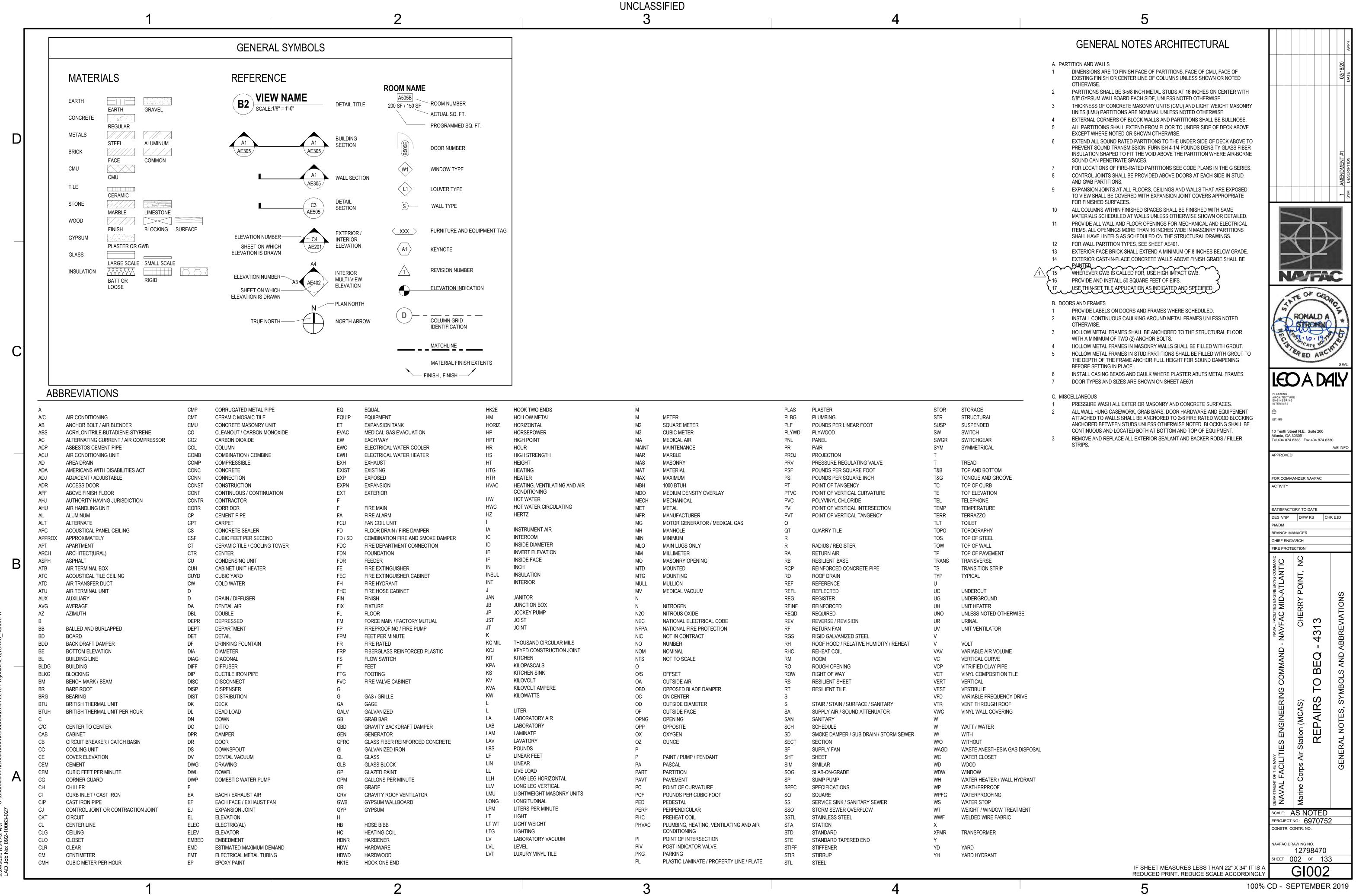
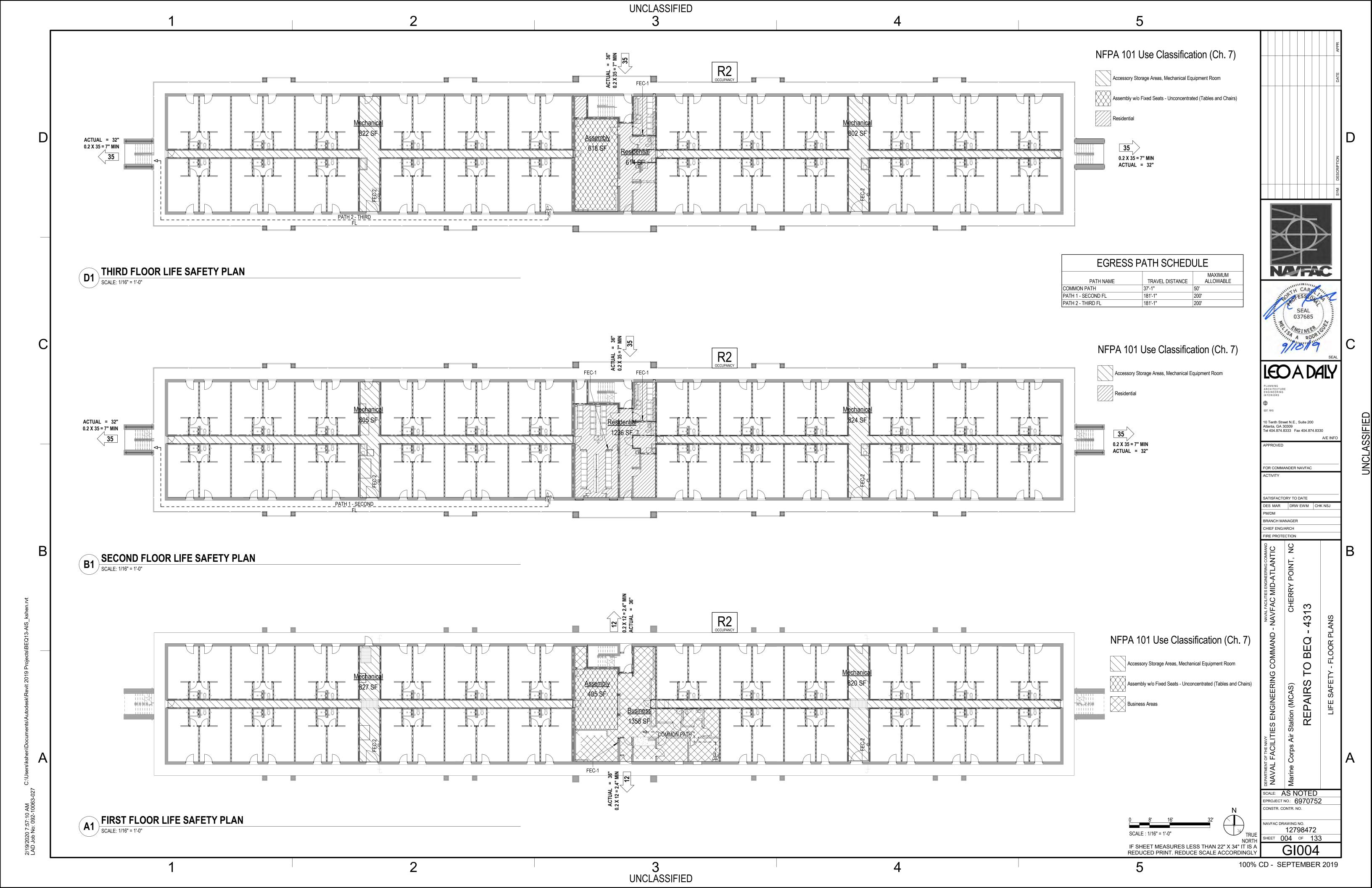
