N/A

LIST EQUIPMENT EFFICIENCIES: SEE SCHEDULES

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DPI SCHOOL # : 1167

SHEET TITLE
MECHANICAL ABBREVIATIONS, LEGEND, ENERGY & MECH SUMMARIES

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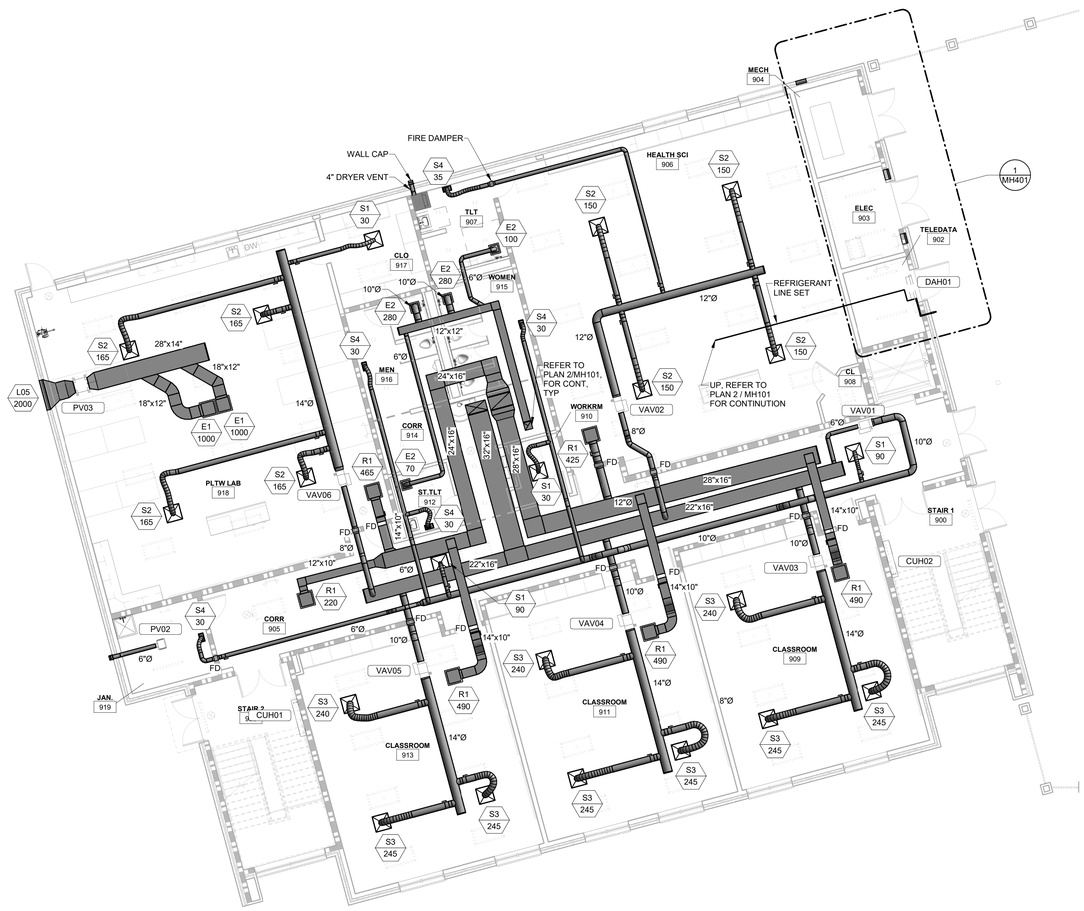
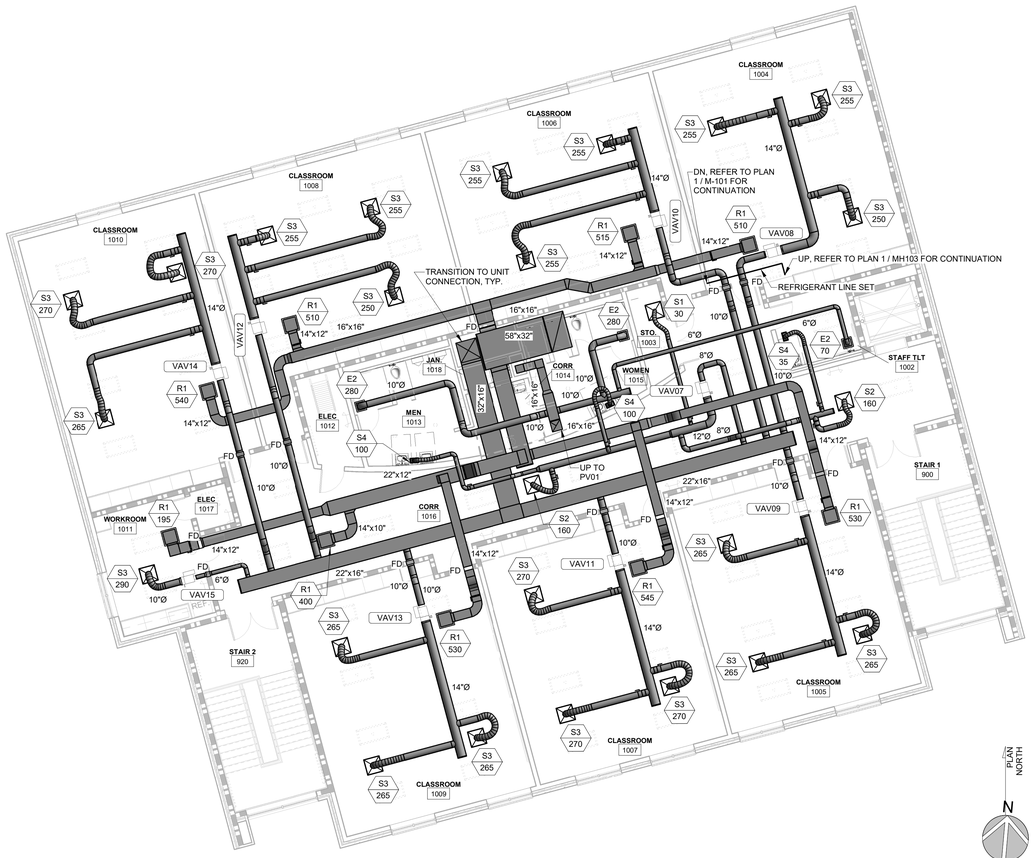
FLOOR PLAN SHEET NOTES

1. MAINTAIN MANUFACTURER'S CLEARANCE REQUIREMENTS FOR INDOOR EQUIPMENT.
2. MECHANICAL CONTRACTOR TO COORDINATE WITH OTHER TRADES PRIOR TO BEGINNING WORK.
3. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY UL NUMBERS (WALLS, FLOOR / CEILINGS, ETC.
4. COORDINATED CONDENSATE PIPE ROUTING WITH GENERAL CONTRACTOR AND OWNER, TYPICAL.
5. CONCERNING DIFFUSER LAYOUT AND CEILING TYPE, REFER TO ARCHITECTURAL PLANS FOR FURTHER INFORMATION.
6. IN GENERAL, LOCATE VAV TERMINALS ABOVE DOOR SWING TO ASSURE CONTINUED ACCESS.



1 CLASSROOM BUILDING FIRST FLOOR PLAN - HVAC

SCALE: 1/8" = 1'-0"



2 CLASSROOM BUILDING SECOND FLOOR PLAN - HVAC

SCALE: 1/8" = 1'-0"

8' 4' 0' 8'

SCALE : 1/8" = 1'-0"

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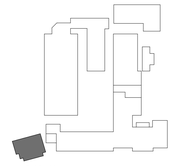
DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING FLOOR PLANS - HVAC



KEY PLAN

ISSUE BLOCK

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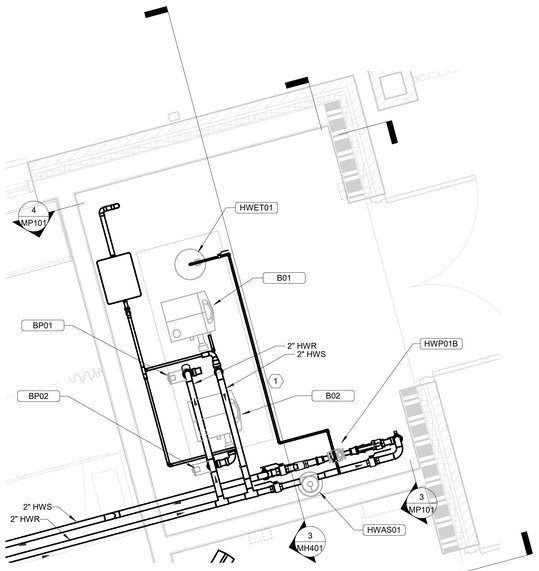
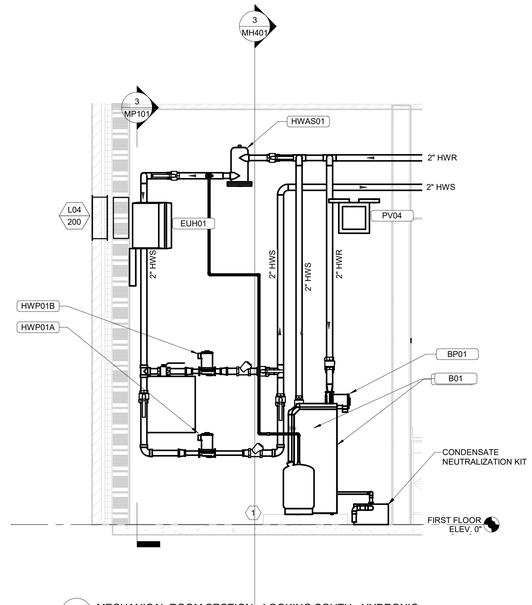
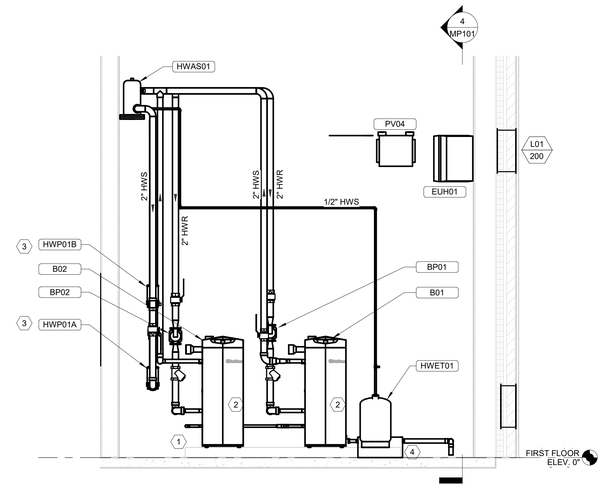
KEYNOTES	
1	MECHANICAL EQUIPMENT HOUSE KEEPING PAD. SEE DETAIL 7.M-502
2	LP GAS CONDENSING BOILER. SEE DETAIL 3.M-503.
3	HEATING WATER PUMP. SEE DETAIL 3.M-502.
4	CONDENSATE NEUTRALIZER KIT. SEE DETAIL 4.M-503
5	CONCEAL PIPING IN WALL



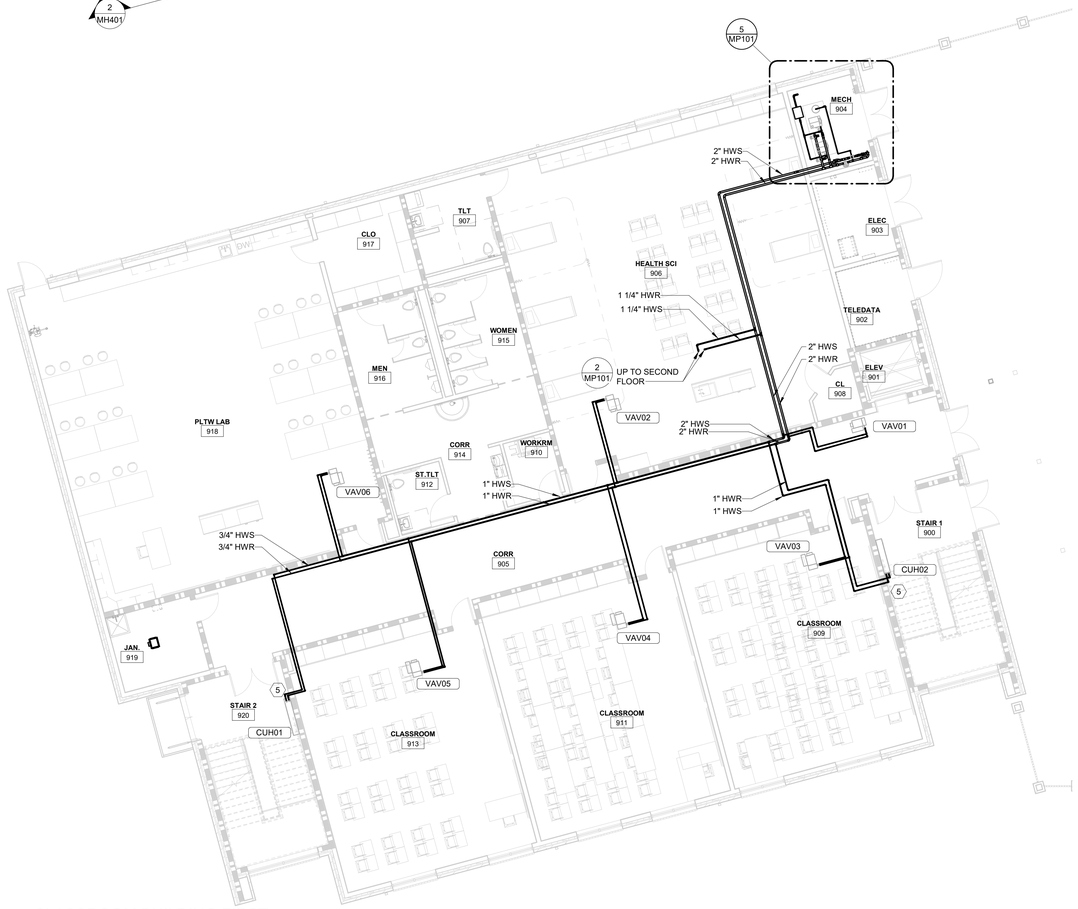
5 MP101 CLASSROOM BUILDING FIRST FLOOR PLAN - HYDRONIC - Callout 1
1/2" = 1'-0"



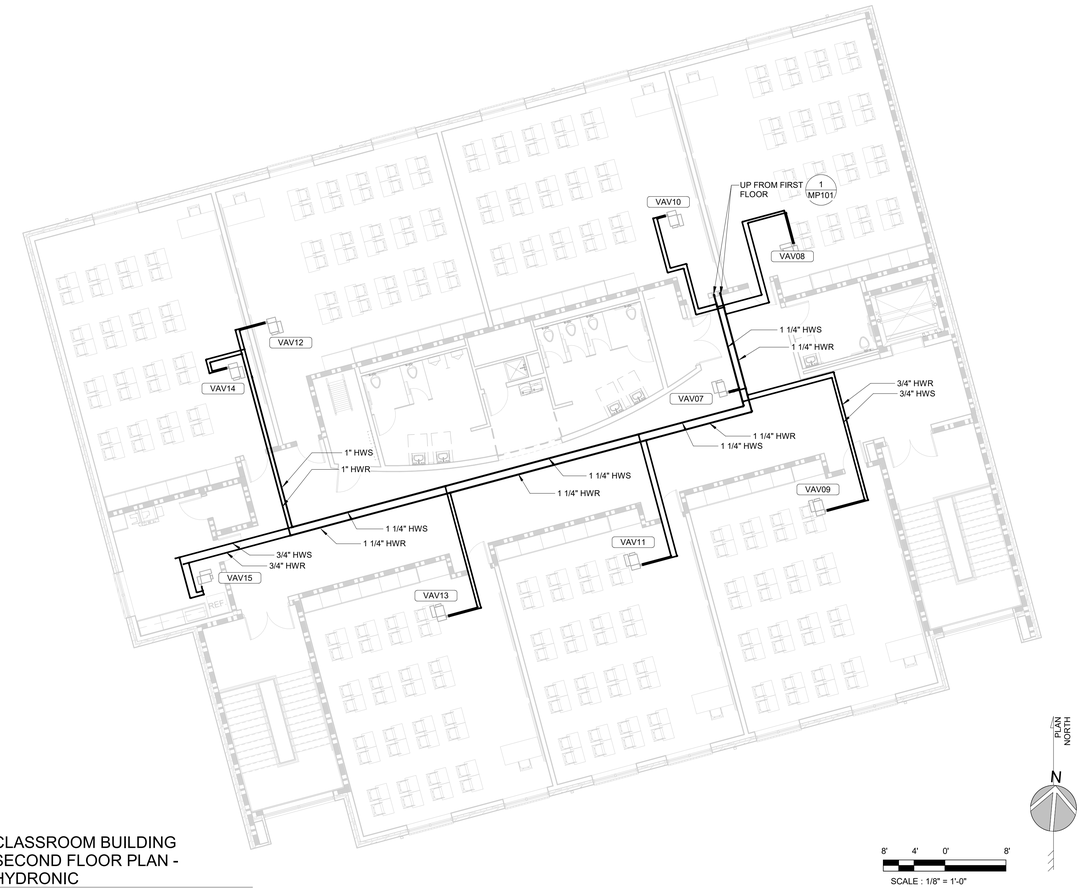
4 MP101 MECHANICAL ROOM SECTION - LOOKING SOUTH - HYDRONIC
1/2" = 1'-0"



3 MP101 MECHANICAL ROOM SECTION - LOOKING WEST - HYDRONIC
1/2" = 1'-0"



1 CLASSROOM BUILDING FIRST FLOOR PLAN - HYDRONIC
SCALE: 1/8" = 1'-0"



2 CLASSROOM BUILDING SECOND FLOOR PLAN - HYDRONIC
SCALE: 1/8" = 1'-0"

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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM ADDITION FLOOR PLANS - HYDRONIC

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: As indicated
DRAWN BY: RWC PROJ MGR: DMH

MP101

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1 CLASSROOM BUILDING FIRST FLOOR PLAN - HVAC RCP AND T-STAT LOCATION

SCALE: 1/8" = 1'-0"

2 CLASSROOM BUILDING SECOND FLOOR PLAN - HVAC RCP AND T-STAT LOCATION

SCALE: 1/8" = 1'-0"

PLAN NORTH

N

8' 4' 0' 8'

SCALE : 1/8" = 1'-0"

BECKER MORGAN GROUP

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910.341.7600

Maryland
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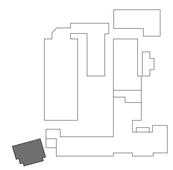
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING FLOOR PLANS - HVAC RCP AND T-STAT LOC



KEY PLAN

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DATE: 01.20.2020
SCALE: 1/8" = 1'-0"
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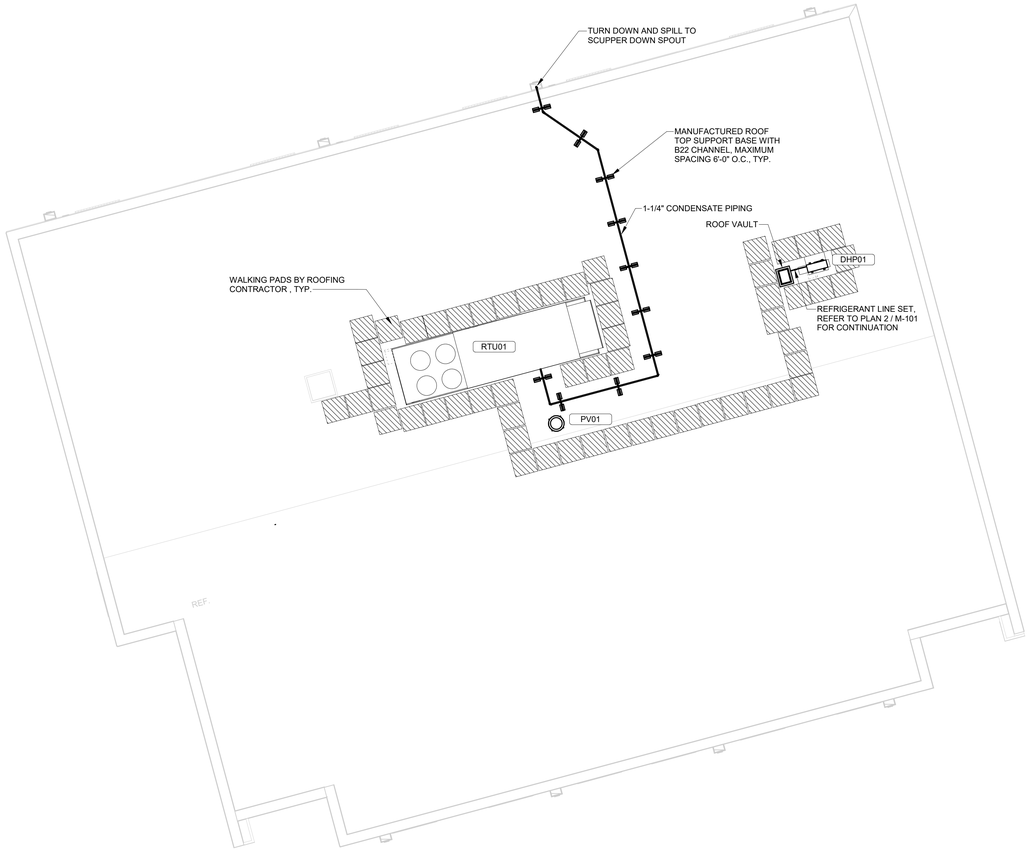
ROOF PLAN SHEET NOTES

1. MAINTAIN MANUFACTURER'S CLEARANCE REQUIREMENTS FOR INDOOR EQUIPMENT.
2. MECHANICAL CONTRACTOR TO COORDINATE WITH OTHER TRADES PRIOR TO BEGINNING WORK.
3. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY UL NUMBERS (WALLS, FLOOR / CEILINGS, ETC.
4. COORDINATED CONDENSATE PIPE ROUTING WITH GENERAL CONTRACTOR AND OWNER, TYPICAL.
5. REFER TO STRUCTURAL DRAWINGS FOR EQUIPMENT ROOF MOUNTING CONDITIONS.
6. ALL ROOF PENETRATIONS SHALL CONFORM TO ROOF MANUFACTURER'S APPROVED METHODS.
7. MAINTAIN MINIMUM 10 FOOT SEPARATION BETWEEN PV01 AND RTU01 OUTSIDE AIR INTAKE.



1 CLASSROOM BUILDING ROOF PLAN - HVAC

SCALE: 1/8" = 1'-0"

PLAN NORTH

N

8' 4' 0' 8'

SCALE : 1/8" = 1'-0"

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550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

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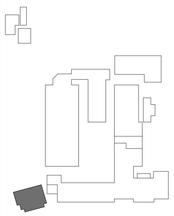
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING ROOF PLAN - HVAC



KEY PLAN

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PROJECT NO:	2019082.00
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SCALE:	1/8" = 1'-0"
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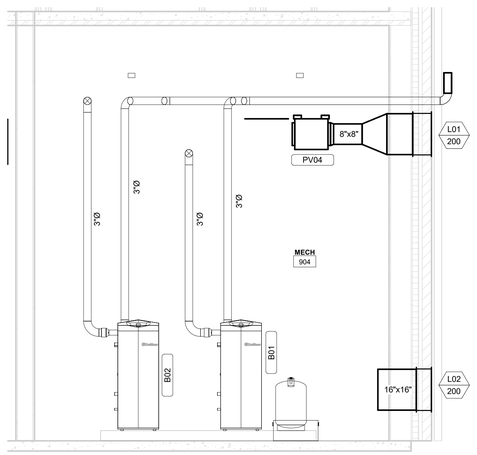
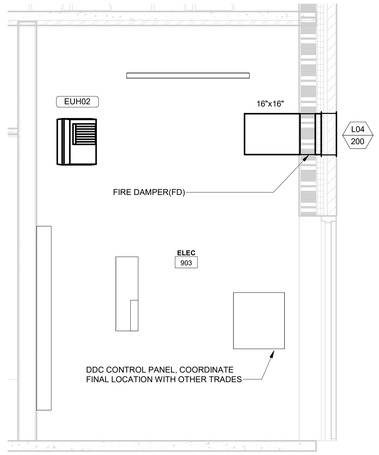


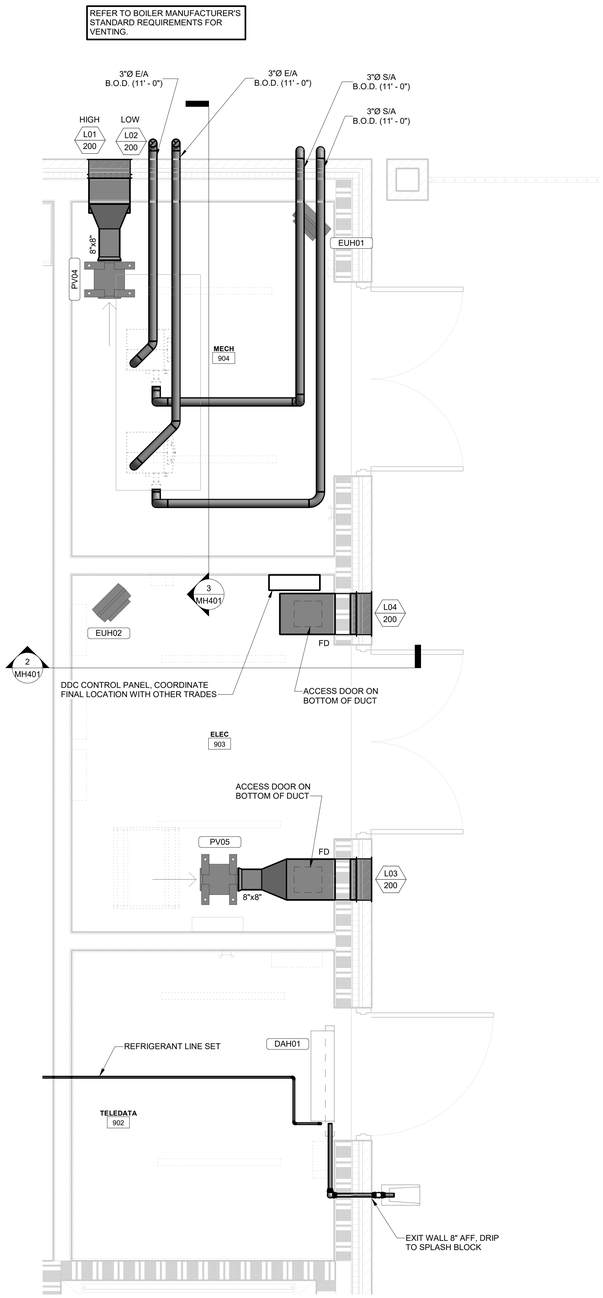
3 MECHANICAL ROOM SECTION-01

SCALE: 1/2" = 1'-0"



2 ELECTRICAL ROOM SECTION-01

SCALE: 1/2" = 1'-0"



1 ENLARGED MECHANICAL ROOMS

SCALE: 1/2" = 1'-0"

2' 1' 2'

SCALE : 1/2" = 1'-0"

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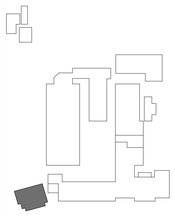
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

ENLARGED PLAN AND SECTIONS



KEY PLAN

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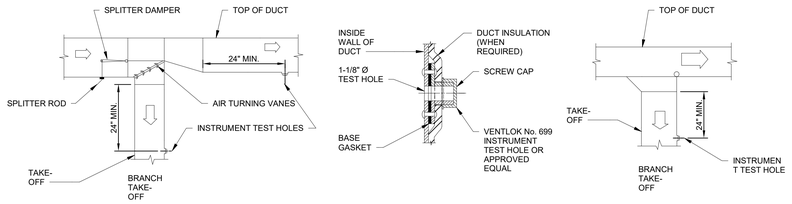
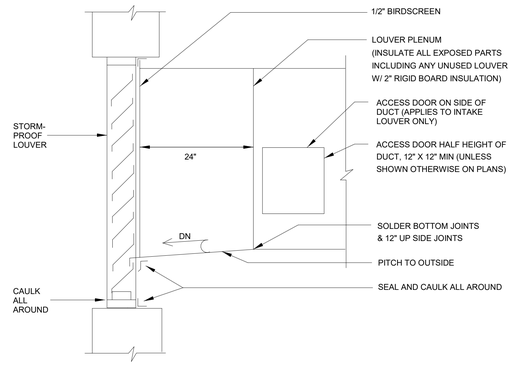
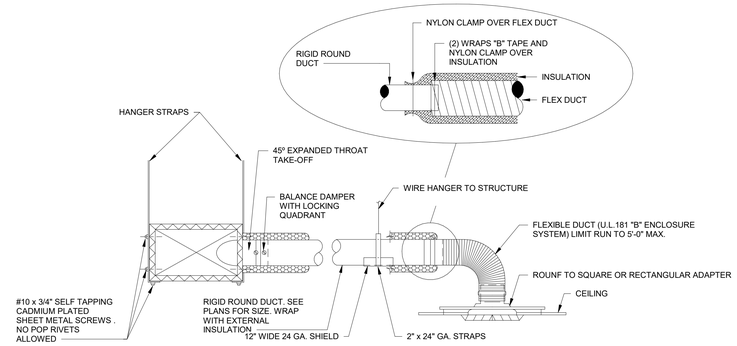


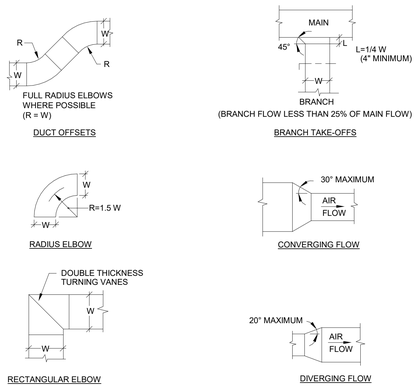
1 TYPICAL LOW PRESSURE DUCT DETAILS
NO SCALE



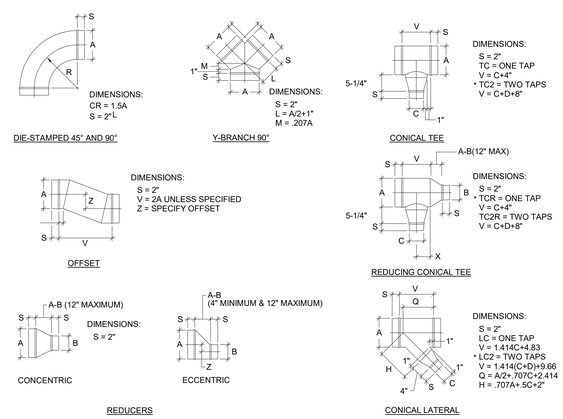
2 LOUVER PLENUM DETAIL
NO SCALE



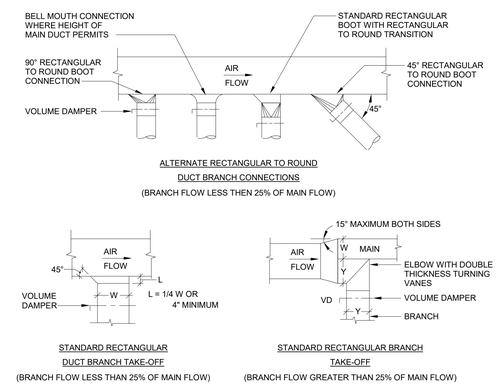
3 TYPICAL DIFFUSER CONNECTION DETAIL
NO SCALE



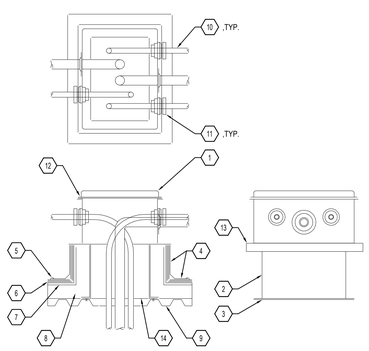
4 RECTANGULAR DUCT FITTING DETAILS
NO SCALE



5 ROUND DUCT FITTING DETAILS
NO SCALE



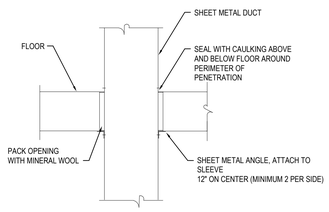
6 ROUND/RECT. DUCT TAKE-OFF FITTING DETAILS
NO SCALE



NOTE:
1. PROVIDE "PRE-FABRICATED HOUSING" MODEL AWI SERIES OR APPROVED EQUAL.
2. ANCHOR TO CURB WITH STAINLESS STEEL HARDWARE.

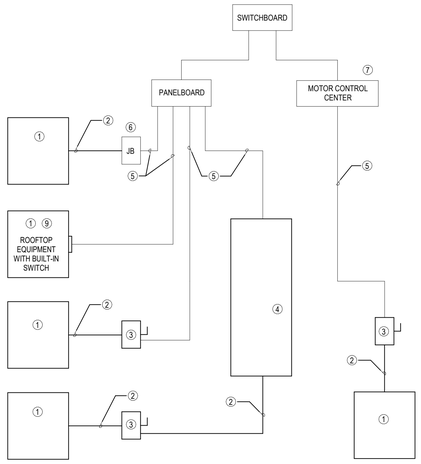
1. WIND RATED ALUMINUM COVER
2. ALUMINUM CURB 14" HIGH MIN. CURB MUST BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. CURB FLANGE, FASTEN TO ROOF DECK
3. FLASHING MEMBRANE
4. CONTINUOUS CAULK WITH RUBBERIZED ASPHALT SEALANT
5. ROOFING SYSTEM
6. RECOVERY BOARD
7. RIGID INSULATION
8. METAL ROOF DECK
9. CONDUIT, PIPE, REFRIGERANT LINE, ETC.
10. EXIT SEAL
11. VANDAL RESISTANT STAINLESS SCREWS
12. INSULATED CURB EXTENSION
13. CURB TO BE INSULATED TO MATCH R-RATING OF ROOF ASSEMBLY
14. CURB TO BE INSULATED TO MATCH R-RATING OF ROOF ASSEMBLY

7 ROOF VAULT DETAIL
NO SCALE



NOTE: EXTERNALLY WRAPPED DUCT INSTALLED SIMILARLY, BLANKET INSULATION SHALL BE INSTALLED OVER ANGLES AND SEALED TO FLOOR BARRIER.

8 TYPICAL DUCT THROUGH NON-RATED WALL
NO SCALE



MECHANICAL NOTES

1. EQUIPMENT OF TRADES OTHER THAN ELECTRICAL.
2. CONDUIT AND WIRING BY HVAC, PLUMBING CONTRACTOR OR OTHER TRADES.
3. IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC, IT SHALL BE PROVIDED AND INSTALLED BY THE EQUIPMENT CONTRACTOR.
4. A COMBINATION STARTER OR VFD SUPPLIED AND INSTALLED BY MECHANICAL CONTRACTOR. POWER AND CONDUIT FROM PANEL BOARD TO VFD BY ELECTRICAL CONTRACTOR MAY BE USED IN LIEU OF A SEPARATE DISCONNECT SWITCH AND STARTER. LOCATE ADJACENT TO EQUIPMENT.
5. FEEDER CIRCUIT WIRING AND CONDUIT IN ELECTRICAL WORK. SEE PANELBOARD SCHEDULES FOR WIRE AND BREAKER SIZES.
6. JUNCTION BOX MAY BE SHOWN ON ELECTRICAL PLANS FOR SOME EQUIPMENT. IF NO STARTER OR DISCONNECT IS SUPPLIED, A JUNCTION BOX SHALL BE INSTALLED ADJACENT TO EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE LINE SIDE WIRING TO THE JUNCTION BOX. LOAD SIDE WIRING WILL BE PROVIDED BY MECHANICAL CONTRACTOR OR OTHER TRADES.
7. PROJECTS UTILIZING AN MCC, THE STARTER CB, OR VFD IN THE MCC ARE PROVIDED BY THE ELECTRICAL CONTRACTOR.
8. IN ALL CASES THE EQUIPMENT CONTRACTOR SHALL MAKE FINAL CONNECTIONS, START UP AND TEST EQUIPMENT.
9. IF THE ROOF TOP FAN IS NOT PROVIDED WITH BUILT IN SWITCH, THE ELECTRICAL CONTRACTOR SHALL PROVIDE A DISCONNECT SWITCH.
10. IN A SINGLE PRIME CONTRACT, IT IS THE RESPONSIBILITY OF THE PRIME CONTRACTOR TO COORDINATE BETWEEN THE ELECTRICAL AND OTHER TRADES.

