

Invitation to Bid
Welding Building Remodel
35-2015/2016



Deliver Sealed Bid and Three Copies to:

Cassie Boatwright, Director of Purchasing and Auxiliary Services
Building 7, Room 737
1000 College Blvd.
Pensacola, FL 32504

Public bid opening: Pensacola State College will conduct a Public bid opening and evaluations on the date and time listed within the timeline which are held at Pensacola State College Board Room, 1000 College Blvd. Pensacola, FL 32504 Room 736. The College may choose to only open the individual bids and publicly announce who a bid was received from. The actual bid prices submitted will not be a public record until the date of posting or the number of days as defined in FS 119.071. Immediately following the bid opening, the Bid Evaluation Committee will evaluate the bids. This may require additional review by the committee or representative.

Timeline

The following timeline is a general guideline for issuance, evaluation, ranking and recommendation for award of this Invitation to Bid. The College reserves the right to change the dates of any events listed. Times listed are local time.

<u>DATE</u>	<u>EVENT</u>
May 12, 2016	ITB issue date
June 6, 2016, 8am	Site Visit on location
June 7, 2016, 2pm	Deadline for questions and requests for clarifications
June 16, 2016, 2pm	Bids due

The timeline above is a proposed schedule. The College may amend the dates as required. All dates and locations of evaluation committee meetings will be posted to Purchasing's website: <http://www.pensacolastate.edu/business-psc/>.

Pensacola State College is a political subdivision of the State of Florida and as such is exempt from all Federal and State taxes. Pensacola State College reserves the right to reject any portion or all bids, to resolicit bids or not and to waive informalities as deemed in the best interest of Pensacola State College. The bid shall remain in force for thirty (30) days after the time of opening.

ANTI-COLLUSION STATEMENT: The Bidder by signing and submitting a bid has "not" divulged to, discussed or compared his/her bid with any other Bidders and has not colluded with any other Bidders or parties to a bid whatsoever. (NOTE: Including there have been No premiums, rebates or gratuities paid or permitted either with, prior to, or after any delivery or personal contact. Any such violation will result in the cancellation of award of any resulting contract from this bid and the Bidder being debarred for not less than three (3) years of doing business with Pensacola State College.)

1.0 OVERVIEW

Pensacola State College is soliciting qualified bids from qualified firms to provide equipment and installation as identified within the attachment.

- 1.01 In order to maintain a fair and impartial competitive process, Pensacola State College shall avoid any oral communication with prospective bidders other than through the purchasing office during the bid process. However, all solicited bidders will be provided a copy of all written questions submitted and Pensacola State College's responses to them, unless the written inquiry pertained to an administrative or procedural matter. Send all inquiries to the attention of: Cassie Boatwright, Director of Purchasing and Auxiliary Services, Email: purchasing@pensacolastate.edu

From the date of issuance of this ITB, until a proposal is made, Respondent must not make available or discuss its proposal, or any part thereof, with any employee or agent of the College, unless permitted by the Director of Purchasing and Auxiliary services, in writing. Contacting the College's personnel or members of the College's District Board of Trustees, either directly or indirectly, regarding this ITB, the selection process or any attempt to further a proposer's interest in being selected, may result in proposer being disqualified and shall render the award to said proposer voidable by the College.

Questions concerning this ITB shall be directed to Cassie Boatwright at Purchasing@PensacolaState.edu and to no other person or department at the College. Questions and requests must be in writing and must be received not later than the date and time indicated in the timeline.

- 1.02 Any addenda issued prior to the opening of the ITB for the purpose of changing the specifications of this request for proposal or related documents, or clarifying the meaning of the same, shall be binding in the same way as if originally written in the ITB specifications and related documents. Since all addenda are available to proposers at the office of the Pensacola State College Director of Purchasing and Auxiliary Services, it is each bidder's responsibility to check with the issuing office and immediately secure all addenda before submitting your bid. The Pensacola State College Director of Purchasing and Auxiliary Services emails addenda to all known prospective bidders, but no guarantee can be made that addenda will be received.

- 1.03 The bidder is assumed to be familiar with all Federal, State of Florida and local laws, ordinances, rules and regulations that in any manner affect the work. Ignorance on the part of the proposer will in no way relieve you from your contractual responsibility. Any resultant award shall include requirements that the resultant contract shall be governed by the laws of the State of Florida.

- 1.04 As deemed in the College's best interest, the College reserves the right to:

1. Reject any or all bids submitted.
2. To resolicit bids or not.
3. To award any portion(s) of this ITB.
4. To waive informalities.
5. To issue to all responsive bidders request for information (RFI's).
6. To issue requests to negotiate with finalist and solicit best and final offers.
7. To evaluate to determine technical equivalents.
8. To award this ITB on a Lot by Lot basis to the responsive low bidder meeting specifications.
9. To award on an outright purchase or lease basis.

- 1.05 A bid bond or deposit, in the amount of five percent (5%) of the base bid will be required to accompany each bid, as guarantee that the successful bidder, will enter into a contract with the Owner, if desired by same. Any deposit must be in the form of a Certified Check, or a Cashier's Check. The bid bond or deposit will be held as liquidated damages, in the event that the successful bidder refuses to enter into a contract with the Owner. In

addition, the successful bidder shall provide a one hundred percent (100%) Performance Bond and one hundred percent (100%) Labor and Material Payment Bond(s), with a surety insurer authorized to do business in the State of Florida as surety, satisfactory to the Owner.

1.06 SCHEDULE: All items shall be completed by December 31, 2016. Bidders shall include the estimated time of completion from notice to proceed as specified on the bid form.

1.07 QUALIFICATIONS: Bidders shall furnish documentation of the following:

- a. He or She is currently registered with or hold an unexpired License issued by the Florida Construction Industry Licensing Board in accordance with current applicable regulations, Licensing of Construction Industry, Florida Statutes.
- b. He or She presently maintains a permanent bona fide place of business practicing this type of work and has had the appropriate experience.
- c. He or She has available, or can obtain, adequate equipment and financial resources to undertake and execute the Contract properly and expeditiously, in accordance with present day practices.
- d. All subcontractors shall be fully licensed in the State of Florida and shall be bondable. Submit copies of current license and documentation from bonding company showing compliance.
- e. He or She shall submit with the Bid the enclosed document entitled "Sworn Statement under Section 287.133(3) (a), Florida Statutes. On Public Crimes".

