

ADVERTISEMENT FOR BIDS

Addition and Renovation:
Craven County Animal Shelter
Craven County
1639 Old Airport Road
New Bern, NC

Craven County will receive bids until 2:00 p.m. on Tuesday June 30, 2015 at the County Manager's Office, 406 Craven Street, New Bern, NC. At that time all bids submitted by qualified contractors holding applicable licenses in North Carolina, will be opened and read aloud, for the addition and renovation of the Craven County Animal Shelter located at 1639 Old Airport Road.

SINGLE PRIME bids will be received on the following categories of work, consistent with all North Carolina Statutes applicable thereto:

GENERAL CONSTRUCTION (INCLUDING SITE WORK), INCLUDING
PLUMBING
HEATING, VENTILATING & AIR CONDITIONING
ELECTRICAL.

Any prospective bidder may arrange to visit the site by scheduling an appointment with Steve Creel, Facilities Director (screel@cravencountync.gov) and/or Charles Francis, Architect (crfrancis1@embarqmail.com).

The Owner reserves the right to reject any or all bids without further obligations to any bidder and waive any or all formalities permitted by North Carolina Statutes that the Owner may deem to the interest of the project.

Each bid shall be accompanied by a bid bond equal to 5% of the bid.

A performance bond in an amount equal to 100% of the Contract price and a payment bond in an amount equal to 100% of the Contract price shall be delivered to Craven County by the successful bidder at the time the contract is signed.

All bonds shall be payable to Craven County and shall be issued by a surety company authorized to do business in North Carolina.

Plans and specifications may be examined at the Office of the County Manager, 406 Craven Street, New Bern, NC and at the office of C. R. Francis / Architecture, 329 Middle Street, New Bern, NC. Plans may be secured by qualified contractors at the office of C. R. Francis Architecture, P.A. with a deposit of \$150.00 or may be obtained from the architect's or county's website. Deposits will be returned to bona fide bidders when the plans and specifications have been returned in good order directly to the office of the architect within thirty (30) days after the date on which the bids have been opened. Prospective bidders are requested to register with the architect at crfrancis1@embarqmail.com if they obtain copies of the plans through the website.

The policy of Craven County is to encourage and recruit minority businesses to bid on public contracts and it awards public contracts without regard to race, religion, color, creed, national origin, sex, age, or handicapping conditions. Craven County Board of Commissioners

Craven County
New Bern, NC
Gene Hodges, Assistant County Manager

PROJECT DATA - CODE SUMMARY
MODIFIED APPENDIX B

PROJECT: ADDITION & RENOVATION: ANIMAL SHELTER - CRAVEN COUNTY
ADDRESS: 1639 OLD AIRPORT ROAD, NEW BERN, NC Zip Code: 28560
PROPOSED USE: Business - Animal Shelter
OWNER/AUTHORIZED AGENT: Craven County Contact: Gene Hodges Phone: 252.636.6600
 Asst. County Manager E-Mail: mhodges@cravencountync.gov

OWNERSHIP TYPE: County
CODE JURISDICTION: Craven County

Architect of Record: C. R. Francis / Architecture, p.a., 329 Middle Street, New Bern, NC
 Charles R. Francis AIA - NC License 3674 252.637.1112
 cfrancis1@crfran.com

Consulting Engineers: Structural / Retaining Walls
 Conzelman Engineering, PA, 5110 Buccoo Reef Road, New Bern, NC
 Elizabeth A. Conzelman, PE NC License 027464 252.571.7253
 econz1@suddenlink.net

Consulting Engineers: Plumbing, Mechanical, Fire Alarm & Electrical
 Conzelman Engineering, PA, 5110 Buccoo Reef Road, New Bern, NC
 Elizabeth A. Conzelman, PE NC License 027464 252.571.7253
 econz1@suddenlink.net

Applicable Code:
 2012 NC BUILDING CODE FOR NEW CONSTRUCTION
 2009 NC REHABILITATION CODE FOR PARTIAL RENOVATION

Original Construction Date: 1990 Original Use[s] BUSINESS - ANIMAL SHELTER
Renovated Date: NONE TO DATE Current Use[s] BUSINESS - ANIMAL SHELTER
 Proposed Use[s] NO CHANGE

Building Data:
Construction Type: Original Building: Type V Ordinary under code at the time of construction
 New Construction: Type V-b

SPRINKLERS: No
STAIRWELLS: No
FIRE DISTRICT: No
BUILDING HEIGHT: FLOOD HAZARD AREA: No

FLOOR	EXISTING BUILDING AREA	NEW BUILDING AREA	SUB-TOTAL
FIRST FLOOR	4939	2635	8574
TOTALS	4939	2635	8574 TOTAL ON SITE

ALLOWABLE AREA
 X THE SQUARE FOOTAGE OF EACH FIRE AREA [902]
 N/A THE SQUARE FOOTAGE OF EACH SMOKE COMPARTMENT [407.4]
 N/A NOTE ANY CODE EXCEPTIONS OR TABLE NOTES THAT MAY HAVE BEEN UTILIZED REGARDING THE ITEMS ABOVE

ACCESSIBLE DWELLING UNITS
 [SECTION 1107]
 Not Applicable

ACCESSIBLE PARKING
 [SECTION 1106]
 No change from existing - No increase in personnel or client volume - increase in animal holding only.

STRUCTURAL DESIGN
DESIGN LOADS

Importance Factors:	Wind (I)	1.0
Snow (I)	1.0	
Seismic (I)	1.0	
Live Loads:	Roof:	20 psf
Mechanical:	20 psf	
Floor:	100 psf	
Ground Snow Load:	10 psf	
Wind Load:	Basic Wind Speed:	120 Mph (ASCE-7)
Exposure Category:	C	
Wind Base Shears (for MWFRS):	V _w =80k V _v =22.4k	

SEISMIC DESIGN CATEGORY: B
 PROVIDE THE FOLLOWING SEISMIC DESIGN PARAMETERS:
 Occupancy Category (Table 1604.5) II
 Spectral Response Acceleration S_s: 17% S_s: 6%
 Site Classification (Table 1613.3.2) D
 Data Source: Prescriptive
 Basic Structural System (Other One) Bearing Wall Dual w/ Special Moment Frame
 Building Frame Dual w/ Intermediate R/C or Special Steel
 Moment Frame Inverted Pendulum
 Seismic Mass Source: V₁ V₂ BY METAL BUILDING ENGINEERS
 Analysis Procedure: Simplified, Equivalent Lateral Force, Dynamic select one
 Architectural, Mechanical, Components: Yes or No

LATERAL DESIGN CONTROL: WIND
SOIL BEAR CAPACITIES: Presumptive Bearing Capacity: 2000 psf
SPECIAL INSPECTIONS REQUIRED: NO

PLUMBING FIXTURE REQUIREMENTS
 [SEE PLUMBING DRAWINGS]

OCCUPANCY: Business
Accessory Occupancies: NONE
Accessory Occupancies: NONE
Special Uses: Not Applicable
Special Provisions: Not Applicable

Mixed Occupancy: No
INCIDENTAL USE SEPARATION [508.2.5]
 N/A THIS SEPARATION IS NOT EXEMPT AS A NON-SEPARATED USE [SEE EXCEPTIONS].
NON-SEPARATED USE [508.3.2]
 N/A THE REQUIRED TYPE OF CONSTRUCTION FOR THE BUILDING SHALL BE DETERMINED BY APPLYING THE HEIGHT AND AREA LIMITATIONS FOR EACH OF THE APPLICABLE OCCUPANCIES TO THE ENTIRE BUILDING. THE MOST RESTRICTIVE TYPE OF CONSTRUCTION, SO DETERMINED, SHALL APPLY TO THE ENTIRE BUILDING.
SEPARATED USE [509.3.3] SEE BELOW FOR AREA CALCULATIONS
 N/A 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.

STORY	USE	BLDG. AREA PER STORY (ACTUAL)	TABLE 503 AREA ²	AREA INCREASE FOR FACTORAGE ³	AREA INCREASE FOR SPRINKLERS ⁴	ALLOWABLE AREA OR UNLIMITED ⁵	MAXIMUM ALLOWABLE AREA ⁶
First Floor:	B	2635	9000	N/A	N/A	9000	9000

No area increases requested or required.

Actual Area of Occupancy A / Allowable Area of Occupancy A + Actual Area of Occupancy B / Allowable Area of Occupancy B - < or = 1

ALLOWABLE HEIGHT

ALLOWABLE HT. BY TABLE 503	INCREASE FOR SPRINKLERS	INDICATED ON CONTRACT DOCUMENTS	CODE REFERENCE
CONSTRUCTION TYPE: V-b	40'	FEET = H + 20' = 19'-9"	N/A
BUILDING HT. IN FEET	2	STORES + 1 = 1	N/A

FIRE PROTECTION REQUIREMENTS

BUILDING ELEMENT	FIRE SEPARATION DISTANCE	RATING REQUIRED	PROVIDED (w/ REDUCTION)	DETAIL # AND SHEET #	RATED ASSEMBLY DESIGN #	RATED PENETRATION DESIGN #	RATED JOINT DESIGN #
STRUCTURAL FRAME INCLUDING COLUMNS, GIRDERS, AND TRUSSES	0	0	0				
BEARING WALLS:							

ENERGY SUMMARY:
Thermal Envelope:
 Climate Zone: 3
 Method of Compliance: Prescriptive Energy Code

Roof / Ceiling Assembly

ASSEMBLY DESCRIPTION:	U-VALUE OF ASSEMBLY:	R-VALUE OF INSULATION:	OPENINGS (WINDOWS / DOORS):	SHADING COEFFICIENT:	PROJECTION FACTOR:
METAL BUILDING ROOF WITH "EMULE-SHOWER SYSTEM FOR INSULATION WITH FIBERGLASS BATT BETWEEN PURLINS AND WITH THERMAL BLOCKS OVER PERLINS	0.040	R-11ci + R-19 w/ R-5 THERMAL BLOCKS	0.28 WINTER 0.26 SUMMER	.40	PF=0

EXTERIOR WALL ASSEMBLY

ASSEMBLY DESCRIPTION:	U-VALUE OF ASSEMBLY:	R-VALUE OF INSULATION:	OPENINGS (WINDOWS / DOORS):	SHADING COEFFICIENT:	PROJECTION FACTOR:
METAL BUILDING SIDING OVER 2.1" RIGID INSULATION OVER ~ 80' OF THE STRUCTURE WITH THE REMAINDER BEING STL STUD WITH 2" CI RIGID INSULATION	0.070, 0.058 (FRAME WALLS), 0.079 (MASON WALL)	R-13, R-9.3	0.28 WINTER 0.26 SUMMER	.40	PF=0

DOOR R-VALUE:
 GLAZED PORTION OF DOOR [75%] 0.77 WINTER 0.75 SUMMER, POLYURETHANE CORE - 0.10
 2.22 OPAQUE DOORS

FLOOR SLAB ON GRADE

ASSEMBLY DESCRIPTION:	U-VALUE OF ASSEMBLY:	R-VALUE OF INSULATION:	HORIZONTAL / VERTICAL REQUIREMENT:	SLAB HEATED:
4" CONCRETE SLAB ON GRADE	NONE	NONE	N/A	NO

MECHANICAL SYSTEMS
 [SEE MECHANICAL DRAWINGS]

Thermal Zone	Winter dry bulb	Summer dry bulb
3	26.4F	94FF

Interior design conditions

Winter dry bulb	Summer dry bulb	Relative humidity
55F	80F	50%

Building heating load

Zone 1	Zone 2	Zone 3
40003BTUH	91422 BTUH	NA

EXTERIOR: NO EXTERIOR BEARING WALLS, FULLY STRUCTURAL STEEL FRAME

EXTERIOR	0	0
INTERIOR	0	0

NON-BEARING WALLS & PARTITIONS:

EXTERIOR	0	0
INTERIOR	0	0

FLOOR CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS
 FLOOR CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS: 0 0
ROOF CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS
 ROOF CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS: 0 0

EMERGENCY LIGHTING: Yes
EXIT SIGNS: Yes
FIRE ALARM: Yes
SMOKE DETECTION SYSTEMS: Yes
PANIC HARDWARE: No [PANIC HARDWARE IS INTEGRATED IN DOOR ON THE MAIN ENTRANCE TO THE NEW STRUCTURE, BUT IS NOT REQUIRED.]

LIFE SAFETY PLAN REQUIREMENTS
 Life Safety Plan Sheet #:
 N/A FIRE AND / OR SMOKE RATED WALL LOCATIONS [CHAPTER 7]
 X ASSUMED AND REAL PROPERTY LINE LOCATIONS
 X EXTERIOR WALL OPENING AREA WITH RESPECT TO DISTANCE TO ASSUMED PROPERTY LINES [705.8]
 X EXISTING STRUCTURES WITHIN 30 FEET OF THE PROPOSED BUILDING
 X OCCUPANCY TYPES FOR EACH AREA AS IT RELATES TO OCCUPANT LOAD CALCULATION [TABLE 1004.1.1]
 X OCCUPANT LOADS FOR EACH AREA
 X EXIT ACCESS TRAVEL DISTANCES [1016]
 X COMMON PATH OF TRAVEL DISTANCES [1014.3 & 1028.8]
 X DEAD END LENGTHS [1018.4]
 X CLEAR EXIT WIDTHS FOR EACH EXIT DOOR
 X MAXIMUM CALCULATED OCCUPANT LOAD CAPACITY EACH EXIT DOOR CAN ACCOMMODATE BASED ON EGRESS WIDTH [1005.1]
 X ACTUAL OCCUPANT LOAD FOR EACH EXIT DOOR
 N/A A SEPARATE SCHEMATIC PLAN INDICATED WHERE FIRE RATED FLOOR/CEILING AND / OR ROOF STRUCTURE IS PROVIDED FOR PURPOSES OF OCCUPANCY SEPARATION
 X LOCATION OF DOORS WITH PANIC HARDWARE [1008.1.10]
 N/A LOCATION OF DOORS WITH DELAYED EGRESS LOCKS AND THE AMOUNT OF DELAY [1008.1.9.7]
 N/A LOCATION OF DOORS WITH ELECTROMAGNETIC EGRESS LOCKS [1008.1.9.8]
 N/A LOCATION OF DOORS EQUIPPED WITH HOLD-OPEN DEVICES
 N/A LOCATION OF EMERGENCY ESCAPE WINDOWS [1029]

Building cooling load 519358TUH 837638TUH 1069758TUH
MECHANICAL SPACE CONDITIONING SYSTEM

Unitary	Unit Description	Split system air/condensing furnace
Heating Efficiency:	93-98%	
Cooling Efficiency:	13.4-14.5 SEER	
Size category of unit	[3] 5 ton + [2] 7.5 ton AC	
List Equipment Efficiencies:	R/EVER (66.1% / 66.1%)	

ELECTRICAL SYSTEM:
 [SEE ELECTRICAL DRAWINGS]
METHOD OF COMPLIANCE:
 ENERGY CODE: PRESCRIPTIVE

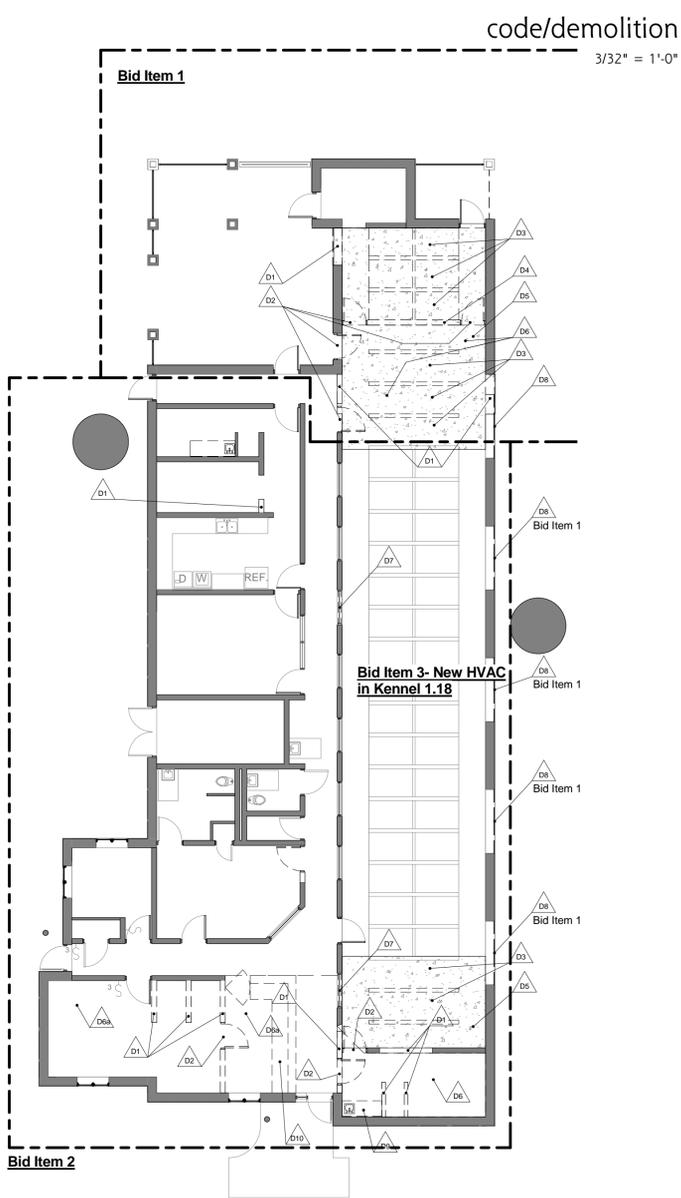
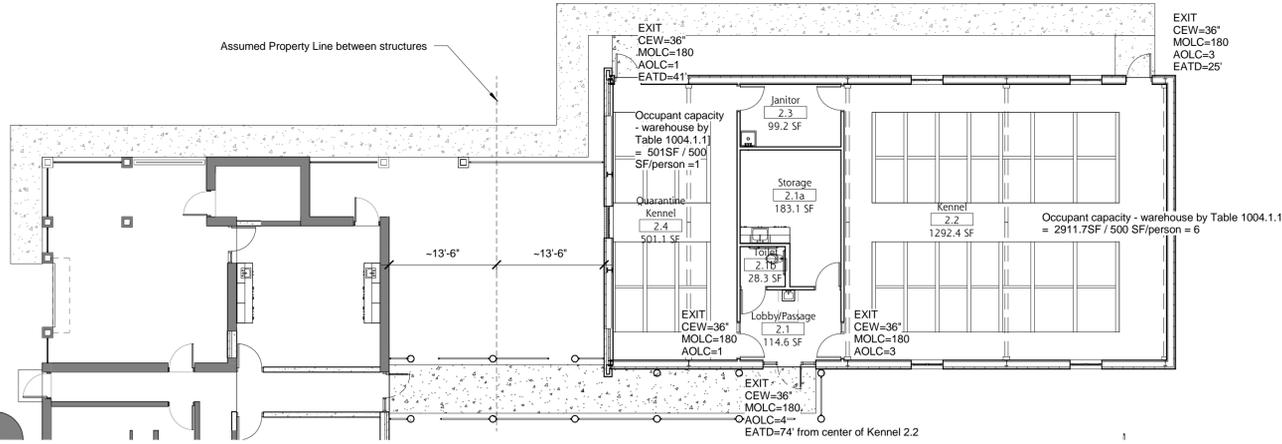
LIGHTING SCHEDULE - SEE ELECTRICAL DRAWINGS

Lamp type required in fixture:	Fluorescent T-8 & LED
Number of lamps in fixture:	1/2
Ballast type used in fixture:	electronic
Number of ballasts in fixture:	1
Total wattage per fixture:	32W/64W FL, 16W or 23W LED
Total interior watts specified vs. allowed:	[whole building or space by space]
Total interior watts specified vs. allowed:	Space by space
Total exterior watts specified vs. allowed:	1334W vs. 1348W
Total exterior watts specified vs. allowed:	69W vs. 1322W

ADDITIONAL PRESCRIPTIVE COMPLIANCE
 506.203 ENERGY RECOVERY VENTILATION SYSTEMS

Area = 2635 SF
Fire Areas [Occupancies]:
 Business 2635 SF
 This occupancy falls within the tabular requirement [Table 1015.1] allowing a single exit for that occupancy.
 All travel distances to exits are less than 200 ft as required by Table 1016.1.
 All openings are located no closer than 10 ft. from the assumed or real property lines as allowed by Table 602 for construction type Vb occupancy B.

Abbreviation Key
 Not all abbreviations are used.
 CEW = Clear Exit Width for each door
 MOLCS = Maximum calculated Occupant Load Capacity based on egress width
 AOLC = Actual Occupant Load Capacity
 PH = Panic Hardware
 HO = Hold Open Device
 EEL = Electromagnetic Egress Lock
 DEL = Delayed Egress Lock - w/ delay time indicated
 DL = Dead End Length in feet
 CPTD = Common Path of Travel Distance in feet
 EATD = Exit Access Travel Distance in feet



② Level 1 - Demolition
 3/32" = 1'-0"

Demolition Schedule

- D1 Remove portion of existing wall [saw cut] for installation of new work.
- D2 Remove existing door.
- D3 Remove existing kennel wire mesh partitions and cmu partitions.
- D4 Remove existing wall in its entirety.
- D5 Remove concrete floor in hatched area.
- D6 Remove ceiling. In bid item 1 - in new portion of corridor and in new triage/exam. room - see finish schedule. In bid item 2 - in new portion of waiting area and in new visiting room 1.21.
- D7 Remove windows.
- D8 Remove upward acting coiling doors.
- D9 Remove cabinet and associated plumbing fixture and piping.
- D10 Remove reception desk, gate, and any and all electrical devices in the way of the new work.
- D11 Remove any and all work in the way of new work shown on sheets 3 through 19.

Addition & Renovation: Animal Shelter

Craven County 1639 Old Airport Road New Bern, NC

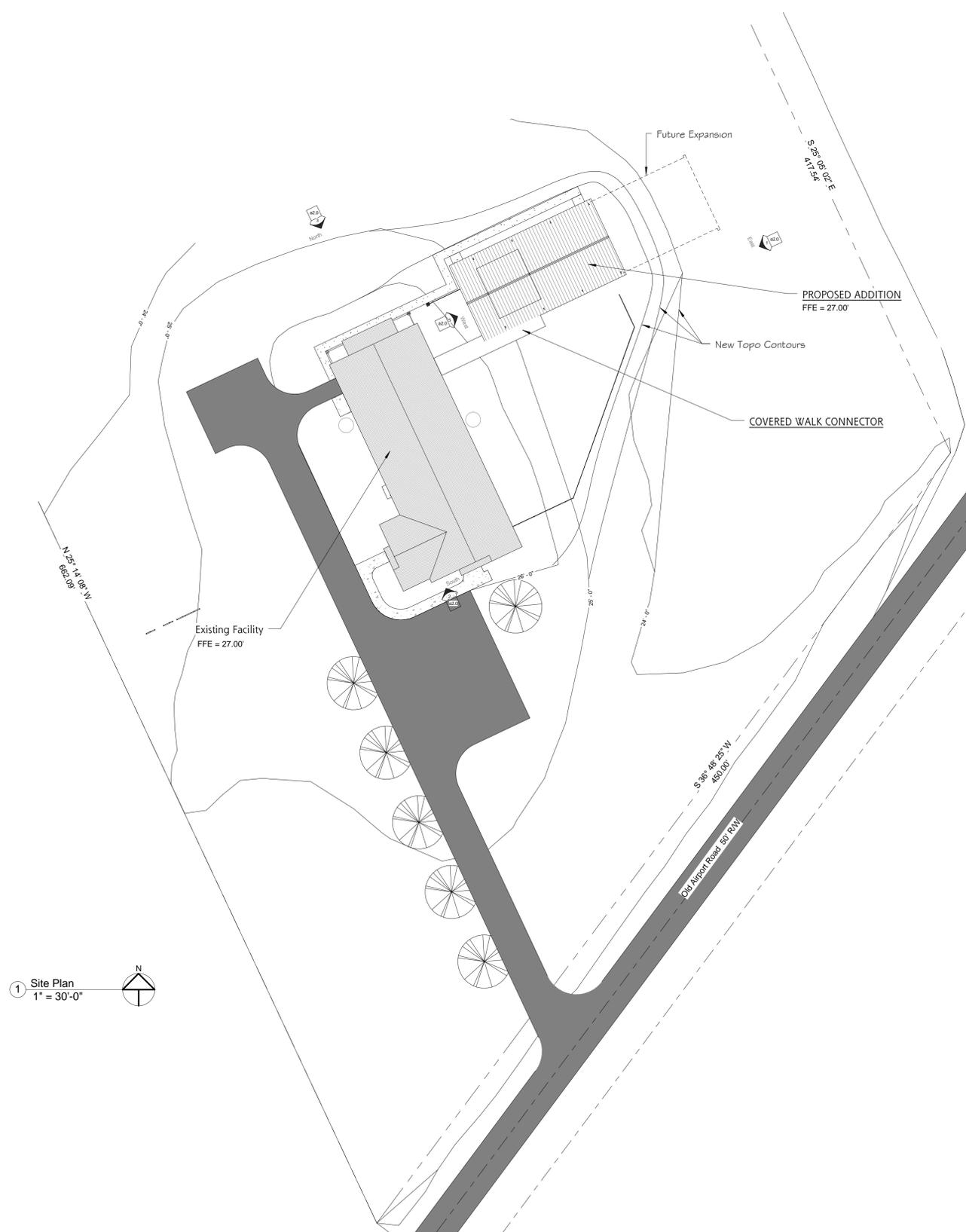


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1 Site Plan
1" = 30'-0"

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Addition & Renovation: Animal Shelter

Craven County

1639 Old Airport Road New Bern, NC



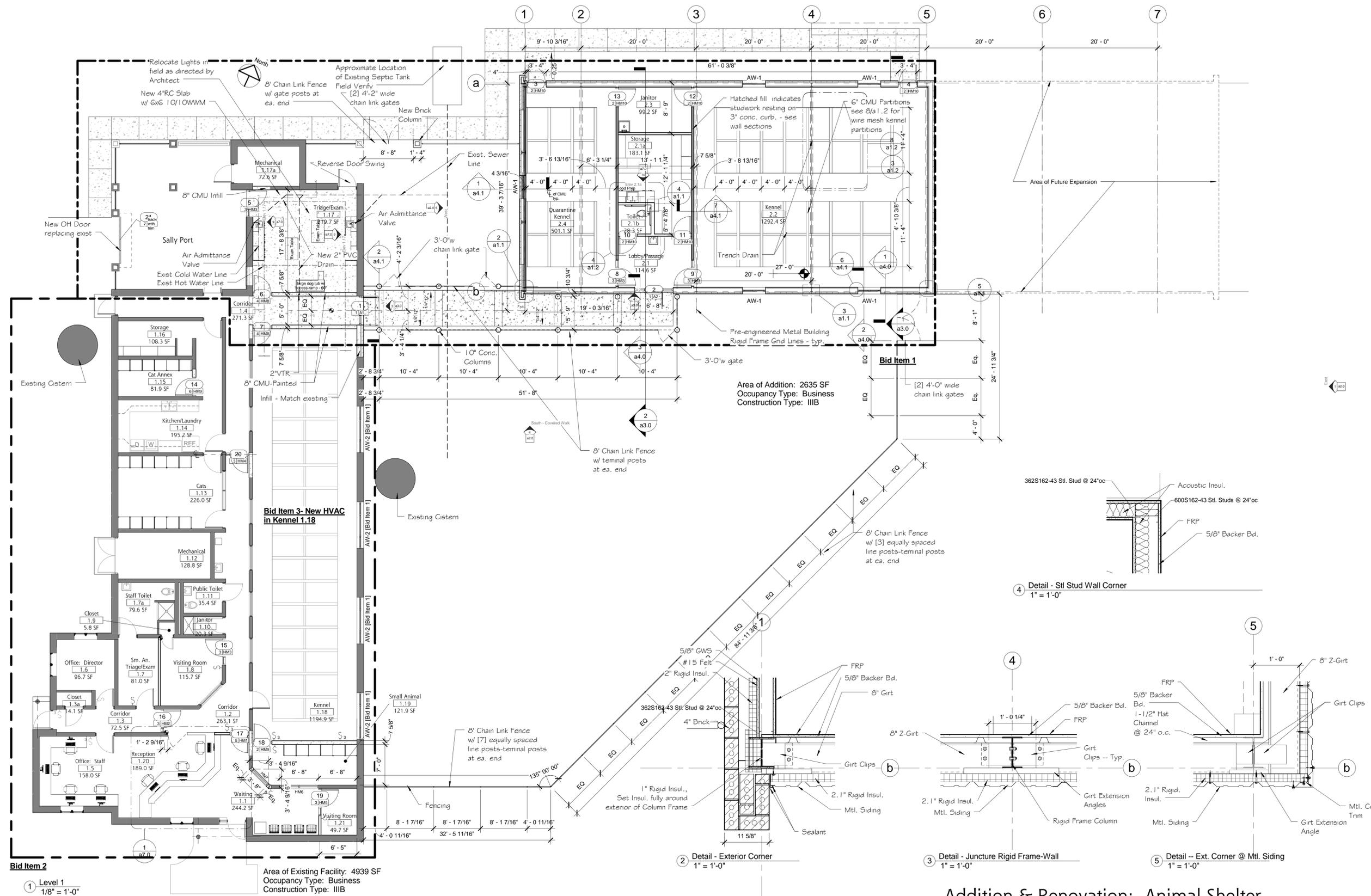
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sheet as1.0

Date: 2 June 2015 Drawn by: Author Sequential No. 3 of 19



Addition & Renovation: Animal Shelter
Craven County 1639 Old Airport Road New Bern, NC

3674
NEW BERN, N.C.

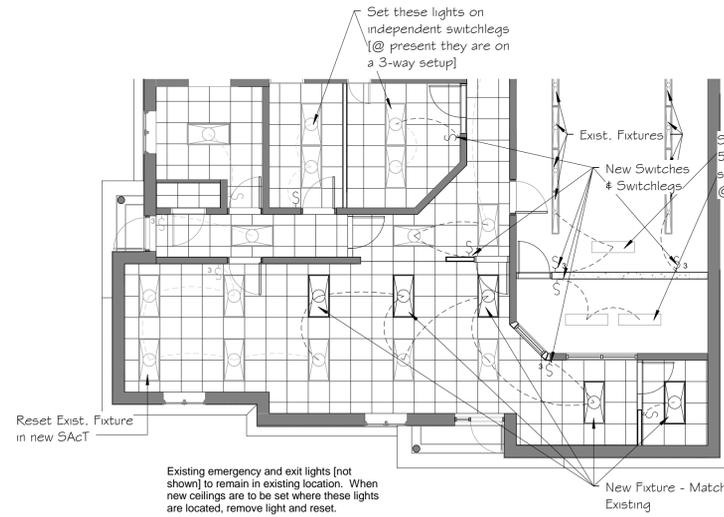
51461
NEW BERN, N.C.

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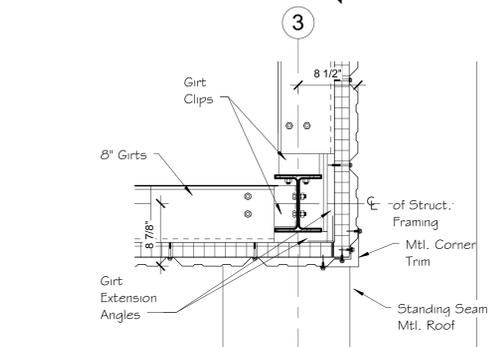
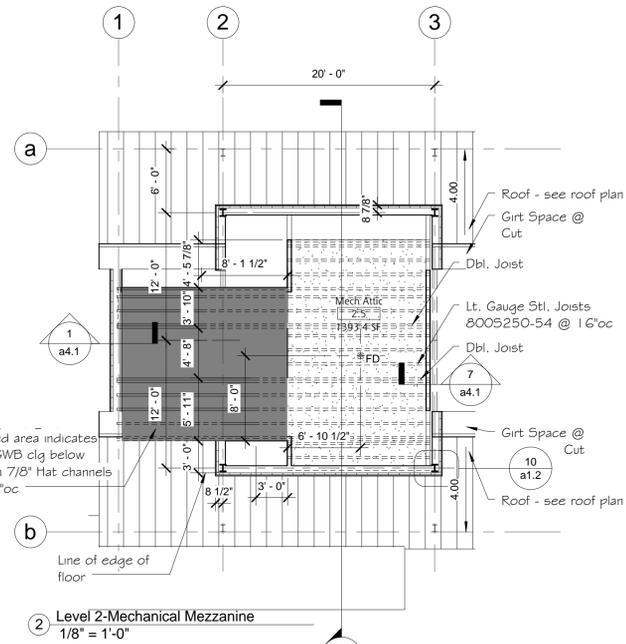
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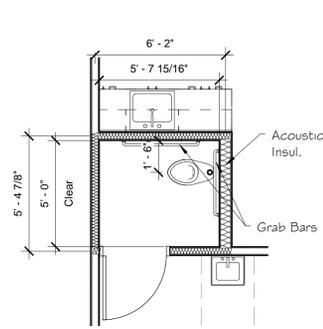
sheet **a1.1**



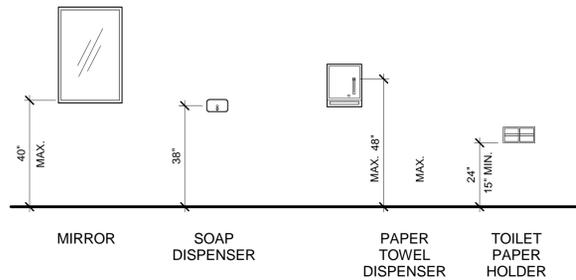
1 Level 1 - Partial Reflected Ceiling
1/8" = 1'-0"



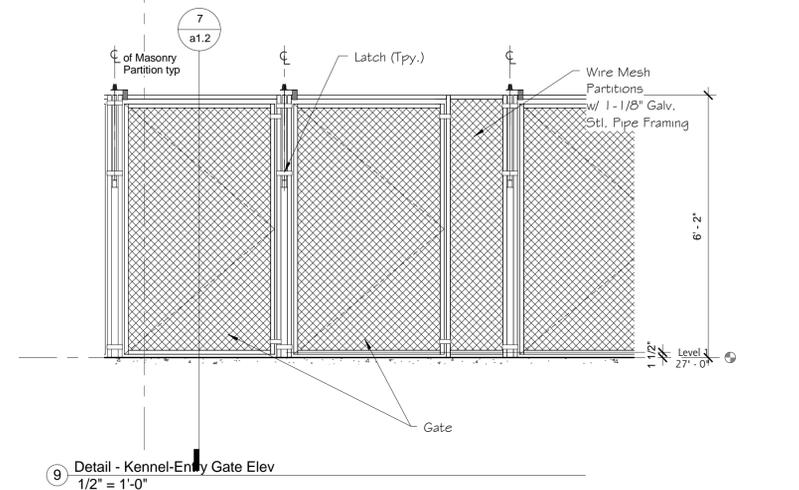
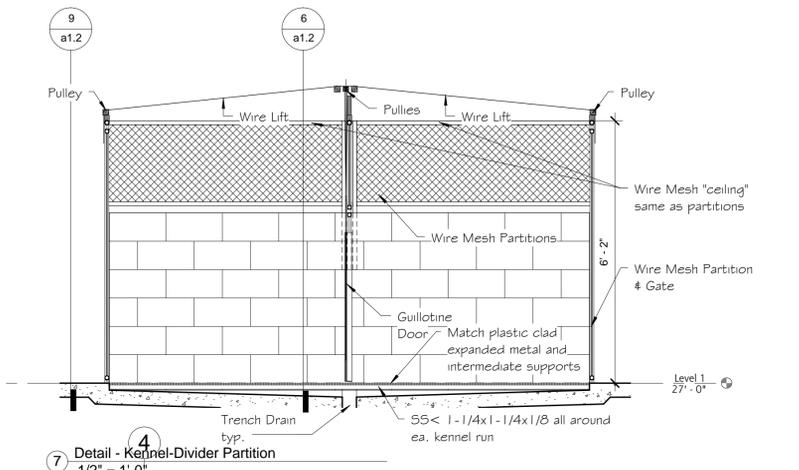
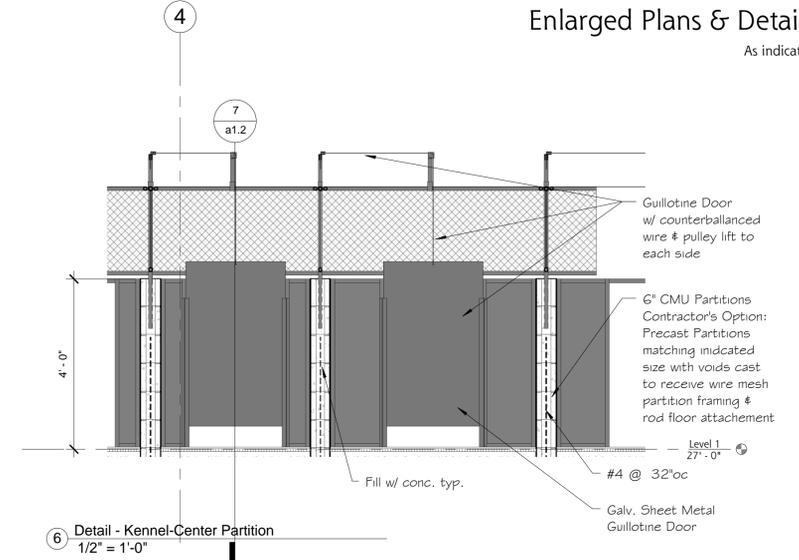
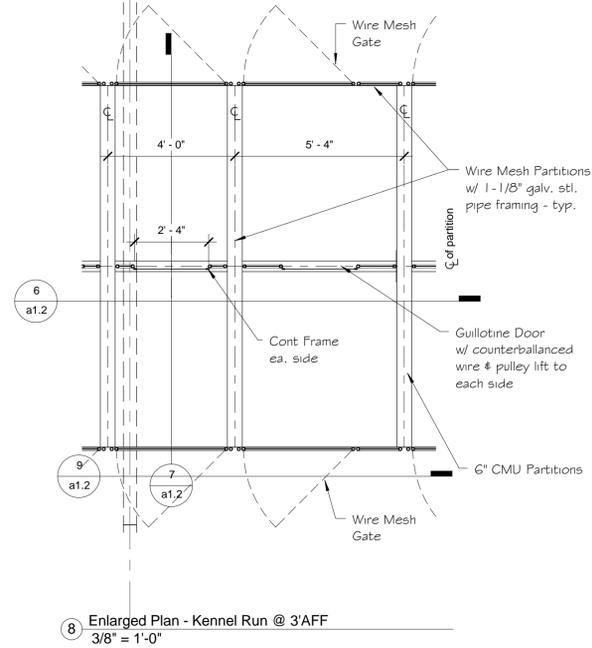
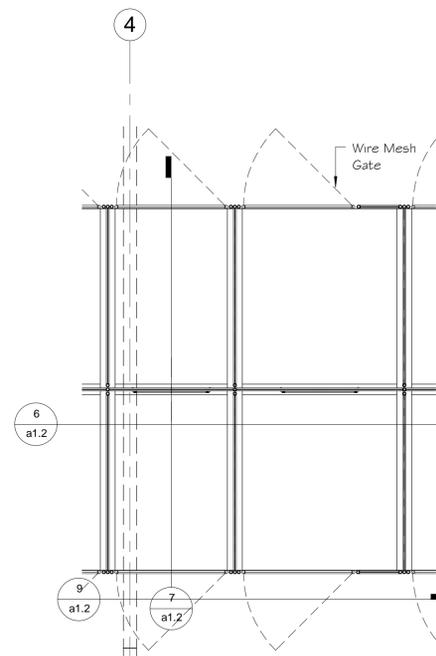
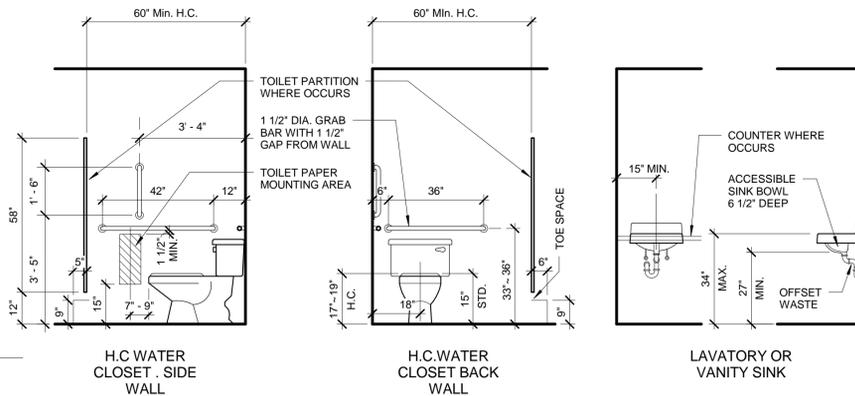
10 Level 2 - Callout 1
1" = 1'-0"



4 Enlarged Plan - Toilet
1/4" = 1'-0"



5 Toilet Accessories Mounting Heights
3/8" = 1'-0"



Addition & Renovation: Animal Shelter

Craven County

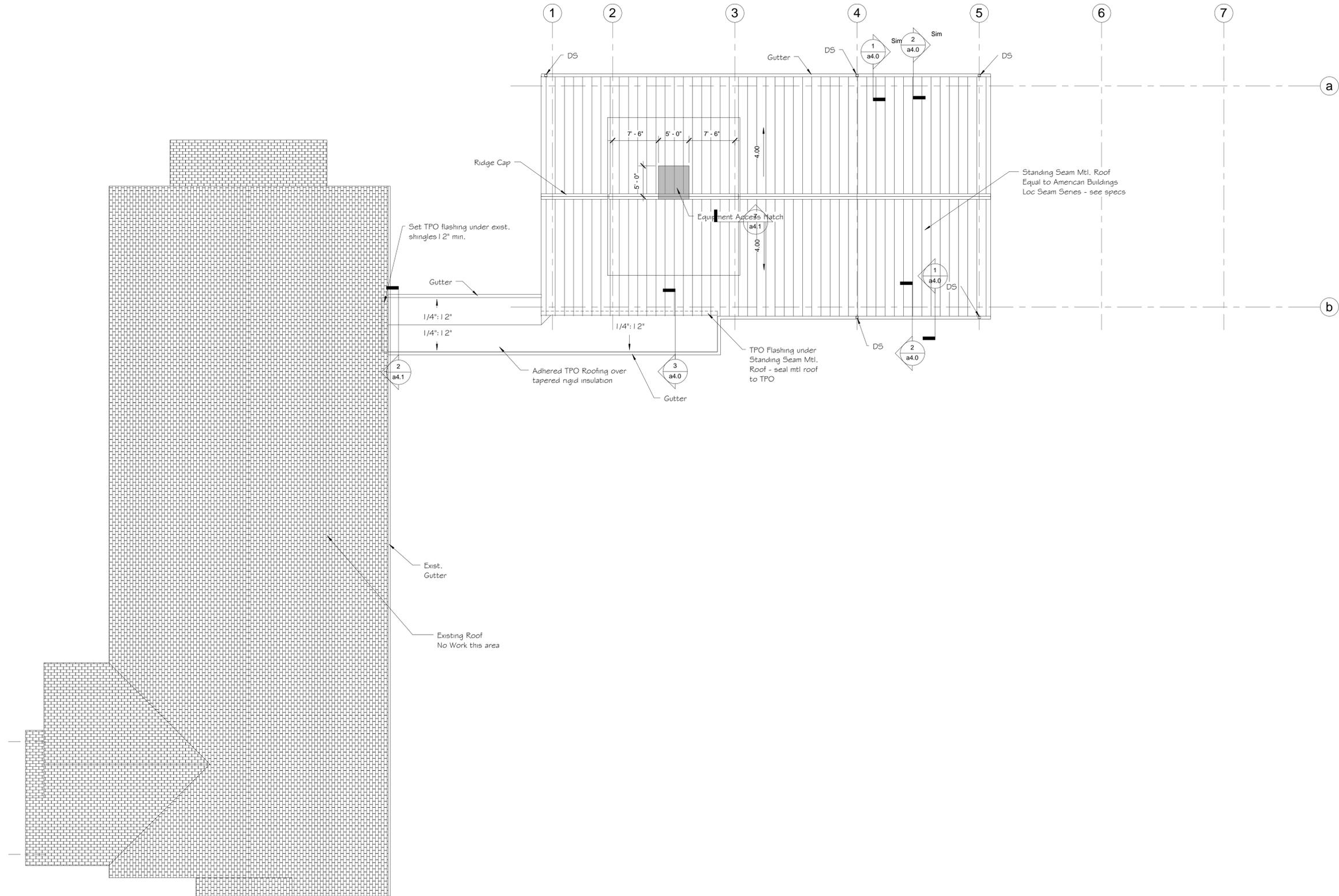
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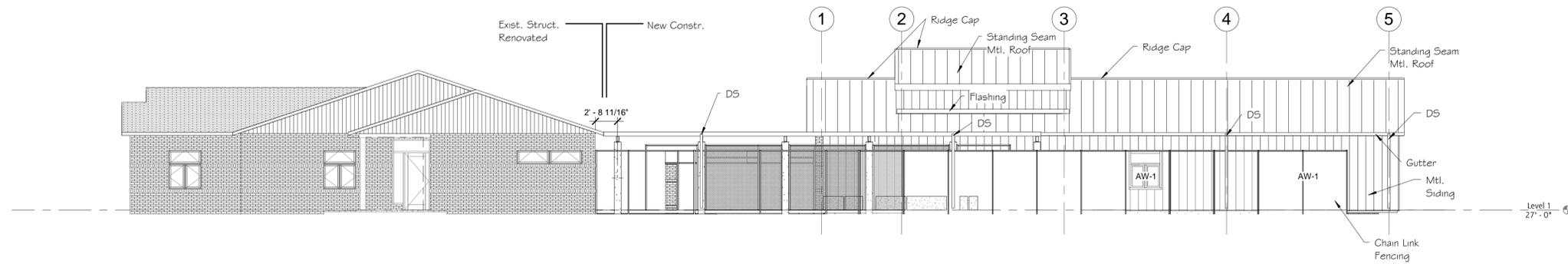
1 Roof
1/8" = 1'-0"

Addition & Renovation: Animal Shelter
Craven County 1639 Old Airport Road New Bern, NC

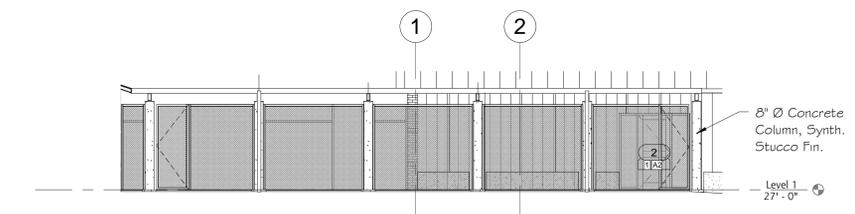


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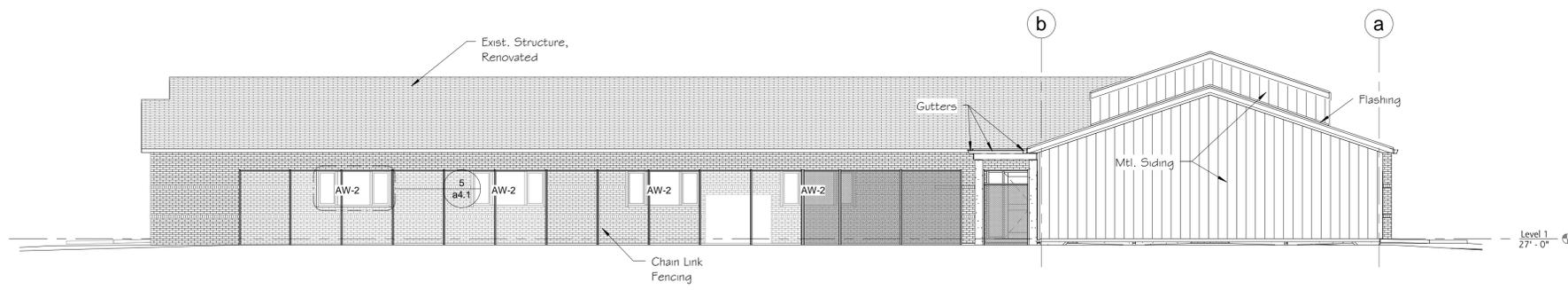
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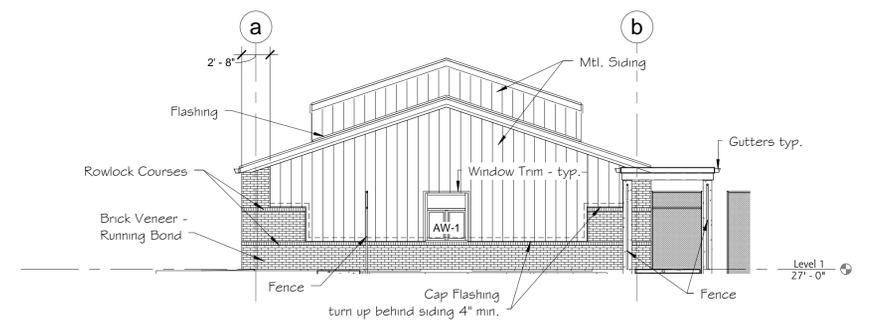
2 South
1/8" = 1'-0"
See Sheet a1.1



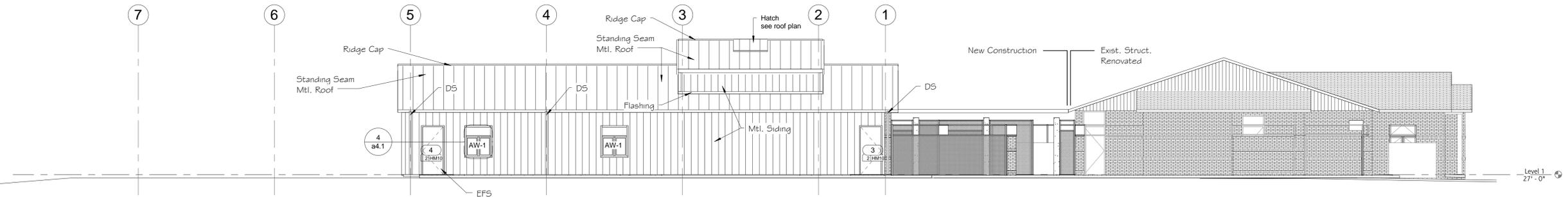
4 South - Covered Walk
1/8" = 1'-0"



1 East
1/8" = 1'-0"



5 West
1/8" = 1'-0"

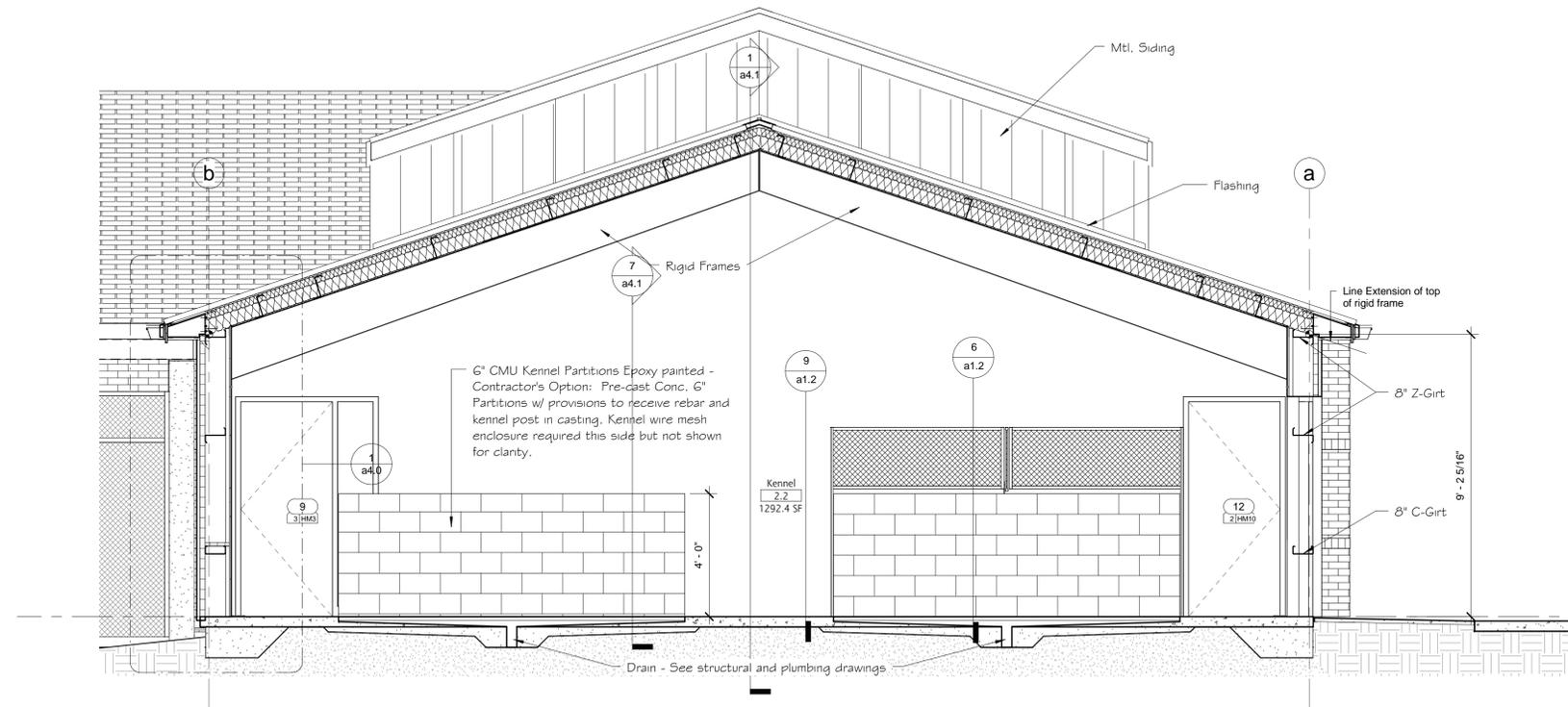


3 North
1/8" = 1'-0"

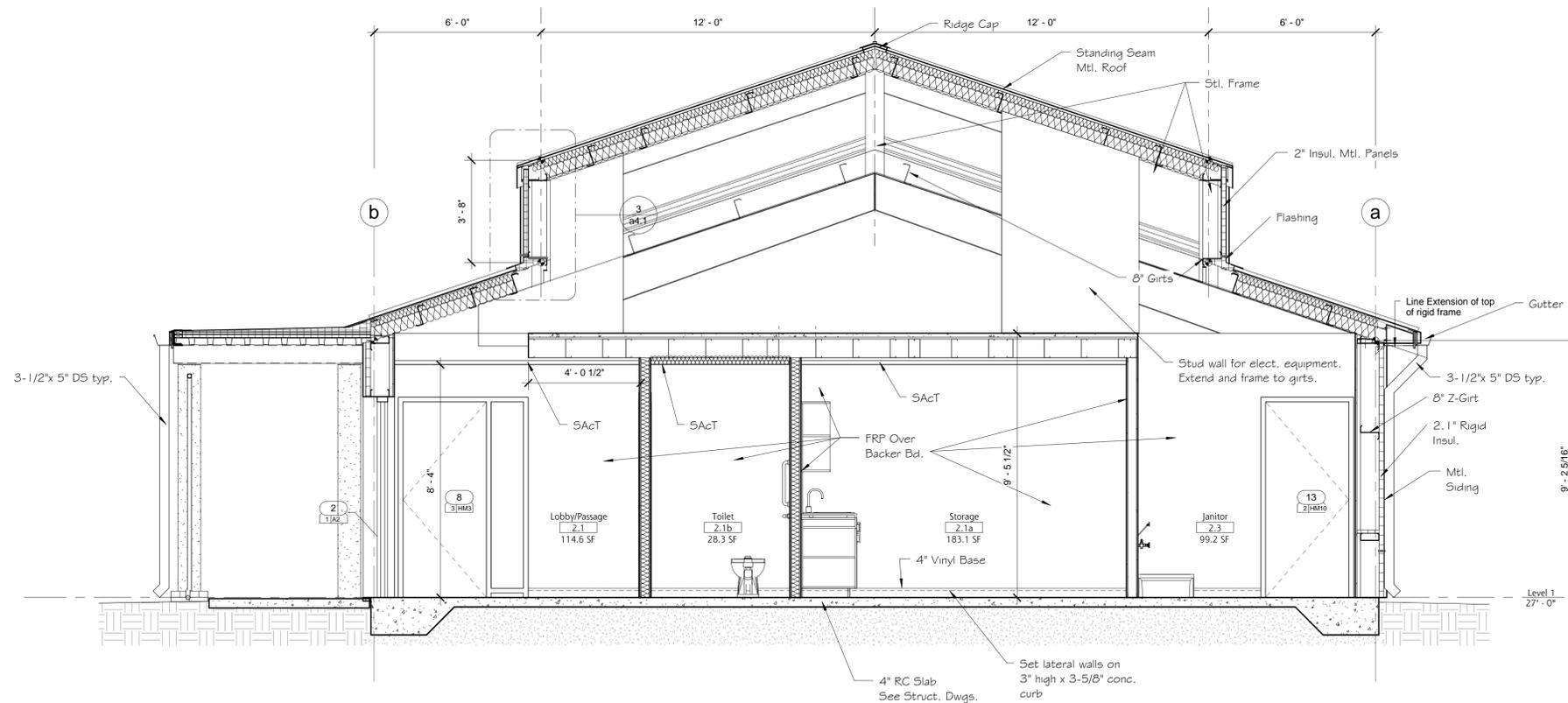
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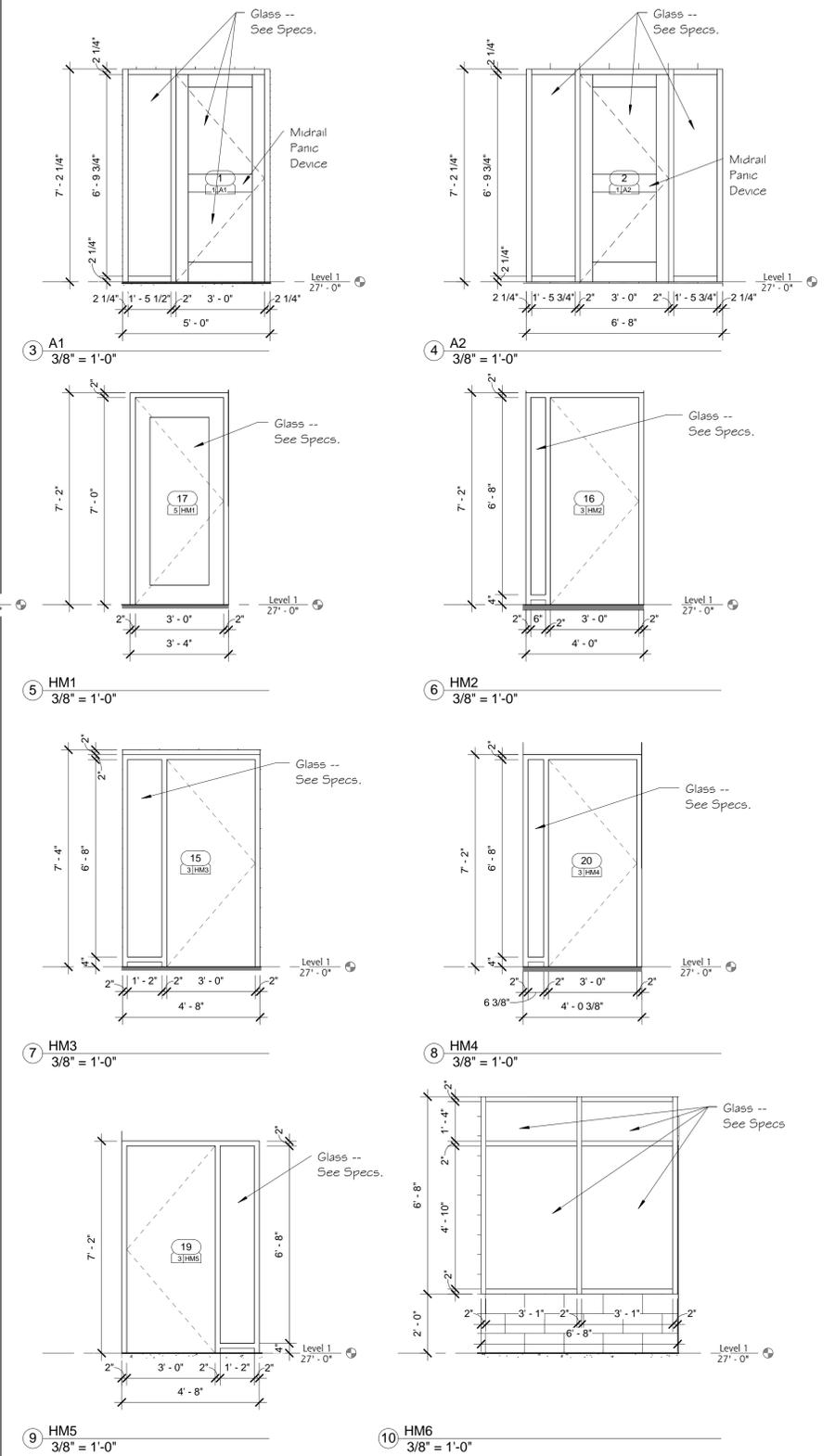




1 Section 1
3/8" = 1'-0"



2 Section 2
3/8" = 1'-0"



Addition & Renovation: Animal Shelter

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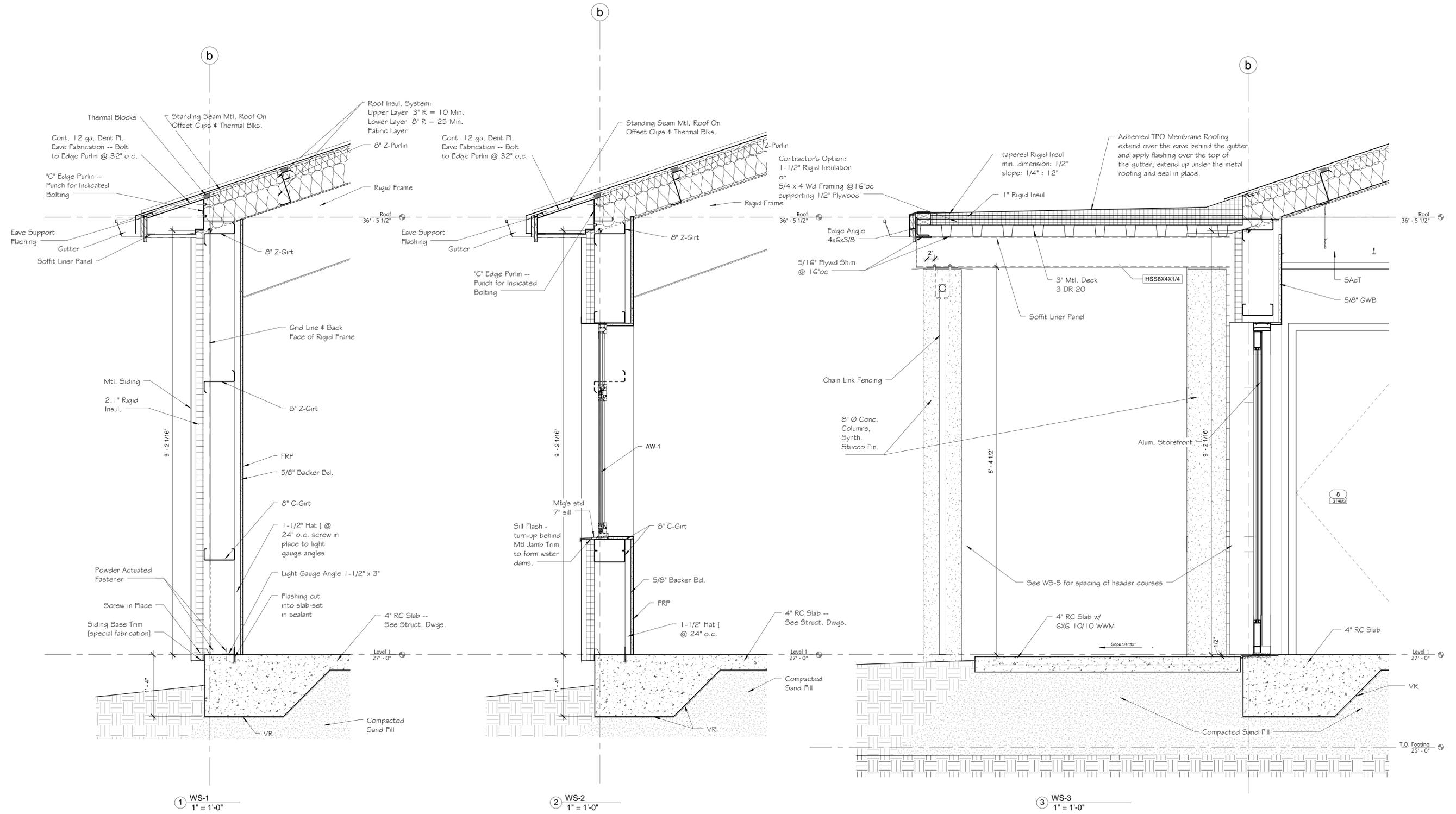