9 MECHANICAL EQUIPMENT CONNECTION DETAIL
NO SCALE

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550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

HVAC DETAILS

ISSUE BLOCK

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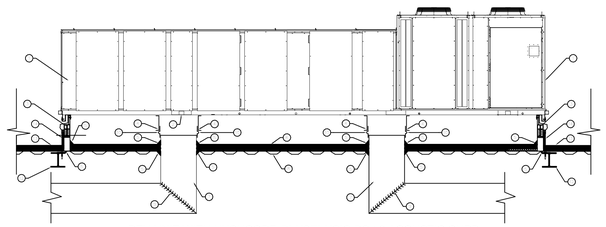


RTU UNIT WITH HUSHCORE ***PLUS™ HSIC-DS-52*** ACOUSTIC CURB

BY RTU UNIT MANUFACTURER

1. RTU-01, 02
2. SA/RA Unit Openings

BY ACOUSTICAL MANUFACTURER

3. 2" Deflection Fully Assembled Seismic HUSH CURB ™
4. Integral Curb Duct Supports
5. HUSH SEALANT™ Acoustical Caulk at all Duct Drops & Curb Perimeter
6. HUSHCORE™ DS-52 Deck System In-Curb Acoustical Treatment

BY HVAC CONTRACTOR

7. Duct Work
8. Roof Deck Flashed to within $\frac{1}{4}$" of all Duct Drops but not in contact with Duct Wall
9. Turning Vane
10. Flex Connectors
11. Submit Letter of Certification from Acoustical Supplier following Inspection

BY GENERAL CONTRACTOR

12. Building Steel
13. Built-up Roof or Concrete
14. Insulation and Cant Strip
15. Curb Slope requirements where applicable

RTU NOISE REDUCTION SYSTEM

HUSHCORE™ ***PLUS™*** System Model ***HSIC-DS-52*** shall be a seismic isolation, 2" deflection, fully adjustable and fully assembled curb system. The completely isolated top and bottom steel structural frames shall have a continuous flexible weatherseal. The system shall be capable of serving as a blocking device during installation. The springs shall have built-in limit stops to snub out wind resistance. The HUSH CURB™ shall be designed and certified as per specified wind and seismic loads by a licensed professional engineer in the state of North Carolina. The HUSH CURB™ shall be 24" high and shipped completely assembled. Factory curbs with a secondary vibration rail kit are not acceptable. The HUSH CURB™ shall have a field installed in-curb ***DS-52*** sound package for radiated noise. Materials shall meet Class "A" per ASTM E84 for flammability The multi-layer composite system shall have a nominal installed height of 8" with transmission loss ratings as listed below in accordance with ASTM-E-90-10. HUSH SEALANT™ model HSAC-100 acoustical grade caulk shall be used around all curb perimeter edges and around all curb openings as detailed above after decking is flashed to within $\frac{1}{4}$" without contacting the duct wall. Fan noise sound attenuation shall be as scheduled on the drawings or as listed in the specifications. A letter of certification shall be issued by the acoustical system supplier stating the complete system has been properly installed prior to setting the units. Products and systems shall be by BRD Noise and Vibration Control, Inc., Wind Gap, PA - (810) 863-6300, www.HUSHCORE.net

PERFORMANCE

To assure optimized aerodynamic and acoustic performance as well as proper integration and coordination of the final installation, the HUSHCORE™ System shall be supplied by the rooftop unit manufacturer as part of a turnkey package. The HUSH CURB™ shall provide minimum 85% vibration isolation efficiency. HUSHCORE™ Model ***HSIC-DS-52*** In-Curb Acoustical Treatment Performance shall be tested in accordance with procedure ASTM E-90-10. The assembly shall be rated at not less than STC-52 with 1/3 octave performance values as listed below for sound radiation through the deck inside the curb.

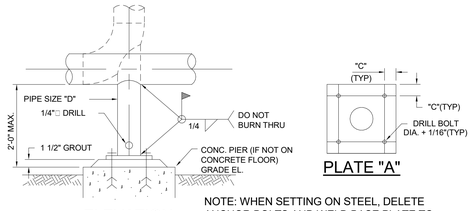
HUSHCORE™ In-Curb Composite ***DS-52*** - (Transmission Loss) in accordance with ASTM E-90-10

Freq. (Hz)	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k
Transmission Loss (dB)	34	37	51	53	55	42	41	45	50	58	53	60	62	63	64	65	67	71	74	78	80	83

APPROVED ALTERNATE MANUFACTURERS:

1. BRD NOISE AND VIBRATION CONTROL, INC.
2. VMC
3. MASON INDUSTRIES

1 TYPICAL RTU ACOUSTICAL DETAIL
NO SCALE



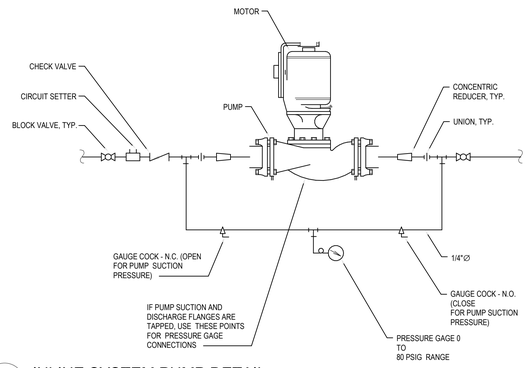
ELEVATION

PLATE "A"

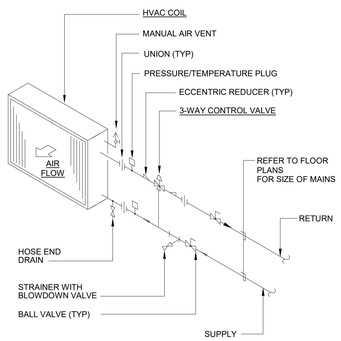
NOTE: WHEN SETTING ON STEEL, DELETE ANCHOR BOLTS AND WELD BASE PLATE TO STEEL WITH 1/4" FILLET ALL AROUND.

PIPE SIZE	STANCHION SIZE "D"	PLATE "A"	DIM "C"	ANCHOR BOLT SIZE
2"	1 1/2" SCH. 40	6"x1/2"x6"	1"	1/2"
3"-4"	2" SCH. 40	6"x5/8"x6"	1"	1/2"
6"-8"	3" SCH. 40	10"x3/4"x10"	1"	5/8"
10"-14"	4" SCH. 40	10"x3/4"x10"	1"	5/8"
16"-20"	6" SCH. 40	12"x1"x12"	1"	3/4"

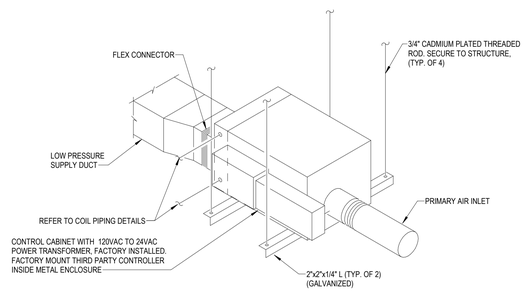
2 PIPE SUPPORT DETAIL
NO SCALE



3 INLINE SYSTEM PUMP DETAIL
NO SCALE



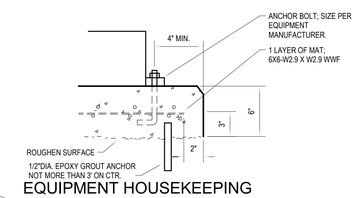
4 HVAC COIL (3-WAY VALVE) DETAIL
NO SCALE



NOTE:
MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCE AND VERIFY INSTALLATION INSTRUCTIONS FOR HANGING SO THAT ALL NECESSARY ACCESS PANELS ARE NOT OBSTRUCTED.

5 TYPICAL SINGLE DUCT TERMINAL WITH HOT WATER COIL
NO SCALE

NOTE:
1. MESH SHALL BE FURNISHED IN SHEETS.
2. ALL PAD EDGES SHALL BE CHAMFERED.
3. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3,000 PSI AT 28 DAYS
4. ONLY ANCHOR EQUIPMENT WITH MANUFACTURER SUPPLIED ANCHOR MOUNTS



6 EQUIPMENT HOUSEKEEPING PAD DETAIL
NO SCALE

BECKER MORGAN GROUP

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3333 Jaeckle Drive, Suite 120
Wilmington, NC 28403
910.341.7600

Maryland
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Dover, DE 19904
302.734.7950
Rittenhouse Station
250 South Main Street, Suite 109
Newark, DE 19711
302.369.3700
www.beckermorgan.com

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ISSUED: 04.16.20

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Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com

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FINAL DRAWING DO NOT USE FOR CONSTRUCTION

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

HVAC DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 12" = 1'-0"
DRAWN BY: GRM PROJ MGR: DMH

M502

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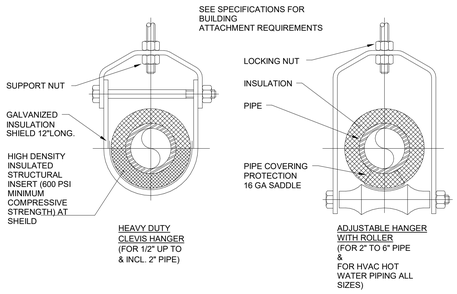


LOAD SCHEDULE		
PIPE SIZE	MAXIMUM SPACING	ROD SIZE
1/2" - 2"	8'	1/2"∅
2 1/2"	10'	5/8"∅
3"	10'	5/8"∅
4"	14'	5/8"∅
5"	14'	5/8"∅

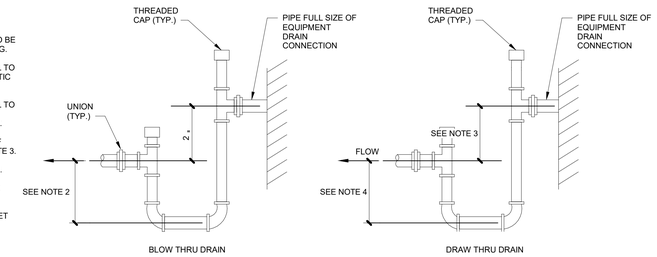
NOTES:

1. THIS DETAIL SHALL BE USED AS A GUIDE. ALL HANGERS SHALL MEET THE REQUIREMENTS OF THE SPECIFICATIONS.
2. PIPE 6" AND LARGER SHALL HAVE ROLLER SUPPORTED WITH DUAL RODS.
3. FOR CHW SERVICE OVER 3" REPLACE SADDLE WITH 12" LONG 14 GA SHIELD WITH RIGID INSULATION BETWEEN PIPE AND SHIELD.
4. WHERE TRAPEZE HANGERS ARE USED FOR HEATING HOT WATER PROVIDE ROLLERS.

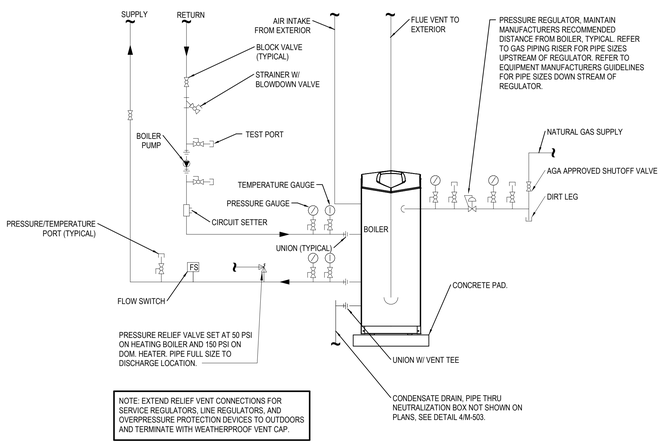
1 PIPE HANGER SUPPORT DETAIL
NO SCALE

NOTES:

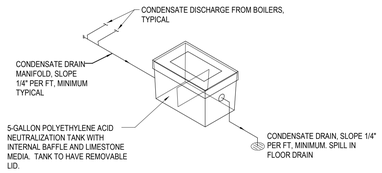
1. LOCATE TRAPS SO AS TO BE ACCESSIBLE FOR CLEANING.
2. HEIGHT SHALL BE EQUAL TO UNIT MAXIMUM TOTAL STATIC PRESSURE PLUS 1/2".
3. HEIGHT SHALL BE EQUAL TO UNIT MAXIMUM NEGATIVE STATIC PRESSURE PLUS 1".
4. HEIGHT SHALL BE 1/2" OF HEIGHT INSTALLED ON NOTE 3.
5. PIPE TO NEAREST DRAIN.
6. TRAP SHALL NOT BLOCK ACCESS TO EQUIPMENT.
7. PROVIDE UNIONS AT INLET AND OUTLET OF TRAP.



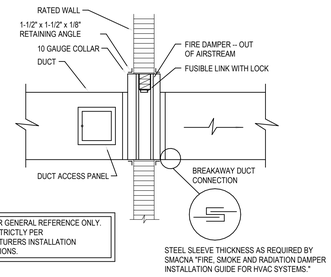
2 TYPICAL EQUIPMENT CONDENSATE DRAIN DETAIL
NO SCALE



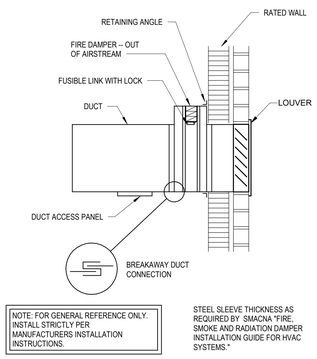
3 GAS-FIRED, FLOOR-MOUNTED HOT WATER BOILER DETAIL
NO SCALE



4 CONDENSATE NEUTRALIZATION TANK DETAIL
NO SCALE



5 FIRE DAMPER DETAIL
NO SCALE



6 FIRE DAMPER DETAIL - EXTERIOR WALL
NO SCALE

BECKER MORGAN GROUP

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3333 Jaeckle Drive, Suite 120
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250 South Main Street, Suite 109
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ISSUED: 04.16.20

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www.cbhfengineers.com

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FINAL DRAWING
DO NOT USE FOR CONSTRUCTION

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

HVAC DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 12" = 1'-0"
DRAWN BY: GRM | PROJ MGR: DMH

M503

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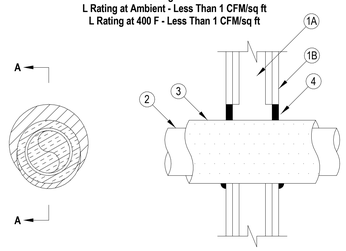
System No. W-L-5028

WL 5028

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 3/4 Hr
L Rating at Ambient - Less Than 1 CFM/sq ft
L Rating at 400 F - Less Than 1 CFM/sq ft



SECTION A-A

1. WALL ASSEMBLY — THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   A. STUDS — WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
   B. GYPSUM BOARD* — 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIAM OF OPENING IS 7-1/2 IN.
   THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.

2. THROUGH PENETRANTS — ONE METALLIC PIPE OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:

   A. STEEL PIPE — NOM 4 IN. DIAM (OR SMALLER) SCHEDULE 40 (OR HEAVIER) STEEL PIPE.
   B. COPPER TUBING — NOM 2 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   C. COPPER PIPE — NOM 2 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. TUBE INSULATION — PLASTICS+ — NOM 3/4 IN. THICK ACRYLONITRILE BUTADIENE/POLYVINYL CHLORIDE (AB/PVC) FLEXIBLE FOAM FURNISHED IN THE FORM OF TUBING. AN ANNULAR SPACE OF MIN 0 IN. (POINT CONTACT) TO MAX 1-1/2 IN. IS REQUIRED WITHIN THE FIRESTOP SYSTEM.

   SEE PLASTICS+ (QMFZ2) CATEGORY IN THE RECOGNIZED COMPONENT DIRECTORY FOR NAMES OF MANUFACTURERS. ANY RECOGNIZED COMPONENT TUBE INSULATION MATERIAL MEETING THE ABOVE SPECIFICATIONS AND HAVING A UL 94 FLAMMABILITY CLASSIFICATION OF 94-5VA MAY BE USED.
   THE HOUR T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT ON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, THE SIZE AND TYPE OF THROUGH PENETRANT AND THE PIPE COVERING THICKNESS, AS SHOWN IN THE TABLE BELOW:

Wall Assembly Hr Rating	Type +	Through Penetrant Max Diam In.
1	A	4
1	A, B, or C	2
2	A	4
2	A, B, or C	2

+INDICATES PENETRANT TYPE AS ITEMIZED IN ITEM 2.

4. FILL, VOID OR CAVITY MATERIAL* — SEALANT — MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. AT THE POINT CONTACT LOCATION BETWEEN PIPE COVERING AND GYPSUM WALLBOARD, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE COVERING/GYPSUM WALLBOARD INTERFACE ON BOTH SURFACES OF WALL.

   HILTI CONSTRUCTION CHEMICALS, DIV OF
   HILTI INC — FS-ONE SEALANT

*BEARING THE UL CLASSIFICATION MARK

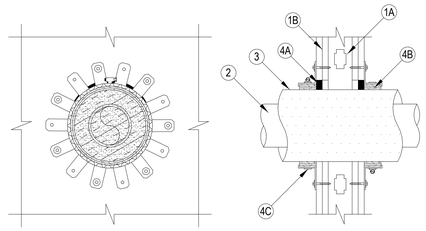
Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. February 08, 2006

System No. W-L-5225

WL 5225

F Ratings - 1 or 2 Hr (See Item 1)
T Rating - 1 or 2 Hr (See Item 1)



SECTION A-A

1. WALL ASSEMBLY - THE FIRE-RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300, U400 OR V400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
   B. GYPSUM BOARD*- THICKNESS, TYPE AND NUMBER OF LAYERS AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIAM OF OPENING IS 5 IN.
   THE HOURLY F AND T RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY ASSEMBLY RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.

2. THROUGH PENETRANTS - ONE NONMETALLIC PIPE OR CONDUIT TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL. THE FOLLOWING TYPES AND SIZES OF PIPES MAY BE USED:

   A. POLYVINYL CHLORIDE (PVC) PIPE - NOM 4 IN. DIAM (OR SMALLER) SCHEDULE 40 CELLULAR OR SOLID CORE PVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) OR VENTED (DRAIN, WASTE, OR VENT) PIPING SYSTEMS.
   B. CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - NOM 4 IN. DIAM (OR SMALLER) SDR 13.5 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.

3. PIPE COVERING* - NOM 1-1/2 IN. THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT TAPE SUPPLIED WITH THE PRODUCT. A NOM ANNULAR SPACE OF MIN 0 IN. (POINT CONTACT) TO MAX 1 IN. IS REQUIRED WITHIN THE FIRESTOP SYSTEM.
   SEE PIPE AND EQUIPMENT COVERING - MATERIALS (BRGU) CATEGORY IN THE BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

4. FIRESTOP SYSTEM: THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
   A. FILL, VOID OR CAVITY MATERIAL* - SEALANT: MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL.
      HILTI CONSTRUCTION CHEMICALS, DIV OF
      HILTI INC — FS-ONE SEALANT
   B. FILL, VOID OR CAVITY MATERIAL* - WRAP STRIP - NOM 3/16 IN. THICK BY 1-3/4 IN. WIDE INTUMESCENT WRAP STRIP. THREE LAYERS INDIVIDUALLY WRAPPED AROUND THE THROUGH-PENETRANT WITH THE ENDS BUTTED AND HELD IN PLACE WITH TAPE. BUTTED ENDS IN SUCCESSIVE LAYERS SHALL BE OFFSET. EACH WRAP STRIP LAYER IS TO BE INSTALLED FLUSH WITH BOTH SURFACES OF WALL. WRAP STRIPS ARE INSTALLED ON EACH SURFACE OF THE WALL.
      HILTI CONSTRUCTION CHEMICALS, DIV OF
      HILTI INC - CP-648E WRAP STRIP
   C. STEEL COLLAR - STEEL COLLAR FABRICATED FROM COILS OF PRECUT MIN 0.016 IN. THICK (NO. 28 GAUGE) GALV STEEL AVAILABLE FROM FILL MATERIAL MANUFACTURER. COLLAR SHALL BE NOM 1-3/4 IN. DEEP WITH 1 IN. WIDE BY 2 IN. LONG ANCHOR TABS ON 1-3/4 IN. CENTERS FOR SECUREMENT TO BOTH SURFACES OF WALL. IN ADDITION, COLLARS CONTAIN RETAINER TABS 1/2 IN. WIDE BY 3/16 IN. LONG, LOCATED OPPOSITE THE ANCHOR TABS. COLLAR SHALL BE TIGHTLY WRAPPED OVER THE WRAP STRIP, OVERLAPPING MIN 1 IN. AT SEAM AND COMPRESSED WITH A MIN 0.028 IN. THICK STAINLESS STEEL BAND AT COLLAR MID-HEIGHT. THE RETAINER TABS ARE FOLDED 90 DEG TOWARDS THE PIPE TO MAINTAIN THE ANNULAR SPACE AROUND THE PIPE AND TO RETAIN THE WRAP STRIP. EACH TAB OF COLLAR SECURED TO SURFACE OF WALL BY MEANS OF NOM 1-1/4 IN. LONG STEEL LAMINATING DRYWALL SCREWS IN CONJUNCTION WITH 1-1/4 IN. DIAM STEEL FENDER WASHERS.

*BEARING THE UL CLASSIFICATION MARK

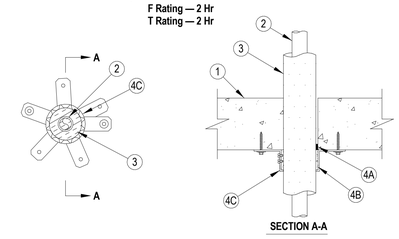
Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. September 14, 2004

System No. C-AJ-5320

CAJ 5320

F Rating — 2 Hr
T Rating — 2 Hr



SECTION A-A

1. FLOOR OR WALL ASSEMBLY — MIN 4-1/2 IN. (114 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600 - 2400 KG/M3) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 3 IN (76 MM).
   SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
2. THROUGH-PENETRANT — ONE NONMETALLIC PIPE OR CONDUIT INSTALLED CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. PIPE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF NONMETALIC PIPES MAY BE USED:
   A. POLYVINYL CHLORIDE (PVC) PIPE — NOM 1 IN. (25 MM) DIAM (OR SMALLER) SCHEDULE 40 CELLULAR OR SOLID CORE PVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) OR VENTED (DRAIN, WASTE OR VENT) PIPING SYSTEM.
3. PIPE INSULATION — NOM 3/4 IN. THICK ACRYLONITRILE BUTADIENE/POLYVINYL CHLORIDE (AB/PVC) FLEXIBLE FOAM FURNISHED IN THE FORM OF TUBING WITH SKIN. ANNULAR SPACE BETWEEN PIPE INSULATION AND PERIPHERY OF OPENING TO BE MIN 0 IN. (POINT CONTACT) AND MAX 3/16 IN. (4.8 MM).
   SEE PLASTICS (QMFZ2) CATEGORY IN THE RECOGNIZED COMPONENT DIRECTORY FOR NAMES OF MANUFACTURERS. ANY RECOGNIZED COMPONENT TUBE INSULATION MATERIAL MEETING THE ABOVE SPECIFICATIONS AND HAVING A UL94 FLAMMABILITY CLASSIFICATION OF 94-5VA MAY BE USED.
4. FIRESTOP SYSTEM — THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
   A. FILL, VOID OR CAVITY MATERIAL - SEALANT* — MIN 1/2 IN. (13 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH BOTTOM SURFACE OF FLOOR OR BOTH SURFACES OF WALL.
      HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE SEALANT
   B. FILL, VOID OR CAVITY MATERIAL* — WRAP STRIP — NOM 3/16 IN. (4.8 MM) THICK BY 1-3/4 IN. (44 MM) WIDE INTUMESCENT WRAP STRIP. THE WRAP STRIP IS CONTINUOUSLY WRAPPED AROUND THE OUTER CIRCUMFERENCE OF THE PIPE COVERING ONE TIME WITH ENDS BUTTED END TO END AND HELD IN PLACE WITH TAPE. THE BOTTOM EDGE OF THE WRAP STRIP SHALL BE BUTTED TIGHTLY AGAINST THE BOTTOM SURFACE OF THE CONCRETE FLOOR. IN WALLS, THE WRAP SHALL BE INSTALLED ON BOTH SURFACES OF THE WALL SUCH THAT THE WRAP STRIP IS BUTTED TIGHTLY AGAINST THE SURFACE ON EACH SIDE OF THE WALL.
      HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E WRAP STRIP
   C. STEEL COLLAR — STEEL COLLAR FABRICATED FROM COILS OF PRECUT MIN 0.016 IN. (0.41 MM) THICK (NO. 28 GAUGE) GALV STEEL AVAILABLE FROM FILL MATERIAL MANUFACTURER. COLLAR SHALL BE NOM 1-3/4 IN. (44 MM) DEEP WITH 1 IN. (25 MM) WIDE BY 2 IN. (51 MM) LONG ANCHOR TABS ON 1-3/4 IN. (44 MM) CENTERS FOR SECUREMENT TO BOTTOM OF FLOOR OR BOTH SURFACES OF WALL. THE OPPOSITE SIDE INCORPORATES RETAINER TABS. 1/2 IN. (13 MM) WIDE BY 3/16 IN. (4.8 MM) LONG, PRE-BENT TOWARD THE PIPE SURFACE. COLLAR SHALL BE TIGHTLY WRAPPED OVER THE WRAP STRIP, OVERLAPPING MIN 1 IN. (25 MM) AT SEAM AND HELD TOGETHER BY TWO #10 BY 3/16 IN. (4.8 MM) OR 1/4 IN. (6 MM) LONG SHEET METAL SCREWS INSTALLED AT THE CENTER OF THE 1 IN. (25 MM) OVERLAP. OPTIONAL SECUREMENT OF THE COLLAR MAY BE ACCOMPLISHED WITH A NOM 1/2 IN. (13 MM) WIDE STAINLESS STEEL HOSE CLAMP SECURED TO THE COLLAR AT ITS MID-HEIGHT (NOT SHOWN). MIN TWO ANCHOR TABS SECURED TO BOTTOM OF FLOOR OR BOTH SURFACES OF WALL WITH 3/16 IN. (4.8 MM) BY 1-1/4 IN. (32 MM) LONG STEEL CONCRETE SCREWS (OR EQUIVALENT) SPACED SYMMETRICALLY.

*BEARING THE UL CLASSIFICATION MARK

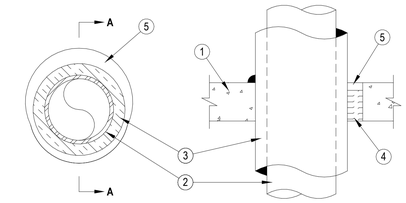
Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. July 25, 2008

System No. C-AJ-5198

CAJ 5198

F Rating — 2 Hr
T Ratings — 0 and 1/2 Hr (See Item 3)



SECTION A-A

1. FLOOR OR WALL ASSEMBLY — MIN 2-1/2 IN. (64 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M3) CONCRETE OR 3 IN. (76 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE WALL. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 7 IN. (178 MM).
   SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
2. THROUGH PENETRANTS — ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED WITHIN THE FIRESTOP DEVICE. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES OF PIPE, CONDUIT OR TUBING MAY BE USED:
   STEEL PIPE —NOM 4 IN. (102 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   COOPER TUBING —NOM 4 IN. (102 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   COPPER PIPE —NOM 4 IN. (102 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
3. TUBE INSULATION —PLASTICS+ — MIN 1/2 IN. (13 MM) TO MAX 3/4 IN. (19 MM) THICK ACRYLONITRILE BUTADIENE/POLYVINYL CHLORIDE (AB/PVC) FLEXIBLE FOAM FURNISHED IN THE FORM OF TUBING. THE ANNULAR SPACE SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1-3/8 IN. (35 MM). WHEN THICKNESS OF TUBE INSULATION IS LESS THAN 3/4 IN. (19 MM), THE T RATING FOR THE FIRESTOP SYSTEM IS 0 HR.
   SEE PLASTICS+ (QMFZ2) CATEGORY IN THE PLASTICS RECOGNIZED COMPONENT DIRECTORY FOR NAMES OF MANUFACTURERS. ANY RECOGNIZED COMPONENT TUBE INSULATION MATERIAL MEETING THE ABOVE SPECIFICATIONS AND HAVING A UL94 FLAMMABILITY CLASSIFICATION OF 94-5VA MAY BE USED.
4. PACKING MATERIAL — MIN 2 IN. (51 MM) THICKNESS OF MIN 4 PCF (64 KG/M3) MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
5. FILL, VOID OR CAVITY MATERIAL*—SEALANT — MIN 1/2 IN. (13 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH THE TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL. AT POINT CONTACT, A MIN 1/2 IN. (13 MM) BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE/INSULATED PIPE INTERFACE ON TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE SEALANT

*BEARING THE UL CLASSIFICATION MARK

Hilti Firestop Systems

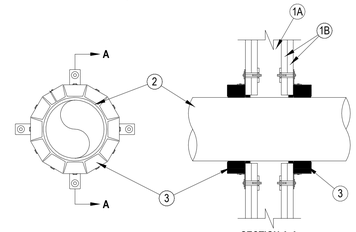
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. February 18, 2008

System No. W-L-2078

WL 2078

Classified by Underwriters Laboratories, Inc. to UL 1479

F Ratings — 1 and 2 Hr (See Item 1)
T Ratings — 0, 1 and 2 Hr (See Items 2 and 3)
L Rating At Ambient — 3 CFM/sq ft
L Rating At 400 F — Less Than 1 CFM/sq ft



SECTION A-A

1. Wall Assembly — The fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL fire Resistance Directory and shall include the construction features noted below:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, as specified in the individual Wall and Partition Design. Max diam of opening is 11-1/2 in. (292 mm).
   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through-Penetrants — One nonmetallic pipe, conduit or tubing to be installed within the firestop system. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 1/2 in. (13 mm). Pipe or conduit to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 10 in. (254 mm) diam (or smaller) Schedule 40 solid-core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 10 in. (254 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 solid-core or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems
   D. Flame Retardant Polypropylene (FRPP) Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   E. Polyvinylidene Fluoride (PVDF) Pipe — Nom 4 in. (102 mm) diam (or smaller) PVDF pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   When max 6 in. diam pipe is used, T Rating is equal to the hourly fire rating of the wall. When nom 8 in. or 10 in. (203 or 254 mm) diam pipe is used, T Rating is 0 hr.
3. Firestop Device* — Firestop Collar — Firestop collar shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to both sides of the wall using the anchor hooks provided with the collar. (Minimum two anchor hooks for 1-1/2 and 2 in. (38 and 51 mm) diam pipes, three anchor hooks for 3 and 4 in. (76 and 102 mm) diam pipes, four anchor hooks for 6 in. (152 mm) diam pipes, ten anchor hooks for 8 in. (203 mm) diam pipes and twelve anchor hooks for 10 in. (254 mm) diam pipes. The anchor hooks are to be secured to the surface of wall with 3/16 in. (4.8 mm) diam by 2-1/2 in. (64 mm) long steel toggle bolts along with washers. As an alternate for pipe sizes of nom 4 in. diam or less, min No. 10 by 1-1/2 in. (254 by 38 mm) long drywall or laminate screws with min 3/4 in. (19 mm) steel washers may be used. When the drywall or laminate screw is used, T Rating shall not exceed 1 hr.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N, CP 643 110/4"N, CP 643 160/6"N, CP 644 200/8" andCP 644 250/10" Firestop Collars
4. Fill, Void or Cavity Material* — Sealant - (Not Shown) — Min 1/2 in. (13 mm) thickness of sealant applied within the annular space for nom 8 in. and 10 in. (203 and 254 mm) diam pipes, flush with each side of wall. Sealant in annular space is optional for max 6 in. (152 mm) diam pipes. A min 1/4 in. (6 mm) thickness of sealant is required within the annular space, flush with each side of wall, to attain the L Ratings for max 6 in. (152 mm) diam pipes.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant or FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Hilti Firestop Systems

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FOR BIDDING

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ISSUED: 04.16.20

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FINAL DRAWING
DO NOT USE FOR CONSTRUCTION

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

HVAC UL DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 12" = 1'-0"
DRAWN BY: GRM | PROJ MGR: DMH

M504

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ROOF TOP UNIT SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	ALTERNATE APPROVED MANUFACTURERS	BASIS OF DESIGN MODEL	SYSTEM TYPE	SUPPLY AIR FANS (2@5000CFM, 5.0HP)						RELIEF AIR FANS (2@5000CFM, 6.0HP)				SUPPLY AIR REFRIGERANT COIL						SUPPLY AIR GAS FURNACE							EFFICIENCY		ELECTRICAL			WEIGHT	NOTES	ACCESSORIES
					TOTAL AIRFLOW	OUTSIDE AIRFLOW	ESP	TSP	MOTOR	SUPPLY FAN QTY	AIRFLOW	ESP	MOTOR	RELIEF FAN QTY	NET TOTAL	NET SENSIBLE	EAT(db)	EAT(wb)	LAT(db)	LAT(wb)	AGA INPUT (MBH) INPUT MAX	INPUT MIN	AGA OUTPUT MAXIMUM (MBH)	GAS CONNECTION	INLET GAS PRESSURE	FUEL TYPE	EAT(db)	LAT(db)	EER	IEER	POWER SUPPLY (V/PH/HZ)	MCA	MOCP			
RTU01	TRANE	DIAKIN, YORK	RF05024E	AIR CONDITIONER	10000 CFM	3300 CFM	2.00 in-wg	3.90 in-wg	10.00 hp	2	10000 CFM	1.00 in-wg	12.00 hp	2	532130 Btu/h	318000 Btu/h	80.2 °F	67.8 °F	52.0 °F	50.4 °F	350	35	283.5	1"	0.9 ft H2O	PROPANE	43.4 °F	71.1 °F	10.7	16.4	460/60/3	130.5 A	150.0 A	8950 lb	1,2,3	A THRU R

NOTES:
1. REFER TO DIVISION SPECIFICATION SECTION 237416.13 - PACKAGED, LARGE-CAPACITY, ROOFTOP AIR-CONDITIONING UNITS FOR ADDITIONAL INFORMATION.
2. AMBIENT DESIGN TEMPERATURE: 95F DB.
3. OUTSIDE AIRFLOW SHALL REMAIN CONSTANT AS SCHEDULED DURING OCCUPIED SCHEDULE.

ACCESSORIES:
A. DOUBLE WALLED CONSTRUCTION WITH HINGED ACCESS DOORS.
B. PLEATED MEDIA TYPE, 2 INCH THICKNESS, MERV 8.
C. DOUBLE INLET, FORWARD CURVED SUPPLY FANS WITH 2 INCH DEFLECTION SPRING ISOLATION.
D. INTERNAL SHAFT GROUNDING RING.
E. EXTENDED GREASE LINES.
F. DOUBLE SLOPING STAINLESS STEEL DRAIN PAN.
G. VARIABLE SPEED COMPRESSORS CAPABLE OF SPEED MODULATION FROM 25 HZ TO A MAXIMIM OF 100 HZ.
H. 100 PERCENT MODULATING RETURN FAN WITH CONTROL SYSTEM TO MODULATE DISCHARGE DAMPERS TO CONTROL BUILDING PRESSURE.
I. 0-100 PERCENT MODULATING COMPARITIVE ENTHALPY ECONOMIZER.
J. FACTORY MOUNTED AIRFLOW MEASUREMENT STATION TO MAINTAIN CONSTANT OUTSIDE AIR.
K. LOW LEAK ECONOMIZER DAMPERS HAVING A LEAKAGE RATE OF 1% AT 1.0 IN WC PRESSURE DIFFERENTIAL.
L. FACTORY DDC MICROPROCESSOR CONTROLS.
M. FACTORY BUILDING MANAGEMENT SYSTEM CONTROL INTERFACE.
N. WIND RATED ROOF CURB WITH PE STAMPED CALCULATIONS AND 2" SPRING ISOLATION.
O. CORROSION COATED CONDENSER AND EVAPORATOR COIL TO MEET ASTM B117 6000 HOUR SALT SPRAY TEST.
P. PROVIDE 5 YEAR PARTS AND LABOR WARRANTY BY EQUIPMENT MANUFACTURER.
Q. ULTRA MODULATING GAS HEAT WITH 10:1 TURNDOWN.
R. PROVIDE SINGLE POINT POWER CONNECTION.

VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE

DRAWING CODE	MANUFACTURER	MODEL NO.	ALTERNATE APPROVED MANUFACTURERS	TYPE	PRIMARY AIRFLOW		HEATING COIL											NOISE CRITERIA		UNIT DIMENSIONS		UNIT WEIGHT	NOTES	ACCESSORIES
					MAX	MIN	CAP	AIRSIDE					WATERSIDE					DISCHARGE	RADIATED	TOP MOUNT HEIGHT	AFF ELEVATION			
								DESIGN FLOW	EAT(db)	LAT(db)	PD	ROWS	FLOW	EWT	LWT	PD								
VAV01	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	330 CFM	115 CFM	5280 Btu/h	115 CFM	53.0 °F	95.6 °F	0.29 in-wg	2	1.00 GPM	130 °F	109 °F	0.2 ft H2O		32	29	12' - 0"	12' - 0"	43 lb	1,2	A,B,C,D
VAV02	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	635 CFM	200 CFM	9598 Btu/h	200 CFM	53.0 °F	97.5 °F	0.53 in-wg	3	1.20 GPM	130 °F	112 °F	0.1 ft H2O		27	25	12' - 0"	12' - 0"	51 lb	1,2	A,B,C,D
VAV03	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	730 CFM	440 CFM	19767 Btu/h	440 CFM	53.0 °F	94.7 °F	0.33 in-wg	3	1.60 GPM	130 °F	103 °F	0.5 ft H2O		22	25	12' - 0"	12' - 0"	62 lb	1,2	A,B,C,D
VAV04	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	730 CFM	440 CFM	19767 Btu/h	440 CFM	53.0 °F	94.7 °F	0.33 in-wg	3	1.60 GPM	130 °F	103 °F	0.5 ft H2O		22	25	12' - 0"	12' - 0"	62 lb	1,2	A,B,C,D
VAV05	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	730 CFM	440 CFM	19767 Btu/h	440 CFM	53.0 °F	94.7 °F	0.33 in-wg	3	1.60 GPM	130 °F	103 °F	0.5 ft H2O		22	25	12' - 0"	12' - 0"	62 lb	1,2	A,B,C,D
VAV06	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	690 CFM	550 CFM	21844 Btu/h	550 CFM	53.0 °F	89.8 °F	0.30 in-wg	3	1.60 GPM	130 °F	101 °F	0.5 ft H2O		21	25	12' - 0"	12' - 0"	51 lb	1,2	A,B,C,D
VAV07	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	585 CFM	175 CFM	7086 Btu/h	175 CFM	53.0 °F	90.6 °F	0.46 in-wg	3	1.00 GPM	130 °F	101 °F	0.0 ft H2O		26	24	12' - 0"	12' - 0"	51 lb	1,2	A,B,C,D
VAV08	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	760 CFM	455 CFM	20083 Btu/h	455 CFM	53.0 °F	93.9 °F	0.35 in-wg	3	1.60 GPM	130 °F	103 °F	0.5 ft H2O		22	25	12' - 0"	12' - 0"	62 lb	1,2	A,B,C,D
VAV09	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	795 CFM	475 CFM	20489 Btu/h	475 CFM	53.0 °F	93.0 °F	0.38 in-wg	3	1.60 GPM	130 °F	102 °F	0.5 ft H2O		22	25	12' - 0"	12' - 0"	62 lb	1,2	A,B,C,D
VAV10	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	765 CFM	460 CFM	20189 Btu/h	460 CFM	53.0 °F	93.7 °F	0.35 in-wg	3	1.60 GPM	130 °F	103 °F	0.5 ft H2O		22	25	12' - 0"	12' - 0"	62 lb	1,2	A,B,C,D
VAV11	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	810 CFM	485 CFM	20685 Btu/h	485 CFM	53.0 °F	92.6 °F	0.39 in-wg	3	1.60 GPM	130 °F	102 °F	0.5 ft H2O		22	25	12' - 0"	12' - 0"	62 lb	1,2	A,B,C,D
VAV12	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	760 CFM	455 CFM	20083 Btu/h	455 CFM	53.0 °F	93.9 °F	0.35 in-wg	3	1.60 GPM	130 °F	103 °F	0.5 ft H2O		22	25	12' - 0"	12' - 0"	62 lb	1,2	A,B,C,D
VAV13	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	795 CFM	480 CFM	20586 Btu/h	480 CFM	53.0 °F	92.8 °F	0.38 in-wg	3	1.60 GPM	130 °F	102 °F	0.5 ft H2O		22	25	12' - 0"	12' - 0"	62 lb	1,2	A,B,C,D
VAV14	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	805 CFM	485 CFM	20685 Btu/h	485 CFM	53.0 °F	92.6 °F	0.38 in-wg	3	1.60 GPM	130 °F	102 °F	0.5 ft H2O		22	25	12' - 0"	12' - 0"	62 lb	1,2	A,B,C,D
VAV15	TRANE	VCWF	TITUS, KRUEGER	SINGLE DUCT	290 CFM	90 CFM	4616 Btu/h	90 CFM	53.0 °F	100.6 °F	0.16 in-wg	2	1.00 GPM	130 °F	111 °F	0.2 ft H2O		37	25	12' - 0"	12' - 0"	43 lb	1,2	A,B,C,D

NOTES:
1. REFER TO DIVISION 23 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. COIL CONNECTION AND CONTROL ENCLOSURE SHALL BE ON SAME SIDE OF THE UNIT. MAINTENANCE ACCESS SHALL BE FROM BOTTOM.