The apparent successful bidder shall also, at the request of the College, submit a fully executed "Contractor's Qualification Statement" AIA Document A305.

1.08 LICENSE: In accordance with Chapter 489.113, Florida Statutes, all individuals or entities engaging in and providing construction services shall be licensed in the State of Florida for that activity. This license requirement includes general and sub-contractors.

The successful low bidder shall be required to submit a list of all contractors to be involved in said project with applicable license numbers (see form included in these documents), including a photographic copy of current license certificates. Submittal of proof of license shall be made with, and as a part of signed contract.

Prime Contractor shall submit proof of licensure with the Bid Form. Failure to submit required proof of license shall be cause for Owner to reject bid as non-responsive, and award bid to second lowest qualified bidder.

1.09 DISQUALIFICATION OF BIDDER: More than one Bid from an individual, firm, partnership, corporation or association under the same or different names will not be considered. Reasonable grounds for believing that a Bidder is interested in more than one Bid for the same will cause the rejection of all Bids which such Bidder is believed to be interested. Bids will be rejected if there is reason to believe that collusion exists between Bidders. Bids in which the prices are obviously unbalanced may be rejected.

1.10 MODIFICATION OF BID: Bid modifications will be accepted from Bidders if addressed to the Owner at the place where Bids are to be received and if received prior to the opening of the Bids. Modifications may be in written or telegraphic form. Modifications will be acknowledged by the Owner before opening of formal Bids.

1.11 WITHDRAWAL OF BIDS: Bids may be withdrawn by written or telegraphic request received from Bidders prior to the time fixed for opening. Negligence on the part of the Bidder in preparing the Bid confers no right for the withdrawal of the Bid after it has been opened.

1.12 BUILDING PERMIT: A permit may be issued to the Contractor by the Facilities Planning and Construction Department of Pensacola State College.

1.13 SECURITY: The Contractor shall be responsible for maintaining security, and the contractor shall be responsible for replacement or repair of items and/or equipment stolen, lost or damaged while the building security is under the care of the Contractor. The Contractor shall be responsible for having a job superintendent present whenever work is in progress. The Contractor shall not change superintendent without the Owners approval.

2.00 GENERAL

Must meet or exceed the specifications listed in Attachment A.

2.01 BASIC DEFINITIONS: Unless otherwise expressly stated, wherever in the Contract Documents the word 'provide' is used, it shall mean furnished and installed in place, complete and tested. The terms Architect and Engineer are used interchangeably.

2.02 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS: If a discrepancy occurs on drawings, in specifications, or between drawings and specifications, the greater quantity or value takes precedence.

2.03 WARRANTY: The warranty herein guarantees the proper operation of all structures, components and systems constructed or installed by the contractor for a period of one year after the date of substantial completion.

If within the guarantee period, repairs or changes are required in connection with the guarantee work, which in the opinion of the Architect is rendered necessary as the result of the use of materials, equipment, or workmanship, which are defective, or inferior, or not in accordance with the terms of the Contract, the Contractor shall, promptly upon receipt of notice from the Owner, and without expense to the Owner, proceed to:

Place in satisfactory condition in every particular all of such guaranteed work, correct all defects therein; and Make good all damages to the structure or site, or equipment or contents thereof which, in the opinion of the Architect are the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, or the equipment and contents or structures or site disturbed in fulfilling any such guarantee.

2.04 INDEMNIFICATION: The Contractor shall, for the sum of one hundred dollars (\$100.00) and other good and valuable consideration paid by the Owner and Architect, individually, receipt of which is hereby acknowledged by the Contractor, indemnify and hold harmless the Owner and Architect and their agents and employees from and against all claims, damages, losses and expenses, including attorney's fees, out of or resulting from the performance of the work provided that such claims, damage, loss or expense: (1) is attributable to bodily injury, sickness, disease or death, or injury to or destruction of tangible property other than the work itself, including the loss of use resulting there-from, and (2) is caused in whole or in part by a negligent act or omission of the Contractor, subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any one of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. This obligation shall not be construed to reduce or negate any other right or obligation of indemnity which would otherwise exist as to any party or person described in this invitation to bid.

2.05 SUBCONTRACTORS: The Contractor shall not contract with any person or entity declared ineligible under Federal laws or regulations from participating in federally assisted construction projects or to whom the Owner or the Architect has made reasonable objection.

2.06 CHANGES IN WORK: Maximum percentages of overhead and profit which may be added by the Contractor to actual costs of such changes in the work are specifically set forth as follows:

For all work done by his organization, or subsidiaries of his organizations, including work traditionally considered as subcontractor work, the Contractor may add 15% of his actual costs for combined overhead and profit.

For any work performed by a subcontractor or forces under the respective subcontractor including any sub-subcontractors or persons not in the direct employ of the subcontractor, a total of 15% of the cost of the change, with 10% to be assigned to the subcontractor and any forces under him and the General Contractor may add 5% of the cost above subcontractor's cost for his overhead and profit.

The above percentages shall be considered reasonable allowance for overhead and profit due to the contractor.

The Contractor shall submit receipts or other evidence showing his costs and his right to the payment claims. All changes in work shall be provided with a detailed cost breakdown indicating material and labor units for all work to be performed. In addition, the cost breakdown shall contain all current tax and labor burden. The allowable amount for the material tax shall be 7.25% and for labor burden shall be 30%.

2.07 INSURANCE AND BONDS: The Contractor shall not commence any work in connection with this agreement until he has obtained all of the following types of insurance with the Owner as additional named insured and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until all similar insurance required of the subcontractor to commence work on his subcontract has been obtained and approved.

All insurance policies shall be with insurers qualified and doing business in Florida.