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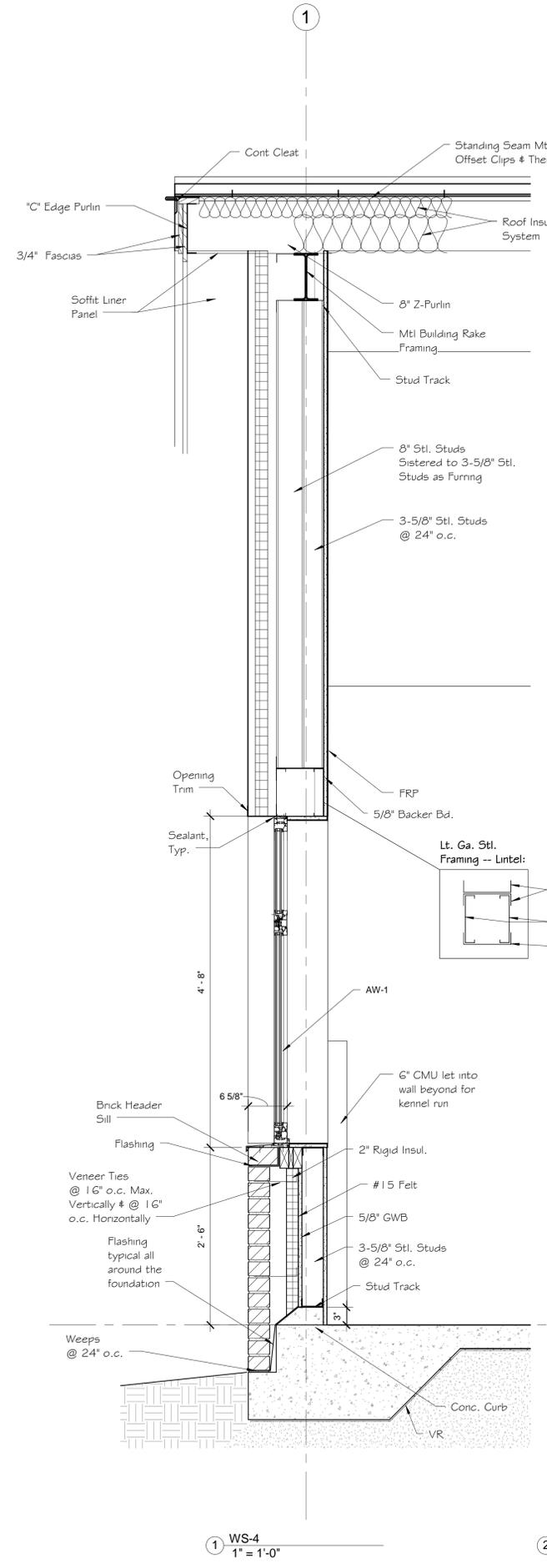
1639 Old Airport Road New Bern, NC



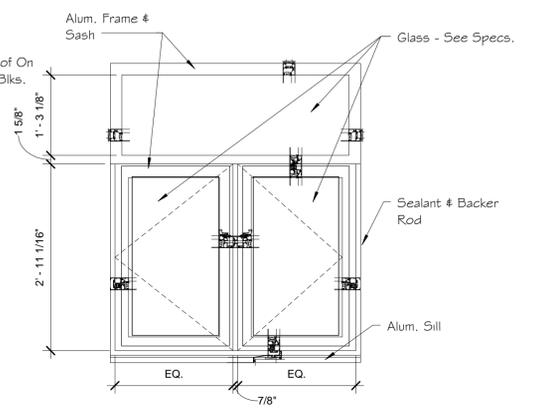
C. R. FRANCIS / ARCHITECTURE

located at 329 middle street new bern, north carolina 28563 tel: (252) 637-1112 fax: (252) 637-7698 p.a.
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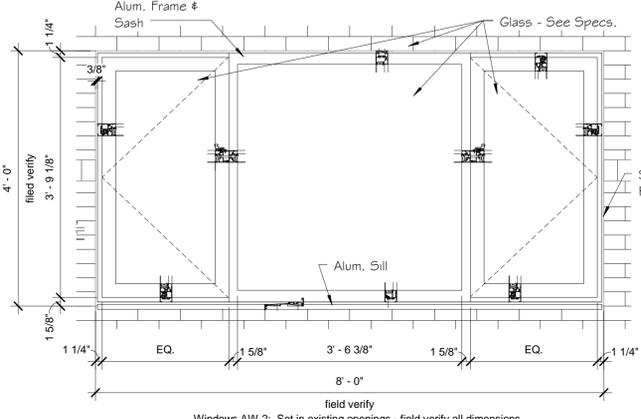
Date: 2 June 2015 Drawn by: crf, dhf Sequential No. 9 of 19 sheet a4.0



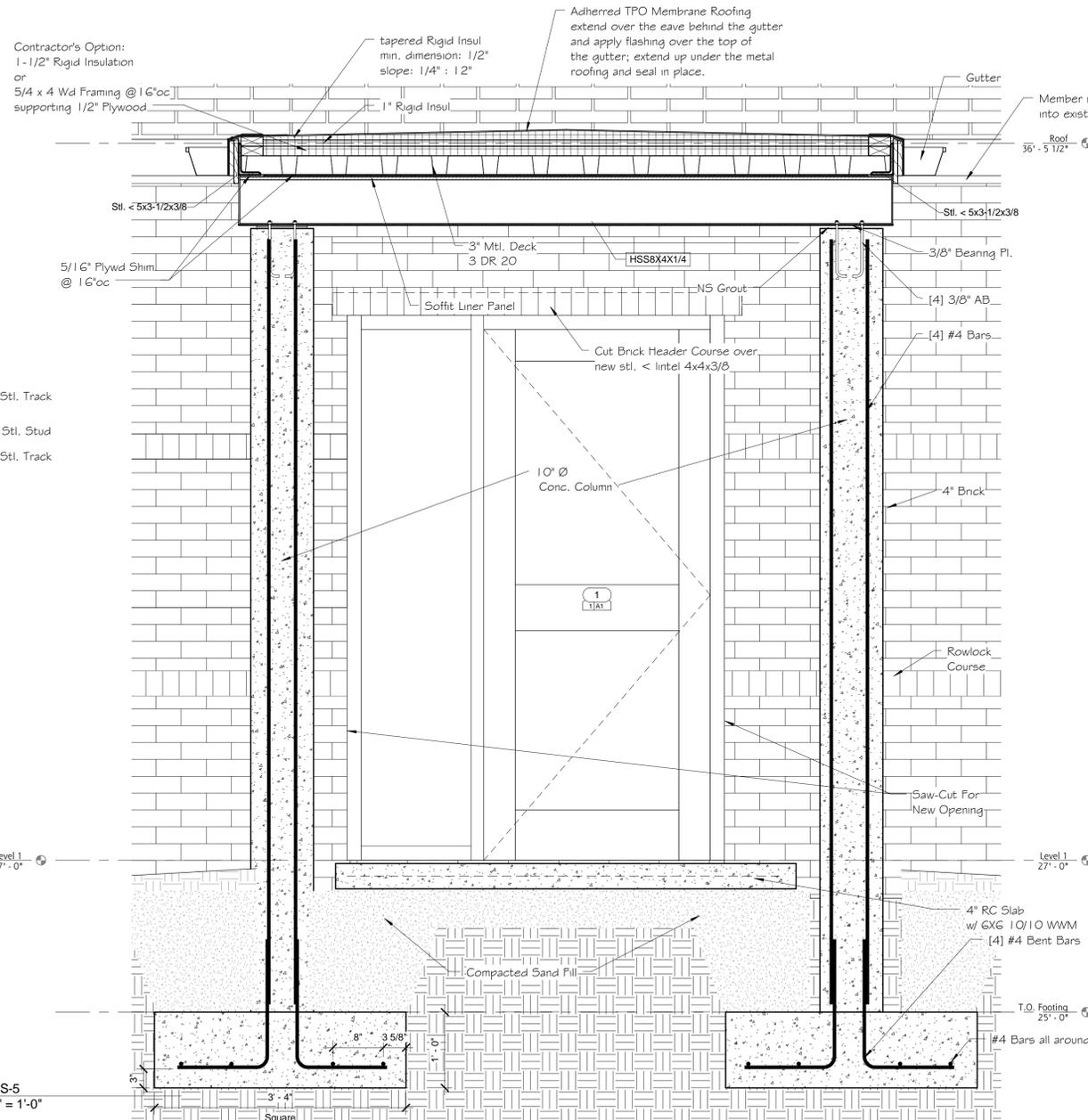
1 WS-4
1" = 1'-0"



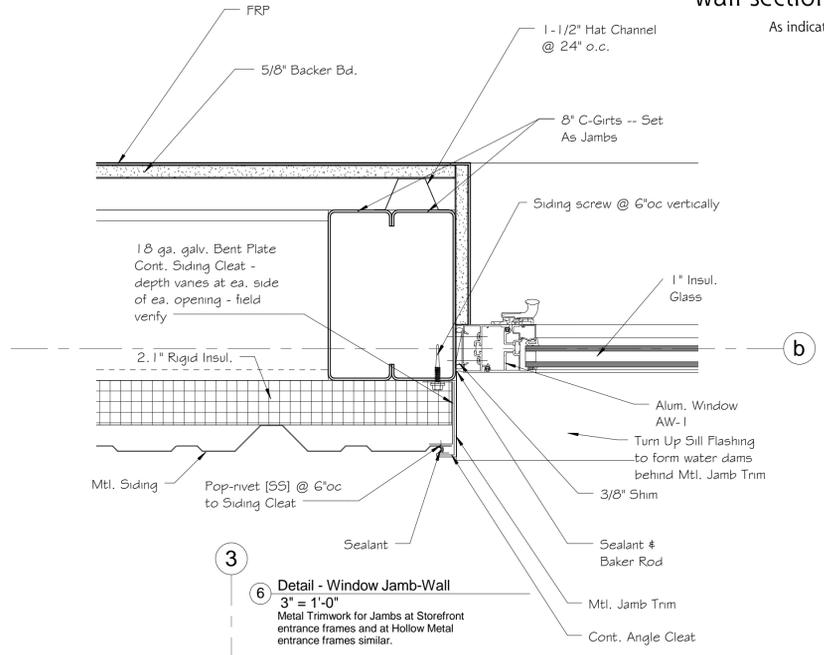
4 Elev. AW-1
3/4" = 1'-0"



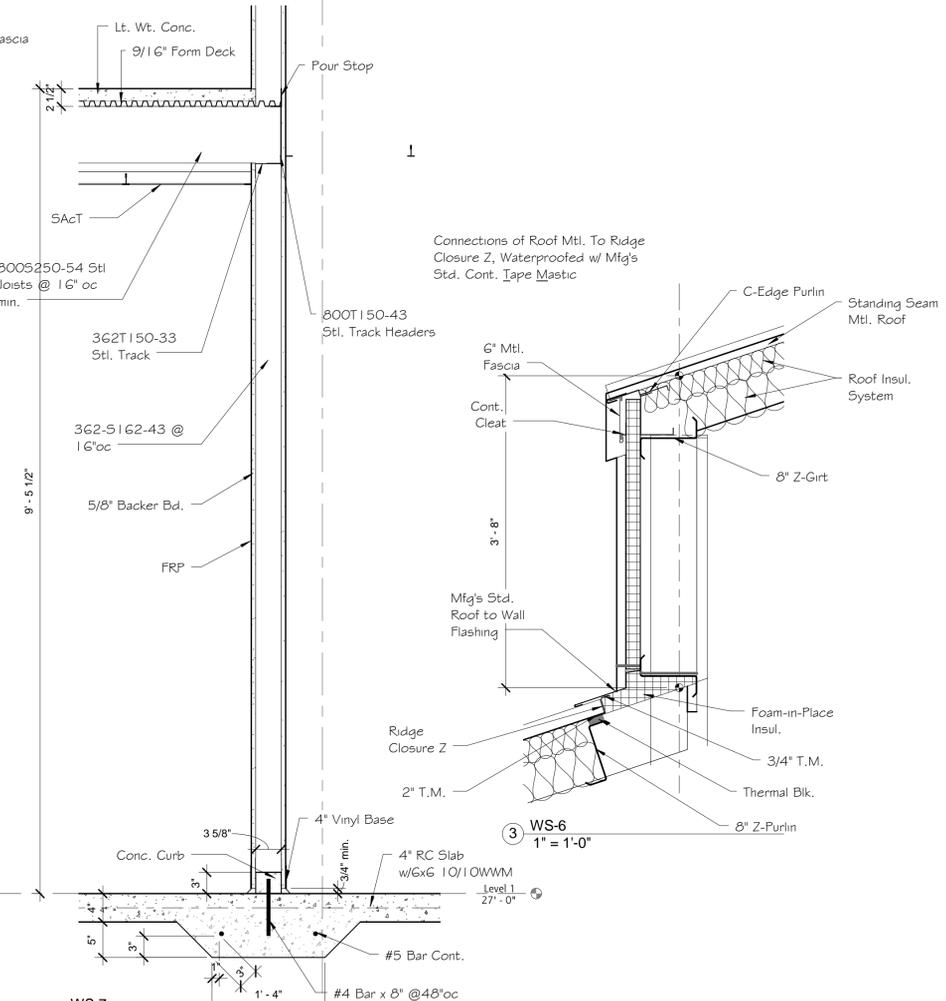
5 Elev. AW-2
3/4" = 1'-0"



2 WS-5
1" = 1'-0"



3 Detail - Window Jamb-Wall
3" = 1'-0"



7 WS-6
1" = 1'-0"

Addition & Renovation: Animal Shelter

Craven County 1639 Old Airport Road New Bern, NC



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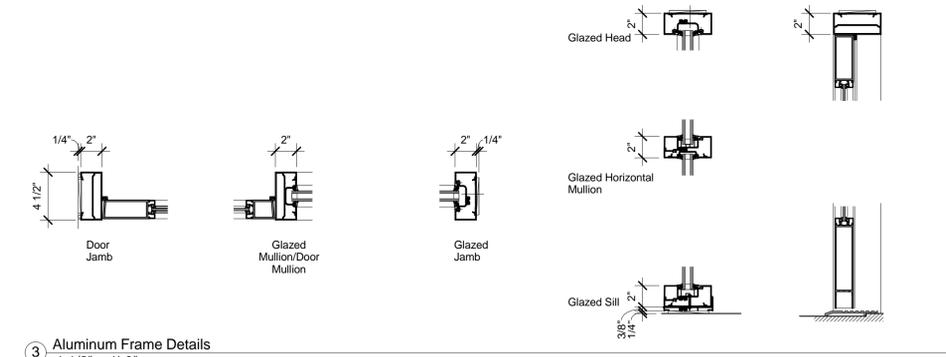
Interior Finish Schedule											
Area Number	Area Name	Bid Item	Floor	Floor Color	Base	Base Color	Wall	Wall Color	Ceiling	Ceiling Color	Remarks
1.1	Waiting	Bid Item 2	Epoxy Matrix*	Match Existing	Vinyl	Match Existing	Paint Exist. # New Surfaces	Match Existing	SACT		
1.2	Corridor	Bid Item 2	NA		Vinyl	Match Existing	Paint Exist. # New Surfaces	Match Existing	Touch Up At New Work	Match Existing	
1.3	Corridor	Bid Item 2	NA		Vinyl	Match Existing	Paint Exist. # New Surfaces	Match Existing	Touch Up At New Work	Match Existing	
1.3a	Closet	NW									
1.4	Corridor	Bid Item 1	Epoxy Matrix*	Match Existing	Vinyl	Match Existing	Paint Exist. # New Surfaces	Match Existing	SACT	White	
1.5	Office: Staff	Bid Item 2	VCT	Match Existing	Vinyl	Match Existing	Paint Exist. # New Surfaces	Match Existing	SACT	White	
1.6	Office: Director	NW									
1.7	Sm. An. Triage/Exam	Bid Item 2	NA		Vinyl	Match Existing	Paint Exist. # New Surfaces	Match Existing	Touch Up At New Work	Match Existing	
1.7a	Staff Toilet	NW									
1.8	Visiting Room	Bid Item 2	NA		Vinyl	Match Existing	Paint Exist. # New Surfaces	Match Existing	Touch Up At New Work	Match Existing	
1.9	Closet	NW									
1.10	Janitor	NW									
1.11	Public Toilet	NW									
1.12	Mechanical	NW									
1.13	Cats	Bid Item 2	NA		NA		Paint Exist. # New Surfaces	Match Existing	NA		
1.14	Kitchen/Laundry	NW									
1.15	Cat Annex	Bid Item 2	NA		NA		Paint Exist. # New Surfaces	Match Existing	Touch Up At New Work	Match Existing	
1.16	Storage	Bid Item 2	NA				Paint Exist. # New Surfaces	Match Existing	NA		
1.17	Triage/Exam	Bid Item 1	Epoxy Matrix*	Match Existing	Vinyl	Match Existing	Paint Exist. # New Surfaces	Match Existing	SGWB Epoxy Painted		
1.17a	Mechanical	Bid Item 1	NA				Paint Exist. # New Surfaces	Match Existing	Touch Up At New Work	Match Existing	
1.18	Kennel	Bid Item 1	NA		NA		Paint Exist. # New Surfaces	Match Existing	Touch Up At New Work	Match Existing	
1.19	Small Animal	Bid Item 2	Epoxy Matrix*	Match Existing	Vinyl	Match Existing	Paint Exist. # New Surfaces	Match Existing	SGWB Epoxy Painted		
1.20	Reception	Bid Item 2	VCT	Match Existing	Vinyl	Match Existing	Paint Exist. # New Surfaces	Match Existing	SACT	White	
1.21	Visiting Room	Bid Item 2	Epoxy Matrix*	Match Existing	Vinyl	Match Existing	Paint Exist. # New Surfaces	Match Existing	SACT	White	
2.1	Lobby/Passage	Bid Item 1	VCT	117 Fawn	Vinyl	27-Mist	GWB Painted	#A1723 Autumnal Equinox	SACT	White	
2.1a	Storage	Bid Item 1	VCT	117 Fawn	Vinyl	27-Mist	FRP	P145 Silver	SACT	White	
2.1b	Toilet	Bid Item 1	VCT	117 Fawn	Vinyl	27-Mist	FRP	P145 Silver	SACT		
2.2	Kennel	Bid Item 1	Epoxy Matrix*	PT-GOG	Vinyl	27-Mist	FRP	P145 Silver	Exp. Structure		Paint exposed steel framing and ductwork: Burgundy
2.3	Janitor	Bid Item 1	Epoxy Matrix*	PT-GOG	Vinyl	27-Mist	FRP	P145 Silver	Exp. Structure		
2.4	Quarantine Kennel	Bid Item 1	Epoxy Matrix*	PT-GOG	Vinyl	27-Mist	FRP	P145 Silver	Exp. Structure	White - see remarks	GWB painted cly at mechanical mezzanine. Paint exposed steel framing and ductwork: Burgundy
2.5	Mezzanine	Bid Item 1	NA		NA		Exp. Structure		Exp. Structure	N/A	

Epoxy Matrix*: Not in Contract - this work will be performed by a separate subcontractor in the direct employ of the Owner.

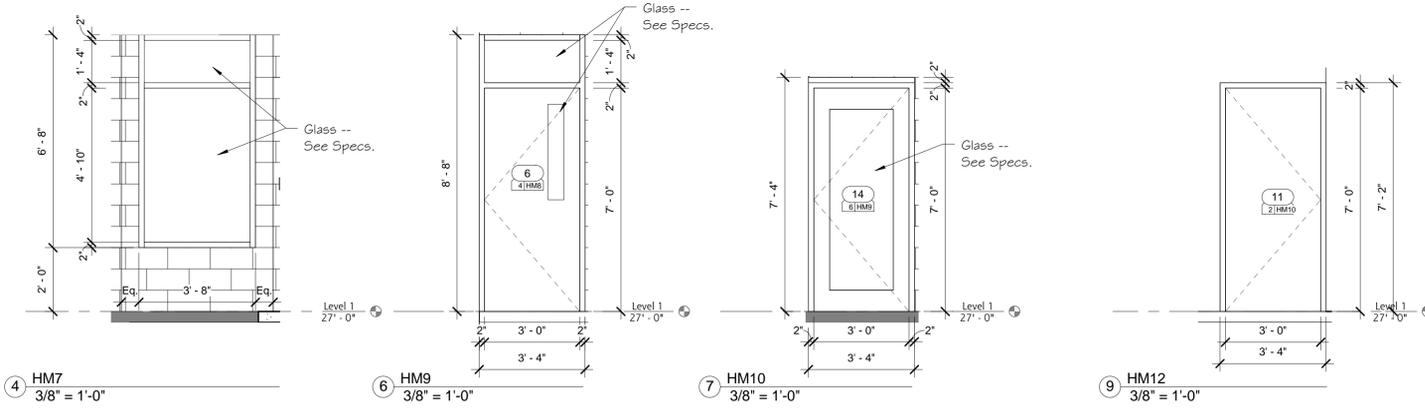
Door Frames: #A1712 Hiking Trail
Doors: #A1670 Castlestone Rose

- Color numbers above refer to the following products.
- Floor colors: VCT, Epoxy matrix, Mannington Essentials, Phoenix One Step
 - Base colors: Vinyl, Johnsonite
 - Wall colors: Paint FRP, Glidden, Marlite
 - Ceiling colors: SACT, Armstrong, Glidden

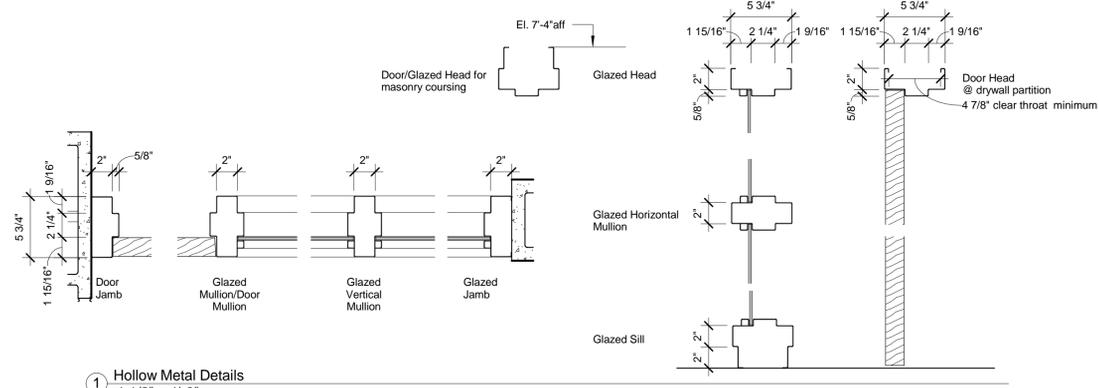
Door Schedule							
Door Number	Type	Door				Frame Type	Remarks
		Width	Height	Thickness	Material		
1	1	3' - 0"	7' - 0"	1 3/4"	Aluminum	Medium Style A1	
2	1	3' - 0"	7' - 0"	1 3/4"	Aluminum	Medium Style A2	
3	2	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM10	
4	2	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM10	
5	3	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM3	w/ 24" x 70" view panel
6	4	3' - 0"	7' - 0"	1 3/4"	Hollow metal	Flush Panel HM8	w/ 6" x 36" view panel
7	4	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM8	w/ 6" x 36" view panel
8	3	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM3	w/ 24" x 70" view panel
9	3	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM3	w/ 24" x 70" view panel
10	2	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM10	
11	2	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM10	w/ 6" x 36" view panel
12	2	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM10	
13	2	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM10	
14	6	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM9	w/ 24" x 70" view panel
15	3	3' - 0"	7' - 0"	1 3/4"	Solid Wood	Flush Panel HM3	w/ 24" x 70" view panel
16	3	3' - 0"	7' - 0"	1 3/4"	Solid Wood	Flush Panel HM2	w/ 24" x 70" view panel
17	5	3' - 0"	7' - 0"	1 3/4"	Solid Wood	Flush Panel HM1	w/ 24" x 70" view panel
18	2	3' - 0"	7' - 0"	1 3/4"	Hollow Metal	Flush Panel HM9	
19	3	3' - 0"	7' - 0"	1 3/4"	Solid Wood	Flush Panel HM5	w/ 24" x 70" view panel
20	3	3' - 0"	7' - 0"	1 3/4"	Solid Wood	Flush Panel HM4	w/ 24" x 70" view panel
21	7	8' - 0"	7' - 0"	2"	Formed Sheet Metal	coiling track with trim	
a	9	3' - 0"	7' - 0"	1 3/4"	EA	Medium Style AF-1	



3 Aluminum Frame Details
1 1/2" = 1'-0"



4 HM7 3/8" = 1'-0"
6 HM9 3/8" = 1'-0"
7 HM10 3/8" = 1'-0"
9 HM12 3/8" = 1'-0"

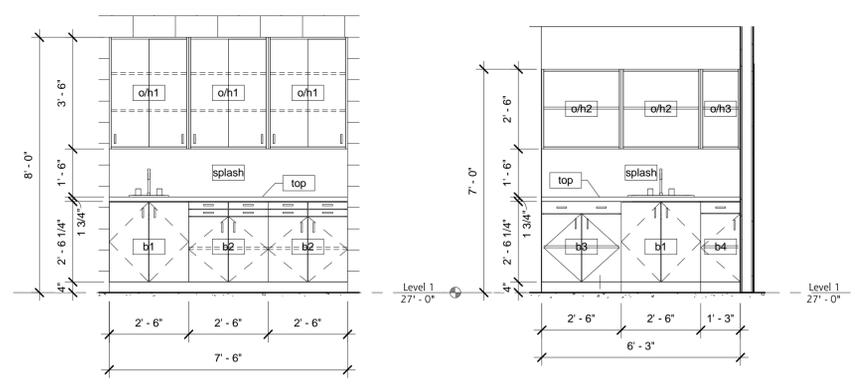
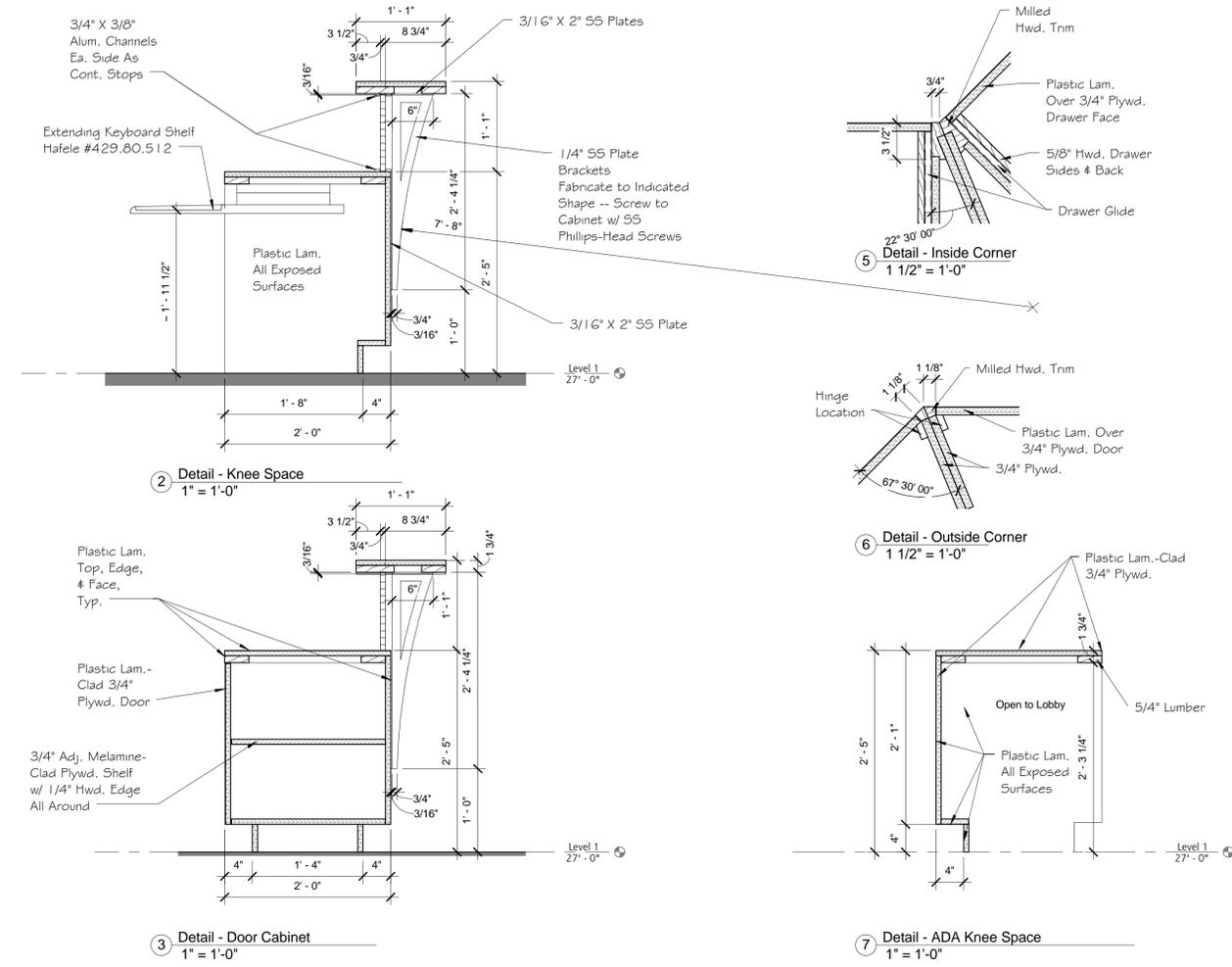
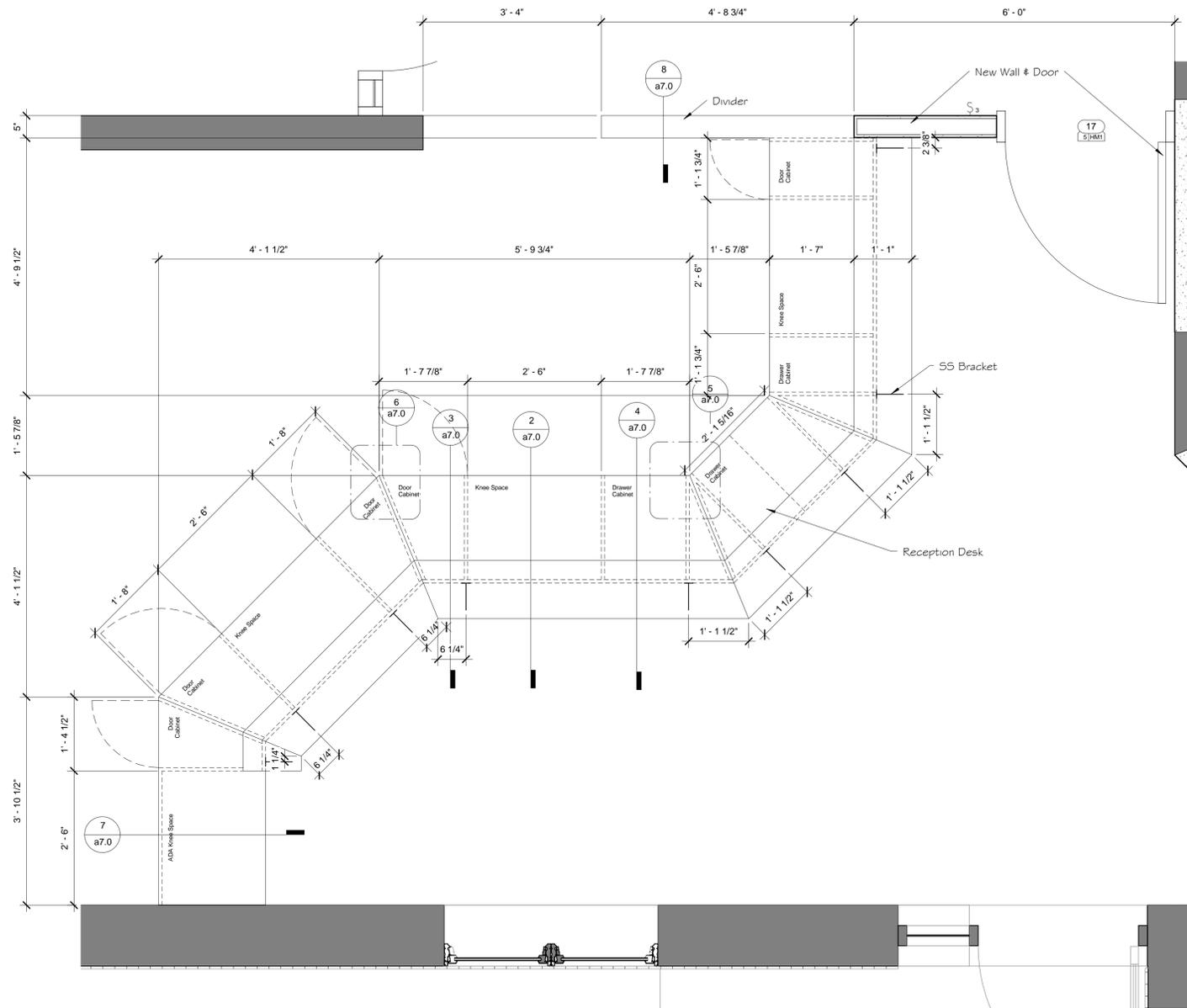


1 Hollow Metal Details
1 1/2" = 1'-0"

Addition & Renovation: Animal Shelter
Craven County 1639 Old Airport Road New Bern, NC



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Cabinet Schedule					
Type Mark	Type	Width	Height	Depth	Remarks
b1	120sa-30.36.24	2' - 6"	2' - 10 1/4"	2' - 0"	Sink: Elkay CR1721 [single faucet hole] with drain, flex stops, p-trap, and Moen Faucet: Align 7365 [chrome] extend hot & cold water lines [PEX] from below floor thru cabinet to fixture
b2	124-30.36.24	2' - 6"	2' - 10 1/4"	2' - 0"	
b3	121a-30.36.24	2' - 6"	2' - 10 1/4"	2' - 0"	
b4	111a-15.36.24	1' - 3"	2' - 10 1/4"	2' - 0"	
o/h1	220c-30.42.12	2' - 6"	3' - 6"	1' - 0 1/2"	
o/h2	200b-30.30.12	2' - 6"	2' - 6"	1' - 0 1/2"	
o/h3	200b-15.30.12	1' - 3"	2' - 6"	1' - 0 1/2"	
splash	901	3' - 0"	2' - 0"		Width vanes - full ht. splash
top	901	3' - 0"	2' - 0"		Width vanes



Addition & Renovation: Animal Shelter
Craven County 1639 Old Airport Road New Bern, NC

C. R. FRANCIS / ARCHITECTURE
located at 329 middle street new bern, north carolina 28563 tel: (252) 637-1112 fax: (252) 637-7698 p.a.
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sheet a7.0
Date: 2 June 2015 Drawn by: cfr, dhf Sequential No. 12 of 19

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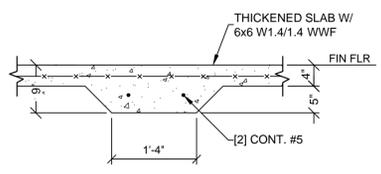
C.R. Francis Architecture
 329 Middle Street
 New Bern, NC 28563

**Craven County
 Animal Shelter**
 1639 Old Airport Road
 New Bern, NC 28560
FOUNDATION PLAN

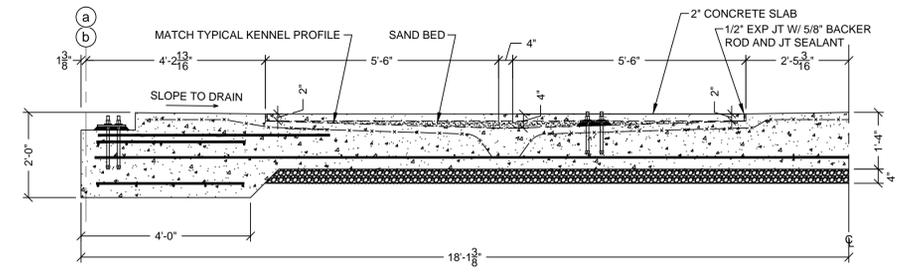
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 5110 Bucco Reef Road
 New Bern, NC 28560
 PH: 252-571-7253
 econz1@suddenlink.net

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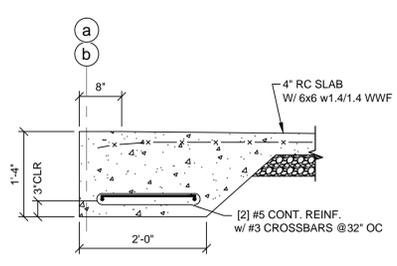
JOB #14033
SHEET 1 of 7
S-1



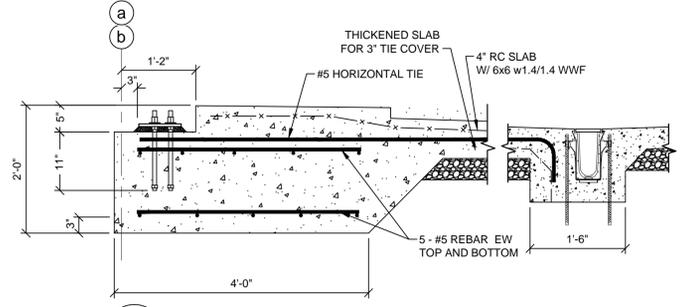
TYPICAL THICKENED SLAB
 SCALE: 1" = 1'-0"



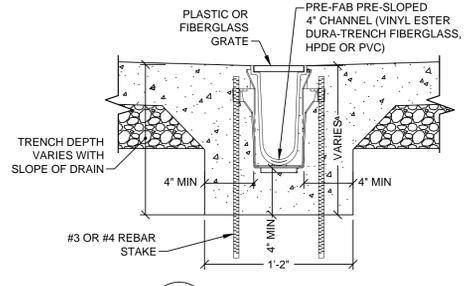
B1 END WALL SECTION
 SCALE: 1/2" = 1'-0"



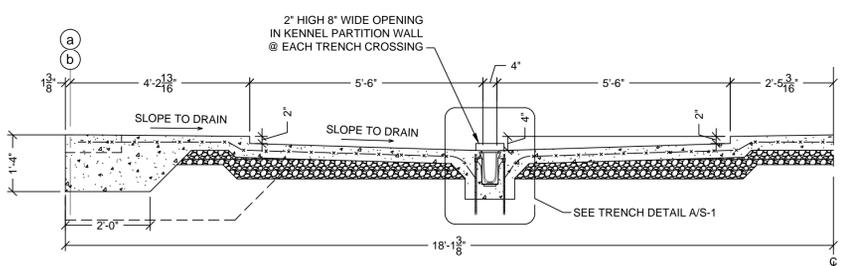
C1 FOOTING SECTION
 SCALE: 3/4" = 1'-0"



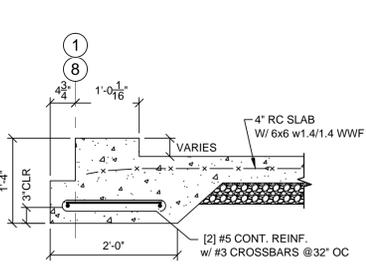
D1 FOOTING SECTION @ COLUMN
 SCALE: 3/4" = 1'-0"



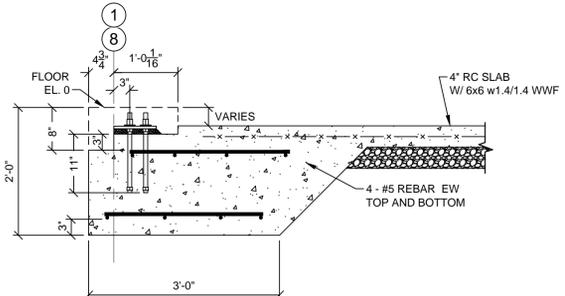
A TRENCH DETAIL
 SCALE: 1-1/2" = 1'-0"



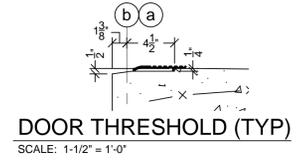
B2 SLAB CROSS SECTION
 SCALE: 1/2" = 1'-0"



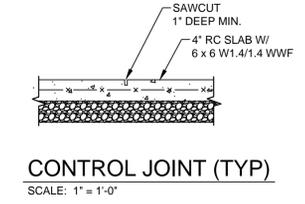
C2 FOOTING SECTION
 SCALE: 3/4" = 1'-0"



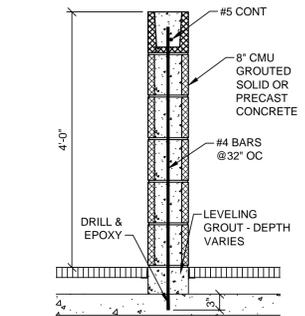
D2 FOOTING SECTION @ COLUMN
 SCALE: 3/4" = 1'-0"



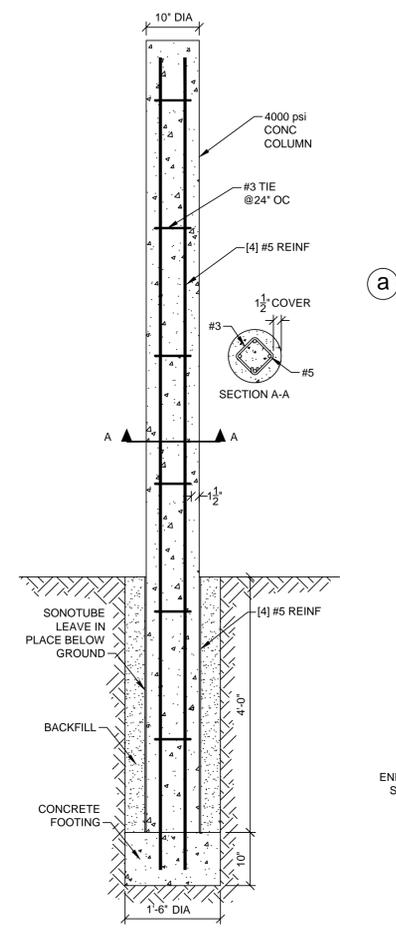
DOOR THRESHOLD (TYP)
 SCALE: 1-1/2" = 1'-0"



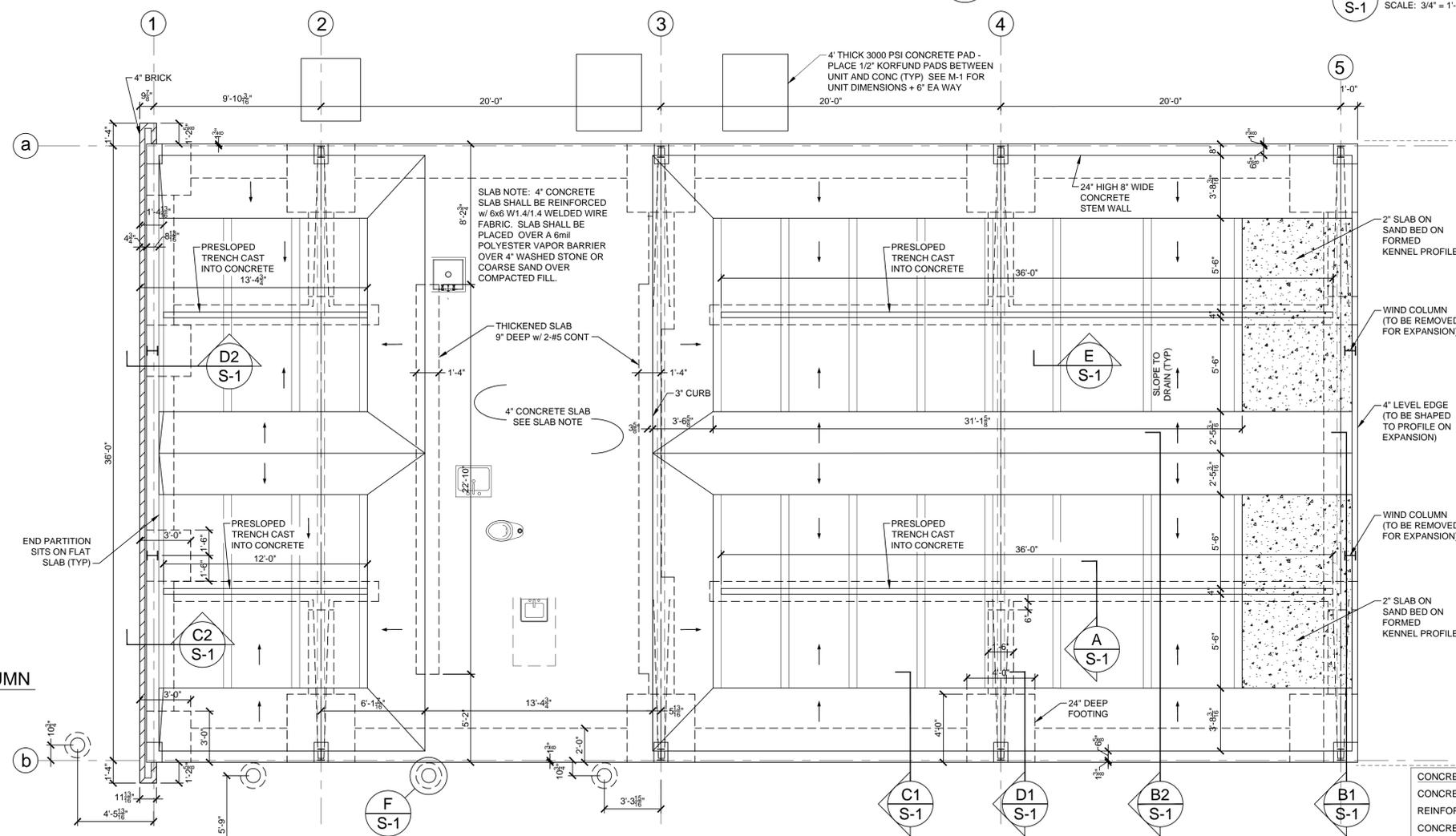
CONTROL JOINT (TYP)
 SCALE: 1" = 1'-0"



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

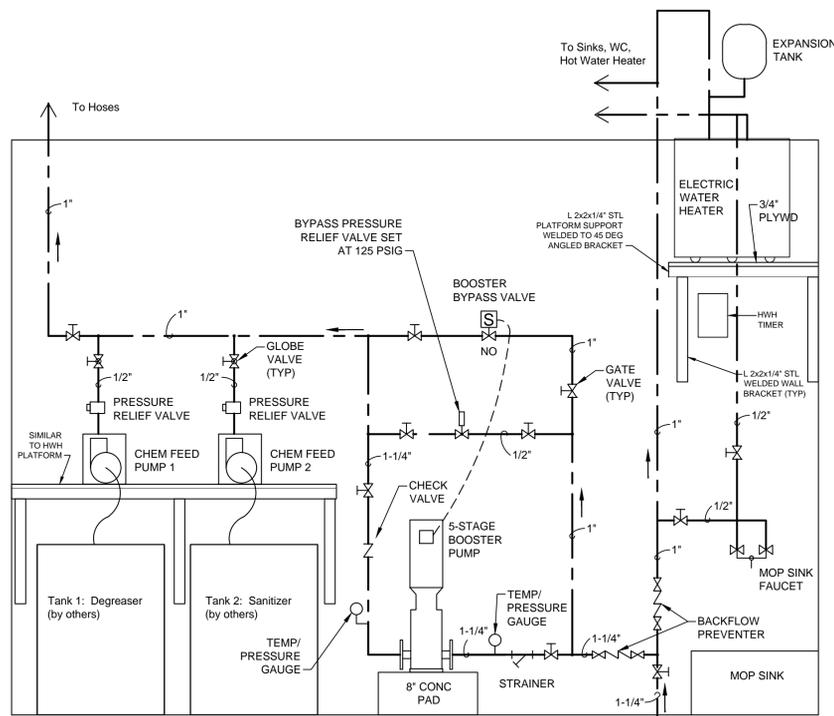


F COVERED WALKWAY COLUMN
 SCALE: 3/4" = 1'-0"

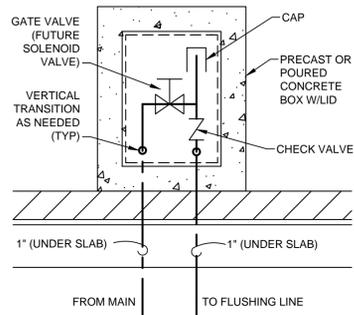


FOUNDATION PLAN
 SCALE: 1/4" = 1'-0"

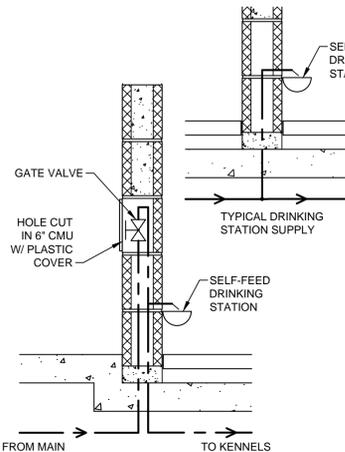
CONCRETE NOTES:
 CONCRETE SHALL HAVE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000PSI.
 REINFORCING STEEL SHALL BE ASTM GRADE 60.
 CONCRETE FOOTINGS SHALL HAVE 3" CLEAR COVER AROUND REINFORCING BARS.
 REINFORCING BARS SHALL HAVE MINIMUM LAP OF 25" OR 36 BAR DIAMETERS.
 WELDED WIRE FABRIC SHALL CONFORM TO ASTM 185
 PROVIDE CONTRACTION JOINTS AS REQUIRED (10'-12" O.C. +/-)
 ALL CONCRETE WORK SHALL CONFORM TO CURRENT NC BUILDING CODE.



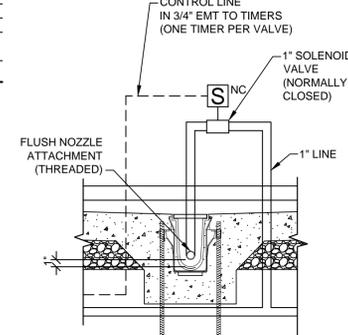
CHEMICAL TREATMENT DIAGRAM
SCALE: 3/4" = 1'-0"



FUTURE CISTERN CONNECTION
SCALE: 1" = 1'-0"



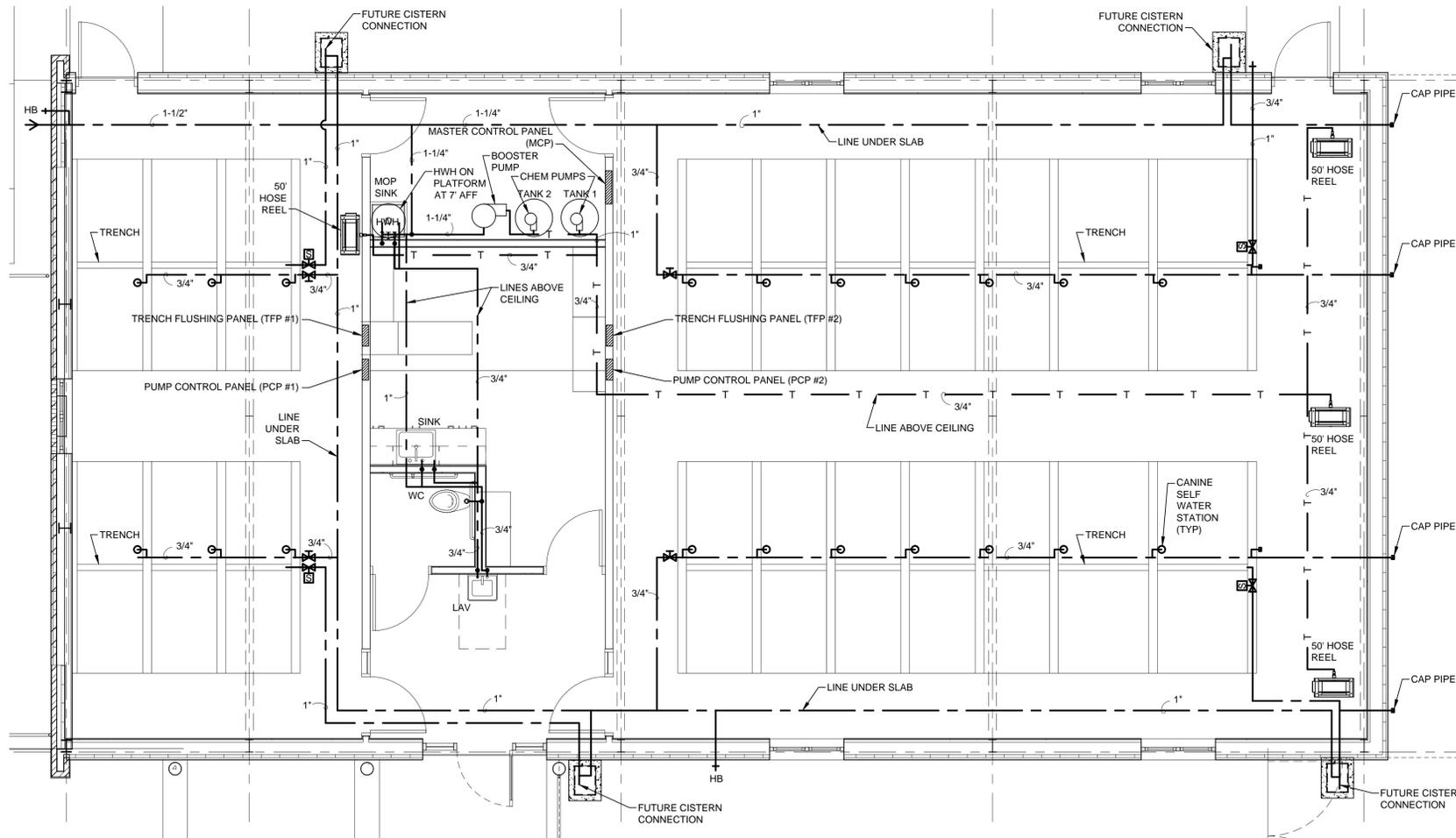
DRINKING STATION LINE CUTOFF
SCALE: 1" = 1'-0"



TRENCH FLUSHING CONTROL
SCALE: 1" = 1'-0"

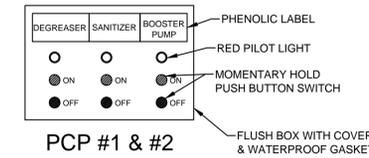
FIXTURE/FITTING	QTY	DESCRIPTION	MFG	MODEL	REMARKS
BOOSTER PUMP	1	FPS 5-STAGE VERTICAL PUMP	FRANKLIN	3VR-5	12 GPM @230' HEAD, 1.5 hp
BYPASS PRESSURE RELIEF VALVE	1	DIAPHRAGM OPERATED BYPASS CONTROL RELIEF VALVE	WATTS	LFBP30	1/2", VALVE SET AT 125 PSIG, LEAD-FREE
CHEMICAL PUMP	2	PULSAFEEDER ELECTRONIC METERING PUMP SERIES E	PULSATRON	LE13	0.5 GPH, 150 MAX PSI, 1/2" TUBING
PRESSURE RELIEF VALVE	2	PULSAFEEDER DIAPHRAGM PRESSURE RELIEF VALVE	PULSATRON	NA100001-PVC	1/2", 10-150 PSI ADJ. PVC VALVE BODY
HOT WATER HEATER	1	20-GAL ELECTRIC WATER HEATER	A.O. SMITH	DEL-20	SINGLE ELEMENT 2500 W
EXPANSION TANK	1	POTABLE WATER EXPANSION TANK	A.O. SMITH	PMC-2	
HWH TIMER	1	WATER HEATER TIME SWITCH	INTERMATIC	WH40	208-277V, 1000W, 40A, EXTERNAL ON/OFF
BACKFLOW PREVENTER	1	REDUCED PRESSURE ZONE ASSEMBLY	WATTS	LF909	1-1/4" BRASS LEAD-FREE
STRAINER	1	WYE-PATTERN LEAD FREE BRONZE STRAINER	WATTS	LF777S	
TEMP / PRESSURE GAUGE	2	COMBINATION PRESSURE AND TEMPERATURE GAUGE	WATTS	LFPTG-1	BOTTOM ENTRY, LEAD-FREE
GATE, GLOBE, CHECK VALVES		GATE, GLOBE AND CHECK VALVE FITTINGS	WATTS	VARIAS	BRASS LEAD-FREE
FLUSH NOZZLE	4	ADJUSTABLE GALLONAGE NOZZLE TIP	MOON AMER	#511	5-10-24-40 GPM SETTINGS
SOLENOID VALVE		RED HAT SOLENOID CONTROLLED VALVE	ASCO	8210	(NC) NORMALLY CLOSED & (NO) NORMALLY OPEN

NOTE: PRODUCTS OF EQUIVALENT QUALITY AND FUNCTION MAY BE SUBSTITUTED FOR PRODUCTS FROM MANUFACTURER LISTED.



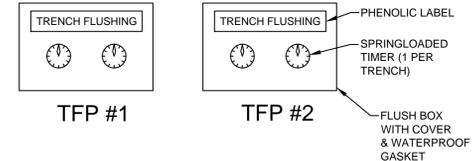
PLUMBING: WATER SUPPLY PLAN
SCALE: 1/4" = 1'-0"

TWO CONTROL PANELS: ALL PUMPS SHALL BE ABLE TO BE STARTED OR STOPPED FROM EITHER PANEL AT ANY TIME. SIMULTANEOUS OPERATION OF PUMPS IS ALLOWED.



PUMP CONTROL PANEL (X2)
NTS

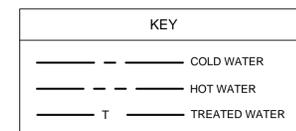
TWO CONTROL PANELS: EACH TIMER CONTROLS ONE TRENCH. FOR FULL PRESSURE, ONLY ONE TIMER SHOULD BE SET AT A TIME.



TRENCH FLUSHING PANELS
NTS

MASTER CONTROL PANEL FURNISHED BY OWNER, INSTALLED BY CONTRACTOR, AND PROGRAMMED BY OWNER'S SELECTED REPRESENTATIVE.

MASTER CONTROL PANEL
NTS



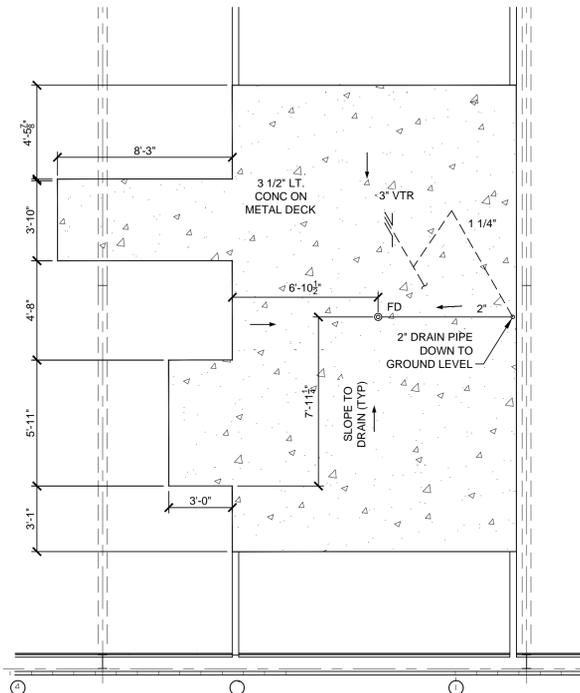
C.R. Francis Architecture
329 Middle Street
New Bern, NC 28563

CRAVEN COUNTY ANIMAL SHELTER
1639 Old Airport Road
New Bern, NC 28560
PLUMBING: WATER SUPPLY

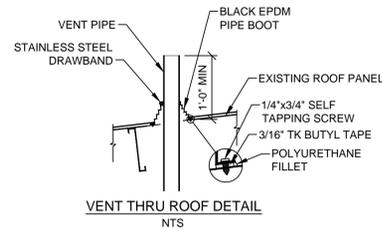
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New Bern, NC 28560
PH: 252-571-7253
econz1@suddenlink.net

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drawn by: EAC
date: 6/01/2015
revisions:

1
2
JOB #14033
SHEET 2 of 7
P-1



MECHANICAL MEZZANINE: DRAIN PLAN
SCALE: 1/4" = 1'-0"



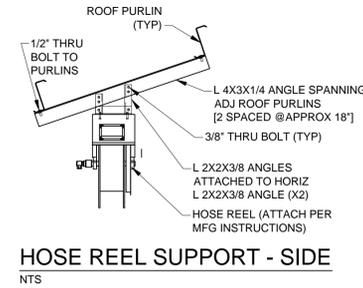
VENT THRU ROOF DETAIL
NTS

PLUMBING FIXTURES 1

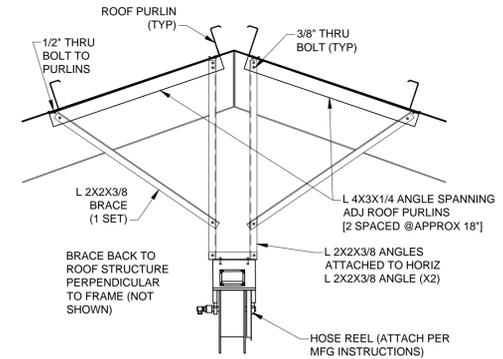
FIXTURE	QTY	WATER SUPPLY FIXTURE UNITS	HOT (wsu)	COLD (wsu)	WATER SUPPLY PIPE DIA (IN)	DRAINAGE FIXTURE UNITS	MIN TRAP SIZE (DIA)	DESCRIPTION	MFG	MODEL	REMARKS					
SERVICE SINK	1	3	3	2.25	2.25	2.25	2.25	3/8"	2	2	1 1/2"	TOP-MOUNT STAINLESS STEEL SINK	KOHLER	K-3348	ZURN GOOSENECK FAUCET Z831A4-XL	
LAVATORY (LAV)	1	2	2	1.5	1.5	1.5	1.5	3/8"	1	1	1 1/4"	ADA LAVATORY - GREENWICH - 4" CENTERS	KOHLER	K-2032-0	ZURN AQUA SENSE BATTERY POWERED FAUCET Z6915-XL	
WATER CLOSET (WC)	1	5	5	-	-	5	5	1"	4	4	4"	FLOOR MOUNTED FLUSHOMETER ADA TOILET	TOTO	CT705ELN(G)	TOTO TET1GNC-32 FLUSH VALVE	
MOP SINK	1	3	3	2.25	2.25	2.25	2.25	3/8"	2	2	1 1/2"	MOP SERVICE BASIN (24"X24")	ZURN	Z1996-24	ZURN Z841M4-5H	
FLOOR DRAIN (FD)	2	-	-	-	-	-	-	-	2	4	2"	P-TRAP FLOOR DRAIN				
HOSE REEL (HR)	4	3	12	-	-	3	12	3/4"	-	-	-	SPRINGLOAD RETRACTABLE FOR 3/4" 50' HOSE	REELCRAFT	D9300 OLP5W	BENCH MOUNT ORIENTATION; HOSE BY OWNER	
HOSE BIBB (HB)	3	2	8	-	-	2	8	1/2"	-	-	-	NON-FREEZE HOSE BIBB	ZURN	Z1315	EXPOSED, 3/4", BRONZE	
DOG WATER STATION	20	0.25	5	-	-	0.25	5	3/4"	-	-	-				MATCH EXISTING	
TRENCH DRAIN	4	-	-	-	-	-	-	-	6	24	4"	PRE-FAB PRE-SLOPED 4" CHANNEL	DURASLOPE		VINYL ESTER DURA-TRENCH FIBERGLASS, HPDE OR PVC	
TOTAL FIXTURES	38	38	6	46	-	37	-									

NOTE: PRODUCTS OF EQUIVALENT QUALITY AND FUNCTION MAY BE SUBSTITUTED FOR PRODUCTS FROM MANUFACTURER LISTED.