ACCESSORIES:
A. PROVIDE 120 VAC TO 24 VAC CONTROL POWER TRANSFORMER, FACTORY INSTALLED BY VAV MANUFACTURER.
B. FACTORY MOUNT THIRD PARTY CONTROLLER INSIDE A METAL ENCLOSURE.
C. CASING REQUIREMENTS SHALL BE 1" DOUBLE WALL WITH R-3.8 INSULATION VALUE.
D. CONNECT VAV BOX TO ELECTRICAL CONTRACTOR PROVIDED/INSTALLED OCCUPANCY SENSOR WITH SPARE SET OF DRY CONTACTS TO OPERATE VAV BOX IN STAND-BY MODE PER SEQUENCE OF OPERATIONS.

LOUVER SCHEDULE

DRAWING CODE	MANUFACTURER	MODEL	ALTERNATE APPROVED MANUFACTURERS	TYPE	FRAME	DESCRIPTION	MATERIAL	LOUVER DEPTH (IN)	SIZE (W x H)	SERVICE TYPE	Air Flow	PERFORMANCE RATINGS			NOTES	ACCESSORIES
												FREE AREA (SF)	S.P. LOSS (IN.H20)	WATER PENETRATION (OZ/SF)		
L01	RUSKIN	ELF6375DXH	VENT PRODUCTS, POTTORF	FIXED	EXTERIOR FLANGE	HORIZONTAL, DRAINABLE-BLADE	ALUMINUM	6	16"x16"	E/A_General Exhaust Air	200 CFM	0.77	.01	-	1,2,3	A,B
L02	RUSKIN	ELF6375DXH				HORIZONTAL, DRAINABLE-BLADE			16"x16"	S/A_Outside Air	200 CFM					
L03	RUSKIN	ELF6375DXH	VENT PRODUCTS, POTTORF	FIXED	EXTERIOR FLANGE	HORIZONTAL, DRAINABLE-BLADE	ALUMINUM	6	16"x16"	E/A_General Exhaust Air	200 CFM	0.77	.01	-	1,2,3	A,B
L04	RUSKIN	ELF6375DXH	VENT PRODUCTS, POTTORF	FIXED	EXTERIOR FLANGE	HORIZONTAL, DRAINABLE-BLADE	ALUMINUM	6	16"x16"	S/A_Outside Air	200 CFM	0.77	.01	-	1,2,3	A,B
L05	RUSKIN	ELF6375DXH	VENT PRODUCTS, POTTORF	FIXED	EXTERIOR FLANGE	HORIZONTAL, DRAINABLE-BLADE	ALUMINUM	6	48"x16"	E/A_General Exhaust Air	2000 CFM	3.28	.05	-	1,2,3	A,B

NOTES:
1. REFER TO DIVISION 23 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. FINISH AS SELECTED BY ARCHITECT FROM MANUFACTURERS FULL RANGE OF COLOR AND GLOSS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION.

ACCESSORIES:
A. BIRD SCREENING (MATERIAL TO MATCH LOUVER MATERIAL).
B. GRAVITY DAMPER, SEA-COAST CONSTRUCTION.

POWER VENTILATOR SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NO.	ALTERNATE APPROVED MANUFACTURERS	FAN TYPE	SERVICE	CAPACITIES				ELECTRICAL							SONES	WEIGHT	NOTES	ACCESSORIES
						AIRFLOW	ESP	DRIVE TYPE	FAN RPM	MOTOR TYPE (ECM)	MOTOR SIZE (HP)	VOLT	PH	FREQUENCY	FLA	MOCP				
PV01	GREENHECK	G-123-VG	TWIN CITY, PENNBARRY	CENTRIFUGAL ROOF VENTILATORS	EXHAUST	1500 CFM	0.50 in-wg	DIRECT	1461	Yes	0.500 hp	115 V	1	60 Hz	6.4 A	15.0 A	12.9	50 lb	1	B,E,F,G,H
PV02	GREENHECK	SP-A50-90-VG	TWIN CITY, PENNBARRY	CEILING-MOUNTED VENTILATORS	EXHAUST	70 CFM	0.25 in-wg	DIRECT	838	Yes	0.008 hp	115 V	1	60 Hz	0.3 A	15.0 A	0.9	15 lb	1	B,E
PV03	GREENHECK	SQ-130-VG	TWIN CITY, PENNBARRY	IN-LINE CENTRIFUGAL VENTILATORS	EXHAUST	2000 CFM	0.38 in-wg	DIRECT	1611	Yes	0.750 hp	115 V	1	60 Hz	13.8 A	20.0 A	14.4	70 lb	1	B,C,I
PV04	GREENHECK	SQ-70-VG	TWIN CITY, PENNBARRY	IN-LINE CENTRIFUGAL VENTILATORS	EXHAUST	200 CFM	0.25 in-wg	DIRECT	1585	Yes	0.338 hp	115 V	1	60 Hz	2.1 A	15.0 A	5	45 lb	1	A,B,C,D
PV05	GREENHECK	SQ-70-VG	TWIN CITY, PENNBARRY	IN-LINE CENTRIFUGAL VENTILATORS	EXHAUST	200 CFM	0.25 in-wg	DIRECT	1585	Yes	0.338 hp	115 V	1	60 Hz	2.1 A	15.0 A	5	45 lb	1	A,B,C,D

NOTES:
1. REFER TO DIVISION 23 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

ACCESSORIES:
A. SAFETY GUARD ON INLET.
B. GRAVITY DAMPER.
C. ISOLATORS AND BRACKETS.
D. ON/OFF/AUTO SWITCH LOCATED PER PLANS.
E. FAN TO RUN ON OCCUPIED SCHEDULE. REFER TO CONTROL SEQUENCES FOR ADDITIONAL INFORMATION.
F. ROOF CURB.
G. BIRD SCREEN.
H. HIGH WIND RATING.
I. FAN TO RUN FROM SWITCH LOCATED PER ELECTRICAL PLANS.

ELECTRIC UNIT HEATER SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALTERNATE APPROVED MANUFACTURERS	DESCRIPTION			ELECTRIC COIL	SUPPLY AIR		FAN MOTOR		ELECTRICAL					UNIT WEIGHT	RECOMMENDED MOUNTING HEIGHT	NOTES	ACCESSORIES
				TYPE	FAN	DISCHARGE	CAPACITY	STEPS	DESIGN	THROW	SPEED (RPM)	MOTOR (HP)	VOLT	PH	FLA	MCA	MOCP				
EUH01	MARKEL	F1F5103N	QMARK, INDEECO	UNIT HEATER	PROPELLER	HORIZONTAL	3 kW	1	400 CFM	12	-	-	208 V	1	15.9 A	19.8 A	20.0 A	25 lb	9' - 0"	1	A,B
EUH02	MARKEL	F1F5103N	QMARK, INDEECO	UNIT HEATER	PROPELLER	HORIZONTAL	3 kW	1	400 CFM	12	-	-	208 V	1	15.9 A	19.8 A	20.0 A	25 lb	9' - 0"	1	A,B

NOTES:
1. REFER TO DIVISION 23 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

ACCESSORIES:
A. FACTORY INSTALLED THERMOSTAT.
B. MOUNTING HARDWARE FOR WALL MOUNT APPLICATION.

BECKER MORGAN GROUP

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ISSUED: 04.16.20

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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

MECHANICAL SCHEDULES

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE:
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M601

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VENTILATION SCHEDULE

1. SUMMARY - RTU01

VENTILATION SIZING METHOD	ASHRAE STD 62.1-2016
DESIGN CONDITION	MINIMUM FLOW (HEATING)
OCCUPANT DIVERSITY (D)	1.000 UNCORRECTED OUTDOOR AIR INTAKE (VOU) 2595 CFM
SYSTEM VENTILATION EFFICIENCY (EV)	0.790
OUTDOOR AIR INTAKE	3287 CFM

2. SPACE VENTILATION ANALYSIS

ZONE NAME / SPACE NAME	MULT.	MINIMUM SUPPLY AIR (CFM) (Vpz)	SPACE FLOOR AREA (FT²) (Az)	AREA OUTDOOR AIR RATE (CFM/FT²) (Ra)	TIME AVERAGED OCCUPANCY (OCCUPANTS) (Pz)	PEOPLE OUTDOOR AIR RATE... (Rp)	AIR DISTRIBUTION EFFECTIVENESS (Ez)	SPACE OOUTDOOR AIR (CFM) (Voz)	BREATHING ZONE OOUTDOOR AIR (CFM) (Vbz)	SPACE VENTILATION EFFICIENCY (Evz)
VAV01										
0905 CORRIDOR	1	66	1181	0	0	0	0.8	**0**	*0*	1.451
0910 SUPPLY	1	2	39	0	0	0	0.8	**0**	*0*	1.451
0912 TOILET	1	3	69	0	0	0	0.8	**0**	*0*	1.451
0914 CORRIDOR	1	10	236	0	0	0	0.8	**0**	*0*	1.451
0915 WOMEN	1	8	181	0	0	0	0.8	**0**	*0*	1.451
0916 MEN	1	8	179	0	0	0	0.8	**0**	*0*	1.451
0921 JAN	1	17	121	0	0	0	0.8	**0**	*0*	1.451
VAV02										
0906 HEALTH SCIENCE	1	184	1745	0	10	7.5	0.8	**94**	*75*	0.94
0907 TOILET	1	12	139	0	0	0	0.8	**0**	*0*	1.451
VAV03										
0909 CLASSROOM	1	438	823	0	30	7.5	0.8	**281**	*225*	0.809
VAV04										
0911 CLASSROOM	1	438	833	0	30	7.5	0.8	**281**	*225*	0.809
VAV05										
0913 CLASSROOM	1	439	833	0	30	7.5	0.8	**281**	*225*	0.81
VAV06										
0917 CLOSET	1	33	139	0	0	0	0.8	**0**	*0*	1.451
0918 LAB	1	527	1642	0	30	7.5	0.8	**281**	*225*	0.917
0919 CLOSET	1	16	36	0	0	0	0.8	**0**	*0*	1.451
VAV07										
1002 STAFF TOILET	1	9	124	0	0	0	0.8	**0**	*0*	1.451
1003 STORAGE	1	5	62	0	0	0	0.8	**0**	*0*	1.451
1012 ACCESS	1	6	82	0	0	0	0.8	**0**	*0*	1.451
1013 MEN	1	17	229	0	0	0	0.8	**0**	*0*	1.451
1014 CORRIDOR	1	6	79	0	0	0	0.8	**0**	*0*	1.451
1014A JAN	1	2	29	0	0	0	0.8	**0**	*0*	1.451
1015 WOMEN	1	17	225	0	0	0	0.8	**0**	*0*	1.451
1016 CORRIDOR	1	111	1455	0	0	0	0.8	**0**	*0*	1.451
1017 CLOSET	1	2	33	0	0	0	0.8	**0**	*0*	1.451
VAV08										
1004 CLASSROOM	1	455	869	0	30	7.5	0.8	**281**	*225*	0.833
VAV09										
1005 CLASSROOM	1	477	823	0	30	7.5	0.8	**281**	*225*	0.861
VAV10										
1006 CLASSROOM	1	459	853	0	30	7.5	0.8	**281**	*225*	0.838
VAV11										
1007 CLASSROOM	1	485	833	0	30	7.5	0.8	**281**	*225*	0.87
VAV12										
1008 CLASSROOM	1	457	847	0	30	7.5	0.8	**281**	*225*	0.836
VAV13										
1009 CLASSROOM	1	478	833	0	30	7.5	0.8	**281**	*225*	0.862
VAV14										
1010 CLASSROOM	1	483	881	0	30	7.5	0.8	**281**	*225*	0.868
VAV15										
1011 WORKROOM	1	85	199	0	6	7.5	0.8	**56**	*45*	0.79
1017 CLOSET	1	2	33	0	0	0	0.8	**0**	*0*	1.451
TOTALS (INCL. SPACE MULTIPLIERS)		**5756**							***2595***	**0.79**

PUMP SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESGIN MODEL	ALTERNATE APPROVED MANUFACTURERS	PUMP TYPE	SERVICE	FLUID	Flow Rate	Pump Head (FT)	INLET	OUTLET	MOTOR ENCLOSURE TYPE	MOTOR ENCLOSURE MATERIALS	MOTOR SPEED RPM	MOTOR HP	ELECTRICAL VOLT	ELECTRICAL PH	ELECTRICAL FREQ	WEIGHT	NOTES	ACCESSORIES
HWP01A	BELL & GOSSETT	PL-55B	GRUNDFOS,TACO	DRY ROTOR CIRCULATOR PUMP	HEATING HOT WATER	WATER	25.0 GPM	30	1 1/2"	1 1/2"	ODM	CAST IRON	3250	0.40 hp	120 V	1	60 Hz	13 lb	1	A,B,C
HWP01B	BELL & GOSSETT	PL-55B	GRUNDFOS,TACO	DRY ROTOR CIRCULATOR PUMP	HEATING HOT WATER	WATER	25.0 GPM	30	1 1/2"	1 1/2"	ODM	CAST IRON	3250	0.40 hp	120 V	1	60 Hz	13 lb	1	A,B,C

NOTES:
1. REFER TO DIVISION 23 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

ACCESSORIES:
A. PREMIUM EFFICIENT MOTOR.
B. BRONZE FITTED.
C. CONSTANT SPEED DRIVE.

CONDENSING BOILER SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESGIN MODEL	ALTERNATE APPROVED MANUFACTURERS	FUEL TYPE	HEATING MEDIUM	DESIGN WATER PRESSURE RATING (PSIG)	AGA INPUT (MBH) MIN	AGA INPUT (MBH) MAX	AGA OUTPUT MAX (MBH)	CONNECTIONS GAS	CONNECTIONS INLET GAS PRESSURE	CONNECTIONS WATER	CONNECTIONS INTAKE	CONNECTIONS VENT	ELECTRICAL VOLT	ELECTRICAL PH	ELECTRICAL FREQ	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT	NOTES	ACCESSORIES
B01	Lochinvar	KHB199N	AERCO, LAARS	NATURAL GAS	HOT WATER	160	20	199	185	1"	0.5 psi	1 1/4"	3"	3"	120 V	1	60 Hz	4.2 A	15.0 A	195 lb	1,2,3,4	A,B,C,D,E
B02	Lochinvar	KHB199N	AERCO, LAARS	NATURAL GAS	HOT WATER	160	20	199	185	1"	0.5 psi	1 1/4"	3"	3"	120 V	1	60 Hz	4.2 A	15.0 A	195 lb	1,2,3,4	A,B,C,D,E

NOTES:
1. REFER TO DIVISION 23 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. REFER TO PLANS FOR VENTING ARRANGEMENT.
3. ROUTE CONDENSATE THROUGH CONDENSATE NEUTRALIZATION KIT. REFER TO PLANS FOR LOCATION AND ARRANGEMENT.
4. MOUNT BOILER ON 4" HIGH CONCRETE HOUSE KEEPING PAD. PROVIDE SINGLE PAD FOR MULTIPLE BOILERS WHERE INDICATED ON PLANS.

ACCESSORIES:
A. MODBUS COMMUNICATION.
B. BMS MSTP INTERFACE TO BACNET
C. HIGH AND LOW GAS PRESSURE SWITCHES WITH MANUAL RESET.
D. LOW WATER CUTOFF WITH MANUAL RESET AND TEST.
E. PROVIDE HOT WATER CIRCULATOR BY BOILER MANUFACTURER. 120/1/60 - 100W.

CABINET HEATER SCHEDULE

DRAWING CODE	MANUFACTURER	MODEL NO.	ALTERNATE APPROVED MANUFACTURERS	TYPE	COIL OUTPUT	COIL WATER	COIL EWT	COIL LWT	COIL WPD	AIRFLOW	MOTOR HP	MOTOR RPM	MOTOR TYPE (ECM)	ELECTRICAL V/PH/HZ	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT	NOTES	ACCESSORIES
CUH01	STERLING	RWI-06	MCQUAY.MODINE	VERTICAL CABINET	31080.00 Btu/h	2.0 GPM	130 °F	98.84 °F	1.2 ftH2O	645 CFM	0.13 hp	838	Yes	115/60/1	6.1 A	15.0 A	218 lb	1,2	A THRU G
CUH02	STERLING	RWI-06	MCQUAY.MODINE	VERTICAL CABINET	6480.00 Btu/h	2.0 GPM	140 °F	110.00 °F	0.0 ftH2O	645 CFM	0.13 hp	838	Yes	115/60/1	6.1 A	15.0 A	218 lb	1,2	A THRU G

NOTES:
1. REFER TO SPECIFICATION SECTION 23 73 33 - HEATING, VENTILATING, AND COOLING SYSTEM FOR FURTHER INFORMATION.
2. CONFIRM PIPING SYSTEM PLACEMENT PRIOR TO SUBMITTING FOR APPROVAL.

ACCESSORIES:
A. FILTER: 1" PLEATED PERV 8.
B. BAR GRILLE INLET AND OUTLET.
C. BEIGE PAINT COLOR.
D. LOW-VOLTAGE TERMINAL STRIP WITH CONTROL POWERED TRANSFORMER.
E. UNIT-MOUNTED NON-FUSED DISCONNECT.
F. 8" EXTENDED END POCKET FOR HEATING WATER PIPING AND CONTROL VALVE.
G. KEYLESS ACCESS DOOR AND LEVELING FEET.

DUCTLESS AIR HANDLER UNIT SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NO.	ALTERNATE APPROVED MANUFACTURERS	ARI COOLING 80/67/95 TOTAL	ARI COOLING 80/67/95 MIN	ARI HEATING 70/47	SEER	COP	FAN SA MAX	ELECTRICAL VOLT	ELECTRICAL PH	ELECTRICAL FREQUENCY	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT	NOTES	ACCESSORIES
DAH01	MITSUBISHI ELECTRIC	PKA-A12KA4	DAIKIN, LG	12000 Btu/h	5800 Btu/h	14000 Btu/h	20.8	4.31	425 CFM	208 V	1	60 Hz	1.0 A	15.0 A	29 lb	1	A,B,C

NOTES:
1. REFER TO DIVISION 23 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

ACCESSORIES:
A. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT AND CONDUCTOR FROM OUTDOOR UNIT TO INDOOR UNIT.
B. WIRED WALL MOUNTED REMOTE CONTROLLER.
C. GRAVITY DRAIN SONDENSATE IS PREFERRED, IF NOT APPLICABLE PROVIDE ASPEN MINI-WHITE OR APPROVED EQUAL WALL MOUNT CONDENSATE PUMP.

DUCTLESS HEAT PUMP UNIT SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NO.	ALTERNATE APPROVED MANUFACTURERS	ELECTRICAL VOLT	ELECTRICAL PH	ELECTRICAL FREQUENCY	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT	REFRIGERANT PIPING MAX LENGTH	REFRIGERANT PIPING MAX HEIGHT DIFFERENTIAL	NOTES	ACCESSORIES
DHP01	MITSUBISHI ELECTRIC	PUZ-A12NKA7	DAIKIN, LG	208 V	1	60 Hz	11.0 A	15.0 A	93 lb	100' - 0"	100' - 0"	1	A,B

NOTES:
1. REFER TO DIVISION 23 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

ACCESSORIES:
A. MANUFACTURER'S LOW AMBIENT WIND BAFFLE FOR COOLING OPERATION TO O-DEGREES F.
B. MANUFACTURERS RECOMMENDED ROOF MOUNTING RAILS AND ACCESSORIES.

AIR/DIRT SEPARATOR SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALTERNATE APPROVED MANUFACTURERS	DESCRIPTION	FLOW	WORKING PRESSURE	WATER CONNECTIONS WATER INLET DIAMETER	WATER CONNECTIONS WATER OUTLET DIAMETER	WEIGHT	NOTES	ACCESSORIES
HWAS01	Bell & Gossett	RL-2N	WESSELS, TACO	AIR SEPARATOR NPT LESS STRAINER	25.8 GPM	125.0 psi	2"	2"	63	1	

NOTES:
1. PROVIDE AUTOMATIC AIR VENT.

ACCESSORIES:
A. N/A

EXPANSION TANK SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	VOLUME	ORIENTATION	OVERALL LENGTH	OVERALL DIAMETER	WEIGHT	NOTES	ACCESSORIES
HWET01	Bell & Gossett	D-15V	2.4 gal	VERICAL	1' - 7 1/2"	12"	43		

NOTES:
1. N/A

ACCESSORIES:
1. N/A

DIFFUSERS, REGISTERS AND GRILLES SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALTERNATE APPROVED MANUFACTURERS	TYPE	SERVICE	NECK SIZE	MODULE SIZE	MATERIAL	FINISH	MOUNTING	NOTES	ACCESSORIES
E1	TITUS	350FLF	PRICE, METAL AIRE	LOUVERED GRILLE	EXHAUST	20 X 20	24 X 24	ALUMINUM	WHITE ENAMEL	T-BAR	1,2,3	-
E2	TITUS	350FLF	PRICE, METAL AIRE	LOUVERED GRILLE	EXHAUST	12 X 12	12 X 12	ALUMINUM	WHITE ENAMEL	CEILING SURFACE	1,2,3	A
R1	TITUS	350FL	PRICE, METAL AIRE	LOUVERED GRILLE	RETURN	20 X 20	24 X 24	ALUMINUM	WHITE ENAMEL	T-BAR	1,2,3	-
S1	TITUS	OMNI-AA	PRICE, METAL AIRE	PLAQUE FACE DIFFUSER	SUPPLY	6"Ø	24 X 24	ALUMINUM	WHITE ENAMEL	T-BAR	1,2,3	A
S2	TITUS	OMNI-AA	PRICE, METAL AIRE	PLAQUE FACE DIFFUSER	SUPPLY	8"Ø	24 X 24	ALUMINUM	WHITE ENAMEL	T-BAR	1,2,3	A
S3	TITUS	OMNI-AA	PRICE, METAL AIRE	PLAQUE FACE DIFFUSER	SUPPLY	10"Ø	24 X 24	ALUMINUM	WHITE ENAMEL	T-BAR	1,2,3	A
S4	TITUS	300FS	PRICE, METAL AIRE	LOUVERED DOUBLE DEFLECTION GRILLE	SUPPLY	12 X 6	12 X 6	ALUMINUM	WHITE ENAMEL	CEILING SURFACE	1,2,3	A

NOTES:
1. REFER TO DIVISION 23 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. DUCT BRANCH CONNECTION SIZE TO BE EQUAL TO THE NECK SIZE OF DIFFUSER UNLESS NOTED OTHERWISE ON PLANS.
3. COORDINATE FINAL COLOR AND FINISH WITH ARCHITECT.

ACCESSORIES:
A. OPPOSED BLADE DAMPER.

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WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

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DSP # : 100
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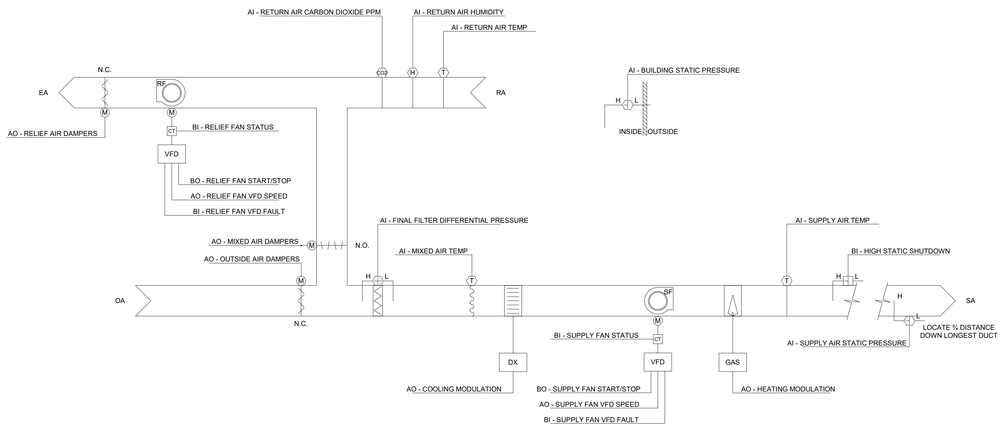
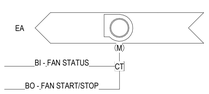


1 VARIABLE AIR VOLUME - RTU CONTROL DIAGRAM AND SEQUENCE
NO SCALE



2 EXHAUST FAN ON-OFF CONTROL DIAGRAM AND SEQUENCE
NO SCALE

EXHAUST FAN - ON/OFF

RUN CONDITIONS - SCHEDULED:
THE FAN SHALL RUN ACCORDING TO A USER DEFINABLE SCHEDULE.

FAN:
THE FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

FAN STATUS:
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- FAN RUNTIME EXCEEDED: FAN STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

EXHAUST FAN ON / OFF CONTROL POINTS

	HARDWARE POINTS				SOFTWARE POINTS							
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
FAN STATUS			X						X		X
FAN START/STOP				X					X		X
SCHEDULE								X			
FAN FAILURE										X	
FAN IN HAND										X	
FAN RUNTIME EXCEEDED										X	

3 EXHAUST FAN COOLING CONTROL DIAGRAM AND SEQUENCE
NO SCALE

EXHAUST FAN - COOLING

RUN CONDITIONS - CONTINUOUS:
THE UNIT SHALL BE CONTINUOUSLY ENABLED TO MAINTAIN A ZONE TEMPERATURE COOLING SETPOINT OF 90°F (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

FAN:
THE FAN SHALL RUN ANYTIME THE ZONE TEMPERATURE RISES ABOVE COOLING SETPOINT, UNLESS SHUTDOWN ON SAFETIES.

FAN STATUS:
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- FAN RUNTIME EXCEEDED: FAN STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

EXHAUST FAN COOLING CONTROL POINTS

	HARDWARE POINTS				SOFTWARE POINTS						
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
ZONE TEMP	X								X		X
FAN STATUS			X						X		X
FAN START/STOP				X					X		X
COOLING SETPOINT					X				X		X
FAN FAILURE										X	
FAN IN HAND										X	
FAN RUNTIME EXCEEDED										X	
HIGH ZONE TEMP										X	

System Point Description	Point								Alarm			
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT (AO)	BINARY HARDWARE OUTPUT (BO)	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
BUILDING STATIC PRESSURE LOCAL SP P	X	X								X	X				
COOLING OUTPUT COMMAND CLG	X			X											
DISCHARGE AIR TEMPERATURE LOCAL DAT	X	X												X	
HEATING OUTPUT COMMAND HTG	X			X											
HOT GAS REHEAT VALVE COMMAND HGRH															
MIXED AIR DAMPER MAD	X			X											
OUTSIDE AIR DAMPER COMMAND OAD	X			X											
OUTSIDE AIR TEMPERATURE LOCAL OAT	X	X												X	
OUTSIDE AIR FLOW LOCAL OA FLW															
PRIMARY FILTER STATUS LOCAL FIL	X		X									X			
RELIEF AIR DAMPER OPEN/CLOSE RLF DPR STS	X				X										
RELIEF AIR FAN SPEED RLF	X			X											
RELIEF AIR FAN START/STOP RLF	X				X										
RELIEF AIR FAN STATUS LOCAL RLF	X		X												
RETURN AIR CO2 LOCAL RA CO2		X												X	
RETURN AIR DAMPER RAD	X			X											
SUPPLY DUCT STATIC PRESSURE LOCAL DA SP		X								X	X		X		
SUPPLY FAN SPEED SF				X											
SUPPLY FAN START/STOP SF					X										
SUPPLY FAN STATUS LOCAL SF	X		X												
APPLICATION MODE APP MODE						X									
BAS COMMUNICATION STATE BAS COM						X									X
COMPRESSOR ENABLE CMP ENA	X					X									
COMPRESSOR LOCKOUT STATUS CMP LCK						X									
COOL OUTPUT CLG						X									
DUCT STATIC PRESSURE SETPOINT DA SP SPT	X					X									
ECONOMIZER ENABLE ECON ENA						X									
ECONOMIZER MINIMUM POSITION SETPOINT ECON MIN POS SP	X					X									
FAN MODE COMMAND FAN MODE						X									
FILTER RUNTIME HOURS FIL HRS						X									
HEAT OUTPUT HTG						X									
HEAT / COOL MODE REQUEST H/C REQ	X					X									
OCCUPANCY STATUS OCC STS	X					X									
OCCUPIED COOLING SETPOINT OCC CLG SP	X					X									
OCCUPIED HEATING SETPOINT OCC HTG SP	X					X									
SPACE CO2 HIGH LIMIT SP CO2 HL						X									
SPACE TEMPERATURE SETPOINT ACTIVE SPT SP ACT	X					X									
SUPPLY AIR HEATING/COOLING SETPOINT SA H/C SP						X									
TIMED OVERRIDE STATUS TOV STS						X									
UNOCCUPIED COOLING SETPOINT UNOCC CLG SP	X					X									
UNOCCUPIED HEATING SETPOINT UNOCC HTG SP	X					X									

SEQUENCE OF OPERATIONS: RTU01
BUILDING AUTOMATION SYSTEM INTERFACE:
THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED BYPASS, MORNING WARM-UP/PRE-COOL, OCCUPIED/UNOCCUPIED AND HEAT/COOL MODES. THE BAS SHALL ALSO SEND THE DISCHARGE AIR TEMPERATURE SETPOINT AND THE DUCT STATIC PRESSURE SETPOINT IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS

OCCUPIED:
DURING OCCUPIED PERIODS, THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE MIXED AIR DAMPERS SHALL OPEN TO MAINTAIN MINIMUM VENTILATION REQUIREMENTS. THE UNIT CONTROLLER SHALL CONTROL THE SUPPLY FAN SPEED TO MAINTAIN THE CURRENT DUCT STATIC PRESSURE SETPOINT (ADJ.). THE DX COOLING AND THE GAS HEAT SHALL CONTROL TO MAINTAIN THE ACTIVE DISCHARGE AIR TEMPERATURE SETPOINT. IF ECONOMIZING IS ENABLED, THE OUTDOOR AIR OR MIXED AIR DAMPERS SHALL MODULATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT AND THE RELIEF AIR DAMPER SHALL TRACK THE MIXED AIR DAMPERS. IF THE DISCHARGE AIR TEMPERATURE SENSOR FAILS, THE DX COOLING SHALL BE DISABLED, THE GAS HEAT SHALL BE DISABLED, AND AN ALARM SHALL ANNUNCIATE AT THE BAS.

UNOCCUPIED:
WHEN THE SPACE TEMPERATURE IS BELOW THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL BE COMMANDED ON, THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED AND THE GAS HEAT SHALL BE ENABLED. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.) PLUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL STOP AND THE GAS HEAT SHALL BE DISABLED. WHEN THE SPACE TEMPERATURE IS ABOVE THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL BE COMMANDED ON, THE OUTSIDE AIR DAMPER SHALL OPEN IF ECONOMIZING IS ENABLED AND REMAIN CLOSED IF ECONOMIZING IS DISABLED AND THE DX COOLING SHALL BE ENABLED. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F MINUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL STOP, THE DX COOLING SHALL BE DISABLED AND THE OUTSIDE AIR DAMPER SHALL CLOSE.

OPTIMAL START:
THE BAS SHALL MONITOR THE SCHEDULED OCCUPIED TIME, OCCUPIED SPACE SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL START OCCURS.

MORNING WARM-UP MODE:
DURING OPTIMAL START, IF THE AVERAGE SPACE TEMPERATURE IS BELOW THE OCCUPIED HEATING SETPOINT A MORNING WARM-UP MODE SHALL BE ACTIVATED. WHEN MORNING WARM-UP IS INITIATED THE UNIT SHALL ENABLE THE HEATING AND FAN(S). THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. WHEN THE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

PRE-COOL MODE:
DURING OPTIMAL START, IF THE AVERAGE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT, PRE-COOL MODE SHALL BE ACTIVATED. WHEN PRE-COOL IS INITIATED THE UNIT SHALL ENABLE THE FAN AND COOLING OR ECONOMIZER. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, UNLESS ECONOMIZING. WHEN THE SPACE TEMPERATURE REACHES OCCUPIED COOLING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

OPTIMAL STOP:
THE BAS SHALL MONITOR THE SCHEDULED UNOCCUPIED TIME, OCCUPIED SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL STOP OCCURS. WHEN THE OPTIMAL STOP MODE IS ACTIVE THE UNIT CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE TO THE SPACE TEMPERATURE OFFSET SETPOINT. OUTSIDE AIR DAMPER SHALL REMAIN ENABLED TO PROVIDE MINIMUM VENTILATION.

OCCUPIED BYPASS:
THE BAS SHALL MONITOR THE STATUS OF THE ON AND CANCEL BUTTONS OF THE SPACE TEMPERATURE SENSORS. WHEN AN OCCUPIED BYPASS REQUEST IS RECEIVED FROM A SPACE SENSOR, THE UNIT SHALL TRANSITION FROM ITS CURRENT OCCUPANCY MODE TO OCCUPIED BYPASS MODE AND THE UNIT SHALL MAINTAIN THE SPACE TEMPERATURE TO THE OCCUPIED SETPOINTS (ADJ.).

HEAT/COOL MODE:
COOLING: THE UNIT CONTROLLER SHALL USE THE DISCHARGE AIR TEMPERATURE SENSOR AND DISCHARGE AIR TEMPERATURE COOLING SETPOINT TO DETERMINE WHEN TO INITIATE REQUESTS FOR COOLING. DISCHARGE AIR SETPOINT SHALL BE MAINTAINED BY CONTROLLING THE COOLING AS REQUIRED.
HEATING: THE UNIT CONTROLLER SHALL USE THE DISCHARGE AIR TEMPERATURE SENSOR AND DISCHARGE AIR TEMPERATURE HEATING SETPOINT TO DETERMINE WHEN TO INITIATE REQUESTS FOR HEATING. DISCHARGE AIR SETPOINT SHALL BE MAINTAINED BY CONTROLLING THE HEATING AS REQUIRED. DURING UNOCCUPIED HEATING OR MORNING WARM-UP MODE. THE UNIT HEAT REQUEST SHALL BE COMMUNICATED TO THE SYSTEM VAVS PRIOR TO COMMENCING HEATING OPERATION TO ALLOW VAV UNITS TO OPEN. THE VFD SHALL BE COMMANDED TO 100% AND THE HEAT SHALL BE STAGED ON AND OFF TO SATISFY THE ZONE TEMPERATURE SETPOINT.

DISCHARGE AIR TEMPERATURE RESET CONTROL:
THE DISCHARGE AIR TEMPERATURE SETPOINT, 55.0 DEG. F - 65.0 DEG. F (ADJ.) SHALL BE RESET BASED ON EITHER THE OUTSIDE AIR TEMPERATURE OR SPACE AVERAGE TEMPERATURE (ADJ.). THE MINIMUM DISCHARGE AIR SETPOINT SHALL BE SET AT 55.0 DEG. F (ADJ.). THE DISCHARGE TEMPERATURE SENSOR SHALL PREVENT THE DISCHARGE AIR TEMPERATURE FROM FALLING BELOW THE MINIMUM DISCHARGE AIR SETPOINT (ADJ.). IF THE DISCHARGE AIR TEMPERATURE CONTINUES TO FALL, THE DISCHARGE TEMPERATURE SENSOR SHALL ACT AS A LOW DISCHARGE TEMPERATURE LIMIT. A LOW TEMPERATURE ALARM SHALL ANNUNCIATE, AND THE UNIT SHALL SHUT DOWN. IF THE DISCHARGE TEMPERATURE RISES ABOVE THE HIGH LIMIT SETPOINT THE SENSOR SHALL ACT AS A HIGH DISCHARGE TEMPERATURE LIMIT AND SHALL KEEP THE UNIT RUNNING. A HIGH TEMPERATURE ALARM SHALL ANNUNCIATE.
OUTDOOR AIR TEMPERATURE RESET: THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE ADJUSTED BASED ON THE OUTSIDE AIR TEMPERATURE AND THE COOLING AND HEATING LOAD OF THE BUILDING.
SPACE TEMPERATURE RESET: THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE ADJUSTED BASED ON THE TEMPERATURE OF THE CRITICAL SPACE(S).

ECONOMIZER:
ENABLE (REFERENCE DRY BULB): OUTSIDE AIR (OA) TEMPERATURE SHALL BE COMPARED WITH A REFERENCE DRY BULB SETPOINT. THE ECONOMIZER SHALL ENABLE WHEN THE OA TEMPERATURE IS LESS THAN REFERENCE DRY BULB SETPOINT. THE ECONOMIZER SHALL BE DISABLED WHEN OA TEMPERATURE IS GREATER THAN REFERENCE DRY BULB SETPOINT + 2.0 DEG. F.