THE CONTRACTOR SHALL PROCURE AND MAINTAIN FOR THE LIFE OF THIS CONTRACT:

1. Workers Compensation and Employers' Liability as follows:
 - a. WC Statutory Limits per FS 440
 - b. E.L. - Each Accident \$500,000
 - c. E.L. Disease – Each Employee \$500,000
 - d. E.L. Disease – Policy Limit \$500,000
2. Comprehensive General Liability with minimum limits as follows:
 - a. Each Occurrence - \$ 1,000,000
 - b. Damage to Rented Premises (Each occurrence)- \$100,000
 - c. Medical Expense (Any one person) \$5,000
 - d. Personal Advertising Injury - \$1,000,000
 - e. General Aggregate - \$2,000,000
 - f. Products-Completed Aggregate - \$2,000,000
 - g. General Aggregate applies to Per Project
3. Automobile Liability providing coverage on any auto to include all owned, hired and non-owned vehicle with following minimum limits:
 - a. Combined Single Limit (Each Accident) - \$1,000,000 OR
 - b. Bodily Injury per person - \$500,000, Bodily Injury per Accident - \$1,000,000, Property Damage per Accident - \$500,000
4. Excess/Umbrella Liability on Occurrence Form with following limit:
 - a. \$1,000,000 each occurrence
 - b. \$2,000,000 aggregate
 - c. Retention /Deductible - \$5,000

The Contractor liability policy shall provide "XCU" (Explosion, Collapse, Underground Damage) coverage for those classifications in which they are included.

Broad Form Property Damage shall be required on Contractor's public liability so that completed operations coverage extends to work performed by the Contractor.

Builders Risk Insurance: Contractor shall purchase and maintain in effect a completed value builder's risk policy issued by an admitted carrier in an amount equal to the full completed value of the project. Such insurance shall be issued on an all risk form. The Contractor shall be responsible for any deductible amounts.

The Contractor shall furnish a Performance Bond in an amount equal to one hundred percent (100%) of the Contract Sum as security for the faithful performance of this Contract and also a Labor and Material Payment Bond in an amount not less than one hundred percent (100%) of the Contract Sum or in a penal sum not less than that prescribed by State, Territorial or local law, as security for the payment of persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract. The Performance Bond and the Labor and Material Payment Bond may be in one or in separate instruments in accordance with local law and shall be delivered to the Owner not later than the date of execution of the Contract. The premium for the required bonds shall be paid by the Contractor. "These bonds shall be executed on behalf of the Contractor in the same manner and by the same person who executed the agreement.

To be acceptable as surety on Performance and Payment Bonds, a surety company shall comply with the following provisions:

The Surety Company must be admitted to do business in the State of Florida. The surety Company shall have been in business and have a record of successful continuous operations for at least five years. The Surety Company shall have at least the following minimum ratings:

Contract Amount	Policy Holders	Required Rating
0 - 100,000	B	CLASS VII
100,000 - 500,000	A	CLASS VIII
500,000 - 750,000	A	CLASS IX
750,000 - 1,000,000	A	CLASS X
1,000,000 - 1,250,000	A	CLASS XI
1,250,000 - 1,500,000	A	CLASS XI
1,500,000 - 2,000,000	A	CLASS XII
2,000,000 - 2,500,000	A	CLASS XII

*From Best's key rating guide.

Best's Policy Holder's Rating of "A" and "B" (which signifies A--Excellent, and B-Good, based upon good underwriting, economic management, adequate reserves for undisclosed liabilities, net resources for unusual stock and sound investment) or an equivalent rating from the Insurance Commissioner, if not rated by Best's. Neither the Surety Company nor any reinsurer shall expose itself to any loss on any one risk in an amount exceeding ten (10%) percent of its surplus to policyholders.

In the case of a surety insurance company, there shall be deducted in addition to the deduction for reinsurance, the amount assumed by any co-surety, the value of any security deposited, pledged or held subject to the content of the Surety and for the protection of the Surety."

Furnish in triplicate a Performance Bond and a Payment Bond, each in the amount of 100% of the Contract Sum, written by a surety licensed to do business in the state where the Project is located. The prescribed form of the Performance Bond and Payment Bond is AIA Document A313.

2.08 LIQUIDATED DAMAGES: Per specifications attached.

3.00 SPECIAL CONDITIONS

- 3.01 Florida sales tax exemption no: 85-8012557294C-2.
- 3.02 Pensacola state college reserves the right to reject any or all ITBs/proposals received, to resolicit or not and to waive informalities as deemed in the best interests of the College.
- 3.04 Any entity or affiliate who has been placed on the discriminatory vendor list may not submit a ITB on a contract to provide goods or services to a public entity, may not submit a ITB on a contract with a public entity for the construction or repair of a public building or public work, may not submit ITBs on leases of real property to a public entity, may not award or perform work as a contractor, supplier, subcontractor, or consultant under contract with any public entity, and may not transact business with any public entity. All invitations to ITB, as defined by 287.012(11)FS, request for proposals, as defined by 287.012(15)FS, and any written contract document of the state shall contain a statement informing entities of the discrimination provisions.
- 3.05 Pensacola State College reserves the right to award an individual lot or a combination of lots; reject any or all lots, whatever seems in the best interest of the College.
- 3.06 The specifications listed are meant to demonstrate the work parameters required, and the functional limits listed are to be considered minimal unless changed by addendum to the bid. Bid evaluation will be made strictly from the minimal specification. Each particular specification which the equivalent offered which does not meet must be identified and submitted along with the detailed specification sheet of the equivalent offered.
- 3.07 The successful bidder shall fully guarantee all items furnished against defect in materials and/or workmanship for a period of 365 days from date of final acceptance by Pensacola State College. Should any such defect, except for normal wear and tear, appear during the warranty period, the successful bidder shall commence repair or replace same at no cost to Pensacola State College within 72 hours after notice.
- 3.08 Proposal tabulations with recommended awards will be posted on the purchasing web page http://pensacolastate.edu/purchasing/current_solicitations.asp

A notice of intended decision to recommend or reject proposals shall be posted in the Purchasing Department and College website at <http://www.pensacolastate.edu/business-psc/>. If a potential Protestor desires to protest a decision or intended decision of the College, the potential Protestor must timely deliver a Notice of Intent to Protest within seventy-two (72) hours of the College's posting of its decision or intended decision. A potential Protestor's failure to timely file a Notice of Intent to Protest within the seventy-two (72) hour time period shall constitute a waiver of the right to protest proceedings.