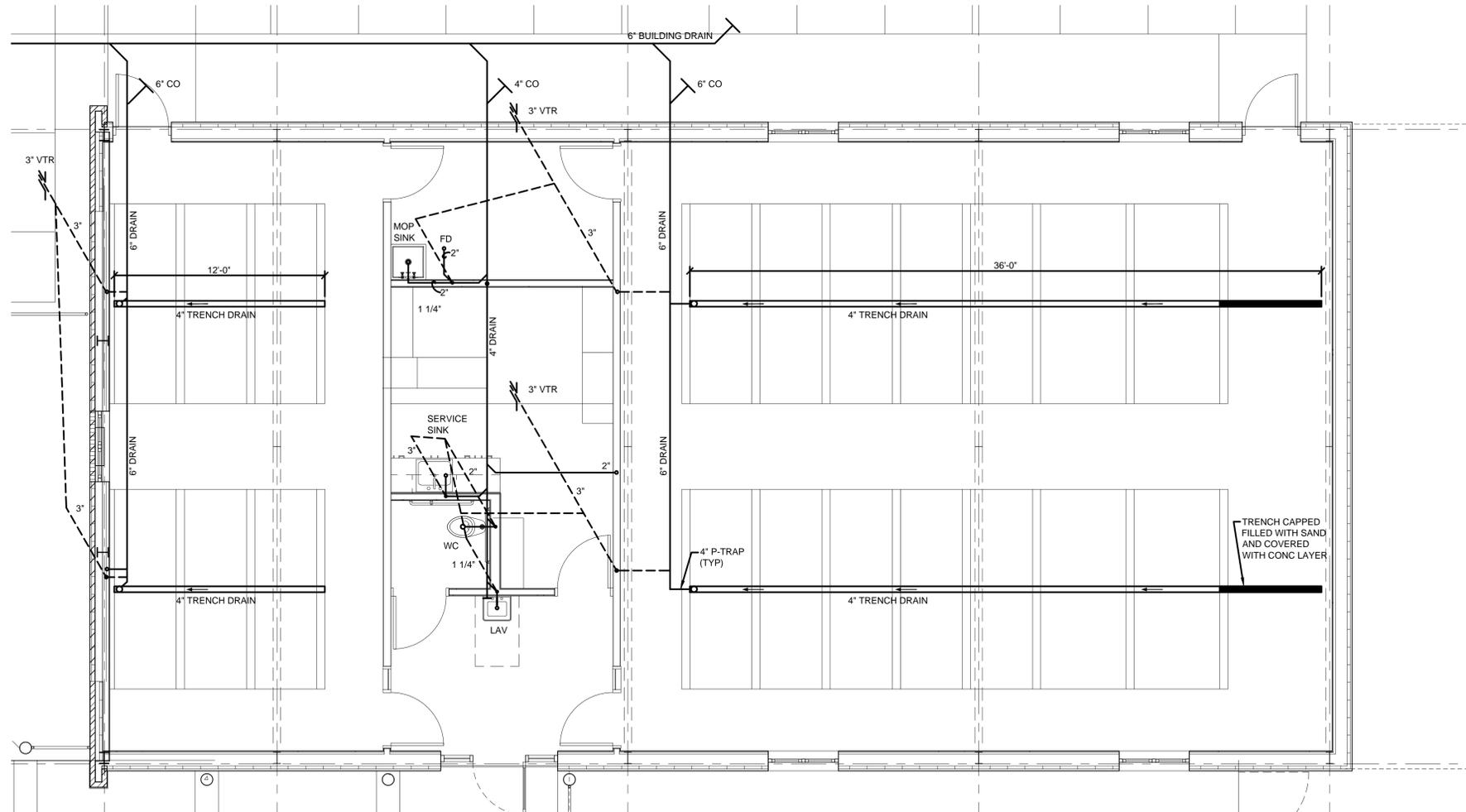
- PLUMBING NOTES:
- ALL PLUMBING WORK SHALL BE PERFORMED BY A LICENSED PLUMBING CONTRACTOR AND SHALL CONFORM TO THE 2012 NORTH CAROLINA PLUMBING CODE AND THE NORTH CAROLINA DEPARTMENT OF HEALTH REGULATIONS. ALL WORK SHALL BE EXECUTED IN A PROFESSIONAL MANNER AND COMPLETED WORK SHALL PRESENT A NEAT APPEARANCE. ALL MATERIAL SHALL BE NEW AND FREE FROM DEFECTS.
 - THESE PLANS ARE DIAGRAMMATIC ONLY AND ARE NOT INTENDED TO SHOW EXACT GEOMETRY OR ALL ELEMENTS OF THE REQUIRED WORK.
 - CUTTING OF CHASES, OPENINGS, OR HOLES IN FLOORS AND CEILINGS SHALL BE DONE IN A MANNER AS NOT TO ENDANGER THE STRUCTURAL STABILITY OF THE STRUCTURE. ALL REPAIRS SHALL BE DONE UNDER THE SUPERVISION OF THE GENERAL CONTRACTOR.
 - FIXTURES, WATER HEATERS, PUMPS AND ALL ACCESSORIES SUPPLIED BY PLUMBING CONTRACTOR. ALL PLUMBING FIXTURES SHALL COMPLY WITH THE REQUIREMENTS OF THE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN AND ICC-ANSI A117.1.
 - THE PLUMBING SUBCONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL AND SUPPLIES REQUIRED FOR THE INSTALLATION OF ALL PLUMBING SYSTEMS SHOWN ON PLUMBING PLANS INCLUDING WATER SUPPLY, DRAINAGE AND VENTING PIPES, COMMERCIAL FROST PROOF HOSE BIBBS, FLOOR DRAINS AND ROOF BOOTS.
 - PIPE MATERIALS: WATER SERVICE PIPES SHALL BE COPPER (TYPE K OR TYPE L) FOR KENNEL HOSE REEL SUPPLY, FLUSH LINES AND DRINKING STATIONS. WATER SERVICE PIPES FOR BATHROOM AND UTILITY SINKS MAY BE COPPER, PVC SCHEDULE 40, CPVC, OR PEX. IF PEX, USE BLUE PEX FOR COLD WATER PIPE AND RED PEX FOR HOT WATER PIPE. USE ABS AND/OR PVC SCHED 40 FOR SEWER DRAIN AND VENT PIPE.
 - HOSE REELS AND SUPPORTS SUPPLIED BY GENERAL CONTRACTOR. SYSTEM CONTROLS SUPPLIED BY ELECTRICAL CONTRACTOR.



HOSE REEL SUPPORT - SIDE
NTS



HOSE REEL SUPPORT - CENTER
NTS



PLUMBING: DRAIN PLAN
SCALE: 1/4" = 1'-0"



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PLUMBING: DRAIN / DETAILS

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SHEET 3 of 7
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GRAVEN COUNTY ANIMAL SHELTER
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SHEET 4 of 7
M-1

CONDENSER SCHEDULE

ZONE	DESCRIPTION	LENNOX MODEL**	QTY	COOLING INPUT - ELECTRICAL DATA				
				V-PH-HZ	COMP RLA	COMP LRA	MCA	MOCP
1	5-TON HP	SSB060H4-230	1	208-3-60	17.6	135.0	23.9	40
2	4-TON HP	SSB048H4-230	2	208-3-60	13.5	88.0	18.6	30

**TRANE OR CARRIER EQUIVALENT MODELS ARE ACCEPTABLE.

GAS FURNACE SCHEDULE

ZONE	DESCRIPTION	QTY	LENNOX MODEL**	LOW INPUT (BTUH)	LOW OUTPUT (BTUH)	HIGH INPUT (BTUH)	HIGH OUTPUT (BTUH)	GAS ENTRY SIZE	EFF	FAN (CFM)	FAN (hp)	ELECTRICAL DATA	
												V-PH-HZ	MOCP
1	GAS FURNACE	1	SLP98UH135XV60D	46,000	45,000	132,000	128,000	1/2"	98.0%	1970	1	120-1-60	20
2	GAS FURNACE	2	SLP98UH110XV60D	-	-	110,000	104,000	1/2"	93.0%	1560	1	120-1-60	15

ALL PIPE SIZING BASED ON NATURAL GAS WITH SPECIFIC GRAVITY OF 0.6, PRESSURE DROP OF 1" W.C. 2 PSI INLET PRESSURE, AND SCHEDULE 40 METALLIC PIPE.

AIR COIL SCHEDULE

ZONE	DESCRIPTION	QTY	MODEL	EER	SEER	NET TOTAL COOLING PER UNIT	
						BTUH	TONS
1	5-TON COIL/CASED	1	LENNOX CH33-62D-2F	11.7	15.5	56,500 BTUH	56,500 BTUH
2	4-TON COIL/CASED	2	LENNOX CH33-48C-2F	11.5	13.5	36,400 BTUH	145,600 BTUH

OUTLET DUCT SIZES

OUTLET SIZE	DUCT SIZE
110-135 CFM	6" ROUND
75 CFM	5" ROUND

NOTE: A MAXIMUM LENGTH OF 5 FT FLEXIBLE DUCT MAY BE USED AT THE OUTLET CONNECTION. ALL OTHER DUCT SIZES SHOWN ON PLAN.

SYSTEM DESIGN CRITERIA

CLIMATE ZONE: 3
 INDOOR DESIGN TEMPERATURES
 FOR COOLING: 80 DEG F
 FOR HEATING: 55 DEG F
 HUMIDITY: 50%
 OUTDOOR DESIGN TEMPERATURES
 FOR COOLING: 94 DEG F
 FOR HEATING: 26 DEG F
 HUMIDITY: 52%

ENERGY RATINGS

METAL BUILDING ROOF: U=0.040
 R-11 c.i. + R-19 BATTING + LINER WITH THERMAL BLOCKS
 METAL BUILDING WALL: U=0.070, U=0.068, U=0.079
 4" BRICK + R-10 C.I. WITH STL 2x6 @ 24" OC + 5/8" GYP BD OR GIRTS + R-13 C.I. RIGID INSULATION + 5/8" GYP BD OR 8" CONCRETE WALL WITH R-9.3 C.I.
 DOOR AND WINDOW CRITERIA: (MAX)
 ENTRANCE DOORS U=0.77, SHGC = 0.40
 GLASS WINDOWS U=0.70, SHGC = 0.40
 OPAQUE DOORS U=0.45

ENERGY CALCULATIONS

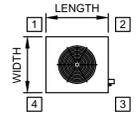
COOLING LOAD:
 ZONE 1: 21,928 BTUH SENSIBLE, 30,007 BTUH LATENT (4.3 TONS)
 ZONE 2: 44,093 BTUH SENSIBLE, 47,329 BTUH LATENT (7.6 TONS) WITH ERV
 ZONE 3: 43,702 BTUH SENSIBLE, 63,273 BTUH LATENT (9.9 TONS)
 TOTAL LOAD: 109,723 BTUH SENSIBLE, 140,609 BTUH LATENT (20.8 TONS)
 HEATING LOAD:
 ZONE 1: 40,003 BTUH
 ZONE 2: 83,763 BTUH
 ZONE 3: 92,804 BTUH
 TOTAL LOAD: 216,570 BTUH

FAN SCHEDULE

ZONE	TYPE	GREENHECK MODEL	NOM CFM	hp	WIDTH	HEIGHT
1	WALL-CENTRIFUGAL	VG-1/4 CW-090-HP-VGDX	811	1/4	10.5	10.5

CONDENSER UNIT SIZE

ZONE	DESCRIPTION	LENNOX STD MODEL**	DIMENSIONS (IN)		
			WIDTH	LENGTH	HEIGHT
1	5-TON CONDENSER	SSB060H4-230	30.5	39.5	39
2	4-TON CONDENSER	SSB048H4-230	30.5	35.0	39



FURNACE/COIL UNIT SIZE

ZONE	DESCRIPTION	LENNOX STD MODEL**	FURNACE DIMENSIONS (IN)			COIL DIMENSIONS (IN)		
			WIDTH	LENGTH	HEIGHT	WIDTH	LENGTH	HEIGHT
1	FURNACE/5 TON COIL	SLP98UH135XV60D/CH33-62D-2F	29.3	33	24.5	21.5	31.5	24.5
2	FURNACE/4 TON COIL	SLP98UH110XV60C/CH33-48C-2F	29.3	33	21	21.5	26.5	21

ENERGY RECOVERY VENTILATOR

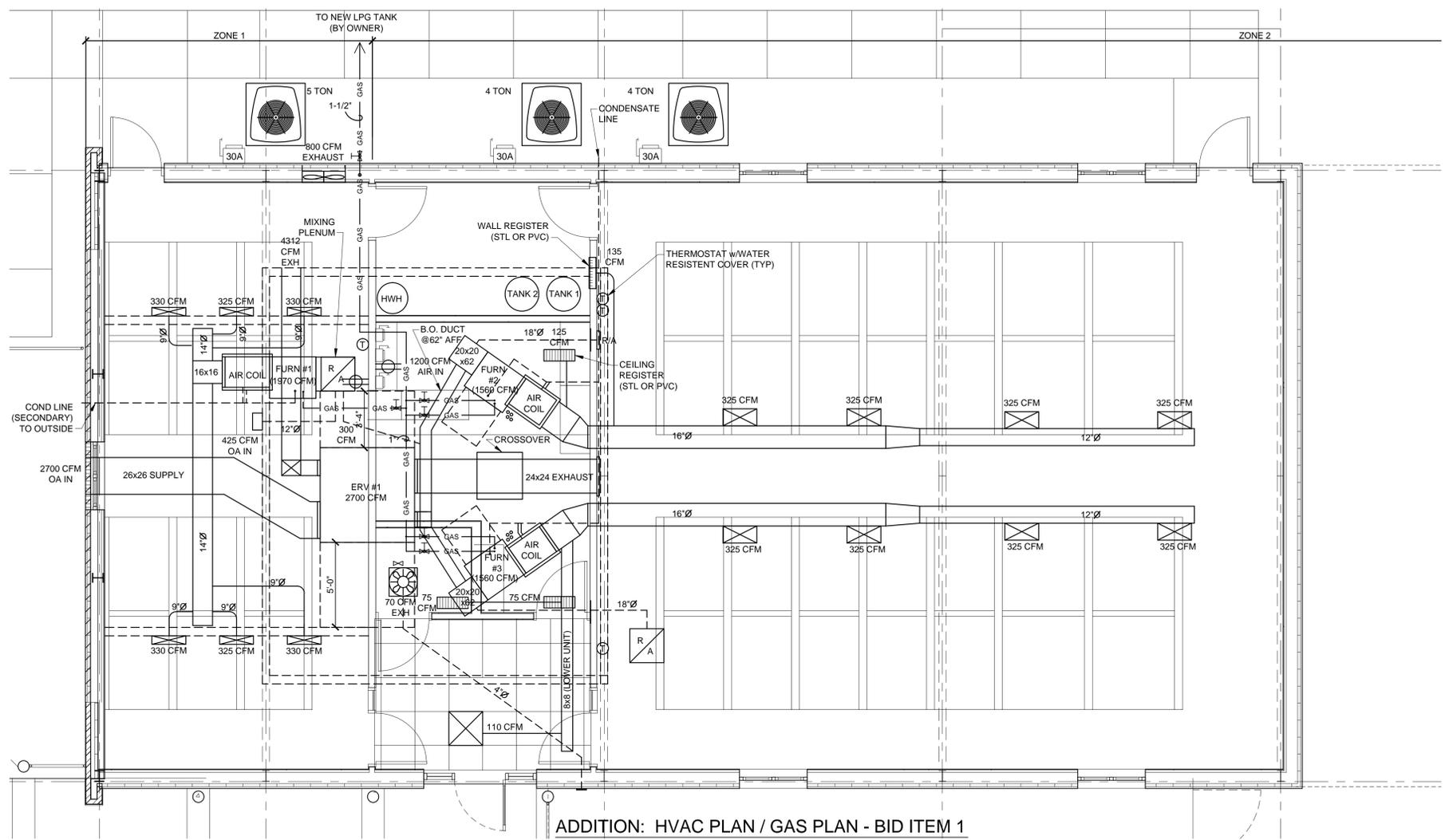
UNIT	DESCRIPTION	HEAT PUMP MODEL	QTY	AIR FLOW (CFM)
ERV	LIGHT COMMERCIAL	GREENHECK ERV-45-15H	1	2700

V-PH-HZ	MCA	MOP	MOTOR SIZE	NET EFFECTIVENESS			
				HEATING		COOLING	
OA EFF	EXH EFF	OA EFF	EXH EFF	OA EFF	EXH EFF	OA EFF	EXH EFF
208-3-60	38.8	50	5hp/5hp	66.1%	66.1%	66.1%	66.1%

NOTE: FACTORY INSTALL BELIMO ACTUATORS WITH FIVE YEAR WARRANTY. ENERGY WHEEL SHALL ALSO HAVE A FIVE YEAR WARRANTY.

ZONE 2 SUMMER PERFORMANCE OUTDOOR AIR COOLING REDUCTION		
	BTUH	TONS
OA LOAD W/O ENERGY RECOVERY	158,637	13.2
OA LOAD WITH ENERGY RECOVERY	91,422	7.6
EQUIPMENT REDUCTION		5.6

ZONE 2 WINTER PERFORMANCE OUTDOOR AIR COOLING REDUCTION	
	BTUH
OA LOAD W/O ENERGY RECOVERY	126,190
OA LOAD WITH ENERGY RECOVERY	83,763
BTUH REDUCTION	42,427



ADDITION: HVAC PLAN / GAS PLAN - BID ITEM 1
 SCALE: 1/4" = 1'-0"

LP GAS NOTES:
 DESIGN IS BASED ON THE 2012 NORTH CAROLINA FUEL GAS CODE.
 ALL FUEL GAS WORK SHALL BE PERFORMED BY A LICENSED FUEL GAS CONTRACTOR AND SHALL CONFORM TO THE 2012 NORTH CAROLINA FUEL GAS CODE. THE FUEL GAS SUBCONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE INSTALLATION OF ALL GAS LINES SHOWN ON THIS PLAN TO 2' FROM BUILDING. LP GAS TANK AND PIPE FROM BUILDING TO TANK SHALL BE BY OWNER.

THESE PLANS ARE DIAGRAMMATIC ONLY AND ARE NOT INTENDED TO SHOW ALL ELEMENTS OF THE REQUIRED WORK. ALL WORK SHALL BE EXECUTED IN A PROFESSIONAL MANNER AND COMPLETED WORK SHALL PRESENT A NEAT APPEARANCE. ALL MATERIAL SHALL BE NEW AND FREE FROM DEFECTS.
 GAS PIPE SHALL BE SCHEDULE 40 METALLIC PIPE. DESIGN IS BASED ON LOW PRESSURE LP AFTER REGULATION, 11" WATER COLUMN. GAS DESIGN BASED ON 576,000 BTUH MAXIMUM DEMAND FOR BID ITEM 1. SIZING BASED ON MAX EQUIV PIPE LENGTH OF 150.

VENTILATION NOTES:
 DESIGN IS BASED ON MINIMUM ASPCA GUIDELINE OF 6 AIR CHANGES PER HOUR WITH 10% GREATER EXHAUST THAN SUPPLY FOR NEGATIVE AIR PRESSURE IN KENNEL AREAS.
 SEE PLAN FOR VENTILATION SYSTEMS.
 MIXING PLENUMS SHALL BE DESIGNED WITH DAMPERS FOR BOTH RETURN AIR AND OUTSIDE AIR TO ACHIEVE OPTIMUM BALANCE OF MIXED AIR TO THE FURNACE. (DO NOT INSTALL DAMPERS ON ERV RETURN OR SUPPLY)

MECHANICAL NOTES:
 DESIGN IS BASED ON THE 2012 NORTH CAROLINA BUILDING CODE.
 ALL NEW MECHANICAL WORK SHALL BE PERFORMED BY A LICENSED HVAC CONTRACTOR AND SHALL CONFORM TO THE 2012 NORTH CAROLINA MECHANICAL CODE. THE HVAC SUBCONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE INSTALLATION OF ALL MECHANICAL EQUIPMENT SHOWN ON THIS PLAN INCLUDING THERMOSTATS, CARBON DIOXIDE MONITORS, MOTORIZED DAMPERS, EXHAUST FANS, DIFFUSERS, DUCTWORK, CONTROL SOFTWARE AND ACCESSORIES. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE INSTALLATION OF HVAC WIRING, OCCUPANCY SENSORS, TRANSFORMERS AND LOW VOLTAGE SYSTEMS.
 THESE PLANS ARE DIAGRAMMATIC ONLY AND ARE NOT INTENDED TO SHOW ALL ELEMENTS OF THE REQUIRED WORK. ALL WORK SHALL BE EXECUTED IN A PROFESSIONAL MANNER AND COMPLETED WORK SHALL PRESENT A NEAT APPEARANCE. ALL MATERIAL SHALL BE NEW AND FREE FROM DEFECTS.
 ALL DUCTWORK SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARD". ROUND DUCT SHALL BE PVC. DAMPERS SHALL BE PROVIDE FOR EACH SUPPLY REGISTER AND AIR FLOW SHALL MATCH DESIGN VALUES WITHIN 5%. MAIN DUCTS SHALL BE WRAPPED IN EXTERIOR INSULATION (R-4.3).



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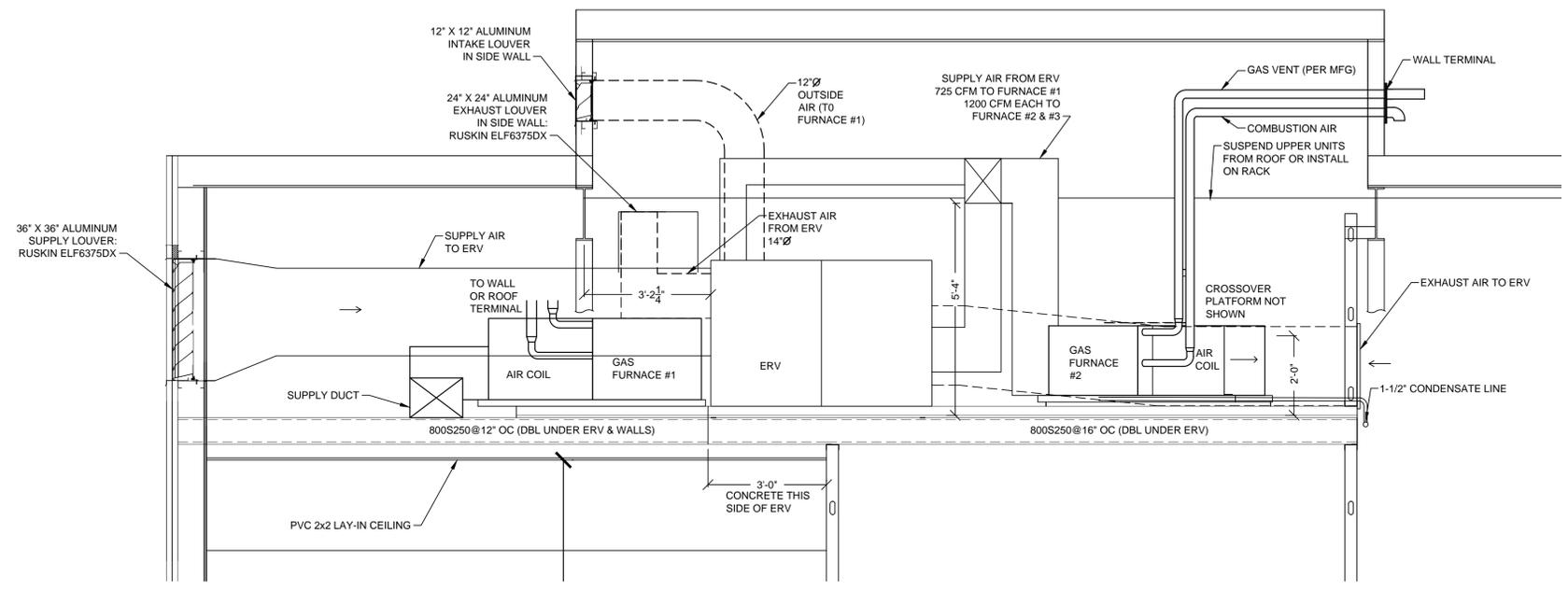
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**Craven County
 Animal Shelter**
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MECHANICAL DETAILS

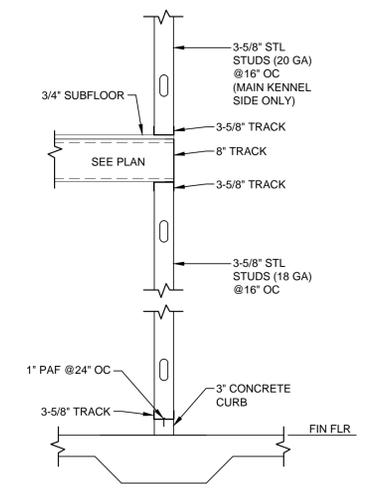
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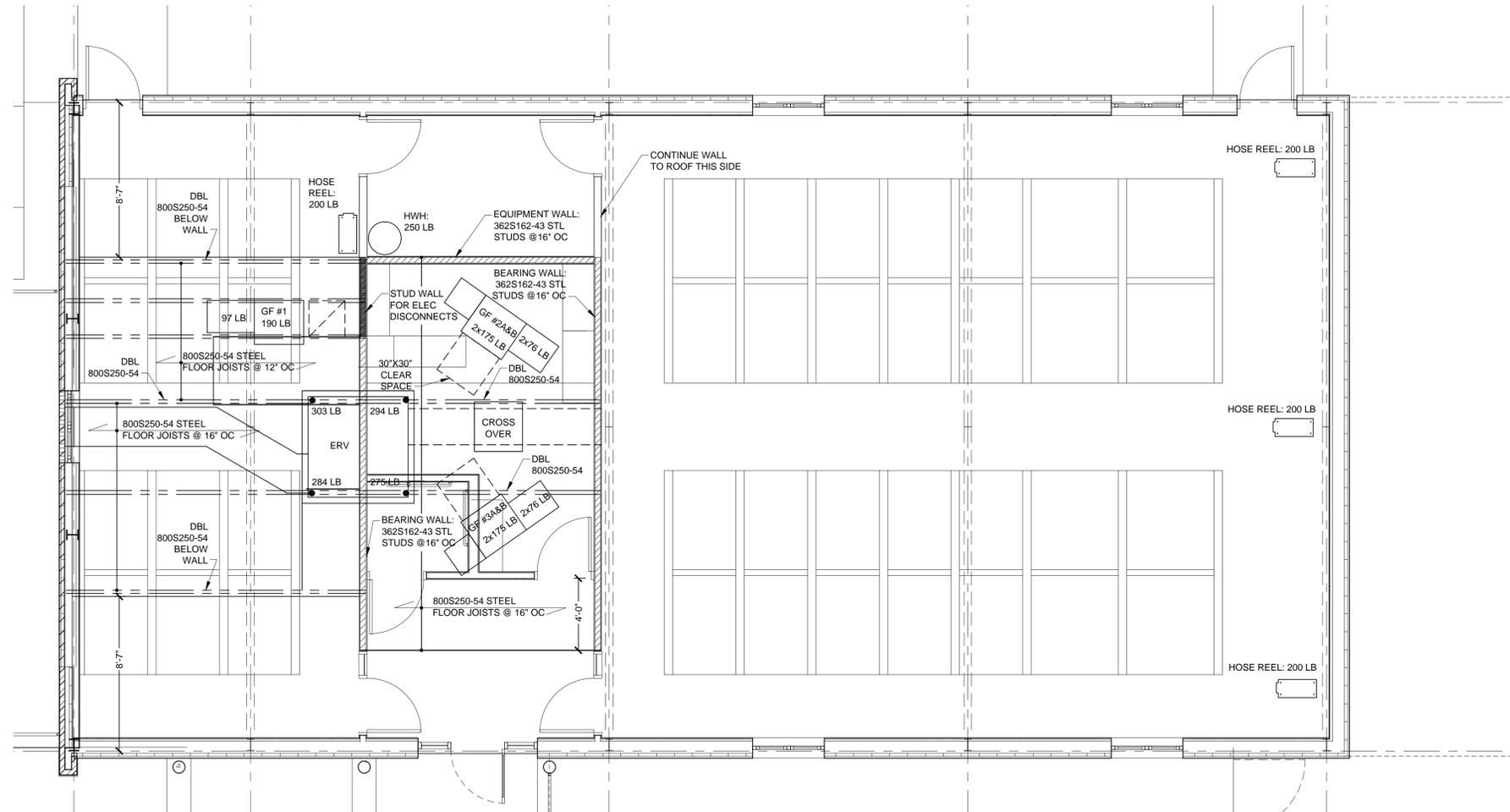
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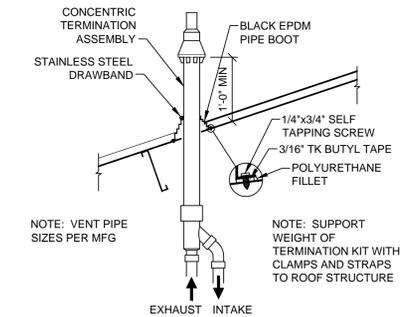
HVAC EQUIPMENT CROSS SECTION
 SCALE: 1/2" = 1'-0"



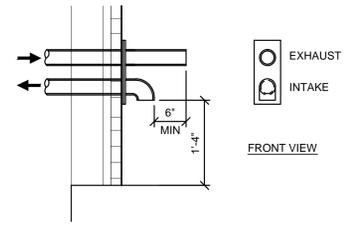
BEARING WALL SECTION
 SCALE: 1" = 1'-0"



EQUIPMENT LOADS & MECHANICAL ROOM FRAMING
 SCALE: 1/4" = 1'-0"



GAS VENT THRU ROOF OPTION
 NTS



GAS VENT THRU WALL DETAIL
 NTS

CONDENSER SCHEDULE

ZONE	DESCRIPTION	QTY	MODEL**	EER	SEER	COOLING INPUT - ELECTRICAL DATA				
						V-PH-HZ	COMP RLA	COMP LRA	MCA	MOCP
3	5-TON AIR COND	2	LENNOX SSB060H4-230	16.0	12.2	208-3-60	16.5	110	22.4	35

**TRANE OR CARRIER EQUIVALENT MODELS ARE ACCEPTABLE.

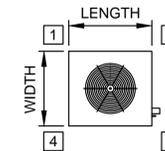
AIR HANDLER SCHEDULE

ZONE	DESCRIPTION	QTY	MODEL**	EER	SEER	NET COOLING PER UNIT	ELECTRICAL DATA		
							V-PH-HZ	MCA	MOCP
3	5-TON AIR HANDLER	2	LENNOX CBX32MV-060	11.5	15.0	60,000 BTUH	208-1-60	11	20

**TRANE OR CARRIER EQUIVALENT MODELS ARE ACCEPTABLE.

CONDENSER UNIT SIZE

ZONE	DESCRIPTION	LENNOX STD MODEL**	DIMENSIONS (IN)		
			WIDTH	LENGTH	HEIGHT
3	5-TON AIR COND	SSB060H4-230	39.5	35.5	39



COIL UNIT SIZE

ZONE	DESCRIPTION	LENNOX STD MODEL**	COIL DIMENSIONS (IN)		
			WIDTH	LENGTH	HEIGHT
3	5-TON AIR HANDLER	CBX32MV-060	21.25	58.5	24.6

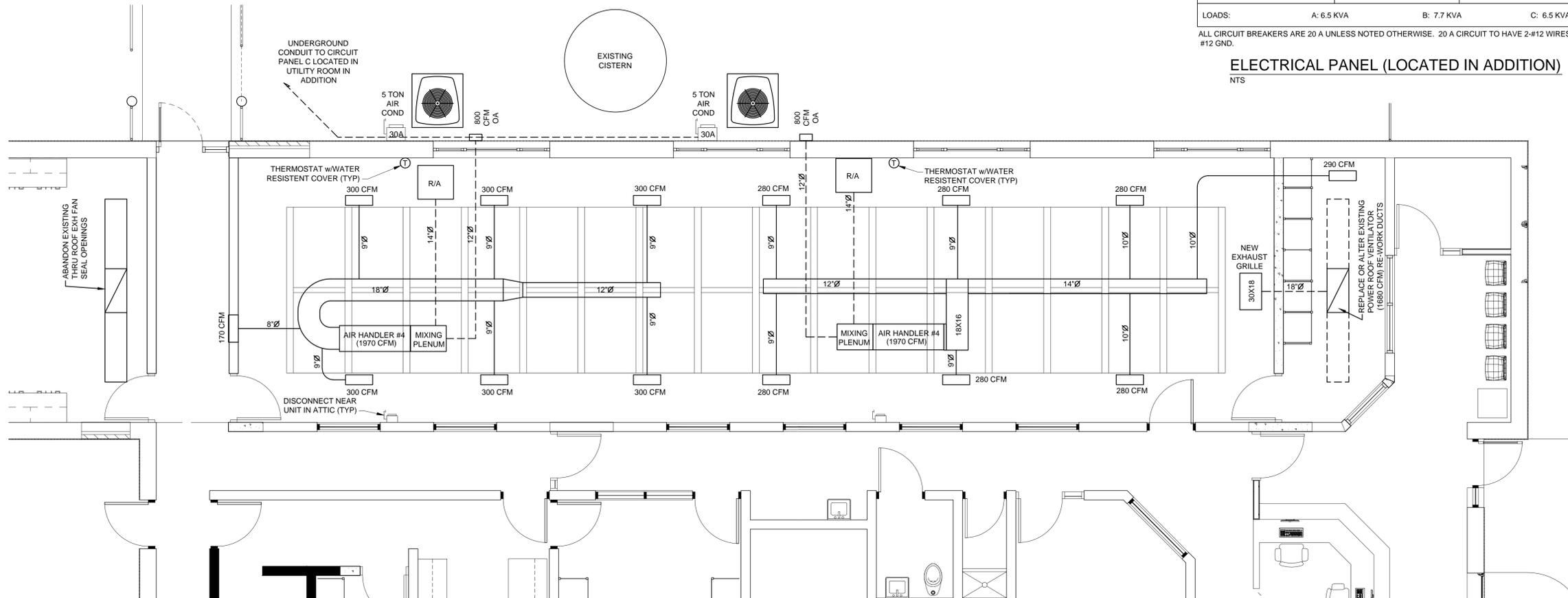
PANEL C (BID ITEM 3)
120V / 208V / 3Ø / 60 HZ
100A

CKT #	LOAD V-A	DESCRIPTION	CIRCUIT BREAKER			DESCRIPTION	LOAD V-A	CKT #
			A	B	C			
1							2	
3	8070	COMP #4: 5 TON	35A		35A	COMP #5: 5 TON	8070	4
5								6
7	2290	AHU #4	20A		20A	AHU #5	2290	8
9								10
11								12
13								14
15								16
17								18

LOADS: A: 6.5 KVA B: 7.7 KVA C: 6.5 KVA

ALL CIRCUIT BREAKERS ARE 20 A UNLESS NOTED OTHERWISE. 20 A CIRCUIT TO HAVE 2-#12 WIRES AND #12 GND.

ELECTRICAL PANEL (LOCATED IN ADDITION)
NTS



EXISTING KENNEL: HVAC PLAN / COOLING ONLY (BID ITEM 3)
SCALE: 1/4" = 1'-0"

VENTILATION NOTES:

DESIGN IS BASED ON MINIMUM ASPCA GUIDELINE OF 6 AIR CHANGES PER HOUR WITH 10% GREATER EXHAUST THAN SUPPLY FOR NEGATIVE AIR PRESSURE IN KENNEL AREAS.

SEE PLAN FOR VENTILATION SYSTEMS.

MIXING PLENUMS SHALL BE DESIGNED WITH DAMPERS FOR BOTH RETURN AIR AND OUTSIDE AIR TO ACHIEVE OPTIMUM BALANCE OF MIXED AIR TO THE FURNACE. (DO NOT INSTALL DAMPERS ON ERV RETURN OR SUPPLY)

MECHANICAL NOTES:

DESIGN IS BASED ON THE 2012 NORTH CAROLINA BUILDING CODE.

ALL NEW MECHANICAL WORK SHALL BE PERFORMED BY A LICENSED HVAC CONTRACTOR AND SHALL CONFORM TO THE 2012 NORTH CAROLINA MECHANICAL CODE. THE HVAC SUBCONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE INSTALLATION OF ALL MECHANICAL EQUIPMENT SHOWN ON THIS PLAN INCLUDING THERMOSTATS, CARBON DIOXIDE MONITORS, MOTORIZED DAMPERS, EXHAUST FANS, DIFFUSERS, DUCTWORK, CONTROL SOFTWARE AND ACCESSORIES. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE INSTALLATION OF HVAC WIRING, OCCUPANCY SENSORS, TRANSFORMERS AND LOW VOLTAGE SYSTEMS.

THESE PLANS ARE DIAGRAMMATIC ONLY AND ARE NOT INTENDED TO SHOW ALL ELEMENTS OF THE REQUIRED WORK. ALL WORK SHALL BE EXECUTED IN A PROFESSIONAL MANNER AND COMPLETED WORK SHALL PRESENT A NEAT APPEARANCE. ALL MATERIAL SHALL BE NEW AND FREE FROM DEFECTS.

ALL DUCTWORK SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARD". ROUND DUCT SHALL BE PVC. DAMPERS SHALL BE PROVIDED FOR EACH SUPPLY REGISTER AND AIR FLOW SHALL MATCH DESIGN VALUES WITHIN 5%. MAIN DUCTS SHALL BE WRAPPED IN EXTERIOR INSULATION (R-4.3).



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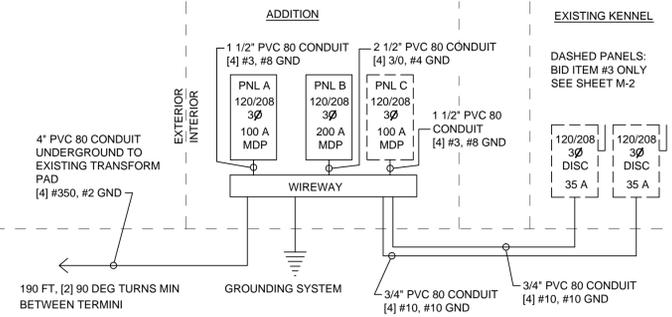
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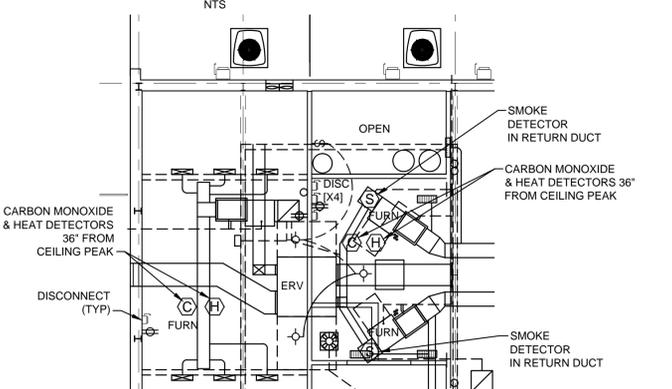
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M-3



ELECTRICAL SCHEMATIC
NTS



ELECTRICAL PLAN - MECH PLATFORM
SCALE: 1/8" = 1'-0"

PANEL A
120V / 208V / 3Ø / 60 HZ
100A

CKT #	LOAD V-A	DESCRIPTION	CIRCUIT BREAKER	DESCRIPTION	LOAD V-A	CKT #
1	224	INT. LIGHTS	A	RECEPTACLES	1620	2
3	352	INT. LIGHTS	B	RECEPTACLES	1620	4
5	256	INT. LIGHTS	C	RECEPTACLES	1620	6
7				HWH RCP	2500	8
9	298	EXT. LIGHTS				10
11	275	EXT. LIGHTS				12
13	670	EXH FANS				14
15				BOOSTER PUMP	2700	16
17						18
19						20
21				CHEM PUMP 1	450	22
23						24
25						26
27				CHEM PUMP 2	450	28
29						30
31						32
33						34
35				FIRE ALARM (LOCKED)		36
37						38
39						40
41						42

LOADS: A: 5.0 KVA B: 4.5 KVA C: 3.3 KVA
ALL CIRCUIT BREAKERS ARE 20 A UNLESS NOTED OTHERWISE. 20 A CIRCUIT TO HAVE 2-#12 WIRES AND #12 GND.

ELECTRICAL NOTES:

- ALL ELECTRICAL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR AND SHALL CONFORM TO THE 2011 NATIONAL ELECTRICAL CODE INCLUDING NORTH CAROLINA AMMENDMENTS. THE ELECTRICAL SUBCONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE INSTALLATION OF ALL ELECTRICAL EQUIPMENT SHOWN ON THIS PLAN INCLUDING LIGHT FIXTURES AND REQUISITE HANGERS AND SUPPORTS, AND TIMERS AND CONTROL SYSTEMS FOR MECHANICAL AND PLUMBING SYSTEMS.
 - THESE PLANS ARE DIAGRAMMATIC ONLY AND ARE NOT INTENDED TO SHOW ALL ELEMENTS OF THE REQUIRED WORK. ALL WORK SHALL BE EXECUTED IN A PROFESSIONAL MANNER AND COMPLETED WORK SHALL PRESENT A NEAT APPEARANCE. ALL MATERIAL SHALL BE NEW AND FREE FROM DEFECTS.
 - ALL CONDUCTORS SHALL BE COPPER SIZE #12 OR BIGGER, UL LISTED AND LABELED. INSULATION WILL BE THN OR THWN. CONDUCTORS SHALL BE RUN IN CONDUITS AND SHALL BE CONTINUOUS FROM OUTLET TO OUTLET.
 - PANELS SHALL BE SQUARE D.
 - ALL SWITCHES, RECEPTACLES AND BOXES LOCATED IN KENNEL AREAS SHALL BE WATERPROOF AND GFCI PROTECTED.
 - FIRE ALARMS/SAFETY AND SECURITY DESIGN BY OTHERS.
- FIRE ALARM: FIRE ALARM CONTRACTOR TO PROVIDE AND INSTALL ADDRESSABLE ANALOG FIRE ALARM SYSTEM, INCLUDING PULL STATIONS, SMOKE DETECTORS, HEAT DETECTORS, NOTIFICATION DEVICES, ANNUNCIATOR AT ENTRANCE AND OUTSIDE STROBE AND ALARM BELL. FIRE ALARM CONTRACTOR TO ARRANGE PERMITS AND INSPECTIONS AND MAKE ANY CHANGES REQUIRED BY AUTHORITY HAVING JURISDICTION.

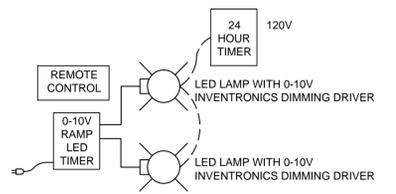
PANEL B
120V / 208V / 3Ø / 60 HZ
200A

CKT #	LOAD V-A	DESCRIPTION	CIRCUIT BREAKER	DESCRIPTION	LOAD V-A	CKT #
1						2
3	8820	COMP #1: 5 TON	40A	ERV	14000	4
5						6
7						8
9	6860	COMP #2: 4 TON	30A	COMP #3: 4 TON	6860	10
11						12
13	1840	FURNACE #1	20A			14
15	1840	FURNACE #2	20A			16
17	1840	FURNACE #3	20A			18
19						20
21						22
23						24
25						26
27						28
29						30

LOADS: A: 14.0 KVA B: 14.0 KVA C: 14.0 KVA
ALL CIRCUIT BREAKERS ARE 20 A UNLESS NOTED OTHERWISE. 20 A CIRCUIT TO HAVE 2-#12 WIRES AND #12 GND.

ENERGY CODE COMPLIANCE: BASED ON SPACE BY SPACE METHOD
INTERIOR CONNECTED LIGHTING
KENNELS: 0.58 WSF ALLOWED 0.53 WSF ACTUAL (FLUOR)
VESTIBULE: 0.64 WSF ALLOWED 0.56 WSF ACTUAL (FLUOR)
RESTROOM: 0.84 WSF ALLOWED 0.90 WSF ACTUAL (LED)
STORAGE: 0.63 WSF ALLOWED 0.47 ACTUAL (FLUOR)
ELECTRICAL/MECHANICAL RMS: 0.95 WSF ALLOWED 0.82 WSF ACTUAL (FLUOR)
QUARANTINE: 0.58 WSF ALLOWED 0.56 WSF ACTUAL FLUOR
OVERALL: 1348 WATTS ALLOWED, 1334 WATTS ACTUAL

EXTERIOR CONNECTED LIGHTING
BASE + ENTRANCE DOORS = 600W + 660W + 62W=1322W ALLOWED, 69 W ACTUAL

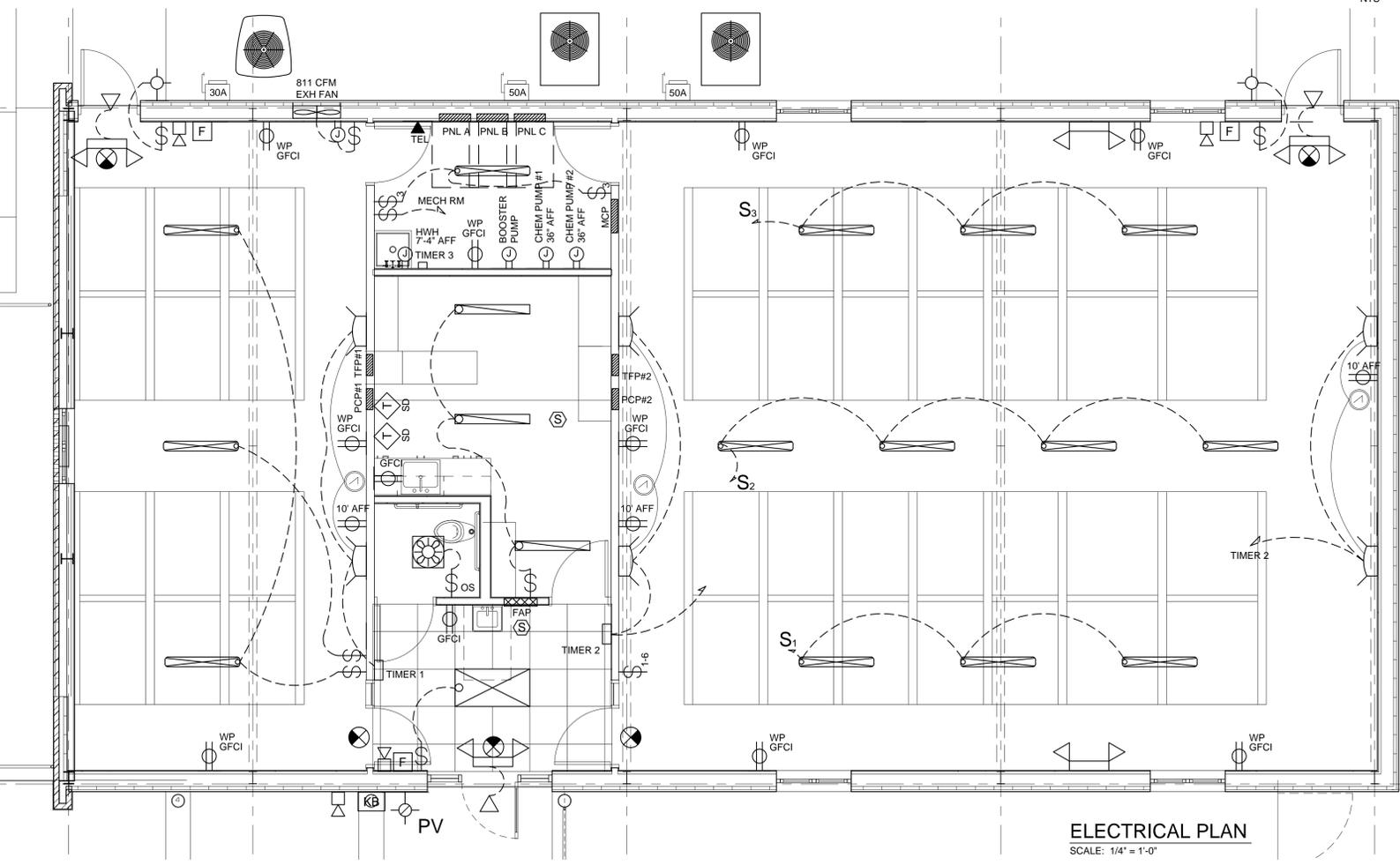


SUNRISE / SUNSET DIMMING SYSTEM
NTS

ELECTRIC LEGEND

	DUPLEX 120V RECEPTACLE		UTILITY LIGHT
	GFCI RECEPTACLE		DIMMABLE LED (UPLIGHT APPLICATION-16W) H.E. WILLIAMS VOLTAIRE MINI ARCHITECTURAL WALL PACK VVMH-LED17/840-WHT-EDD-IN-120
	JUNCTION BOX		EXT WALL LIGHT (LED-23W) PV=PHOTOVOLTAIC SWITCH
	SINGLE POLE SWITCH		1-BULB FLUORESCENT SURFACE MOUNT (1 @ T-8 = 32W) LITHONIA CB 32 120 GEB101S
	OCCUPANT SENSING SWITCH W/TIMER		2-BULB FLUORESCENT WET LOCATION INDUSTRIAL SUSPENDED ALUMINUM FIXTURE (2 @ T-8 = 64W) LITHONIA XLW232MV
	3-POLE SWITCH		2-BULB FLUORESCENT 2x4 LAY-IN (2 @ T-8 = 64W) LITHONIA GT2MV
	SWITCH BANK (3 OVER 3)		EXIT SIGN H.E. WILLIAMS EXIT/WET/CP-SF-R-WHT-EM
	24-HOUR TIMER TIMER 1 - SEE PLUMBING SCHED TIMER 2, 3 - INTERMATIC STO1		EXIT SIGN (LED) W/ EMERGENCY FLOOD LIGHTS H.E. WILLIAMS EXIT/EM/WET-R-WHT
	RAMP LED CONTROLLER ECOEXOTIC 0-10V		EMERGENCY EGRESS LIGHTS SPACE PER MFG FOR 1 IC H.E. WILLIAMS EMER/WET-WHT
	BRANCH CIRCUIT		FIRE ALARM : PULL STATION
	DISCONNECT		FIRE ALARM : AUDIBLE VISUAL APPLIANCE STROBE/BELL
	DISCONNECT (WP)		FIRE ALARM : ANNUNCIATOR PANEL
	ELECTRIC PANEL		SMOKE DETECTOR
	EXHAUST FAN (SIDEWALL MOUNTED)		CARBON MONOXIDE DETECTOR
	EXHAUST FAN/ LIGHT COMBINATION		SMOKE DETECTOR TEST STATION (HVAC)
	TELEPHONE OUTLET		KNOX BOX
	MCP		
	TFP		
	PCP		

NOTE: PRODUCTS OF EQUIVALENT QUALITY AND FUNCTION MAY BE SUBSTITUTED FOR PRODUCTS FROM MANUFACTURER LISTED.



ELECTRICAL PLAN
SCALE: 1/4" = 1'-0"



C.R. Francis Architecture
329 Middle Street
New Bern, NC 28563

Craven County
ANIMAL SHELTER
1639 Old Airport Road
New Bern, NC 28560
ELECTRICAL PLAN

Conzelmann Engineering, PA
License No. C-3907
5110 Bucco Reef Road
New Bern, NC 28560
PH: 252-571-7253
econz1@suddenlink.net

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all rights reserved
drawn by: EAC
date: 6/02/2015
revisions:

1
2
JOB #14033
SHEET 7 of 7
E-1

C . R . F R A N C I S / A R C H I T E C T U R E

p. o. box 1387 new bern, nc 28563 phone: 252.637.1112 fax: 252.637.7698

Charles R. Francis
AIA

Diane H. Filipowicz
Assoc. AIA

ADDITION & RENOVATION:
CRAVEN COUNTY ANIMAL SHELTER
1639 OLD AIRPORT ROAD
NEW BERN, NC



Located at
329 middle
street

ADDITION & RENOVATION:
CRAVEN COUNTY ANIMAL SHELTER
1639 OLD AIRPORT ROAD
NEW BERN, NC

I N S T R U C T I O N S T O B I D D E R S

1. Time: Sealed bids will be delivered to the office of County Manager at 406 Craven Street, New Bern at 2:00pm 30 June 2015.
2. Opening: Bids will be opened publicly and read aloud in accordance with N.C.G.S. 143 Article 8 as amended. Announcement of the successful bidder will be made within 30 days of the above date to all firms submitting a bid.
3. Term of Bid: Each contractor, in submitting a bid, agrees to hold firm to his quotation for a period of 30 days with an option to extend the time to 45 days if exercised by the Owner.
4. Owner's Right: The owner reserves the right to reject any or all bids without prejudice or obligation whatsoever to the bidder.
5. Single Prime Bids: General contractors shall submit single prime bid in accordance with G.S. 143-128.
 1. Single prime bids must list subcontractors for plumbing, heating, ventilating and air conditioning, and electrical.
 2. Advertise in general circulation, trade association and minority-focus media of the subcontracting opportunities to be awarded.
 3. Provide timely written notices to known minority-businesses capable of subcontracting the work, soliciting their participation of work to be awarded.
 4. Provide all interested minority-businesses with equal access to plans, specifications and other requirements and information concerning the subject work.
 5. Negotiate in good faith with interested minority-businesses, rejecting them only for sound reasons after a thorough investigation of their offers and capabilities.
6. Contract Form: Contracts with the successful bidders will be executed on AIA Document A-101 (2007 edition).
7. Bid Security
Bid Bonds
Liquidated Damages: See Supplementary General Conditions.

8. Insurance: See Supplementary General Conditions.
AIA Form G715 shall be attached to Accord Certificate of Insurance 25-S.
9. Gold Pages: Gold pages (Supplementary General Conditions and Division 1) set forth the conditions and procedures governing the project. All contractors, subcontractors and suppliers are advised to read carefully the aforesaid pages before beginning to prepare any estimate or to make a quantity takeoff.
10. Bid Forms: Clean bid forms will be provided to all contractors by email who have registered their intention to bid. Contractors may remove and use forms included in this specification.
11. Rules for Bid Opening: All bids must be presented in person to the Owner or Architect and that person must remain for the bid opening to witness the opening of the bids.

All bids must be on bid form. Bids shall be placed in a sealed envelope with contractor's name, project name, date of bid, and license [if required for the project] on the face of the envelope.

Erasures or changes in bid must be noted or explained over signature of the bidder.
12. Return of Documents Plan deposits will be returned to the holder of documents when contract documents are returned to the Architect's office within 30 days of the bid opening with the documents in good condition [bound in the original binders and **all sheets unmarked** We have had drawings returned marked to the point of being illegible and sheets of drawings unbound and out of order. This condition will preclude the return of deposit checks.].

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ADDITION & RENOVATION: CRAVEN COUNTY ANIMAL SHELTER
1639 OLD AIRPORT ROAD
NEW BERN, NC

PROPOSAL OF: _____
[herein after called "BIDDER"], organized and existing under the laws of the State of North Carolina doing business as _____.*

*Insert "a corporation", "a partnership", or "an individual" as applicable.

TO:
the Craven County Board of Commissioners
[hereinafter called "OWNER"]

In compliance with your Advertisement for Bids, the BIDDER hereby proposes to perform all WORK for the construction of:

ADDITION & RENOVATION: CRAVEN COUNTY ANIMAL SHELTER

in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to its own organization, that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

Bidder hereby agrees to commence WORK under this contract on or before a date to be specified in the notice to proceed and to fully complete the PROJECT within one hundred eighty [180] consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of \$150 for each consecutive calendar day thereafter as provided in Article 15 of the General Conditions [and fully stated in Article 10 of the architects Supplementary General Conditions found in the gold pages of the project manual].

BIDDER acknowledges receipt of the following ADDENDA:

Addendum #1 submitted _____

Addendum #2 submitted _____

Addendum #3 submitted _____

BID SCHEDULE

NOTE: BIDS shall include sales tax and all other applicable taxes and fees.

Therefore, being fully familiar with all of the conditions of the CONTRACT DOCUMENTS including the plans, specifications, addenda, conditions of the contract, instructions to bidders, and the project site, I, we, hereby propose to furnish all labor, material, and equipment necessary and required to complete work on each of the bid items listed below on the above named project for the sums of:

Bid Item 1: Renovation of the north portion of the existing facility and construction of the new annex building including any and all allowances indicated in Section 01 60 00:

_____ DOLLARS
[\$ _____]

Bid Item 2: Renovation of the south portion of the existing facility including any and all allowances indicated in Section 01 60 00:

_____ DOLLARS
[\$ _____]

Bid Item 3: Installation of a new heating and air conditioning zone in the area of the existing kennel including any and all allowances indicated in Section 01 60 00:

_____ DOLLARS
[\$ _____]

ALTERNATES:

None

NO UNIT PRICE BIDS REQUIRED

Respectfully submitted:

Signature

Address

Title

Date

License number

SEAL - as required by the corporate and or licensing laws and guidelines of the State of North Carolina

Bid Form Attachment

List of Proposed Subcontractors:

Prime Subcontractors:

Plumbing: _____

Mechanical: _____

Electrical: _____

Any other subcontractor that may fall under the purview of the NC SB 914 requirements.

Bidding Checklist

Please include items 1 though 6 in your bid package

- 1. Bid Form
- 2. Bid Form Attachment: List of Subcontractors [although the common practice is to list PM&E subs, the wording is such that any major subcontractor is applicable to be listed]
- 3. Bid Bond
- 4. Any and all documents required by the State of NC in relationship to Article 16 of the Supplementary General Conditions dealing with minority and female businesses

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- 01 20 00 ESTABLISHING THE CONTRACT
- 01 30 00 EXECUTION OF THE CONTRACT
- 01 40 00 ADMINISTRATIVE REQUIREMENTS
- 01 50 00 QUALITY REQUIREMENTS
- 01 60 00 PAYMENT PROCEDURES
- 01 70 00 PROJECT CLOSEOUT

DIVISION 02 SITE WORK

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REMEDIATION
 - 02 11 00 Site Clearing
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 - 07 52 00 Membrane Roofing
[TPO]
- 07 60 00 FLASHING AND SHEET METAL
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 - 10 56 00 Storage Assemblies
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NOT USED

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NOT USED

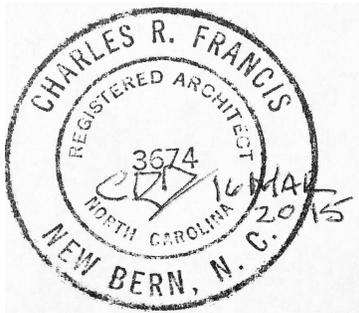
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26 00 00 ELECTRICAL



Charles R. Francis
AIA

Diane H. Filipowicz
Assoc. AIA

GENERAL CONDITIONS

The General Conditions for this project are the GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, AIA DOCUMENT A201-2007

The aforesaid document will be bound into the successful bidder's official contract document set in the presence of the Contractor upon contract signature. Copies of this document bound into the full set of contract documents are on file for review at the following locations:
Office of the Architect.



Located at
329 middle street

SUPPLEMENTARY GENERAL CONDITIONS

ARTICLE 1 IDENTIFICATION.

For the purpose of the contract documents, the following identification shall be given to these terms:

Owner: Craven County Board of Commissioners
406 Craven Street
New Bern, NC 28560

Architect: C. R. Francis Architecture, P. A.
329 Middle Street,
New Bern, NC 28560

Engineer: Any one or all of the Consulting Engineers engaged by the Architect for engineering services for definitive portions of the work whose name and seal appears on the drawings.

Drawings: Any one or all sheets of drawings entitled:
ADDITION & RENOVATION:
CRAVEN COUNTY ANIMAL SHELTER
1639 OLD AIRPORT ROAD
NEW BERN, NC

Also: Any additional sheets similarly identified and consecutively numbered issued from time to time as the work progresses to more clearly illustrate the intent of the above mentioned drawings or to illustrate a contract modification.

ARTICLE 2 GENERAL CONDITIONS.

The General Conditions of the contract shall be as set out in the preceding 39 printed pages, and these Supplementary General Conditions pages 40 through 50. These conditions shall be applicable to and form a part of each set of contract documents and all of the conditions contained herein will be applicable to the contract between the Owner and each Contractor.

Should anything written in the Supplementary General Conditions conflict in the above mentioned General Conditions or require more inclusive items or set out additional conditions, the Supplementary General Conditions shall take precedence.

ARTICLE 3 AMENDMENTS TO A.I.A. DOCUMENT A201, 2007 EDITION.

GENERAL PROVISIONS: ARTICLE 1.

Execution, Correlation, Intent and Interpretation.

1.1.3.1 Add the following sentence:

Work which is attributed to any condition of the site which was visible at the time of bidding or could reasonably have been concluded by a familiarization with the site and the attendant local conditions shall be in-

cluded in the Project Cost and no additional cost shall be charged to the Owner for any labor, materials or service required in its execution.

1.1.5.1 Additional paragraph:

It is the intent that all various items indicated or shown in detail on the plans or mentioned in these specifications shall be completed as one whole unit and any work or thing necessary to connect the various parts of the work to produce that result shall be furnished and done by the Contractor without change in the contract price.

1.1.5.2 Additional paragraph:

Certain drawings are customarily considered diagrammatic in character such as those illustrating electrical, plumbing, heating and air-conditioning, and equipment layouts. These drawings must be followed as closely as possible consistent with the construction and should not be scaled. Dimensions must come from field conditions or architectural drawings. Every fitting, device, bend or connection is not necessarily shown, but must be furnished if required to accomplish the operation set out in the specification.

CONTRACTOR: ARTICLE 3

3.14 Cutting and Patching

3.14.1.4 Add the following paragraph:

In the event that the work consists of the restoration of, the renovation of, or the addition to an existing structure, the contractor shall do all cutting, fitting or patching of the existing structure required to fit or receive the new work.

INSURANCE: ARTICLE 11

11.3.1 & 11.4.2

Property Insurance with extended coverage, Article 11.3.1 and Boiler and Machinery Insurance Article 11.4.2, General Conditions are hereby amended to the extent that the coverage as set forth shall be obtained and paid for by the Contractor as part of Builder's Risk Policy with appropriate riders.

Add the following sentence at the end of each paragraph: "Insurance shall be kept in force for the duration of the contract or until occupancy, whichever occurs first."

11.3.1.2

Delete in its entirety.

Insert the following sentence:

The Contractor shall file a copy of all policies with the Owner at the time contracts are signed. If the Owner is damaged by failure of the Contractor to maintain such insurance or notify the Owner of its termination, the Contractor shall bear the reasonable costs properly attributed thereto.

11.3.1.3

Omit the last sentence.

Insert the following sentence:

The Contractor shall pay all costs not covered because of deductibles in the property insurance policies.

11.3.4

Delete in its entirety.

Insert the following sentence:

Any special insurance coverage desired by the Contractor shall be provided by the Contractor.

12.2.3

Omit the last portion of the sentence following "...Contract Documents" and set a period following "Documents".

Article 15 Claims and Disputes

Omit the following paragraphs 15.3 Mediation and all subparagraphs.

Omit the following paragraphs 15.4 Arbitration and all subparagraphs.

ARTICLE 4 BIDS AND BONDS.

Each contractor submitting a bid on work covered by these contract documents shall:

- [1] Hold a Contractor's license of the proper classification according to and in compliance with the laws of North Carolina applicable to his branch of the work and shall place the number and classification of such licenses on the outside of the envelope containing the Contractor's sealed bid.
- [2] The Act of considering a bid from any bidder shall be construed only as a business courtesy extended to the contractors by the Owner who reserves the right, and each bidder by his act of submitting a bid thereby concurs in the right of the Owner, to reject any or all bids without further obligation to any bidder; nor shall the owner be called upon to make known the reason for doing so.
- [3] The Owner likewise reserves the right to waive any or all formalities consistent with the North Carolina General Statutes 143 Article 8 in receiving, considering, or accepting any bid submitted, which may, in their opinion, expedite the awarding of the contract, or be in the best interest of the project.
- [4] Attach to his bid as bid security a bid bond or certified check in an amount equal to five percent (5%) of the bid; bond or check shall be issued to the Owner, named precisely as in the preceding "Identification" paragraph Article 1, by a surety company authorized to do business in North Carolina.
 - a. Should any bidder to whom the contract has been awarded refuse or fail to sign the contract and file payment and performance bond hereinafter described within five days after being notified in writing by the Architect that the contract has been awarded to him, he shall forfeit the full amount of his bid security as liquidated damages for refusal or failure on the part of the bidder. All conditions of

this paragraph are applicable to all bidders in sequence established by the amount of their bids beginning with the lowest bid.

- b. Bid bonds in the form of checks shall be returned promptly to the bidder after the bids have been opened, and the contract awarded to and signed by the successful bidder; in any case, not later than thirty (30) days after the date set for the opening of the bids.

[5] File with the Owner at the time a contract is signed a performance bond in an amount equal to one hundred percent (100%) of the contract price and a payment bond equal to one hundred percent (100) of the contract price, both issued by a surety company authorized to do business in North Carolina. Bond will be on the standard A.I.A. form of Surety Association of America and issued in favor the Owner.

ARTICLE 5 INSURANCE COVERAGE.

Contractor shall provide insurance as follows in the amounts and coverage listed:

Workmen's Compensation	Minimum legal limit
Contractors' Liability	Contractual Liability \$1,000,000 Combined single limit
	Comprehensive General Liability \$1,000,000 Combined single limit
	Personal Injury with employment exclusion deleted, \$1,000,000 Combined single limit
Auto Insurance (Vehicles on Site)	Comprehensive auto liability \$500,000 Combined single limit
Property Insurance (Builder's Risk)	Full insurable value, including Architectural and Engineering fees.

ARTICLE 6 SALES TAX

The Owner is a subdivision of the State and as such is a tax exempt institution for taxes collected for State sales tax. Therefore, the Contractor shall furnish to the Owner, by attachment to his Estimate and Request for Payment, an affidavit of the amount on North Carolina sales and use taxes paid by the Contractor, his subcontractors and suppliers on materials entering into the work and invoiced during the period included in the Request for Payment. The affidavit shall be in a form acceptable to the North Carolina Department of Revenue for reimbursement to tax exempt institutions. If materials are invoiced to inventory in bulk lots, the Contractor shall have his supplier issue special invoices covering those items and quantities entering into this project and showing the appropriate tax, otherwise, the Contractor is the vendor and he shall pay the sales tax on the material himself and indicate such amounts on the affidavit.

ARTICLE 7 EQUALS AND SUBSTITUTES.