OPERATION:
THE SUPPLY AIR SENSOR SHALL MEASURES THE DRY BULB TEMPERATURE OF THE AIR LEAVING THE EVAPORATOR COIL WHILE ECONOMIZING. WHEN ECONOMIZING IS ENABLED AND THE UNIT IS OPERATING IN THE COOLING MODE, THE ECONOMIZER DAMPER SHALL BE MODULATED BETWEEN ITS MINIMUM POSITION AND 100% TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT. THE ECONOMIZER DAMPER SHALL MODULATE TOWARD MINIMUM POSITION IN THE EVENT THE DISCHARGE AIR TEMPERATURE FALLS BELOW THE DISCHARGE LOW LIMIT TEMPERATURE SETPOINT. COMPRESSORS SHALL BE DELAYED FROM OPERATING UNTIL THE ECONOMIZER HAS OPENED TO 100%.

VENTILATION CONTROL:
WHEN THE SPACE CO2 LEVEL IS GREATER THAN OR EQUAL TO THE DESIGN MINIMUM CO2 SETPOINT, THE OUTDOOR AIR DAMPER SHALL OPEN TO THE DESIGN MINIMUM OUTDOOR AIR DAMPER SETPOINT. WHEN THE SPACE CO2 LEVEL IS LESS THAN OR EQUAL TO THE DCV MINIMUM CO2 SETPOINT, THE OUTDOOR AIR DAMPER SHALL CLOSE TO THE DCV MINIMUM OUTDOOR AIR DAMPER SETPOINT. IF THERE IS A CALL FOR ECONOMIZER COOLING, THE DAMPER SHALL BE OPENED FURTHER TO SATISFY THE COOLING REQUEST

SUPPLY FAN:
THE SUPPLY FAN SHALL BE ENABLED WHILE IN THE OCCUPIED MODE AND CYCLED ON DURING THE UNOCCUPIED MODE.

SUPPLY DUCT STATIC PRESSURE CONTROL:
DURING THE OCCUPIED MODE THE UNIT CONTROLLER SHALL MODULATE THE OUTPUT TO THE VFD AS REQUIRED TO MAINTAIN THE DUCT STATIC PRESSURE SETPOINT OF 1.5 INCHES OF W.C. (ADJ.). IF THE DUCT STATIC PRESSURE FALLS BELOW 1.3 INCHES OF W.C. (ADJ.) THE UNIT CONTROLLER SHALL INCREASE THE OUTPUT TO THE VFD TO MAINTAIN SETPOINT. IF THE DUCT STATIC PRESSURE RISES ABOVE 1.7 INCHES OF W.C. (ADJ.) THE UNIT CONTROLLER SHALL DECREASE THE OUTPUT TO THE VFD TO MAINTAIN SETPOINT. UPON A CALL FOR HEATING OR COOLING IN THE UNOCCUPIED MODE THE UNIT CONTROLLER SHALL MODULATE THE SPEED OF THE VFD TO 100%.
STATIC PRESSURE HIGH LIMIT:
IF FOR ANY REASON THE SUPPLY AIR PRESSURE EXCEEDS THE SUPPLY AIR PRESSURE HIGH LIMIT, THE SUPPLY FAN SHALL SHUT DOWN. THE UNIT SHALL BE ALLOWED TO RESTART THREE TIMES AFTER A 15 MINUTE OFF PERIOD. IF THE OVER-PRESSURIZATION CONDITION OCCURS ON THE FOURTH RESTART, THE UNIT SHALL SHUT DOWN AND A MANUAL RESET DIAGNOSTIC IS DISPLAYED AT THE REMOTE PANEL AND/OR THE BAS SYSTEM.
RELIEF AIR AND BUILDING PRESSURE CONTROL:
A DIFFERENTIAL PRESSURE TRANSDUCER SHALL ACTIVELY MONITOR THE DIFFERENCE IN PRESSURE BETWEEN THE BUILDING (INDOORS) AND OUTDOORS. IF THE BUILDING PRESSURE INCREASES ABOVE THE DIFFERENTIAL PRESSURE SETPOINT, THE UNIT CONTROLLER SHALL OPEN THE RELIEF AIR DAMPER, TURN ON THE RELIEF AIR FAN AND MODULATE THE RELIEF AIR FAN VFD TO CONTROL BUILDING PRESSURE TO THE DIFFERENTIAL PRESSURE SETPOINT. IF THE BUILDING PRESSURE DECREASES BELOW THE DIFFERENTIAL PRESSURE SETPOINT, THE ASSOCIATED CONTROLLER SHALL DEACTIVATE THE RELIEF AIR FAN VFD.
A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE RELIEF AIR FAN. IF THE SWITCH IS DETECTED TO BE OPEN FOR 40 CONSECUTIVE SECONDS AFTER A REQUEST FOR RELIEF FAN OPERATION A FAN FAILURE ALARM SHALL ANNUNCIATE AT THE BAS AND THE RELIEF FAN SHALL STOP. A MANUAL RESET SHALL BE REQUIRED.

FILTER STATUS:
A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER(S) WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSES DURING NORMAL OPERATION A DIRTY FILTER ALARM SHALL ANNUNCIATE AT THE BAS.

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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

MECHANICAL CONTROL DIAGRAMS AND SEQUENCES

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
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SCALE: 12" = 1'-0"
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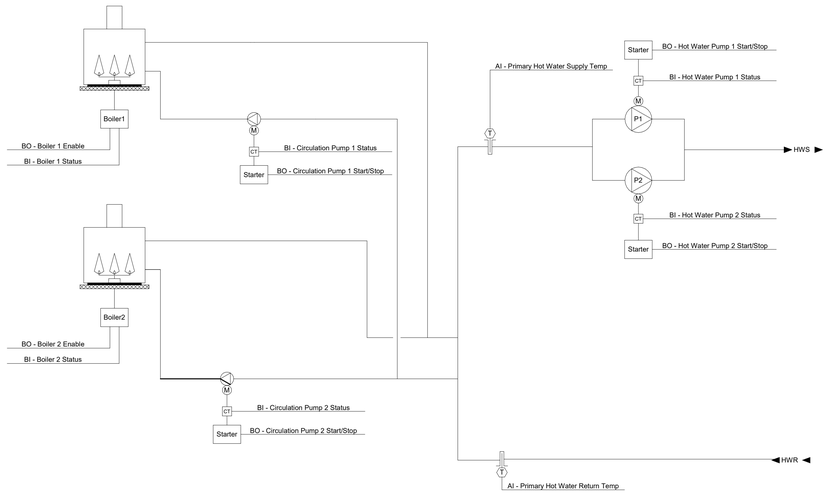


1 TWO BOILER SYSTEM CONTROL DIAGRAM AND SEQUENCE
NO SCALE

BOILER PLANT

BOILER SYSTEM RUN CONDITIONS:
THE BOILER SYSTEM SHALL BE ENABLED TO RUN WHENEVER:
- A DEFINABLE NUMBER OF HOT WATER COILS NEED HEATING.
- AND OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).

TO PREVENT SHORT CYCLING, THE BOILER SYSTEM SHALL RUN FOR AND BE OFF FOR MINIMUM ADJUSTABLE TIMES (BOTH USER DEFINABLE), UNLESS SHUTDOWN ON SAFETIES.

THE BOILER SHALL RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

HOT WATER PUMP LEAD/STANDBY OPERATION:
THE TWO HOT WATER PUMPS SHALL OPERATE IN A LEAD/STANDBY FASHION.
- THE LEAD PUMP SHALL RUN FIRST.
- ON FAILURE OF THE LEAD PUMP, THE STANDBY PUMP SHALL RUN AND THE LEAD PUMP SHALL TURN OFF.

THE DESIGNATED LEAD PUMP SHALL ROTATE UPON ONE OF THE FOLLOWING CONDITIONS (USER SELECTABLE):
- MANUALLY THROUGH A SOFTWARE SWITCH
- IF PUMP RUNTIME (ADJ.) IS EXCEEDED
- DAILY
- WEEKLY
- MONTHLY

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HOT WATER PUMP 1
  - FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
  - RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
  - RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.
- HOT WATER PUMP 2
  - FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
  - RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
  - RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.

CIRCULATION PUMP 1:
THE CIRCULATION PUMP 1 SHALL RUN ANYTIME BOILER 1 IS CALLED TO RUN AND SHALL HAVE A USER DEFINABLE DELAY (ADJ.) ON STOP.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- CIRCULATION PUMP 1 FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- CIRCULATION PUMP 1 RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- CIRCULATION PUMP 1 RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER-DEFINABLE LIMIT.

CIRCULATION PUMP 2:
THE CIRCULATION PUMP 2 SHALL RUN ANYTIME BOILER 2 IS CALLED TO RUN AND SHALL HAVE A USER DEFINABLE DELAY (ADJ.) ON STOP.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- CIRCULATION PUMP 2 FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- CIRCULATION PUMP 2 RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- CIRCULATION PUMP 2 RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER-DEFINABLE LIMIT.

BOILER LEAD/STANDBY OPERATION:
THE TWO BOILERS SHALL OPERATE IN A LEAD/STANDBY FASHION WHEN CALLED TO RUN AND FLOW IS PROVEN.
- THE LEAD BOILER SHALL RUN FIRST.
- ON FAILURE OF THE LEAD BOILER, THE STANDBY BOILER SHALL RUN AND THE LEAD BOILER SHALL TURN OFF.

THE DESIGNATED LEAD BOILER SHALL ROTATE UPON ONE OF THE FOLLOWING CONDITIONS: (USER SELECTABLE):
- MANUALLY THROUGH A SOFTWARE SWITCH
- IF BOILER RUNTIME (ADJ.) IS EXCEEDED
- DAILY
- WEEKLY
- MONTHLY

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- BOILER 1
  - FAILURE: COMMANDED ON BUT THE STATUS IS OFF.
  - RUNNING IN HAND: COMMANDED OFF BUT THE STATUS IS ON.
  - RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.
- BOILER 2
  - FAILURE: COMMANDED ON BUT THE STATUS IS OFF.
  - RUNNING IN HAND: COMMANDED OFF BUT THE STATUS IS ON.
  - RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.
- LEAD BOILER FAILURE: THE LEAD BOILER IS IN FAILURE AND THE STANDBY BOILER IS ON.

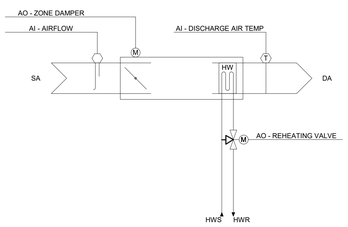
HOT WATER SUPPLY TEMPERATURE SETPOINT:
THE BOILER SHALL MAINTAIN A HOT WATER SUPPLY TEMPERATURE SETPOINT AS DETERMINED BY ITS OWN INTERNAL CONTROLS (PROVIDED BY OTHERS).

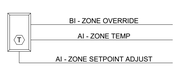
PRIMARY HOT WATER TEMPERATURE MONITORING:
THE FOLLOWING TEMPERATURES SHALL BE MONITORED:
- PRIMARY HOT WATER SUPPLY.
- PRIMARY HOT WATER RETURN.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH PRIMARY HOT WATER SUPPLY TEMP: IF GREATER THAN 200°F (ADJ.).
- LOW PRIMARY HOT WATER SUPPLY TEMP: IF LESS THAN 100°F (ADJ.).

BOILER PLANT CONTROL POINTS

	HARDWARE POINTS				SOFTWARE POINTS							
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
PRIMARY HOT WATER RETURN TEMP	X								X		X
PRIMARY HOT WATER SUPPLY TEMP	X								X		X
BOILER 1 STATUS			X						X		X
BOILER 2 STATUS			X						X		X
CIRCULATION PUMP 1 STATUS			X						X		X
CIRCULATION PUMP 2 STATUS			X						X		X
HOT WATER PUMP 1 STATUS			X						X		X
HOT WATER PUMP 2 STATUS			X						X		X
BOILER 1 ENABLE				X							X
BOILER 2 ENABLE				X							X
CIRCULATION PUMP 1 START/STOP				X					X		X
CIRCULATION PUMP 2 START/STOP				X					X		X
HOT WATER PUMP 1 START/STOP				X							X
HOT WATER PUMP 2 START/STOP				X							X
OUTSIDE AIR TEMP					X						X
BOILER 1 FAILURE										X	
BOILER 1 RUNNING IN HAND										X	
BOILER 1 RUNTIME EXCEEDED										X	
BOILER 2 FAILURE										X	
BOILER 2 RUNNING IN HAND										X	
BOILER 2 RUNTIME EXCEEDED										X	
CIRCULATION PUMP 1 FAILURE										X	
CIRCULATION PUMP 1 RUNNING IN HAND										X	
CIRCULATION PUMP 1 RUNTIME EXCEEDED										X	
CIRCULATION PUMP 2 FAILURE										X	
CIRCULATION PUMP 2 RUNNING IN HAND										X	
CIRCULATION PUMP 2 RUNTIME EXCEEDED										X	
HIGH PRIMARY HOT WATER SUPPLY TEMP										X	
HOT WATER PUMP 1 FAILURE										X	
HOT WATER PUMP 1 RUNNING IN HAND										X	
HOT WATER PUMP 1 RUNTIME EXCEEDED										X	
HOT WATER PUMP 2 FAILURE										X	
HOT WATER PUMP 2 RUNNING IN HAND										X	
HOT WATER PUMP 2 RUNTIME EXCEEDED										X	
LEAD BOILER FAILURE										X	X
LOW PRIMARY HOT WATER SUPPLY TEMP										X	





2 VAV TERMINAL UNIT CONTROL DIAGRAM AND SEQUENCE
NO SCALE

VARIABLE AIR VOLUME - TERMINAL UNIT

RUN CONDITIONS - SCHEDULED:
THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:
- OCCUPIED MODE: THE UNIT SHALL MAINTAIN
  - A 75°F (ADJ.) COOLING SETPOINT
  - A 70°F (ADJ.) HEATING SETPOINT.
- UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN
  - A 85°F (ADJ.) COOLING SETPOINT.
  - A 55°F (ADJ.) HEATING SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
- LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

ZONE SETPOINT ADJUST:
THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR.

ZONE OPTIMAL START:
THE UNIT SHALL USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THIS ALGORITHM SHALL MINIMIZE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD.

ZONE UNOCCUPIED OVERRIDE:
A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.

REVERSING VARIABLE VOLUME TERMINAL UNIT - FLOW CONTROL:
THE UNIT SHALL MAINTAIN ZONE SETPOINTS BY CONTROLLING THE AIRFLOW THROUGH ONE OF THE FOLLOWING:

OCCUPIED:
- WHEN ZONE TEMPERATURE IS GREATER THAN ITS COOLING SETPOINT, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM OCCUPIED AIRFLOW (ADJ.) AND THE MAXIMUM COOLING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.
- WHEN THE ZONE TEMPERATURE IS BETWEEN THE COOLING SETPOINT AND THE HEATING SETPOINT, THE ZONE DAMPER SHALL MAINTAIN THE MINIMUM REQUIRED ZONE VENTILATION (ADJ.).
- WHEN ZONE TEMPERATURE IS LESS THAN ITS HEATING SETPOINT, THE CONTROLLER SHALL ENABLE HEATING TO MAINTAIN THE ZONE TEMPERATURE AT ITS HEATING SETPOINT. ADDITIONALLY, IF WARM AIR IS AVAILABLE FROM THE AHU, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM OCCUPIED AIRFLOW (ADJ.) AND THE MAXIMUM HEATING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.

VARIABLE AIR VOLUME - TERMINAL UNIT - CONT.

UNOCCUPIED:
- WHEN THE ZONE IS UNOCCUPIED THE ZONE DAMPER SHALL CONTROL TO ITS MINIMUM UNOCCUPIED AIRFLOW (ADJ.).
- WHEN THE ZONE TEMPERATURE IS GREATER THAN ITS COOLING SETPOINT, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM UNOCCUPIED AIRFLOW (ADJ.) AND THE MAXIMUM COOLING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.
- WHEN ZONE TEMPERATURE IS LESS THAN ITS UNOCCUPIED HEATING SETPOINT, THE CONTROLLER SHALL ENABLE HEATING TO MAINTAIN THE ZONE TEMPERATURE AT THE SETPOINT. ADDITIONALLY, IF WARM AIR IS AVAILABLE FROM THE AHU, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM UNOCCUPIED AIRFLOW (ADJ.) AND THE AUXILIARY HEATING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.

REHEATING COIL VALVE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE REHEATING COIL VALVE OPEN ON DROPPING TEMPERATURE TO MAINTAIN ITS HEATING SETPOINT.

WHEN COLD AIR IS AVAILABLE FROM THE AHU AND THERE IS NO FAN PRESENT IN THE BOX, THE ZONE DAMPER SHALL MODULATE TO THE MINIMUM OCCUPIED AIRFLOW (ADJ.). IF MORE HEAT IS REQUIRED, THE ZONE DAMPER SHALL MODULATE TO THE AUXILIARY HEATING AIRFLOW (ADJ.).

REHEATING - HIGH DISCHARGE AIR TEMPERATURE LIMIT:
THE CONTROLLER SHALL MEASURE THE DISCHARGE AIR TEMPERATURE AND LIMIT REHEATING IF THE DISCHARGE AIR TEMPERATURE IS MORE THAN 95°F (ADJ.).

DISCHARGE AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).

LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).

VAV TERMINAL UNIT CONTROL POINTS

	HARDWARE POINTS				SOFTWARE POINTS						
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
AIRFLOW	X								X		X
DISCHARGE AIR TEMP	X								X		X
ZONE SETPOINT ADJUST	X										X
ZONE TEMP	X								X		X
REHEATING VALVE		X							X		X
ZONE DAMPER		X							X		X
ZONE OVERRIDE			X						X		X
AIRFLOW SETPOINT					X				X		X
COOLING SETPOINT					X				X		X
DAT HEATING LIMIT					X						
HEATING SETPOINT					X				X		X
HEATING MODE						X			X		
SCHEDULE								X			
HIGH DISCHARGE AIR TEMP										X	
HIGH ZONE TEMP										X	
LOW DISCHARGE AIR TEMP										X	
LOW ZONE TEMP										X	

RECIRCULATING DOMESTIC HOT WATER PUMP CONTROL POINTS

	Hardware Points				Software Points						
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Show On Graphic
RECIRC Pump Status			x						x		x
RECIRC Pump Start/Stop				x					x		x
RECIRC Pump Failure										x	
RECIRC Pump Running in Hand										x	
Low RECIRC Water Temp										x	

DUCTLESS SPLIT SYSTEM CONTROL POINTS

	HARDWARE POINTS				SOFTWARE POINTS						
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
ZONE TEMP	X								X		X
HIGH ZONE TEMP										X	
LOW ZONE TEMP										X	

DUCTLESS SPLIT SYSTEM UNITS

GENERAL:

1. A MICROPROCESSOR-BASED CONTROLLER (FURNISHED WITH THE UNIT) SHALL CONTROL THE SPLIT SYSTEM AIR CONDITIONING UNIT.

2. THE INDOOR EVAPORATOR UNIT FAN AND DX COOLING SYSTEM SHALL BE STARTED AND STOPPED VIA THE MICROPROCESSOR BASED CONTROLS.

3. A SPACE TEMPERATURE SENSOR WILL MONITOR THE ROOM CONDITIONS FOR TEMPERATURE ALARM MONITORING THROUGH THE BUILDING AUTOMATION SYSTEM (BAS).

SYSTEM DESCRIPTION:

1. THE SYSTEM IS A DUCTLESS SPLIT SYSTEM COOLING ONLY UNIT.

2. THE OUTDOOR CONDENSING UNIT IS LOCATED REMOTELY.

SYSTEM CONTROL:

TEMPERATURE CONTROL:

A. INDOOR UNIT:

1) ON A RISE IN SPACE TEMPERATURE ABOVE THE ACTIVE SET POINT, THE MICROPROCESSOR CONTROLLER SHALL INDEX THE INDOOR UNIT EVAPORATOR FAN TO RUN. THE FAN SHALL RUN INITIALLY AT A PREDETERMINED SPEED UPON STARTUP. IN AUTO MODE, THE INDOOR EVAPORATOR FAN SHALL CYCLE WITH A CALL FOR COOLING, AND THE FAN SHALL SWITCH VIA THE MICROPROCESSOR CONTROLS BETWEEN LOW SPEED AND HIGH SPEED BASED UPON THE ROOM TEMPERATURE DEVIATION FROM THE SET POINT.

2) THE MICROPROCESSOR CONTROLLER WILL ENERGIZE THE OUTDOOR COMPRESSOR TO RUN UPON A CALL FOR COOLING, BASED UPON THE SET POINT ENTERED INTO THE MICROPROCESSOR CONTROLLER.

3) UPON A DROP IN SPACE TEMPERATURE, THE MICROPROCESSOR WILL DE-ENERGIZE THE COMPRESSOR. THE INDOOR UNIT FAN WILL CONTINUE TO RUN FOR A PRE-DETERMINED CYCLE LENGTH TO DISSIPATE REMAINING ENERGY FROM THE COIL. THE UNIT CONTROLS SHALL INCLUDE AN ANTI-CYCLE TIMER TO PREVENT MULTIPLE STARTS ON THE COMPRESSOR.

BAS INTERFACE:

1. A TEMPERATURE SENSOR SHALL BE WIRED TO THE BAS TO MONITOR THE ACTIVE SPACE TEMPERATURE. THE BAS SHALL INITIATE AN ALARM WHENEVER THE SPACE TEMPERATURE RANGES BEYOND THE HIGH OR LOW LIMITS DEFINED FOR THE SPACE (85F HIGH ALARM/65F LOW ALARM, ADJ.).

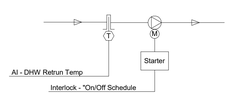
2. THE BAS SYSTEM SHALL MONITOR THE STATUS OF THE INDOOR EVAPORATOR UNIT VIA A BINARY-IN (B.I.) SIGNAL TO THE CONTROLLER.

BOILER ROOM WATER DETECTION:

THE WATER DETECTOR SHALL MONITOR FOR PRESENCE OF WATER ON FLOOR OF ROOM.

ALARM SHALL BE PROVIDED IF WATER IS DETECTED. ROOM/DETECTOR SHALL BE IDENTIFIED.

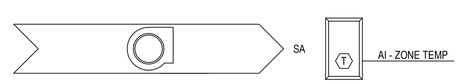
3 BOILER ROOM WATER DETECTION DIAGRAM AND SEQUENCE
NO SCALE



RECIRCULATING DOMESTIC HOT WATER PUMP

SERVICE HOT WATER HEATER WITH RECIRCULATION PUMP- RUN CONDITIONS:
START/STOP PUMP VIA LINE-VOLTAGE RELAY BASED ON USER-DEFINED "ON/OFF" SCHEDULE
- INITIATE ALARM IF RECIRCULATION WATER TEMPERATURE FALLS BELOW 100°F (ADJ.).

4 RECIRCULATING DOMESTIC HOT WATER PUMP DIAGRAM AND SEQUENCE
NO SCALE



5 DUCTLESS SPLIT SYSTEM CONTROL DIAGRAM AND SEQUENCE
NO SCALE

BECKER MORGAN GROUP

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ISSUED: 04.16.20

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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

MECHANICAL CONTROL DIAGRAMS AND SEQUENCES

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 12" = 1'-0"
DRAWN BY: GRM PROJ MGR: DMH

M702

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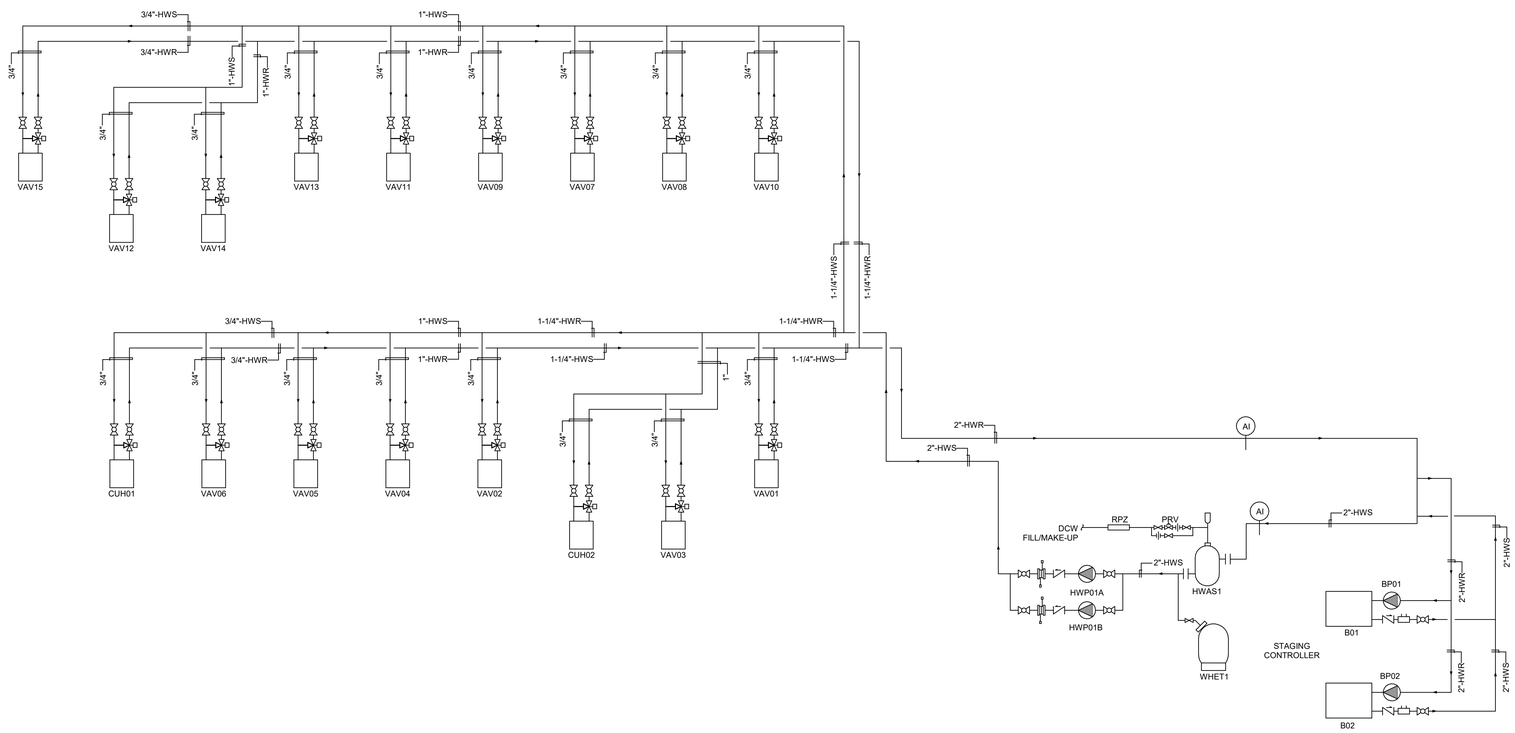

1 HOT WATER FLOW DIAGRAM
NO SCALE

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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

HYDRONIC PIPING FLOW DIAGRAM

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 12" = 1'-0"
DRAWN BY: RWC PROJ MGR: DMH