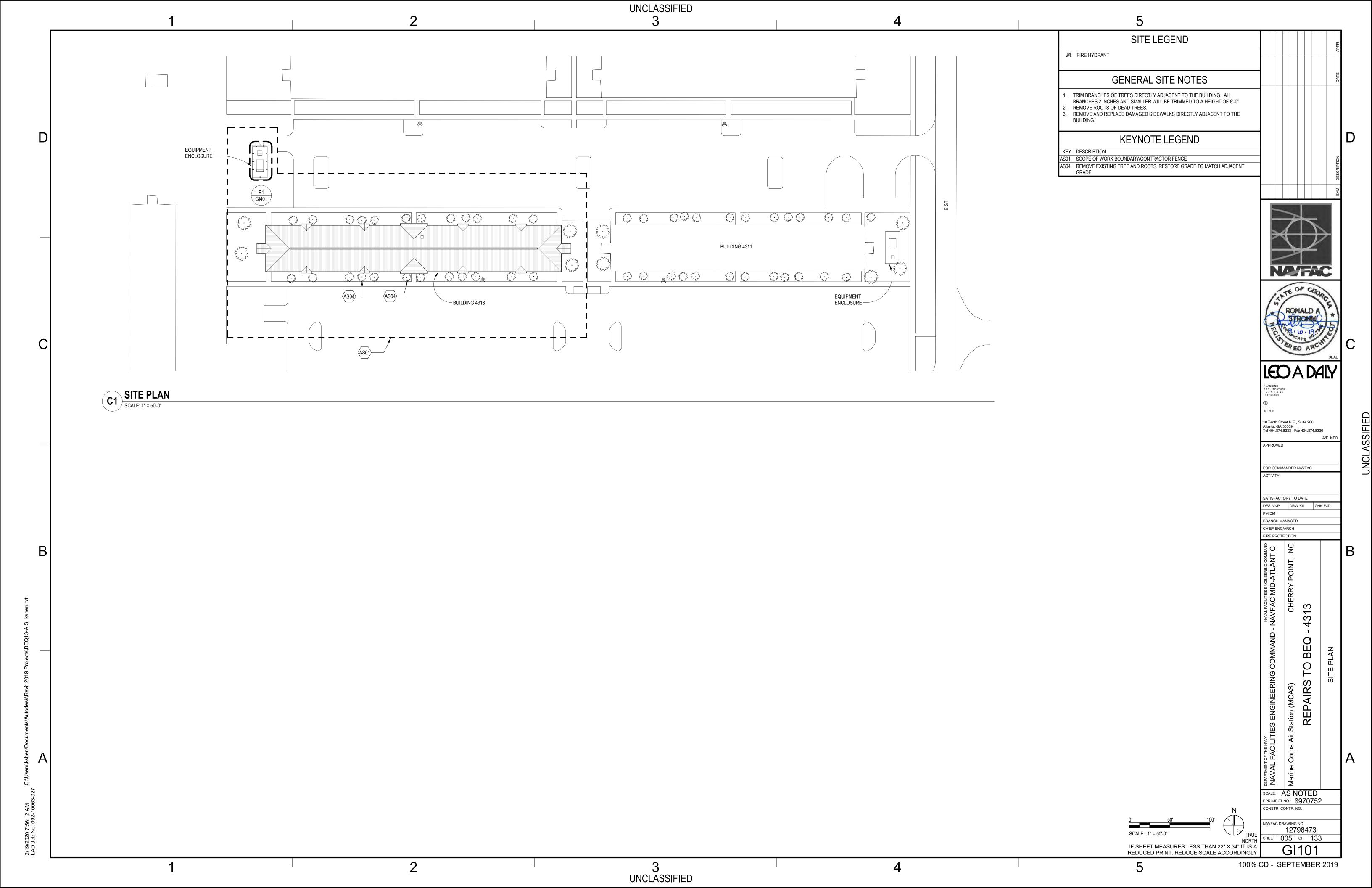
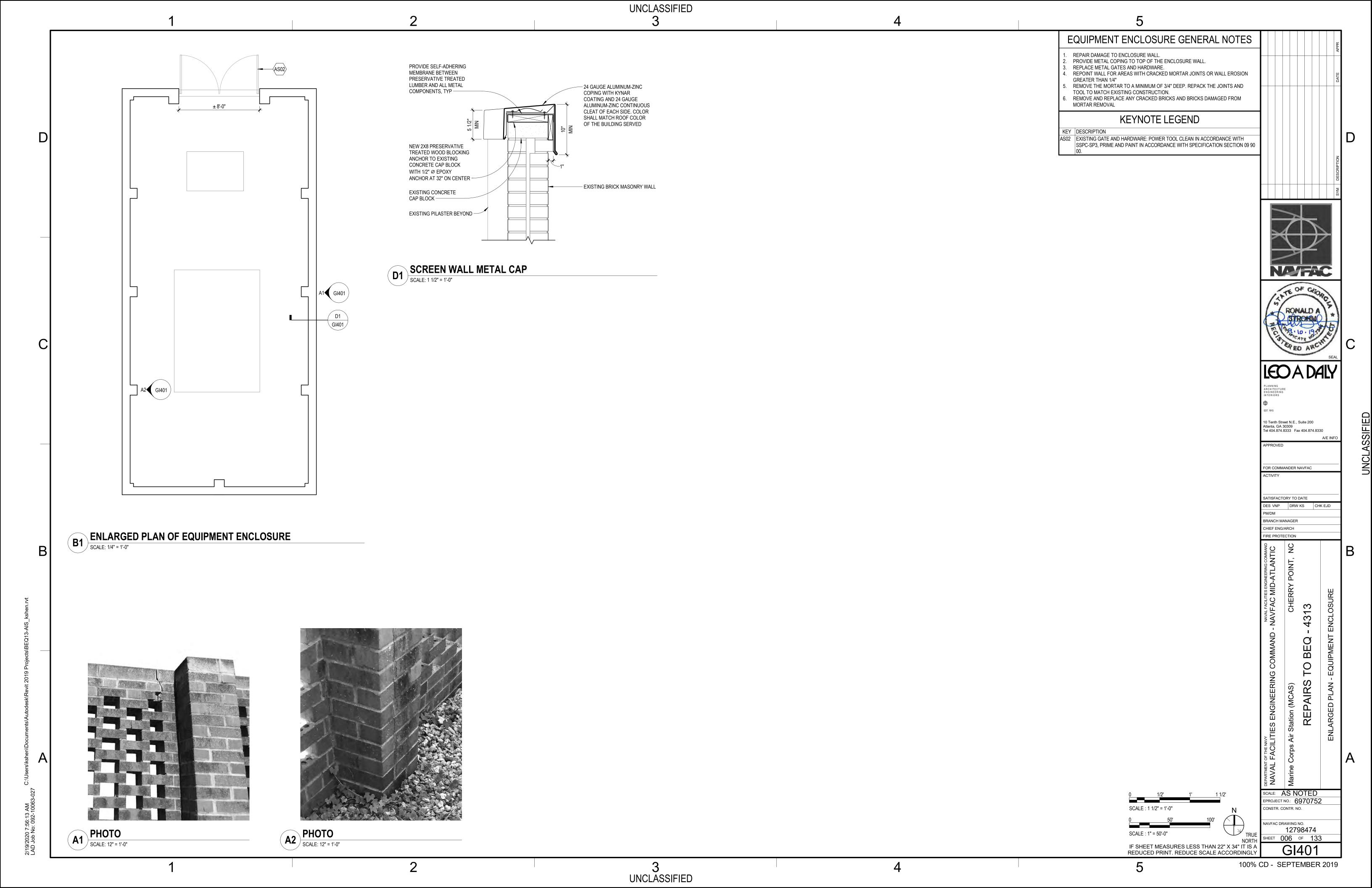
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GENERAL STRUCTURAL NOTES