A Notice of Intent to Protest shall: (i) be delivered to the Pensacola State College's Purchasing Department and addressed to the Director of Purchasing and Auxiliary Services at 1000 College Blvd., Pensacola, FL, 32504; (ii) identify the solicitation by number and title or any other language that will enable the College to identify it; and (iii) state that the person intends to protest the decision. The seventy-two (72) hour period will not be extended by service of the Notice of protest by mail.

The Protestor must then timely deliver a Formal Written Protest to Pensacola State College's Purchasing Department and addressed to the Director of Purchasing and Auxiliary Services at 1000 College Blvd., Pensacola, FL, 32504 within ten (10) days after the date the Notice of Intent to Protest was filed. The seventy-two (72) hour period will not be extended by service of the Notice of Protest by mail. The Formal Written Protest must include the required filing fee and security bond as specified herein. The failure of the Protestor to timely file the Formal Written Protest or to timely file the filing fee and security bond shall constitute a waiver of the Protestor's right to protest proceedings and/or the denial and dismissal of the Protestor's protest.

The formal written protest shall contain the following information:

1. The identification of the Protestor.
2. A statement of when and how the Protestor received notice of the College's action or proposed action.
3. A statement of the material facts alleged, including a statement of the specific facts the Protestor contends warrant reversal or modification of the College's proposed action.
4. A statement of the specific rules or statutes that the Protestor contends require reversal or modification of the College's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes.
5. A statement of the relief sought by the Protestor, stating precisely the action Protestor wishes the College to take with respect to the proposed action.

A Protestor may only protest a decision or intended decision of the College resulting from a competitive solicitation for a contract of \$65,000 or more. A valid Protest must allege that the College violated law, regulation, its rules and/or procedures or the terms, conditions or specifications contained within the competitive solicitation documents. Mere disagreement with the result of a competitive solicitation is not sufficient grounds for a valid Protest.

Notwithstanding anything in this procedure to the contrary, a protest may not challenge the relative weight assigned to the solicitation evaluation criteria by the College, or the formula for assigning points in making an award or recommendation of award.

For the purposes of determining timeliness of any notice or filing or the tolling of any time period under this process: (i) references to "days" shall mean calendar days; (ii) in the event that the final day for a College employee or official to respond or for a person to file a protest or appeal falls on a Saturday, Sunday, or a College observed holiday, the date for responding or filing such protest or appeal shall be extended until the next day which is neither a Saturday, Sunday, or College observed holiday; and (iii) notices received by the College after the close of the College's business hours at 4:00 p.m. local time, shall be deemed received by the College effective as of the next business day of the College.

The Protestor shall be liable for all of its own costs and expenses incurred related to a Protest, including all appeals.

The Protestor shall file with the Purchasing Department, a security in the form of a certified check, letter of credit or protest bond (in a form, and with such terms, approved by the College) payable to the College in an amount equal to two percent (2%) of the estimated contract amount, or proposal amount. If no contract price was submitted, the College shall estimate the contract amount based on factors including, but not limited to, the price of previous or existing contracts for similar contracts or services. Such bond or other security must be received prior to the expiration of the time for filing the Formal Written Protest. If the protest is successful, the posted security will be refunded in full. If the protest is unsuccessful, the security shall be returned, less all fees, expenses, damages, costs and charges incurred by the College.

Noncompliance with these filing requirements within the applicable deadline for filing of the Protest shall be deemed to be a waiver by the Protestor of the right to protest proceedings under this procedure.

3.09 SPECIAL POLICY AND PROCEDURES: Contractor and subcontractor personnel are not permitted to use the campus facilities.

Smoking is not permitted in any campus facility.

Profane language or improper behavior will result in immediate termination from the construction site.

The Contractor shall erect temporary barricades and fencing as required to keep the unauthorized out of the construction area, and provide signs that read. "This area is a designated construction site; anyone who trespasses on this property commits a felony per Florida Statute 810.09(2d).

3.10 The College intends to utilize Owner Direct Purchasing for materials to allow for tax savings. Attachment B outlines this process. Successful bidder agrees to this process and will provide all necessary documentation and support to assist the College in Owner Direct Purchases.

BID FORM

Total Lump Sum Cost as specified \$ _____

Payment Terms: Net 30 days or prompt payment discount of ____%, ____ Days offered by Proposer.

Completion after notice to proceed: _____

Firm

Authorized Agent Name

Signature

Date

Firms certify by their signature they have read and understand the conditions and specifications of this Invitation to Bid and they have the authority, capacity, and capability to perform all conditions and specifications of this Invitation to Bid.

Tax Reporting Name _____

Name shown on income tax return

Company Name _____

If applicable, DBA name for checks

Federal Tax Identification Number _____

Employer Identification Number

OR

Social Security Number

Type of Business

Corporation

Sole Proprietor

Partnership

LLC _____(classification)

Order form Information (Information for Obtaining Quotes/Purchase Order Submission)

Street/PO Box _____

City _____

State/Zip _____

Contact Person Name/Title _____

Phone _____

Fax _____

Email Address _____

Website _____

Payment Address

Same as Above

Street/PO Box _____

City _____

State _____

Zip _____

Contact Person Name _____

Title _____

Email Address _____

Website _____

Minority Business Status

Check all that apply to your organization

African American (person having origins in any of the black racial groups of the African Diaspora, regardless of cultural origin)

Hispanic American (person of Spanish or Portuguese culture with origins in Spain, Portugal, Mexico, South America, Central America, or the Caribbean, regardless of race)

Asian American (person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands, including the Hawaiian Islands before 1778)

Native American (person who has origins in any of the Indian Tribes of North America before 1835)

American Woman

Ability to Conduct Business

Is your organization legally able to conduct business with public entities in the State of Florida, pursuant to Florida Statute 287.133, and with the Federal Government as per epls.gov? No Yes

At the present time, or at any time in the last twelve months, has any owner, officer, stockholder, employee or other person with an interest either directly or indirectly with your company been employed by Pensacola State College? No Yes

I certify that the information supplied herein is correct to the best of my knowledge. I further certify that in doing business with Pensacola State College my firm is in compliance with Chapter 112.313, Florida Statutes, relating to conflict of interest (www.flsenate.gov/Statutes/). I agree to the Purchase Order Terms and Conditions of Pensacola State College.