M703

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GENERAL NOTES

1. ALL ELECTRICAL WORK SHALL BE IN FULL COMPLIANCE WITH NFPA, THE NORTH CAROLINA STATE BUILDING CODE, ALL LOCAL CODES AND ORDINANCES AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.
2. ALL EQUIPMENT PROVIDED BY THE CONTRACTOR SHALL BE LISTED AND LABELED BY A NATIONALLY-RECOGNIZED TESTING AGENCY, ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION, FOR THE CONDITIONS OF INSTALLATION. ALL MATERIAL, EQUIPMENT AND DEVICES SHALL BE NEW CURRENT PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SUCH PRODUCTS. EQUIPMENT SHALL BE SUITABLE FOR ITS APPLICATION (E.G. WHEN INSTALLED OUTDOORS, IT SHALL BE WEATHERPROOF, ETC.)
3. THE CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS FOR WORK REQUIREMENTS, THE AMOUNT OF SPACE AVAILABLE FOR ELECTRICAL EQUIPMENT, AND LAYOUT HIS WORK IN A COMPATIBLE AND COMPLEMENTARY MANNER.
4. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THOROUGHLY FAMILIARIZING HIMSELF WITH ANY CONTRACTUAL REQUIREMENTS AS MAY BE SET FORTH IN THE OTHER DIVISIONS OF THE PROJECT SPECIFICATIONS.
5. UNLESS SPECIFICALLY NOTED OTHERWISE, SYSTEMS PROVIDED OR INSTALLED BY THE ELECTRICAL CONTRACTOR SHALL BE COMPLETE AND FULLY-FUNCTIONING AFTER INSTALLATION. INCIDENTAL COMPONENTS MAY NOT BE SHOWN, AND ALL WORK WHICH MAY BE REASONABLY IMPLIED AS BEING INCIDENTAL TO THIS WORK, BUT REQUIRED FOR THE PROPER OPERATION OF THE EQUIPMENT OR SYSTEM, SHALL BE PROVIDED BY THE CONTRACTOR AND INCLUDED IN THE BID. ADDITIONAL CIRCUITS SHALL BE INSTALLED WHEREVER NEEDED TO CONFORM TO THE SPECIFIC REQUIREMENTS OF EQUIPMENT.
6. TEMPORARY POWER CONNECTIONS AS REQUIRED SHALL BE PROVIDED BY THE CONTRACTOR AND INCLUDED IN THE BID. ALL TEMPORARY EQUIPMENT WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. THE CONTRACTOR SHALL PROVIDE DETAILS, METHODS, MATERIALS, ETC. FOR REVIEW PRIOR TO MAKING TEMPORARY CONNECTIONS. FURNISH AND INSTALL ALL EQUIPMENT AND MATERIALS INCLUDING CONTROL EQUIPMENT, MOTOR STARTERS, BRANCH AND FEEDER CIRCUIT BREAKERS, PANELBOARDS, TRANSFORMERS, ETC. FOR TEMPORARY POWER. COORDINATE WITH THE ELECTRICAL UTILITY COMPANY AS REQUIRED.
7. THE WORK SHALL INCLUDE COMPLETE TESTING OF ALL EQUIPMENT AND WIRING AT THE COMPLETION OF WORK AND ANY MINOR CORRECTIONS, CHANGES OR ADJUSTMENTS NECESSARY FOR THE PROPER FUNCTIONING OF THE SYSTEM AND EQUIPMENT.
8. ALL ELECTRICAL EQUIPMENT SHALL, AT ALL TIMES DURING CONSTRUCTION, BE ADEQUATELY PROTECTED AGAINST MECHANICAL INJURY, OR DAMAGE BY WATER AND/OR THE ELEMENTS. ELECTRICAL EQUIPMENT SHALL NOT BE STORED OUT OF DOORS, BUT SHALL BE STORED IN DRY PERMANENT SHELTERS. IF AN APPARATUS HAS BEEN DAMAGED, OR HAS BEEN SUBJECT TO POSSIBLE INJURY BY WATER OR THE ELEMENTS, SUCH DAMAGE SHALL BE REPLACED AT NO ADDITIONAL COST.
9. DO NOT SCALE ELECTRICAL DRAWINGS. REFER TO THE ARCHITECTURAL DRAWINGS FOR DIMENSIONS.
10. CIRCUIT LAYOUTS ARE NOT INTENDED TO SHOW THE NUMBER OF FITTINGS, OR OTHER INSTALLATION DETAILS. UNLESS NOTED OTHERWISE, THE EXACT ROUTING OF FEEDER AND BRANCH CIRCUIT RACEWAYS AND CABLES IS THE RESPONSIBILITY OF THE CONTRACTOR. RISER AND GENERAL CIRCUIT ARRANGEMENTS ARE SHOWN SCHEMATICALLY/DIAGRAMMATICALLY ONLY. THE CONTRACTOR SHALL ROUTE CONDUITS AS REQUIRED BY THE CONDITIONS OF THE INSTALLATION.
11. UNLESS DIMENSIONED, DEVICE LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. ADJUST EXACT LOCATIONS AS REQUIRED TO SERVE THE INTENDED PURPOSE AND TO AVOID CONFLICTS AND INTERFERENCES WITH OTHER TRADES. EXACT DEVICE LOCATIONS SHALL BE AS INDICATED ON THE ARCHITECTURAL DRAWINGS OR AS DIMENSIONED. IF NOT SHOWN ON THE ARCHITECTURAL DRAWINGS OR DIMENSIONED ON THE ELECTRICAL DRAWINGS, VERIFY EXACT LOCATION WITH THE ARCHITECT/ENGINEER PRIOR TO ROUGH-IN.
12. CONDUIT TERMINATING IN PRESSED STEEL BOXES SHALL HAVE DOUBLE LOCKNUTS AND INSULATED BUSHINGS. CONDUITS TERMINATING IN GASKETED ENCLOSURES SHALL BE TERMINATED WITH GROUNDING TYPE CONDUIT HUBS.
13. DEVICE BOXES SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF TWELVE (12) INCHES TO REDUCE SOUND TRANSMISSION BETWEEN ROOMS.
14. BRANCH CIRCUIT HOMERUNS SHOWN ON DRAWINGS INDICATE PHASE CONDUCTORS, NEUTRAL, EQUIPMENT GROUND CONDUCTORS AS REQUIRED. ADDITIONAL CONDUCTORS REQUIRED FOR CONTROL SHALL BE INCLUDED EVEN IF NOT EXPLICITLY SHOWN.
15. SEAL ALL CONDUIT OPENINGS THROUGH EXTERIOR BUILDING WALLS WATERTIGHT.
16. IN WET LOCATIONS AND EXTERIOR, ALL WIRING DEVICES SHALL BE WEATHER-RESISTANT LISTED WITH WEATHERPROOF WHILE IN USE COVER. LIGHTING FIXTURES SHALL BE APPROPRIATELY RATED AND LISTED FOR THE ENVIRONMENT INCLUDING 0 DEGREE BALLASTS FOR FLUORESCENT.
17. RACEWAYS PENETRATING FLOORS, CEILINGS OR WALLS SHALL BE PROPERLY SEALED SMOKETIGHT.
18. RACEWAYS PENETRATING RATED FLOOR, CEILING OR WALL ASSEMBLIES SHALL BE PROPERLY SEALED IN ACCORDANCE WITH THE CORRESPONDING UNDERWRITERS LABORATORIES (OR OTHER APPROVED THIRD PARTY TESTING AGENCY) APPROVED AND LISTED FIRESTOPPING MATERIALS AND MANUFACTURER APPROVED INSTALLATION TECHNIQUES COMPLYING WITH ALL APPLICABLE CODES. SEE ARCHITECTURAL DRAWINGS FOR IDENTIFICATION OF RATED WALLS AND CEILINGS.
19. ALL RACEWAYS SHALL BE CONCEALED WHERE POSSIBLE.
20. INSTALL EXPOSED RACEWAYS PARALLEL TO OR AT RIGHT ANGLES TO NEARBY SURFACES OR STRUCTURAL MEMBERS, AND FOLLOW THE SURFACE CONTOURS AS MUCH AS POSSIBLE. NO DIAGONAL RUNS WILL BE ALLOWED. ALL CONDUITS SHALL BE RUN STRAIGHT AND TRUE. RUN PARALLEL OR BANKED RACEWAYS TOGETHER ON COMMON SUPPORTS WHERE PRACTICAL. MAKE BENDS IN PARALLEL OR BANKED RUNS FROM SAME CENTERLINE TO MAKE BENDS PARALLEL.
21. PROVIDE AND PLACE ALL SLEEVES FOR CONDUITS PENETRATING WALLS, FLOORS, PARTITIONS, ETC. LOCATE ALL NECESSARY SLOTS FOR ELECTRICAL WORK AND FORM BEFORE CONCRETE IS POURED.
22. PATCHING OF WATERPROOFED SURFACES SHALL RENDER THE AREA OF THE PATCHING COMPLETELY WATERPROOF.
23. ALL MOTORS, DRY TYPE TRANSFORMERS AND OTHER VIBRATING EQUIPMENT SHALL BE CONNECTED TO THE CONDUIT SYSTEM BY MEANS OF A SHORT SECTION (18 INCH MINIMUM) OF FLEXIBLE CONDUIT UNLESS OTHERWISE INDICATED. AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED INSIDE THE FLEXIBLE CONDUIT AND TERMINATE AT THE LOAD END WITH AN APPROVED GROUNDING CLAMP OR LUG.
24. SURFACE MOUNTED PANELBOARDS, JUNCTION, OUTLET AND PULL BOXES, RACEWAYS, ETC., INSTALLED ON EXTERIOR SURFACES OR INSIDE ON EXTERIOR WALLS SHALL BE SUPPORTED BY SPACERS TO PROVIDE A 1/4" MINIMUM CLEARANCE BETWEEN THE WALL AND EQUIPMENT.
25. CEILING MOUNTED DEVICES INSTALLED IN ACOUSTICAL TILE CEILING AREAS SHALL BE SUPPORTED FROM THE STRUCTURE ABOVE WITH RODS OF SUFFICIENT SIZE TO PREVENT VERTICAL MOVEMENT OF THE OUTLET BOX. BRIDGES ALONE ARE NOT ADEQUATE UNLESS SPECIFICALLY APPROVED. CEILING MOUNTED EXIT LIGHT FIXTURES SHALL BE INSTALLED LEVEL. DO NOT SUPPORT DEVICES FROM ACCOUSTICAL CEILING TILE.
26. EXCAVATION AND TRENCHING REQUIRED FOR THE INSTALLATION OF ELECTRICAL POWER AND TELECOMMUNICATIONS RACEWAYS SHALL BE PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF DIVISION 26 OF THE PROJECT SPECIFICATIONS.
27. PRIOR TO TRENCHING IN ANY AREA, THE CONTRACTOR SHALL CONTACT ELECTRICAL, COMMUNICATIONS/DATA/FIBER, CABLE TELEVISION, GAS AND WATER UTILITY PROVIDERS AND HAVE ALL UTILITIES IN THE AREA IDENTIFIED. DAMAGE TO ANY UNDERGROUND UTILITIES OR STRUCTURES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT.
28. ALL UNDERGROUND RACEWAYS SHALL BE IDENTIFIED BY UNDERGROUND LINE MARKING TAPE LOCATED DIRECTLY ABOVE THE RACEWAY AT 6 TO 8 INCHES BELOW FINISHED GRADE. SEE SPECIFICATIONS SECTION 260553.
29. PROVIDE ADHESIVE BACKED RECEPTACLE DEVICE PLATE LABELS IDENTIFYING THE CIRCUIT FEEDING THE DEVICE. LABELS SHALL INDICATE PANEL AND CIRCUIT NUMBER.
30. FINAL TYPED PANELBOARD DIRECTORIES INSTALLED IN THE PANELBOARD DOOR POCKET SHALL INCLUDE FINAL ACTUAL ROOM NAMES AND NUMBERS IN ADDITION TO THE GENERAL DESCRIPTION SHOWN ON THE PANEL SCHEDULES ON THE DRAWINGS.
31. CONDUCTOR SIZING IS BASED ON 75 DEGREE C. COPPER NEC RATINGS, UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL VERIFY, PRIOR TO INSTALLATION OF CONDUCTORS OR CONDUIT FEEDING ANY EQUIPMENT, THE ELECTRICAL EQUIPMENT IS RATED FOR USE WITH 75 DEGREE C. WIRING. IF ANY EQUIPMENT IS RATED FOR USE WITH LESS THAN 75 DEGREE C. CONDUCTORS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER IMMEDIATELY FOR EVALUATION/CORRECTION.
32. DO NOT PULL CONDUCTORS UNTIL THE CONDUIT SYSTEM IS COMPLETE IN EVERY DETAIL. IN THE CASE OF CONCEALED WORK, "COMPLETE" MEANS UNTIL ALL ROUGH PLASTERING OR MASONRY HAS BEEN COMPLETED.
33. WHERE SIZE IS NOT SHOWN ON THE DRAWINGS, BRANCH CIRCUITS SHALL CONSIST OF #12 OR #10 AWG MINIMUM PHASE, NEUTRAL AND EQUIPMENT GROUND CONDUCTORS IN 1/2" MINIMUM RACEWAY.
34. USE #10 AWG CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS WITH A TOTAL INSTALLED LENGTH GREATER THAN 75 FEET AND/OR BRANCH CIRCUIT HOMERUNS LONGER THAN 50 FEET, I.E.; #12 AWG INCREASED TO #10 AWG FOR RECEPTACLE BRANCH CIRCUITS OVER 75 FEET TOTAL LENGTH (INCLUDING THE HOMERUN SEGMENT) AND HOMERUNS OVER 50 FEET. IF 277 VOLT CIRCUITS ARE SHOWN, USE #10 AWG CONDUCTORS FOR 20 AMPERE, 277 VOLT BRANCH CIRCUITS WITH TOTAL INSTALLED LENGTH GREATER THAN 200 FEET AND/OR BRANCH CIRCUIT HOMERUNS LONGER THAN 125 FEET, I.E.; #12 AWG INCREASED TO #10 AWG FOR RECEPTACLE BRANCH CIRCUITS OVER 75 FEET TOTAL LENGTH (INCLUDING THE HOMERUN SEGMENT) AND HOMERUNS OVER 50 FEET.
35. COMMON NEUTRAL MULTIWIRE RECEPTACLE BRANCH CIRCUITS ARE NOT PERMITTED. PROVIDE SEPARATE, INDIVIDUAL NEUTRAL CONDUCTORS FOR MULTIWIRE BRANCH CIRCUITS.
36. KEEP CONDUCTOR SPLICES TO A MINIMUM. INSTALL SPLICES AND TAPES THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAN CONDUCTORS BEING SPLICED. USE SPLICE AND TAP CONNECTORS COMPATIBLE WITH CONDUCTOR MATERIAL. INSTALL CONDUCTORS AT EACH OUTLET WITH AT LEAST 6 INCHES OF SLACK. CONNECT OUTLETS AND COMPONENTS TO WIRING AND TO GROUND AS INDICATED AND INSTRUCTED BY THE MANUFACTURER.
37. DO NOT SPLICE BRANCH CIRCUIT HOMERUNS WITHOUT THE PERMISSION OF THE ARCHITECT/ENGINEER. HOMERUNS SHALL BE CONTINUOUS FROM THE LAST OUTLET BOX TO THE SERVING PANELBOARD.
38. DO NOT COMBINE BRANCH CIRCUIT HOMERUNS UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS.
39. DO NOT CHANGE CIRCUITING SHOWN WITHOUT PERMISSION OF THE ARCHITECT/ENGINEER.
40. TROUGH TAPS SHALL BE AT SWITCH AMPACITY, UNLESS NOTED OTHERWISE.
41. INSTALL WIRING DEVICES AT HEIGHTS AS SHOWN ON THE DRAWINGS. ALSO COORDINATE MOUNTING HEIGHTS WITH THE ARCHITECTURAL DRAWINGS AND CASEWORK DETAILS. IF CONFLICTING, ARCHITECTURAL DRAWINGS AND DETAILS SHALL GOVERN.
42. PROVIDE GROUND FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL IN ACCORDANCE WITH THE NEC INCLUDING ALL ELECTRIC WATER COOLERS, EXTERIOR RECEPTACLES AND RECEPTACLES IN AREAS SUBJECT TO POSSIBLE WET CONDITIONS. ALL RECEPTACLES INSTALLED WITHIN 6 FEET OF A SINK SHALL BE GFI PROTECTED. ALL RECEPTACLES IN NON-RESIDENTIAL KITCHENS SHALL BE GFI PROTECTED.
43. CONNECT BATTERY PACK TYPE EMERGENCY AND EXIT LIGHTING FIXTURES TO THE UNSWITCHED LIGHTING CIRCUIT SERVING THE SPACE LIGHTED BY THE EMERGENCY AND EXIT FIXTURES. THESE CONNECTIONS ARE INTENTIONALLY NOT SHOWN TO MAINTAIN DRAWING FOR CLARITY.
44. COORDINATE LIGHTING FIXTURE LOCATIONS WITH THE ARCHITECTURAL REFLECTED CEILING PLAN. IF CONFLICTS ARE NOTED, REQUEST CLARIFICATION FROM THE ARCHITECT/ENGINEER BEFORE PROCEDING.
45. ADJACENT SWITCHES SHALL BE GANGED. INSTALL BARRIERS BETWEEN UNLIKE VOLTAGE SECTIONS.
46. SEPARATE NEUTRALS ARE REQUIRED FOR ALL DIMMED LIGHTING CIRCUITS.
47. WHERE THE DRAWINGS INDICATE A LIGHTING FIXTURE IS TO BE PROVIDED WITH SPECIAL FEATURES/SWITCHING (DIMMING, EMERGENCY BATTERY, MULTI-LEVEL, ETC), THE CONTRACTOR SHALL PROVIDE THESE FIXTURES WITH THE APPROPRIATE BALLASTING TO ACCOMMODATE THE SPECIAL FEATURE. THE CONTRACTOR SHALL PROVIDE THE FIXTURES AS INDICATED IN THE LIGHTING FIXTURE SCHEDULE WITH MODIFICATIONS AS REQUIRED BY DRAWING NOTES.
48. COORDINATE LOCATIONS OF PLUMBING, MECHANICAL, ELEVATOR, DATA AND TELEPHONE AND AUDIO/VISUAL EQUIPMENT AND OF OWNER-PROVIDED EQUIPMENT WITH THE RESPECTIVE CONTRACTORS AND VENDORS AND THE OWNER BEFORE ROUGH-IN. ADJUST LIGHTING FIXTURES, RECEPTACLES AND ELECTRICAL EQUIPMENT TO ACCOMMODATE THIS EQUIPMENT. ADVISE THE ARCHITECT/ENGINEER OF CONFLICTS BEFORE ROUGH-IN
49. BEFORE COMMENCING WORK OR ORDERING MATERIALS, THE CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND VERIFY THE NAMEPLATE RATINGS OF ALL EQUIPMENT (MOTORS, HEATERS, COMPRESSORS, ETC.) AND ADJUST THE RATINGS OF THE ELECTRICAL EQUIPMENT (SWITCHES, FUSES, CIRCUIT BREAKERS, FEEDERS, ETC.) AS APPROPRIATE TO SERVE THIS EQUIPMENT.
50. ENERGIZE EQUIPMENT ONLY AFTER OBTAINING PERMISSION FROM THE CONTRACTOR PROVIDING THE EQUIPMENT.
51. UNLESS SPECIFICALLY NOTED OTHERWISE, THE ELECTRICAL CONTRACTOR SHALL MAKE FINAL CONNECTIONS TO ALL UTILIZATION EQUIPMENT SHOWN ON THE DRAWINGS. VERIFY THE TYPE OF FINAL CONNECTION AND PROVIDE APPROPRIATE WIRING METHOD. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL, PLUMBING AND GENERAL CONTRACTORS, PRIOR TO ORDERING OR INSTALLATION OF ANY EQUIPMENT, TO VERIFY MECHANICAL AND PLUMBING EQUIPMENT REQUIREMENTS ARE PROVIDED IN THE ELECTRICAL DESIGN. THE CONTRACTOR WILL NOT BE COMPENSATED FOR COSTS ASSOCIATED WITH CHANGING THE ELECTRICAL SYSTEMS TO MATCH UTILIZATION EQUIPMENT, EVEN IF THE ELECTRICAL WORK IS INSTALLED PER THE ELECTRICAL DRAWINGS.
52. THE MECHANICAL AND PLUMBING CONTRACTORS SHALL FURNISH ALL STARTERS AND CONTROLS FOR THEIR EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL MOUNT STARTERS FURNISHED BY THE MECHANICAL AND PLUMBING CONTRACTORS, THE ELECTRICAL CONTRACTOR PROVIDE ALL SAFETY SWITCHES, WIRING AND CONNECTIONS TO LINE SIDE AND LOAD SIDE OF STARTERS AND SAFETY SWITCHES COMPLETE TO MECHANICAL EQUIPMENT. FOR RESISTANCE TYPE LOADS WHERE STARTERS OR CONTACTORS ARE NOT REQUIRED, THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL POWER WIRING AND CONNECTIONS COMPLETE TO EQUIPMENT. THE MECHANICAL AND PLUMBING CONTRACTORS SHALL PROVIDE ALL CONTROL WIRING AND CONNECTIONS AND DEVICES FOR THEIR EQUIPMENT.
53. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL EQUIPMENT TERMINATIONS, PLUGS AND CORDSETS WITH VENDOR EQUIPMENT AND VERIFY ALL DEVICE LOCATIONS FOR SPECIALITY EQUIPMENT WITH CASEWORK PRIOR TO ROUGH-IN.
54. THE LAYOUT AND PLACEMENT OF ELECTRICAL DISTRIBUTION EQUIPMENT IN ELECTRICAL AND MECHANICAL EQUIPMENT ROOMS IS BASED ON PUBLISHED EQUIPMENT SIZES AND SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. DEVIATIONS FROM CONFIGURATIONS SHOWN IS THE RESPONSIBILITY OF THE CONTRACTOR. PROVIDE NATIONAL ELECTRIC CODE REQUIRED CLEARANCES FOR ALL ELECTRICAL EQUIPMENT, PANELBOARDS, TRANSFORMERS, SAFETY SWITCHES, SWITCHBOARDS, ETC. COORDINATE RESOLUTION OF CONFLICTS WITH OTHER TRADES. ADVISE THE ARCHITECT/ENGINEER OF CONFLICTS BEFORE ROUGH-IN.
55. COORDINATION WITH THE UTILITY COMPANY FOR PLACEMENT OF THE UTILITY'S FACILITIES AND THE CONTRACTOR'S SERVICE ENTRANCE RACEWAYS AND CONNECTIONS TO THE CONTRACTOR'S SERVICE ENTRANCE CONDUCTORS IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
56. TELECOMMUNICATIONS AND DATA CABLES WILL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. LEAVE PULL WIRES OR ROPES OF ADEQUATE TENSILE STRENGTH IN ALL EMPTY CONDUITS.
57. PROVIDE TELEPHONE, FIBER AND DATA SERVICE ENTRANCE CONDUIT IN SIZES AND LOCATIONS FOR MOBILE UNITS AS SHOWN ON THE DRAWINGS AND AS REQUIRED BY THE OWNER AND THE SERVICE UTILITIES. UTILITY SERVICE ENTRANCE CABLES WILL BE PROVIDED AND INSTALLED BY THE OWNER'S SERVICE UTILITIES. LEAVE PULL WIRES OR ROPES OF ADEQUATE TENSILE STRENGTH IN ALL EMPTY CONDUITS.
58. EXACT SPACING OF SMOKE AND HEAT DETECTORS AND A/V DEVICES SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE WITH POSITIONS SHOWN ON THE DRAWINGS. DETECTOR SPACING IS BASED UPON NFPA 72 INCLUDING APPENDIX A. SLIGHT ADJUSTMENTS MAY BE MADE IN SPACING IF REQUIRED BY FIELD CONDITIONS, BUT SPACING SHALL NOT EXCEED ADA, NFPA AND EQUIPMENT MANUFACTURERS SPACING CRITERIA. DO NOT INSTALL SMOKE DETECTORS WITHIN 3 FEET OF SUPPLY AIR DIFFUSERS OR RETURN GRILLES. PROVIDE FLEX CONDUIT CONNECTION TO SMOKE AND HEAT DETECTORS OF ADEQUATE LENGTH TO ALLOW HORIZONTAL ADJUSTMENT OF FOUR FEET FROM POSITION INDICATED ON DRAWINGS.
59. INSTALLATION INFORMATION PACKED WITH LIGHTING FIXTURES, DEVICES AND EQUIPMENT SHALL BE RETAINED FOR INCLUSION IN THE OPERATIONS AND MAINTENANCE MANUALS.
60. SAFETY: COMPLY WITH OSHA AND NEC ARC FLASH PROTECTION REQUIREMENTS.
61. ALL SWITCHES, RECEPTACLE AND LIGHTS SHALL COMPLY WITH ANSI 117.2 FOR ADA REQUIREMENTS.
62. THE ELECTRICAL CONTRACTOR AND ALL SUB CONTRACTORS WORKING FOR THE ELECTRICAL CONTRACTOR ARE RESPONSIBLE FOR COMMISSIONING EACH SYSTEM INDICATED IN THESE DRAWINGS. THE ELECTRICAL CONTRACTOR AND ALL SUB CONTRACTORS WORKING FOR THE ELECTRICAL CONTRACTOR ARE RESPONSIBLE FOR PROVIDING A COMPLETE OPERATIONAL SYSTEM TO OWNER. THE SYSTEMS WILL NOT BE CONSIDERED OPERATIONAL UNTIL THE OWNER HAS APPROVED EACH SYSTEM.
63. INSTALL COLOR CODED CEILING TACKS IN ACOUSTICAL TILE CEILINGS OR COLOR CODED TAPE ON CEILING GRID TO IDENTIFY LOCATION OF ELECTRICAL EQUIPMENT, DISCONNECTS, LIGHTING CONTROLLERS AND POWER PACKS ETC... THAT REQUIRE REGULAR MAINTENANCE OR ARE PART OF A LIFE SAFETY SYSTEM. DOTS SHALL BE PLACED ON CEILING GRID.
64. MC CABLE WITH INSULATED GROUND CONDUCTOR MAY BE USED FOR BRANCH CIRCUITS. DO NOT USE WHERE SUBJECT TO PHYSICAL DAMAGE OR WHERE EXPOSED TO CORROSIVE CONDITIONS.

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION
	WALL MOUNTED LIGHT FIXTURE LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)
	RECESSED LIGHT FIXTURE LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)
	2x4 LIGHT FIXTURE, RECESSED OR SURFACE MOUNTED LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)
	4FT SUSPENDED OR SURFACE MOUNTED LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)
	SURFACE LIGHT FIXTURE LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)
	4FT OR 8FT CHANNEL LIGHT FIXTURE, SUSPENDED OR SURFACE MOUNTED LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)
	EMERGENCY LIGHTING UNIT, 2-HEAD WITH BATTERY BACK-UP, WALL MOUNTED, "NOT SWITCHED" INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)
	EXIT SIGN W/EMERGENCY LIGHTING UNIT, WALL/END MOUNTED, ARROW INDICATES DIRECTION. INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)
	SINGLE POLE SW., 120/277 VAC, 20A, MOUNTED AT 48" AFF UNLESS NOTED OTHERWISE
	3-WAY SW., 120/277 VAC, 20A, MOUNTED AT 48" AFF UNLESS NOTED OTHERWISE
	KEYED SW., 120/277 VAC, 20A, MOUNTED AT 48" AFF UNLESS NOTED OTHERWISE
	HEAVY DUTY 0-10V DIMMER, 1500W @ 120VAC, 4000W @ 277VAC MOUNTED AT 48:AFF UNLESS NOTED OTHERWISE
	WALL MOUNTED OCCUPANCY SENSOR, SINGLE BUTTON ON/OFF CONTROL, 180° COVERAGE, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, DUAL BUTTON ON/OFF CONTROL, 180° COVERAGE, ADDITIONAL POWER SUPPLY FOR FAN OPERATION, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
OS	CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, 360° COVERAGE, NPP-16-ER, NPP-16-D-ER POWER PACKS REQUIRED FOR LIGHTING CONTROLS IN OPEN OFFICE AREAS. POWER PACKS SHALL BE MOUNTED ABOVE ACCESSIBLE CEILINGS, MARK CEILING TILE WITH RED DOT TO INDICATE LOCATION. 2 = SECOND CONTACT TO BE PROVIDED FOR CONNECTION TO BUILDING MANAGEMENT
	TIMED SW.,5 MIN, 10 MIN, 15 MIN, 30 MIN, 120/277 VAC, 20A, MOUNTED AT 48" AFF UNLESS NOTED OTHERWISE
EPO	WALL MOUNTED EMERGENCY OFF PUSH BUTTON WITH RED MUSHROOM STYLE HEAD, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
	RECEPTACLE, DUPLEX, 120VAC, 20A MOUNTED 16"AFF UNLESS OTHERWISE NOTED (SEE ELECTRICAL MOUNTING HEIGHT DETAIL) WP - LISTED WEATHER-RESISTANT TYPE DEVICE WITH WEATHERPROOF, EXTRA DUTY, WHILE IN USE COVER GFI - GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A, MOUNTED 24" AFF LOCATE GFI TEST SWITCH IN A READILY ACCESSIBLE LOCATION T - TAMPER RESISTANT R - RECEPTACLE SHALL BE RED IN COLOR PER NEC 70, 517.31(E)
	RECEPTACLE, DUPLEX, 120VAC, 20A, MOUNTED 6" AFF, ABOVE COUNTER TOP.
	RECEPTACLE, QUADPLEX, 120VAC, 20A MOUNTED 16"AFF UNLESS OTHERWISE NOTED (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	240 VOLT RECEPT.
	JUNCTION BOX
480/277 208/120	PANELBOARD, SURFACE OR RECESSED MOUNTED AS SHOWN. SIZE, RATINGS, AND MOUNTING AS INDICATED ON PANEL SCHEDULE. CONTRACTOR IS RESPONSIBLE FOR REQUIRED CLEARANCE IN FRONT OF ELECTRICAL PANEL. SEE NEC TABLE 110.26 WORKING SPACES FOR ADDITIONAL CLEARANCE CONDITIONS.
	TRANSFORMER (TYPE DENOTED)
	DISCONNECT SWITCH, FUSED, HEAVY DUTY, SIZE AS INDICATED ON DRAWINGS ##A = DISCONNECT SIZE / # = NUMBER OF POLES / # = NEMA RATING, /##AF = FUSE SIZE
	PHOTOCELL
	HALFTONE SYMBOL INDICATES EXISTING
	DASHED SYMBOL INDICATES REMOVED
	FLOOR RECEPT. (DUPLEX SHOWN)
	WALL TELEPHONE W/ INTERCOM OUTLET
	DATA INFORMATION OUTLET (TYPE DENOTED)
	WIRELESS ACCESS POINT, DATA CABLE MUST BE TERMINATED IN A JACK IN THE CEILING. 1FT PATCH CABLE MUST BE PROVIDED AND DROPPED BELOW THE CEILING
	BELL
	INTERCOM SPEAKER (WALL OR CEILING MT.)
	ANTENNA
	FIRE ALARM REMOTE ANNUNCIATOR
DC	DOOR CONTACTS - TO INTRUSION DETECTION PANEL
CR	CARD READER
	CCTV CAMERA
1	KEYED NOTE (SEE SCHEDULE)
	POWER AND SWITCH LEG
	UNSWITHCED LEG

ELECTRICAL ABBREVIATIONS LIST

1P	1 POLE (2P, 3P, 4P, ETC.)
A	AMPERE
AC	ABOVE COUNTER OR AIR CONDITIONER
ACLG	ABOVE CEILING
ADO	AUTOMATIC DOOR OPENER
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFI	ARC FAULT CIRCUIT INTERRUPTER
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
AMP	AMPERE
AMPL	AMPLIFIER
ANNUN	ANNUNCIATOR
APPROX	APPROXIMATELY
AQ-STAT	AQUASTAT
ARCH	ARCHITECT, ARCHITECTURAL
AS	AMP SWITCH
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BD	BOARD
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
C	CONDUIT
CAB	CABINET
CAT	CATALOG
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLG	CEILING
COMB	COMBINATION
CMPR	COMPRESSOR
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUATION OR CONTINUOUS
CONTR	CONTRACTOR
CONV	CONVECTOR
CP	CIRCULATING PUMP
CRT	CATHODE-RAY TUBE
CT	CURRENT TRANSFORMER
CTR	CENTER
CU	COPPER
DCP	DOMESTIC WATER CIRCULATING PUMP
DEPT	DEPARTMENT
DET	DETAIL
DIA	DIAMETER
DISC	DISCONNECT
DIST	DISTRIBUTION
DN	DOWN
DPR	DAMPER
DS	SAFETY DISCONNECT SWITCH
DT	DOUBLE THROW
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
EMT	ELECTRICAL METALLIC TUBING
EP	ELECTRIC PNEUMATIC
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXH	EXHAUST
EXP	EXPLOSION PROOF
FA	FIRE ALARM
FABP	FIRE ALARM BOOSTER POWER SUPPLY PANEL
FACP	FIRE ALARM CONTROL PANEL
FCU	FAN COIL UNIT
FIXT	FIXTURE
FLR	FLOOR
FLUOR	FLUORESCENT
FU	FUSE
FUDS	FUSED SAFETY DISCONNECT SWITCH
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTOR
GND	GROUND
GRS	GALVANIZED RIGID STEEL (CONDUIT)
GYP BD	GYPSUM BOARD
HOA	HANDS-OFF-AUTOMATIC SWITCH
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPF	HIGH POWER FACTOR
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HWP	HYDRONIC WATER PUMP
IC	INTERRUPTING CAPACITY
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
INCAND	INCANDESCENT
IR	INFRARED
I/W	INTERLOCK WITH
J-BOX	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT-AMPERE
KVAR	KILOVOLT-AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
LOC	LOCATE OR LOCATION
LT	LIGHT
LTG	LIGHTING
LTNG	LIGHTNING
LV	LOW VOLTAGE
MAX	MAXIMUM
MAG.S	MAGNETIC STARTER
M/C	MOMENTARY CONTACT
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDC	MAIN DISTRIBUTION CENTER
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MFS	MAIN FUSED DISCONNECT SWITCH
MH	MANHOLE
MIC	MICROPHONE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MMS	MANUAL MOTOR STARTER
MOA	MULTIOUTLET ASSEMBLY
MSP	MOTOR STARTER PANELBOARD
MSBD	MAIN SWITCHBOARD
MT	MOUNT
MT.C	EMPTY CONDUIT
MTS	MANUAL TRANSFER SWITCH
MTR	MOTOR, MOTORIZED
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NFDS	NON-FUSED SAFETY DISCONNECT SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NPF	NORMAL POWER FACTOR
NTS	NOT TO SCALE
OH	OVERHEAD
OL	OVERLOADS
PA	PUBLIC ADDRESS
PB	PULL BOX OR PUSHBUTTON
PE	PNEUMATIC ELECTRIC
PED	PEDESTAL
PF	POWER FACTOR
PH	PHASE
PIV	POST INDICATING VALVE
PNL	PANEL
PP	POWER POLE
PR	PAIR
PRI	PRIMARY
PROJ	PROJECTION
PRV	POWER ROOF VENTILATOR
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE (CONDUIT)
PWR	POWER
QUAN	QUANTITY
RCPT	RECEPTACLE
REQD	REQUIRED
RM	ROOM
RSC	RIGID STEEL CONDUIT
RTU	ROOF TOP UNIT
SC	SURFACE CONDUIT
SEC	SECONDARY
SHT	SHEET
SIM	SIMILAR
S/N	SOLID NEUTRAL
SPEC	SPECIFICATION
SPKR	SPEAKER
SP	SPARE
SR	SURFACE RACEWAY
SS	STAINLESS STEEL
SSW	SELECTOR SWITCH
S/S	STOP/START PUSHBUTTONS
STA	STATION
STD	STANDARD
SURF	SURFACE MOUNTED
SW	SWITCH
SWBD	SWITCHBOARD
SYM	SYMMETRICAL
SYS	SYSTEM
TEL	TELEPHONE
TEL/DATA	TELEPHONE/DATA
TERM	TERMINAL
TL	TWIST LOCK
TR	TAMPER RESISTANT
T-STAT	THERMOSTAT
TTC	TELEPHONE TERMINAL CABINET
TV	TELEVISION
TVTC	TELEVISION TERMINAL CABINET
TYP	TYPICAL
UC	UNDER COUNTER
UE	UNDERGROUND ELECTRICAL
UG	UNDERGROUND
UH	UNIT HEATER
UT	UNDERGROUND TELEPHONE
UTIL	UTILITY
UV	UNIT VENTILATOR OR ULTRAVIOLET
V	VOLT
VA	VOLT-AMPERES
VDT	VIDEO DISPLAY TERMINAL
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
W	WATT
W/	WITH
WG	WIRE GUARD
WH	WATER HEATER
W/O	WITHOUT
WP	WEATHERPROOF
XFMR	TRANSFORMER
XFR	TRANSFER
∠	ANGLE
@	AT
Δ	DELTA
'	FEET
"	INCHES
#	NUMBER
Ø	PHASE
℄	CENTER LINE
PL	PLATE

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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

ELECTRICAL SYMBOLS AND ABBREVIATIONS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO:	2019082.00
DATE:	01.20.2020
SCALE:	As indicated
DRAWN BY: HGH	PROJ MGR: WAC

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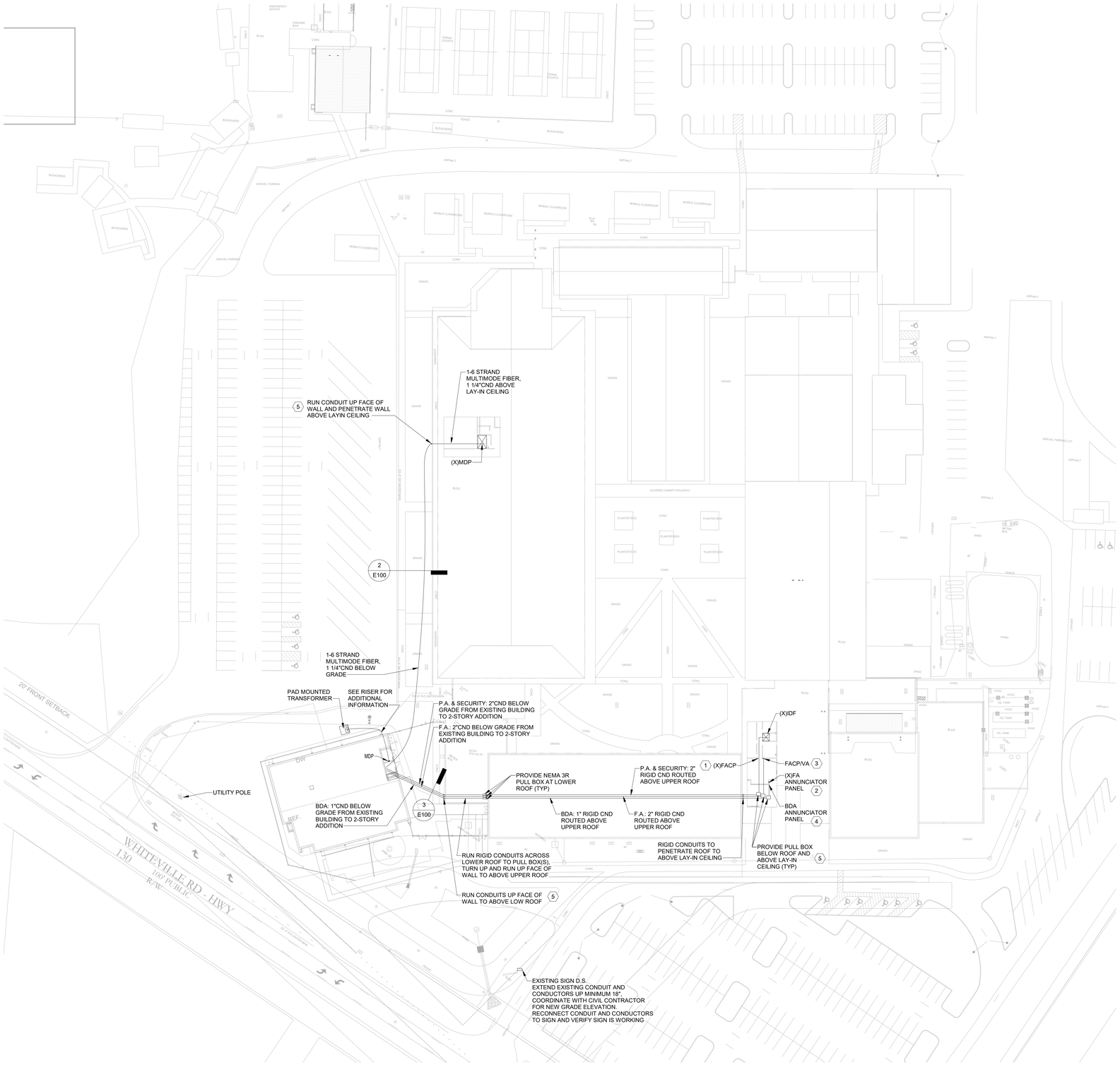
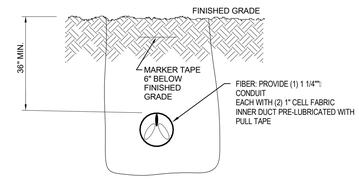
KEYNOTES

1	EXISTING FIRE ALARM CONTROL PANEL
2	EXISTING FIRE ALARM ANNUNCIATOR PANEL
3	FIRE ALARM VOICE / ALARM CONTROL PANEL (FACP), MOUNTED ABOVE EXISTING CASEWORK
4	BDA ANNUNCIATOR PANEL, SEE BDA INSALLATION NOTES SHEET E603
5	ELECTRICAL CONTRACTOR SHALL PAINT EXTERIOR CONDUIT TO MATCH COLOR OF SURFACE THAT CONDUIT IS ATTACHED, MATCH BRICK COLOR, MATCH FACIA COLOR AND MATCH TRIM COLOR ETC...



1 ELECTRICAL SITE PLAN
SCALE: 1" = 40'-0"



2 DUCTBANK SECTION - FIBER
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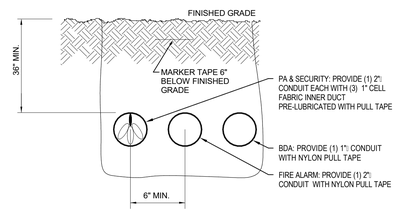

3 DUCTBANK DETAIL - FIRE ALARM/PA & SECURITY/BDA
NO SCALE

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ELECTRICAL SITE PLAN

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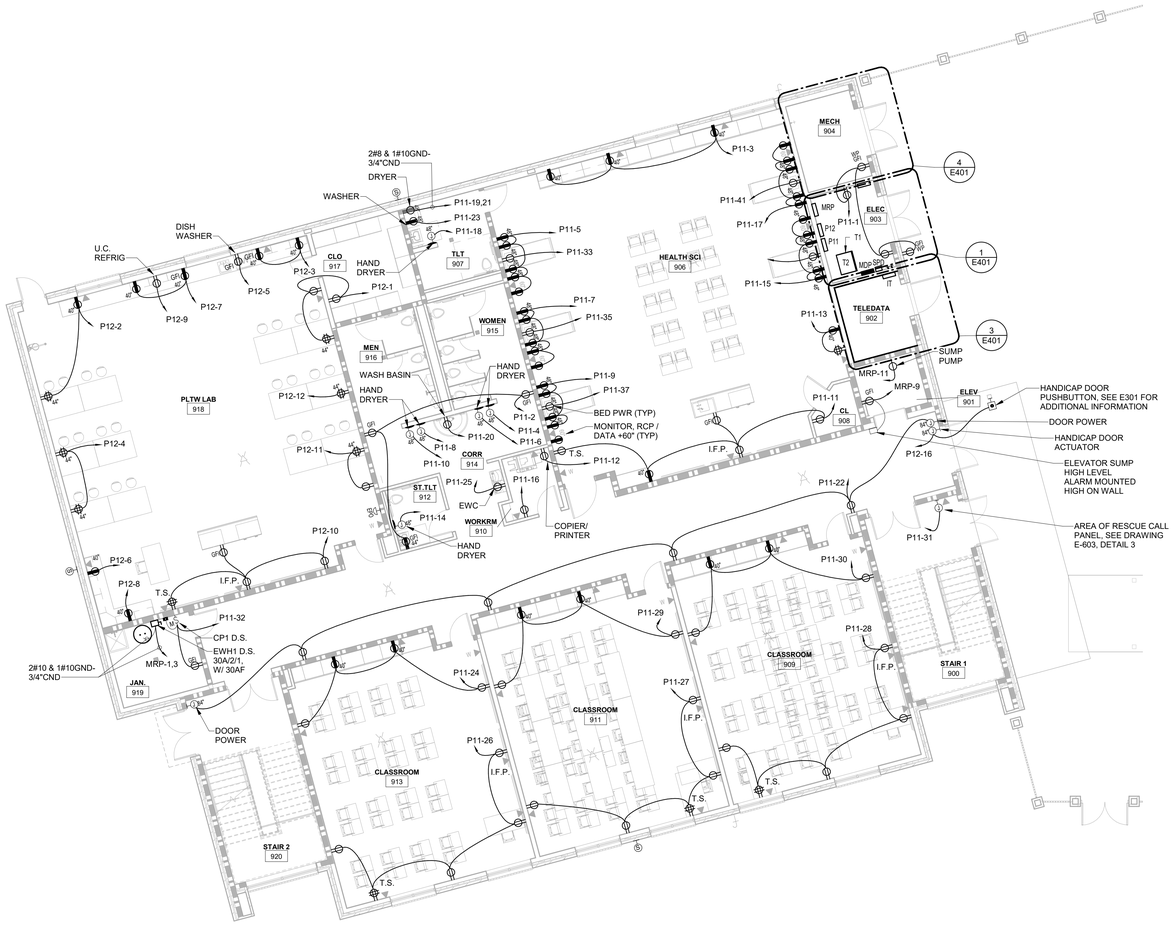
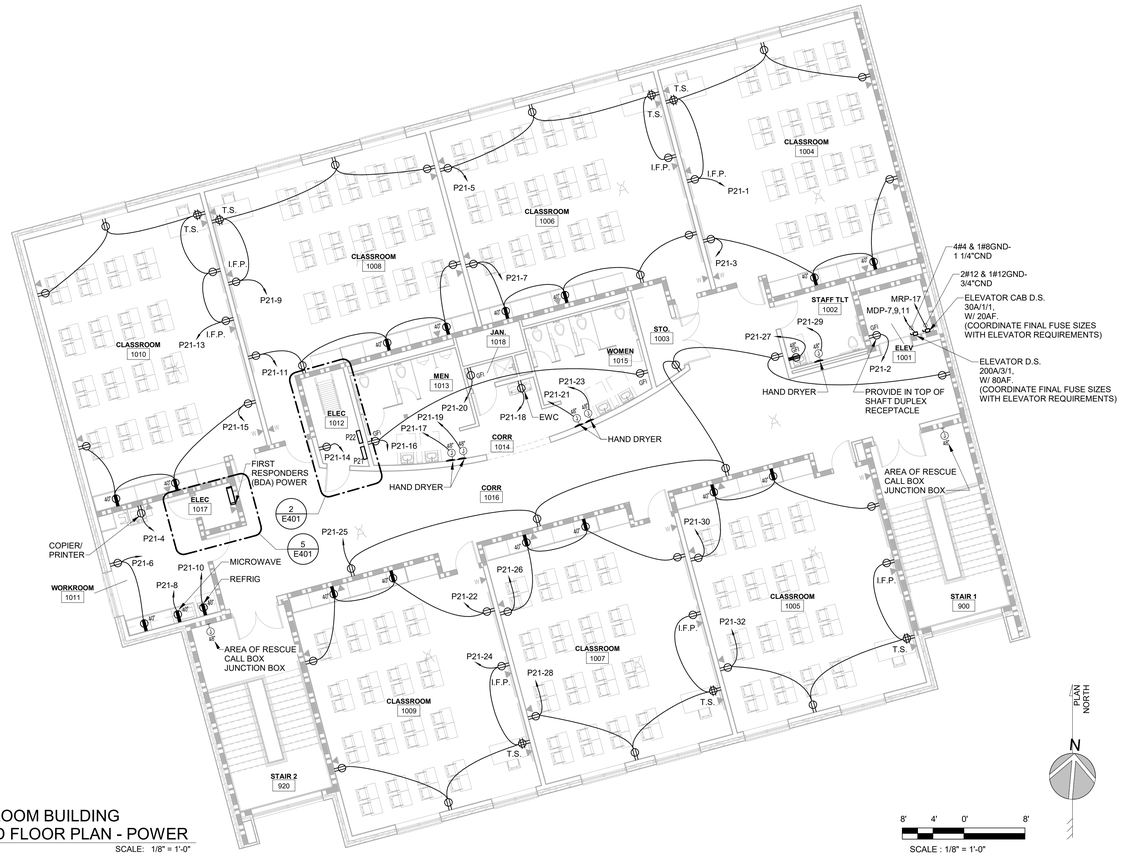


1 CLASSROOM BUILDING FIRST FLOOR PLAN - HVAC POWER

SCALE: 1/8" = 1'-0"



2 CLASSROOM BUILDING SECOND FLOOR PLAN - POWER

SCALE: 1/8" = 1'-0"

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550 WHITEVILLE ROAD N.W.
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DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING AND RENOVATION FIRST AND SECOND FLOOR PLANS - POWER