- [1] Equal products are those products of similar material, quality, use and design to that specified, but produced by a different manufacturer. Their use does not modify or change a requirement of the specification other than the trade name.
- [2] Substitute products are products of similar use to that specified, produced by the same or different manufacturers, which requires a modification or change in the specifications and thereby involves a modification of the contract documents (change order) with the attendant contract price adjustments.
- [3] In the specifications, products and processes will be referred to by trade names, Federal Specifications, ASTM Standards, industry referenced standards and/or generic name; the phrase "or equal" may also occur. In these cases, the following options shall be available to the contractor, depending on the method of specification used.
 - a. If three or more trade names with attendant product identification are listed for a single product, the contractor may furnish any of the products listed but his choice will be limited to those listed.
 - b. If one trade name and attendant product identification is given followed by the expression "or equal products manufactured by" and a list of two or more manufacturers are given, the contractor shall use the product named or he may use a product of, and shall be limited to, one of the other manufacturers listed, provided that the product used is similar in design, quality, and use to the product identified. However, the burden of proof that such is the case is the Contractor's, and he shall submit such evidence to the Architect for approval before incorporating the product into the work or including it in a request for payment.
 - c. If one or more industry, Federal or ASTM reference standards is used without any other proprietary identification, the contractor may furnish any product available to him which meets these requirements; however, the burden of proof that such is the case is the Contractor's, and he shall submit such evidence to the Architect for approval before incorporating the product into the work or including it in a request for payment.
 - d. If a trade name is listed for a product followed by the phrase "or equal", the Contractor shall use the product named, or he may use another product provided he obtains the written approval of the Architect. Naming of a product in this case shall be interpreted as establishing a standard of quality by which any product of similar design, operation and use will be compatible if submitted by the Contractor for approval.
 - e. If one name only appears in the specifications, the specification is considered closed and no other products may be used, nor will any submittals for equals be considered; except that, if the project used public funds, the phrase "or equal" is implied and the procedure shall be the same as if it were so written.
- [4] No approvals of products as "equal" will be made prior to the bidding; however, additional trade names may be added to a specified list by addendum prior to bidding.
- [5] Consistent with statutory requirements, the Architect's decision in the matter of an equal or a substitute product shall be final and binding on all interested parties. An

adverse decision on any such request made by the Contractor constitutes only the Architect's professional opinion of the products and combination of materials most advantageous for the project, and creates no reflection or discredit on any materials, supplier, or manufacturer.

ARTICLE 8 CHANGE IN THE WORK.

The establishment of the cost or credit for changes in the work [change orders or construction change directives] executed under the General Conditions Article 7 shall be the sum of the following listed items.

Evidence of these charges will be delivered to the Architect when submitting costs or credits for change in the work.

- [1] Invoice cost of materials entering permanently into the work.
- [2] Actual time on the site of properly classified labor to perform the work. Time will be verified by the Contractor's time records and must be approved by the Architect.
- [3] Cost of FICA Insurance and Workmen's Compensation Insurance based on Cost of Labor.
- [4] Invoice cost to the contractor of consumable supplies used on the site in performance of the work.
- [5] Cost of rental of power tools necessary for use in the work. Only such time as necessary for transportation of tools and time to do the operation will be allowed.
- [6] 20% of the sum of items 1, 2, 3, 4, and 5 above shall cover overhead, bond, other insurance, profit, supervision of foremen and job superintendent, and all other general expenses.

On the work to be executed involving a subcontract, then the 20% fee shall be divided by the General Contractor as follows: 12% to the subcontractor and 8% to the general contractor.

ARTICLE 9 DAMAGED WORK.

Any damaged work, regardless of whose responsibility or who damaged the work, shall be immediately removed and replaced, or repaired to its original condition by the contractor whose work it is. The action does not waive any of the contractor's rights or claims set forth in the following Articles of the General Conditions: Article 3, Article 9, Article 10, Article 11.

ARTICLE 10 SAFETY OF OPERATIONS.

The contractor shall familiarize himself with Rules & Regulations Governing the Construction Industry as promulgated by the N. C. Commissioner of Labor under N. C. General Statutes Section 95-11 and The Williams-Steiger Occupational Safety and Health Act of 1970 (including any subsequent additions and/or modifications) administered by the N. C. Department of Labor and shall be responsible for conducting his operation in accordance thereof.

The Contractor shall notify his personnel that they fall under the requirements of Sheriff's General Order 4.1 for work in this building and that appropriate clothing is required. Furthermore, they are subject to searches and seizures when on property controlled by the sheriff's department [in this case, the full building].

The Contractor shall require personnel to provide contact information to the Owner for security and access control purposes and personnel shall wear identification badges and adhere to any and all security access requirements imposed by the Owner.

ARTICLE 11 TIME OF COMPLETION PENALTY.

The contract price will be reduced in an amount equal to a prorated share of \$150 per day beginning 180 days from the receipt of written notice to proceed and continuing for each calendar day thereafter until substantial completion of the project, with credit allowed for accumulated time extensions

No extension of time will be considered for any cause whatsoever except where the delay is primarily attributable to acts of neglect by the Architect or the Owner, or by modification in the work where a resulting time extension explicitly sets forth as part of the consideration of the modification, or by fire damage to the work on the site or by labor dispute which effectively eliminates all sources of the material involved or prevents the delivery or use thereof.

Where separate contractors are involved, contractors may submit in writing to the Architect, with copies to the offending contractor, a statement attributing delay of the project to another contractor. The Architect will consider such allegations in assessing the distribution of penalty, but will not be bound by them.

The Architect will be the judge as to the assessment of the prorata share of the penalty assessed to each prime contractor on the project.

Causes listed for delay in the time justifying an extension, General conditions paragraph 8.3.1, and not repeated herein, will be considered in computing any penalties assessed under the terms of this article.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK.

12.2.2 Guarantee Period.

Guarantee period referred to in Article 12 of the General Conditions shall be a period of one year from substantial completion of the project or from final acceptance of that portion of the work involved, whichever is the later, except that manufacturers' standard warranties and specified special guarantees, warranties shall extend for their full time period if longer.

ARTICLE 13 OCCUPANCY OR "READY FOR USE".

For the work to be considered ready to "occupy or utilize the work or designated portion thereof for the use for which it was intended", the following conditions must be met:

- [1] Certificate of occupancy must be issued by the Building Authority.
- [2] Utility connections must be complete.

Where separate contractors are involved, it may be that such conditions may be dependent upon other contractors upon whom the Contractor has no control. In such cases, the Architect may waive one or more of the conditions provided the delay is likely to become unreasonably long and the Contractor's work is otherwise complete.

In that portions of the work contain a 911 communication center, it will not be considered ready for "use for which it is intended" until it is ready to receive 911 personnel; therefore: the Owner's supplier/contractors and own workforce shall be allowed access to the areas as the work progresses to set up equipment devices and systems required to make the project

ready to receive communications personnel. This activity shall not be considered occupancy under the definitions of the contract, nor shall it affect issuance of certificates of substantial completion when the contractors' work reaches that condition.

The delivery or storage of furniture or other equipment in the building by the Owner will not be considered occupancy; however, the Contractor's insurance will not be expected to cover such material.

ARTICLE 14 REQUEST FOR PAYMENT FORMAT.

The Contractor will be given C. R. Francis / Architecture's Estimate & Request for Payment and Materials in Store forms for use on the project. Contractors may use a computer generated cost breakdown following the aforesaid format. AIA Forms G702 and G703, if submitted, will be returned to the contractor without submittal to the owner for payment. A reduced copy of C. R. Francis / Architecture's forms are included as an appendix to the Supplementary General Conditions.

ARTICLE 15 RETAINAGE.

The Owner will retain five percent (5%) of the progress payments until the project reaches 50% completion, at which point retainage will be reduced to zero percent (0%) [with written consent of surety] unless the Contractor is not performing satisfactorily.

ARTICLE 16 COMPLETION INSPECTIONS.

The Contractor shall prepare for several inspections in closing out the project.

[a] Prefinal Inspection

Near completion of the work, the Architect (or Engineer) will inspect the work, making a list of items for completion and correction.

[b] Final Inspection

After all, or most, of the prefinal corrections and completions have been made, the Architect, with the Owner, will inspect the work, defining any work that is unacceptable, incomplete or requires further correction.

[c] Building Inspections

City Building Inspectors will be inspecting the work as it progresses. The Contractor should arrange for the building inspectors' final inspection and the issuance of a "Certificate of Occupancy". This inspection is a legal inspection, separate and apart from the aforementioned contractual inspections. If demands of the City Inspector exceed or otherwise require work beyond that indicated, specified, or reasonably implied by the contract documents, or beyond that which an experienced contractor working in the area would normally be aware, appropriate change orders will be issued.

[d] County Environmental Health Inspection

County Sanitarians will inspect the work with particular attention to water systems, sewage disposal system, toilets, kitchens, and storage areas. Workmanship, surface finishes, fixtures, and equipment in these areas must meet the standards of the N. C. Health Department as interpreted by these officers. Should the demands of the sanitarian exceed or otherwise require work beyond that indicated, specified or reasonably implied by the contract documents, appropriate change orders will be issued.

ARTICLE 17 DEPARTMENT OF LABOR FIRED & UNFIRED PRESSURE VESSELS INSPECTION.

Mechanical or other contractors installing pressure vessels (boilers, hot water heaters, etc.) shall have such equipment inspected and approved by the North Carolina Department of La-

bor, Division of Boiler Inspections. Post certificates of inspection issued by Boiler Inspector in suitable glass covered frames adjacent to the equipment.

ARTICLE 18 NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES INSPECTION.

Inspectors from the Department of Natural Resources will visit the site from time to time enforcing the soil erosion and sediment control laws and regulations. This is a legal inspection and the Contractor is required to comply.

- a. The Contractor shall indemnify the Owner from damages or civil penalties resulting from the contractor's performance or failure of performance of the work being in violation of the Sediment Pollution Control & Water Runoff Acts.
- b. Upon receipt of notice that a land disturbing activity is in violation of said Act, the Contractor(s) shall be responsible for insuring that all steps or actions necessary to bring the project into compliance with said Act are promptly taken.

ARTICLE 19 PARTICIPATION OF MINORITY & FEMALE BUSINESSES.

a. Statement of Policy.

It is the policy of the Craven County Board of Commissioners to have an appropriate verifiable percentage goal for participation by minority businesses, as the same are defined in G.S. 143-128(c)(2), in the total value of work for each project for which Public Contract or Contracts are awarded pursuant to G.S. 143-128; and to award Public Contracts without regard to race, religion, color, creed, national origin, sex, age or handicapping condition.

b. Statement of Objectives.

1. For purposes of ensuring participation by minority and female businesses in the awarding of public contracts by the Craven County Board of Commissioners, the Board has adopted 10% as an appropriate verifiable percentage goal for participation by minority and female businesses in the total value of work for which a contract or contracts are awarded in either a separate-prime contract system or a single-prime contract system, pursuant to G.S. 143-128.
2. The Contractors shall, through procedures and solicitation, ensure a good faith effort in the recruitment and selection of minority and female businesses for participation in contracts in accordance with requirements of G.S. 143-128.

c. Procedures.

1. Contractors are required to negotiate in good faith with interested minority and female businesses, rejecting them only for sound reasons after a thorough investigation of their offers and capabilities.
2. The low bidder for a single prime contract shall be required to provide the following information prior to the award of a contract:
 - [a] The names and addresses of minority and female businesses which will participate in the Contract; and a description of the work which each will perform and the dollar amount of participation by each.
 - [b] The names and addresses of each minority and female business contacted.

[c] The name and address of each minority and female business responding to the Prime Contractor or otherwise demonstrating an interest in performance of any part of the work and the reasons each such minority or female business was rejected or otherwise failed to be awarded any work.

[d] A copy of all advertisements or correspondence the bidder has used to attract minority and female businesses.

d. Lowest Responsible Bidder.

Nothing in this policy shall be construed to require contractors or the Owner to award contracts or subcontracts to or to make purchases of materials or equipment from minority or female business contractors or minority or female business subcontractors who do not submit the lowest responsible bid or bids.

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DIVISION 01 GENERAL REQUIREMENTS

Includes work by the All Prime Contractors covered in the following sections.
Section designations are neither consecutive nor numerically inclusive.

01 10 00	SUMMARY OF WORK
01 20 00	PRICE AND PAYMENT PROCEDURES
01 30 00	ADMINISTRATIVE REQUIREMENTS
01 40 00	QUALITY REQUIREMENTS
01 50 00	TEMPORARY FACILITIES
01 70 00	EXECUTION AND CLOSEOUT REQUIREMENTS

01 10 00 SUMMARY OF THE WORK

01 11 00.00 PROJECT SUMMARY.01 11 13.00 PROJECT.01 11 13.10 PROJECT DESCRIPTION.

A project consisting of the construction of a new animal shelter annex building of 4444 square feet and the renovation of portions of the existing facility. The new facility will use pre-engineered metal building components for the structural framing, portions of the exterior walls and the roof. The project will be bid with three bid items:

Bid Item 1: Renovation of the north portion of the existing facility and construction of the new annex building.

Bid Item 2: Renovation of the south portion of the existing facility.

Bid Item 3: Installation of a new heating and air conditioning zone in the area of the existing kennel.

01 11 13.20 PROJECT MANUAL.

a. Documents.

The project manual includes the following documents pertinent to the bidding and construction of the project:

1. Instructions to Bidders
2. General Conditions
3. Supplementary General Conditions
4. General Requirements
5. Construction Specifications
6. Addenda
7. Change Orders

b. Format.

This manual has been developed in accordance with the general format of the CSI MasterFormat 2004 Edition modified by the Architect for this project. Standardized numbers for broad scope and narrow scope sections have been used subject to certain modifications to accommodate the characteristics of the work. Narrow scope sections have been subordinated to general requirements of broad scope sections under which they occur.

c. Addenda.

Addenda and change orders, which may from time to time be used, will be keyed to the section or sections in which the work covered is modified. The Contractor will be furnished extra copies of convenient size to attach to the back of the page opposite the modified specification. Each contractor shall keep his job copy and office copy Project Manual up to date in this respect.

d. Specification Color-Code.

To facilitate the division of the work into separate contracts, colored paper has been used.

[1]	All Contractors	Gold
[2]	General Construction Contractor	White
[3]	Plumbing Sub-Contractor	Green
[4]	Heating, Ventilating & Air Conditioning Sub-Contractor	Pink
[5]	Electrical Sub-Contractor	Blue

01 12 00.00 CONTRACT SUMMARY.

This project will be bid as follows:

Subsection 01 12 16 Single Prime Contractor

01 12 16.00 SINGLE PRIME CONTRACT.

[1] General contractors shall submit bid including General Construction Division 1 through Division 14, Plumbing Division 22, Heating, Ventilating and Air Conditioning Division 23, and Electrical Divisions 26.

01 13 00.00 PERSONNEL & DOCUMENT INTERFACE.**01 13 13.00 ENGINEERS STATUS.**

The Architect's Consulting Engineers for the various parts of the work shall have the same status with the Contractor as the Architect in so far as the work designed by the Engineer is concerned, except that the Architect will retain authority and responsibility for all interpretations and decisions involving the General Conditions and Supplementary General Conditions, although the Engineer's opinion will be included in any documented decision.

01 13 16.00 CONTRACT DRAWINGS.

The complete set of drawings will be made a contract document for each prime contractor. For clarity and convenience the sheets have been titled by major work divisions; however, each contractor shall include all the work covered in the specified scope of his contract, regardless of the designated title of the sheet on which the work appears. Therefore, each prime contractor shall review all sheets of drawings to familiarize himself with the conditions and requirements of his contract.

01 14 00.00 WORK RESTRICTIONS.**01 14 13.00 ACCESS TO THE SITE.**

The Contractor shall have access to the site at all times during the process of construction. If the Owner is also occupying or using portions of the site, the Contractor shall follow the procedure listed below for coordination of activities.

01 14 16.00 SITE COORDINATION WITH OWNERS/OCCUPANTS.

On a site with existing occupied structures, the Owner, businesses and employees traffic take precedence. The Contractor shall coordinate his traffic with Owners representative.

01 18 00.00 PROJECT UTILITY SERVICES.

The following utilities provide service to the site. In the event that notification or coordination is required, the following contacts are hereby provided:

Electrical:	City of New Bern
Telephone:	CenturyLink
Water/Sewer:	Craven County / City of New Bern
Gas:	Piedmont Natural Gas

01 20 00 ADMINISTRATIVE REQUIREMENTS**01 21 00.00 PROJECT MANAGEMENT AND COORDINATION.****01 21 13.00 PROJECT COORDINATION.****01 21 13.10 CONSULTANTS.**

Consultants for this project are as follows: For those portions of the work designed by the indicated Consultant, the Contractor shall direct Submittals, Requests for Interpretation or Clarification, etc. directly to the Consultant with a copy to the Architect.

Structural Engineer:	Elizabeth Conzelman, PE: Conzelman Engineering, P.A.
Mechanical Engineer:	Elizabeth Conzelman, PE: Conzelman Engineering, P.A.
Electrical Engineer:	Elizabeth Conzelman, PE: Conzelman Engineering, P.A.

01 21 19.00 PROJECT MEETINGS.**01 21 19.10 PROGRESS CONFERENCES.****a. Preconstruction Conference:**

A preconstruction conference shall be scheduled by the Architect. All prime contractors shall have a responsible company executive, the project manager and the project superintendent present. Principal subcontractors shall have a representative present if notified to do so. The agenda for the meeting in general will be limited to the following:

1. Review of Division 01 requirements
2. Payment Procedures
3. Site Access/Barricades
4. Emergency notification requirements

b. Monthly Progress Meetings:

Construction conferences will be held each month with representatives of each prime contractor, each prime contractor's job superintendent, the architect's representative, the various engineers' representatives, and the owner's representative, with additional personnel as the architect or the contractor may request. The agenda for the meeting will be limited to the following:

1. Review and updating the schedule and review of any scheduling problems.
2. Issues concerning the relationship among the various Contractors.
3. Change Order requests

c. Preinstallation Meetings:

A conference, including the general contractor's representative, the subcontractors' representatives, the subcontractor's job superintendents, and the architect's representative shall be held prior to the commencing of any portion of the following subcontract work:

01 22 00.00 CONSTRUCTION PROGRESS DOCUMENTATION.**01 22 19.00 CONSTRUCTION PROGRESS SCHEDULE.**

The General Contractor shall prepare and set up in the field office a work progress schedule chart showing the various trades and times they will be on the job, set in relation to the total anticipated time required for the completion of the project. He will obtain the pertinent information from other contractors prior to the commencement of work in the field and enter this information on the chart. The chart will be notated and brought up to date weekly, and, on the basis of this schedule, the General

Contractor will notify the various trades, subcontractors and other contractors when they are needed on the job.

01 23 00.00 SUBMITTAL PROCEDURES.

01 23 23.00 SAMPLES AND SHOP DRAWINGS.

01 23 23.10 SUBMITTALS.

a. Required Shop Drawings.

Required shop drawings, brochures and product information shall be submitted in quantities to provide sufficient copies for the job office, the Architect's office and the Engineer's office (if applicable) plus those required by the contractor, his subcontractors and suppliers.

b. Required Samples.

Required samples shall be submitted in quantities to provide filing of approved sample at the job office, the Architect's office and the Engineer's office (if applicable). Approved samples, where their nature is such to be incorporated in the work, may be picked up by the Contractor, used in the construction after they have served their purpose of comparison to similar materials delivered to the site. Samples remain the property of the Contractor.

01 23 23.20 SUBMITTALS.

a. Equal and Substitute Submittals.

Submittals for equal or substitute products must be made to the Architect or Engineer 14 days prior to the date of bid or the Architect/Engineer may use this delay as sufficient reason to reject the submittal without further consideration.

01 23 23.30 ENGINEERS APPROVALS.

a. Approvals Required.

Where approvals are required for Engineer designed work, they shall be by the Engineer for technical considerations and the Architect for appearance and compatibility with the Architect designed work.

b. Transmittals.

All submittals, shop drawings, written requests and correspondence originating from the Contractor to the Engineer shall be routed direct to the Engineer with a copy of the transmittal letter simultaneously routed to the Architect.

01 30 00 QUALITY REQUIREMENTS**01 31 00.00 REGULATORY REQUIREMENTS.****01 31 13.00 CODES.**

Codes referred to in the specifications are applicable to the project and set forth as a minimum standard for any work to which they apply. Interpretation of the codes and regulations shall be by the agency or office responsible for their enforcement.

- [1] North Carolina Building Code. Volumes I, IA, IC, II, III, IV, V, VI
- [2] North Carolina Health Department Sanitary Regulations.
- [3] North Carolina Boiler Inspection Code.
- [4] National Fire Protection Association.
- [5] All local County and City Plumbing, Electrical, Zoning, and Building Regulations.
- [6] North Carolina Department of Labor. OSHA Stds

01 32 00.00 REFERENCES.**01 32 19.00 REFERENCE STANDARDS.**

Reference to known standard specifications shall mean the current edition of those standards in publication at the date of the bidding. Only those requirements of the standard specifications as are applicable to the specified product in its intended use in this project shall apply, and conformity with a standard specification does not relieve the product of performing properly in the context of other conditions set forth in the contract documents.

01 33 00.00 QUALITY ASSURANCE.**01 33 16.00 SUPPLIER QUALIFICATIONS.****01 33 16.10 Approved List of Subcontractors & Suppliers**

Lists of subcontractors and suppliers as required by General Conditions Article 5.2.1 shall be submitted no later than 30 days after the date of the contract if the contractor is to be considered as acting "promptly" and "responsibly" in this matter, and no payment for "job set-up" included in the contractor's Estimate & Request for Payment will be approved until a complete list has been submitted.

01 33 16.20 Rejection of Subcontractors or Suppliers.

If as allowed under General Conditions paragraph 5.2.3, either the Owner or the Architect object to the use of a supplier or subcontractor for cause, the Contractor shall replace the supplier or subcontractor with an acceptable entity and the contract price, if required, will be adjusted by Change Order.

01 35 00.00 QUALITY CONTROL.**01 35 29.00 TESTING.**

Tests will be made in accordance with applicable ASTM standards by an independent laboratory acceptable to the Architect.

01 40 00 TEMPORARY FACILITIES**01 41 00.00 TEMPORARY CONSTRUCTION UTILITIES.****01 41 13.00 CONSTRUCTION UTILITY SERVICE.**

- [1] The Contractor shall supply and pay for all electricity, water, fuel, gas, telephone, utility deposits, or other expense for utilities services which are required or used in the construction, completion and testing of the work under his contract. The General Contractor shall be responsible for obtaining and paying for the required utility service and may prorate the costs of these services to the various contractors and subcontractors.

01 41 23.00 CONSTRUCTION HEATING AND AIR CONDITIONING.

- [1] The General Contractor, at his own expense, shall provide heat for the new work during the course of construction by the use of temporary equipment and/or through arrangement with the mechanical trades [sub]contractor for use of the building's heating and air conditioning system. Once heat or cooling has been applied in an enclosed area, the temperature shall not be allowed to drop below 50 degrees F or rise above 80 degrees F.
- [2] Following the installation of equipment sensitive to humidity such as dimmer panels, audio controls, and certain finishes etc., the Contractor shall maintain relative humidity in the range of 50% to 60% by either air conditioning or dehumidification.
- [3] The appropriate mechanical trades subcontractor shall, upon request from the General Contractor and approval from the Architect/Engineer, set the building's mechanical system into operation for temporary heat and /or cooling. The mechanical subcontractor shall monitor the use of the system with respect to dust infiltration and shall provide appropriate filtering to keep the system clean.

01 41 26.00 CONSTRUCTION ILLUMINATION.

- [1] The General Contractor, at his own expense, shall provide illumination for the building during the course of construction by the use of temporary equipment and/or through arrangement with the electrical trades subcontractor for use of the building's lighting system following the activation of the building's electrical system.
- [2] The appropriate electrical trades subcontractor shall, upon request from the General Contractor and approval from the Architect/Engineer and the local building inspector, set the building's electrical system into operation for the temporary usage of the building's lighting system. Upon completion of the temporary usage of the lighting system, the system shall be re-bulbed with new bulbs as required in Division 26 of these specifications and the General Contractor shall purchase and deliver to the owner new ballasts equal to 3% of the total ballasts for each fixture type on the project.

01 41 36.00 CONSTRUCTION WATER SUPPLY.

The Contractor may use the Owners existing water supply during the course of the Work.

01 42 00.00 CONSTRUCTION FACILITIES.**01 42 13.00 FIELD OFFICE.**

The General Contractor shall maintain a job office on the site and provide therein, in addition to his requirements a filing space for the shop drawings for each separate contractor, as well as his own. The job office shall be provided with light, heat, air conditioning, and telephone service.

01 42 16.00 TEMPORARY STORAGE.

All materials stored on the site shall be stored and handled to prevent deterioration, deformation, or intrusion of foreign matter [water, dirt, sand, microbes, mold, etc.]. Materials stored in shed will be

neatly stored on shelves, or in such a way as to enable a complete, thorough and orderly check by the Architect or his representative. No payment for materials stored on the site not meeting the aforementioned requirements will be made.

01 42 19.00 SANITARY FACILITIES.

The General Contractor shall provide temporary toilet facilities for all workmen on the project. The facilities shall meet the requirements of the North Carolina Department of Labor and the North Carolina Department of Health, Sanitation Division.

01 45 00.00 VEHICULAR ACCESS AND PARKING.

The Contractor shall, in so far as practical, confine his traffic to and from the site to those areas designated as drives and parking. The Contractor at his own option may install a temporary gravel drive for the duration of the Work. If the Contractor installs such a drive, he will

1. install the drive in a location acceptable to the Owner's Director of Maintenance and the Architect and
2. at the end of the project remove the drive, install grass and leave the site in its original condition.

Special care shall be taken to avoid job traffic causing soil erosion or silting of ditches and streams, or otherwise affecting sediment control.

01 46 00.00 TEMPORARY BARRIERS AND ENCLOSURES.

The General Contractor shall provide temporary barricades around construction activities during the course of the work. The extent of the area enclosed by such barricades shall be determined by the Contractor and the Building Inspector in agreement of the Owner; but, in any case, shall enclose all construction equipment and material storage. Barricades shall consist of gates, wire fencing or similar materials of sufficient strength and nature to prevent casual encroachment of the construction area by unauthorized persons.

01 48 00.00 PROJECT IDENTIFICATION.

01 48 13.00 JOB SIGN.

The job sign shall be furnished by the General Contractor.

a. Sign.

Furnish a sign for the project painted by a competent sign painter on a plywood sheet 8'-0" x 4'-0" x 1/2". Sign shall be composed vertically and shall contain the following information in suitably sized lettering in order of importance. The Architect will furnish a diagram of the sign indicating the design for the following information.

- [a] Name of Project
- [b] Name of Owner
- [c] Name of General Contractor
- [d] Name of Each Separate Contractor
- [e] Names of Principal Subcontractors (optional)

Colors shall be light gray and red. Locate sign where directed on 4" x 4" wood posts.

b. Other Signs.

No other signs shall be allowed on the site.

01 50 00 EXECUTION AND CLOSEOUT REQUIREMENTS**01 51 00.00 EXAMINATION & PREPARATION.****01 51 13.00 ACCEPTANCE OF CONDITIONS.**

The act of submitting a bid on the Work states that the Contractor has visited the site and reviewed the contract documents with respect to the site conditions and accepts the site in its present condition as related to the proposed Work.

01 54 00.00 CLEAN UP OF SITE.**01 54 13.00 PROGRESS CLEANING.**

Trash and debris shall be collected in a convenient location designated by the General Contractor and disposed of regularly in periods not to exceed 30 days. Disposal shall be in accordance with the law and at disposal points designated by the County and/or Municipal authorities. Each contractor shall be responsible for his and his subcontractors' debris, either by handling it himself or sharing the cost of handling with the other contractors.

a. Weekly Clean Up

Each Contractor shall clean the site weekly of construction debris and any and all strapping wires, bands, and other devices used to bundle construction materials provided under their contract..

01 54 23.00 FINAL CLEANING.

Upon completion of the project, the General Contractor shall leave the premises raked clean. The interior of the building shall be left clean and free of all construction dirt and smudges. Mechanical room's surfaces shall be vacuumed to remove dust and dirt, which might affect the mechanical system. Floors shall be polished, windows washed, fixtures cleaned and readied for assumption of normal janitorial maintenance by the Owner. All temporary labels and trademarks shall be removed. Each Contractor shall be responsible for cleaning of the work installed under his contract

01 58 00.00 CLOSEOUT SUBMITTALS.**01 58 13.00 COMPLETION AND CORRECTION LIST.**

See Supplementary General Conditions Article 15 Completion Inspections.

01 58 23.00 INSTRUCTION & MAINTENANCE MANUAL.

Each Contractor shall assemble and deliver to the Architect [or Engineer] four- [4] complete sets of parts lists, operating instructions, and manufacturers' data on all items of equipment furnished and installed under his contract. [Requirements for other contractors are reiterated in their respective sections and divisions.] These manuals will be delivered to the Owner two weeks prior to the final inspection. The manuals shall be three-ring "D" type heavy-back notebooks with the name of the project and the words "Operations and Maintenance Manuals" on the cover and Spine. Each page shall be marked as to the Division, Section and Paragraph in which the product it refers to was specified. The manuals shall contain the following items as a minimum:

- a. Index and page numbers
- b. Certificate of Substantial Completion
- c. Warranties, Guarantees, & Bonds.
- d. Release of Liens
- e. List of all Sub-contractors and suppliers with names, addresses and phone numbers.

- f. Hardware Certification.
- g. Complete operation, maintenance and cleaning procedures for each item including for operating equipment, sequence of events, locations of switches, emergency procedures and any other critical items. Include all parts lists provided with equipment.
- h. Lubrication schedules and types of lubricants

These items, in general, shall include descriptive materials for each item furnished and installed and all submittal data.

01 58 36.00 WARRANTIES, GUARANTEES & BONDS.

All warranties and guarantees required by the specifications shall be delivered in the afore specified Operations and Maintenance Manual. Final Payment will be processed only upon receipt of these documents.

01 59 00.00 DEMONSTRATION & TRAINING.

The Contractor shall schedule with the Owner a meeting to instruct the Owner in the operation of the equipment installed under his respective Contract. Indicate to the Owner the scope of work, location of concealed lines, piping, and motorized equipment and provide directions for the operation and maintenance of the various items installed. This instructional period shall be done at the Owner's convenience and direction at the conclusion of the project. Instructions shall be given, as if the Owner were not remotely familiar with the project and sufficient time shall be spent to acquaint him with the entire scope of work.

01 60 00 PRICE AND PAYMENT PROCEDURES**01 61 00.00 ALLOWANCES.****01 61 13.00 CASH ALLOWANCES.****01 61 13.10 GENERAL.**

- a. Prime contractors shall include the following cash allowances in their contract cost for items covered in their respective portions of the work.
- b. Cash allowance shall cover and include net cost of item delivered at the job site or at the point of fabrication if it is to be incorporated into the item especially fabricated for the job.
- c. Charges in excess of cash allowance will be paid by the Owner. Unspent balances will be credited to the Owner.

01 61 13.20 CASH ALLOWANCES.

NONE

01 62 00.00 UNIT PRICES.**01 62 13.00 UNIT PRICE BIDS.**

Unit prices where required shall be listed on the bid form and will be incorporated in the contract. In the event that work is required on items covered by unit prices, the Contractor shall notify the Architect and Owner that such work is required and he shall submit the requisite quantities so that a change order may be executed.

01 63 00.00 ALTERNATES.**01 63 13.00 ALTERNATE BIDS.****01 63 13.10 GENERAL.**

- a. The following listed alternates for changes from the work as prescribed in these plans and specifications shall be included in the contractor's bid.
- b. All alternates shall be applied individually to the base bid.
- c. If a contractor desires not to bid an item listed as an alternate, he shall enter on his bid form "NO BID" opposite the alternate item in question. Where such a statement is entered on a bid, that bid will not be considered if award is being made on the basis of the alternate not bid.
- d. Should available funds of the Owner require omission of part of the work or permit additions to the work by the adoption of certain alternates, the Owner, in order to proceed with award of contract, reserves the right to reinstate omitted work covered by any alternates adopted at the time the contract is signed at the same price the contractor deducted or added for such alternate to his original base bid provided such reinstatement is made within sixty days after the date of the contract, and no work has been done which is covered by the alternate.

01 63 13.20 ALTERNATES.

NONE

01 65 00.00 SUBSTITUTION PROCEDURES.**01 65 13.00** PRODUCT SUBSTITUTION PROCEDURES.

See Supplementary General Conditions Article 6 Equals and Substitutes

01 66 00.00 CONTRACT MODIFICATION PROCEDURES.**01 66 13.00** REQUESTS FOR INTERPRETATION OR CLARIFICATION.

During the process of bidding or negotiation of a contract, certain items may require the Contractor to request further information than the Contractor determines from studying the Contract Documents. At such time, the Contractor only may submit formal requests to the Architect for further information with the following stipulations:

- [1] Requests shall be in writing only and directed to the Architect or his consultant for that portion of the work. When a request is submitted during the bidding process, the request must be received by the Architect or his consultant for that portion of the work a minimum of 5 working days prior to receipt of bids.
- [2] Requests from Subcontractors shall be routed through a Contractor registered as bidding on the project.
- [3] Requests not following this procedure will be discarded.
- [4] Following the establishment of a contract, it is assumed that the Contractor and his Subcontractors and Suppliers understand the intent of the contract documents and any further interpretations or clarifications will take place during the submittal review process.

01 66 39.00 FIELD DIRECTIVE.

During the process of construction, the Architect or his representative may, due to certain conditions observed in the field, require the Contractor to take minor actions consistent with the Contract Documents. Such a requirement or "Field Directive" shall be stated in writing and become a part of the contract documents. Such a directive shall follow the requirements outlined in Article 7 Changes in the Work paragraph 7.4 .

01 66 43.00 ADDENDA.

Following the receipt of a Request for Interpretation or Clarification, the Architect will issue an Addendum that with issuance becomes a part of these Contract Documents.

01 66 63.00 CHANGE ORDERS.

See General Conditions Article 7 Changes in the Work and Supplementary General Conditions Article 7 Changes in the Work for required procedures. Architect will receive Contractor' data as required in the aforementioned documents and prepare documents for signature on the Architect's standard form.

01 69 00.00 PAYMENT PROCEDURES.**01 69 73.00** SCHEDULE OF VALUES.

As required under General Conditions paragraph 9.2.1, the Contractor shall prepare on the Architect's Estimate and Request for Payment form, a schedule of values based upon the project manual's table of contents , listing the items, quantities, and values of each. This schedule shall be submitted, reviewed, and approved prior to submission of the first Estimate and Request for Payment.

01 69 00.00 PROGRESS PAYMENTS.

The following procedure will be used for payments on this project:

1. Contractor will close his books for the month on or about the 25th and fill in the Architect's Estimate and Request for Payment form. This form will be submitted to the Architect.
2. Upon receipt of the Estimate and Request for Payment form, the Architect will review the form for

compliance with the work present in the field at the time of submission and for those items in storage, if any.

3. The Architect will submit the form to the Owner for payment. Payment will be made on or about the 10th of the month following submittal.

01 69 00.00 TESTING PAYMENTS.

Where engineering or other laboratory tests are required in the specification, they shall be paid for by the Contractor unless noted otherwise.

DIVISION 2 SITE WORK

Includes work by the General Contractor covered in the following sections.
Section designations are neither consecutive nor numerically inclusive.

02 10 00	SITE CLEARING, DEMOLITION, REMEDIATION
02 20 00	EARTHWORK
02 70 00	Storm Water and Erosion Control Systems
02 90 00	EARTHWORK TREATMENT

02 10 00 SITE CLEARING, DEMOLITION, & REMEDIATION**00 00 00.10 GENERAL.****02 10 00.11 WORK INCLUDED.**

Furnish all labor, material, and equipment required for the site clearing, demolition, and remediation indicated, specified, or both including all incidental items normally required for conditions encountered. Subsections forming this specification include the following:

Subsection	02 11 00	Site Clearing
Subsection	02 12 00	Demolition

02 11 00.00 SITE CLEARING**02 11 13.00 SITE CLEARING****02 11 13.10 GENERAL.****02 11 13.11 Actions.**

- a. Remove all trees [unless indicated to remain], stumps, shrubbery, and undergrowth within 10' of the perimeter of all new structures, new parking lots, new sidewalks, new roads, new streets, new drives, and any other new open area indicated on the site plan.
- b. Remove all underbrush and growth except for trees in areas where grading to new contours is indicated.
- c. Install indicated tree protection fencing.

02 11 13.12 Subcontractor.

Clearing of the site shall accomplished under a subcontract to a subcontractor regularly involved in the in the type of work indicated.

02 11 13.20 METHODS OF OPERATIONS.

- a. **Clearing:** Clearing shall be carefully and selectively done in a manner such as to prevent damage to remaining trees and shrubs. Heavy equipment shall not be used except within the perimeter of the specified areas. All other clearing shall be done by hand or farm type tractors. Remove all roots, stumps, and undergrowth.
- b. **On Site Burning:** All debris shall be removed from the site. No on site burning will be allowed.
- c. **Tree Protection Fencing.**
 1. Tree protection fencing shall be installed before the clearing operations commence, and shall remain in place until all construction in the vicinity of the trees is completed.
 2. Tree protection measures shall be located so that they maintain a 6 foot radius around existing plants or provide a 1 foot radius for each 1 inch diameter of trees [measured at a point 4 ½ above the surrounding grade], which ever is greater.
 3. Tree protection area shall remain free of material storage, fill, and equipment and shall be so posted.

02 12 00.00 DEMOLITION

02 12 00.10 GENERAL.02 12 00.11 Types.

The following Demolition types are required under this specification:

02 12 19 Selective Structure Demolition

02 12 19.00 SELECTIVE STRUCTURE DEMOLITION

02 12 19.10 GENERAL.02 12 19.11 Location.

All work is confined to the property . Any action indicated on the plan includes any all work required for that action to take place in it's entirety. The work in general consists of the following actions:

[1] Architectural, Structural, Plumbing, Mechanical, and Electrical:

a. Any and all activities so stated on the demolition schedule on the drawings.

02 12 19.20 EXECUTION02 12 19.21 Demolition.

1. The Contractor shall fully remove indicated work above and below grade. All demolished items become the property of the Contractor and shall be removed from the site for proper disposal or storage.
 2. The Contractor shall exercise care in the removal of portions of the indicated work so as to not damage adjacent existing items, structures, or building amenities. The Contractor shall take particular care in the removal of structural elements to properly shore and support the existing structure above.
 3. The Contractor shall saw cut to indicated lines and carefully remove indicated work so as to not damage the remaining paving.
-

02 20 00 EARTHWORK**00 00 00.10 GENERAL.****02 20 00.11 WORK INCLUDED.**

Furnish all labor, material, and equipment required for the earthwork indicated, specified, or both including all incidental items normally required for installation and conditions encountered. The following actions are specifically mandated.

- a. Review the site prior to submitting any bid and accept the site in its present condition.
- b. Furnish all labor, equipment and materials necessary to complete excavating, filling, backfilling and grading indicated, specified or both.
- c. Remove excess excavated materials to designated locations and pile or spread on site where indicated or directed.
- d. Provide temporary culverts required to perform operations and maintain flow.

02 20 00.12 WORK NOT INCLUDED.

Excavation and backfilling required by mechanical trades Section 15 Plumbing, Section 16 Heating, Ventilating and Air Conditions, and Section 17 Electrical.

02 20 00.13 SITE ENGINEER.

The Architect's consulting engineer will review, check and verify the contractor's field operations. It will remain the contractor's responsibility to set lines, elevations, grade stakes, etc. as required to perform the work.

02 20 00.14 SOILS ENGINEERING.

- a. Beginning at the time when the open excavation is brought to indicate elevations, the site engineer, assisted by a soil engineering service, shall monitor earthwork operations. The contractor shall schedule and proceed with the work once this stage is reached in a continuous and orderly manner to minimize down time so that testing can be performed without interruption.

02 20 00.16 TESTING.

Testing by soils engineering service required in these specifications or ordered by the site engineer will be paid for by the Owner and are not included in this contract.

02 20 00.17 LIMIT OF CONTRACT.

For the purpose of work in this section, the Limit of the Contract shall be the areas indicated on the site development plans and appurtenant off-site work.

02 20 00.18 BENCH MARK.

A mark set at an identifiable point indicated on the site plan will establish a benchmark from which all grades and starting points for vertical dimensions will be established. Lines parallel to and perpendicular to the existing structure will form the base lines of the horizontal dimensions.

02 22 00.00 EXCAVATION AND FILL**02 22 00.10 GENERAL.****02 22 00.11 TYPES.**

The following earthwork operations types are required under this specification:

02 22 13 Subgrade Preparation

02 22 16	Dewatering
02 22 19	Excavation
02 22 23	Fill

02 22 16.00 DEWATERING**02 22 16.10 GENERAL.****02 22 16.11 Location.**

In those locations indicated in the geotechnical report or where excavations approach the water table.

02 22 16.20 METHODS.**02 22 16.21 Execution.**

- a. Water shall be removed from excavated area by means of temporary ditches draining into catch basins or existing ditches on or adjacent the site. Shallow ditching may be required within the excavated area. Ditching shall be as extensive as necessary to effectively remove and prevent water from collecting on the undercut surface.
- b. Where excavations approach the water table, well pointing or other dewatering efforts may be required to maintain water free excavations dependent upon the season and local rain conditions. When the General Contractor determines that well pointing is necessary, he shall direct all removed water into catch basins or ditches as required under paragraph 16.21 a.

02 22 19.00 EXCAVATION**02 22 19.10 GENERAL.****02 22 19.11 Location.**

Excavations shall occur where indicated, scheduled, specified, or otherwise be required in order to properly develop the site as required under these contract documents.

02 22 19.20 EXECUTION**02 22 19.21 Excavation.**

- a. Excavate the entire building, parking, and roadway areas within the area indicated on the site development drawings to a net depth of 6", following the natural contour of the existing ground. Excavations may be phased so as to minimize open and cut areas.
- b. Excavate trenches for retaining walls. Shore cut earth walls with sheet pile or other engineered method of earth stabilization at trenching excavation.
- c. Following the initial excavation, excavate in 6" to 8" layers to indicated depths. Stockpile cut earth meeting fill specifications for reinstallation.
- d. Following general excavation and filling operations used to establish the building pad, excavate for footings to depth and width shown.
- e. The Contractor's attention is directed to Article 10 of the Supplementary General Conditions concerning O.S.H.A. requirements governing the specified operations.

02 22 19.22 Preparation of Undercut Surfaces.

- a. After undercut is exposed at a time of dry weather, the area shall be proof rolled to consolidate surfaces. Proof rolling shall consist of not less than 4 passes with a 15-ton pneumatic-tired roller (moderately loaded dump truck), 2 times in each direction.
- b. Operation shall be in presence of site engineer who will order compaction tests; minor backhoe cuts

and related procedures as he may determine necessary to establish whether the undercut surface is acceptable to receive backfilling.

- c. The Contractor shall furnish all required proof rolling and test cutting. If it is determined that further undercutting is required, the contract shall be adjusted for any additional yardage removed from the excavation and for the cost of any proof rolling of the new undercut surfaces.

02 22 19.23 Obstructions.

- a. If in the course of excavation concealed obstructions, natural or otherwise, not shown or indicated, are encountered which, in the opinion of the Architect, require removal, the contract price will be adjusted according to terms set forth in the general conditions.
- b. It is assumed that all material to be excavated is earth and shall include all materials not classified as rock excavation and shall include clay, silt, sand, muck, gravel, shales, hardpan, loose stone in masses, and boulders measuring less than 1/2 cu. yd. in volume, none of which, if encountered, shall be cause for a price adjustment.

02 22 19.23 Variations.

If, through error, excavations are made deeper than shown, additional backfilling will be provided at 98% compaction and certified by soil testing. This will be done at no additional cost and include any additional testing

02 22 23.00 **FILL OPERATIONS**

02 22 23.10 GENERAL.

02 22 23.11 Location.

The site shall be filled or back filled as indicated.

- a. The building area shall be back filled with specification fill followed by a top layer of sand and fully compacted.
- b. The paving area shall be back filled with specification fill and fully compacted.
- c. Other areas shall be filled with common fill with no compaction required.

02 22 23.12 Equipment.

Compaction equipment shall be 15-ton pneumatic-tired roller or such other equipment, as the site engineer shall approve.

02 22 23.20 MATERIALS.

Fill materials shall conform to the following standards. Certificates of tests performed by a commercial testing laboratory must be furnished for approval before any material is delivered to the site.

- | | |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] Specification fill: | Locally available or on-site excavated sand and clay fill material, clean and free of rocks or organic materials, meeting the requirements listed below.
ASTM D-424-59 plastic index less than 30, liquids limit less than 55.
ASTM D-698-66T dry density more than 95 lbs. per cubic foot, containing not more than 15% fines. |
| [2] Sand fill: | Locally secured sand no more than slightly clayey, free from organic material, silt and debris. Soil engineering classification SM or SC. |

[3] Common fill: Any earth removed from excavation and separated at the direction of the site engineer into "topsoil" and "subsoil" and not approved as specification fill.

02 22 23.30 EXECUTION

02 22 23.31 Building Area.

Across entire excavated building area, spread specification grade fill in an initial layer of 10" and in subsequent layers of not more than 6". Top layer shall be compacted sand fill. Compact each layer individually to 98% density obtained at optimum moisture content in accordance with ASTM D-698-71T, Standard Proctor Method.

02 22 23.32 Areas of Pavement.

Bring paving area to required elevation in 10" layers. Compact each layer individually to 95% density obtained at optimum moisture content in accordance with ASTM D-698-71T, Standard Proctor Method.

02 22 23.33 Other Areas.

In sequence listed on drawings, fill areas to within 4 " of the elevations and contours indicated, using common fill obtained through on-site operations. Spread fill uniformly to a level slightly above elevation required allowing for settlement and shrinkage.

02 22 23.34 Topsoil.

Spread 4" layer of topsoil [originally secured from site excavations or new as required] over filled and / or excavated areas to form finished grades and elevations. Save best available topsoil in surplus earth piles to be used around building after construction. Do not cover any portion of paving or building area backfill. Use best available topsoil to fill planting areas. No additional topsoil will be required to be furnished.

02 22 23.35 Excess Material.

All excess earth recovered from excavations shall be placed at locations on the site as directed or removed from the site

02 22 23.43 Testing.

02 22 23.44 Test Reports.

- a. The site engineer will direct the soil technicians to perform daily compaction test reports while compaction work is in progress. These tests will be paid for by the Owner.
- b. If any test fails to meet the specified requirements, the areas from the point of the test to the next adjacent satisfactory tests will be reworked and retested until results indicate that the specification has been met.

02 22 23.45 Number of Tests.

- | | | |
|----|------------------|--------------------------------------------------------------------------------------------------------|
| 1. | Building area: | As directed for cut or filled surface:
1 test for each 2000 sq. ft. of area and at each fill layer. |
| 2. | Trenches | 1 test for each 100 linear. ft. of trench. |
| 3. | Pavement area: | 1 test each 1000 sq. ft. cut surface

1 test each 1000-sq. ft. fill area at each fill layer. |
| 4. | Corrective work: | As many tests as are required by the Engineer to prove compliance of corrective work. |

02 22 23.46 Payment for Corrective-Work Test.

Testing of corrective work will be charged to the Contractor.

02 23 00.00 GRADING

02 23 13.00 ROUGH AND FINISH GRADING

02 23 13.10 GENERAL.

02 23 13.11 Location.

All areas of the site within the Limits of the Project not covered by building, pavements or other site appurtenance shall be graded .

02 23 13.17 Subcontractor.

Grading shall be performed under a subcontract to a single subcontractor regularly involved in the field.

02 23 13.40 EXECUTION

02 23 13.41 Rough Grading.

All cleared and grubbed areas without additional fill, as well as filled areas, shall be rough graded in accordance with indicated contours and elevations that will provide uniform slopes between given elevations, curves gently rounded, and surface water naturally flowing into surrounding ditches and swales. Surfaces shall be true to indicated shapes.

a. Insufficient Fill.

Should excavated earth (common fill) obtained on the site not be sufficient to accomplish filling to all the elevations required, the contractor shall follow the priorities given in the scheduled disposition of excavated material. In the event that adequate amounts of common fill excavated from the site are not available, the contractor shall procure off-site material

b. Excess Common Fill.

If excavations provide more excess materials than required for grading, the contractor shall dispose of as directed in Division 1.

c. Drainage.

Drainage from all back filled or filled areas shall be provided by the placement of ditches as directed by the site engineer to effectively eliminate accumulation of surface water

02 23 13.42 Fine Grading.

Carefully grade site for drives, walks, and to form new contours and/or elevations indicated. Spread any topsoil cut from earthwork operations uniformly over fresh-cut surfaces to the extent it will cover. If finish elevations indicated require additional fill, furnish any material equal or better than that obtained on the site. Grading shall be done with a light bulldozer or farm-type tractor. Care shall be taken to protect and save any shrubs or trees identified for saving by the Owner.

02 23 13.43 Tolerances / Testing.

Grading tolerances shall be within 1" of indicated contours and elevations adjacent structures, walks, drives, and roads. Where steps or ramps are indicated, elevations at the first riser or at the beginning of the ramp shall be within 1/16" of that indicated.

02 70 00 EROSION CONTROL**02 70 00.10 GENERAL.**02 70 00.11 WORK INCLUDED.

Furnish all labor, material, and equipment required for the fabrication and installation of erosion control systems indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	02 71 00	Soil Erosion Control
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02 71 00.00 SOIL EROSION CONTROL**02 71 00.10 GENERAL.**02 71 00.11 TYPES.

The following erosion control types are required under this specification:

02 71 13	Sedimentation Fencing
02 71 16	Temporary Seeding

Furnish and install all soil erosion control devices specified, including all incidental items normally required for installation and conditions encountered. Although the project is less than one acre and does not fall under the jurisdiction of the NC Department of Natural Resources, the work shall comply with the guidelines of stated department for those devices installed

02 71 00.12 RELATED SECTIONS

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	31 10 00	Site Clearing & Demolition
Section	31 20 00	Earthwork
Section	33 40 00	Storm Drainage
Section	32 10 00	Roads & Walks

02 71 00.13 REFERENCE SPECIFICATIONS.

Comply with pertinent standards of the:

NC Department of Natural Resources.

02 71 00.14 SUBMITTALS.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

02 71 13.00 SEDIMENTATION FENCING**02 71 13.10 GENERAL.**02 71 13.11 Location.

Sedimentation fencing shall be installed where indicated, scheduled, or specified including but not limited to the following:

- [1] Perimeter silt fences around and containing open cuts during earthwork and successive operations.
- [2] Silt protection around any catch basin or drop inlet.

02 71 13.20 MATERIALS.

Materials shall conform to the following:

- [1] Silt Fencing: Synthetic [polypropylene, nylon, or polyester or polyethelene filter fabric or pervious sheet, UV protected, with the following physical characteristics:
 - a. Filtering efficiency: 85% min.
 - b. Tensile Strength: 30#/lin. In.
 - c. Slurry Flow Rate: 0.3 gal./sf/min.
- [2] Posts: Contractors option of any of the following materials:
 - a. Pine: 4" dia. Min.
 - b. Oak: 2" dia. Min
 - c. Steel: <, pipe, tube, or [with 1.33 #/LF for a minimum length of 4'-0"

02 71 13.30 INSTALLATION

- a. Install sedimentation filter fencing at the perimeter of all open cuts immediately after the opening of the earth. Space posts at 4'-0"oc for standard wt. Filter fencing or 6'-0"oc for heavy weight.
- b. Fencing shall be installed so that no part of the filter fence is taller than 18"
- c. Fencing shall be from a continuous roll cut to the length of the run of the fence. Where joints are necessary or required, securely fasten the filter to the post and overlap the next run of filter material
- d. Where standard weight filter fencing is installed, place full height reinforcement formed of steel mesh with a minimum gauge of 14 and a mesh spacing of 6 x 6.

02 71 13.40 MAINTENANCE

- a. Inspect sedimentation fences at least once a week and after each rainfall. Make any required repairs immediately.
- b. Should the sedimentation fencing collapse, tear, decompose, or become ineffective, replace promptly.
- c. Remove sediment deposits to maintain adequate filtering storage volume. Take care in removal of sediment deposits so as to not undermine the fencing.
- d. Remove all fencing materials and suitable sediment deposits during rough and fine grading operations making the site ready for temporary seeding.

02 71 16.00 TEMPORARY SEEDING

02 71 16.10 GENERAL.

02 71 16.11 Location.

Install seeding in the following areas:

- [1] All areas opened as required for specified site operations and remaining uncovered by any paving operations.

02 71 16.20 MATERIALS.

Materials shall conform to the following:

Winter Cover: August 15 to Dec. 30

Lime:	1 ton min. / acre
Fertilizer:	10-10-10 @ 700# / acre
Seed:	Rye @120# / acre
Mulch:	Straw 2 tons / acre

- a. Loosen area to receive seed to a depth of four inches, dampen thoroughly, and cultivate to properly break up clods and lumps. Remove stones larger than 1"φ.
- b. After cultivation, rake area to remove clods, rocks, weeds, roots, and debris. Perform grading and shaping refinements to bring surface to true uniform planes free from irregularities and to provide drainage and proper slope in swales and to catch basins.
- c. Immediately prior to seeding or sodding, fertilize lawn areas with specified material at 15-lbs./100-sq. ft. unless hydro seeding is used.
- d. After preparation of lawn areas and with top soil in semidry condition, roll lawn planting areas in two directions at approximately right angles with water ballast roller weighing 100 to 300 lbs. according to soil type.

Rake or scarify and cut or fill irregularities that develop as required and again roll until areas are true and uniform, free from lumps, depressions, and irregularities. Summer Cover: March 1 to August. 15

Lime:	1 ton min. / acre
Fertilizer:	5-10-10 @ 700# / acre
Seed:	Browntop millet @120# / acre
Mulch:	Straw 2 tons / acre

02 71 16.30 SITE PREPARATION.

- a. Loosen area to receive seed to a depth of four inches, dampen thoroughly, and cultivate to properly break up clods and lumps. Remove stones larger than 1"φ.
- b. After cultivation, rake area to remove clods, rocks, weeds, roots, and debris. Perform grading and shaping refinements to bring surface to true uniform planes free from irregularities and to provide drainage and proper slope in swales and to catch basins.
- c. Immediately prior to seeding or sodding, fertilize lawn areas with specified material at 15-lbs./100-sq. ft. unless hydro seeding is used.
- d. After preparation of lawn areas and with top soil in semidry condition, roll lawn planting areas in two directions at approximately right angles with water ballast roller weighing 100 to 300 lbs. according to soil type.
- e. Rake or scarify and cut or fill irregularities that develop as required and again roll until areas are true and uniform, free from lumps, depressions, and irregularities.

02 71 16.40 SEEDING.

After lawn areas are graded, sow seed with seed spreader equipment at a time when little or no wind is blowing. Hydro-seeding methods may be used in lieu of hand seeding when using the following guidelines.

- a. Prepare soil as for seeding.
- b. Apply a mixture of fiber, specified seed, and fertilizer, and water with an approved hydraulic sprayer.
- c. Carefully spray areas to receive seed, keeping seed away from and out of planting beds, walks, structures and areas not indicated to receive seed.

02 71 16.50 **Mulching and Watering.**

- b. After sowing, rake or broom seed in gently and roll area to firm in seed. After rolling, cover area evenly with top dressing of mulch.
 - c. Thoroughly water seeded areas. Reseed areas that do not show prompt germination at 15-day intervals until an acceptable stand of grass is assured.
-

02 90 00 EARTHWORK TREATMENT**02 90 00.10 GENERAL.**02 90 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of earthwork treatment indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

02 90 00.12 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	02 20 00	Earthwork
Section	03 30 00	Concrete
Section	04 20 00	Unit Masonry
Section	06 10 00	Rough Carpentry

02 91 00.00 SOIL TREATMENT**02 91 16.00 TERMITE CONTROL****02 91 16.10 GENERAL.**02 91 16.11 Location.

Termite control chemicals shall be applied in locations indicated, scheduled, or specified.

02 91 16.12 Submittals.

A. Shop Drawings:

The Contractor shall furnish manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

02 91 16.13 Guarantee.

Application shall be by a licensed agent of a recognized termite control company who shall provide the Owner with a 5 year warranty in the form of a \$5,000 surety bond against damage to the building or contents from subterranean termites. Inspection or service fees included in the 5 year warranty period shall be paid up for 1 year by the Contractor with Owner's option to renew annually.

02 91 16.14 Applicator.

Work shall be performed by an applicator of pest control chemicals licensed by the N. C. Department of Agriculture

02 91 16.20 MATERIALS.

Materials shall conform to the following:

[1] Fipronil [Termidor]: 0.06 percent in water emulsion.

Other chemicals currently approved by the EPA and N. C. Department of Agriculture may be submitted to the Architect for approval.

02 91 16.30 APPLICATION.02 91 16.31 Interior Floor Slab.

Under interior floor slab, apply overall at manufacturer's recommended level but no less than 1-1/2 gallons per 10 sq. ft.

DIVISION 03 CONCRETE

Includes work by the General Contractors covered in the following sections.
Section designations are neither consecutive nor numerically inclusive.

03 10 00	CONCRETE FORMWORK
03 20 00	CONCRETE REINFORCING
03 30 00	CAST-IN-PLACE CONCRETE

03 10 00 CONCRETE FORMING AND ACCESSORIES**03 10 00.10 GENERAL.**03 10 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of formwork indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

- a. The work includes providing formwork and shoring for cast-in-place concrete, and installation into formwork of items furnished by others, such as anchor bolts, setting plates, bearing plates, anchorages, inserts, frames, nosings and other items to be embedded in concrete (but not including reinforcing steel).

03 10 00.12 Related Sections

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	03 20 00	Concrete Reinforcing
Section	03 30 00	Cast-in-Place Concrete

03 11 00.00 CONCRETE FORMING**03 11 13.00 STRUCTURAL CAST-IN-PLACE CONCRETE FORMING****03 11 13.10 GENERAL.**03 11 13.11 Location.

At all areas on the structural drawings requiring formwork for concrete installation.

03 11 13.12 Reference Specifications.

Comply with pertinent standards of the:

- a. The American Concrete Institute "Standard Specifications for Structural Concrete for Buildings," ACI 301-96. A copy of these standard specifications shall be purchased by the Contractor and shall be maintained in good condition at the job site at all times during construction. This reference may be purchased from the American Concrete Institute, P.O. Box 9094, Farmington Hills, Michigan 48333. This reference is referred to hereafter in these specifications as the ACI Specifications.
- b. The American Concrete Institute "ACI Detailing Manual - 1994," ACI Special Publication SP-66 (94), hereafter referred to in this Section as the ACI Detailing Manual.
- c. The Concrete Reinforcing Steel Institute "Manual of Standard Practice," 26th Edition, 1996, hereafter referred to in this Section as the CRSI Manual.
- d. The American Concrete Institute "Recommended Practice for Concrete Formwork," ACI 347R-94, and "Formwork for Concrete," ACI Manual SP-4.

03 11 13.13 Submittals.

- a. Shop DRAWINGS:
The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

1. Erection Drawings: The Contractor shall submit erection drawings to the Architect for review in sufficient detail to illustrate the steel floor form erection procedure, including the sequence of erection, layout of deck panels, anchorage details, and each condition requiring closure panels, supplementary framing, special jointing or other accessories.

03 11 13.14 Product Handling.

2. Steel forming shall be carefully unloaded by removing from delivery vehicles in such a manner as to preclude damage to or alter the configuration or finish of the material. Damaged formwork shall be replaced prior to erection at no additional cost to the Owner.
3. Steel forming which is stored at the project site shall be at least 4 inches above the ground on platforms, skids, or other supports, and shall be protected from corrosion.

03 11 13.15 Design Conditions.

Formwork shall comply with Chapter 16 of the North Carolina Building Code. Loading shall be determined for each element to be supported according to standards established by The American Concrete Institute "Standard Specifications for Structural Concrete for Buildings," ACI 301-96,

03 11 13.16 Subcontractor.

Formwork shall be fabricated and installed under a subcontract to a single installer regularly involved in the fabrication and installation of formwork of the type indicated.

03 11 13.20 MATERIALS.

- a. Forms for Footings: Earth cuts may be used as forms for vertical surfaces for footings below finished grade where the workmanship and soil type permit accurate excavation to the size and shape shown on the Drawings. Sloping sides, rounded corners, and irregular or disturbed bottoms will not be accepted. Where these requirements cannot be met, the vertical surfaces shall be formed with wood or metal forming materials to the required dimensions as shown on the Drawings. Bottoms of footings shall be graded uniformly and level to the required elevations. Where required to provide a uniform grade, provide coarse compacted sand, aggregate base course material (ABC) or other similar acceptable materials at no additional cost to the Owner.
- b. Removable Forms: Forming materials shall conform to Section 2 of the ACI Specifications.

03 11 13.30 EXECUTION

03 11 13.31 Standards.

Comply with the pertinent standards referenced in paragraph 03 11 13.13

03 11 13.32 Installation.

1. Chamfers: All interior and exterior corners and edges of formed joints where concrete will be left permanently exposed to view, and all corners of all columns, shall be beveled unless otherwise noted on the Drawings.
2. Chamfer Strips: Chamfer strips shall be 3/4 inch in size unless otherwise noted on the Drawings. Wood, metal, PVC, or other acceptable materials shall be used to provide straight and properly beveled corners and edges.
3. Tightening Forms: Immediately prior to the commencement of concrete placement all joints in the formwork shall be tightened to prevent the leakage of concrete. Wetting of wood formwork to swell joints together shall be employed where necessary to provide tight joints prior to the placement of concrete.
4. Clean forms as erection proceeds to remove foreign matter within forms prior to placing concrete.

During cold weather, remove ice and snow from within forms prior to placing concrete.

03 11 13.33 Inspections.

1. Inspection By The Contractor: Prior to notification of the Architect for a field review of concrete reinforcement, the Contractor shall inspect all formwork for proper dimensions, attachment, tightness and adequacy.
2. Field Review By The Architect: The Contractor shall afford the Architect whatever casual labor, platforms, ladders or other access as may be required for proper field review of the work.

03 20 00 CONCRETE REINFORCING**03 20 00.10 GENERAL.**03 20 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of reinforcing for concrete work indicated, specified, or both including bars, welded wire mesh, ties and supports and all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

03 20 00.12 Related Sections

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	03 10 00	Concrete Forming & Accessories
Sections	03 30 00	Cast-in-Place Concrete
Division	22	Plumbing
Division	23	Heating, Ventilation, and Air Conditioning
Division	26	Electrical

03 21 00.00 REINFORCING STEEL**03 21 13.00 BARS & MESH****03 21 13.10 GENERAL.**03 21 13.11 Location.

At all areas on the drawings requiring reinforcing as part of the concrete installation.

03 21 13.12 Reference Specifications.

Comply with pertinent standards of the:

- a. The American Concrete Institute "Standard Specifications for Structural Concrete for Buildings," ACI 301-96. A copy of these standard specifications shall be purchased by the Contractor and shall be maintained in good condition at the job site at all times during construction. This reference may be purchased from the American Concrete Institute, P.O. Box 9094, Farmington Hills, Michigan 48333. This reference is referred to hereafter in these specifications as the ACI Specifications.
- b. The American Concrete Institute "ACI Detailing Manual - 1994," ACI Special Publication SP-66 (94), hereafter referred to in this Section as the ACI Detailing Manual.
- c. The Concrete Reinforcing Steel Institute "Manual of Standard Practice," 26th Edition, 1996, hereafter referred to in this Section as the CRSI Manual.
- d. The Concrete Reinforcing Steel Institute Manual "Placing Reinforcing Bars," hereafter referred to in this Section as the CRSI Placing Manual.
- e. The Concrete Reinforcing Steel Institute Manual "Reinforcement Bar Splices," hereafter referred to in this Section as the CRSI Bar Splicing Manual.

03 21 13.13 Submittals.

a. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections

and size. The Contractor shall be responsible for dimensions and quantities.

1. Complete shop and placing drawings shall be prepared for reinforcement in accordance with the ACI Detailing Manual and the CRSI Manual. Placing drawings shall show sufficient detail to illustrate the reinforcing steel placing procedure including placement of accessories. In addition, all reinforced concrete walls shall have the reinforcing steel shown in wall elevations with sufficient sections to facilitate the accurate setting of reinforcing bars. Wall openings and additional reinforcement required at openings shall be shown.

03 21 13.14 Product Certification.

1. Certified mill test reports of ladle analysis, tensile properties and bend tests of each batch of steel from which reinforcement is fabricated.
2. Certificates of conformance of stainless steel accessories.

03 21 13.15 Product Handling

Reinforcement shall be carefully unloaded from delivery vehicles in such a manner as to preclude the altering of the configuration of the individual pieces.

- a. Reinforcement shall be stored in an orderly manner to avoid mixing bars of different marks.
- b. Reinforcement and accessories which are stored at the project site shall be at least 4 inches above the ground on platforms, skids or other supports, and shall be free from oil, mud, dirt, or deep and excessive corrosion when placed in the formwork and immediately prior to the placement of concrete.
- c. Accessories and other packaged materials shall be stored in their original unbroken packages until ready for use in the work.

03 21 13.20 MATERIALS.

Materials shall conform to the following:

- a. Reinforcing Bars: Bars shall be rolled from new billet-steel of domestic manufacture conforming to "Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement," ASTM A615-94, Grade 60.
- b. Welded Wire Mesh: Mesh shall conform to ASTM A185 or ASTM A497.
- c. Metal Accessories: Only metal accessories conforming to the following shall be used for the support of the reinforcing bars:
 - (1) High chairs with sand plates (HCP) shall be used to support reinforcing steel in footings and other members in contact with the earth. Wire shall not be less than #4 and plate shall not be less than 20 gauge. HCP shall be constructed with one, approximately square, sand plate.
 - (2) CRSI "Class 2 - Type B - Stainless Steel Protected Bar Supports" shall be provided to support all reinforcing steel in members to be left permanently exposed to view. Such supports shall be constructed of stainless steel containing not less than 16% chromium.
 - (3) CRSI "Class 3 - Bright Basic Bar Supports" shall be provided to support reinforcing steel for all other concrete members..