Authorized Signature

Name and Title

Date

ABBREVIATIONS

&	AND	FFE	FINISHED FLOOR ELEVATION	OPP	OPPOSITE
@	AT	FA	FIRE ALARM	OD	OUTSIDE DIAMETER
L	ANGLE	FIN GR	FINISH GRADE	OH	OVERHEAD, OVERHANG
CL	CENTERLINE, CLASS, CLOSE	FE	FIRE EXTINGUISHER	PRKG	PARKING
C	CHANNEL	FEB	FIRE EXTINGUISHER BRACKET	PVMT	PAVEMENT
AFF	ABOVE FINISH FLOOR	FEC	FIRE EXTINGUISHER CABINET	PLAM	PLASTIC LAMINATE
ACT	ACOUSTICAL TILE	FP	FIREPROOF	PL	PROPERTY LINE
ADJ	ADJACENT	FLR	FLOOR	PLYWD	PLYWOOD
A/C	AIR CONDITIONING	FD	FLOOR DRAIN	PVC	POLYVINYL CHLORIDE
ALT	ALTERNATE	FTG	FOOTING	PCF	POUNDS PER CUBIC FOOT
ALUM	ALUMINUM	FDTN	FOUNDATION	PSF	POUNDS PER SQUARE FOOT
ARCH	ARCHITECT(URAL)	GAGE	GAGE	PSI	POUNDS PER SQUARE INCH
AUTO	AUTOMATIC	GALV	GALVANIZED IRON	PCC	PRECAST CONCRETE
BRG	BEARING	GC	GENERAL CONTRACT(OR)	PL	PLATE
BRG PL	BEARING PLATE	GEJ	GUTTER EXPANSION JOINT	PT	PRESSURE TREATED
BM	BEAM, BENCH MARK	GL	GLASS, GLAZING	QT	QUARRY TILE
BLKG	BLOCKING	GB	GRAB BAR	R	RADIUS, RISER, RANGE
BD	BOARD	GR LN	GRADE LINE	REF	REFERENCE, REFRIGERATOR
BOT	BOTTOM	GF/GI	GOVERNMENT FURNISHED/ GOVERNMENT INSTALLED	REG	REGISTER
BLDG	BUILDING			REINF	REINFORCE(D), (ING)
BUR	BUILT-UP ROOFING			REINFB	REINFORCING BARS
CAB	CABINET			RCP	REINFORCED CONCRETE PIPE, REFLECTED CEILING PLAN
CPT	CARPET(ED)				
CI	CAST IRON	GMS	GOVERNMENT FURNISHED/ GOVERNMENT INSTALLED	RET	RETURN
CB	CATCH BASIN	GYP BD	GYP(SUM) BOARD	RA	RETURN AIR
CF/CI	CONTRACTOR FURNISHED/ CONTRACTOR INSTALLED	HDBD	HARDBOARD	REV	REVISION(S), REVISED
CF/GI	CONTRACTOR FURNISHED/ GOVERNMENT INSTALLED	HDW	HARDWARE	RH	RIGHT HAND
CK	CAULK(ING)	HTG	HEATING	ROW	RIGHT OF WAY
CLG	CEILING	HVAC	HEATING/VENTILATING/AIR	RD	ROOF DRAIN
CEM	CEMENT	HT	HEIGHT	RFG	ROOFING
CID	COMPREHENSIVE INTERIOR DESIGN PACKAGE	HC	HOLLOW CORE, HANDICAP(PED)	RM	ROOM
CM	CENTIMETER(S)	HM	HOLLOW METAL	SCHED	SCHEDULE
CLR	CLEAR(ANCE)	HORIZ	HORIZONTAL	SECT	SECTION
COL	COLUMN	HB	HOSE BIBB	SF	SQUARE FOOT/FEET
CONC	CONCRETE	HS	HOT STACK	SS	SERVICE SINK
COR	CONTRACTING OFFICER'S REPRESENTATIVE	INCL	INCLUDE(D), (ING)	SHT	SHEET
CMU	CONCRETE MASONRY UNIT	ID	INSIDE DIAMETER	SIM	SIMILAR
COND	CONDITION	INV EL	INVERT ELEVATION	SC	SOLID CORE
CONSTR	CONSTRUCTION	INSUL	INSULATE(D), (ING), (ION)	S	SOUTH
CONT	CONTINUOUS OR CONTINUE	INT	INTERIOR	SPKR	SPEAKER
CONTR	CONTRACT(OR)	INV	INVERT	SPEC	SPECIFICATION(S)
CJ	CONSTRUCTION/CONTROL JOINT	JT	JOINT	SQ	SQUARE
CORR	CORRIDOR	KIT	KITCHEN	STD	STANDARD
COTR	CONTRACTING OFFICER TECHNICAL REP	LAM	LAMINATE(D)	STA	STATION
CU FT	CUBIC FOOT	LAV	LAVATORY	STL	STEEL
CU YD	CUBIC YARD	L	LENGTH	STOR	STORAGE
CW	CURTAIN WALL	LH	LEFT HAND	SD	STORM DRAIN
DIA	DIAMETER	LP	LAMPPOLE	STRUCT	STRUCTURAL
DET	DETAIL	MH	MANHOLE	SUSP	SUSPENDED
DIM	DIMENSION	MFR	MANUFACTURER	SYMM	SYMMETRY(ICAL)
DIV	DIVISION	MAX	MAXIMUM	SYS	SYSTEM
DS	DOWNSPOUT	MECH	MECHANIC(AL)	TE	TOP ELEVATION
DL	DRAIN LEADER	MTL	METAL	TEL	TELEPHONE
DWG	DRAWING	M	METER(S)	TOC	TOP OF CONCRETE
DF	DRINKING FOUNTAIN	MM	MILLIMETER(S)	TOP	TOP OF PAVING
DW	DISHWASHER	MIN	MINIMUM	TV	TELEVISION
EF	EACH FACE	MISC	MISCELLANEOUS	THK	THICK(NESS)
E	EAST	MT	MOUNT	T&B	TOP AND BOTTOM
ELEC	ELECTRIC(AL)	MTD	MOUNTED	T&G	TONGUE AND GROOVE
EWC	ELECTRIC WATER COOLER	MTG	MOUNTING	TOS	TOP OF SLAB, TOP OF STEEL
EL	ELEVATION	MULL	MULLION	TYP	TYPICAL
ELEV	ELEVATOR	NAT	NATURAL	UNO	UNLESS NOTED OTHERWISE
EQ	EQUAL	NOM	NOMINAL	VERT	VERTICAL
EQUIP	EQUIPMENT			VCT	VINYL COMPOSITION TILE
EXH	EXHAUST			WSCT	WAINSCOT
EXIST	EXISTING			WC	WATER CLOSET
EXT	EXTERIOR			WH	WATER HEATER
				WP	WATERPROOFING
				WWF	WELDED WIRE FABRIC
				W	WEST, WIDTH, WIDE
				WITH	WITH
				WITHO	WITHOUT
				WD	WOOD
				WB	WOOD BASE