ISSUE BLOCK

Mark	Date	Description
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	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
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SCALE: 1/8" = 1'-0"
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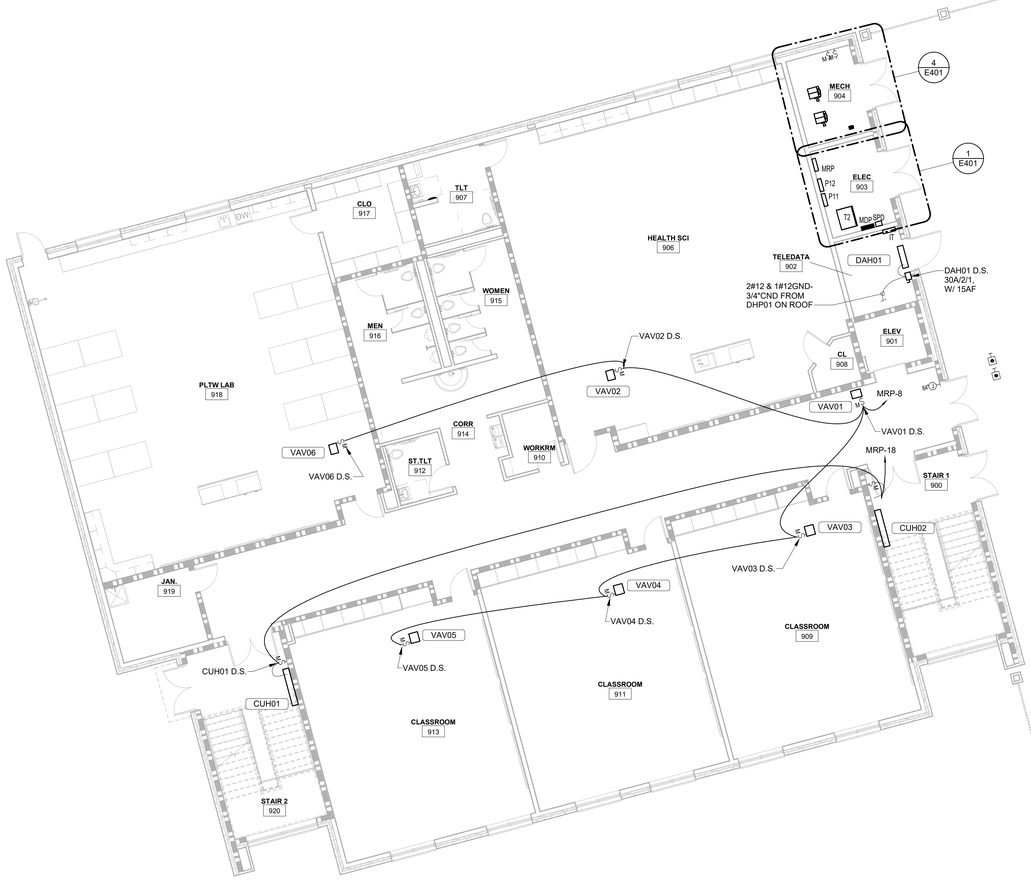
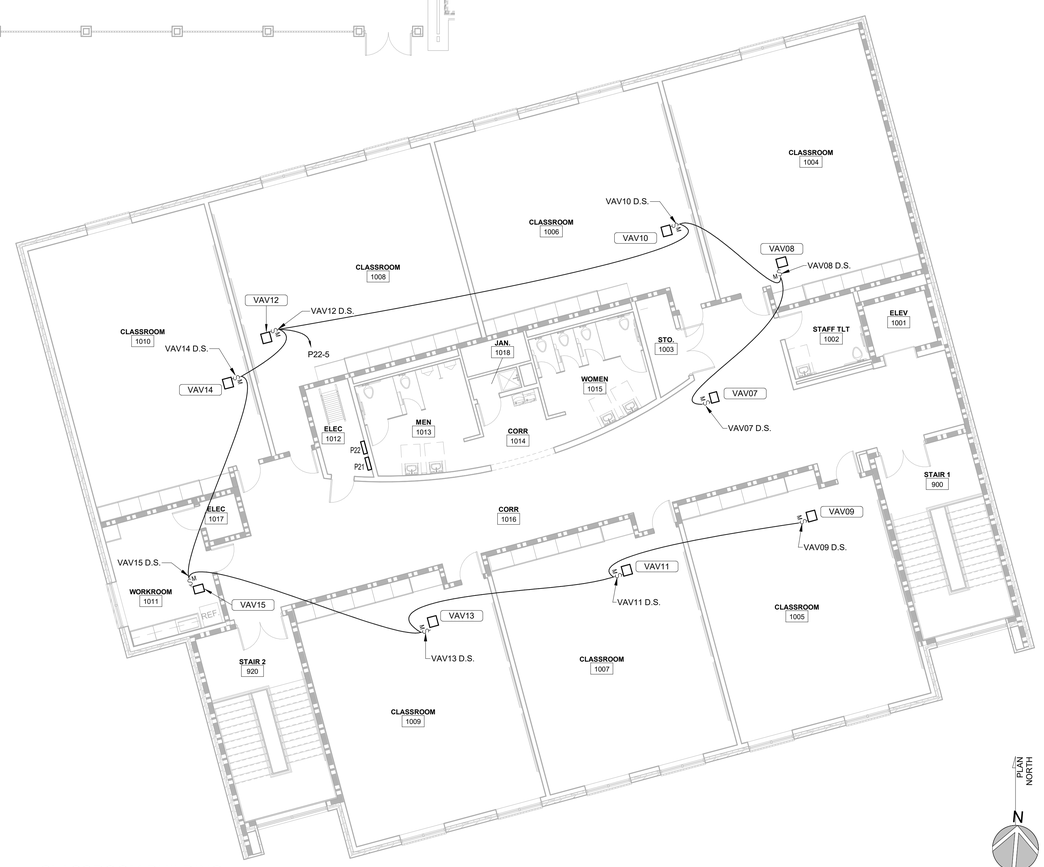


1 CLASSROOM BUILDING FIRST FLOOR PLAN - HVAC POWER

SCALE: 1/8" = 1'-0"



2 CLASSROOM BUILDING SECOND FLOOR PLAN - HVAC POWER

SCALE: 1/8" = 1'-0"

8' 4' 0' 8'

SCALE : 1/8" = 1'-0"

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550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING AND RENOVATION FIRST AND SECOND FLOOR PLANS - HVAC POWER

ISSUE BLOCK

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PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 1/8" = 1'-0"
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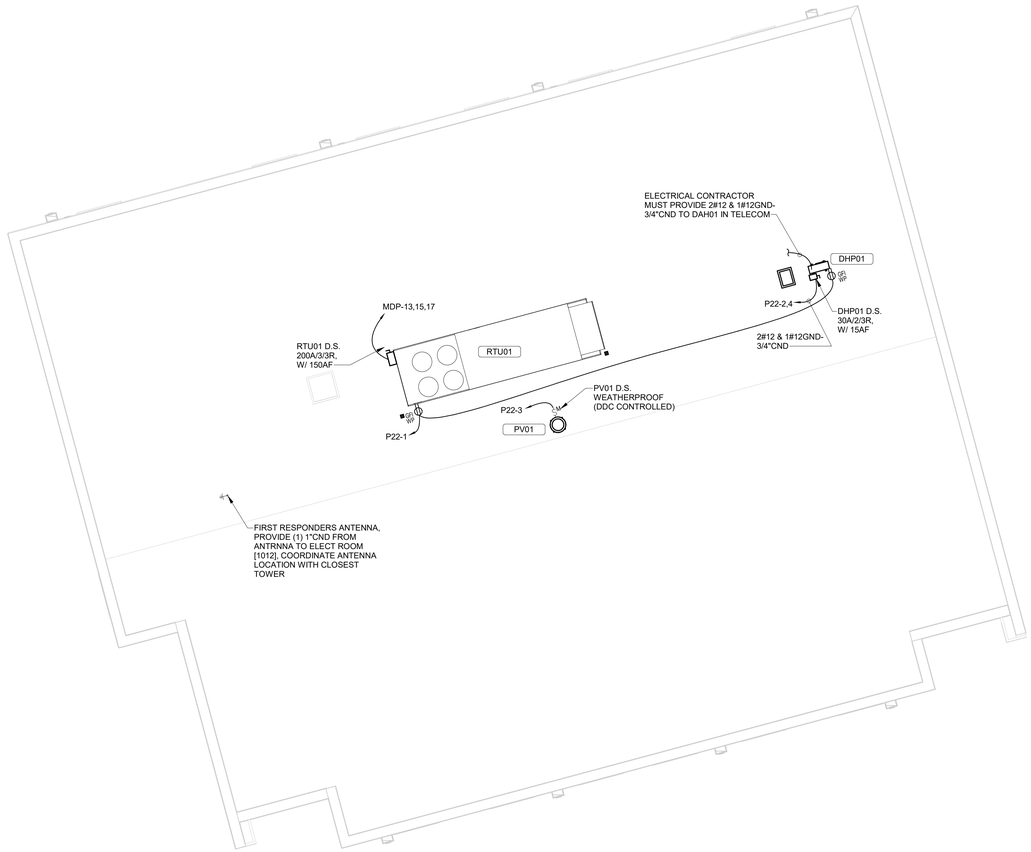

1 CLASSROOM BUILDING ROOF PLAN - POWER

SCALE: 1/8" = 1'-0"

PLAN NORTH

N

8' 4' 0' 8'

SCALE : 1/8" = 1'-0"

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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING AND RENOVATION ROOF PLAN - POWER

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
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	07.11.19	NCDPI SD SUBMISSION

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SCALE: 1/8" = 1'-0"
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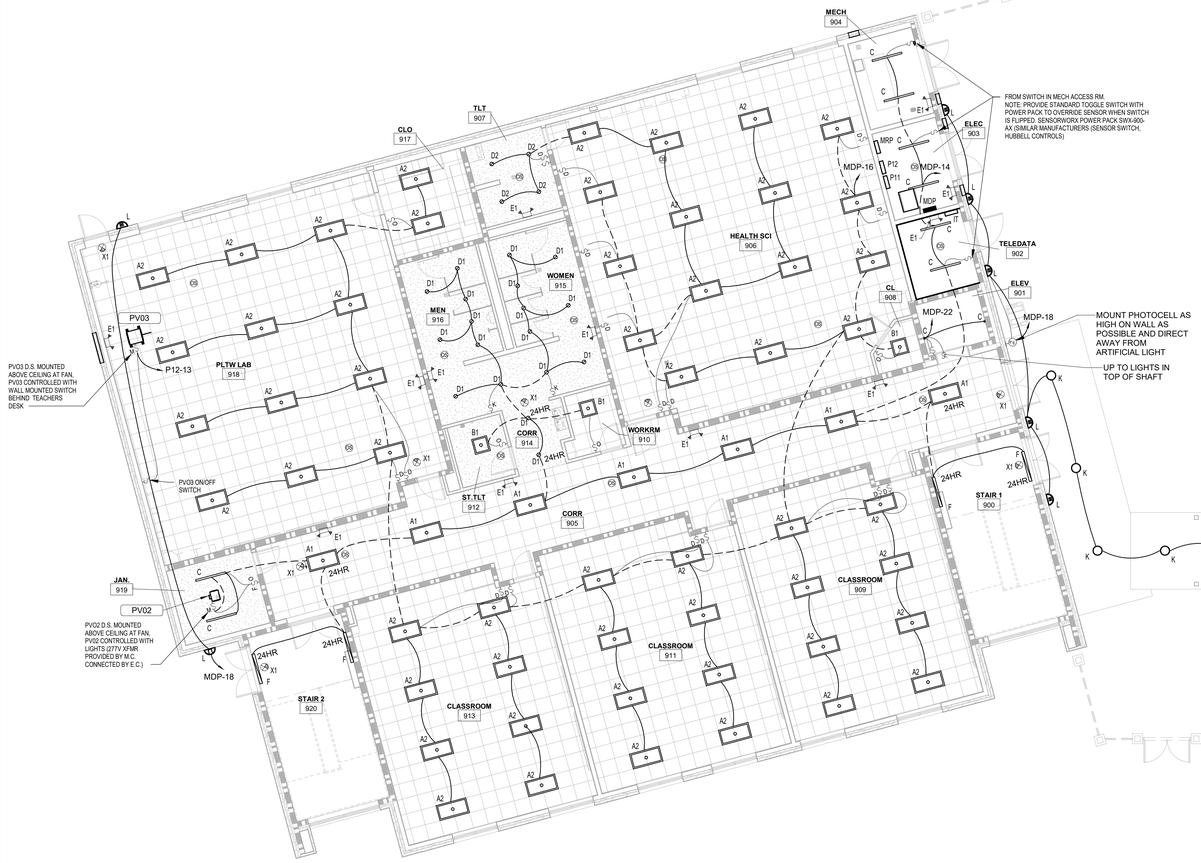
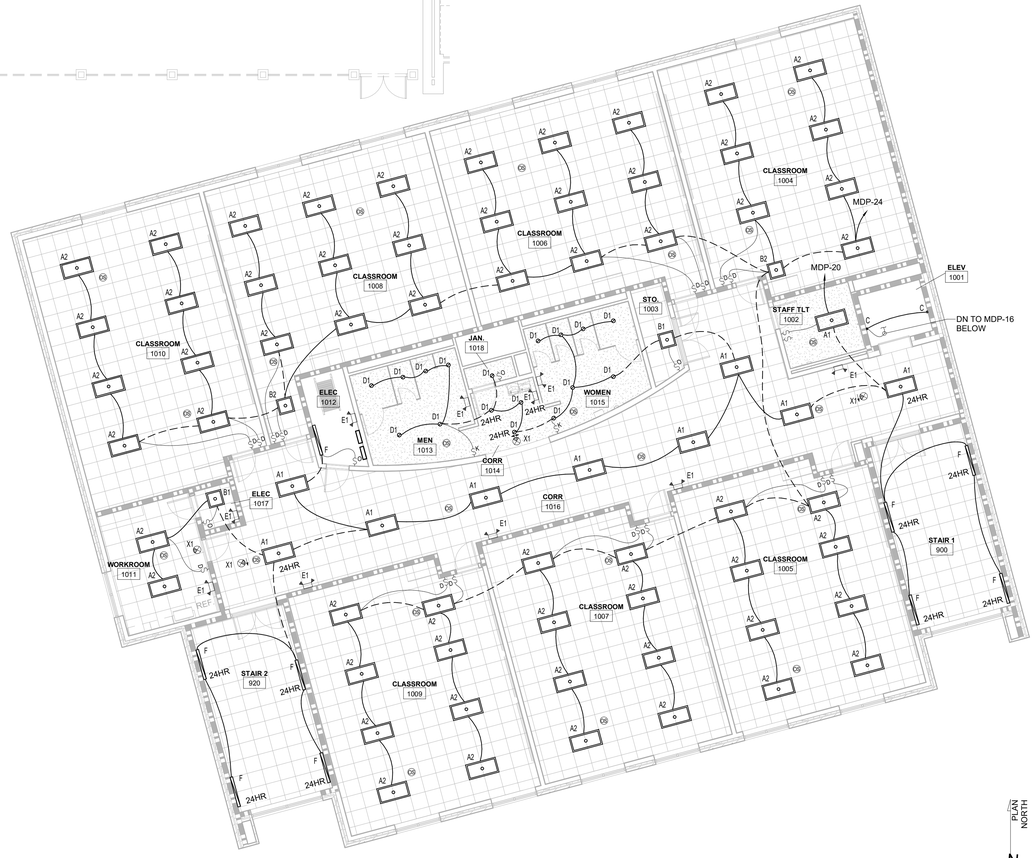


1 CLASSROOM BUILDING FIRST FLOOR PLAN - LIGHTING

SCALE: 1/8" = 1'-0"



2 CLASSROOM BUILDING SECOND FLOOR PLAN - LIGHTING

SCALE: 1/8" = 1'-0"

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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING FIRST AND SECOND FLOOR PLANS - LIGHTING

ISSUE BLOCK

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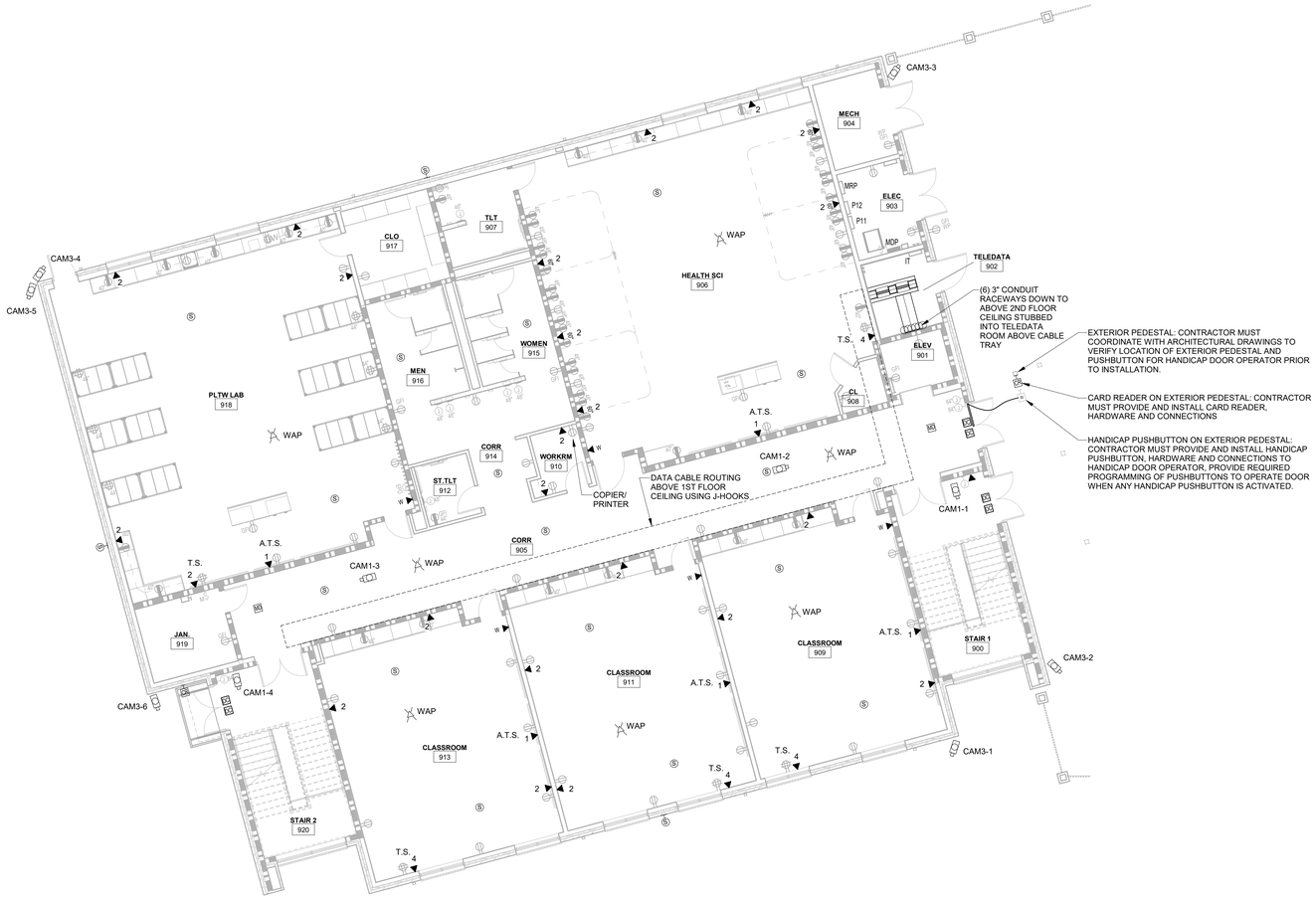

(6) 3" CONDUIT RACEWAYS DOWN TO ABOVE 2ND FLOOR CEILING STUBBED INTO TELEDATA ROOM ABOVE CABLE TRAY

EXTERIOR PEDESTAL: CONTRACTOR MUST COORDINATE WITH ARCHITECTURAL DRAWINGS TO VERIFY LOCATION OF EXTERIOR PEDESTAL AND PUSHBUTTON FOR HANDICAP DOOR OPERATOR PRIOR TO INSTALLATION.

CARD READER ON EXTERIOR PEDESTAL: CONTRACTOR MUST PROVIDE AND INSTALL CARD READER, HARDWARE AND CONNECTIONS

HANDICAP PUSHBUTTON ON EXTERIOR PEDESTAL: CONTRACTOR MUST PROVIDE AND INSTALL HANDICAP PUSHBUTTON, HARDWARE AND CONNECTIONS TO HANDICAP DOOR OPERATOR, PROVIDE REQUIRED PROGRAMMING OF PUSHBUTTONS TO OPERATE DOOR WHEN ANY HANDICAP PUSHBUTTON IS ACTIVATED.

1 CLASSROOM BUILDING FIRST FLOOR PLAN - SYSTEMS

SCALE: 1/8" = 1'-0"

(6) 3" CONDUIT RACEWAYS DOWN TO ABOVE 1ST FLOOR CEILING

2 CLASSROOM BUILDING SECOND FLOOR PLAN - SYSTEMS

SCALE: 1/8" = 1'-0"

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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING FIRST AND SECOND FLOOR PLANS - SYSTEMS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
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	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
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DRAWN BY: HGH | PROJ MGR: WAC

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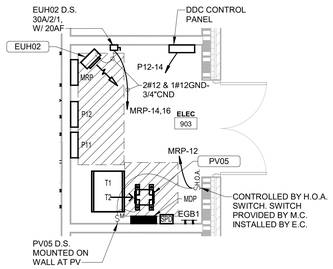
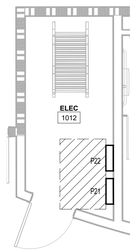


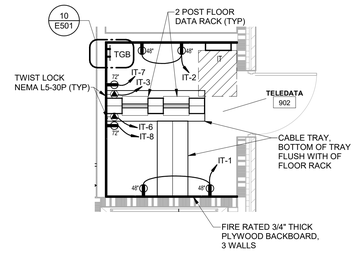
1 ENLARGED ELECTRICAL ROOM POWER PLAN

SCALE: 1/4" = 1'-0"



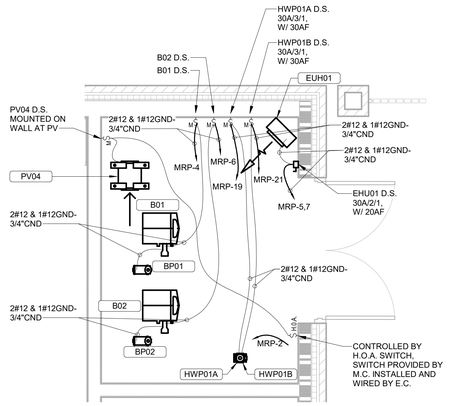
2 ENLARGED ELECTRICAL ROOM POWER PLAN

SCALE: 1/4" = 1'-0"



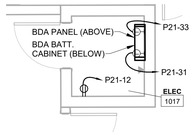
3 ENLARGED TELEDATA ROOM POWER PLAN

SCALE: 1/4" = 1'-0"



4 ENLARGED MECHANICAL ROOM POWER PLAN

SCALE: 3/8" = 1'-0"



5 ENLARGED ELECTRICAL ROOM POWER PLAN

SCALE: 1/4" = 1'-0"

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PROJECT TITLE

WEST
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HIGH SCHOOL
NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

ENLARGED
ELECTRICAL PLANS

ISSUE BLOCK

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	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: As indicated
DRAWN BY: HGH | PROJ MGR: WAC

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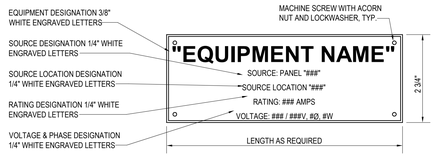
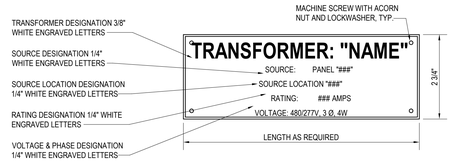


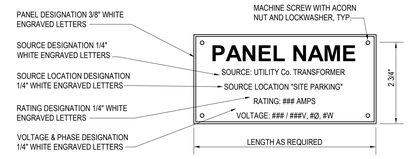
NOTE: SEE SPECS. SECTION 260553 FOR NAMEPLATE MATERIAL AND ENGRAVING COLORS.

1 NAME PLATE - EQUIPMENT
NO SCALE



NOTE: SEE SPECS. SECTION 260553 FOR NAMEPLATE MATERIAL AND ENGRAVING COLORS.

2 NAME PLATE - TRANSFORMER
NO SCALE



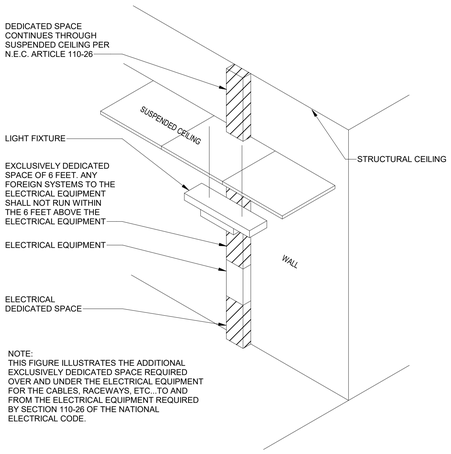
NOTE: SEE SPECS. SECTION 260553 FOR NAMEPLATE MATERIAL AND ENGRAVING COLORS.

3 NAME PLATE - PANELBOARD
NO SCALE

NOTES:
1. LABEL SHOWN CAN BE SOURCED FROM SAFETYSIGN.COM, OTHER SUPPLIERS ARE COMPLIANTSIGNS.COM & SETON.COM

2. THIS WARNING LABEL MINIMALLY COMPLIES WITH NEC, HOWEVER IF ELECTRICAL EQUIPMENT IS LIKELY TO REQUIRE EXAMINATION OR MAINTENANCE WHILE ENERGIZED A DETAILED SHORT CIRCUIT AND ARC FLASH HAZARD ANALYSIS IS RECOMMENDED.

4 NAME PLATE - WARNING
NO SCALE



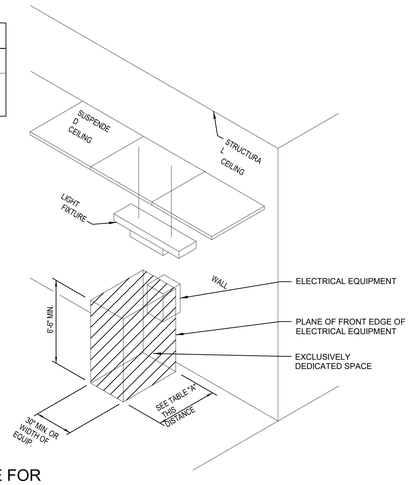
NOTE:
THIS FIGURE ILLUSTRATES THE ADDITIONAL EXCLUSIVELY DEDICATED SPACE REQUIRED OVER AND UNDER THE ELECTRICAL EQUIPMENT FOR THE CABLES, RACEWAYS, ETC., TO AND FROM THE ELECTRICAL EQUIPMENT REQUIRED BY SECTION 110-26 OF THE NATIONAL ELECTRICAL CODE.

5 DEDICATED SPACE FOR ELECTRICAL EQUIPMENT N.E.C. ARTICAL 1101
NO SCALE

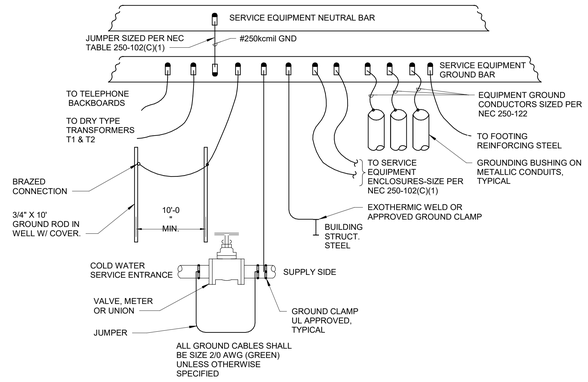
Table A - Working Clearances

VOLTAGE TO GROUND NOMINAL	MINIMUM CLEAR DISTANCE (FEET) CONDITION: 1	2	3
0 - 150	3	3	3
151 - 600	3	3 1/2	4

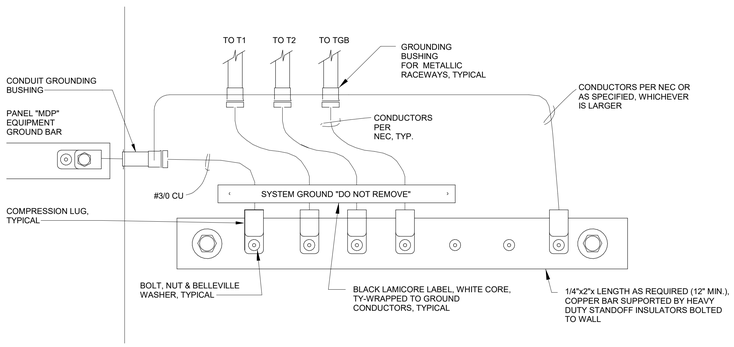
WHERE THE "CONDITIONS" ARE AS FOLLOWS:
1. EXPOSED LIVE PARTS ON ONE SIDE AND NO LIVE OR GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES EFFECTIVELY GUARDED BY SUITABLE WOOD OR OTHER INSULATING MATERIALS. INSULATED WIRE OR INSULATED BUSBARS OPERATING AT NOT OVER 300V SHALL NOT BE CONSIDERED LIVE PARTS.
2. EXPOSED LIVE PARTS ON ONE SIDE AND GROUNDED PARTS ON THE OTHER SIDE.
3. EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORK SPACE (NOT GUARDED AS PROVIDED IN CONDITION 1) WITH THE OPERATOR BETWEEN.



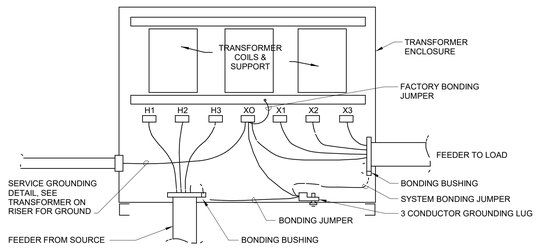
6 WORKING CLEARANCE FOR ELECTRICAL EQUIPMENT
NO SCALE



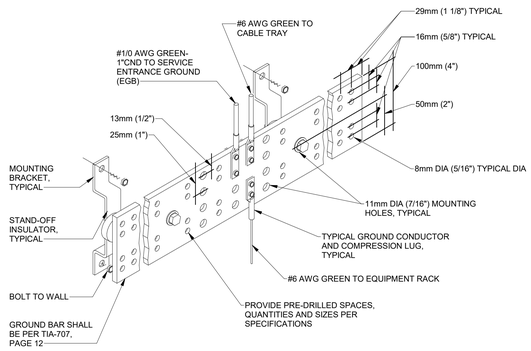
7 GROUNDING DETAIL - SERVICE
NO SCALE



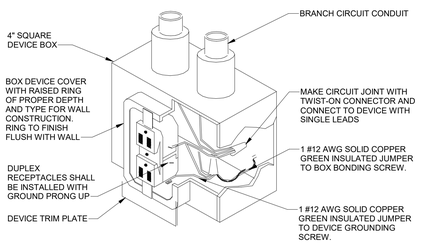
8 SERVICE EQUIPMENT GROUND BAR DETAIL (EGB)
NO SCALE



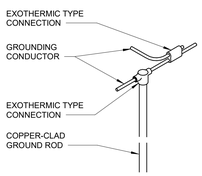
9 TRANSFORMER GROUNDING DETAIL
NO SCALE



10 TELECOM GROUND BAR DETAIL (TGB)
NO SCALE



11 RECEPTACLE GROUNDING DETAIL
NO SCALE



12 GROUND ROD DETAIL
NO SCALE

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PROJECT TITLE
WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE
ELECTRICAL DETAILS

ISSUE BLOCK

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	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
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DRAWN BY: HGH | PROJ MGR: WAC

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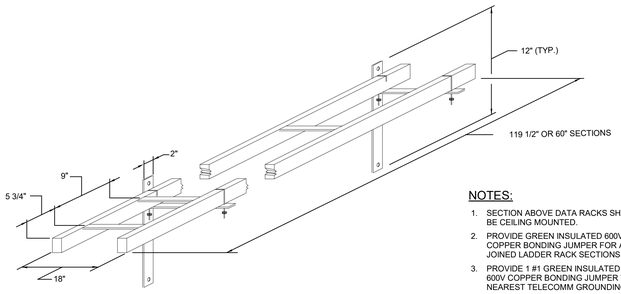
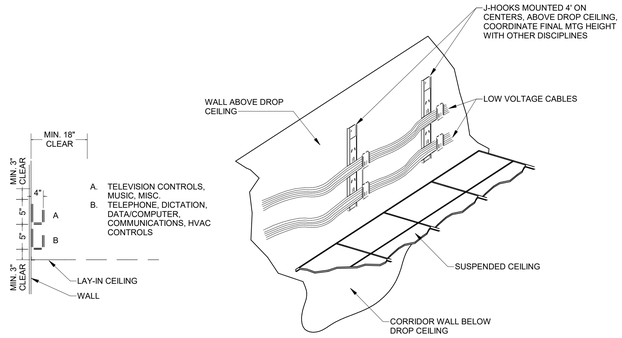


NOTES:

1. SECTION ABOVE DATA RACKS SHALL BE CEILING MOUNTED.
2. PROVIDE GREEN INSULATED 600V #6 COPPER BONDING JUMPER FOR A11 JOINED LADDER RACK SECTIONS.
3. PROVIDE 1 #1 GREEN INSULATED 600V COPPER BONDING JUMPER TO NEAREST TELECOMM GROUNDING BAR.

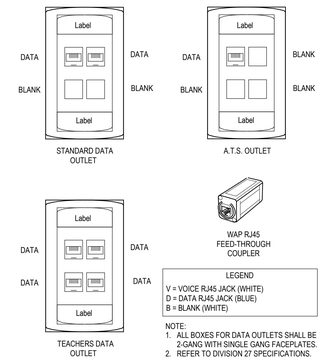
1 WALL MOUNTED TELECOM LADDER RACK DETAIL

NO SCALE



2 J-HOOK DETAIL

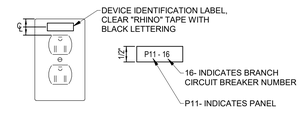
NO SCALE



NOTE:
1. ALL BOXES FOR DATA OUTLETS SHALL BE 2-GANG WITH SINGLE GANG FACEPLATES.
2. REFER TO DIVISION 27 SPECIFICATIONS.

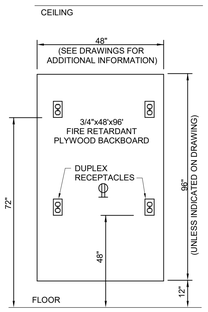
3 DATA FACE PLATE DETAIL

NO SCALE



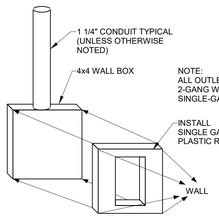
4 LABELING DETAIL

NO SCALE



5 PLWOOD BACKBOARD MOUNTING DETAIL

NO SCALE



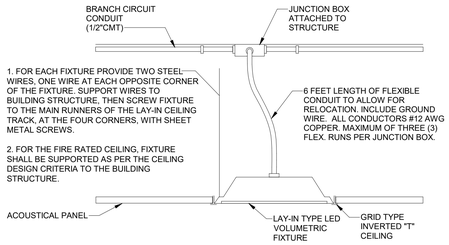
NOTE:
ALL OUTLET BOXES SHALL BE 2-GANG WITH ADAPTORS TO SINGLE-GANG FACEPLATES.

6 OUTLET PATHWAY DETAIL

NO SCALE

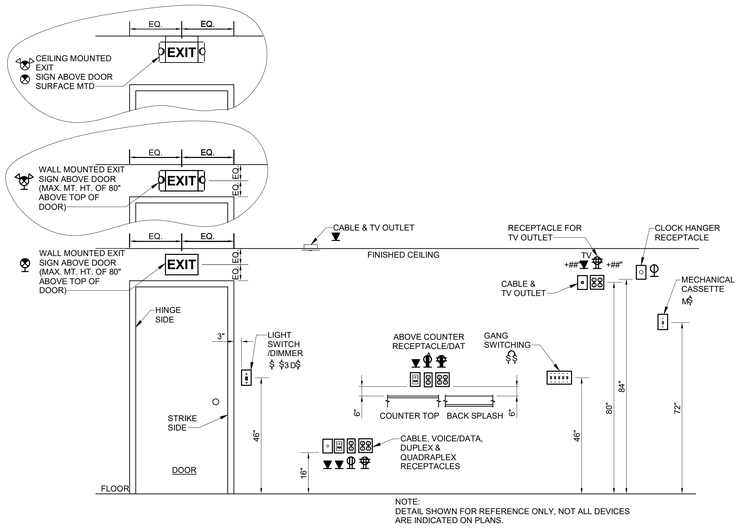
1. FOR EACH FIXTURE PROVIDE TWO STEEL WIRES, ONE WIRE AT EACH OPPOSITE CORNER OF THE FIXTURE. SUPPORT WIRES TO BUILDING STRUCTURE, THEN SCREW FIXTURE TO THE MAIN RUNNERS OF THE LAY-IN CEILING TRACK, AT THE FOUR CORNERS, WITH SHEET METAL SCREWS.

2. FOR THE FIRE RATED CEILING, FIXTURE SHALL BE SUPPORTED AS PER THE CEILING DESIGN CRITERIA TO THE BUILDING STRUCTURE.



7 LIGHTING FIXTURE MOUNTING DETAIL

NO SCALE



NOTE:
DETAIL SHOWN FOR REFERENCE ONLY, NOT ALL DEVICES ARE INDICATED ON PLANS.