- 31. THE CLEAR DISTANCE BETWEEN PARALLEL BARS SHALL NOT BE LESS THAN THE NOMINAL DIAMETER OF THE BARS, NOR LESS THAN 1".
- 32. MAXIMUM FACE SHELL THICKNESS SHALL BE 1 1/2 INCHES FOR HOLLOW CONCRETE MASONRY UNITS. 33. CONDUITS, PIPES, AND SLEEVES IN MASONRY SHALL BE NO CLOSER THAN (3) DIAMETERS ON CENTER. MINIMUM SPACING OF CONDUITS, PIPES OR SLEEVES OF DIFFERENT DIAMETERS SHALL BE DETERMINED USING THE LARGER DIAMETER.
- 34. MAXIMUM DIAMETER OF CONDUIT, PIPE, OR SLEEVE SHALL BE 1 1/2 INCH PER MASONRY CORE. ONLY (1) CONDUIT, OR (1) PIPE, OR (1) SLEEVE IS ALLOWED PER CORE. PLACE CONDUITS, PIPES, AND SLEEVES IN MASONRY CELLS TO GREATEST EXTENT POSSIBLE.

TENSION LAP SPLICE LENGTH AND STANDARD HOOK DEVELOPMENT LENGTH									
FOR DEFORMED BARS IN NORMAL WEIGHT 8 INCH CMU (INCHES)									
		GRADE 60 UNCOATED BARS - CENTERED IN GROUTED CELL		GRADE 60 UNCOATED BARS - OFFSET IN GROUTED CELL					
BAR SIZE	TYPE	f'm = 1,500 PSI	f'm = 2,000 PSI	f'm = 1,500 PSI	f'm = 2,000 PSI				
#3	LAP SPLICE (CLASS A)	12	12	15	13				
	STANDARD HOOK DEVELOPMENT	5	5	5	5				
#4	LAP SPLICE (CLASS A)	17	15	26	22				
	STANDARD HOOK DEVELOPMENT	7	7	7	7				
#5	LAP SPLICE (CLASS A)	27	23	40	35				
	STANDARD HOOK DEVELOPMENT	9	9	9	9				
#6	LAP SPLICE (CLASS A)	50	43	54	54				
	STANDARD HOOK DEVELOPMENT	10	10	10	10				