03 21 13.30 FABRICATION.

03 21 13.31 Standards.

Comply with the pertinent standards referenced in paragraph 03 21 13.13

03 21 13.32 Fabricated Items.

Unless otherwise noted on the Drawings, all reinforcing bars shall be bent cold in the shop to the required configuration. Field bending or heating of reinforcing bars is prohibited.

03 21 13.40 EXECUTION03 21 13.41 Standards.

Reinforcing steel shall be placed in accordance with the CRSI Placing Manual, unless otherwise required by the Drawings or these Specifications

03 21 13.42 Installation.

- a. Where interior or exterior concrete surfaces will be left permanently exposed to view the tie wires shall be set in such a manner that ends of the wires are directed into the concrete and not toward the exposed concrete surfaces, so as to maintain the specified minimum concrete cover.
- b. Tack welding or other application of heat to the reinforcement shall not be permitted, unless specifically required by the Drawings or these Specifications.
- c. Splices of Reinforcement: All splices in reinforcing bars shall be in accordance with the lapped splice requirements of the ACI Specifications and the CRSI Bar Splicing Manual, but in no case less than 36 bar diameters, unless otherwise noted on the Drawings.

03 21 13.43 Inspections.

1. Inspection By The Contractor: Prior to notification of the Architect for a field review of the concrete reinforcement, the Contractor shall carefully inspect all reinforcing bars and accessories for correct number, size, length, location, physical condition, support and arrangement in the forms.
2. Field Review By The Architect: It shall be the responsibility of the Contractor to give at least 24-hour notice to the Architect upon completion of the installation of reinforcing steel and prior to the placement of concrete to allow for scheduling of personnel by the Architect for a field review of the reinforcement.
3. The Contractor shall afford the Architect whatever labor, platforms, ladders or other access as may be required for proper field observation of the reinforcement.

03 30 00 CAST-IN-PLACE CONCRETE**03 30 00.10 GENERAL.**03 30 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of cast-in-place concrete indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	03 31 33	Structural Concrete
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03 30 00.12 Related Sections

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Division	22	Plumbing
Division	23	Heating, Ventilation, and Air Conditioning
Division	26	Electrical

03 31 00.00 STRUCTURAL CONCRETE**03 31 13.00 CONCRETE****03 31 00.10 GENERAL.**03 31 00.11 Location.

At all areas on the structural drawings requiring cast in place concrete.

03 31 00.12 Reference Specifications.

Comply with pertinent standards of the:

- a. Concrete work shall conform to all requirements of The American Concrete Institute "Standard Specifications for Structural Concrete for Buildings," ACI 301-96, except as modified by the supplemental requirements contained in these project specifications. The referenced specifications are declared to be a part of these project specifications the same as if fully set forth herein. A copy of these standard specifications shall be purchased by the Contractor and shall be maintained in good condition at the job site at all times during construction. This reference may be purchased from the American Concrete Institute, P.O. Box 9094, Farmington Hills, Michigan 48333. This reference is referred to hereafter in these specifications as the ACI Specifications.
- b. The American Concrete Institute "Guide for Concrete Floor and Slab Construction," ACI 302.1R-89.

03 31 00.13 Submittals.

- a. Concrete Mix Designs.
- b. Certificates of Analysis for Concrete Aggregates.
- c. Certificates of Conformance for Cement and Admixtures.
- d. Proposed method of concrete curing and trade names and manufacturer's data for proposed curing materials.
- e. Trade names and manufacturer's data for proprietary items.
- f. Trade name and physical data for the proposed non-slip aggregate.
- g. Certificates of conformance for non-shrink grout.

- h. Name of proposed independent testing agency to prepare concrete mix designs and to conduct the specified tests to be provided by the Contractor.

03 31 00.14 Product Handling:

- 1 Revolution counters shall be in operation for all concrete discharged for use on this project. Counters shall be activated at the time mixing is commenced and shall remain in operation until discharge is commenced.
- 2 The rates of delivery shall be scheduled so as to prevent delay in placing the concrete after mixing, or holding the materials too long in the mixer. All concrete shall be discharged from the mixer within 1-1/2 hours after the introduction of water into the mix or before the drum has been revolved 300 revolutions, whichever comes first, except that in hot weather when the ambient temperature is above 80°F the concrete shall be discharged from the mixer within 1 hour after water is introduced to the mix.
- 3 Equipment shall be maintained in proper operating condition, with drums cleaned before charging each batch.
- 4 All concrete materials shall be mixed and handled in conformance with the requirements of ASTM C 94, "Standard Specification for Ready-Mixed Concrete," unless otherwise modified by these project specifications.
- 5 All batching shall be by weight and not by volume.

03 31 00.15 Testing.

Routine testing of materials for compliance with the requirements of these specifications shall be performed by a testing agency selected and paid by the Owner. Test reports shall be furnished to the Architect immediately following each day's testing.

- a. Testing agencies employed for concrete testing and inspection services shall conform to the requirements of "Standard Recommended Practice for use in the Evaluation of Testing and Inspection Agencies as Used in Construction," ASTM E 329. When requested by the Architect, each testing agency shall provide satisfactory evidence to the Architect that an inspection of its facilities within the previous 30 months was made by the Cement and Concrete Reference Laboratory of the National Bureau of Standards, or acceptable equivalent agency, and that any deficiencies mentioned in the report of that inspection have been corrected. Accreditation as a Class I or II Laboratory by BACTL (Board of Accreditation of Concrete Testing Laboratories, Inc.) will suffice as evidence of the laboratory meeting these ASTM requirements.
- b. Test reports shall be furnished to the Architect in triplicate immediately following each day's testing.

03 31 00.16 Subcontractor.

Cast-in-Place Concrete shall be installed under a subcontract to a single subcontractor regularly involved in the installation of concrete of the type indicated. Concrete mixing shall meet the following:

- a. Batch Plants shall comply with the requirements of "Guide for Measuring, Mixing, Transporting, and Placing Concrete," ACI 304R-89, with sufficient capacity to produce concrete of the quality specified in quantities required to meet the construction schedule. All plant facilities are subject to inspection by testing laboratories employed by the Owner and the acceptance of the Architect.
- b. All equipment shall conform to the requirements of "Standard Specification for Ready-Mixed Concrete," ASTM C 94, unless otherwise modified by these project specifications.

03 31 00.20 MATERIALS.

Materials shall conform to the following:

- [1] Cast-in-Place Concrete: See design mix requirements below

Design of Concrete: The Contractor shall be responsible for furnishing the concrete mix designs and shall include in his bid a sum of money necessary to engage an independent testing laboratory, approved by the Architect, to prepare the mix designs for the classes of concrete specified in the "Properties and Location of Concrete" table which follows. The materials and proportioning shall be in accordance with Section 4 of the ACI Specifications, unless otherwise modified by these project specifications.

- a. The Contractor shall submit these mix designs, test data, laboratory strength tests and certificates of analysis for cement and aggregates to the Architect for review prior to the placement of any concrete.
- b. If concrete is to be placed by pumping, the concrete mixes shall be proportioned for the type of equipment to be used so as to have a continuous flow of concrete through the pumping system.
- c. Properties and Location of Concrete:

Concrete Class [Location]	Min 28-Day Compressive Strength[6" x 12" Cylinders]	Maximum Allowable Course Aggregate Size and Type	Slump	**Total Air Content by Volume	Maximum Water / Cement Ratio*
Elevated Floor Slabs [light weight concrete]	4000 psi	Pea gravel	2" to 5"	Not Required	0.40
Ground Floor Slabs	3500 psi	¾" Stone	2" to 5"	5%± 1-1/2%	0.45
Footings	3000 psi	1-1/2" Stone	2" to 4"	Not Required	0.58
All Other Concrete	3000 psi	¾" Stone	2" to 4"	5%± 1-1/2%	0.46
*Including free surface moisture on aggregates and liquid admixtures. W/C ratio is maximum permissible ratio for concrete when strength data from field experience or trial mixtures are not available. Higher ratios may be acceptable provided documentation is submitted in accordance with ACI Specifications.					
**Air entrained concrete not required for interior floor slabs.					

- [2] Cement: The cement used in the work shall conform to ASTM C150, Normal - Type 1 Portland and correspond to that on which the selection of concrete proportions was based. Flash shall not exceed 20% by weight of the required cement content. See "Criteria for use of Fly Ash and Other Concrete Additives," for other requirements.
- [3] Fly Ash: Conform to ASTM C618, Class F, loss on ignition less than 4%.
- [4] Fine and course aggregate: ASTM C33.
- [5] Admixtures: Calcium chloride or admixtures containing calcium chloride shall not be used on this project.
- [6] Admixtures: Air-entraining admixtures shall be sulfonated hydrocarbons or neutralized vinsol resin conforming to "Standard Specification for Air-Entraining Admixtures for Concrete," ASTM C 260, unless otherwise modified by these Specifications, and shall be provided at the manufacturer's recommended rate to produce the specified air entrainment in accordance with table 4.2.2.4 of the ACI Specifications.
- [7] Admixtures: Water-reducing, retarding, or accelerating admixtures shall conform to "Standard Specification for Chemical Admixtures for Concrete," ASTM C 494, unless otherwise modified by these Specifications. Such admixtures shall be subject to approval by the Architect as to manufacturer, type, and proportions.

- [8] Expansion Joint Filler: Bituminous impregnated, preformed type conforming to "Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)," ASTM D 1751, shall be provided at locations indicated on the Drawings and between all points of contact between slabs and vertical surfaces, such as column pedestals, foundation walls, grade beams, and similar members, unless otherwise noted on the Drawings. Joint filler shall be provided between all horizontal concrete surfaces at expansion and isolation joints, unless otherwise noted on the Drawings.
- [9] Joint Sealing Compound: Flexible joint sealing compound shall conform to "Standard Specification For Elastomeric Joint Sealants," ASTM C 920, Type M, Grade P, Class 25, Use T. Joint sealing compound shall be provided at locations noted on the Drawings and at all joints in floor slabs (interior and exterior) to be left permanently exposed to view. The color of joint sealing compound for exposed joints shall match the color of the concrete.
- [10] Liquid Chemical Floor Hardener: All interior concrete floor surfaces to be left permanently exposed to view shall receive a two-coat treatment of a colorless, aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent, containing not less than 2 pounds of fluosilicate per gallon. Material shall be equivalent to "Hornolith" manufactured by A. C. Horn Co., "Saniseal 50" manufactured by Master Builders Co., or "Lapidolith" manufactured by Sonneborn Building Products, Inc.
- [11] Abrasive Aggregate for Non-slip Finish: All exterior concrete platforms, steps and landings, and all interior and exterior concrete ramps shall receive a "dry shake" application of crushed ceramically bonded aluminum oxide grits as abrasive aggregate for non-slip finish. The material shall be equivalent to "Frictex" manufactured by Sonneborn Building Products, Inc., "Korundum" manufactured by Concrete Service Materials Company or "Non-Slip" manufactured by Euclid Chemical Company, shall be factory-graded, packaged, rust-proof and non-glazing, and shall be unaffected by freezing moisture and cleaning materials.
- [12] Concrete Curing Paper: Where curing paper is selected for final curing of flatwork, Sisalkraft "Orange Label," Ludlow Papers, Inc., "Scuf-Champ," "Glas-Kraft" Grade A, or equivalent concrete curing paper conforming to "Standard Specification for Sheet Materials for Curing Concrete," ASTM C 171, Type 1, Waterproof Paper, shall be used. Polyethylene or similar plastic sheets shall not be used for concrete curing.
- [13] Non-shrink Grout: Non-shrink grout shall conform to Corps of Engineers Specification CRD-C 621. Where grout is to be permanently exposed to view, it shall be non-metallic and non-staining.
- [14] Vapor Barrier under Slabs-on-grade: Unless otherwise noted, a vapor barrier equivalent to "Moistop," manufactured by the Fortifiber Corporation, shall be installed under all interior slabs-on-grade and at other locations noted on the Drawings.
- [15] Anchor Bolts: Anchor bolts shall conform to Section 1c of "Standard Specification for Carbon Steel Externally Threaded Standard Fasteners," ASTM A 307, Grade A or ASTM A 36 as noted on drawings. Plain washers for anchor bolts shall conform to "Plain Washers," ANSI B18.22.1, Type A. Furnish one washer with each anchor bolt, unless otherwise noted on the Drawings.

[16] Structural Steel: Structural steel shapes and plates to be embedded in or anchored to the concrete shall conform to "Standard Specification for Structural Steel," ASTM A 36.

[17] Stone Fill under Slabs-on-grade: Unless otherwise noted, a minimum thickness of 4 inches of clean N.C. Department of Transportation standard size No. 67 coarse aggregate shall be provided under all interior slabs-on-grade and at other locations noted on the Drawings.

03 31 00.30 EXECUTION

03 31 00.31 Conveying.

Where concrete is to be placed by pumping, a properly proportioned mix design shall be submitted by the Contractor for review by the Architect prior to placement of concrete. The pumping equipment shall be so constructed that no aluminum or aluminum alloy is used in the construction of that portion of the pumping system that will come into contact with the concrete. This shall apply to the discharge pipes as well as the pump itself.

- [1] Proportioning, mixing and conveying shall conform to the recommendations of the American Concrete Institute Committee Report 304.2R-71(82), "Placing Concrete by Pumping Methods."
- [2] Runways for moving equipment and materials shall be provided with struts or legs, and shall be supported directly on the formwork or structural member without resting on the reinforcing steel.

03 31 00.32 Embedded Items.

All dowels, anchor bolts, sleeves, inserts, and other embedded items shall be set with the aid of templates and shall be securely positioned in place prior to the placement of concrete. Threaded parts shall be greased or otherwise protected against bonding of concrete.

03 31 00.33 Consolidation.

All concrete shall be consolidated by the use of mechanical vibrators operated by experienced workmen under competent supervision. Vibrating shall be supplemented by spading and rodding. No forking or raking shall be permitted. "Jitterbugs" shall not be used on this project.

- a. Where the Drawings require concrete fill to be placed in locations where proper placement and consolidation is difficult, the concrete may be proportioned with 3/8" maximum aggregate size and the maximum slump increased to 8 inches, provided the minimum specified strength requirements are maintained. The Contractor shall provide a properly proportioned, laboratory prepared, mix design and submit this mix design to the Architect for review prior to placement of concrete.
- b. Grouting: In concrete columns, walls, and where conditions impair consolidation of concrete, or where reinforcement is congested, the Contractor shall first deposit in the forms batches of grout containing proportions of one part cement to two parts of concrete sand with sufficient water for workability, to a depth of at least three inches.

03 31 00.34 Non-Shrink Grout.

The Contractor shall provide non-shrink grout under all structural steel column bases and beam bearings on masonry or concrete, unless otherwise indicated on the Drawings.

- a. Non-shrink grout shall be mixed in strict accordance with the manufacturer's printed instructions. Bedding grout shall be placed solidly between bearing surfaces and bases or plates to insure that no voids remain. Finish surfaces at edges at a 45° bevel and properly cure the grout.

03 31 00.35 Slabs-on-grade.

Prior to placing reinforcement the Contractor shall prepare the grade, compact the fill, place vapor barrier, set keyways, joint material, and other embedded items as required by the Drawings and other Sections of the Specifications.

- a. One layer of vapor barrier shall be installed over the base material with all edges lapped a minimum of 4 inches and sealed continuously with waterproof tape or other approved material. Openings around piping, conduit, and other openings through the vapor barrier shall be sealed, and the edges of the vapor barrier shall be turned up a minimum of 2 inches at walls and other vertical surfaces.
- b. Screed chairs, grade stakes or other objects shall not be permitted to damage or penetrate the vapor barrier or waterproofing membrane. Buggy runways shall be used where concrete is required to be transported over the vapor barrier or waterproofing membrane. Screeds may be set in mounded concrete in lieu of screed chairs.

03 31 00.36 Cold Weather Conditions.

Concrete shall not be placed when the ambient temperature is 40°F. and falling and when freezing weather is predicted within 24 hours. Subject to written approval of a letter of request to the Architect from the Contractor, "Recommended Practice for Cold Weather Concreting," ACI 306R-88, may be followed for placing concrete in cold weather with the following modifications:

1. No calcium chloride or other accelerators or "anti-freeze" shall be used.
2. High early strength (Type III) cement shall not be used.
3. Fly Ash is not permitted in concrete placed during cold weather conditions.
4. In addition to laboratory cured test specimens, additional concrete test specimens shall be cured under field conditions as required and directed by the Architect to check the adequacy of curing and protection of the concrete. The Testing Agency shall provide a "Hi-Lo" thermometer at the site to record the maximum and minimum concrete temperatures during the curing period. The Contractor is required to maintain the temperature of the concrete above 50°F for the duration of the curing period.
5. Hot water shall be used for mixing water when required to maintain minimum specified concrete delivery temperatures.
6. A description of the proposed method of curing and protection shall be submitted to the Architect for review prior to the commencement of cold weather concrete work.

03 31 00.37 Hot Weather Conditions.

When concrete is to be placed under conditions of high ambient temperature, the concrete shall be mixed, transported and placed in accordance with the ACI "Recommended Practice For Hot Weather Concreting," ACI 305R-89, and the Contractor shall take appropriate steps to prevent the concrete from exceeding 90°F. at time of placement. Wood and earth forms shall be thoroughly wet just prior to the placement of concrete and shall be maintained in a moist condition until concrete is placed in them.

03 31 00.38 Finishes.

- a. Finishes: Unless otherwise noted, the tolerances, repairing, patching and finishing of concrete work shall be in accordance with the ACI Specifications.
 1. Footings: At the completion of consolidation of the concrete, the tops of all footings, shall be floated to a level, plane, dense surface with wood or metal floats.
 2. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo; and where indicated.
 1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation

of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Finish surfaces to tolerances of F(F) 18 (floor flatness) and F(L) 15 (floor levelness) measured according to ASTM E 1155. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

3. Exterior and interior formed surfaces to be left permanently exposed to view shall receive a "Smooth Rubbed Finish," unless otherwise noted.
4. Exterior Flatwork and walks shall receive a "Broom or Belt Finish."
5. Exterior and interior concrete steps, platforms, landings and ramps shall receive a "non-slip finish" of approved ceramically-bonded aluminum oxide abrasive grits, as specified, unless otherwise noted.
6. Interior flatwork to receive terrazzo, tile, toppings, or other cementitious finish applications shall receive a "Scratched Finish."
 1. After placing slabs, finish surface to tolerances of F(F) 15 (floor flatness) and F(L) 13 (floor levelness) measured according to ASTM E 1155. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.
7. All other interior flatwork surfaces shall receive a "Troweled Finish."
 1. After floating, begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances of F(F) 20 (floor flatness) and F(L) 17 (floor levelness) measured according to ASTM E 1155. Grind smooth any surface defects that would telegraph through applied floor covering system.
- b. Liquid Chemical Floor Hardener: All concrete floor surfaces to receive liquid chemical floor hardener shall receive a final cleaning to remove all foreign materials, including mortar, paint, plaster, and similar materials, to prevent any foreign materials from showing through the finished surface.
 - 1 One coat shall be applied upon completion of curing the slab and one coat applied after a final painting and other finishes are complete. The final result shall be a uniform transparent appearance which, when subjected to an abrasion test made with a stiff wire brush, shall not dust, but shall polish without showing abrasion.
- c. Non-slip Finish: Surfaces to receive a non-slip finish shall be given a "dry-shake" application of crushed ceramically-bonded aluminum oxide abrasive particles. The materials shall be factory blended with Portland cement in the proportions recommended by the manufacturer.
 - 1 The rate of application shall be not less than 25 lbs. per 100 sq. ft. Approximately two-thirds of the blended material for required coverage shall be applied to the surface by a method that insures even coverage without segregation. Floating shall be commenced immediately after application of the first "dry-shake." After this material has been embedded by floating, the remainder of the blended material shall be broadcast at right angles to the previous application. The second application shall be heavier in any areas not sufficiently covered by the first application. A second floating shall follow immediately.
 - 2 After the abrasive particles have been embedded by the two floatings, the surface shall receive a troweled finish.

- 3 At the completion of finished work, the surfaces shall receive an application of liquid membrane-forming curing compound and shall not receive any traffic for at least 24 hours thereafter.

03 31 00.39 Curing and Protection.

All concrete shall be cured a minimum of 7 days by one or more methods specified in Section 5 of the ACI Specifications, except polyethylene or similar plastic sheets shall not be used for the curing of concrete.

- [1] Membrane-forming curing compounds shall not be used on any surface against which additional concrete or other cementitious finishing materials are to be bonded.
- [2] Concrete curing paper shall be used for final curing of flatwork only. When selected for final curing, the paper shall be placed as follows:
 3. Unroll curing paper over the entire surface to be cured. Lap ends and edges a minimum of 4 inches and seal continuously with masking or pressure-sensitive tape and provide sufficient weights over paper to prevent separation from concrete surface.
 4. Curing paper shall be used for curing purposes only one time.
- [5] Where concrete topping is placed over waterproof membranes, the Contractor shall exercise special care to avoid punching holes in or otherwise damaging the waterproof membrane.

03 31 00.39 Field Quality Control.

Prior to notification of the Architect for a field review preceding concrete placement, the Contractor shall carefully inspect all formwork, reinforcing steel placement, embedded items, and shall coordinate the installation of embedded items by other Contractors.:

03 31 00.40 Testing.

- a. Routine testing of materials and of resulting concrete for compliance with the Specifications shall be the duty of the testing agency selected and paid for by the Owner. This agency shall be responsible for all testing including the taking, handling, transporting and curing of concrete samples, and the preparation and breaking of test specimens.
- b. The Contractor shall be responsible for notification of the testing agency in ample time for the assignment of testing personnel, and shall afford the testing agency a safe area for the storage of test specimens.
- c. Four specimens shall be molded from each sample of concrete for compressive strength tests. Two specimens shall be tested at 7 days for information and two specimens tested at 28 days for acceptance. Any additional specimens required as reserve for the Contractor will be at the Contractor's expense. Make at least one strength test for each 100 cu. yds., or fraction thereof, of each mix design of concrete placed in any 1 day.
- d. The testing agency shall make and record a slump test in connection with each sampling of concrete. The testing agency shall immediately notify the Contractor when the slump tests indicate the concrete is not within the specified limits and the Contractor shall immediately cease concrete placement until the deficiency is corrected. Additional slump tests shall be made when directed by the Architect or as necessary to control the consistency of the concrete.
- e. The testing agency shall make and record an air test in connection with each sampling of air-entrained concrete. The testing agency shall immediately notify the Contractor when the air tests indicate the air-entrainment is not within the specified limits and the Contractor shall immediately cease concrete placement until the deficiency is corrected.
- f. The testing agency shall determine the number of turns of the drum on each concrete truck from which samples are secured, and shall note the revolutions on the concrete test report. In the event

the number of revolutions is less than 100 or more than 300, the Contractor shall be notified immediately by the concrete technician in the field and the technician shall note his instructions to the Contractor on the concrete test report. Any concrete delivered in a truck on which the revolution counter is inoperable or has not been activated shall be immediately rejected by the Contractor.

- g. The Contractor shall not commence placement of concrete until such time as the representative of the testing agency is on the job site with the necessary equipment to perform the specified tests.
- h. Any testing required for the convenience of the Contractor or any retesting of materials failing to meet the requirements of the Specifications shall be entirely at the Contractor's expense.
- i. Failure of the Contractor to notify the testing agency in time to cancel visits to the job site by representatives of the testing agency in the event of the cancellation of scheduled concrete placement or other related work after notification of the testing agency shall result in the payment for cost of such visits by the Contractor.

03 31 00.41 Field Review By The Architect.

The Contractor shall give at least a 24-hour notice to the Architect prior to placing concrete to permit field review of the general construction work as well as mechanical, electrical and other work to be incorporated into the concrete.

- a. The Contractor shall afford the Architect whatever casual labor, platforms, ladders or other access as may be required for proper field review of the concrete work.
- b. Field review of the work by the Architect shall in no way relieve the Contractor of his responsibility to furnish materials and workmanship in full compliance with the Drawings, Specifications and requirements of the work.

03 31 00.42 Evaluation of Concrete Strength.

Strengths of concrete shall be evaluated in accordance with Section 1 of the ACI Specifications, except that in no case shall the strength tests have values less than ninety percent (90%) of the specified 28-day strength.

DIVISION 04 MASONRY

Includes work by the General Contractors covered in the following sections.
Section designations are neither consecutive nor numerically inclusive.

04 20 00	UNIT MASONRY
	04 20 13 MORTAR
04 21 00	CLAY UNIT MASONRY
04 22 00	CONCRETE UNIT MASONRY

04 20 00 UNIT MASONRY**04 20 00.10 GENERAL.**04 20 00.11 WORK INCLUDED.

Furnish all labor, material, and equipment required to construct masonry work indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	04 21 00	Clay Unit Masonry - Repair
Subsection	04 22 00	Concrete Unit Masonry

04 20 00.12 RELATED SECTIONS

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	07 90 00	Joint Protection
Division	23	Mechanical
Divisions	26 & 27	Electrical & Communications

04 20 00.13 WORK OF OTHER TRADES.

All items other than masonry materials inserted or embedded in masonry shall be placed by their respective trades. The masons shall co-operate with the other trades and shall assist in setting such miscellaneous items to provide neat and accurate fittings.

- a. Notify various trades of the schedule of work in sufficient time to allow them to install such portions of their work as are affected and in no case shall any trade be covered or passed before his work is completed.

04 20 00.14 GENERAL MASONRY REQUIREMENTS.a. Dimensions.

Plans and other drawings set to 1/4" per foot scale and smaller uses the standard masonry convention of modular dimensioning to the nearest inch for individual units and runs of units i.e. 8" on plan is 7-5/8" actual and 28'-0" on plan is 27'-11 5/8" actual. Contractor shall maintain modular actual dimensions. Walls shall be laid out centered between columns or other structural elements with any differences taken up in expansion joints, masonry joints, or window or door openings. Single wythe walls shall be centered on dimension. See enlarged details for multi-wythe walls.

b. Tolerances.

1. Variation from Plumb: Vertical lines and surfaces of columns, walls and arises shall not exceed 1/4" (1/8" in glass blockwork) in 10', or 3/8" in a story height. External corners, expansion joints, control joints and other conspicuous lines, shall not exceed 1/4" in any story or 20'. Vertical alignment of head joints shall not exceed plus or minus 1/4" in 10', 1/2" maximum.
2. Variations from Level: Bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, shall not exceed 1/4" in 28'. For top surface of bearing walls, do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.
3. Variation of Linear Building Line: Position shown in plan and related portion of columns, walls and partitions shall not exceed 1/4" in any bay.

c. Layout.

Lay out walls in advance for accurate spacing of surface bond patterns, with uniform joint widths and to properly locate openings, movement type joints, returns and offsets. Avoid the use of less than

half-size units at corners, jambs and wherever possible at other locations.

- d. Combination.
1. Lay up walls plumb and with courses level, accurately spaced and within tolerances specified. Coordinate with other work. Cut and fit around mechanical, electrical and other built-in work of other trades.
 2. Build chases and recesses as shown and as required for the work of other trades. Provide not less than 8" of masonry between chase or recess and jamb of openings, and between chases and recesses.
- e. Stopping and Resuming Work.
Rack back one-half unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry
- f. Protection.
Precaution shall be taken to protect walls from any moisture conditions due to rain, snow, or other weather conditions. No masonry shall be laid in temperature below 35°F. At the end of each day's work, cover top of wall with waterproof sheeting. Extend cover down 24" on each side of wall and hold securely in place.
- g. Repair, Pointing and Cleaning.
1. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units. Provide new units to match adjoining units and install in fresh mortar or grout, point to eliminate evidence of replacement.
 2. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints, including corners, openings and adjacent work to provide a neat, uniform appearance.
- h. Final Cleaning:
After masonry is thoroughly set and cured, remove large particles of mortar and clean masonry with proprietary cleaner of contractor's choice. Remove all mortar smears and droppings, all foreign materials, and visible stains from masonry surfaces. Sandblasting and grinding are prohibited.

04 20 00.15 MASONRY-WALL REINFORCING.

- a. Masonry wall reinforcing shall be constructed of galvanized, welded-wire products conforming to A-82 and ASTM A-116 class 1, furnished on 10-ft. lengths, sized for thickness of wall.
- | | |
|-----------------------|--------------------------------------------------------------------------------------------------|
| [1] Single wythe wall | Standard #9 ga. double longitudinal rods and #9 truss rods, 16" o.c. Standard truss reinforcing. |
|-----------------------|--------------------------------------------------------------------------------------------------|
- b. Manufacturer.
Products shall be manufactured by one of the following:
- A.A. Wire Products Co.
 - Dur-O-Wal, Inc.
 - Masonry Reinforcing Corp. of America

04 20 00.16 ANCHORS & TIES.

- a. Masonry anchors shall be 16 ga., crimped tab in various lengths for conditions encountered.
- b. Glass-block anchors shall be 20 ga. perforated, galvanized type 24" x 1¾, equal to Pittsburgh Corning panel anchors.

c. Masonry ties shall be galvanized steel, 16 ga., and crimped straps 1-1/2" wide x 8" & 12" long.

04 20 00.17 EXPANSION CONTROL.

Provide vertical and horizontal expansion control and isolation joints in masonry as indicated.

04 20 13.00 **MORTAR**

04 20 13.10 GENERAL.

04 20 13.11 JOB MORTAR.

Furnish all labor, material, and equipment required for the mixing of job mortar indicated, specified or both which shall consist of the following kinds and types.

Type N

Type N colored

04 20 13.12 SUBMITTALS.

The Contractor shall furnish manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

04 20 13.13 MORTAR TYPE LOCATIONS.

Type N (colored) shall be used for exterior face brick repair and shall match existing color. Type N (plain) may be used in all other masonry.

04 20 13.20 MATERIALS.

Mortar materials shall conform to the following Federal or ASTM specifications. Brands will be approved by the Architect. Samples will be submitted if requested.

[1]	Masonry cement	ASTM C 270-64T type II
[2]	Portland cement	ASTM C 150-64 type I or II
[3]	Coloring	Mineral pigment, natural or synthetic iron oxides factory mixed in masonry cement. Color: match mortar on the existing structure.
[4]	Hydrated lime	ASTM C207 Type S
[5]	Admixture	Liquid or dry type compatible with masonry cement used. Grace Hydractite Master Building Omicron Standard Dri-Wall Thoroguard
[6]	Sand	Natural, clean, sharp ASTM C-144. 100% passing #16 sieve and not over 20% passing a 50% sieve by volume. Color: white - glass block work. Optional - all other masonry.
[7]	Water	Clean, potable water as secured from temporary shallow well provided by Contractor or from temporary connection to City Water.

04 20 13.30 MIXES.

04 20 13.31 MACHINE MIXING.

Mortar shall be machine mixed with sufficient water to produce a smooth working consistency conforming to ASTM C 270-62.

04 20 13.32 TYPE N.

1 part masonry cement to 3 parts sand by volume. Add admixture in accordance with manufacturer's directions but not less than 1 quarter of 1 pound per bag of masonry cement.

- 04 20 13.33 COLORED MORTAR.
Colored mortar shall be mixed according to its type from factory colored masonry cement. Separate colors will be selected by the Architect for use with each color of brick used on the job.
- 04 20 13.40 TIME AND TEMPERING.
Mortar shall be used within 2-1/2 hours of mixing. During this period tempering will be allowed to replace evaporated mixture.
- 04 21 00.00 CLAY UNIT MASONRY
- 04 21 13.00 BRICK MASONRY
- 04 21 13.10 GENERAL.
- 04 21 13.11 Location & Types.
The following brick types are required under this specification:
Face Brick
- 04 21 13.13 Submittals.
a. Samples:
Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.
- 04 21 13.14 Subcontractor.
Brickwork shall be installed under a subcontract to a single masonry subcontractor regularly involved in the trade.
- 04 21 13.20 MATERIALS.
Materials shall conform to the following:
[1] Face brick ASTM C 216, Grade SW, Type FBS tunnel kiln, modular sized, wire cut, 3-5/8" x 2-1/4" x 7-5/8"
Match color and finish of existing brickwork on the adjacent building.
- 04 21 13.30 EXECUTION
- 04 21 13.32 Installation.
- 04 21 13.33 Wetting.
Wet clay brick using wetting methods which ensure that units are nearly saturated but surface dry when laid.
- 04 21 13.34 Coursing.
a. All brick shall be laid in full mortar bed with full shoved horizontal and vertical joints.
b. Brick courses will be maintained uniform at 3 courses to 8" for the full height of the wall unless specifically detailed otherwise. Lay 3 brick with 3 equal mortar joints at 24" horizontally. Maximum joints 1/2"; minimum joints 1/4".
- 04 21 13.35 Jointing.
a. Exterior joints shall match existing profile.
- 04 21 13.37 Patterns.
a. Lay brickwork to match existing bonding pattern.

04 22 00.00 CONCRETE UNIT MASONRY**04 22 00.10 GENERAL.**04 22 00.11 TYPES.

All interior areas where concrete masonry is indicated or scheduled shall receive masonry of the type indicated, specified, or otherwise required.

04 22 00.12 REFERENCE SPECIFICATIONS.

Comply with pertinent standards of the:

National Concrete Masonry Association.

04 22 00.13 SUBMITTALS.

Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

04 22 00.16 SUBCONTRACTOR.

Concrete masonry shall be installed under a subcontract to a masonry subcontractor regularly involved in the trade.

04 22 13.00 STANDARD CONCRETE MASONRY**04 22 13.10 GENERAL.**04 22 13.11 LOCATION.

Interior: Exposed interior blockwork standard blockwork with tooled joints.

04 22 13.20 MATERIALS.

Materials shall conform to the following:

[1] Concrete Masonry Units ASTM C-90, Type 1, Grade N-1, 100% lightweight
[CMU]: aggregate ASTM 331 expanded slate.

Sizes: 5-5/8" x 7-5/8" x 15-5/8".

Following type units are required:

Unscored

04 22 13.30 EXECUTION04 22 13.31 Installation.04 22 13.32 Coursing.

a. Concrete masonry will be laid in full mortar bed with full horizontal bed and vertical joints filled across the units.

b. Block courses shall be maintained at 3 courses for 24" for the full height of the wall unless specifically indicated otherwise. Lay 3 block plus 3 mortar joints to 48" horizontally.

04 22 13.33 Jointing.

a. Jointing shall be flush type tooled with a standard round joint tool to form a concave profile.

04 22 13.34 Bonding.

a. Block will be laid in running bond.

b. Where it is necessary to use less than a full-size unit in exposed work, concrete block shall be cut with a masonry saw to indicated lines.

04 22 13.35 Grouting.

- a. As the work progresses, build in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items. Fill space between hollow-metal frames and masonry solid with mortar.
- b. Fill CMU cores with grout 3 courses (24") under bearing plates, beams, lintels, posts and similar conditions unless otherwise indicated. Fill cores of concrete masonry below floor line solid with concrete grout.

04 22 13.40 ACCESSORY INSTALLATION.04 22 13.41 Horizontal Reinforcing.

Place masonry reinforcing in all brick, block, and brick and block masonry walls. Cut side rods on one side and bend around corners to provide continuity. Lap all running joints 8". Stagger running joints in wall.

- a. Horizontal reinforcing on concrete-masonry walls and partitions shall be provided at every 2nd course in all walls and partitions whether indicated or not.

04 22 13.42 Rods and Bars.

Vertical rods and bars embedded in masonry course shall be fully grouted with masonry cement in each core through which they pass. Bars shall extend into concrete grade beam, footing, or slab for anchorage.

- a. Install vertical bars at locates indicated and at locations required by Code, those being generally at each corners and at each side of each wall opening on exterior walls.

04 22 13.43 Anchors.

- a. Anchors and bolts embedded in masonry shall be fully grouted in each core or joint in which they engage.

DIVISION 05 METALS

Includes work by the General Contractors covered in the following sections.
Section designations are neither consecutive nor numerically inclusive.

05 30 00	STEEL DECKING
05 40 00	COLD FORMED METAL FRAMING
05 50 00	METAL FABRICATION

05 30 00 METAL DECKING**05 30 00.10 GENERAL.**05 30 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of metal decking indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	05 31 00	Steel Decking
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05 30 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	05 10 00	Structural Steel
Division	04	Masonry

05 31 00.00 STEEL DECKING**05 31 00.10 GENERAL.**05 31 00.11 TYPES.

The following steel deck types are required under this specification:

05 31 13	Steel Floor Decking
05 31 23	Steel Roof Decking

05 31 00.12 REFERENCE SPECIFICATIONS.

Comply with pertinent standards of the:

- a. Steel decking shall be designed and manufactured in accordance with the current edition of the "Design Manual for Composite Decks, Form Decks, Roof Decks and Cellular Metal Floor Deck with Electrical Distribution," of the Steel Deck Institute, hereinafter referred to as the SDI Specifications.

05 31 00.13 SUBMITTALS.

A. Shop Drawings:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities

B. Manufacturers Literature:

The Contractor shall furnish manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

05 31 00.14 DESIGN CONDITIONS.

Steel deck shall comply with Chapter 16 of the North Carolina Building Code. Loading shall be as required for the 120 m.p.h. wind load with velocity as determined under Section 1606 and ASCE 7-93. Deflection shall be limited to L/240 of any span at full pressure [wind, snow, live or code mandated combinations] acting normal to the surface plus product dead load.

05 31 23.00 STEEL FLOOR DECK

05 31 23.10 GENERAL.05 31 23.11 Location.

Steel floor decking shall be provided for areas indicated, scheduled, or specified

05 31 23.20 MATERIALS.

a. Steel Floor Deck:

1. Steel floor decking shall be manufactured from steel conforming to "Standard Specification for Steel, Cold-Rolled Sheet, Carbon Structural," ASTM A 611, Grade C, or "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality," ASTM A 446, Grade A, or equivalent material having a minimum yield strength of 33,000 psi.
2. Steel floor deck shall be zinc-coated (Galvanized) to conform to "Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements," ASTM A 525, coating designation G60

b. Accessories:

1. Metal closure strips and other accessories to be attached directly to the steel deck to provide a finished surface for the application of insulation and roofing shall be furnished by the steel deck manufacturer as part of the decking.
2. All steel accessories shall be zinc coated in conformance with "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements," ASTM A 525, coating designation G60.
3. Galvanizing repair paint shall be a high zinc-dust content paint for repair of damaged galvanized surfaces conforming to Steel Structures Painting Council SSPC-Paint 5 Zinc Dust, Zinc Oxide, and Phenolic Varnish Paint.

05 31 23.30 EXECUTION05 31 23.31 Standards.

Floor deck units and accessories shall be installed in accordance with the SDI Specifications and the manufacturer's printed recommendations and approved shop drawings

05 31 23.32 Installation.

a. Placing Floor Deck Units.

Placement of floor deck units shall commence following the installation all supporting members. Roof deck units shall be placed on supporting steel framework and adjusted to final position with ends bearing on supporting members and accurately aligned end to end before being permanently fastened. Ends shall be lapped not less than 2". Side-lap interlocks shall not be stretched or contracted. Deck units shall be placed flat and square and secured to adjacent framing without warp or excessive deflection.

b. Anchorage and Attachment of Deck Units.

Steel floor decking shall be attached to the steel supporting members by attaching to the structural frame with self-tapping galvanized screws at a maximum spacing of 12 inches o.c. Self-tapping screws shall be a minimum of 3/16 inch diameter with a head diameter sufficient to resist the uplift forces required by the SDI Specifications.

c. Cutting and Fitting.

1)Cutting openings through the deck less than 16 square feet in area, and all skew cutting, shall be

performed in the field in a neat and workmanlike manner. Cut and fit roof deck units and accessories around other work projecting through or adjacent to the roof decking. Provide neat, square and trim cuts.

2) Additional metal reinforcement and closure pieces shall be provided at openings as required for strength, continuity of decking and support of other work, unless otherwise shown.

d. Closure Strips.

Metal closure strips shall be provided at all open uncovered ends and edges of roof decking, and in the voids between decking and other construction. They shall be welded into position to provide a complete decking installation.

e. Field Touch-up Painting.

After completion of the roof decking installation, wire brush, clean and paint scarred areas, welds and rust spots on the top and bottom surfaces of decking units and supporting steel members.

05 31 23.00 STEEL ROOF DECK

05 31 23.10 GENERAL.

05 31 23.11 Location.

Steel roof decking shall be provided for areas indicated, scheduled, or specified

05 31 23.20 MATERIALS.

c. Steel Roof Deck:

3. Steel roof decking shall be manufactured from steel conforming to "Standard Specification for Steel, Cold-Rolled Sheet, Carbon Structural," ASTM A 611, Grade C, or "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality," ASTM A 446, Grade A, or equivalent material having a minimum yield strength of 33,000 psi.

4. Steel roof deck shall be zinc-coated (Galvanized) to conform to "Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements," ASTM A 525, coating designation G60

d. Accessories:

1. Metal closure strips and other accessories to be attached directly to the steel deck to provide a finished surface for the application of insulation and roofing shall be furnished by the steel deck manufacturer as part of the decking.

2. All steel accessories shall be zinc coated in conformance with "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements," ASTM A 525, coating designation G60.

3. Galvanizing repair paint shall be a high zinc-dust content paint for repair of damaged galvanized surfaces conforming to Steel Structures Painting Council SSPC-Paint 5 Zinc Dust, Zinc Oxide, and Phenolic Varnish Paint.

05 31 23.30 EXECUTION

05 31 23.31 Standards.

Roof deck units and accessories shall be installed in accordance with the SDI Specifications and the manufacturer's printed recommendations and approved shop drawings

05 31 23.32 Installation.

f. Placing Roof Deck Units.

Placement of roof deck units shall commence following the installation all supporting members. Roof deck units shall be placed on supporting steel framework and adjusted to final position with ends bearing on supporting members and accurately aligned end to end before being permanently fastened. Ends shall be lapped not less than 2". Side-lap interlocks shall not be stretched or contracted. Deck units shall be placed flat and square and secured to adjacent framing without warp or excessive deflection.

- g. Anchorage and Attachment of Deck Units.
Steel roof decking shall be attached to the steel supporting members by attaching to the structural frame with self-tapping galvanized screws at a maximum spacing of 12 inches o.c. Self-tapping screws shall be a minimum of 3/16 inch diameter with a head diameter sufficient to resist the uplift forces required by the SDI Specifications.
- h. Cutting and Fitting.
3) Cutting openings through the deck less than 16 square feet in area, and all skew cutting, shall be performed in the field in a neat and workmanlike manner. Cut and fit roof deck units and accessories around other work projecting through or adjacent to the roof decking. Provide neat, square and trim cuts.
4) Additional metal reinforcement and closure pieces shall be provided at openings as required for strength, continuity of decking and support of other work, unless otherwise shown.
- i. Closure Strips.
Metal closure strips shall be provided at all open uncovered ends and edges of roof decking, and in the voids between decking and other construction. They shall be welded into position to provide a complete decking installation.
- j. Field Touch-up Painting.
After completion of the roof decking installation, wire brush, clean and paint scarred areas, welds and rust spots on the top and bottom surfaces of decking units and supporting steel members.

05 40 00 COLD FORMED METAL FRAMING**05 40 00.10 GENERAL.**05 40 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of cold formed metal framing indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	05 41 00	Structural Metal Stud Framing
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05 40 00.12 Work Not Included.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Subsection	09 22 16	Non Structural Metal Framing
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05 40 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Division	08	Doors, Windows, & Glass
Division	09	Finishes
Section	13 30 00	Special Structures

05 41 00.00 STRUCTURAL METAL STUD FRAMING**05 41 13.00 EXTERIOR NON-LOAD BEARING STEEL STUDS****05 41 13.10 GENERAL.**05 41 13.11 Location.

Structural Steel Studs shall be provided in spaces indicated, scheduled, or specified.

05 41 13.12 Reference Specifications.

Comply with pertinent standards of the:

American Iron and Steel Institute [AISI] "Specification for the Design of Cold-Formed Steel Structural Members" latest edition.

And

Steel Stud Manufacturers Association "Product Technical Information" latest edition [download at www.ssma.com]

05 41 13.13 Submittals.

1. Shop Drawings:

The Contractor shall furnish installer's manufacturers' literature and shop drawings for each shop assembled item to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities. Informations shall also include the following:

b. Materials list

c. Manufacturer's recommended installation procedures.

05 41 13.14 Design Conditions.

Structural Steel Studs shall comply with Chapter 16 of the North Carolina Building Code. Loading shall be

as required for the 120 m.p.h. wind load with velocity as determined under Section 1606 and ASCE 7-93. Deflection shall be limited to 1/240 of any span at full pressure acting normal to the surface plus product dead load.

05 41 13.15 Subcontractor.

Structural steel studwork shall be engineered, manufactured, and fabricated under a subcontract to a single manufacturer regularly involved in the development, fabrication and installation of product indicated. Installation shall be by a subcontractor regularly involved in the trade

05 41 13.16 Basis of Design – Manufacturer.

1. The following product was used in the development of this project.

Dietrich Metal Framing

2. Products of the following manufacturers *meeting these specifications* may be installed:

MarinoWare

Dale/Incor.

05 41 13.20 MATERIALS.

Materials shall conform to the following:

- | | |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] Steel Studs: | S-section steel studs in the following sizes:
See drawings for sizes required. |
| [2] Steel Track: | T-section steel tracks in the following sizes:
See drawings for sizes required. |
| [3] Track, Bridging, and Deflection Clips: | 18-ga. steel, galvanized, designed for top, bottom, and intermediate support of channel... |
| [4] Accessories: | Welding washers, channel aligners, slips, angles, shoes, etc., shall be furnished as required for the installation. Similar gauge to stud work... |
| [5] Fasteners: | Mechanical fasteners shall comply with the requirements stated in the SSMA screw load table: Allowable loads for screw connections. Welding shall comply with the requirements stated in the SSMA weld table: Allowable loads for fillet welds and flare groove welds. |

05 41 13.30 FABRICATION.

05 41 13.31 Standards.

Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.

05 41 13.32 Fabricated Items [Assemblies].

- a. Fabricate framing assemblies using jigs or templates.
- b. Cut framing members by sawing or shearing; do not torch cut.
- c. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is prohibited.
- d. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- e. Retain subparagraph above and subparagraph below if using mechanical fasteners.

- f. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
- g. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
- h. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

05 41 13.33 Tolerances.

Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

- a. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
- b. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

05 41 13.40 EXECUTION.

05 41 13.41 Standards.

Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.

05 41 13.42 Installation [General].

- a. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- b. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.
- c. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - a. Cut framing members by sawing or shearing. [Torch work is prohibited.]
 - b. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. [Wire tying of framing members is prohibited.]
 - 1. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - 2. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- d. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- e. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- f. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

- g. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

05 41 13.42 Installation [Exterior Non-Load-Bearing Steel Studs].

- a. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- b. Position stud between floor and top runner tracks at spacing indicated or specified. Attach bottom runner to concrete floor with power driven pins not less than 24" o.c. Fasten both flanges of studs to track. Space studs as follows: 24"oc
- c. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
- d. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
- e. Connect vertical deflection clips to infill studs and anchor to building structure.
- f. Install horizontal bridging in wall studs, spaced in rows not more than 48 inches apart. Fasten at each stud intersection. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
- g. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.

05 41 13.43 Tolerances / Testing.

- [1] Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
- [2] Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

05 50 00 METAL FABRICATIONS**05 50 00.10 GENERAL.**05 50 00.11 Work Included.

- a. Furnish all labor, material, and equipment required for the fabrication and installation of various metal items indicated, specified, or both including necessary anchors, attachments and accessories and all incidental items normally required for installation, conditions encountered and to derive the full benefit of use of the items required.
- b. All work shall be neatly fitted. No scratched, dented, or damaged articles will be incorporated in the building.
- c. Subsections forming this specification include the following:

Subsection	05 51 00	Metal Stairs and Ladders
Subsection	05 52 00	Metal Railings
Subsection	05 58 00	Miscellaneous Fabrications

05 50 00.12 WORK NOT INCLUDED.

Section	05 10 00	Structural Steel
Section	13 30 00	Special Structures

05 50 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	13 30 00	Special Structures
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05 58 00.00 MISCELLANEOUS FABRICATIONS**05 58 11.00 MISCELLANEOUS METALS****05 58 11.10 GENERAL.**05 58 11.11 Location.

Miscellaneous metalwork shall be provided for spaces indicated, scheduled, or specified

05 58 11.12 Types.

The following metalwork types are required under this specification:

Steel fabrications

05 58 11.13 Reference Specifications.

In the absence of specific details or specifications to the contrary, the following standards and recommended practices [latest edition] of the AISC are to be followed in performing the work.

American Institute of Steel Construction

"Specifications for the Design, Fabrication and
Erection of Structural Steel for Buildings"

"Code of Standard Practice"*

American Welding Society

"Application of and Extracts from Code for Arc and Gas

Welding in Building Construction"

*Code of Standard Practice is hereby amended by the deletion of Paragraph 4.2.1 Shop & Erection Drawings Approval.

05 58 11.14 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

05 58 11.16 Design Conditions.

Miscellaneous metal fabrications shall comply with Chapter 16 of the North Carolina Building Code. Loading shall be the minimum code requirement for the type indicated, *with 120 m.p.h. wind load with velocity as determined under Section 1606 and ASCE 7-93. Deflection shall be limited to 1/240 of any span at full pressure acting normal to the surface plus product dead load.*

05 58 11.17 Subcontractor.

Miscellaneous metal fabrications shall be engineered, manufactured, fabricated and installed under a subcontract to a single manufacturer regularly involved in the development, fabrication and installation of fabrications of the type indicated.

05 58 11.20 MATERIALS.

Items requiring the listed materials shall conform to the following:

- | | |
|-----------------------------------|------------------------|
| [1] Steel plates, shapes, & bars: | ASTM A-36. |
| [2] Steel pipe: | ASTM A-53 Schedule 40. |
| [3] Cold rolled sheet: | ASTM A-366. |
| [4] Iron castings: | ASTM A-48 Class 30. |
| [5] Nuts & bolts: | ASTM A-307. |
| [6] Lag bolts: | DOC FF B-561. |
| [7] Machine screws: | DOC FF S-92. |

05 58 11.21 Shop Prime Coat.

All miscellaneous metal items constructed of steel shall be shop primed according to manufacturer's standard process or as specified for structural steel.

05 58 11.22 Galvanized Coating.

All miscellaneous metal items constructed of steel and exposed to the weather including but not limited to masonry lintils shall be hot dipped galvanized.

05 58 11.30 FABRICATION05 58 11.31 Standards.

- a. Metal work shall be fabricated by a single firm specializing in this type work in accordance with the standards of American Institute of Steel Construction.
- b. Metal work shall be factory fabricated plumb, square, and true to detail with all faces, coplanar.

05 58 11.32 Fabricated Items.a. Rough Hardware.

Furnish bent or otherwise custom-fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting work, and for anchoring or securing woodwork to structure. Fabricate items to sizes, shapes and dimensions required.

- b. Loose Lintels.
Lintels not otherwise detailed over openings, access ways or for passage of mechanical work shall extend a minimum of 8" into the masonry on each side of the openings. Lintels in masonry work for each 4" of wall thickness shall be steel angles with the horizontal leg 3-1/2" and the vertical leg height and thickness sufficient to provide a section modulus of the member required to support the load involved.
- c. Miscellaneous Framing and Support.
 - 1) Provide steel framing and supports for applications indicated including covered walks; including, but not limited to, stage light brackets, chain hoist rail, refrigeration compressor brackets, railing anchors and electronic hardware supports.
 - 2) Fabricate units to sizes, shapes, and profiles indicated and required to receive adjacent other construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, anchors and similar items.
- d. Bolts and Anchors.
Miscellaneous bolts and anchors not otherwise specified shall be fabricated of ASTM A-36 steel to applicable trade standards. Bolts and anchors for galvanized work shall be galvanized. Devices for nonferrous metal work shall be of same material of the item they serve.

05 58 11.40 EXECUTION

05 58 11.41 Standards.

Metalwork shall be installed in accordance with approved shop drawings and the manufacturer's written installation directives.

05 58 11.42 Installation.

- a. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- b. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- c. Field Welding: Comply with the following requirements:
 - 1) Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2) Obtain fusion without undercut or overlap.
 - 3) Remove welding flux immediately.
 - 4) At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- d. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors.
- e. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

DIVISION 06 CARPENTRY

Includes work by the General Contractors covered in the following sections.
Section designations are neither consecutive nor numerically inclusive.

06 10 00	ROUGH CARPENTRY
06 20 00	FINISH CARPENTRY
06 40 00	ARCHITECTURAL WOODWORK

06 10 00 ROUGH CARPENTRY**06 10 00.10 GENERAL.****06 10 00.11 Work Included.**

Furnish all labor, material, and equipment required for the fabrication and installation of miscellaneous wood framing indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	06 11 00	Wood Framing
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06 10 00.12 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	03 30 00	Cast-In-Place Concrete
Section	04 20 00	Unit Masonry
Subsection	09 22 00	Support Systems
Subsection	10 28 00	Toilet, Bath, and Laundry Accessories

06 11 00.00 WOOD FRAMING**06 11 00.10 GENERAL.****06 11 00.11 Types.**

The following wood framing types are required under this specification:

06 11 13	Common Framing
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06 11 00.12 Reference Specifications.

Structural framing and rough carpentry shall conform to standard practices as set forth by FHA minimum standards for single dwelling units and to Chapter 23 "Wood" and Chapter 16 "Structural Loads" with special attention to Section 1606 "Wind Loads" North Carolina Building Code, latest edition.

06 11 00.13 Submittals.

The Contractor shall furnish supplier's certification of grade of products listed herein.

06 11 00.14 Design Conditions.

Rough framing shall comply with Chapter 16 of the North Carolina Building Code for dead and live loads as pertains to shoring and blocking.

06 11 03.00 COMMON FRAMING**06 11 03.10 GENERAL.****06 11 03.11 Location.**

Common wood framing shall be installed where indicated, for the support of and or attachment of other work elements and in the forming and shoring for installation of cementitious fills and structural components.

06 11 03.20 MATERIALS.**06 11 03.21 Framing Materials.**

Materials shall conform to the following:

[1] Dimension lumber: All lumber to be grade marked S4S; max. moisture content 15%. SPIB#2, KD, shortleaf dimension Southern Pine or WWPA construction MC15, C4S, Douglas Fir. Any dimension lumber permanently incorporated into the work shall be fire retardant treated [FRT].

- 06 11 03.22 Rough Hardware.
Include all anchors, bolts, washers, spikes, screws, nails, wire rods, weights, hooks, hangers, etc., indicated or required to assemble various materials according to details or required by code.
- 06 11 03.23 Framing Accessories.
Hot Dipped Galvanized Sheet Steel [ASTM A653 / A653M high strength low-alloy steel Type A or B w/ G60 coating] fabrications equal to Simpson Strong Tie framing anchors, hangers, or tie downs as indicated, specified, or required by conditions encountered.
- 06 11 03.24 Pressure Treatments.
All lumber in contact metals, concretes, masonry materials, or earth or in connection with roofs, eaves, or cants shall be pressure treated for termite and decay prevention. Brush coat field cuts with same chemical used for treatment.
- (1) Treatment Standard pressure process conforming to: AWWA C2 (lumber) and AWWA C9 (plywood) retention .25 lbs. per cubic foot for Wolman salts. Provide certification of compliance from treatment plant or approved AWWA quality control mark on lumber.
- 06 11 03.30 EXECUTION
- 06 11 03.31 Standards.
- Wood blocking, forming, and shoring framing shall conform to standard practices of the trade and shall be sufficient to support the loads involved.
 - Work shall be done by experienced carpenters; cutting shall be neat and accurate; fitting shall be plumb and square. Wood framing, forming, and blocking shall be closely fitted, well nailed and rigidly secured.
 - Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by code.
 - Provide wood grounds, nailers, blocking and sleepers where shown or required for screening or attachment of other work. Form to shapes and cut as required for true line and level of work to be attached. Coordinate location with other work involved. Attach to substrates as required to support applied loading.
- 06 11 03.32 Wood Blocking.
- Provide blocking between studs to receive anchors for toilet accessories, cabinetwork, and other items indicated or specified to be attached to wall.
- 06 11 03.35 Anchorage.
- Each wood framing and or blocking element shall be firmly anchored to bearing substrates. Anchorage and tying devices shall develop load capacity to conform to project data indicated loads.

06 20 00 FINISH CARPENTRY**06 20 00.10 GENERAL.**06 20 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of exterior finished carpentry, including trim, and other items requiring carpentry trade indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Include installation on exterior of all various items indicated or specified normally requiring the carpentry trade. Subsections forming this specification include the following:

Subsection	06 22 00	Exterior Finish Carpentry
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06 20 00.12 WORK NOT INCLUDED.

Interior and exterior finish carpentry and trim included in Section 06 40 00 Architectural Woodwork.

06 20 00.13 RELATED SECTIONS.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	06 10 00	Rough Carpentry
Section	06 40 00	Architectural Woodwork
Section	07 20 00	Thermal Protection
Section	07 90 00	Joint Protection
Section	09 90 00	Painting and Coatings

06 22 00.00 EXTERIOR FINISH CARPENTRY**06 22 13.00 MILLWORK****06 22 13.10 GENERAL.**06 22 13.11 Location.

Exterior millwork shall be provided as indicated, scheduled or specified. The following types are required under this specification:

Wood Standing and Running Trim

06 22 13.12 Reference Specifications.

Comply with pertinent standards of the:

"Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI), except as otherwise indicated.

06 22 13.14 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

B. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

06 22 13.15 Basis of Design – Manufacturer.

a. Finish carpentry items shall be supplied by a recognized millwork company experienced in projects of this size and type.

- b. Finish lumber and trim shall be mill cut and dressed.

06 22 13.20 MATERIALS.

Materials shall conform to the following:

- [1] Standing and running trim: Southern Yellow Pine, SPIB, KD, B&B, finish S4S in milled to indicated shapes.

06 22 13.21 Preservative Treatment.

- a. Following fabrication, lumber shall be mill treated for decay prevention by "Wood Life" treatment or by 3-minute immersion in a 5% solution of pentachlorophenol. Apply brush coat on cut surfaces in field.
- b. Any wood in contact with concrete or masonry shall be brush treated in the field with an additional application of 5% solution of pentachlorophenol.

06 22 13.22 Miscellaneous Materials.

- [1] Nails DOC FF-N-101, standard steel wire finish nails for lumber and trim. Exterior nails shall be stainless steel.
DOC FF-N-101, 4d copper nails shingle siding.

06 22 13.30 FABRICATION

06 22 13.31 Standards.

Finish Carpentry fabrication and milling shall conform to the following:

Standing and running trim	AWI Sections 300: Custom Grade
Miscellaneous wood work	AWI Sections 700: Custom Grade

06 22 13.32 Fabricated Items.

- a. Before proceeding with fabrication of woodwork required to be fitted to other construction, obtain measurements and verify dimensions and shop drawing details as required for accurate fit.
- b. Finish Carpentry fabrications shall be accurately fabricated in accordance with the details shown on the drawings.
- c. Provide kiln dried (KD) lumber with an average moisture content range of 6% to 11%. Maintain temperature and relative humidity during fabrication, storage and finishing operations so that moisture content values for woodwork at time of installation do not exceed 8% to 13%.

06 22 13.33 Product Delivery, Storage and Handling.

- a. Protect woodwork during transit, delivery, storage and handling to prevent damage, soiling, and deterioration.

06 22 13.34 Tolerances.

Finish Carpentry fabrication and milling shall meet the applicable requirements of AWI paragraphs 300/700-T-1 through 300/700-T-2 for smoothness of materials, tightness and accuracy of assembly and fabrication.

06 22 13.40 EXECUTION

06 22 13.41 Standards.

Finish Carpentry assembly and installation shall conform to the following:

Standing and running trim	AWI Sections 300: Custom Grade
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06 22 13.42 Installation.

- a. All ornamental wood components shall be accurately installed in accordance with the details shown

on drawings. Install the work plumb, level, true and straight with no distortions as required by the indicated AWI Grade. Shim as required using concealed shims.

- b. Prime and back prime exterior ornamental woodwork components prior to installation. Install flashing where required. Apply first coat of finish painting to protect exterior components immediately upon completion of installation.
- c. Scribe and cut work to fit adjoining work, and refinish cut surfaces, or repair damaged finish at cuts.
- d. Ornamental woodwork shall be installed with minimum number of joints possible, using full-length or laminated pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, and comply with indicated quality standards.
- e. All finish wood millwork shall be assembled and installed *without* contact with concrete or masonry materials; provide separator sheets where direct adjacency is indicated or otherwise required. Secure to anchors and other structural components with concealed fasteners and blind nailing as required for a complete installation. Set nailing at slight angles so as to lock in trim members. Use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork, and matching final finish where transparent finish is indicated.
- f. Repair damaged and adjudged defective woodwork wherever possible to eliminate defects functionally and visually. Where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.
- g. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacture with respect to surfaces, sizes or patterns.

06 22 13.43 Tolerances / Testing.

- a. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'0" for plumb and level; with 1/16" maximum offset in revealed adjoining surfaces.
 - b. Finish Carpentry fabrication and milling shall meet the applicable requirements of AWI paragraphs 300/700-T-1 through 300/700-T-2 for smoothness of materials, tightness and accuracy of assembly and fabrication.
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06 40 00 ARCHITECTURAL WOODWORK**06 40 00.10 GENERAL.**06 40 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of interior finished carpentry and architectural woodwork indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	06 41 00	Architectural Wood Cabinetwork
Subsection	06 42 00	Architectural Millwork

06 40 00.12 WORK NOT INCLUDED

Section	10 56 16	Storage Shelving
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06 40 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	07 90 00	Joint Protection
Section	08 14 00	Wood Doors
Section	08 70 00	Finish Hardware
Section	09 90 00	Painting
Division	10	Specialties

06 41 00.00 ARCHITECTURAL WOOD CABINETWORK**06 41 00.10 GENERAL.**06 41 00.11 TYPES.

The following cabinetwork types are required under this specification:

06 41 16	Plastic-Laminate-Clad Cabinets
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06 41 00.12 REFERENCE SPECIFICATIONS.

Comply with pertinent standards of the:

AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI), except as otherwise indicated.

06 41 00.13 SUBMITTALS.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

B. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

06 41 16.00 PLASTIC-LAMINATE-CLAD CABINETWORK

06 41 16.10 GENERAL.06 41 16.11 Location.

Plastic Laminate Clad Cabinetwork shall be provided for spaces indicated, scheduled, or specified

06 41 16.12 Basis of Design – Manufacturer.

Architectural woodwork, interior finish carpentry, and interior millwork items shall be supplied by a recognized millwork company participating in the Architectural Woodwork Institute (AWI).

06 41 16.20 MATERIALS.06 41 16.21 Finish Lumber.

- [1] Exposed trim indicated or specified as hardwood: S4S, KD, clear Birch AWI Custom Grade.
- [2] Concealed lumber or trim not otherwise specified, and concealed members: Douglas Fir or White Pine B & Btr., VG, KD, WWP.

06 41 16.22 Plywood.

- a. Exposed interior plywood shall be sliced Birch conforming to CS 35-61, premium face.
- b. Exposed interior plywood shall be melmine clad. Color shall be light gray.
- c. Concealed interior plywood or interior plywood not otherwise specified shall be INT, DFPA, conforming to specification CS 45-55.

06 41 16.23 Plastic Laminate.

- a. Where plastic tops and sides are shown on cabinets, counters, etc., finish will be plastic laminate NEMA LD-3. Items less than 4' x 12' will have plastic in a continuous member over exposed surface. Outside edge of top shall be fused with beveled edges, routed and filed.
- b. Hardwood edging shall be mitered around all edges and outside corners unless details indicate continuous plastic; in which case, fused and beveled joints shall be made.
- c. Mill veneer to plywood as shown, using glue of manufacturer of the plastic sheet; apply to inside and out side of doors.
- d. Thickness shall be .050" for horizontal surfaces, counter tops, edges, backlash; .030" for counter faces, end panels, doors and other vertical surfaces.

06 41 16.24 Cabinet Hardware.

Furnish following items for conditions encountered.

- [1] Door & drawer pull: Hafele 116.39.464, matte finish, chrome-plated wire pull
- [2] Hinges: Hafele Duo-Matic hinges with Duo-Matic mounting plates with internal spring closure open to 110 or 165 degrees as conditions allow
- [3] Shelf standard & bracket: 3mm. Nickel-plated pin with clear plastic surround, 4 required at each shelf, equal to Hafele 281.40.703.
- [4] Drawer slides: Metal channel type 50 lbs./pr. capacity, 1/2" width nylon rollers; 2 required for each drawer.
- [5] Shelf slides: Metal channel type with full extension lock, 45

lbs./pr, 1/2"± width; 2 required for each drawer.

06 41 16.25 Miscellaneous Materials.

Materials shall conform to the following:

- | | |
|------------|-------------------------------------------------------------|
| [1] Nails | DOC FF-N-101 standard steel wire nails, zinc coated. |
| [2] Screws | DOC FF-S-111 stainless steel Phillips head in exposed trim. |

06 41 16.30 FABRICATION

06 41 16.31 Standards.

Cabinetwork and counter top fabrication shall conform to the following: AWI Section 400

06 41 16.32 Design and Construction Features.

Comply with details shown for profile and construction of architectural woodwork; and, where not otherwise shown, comply with applicable Quality Standards, with alternate details at Fabricator's option.

06 41 16.33 Measurements.