8 ELECTRICAL DEVICES MOUNTING DETAIL

NO SCALE

BECKER MORGAN GROUP

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www.beckermorgan.com

ISSUED
FOR BIDDING

NOT FOR CONSTRUCTION
ISSUED: 04.16.20

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Wilmington, NC 28401
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FINAL DRAWING
DO NOT USE FOR CONSTRUCTION

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

ELECTRICAL DETAILS

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 12" = 1'-0"
DRAWN BY: HGH PROJ MGR: WAC

E502

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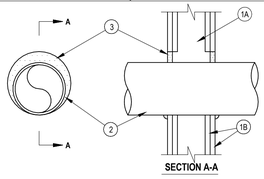
System No W-L-1054

October 14, 2015

ANSI / UL1479 (ASTM E814)	CAN / ULC S115
F Ratings - 1 and 2 Hr (See Items 1 & 3)	F Ratings - 1 and 2 Hr (See Items 1 & 3)
T Ratings - 0 Hr	FT Ratings - 0 Hr
L Ratings at Ambient - Less Than 1 CFM / sq ft	FH Ratings - 1and 2 HR (See Items 1 and 3)
L Ratings at 400 F - Less Than 1 CFM / sq ft	FTH Ratings - 0 Hr
	FTH Ratings - 0 Hr L Rating at Ambient - Less Than 1 CFM / sq ft
	L Ratings at 400 F - Less Than 1 CFM / sq ft



SECTION A-A

1. WALL ASSEMBLY -- THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300A OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   A. STUDS -- WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC. WHEN STEEL STUDS ARE USED AND THE DIAM OF OPENING EXCEEDS THE WIDTH OF STUD CAVITY, THE OPENING SHALL BE FRAMED ON ALL SIDES USING LENGTHS OF STEEL STUD INSTALLED BETWEEN THE VERTICAL STUDS AND SCREW-ATTACHED TO THE STEEL STUDS AT EACH END. THE FRAMED OPENING IN THE WALL SHALL BE 4 TO 6 IN. WIDER AND 4 TO 6 IN. HIGHER THAN THE DIAM OF THE PENETRATING ITEM SUCH THAT, WHEN THE PENETRATING ITEM IS INSTALLED IN THE OPENING, A 2 TO 3 IN. CLEARANCE IS PRESENT BETWEEN THE PENETRATING ITEM AND THE FRAMING ON ALL FOUR SIDES.

   B. GYPSUM BOARD* -- 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 32-1/4 IN. FOR STEEL STUD WALLS. MAX DIAM OF OPENING IS 14-1/2 IN. FOR WOOD STUD WALLS.

   THE F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE FIRE RATING OF THE WALL ASSEMBLY.

2. THROUGH-PENETRANTS -- ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE SHALL BE MIN 0 IN. TO MAX 2-1/4 IN. PIPE MAY BE INSTALLED WITH CONTINUOUS POINT CONTACT. PIPE, CONDUIT OR TUBING MAY BE INSTALLED AT AN ANGLE NOT GREATER THAN 45 DEGREES FROM PERPENDICULAR. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:

   A. STEEL PIPE -- NOM 30 IN DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

   B. IRON PIPE -- NOM 30 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.

   C. CONDUIT -- NOM 4 IN DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR 6 IN. DIAM STEEL CONDUIT.

   D. COPPER TUBING -- NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

   E. COPPER PIPE -- NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 5/8 IN. (16 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. AT THE POINT OR CONTINUOUS CONTACT LOCATIONS BETWEEN PIPE AND WALL, A MIN 1/2 IN. (13 MM) DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE WALL INTERFACE ON BOTH SURFACES OF WALL.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- FS-ONE SEALANT

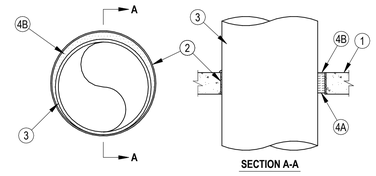
*INDICATES SUCH PRODUCTS SHALL BEAR THE UL OR CUL CERTIFICATION MARK FOR JURISDICTIONS EMPLOYING THE UL OR CUL CERTIFICATION (SUCH AS CANADA), RESPECTIVELY.

2 U.L. WL1054
NO SCALE

System No. C-AJ-1226

January 07, 2015

ANSI / UL1479 (ASTM E814)	CAN / ULC S115
F Ratings - 3 Hr	F Ratings - 3 Hr
T Ratings - 0 Hr	FT Ratings - 0 Hr
L Ratings at Ambient - Less Than 1 CFM / sq ft	FH Ratings - 3 HR
L Ratings at 400 F - 4 CFM / sq ft	FTH Ratings - 0 Hr
	L Rating At Ambient - Less Than 1 CFM / sq ft
	L Ratings at 400 F - 4 CFM / sq ft



SECTION A-A

1. FLOOR OR WALL ASSEMBLY MIN 4-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400KG/M3) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 32 IN. (813 MM)
2. METALLIC SLEEVE (OPTIONAL) NOM 32 IN. (813 MM) DIAM (OR SMALLER) SCHEDULE 40 (OR HEAVIER) STEEL SLEEVE CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY. FLUSH WITH FLOOR OR WALL SURFACES OR EXTENDING A MAX OF 3 IN (76 MM) ABOVE FLOOR OR BEYOND BOTH SURFACES OF WALL.

2A. SHEET METAL SLEEVE - (OPTIONAL) MAX 6 IN. (152 MM) DIAM, MIN 26 GA. GALV STEEL PROVIDED WITH A 26 GA GALV STEEL SQUARE FLANGE SPOT WELDED TO THE SLEEVE AT APPROX MID-HEIGHT, OR FLUSH WITH BOTTOM OF SLEEVE IN FLOORS, AND SIZED TO BE A MIN OF 2 IN. (51 MM) LARGER THAN THE SLEEVE DIAM. THE SLEEVE IS TO BE CAST IN PLACE AND MAY EXTEND A MAX OF 4 IN (102 MM) BELOW THE BOTTOM OF THE DECK AND A MAX OF 1 IN. (25 MM) ABOVE THE TOP SURFACE OF THE CONCRETE FLOOR.

2B. SHEET METAL SLEEVE - (OPTIONAL) MAX 12 IN. (305 MM) DIAM, MIN 24 GA. GALV STEEL PROVIDED WITH A 24 GA GALV STEEL SQUARE FLANGE SPOT WELDED TO THE SLEEVE AT APPROX MID-HEIGHT, OR FLUSH WITH BOTTOM OF SLEEVE IN FLOORS, AND SIZED TO BE A MIN OF 2 IN. (51 MM) LARGER THAN THE SLEEVE DIAM. THE SLEEVE IS TO BE CAST IN PLACE AND MAY EXTEND A MAX OF 4 IN (102 MM) BELOW THE BOTTOM OF THE DECK AND A MAX OF 1 IN. (25 MM) ABOVE THE TOP SURFACE OF THE CONCRETE FLOOR.

3. THROUGH-PENETRANT ONE METALLIC PIPE OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE OR CONDUIT AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1-7/8 IN (48 MM). PENETRANT MAY BE INSTALLED WITH CONTINUOUS POINT CONTACT. PENETRANT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR CONDUITS MAY BE USED:

   A. STEEL PIPE NOM 30 IN. (762 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

   B. IRON PIPE NOM 30 IN. (762 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.

   C. COPPER PIPE NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

   D. COPPER TUBING NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

   E. CONDUIT NOM 6 IN. (152 MM) DIAM (OR SMALLER) STEEL CONDUIT.

   F. CONDUIT NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT).

4. FIRESTOP SYSTEM THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:

A. PACKING MATERIAL MIN 4 IN. (102 MM) THICKNESS OF MIN 4 PCF (64 KG.M3) MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL OR SLEEVE AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.

B. FILL, VOID OR CAVITY MATERIAL* -- SEALANT MIN 1/4 IN. (6 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR OR WITH BOTH SURFACES OF WALL. AT THE POINT OR CONTINUOUS CONTACT LOCATIONS BETWEEN PIPE AND CONCRETE, A MIN 1/4 IN. (6 MM) DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE OR SLEEVE/PIPE PENETRANT INTERFACE ON THE TOP SURFACE OF FLOOR AND ON BOTH SURFACES OF WALL.

   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS-ONE SEALANT OR FS-ONE MAX INTUMESCENT SEALANT

* INDICATED SUCH PRODUCTS SHALL BEAR THE UL OR CUL CLASSIFICATION MARK FIR JURISDICTIONS EMPLOYING THE UL OR CUL CERTIFICATION (SUCH AS CANADA, RESPECTIVELY.

1 U.L. CAJ1226
NO SCALE

BECKER MORGAN GROUP

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NOT FOR PERMITS

ISSUED: 01.20.20

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PROGRESS DRAWING
DO NOT USE FOR CONSTRUCTION

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1165

SHEET TITLE

U.L. DETAILS

ISSUE BLOCK

Mark	Date	Description
	01.20.20	60% CD PROGRESS DRAWINGS
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 12" = 1'-0"
DRAWN BY: HGH | PROJ MGR: WAC

E503

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Branch Panel: MDP

Location: ELEC 903
Supply From:
Mounting: SURFACE
Enclosure: NEMA 1

Volts: 480Y/277
Phases: 3
Wires: 4

A.I.C. Rating: 14,000 AMPS SYMMETRICAL
Mains Type: MAIN CB
Mains Rating: 600.0 A
MCB Rating: 600.0 A

Notes:
SERVICE ENTRANCE RATED

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1				14303 VA	0 VA								2
3	PANELS P11, P12 VIA XFMR T1	175.0 A	3			14358 VA	0 VA			3	60.0 A	SPD	4
5								12243 VA	0 VA				6
7				11085 VA	17074 VA								8
9	ELEVATOR D.S.	80.0 A	3			11085 VA	16130 VA			3	175.0 A	PANEL MRP VIA XFMR T2	10
11								11085 VA	16806 VA				12
13				28931 VA	1115 VA					1	20.0 A	LTS: MECH, E.EC, TELEDATA, CORR, TLTS, STAIRS	14
15	RTU01 D.S.	150.0 A	3			28931 VA	2871 VA			1	20.0 A	LTS: 1ST FLR CLASSROOMS	16
17								28931 VA	470 VA	1	20.0 A	LTS: EXTERIOR BLDG AND COVERED WALK	18
19	SPARE	20.0 A	1	0 VA	1374 VA					1	20.0 A	LTS: WRK RM CORR, TLT'S, STAIRS	20
21	SPARE	20.0 A	1			0 VA	140 VA			1	20.0 A	LTS: ELEV SHAFT	22
23	SPARE	20.0 A	1					0 VA	2769 VA	1	20.0 A	LTS: 2ND FLR CLASSROOMS	24
25	SPARE	20.0 A	1	0 VA	0 VA					1	20.0 A	SPARE	26
27	SPARE	20.0 A	1			0 VA	0 VA			1	20.0 A	SPARE	28
29	SPARE	20.0 A	1					0 VA	0 VA	1	20.0 A	SPARE	30
31	SPACE	--	--	0 VA	0 VA					1	20.0 A	SPARE	32
33	SPACE	--	--			0 VA	0 VA			1	20.0 A	SPARE	34
35	SPACE	--	--					0 VA	0 VA	1	20.0 A	SPARE	36
37	SPACE	--	--	0 VA	0 VA					--	--	SPACE	38
39	SPACE	--	--			0 VA	0 VA			--	--	SPACE	40
41	SPACE	--	--					0 VA	0 VA	--	--	SPACE	42
		Total Load:		73458 VA		73250 VA		72283 VA					
		Total Amps:		265.7 A		265.0 A		260.9 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	90708 VA	100.00%	90708 VA		
Motor	60 VA	125.00%	75 VA	**Total Conn. Load:**	183889 VA
Other	2630 VA	100.00%	2630 VA	**Total Est. Demand:**	163219 VA
Power	22314 VA	100.00%	22314 VA	**Total Conn.:**	221.2 A
RCPT	54662 VA	59.15%	32331 VA	**Total Est. Demand:**	196.3 A
Lighting	1873 VA	100.00%	1873 VA		
LTS	6504 VA	125.00%	8130 VA		
Heating	6614 VA	100.00%	6614 VA		

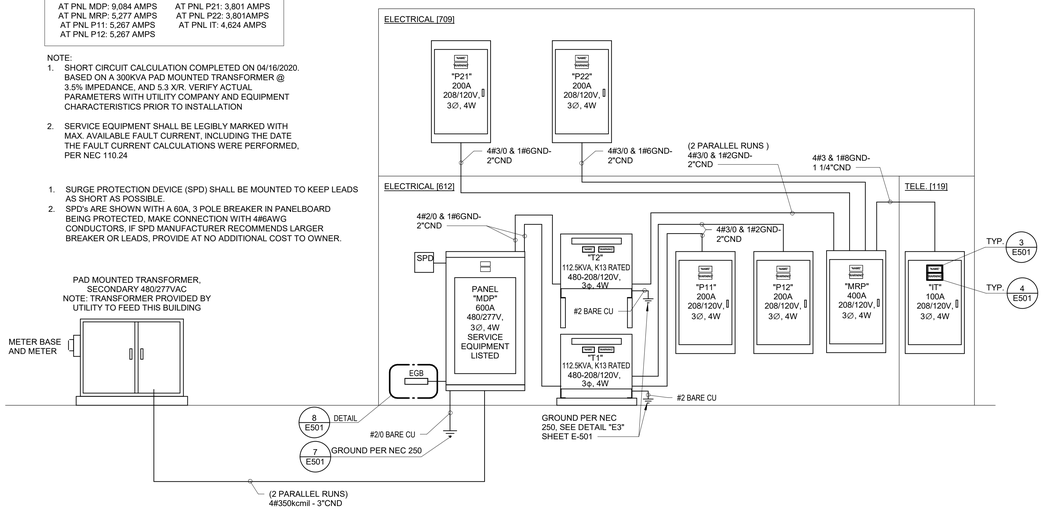
Notes:
1. HVAC EQUIPMENT MUST USE TYPE HACR BREAKERS.
2. PROVIDE GFI BREAKER.
3. PROVIDE BREAKER HANDEL LOCKING DEVICE.

AVAILABLE FAULT CURRENT

AT PNL MDP: 9,084 AMPS
AT PNL MRP: 5,277 AMPS
AT PNL P11: 5,267 AMPS
AT PNL P12: 5,267 AMPS
AT PNL P21: 3,801 AMPS
AT PNL P22: 3,801AMPS
AT PNL IT: 4,624 AMPS

NOTE:
1. SHORT CIRCUIT CALCULATION COMPLETED ON 04/16/2020. BASED ON A 300KVA PAD MOUNTED TRANSFORMER @ 3.5% IMPEDANCE, AND 5.3 X/R. VERIFY ACTUAL PARAMETERS WITH UTILITY COMPANY AND EQUIPMENT CHARACTERISTICS PRIOR TO INSTALLATION
2. SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED WITH MAX. AVAILABLE FAULT CURRENT, INCLUDING THE DATE THE FAULT CURRENT CALCULATIONS WERE PERFORMED, PER NEC 110.24

1. SURGE PROTECTION DEVICE (SPD) SHALL BE MOUNTED TO KEEP LEADS AS SHORT AS POSSIBLE.
2. SPD's ARE SHOWN WITH A 60A, 3 POLE BREAKER IN PANELBOARD BEING PROTECTED. MAKE CONNECTION WITH 4#6AWG CONDUCTORS, IF SPD MANUFACTURER RECOMMENDS LARGER BREAKER OR LEADS, PROVIDE AT NO ADDITIONAL COST TO OWNER.



1 RISER DIAGRAM
NO SCALE

Branch Panel: P11

Location: ELEC 903
Supply From: T1
Mounting:
Enclosure: NEMA 1

Volts: 208Y/120
Phases: 3
Wires: 4

A.I.C. Rating: 10,000 AMPS SYMMETRICAL
Mains Type: MAIN CB
Mains Rating: 200.0 A
MCB Rating: 200.0 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1	RCPTS: ELECT, MECH, EXTERIOR	20.0 A	1	720 VA	540 VA					1	20.0 A	RCPTS: TLT'S	2
3	RCPTS: HEALTH SCIENCE	20.0 A	1			540 VA	1380 VA			1	20.0 A	HAND DRYER	4
5	RCPTS: HEALTH SCIENCE	20.0 A	1					180 VA	1380 VA	1	20.0 A	HAND DRYER	6
7	RCPTS: HEALTH SCIENCE	20.0 A	1	885 VA	1380 VA					1	20.0 A	HAND DRYER	8
9	RCPTS: HEALTH SCIENCE	20.0 A	1			720 VA	1380 VA			1	20.0 A	HAND DRYER	10
11	RCPTS: HEALTH SCIENCE	20.0 A	1					1080 VA	1100 VA	1	20.0 A	RCPT: COPIER/PRINTER	12
13	RCPTS: HEALTH SCIENCE	20.0 A	1	540 VA	1380 VA					1	20.0 A	HAND DRYER	14
15	RCPTS: HEALTH SCIENCE	20.0 A	1			885 VA	180 VA			1	20.0 A	RCPT: WRK RM	16
17	RCPTS: HEALTH SCIENCE	20.0 A	1					885 VA	1380 VA	1	20.0 A	HAND DRYER IN TLT	18
19	RCPT: DRYER IN TLT	30.0 A	2	2496 VA	180 VA					1	20.0 A	RCPT: 350 WASH BASIN (NOTE 2)	20
21						2496 VA	1080 VA			1	20.0 A	RCPTS: CORR	22
23	RCPT: WASHER IN TLT	20.0 A	1					1200 VA	720 VA	1	20.0 A	RCPTS: CLASSROOM	24
25	RCPT: EWC (NOTE 2)	20.0 A	1	430 VA	1080 VA					1	20.0 A	RCPTS: CLASSROOM	26
27	RCPTS: CLASSROOM	20.0 A	1			1080 VA	1080 VA			1	20.0 A	RCPTS: CLASSROOM	28
29	RCPTS: CLASSROOM	20.0 A	1					720 VA	720 VA	1	20.0 A	RCPTS: CLASSROOM	30
31	AREA OD RESCUE CALL PANEL	20.0 A	1	400 VA	240 VA					1	20.0 A	RCPT	32
33	RCPTS: HEALTH SCIENCE BED	20.0 A	1			180 VA	0 VA			1	20.0 A	SPARE	34
35	RCPTS: HEALTH SCIENCE BED	20.0 A	1					180 VA	0 VA	1	20.0 A	SPARE	36
37	RCPTS: HEALTH SCIENCE BED	20.0 A	1	180 VA	0 VA					1	20.0 A	SPARE	38
39	RCPTS: HEALTH SCIENCE BED	20.0 A	1			180 VA	0 VA			1	20.0 A	SPARE	40
41	RCPTS: HEALTH SCIENCE BED	20.0 A	1					180 VA	0 VA	1	20.0 A	SPARE	42
		Total Load:		10447 VA		11178 VA		9723 VA					
		Total Amps:		88.0 A		94.1 A		81.0 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Motor	60 VA	125.00%	75 VA		
Power	9040 VA	100.00%	9040 VA	**Total Conn. Load:**	31348 VA
RCPT	22249 VA	72.47%	16125 VA	**Total Est. Demand:**	25239 VA
				Total Conn.:	87.0 A
				Total Est. Demand:	70.1 A

Notes:
1. HVAC EQUIPMENT MUST USE TYPE HACR BREAKERS.
2. PROVIDE GFI BREAKER.
3. PROVIDE BREAKER HANDEL LOCKING DEVICE.

Branch Panel: P12

Location: ELEC 903
Supply From: T1
Mounting:
Enclosure: NEMA 1

Volts: 208Y/120
Phases: 3
Wires: 4

A.I.C. Rating: 10,000 AMPS SYMMETRICAL
Mains Type: MAIN CB
Mains Rating: 200.0 A
MCB Rating: 200.0 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1	RCPTS: PLTW LAB	20.0 A	1	720 VA	540 VA					1	20.0 A	RCPTS: PLTW LAB	2
3	RCPTS: PLTW LAB	20.0 A	1			360 VA	720 VA			1	20.0 A	RCPTS: PLTW LAB	4
5	RCPTS: DISHWASHER IN PLTW LAB	20.0 A	1					1440 VA	180 VA	1	20.0 A	RCPTS: PLTW LAB	6
7	RCPTS: PLTW LAB	20.0 A	1	360 VA	180 VA					1	20.0 A	RCPTS: PLTW LAB	8
9	RCPT: U.C. REFRIG	20.0 A	1			600 VA	900 VA			1	20.0 A	RCPTS: PLTW LAB	10
11	RCPTS: PLTW LAB	20.0 A	1					540 VA	360 VA	1	20.0 A	RCPTS: PLTW LAB	12
13	PV03 D.S.	20.0 A	1	1656 VA	400 VA					1	20.0 A	DDC CONTROL PANEL	14
15	SPARE	20.0 A	1			0 VA	600 VA			1	20.0 A	HANDICAP DOOR ACTUATOR	16
17	SPARE	20.0 A	1					0 VA	0 VA	1	20.0 A	SPARE	18
19	SPARE	20.0 A	1	0 VA	0 VA					1	20.0 A	SPARE	20
21	SPARE	20.0 A	1			0 VA	0 VA			1	20.0 A	SPARE	22
23	SPARE	20.0 A	1					0 VA	0 VA	1	20.0 A	SPARE	24
25	SPARE	20.0 A	1	0 VA	0 VA					1	20.0 A	SPARE	26
27	SPARE	20.0 A	1			0 VA	0 VA			1	20.0 A	SPARE	28
29	SPARE	20.0 A	1					0 VA	0 VA	1	20.0 A	SPARE	30
31	SPACE	--	--	0 VA	0 VA					--	--	SPACE	32
33	SPACE	--	--			0 VA	0 VA			--	--	SPACE	34
35	SPACE	--	--					0 VA	0 VA	--	--	SPACE	36
37	SPACE	--	--	0 VA	0 VA					--	--	SPACE	38
39	SPACE	--	--			0 VA	0 VA			--	--	SPACE	40
41	SPACE	--	--					0 VA	0 VA	--	--	SPACE	42
		Total Load:		3856 VA		3180 VA		2520 VA					
		Total Amps:		33.0 A		27.3 A		21.0 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	1656 VA	100.00%	1656 VA		
Power	600 VA	100.00%	600 VA	**Total Conn. Load:**	9156 VA
RCPT	6900 VA	100.00%	6900 VA	**Total Est. Demand:**	9156 VA
				Total Conn.:	25.4 A
				Total Est. Demand:	25.4 A

Notes:
1. HVAC EQUIPMENT MUST USE TYPE HACR BREAKERS.
2. MAIN BREAKER MUST BE PROVIDED WITH SHUNT TRIP.

LOAD SUMMARY

VOLTAGE	PHASE
480	3
LARGEST MOTOR APPROX. AMPS	104 AMPS
LARGEST MOTOR APPROX. AMPS x .25	26 AMPS
HVAC	
RTU	86,799 VA
HWP1	960 VA
HWP2	960 VA
PV01	768 VA
PV02	36 VA
PV03	1,656 VA
PV04	252 VA
PV05	252 VA
EUH01	3,307 VA
EUH02	3,307 VA
B01	403 VA
B02	403 VA
SP1	941 VA
CUH01	586 VA
CUH02	586 VA
WATER HEATER	4,500 VA
DUCTLESS	1,830 VA
SUB-TOTAL HVAC DEMAND	107,546 VA
SUB-TOTAL HVAC DEMAND	129 AMPS
EQUIPMENT	
ELEVATOR	33,256 VA
SECURITY	400 VA
FA	400 VA
MISCELLANEOUS	7,560 VA
HAND DRYERS	15,180 VA
SUB-TOTAL EQUIPMENT DEMAND	56,796 VA
SUB-TOTAL EQUIPMENT DEMAND	68 AMPS
ADD FOR LARGEST MOTOR	26 AMPS
TOTAL EQUIPMENT DEMAND	94 AMPS
LIGHTING	
LIGHTS (INTERIOR, BASED ON NEC 220.12)	41,586 VA
LIGHTS (EXTERIOR)	600 VA
SIGN	1,200 VA
TOTAL LIGHTING LOAD	43,386 VA
LIGHTING LOAD x 1.25	54,233 VA
TOTAL DEMAND FOR LIGHTING	65 AMPS
RECEPTACLES	
RECEPTACLES	54,619 VA
FIRST 10000VA	10,000 VA
REMAINDER @ 50%	22,310 VA
TOTAL DEMAND FOR RECEPTACLE/POWER PANELS	32,310 VA
TOTAL DEMAND FOR RECEPTACLE/POWER PANELS	39 AMPS
TOTAL DEMAND BUILDING AMPS	328 AMPS
TOTAL DEMAND BUILDING AMPS	272,583 VA
TOTAL BUILDING CONNECTED LOAD	262,348 VA

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ISSUED
FOR BIDDING
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ISSUED: 04.16.20

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FINAL DRAWING
DO NOT USE FOR CONSTRUCTION

PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

ELECTRICAL RISER DIAGRAM AND SCHEDULES

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 12" = 1'-0"
DRAWN BY: HGH PROJ MGR: WAC

E601

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Branch Panel: MRP

Location: ELEC 903
Supply From: T2
Mounting: RECESSED
Enclosure: NEMA 1

Volts: 208Y/120
Phases: 3
Wires: 4

A.I.C. Rating: 10,000 AMPS SYMMETRICAL
Mains Type: MAIN CB
Mains Rating: 200.0 A
MCB Rating: 600.0 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1	EWH1 D.S.	30.0 A	2	2250 VA	252 VA					1	15.0 A	PV04 D.S.	2
3						2250 VA	104 VA			1	20.0 A	B01 D.S. & BP01	4
5	EUH01 D.S.	20.0 A	2					1654 VA	104 VA	1	20.0 A	B02 D.S. & BP02	6
7				1654 VA	216 VA					1	20.0 A	VAV COLTROL POWER	8
9	RCPT: ELEVATOR PIT	20.0 A	1			180 VA	0 VA			1	20.0 A	SPARE	10
11	RCPT: ELEV. SUMP PUMP	20.0 A	1					1176 VA	252 VA	1	15.0 A	PV05 D.S.	12
13	SPARE	20.0 A	1	0 VA	1654 VA					2	20.0 A	EUH02 D.S.	14
15	SPARE	20.0 A	1			0 VA	1654 VA						16
17	ELEVATOR CAB D.S.	20.0 A	1					1441 VA	1464 VA	1	20.0 A	CUH01 D.S. & CUH02 D.S.	18
19	HVAC	20.0 A	1	564 VA	0 VA					1	20.0 A	SPARE	20
21	HVAC	20.0 A	1			564 VA	0 VA			--	--	SPACE	22
23	SPACE	--	--					0 VA	0 VA	--	--	SPACE	24
25	SPACE	--	--	0 VA	0 VA					--	--	SPACE	26
27	SPACE	--	--			0 VA	0 VA			--	--	SPACE	28
29	SPACE	--	--					0 VA	0 VA	--	--	SPACE	30
31	PANEL IT	100.0 A	3	1080 VA	0 VA					--	--	SPACE	32
33						2164 VA	0 VA			--	--	SPACE	34
35								2164 VA	0 VA	--	--	SPACE	36
37	PANEL P21	200.0 A	3	8580 VA	1608 VA								38
39						8360 VA	1464 VA			3	200.0 A	PANEL P22	40
41								8530 VA	324 VA				42
		Total Load:		17074 VA		16130 VA		16806 VA					
		Total Amps:		143.2 A		134.4 A		140.9 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	2258 VA	100.00%	2258 VA		
Other	2468 VA	100.00%	2468 VA	**Total Conn. Load:**	48502 VA
Power	12799 VA	100.00%	12799 VA	**Total Est. Demand:**	40833 VA
RCPT	25513 VA	69.60%	17757 VA	**Total Conn.:**	134.6 A
Heating	6614 VA	100.00%	6614 VA	**Total Est. Demand:**	113.3 A

Notes:

Branch Panel: P21

Location: ELEC 1012
Supply From: MRP
Mounting:
Enclosure: NEMA 1

Volts: 208Y/120
Phases: 3
Wires: 4

A.I.C. Rating: 10,000 AMPS SYMMETRICAL
Mains Type: MAIN CB
Mains Rating: 200.0 A
MCB Rating: 200.0 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1	RCPTS: CLASSROOM	20.0 A	1	900 VA	180 VA					1	20.0 A	RCPT: ELEV SHAFT (TOP)	2
3	RCPTS: CLASSROOM	20.0 A	1			720 VA	1100 VA			1	20.0 A	RCPT: COPIER/PRINTER	4
5	RCPTS: CLASSROOM	20.0 A	1					900 VA	360 VA	1	20.0 A	RCPTS: WORK RM	6
7	RCPTS: CLASSROOM	20.0 A	1	900 VA	900 VA					1	20.0 A	RCPT: MICRO	8
9	RCPTS: CLASSROOM	20.0 A	1			900 VA	1200 VA			1	20.0 A	RCPT: REFRIG	10
11	RCPTS: CLASSROOM	20.0 A	1					900 VA	180 VA	1	20.0 A	RCPT	12
13	RCPTS: CLASSROOM	20.0 A	1	1080 VA	180 VA					1	20.0 A	RCPT: ELEC	14
15	RCPTS: CLASSROOM	20.0 A	1			720 VA	360 VA			1	20.0 A	RCPTS: TLTS	16
17	HAND DRYER	20.0 A	1					1380 VA	430 VA	1	20.0 A	RCPT: EWC (NOTE 1)	18
19	HAND DRYER	20.0 A	1	1380 VA	180 VA					1	20.0 A	RCPT: JAN	20
21	HAND DRYER	20.0 A	1			1380 VA	720 VA			1	20.0 A	RCPTS: CLASSROOM	22
23	HAND DRYER	20.0 A	1					1380 VA	900 VA	1	20.0 A	RCPTS: CLASSROOM	24
25	RCPTS: CORR. STO	20.0 A	1	1080 VA	720 VA					1	20.0 A	RCPTS: CLASSROOM	26
27	RCPT: STAFF TLT	20.0 A	1			180 VA	900 VA			1	20.0 A	RCPTS: CLASSROOM	28
29	HAND DRYER	20.0 A	1					1380 VA	720 VA	1	20.0 A	RCPTS: CLASSROOM	30
31	"EMERGENCY COMMUNICATION SYSTEM"	20.0 A	1	180 VA	900 VA					1	20.0 A	RCPTS: CLASSROOM	32
33	"EMERGENCY COMMUNICATION SYSTEM"	20.0 A	1			180 VA	0 VA			1	20.0 A	SPARE	34
35	SPARE	20.0 A	1					0 VA	0 VA	1	20.0 A	SPARE	36
37	SPARE	20.0 A	1	0 VA	0 VA					1	20.0 A	SPARE	38
39	SPARE	20.0 A	1			0 VA	0 VA			1	20.0 A	SPARE	40
41	SPARE	20.0 A	1					0 VA	0 VA	1	20.0 A	SPARE	42
		Total Load:		8580 VA		8360 VA		8530 VA					
		Total Amps:		71.7 A		69.7 A		71.3 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Other	180 VA	100.00%	180 VA		
Power	6900 VA	100.00%	6900 VA	**Total Conn. Load:**	25470 VA
RCPT	18390 VA	77.19%	14195 VA	**Total Est. Demand:**	21275 VA
				Total Conn.:	70.7 A
				Total Est. Demand:	59.1 A

Notes:
1. PROVIDE GFI BREAKER.

Branch Panel: P22

Location: ELEC 1012
Supply From: MRP
Mounting:
Enclosure: NEMA 1

Volts: 208Y/120
Phases: 3
Wires: 4

A.I.C. Rating: 10,000 AMPS SYMMETRICAL
Mains Type: MAIN CB
Mains Rating: 200.0 A
MCB Rating: 200.0 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1	RCPTS: ON ROOF	20.0 A	1	360 VA	1248 VA					2	15.0 A	DHP01 D.S. (DAH01)	2
3	PV01 D.S. ON ROOF	20.0 A	1			216 VA	1248 VA						4
5	VAV CONTROL POWER	20.0 A	1					324 VA	0 VA	1	20.0 A	SPARE	6
7	SPARE	20.0 A	1	0 VA	0 VA					1	20.0 A	SPARE	8
9	SPARE	20.0 A	1			0 VA	0 VA			1	20.0 A	SPARE	10
11	SPARE	20.0 A	1					0 VA	0 VA	1	20.0 A	SPARE	12
13	SPARE	20.0 A	1	0 VA	0 VA					1	20.0 A	SPARE	14
15	SPARE	20.0 A	1			0 VA	0 VA			1	20.0 A	SPARE	16
17	SPARE	20.0 A	1					0 VA	0 VA	1	20.0 A	SPARE	18
19	SPARE	20.0 A	1	0 VA	0 VA					1	20.0 A	SPARE	20
21	SPARE	20.0 A	1			0 VA	0 VA			--	--	SPACE	22
23	SPACE	--	--					0 VA	0 VA	--	--	SPACE	24
25	SPACE	--	--	0 VA	0 VA					--	--	SPACE	26
27	SPACE	--	--			0 VA	0 VA			--	--	SPACE	28
29	SPACE	--	--					0 VA	0 VA	--	--	SPACE	30
31	SPACE	--	--	0 VA	0 VA					--	--	SPACE	32
33	SPACE	--	--			0 VA	0 VA			--	--	SPACE	34
35	SPACE	--	--					0 VA	0 VA	--	--	SPACE	36
37	SPACE	--	--	0 VA	0 VA					--	--	SPACE	38
39	SPACE	--	--			0 VA	0 VA			--	--	SPACE	40
41	SPACE	--	--					0 VA	0 VA	--	--	SPACE	42
		Total Load:		1608 VA		1464 VA		324 VA					
		Total Amps:		14.9 A		13.7 A		2.7 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	424 VA	100.00%	424 VA		
Other	2288 VA	100.00%	2288 VA	**Total Conn. Load:**	3396 VA
Power	324 VA	100.00%	324 VA	**Total Est. Demand:**	3396 VA
RCPT	360 VA	100.00%	360 VA	**Total Conn.:**	9.4 A
				Total Est. Demand:	9.4 A

Notes:

LIGHTING FIXTURE SCHEDULE

MARK	DESCRIPTION	MANUFACTURER/SERIES	NOM. SIZE	TEMP(°K)	LAMPS	VOLTS	DELIVERED LUMENS	WATTS	LENS	COLOR	MOUNTING HEIGHT	BALLAST/ DRIVER	REMARKS
A1	2X4 LAY-IN LED TROFFER	LITHONIA: GTL SERIES COLUMBIA: LJT24 SERIES DAY-BRITE	2'x4'	3500	LED	MVOLT	5400	51	A19 ACRYLIC	WHITE	RECESSED LAY-IN	LED DRIVER	
A2	2X4 LAY-IN LED TROFFER	LITHONIA: GTL SERIES COLUMBIA: LJT24 SERIES DAY-BRITE	2'x4'	3500	LED	MVOLT	5400	51	A19 ACRYLIC	WHITE	RECESSED LAY-IN	LED DRIVER DIMMING	1
B1	2X2 LAY-IN LED TROFFER	LITHONIA: GTL SERIES COLUMBIA: LJT22 SERIES DAY-BRITE	2'x2'	3500	LED	MVOLT	2700	26	A19 ACRYLIC	WHITE	RECESSED LAY-IN	LED DRIVER	
C	LED UTILITY LIGHT	LITHONIA: CSS COLUMBIA: CSL4 SERIES DAY-BRITE	4'	3500	LED	MVOLT	3000	31	ACRYLIC	WHITE	SURFACE / SUSPENDED	LED DRIVER	4, 6
D1	RECESSED LED DOWN LIGHT	LITHONIA: LDN6 INTENSE LIGHTING: SS6G4DR SERIES DAY-BRITE	6" DIA	3500	LED	MVOLT	4000	21	OPEN	WHITE	RECESSED GYPBOARD	LED DRIVER	
D2	RECESSED LED DOWN LIGHT	LITHONIA: LDN6 INTENSE LIGHTING: SS6G4DR SERIES DAY-BRITE	6" DIA	3500	LED	MVOLT	4000	21	OPEN	WHITE	RECESSED GYPBOARD	LED DRIVER	2
E1	2-HEAD EMERGENCY LIGHT	EELP: EM2LF SERIES ISOLITE: SERIES EMERGI-LITE PREMIER SERIES	12"Wx5.5"Hx6"D		LED	MVOLT		12		WHITE	WALL MOUNTED 7'-6"AFF		8
F	STAIR DIRECT / INDIRECT LED LIGHT	LUMINAIRE: LED ENDEAVOR CORONET NULITE		3500	LED	MVOLT	4000	35		WHITE	WALL MOUNTED 10'-0AFF	LED DRIVER	4, 8
K	EXTERIOR LED AREA LIGHT	BROWNLEE: 7162LED LITON: LCMPD SERIES	12"DIAx4"D	4000	LED	MVOLT	1000	16.6		VERIFY WITH ARCHITECT	SURFACE CEILING	LED DRIVER	3, 5, 8
L	EXTERIOR LED AREA LIGHT TYPE 3 DISTRIBUTION	LITHONIA: WSR-LED HUBBELL: GEOPAK SERIES 2	18"Wx7"Hx9"D	4000	LED	MVOLT	3433	44		DARK BRONZE	WALL MOUNTED B.O.F. 8'-6" AFF	LED DRIVER	3, 5, 8, 9
X1	EXIT SIGN, SINGLE FACE	LITHONIA EXR LED EL M6 ISOLITE ELT-EM-R-1W-BA-SC-UC EMERGI-LITE: PRESTIGE SERIES	12"Wx8"Hx2"D		LED	MVOLT		2	RED	WHITE	SURFACE CEILING / 7'-6"AFF WHEN WALL MOUNTED		8
X2	EXIT SIGN DOUBLE FACE	LITHONIA EXR LED EL M6 ISOLITE ELT-EM-R-2W-BA-SC-UC EMERGI-LITE: PRESTIGE SERIES	12"Wx8"Hx2"D		LED	MVOLT		2	RED	WHITE	SURFACE CEILING / 7'-6"AFF WHEN WALL MOUNTED		8

REMARKS:
1. 0-10V DIMMING 1%
2. DAMP LOCATION
3. WET LOCATION
4. 50% DIMMING
5. LED REQUIRED SURGE PROTECTION
6. VERIFY FINAL MOUNTING HEIGHT WITH ARCHITECT
7. FINAL COLOR SELECTION BY ARCHITECT
8. 90 MIN BATTERY BACK-UP.
9. INTEGRAL PHOTOCELL

GENERAL NOTES:
A. THE CONTRACTOR SHALL VERIFY THE LEAD TIME OF ALL PRODUCTS SPECIFIED IN THIS SCHEDULE AT THE TIME OF PACKAGE QUOTE.
B. DURING THE BID PROCESS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY DELIVERY/SCHEDULING ISSUES.
C. NO SUBSTITUTIONS WILL BE ALLOWED DUE TO THE LACK OF COORDINATION OF DELIVERY DATES AND CONSTRUCTION SCHEDULE AFTER BID.
D. ALL EXPEDITED EXPENSES SHALL BE THE RESPONSIBILITY OF THE CONTRACTORS.
E. FIXTURES TO BE INSTALLED IN CEILINGS, INDICATE ON THE ARCHITECTURAL PLANS AS HAVING INSULATION IN CONTACT WITH THE CEILING SURFACE, SHALL BE IC RATED BY MANUFACTURER.
F. LIGHTING FIXTURES SHALL MEET THE AESTHETICS, DESCRIPTION AND SPECIFICATIONS, SUBSTITUTIONS SHALL INCLUDE PT. BY PT. CALCULATIONS.
G. LIGHTING FIXTURES, AS SPECIFIED, HAVE BEEN SO SELECTED TO ACHIEVE REQUIRED/DESIRED FOOTCANDLE LEVELS IN THEIR RESPECTIVE AREA. HENCE SPECIFIC FIXTURE CHARACTERISTICS WHICH MAY CREATE PARTICULAR ILLUMINATION RESULTS ARE ESSENTIAL. ANY DEVIATIONS FROM SPECIFIED FIXTURES SHALL DEEM THE SUBMITTING AGENT AND CONTRACTORS RESPONSIBLE IN PROVIDINGSUCH DEVIATION FOR THE ARCHITECT/ENGINEER AND OWNER TO MAKE AN INFORMED DECISION.
H. SUBSTITUTIONS APPROVED BY THE ENGINEER PREVIOUS TO BID ARE ACCEPTABLE AS LONG AS THEY ARE EQUAL TO THE FIXTURE SPECIFIED, UNLESS OTHERWISE NOTED. THIS INCLUDES LENS, COLORS, REFLECTORS, PHOTOMETRICS, HOUSING MATERIAL, FINISHES, ETC. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER WITH CUT SHEETS FOR APPROVAL. LISTED SEPARATELY SO THE ARCHITECT, ENGINEER AND OWNER CAN MAKE AN INFORMED DECISION. SUBSTITUTE FIXTURES SHALL BE PRICED WITH THE SPECIFIED FIXTURE AND ALL 4' LED LAMPS SHALL BE 3500 K, OTHER LAMPS SHALL BE AS SCHEDULED.
J. ANY FIXTURE WITH THE TEXT "NL" ADJACENT TO IT SHALL INDICATE THAT THAT FIXTURE IS A NIGHT LIGHT (24HR LIGHT). THE FIXTURE SHALL BE CONNECTED TO THE UNSWITCHED HOT LEG OF THE INDICATED CIRCUIT.
K. ACRYLIC PRISMATIC LENSES SHALL BE 0.156" NOMINAL MINIMUM THICKNESS.
L. ALL EXIT AND EMERGENCY FIXTURES SHALL COMPLY WITH NCSBC STANDARDS AND HAVE AUTOMATIC TESTING DEVICES.
M. LED EMERGENCY BATTERY SHALL PROVIDE 1400 MINIMUM LUMENS OUTPUT FROM 1 LAMP FOR 90 MINUTES MINIMUM.
N. LED MODULES SHALL BE REPLACEABLE.
O. PROVIDE MANUFACTURER INSTALLED NEC 2014 ARTICLE 410.130 (G) COMPLIANT DISCONNECTING MEANS FOR ALL APPLICABLE FIXTURES.
P. SEE SPECIFICATIONS SECTIONS 265100 AND 265200 FOR ADDITIONAL REQUIREMENTS.
Q. ELECTRICAL CONTRACTOR SHALL RECEIVE APPROVAL FOR ALL LIGHTING FIXTURES FROM ARCHITECT/OWNER PRIOR TO PURCHASE AND ROUGH-IN.