TENSION LAP SPLICE LENGTH FOR DEFORMED BARS IN MASONRY NOTES

- 1. BASED ON fy = 60,000 PSI FOR GRADE 60 STEEL.
- 2. TENSION LAP SPLICE LENGTH FOR CENTERED IN GROUTED CELL IS BASED ON 3" OF MASONRY COVER AND NOT CONFINED.
- 3. TENSION LAP SPLICE LENGTH FOR OFFSET IN GROUTED CELL IS BASED ON 2" OF MASONRY COVER AND NOT CONFINED.
- 4. ALL BOND BEAM REBAR SPLICES SHALL BE STAGGERED 24 INCHES, MIN (EVERY OTHER BAR).
- 5. IF TABULATED LAP SPLICE VALUES ARE NOT DESIRABLE TYPE 2 MECHANICAL SPLICE FASTENERS MAY BE APPROVED BY ENGINEER OF RECORD UPON REQUEST.

- **6.** TABULATED VALUES ARE FOR UNCOATED OR ZINC-COATED (GALVANIZED) BARS.
- 7. FOR EPOXY COATED BARS, MULTIPLY LENGTH BY 1.5.
- VALUES NOTED ARE FOR 90 DEGREE STANDARD HOOKS. FOR 180 DEGREE STANDARD HOOKS, BAR EXTENSIONS MAY NOT BE LESS THAN THE LARGER OF 2 1/2 INCHES OR 4 TIMES
- 9. 90 DEGREE STANDARD HOOK EXTENSIONS SHALL BE 16 * db FOR #3 BARS THROUGH #8 BARS.

TENSION LAP SPLICE LENGTH AND STANDARD HOOK DEVELOPMENT LENGTH FOR DEFORMED BARS IN NORMAL WEIGHT 12 INCH CMU (INCHES)

		GRADE 60 UNCOATED BARS - CENTERED IN GROUTED CELL		GRADE 60 UNCOATED BARS - OFFSET IN GROUTED CELL	
BAR SIZE	TYPE	f'm = 1,500 PSI	f'm = 2,000 PSI	f'm = 1,500 PSI	f'm = 2,000 PSI
#3	LAP SPLICE (CLASS A)	12	12	15	13
	STANDARD HOOK DEVELOPMENT	5	5	5	5
#4	LAP SPLICE (CLASS A)	12	12	26	22
	STANDARD HOOK DEVELOPMENT	7	7	7	7
#5	LAP SPLICE (CLASS A)	16	14	40	35
	STANDARD HOOK DEVELOPMENT	9	9	9	9
#6	LAP SPLICE (CLASS A)	30	26	54	54
	STANDARD HOOK DEVELOPMENT	10	10	10	10

TENSION LAP SPLICE LENGTH FOR DEFORMED BARS IN MASONRY NOTES

- 1 BASED ON fy = 60,000 PSI FOR GRADE 60 STEEL
- 2. TENSION LAP SPLICE LENGTH FOR CENTERED IN GROUTED CELL IS BASED ON 5" OF MASONRY COVER AND NOT CONFINED.
- 3. TENSION LAP SPLICE LENGTH FOR OFFSET IN GROUTED CELL IS BASED ON 2" OF MASONRY COVER AND NOT CONFINED.
- **4.** ALL BOND BEAM REBAR SPLICES SHALL BE STAGGERED 24 INCHES, MIN (EVERY OTHER BAR).
- 5. IF TABULATED LAP SPLICE VALUES ARE NOT DESIRABLE TYPE 2 MECHANICAL SPLICE FASTENERS MAY BE APPROVED BY ENGINEER OF RECORD UPON REQUEST.

- TABULATED VALUES ARE FOR UNCOATED OR ZINC-COATED (GALVANIZED) BARS.
- 7. FOR EPOXY COATED BARS, MULTIPLY LENGTH BY 1.5.
- 8. VALUES NOTED ARE FOR 90 DEGREE STANDARD HOOKS. FOR 180 DEGREE STANDARD HOOKS, BAR EXTENSIONS MAY NOT BE LESS THAN THE LARGER OF 2 1/2 INCHES OR 4 TIMES
- 9. 90 DEGREE STANDARD HOOK EXTENSIONS SHALL BE 16 * db FOR #3 BARS THROUGH #8 BARS.

1. ALL HIGH-STRENGTH BOLTS SHALL BE INSTALLED AS PRETENSIONED BOLTS TO MINIMUM BOLT PRETENSION VALUES LISTED BELOW IN ACCORDANCE WITH RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS".