- a. Before proceeding with fabrication of woodwork required to be fitted to other construction, obtain measurements and verify dimensions and shop drawing details as required for accurate fit.
- b. Where sequence of measuring substrate before fabrication would delay the project, proceed with fabrication (without field measurements) and provide ample borders and edges to allow for subsequent scribing and trimming of woodwork for accurate fit.

06 41 16.32 Fabricated Items.

- a. All wood cabinetwork shall be accurately fabricated in accordance with the details shown on drawings. Where an item is not completely described, it will be detailed similar to other related items and furnished same as other related items. Cabinetwork shall be mill assembled as far as practical.
- b. Cabinets and similar items indicated or detailed, but not scheduled or noted as casework, shall be considered cabinetwork under this specification.
- c. Cabinetwork shall conform to AWI standard Custom Grade.

06 41 16.33 Tolerances.

No plywood edge shall be left exposed. Corners will be mitered or edged with clear hardwood or taped with hardwood veneer according to details.

06 41 16.34 Product Delivery, Storage, and Handling.

- a. Protect woodwork during transit, delivery, storage and handling to prevent damage, soiling, and deterioration.
- b. Do not deliver woodwork until wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas.
- c. Maintain temperature and humidity in installation areas as required to maintain moisture content of installed woodwork with a 1.0- percent tolerance of optimum moisture content, from date of installation through remainder of construction period.

06 41 16.40 EXECUTION

06 41 16.41 Standards.

Cabinetwork and counter tops installation shall conform to the following: AWI Section 400

06 41 16.42 Installation.

- a. All wood cabinetwork shall be accurately installed in accordance with the details shown on drawings.
- b. Cabinetwork shall be installed without distortion so that doors and drawers will fit openings properly and be accurately aligned. Adjust hardware to center doors and drawers in openings to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.
- c. Anchor cabinetwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Set nailing at slight angles so as to lock in trim members. Except where prefinished matching fastener heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork, and matching final finish where transparent finish is indicated.
- d. Any wood in contact with concrete floor slab or masonry shall be brush treated with 5% solution of pentachlorophenol.
- e. Scribe and cutwork to fit adjoining work, and refinish cut surfaces, or repair damaged finish at cuts.
- f. Repair damaged and adjudged defective woodwork wherever possible to eliminate defects functionally and visually. Where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.
- g. Protect architectural woodwork during remainder of construction period to insure that work will be without damage or deterioration at time of acceptance.

06 41 16.43 Tolerances.

Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'0" for plumb and level (including counter tops); with 1/16" maximum offset in revealed adjoining surfaces. Counter tops shall be flush across surface

DIVISION 07 MOISTURE PROTECTION

Includes work by the General Contractors covered in the following sections.
Section designations are neither consecutive nor numerically inclusive.

07 10 00	DAMPPROOFING AND WATERPROOFING
07 20 00	THERMAL PROTECTION
07 30 00	WEATHER BARRIERS
07 50 00	ROOFING
07 60 00	FLASHING AND SHEET METAL
07 90 00	JOINT PROTECTION

07 10 00 DAMPPROOFING AND WATERPROOFING**07 10 00.10 GENERAL.**07 10 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of dampproofing and waterproofing indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Coordinate work with other trades. Apply materials only to complete or surfaces ready to receive materials. Subsections forming this specification include the following:

Subsection	07 11 00	Dampproofing
Subsection	07 19 00	Water Repellents

07 10 00.12 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	03 30 00	Cast-In-Place Concrete
Section	04 20 00	Unit Masonry
Section	06 10 00	Rough Carpentry

07 11 00.00 DAMPPROOFING**07 11 00.10 GENERAL.**07 11 00.11 TYPES.

The following dampproofing types are required under this specification:

07 11 19	Building Felt
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07 11 00.12 SUBMITTALS.

A. Shop Drawings:

The Contractor shall furnish manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

07 11 19.00 BUILDING FELT**07 11 19.10 GENERAL.**07 11 19.11 Location.

Building felt shall be provided over surfaces indicated, scheduled, or specified.

07 11 19.20 MATERIALS.

Materials shall conform to the following:

[1] Building Felt:	#30 asphalt/rag felt ASTM D-226-82.
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07 11 19.30 EXECUTION07 11 19.31 Standards.

Installation of bitumen dampproofing shall be in accordance with the manufacturer's standard specification and any written manufacturer's instructions unless otherwise directed in these specifications.

07 11 19.32 Installation.

- a. Following installation of sheathing, apply felt shingle style, starting by lapping 3" minimum over foundation walls below floor level. Staple in place with stainless steel staples at 8" o.c. along the perimeter and 12" o.c. in field. Bed top of each felt in 4" wide stripe of roofing cement.
 - b. Inter-leaf with other flashings as work progresses, forming a water-resistant membrane over the sheathing.
 - c. Where required, apply to masonry surfaces with asphaltic mastic.
 - d. Turn felt 3" into window openings
-

07 19 00.00 WATER REPELLENTS

07 19 23.00 SILOXANE WATER REPELLENT

07 19 23.10 GENERAL.07 19 23.11 Location.

Siloxane water repellent shall be provided over surfaces indicated, scheduled, or specified. Treat all exterior brickwork with transparent dampproofing solution.

07 19 23.12 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

07 19 23.13 Warranty.

Furnish the written warranty of the manufacturer covering retreatment in whole or in part of any portion of masonry surfaces that exhibits defects in application or materials within three years of the date of substantial completion

07 19 23.14 Basis of Design – Manufacturer.

Products of any manufacturer *meeting these specifications* may be installed.

07 19 23.20 MATERIALS.

Materials shall conform to the following:

- | | |
|----------------------|------------------------------------------------------------------------------------------|
| [1] Water repellent: | 8% [by weight] oligomeric siloxane resin solution solution
in mineral spirit carrier. |
|----------------------|------------------------------------------------------------------------------------------|

07 19 23.30 EXECUTION07 19 23.31 Application.

Surface shall receive 2 applications of transparent dampproofing. First coat will be applied by spray, followed double back application by roller. Printed directions of the manufacturer will be explicitly followed for each type of application. Apply after masonry-cleaning operations have been completed. Protect adjacent surfaces from application.

07 19 23.32 Tolerances / Testing.

Treated surface shall fail to show "wetting" and water shall form in droplets which will run off when sprayed with a hose or in rain. Any areas not having these characteristics shall be retreated until this condition is obtained.

07 20 00 THERMAL PROTECTION**07 20 00.10 GENERAL.**07 20 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of thermal protective materials, devices, and systems indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	07 21 00	Thermal Insulation
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07 20 00.12 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	03 30 00	Cast-in-Place Concrete
Section	06 10 00	Rough Carpentry
Section	07 50 00	Roofing

07 21 00.00 THERMAL INSULATION**07 21 00.10 GENERAL.**07 21 00.11 Types.

The following insulation types are required under this specification:

07 21 13	Rigid Insulation
07 21 16	Batt and Blanket Insulation

07 21 00.12 Submittals.

Literature:

The Contractor shall furnish manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

07 21 13.00 RIGID INSULATION**07 21 13.10 GENERAL.**07 21 13.11 Location.

Rigid Insulation shall be provided in spaces indicated, scheduled, or specified.

1. Insulate the exterior walls between the metal skin and the girts.

07 21 13.12 Basis of Design – Manufacturer.

1. Products of the following manufacturers *meeting these specifications* may be installed:

Any manufacturer meeting or exceeding the material specification in 07 21 13.20.

07 21 13.20 MATERIALS.

Materials shall conform to the following:

- [1] Rigid Insulation: 2.1" Isocyanurate foam panels with glass fiber reinforced foil faces ASTM C 1289 Type I Class 1 grade 3 and NFPA 286 [exposed usage] Flame Spread less than 25 per ASTM E84; R=13.3 [k=6.3] per ASTM C518, 4'x8' and 4'x9' as required. Equal to Hunter Xci 286
- [2] Seam Tape: Manufacturer's proprietary tape for seaming between insulation panels.

07 21 13.40 EXECUTION

07 21 13.41 Installation.

Boards shall be placed in close and continuous contact to form a continuous insulating surface between the structural framing system and the metal skin. White foil side shall be exposed to the inside with all seams taped using matching color tape.

07 21 16.00 BATT AND BLANKET INSULATION

07 21 16.10 GENERAL.

07 21 16.11 Location.

Batt Insulation shall be provided in spaces indicated, scheduled, or specified.

1. Insulate the ceiling area (interior) at locations specified.
2. Insulate between studs at locations specified.

07 21 16.12 Basis of Design – Manufacturer.

[1] The following product was used in the development of this project.

Johns Manville

[2] Products of the following manufacturers *meeting these specifications* may be installed:

Owens Corning

Johns Manville

Certain Teed Corporation

07 21 16.20 MATERIALS.

Materials shall conform to the following:

- [1] Glass-fiber batt or blanket: Glass Fiber insulation meeting ASTM C 991 Type I, 48" or 60" widths. Flame Spread 25 or less by ASTM E84. Thickness as indicated.
- [2] Sound attenuation: 4" mineral wool or semirigid fiberglass, ASTM C 665 Type I, noncombustible, in accordance with ASTM E-136, equal to Manville Pyro-Fiber Sound Control Batts.
- [3] Fabric Liner: White coated woven polyethylene fabric, Class A include all strapping, sealing tapes, and fasteners [color matched] to fully support insulation system.

07 21 16.30 EXECUTION

07 21 16.31 Standards.

Comply with approved submittals and manufacturer's written instructions.

07 21 16.32 Installation.

- a. Insulation shall be undamaged, dry, and unsoiled. Insulation shall be immediately placed upon removal from packaging.

- b. Place batt or blanket insulation types in locations as follows:
- | | | |
|-------------------------------|----------------------------------|----------------------------------------------|
| Roof system insulation: | Upper layer: | 3" R=10 min. |
| | Lower layer: | 8" R=25 min. |
| | Thermal Blocks: | 1" min. R=5 |
| | Fabric liner | |
| | System equal to: | Simple Savers System by Thermal Design, Inc. |
| Sound attenuation insulation: | Ceiling [where indicated] | 4" |
| | Interior Walls [where indicated] | 4" [extend to 4" above finished ceilings] |
- c. Roof System: following installation of the steel structure and prior to installation of the metal roof, set thermal blocks and upper insulation layer. Upon completion of roofing and mechanical and electrical rough-in, set lower layer, fabric liner and steel strapping retainer grid. Properly trim and seal liner to structural framing.
- d. Where framing is wood studwork, staple flanges to **face** of studs.
- e. Where framing is metal studwork, tape flanges to **face** of studs.
- f. Lap and tape flanges to provide continuity of the vapor barrier surface toward the inside of the building. Staple in place.
- g. Place sound attenuation insulation in close and continuous contact, fit snugly around all obstructions, lap flanges and caulk edges at floor and ceiling. Cover back of electric boxes.
- h. Maintain 3" minimum clearance around recessed lighting fixtures.
- i. Where insulation closes ventilation pathway at roof eave, place eave ventilation baffles.
- j. Protect insulation and integral vapor retarders from damage due to physical abuse, harmful weather exposures, and other causes. Provide temporary covers or enclosures where insulation is subject to damage or abuse and cannot be protected by permanent construction immediately following installation.

07 30 00 WEATHER BARRIERS**07 30 00.10 GENERAL.**07 30 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of weather barriers [vapor retarders] indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Section	07 31 00	Vapor Retarders
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07 30 00.12 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	02 20 00	Earthwork
Division	03	Concrete
Division	22	Plumbing
Division	23	Heating, Ventilation, and Air Conditioning

07 31 00.00 VAPOR RETARDERS**07 31 16.00 BELOW-GRADE VAPOR RETARDERS****07 31 16.10 GENERAL.**07 31 16.11 Location.

Locate under all new concrete slabs forming interior floors set on grade

07 31 16.12 Types.

The following vapor retarder types are required under this specification:

Reinforced plastic

07 31 16.13 Reference Specifications.

Comply with pertinent standards of the:

ASTM E1745 [performance]

ASTM E1643 [installation].

07 31 16.14 Submittals.

a. Literature:

The Contractor shall furnish manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

b. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

07 31 16.18 Basis of Design – Manufacturer.

a. The following product was used in the development of this project.

Raven Industries – Dura Skrim R Series

b. Products of the following manufacturers *meeting these specifications* may be installed:

Any manufacturer meeting or exceeding the material specification in 07 31 16.20.

07 31 16.20 MATERIALS.

Materials shall conform to the following:

- | | |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| [1] Vapor Retarder: | Heavy duty reinforced scrim laminated between two layers of polyethylene 8 mil. black equal to Dura Skrim R8BBR 12"W min. |
| [2] Sealing Tape and Sealants: | Proprietary products of the manufacturer used to seal seams, punctures, and tears. |

07 31 16.30 EXECUTION

07 31 16.31 Standards.

Installation shall comply with the requirements of the approved shop drawings and manufacturer's written instructions.

07 31 16.32 Installation.

- a. Following installation of compacted subsurface, unroll the vapor retarder running the longest dimension parallel with the direction of the pour and pull open all folds to full width.
- b. Lap the vapor retarder over the foundation work and seal to the vertical foundation surfaces with double-sided tape. Seal around sewer pipes, support columns or any other penetration with manufacturer's recommended sealant to create a monolithic membrane between the surface of the slab and moisture sources below and at the slab perimeter. Pipe boots may be fabricated from the vapor retarder membrane and fastened with double sided tape and/or single sided tape for more demanding applications.
- c. Overlap joints a minimum of 6 inches and seal overlap together with manufacturer's seaming tape. Holes or openings through the vapor retarder should be effectively sealed with an elastomeric sealant to maintain the integrity of the vapor retarder..

07 31 16.33 Protection.

- a. When installing reinforcing steel and utilities in addition to the placement of concrete, take precaution to protect the vapor retarder. Carelessness during installation can damage the most puncture-resistant retarder. Provide for additional protection in high traffic areas.
- b. See Division 03 for specified reinforcing supports. Carefully install supports to protect the vapor retarder from puncture.
- c. Avoid driving stakes through the vapor retarder. If this cannot be avoided, each individual hole must be repaired.

07 50 00 ROOFING**07 50 00.10 GENERAL.**07 50 00.11 Work Included.

Furnish all labor, material, and equipment required for the installation of the complete roofing system indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Furnish and install penetration flashings for mechanical and electrical equipment and accessories penetrating through roofing. Subsections forming this specification include the following:

Subsection	07 51 00	Roofing Insulation
Subsection	07 52 00	Membrane Roofing

00 00 00.12 Work Not Included.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	13 30 00	Special Structures
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07 50 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	05 30 00	Metal Deck
Section	06 10 00	Rough Carpentry
Section	07 60 00	Flashing and Sheet Metal

07 50 00.14 Reference Specifications.

Comply with pertinent standards of the:

"NRCA Roofing & Waterproofing Manual," (latest edition)

"UL Fire Resistance Directory," 1985

07 50 00.15 Design Loads.

Design of the roofing system shall comply with requirements for structural loading found in Chapters 15 and 16 of the North Carolina Building Code as follows:

Occupancy Category Classification: 1

Roof Live Load: 20 psf with a maximum point load of 300 lbs.

Ground Snow Load: 10 psf

Wind Speed: 120 m.p.h. wind load [3 second gust as determined from NCBC Table 1609] with velocity as determined under Section 1606 and ASCE 7-93.

Seismic: See NCBC 2012 Section 1613

Deflections shall not exceed the following: L/240

07 50 00.16 Submittals.

A. Shop Drawings:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities. Shop drawing shall fully indicate the design loading and the layout and attachment of specified materials. Where tapered insulation is specified, the layout of boards [tapered and flat] shall be shown including the

methodology of achieving indicated thickness.

- B. Samples:
Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

07 50 00.17 Defective Work.

The following types of failure will be adjudged as defective work and must be corrected if occurring within the Contractors' Guarantee specified in 07 50 00.17. Once corrective measures are begun, they shall continue to a satisfactory conclusion regardless of the guarantee period. Temporary or short-term repairs shall not relieve the contractor of his responsibility under the guarantee. After repairs, the contractor's obligation under the guarantee shall not be satisfied until the roof has stayed weather tight and without failure until the date of expiration of the guarantee, but in any case not less than 6 months.

- a. Leaking, failure to stay in place.
- b. Splitting; membrane separation, membrane bubbling, membrane shrinkage, separation at seams and attachments; buckling up; tearing.
- c. Metal work: Undue expansion; uplifting; deformation; loosening; and splitting seams.

07 50 00.18 Warranty.

- 1. Certifications:
 - a. The Contractor shall furnish manufacturer's certificates (in duplicate) certifying that the materials provided comply with these specifications. Certification of Independent Testing Laboratories may be required as supporting evidence. Certification shall include the roofing materials specified incorporated in the roofing system.
 - b. The Contractor shall furnish certificates (in duplicate) from the installer certifying that the installation of the roof system comply with these specifications. Certification of Independent Testing Laboratories may be required as supporting evidence. Certification shall include installation of the roofing materials specified and incorporated in the roofing system.
- 2. Contractors Guarantee:
 - a. In addition to the manufacturer's warranty [specified in 07 50 00.17.3 below], the contractor shall furnish a guarantee to the Owner covering complete repair of all defective work and full replacement of all defective materials occurring within five [5] years of the date of final acceptance of the project. Guarantee shall include repair and replacement of ALL WORK damaged due to defects in the roof system.
- 3. Manufacturers' Warranties:
 - a. Membrane [low slope] roofing: Furnish the manufacturer's written warranty including high wind speed coverage for the design wind speed specified in 07 05 00.14, signed and sealed by an authorized agent of the roofing manufacturer covering repair and replacement in whole or in part without monetary limitation any portion of the membrane roofing that exhibits failure in or defects of design, workmanship, or materials within ten [10] years of the date of substantial completion.

07 50 00.19 Final Repairs & Maintenance Materials.

At substantial completion, re-examine each roof membrane and roof accessories, correct any deficiencies including patching of and/or replacement of any part of which may have been damaged in construction operations subsequent to the initial installation. Deliver to the owner:

An amount of TPO roofing and flashing equal to 5% of the materials of the roof area installed.

07 51 00.00 ROOFING INSULATION

07 51 16.00 SUBSTRATE INSULATION

07 51 16.10 GENERAL.07 51 16.11 Location.

Substrate insulation shall be provided over surfaces indicated, scheduled, or specified

07 51 16.12 Types.

The following insulation types are required under this specification:

Low slope roof insulation

07 51 16.20 MATERIALS.

Materials shall conform to the following:

- | | |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] Substrate insulation: | 1" homogeneous expanded perlite board with sealed surface ASTM C-728 compressive resistance 32 psi. R=2.78. |
| [2] Tapered insulation: | Homogeneous expanded perlite board with sealed surface ASTM C-728. Compressive resistance =32 psi minimum. R/in=2.78, slope=¼" per 12" minimum thickness 1. |

07 51 16.30 EXECUTION07 51 16.31 Standards.

Installation of substrate insulation shall be in strict accordance with the approved shop drawings, the manufacturer's standard specification, and any written manufacturer's instructions unless otherwise directed in these specifications.

07 51 16.32 Installation.07 51 16.33 Flat wood & metal decks

Apply tapered substrate insulation boards in patterns indicated over vapor barrier with joints staggered. Keep boards in close and continuous contact. Where insulation exceeds 2-3/4" thickness, apply 2" thick substrate insulation prior to tapered application. Offset vertical joints where multiple layers are installed. Field cuts shall be neat and straight. Following setting of substrate insulation, attach with mechanical fasteners as required to achieve FM-I90 rating.

07 52 00.00 MEMBRANE ROOFING

07 52 19.00 TPO SINGLE PLY ROOFING

07 52 19.10 GENERAL.07 52 19.11 Location.

TPO Single Ply Roofing shall be provided over surfaces indicated, scheduled, or specified.

07 52 19.12 Types.

The following TPO Single Ply Roofing types are required under this specification:

adhered membrane

07 52 19.13 Basis of Design – Manufacturer.

- The following product was used in the development of this project.

Firestone

- Products of the following manufacturers *meeting these specifications* may be installed:

Firestone [TPO]
 GAF [TPO]
 Carlisle SynTec [TPO]

07 52 19.20 MATERIALS.

Materials shall conform to the following:

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] Field base membrane ply: | Heat weldable Thermoplastic PolyOlefin membrane manufactured with a polyester weft reinforcement.
Thickness: 45 mils
Size: 3'-3", 5'-0", 6'-6", or 10'-0" x 100'-0"
Color: White
Equal to Firestone Ultraply TPO Membrane |
| [2] Membrane flashing ply: | Heat weldable Thermoplastic PolyOlefin membrane manufactured with a polyester weft reinforcement.
Thickness: 45 mils
Size: 3'-3" x 100'-0" FIELD CUT TO REQUIRED SIZE
Color: White
Equal to Firestone Ultraply TPO Membrane |
| [3] T-Joint Covers and
Unsupported flashing ply:
[used to flash accessories
where standard
membrane is not
appropriate] | Heat weldable Thermoplastic PolyOlefin membrane unreinforced.
Thickness: 60 mils
Size:
T-Joint Covers: 4"x4"
Unsupported Flashing: 2'-0" x 50'-0"
Color: White
Equal to Firestone Ultraply TPO Unsupported Flashing |
| [4] Adhesive: | Manufacturer's proprietary contact adhesive specifically designed to adhere TPO membranes to substrate surfaces. Equal to Firestone Ultraply TPO Bonding Adhesive. |

07 52 19.30 EXECUTION

07 52 19.31 Standards.

Installation of TPO single ply roofing shall be in strict accordance with the approved shop drawings, the manufacturer's standard specification, and any written manufacturer's instructions unless otherwise directed in these specifications.

07 52 19.32 Surface preparation

- a. Following installation of insulation, wood blocking, wood nailers, and equipment installed by other trades, the surfaces to receive roofing membrane shall be cleaned, made smooth and free of debris, grease or oils.
- b. Any required inspections shall be made following completion of cleaning activities.
- c. Verify that installation of subroofing materials are secure, free of voids, and meet approval agency and or manufacturers requirements.
- d. Verify that all materials are dry and that surface and air temperatures are 40°F or rising prior to installation of roofing products.

07 52 19.33 Field membrane ply application

- a. Unroll base membrane ply on insulation and allow to “relax” a minimum of 30 minutes in place and aligned with laps as required by manufacturer. Layout with start so that the edge lap is centered on the roof drain at low point of the roof. Cut to indicated shapes and slopes with membrane set lapping shingle style from drain to ridges and edges.
- b. Fold back half of the membrane, sweep clean, and apply bonding adhesive with an even uniform film thickness at manufacture’s specified rate to both the substrate and the membrane.
- c. Starting at the fold, roll the sheet over the substrate evenly so as to preclude wrinkles, gaps, or fish-mouths.
- d. Broom in the membrane and repeat the procedure for the other portion of the sheet.
- e. Take care to keep adhesive away from portion of membrane to be seamed. In the event that adhesive laps over seam lap area, fully clean [using manufacturers proprietary cleaning agent] prior to seaming.

07 52 19.34 Seaming.

- a. Clean seam area as directed by manufacturer prior to commencing seaming operations.
- b. Seams shall be field formed as follows:
 - Horizontal Seams: width 1-1/2” using an automatic heat welder
 - Vertical Seams and other seams inaccessible to the automatic heat welder: width 2” using hand held welder
- c. Install T-Joint Patches at all intersections of field seams.
- d. All cut edges with polyester scrim exposed shall be sealed with manufacturers proprietary edge sealant.

07 52 19.35 Vertical and sloped flashing membrane

- a. At perimeter of field membrane, install seam plates and fasteners at 12” oc.
- b. Following installation of field membrane, layout flashing in shape required [2” side and offset laps] and using chalk lines layout laps and cut lines for vertical flashing. Set lap mark 6” inside [toward drain] of vertical or canted surfaces. Hold top edge in place using fasteners and seam plates at 12”oc.
- c. Adhere to wall surface as required in 07 52 19.33 and heat weld seams as required under 07 52 19.34 for seam type encountered.
- d. Heat weld flashing to base membrane from bottom to top, followed by bottom lap roof tie-in according to manufacture’s instructions.
- e. Firmly press in place sealing all voids.

07 52 19.37 Installation at roof edge flashing

- a. Install field membrane as required with roof edges turned back 2’-0”. Lap 2’-0” field membrane on insulation and nailer, then over roof edge and turn down as indicated to form vertical water stop [3” min.] and fasten with roofing nails to horizontal face of nailer.
- b. Install continuous cleat and metal edge to detail over edge membrane. Prime all dissimilar surfaces where required. Set edge metal and bed in sealant to edge membrane and nail in place at 3” oc to upper horizontal face of wood nailer with maximum 2” from outside edge.
- c. Apply adhesive to edge and field membrane [leaving the adhesive off of the portion of the membrane that will rest over the metal edge] and roll field membrane over edge membrane.
- d. Seam the field membrane to the TPO coated metal edge.
- e. Apply decorative edge where required.

07 52 19.40 Tolerances / Testing.

- a. Upon completion, installation shall be smooth, free of air pockets, wrinkles, fish mouths, or tears.

Lap seam lines shall be straight and true with membrane cut to maintain roof geometry.

- b. Test TPO single ply roof for water tightness by flooding with water as directed. If any leaks occur, repair or reconstruct work, repeat test until roofs are made watertight.

07 60 00 FLASHING & SHEET METAL**07 60 00.10 GENERAL.**07 60 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of flashings and sheet metal indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	07 62 00	Architectural Sheet Metal
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07 60 00.12 Work Not Included.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	13 30 00	Special Structures
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07 60 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	06 10 00	Rough Carpentry
Section	08 10 00	Doors and Frames
Section	08 30 00	Specialty Doors and Frames
Section	08 40 00	Entrances, Storefronts, and Curtain Walls
Section	13 30 00	Special Structures

07 62 00.00 ARCHITECTURAL SHEET METAL**07 62 13.00 ARCHITECTURAL SHEET METAL****07 62 13.10 GENERAL.**07 62 13.11 Location.

Architectural sheet metalwork and flashing shall be provided over surfaces indicated, scheduled, or specified.

07 62 13.12 Reference Specifications.

Comply with pertinent standards of the:

Revere Copper Products - "Copper & Common Sense".

07 62 13.13 Submittals.

a. Shop Drawings:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

b. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job. Mockups of each item listed below shall be submitted to the Architect for approval.

07 62 13.14 Inspection.

No metal flashing or any portion thereof shall be covered with any material until the Architect or Engineer has inspected installation. If any material is covered before such inspection, it shall be

uncovered.

07 62 13.15 Defective Work.

Following types of failure will be adjudged as defective work and shall be corrected immediately. Once corrective measures are begun, they shall continue to a satisfactory conclusion regardless of the guarantee period.

- a. Leaking, failure to stay in place.
- b. Undo expansion; uplifting; deformation; loosening; and splitting seams.

07 62 13.16 Subcontractor.

Architectural sheet metalwork and flashing shall be fabricated and installed under a subcontract to a single fabricator regularly involved in the development, fabrication and installation of sheet metalwork of the type indicated.

07 62 13.20 MATERIALS.

Materials shall conform to the following:

- | | |
|----------------|-------------------------------------------------------------------------------------------------|
| [1] Metalwork: | 22 ga. prefinished sheet or roll steel matching the metal siding specified in Section 13 30 00. |
| [2] Nails: | Wood Framing: Stainless steel 4d flat head nails
Metal Framing: Stainless steel pop rivets |
| [3] Sealants: | Caulking and sealants shall conform to Section 07 90 00. |

07 62 13.30 FABRICATION & INSTALLATION

07 62 13.31 Fabricated Items.

07 62 13.32 Masonry Cap Flashing.

Masonry cap flashing shall be shop fabricated to match indicated details and extend back and up into metal wall structure not less than 4" and be fastened to metal siding with color matching pop rivets. The outside edge shall be turned up ½" to form hem. Turn ends up 1" behind the opening's metal jamb trim by special structures subcontractor.

07 62 13.34 Window Sill.

Window sills shall be shop fabricated to detail in two pieces: a continuous lock strip and a flashing cover. The lock strip shall be shop broken to shape and secured to the sub-framing components with stainless steel pop rivets at 4"oc. Fabricate flashing to detail and lock in place over lock strip. Ends shall be turned up 1" to form concealed water dams. Flashing shall extend under the aluminum storefront units and turn up ¾" on the inside between the storefront and the sill. Fabricate corners between water dams and rear turn-up and at the 45° sill bend watertight using bent sheetmetal components, sealants, and stainless steel pop rivets.

07 62 13.38 Cleaning

All metalwork exposed to view shall be cleaned with a strong detergent. Remove all sealants exposed to view.

07 62 13.37 Gutters & Downspouts.

a. Gutter Construction.

1. Gutter shall be formed of specified metal. Braces and anchor straps shall be formed of 20 gauge metal matching specification metal. Ends of each length shall be joined by 1" lapped, riveted and sealed seams. Rivets shall be color matching pop rivets 3/16" in diameter spaced 2" apart minimum.

2. Outer edge of gutter shall be folded over continuous $\frac{3}{4}$ " x $\frac{1}{4}$ " stiffening bar. The top rear edge of the cutter shall terminated in a $\frac{3}{4}$ " fold. Into this fold, engage cleats 16" wide spaced 4 feet apart, nailed to the eave blocking to hang gutter. Hold gutter in place and support with transverse gutter braces and hangers spaced as indicated. Rear edge of gutter shall be at least 1" higher than outer edge of gutter.
 3. Transverse gutter braces 3" wide bent to form a channel 1-1/2" wide with $\frac{3}{4}$ " flanges shall be attached with rivets. Braces shall engage fold and stiffening bar in inner edge of gutter.
- b. Expansion Joints.
Expansion joints shall be provided midway between all outlets and tubes and where ends of gutters abut walls. Ends of each gutter section shall be closed and shall be flanged, riveted and soldered to gutter lining. Top edge of gutter ends shall have horizontal flange 1-1/2" wide for connection to expansion joint cover strip. Expansion joints shall have open space 1" wide between adjacent gutter ends. Loose lock joints shall provide for gutter movement of $\frac{1}{2}$ " in either direction.
- c. Downspouts.
Downspouts shall be rectangular standard shape connected directly to gutter and anchored to wall, terminating with spout above splash block. Outlet tubes or downspouts shall be formed of specified metal, with lock and sealed longitudinal seam. Upper end of tube shall be flanged $\frac{3}{4}$ " and sealed to inside bottom of gutter. Wire basket type strainers shall be provided and set at all outlets.

07 90 00 JOINT PROTECTION**07 90 00.10 GENERAL.****07 90 00.11 Work Included.**

Furnish all labor, material, and equipment required for the fabrication and installation of joint protection materials, devices, and systems indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Clean joints of all residues.

Subsections forming this specification include the following:

Subsection	07 92 00	Joint Sealants
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07 90 00.12 Work Not Included.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	13 30 00	Special Structures
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07 90 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	06 10 00	Rough Carpentry
Section	08 10 00	Doors and Frames
Section	08 30 00	Specialty Doors and Frames
Section	08 40 00	Entrances, Storefronts, and Curtain Walls
Section	13 30 00	Special Structures

07 92 00.00 JOINT SEALANTS**07 92 13.00 ELASTOMERIC JOINT SEALANTS****07 92 13.10 GENERAL.****07 92 13.11 Location.**

Elastomeric joint sealants shall be provided in spaces indicated, scheduled, or specified. Applications occur at the juncture of the following materials:

- [1] Steel Door Frames to Metal Siding and Metal Trim
- [2] Aluminum Window Frames to Metal Siding and Metal Trim
- [3] Aluminum Louver Frames to Metal Siding and Metal Trim
- [4] Interior material junctures as specified

07 92 13.12 Types.

The following condition types are required under this specification:

- Exterior
- Interior

07 92 13.13 Submittals.**a. LITERATURE:**

The Contractor shall furnish manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

- b. Samples:
Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

07 92 13.14 Warranty.

- 1 Furnish the written warranty of the sealant manufacturer covering repair and replacement in whole or in part of any portion of sealants that exhibits defects in material performance and or properties within 20 years of the date of substantial completion.
- 2 Furnish the written warranty of the sealant installer covering repair and replacement in whole or in part of any portion of the sealants that exhibits defects of material workmanship and installation within 2 years of the date of substantial completion.

07 92 13.15 Basis of Design – Manufacturer.

1. Products of the following manufacturers *meeting these specifications* may be installed:

Dow Corning
GE Silicones
NUCO
Tremco

07 92 13.20 MATERIALS.

07 92 13.21 Sealants and Related Materials.

Materials shall conform to the following:

- | | |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] Exterior caulking compound: | ASTM C-920 Type M or S Grade NS Class 25, Exposure Use NT, Substrate Use O, single or multi component silicone, gun consistency, non-sagging type.

Colors – selected from manufacturer's full range of colors. |
| [2] Primer: | Proprietary chemical recommended by the sealant manufacturer required for adhesion of sealant to various substrate materials. |
| [3] Cleaner: | Proprietary cleaner recommended by the sealant manufacturer free of oily residues or other substances capable of staining or harming joint substrates and adjacent substances. |
| [4] Interior caulking: | Nonsag, paintable, nonstaining latex sealant ASTM C 834, Type P, Grade NF |
| [5] Acoustical sealant: | Nonsag, paintable, nonstaining latex sealant ASTM C 834 Type P, Grade NF flame-spread and smoke-developed indexes of less than 25 per ASTM E 84 |

07 92 13.22 Sealant Backings.

Materials shall conform to the following:

1. Cylindrical Sealant Backing: ASTM C1330, Type B, bicellular backer rod. All joints requiring backer rods greater than 3/8" in width.
2. Elastomeric Tubing Backing: ASTM D-1056, neoprene, butyl, EPDM, or silicone tubing. All joints requiring backer rods 3/8" in width or less.

3. Bond-Breaker Tape: Polyethylene or other plastic self adhesive tape recommended by the sealant manufacturer for preventing sealant adhesion to rigid, inflexible joint-filler materials or to joint surfaces at back of joint.

07 92 13.40 EXECUTION

07 92 13.41 Standards.

1. Comply with sealant manufacturer's written instructions for installation of indicated products.
2. Comply with recommendations of ASTM C-1193 for use of sealants with respect to adjoining materials.

07 92 13.42 Installation.

07 92 13.43 General.

- a. All exterior joints where similar or dissimilar materials adjoin in a manner such as to allow the entrance of water or moisture and where indicated on the drawings, shall be fully caulked to effect a watertight seal.
- b. Install sealants only when ambient and substrate temperatures are within limits permitted by manufacturer, but in no case shall sealants be install when temperature is 40 degrees [F] or lower
- c. Install sealants only when surfaces and substrates are dry.

07 92 13.44 Preparation.

- a. Clean substrates as required by the sealant manufacturer.
- b. Prime joint substrates where recommended in writing by the manufacturer of the joint sealant. Apply primer to comply with manufacturer's instruction. Confine primers to areas of sealant bond. Mask adjacent surfaces as required.

07 92 13.45 Sealant Installation.

- a. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths for optimum sealant performance. Backings shall be continuous, and installed without stretch, twist, puncture, or tear.
- b. Install bond-breaker tapes or compounds where sealant backings are not used between sealants and back of joints.
- c. Install sealants complying with following:
 1. Place sealants so they contact and fully wet joint substrates.
 2. Completely fill recesses provide for each joint configuration.
 3. Produce uniform, cross-section and depth relative to width that allows for optimum sealant movement.
 4. Excess materials and smears shall be avoided, but if they occur, they shall be carefully removed without damage to other materials, using solvents available from the products used.
- e. Following sealant application and before skinning or curing begins, tool sealants according to the following requirements:
 1. Remove excess sealants from adjacent surfaces.
 2. Apply tooling agent.

3. Tool joints to indicated configurations in indicated locations, matching profiles for concave, flush, and recessed joints as indicated in ASTM C-1193.
- f. Protect sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion.
- g. Any rough, uneven, or damaged seams shall be removed, cleaned, primed, and recaulked to a state indistinguishable from the original work.

07 92 13.46 Tolerances / Testing.

- a. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
- b. Extent of Testing: Test completed elastomeric sealant joints as follows:
 1. Perform 1 test for each 100 feet of joint length on each floor per elevation.
- c. Test Method: Test joint sealants according to Appendix X1 in ASTM C 1193 as appropriate for type of joint-sealant application indicated.
- d. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements.
- e. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

DIVISION 08 DOORS, WINDOWS, AND GLASS

Includes work by the General Contractors covered in the following sections.
Section designations are neither consecutive nor numerically inclusive.

- 08 10 00 DOORS AND FRAMES
- 08 30 00 SPECIALTY DOORS AND FRAMES
- 08 40 00 ENTRANCES, STOREFRONTS AND CURTAIN WALLS
- 08 50 00 WINDOWS
- 08 70 00 HARDWARE
- 08 80 00 GLAZING
- 08 90 00 LOUVERS AND VENTS

08 10 00 DOORS AND FRAMES**08 10 00.10 GENERAL.**08 10 00.11 Work Included.

Furnish all labor, material, and equipment required to provide doors and frames indicated, specified, or both including all incidental items, and accessories normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	08 11 00	Metal Doors and Frames
Subsection	08 14 00	Wood Doors
Subsection	08 16 00	Composite Doors and Frames

08 10 00.12 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	09 20 00	Lathing, Plastering, and Wall Board Systems
Section	09 93 00	Staining & Transparent Finishes
Section	13 30 00	Special Structures

08 11 00.00 METAL DOORS AND FRAMES**08 11 13.00 HOLLOW METAL DOORS AND FRAMES****08 11 13.10 GENERAL.**08 11 13.11 Location.

Hollow metal doors and frames shall be provided in spaces indicated, scheduled, or specified.

08 11 13.12 Types.

The following hollow metal door and frame types are required under this specification:

Masonry & Exterior Walls:	Fully welded steel doors and frames
Gypsumboard Walls:	Fully welded steel doors and frames

08 11 13.13 Reference Specifications.

Comply with pertinent standards of the:

Steel Door Institute
"Standard Specification for Hollow-Metal Doors & Frames"
SDI-100.

Underwriters Laboratories
"Fire Test of Door Assemblies"

National Fire Protection Association [NFPA]
Fire Rated Assemblies: NFPA 80
Smoke Control Assemblies: NFPA 105

08 11 13.14 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

08 11 13.15 Warranty.
Furnish the written warranty of the hollow metal frame manufacturer covering repair and replacement in whole or in part of any portion that exhibits defects of design, workmanship, or materials within one [1] year[s] of the date of substantial completion

08 11 13.16 Design Conditions.
Hollow metal frames shall comply with the loading requirements of Chapter 16 of the North Carolina Building Code.

08 11 13.17 Subcontractor.
Hollow metal frames shall be engineered, manufactured, and fabricated under a subcontract to a single manufacturer regularly involved in the development, fabrication and installation of hollow metal work of the type indicated.

08 11 13.18 Hardware.
Frames shall be prepared at the factory to receive hardware as specified in Section 08 70 00. Templates provided by hardware supplier. Comply with applicable requirements of the ANSI A 115 series specifications for door and frame preparation for hardware

08 11 13.19 Basis of Design – Manufacturer.
Products of the following manufacturers *meeting these specifications* may be installed:

Ceco Door Products
Republic Builders Products
Curries Company
Steelcraft

08 11 13.20 MATERIALS.
Door and frames shall conform to HMMA guide specification 861 for commercial doors and frames as modified in the following table:

[1] Sheet Steel:	ASTM A366	Frames:	16 ga.
[2] Reinforcing:	ASTM A366 & A36	Frames:	10 ga.
		Hardware:	3/16" plate
[3] Anchorage:	ASTM A366	Jamb:	14 ga.
		Floor:	12 ga.
[4] Glazing Stops:	ASTM A366		18 ga.

08 11 13.30 FABRICATION

- 08 11 13.31 Standards.
- a. Hollow-metal work shall be fabricated by a single firm specializing in this type work in accordance with the standards of the Steel Door Institute. Frames for doors designated as "UL Labeled" constructed to conform the Underwriters Laboratory specifications and so labeled to meet or exceed the hour rating scheduled.
 - b. Where fire-rated UL label doors are scheduled, provide hollow-metal door and frame meeting ASTM E-152 and so labeled for the specified time interval. Assembly and installation shall comply with NFPA-80. Doors and frames shall conform to all other requirements of this section.
 - c. Doors and frames shall be factory fabricated plumb, square, and true to detail with all faces, coplanar. Following fabrication, frames will be disassembled into components for ease of transport.

08 11 13.32 Fabricated Items.

- a. Frames.

1. Frames, stops, mouldings, and other miscellaneous frame items shall be constructed of tabular indicated gauge cold-rolled sheet steel by width, depth and section indicated. Units shall be factory engineered with integral transoms and sidelights as indicated. Frames shall be straight, plumb, true, square, and coplanar, accurately formed to indicated profiles and shapes with minimum radius for the thickness of metal specified.
2. Miter, reinforce and internally weld corners. Reinforcing plates shall be not less than tabular indicated steel gauge for frame assembly reinforcement and not less than tabular indicated steel plate for hinges and closers. Where frames are fabricated in sections due to shipping or handling requirements, provide alignment plates or angles at each joint, fabricated of the same thickness metal as the frames.
3. Welding – Welds shall be ground smooth, filled, dressed and made smooth, flush, and invisible.
4. Anchorage - Provide not less than three adjustable anchor devices on each jamb. Anchor frames to rough floor construction by clip angle on back of frame bolted or welded to floor construction. Use galvanized anchors on exterior frames.
5. Silencers - Punch frames and equip with three rubber silencers on jamb strikes.
6. Glazing Stops - Provide cold rolled channel-type 18-ga. steel glazing stops held in place with oval-head Phillips screws. Stops shall be provided for all openings where fixed panels, display panels or glazing is indicated. Stops shall be straight, plumb, true, square, and coplanar.

b. Hollow Metal Doors.

1. Flush Seamless Type – Doors shall be flush seamless construction 1-3/4" thick with solid insulation fill. Face sheets shall be #18 ga. steel faces lock and hinge. Edges shall have a smooth, unbroken surface with top and bottom edges closed flush. Integral construction shall be not less than 18 ga. with 3/16" plate reinforcement for closers and 14-ga. reinforcement for other hardware. All construction shall be welded. Provide factory fabricated openings as indicated and specified. Provide weeps for exterior doors.
2. Insulation - Sound deadening shall be rock wool, insulite or other noncombustible standard product of the manufacturer whose door is used.

c. Hardware.

Each door assembly shall be furnished and reinforced to receive hardware listed for the respective opening in Section 870.

d. Finish.

1. Interior - Factory finish with rust inhibiting, bonderized primer, oven dried after fabrication.
2. Exterior - Factory finish with baked-enamel primer over galvanized 1.25, G-60 class coating ASTM A 525.

08 11 13.33 Tolerances.

Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames

08 11 13.40 EXECUTION

08 11 13.41 Standards.

- a. Comply with approved shop drawings and the provisions of SDI-105 "Recommended Erection Instructions for Steel Frames," unless otherwise indicated.
- b. Install fire-rated frames in accordance with NFPA Std. No. 80

08 11 13.42 Installation.

a. Frames.

1. Place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumb, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
2. Grout solid all hollow-metal frames set in masonry or attached to concrete.
3. Where frames are fabricated in sections due to shipping or handling limitations, field splice at approved locations by continuously welding face joint; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
4. Install frames with removable glazing stops located on secure side of opening.
5. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
6. Anchorage:
 - i. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with post installed expansion anchors
 - ii. Masonry and Concrete Walls: Coordinate installation of frames and anchors [strap, wire, or other indicated or specified] to allow for solidly filling space between frames and masonry with mortar as specified in Division 04.
 - iii. Metal-Stud Partitions: Coordinate installation of frames and anchors to allow solidly packed mineral-fiber insulation behind frames.
 - iv. Ceiling Struts: Extend struts vertically from top of frame at each jamb to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable wedged or bolted anchorage to frame jamb members.

b. Doors.

1. Fit hollow-metal doors accurately in frames, within clearances specified in SDI-100.

c. Adjusting and Cleaning.

1. Final Adjustments: Check and adjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including standard steel doors or frames that are warped, bowed, dented, or otherwise unacceptable.
2. Clean grout and other bonding material off standard steel doors and frames immediately after installation.
3. Finish Touchup: Clean abraded areas and repair with primer or galvanizing touchup paint according to manufacturer's written instructions.

08 11 13.43 Tolerances / Testing.

Adjust standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:

- a. Squareness: Plus or minus 1/16 inch measured at door rabbet on a line 90 degrees from jamb

perpendicular to frame head.

- b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
- c. Twist: Plus or minus 1/16 inch measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
- d. Plumbness: Plus or minus 1/16 inch measured at jambs at floor.
- e. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c., and not more than 2 inches o.c. from each corner. Stops deformed as a result of overtightening of screws shall be replaced.

08 14 00.00 WOOD DOORS

08 14 00.10 GENERAL.

08 14 00.11 Types.

The following wood door types are required under this specification:

08 14 16 Flush Panel Wood Doors

08 14 00.12 Reference Specifications.

Comply with pertinent standards of the:

Architectural Woodwork Institute

"Architectural Woodwork Quality Standards" latest edition.

Section 1300

NWWDA "Industry Standard for Wood Flush Door"

Underwriters Laboratories

"Fire Test of Door Assemblies"

National Fire Protection Association [NFPA]

Fire Rated Assemblies: NFPA 80

Smoke Control Assemblies: NFPA 105

08 14 00.13 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturer's literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

B. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

08 14 00.14 Warranty.

Furnish the written warranty of the door manufacturer covering repair and replacement in whole or in part of any portion of any wood door that exhibits defects of design, workmanship, or materials as follows:

- a. Exterior Doors [Solid-Core, and Stile and Rail] : Five years.
- b. Interior Doors [Solid-Core, and Stile and Rail]: Life of installation.
- c. Hollow-Core Interior Doors: Two years.

08 14 00.15 Design Conditions.

Wood doors shall comply with the structural requirements of Chapter 16 of the North Carolina Building Code.

008 14 0.16 Subcontractor.

Wood doors shall be engineered, manufactured, and fabricated under a subcontract to a manufacturer regularly involved in the development and fabrication of wood doors of the type indicated.

08 14 00.17 Environmental Conditions.

Prior to the delivery and installation of wood doors, the following conditions shall apply:

1. The structure shall be enclosed with wet work complete and the HVAC system operating and maintaining temperature and relative humidity levels.
2. Temperature range: 60°F to 90°F.
3. Relative humidity range: 50% to 65%.

08 14 16.00 FLUSH PANEL WOOD DOORS**08 14 16.10 GENERAL.**08 14 16.11 Location.

Flush panel wood doors of the following types shall be provided in spaces indicated, scheduled, or specified.

1. Solid Core

08 14 16.12 Basis of Design – Manufacturer.

1. The following product was used in the development of this project.

Eggers Industries

2. Products of the following manufacturers *meeting these specifications* may be installed:

Ampco Products, Inc.
Alcoma Hardwoods, Inc.
Eggers Industries
Mohawk Flush Doors, Inc.
Weyerhaeuser Company

08 14 16.20 MATERIALS.

Flush doors shall conform to the following tabular values:

		Solid Core
[1]	AWI Specification:	SLC-5ME
[2]	AWI Grade:	Premium
[3]	Door Thickness:	1-3/4" unless noted scheduled otherwise
[4]	Core:	Staved Lumber
[5]	Finish	Transparent
[6]	Veneer Face:	Grade A or Better Birch
[7]	Veneer Cut:	Plain Sliced
[8]	Veneer Match:	Book Match
[9]	Assembly Match:	Center
[10]	Vertical Edges:	Match Face Veneer
[11]	Machining:	Field Machined except where required by UL for labeling requirements
[12]	Finishing:	Field Finished See Section990
[13]	Warp:	Maximum allowable = 1/8"

[14]	Label	None Required
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08 14 16.30 FABRICATION

08 14 16.31 Standards.

- a. Flush panel wood doors shall be fabricated by a single firm specializing in this type work in accordance with the standards of the Architectural Woodwork Institute. Doors designated as "UL Labeled" shall be constructed to conform the Underwriters Laboratory specifications and so labeled to meet or exceed the rating scheduled.
- b. Where fire-rated UL labeled doors are scheduled, assembly and installation shall comply with NFPA-80. Doors and frames shall conform to all other requirements of this section.
- c. Doors shall be factory fabricated plumb, square, and true to detail with all faces, coplanar.

08 14 16.32 Fabricated Items.

- a. Fabricate doors in sizes indicated on schedule. Include scheduled, indicated, and specified transoms, trim, and fittings. Doors shall be fully coplanar, without warpage or show-through of core or bands. Apply any detailed trim.
- b. Where trim is indicated as continuing from door to transom, maximum allowable offset is 1/32".
- c. Factory fit doors to clearance requirements for indicated AWI Specification. Comply with clearance requirements in NFPA 80 for fire rated doors.
- d. Fabricate transom and side panels same as door. Provide clip angle support concealed from face of door on bottom of transom or side panel and attach edges with concealed transom plugs or blind face nailing.
- e. Cut and trim openings [glazed view panels and / or louvers] through doors as indicated. Where door is labeled, comply with rating requirements.

08 14 16.40 INSTALLATION.

08 14 16.41 Standards.

Doors shall be installed in accordance with approved shop drawings and the manufacturer's written installation directives. Where fire rated doors are installed, comply with the requirements of NFPA 80.

08 14 16.42 Protection

Store doors flat with free air movement in dry areas. Doors shall be wrapped or otherwise protected from dirt and handprints after hanging and before finishing.

08 14 16.43 Hanging.

- i. Doors shall be hung plumb and neatly fitted in frames according to AWI standards. Transom panels shall be held in place by concealed anchors. Joint in panels above double doors will be splined. Bevel edges 1/8" in 2" clearances; heads and jambs 1/8"; meeting stiles 1/16", 1/8" over flush floor, 1/4" over thresholds. Bevels and clearances shall be uniform throughout the project.
- ii. Provide the following clearances:
 - 1/8" at heads, jambs, and between pairs of doors.
 - 1/8" from finished floor to bottom of door.
 - 1/4" from top of threshold to bottom of door.

08 14 16.44 Hardware.

Install hardware scheduled in Section 08 70 00 according to manufacturer's directions.

08 14 16.45 Louvers.

Install louvers as specified in Section 08 90 00.

08 14 16.43 Tolerances / Testing.

Fully align doors with frames with margins indicated in 08 14 16.43. Doors and frames shall be coplanar, square, and without warpage or scratches and shall swing and operate freely.

08 30 00 SPECIALTY DOORS AND FRAMES**08 30 00.10 GENERAL.****08 30 00.11 Work Included.**

Furnish all labor, material, and equipment required for the fabrication and installation of ----- indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	08 31 00	Access Doors and Panels
Subsection	08 33 00	Coiling Doors

08 30 00.12 Work Not Included.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section
Section
Section

08 30 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	06 40 00	Architectural Woodwork
Section	08 14 00	Wood Doors
Section	08 70 00	Hardware

08 31 00.00 ACCESS DOORS & PANELS**08 31 13.00 ACCESS DOORS****08 31 13.10 GENERAL.****08 31 13.11 Location.**

- a. Furnish access doors in masonry, drywall, stucco and acoustic tile surfaces where indicated or proper size to service items to be accessed.
- b. See mechanical drawings for locations of access panels to mechanical equipment.

08 31 13.12 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	04 20 00	metal Unit Masonry
Section	09 20 00	Lathing & Plastering
Section	09 29 00	Gypsum Drywall
Section	09 50 00	Ceilings
Division	22	Plumbing
Division	23	Heating, Ventilation, & Air Conditioning
Division	26	Electrical

08 31 13.13 Submittals.

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections

and size. The Contractor shall be responsible for dimensions and quantities.

- a. Samples:
Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

08 31 13.14 Basis of Design – Manufacturer.

1. Products of the following manufacturers *meeting these specifications* may be installed:

Barco Access Doors
J. L. Industries
Karp Associates
Larsen's Manufacturing Company
Milcor Limited Partnership.
Nystrom Building Products

08 31 13.20 MATERIALS.

Materials shall conform to the following:

- | | |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] Steel Plate, Shapes, & Bars: | ASTM A36. |
| [2] Steel Sheet: | Commercial Steel of the following types:
Hot Rolled Steel Sheets: ASTM A569
Cold-Rolled Steel Sheets: ASTM A 366 or ASTM A620 Drawing Steel
Electrolytic Zinc-Coated Steel Sheet: ASTM A591 with Class C coating and phosphorus treatment preparation for painting.
Metallic-Coated Steel Sheet: ASTM A653 |
| [3] Stainless Steel Strip, Plate, and Flat Bars: | ASTM A666 Type 304. . |
| [4] Stainless Steel Bars & Shapes: | ASTM A276 Type 304. |
| [5] Aluminum Extrusions: | ASTM B 221, alloy 6063-T6. |
| [6] Aluminum Sheet: | ASTM B 209 alloy recommended by producer for use and finish with minimum properties equal to or greater than 5005-H15. |

08 31 13.30 DOOR TYPES & FABRICATION.

08 31 13.33 Drywall Ceiling & Walls.

- a. Frame: 16 ga. formed sheet steel with 24 ga. galvanized corner bead all around.
- b. Door: 14 ga. formed sheet steel with recessed pan for installation of drywall surfaces by others. All edges square.
- c. Finish: Manufacturer's standard metal primed coat finished ready for finish painting.
- d. Hinges: Fully concealed pivot rod hinge [piano hinge].
- e. Latch: Flush screwdriver operated stainless steel cam.
- f. Locations: Unrated drywall walls and ceilings.
- g. Minimum Size: 14" x 14"

08 31 13.34 Acoustical Tile Access.

- a. Frame: 16 ga. formed sheet steel. All edges square.

- b. Door: 14 ga. formed sheet steel with recessed pan for installation of acoustic tile surfaces by others. All edges square.
- c. Finish: Manufacturer's standard metal primed coat with baked on white enamel finish coat.
- d. Hinges: Fully concealed continuous pivot rod hinge [piano hinge].
- e. Latch: Flush screwdriver operated stainless steel cam.
- f. Locations: Unrated acoustic tile ceilings.
- g. Minimum Size: 24" x 24"

08 31 13.40 EXECUTION

08 31 13.41 Locations.

- a. General-purpose access doors are indicated and sized on the architectural drawings.
- b. See plumbing, mechanical, and electrical drawings for equipment access, valves, junction boxes, and accessory items requiring access doors. When no requirements are indicated, the following locations at a minimum require access doors. The General Contractor shall be responsible for full coordination of location of access doors and access door sizes for the aforementioned equipment access.
 - 1 door to each plumbing chase.
 - 1 door to each in-wall valve.
 - 1 door to each mechanical unit located above ceilings for access to fans and for access to filters.
 - 1 door to each electrical junction box otherwise inaccessible located behind or above gypsum drywall walls or ceilings.

08 31 13.42 Installation.

- a. Install access doors in accordance with manufacturer's printed instructions and shop drawings set. Securely attach to adjacent structure as required for each door and wall type.
- b. Set doors level, plumb, and true. Upon completion, doors and frames shall be fully coplanar and aligned with the surface in which the unit is set.
- c. Adjust operating hardware to ensure proper operation.
- d. Where required, caulking shall be done in such a manner to make a neat, clean, and watertight connection to other work. See Section 790 Caulking and Sealants.

08 33 00.00 COILING DOORS

08 36 13.00 OVERHEAD COILING DOORS

08 36 13.10 GENERAL.

08 36 13.11 Location.

Overhead coiling doors shall be furnished and installed where indicated, scheduled, or specified and shall be furnished complete with all equipment, hangers, weatherstripping, and controls required for the operations indicated.

08 36 13.14 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

08 36 13.15 Warranty.
Furnish the written warranty of the door manufacturer covering repair and replacement in whole or in part of any portion of sectional doors that exhibits defects of design, workmanship, or materials within ----- years of the date of substantial completion

08 36 13.16 Design Conditions.
Overhead coiling doors shall comply with Chapter 16 of the North Carolina Building Code. Loading shall comply with dead load, wind load and snow loading and combinations as defined in the aforesaid chapter, *with-the wind speed and load as determined under Section 1606 and ASCE 7-93. Deflection shall be limited to 1/240 of any span at full pressure acting normal to the surface plus product dead load.*
Wind speed for this portion of Craven County is 120 mph.

08 36 13.17 Subcontractor.
Overhead coiling doors shall be engineered, manufactured, fabricated and installed under a subcontract to a single subcontractor representing a manufacturer regularly involved in the development, fabrication and installation of doors of the type indicated.

08 36 13.18 Basis of Design – Manufacturer.
1. The following product was used in the development of this project.
Overhead Door Corporation: Stormtite 780CD
2. Products of manufacturers *meeting these specifications* may be installed.

08 36 13.20 MATERIALS.

Materials shall conform to the following:

- | | |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] Coiling Doors: | Door Assembly: Metal slat construction.
c. Curtain Steel: 26 gauge, galvanized flat profile.
d. End Stiles: 16 gauge with thermal break.
e. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated. R-value of 10.9.
f. Finish and Color: Two coat baked-on polyester:
Color: to be selected from manufacturer's standard color palette.
g. Wind load Design: Provide to meet the Design/Performance requirements specified.
h. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
i. Lock: Keyed lock
j. Weatherstripping:
Bulb-type strip at bottom section.
Flexible Jamb seals.
Flexible Header seal. |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- | | |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [2] Track: | Chain Hoist Operation
Manufacturer's standard galvanized steel track with brackets, frames, counterbalance, and other devices required for the proper operation of upward acting door. |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- | | |
|---------------|--------------------------------------------------------------------------------------------------------------|
| [3] Hardware: | Hinges, neoprene tire rollers, and other devices required for the proper operation of overhead coiling door. |
|---------------|--------------------------------------------------------------------------------------------------------------|

08 36 13.30 EXECUTION.

08 36 13.31 STANDARDS.
Install overhead coiling doors and track in accordance with approved shop drawings and the

manufacturer's printed instructions.

08 36 13.32 INSTALLATION.

1. Installation shall be by an authorized installer/supplier of the manufacturer whose product is used. Mechanics shall be factory trained and familiar with the type of installation required. In place, the door shall operate smoothly without binding.
2. Installation of door, track, and operating equipment shall be complete with all necessary hardware, jamb and head molding strips, anchors, inserts, hangers, and equipment supports.
3. All work shall be neatly fitted. Miters shall be accurate and true. Joints shall be neat and close fitting. All work shall be plumb and square. No scratched, dented, or damaged articles will be incorporated in the building.
4. Fasten vertical track assembly to framing, spaced not less than 24 inches apart. Hang horizontal track from structural overhead framing with angle or channel hangers fastened to framing by welding or bolting or both. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.
5. Lubricate and adjust doors and operators to operate easily, free from warp, twist, or distortion and with weather-tight fit around entire perimeter.
6. Touch-up paint: Clean field welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A 780.

08 36 13.33 TOLERANCES.

Installation shall comply with the manufacturer's shop drawings and installation instructions, but in no case shall exceed the tolerance listed below:

Plumb and level : 1/8" in 10'-0"

08 40 00 ENTRANCES, STOREFRONTS, AND CURTAIN WALLS**08 40 00.10 GENERAL.****08 40 00.11 Work Included.**

Furnish all labor, material, and equipment required for the fabrication and installation of framed glazed assemblies indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Section	08 41 00	Storefronts
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08 40 00.12 Work Not Included.

Glazing of items specified in Section 08 80 00.

08 40 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	08 70 00	Finish Hardware
Section	08 80 00	Glazing
Section	13 30 00	Special Structures

08 41 00.00 STOREFRONTS**08 41 00.10 GENERAL.****08 41 00.11 Types.**

The following storefront types are required under this specification:

Section	08 41 13	Aluminum Framed Storefronts
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08 41 00.12 Reference Specifications.

Comply with pertinent standards of the:

Architectural Aluminum Manufacturers Association
"Metal Curtain Wall, Window, Store Front & Entrance Specification Manual"

08 41 00.13 Submittals.**1. Shop DRAWINGS:**

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

2. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

08 41 00.14 Warranty.

Furnish the written warranty of the manufacturer covering repair and replacement in whole or in part of any portion of the storefront[s] that exhibits defects of design, workmanship, or materials within ten [10] years of the date of substantial completion. Such defects include, but are not limited to, the following:

- Structural failures including, but not limited to, excessive deflection.
- Noise or vibration caused by thermal movements.
- Deterioration of metals, finishes, and or other materials beyond normal weathering.
- Adhesive or cohesive sealant failures.
- Water leakage through fixed glazing and framing areas.

Failure of operating components to function properly.

08 41 00.15 Design Conditions.

Design of the roofing system shall comply with requirements for structural loading found in Chapters 15 and 16 of the North Carolina Building Code as follows:

Occupancy Category Classification: 1

Wind Speed: 120 m.p.h. wind load [3 second gust as determined from NCBC Table 1609] with velocity as determined under Section 1606 and ASCE 7-93.

Seismic: See NCBC 2012 Section 1613

08 41 00.16 Hardware.

Doors and frames shall be prepared at the factory to receive hardware as specified in Section 870. Templates provided by hardware supplier. Comply with applicable requirements of the ANSI A 115 series specifications for door and frame preparation for hardware.

08 41 00.17 Subcontractor.

Storefronts shall be engineered, manufactured, fabricated and installed under a subcontract to a single installer/manufacture regularly involved in the development, fabrication and installation of storefronts of the type indicated.

08 41 13.00 ALUMINUM FRAMED STOREFRONTS

08 41 13.10 GENERAL.

08 41 13.11 Location.

Aluminium framed storefronts shall be provided for spaces indicated, scheduled, or specified in the following types:

Glazed Doors

08 41 13.12 Basis of Design – Manufacturer.

a. The following product was used in the development of this project.

Manufacturer	Frames	Doors
YKK AP America Inc.	YES 45TU	35D with Mid Panel panic device

b. Products of the following manufacturers *meeting these specifications* may be installed:

Manufacturers	Frames	Doors
YKK AP America Inc.	YES 45TU	35D with Mid Panel panic device
Kawneer Company, Inc. [an Alcoa company]	TRIFAB 451T	350 with Panel Line exit devices
Oldcastle [formerly Vistawall]	SERIES 3000-S	375 Series with In-Line Panic device
U. S. Aluminum Corp.	SERIES IT451	Model 400 with Mid Panel panic device

08 41 13.20 MATERIALS.

Materials shall conform to the following:

[1] Aluminum Extrusions: ASTM B211, 6063 – T5.

[2]	Sheet Aluminum:	ASTM B209, 3003 – H14 .080”.
[3]	Fasteners: concealed exposed.	Stainless steel Hardened aluminum alloys or AISI 300 series stainless steel.
[4]	Glass.	See Sect. 08 80 00
[5]	Glazing Accessories:.	Setting blocks, edge blocks, and spacers meeting ASTM C 864.
[6]	Wire cloth:.	18x14-mesh .012 aluminum insect screen held in place with mfg.’s standard vinyl and/or aluminum retention stops.

08 41 13.21 Doors, Frames & Operable Sash.

Sections shall be 6063-T5 aluminum alloy extrusions minimum thickness ~1/8" thick with bolted and welded joints. All connections shall be concealed. Comply with ASTM B 221 for extrusions and ASTM B 209 for sheet or plate. Furnish and install insect screening for all operable vents.

08 41 13.22 Hardware.

- a. Each door assembly shall be furnished and reinforced to receive hardware listed for the respective opening in Section 08 70 00. In addition, the following manufacturer's standard items shall be furnished.

Mfg.'s. Standard Offset Pivot Package with optional Standard Intermediate Pivot equal to YKK H-2100 and H-2200 series for the handing required.

Mfg.'s 1" diameter push and pull bars equal to YKK H-1104

Mfg.'s. standard built into door panic device with concealed rods. [glazed doors only]

- b. Pushes, pulls, closer arms and panic devices shall be attached with hex nuts and washers.
c. Operable sash shall complete with manufacturers standard concealed stainless steel hinges, strikes, and operators.

08 41 13.23 Finish.

All aluminum surfaces of doors, frames and hardware shall be fluoropolymer finished meeting AAMA 2605 [Kynar finish]. See the Interior Finish Schedule for colors and color locations.

08 41 13.30 FABRICATION

08 41 13.31 Standards.

- a. Entrance work shall be fabricated by a single firm specializing in this type work in accordance with the standards of the AAMA Specifications for Aluminum Structures.
b. Entrance work shall be factory fabricated in accordance with the approved shop drawings.

08 41 13.32 Fabricated Items.

Doors and frames shall be factory fabricated plumb, square, and true to detail with all faces coplanar. Following fabrication, frames will be disassembled into components for ease of transport.

08 41 13.33 Glazed Doors & Frames.

- a Doors shall be 1-3/4" depth by **medium width stile nominal 3-1/2"** with fiber stile weather-stripping. Reinforce with concealed tie rods. Bottom rail shall be 7-1/2" minimum meeting the requirements of the NC Accessibility Code and the ADA.
b Frames shall be 4-1/2" deep tubular sections thermally broken by width indicated. Sections shall be

full size unless otherwise indicated. Combinations of narrower tubular sections to achieve indicated widths will not be accepted.

- c Glazing stops shall be extruded into the door or frame with neoprene or EPDM insert for puttyless glazing.
- d Doorstop shall be extruded aluminum with a continuous vinyl insert for weatherproofing and sound deadening.
- e Fastening screws shall be flat Phillips head stainless steel for countersunk installation.

08 41 13.34 Tolerances.