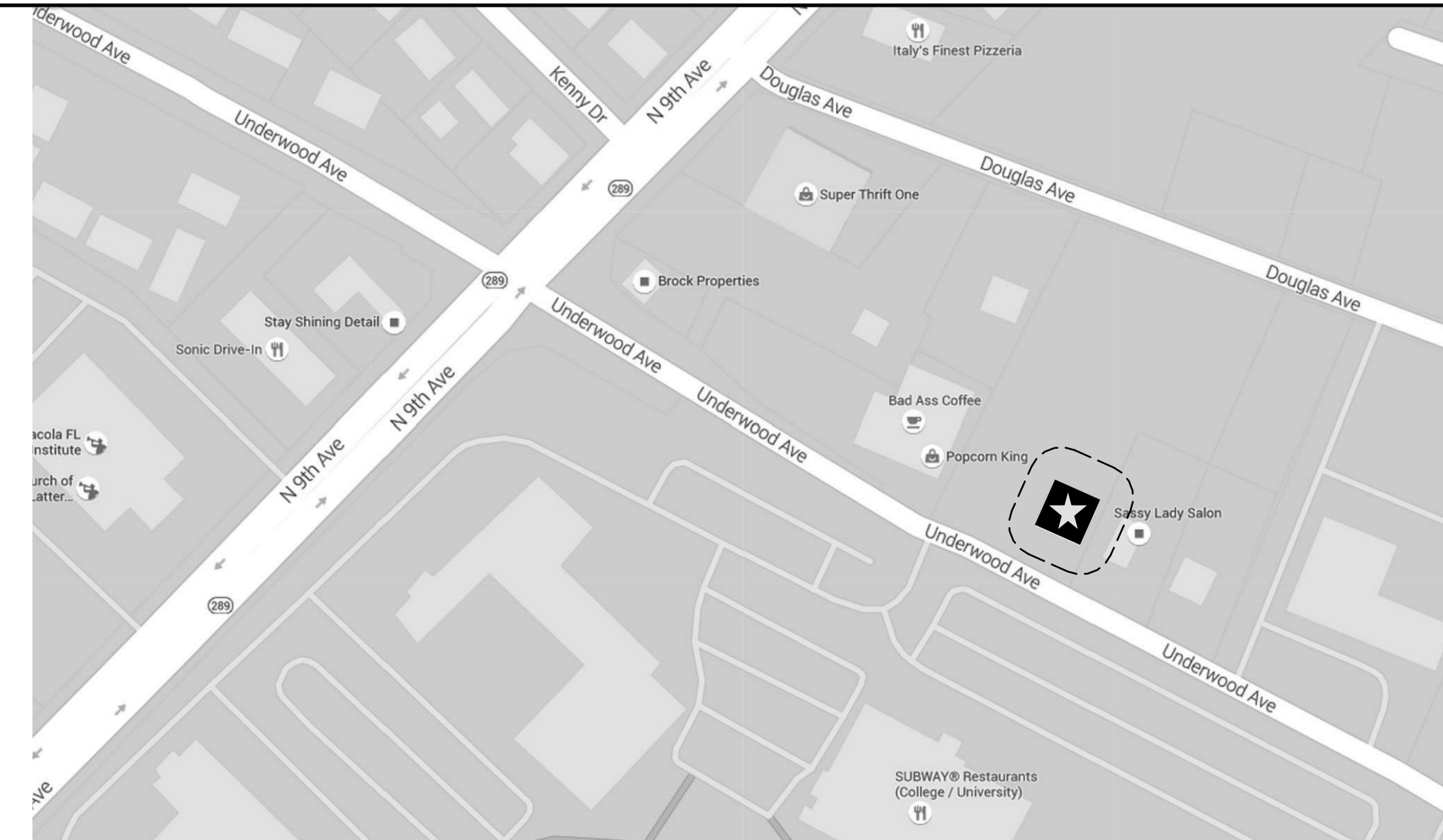
PENSACOLA STATE COLLEGE - WELDING SHOP

1018 UNDERWOOD AVE.
PENSACOLA, FL 32504

PROJECT NUMBER: 142615.02

OWNER: PENSACOLA STATE COLLEGE
1000 COLLEGE BLVD.
PENSACOLA, FL 32504

ARCHITECTURAL: BULLOCK TICE ASSOCIATES
909 EAST CERVANTES STREET
PENSACOLA, FL 32501
LARRY ADAMS, JR., AIA/LEED AP
(850) 434-5444