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- 2. UNLESS DETAILED OTHERWISE, ALL FIELD CONNECTIONS SHALL BE MADE USING 3/4" DIAMETER ASTM F3125 GRADE A325-N HIGH STRENGTH BOLTS: 'N' INDICATES BEARING TYPE WITH THREADS IN SHEAR PLANE. ALL FIELD CONNECTIONS SHALL BE TIGHTENED IN ACCORDANCE WITH RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS".
- 3. STEEL ERECTOR SHALL PROVIDE THE NECESSARY BRACING FOR STRUCTURE STABILITY DURING ERECTION AND UNTIL ALL STEEL IS PLUMB AND SECURED, AND DECK CONNECTIONS AND CONCRETE PLACEMENT ARE COMPLETE.
- ALL WELDING SHALL BE DONE USING ELECTRODES WITH A MINIMUM TENSILE STRENGTH OF 70 KSI IN CONFORMANCE WITH THE AMERICAN WELDING SOCIETY (AWS) "STRUCTURAL WELDING CODE" AWS D1.1 - LATEST EDITION.
- 5. GENERAL CONTRACTOR SHALL REMOVE EARTH OR DEBRIS FROM TOP OF FOUNDATION AS REQUIRED TO INSTALL COLUMN.
- 6. ALL STEEL EXPOSED TO EXTERIOR ELEMENTS (NOT WITHIN THE BUILDING WEATHERPROOFING ENVELOPE) SHALL BE HOT-DIP GALVANIZED.
- 7. ALL RE-ENTRANT CORNERS OF BEAM COPES AND PLATE CUTS MUST BE SHAPED NOTCH-FREE PER AWS D1.1 TO A RADIUS. AN APPROXIMATE MINIMUM RADIUS TO WHICH THIS CORNER MUST BE SHAPED IS 1/2 INCH.
- 8. BEARING SURFACES OF COLUMNS SHALL BE FINISHED TO PROVIDE FULL BEARING CONTACT WITH BASE PLATE (AND CAP PLATE IF REQUIRED BY LOAD TRANSFER). BASE PLATES AND CAP PLATES SHALL BE FINISHED IN ACCORDANCE WITH SECTION M2.8 OF THE AISC SPECIFICATION.

M. POST-INSTALLED ANCHORAGE:

1. POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE STRUCTURAL ENGINEER-OF-RECORD PRIOR TO INSTALLING POST-INSTALLED ANCHORS IN PLACE OF MISSING OR MISPLACED CAST-IN-PLACE ANCHORS. CARE SHALL BE TAKEN IN PLACING POST-INSTALLED ANCHORS TO AVOID CONFLICTS WITH EXISTING REBAR. ALL POST-INSTALLED ANCHORS (IN CONCRETE OR CMU) ARE TO BE INSTALLED IN STRICT CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS (INCLUDING BUT NOT LIMITED TO DRILL BIT SIZE, PROPER CLEANING OF HOLES, INSTALLATION TORQUE, AND TEMPERATURE CONSTRAINTS).