Manufacturing tolerances shall comply with the following:

Material Cuts :	Square to 1/32" over largest dimension; proportionate amount of 1/32" on the two dimensions.
Maximum Offset:	1/64" in alignment between adjacent members
Maximum Offset:	1/64" between framing members at glazing pocket corners.
Joints:	Hairline and square to adjacent member.
Variation:	1/16" in squareness of doors and frame assemblies
Flatness:	± 1/16" off neutral plane.

08 41 13.40 EXECUTION

08 41 13.41 Standards.

Comply with approved shop drawings and manufacturer's written installation instructions.

08 41 13.42 Installation.

- a. All entrance work shall be installed by skilled mechanics to best trade standards. Miters shall be accurate and true. Joints shall be neat and close fitting. All work shall be plumb and square.
- b. Paint all surfaces of dissimilar metals in contact with each other or aluminum in contact with masonry one coat of bituminous-base aluminum paint.
- c. Install hardware specified for opening in this section and Section 08 70 00.
- d. See other sections of the specifications for glazing methods and materials.
- e. Exterior caulking shall be done in such a manner to make a neat, watertight connection to other work. Concealed caulking shall be applied to field joints and framework. See Section 07 90 00 Caulking & Sealants.

08 41 13.43 Cleaning.

Clean complete system inside and outside. Remove excess sealants, glazing compounds, dirt or other substances.

08 41 13.44 Tolerances / Testing.

- a. Installation shall comply with the tolerances indicated in 08 41 13.35.
- b. After glazing, the exterior doors and frames shall be subjected to a medium force, fine hose spray for 15 minutes to determine if it is watertight. Any leakage shall be corrected if necessary, removing the frames or parts thereof and reassembling with sealants and concealed caulking beads.

08 50 00 WINDOWS**08 50 00.10 GENERAL.**08 50 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of windows indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	08 51 00	Metal Windows
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08 50 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	07 92 00	Joint Sealants
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08 51 00.00 METAL WINDOWS**08 51 00.10 GENERAL.**08 51 00.11 Types.

The following storefront types are required under this specification:

Section	08 51 13	Aluminum Windows
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08 51 00.12 Reference Specifications.

Comply with pertinent standards of the:

Architectural Aluminum Manufacturers Association

08 51 00.13 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

B. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

08 51 00.14 Warranty.

Furnish the written warranty of the manufacturer covering repair and replacement in whole or in part of any portion of the window[s] that exhibits defects of design, workmanship, or materials within ten [10] years of the date of substantial completion. Such defects include, but are not limited to, the following:

- a. Structural failures including, but not limited to, excessive deflection.
- b. Deterioration of metals, finishes, and or other materials beyond normal weathering.
- c. Adhesive or cohesive sealant failures.
- d. Water leakage through fixed glazing and framing areas.
- e. Failure of operating components to function properly.

08 51 00.15 Design Conditions.

Design of the roofing system shall comply with requirements for structural loading found in Chapters 15 and 16 of the North Carolina Building Code as follows:

Occupancy Category Classification: 1

Wind Speed: 120 m.p.h. wind load [3 second gust as determined from NCBC Table 1609] with velocity as determined under Section 1606 and ASCE 7-93.

Seismic: See NCBC 2012 Section 1613

08 51 00.17 Subcontractor.

Windows shall be engineered, manufactured under a subcontract to a single manufacturer regularly involved in the development and fabrication of windows of the type indicated. Installers shall be authorized and or certified and trained installers by the manufacturer of the approved product.

08 51 13.00 **ALUMINUM WINDWS**

08 51 13.10 **GENERAL.**

08 51 13.11 Location.

Aluminium windows shall be provided for spaces indicated, scheduled, or specified in the following types:

Fixed aluminum windows

08 51 13.12 Basis of Design – Manufacturer.

1. The following product was used in the development of this project.

Manufacturers	Series
YKK AP America Inc.	YOW 225 TU <u>thermally broken</u>

2. Products of the following manufacturers *meeting these specifications* may be installed:

Manufacturers
YKK AP America Inc.
Kawneer Company, Inc. [an Alcoa company]
Oldcastle [formerly Vistawall]
U. S. Aluminum Corp.

08 51 13.20 **MATERIALS.**

Materials shall conform to the following:

[1]	Aluminum Extrusions:	ASTM B211, 6063 – T5.
[2]	Sheet Aluminum:	[anodized frames] ASTM B209, 5005 – H14 . 050”.
[3]	Fasteners: concealed exposed.	Stainless steel Hardened aluminum alloys or AISI 300 series stainless steel.
[4]	Glass.	See Sect. 08 80 00
[5]	Glazing Accessories:.	Setting blocks, edge blocks, and spacers meeting ASTM C 864.
[6]	Gaskets:	Standard EPDM or Neoprene gaskets as furnished by the manufacturer – ASTM C864
[7]	Adhesive:	Dow Corning 995 or as recommended by the window manufacturer.

08 51 13.21 Frames.

Sections shall be 6063-T5 aluminum alloy extrusions minimum thickness ~1/8" thick with bolted and welded joints. All connections shall be concealed. Comply with ASTM B 221 for extrusions and ASTM B 209 for sheet or plate.

08 51 13.23 Finish.

- a. All aluminum surfaces of frames shall be AA-M12C22-A41 Class 1 #77. Color to be selected from

manufacturer's standard color palette.

08 51 13.30 FABRICATION

08 51 13.31 Standards.

- a. Windows shall be fabricated by a single firm specializing in this type work in accordance with the standards of the AAMA Specifications for Aluminum Structures.
- b. Windows shall be factory fabricated plumb, square, and true to detail with all faces, coplanar.

08 51 13.33 Window Frames.

- a. Frames shall be 2-1/4" deep extrusions thermally broken as indicated. Sections shall be full size unless otherwise indicated.
- b. Glazing stops shall be extruded and set into the frame with neoprene insert for puttyless glazing on the exterior.

08 51 13.35 Tolerances.

The following minimum manufacturing tolerances shall apply to the specified products:

Material Cuts :	Square to 1/32" over largest dimension; proportionate amount of 1/32" on the two dimensions.
Maximum Offset:	1/64" in alignmet between adjacent members
Maximum Offset:	1/64" between framing members at glazing pocket corners.
Joints:	Hairline and square to adjacent member.
Flatness:	± 1/16" off neutral plane.

08 51 13.40 EXECUTION

08 51 13.41 Standards.

Comply with approved shop drawings and manufacturer's written installation instructions.

08 51 13.42 Installation.

- a. All window work shall be installed by skilled mechanics to best trade standards. Joints shall be neat and close fitting. All work shall be plumb and square.
- b. Paint all surfaces of dissimilar metals in contact with each other or aluminum in contact with masonry one coat of bituminous-base aluminum paint.
- c. See Section 08 80 00 Glazing for glazing methods and materials.
- d. Exterior caulking shall be done in such a manner to make a neat, watertight connection to other work. Concealed caulking shall be applied to field joints and framework. Sec Section 07 92 00 Joint Sealants.

08 51 13.43 Cleaning.

Clean complete system inside and outside. Remove excess sealants, glazing compounds, dirt or other substances.

08 51 13.44 Tolerances / Testing.

- a. Window frame installation shall be neat and close fitting, plumb, and square, ready for glazing and caulking.
- b. After glazing, the window units shall be subjected to a medium force, hose spray for 15 minutes to determine if it is watertight. Any leakage shall be corrected if necessary, removing the frames or parts thereof and reassembling with sealants and concealed caulking beads.

08 70 00 HARDWARE**08 70 00.10 GENERAL.**08 70 00.11 Work Included.

Furnish all labor, material and equipment required for the installation of all finish hardware indicated, specified, and required by the actual conditions encountered in the building in accordance with the specified requirements indicated herein. Include all screws, expansion bolts, attachment devices, and incidental items normally required for installation and conditions encountered and required to derive full benefit and use of items furnished. Subsections forming this specification include the following:

Subsection	08 71 00	Door Hardware
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08 70 00.12 Work Not Included

Window hardware, toilet partition hardware, gate hardware, locker hardware, miscellaneous cabinet and rough hardware specified in other sections.

08 70 00.13 Related Sections

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	08 10 00	Doors and Frames
Division	09	Finishes

08 71 00.00 DOOR HARDWARE**08 71 11.00 FINISH DOOR HARDWARE****08 71 11.10 GENERAL.**08 71 11.11 Location.

Finish door hardware of the types indicated herein shall be provided in spaces indicated, scheduled, or specified.

08 71 11.12 Coordination.

The Contractor shall be responsible for full coordination of hardware herein with any special fabrication required for doors and frames specified in Division 8. Furnish templates as required.

08 71 11.13 Submittals.

The Contractor shall furnish manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

The Contractor shall submit a complete and itemized hardware schedule for Architect's approval before delivering any hardware to site. The schedule shall generally follow Architect's schedule of items indicated in succeeding subsections.

Submit manufacturer's color and finish samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

08 71 11.14 Basis of Design – Manufacturer.

Products of the following manufacturers *meeting these specifications* may be installed:

[1]	Lock sets and latch sets	Hagar Corbin Russwin Schlage
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[2]	Hinges	Hager Stanley McKinney
[3]	Closers	Dorma Corbin/Russwin LCN
[4]	Exit devices	Von Duprin, Dorma, Corbin Russwin
[5]	Miscellaneous specialties: Bolts and Stops Thresholds and Weather-stripping	H. B. Ives, Rockwood, Hager Hager, Pemko, Reese

In so far as practical, products of one type or group shall be by a single manufacturer.

08 71 11.20 MATERIALS.

08 71 11.21 Lock Sets and Latch Sets.

Lock sets and latch sets shall be extra heavy-duty cylindrical lever fabrication. Deadlocks shall be cylindrical fabrications. Cylinders shall be recore keyway compatible with any existing master keying system. Lock and latch sets and deadlocks shall be selected from one of the following manufacturer's series. One manufacturer shall be selected for all lock sets, latch sets, and deadlocks for the work.

	Hager	Corbin Russwin	Schlage
Locksets/Latchsets	3400	CL3300	ND-Series
Deadlocks	3100	ML2000	L Series
Design	Archer	Princeton	Sparta
Rose	Std.	PSA	Std.

ANSI Grade A156.13 Series 1000 Grade 1

Finish 630/US32D - Bright Chrome Plated

Keying

- Locks and cylinders shall be delivered without keyway core except those required by the contractor to maintain security with construction keys.
- Keying schedule will be furnished to the contractor by the Architect.
- Furnish and install factory combined keyway cores by manufacturer of Owner's present recore system for all keyed locks and cylinders. At substantial completion, set the keying system in place under grandmaster in the presence of and in cooperation with, the Owner's locksmith.
- Arrange factory shipment of keyway cores to the Owner. The Owner will deliver the key cores and keys to the Contractor for installation by the contractor when the project or a portion thereof, is ready for the owner to assume responsibility for access.
- Construction keys and cores are and shall remain property of the Contractor.

08 71 11.22 Hinges.

Shall be selected from a single manufacturer listed on the following table. Finish US32D unless scheduled otherwise.

	Hager	Stanley	McKinney
Ball Bearing Hinges	BB1191	BB179	TA2314
Mortice Hinges	1191	179	T2314

08 71 11.23 Closers.

Shall be selected from a single manufacturer listed on the following table in fully adjustable sizes. Provide

aluminum cover. Provide hold-open arms and parallel arms as scheduled. Finish US 26D unless scheduled otherwise.

	LCN	Dorma	Corbin Russwin
Series	4041	8901	DC2200

ANSI Grade A156.4 Grade 1

- a. Surface closers shall be mounted to door with arm to frame. Use through-bolts with grommets.
- b. Furnish brackets as required to properly position closers. Flush transom brackets required at all doors with transoms.

08 71 11.24 Push Plates, Kick Plates & Pulls.

Shall be selected from a single manufacturer listed in the following table. Finish US32D unless scheduled otherwise.

	Ives	Rockwood	Hagar
Pulls	8102-8	107	3G
Push plates	8200 Series	70 Series	30S Series
Kick plates	8400 Series	70 Series	190S

08 71 11.25 Exit Bolts.

Shall be selected from a single manufacturer listed in the following table. Furnish with aluminum housing and stainless steel touch bars with cylinder-keyed dogging device on exterior entrance doors and standard dogging device on all others, unless designated (f) Fire doors, to hold latches in retracted position.

	Von Duprin	Dorma	Corbin Russwin
Series	99	9000	ED9000

ANSI Grade Grade 1

08 71 11.26 Cabinet Hardware.

Hardware for casework and cabinetwork not included.

08 71 11.27 Miscellaneous Specialties.

Furnish the following items at locations specified as follows.

Bolts and Stops

	Ives	Rockwood	Hagar	Finish
Mortice Flush Bolts 1 ea. foot and head*	FB358	557	283D	US32D
Door Stops at ea. door as follows:				
Interior wall stops:	401 and 402 for conditions encountered	400 thru 405 for conditions encountered	230Wand 231W for conditions encountered	US32D
Interior floor stops	436	440/441	241F	US32D

*All inactive leaves unless other bolts scheduled.

Coordinators

	Ives	DCI	Hagar	Finish
Coordinators*	COR series	600 series	297D	US32D

*At all double doors with astragals inhibiting proper closing. [generally applies to all double fire doors.]

All coordinators shall be UL labeled and rated and sized as required for the related doors. Furnish complete with all carrying bars, mounting brackets, or fillers required for proper operation. Upon

complete installation, coordinator [with fillers] shall fully fill the width of the opening.

Holdopens

	Glynn-Johnson	Dorma	Mfg. optional	Finish
Holdopens*	450 series F	#700	--	US32D

*at all storage room doors

Thresholds and Weather-stripping

Thresholds	Hagar	Pemko	Reese	Finish	Inserts
At all exterior entrances with carpet	431S	229	F-S245A	Mill fin. aluminum	
At all other exterior entrances (no carpet)	412S	171	F-S205A	Mill fin. aluminum	
At all interior doors where carpet terminates with another material	505S	236	F-S565A	Mill fin. aluminum	

Weather-stripping – REQUIRED ON ALL EXTERIOR DOORS unless the device is builtin integrally with the door or frame

Jamb weather-stripping	862S	319	403	Mill fin. aluminum	Neoprene
Bottom sweeps at out swinging exterior doors	750S	315	323	Mill fin. aluminum	Neoprene
Bottom sweeps at inswinging exterior doors	774S	209	DB591	Mill fin. aluminum	Vinyl

08 71 11.28 Cylinders.

Cylinders shall be recore type 6-pin compatible with Owner's existing master keying system. Finish US32D unless scheduled otherwise. Unless otherwise indicated, each opening shall receive a recore cylinder keyed into the master system.

08 71 11.40 EXECUTION

08 71 11.41 Installation.

- Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Install surface-mounted items following completion of finish work.
- Accurately set hardware in position, plumb, aligned, and true. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
- Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards. Hinges and other morticed work shall be flush with adjacent surfaces.
- Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating

equipment and to comply with accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
2. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.
- e. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:
 1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and any electrified door hardware items.
 2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
 3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

08 71 11.42 CLEANING AND PROTECTION.

- a. Clean hardware and adjacent surfaces soiled by door hardware installation.
- b. Clean operating items as necessary to restore finish and proper function.
- c. Provide protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

08 71 12.00 FINISH HARDWARE SCHEDULE.

- a. The following schedule lists types and quantities of various items at each opening, but does not necessarily cover every item required as heretofore specified in general terms. Any opening not scheduled shall be furnished with hardware items same as similar opening and in accordance with general materials requirements of this specification.
- b. Include all items for each condition heretofore specified.

Item 1

DOOR #1	EXTERIOR	TO	CORRIDOR 1.4
DOOR #2	EXTERIOR	TO	LOBBY/PASSAGE 2.1
1 Offset hinge set			By Door Mfg - See 08 41 13.22
1 Pull			By Door Mfg - See 08 41 13.22
1 Midrail Panic Device			By Door Mfg - See 08 41 13.22
1 Closer	PA		
1 Cylinder			
1 Threshold			
1 Bottom Sweep			

Item 2

DOOR #3	EXTERIOR	TO	QUARANTINE KENNEL 2.4
DOOR #4	EXTERIOR	TO	KENNEL 2.2
DOOR #5	SALLY PORT	TO	TRIAGE/EXAM 1.17

- 3 Hinges MBBH
- 1 Closer PA
- 1 Exit Lockset ANSI F89
- 1 Threshold
- 1 Weatherstrip
- 1 Bottom Sweep

Item 3

- DOOR #6 CORRIDOR 1.4 TO TRIAGE/EXAM 1.17
- DOOR #7 CORRIDOR 1.4 TO KENNEL 1.18
- DOOR #8 LOBBY/PASSAGE 2.1 TO QUARANTINE KENNEL 2.4
- DOOR #9 LOBBY/PASSAGE 2.1 TO KENNEL 2.2
- DOOR #14 KITCHEN/LAUNDRY 1.14 TO CAT ANNEX 1.15
- DOOR #15 CORRIDOR 1.2 TO VISITING ROOM 1.8
- DOOR #18 KENNEL 1.18 TO SMALL ANIMAL 1.19
- DOOR #19 WAITING 1.1 TO VISITING ROOM 1.21

- 3 Hinges MBBH
- 1 Closer PA
- 1 Passage Latchset ANSI F75

Item 4

- DOOR #10 LOBBY/PASSAGE 2.1 TO TOILET 2.1B
- 3 Hinges MBBH
- 1 Closer PA
- 1 Privacy Lockset ANSI F76a

Item 5

- DOOR #11 LOBBY/PASSAGE 2.1 TO STORAGE 2.1A
- DOOR #12 KENNEL 2.2 TO JANITOR 2.3
- DOOR #13 QUARANTINE KENNEL 2.4 TO JANITOR 2.3

- 3 Hinges MBBH
- 1 Closer PA
- 1 Storeroom Lockset ANSI F86

Item 6

- DOOR #16 CORRIDOR 1.2 TO CORRIDOR 1.3
- Corridor 1.2 to Corridor 1.4

- 3 Hinges MBBH
- 1 Closer PA
- 1 Push
- 1 Pull

Item 7

- DOOR #17 WAITING 1.1 TO CORRIDOR 1.2

- 3 Hinges MBBH

- 1 Closer PA
- 1 Lockset ANSI EU Electrically Unlocked Fail Safe – Provide wiring, push button operator and any and all equipment required to operate device.

Item 8

DOOR #21 EXTERIOR TO SALLY PORT

- 1 Cylinder

MH MORTISE HINGE
MBBH MORTISE BALL BEARING HINGE
PA PARALLEL ARM
ANSI # INDICATES FUNCTION OF SPECIFIED DEVICE IN SCHEDULE ABOVE

08 80 00 GLAZING**08 80 00.10 GENERAL.**08 80 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of of all glass and glazing work on windows, doors, partition lights, cabinets, etc., throughout the exterior and interior of the building as indicated, scheduled, or specified, including all incidental items normally required for installation and conditions encountered.. Subsections forming this specification include the following:

Subsection	08 81 00	Glass
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08 80 00.12 Related Sections

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	08 10 00	Doors and Frames
Section	08 50 00	Windows

08 81 00.00 GLASS GLAZING**08 81 11.00 GLASS****08 81 11.10 GENERAL.**08 81 11.11 Location.

Glass shall be provided in spaces, frames, sash, doors, and other devices indicated, scheduled, or specified.

08 81 11.12 Types.

The following glass types are required under this specification:

- Insulating Glass
- Tempered Insulating Glass
- Tempered Float Glass

08 81 11.14 Submittals.

a. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

08 81 11.15 Warranty.

Furnish the written warranty of the glass manufacturer covering repair and replacement in whole or in part of any portion of glazing that exhibits defects of design, workmanship, or materials within ten [10] years of the date of substantial completion

08 81 11.16 Design Conditions.

Glass shall comply with Chapter 16 of the North Carolina Building Code. Loading shall be for *120 m.p.h. wind load with velocity as determined under Section 1606 and ASCE 7-93.* .

08 81 11.17 Subcontractor.

Unless other indicated, glass shall be engineered, manufactured, and fabricated under a subcontract to a single manufacturer regularly involved in the development, fabrication and installation of glazing of the type indicated.

08 81 11.20 MATERIALS.

Materials shall conform to the following:

08 81 11.21 Glass.

Glass shall conform to ASTM C 1036, ASTM C 1048, and to the following:

- | | | |
|-----|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] | Insulating Glass | ASTM E 119
1" preassembled units consisting of hermetically sealed panes of glass.
Outer layer: 1/4" float, Type I, Class 2. Quality q3. Tinted: gray equal to PPG Solar Gray.
Inner layer: 1/4" float, Type I, Class 2. Quality q3. Clear, marked "Tempered. Tinted: gray.
Inner layer:
With 1/2" air space and manufacturer's standard sealing and spacer system, desiccant, and corner design. |
| [2] | Tempered Insulating Glass | ASTM E 119
1" preassembled units consisting of hermetically sealed panes of glass.
Outer layer: 1/4" tempered float, Type I, Class 2. Quality q3. Tinted: gray equal to PPG Solar Gray.
Inner layer: 1/4" tempered float, Type I, Class 2. Quality q3. Clear, marked "Tempered. Tinted: gray.
Inner layer:
With 1/2" air space and manufacturer's standard sealing and spacer system, desiccant, and corner design. |
| [3] | Tempered float glass: | ASTM C 1048 Type I Quality Q3 Class I 1/4" tempered safety glass, clear. ANSI Z 97.1, SG, CC, marked "High Temper." |

08 81 11.23 Glazing Compound.

DAP Flexiglaze #1231. Pecora M-251 or PRC-300.

08 81 11.24 Glazing Tape.

Rectangular gray 1/8" thick and 1/2" extruded polybutyl, Pecora-Extru-seal B-44.

08 81 11.25 Setting Blocks, Spacers, Edge Blocks.

Elastomeric material with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in required locations and to limit movement within the frame.

08 81 11.30 GLASS TYPE LOCATION.

Glaze the following with Insulating Glass.

- [1] Exterior windows labeled AW 1 and AW2.

Glaze the following with Tempered Insulating Glass:

- [1] Exterior aluminum entrance doors, sidelites, and transom lites.

Glaze the following with Tempered Float Glass:

- [1] New interior wood or hollow-metal corridor separation doors transoms and sidelights where no hourly rating is required.

08 81 11.40 EXECUTION**08 81 11.41** Installation.

- a. All glazing shall be done by men experienced in the trade. Glass shall be set to allow freedom of movement in watertight seal.
- b. Clean surfaces to receive glass immediately before glazing commences. Remove any coatings, which may preclude continuous adhesion of glazing setting materials.
- c. Protect glass edges from damage during handling and installation. Remove damaged glass from site and dispose of as required in the Supplementary General Conditions and Division 1.
- d. Apply primers as required by the glass and / or sealant manufacturer.
- e. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- f. Maintain edge pressures within published tolerances.
- g. Provide spacers for glass lites where the length plus the width is larger than 50 inches. Locate spaces as follows:
 1. Located spacers directly opposite each other on both inside and outside faces of glass. Install requisite size and spacing to preserve mandated face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 2. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- h. Provide edge blocking where required to prevent glass from moving sideways in frame or sash.
- i. Where glass is installed using neoprene gasketing systems, set with adequate anchorage so as to prevent gasket walkout or corner pullout. Set with sealant where recommended by manufacturer.

08 81 11.43 Interior Glazing – Wood or Metal Frames – Tape Glazed – Non-rated frames.

Where frames are indicated with a stop on each side of the glazing unit, the frame shall be tape glazed using the following method:

- a. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- b. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- c. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- d. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- e. Do not remove release paper from tape until just before each glazing unit is installed.

08 81 11.45 Factory Furnished Inserts – Aluminum Frames.

In glazed openings furnished with vinyl or neoprene glazing inserts, glass shall be cut to allow freedom of movement yet give the inset full contract. Place setting blocks if required to hold glass in position and pull up stops to exert uniform pressure and watertight seal.

08 81 11.45 Factory Fabricated Heat Barrier Frames.

- a. Heat Barrier Frames shall be fabricated by a single firm specializing in this type work in accordance with the standards of the Steel Door Institute. Frames for view panels designated as "ASTM E119" constructed to conform the ASTM standards and shall be so labeled to meet or exceed the hour rating scheduled. Frames shall be glazed with 7/8" Ceramic Fire Glass and held in place and protected with proprietary fasteners, insulations, and sealants.
- b. Frames shall be factory fabricated plumb, square, and true to detail with all faces, coplanar. Following fabrication, frames will be disassembled into components for ease of transport.

08 81 11.46 Cleaning and Protection.

- a. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Remove nonpermanent labels, and clean surfaces. Marking on glass surfaces to indicate the presence of glass is hereby prohibited.
- b. Protect glass from contact with contaminating substances resulting from construction operations, including but not limited to mortar, weld splatter, and concrete residue. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.
- c. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- d. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

08 90 00 LOUVERS AND VENTS**00 00 00.10 GENERAL.**00 00 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of louvers, grills, and vents indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Section	08 91 00	Louvers
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00 00 00.12 Work Not Included.

Grilles, louvers, and diffusers included as part of the work included in the following division:

Divison 23 Heating, Ventilating, and Air Conditioning

00 00 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	08 10 00	Doors and Frames
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08 91 00.00 LOUVERS**08 91 00.10 GENERAL.**08 91 00.11 Types.

The following louver types are required under this specification:

08 91 26	Door Louvers
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08 91 00.12 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

08 91 00.16 Subcontractor.

Louvers shall be engineered, manufactured, fabricated and installed under a subcontract to a single manufacturer regularly involved in the development, fabrication and installation of louvers of the type indicated.

08 91 26.00 DOOR LOUVERS**08 91 26.10 GENERAL.**08 91 26.11 Location.

All locations where door louvers are scheduled or indicated.

08 91 26.12 Basis of Design – Manufacturer.

1. The following product was used in the development of this project.

Construction Specialties, Inc.

2. Products of the following manufacturers *meeting these specifications* may be installed:

Construction Specialties, Inc.
The Airolite Company
Ruskin Manufacturing

08 91 26.20 MATERIALS.

Materials shall conform to the following:

- [1] Door Louvers: Extruded aluminum 16 B & S gauge, anodized finish, fixed sight-proof louvers, with adjustable frame and countersunk screws, adaptable to wood or metal doors.

08 91 26.30 EXECUTION

08 91 26.31 Installation.

Install door louvers in precut openings in doors. Provide door supplier with templates for proper fit.

08 91 26.40 Door Louver Schedule.

- a. Provide louvers in doors between spaces indicated. Sizes are based on 80% free area. Adjust sizes accordingly for free area variation.
- b. Submit schedule indicating actual size free area for approval before fabrication.
- c. Set louver centered in door 8" from bottom edge with vanes horizontal.

08 91 26.41 Schedule.

Toilet Room Doors: 8"h x 16"w

DIVISION 09 FINISHES

Includes work by the General Contractors covered in the following sections.
Section designations are neither consecutive nor numerically inclusive.

09 20 00	WALL BOARD SYSTEMS
09 50 00	CEILINGS
09 60 00	FLOORING
09 70 00	WALL FINISHES
09 90 00	PAINTING & COATING

09 20 00 WALL BOARD SYSTEMS**09 20 00.10 GENERAL.**09 20 00.11 Work Included.

Furnish all labor, material, and equipment required to provide wallboard finishes, and their related supporting systems indicated, specified, or both including all incidental items, accessories, and trim normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	09 22 00	Support Systems
Subsection	09 29 00	Gypsum Wall Board

09 20 00.12 Work Not Included.

The installation of structural studwork resisting and/or supporting imposed vertical and horizontal loads is included in Subsection 05 40 00.

09 20 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	05 10 00	Structural Metal Framing
Section	06 10 00	Rough Carpentry
Division	23	Mechanical Systems
Division	26	Electrical

09 22 00.00 SUPPORT SYSTEMS**09 22 00.10 GENERAL.**09 22 00.11 Types.

The following support system types are required under this specification:

09 22 13	Metal Furring
09 22 16	Non-Structural Metal Framing
09 22 26	Suspension Systems
09 22 36	Lath

09 22 00.12 Reference Specifications.

Comply with pertinent standards of the:

American Institute of Steel Construction.
"Light Gauge Cold Formed Steel Design Manual"

U. S. Gypsum.
"Gypsum Construction Handbook"

09 22 00.13 Submittals.

a. Literature:

The Contractor shall furnish manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

09 22 00.14 Design Conditions.

Framing shall comply with Chapter 16 of the North Carolina Building Code. Interior horizontal loading

shall be a minimum of 5 lbs. per sq. ft. live load. *Deflection shall be limited to 1/240 wall board surfaces of any span at full pressure acting normal to the surface plus product dead load.*

09 22 00.16 Subcontractor.

Support systems shall be installed under a subcontract to an installer regularly involved in the development, fabrication and installation of support systems of the type indicated.

09 22 13.00 METAL FURRING

09 22 13.10 GENERAL.

09 22 13.11 Location.

Metal furring shall be provided in spaces indicated, scheduled, or specified

09 22 13.12 Basis of Design – Manufacturer.

[1] The following product was used in the development of this project.

U S Gypsum Company

[2] Products of the following manufacturers *meeting these specifications* may be installed:

National Gypsum Company [Gold Bond]

Marino / Ware

09 22 13.20 MATERIALS.

Materials shall conform to the following:

- | | |
|---------------------------|------------------------------------------------------------------|
| [1] Hat Channels: | 7/8" & 1-1/2" galvanized, cold rolled furring channels 26 ga. |
| [2] Cold Rolled Channels: | 1-1/2" & 3/4" galvanized, cold rolled furring channels, 26 ga.. |
| [3] Resilient Channels: | 1/2" x 2-5/8" galvanized, cold rolled resilient channels, 26 ga. |

09 22 13.30 EXECUTION.

09 22 13.31 Standards.

Furring shall be installed according to manufacturer's directions and conforming to recommended AISC procedures. Tack weld where indicated on drawings and at other locations where rigidity requires; otherwise, snaps, bolts or metal screws may be used. Tie wires are not permitted. Assembly shall be firm and rigid before application of gypsum board.

09 22 13.32 Installation.

Position furring on walls at indicated spacing. Shim where required to make wall true and vertical.

09 22 13.33 Tolerances.

Maximum variations:

Plumb and level: 1/8" in 8'-0"

Plane to plane: 1/16" at any one location along a joint, seam, or edge.

09 22 26.00 SUSPENSION SYSTEMS

09 22 26.10 GENERAL.

09 22 26.11 Location.

Suspension systems shall be provided in spaces indicated, scheduled, or specified

09 22 26.12 Basis of Design – Manufacturer.

1. The following product was used in the development of this project.

U. S. Gypsum

2. Products of the following manufacturers *meeting these specifications* may be installed:

National Gypsum
Marino/Ware
U. S. Gypsum

09 22 26.20 MATERIALS.

09 22 26.21 Wall Board Suspension Systems.

Materials shall conform to the following:

- | | |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] Main Tees: | Heavy duty "T" profile 1-1/2" high x 1-1/2" wide cold rolled hot dipped galvanized steel with knurled face for UL fire rated systems USG DGLW-26 or equal. |
| [2] Cross Tees: | Heavy duty "T" profile 1-1/2" high x 1-1/2" wide cold rolled hot dipped galvanized steel with knurled face and with quick release for UL fire rated systems USG DGLW-424 or equal. |
| [3] Perimeter Edge: | Heavy duty "C" profile 1-9/16" x 1" cold rolled hot dipped galvanized steel with knurled face for UL fire rated systems. |
| [4] Suspension Wire: | Manufacturer's standard 12 ga. Suspension wire |
| [5] Accessories: | Manufacturer's standard clip, shims, joints, etc. designed for the conditions encountered.. |

09 22 26.40 EXECUTION – WALL BOARD

09 22 26.41 Standards.

Apply suspension system and related work in accordance with ASTM C636, and manufacturers printed recommendations, latest edition..

09 22 26.42 Installation.

1. Grid shall be laid straight, level, and true. Where angled planes are indicated, planes shall be true to angle of incline across the full surface.
2. Where ceiling is suspended away from contact with the structure or where anchorage to structure exceeds 4'-0" oc place supplementary 1-1/2" channels 4'-0" oc perpendicular to section or anchor bar to receive ceiling system. Provide secondary support between beams and joists where required to avoid mechanical equipment and other obstructions.
3. Hang system from structural system above [beams, trusses, bar joists, joists, etc.]. *Do not hang ceiling system from metal roofing.* Avoid splay hangers. If splay hangers are necessary, limit angle to 15 deg. from vertical.
4. Provide metal channel edging at all edges where ceiling adjoins wall openings or other materials. Edge of grid system shall be supported from structure. Edge channels shall be mechanically attached to walls or partitions.
5. Frame opening for light fixtures, air conditioning outlets, ventilators, access doors etc. Reinforce ceiling system with necessary channels and supports; however, weight or load of any such items in openings shall not be supported by the ceiling system.

09 22 26.43 Tolerances/ Testing.

Maximum variations:

Plumb and level: 1/8" in 8'-0"
 Plane to plane: 1/16" at any one location along a joint, seam, or edge.

09 28 00.00 BACKER BOARDS

09 28 11.00 FIBERGLASS-MAT FACED GYPSUM BACKER BOARD

09 28 11.10 GENERAL.

09 28 11.11 Location.

All interior surfaces where backer board is indicated or scheduled shall board of the type indicated indicated, specified, or otherwise required. Backer board is required in all locations scheduled to receive FRP as a finish material.

09 28 11.12 Submittals.

a. Shop DRAWINGS:

The Contractor shall furnish manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

b. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

09 28 11.13 Subcontractor.

Backer board shall be installed under a subcontract to a single installer regularly involved in installation of gypsumboard surfaces of the type indicated.

09 28 11.20 MATERIALS.

1. Backer Board: Fiberglass-Mat Faced Gypsum Backing Board: ASTM C1178, Type X equal to Georgia-Pacific DensShield Gireguard Tile Backer
 1. Thickness: 5/8 inch.
 2. Width: 4 feet.
 3. Length: 8 feet.
 4. Weight: 2.5 lb/sq. ft.
 5. Edges: Square.
 6. Surfacing: Coated fiberglass mat on face, back, and long edges.
 7. Mold Resistance (ASTM D3273): Not less than 10, in a test as manufactured.
 8. Microbial Resistance (ASTM D6329): Will not support microbial growth.
 9. Permeance (ASTM E96): Not more than 1.0 perms when tiled.
 10. Robinson Floor Test Rating (ASTM C627): Light commercial.
2. Fasteners: Corrosion resistant 1" Type S bugle head metal self-tapping type or equal as recommended by the board manufacturer.

09 28 11.30 EXECUTION

09 28 11.31 Standards.

Apply backer boards and related work in accordance with manufacturer's printed instructions.

09 28 11.32 Installation.

1. Complete rough-in of all trades prior to installation of boards.
2. Separate board from rough-in and fixtures and fill space as recommended by manufacturer.
3. Shim as required to meet the required installation tolerances. Securely fasten boards to substrate.

09 28 11.33 TOLERANCES / Testing.

Maximum variations:

Plumb and level:	1/8" in 8'-0"
Plane to plane:	1/32" at any one location along a joint, seam, or edge.

09 29 00.00 GYPSUM WALL BOARD

09 29 11.00 GYPSUMBOARD

09 29 11.10 GENERAL.09 29 11.11 Location.

All interior surfaces where gypsum wall board [GWB] is indicated or scheduled shall board of the type indicated indicated, specified, or otherwise required.

09 29 11.12 Reference Specifications.

Comply with pertinent standards of the:

Work shall be performed in accordance with ASTM C-754, ASTM Gypsum Association GA-216, and as set forth in Gypsum Construction Handbook, U.S. Gypsum Co., latest edition.

09 29 11.13 Submittals.

a. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

a. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

09 29 11.14 Subcontractor.

Gypsumboard shall be installed under a subcontract to a single installer regularly involved in installation of gypsumboard surfaces of the type indicated.

09 29 11.20 MATERIALS.

Materials shall conform to the following:

- | | |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| a. Gypsum Wall Board: | "Sheetrock", ASTM C 36, Standard 1/2" thick & Type X 5/8" thick, UL listed. 4' x 8', 4' x 10', 4' x 12' sheets, tapered edges. |
| b. Water resistant gypsum board: | ASTM C-630, Type X, 5/8" thick, 4' x 8' tapered edges "Green Board". |
| c. Screws: | 1" Type S bugle head metal self-tapping type ASTM C-646. |
| d. Metal accessories: | 1-1/4" x 1-1/4" galvanized corner beads, galvanized casing and trim beads with taping wings. USG #103 and Series 200. |

- e. Suspension system: See 09 22 26.
- f. Joint compound: Ready mixed vinyl based ASTM C-475 water-resistant type with water-resistant gypsum board..

09 29 11.30 EXECUTION

09 29 11.31 Standards.

Apply gypsum wall board and related work in accordance manufacturer's printed instructions and as indicated in the USG Handbook, latest edition. Use largest practical sheets to minimize butt joints. Install with face side out. Position boards so like edges abut. Work shall be performed in a ventilated area where temperature must be maintained at 56°. F or above. Provide openings for light fixtures and mechanical work in rated surfaces to comply with UL requirements to maintain fire rated resistance.

09 29 11.32 Installation.

09 29 11.33 Gypsum Board on Stud Framing [metal or wood].

Place gypsum board sheets horizontally, breaking joints between opposite sides of partition. On ceiling, place boards perpendicular to joists on furring strips. Shim as required to provide plumb and level surfaces. Supports shall be 24" and/or 16" oc and at all edges. Attach with nails 8" oc around perimeter and 12" oc at intermediate supports.

09 29 11.34 Gypsum Board on Light Weight Metal Framing

- a. When all stud, furring channels and "Z" channels are in place, they will form the shape of the space, with attachments for gypsum board 24" oc at walls and 16" oc at ceilings; with attachments at inside corners and at edges where directions change. Apply single layer face out with long dimension vertical and all abutting edges and joints occurring over stud flange or furring strip. Stagger joints on opposite sides of partition. Cut boards to fit work of others
- b. Attach boards with electric screw gun. Space screws 3/8" from edge 8" oc. around perimeter and 12" oc at intermediate supports. Stagger screws along abutting edges.

09 29 11.35 Gypsum Board on Suspended Ceilings

Place carrying T's perpendicular to joist suspended to required level on hanger wires at each point of support. Attach hangers to T's maximum 4'-0" oc; hanger angle maximum 15 deg. from vertical. Attach intermediate T's perpendicular to carrying T's. Attach gypsum board in same manner as on attached to joist ceilings.

09 29 11.36 Gypsum Board on Metal Furred Surfaces

Following installation of suspension system, place gypsum board with minimum joints in same manner as on ceilings.

09 29 11.37 Finishes

- a. Gypsum wall board surfaces shall be finished according to the following requirements

	Surface	Finish
a.	Ceilings	Level 4
b.	Walls	Level 4
c.	Concealed Fire Barriers	Level 3 modified

- b. Finish level applications.

1. Pre-fill. Mix compound and fill all joints between boards to top of eased or beveled edge. Wipe off excess compound and allow to harden.
2. Level 1 – Taping. Butter taping compound into inside corner and joints. Place tape over joints and press into fresh compound. Remove excess compound

3. Level 2 – First Coat. Following bedding of tape, apply skim coat of joint compound over center of tape and allow to dry completely in accordance with manufacturer’s instruction. Trowel width minimum: 6” Spot fastener heads and fill corner and edge beads.
4. Level 3 – Second Coat. After all first coat compounds have dried, apply second joint compound coat over taped seams, fastener head, and beads. Joint compound shall extend beyond first coat by a minimum of 2” each side. Trowel width minimum: 10” Allow to dry. Lightly sand.
5. Level 4 – Third coat application. Following completion and drying of second coat, apply a thin finishing coat to joints, fastening heads, and beads. Feather edges of third coat 2” beyond second coat. Minimum trowel width: 14”. Lightly sand when dry.
6. Level 5 – Following completion of third coat application, fully cover gypsumboard surfaces with joint compound in accordance with the manufacturer’s requirements for fully smooth and unblemished finish. Lightly sand following drying.
7. Knock Down Finish -- Finish shall be formed by the application of standard perforated tape over joints set in accordance with manufacturer’s recommendations through level 4 indicated above, followed by a gun application of joint compound. “Knock Down” finish with long trowel. Finish shall simulate “Birch Tree Bark”.

09 29 11.40 Tolerances / Testing.

Maximum variations in board installation: [These tolerances supersede any “industry standard.”]

Plumb and level: 1/8” in 8’-0”

Plane to plane: 1/16” at any one location along a joint, seam, or edge.

Maximum variations following installation to Level 4 finish:

Surface evenness: No shadowing or shading with light set at 15-degree angle to plane of surface.

Maximum variations following installation to Level 5 finish:

Surface evenness: No shadowing or shading with light set at 10-degree angle to plane of surface.

09 50 00 CEILINGS**09 50 00.10 GENERAL.**09 50 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of ceilings indicated, specified, or both including all incidental items normally required for installation and conditions encountered. The system specifically required for this project is . Subsections forming this specification include the following:

Subsection	09 51 00	Acoustical Ceilings
Subsection	09 53 00	Acoustical Ceiling Suspension Systems

09 50 00.12 Work Not Included.

The following work is not covered in this portion of the specification:

Suspended Gypsum Ceilings Section 09 20 00 Lathing, Plastering, & Wall Board Systems included in:

09 50 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	07 20 00	Thermal Protection
Division	23	Mechanical

09 50 00.14 Fire Rating.

The materials furnished, when properly assembled, shall, in combination with the building structure indicated, provide an UL-rated fire resistance as follows:

09 50 00.15 Project Conditions – Environmental Requirements.

Building shall be fully enclosed with the mechanical systems and controls fully operational and with the roof fully watertight prior to installation of ceiling systems. The following climatic conditions shall be established and maintained prior to acoustic tile installation and during the remainder of construction:

Temperature: range 60 -85° F

Humidity: 75% RH maximum.

09 50 00.16 Additional Materials.

Supply the owner with two full unbroken cartons of matching acoustic tile of each type installed in the project, in care of the facility maintenance staff at completion of the project.

09 51 00.00 ACOUSTICAL CEILINGS**09 51 23.00 ACOUSTICAL TILE CEILINGS****09 51 23.10 GENERAL.**09 51 23.11 Location.

All surfaces where suspended acoustic tile is indicated [SAcT].

09 51 23.12 Reference Specifications.

Comply with pertinent standards of the:

American Society for Testing and Materials [ASTM].

Applicable standards for fire testing, surface burning, and sound absorption, "

Underwriters Laboratories, Inc
 "Fire Resistance Directory"
 .CISCA
 "Ceiling Systems Installation Handbook"

09 51 23.13 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

B. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

09 51 23.14 Subcontractor

Acoustic tile shall be installed under a subcontract to a single installer regularly involved in installation of acoustic tile of the type indicated.

09 51 23.20 MATERIALS.

Materials shall conform to the following:

- | | |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] Moisture Resistant Acoustic Tile: | 2'-0" x 2'-0" x 5/32" PVC tile ASTM E84: Class A Flame Spread [0-25], Smoke Development Index [0-450]
Color: White
Finish: Flat Matte
Product equal to New Ceiling Tiles, LLC
Type: Genesis Sanitary Ceiling Panels
Series: Smooth-Pro SE |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

09 51 23.30 EXECUTION

09 51 23.31 Standards.

Install suspension system and related work in accordance with ASTM C636, CISCA Installation Standards, and with the manufacturer's printed instructions, latest edition.

09 51 23.32 Installation.

- a. Tile shall be laid in grid system and held in place by spring clips or other devices. Tiles shall be fitted neatly and be fully supported on all four edges.
- b. Where tile is cut, cuts shall be accurate and tight to adjacent work [grid, surfaces, fixtures, etc.] Cuts shall be clean and crisp without ragged edges and chips matching the profile of the remainder of the tile on edges, or the profile of the adjacent surface when made to allow installation of fixtures or equipment.

09 51 23.33 Tolerances / Testing.

- | | |
|------------------|------------------------------------------------------------------------------------------|
| Plumb and level: | 1/8" in 8'-0" at any one location with a maximum variation of 1/8" across ceiling plane. |
| Tile to Tile: | 1/16" at any one location along a joint, seam, or edge. |
-

09 53 00.00 ACOUSTICAL CEILING SUSPENSION SYSTEMS

09 53 33.00 PLASTIC SUSPENSION SYSTEMS

09 53 33.10 GENERAL.09 53 33.11 Location.

All surfaces where suspended acoustic tile is indicated [SAct].

09 53 33.12 Reference Specifications.

Comply with pertinent standards of the:

American Society for Testing and Materials [ASTM].

1. Applicable standards for manufacturing of metal suspension systems and installation of suspended ceilings.
2. Applicable standards for fire testing, surface burning, and sound absorption"

Underwriters Laboratories, Inc

"Fire Resistance Directory"

CISCA

"Ceiling Systems Installation Handbook"

09 53 33.13 Submittals.

A. Shop Drawings:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

B. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

09 53 33.16 Subcontractor.

Acoustic tile suspension system shall be installed under a subcontract to a single installer regularly involved in installation of systems of the type indicated.

09 53 33.20 MATERIALS.

Materials shall conform to the following:

- | | |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] Suspension System: | Suspension system shall consist basically of exposed painted PVC "T" supports and edge channels with required clips, hangers and suspension channels, and shall be compatible with the ceiling tile used. |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Color: White

Product equal to New Ceiling Tiles, LLC

Type: Vinyl Ceiling Grid

09 53 33.30 EXECUTION09 53 33.31 Standards.

Install suspension system and related work in accordance with ASTM C636, CISCA Installation Standards, and with the manufacturer's printed instructions, latest edition.

09 53 33.32 Installation.

- a. Install suspension system in the pattern indicated on the reflected ceiling plan unless otherwise indicated or specified.

- b. Grid shall be laid straight, level, true and coplanar. Unless otherwise indicated on reflected ceiling plans, work shall be started at the center of each room or panel with either support or a full tile centered. However, in ceiling areas separated only by glass or transparent surfaces or folding partitions all tile lines shall be continuous from room to room.
- c. Where ceiling is suspended away from contact with the structure or where anchorage to structure exceeds 4'-0" o.c. place 1-1/2" channels 4'-0" o.c. perpendicular to section or anchor bar to receive ceiling system. Provide secondary support between beams and joists where required to avoid mechanical equipment and other obstructions.
- d. Do not hang ceiling system from metal deck ribs. Avoid splay hangers. If splay hangers are necessary, limit angle to 15 deg. from vertical.
- e. Grid pattern, unless otherwise indicated, shall be so arranged to avoid less than 1/2 tiles occurring at edges.
- f. Provide edging strip at all edges where acoustical tile adjoins wall openings or other materials. Turn outside corners of edging with finish corner clips. Edge of grid system shall be supported from structure. Edge channel shall not be required to support more than the parallel edge of the adjacent tile. Edge channels shall be mechanically attached to walls or partitions.
- g. Provide openings for light fixtures, air conditioning outlets, ventilators, etc. Reinforce ceiling system with channels and supports as required to fully support ceiling panels; however, weight or load of any such items in openings shall not be supported by the ceiling system.

09 53 33.33 Tolerances / Testing.

- | | |
|-------------------------------|------------------------------------------------------------------------------------------|
| Plumb and level: | 1/8" in 8'-0" at any one location with a maximum variation of 1/8" across ceiling plane. |
| Grid element to Grid element: | 1/16" at any one location along a joint, seam, or edge. |

09 60 00 FLOORING**09 60 0010 GENERAL.**09 60 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of flooring products indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	09 65 00	Resilient Flooring
Subsection	09 67 00	Fluid Applied Flooring

09 60 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	03 30 00	Concrete
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09 65 00.00 RESILIENT FLOORING**09 65 00.10 GENERAL.**09 65 00.11 Types.

The following flooring types are required under this specification:

09 65 13	Resilient Base
09 65 19	Resilient Tile

09 65 00.12 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

B. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

09 65 00.13 Subcontractor.

Resilient flooring shall be installed under a subcontract to a single supplier/installer regularly involved in the procurement and installation of flooring of the type indicated.

09 65 13.00 RESILIENT BASE**09 65 13.10 GENERAL.**09 65 13.11 Location.

Resilient base shall be provided for spaces indicated, scheduled, or specified. Base shall fully cover juncture of wall with floor unless otherwise noted or scheduled.

09 65 13.20 MATERIALS.

Materials shall conform to the following:

- [1] Resilient Base: 1/8" standard 4" high rubber or vinyl with preformed inside and outside corners, complying with the following:
 Rubber FS SS-W-40 Type I
 Vinyl FS SS-W-40 Type II
 Color shall be as scheduled on the Interior Finish Schedule.
 Cove toe against resilient floor field.
 Straight toe against carpet.
- [2] Base Adhesive: Proprietary, resin based, high strength base adhesive recommended by manufacturer for products and substrate encountered.

09 65 13.30 EXECUTION09 65 13.31 Standards.

Set base in strict accordance with standard specification of the manufacturer.

09 65 13.32 Installation.

Set base over CMU, wall-coverings, and other wall finishes and after carpet is installed where these conditions occur. Extend base across the toe space of fixed cabinets. Place preformed corners on inside and outside corners

09 65 13.33 Tolerances / Testing.

Fully align base members across material junctures.

09 65 19.00 **RESILIENT TILE****09 65 19.10** GENERAL.09 65 19.11 Location.

Resilient tile flooring shall be provided for spaces indicated, scheduled, or specified.

09 65 19.20 MATERIALS.09 65 19.21 Tiles.

Materials shall conform to the following:

- [1] Vinyl Composition Tile [VCT]: ASTM F 1066 Class 2 composition tile floor covering 12" x 12" x 1/8" marbleized pattern, smooth. Color and pattern shall be as scheduled on the Interior Finish Schedule.

09 65 19.22 Installation Accessories.

Materials shall conform to the following:

- [1] Tile Adhesive: Proprietary water-resistant adhesive recommended by manufacturer for products and substrate encountered.
- [2] Underlayment: Latex emulsion and Portland cement.

09 65 19.30 EXECUTION09 65 19.31 Standards.

Set flooring in strict accordance with standard specification of the manufacturer unless otherwise directed in these specifications.

09 65 19.32 Installation.09 65 19.33 Moisture Test.

Submit results of tests for moisture and certification that such results are within the manufacturer's allowable tolerance for the mastic used before laying any tile. A test shall be made in each room or area in which tile is to be laid.

09 65 19.34 Preparation.

- [1] Contractor shall schedule tile installation work separate from any other work within the same space.
- [2] No tile work will be started until the surface to be covered has been inspected by the Architect. Such inspection, however, shall not relieve the contractor of his responsibility for the entire area to be in proper condition to receive the finished flooring.
- [3] All cracks, construction joints, and the like, shall be properly filled with mastic and the floor leveled to a smooth surface with latex emulsion underlayment. Rough spots or high points shall be ground with carborundum.
- [4] No tile shall be placed over surface rough enough to show through the tile at a later date. Likewise, no underlying debris shall be evident visually or tactility. The surface shall be level with no evident rolling, shadowing, or dimpling.
- [5] Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, silicone, using mechanical methods recommended by the manufacturer. Solvents are prohibited.
- [6] Broom and vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for salts, carbonation, or dust. Correct unsatisfactory conditions involving the aforementioned substances.

09 65 19.35 Tile Setting.

- a. Corners shall meet exactly and be fully adhered. Pieces less than 1/2 tile will not be used without permission from the Architect. Tile shall be set in a workmanlike manner starting at the intersection of the center-lines of the area. No cracked tile will be accepted.
- b. Where resilient tile floors join floors of other finishes at doors, the division line between the materials shall be under the door when the door is closed. Provide edging strip of same material, as tile on edges not detailed otherwise. Provide vinyl nosing at sheet vinyl edges. Where carpet adjoins resilient tile, aluminum threshold strip specified in Division 08 shall provide edging.
- c. Regardless of manufacturer's allowance, applying of adhesive and setting of tile shall be completed on the same working day.

09 65 19.36 Finishing.

- a. At the completion of all other work, clean tile floor and base as recommended by the manufacturer. Thoroughly remove cement, dirt or other foreign substances and surface blemishes.
- b. Vacuum floor thoroughly to remove loose particulate matter. Wash floor following manufacturer's recommendations for time and procedures.
- c. Apply protective floor polish to surfaces that have been thoroughly cleaned.
- d. Cover and protect floor until preparation time for inspection for substantial completion. At that time remove protective cover. Re-clean and/or strip floor of protective wax and prepare for final waxing and finishing.
- e. Apply two coats of manufacturer's recommended wax, each of which will be machine polished to

produce a uniform finish. Floor must be in this condition at final inspection.

09 67 00.00 FLUID APPLIED FLOORING

09 67 13.00 EPOXY MATRIX FLOORING

09 67 13.10 General.

09 67 13.11 Location.

Epoxy matrix flooring shall be provided for spaces indicated, scheduled, or specified.

09 67 13.14 Submittals.

A. Suppliers Literature:

The Contractor shall furnish supplier's literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

09 67 13.15 Warranty.

Furnish the written warranty of the epoxy matrix flooring manufacturer covering repair and replacement in whole or in part of any portion of flooring that exhibits defects of materials or excessive wear within ten [10] years of the date of substantial completion

09 67 13.17 Subcontractor.

Epoxy matrix flooring shall be installed under a subcontract to a single installer regularly involved in the installation of flooring of the type indicated.

09 67 13.18 Basis of Design – Manufacturer.

1. The following product was used in the development of this project.

Phoenix One Step Epoxy Flooring

2. Products of the other manufacturers *meeting these specifications* may be installed.

09 67 13.20 MATERIALS.

Materials shall conform to the following:

- [1] Epoxy: A two part colored epoxy compound w/100% solids, without solvents or thinners.
- [2] Aggregate: Mixture of marble, silica sand, and quartz.
- [3] Sealer: A two part clear epoxy compound w/ 100% solids, without solvents or thinners.

Proportion of epoxy to aggregate in the base material shall not exceed 3 pounds of aggregate to 1 pound of epoxy to form the base material.

Upon installation, the epoxy matrix flooring shall meet the following:

Test	ASTM	Result: Base/Sealer
Compressive Strength:	C-579	17,000 psi after 7 days.
Tensile Strength	C-307	7,100/6,000 psi after 7 days.
Flexural Strength	C-580	10,000/12,400 psi after 7 days.
Adhesive Strength	D-4541	>500/=300psi with 100% conc. failure
Flammability	D-570	Self Extinguishing
Abrasion Resistance	C-501	18/100 mg.

Slip-resistance	D-2047	ADA compliant
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09 67 13.30 EXECUTION09 67 13.31 Standards.

Install flooring in strict accordance with manufacturer's standard application instructions.

09 67 13.32 Installation.

1. Contractor shall schedule epoxy matrix floor installation work separate from any other work within the same space. Concrete subfloor shall be allowed to cure for 28 days and shall be free of water for 7 days prior to installation.
 2. No installation will be started until the surface to be covered has been inspected by the Architect. Such inspection, however, shall not relieve the Contractor of his responsibility for the entire area to be in proper condition to receive the finished flooring. Subfloor shall be clean of all dirt, debris, paint, laitance, grease, wax, oil or animal fats etc. Following cleaning, the floor shall be fully washed rinsed, squeeze-dry mopped and allowed to fully dry.
 3. Mix flooring components as directed in manufacturer's instructions. Pour as directed and trowel to 1/8" thickness following manufacturer's directions so that the aggregate is flattened and the epoxy is brought to the top.
 4. Apply specified two part epoxy gloss seal coat as directed using brushes and squeegees.
-

09 70 00 WALL FINISHES**09 70 00.10 GENERAL.**09 70 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of wall finishes indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Section	09 77 00	Special Wall Surfacing
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09 70 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	06 10 00	Rough Carpentry
Section	09 20 00	Wall Board Systems

09 77 00.00 SPECIAL WALL SURFACING**09 77 13.00 FIBERGLASS REINFORCED WALL PANELS****09 77 13.10 GENERAL.**09 77 13.11 Location.

All surfaces where fiberglass reinforced wall panels is scheduled, indicated, or specified

09 77 13.12 Types.

The following fiberglass reinforced wall panels types are required under this specification:

Smooth finish fiberglass reinforced wall panels

09 77 13.14 Submittals.

a. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

09 77 13.15 Basis of Design – Manufacturer.

1. The following product was used in the development of this project.
Marlite
2. Products of the following manufacturers *meeting these specifications* may be installed:
Crane Components
Glasbord
Marlite
Panolam

09 77 13.20 MATERIALS.

Materials shall conform to the following:

- | | |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1] Fiberglass reinforced wall panels: | 0.090" fiberglass reinforce thermosetting polyester resin panel sheet complying with ASTM D 5319
Width: 4'-0"
Length: 10'-0"
Finish: Smooth
Color: 145 Silver.
Product equal to Marlite Standard FRP |
| [2] Adhesive: | Recommended product of the wall panel manufacturer for the substrate indicated. |
| [3] Trim: | Panel manufacturer's standard pvc trim in shapes for the following conditions: Inside corner, panel division, and edge. |
| [4] Sealant: | Panel manufacturer's color match silicone sealant. |
| [5] Substrate: | See Section 09 20 00 Wall Board Systems |

09 77 13.40 EXECUTION09 77 13.31 Standards.

Set wall panels in strict accordance with standard specification of the manufacturer.

09 77 13.41 Installation.

- a. Wall panels shall be hung by skilled installers experienced in hanging of materials specified.
- b. Trowel apply adhesive as directed by manufacturer.
- c. Apply panels to board substrate as indicated. Orient seam gaps [field and corner] vertically and allow for manufacture mandated separation for expansion and contraction.
- d. Apply moldings to allow for 1/8" expansion movement using specified sealants to form a watertight installation.

09 77 13.42 Tolerances / Testing.

All seams shall be formed true vertical and true horizontal with no subsurface showing.

09 90 00 PAINTING & COATINGS**09 90 00.10 GENERAL.**09 90 00.11 Work Included.

- a. Furnish all labor, material, and equipment required to provide finishes of paint or paint related materials indicated, specified, or both including all incidental items normally required for conditions encountered to exterior and interior exposed surfaces throughout the project, except where specifically excluded.
- b. Furnish all labor, material, and equipment required to provide surface preparation and priming specified are in addition to shop priming and surface treatment specified under other sections of work.

Subsections forming this specification include the following:

Subsection	09 91 00	Painting
Subsection	09 93 00	Staining & Transparent Finishing

09 90 00.12 Work Not Included.

Brick masonry treatment specified in Division 07.

09 90 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	06 20 00	Finish Carpentry
Section	09 20 00	Wallboard Systems

09 90 00.14 General Requirements.

- a. The finishing subcontractor(s) shall furnish all materials, equipment, drop cloths, etc., necessary during the prosecution of his work. Protect all other trades work at all times and be responsible for damage resulting from painting operations.
- b. Materials shall be stored in shed provided by the Contractor and not in the building. Rags, etc., shall be removed from the building nightly, including clothing.
- c. Materials shall be delivered to the site in new and unopened containers, No materials shall be reduced or changed in any way except as specified, and all products shall be applied in accordance with instructions on the package.
- d. If woodwork, metal, or any other surface to be finished cannot be put in proper condition for finishing by customary cleaning, sanding, or puttying operations, the finishing subcontractor shall notify the Contractor and Architect in writing or assume responsibility for and rectify any resulting unsatisfactory finish.

09 90 00.15 Design Conditions.

- a. Apply water base products only when temperature of surfaces to be painted and surrounding air temperatures are between 50 degrees F and 95 degrees F unless otherwise required by the manufacturer.
- b. Apply solvent thinned products only when temperature of surfaces to be painted and surrounding air temperatures are between 55 degrees F and 95 degrees F unless otherwise required by the manufacturer..
- c. Do not apply finishing products in snow, rain, fog, or mist; or when relative humidity exceeds 85%; or

to damp or wet surfaces.

- d. Painting and staining may be continued during inclement weather if areas and surfaces to be finished are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

09 90 00.16 Subcontractor.

Paint and related products shall be applied under a subcontract to a single subcontractor regularly involved in the application of finishes of the type indicated..

09 91 00.00 PAINTING

09 91 00.10 GENERAL.

09 91 00.11 Requirements.

- a. It is the intent that all exposed surfaces, inside and outside the building not finished with stain, wall covering or other special finishes will be painted with the exception of the following items when not specifically referred to in application; brick, stone, stucco, masonry coatings, concrete, copper, glass, glazed tile, acoustical tile, factory finished bright metals, or factory finished products.
- b. Any area giving appearance of insufficient coverage after specified applications shall receive additional application until the proper results are obtained.
- c. Paint exposed surfaces whether or not colors are designated in "schedule", except where natural finish of material is specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint same as adjacent similar materials or areas. If color or finish is not specified, Architect will select color from standard colors scheduled for materials specified.
- d. Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels pipe spaces, duct shafts, and attics. Walls behind tack boards, chalkboards, and cabinetwork may be left unpainted.
- e. Painting for electrical work is limited to panel faces, junction boxes, conduits and gutters in habitable spaces other than mechanical rooms, closets, etc. Other painting specified in Division 26.
- f. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
- g. Paint backsides of access panels, and removable or hinged covers to match exposed surfaces.
- h. Shop priming specified for various materials in other sections.
- i. Omit first coat (primer) on metal surfaces, which have been shop primed and touch-up painted, unless otherwise specified.
- j. Paint exposed roofing aluminum sheet metal surfaces, including eave strips. Downspout leaders, gutter faces and expansion joint caps. No paint required on flashing and valleys.
- k. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces.

09 91 00.12 Reference Specifications.

Comply with pertinent standards of the:

09 91 00.13 Submittals.

A. Technical Literature:

The Contractor shall furnish to the Architect for approval manufacturers' technical literature including paint label analysis and application instructions for each material specified.

B. Samples:

Submit samples for Architect's review of color and texture only. Provide a listing of material and application for each coat of each finish sample.

[1] On a 12" x 12" hardboard, provide two samples of each color and material, with texture to simulate actual conditions. Resubmit samples as requested by Architect until acceptable sheen, color, and texture is achieved. If colors are those listed in color schedule, color chips may be substituted for this requirement.

09 91 00.14 Basis of Design – Manufacturer.

1. The following product was used in the development of this project.

ICI-Glidden Co

2. Products of the following manufacturers *meeting these specifications* may be installed:

Pratt & Lambert

Devoe-Raynolds Company

Benjamin Moore

09 91 00.20 MATERIALS.

See 09 91 13 Exterior Applications and 09 91 23 Interior Applications for product requirements:

09 91 00.21 COLORS & FINISHES.09 91 00.22 Colors.

Colors shall be those shown on the color schedule. If products of manufacturer other than those listed in the color schedule are to be used, the contractor will submit to the Architect a complete color schedule for approval, with color chips, and locations clearly indicated. If accurate or acceptable color match cannot be made with manufacturer's standard colors, special colors will be prepared. Colors of one manufacturer will be used throughout.

09 91 00.23 Finishes.

In general, all finishes listed below shall apply throughout the building. Finishes shall be subject to minor variations on color schedule at the Architect's discretion.

Interior surfaces:	Eggshell finish
Interior metal work not otherwise specified:	Low luster semigloss finish
Exterior surfaces:	Standard outside finishes
All other metal surfaces:	Low luster semigloss finish
Wood trim:	Low luster semigloss finish
Hardwood:	Stained finish – see Subsection 09 93 00
All surfaces subject to dampness or moisture:	Enamel finish

09 91 00.30 EXECUTION09 91 00.31 Surface Preparation.a. General.

- [1] Determine alkalinity and moisture content of surfaces. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct the condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
- [2] Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.
- [3] Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish painted, or provide surface applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
- [4] Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Schedule cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly painted surfaces.

b. Cementitious Materials.

Prepare cementitious surfaces including concrete, concrete block, cement plaster and cement composition board to painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.

c. Wood.

- [1] Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of priming coat. After priming, fill holes, cracks, joints and imperfections in finish surfaces with putty or plastic wood filler. Sandpaper smooth when dry.
- [2] Prime, stain, or seal wood required to be job painted immediately upon delivery to job. Prime edges, ends, faces, undersides and backsides.
- [3] Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.

d. Ferrous Metals.

Clean ferrous surfaces, which are not galvanized or shop coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.

e. Galvanized Surfaces.

Clean free of oil and surface contaminants with non-petroleum based solvent.

f. Plaster & Drywall.

Clean surfaces; repair gouged irregular or damaged surfaces with putty or spackle and sand smooth. Test plaster surfaces with moisture meter. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.

09 91 00.32 Materials Preparation.

- a. Mix and prepare painting materials in accordance with manufacturer's directions.
- b. Store materials not in actual use in tightly covered containers. Maintain containers used for storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.
- c. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

09 91 00.33 Painting Procedures.

- a. All painting will be done by experienced workmen and only first class work will be permitted or accepted.
- b. Apply paint in accordance with manufacturer's printed instructions. Use applicators and techniques as listed in application specification or, if not listed, as best suited for substrate and type of material being applied.
- c. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance.
- d. Give special attention to insure that all surfaces, including edges, corners, crevices, recesses, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
- e. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.
- f. Apply first coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practical after preparation and before subsequent surface deterioration.
- g. Allow sufficient time between successive coatings to permit proper drying; but in no case less time than indicated in the manufacturer's instructions. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat

09 91 00.34 Minimum Coating Thickness.

Apply materials at not less than manufacturer's recommended spreading rate to establish recommended total dry film thickness.

09 91 00.35 Prime Coats.