SYMBOLS LEGEND

ROOM NAME	ROOM NAME / NUMBER		ELEVATION NUMBER		DETAIL NUMBER
	DOOR NUMBER		EXTERIOR ELEVATION SYMBOL		DETAIL SYMBOL
	WINDOW TYPE		NORTH ARROW		SECTION SYMBOL
	WALL TYPE		INTERIOR ELEVATION SYMBOL		SECTION SYMBOL
	ELEVATION TARGET		SHEET ON WHICH ELEVATION IS DRAWN		SHEET ON WHICH SECTION IS DRAWN

INDEX OF DRAWINGS	
SHEET NUMBER	SHEET NAME
GENERAL	
G-001	TITLE SHEET
STRUCTURAL	
S-001	GENERAL NOTES & WIND LOAD DIAGRAM
S-101	SLAB-ON-GRADE PLAN
S-110	WALL FRAMING PLAN
S-201	WALL ELEVATIONS
S-301	SECTIONS & DETAILS
S-302	SECTIONS & DETAILS
ARCHITECTURAL	
A-001	LIFE SAFETY PLAN
A-101	ARCHITECTURAL SITE PLAN
A-109	DEMO PLAN
A-110	BUILDING NOTE PLAN
A-111	BUILDING DIMENSION PLAN

INDEX OF DRAWINGS	
SHEET NUMBER	SHEET NAME
A-140	ROOF PLAN
A-150	CEILING PLAN
A-201	EXTERIOR ELEVATIONS
A-202	EXTERIOR ELEVATIONS
A-301	BUILDING SECTIONS
A-302	BUILDING SECTIONS
A-310	WALL SECTIONS
A-401	WALL DETAILS
A-450	INTERIOR ELEVATIONS
A-601	OPENING SCHEDULE AND DETAILS
A-602	DOOR AND WINDOW DETAILS
A-603	DOOR AND WINDOW DETAILS
PLUMBING	
P-001	PLUMBING NOTES, DETAILS, & LEGEND
P-101	PLUMBING DEMOLITION PLAN
P-201	PLUMBING NEW WORK PLAN

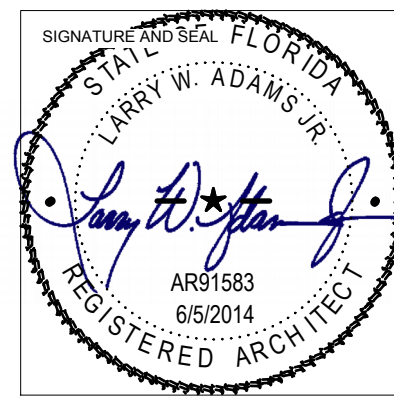
INDEX OF DRAWINGS	
SHEET NUMBER	SHEET NAME
MECHANICAL	
M-001	HVAC NOTES & LEGEND
M-100	HVAC DEMO FLOOR PLAN
M-110	HVAC NEW WORK FLOOR PLAN
M-501	HVAC DETAILS
M-502	HVAC DETAILS
M-601	HVAC SCHEDULES
ELECTRICAL	
E-101	ELECTRICAL DEMO PLAN
E-102	LIGHTING NEW WORK PLAN
E-103	POWER & SIGNAL NEW WORK PLAN
E-104	POWER RISER DIAGRAM & ELECTRICAL SCHEDULES

INDEX OF DRAWINGS	
SHEET NUMBER	SHEET NAME
TELECOMM	
T-100	COMMUNICATIONS NEW WORK
T-501	COMMUNICATIONS DETAILS
T-502	COMMUNICATIONS DETAILS
T-503	COMMUNICATIONS DETAILS
T-601	COMMUNICATIONS SINGLE LINE DIAGRAM

BTA
...optimizing design value
PLANNING ARCHITECTURE INTERIOR DESIGN DESIGN BUILD

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May 2, 2016



PSC WELDING SHOP

UNDERWOOD AVE - PENSACOLA, FL 32504

REVISIONS:

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
TITLE SHEET

SHEET:
G-001

1.00 GENERAL NOTES

1.01 DRAWINGS SHOW TYPICAL AND CERTAIN SPECIFIC CONDITIONS ONLY. FOR DETAILS NOT SPECIFICALLY SHOWN, PROVIDE DETAILS SIMILAR TO THOSE SHOWN.

1.02 VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS BEFORE STARTING WORK. NOTIFY STRUCTURAL ENGINEER OF ANY DISCREPANCY.

1.03 THE DESIGN, ADEQUACY, AND SAFETY OF ERECTION BRACING, SHORING, TEMPORARY SUPPORTS, ETC., ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. TAKE NECESSARY PRECAUTIONS TO PROTECT THE EXISTING STRUCTURE AND ITS FOUNDATION AND TO LIMIT, TO THE EXTENT POSSIBLE, THE EFFECTS OF CONSTRUCTION THAT THE NEW STRUCTURE HAS ON THE EXISTING STRUCTURE.

1.04 COORDINATE STRUCTURAL CONTRACT DOCUMENTS WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL. NOTIFY STRUCTURAL ENGINEER OF ANY CONFLICT AND/OR OMISSION. CONTRACTOR SHALL MAKE NO DEVIATION FROM DESIGN DRAWINGS WITHOUT WRITTEN APPROVAL OF THE ARCHITECT. FOR ADDITIONAL OPENINGS NOT SHOWN ON THE STRUCTURAL DRAWINGS, SEE ARCHITECTURAL, MECHANICAL, AND PLUMBING DRAWINGS.