GENERAL STRUCTURAL NOTES

- 2. WHEN A SPECIFIC PRODUCT AND MANUFACTURER IS REFERENCED IN THE CONTRACT DOCUMENTS, THAT SPECIFIC PRODUCT SHALL BE USED UNLESS THE CONTRACTOR SUBMITS A REQUEST FOR A PRODUCT SUBSTITUTION OF A PRE-APPROVED ANCHOR WITH EQUIVALENT RESISTANCE VALUES IN THE APPROPRIATE BASE MATERIAL PER THE APPLICABLE EVALUATION REPORT (ICC-ES ESR). ALL REQUESTS FOR SUBSTITUTION SHALL INCLUDE PRODUCT SPECIFICATIONS AND DESIGN DATA FOR REVIEW BY THE STRUCTURAL ENGINEER-OF-RECORD. CONTRACTOR SHALL SUBMIT CALCULATIONS DEMONSTRATING PROPOSED SUBSTITUTION IS EQUAL TO SPECIFIED PRODUCTS. IF CONTRACTOR PROPOSES AN ANCHORING PRODUCT THAT IS NOT PRE-APPROVED, A COST COMPARISON WITH THE SPECIFIED PRODUCT SHALL BE PROVIDED AND ANY SAVINGS SHALL BE GIVEN BACK TO THE OWNER SINCE IT WAS NOT THE PRODUCT
- 3. ALL PERSONNEL INSTALLING ADHESIVE/MECHANICAL ANCHORS SHALL BE TRAINED BY THE MANUFACTURER ON PROPER INSTALLATION TECHNIQUE. TRAINING DOCUMENTATION SHALL BE AVAILABLE ON REQUEST.
- 4. PROVIDE CONTINUOUS SPECIAL INSPECTION FOR ALL MECHANICAL AND ADHESIVE ANCHORS PER THE APPLICABLE EVALUATION REPORT (ICC-ES ESR). [THE ANCHOR MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT DURING THE INITIAL INSTALLATION OF EACH TYPE OF ANCHOR TO REVIEW AND APPROVE OF THE CONTRACTOR'S INSTALLATION PROCEDURES.] THE OWNER'S TESTING AGENCY SHALL ALSO OBSERVE THE INSTALLATION OF EACH ANCHOR TYPE, AND PROVIDE THE INSPECTION OF ALL ANCHORS DURING INSTALLATION TO VERIFY CONFORMANCE WITH THE MANUFACTURER'S INSTALLATION RECOMMENDATIONS. SUBMIT REPORT FROM MANUFACTURER'S REPRESENTATIVE FOR REVIEW BY THE STRUCTURAL ENGINEER.
- 5. MECHANICAL ANCHORS SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ACI 355.2 AND ICC-ES AC193 FOR CRACKED AND UN-CRACKED CONCRETE RECOGNITION. PRE-APPROVED MECHANICAL ANCHORS INCLUDE:
- A. HILTI HSL-3 HEAVY DUTY EXPANSION ANCHORS (ICC-ES ESR-1545)
- B. HILTI HDA UNDERCUT ANCHORS (ICC-ES ESR-1546)
- C. HILTI KWIK BOLT TZ ANCHORS (ICC-ES ESR-1917)
- D. SIMPSON STRONG-TIE STRONG-BOLT 2 WEDGE ANCHOR (ICC-ES ESR-3037)
- 6. ADHESIVE ANCHORS SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ICC-ES AC308 FOR CRACKED AND UN-CRACKED CONCRETE RECOGNITION. PRE-APPROVED ADHESIVE ANCHORS INCLUDE:
- A. SIMPSON STRONG-TIE SET-XP EPOXY ADHESIVE ANCHORS (ICC-ES ESR-2508)
- B. HILTI HIT-HY 200 ADHESIVE ANCHORS (ICC-ES ESR-3187)
- C. HILTI HIT-RE 500 V3 ADHESIVE ANCHORS (ICC-ES ESR-3814)
- [DO NOT USE CHEMICAL ANCHORS IN OVERHEAD APPLICATIONS.]
- 7. FASTENERS GENERICALLY REFERRED TO AS "CONCRETE SCREW ANCHORS" SHALL BE ONE OF:
- A. SIMPSON STRONG-TIE TITEN HD SCREW ANCHOR (ICC-ES ESR-2713)
- B. HILTI KWIK HUS-EZ SCREW ANCHORS (ICC-ES ESR-3027)
- C. ITW RED HEAD TAPCON+ SCREW ANCHORS (ICC-ES ESR-3699)
- **8.** MASONRY ANCHORS:
- A. ANCHORAGE TO SOLID-GROUTED CONCRETE MASONRY
 - I. MECHANICAL ANCHORS SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ICC-ES AC01 OR AC 106. PRE-APPROVED MECHANICAL ANCHORS INCLUDE
 - i. SIMPSON STRONG-TIE TITEN-HD SCREW ANCHORS (ICC-ES ESR-1056)
 - ii. SIMPSON STRONG-TIE WEDGE-ALL ANCHORS (ICC-ES ESR-1396)
 - iii. HILTI KWIK HUS-EZ SCREW ANCHORS (ICC-ES ESR-3056) iv. HILTI KWIK BOLT TZ MASONRY ANCHORS (ICC-ES ESR-3785)

 - II. ADHESIVE ANCHORS SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ICC-ES AC58. PRE-APPROVED ADHESIVE ANCHORS
 - i. SIMPSON STRONG-TIE SET ADHESIVE ANCHOR SYSTEM (ICC-ES ESR-1772)
 - ii. SIMPSON STRONG-TIE ACRYLIC-TIE ADHESIVE ANCHOR SYSTEM (ICC-ES ESR-1958)
 - iii. HILTI HIT-HY 200 ADHESIVE ANCHOR SYSTEM (ICC-ES ESR-3963) iv. HILTI HIT-HY 270 ADHESIVE ANCHOR SYSTEM (ICC-ES ESR-4143)
- B. ANCHORAGE TO HOLLOW CONCRETE MASONRY / UNREINFORCED CLAY BRICK MASONRY
 - I. ADHESIVE ANCHORS WITH SCREEN TUBES SHALL BE TESTED AND QUALIFIED IN ACCORDANCE WITH ICC-ES AC58 OR AC60, AS APPROPRIATE. THE APPROPRIATE SCREEN TUBE SHALL BE USED AS RECOMMENDED BY THE ADHESIVE MANUFACTURER. PRE-APPROVED ADHESIVE ANCHORS WITH SCREEN TUBES INCLUDE:
 - i. SIMPSON STRONG-TIE SET ADHESIVE ANCHOR SYSTEM (ICC-ES ESR-1772)
- ii. HILTI HIT-HY 270 ADHESIVE ANCHOR SYSTEM (ICC-ES ESR-4144)