2018 APPENDIX B BUILDING CODE SUMMARY
ELECTRICAL SUMMARY
ELECTRICAL SYSTEMS AND EQUIPMENT

METHOD OF COMPLIANCE:
ENERGY CODE: ☑ PRESCRIPTIVE ☐ PERFORMANCE
ASHRAE 90.1: ☐ PRESCRIPTIVE ☐ PERFORMANCE

LIGHTING SCHEDULE (EACH FIXTURE TYPE)
LAMP TYPE REQUIRED IN FIXTURE: SEE FIXTURE SCHEDULE
NUMBER OF LAMPS IN FIXTURE: SEE FIXTURE SCHEDULE
BALLAST TYPE USED IN THE FIXTURE: SEE FIXTURE SCHEDULE
NUMBER OF BALLASTS IN FIXTURE: SEE FIXTURE SCHEDULE
TOTAL WATTAGE PER FIXTURE: SEE FIXTURE SCHEDULE

TOTAL INTERIOR WATTAGE: (WHOLE BUILDING OR SPACE BY SPACE)
ALLOWED = 19,083 WATTS
ADDITIONAL 10% = 17,175 WATTS
SPECIFIED = 10,439 WATTS

EXTERIOR ALLOWANCE:
(TRADEABLE SURFACES)
ALLOWED = N/A WATTS
SPECIFIED = N/A WATTS

(NON-TRADEABLE SURFACES:)
ALLOWED = N/A WATTS
SPECIFIED = N/A WATTS

ADDITIONAL PRESCRIPTIVE COMPLIANCE
☐ 506.2.1 MORE EFFICIENT MECHANICAL EQUIPMENT
☑ 506.2.2 REDUCED LIGHTING POWER DENSITY
☐ 506.2.3 ENERGY RECOVERY VENTILATION SYSTEMS
☐ 506.2.4 HIGHER EFFICIENCY SERVICE WATER HEATING
☐ 506.2.5 ON-SITE SUPPLY OF RENEWABLE ENERGY
☐ 506.2.6 AUTOMATIC DAYLIGHTING CONTROL SYSTEMS

Branch Panel: IT

Location: TELEDATA 902
Supply From: MRP
Mounting:
Enclosure: NEMA 1

Volts: 208Y/120
Phases: 3
Wires: 4

A.I.C. Rating: 10,000 AMPS SYMMETRICAL
Mains Type: MAIN CB
Mains Rating: 100.0 A
MCB Rating: 100.0 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1	RCPT: TELEDATA	20.0 A	1	360 VA	360 VA					1	30.0 A	SPEC RCPT: TELECOM	2
3	RCPT: TELEDATA	20.0 A	1			2164...							4
5	SPARE	20.0 A	1					0 VA	2164...	1	30.0 A	SPEC RCPT: TELECOM	6
7	RCPT: TELEDATA	20.0 A	1	180 VA	180 VA					1	20.0 A	RCPT: TELEDATA	8
9	SPARE	20.0 A	1			0 VA	0 VA			1	20.0 A	SPARE	10
11	SPARE	20.0 A	1					0 VA	0 VA	1	20.0 A	SPARE	12
13	SPARE	20.0 A	1	0 VA	0 VA					1	20.0 A	SPARE	14
15	SPACE	--	--			0 VA	0 VA			--	--	SPACE	16
17	SPACE	--	--					0 VA	0 VA	--	--	SPACE	18
19	SPACE	--	--	0 VA	0 VA					--	--	SPACE	20
21	SPACE	--	--			0 VA	0 VA			--	--	SPACE	22
23	SPACE	--	--					0 VA	0 VA	--	--	SPACE	24
		Total Load:		1080 VA		2164 VA		2164 VA					
		Total Amps:		9.0 A		19.4 A		19.4 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
RCPT	5407 VA	100.00%	5407 VA		
				Total Conn. Load:	5407 VA
				Total Est. Demand:	5407 VA
				Total Conn.:	15.0 A
				Total Est. Demand:	15.0 A

Notes:

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ISSUED: 04.16.20

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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

ELECTRICAL PANEL SCHEDULES AND LIGHTING FIXTURE SCHEDULE

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 12" = 1'-0"
DRAWN BY: HGH PROJ MGR: WAC

E602

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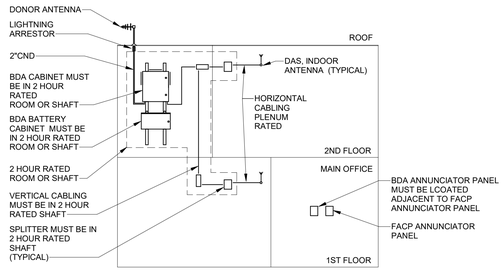
BDA INSTALLATION NOTES

1. ALL WIRING SHALL BE IN ACCORDANCE WITH LOCAL AND NATIONAL CODES, INCLUDING NFPA 72 (2013 EDITION) AND NEC.
2. A BDA SYSTEM IS AN EMERGENCY RESPONDER RADIO ENHANCED SYSTEM IN COMPLIANCE WITH THE NC FIRE CODE, SECTION 510.
3. WHERE REQUIRED, WIRING SHALL BE RUN IN MINIMUM 3/4" CONDUIT. SURFACE METAL RACEWAY IS ACCEPTABLE.
4. PLENUM RATED COAXIAL CABLE WITHOUT CONDUIT, MAY BE ACCEPTABLE FOR HORIZONTAL RUNS IN AREAS OTHER THAN WHERE WATERPROOF DEVICES ARE REQUIRED. HOWEVER, CONDUIT SHALL BE USED TO PENETRATIONS IN RATED WALLS SHALL BE MADE IN CONDUIT PER APPROPRIATE U.L. SYSTEM.
5. MANUFACTURER'S 1/2" COAXIAL CABLE SHALL BE USED FOR THE BDA SYSTEM, DUE TO ITS LOW OHM LOSS PROPERTIES.
6. THE DIRECTIONAL DONOR ANTENNA ON THE ROOF SHALL BE TIED INTO THE BUILDING GROUNDING SYSTEM.
7. ALL CABLES USED FOR BDA SHALL BE GROUNDED TO THE BUILDING GROUNDING SYSTEM.
8. THE CABLE BETWEEN THE DONOR ANTENNA AND THE AMPLIFIER MAY BE RUN TO THE ROOF, BUT IT MUST BE IN CONDUIT.
9. A LIGHTNING ARRESTOR SHALL BE INSTALLED ON THE ANTENNA.
10. THE CABLE FROM THE DONOR ANTENNA TO THE AMPLIFIER SHALL BE SEPARATED FROM THE RISER CABLE FROM THE BDA TO THE INDOOR ANTENNA, THIS REQUIREMENT APPLIES TO THE RISER.
- IF BOTH CABLES ARE NOT IN CONDUIT, THE MINIMUM SEPARATION SHALL BE SIX (6) FEET.
- IF AT LEAST ONE CABLE IS IN CONDUIT, THE MINIMUM SEPARATION SHALL BE THREE (3) FEET.
- THESE CABLES ARE ALLOWED TO CROSS A MAXIMUM OF ONE TIME.

11. THE BDA AMPLIFIER ENCLOSURE SHALL BE INSTALLED ON METAL STRUT CHANNEL (TO ALLOW AIRFLOW). SEE INSTALLATION DIAGRAM.
12. THE BDA AMPLIFIER AND BATTERY ENCLOSURES SHALL BE GROUNDED TO THE BUILDING GROUNDING SYSTEM UTILIZING A SHORT, DIRECT PATH WITH THE MINIMUM NUMBER OF BENDS (GROUNDING CABLES SHALL NOT REVERSE DIRECTION WHEN CONNECTING TO TERMINATION POINTS.)
13. A.C. WIRES SHALL BE RUN IN SEPARATE CONDUIT FROM D.C. WIRING, SUCH THAT A SYSTEM ALARM DOES NOT DE-ENERGIZE THE CONTROL PANEL, MINIMUM SIZE WIRE TO BE AWG 12 THHN. PROTECTION AGAINST VOLTAGE TRANSIENTS AND SURGES SHALL BE INSTALLED AT THE ELECTRICAL PANELBOARD AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
- PRIMARY AC POWER TO THE BDA AMPLIFIER SHALL BE DEDICATED CIRCUIT.
- REDUNDANT AC POWER TO THE BDA AMPLIFIER SHALL BE A 120VAC CIRCUIT. (PROVIDING A SECOND (REDUNDANT) POWER CIRCUIT IS PER THE MANUFACTURERS RECOMMENDED PRACTICE.)
- CIRCUIT DISCONNECTING MEANS SHALL BE PERMANENTLY IDENTIFIED BY THE SYSTEM TYPE: i.e. "EMERGENCY COMMUNICATION SYSTEM" (ECS)

14. CONDUIT FOR THE DONOR (ROOF) ANTENNA AND FOR THE RISER COAXIAL CABLE SHALL BE PARALLEL TO THE DBA ENCLOSURE. THESE CONDUITS SHALL TERMINATE WITH A BUSHING WITHIN TWO (2) FEET OF THE BOTTOM OF THE ENCLOSURE. THE BDA INSTALLER SHALL MAKE THE CONNECTION PROVIDED, PRE-WIRED 1/4" FLEX CABLE FROM THE BDA.
15. INSTALLATION REQUIREMENTS TO COMPLY WITH NFPA 72, SECTION 24.3.6.8:
- THE RISER COAXIAL CABLE SHALL BE INSTALLED IN A 2 HOUR RATED ENCLOSURE OR SHAFT. (2 HOUR RATED COAXIAL CABLE IS NOT AVAILABLE AT THE CORRECT LOW OHM LOSS RATING.)
- THE SPLITTER CONNECTIONS BETWEEN THE RISER CABLE AND THE HORIZONTAL FEEDER CABLE SHALL ALSO BE MADE WITH A 2 HOUR RATED ENCLOSURE. THE FEEDER CABLE PASSAGE THROUGH THAT 2 HOUR ENCLOSURE SHALL BE FIRE STOPPED WITH THE APPROPRIATE U.L. SYSTEM.
- ALL FEEDER CABLES SHALL BE PLENUM RATED AT A MINIMUM. (FEEDER CABLES ARE THE HORIZONTAL RUNS TO THE DAS.)

16. WHEN SPLITTER CONNECTIONS ARE IN CONDUIT, PROVIDE A MINIMUM 12 INCH x 12 INCH JUNCTION COX TO MAKE THE CONNECTION.
17. THE BDA ANNUNCIATOR SHALL BE INSTALLED NEAR THE FIRE ALARM CONTROL PANEL.
18. ALL FIELD WIRING SHALL BE CHECKED FOR SHORTS, OPENS, AND GROUNDS BEFORE MAKING CONNECTIONS.
19. SEE MANUFACTURERS SHEETS FOR MOUNTING DETAILS.
20. ALL JUNCTION BOX COVERS SHALL BE RED IN COLOR. THOSE IN FINISHED ARES ARE PERMITTED TO MATCH THE FINISH COLOR.
21. ALL PENETRATIONS THROUGH RATED WALLS SHALL BE SEALED USING APPROPRIATE U.L. SYSTEM.



NOTE: ALL VERTICAL ITEMS MUST BE MADE WITH IN 2 HOUR RATED ENCLOSURE (CABLE, CONNECTORS ETS..)

4 BDA RISER DIAGRAM
NO SCALE

BDA PROJECT NOTES IN TESTING AND INSTALLATION SEQUENCING

1. A PRELIMINARY SITE SURVEY IS NEEDED TO DETERMINE THE EXISTING dBm SIGNAL STRENGTH.
2. A MORE DETAILED SURVEY WILL MAP THE BUILDING ONCE THE BUILDING IS SUBSTANTIALLY COMPLETED.
3. THE NEXT SIGNAL STRENGTH SURVEY WILL COMPLY WITH THE 2018 NCFC, 510.5.3 AND NFPA 72, 24.5.2.1 (2013 EDITION)
   - EACH FLOOR SHALL BE DIVIDED INTO 20 (APPROXIMATELY) EQUAL TEST AREAS. THE WORST CASE SIGNAL STRENGTH READING SHALL BE RECORDED. PROVIDE 90 PERCENT FLOOR AREA RADIO COVERAGE.
- CRITICAL AREAS, IF PRESENT, SHALL BE SURVEYED SEPARATE FROM THE EQUAL TEST AREAS;
--- EXIT STAIRS
--- EXIT PASSAGEWAYS
--- ELEVATOR LOBBIES
--- AT STANDPIPE CABINETS
--- SPRINKLER SECTIONAL VALVE LOCATIONS
--- AHJ MAY REQUIRE ADDITIONAL LOCATIONS.

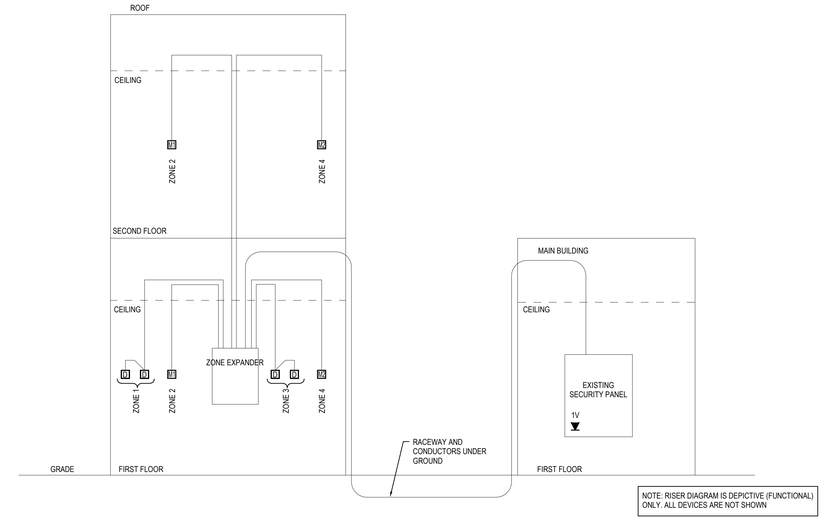
-- CRITICAL AREAS SHALL BE PROVIDED WITH 99 PERCENT RADIO COVERAGE.

4. THE MINIMUM SIGNAL STRENGTH OF -95 dBm IS REQUIRED.

PROJECT SPECIFIC REQUIREMENTS

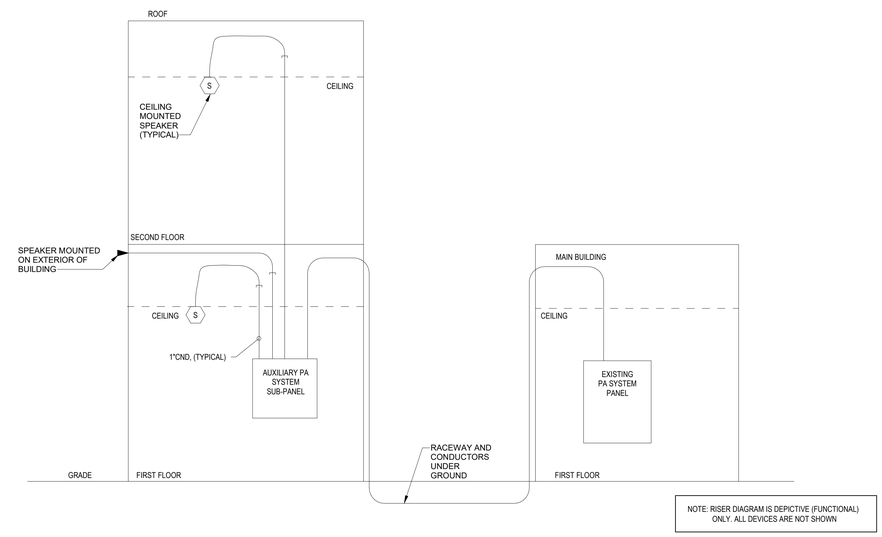
EMERGENCY RESPONDERS RADIO AMPLIFICATION SYSTEM:

a. IN BASE CONTRACT, CONTRACTOR SHOULD INCLUDE INITIAL TESTING/SURVEY OF SIGNAL STRENGTH AT ENVELOPE COMPLETION, FINAL TESTING/SURVEY PRIOR TO SUBSTANTIAL COMPLETION OF BUILDING AND ALL REQUIRED SHOP DRAWINGS AND DOCUMENTATION TO LOCAL AHJ TO CONFIRM BUILDING MEETS RADIO SIGNAL STANDARDS. TESTING SURVEYS SHOULD COMPLY 2018 NCFC, 510.5.3 AND NFPA 72,224.5.2.1
b. IN BASE CONTRACT, CONTRACTOR SHOULD INCLUDE ALL CONDUIT/RACEWAYS (INCLUDING CONDUIT FROM BDA LOCATION ON PLAN TO MAIN FACP ANNUNCIATOR PANEL LOCATION, JUNCTION BOXES, ETC. SHOWN ON CONTRACT DOCUMENTS FOR THE POTENTIAL BDA SYSTEM. SHOULD BDA SYSTEM NOT BE REQUIRED, ALL RACEWAYS AND BOXES SHALL BE LABELED, CAPPED AND LEFT IN PLACE.
c. CM@RISK WILL CARRY ALLOWANCE FOR BDA SYSTEM(S) SHOULD TESTING INDICATE THE NEED FOR EMERGENCY RESPONDER COMMUNICATION AMPLIFIER. SHOULD BDA SYSTEM BE REQUIRED ELECTRICAL CONTRACTOR SHALL PROVIDE FORMAL PROPOSAL FOR INSTALLATION OF COMPLETE BDA SYSTEM (AS SHOWN ON PLANS AND NOTES).



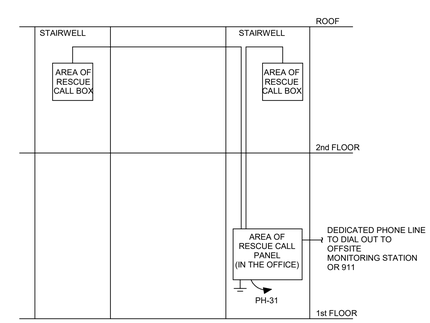
NOTE: RISER DIAGRAM IS DEPICTIVE (FUNCTIONAL) ONLY. ALL DEVICES ARE NOT SHOWN

1 SECURITY RISER DIAGRAM1
NO SCALE



NOTE: RISER DIAGRAM IS DEPICTIVE (FUNCTIONAL) ONLY. ALL DEVICES ARE NOT SHOWN

2 SPEAKER RISER DIAGRAM1
NO SCALE



NOTES:
1.THE ELECTRICAL CONTRACTOR SHALL PROVIDE (1) DEDICATED PHONE OUTLET AT EACH AREA OF RESCUE CALL BOX.

3 AOR RISER
NO SCALE

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PROGRESS DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1165

SHEET TITLE

ELECTRICAL SYSTEMS RISER DIAGRAMS

ISSUE BLOCK

Mark	Date	Description
	01.20.20	60% CD PROGRESS DRAWINGS
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO: 2019082.00
DATE: 01.20.2020
SCALE: 12" = 1'-0"
DRAWN BY: HGH PROJ MGR: WAC

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1 CLASSROOM BUILDING FIRST FLOOR PLAN - FIRE ALARM

SCALE: 1/8" = 1'-0"

2 CLASSROOM BUILDING SECOND FLOOR PLAN - FIRE ALARM

SCALE: 1/8" = 1'-0"

PLAN NORTH

N

8' 4' 0' 8'

SCALE : 1/8" = 1'-0"

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FINAL DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1167

SHEET TITLE

CLASSROOM BUILDING FIRST AND SECOND FLOOR PLANS - FIRE ALARM

ISSUE BLOCK

Mark	Date	Description
	04.16.20	ISSUED FOR BIDDING
	03.20.20	100% REVIEW SUBMITTAL
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO:	2019082.00
DATE:	01.20.2020
SCALE:	1/8" = 1'-0"
DRAWN BY: HGH	PROJ MGR: WAC

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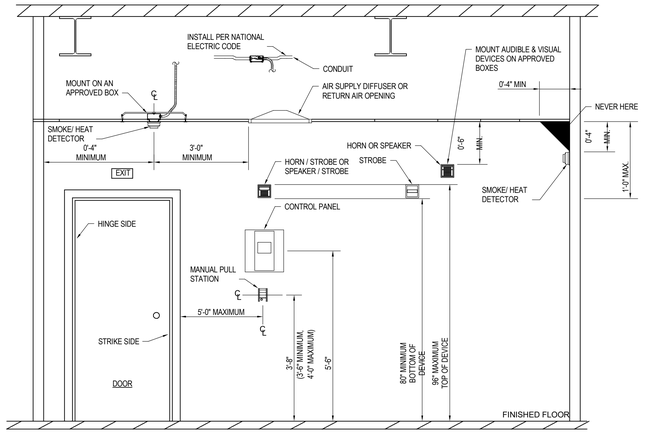
MANUAL FIRE ALARM SYSTEM NOTES

1. AS A MINIMUM THE FIRE ALARM SYSTEM SHALL INCLUDE DETECTORS, PULL STATIONS, FIRE ALARM CONTROL PANEL, VOICE/ALARM COMMUNICATION SYSTEM ADJACENT TO THE EXISTING FIRE ALARM SYSTEM, HORN/STROBES AND SPRINKLER MONITORING WITH FIRE RATED CABLE. THE FIRE ALARM SYSTEM SHALL MEET NFPA REQUIREMENTS, THE NATIONAL ELECTRICAL CODE, THE STATE CODES, AND THE LOCAL BUILDING CODES.
2. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL CABLE, MATERIALS AND EQUIPMENT AS SHOWN ON THE DRAWINGS/OR HEREIN SPECIFIED. ALL SYSTEM COMPONENTS SPECIFIED HEREIN, AS WELL AS THEIR INSTALLATION, SHALL COMPLY WITH APPLICABLE STANDARDS OF THE NATIONAL ELECTRICAL CODE, NATIONAL FIRE PROTECTION ASSOCIATION, AND LOCAL CODES HAVING AUTHORITY. ALL EQUIPMENT SHALL BE UL LISTED FOR FIRE ALARM SYSTEM USE.
3. THE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND SHALL BE INSTALLED AND CONNECTED UNDER THE DIRECTION AND SUPERVISION OF A MANUFACTURER'S REPRESENTATIVE. UPON COMPLETION OF INSTALLATION, THE MANUFACTURER'S REPRESENTATIVE SHALL PERFORM ALL OPERATIONAL TESTS AND ADJUSTMENTS AND CERTIFY IN WRITING THAT THE SYSTEM IS PROPERLY INSTALLED AND FUNCTIONS AS SPECIFIED.
4. ALL WIRING SHALL BE SYSTEM OR UL LISTED FIRE RATED CABLE AND COLOR CODED TO ALLOW EASE OF IDENTIFICATION OF THE DIFFERENT CIRCUITRY REQUIRED FOR THE SYSTEM. NO CIRCUIT SHALL CHANGE COLOR AT ANY POINT END TO END.
5. THE MANUFACTURER'S AUTHORIZED REPRESENTATIVE SHALL PROVIDE SUPERVISION OF FINAL SYSTEM PANEL CONNECTIONS, PERFORM A COMPLETE FUNCTIONAL TEST OF THE SYSTEM, AND A WRITTEN REPORT TO THE CONTRACTOR ATTESTING THE PROPER OPERATION OF THE COMPLETED SYSTEM.
6. ALL WIRING SHALL BE INSTALLED IN COMPLIANCE WITH N.E.C., NFPA 72, ALL STATE AND LOCAL REQUIREMENTS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
7. SLEEVE AND SEAL ALL PENETRATIONS THROUGH FIRE WALLS.
8. WIRING SHALL BE A MINIMUM OF NO. 14 AWG UNLESS OTHERWISE NOTED.
9. THE SMOKE DUCT DETECTOR SHALL BE FURNISHED AND TERMINATED BY THE FIRE ALARM CONTRACTOR, INSTALLED BY THE MECHANICAL CONTRACTOR.
10. SHOP DRAWINGS MUST BE SUBMITTED BY THE FIRE ALARM CONTRACTOR COMPLYING WITH THE FIRE ALARM PLAN REVIEW REQUIREMENTS POLICY - THESE DRAWINGS DO NOT CONSTITUTE APPROVAL AND MAY CHANGE AFTER A FULL REVIEW BY THE FIRE DEPT. HAVING JURISDICTION. A SEPARATE PERMIT MUST BE OBTAINED PRIOR TO INSTALLATION.
11. IN CORRIDORS WHERE MORE THAN TWO VISIBLE NOTIFICATION APPLIANCES ARE IN ANY FIELD OF VIEW, THEY SHALL FLASH IN SYNCHRONIZATION.
12. FIRE ALARM CONTRACTOR IS RESPONSIBLE FOR MODULES TO SHUTDOWN HVAC EQUIPMENT DURING ALARM CONDITION.
13. ALL FIRE ALARM WORK AND DEVICES SHALL BE INSTALLED AND TERMINATED BY A NICET LEVEL 2 FIRE ALARM TECHNICIAN.
14. IN THE EVENT OF AN ALARM THERE SHALL BE A "GLOBAL" SHUT DOWN OF ALL AIR HANDLING EQUIPMENT.
15. PROVIDE CONTROL VOLTAGE TO THE SHUNT TRIP CIRCUIT TO SHUT DOWN THE ELEVATOR POWER. IT SHALL BE MONITORED FOR THE PRESENCE OF OPERATING VOLTAGE. LOSS OF VOLTAGE TO THE CONTROL CIRCUIT FOR THE DISCONNECTING MEANS SHALL CAUSE A SUPERVISORY SIGNAL TO BE INDICATED AT THE CONTROL UNIT AND REQUIRE REMOTE ANNUNCIATORS. PER NFPA 72 - 6.16.4.4 (2007)
16. THE VOICE/ALARM COMMUNICATION SYSTEM PROVIDED DURING THIS PROJECT SHALL HAVE THE CAPACITY TO COVER THE ENTIRE CAMPUS IN FUTURE. THE VOICE/ALARM COMMUNICATION SYSTEM SHALL BECOME THE PRIMARY COMMUNICATING FACP AND WILL COMMUNICATE WITH THE EXISTING PANEL AND REPORT ALARMS AND SIGNALS FROM EXISTING PANEL.

FIRE ALARM SYSTEM CONTROL MATRIX

SYSTEM INPUTS \ SYSTEM OUTPUTS	ACTUATE COMMON ALARM SIGNAL INDICATOR	ACTUATE NOTIFICATION APPLIANCES	ACTUATE COMMON TROUBLE SIGNAL INDICATOR	ACTUATE COMMON SUPERVISORY SIGNAL INDICATOR	ALARM SIGNAL TO MONITORING SERVICE	SUPERVISORY SIGNAL TO MONITORING SERVICE	TROUBLE SIGNAL TO MONITORING SERVICE	DISPLAY/PRINT CHANGE OF STATUS	TRANSMIT ALARM SIGNAL TO CENTRAL STATION	RELEASE MAGNETICALLY HELD DOORS	RECALL ELEVATORS TO PRIMARY RECALL FLOOR	RECALL ELEVATORS TO ALTERNATE RECALL FLOOR	ACTIVATE FIRE ART SIGNAL	SIGNAL HVAC CONTROL SYSTEM	SHUNT TRIP ELEVATOR FEEDER CIRCUIT BREAKER
COMBINATION SMOKE / CARBON MONOXIDE DETECTORS	X	X			X			X	X	X				X	
HEAT DETECTORS	X	X			X			X	X	X				X	
MANUAL PULL STATIONS	X	X			X			X	X	X				X	
SYSTEM TROUBLE CONDITION			X				X	X							
LOSS OF FACU AC POWER (NOTE 1)			X				X	X							
GROUND FAULT			X				X	X							
SHORT CIRCUIT			X				X	X							
OPEN CIRCUIT			X				X	X							
PRIMARY FLOOR ELEVATOR LOBBY RECALL SMOKE DETECTOR	X	X			X			X	X	X		X		X	
ALTERNATE FLOOR ELEVATOR LOBBY RECALL SMOKE DETECTOR	X	X			X			X	X	X	X			X	
ELEVATOR MACHINE ROOM SMOKE DETECTOR	X	X			X			X	X	X			X	X	
ELEVATOR MACHINE ROOM HEAT DETECTOR	X	X			X			X	X	X					X
ELEVATOR PIT SMOKE DETECTOR	X	X			X			X	X	X			X	X	
ELEVATOR PIT HEAT DETECTOR	X	X			X			X	X	X					X
EXHAUST HOOD FIRE SUPPRESSION SYSTEM	X	X			X			X	X	X				X	

NOTES:
1. ONLY AFTER LOSS OF POWER FOR > 8 HOURS.
2. ELEVATOR INPUTS AND OUTPUTS ARE TYPICAL FOR EACH ELEVATOR.
3. REFER TO FIRE PROTECTION DRAWINGS FOR SPRINKLER DEVICE LOCATIONS.
4. REFER TO MECHANICAL DRAWINGS FOR DUCT MOUNTED SMOKE DETECTOR LOCATIONS.
5. TYPICAL, QUANTITIES OF DEVICES ARE NOT SHOWN, SEE FIRE PROTECTION DRAWINGS FOR QUANTITIES AND LOCATIONS.

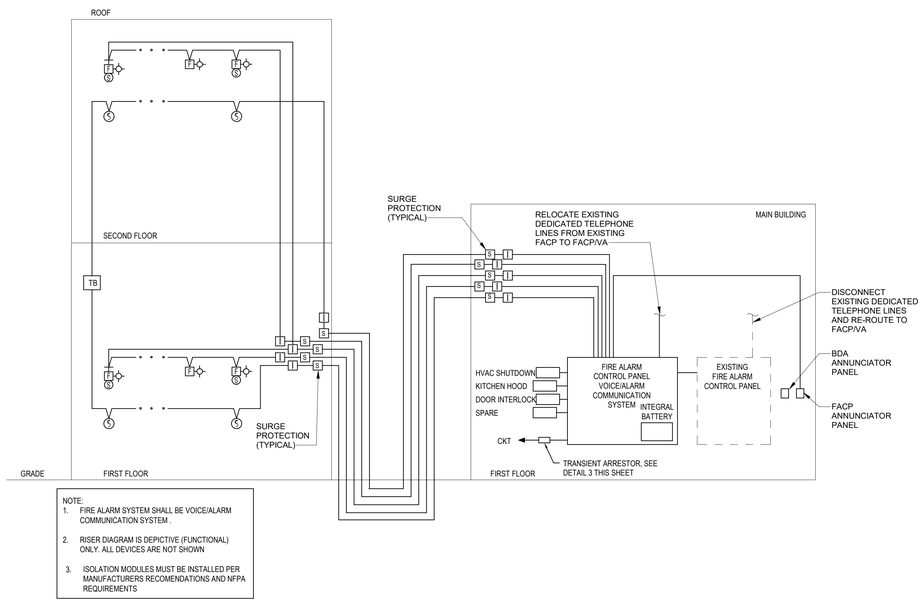


NOTE:
DETAIL SHOWN FOR REFERENCE ONLY, NOT ALL DEVICES ARE INDICATED ON PLANS.

2 FIRE ALARM DEVICES MOUNTING HEIGHTS1
NO SCALE

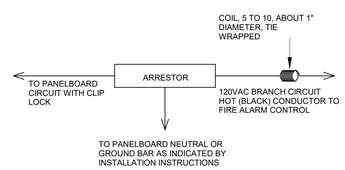
FIRE ALARM SYMBOL LEGEND

SYMBOL	DESCRIPTION
(X)FACP	EXISTING FIRE ALARM CONTROL PANEL
	EXISTING FIRE ALARM REMOTE ANNUNCIATOR
	FACP/VA- FIRE ALARM CONTROL PANEL VOICE ALARM
F S	FIRE ALARM SPEAKER/STROBE DEVICE, 80" AFF, *15cd" INDICATES CANDELA RATING
F	FIRE ALARM STROBE DEVICE, 80" AFF, *15cd" INDICATES CANDELA RATING
	COMBINATION SMOKE / CARBON MONOXIDE DETECTOR, CEILING MOUNTED
F	FIRE ALARM MANUAL STATION, 48" AFF
I	F.A. INDIVIDUAL ADDRESSABLE ISOLATION MODULE
S	SURGE PROTECTION MODULE
(X)	INDICATES EXISTING EQUIPMENT
1	KEYED NOTE (SEE SCHEDULE)



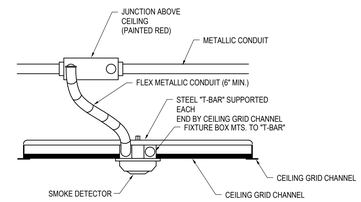
NOTE:
1. FIRE ALARM SYSTEM SHALL BE VOICE/ALARM COMMUNICATION SYSTEM .
2. RISER DIAGRAM IS DEPICTIVE (FUNCTIONAL) ONLY. ALL DEVICES ARE NOT SHOWN
3. ISOLATION MODULES MUST BE INSTALLED PER MANUFACTURERS RECOMENDATIONS AND NFPA REQUIREMENTS

1 FIRE ALARM RISER1
NO SCALE

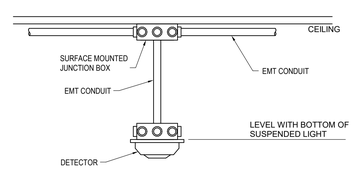


NOTES:
SECURELY MOUNT TRANSIENT ARRESTOR IN ACCESSIBLE JUNCTION BOX OR PROPER METAL ENCLOSURE ADJACENT TO THE PANELBOARD. PROVIDE ENGRAVED LABEL INDICATING ITS LOCATION

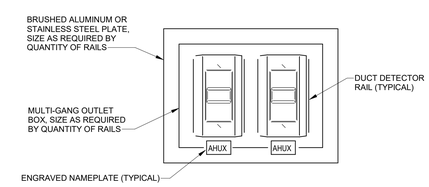
3 TRANSIENT ARRESTOR INSTALLATION DETAIL1
NO SCALE



4 TYPICAL CEILING MOUNTED DETECTOR MOUNTING DETAIL1
NO SCALE



5 TYPICAL SYSPENDED DEVICE DETAIL1
NO SCALE



6 AHU RAIL INSTALLATION DETAIL1
NO SCALE

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PROGRESS DRAWING
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PROJECT TITLE

WEST BRUNSWICK HIGH SCHOOL NEW BUILDING

550 WHITEVILLE ROAD N.W.
SHALLOTTE, NC 28470

DSP # : 100
DPI SCHOOL # : 1165

SHEET TITLE

FIRE ALARM RISER DIAGRAM, LEGEND AND NOTES

ISSUE BLOCK

Mark	Date	Description
	01.20.20	60% CD PROGRESS DRAWINGS
	10.14.19	NCDPI DD SUBMISSION
	07.30.19	SD PROGRESS DRAWINGS
	07.11.19	NCDPI SD SUBMISSION

PROJECT NO:	2019082.00
DATE:	01.20.2020
SCALE:	As indicated
DRAWN BY: HGH	PROJ MGR: WAC

F601

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