- a. Apply prime coat fully over materials, which are required to be painted or finished, and which has not been prime coated by others.
- b. Re-coat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn through or other defects due to insufficient sealing.

09 91 00.36 Pigmented (Opaque) Finishes.

Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will be corrected and refinished.

09 91 00.37 Transparent (Clear) Finishes.

Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, or other surface imperfections.

- a. Provide satin finish for final coats, unless otherwise indicated.

09 91 00.38 Clean Up and Protection.

- a. Clean Up.

- [1] During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each workday.
- [2] Upon completion of painting work, clean window glass and other paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

- b. Protection.

- [1] Protect work of other trades, whether to be painted or not, against damage by painting and finishing operations. Correct any damage by repainting, cleaning, repairing or replacing, as acceptable to Architect.
- [2] Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
- [3] At the completion of work of other trades, touch up and restore all damaged or defaced painted surfaces.

09 91 00.39 Completed Work.

Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

09 91 13.00 EXTERIOR PAINT APPLICATIONS

09 91 13.11 Metal Work.

- a. All exposed metal work not otherwise specified, including structural steel, decking, hollow metal work, unexcluded sheet metal work, and miscellaneous metal items shall receive 1 coat field primer, followed by 2 coats of alkyd oil exterior paint. Galvanized metal surfaces shall be primed with galvanum. Other surfaces shall be primed with Tnemec 99G or Rustoleum 1060.
- b. Concealed structural steel - Touch up scratched or damaged shop primer, spot prime bolts, welds, field cuts and other unprimed surface with same primer material as shop coat.

09 91 13.12 Concrete Masonry.

All exposed concrete masonry shall receive 2 coats acrylic latex concrete masonry paint, TT-P-19, 2.5 mil dry film thickness.

09 91 13.13 Woodwork.

All exposed exterior wood trim and miscellaneous wood items shall receive oil base primer and 2 coats of vinyl latex house paint.

09 91 23.00 INTERIOR PAINT APPLICATIONS

09 91 23.11 Metal Work.

All exposed metal work not otherwise specified, including structural steel, hollow metal work, railings, unexcluded sheet metal work, shall receive 2 coats of medium oil alkyd paint semigloss over either shop or field primer. Metal deck ceilings shall receive 2 coats medium oil alkyd paint flat over field primer. See 09 91 23.13 for priming requirements.

09 91 23.12 Woodwork.

- a. Interior softwood trim, cabinets, paneling, etc. shall be given two coats of medium oil, alkyd paint over priming coat, including interiors of cabinets.
- b. Shelving shall receive 1 coat of sanding sealer followed by light sanding and 1 coat of white shellac (not required if prefabricated shelves are finished with equivalent factory finish).

09 91 23.13 Concrete Masonry.

- a. Surfaces scheduled as "Concrete Masonry Painted" or "CMU Painted" and other interior concrete masonry not otherwise excluded shall receive a heavy coat of latex base block fill, roller applied, followed by two coats of acrylic latex semi-gloss wall paint.
- b. Surfaces scheduled "Epoxy Paint on CMU" shall receive a heavy coat of block fill, roller applied, 10 mils dry coat compatible with finish coat, followed by two coats of polyester epoxy paint TT-C-545 Class B, Spray applied, combined thickness 8 mils dry coat, semigloss finish.
- c. Masonry walls scheduled, as "CMU" shall receive no paint of any kind.

09 91 23.14 Drywall Surfaces Not Receiving Wall Covering.

- a. Drywall surfaces scheduled "GWB Painted" and other drywall surfaces not otherwise scheduled and not otherwise excluded shall receive primer followed by two coats acrylic latex eggshell paint.

09 91 23.16 Concrete Floors.

- a. Concrete floors scheduled "Concrete Painted" shall receive 2 coats of urethane based concrete floor paint.
- b. All other concrete floors see Section 09 60 00.

09 91 23.17 Field Priming.

After structural steel is in place and all connections and welds completed and prepared, apply spot priming field coat of primer of same type as shop primer over any bare or unpainted structural steel surface including field welds.

09 93 00.00 STAINING & TRANSPARENT FINISHING**09 93 00.10 GENERAL.**09 93 00.11 Requirements.

- a. It is the intent that certain exposed surfaces, inside and outside the building not finished with paint, wall covering or other special or natural finishes will be stained.
- b. Any area giving appearance of insufficient coverage after required applications shall receive additional applications until the proper results are obtained.
- c. Stain exposed surfaces whether or not colors are designated in "schedule." If color or finish is not specified, Architect will select color from manufacturer's full range of stain colors for materials specified.

09 93 00.12 Submittals.

- A. Technical Literature:
The Contractor shall furnish manufacturers' technical literature including stain label analysis and application instructions for each material specified to the Architect for approval.

b. Samples:

- [1] Submit samples for Architect's review of color and texture only. Provide a listing of material and application method for each coat of each finish sample
- [2] On actual wood surfaces, provide two 4" x 8" samples of natural and stained wood finish. Label and identify each as to location and application.

09 93 00.17 Basis of Design – Manufacturer.

- [1] The following product was used in the development of this project.

ICI-Glidden Co

- [2] Products of the following manufacturers *meeting these specifications* may be installed:

Pratt & Lambert

Devoe-Raynolds Company

Benjamin Moore

09 93 00.20 MATERIALS.

See 09 91 13 Exterior Applications and 09 91 23 Interior Applications:

09 93 00.21 COLORS & FINISHES.09 93 00.22 Colors.

Colors shall be those shown on the color schedule. If products of manufacturer other than those listed in the color schedule are to be used, the contractor will submit to the Architect a complete color schedule for approval, with color chips, wall covering swatches and locations clearly indicated. If accurate or acceptable color match cannot be made with manufacturer's standard colors, special colors will be prepared. Colors of one manufacturer will be used throughout unless otherwise indicated.

09 93 00.23 Finishes.

In general, all finishes listed below shall apply throughout the building. Finishes shall be subject to minor variations on color schedule at the Architect's discretion.

Hardwood

09 93 00.30 EXECUTION09 93 00.31 Surface Preparation.a. General.

- [1] Perform preparation and cleaning procedures in accordance with stain manufacturer's instructions and as herein specified, for each particular substrate condition.
- [2] Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish stained, or provide surface applied protection prior to surface preparation and finishing operations. Remove, if necessary, for complete staining of items and adjacent surfaces. Following completion of each space or area, reinstall removed items.
- [3] Clean surfaces to be stained before application. Remove oil and grease prior to mechanical cleaning. Schedule cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly stained surfaces.

b. Wood.

- [1] Clean wood surfaces to be stained of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view, and dust off. Fill holes, cracks, joints and imperfections in finish surfaces with putty or plastic wood filler. Sandpaper smooth when dry.
- [2] Stain wood required to be job stained immediately upon delivery to job.
- [3] Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.

09 93 00.32 Materials Preparation.

- a. Mix and prepare materials in accordance with manufacturer's directions.
- b. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of stain in a clean condition, free of foreign materials and residue.
- c. Stir materials before application to produce a mixture of uniform density, and stir as required during application.

09 93 00.33 Staining Procedures.

- a. All staining will be done by experienced workmen and only first class work will be permitted or accepted.
- b. Apply stain in accordance with manufacturer's directions. Use applicators and techniques as listed in application specification or, if not listed, as best suited for substrate and type of material being applied.
- c. Apply first coat material to surfaces that have been cleaned, pretreated or otherwise prepared for staining as soon as practical after preparation and before subsequent surface deterioration.
- d. Apply additional coats when opaque stains show undercoats, stains or other conditions show through final coat of paint, until stain is of uniform finish, color and appearance.
- e. Give special attention to insure that all surfaces, including edges, corners, crevices, and recesses receive uniform finish, color and appearance.
- f. Do not stain over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a uniform stain finish.

09 93 00.34 Minimum Coating.

Apply materials at not less than manufacturer's recommended spreading rate to establish recommended finish.

09 93 00.35 Transparent (Clear) Finishes.

Use multiple clear coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, or other surface imperfections.

- a. Provide satin finish for final coats, unless otherwise indicated.

09 93 00.36 Clean Up and Protection.

c. Clean Up.

- [1] During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each workday.
- [2] Upon completion of painting work, clean window glass and other paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or

otherwise damage finished surfaces.

d. Protection.

- [1] Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting as acceptable to Architect.
- [2] Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
- [3] At the completion of work of other trades, touch up and restore all damaged or defaced painted surfaces.

09 93 00.39 Completed Work.

Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

09 93 23.00 INTERIOR STAIN APPLICATIONS

09 93 23.12 Woodwork.

- a. Hardwood trim, and hardwood veneers shall be filled, or sealed, stained with transparent colored stain and finished with three coats of water based polyurethane. The third coat shall be a satin finish.

DIVISION 10 SPECIALTIES

Includes work by the General Contractor covered in the following sections.
Section designations are neither consecutive nor numerically inclusive.

SECTION 1010 INFORMATION SPECIALTIES
SECTION 1020 INTERIOR SPECIALTIES

10 10 00 INFORMATION SPECIALTIES**10 10 00.10 GENERAL.**10 10 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of information specialties indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	10 14 00	Signage
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10 10 00.12 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	09 20 00	Wall Board Systems
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10 14 00 SIGNAGE**10 14 00.10 GENERAL.**10 14 00.11 Types.

The following signage types are required under this specification:

10 14 16	Plaques
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10 14 00.12 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

B. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

10 14 00.13 Design Conditions.

a. Signage shall comply with Chapter 16 of the North Carolina Building Code for structural loading conditions.

b. Signage shall comply with the latest edition of the North Carolina Building Code, Chapter 11 Accessibility [for scoping requirements] and ICI/ANSI A117.1-2003 [for technical requirements] and with the "Americans with Disabilities Act" Public Law 101-336 [ADA]

10 14 00.14 Subcontractor.

Signage shall be engineered, manufactured, fabricated and installed under a subcontract to a single manufacturer regularly involved in the development, fabrication and installation of signs of the type indicated.

10 14 16.00 PLAQUES [ROOM SIGNAGE]**10 14 16.10 GENERAL.**10 14 16.11 Location.

Room and Accessible Route Identification signage plaques shall be provided for spaces indicated,

scheduled, or specified and as required under the scoping requirements of NCBC Chapter 11 and under the requirements of the ADA PL 101-336 as indicated in paragraph 10 14 00.13b above. Signage shall apply only to areas within the project limits. Specific locations are identified as follows:

- a. Each door into each space identified on the Interior Finish Schedule
- b. Each exit identified as an exit by a lighted exit sign on the electrical lighting plans
- c. Each fire extinguisher cabinet as located on the floor plans
- d. Each fire alarm pull station as shown on the Fire alarm riser diagram and as indicated on the electrical plans
- e. Each accessible entrance. [none required this project]
- f. Each inaccessible entrance shall have a sign directing a handicapped person to the nearest accessible entrance. [2 required for this project]
- g. Signage identifying mechanical rooms and electrical rooms shall incorporate wording stating "No Storage" in addition to identification requirements.
- h. One sign stating: "Emergency Operations Center Level 1" to be posted in the basement adjacent the existing elevator.

10 14 16.20 MATERIALS.

Materials shall conform to the following:

- | | |
|-----------------------------------------------|--------------------------------------------------------------------------------------|
| [1] Acrylic Sheet: | Cast-Acrylic Sheet, clear matte finish, in indicated or specified thicknesses. |
| [2] Acrylic Letters, Numbers, & Braille Tags: | Acrylic copy colored, chemically compatible with acrylic sheet and welding chemical. |
| [3] Silkscreen Paint: | Manufacturer's standard silk-screening enamel. |

10 14 16.30 FABRICATION

10 14 16.31 Fabricated Items.

10 14 16.32 Room Identification Signs [door signs]

- a. Quantity.
Provide identifying nameplates for all interior doors in building and for code mandated signs as defined in NCBC Chapter 11 and under the requirements of the ADA PL 101-336. Also, furnish code mandated [NCBC, ADA, Department of Labor] signage required for the operation of and limitation of operation of elevators located within the structure. Doors shall have number of area into which they open. Two or more doors opening into same areas shall have the same number.
- b. Type.
 1. Nameplates shall be matte finish acrylic with reverse side screen printed for color application, 3/16" thick min., minimum size 7-5/8" x 7-5/8" in configurations as indicated in ANSI A117.1-2003, with round corners.
 2. Nameplates with male or female icons shall be matte finish acrylic with reverse side screen printed for color application 3/16" thick min., minimum size 7-5/8" x 7-5/8" in configurations as indicated in ANSI A117.1-2003, with round corners.
 3. Copy shall be raised 1/32" minimum above the surface of the sign and fully chemically welded to the acrylic sheet.
 4. Colors:

Copy: Dark color selected from manufacturer's full color palette
 Background: Light color selected from manufacturer's full color palette.
 See typical sign elevation for application of county seal on each sign.

6. Font: Helvetica upper case with Grade 2 Braille tags.

7. Font Sizes:

	Numerals	Letters
Nameplates:	3/4"	7/8"
Nameplates with	5/8"	3/4"
Male/Female Icons		

10 14 16.40 EXECUTION

10 14 16.42 Installation.

- a. Signage shall be set plumb, level, square, and coplanar to surfaces on which they are to be affixed.
- b. Door signs shall be mechanically attached to the subsurface materials using countersunk flat head Phillips head stainless steel screws set at the center [radius point] of the rounded corners.
- c. The horizontal centerline of the room identification signs shall be set at 60" above the finished floor. The vertical centerline of the sign shall comply with paragraph 703.3.11 of ICI/ANSI A117.1 reprinted below.

703.3.11Location. Where a tactile sign is provided at a door, the sign shall be alongside the door at the latch side. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a tactile sign is provided at double doors with two active leaves, the sign shall be to the right of the right-hand door. Where there is no wall space on the latch side of a single door, or to the right side of double doors, signs shall be on the nearest adjacent wall. Signs containing tactile characters shall be located so that a clear floor area 18 inches [455 mm] minimum by 18 inches [455 mm] minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.

Exception: signs with tactile characters shall be permitted on the push side of doors with closers and without hold-open devices.

10 14 16.43 TOLERANCES / TESTING.

Plaques shall be set:

Plumb and level : 1/8" in 8'-0"

10 20 00 INTERIOR SPECIALTIES**10 20 00.10 GENERAL.**10 20 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of miscellaneous interior products indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following:

Subsection	10 28 00	Toilet, Bath, and Laundry Accessories
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10 20 00.12 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	05 10 00	Structural Metal Framing
Section	06 10 00	Rough Carpentry
Section	08 10 00	Doors and Frames
Section	09 20 00	Lathing, Plastering, and Wall Board Systems

10 28 00.00 TOILET, BATH, AND LAUNDRY ACCESSORIES**10 28 13.00 TOILET ACCESSORIES****10 28 13.10 GENERAL.**10 28 13.11 Location.

Toilet accessories shall be provided for spaces indicated, scheduled, or specified.

10 28 13.12 Types.

Factory fabricated stainless steel accessories developed for use in commercial establishments.

10 28 13.14 Submittals.

A. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature for each item specified to the Architect for approval. Such approval will be as to design, quality, connections and size. The Contractor shall be responsible for dimensions and quantities.

B. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

10 28 13.17 Subcontractor

Toilet accessories shall be engineered, manufactured, and fabricated under a subcontract to a single manufacturer regularly involved in the development, fabrication and installation of products of the type indicated.

10 28 13.18 Basis of Design – Manufacturer.

1. The following product was used in the development of this project.

Bobrick Washroom Equipment

2. Products of the following manufacturers *meeting these specifications* may be installed:

Bobrick Washroom Equipment

McKinney
Bradley Corp

10 28 13.20 MATERIALS.

All accessories shall be satin finish stainless steel.

10 28 13.21 Products.

Products and materials shall conform to the following:

[1] Gang Toilets

At each lavatory

	Bobrick	McKinney	Bradley
Towel holder	B-262	610	250-15
Soap dispenser	B-360P	860	225
Mirror	20" w x 40" h framed		

At each water closet

	Bobrick	McKinney	Bradley
Paper holder	B-2740	1031DLCD	5241-50
Coat hook	B-233	1544	9114

At each water closet (Women)

	Bobrick	McKinney	Bradley
Paper holder	B-2740	1031DLCD	5241-50
Coat hook	B-233	1544	9114
Napkin disposal	B-254	626	4722
Fold-down shelf	B-287	1080	790

At each water closet equipped for handicapped

	Bobrick	McKinney	Bradley
@ 3' x 5' stalls			
2 grab bars	B-6206 x 42"	9604 x 42"	812 x 42"
@ 5' x 5' stalls			
1 grab bar	B-6206 x 36"	9604 x 36"	812 x 36"
1 grab bar	B-6206 x 42"	9604 x 42"	812 x 42"
1 grab bar [vertical]	B-6206 x 18"	9604 x 18"	812 x 18"

[2] In Other Spaces with Lavatories or Sinks

At each lavatory or sink

	Bobrick	McKinney	Bradley
Towel holder	B-360P	860	225
Soap dispenser	B-306	352	643-12

10 28 13.22 Keying.

Provide universal keys [4] for internal access to accessories for servicing and resupplying.

10 28 13.23 Handicapped protective devices.

- [1] Pipe protection: 1/8" vinyl pipe and valve enclosure. Smooth high gloss finish. Antimicrobial, paintable, snap clip fastners. The following fittings are required:
- Valve cover.
 - Supply cover

P-trap cover

Waste cover

Elbows,"T"s and other miscellaneous fittings required to completely cover the exposed piping.

10 28 13.30 FABRICATION.

10 28 13.31 Fabricated Items.

Units will be fabricated with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

10 28 13.40 EXECUTION

10 28 13.41 Standards.

Install accessories according to the approved shop drawings and any manufacturers' written instructions.

10 28 13.42 Installation.

- a. All devices shall be installed plumb, level, square, and firmly anchored. Exposed screws shall be drawn up tight without deforming assembly.
- b. Use fasteners appropriate to substrate indicated and recommended by unit manufacturer. Devices attached to toilet partitions shall be furnished with stainless steel through bolts with sex nuts. Devices set in framed partitions shall be attached with manufacturer's standard fastener system.
- c. Units exhibiting sharp or rough edges or corners will be considered defective, shall be removed from the Work, and the unit shall be replaced.
- d. Set devices at location and height indicated.
- e. Install grab bars to withstand the code mandated downward load when tested according to method in ASTM F 446
- f. Fully cover any and all exposed piping with protective devices following manufacturer instructions. Set devices with snap on clips out of view on the back or bottom side of piping.
- g. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- h. Remove temporary labels and protective coatings.
- i. Clean and polish exposed surfaces according to manufacturer's written recommendations.

10 28 13.43 Tolerances / Testing.

Test all units for attachment to substrates. Units shall maintain their position without movement.

DIVISION 11 EQUIPMENT

Includes work by the General Contractor covered in the following sections. Section designations are neither consecutive nor numerically inclusive.

NOT USED

DIVISION 12 FURNISHINGS

Includes work by the General Contractor covered in the following sections. Section designations are neither consecutive nor numerically inclusive.

Not Used

DIVISION 13 SPECIAL CONSTRUCTION

Includes work by the General Contractor covered in the following sections. Section designations are neither consecutive nor numerically inclusive.

- 13 10 00 Special Facilities Components
- 13 30 00 Special Structures

- | | | |
|----|--------------------------------------|-------------------------------------------------------------|
| 2. | Pipe: | Galvanized cold rolled steel pipe sections: |
| | | 1-1/8" vertical |
| | | 1-1/8" horizontal and reinforcing bar |
| | | 1-1/8" double channel door frames |
| | | 1-1/8" cap bar |
| 3. | Stiffener & Hardware
Reinforcing: | 1/8" galvanized steel plate. Standard galvanized wire mesh. |
| 4. | Hardware: | |
| | Hinges: | Galvanized steel hinges, 3 ea. opening. |

13 19 13.30 EXECUTION

13 19 13.31 Standards.

Install kennel enclosures and related work in accordance with ASTM C636, CISCA Installation Standards, and with the manufacturer's printed instructions, latest edition.

13 19 13.32 Installation.

- a. Mesh partition insets shall be assembled as indicated of manufacturer's standard components. Joints shall be mortise and tendon and spot welded. For freestanding partitions over 8'-0" in height, provide flat bar stiffener posts between abutting panel frames. Provide bolts on inactive leaves and deadlock on active leaves compatible with cylinders specified in Section 870. Furnish hinges, strikes. Latches and other hardware required for operation.
- b. Erect partitions plumb, rigid, properly aligned, and securely fastened in place, complying with drawings and manufacturer's recommendations. Provide additional field bracing as shown or necessary for rigid secure installation.
- c. Where mesh partition inserts are required to be set in hollow metal work, insets shall be bolted in place.

13 30 00 SPECIAL STRUCTURES**13 30 00.10 GENERAL.**13 30 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of special structures indicated, specified, or both including all incidental items normally required for installation and conditions encountered. Subsections forming this specification include the following::

Subsection	13 34 00	Fabricated Engineered Structures
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13 30 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	03 30 00	Cast-In Place Concrete
Section	05 50 00	Miscellaneous Metals
Section	07 20 00	Thermal Protection
Section	07 90 00	Caulking & Sealants
Section	08 10 00	Metal Doors and Frames
Section	08 40 00	Entrances, Storefronts, and Curtainwalls
Section	08 90 00	Louvers and Vents
Section	09 90 00	Painting
Division	22	Plumbing
Division	23	Heating, Ventilation, and Air Conditioning
Division	26	Electrical

13 34 00.00 FABRICATED ENGINEERED STRUCTURES**13 34 19.00 METAL BUILDING SYSTEMS****13 34 19.10 GENERAL.**13 34 19.11 Types.

The following metal building types are required under this specification:

Gable:	A continuous frame structure composed of post and beam endwalls with clear span rigid frames forming the interior structural system. Secondary framing is composed of multi-span roof purlins and semi-recessed girts.
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13 34 19.12 Reference Specifications.

In the absence of specific details or specifications to the contrary, the following standards and recommended practices of the AISC are to be followed in performing the work.

American Institute of Steel Construction

"Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings"

"Code of Standard Practice"*

"Specification for Design of Light Cold Formed Steel Structural Members"

American Welding Society

"Application of and Extracts from Code for Arc and Gas Welding in Building Construction"

*Code of Standard Practice is hereby amended by the deletion of Paragraph 4.2.1 Shop & Erection Drawings Approval.

13 34 19.13 Submittals.

a. Shop DRAWINGS:

The Contractor shall furnish supplier's detailed engineered shop drawings for the structural framing, secondary framing, lateral support, and panels forming the structure's skin as specified to the Architect for approval. Such approval will be as to design, quality, structure, connections, and sizes. The Contractor shall be responsible for dimensions and quantities. Shop drawings shall be designed and sealed by a professional engineer registered in North Carolina..

a. Samples:

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

13 34 19.14 Warranty.

Furnish the written warranty of the metal building manufacturer covering repair and replacement in whole or in part of any portion of structure that exhibits defects of design, workmanship, or materials within 20 years of the date of substantial completion.

13 34 19.15 Design Conditions.

The pre-engineered metal building shall comply with Chapter 16 of the North Carolina Building Code with the following conditions:

Occupancy Category Classification: I.

Roof Live Load: 20 psf with a maximum point load of 300 lbs.

Ground Snow Load: 10 psf

Wind Speed: 120 *m.p.h. wind load [3 second gust as determined from NCBC Table 1609] with velocity as determined under Section 1606 and ASCE 7-93.*

Seismic: See NCBC 2012 Section 1613

Deflections shall not exceed the following:

Vertical Deflections

Roof Purlins: L/150 [roof only], L/240 [supporting ceiling tiles], L/360 [supporting plaster or gypsumboard ceilings]

Rafters and Rigid Frames: L/150 [roof only], L/240 [supporting ceiling tiles], L/360 [supporting plaster or gypsumboard ceilings]

Horizontal Deflections:

Wall Panels: L/120

Girts: L/120

Frames: H/60

13 34 19.16 Subcontractor.

Pre-engineered metal building shall be engineered, manufactured, fabricated under a subcontract to a single manufacturer regularly involved in the development, and fabrication of structures of the type indicated, and installed by a contractor or subcontractor regularly involved in the installation of structures of this type.

13 34 19.17 Basis of Design – Manufacturer.

- a. The following manufacturer's product was used in the development of this project and is referenced in the following paragraphs of the specification.

American Building Company [ABC] – a division of Nucor Corporation

- b. Products of the following manufacturers *meeting these specifications* may be installed:

American Building Company [ABC]

Ceco Building Systems – an NCI Company

Varco Pruden Buildings - a division of BlueScope Buildings North America, Inc.

13 34 19.20 MATERIALS.13 34 19.21 Structural Framing.

Structural framing shall comply with the following:

Mill rolled sections and shapes:	ASTM A36 or A572 Grade 50 or 55 as applicable
Built up sections:	ASTM A1011, A572, A529 all Grade rated 55
Purlins, girts, eave struts, and "C" sections:	ASTM A1011 Grade 55
Galvanized purlins and girts:	ASTM A653 Grades 50 & 55 w/ G90 coating meeting the requirements of ASTM A924

Finish: All milled structural framing shall be cleaned of all foreign matter and loose mill scale and shall be factory primed with a one mil coat of manufacturers proprietary red oxide primer. Cold formed elements may be pre-painted with a primer finish coat of 0.45 to 0.55 mils.

13 34 19.22 Panels.

Panels shall comply with the following:

Roof panels	Profiles equal to ABC Loc Seam Panels: 22 ga. 50ksi
Wall Panels	Profiles equal to ABC Architectural III Wall Panels: 24 ga. 80 ksi

Finish: Panels shall be finished on the exterior with a .25mil primer followed by an exterior coating of PVDF [Kynar 500 or Hylar 5000] to a dry film thickness of 0.70 mils equal to ABC's Smartkote®. The interior finish shall be manufacturer's standard White polyester topcoat over primer.

13 34 19.23 Accessories.

- a. Closure Strips:

Closure strips shall be formed closed cell non-shrinking laminated polyethylene fabricated for the conditions specified including but not limited to wall and roof panels, ridges, and rakes.

- b. Metal Closures

Formed metal closures shall be fabricated to shape of 20 ga. aluminum-zinc alloy coated steel matching the finish and color of the adjoining panels.

- c. Trim:

Shop and field formed trims shall be fabricated of 24 ga. aluminum-zinc alloy coated steel matching the finish and color of the adjoining panels.

13 34 19.24 Fasteners.

Fasteners for steel wall and roof panels shall be hexagonal washer head self tapping stainless steel screw fasteners for exterior application, galvanized or cadmium-plated fasteners for interior application. Exposed roof fasteners shall be gasketed or have metal-backed gasket washers on the exterior side of the covering to waterproof the fastener penetration. Minimum roof washer diameter when independent of the fastener shall be 3/8". Gaskets shall be neoprene or EPDM 1/8" thick.

1. Bolts:
ASTM A 325 Fasteners shall be not less than 3/4" diameter unless indicated otherwise, shouldered or plain shank as required, with hex nuts and washers.
2. Screws:
Fasteners shall be as recommended by the manufacturer to meet the design conditions [strength and or length] encountered.
3. Blind Rivets:
Fasteners shall be stainless steel with 1/8" nominal diameter shank. Rivets shall be threaded stem type if used for other than the fastening of trim. Rivets with hollow stems shall have closed ends. Exposed rivets shall match the color of the adjoining panel.
4. Explosive Actuated Fasteners:
Fasteners shall have a shank diameter of not less than 0.145" with a shank length of not less than 1/2" for fastening panels to steel and not less than 1" for fastening panels to concrete.
5. Panel Clips:
Clips shall be die formed 12 ga. galvanized fabrications 3-1/2"h x 6" designed for use with thermal blocks.

13 34 19.27 Insulation.
See Division 07

13 34 19.28 Sealants.
Panel sealants shall comply with the following:

Condition	Sealant Type	Product for the condition
Standing Seam Roofing Panels: end laps, side laps, ridges and eave laps.	Solid isobutylene tripolymer tape	Sika-Tape TC-95 or equal
Eaves, endlaps, ridge and eave closures	Non-skinning butyl caulk	SikaLastomer-511 or equal
Gutter and downspout joints, roof accessories, doors, windows, and louvers.	Polyurethane caulk	SikaFlex 219LM or equal

See 07 90 00 for other sealants required on the project.

13 34 19.30 FABRICATION.

13 34 19.31 Fabricated Items.

- a. Fabricate structural framing to sizes, shapes, and profiles as indicated on the architectural drawings and on the approved shop drawings. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, anchors and similar items. Rigid frames columns shall be fabricated of uniform dimension [non-tapering] shapes.
- b. Fabricate sheet metal trims in full lengths. Hem all sides and ends.

13 34 19.40 EXECUTION

13 34 19.41 Standards.

Structural Steel erection shall be in accordance with the approved manufacturer's shop drawings sealed by an engineer registered in the State of North Carolina with applicable provisions of the AISC Code of Standard Practice and the MBMA Manual.

13 34 19.42 Installation.13 34 19.43 Framing and Structural Members

- a. Members shall be accurately spaced to assure proper fitting of covering and set so as to properly form indicated openings for glazed frames, doors, windows, etc.
- b. As erection progresses, securely fasten members to resist induced loads. Temporarily brace to assure stability of the structure.
- c. Framing members requiring fabrication or modification on site shall be fabricated or modified under the direction of the structural engineer. Structural elements shall be saw or abrasive cut; bolt holes shall be drilled. Flame cutting is prohibited.
- d. Installation tolerances for framing shall be 1/8" from level; 1/8" from plumb.

13 34 19.44 Panels.

1. Wall panels shall be applied with the longitudinal configurations in the vertical position over insulation panels.
2. Roof covering panels shall be applied with the longitudinal configurations in the direction of the roof slope and endlapped shingle style. Installation shall use standoff clips and thermal blocks.
3. Fasten panels and accessories [closure strips, etc.] to sub-framing members at spacings indicated on shop drawings.
4. Remove all shavings from finish surfaces and touch up the cut edges matching panel finish.
5. Panels shall be installed to a tolerance of within 1/8"
6. Side lap distances, end lap distances, joint sealing, and spacing of fasteners shall be in accordance with the shop drawings and manufacturer's instructions.
7. Fasteners shall be fully concealed within the wall cavity.
8. Seal side laps, and end laps of roof and wall panels and accessories.

DIVISION 14 CONVEYING SYSTEMS

Includes work by the General Contractor covered in the following sections. Section designations are neither consecutive nor numerically inclusive.

Not Used

DIVISION 22 Plumbing

Includes work by the Plumbing [Sub] Contractor covered in the following sections. Section designations are neither consecutive nor numerically inclusive.

22 00 00 PLUMBING SYSTEM

22 00 00 PLUMBING**22 00 00.10 GENERAL.**22 00 00.11 Work Included.

- a. Furnish all labor, material, and equipment required for the fabrication and installation [including any required earthwork] of complete plumbing system indicated, specified, or both including all incidental items normally required for installation and conditions encountered.
- b. Where an existing system is in place, and elements of the existing equipment are required to be reused and incorporated in the new systems, the contractor shall:
 - 1)demolish and dispose of portions of the existing systems as indicated and/or specified, and
 - 2) shall carefully save, clean and recondition, protect, and store the equipment to remain and be reincorporated in the new system.

22 00 00.12 Subcontractor.

Work shall be included in the General Contract and performed by a properly licensed subcontractor who regularly installs commercial plumbing.

22 00 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	02 20 00	Earthwork
Division	23	Mechanical
Division	26	Electrical

22 00 00.14 Reference Specifications.

The following codes, standards, and specifications shall form a part of these specifications:

North Carolina State Building Code: Plumbing latest edition

Regulations of the North Carolina Department of Health.

All fabricated assemblies of electrically operated equipment, furnished under this contract, shall have Underwriters' Laboratory approval or UL re-examination listing in every case where such approval has been established for the particular type of materials or devices in question.

National Electrical Code, latest edition.

22 00 00.15 Drawings.

The plumbing plans are diagrammatic only and are not intended to show all fittings and details of the work. The location of piping is approximate and the plumbing subcontractor shall make any necessary changes in the location to avoid structural and mechanical components, after submitting any such changes to the Architect and securing approval.

22 00 00.16 Shop Drawings.

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature as required under the General Conditions of the Contract, and as required in Division 01.

22 00 00.17 Coordination.

The Contractor shall review the complete set contract documents to establish the points of connection of

work specified in this division with other equipment and indicated or specified.

1. Chases, Cutting, and Patching:

- a. The Plumbing Subcontractor in concert with the Contractor shall layout the location of chases, holes or openings for forces of the Contractor to fabricate, cut or install.
- b. The cutting of chases, openings, or holes, in floors and ceilings, shall be done in a manner as not to endanger the stability of the structure or any part thereof. The contractor shall not, in any case, cut or alter the work of any other contractor without the approval of and under the direction of the Architect or Engineer. All repairs, resulting from cutting, shall be done under the supervision of the Project Superintendent.

2. Excavation and Backfilling:

- a. Excavate for all work required in connection with the work specified in this Division 22. All such excavating shall be done in a manner as not to endanger the stability of the structure or any part thereof, or any work in place by other contractors. All backfilling shall be thoroughly tamped as required in Section 02 20 00. Where excavations are made through existing lawns, sidewalks, and other finish materials, the Contractor shall restore the finish to its original condition.
- b. Excess earth shall be disposed of as required under Section 02 20 00.

22 00 00.20 MATERIALS.

Materials shall conform to the following:

- a. All material and equipment shall be new, free from defects or other imperfections.
- b. The Contractor shall provide identifying nameplates for all equipment, switches, panels, etc. The nameplates shall be laminated phenolic plastic, black front and back with white core, allowing engraved letters etched into the core. Nameplates shall be fastened with pan head tapping screws.

22 00 00.30 EXECUTION.

22 00 00.31 Installation.

- a. All work shall be executed in a workmanlike manner by skilled mechanics and shall present a neat appearance when completed. Support and attach piping and equipment as hereinafter specified and required.
- a. Plumbing plans are diagrammatic and shall not be scaled. Secure dimensions from the architectural drawings or field measurement.
- b. Piping shall be installed as indicated with piping runs plumb, level [where required], square, and to indicated slopes. Where necessary, piping will be equipped with offsets to avoid structure.
- c. The Plumbing Sub-contractor shall lay out and install the Work in advance of pouring concrete floors and walls. He shall furnish all sleeves to the Contractor for openings through poured floors or walls, above grade, required for passage of all piping. Where indicated on the drawings, the Sub-contractor shall install fire caulking to meet the mandates of the indicated UL penetration requirements
- d. All fixtures shall be accurately roughed in according to the manufacturer's instructions so that no offset adapters, flexible connections, or other improvisations are required. All work indicating such condition shall be torn out and corrected.
- e. All fixtures, floor drains, flush valves and traps shall be set plumb and level.
- f. Connections shall be made at locations indicated. Check-valves, and other apparatus, which require adjustment, shall be installed at sufficient distance from the structure to allow for service as

required.

22 00 00.31 Testing.

- a. All piping and equipment installed under this Contract shall be tested in the presence of the Engineer or his authorized representative, and proved tight for the periods stated above, or longer if required by the Inspector.
- b. All water piping shall be made tight under hydrostatic test of 125 psi for one hour. Any and all leaks shall be corrected immediately. Where joints in copper or PVC lines leak, the joint shall be resoldered [copper] or refabricated [PVC]. Where copper is the specified material, both pipe and fittings shall be thoroughly cleaned to the original condition.
- c. All sanitary drainage and vent piping shall be tested before fixtures are installed and before connection is made to the sewer by capping or plugging the opening and filling the entire system with water and allowing it to stand thus filled for three hours. A minimum of 10 feet of water head shall be placed upon the system or portion thereof being tested.
- d. Hot water piping shall be tested at normal operating temperatures, as well as when containing cold water.
- e. All tests shall be strictly made in accordance with the methods as outlined in the North Carolina Building Code Volume II.
- f. Any defect, in any materials or equipment, which may become evident while under test, shall be immediately made good by the Contractor without cost to the Owner.
- g. Where necessary, the Work may be tested in sections. When additional installations are made to work, which has already been tested, the previously tested lines shall be placed under the same test as the newly added lines.
- h. No plumbing system or part thereof shall be covered or concealed until after it has been tested and approved. If such work has been covered or concealed before testing, it shall be exposed for testing.
- i. Testing shall be repeated the number of times required to prove the complete absence of leaks under all operating conditions anticipated by the Owner.
- j. Prior to any section of the Work being tested, the Contractor shall notify the Engineer at least forty-eight hours before the test is ready in order that the Engineer may be present when the test is made.

22 00 00.32 Connection to Equipment by Others.

The electrical subcontractor will provide a disconnect means, either in the form of a breaker in a panel, or as a disconnect switch as shown on the drawings located adjacent the water heater. The plumbing subcontractor shall connect to the load side lugs of the disconnect means and wire the water heater completely.

22 00 00.33 Fire Stopping.

All penetrations through floors and rated walls shall be fire stopped with a UL approved material specifically intended for that purpose, applied in accordance with the manufacturer's instructions.

22 00 00.40 PROJECT CLOSEOUT.

22 00 00.41 Sterilizing and Flushing.

- a. All water piping shall be sterilized with chlorine, 50 milligrams per liter, and held for a 24-hour period, after which the system shall be flushed prior to being put into service.
- b. During the flushing of the system, all flush valves shall be thoroughly flushed out to insure the

removal of sediment, pipe dope, etc., from waterlines and flush valves, removing such working parts of the flush valves as may be deemed necessary. The system shall be drained and flushed sufficiently to provide chlorine residue of 0.2 PPM or less.

22 00 00.42 Placing in Service.

- a. Upon completion and sterilization of the entire installation, the complete system shall be tested by actual operation of each item in the system to prove that it will function as intended.
- b. Flush all water and waste piping, etc., to insure that no foreign materials are in the lines, and that a continuous flow of water and waste can be effected.
- c. Place the entire system in a satisfactory operating condition and furnish all assistance and instruction required by the Owner's representative during the initial operating period.

22 00 00.43 Instruction.

The Contractor shall schedule with the Owner a meeting to instruct the Owner in the operation of the plumbing systems. Indicate to the Owner the scope of work, location of buried lines, and provide directions for operating and maintaining various items of plumbing equipment. This instructional period shall be done at the Owner's convenience and direction at the conclusion of the project. Instructions shall be given as if the Owner were not remotely familiar with the project and sufficient time shall be spent to acquaint him with the entire scope of work.

22 00 00.44 Operating and Maintenance Manuals.

Assemble and deliver to the Contractor four [4] complete sets of parts lists, operating instructions, and manufacturers' data including warranty information on all items of equipment furnished and installed under this contract. This data shall be included in the Contractor's maintenance manual delivered to the Owner two weeks prior to the final inspection:

- a. Index and page numbers
- b. Parts List and Technical Data
- c. Operating Instructions
- d. Warranties
- e. List of all Sub-contractors and suppliers with names, addresses and phone numbers.
- f. Complete start-up operation and shutdown procedures for each system including sequence of events, locations of switches, emergency procedures and any other critical items.
- g. Lubrication schedules and types of lubricants

In general, include descriptive materials for plumbing fixtures, cleanouts, water coolers, and any other items furnished and installed and all submittal data.

DIVISION 23 Heating, Ventilating, & Air Conditioning

Includes work by the Mechanical [Sub] Contractor covered in the following sections. Section designations are neither consecutive nor numerically inclusive.

23 00 00 HEATING, VENTILATION, & AIR CONDITIONING (HVAC)

23 00 00 HEATING, VENTILATING, & AIR CONDITIONING

23 00 00.10 GENERAL.

23 00 00.11 Work Included.

Furnish all labor, material, and equipment required for the fabrication and installation of heating, ventilation, and air conditioning systems indicated, specified, or both including all incidental items normally required for installation and conditions encountered.

23 00 00.12 Subcontractor.

Work shall be included in the General Contract and performed by a properly licensed subcontractor who regularly installs commercial heating, ventilating, and air conditioning systems factory trained for the installation of the specified equipment.

23 00 00.13 Related Sections.

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Subsection	02	Earthwork
Division	22	Plumbing
Division	26	Electrical

23 00 00.14 Reference Specifications.

The following specifications and standards shall form a part of these specifications:

North Carolina State Building Code Volume III latest edition.

North Carolina State Building Code Volume IV latest edition, which includes the National Electric Code together with any subsequent supplements.

Underwriters' Laboratory, Inc., Standards for Cabinets and Boxes, Rubber Wires and Cables, and Thermoplastic Insulated Wires and Cables

- a. All fabricated assemblies of electrically operated equipment shall have UL approval or UL re-examination listing in every case where such approval has been established for the particular type of material or device in question.

23 00 00.15 Drawings.

- a. The mechanical plans are diagrammatic and are not intended to show every fitting and all details of the work. The location of ductwork, piping, and devices is approximate and the mechanical subcontractor shall make any requisite changes in the location to avoid structural, plumbing, and / or electrical components; and to allow for proper maintenance after submitting any such changes to the Architect or his Consulting Engineer and securing approval.
- b. Where an existing system is in place, and elements of the existing equipment are required to be reused and incorporated in the new systems, the drawings indicate and differentiate graphically the existing components to be reused and or reinstalled. Where items of equipment are not indicated as existing, they shall be considered new.
- c. Certain diagrams are general in nature, developed to show certain related components *in their completed and operational state*, and do not differentiate between new and existing components. Where this occurs, the contractor shall refer to the plans and riser diagrams where the new and existing components are differentiated.

23 00 00.16 Shop Drawings.

The Contractor shall furnish supplier's detailed shop drawings and manufacturers' literature as required under the General Conditions of the Contract, and as required in Division 01.

23 00 00.17 Coordination.

The Contractor shall review the complete set of contract documents to establish the points of connection of the work specified in this division with other equipment indicated or specified.

1. Chases, Cutting, and Patching:

- a. The Mechanical Subcontractor in concert with the Contractor shall layout the location of chases, holes or openings for forces of the Contractor to fabricate cut or install.
- b. The cutting of chases, openings, or holes, in floors and ceilings, shall be done in a manner as not to endanger the stability of the structure or any part thereof. The Contractor shall not, in any case, cut or alter the work of any other contractor without the approval of and under the direction of the Architect or Structural Engineer. All repairs, resulting from cutting, shall be done under the supervision of the Project Superintendent.

2. Excavation and Backfilling:

- a. Excavate for all work required in connection with the work specified in this Division 23. All such excavating shall be done in a manner as not to endanger the stability of the structure or any part thereof, or any work in place by other contractors. All backfilling shall be thoroughly tamped as required in Section 02 20 00. Where excavations are made through existing lawns, sidewalks [cuts shall be made on the nearest joint lines allowing matching of concrete patterning], roads, parking lots and access drives, and other finish materials, the Contractor shall restore the aforementioned items to their original condition. In the event that the item is some form of loose unit masonry, the item shall be removed, stored and reinstalled.
- b. Excess earth shall be disposed of as required under Section 02 20 00.

23 00 00.20 MATERIALS.

Materials shall conform to the following:

- a. All material and equipment shall be new, free from defects or other imperfections unless otherwise indicated or specified.
- b. The Contractor shall provide identifying nameplates for all [new and existing] equipment, switches, panels, etc. The nameplates shall be laminated phenolic plastic, black front and back with white core, allowing engraved letters etched into the core. Nameplates shall be fastened with stainless steel pop rivets or stainless steel pan head self-tapping screws.

23 00 00.30 INSTALLATION.23 00 00.31 General.

- a. All work shall be executed in a workmanlike manner by skilled mechanics and shall present a neat appearance when completed. All ductwork shall be sealed and shall be insulated unless otherwise directed. Support and attach ductwork, conduit, and equipment as hereinafter specified and required.
- b. Mechanical plans are diagrammatic and shall not be scaled. Secure dimensions from the architectural drawings or field measurement.
- c. Ductwork shall be installed as indicated with runs plumb, level [where required], square and to

indicated slopes held in place with hangers, supports, and/or anchoring devices as indicated or specified. Where necessary, ductwork will be equipped with offsets to avoid structure and plumbing waste lines.

- d. The Mechanical Sub-contractor shall lay out and install the Work in advance of work by the concrete and masonry trades. He shall furnish all sleeves to the Contractor for openings through poured floors or walls above grade, required for the passage of all ductwork and piping. Where ductwork and or piping is indicated on the drawings as penetrating fire rated walls and partitions, the Sub-contractor shall install fire dampers [ductwork] and or fire caulking [ductwork sleeves or collars and piping] to meet code and UL mandates.
- e. All registers, grills, diffusers, and devices shall be set plumb and level and parallel and square to adjacent surfaces.
- f. Connections shall be made at locations indicated. Heating and air conditioning units and other apparatus, which require adjustment, shall be installed to allow for proper service access.

23 00 00.32 Testing.

- a. Air Flow:
Following complete installation of system, airflow readings shall be taken at each supply and return grill. Readings shall be within 5% of those indicated on the contract documents. Readings in deficit or in excess shall require to Contractor to fine tune dampers and other controls in order to bring the system into compliance.
- b. Electrical work:
Connections, control wiring and other electrical work shall be tested according to standards established in Division 26 for the various wiring types encountered.
- c. Gas piping:
 1. Gas piping systems shall be tested in strict accordance with the National Fire Protection Association's National Fuel Gas Code 54 and the NCBC.
 2. The gas piping system shall be air tested at 50 psi for a period of not less than one [1] hour without loss of pressure. Any leaks that occur shall be checked for leaks with a water-soap solution. Where leaks are found, the joint shall be remade.

23 00 00.33 Connection to Equipment by Others.

- a. The electrical subcontractor will provide a disconnect means, either in the form of a breaker in a panel or as a disconnect switch, as shown on the drawings, located adjacent the following items of equipment:

Air handlers, compressors, and ERVs

The mechanical subcontractor shall connect to the load side lugs of the disconnect means and complete all wiring to the aforementioned items of equipment.

- b. The electrical subcontractor will provide a junction box, leaving 12" of spare conductors, located adjacent the exhaust fans. The mechanical subcontractor shall connect to the conductors within the junction box and wire the exhaust fans completely. The mechanical subcontractor shall provide the necessary switchleg, including all conduit, conductors, outlet boxes, and motor overload protection.
- c. Miscellaneous:
 1. All individual motor starters for mechanical equipment (fans, pumps, etc.) shall be furnished and installed under Division 23 unless indicated as part of a motor control center. Motor starters for mechanical equipment provided in motor control centers will be furnished under Division 26.

2. Power wiring will be provided up to a termination point consisting of a junction box, trough, starter or disconnect switch. Under Division 26 line side terminations will be provided. Wiring from the termination point to the mechanical equipment, including final connections shall be provided under Division 23.
3. Duct smoke detectors will be provided and wired by Division 26, and shall be installed by the mechanical subcontractor. Fire alarm AHU shut down circuits will be wired from the fire alarm control panel to a termination point, adjacent to the fire alarm control panel, under Division 26. AHU control wiring from the termination point to the equipment shall be under Division 23.
4. Relays, actuators, timers, seven-day clocks, alternators, pressure, vacuum, float, flow, pneumatic-electric, and electric-pneumatic switches, aquastats, freezestats, line and low voltage thermostats, thermals, remote selector switches, remote pushbutton stations, emergency break-glass stations, interlocking, disconnect switches beyond termination point, and other appurtenances associated with equipment under Division 23 shall be furnished, installed and wired under Division 23.
5. Wiring required for controls and instrumentation unless otherwise indicated shall be furnished and installed under Division 23.
6. Roof exhaust fans with built-in disconnects provided under Division 23 will be wired under Division 26 to the line side of the disconnect switch. A disconnect switch will be provided under Division 26 if the fan is not provided with a built-in disconnect switch. In this case wiring from the switch to the fan shall be under Division 23.

23 00 00.34 Fire Stopping.

All penetrations through floors and rated walls shall be fire stopped with a UL approved material specifically intended for that purpose, applied in accordance with the manufacturer's instructions.

23 00 00.40 PROJECT CLOSEOUT.

23 00 00.41 Cleaning and Start-up.

- a. Units, ductwork, and other equipment installed under this contract shall be left in a like new condition. Clean equipment, pipe work, ductwork, etc. Touch up scarred surfaces on factory finished products with materials supplied by the manufacturer.
- b. Equipment startup shall be by the Mechanical Subcontractor under the supervision of the equipment manufacturer's representative.
- c. Place all equipment in satisfactory operation, observing equipment alignments and settings. Align pulleys, sheaves, and other similar equipment if excessive vibration is observed. Run all equipment through complete operating cycles for both heating and cooling.

23 00 00.42 Placing in Service.

- a. Upon completion of the electrical installation, the complete mechanical system shall be tested by actual operation of each item in the system to prove that it will function as intended. Should proper conditions not be available to adequately insure the correct operation of either the heating equipment or the cooling equipment, then the contractor shall return at such time as conditions may allow proper testing.
- b. Place the entire system in a satisfactory operating condition and furnish all assistance and instruction required by the Owner's representative during the initial operating period.

23 00 00.43 Instruction.

The Contractor shall schedule with the Owner a meeting to instruct the Owner in the operation of the electrical systems. Indicate to the Owner the scope of work, location of buried lines, and provide directions for operating and maintaining various items of electrical equipment. This instructional period shall be done at the Owner's convenience and direction at the conclusion of the project. Instructions shall be given as if the Owner were not familiar with the project and products installed, and sufficient time shall be spent to acquaint him with the entire scope of work.

23 00 00.44 Operating and Maintenance Manuals.

Assemble and deliver to the Contractor four [4] complete sets of parts lists, operating instructions, and manufacturers' data including warranty information on all items of equipment furnished and installed under this contract. This data shall be included in the Contractor's maintenance manual delivered to the Owner two weeks prior to the final inspection:

- a. Index and page numbers
- b. Parts List and Technical Data
- c. Operating Instructions
- d. Warranties
- e. List of all Sub-contractors and suppliers with names, addresses and phone numbers.
- f. Complete start-up operation and shutdown procedures for each system including sequence of events, locations of switches, emergency procedures and any other critical items.
- g. Lubrication schedules and types of lubricants

In general, include descriptive materials for any and all mechanical equipment and controls furnished under this contract, and all submittal data.

DIVISION 26 Electrical

Includes work by the Electrical [Sub] Contractor covered in the following sections. Section designations are neither consecutive nor numerically inclusive.

26 00 00 ELECTRICAL

26 00 00 ELECTRICAL

26 00 00.10 GENERAL.

26 00 00.11 Work Included.

1. Furnish all labor, material, and equipment required for the fabrication and installation of the complete electrical system indicated, specified, or both including all incidental items normally required for the installation and conditions encountered.
 - a. Electrical power including service entrance and all secondary distribution
 - b. Lighting fixtures, lamps, and requisite hangers and supports
 - c. Voice and data communications system raceway
 - d. Fire alarm system extension
 - e. Install a neutral line in each new switchleg in the new structure and in each new switchleg in the existing facility. These lines shall be connected into the system at the fixture closest to the switch in the circuit run and shall be capped in the switch box for future use.
2. Where an existing system is in place, and elements of the existing equipment are required to be reused and incorporated in the new systems, the contractor shall:
 - a. demolish and dispose of portions of the existing systems as indicated and/or specified or in the way of the new work,
and
 - b. shall carefully save, clean and recondition, protect, and store the equipment to remain and be reincorporated in the new system.

26 00 00.12 Subcontractor

Work shall be included in the General Contract and performed by a properly licensed subcontractor who regularly installs commercial electrical systems.

26 00 00.13 Related Sections

Special attention is directed to work in the following sections and or divisions affecting the work specified in this section.

Section	02 20 00	Earthwork
Division	22	Plumbing
Division	23	Mechanical

26 00 00.14 Reference Specifications

The following codes, standards and specifications shall form a part of these specifications:

North Carolina State Building Code: Electrical latest edition, which includes the National Electric Code together with any subsequent supplements.

Underwriters' Laboratory, Inc., Standards for Cabinets and Boxes, Rubber Wires and Cables, and Thermoplastic Insulated Wires and Cables

- a. All fabricated assemblies of electrically operated equipment shall have UL approval or UL re-examination listing in every case where such approval has been established for the particular type of material or device in question.

26 00 00.15 Drawings.

The electrical plans are diagrammatic only and are not intended to show all fittings and details of the

work. The location of conduit and devices is approximate and the electrical subcontractor shall make any necessary changes in the location to avoid footings, beams, ductwork, etc., after submitting any such changes to the Architect and securing approval.

26 00 00.16 Shop Drawings

Submit manufacturer's samples [smallest practical quantities] to the Architect for approval of each material listed below before placing on the job.

26 00 00.17 Coordination

The Contractor shall review the complete set of contract documents to establish the points of connection of work specified in this division with other equipment indicated or specified.

1. Chases, Cutting, and Patching

- a. The Electrical Subcontractor in concert with the Contractor shall layout the location of chases, holes or openings for forces of the Contractor to fabricate cut or install.
- b. The cutting of chases, openings, or holes, in floors and ceilings, shall be done in a manner as not to endanger the stability of the structure or any part thereof. The contractor shall not, in any case, cut or alter the work of any other contractor without the approval of and under the direction of the Architect or Engineer. All repairs, resulting from cutting, shall be done under the supervision of the Project Superintendent.

2. Excavation and Backfilling

- a. Excavate for all work required in connection with the work specified in this Division 26. All such excavating shall be done in a manner as not to endanger the stability of the structure or any part thereof, or any work in place by other contractors. All backfilling shall be thoroughly tamped as required in Section 02 20 00. Where excavations are made through existing lawns, sidewalks, and other finish materials, the Contractor shall restore the finish to its original condition.
- b. Excess earth shall be disposed of as required under Section 02 20 00.

26 00 00.20 MATERIALS

Materials shall conform to the following:

- a. All material and equipment shall be new, free from defects or other imperfections.
- b. The Contractor shall provide identifying nameplates for all equipment, switches, panels, etc. The nameplates shall be laminated phenolic plastic, black front and back with white core, allowing engraved letters etched into the core. Nameplates shall be fastened with pan head tapping screws.
- c. MC Cable [wet area rated] may be used in lieu of conduit and individual conductors as required by note 3 of the electrical notes on E-1.

26 00 00.30 INSTALLATION

26 00 00.31 General.

- a. All work shall be executed in a workmanlike manner by skilled mechanics and shall present a neat appearance when completed. Support and attach conduit and equipment as hereinafter specified and required.
- b. Electrical plans are diagrammatic and shall not be scaled. Secure dimensions from the architectural drawings or field measurement.
- c. Conduit shall be installed as indicated with runs plumb, level [where required], square and to indicated slopes held in place with hangers, supports, and/or anchoring devices as indicated or

specified. Where necessary, conduits will be equipped with offsets to avoid structure.

- d. The Electrical Sub-contractor shall lay out and install the Work in advance of pouring concrete floors and walls. He shall furnish all sleeves to the Contractor for openings through poured floors or walls, above grade, required for passage of all piping.
- e. All fixtures shall be accurately roughed in according to the manufacturer's instructions so that no offset field fabricated adapters, flexible connections, or other improvisations are required. All work indicating such condition shall be torn out and corrected.
- f. All fixtures and devices shall be set plumb and level.
- g. Connections shall be made at locations indicated. Disconnects, and other apparatus, which require adjustment, shall be installed to allow for service as required.

26 00 00.32 Testing.

a. Feeder Insulation Resistance Testing

All current carrying phase conductors and neutrals shall be tested as installed, and before connections are made, for insulation resistance and accidental grounds. This shall be done with a 500-volt megger. The procedures listed below shall be followed:

1. Minimum readings shall be one million (1,000,000) or more ohms for #6 AWG wire and smaller, 250,000 ohms or more for #4 AWG wire or larger, between conductors and between conductor and the grounding conductor.
2. After all fixtures, devices and equipment are installed and all connections completed to each panel, the contractor shall disconnect the neutral feeder conductor from the neutral bar and take a megger reading between the neutral bar and the grounded enclosure. If this reading is less than 250,000 ohms, the contractor shall disconnect the branch circuit neutral wires from this neutral bar. He shall then test each one separately to the panel and until the low readings is found. The contractor shall correct troubles, reconnect and retest until at least 250,000 ohms from the neutral bar to the grounded panel can be achieved with only the neutral feeder disconnected.
3. The contractor shall send a letter to the engineer certifying that the above has been done and tabulating the megger readings for each panel. This shall be done at least four (4) days prior to final inspection.
4. At final inspection, the contractor shall furnish a megger and show the engineers that the panels comply with the above requirements. He shall also furnish a hook-on type ammeter and voltmeter to take current and voltage readings as directed by the representatives.

b. Ground System Testing

Upon completion of installation of the electrical grounding and bonding systems, the ground resistance shall be tested with a ground resistance tester. Where tests show resistance-to-ground is over 25 ohms, appropriate action should be taken to reduce the resistance to 25 ohms, or less. (The compliance should be demonstrated by retesting.) See section 26 05 19.32c for work required when excessive resistance is encountered.

c. Circuit Breaker Testing

For services 1000 amperes and larger, the following tests should be performed on the service circuit breakers and the distribution circuit breakers. Testing shall be performed by a qualified factory technician at the job site. All readings shall be tabulated:

1. Phase tripping tolerance (within 20% of U/L requirements).
2. Trip time (per phase) in seconds.

3. Instantaneous trip (amps) per phase.
 4. Insulation resistance (in mega-ohms) at 100 volts (phase to phase, and line to load).
- d. Ground Fault Protection System
The ground fault protection on the new circuit breakers (if provided) shall be performance tested in the field and properly calibrated and set in accordance with the coordination study.
- e. Documentation
1. All tests specified shall be completely documented indicating time of day, date, temperature and all pertinent test information.
 2. All required documentation of readings indicated above shall be submitted to the engineer prior to, and as one of the prerequisites for, final acceptance of the project.

26 00 00.33 Connection to Equipment by Others.

- a. The electrical subcontractor will provide a disconnect means, either in the form of a breaker in a panel, or as a disconnect switch as shown on the drawings located adjacent the water heater. The plumbing subcontractor shall connect to the load side lugs of the disconnect means and wire the water heater completely.
- b. The electrical subcontractor shall provide a disconnect means, either in the form of a breaker in a panel or as a disconnect switch, as shown on the drawings, located adjacent the following items of equipment:

Air handlers, compressors, and ERVs

The mechanical subcontractor will connect to the load side lugs of the disconnect means and complete all wiring to the aforementioned items of equipment.
- c. The electrical subcontractor shall provide an outlet, leaving 12" of spare conductors, located adjacent the exhaust fans. The mechanical subcontractor will connect to the conductors within the outlet and wire the exhaust fans completely. The mechanical subcontractor will provide the necessary switchleg, including all conduit, conductors, outlet boxes, and motor overload protection.
- d. Miscellaneous:
 1. All individual motor starters for mechanical equipment (fans, pumps, etc.) will be furnished and installed under Division 23 unless indicated as part of a motor control center. Motor starters for mechanical equipment provided in motor control centers shall be furnished under Division 26.
 2. Power wiring shall be provided up to a termination point consisting of a junction box, trough, and starter or disconnect switch. Under Division 26 line side terminations shall be provided. Wiring from the termination point to the mechanical equipment, including final connections will be provided under Division 23.
 3. Duct smoke detectors shall be provided and wired by Division 26, installed by Division 23. Fire alarm AHU shut down circuits shall be wired from the fire alarm control panel to a termination point, adjacent to the fire alarm control panel, under Division 26. AHU control wiring from the termination point to the equipment will be under Division 23.
 4. Relays, actuators, timers, seven-day clocks, alternators, pressure, vacuum, float, flow, pneumatic-electric, and electric-pneumatic switches, aquastats, freezestats, line and low voltage thermostats, thermals, remote selector switches, remote pushbutton stations, emergency break-glass stations, interlocking, disconnect switches beyond termination point, and other appurtenances associated with equipment under Division 23 will be furnished, installed and wired under Division 23.

5. Wiring required for controls and instrumentation unless otherwise indicated will be furnished and installed under Division 23.
6. Roof exhaust fans with built-in disconnects provided under Division 23 shall be wired under Division 26 to the line side of the disconnect switch. A disconnect switch shall be provided under Division 26 if the fan is not provided with a built-in disconnect switch. In this case wiring from the switch to the fan will be under Division 23.

26 00 00.34 Fire Stopping.

All penetrations through floors and rated walls shall be fire stopped with a UL approved material specifically intended for that purpose, applied in accordance with the manufacturer's instructions.

26 00 00.40 PROJECT CLOSEOUT

26 00 00.41 Placing in Service.

- a. Upon completion of the entire electrical installation, the complete system shall be tested by actual operation of each item in the system to prove that it will function as intended.
- b. Place the entire system in a satisfactory operating condition and furnish all assistance and instruction required by the Owner's representative during the initial operating period. Where emergency generators and other special motorized equipment is installed, factory startup is required.

26 00 00.42 Instruction.

The Contractor shall schedule with the Owner a meeting to instruct the Owner in the operation of the electrical systems. Indicate to the Owner the scope of work, location of buried lines, and provide directions for operating and maintaining various items of electrical equipment. This instructional period shall be done at the Owner's convenience and direction at the conclusion of the project. Instructions shall be given as if the Owner were not remotely familiar with the project and sufficient time shall be spent to acquaint him with the entire scope of work.

26 00 00.43 Operating and Maintenance Manuals

Assemble and deliver to the Engineer four [4] complete sets of parts lists, operating instructions, and manufacturers' data on all items of equipment furnished and installed under this contract. These manuals shall be delivered to the Owner two weeks prior to the final inspection. The manuals shall be three-ring heavy-back notebooks with the name of the project and the words "Operations and Maintenance Manuals" on the cover and Spine. The manuals shall contain the following items as a minimum:

- a. Index and page numbers
- b. Certificate of Substantial Completion
- c. Warranties
- d. List of all Sub-contractors and suppliers with names, addresses and phone numbers.
- e. Complete start-up operation and shutdown procedures for each system including sequence of events, locations of switches, emergency procedures and any other critical items.
- f. Lubrication schedules and types of lubricants

These items, in general, shall include descriptive materials switchboards, panel boards, bus ducts, lighting fixtures, devices, etc., and any other items furnished and installed and all submittal data.

Appendix

Estimate and Request for Payment – Application Form

Estimate and Request for Payment – Continuation Sheet

Estimate and Request for Payment – Materials in Store Sheet

ESTIMATE AND REQUEST FOR PAYMENT

PROJECT: _____ OWNER: _____ APPLICATION No.: _____
CONTRACTOR: _____ DISCIPLINE: _____ DATE: _____

THE ABOVE NAMED CONTRACTOR REQUESTS FROM THE OWNER PARTIAL PAYMENT AS HEREIN INDICATED FOR THE PERIOD FROM _____ TO _____

THIS STATEMENT IS FOR ESTIMATING PURPOSES AND PAYMENT DOES NOT CONSTITUTE ACCEPTANCE OF WORK SHOWN REGARDLESS OF % OF COMPLETION INDICATED IN THE ATTACHED CONTINUATION SHEET.

ORIGINAL CONTRACT AMOUNT: _____
NET CHANGE TO DATE BY CHANGE ORDERS: _____
CONTRACT SUM TO DATE: _____
TOTAL THIS ESTIMATE: _____
TOTAL OF VALUES INDICATED IN COLUMN 8 ON CONTINUATION SHEETS
LESS _____% RETAINED: _____
VALUE OF THIS ESTIMATE: _____
LESS PREVIOUS AMOUNT AUTHORIZED: _____
REQUESTED THIS ESTIMATE: _____

CERTIFICATION

I, _____
[NAME]

TITLE [OWNER, PARTNER, ETC.]
OF _____
FIRM NAME

CONTRACTOR FOR THE PURPOSE OF SECURING THE PAYMENT REQUESTED

CERTIFY:

1. THAT ALL WORK LISTED ABOVE HAS BEEN COMPLETED IN ACCORDANCE WITH THE CONGRACT DOCUMENTS.
2. THAT ALL LAWFUL CHARGES FOR LABOR, SERVICES, AND MATERIAL, COVERED BY PREVIOUS APLICATIONS HAVE BEEN PAID IN FULL.
3. THAT MONIES DUE TO DATE AND INCLUDED INTHIS ESTIMATE ARE RECEIVED IN TRUST FOR PROMPT PAYMENT TO RESPECIVE CREDIGTORS.

SIGNED: _____

NOTARY

SUBSCRIBED AND SWORN TO BEFORE ME
THIS _____ DAY OF _____ 2006

NOTARY PUBLIC

MY COMMISSION EXPIRES _____

ESTIMATE and REQUEST for PAYMENT
CONTINUATION SHEET

C. R. FRANCIS / ARCHITECTURE

p.o. box 1387 new bern, n c 28563 phone: 252.637.1112 fax: 252.637.7698



1	2	3	4		5		6	7	8
ITEM NO.	ITEM	QUANTITY BREAKDOWN	COST BREAKDOWN		VALUE OF WORK COMPLETE		% COMPLETE 5A+5B/4A+4B	VALUE OF MATERIAL IN STORE	TOTAL THIS ESTIMATE 5A+5B+7
			4A MATERIALS	4B LABOR	5A PREVIOUS APPLICATION	5B THIS APPLICATION			

INDICATE TOTALS ON LAST SHEET ONLY

THIS STATEMENT IS FOR ESTIMATING PURPOSES AND PAYMENT DOES NOT CONSTITUTE ACCEPTANCE OF WORK SHOWN REGARDLESS OF % OF COMPLETION INDICATED IN COLUMN NO. 6.