N. <u>SUMBITTALS</u>

- 1. CONTRACTOR SHALL REVIEW, STAMP, SIGN AND DATE ALL SHOP DRAWINGS PRIOR TO FORWARDING TO ARCHITECT/ENGINEER. THE ENGINEER'S REVIEW IS TO BE FOR CONFORMANCE WITH THE DESIGN CONCEPT AND GENERAL COMPLIANCE WITH THE RELEVANT CONTRACT DOCUMENTS. THE ENGINEER'S REVIEW DOES NOT RELIEVE THE CONTRACTOR OF THE SOLE RESPONSIBILITY TO REVIEW, CHECK AND COORDINATE THE SHOP DRAWINGS PRIOR TO SUBMISSION. THE CONTRACTOR REMAINS SOLELY RESPONSIBLE FOR ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF SHOP DRAWINGS AS THEY PERTAIN TO MEMBER SIZES, DETAILS, DIMENSIONS, ETC.
- 2. PRIOR TO FABRICATION, SUBMIT SHOP DRAWINGS IN THE FORM OF BLACKLINE PRINTS OR PORTABLE DOCUMENT FORMAT (PDF) FOR APPROVAL. IN NO CASE SHALL REPRODUCTION OF THE CONTRACT DRAWINGS BE USED AS SHOP DRAWINGS. DRAWINGS SHALL SHOW ERECTION PLANS, DIMENSIONS BRACING AND BRIDGING REQUIREMENTS, DETAILS, SUPPORTED MECHANICAL EQUIPMENT AND PIPING.
- 3. SUBMIT THE FOLLOWING ITEMS:
- A. CONCRETE MIX DESIGN(S) MIX DESIGNS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW. A SIGNED CERTIFICATION STATING COMPLIANCE WITH ACI 318, CHAPTER 5 SHALL BE SUBMITTED WITH EACH MIX DESIGN.
- B. REINFORCING STEEL SHOP DRAWINGS
- C. STRUCTURAL STEEL SHOP DRAWINGS

P. <u>INTERPRETATION OF CONFLICT:</u>

- 1. SHOULD CONFLICTS OCCUR IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL REQUEST INTERPRETATION BEFORE PROCEEDING WITH THE ASSOCIATED WORK. ALL SUCH REQUESTS SHALL FIRST BE PRECEDED BY A DILIGENT INVESTIGATION INTO THE CONTRACT DOCUMENTS. EVIDENCE OF SUCH INVESTIGATION SHALL BE CONTAINED IN ALL REQUESTS FOR INTERPRETATION SUBMITTED.
- 2. IF THE CONTRACTOR FAILS TO MAKE SUCH A REQUEST, NO EXCUSE WILL THEREAFTER BE ENTERTAINED FOR FAILURE TO CARRY OUT THE WORK IN A SATISFACTORY MANNER. SHOULD CONFLICTS OCCUR IN OR BETWEEN DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR IS DEEMED TO HAVE ESTIMATED ON THE MORE EXPENSIVE WAY OF DOING THE WORK UNLESS HAVING ASKED FOR, AND OBTAINED, WRITTEN DECISION BEFORE SUBMISSION OF PROPOSAL AS TO WHICH METHOD OR MATERIALS WILL BE REQUIRED.

Q. <u>SPECIAL INSPECTIONS:</u>

- 1. SEE SPECIFICATION SECTION 01 45 35
- 2. SEE STATEMENT OF SPECIAL INSPECTIONS (SSI) ON SHEET SS002 FOR STRUCTURAL TESTS AND SPECIAL INSPECTIONS REQUIREMENTS

R. PROVISIONS FOR FUTURE EXPANSION:

1. NO PROVISIONS FOR FUTURE EXPANSION HAVE BEEN MADE IN THE STRUCTURAL SYSTEMS.

tlanta, GA 30309 el 404.874.8333 Fax 404.874.8330 OR COMMANDER NAVFAC ATISFACTORY TO DATE RANCH MANAGER CHIEF ENG/ARCH IRE PROTECTION \mathcal{C} \mathcal{C} NAVAL SCALE: AS NOTED PROJECT NO.: 6970752 ONSTR. CONTR. NO.

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NAVFAC DRAWING NO 12798476 HEET 008 OF 133

IF SHEET MEASURES LESS THAN 22" X 34" IT IS A REDUCED PRINT. REDUCE SCALE ACCORDINGLY