1.05 DESIGN CRITERIA:

THE STRUCTURE HAS BEEN DESIGNED UTILIZING THE FOLLOWING REFERENCES:

- A. FLORIDA BUILDING CODE, 2014
- B. ASCE 7-10, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
- C. ACI 318-11, BUILDING CODE REQUIREMENTS FOR CONCRETE STRUCTURES
- D. AISC STEEL CONSTRUCTION MANUAL 14TH EDITION

1.06 DESIGN LOADS

A. WIND LOADS - STRUCTURE HAS BEEN DESIGNED TO CONFORM TO THE WIND PROVISIONS OF ASCE 7-10. SEE WIND PRESSURE DIAGRAM & CHART FOR THE FOLLOWING:

- 1. BASIC WIND SPEED (3-SEC GUST)
- 2. BUILDING RISK CATEGORY
- 3. WIND EXPOSURE CATEGORY
- 4. INTERNAL PRESSURE COEFFICIENT
- 5. COMPONENT & CLADDING WIND PRESSURES

1.07 SHOP DRAWING SUBMITTALS:

A. THE REVIEW OF SUBMITTALS AND/OR SHOP DRAWINGS DONE BY THE STRUCTURAL ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO REVIEW AND CHECK SHOP DRAWINGS BEFORE SUBMITTAL TO THE STRUCTURAL ENGINEER. THE REVIEW BY THE STRUCTURAL ENGINEER IS FOR GENERAL CONFORMANCE ONLY. IF SHOP DRAWINGS HAVE NOT BEEN REVIEWED AND APPROVED BEFORE SUBMITTAL TO THE STRUCTURAL ENGINEER, THEY SHALL BE RETURNED WITHOUT APPROVAL.

B. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ANY AND ALL ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF ALL SHOP DRAWINGS IN RELATIONSHIP TO THE CONSTRUCTION DOCUMENTS.

C. ALL MODIFICATIONS MADE FOR SUBMITTALS THAT ARE RE-SUBMITTED SHALL CLEARLY NOTE ALL CHANGES.

D. REPRODUCING THE CONTRACT DOCUMENTS FOR USE AS SHOP DRAWINGS IS NOT ALLOWED, AND SHOP DRAWINGS WILL BE RETURNED WITHOUT APPROVAL.

E. GENERAL SHOP DRAWING REQUIREMENTS:

1. SUBMIT SHOP DRAWINGS AND ANY OTHER SPECIAL INFORMATION NECESSARY FOR PROPER FABRICATION, ERECTION, AND PLACEMENT OF STRUCTURAL FABRICATIONS. INCLUDE PLANS, ELEVATIONS, AND SECTIONS. CLEARLY SHOW ANCHORAGES, CONNECTIONS, AND ACCESSORY ITEMS. THE DETAILER MUST INTERPRET THE CONTRACT DOCUMENTS AND CLEARLY CONVEY THIS INTERPRETATION TO THE FIELD IN THE FORM OF PLACING OR ERECTION DRAWINGS.

2. CONCRETE REINFORCING DETAILER - PROVIDE PLACING DRAWINGS FOR FABRICATION AND PLACING OF REINFORCING STEEL. THESE DRAWINGS SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING: BAR LISTS, SCHEDULES, BENDING DETAILS, PLACING DETAILS, PLACING PLANS, AND PLACING ELEVATIONS. CLEARLY SHOW FOUNDATION REINFORCING. INDICATE BAR LENGTHS, LOCATION AND SPLICES OF CONTINUOUS BARS, AND BAR SUPPORTS. CLEARLY SHOW LOCATIONS OF ALL DOWELS ON PLAN.

2.00 FOUNDATIONS AND SLAB-ON-GRADE

2.01 SHALLOW FOUNDATIONS HAVE BEEN DESIGNED FOR AN ALLOWABLE SOIL BEARING PRESSURE OF 1500 PSF.

2.02 AT THIS TIME NO GEOTECHNICAL REPORT HAS BEEN SUBMITTED. AN ALLOWABLE SOIL BEARING PRESSURE HAS BEEN CONSERVATIVELY ESTIMATED BASED ON SIMILAR PROJECTS OF THIS SIZE AND LOCATED IN THE SAME GENERAL AREA OF CONSTRUCTION. GEOTECHNICAL ENGINEER SHALL CHECK COMPACTION OF THE FOOTINGS. THE SOILS IMMEDIATELY BENEATH ALL FOOTINGS SHOULD BE COMPACTED FOR A MINIMUM DEPTH OF 12 INCHES TO A MINIMUM OF 95% OF THE SOIL'S MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED PROCTOR TEST (ASTM D1557) USING A LARGE TAMPER.

2.03 A QUALIFIED GEOTECHNICAL ENGINEER SHALL VERIFY CONDITION AND/OR ADEQUACY OF ALL SUBGRADES, FILLS AND BACKFILLS BEFORE PLACEMENT OF FOUNDATIONS, FOOTINGS, SLABS, WALLS, FILLS, BACKFILLS, ETC. SHOULD THE CONTRACTOR FIND UNDESIRABLE SOILS, HE SHALL STOP WORK AND IMMEDIATELY CONTACT THE ENGINEER OF RECORD. ALL FOOTINGS SHALL REST EITHER ON UNDISTURBED SOIL OR A MANUALLY OPERATED VIBRATORY SLED OR TAMPER SHOULD BE USED TO DENSIFY ANY SOILS IN THE BOTTOM OF THE FOOTING TRENCHES LOOSENEED DURING THE EXCAVATION OPERATION.

2.04 CONTRACTOR IS RESPONSIBLE FOR ADEQUATELY PROTECTING ALL EXCAVATION SLOPES.

2.05 DEWATER TO AT LEAST TWO FEET BELOW BOTTOM OF LOWEST FOUNDATION IF GROUNDWATER IS ENCOUNTERED.

2.06 SLAB-ON-GRADE REQUIREMENTS:

A. UNLESS NOTED OTHERWISE, THE SLAB-ON-GRADE SHALL BE A MINIMUM OF 6 INCHES THICK, PLACED ON COMPACTED SUBGRADE, AND REINFORCED AS INDICATED ON PLANS.

B. SUBGRADE SHALL BE PREPARED AS RECOMMENDED IN THE GEOTECHNICAL REPORT. IN THE ABSENCE OF A GEOTECHNICAL REPORT, THE TOP 12" OF THE SUBGRADE SHALL BE COMPACTED TO 95% OF THE MAXIMUM MODIFIED PROCTOR DENSITY. DENSITY TESTS SHALL BE TAKEN AT 2500 SF INTERVALS.

C. VAPOR RETARDER SHALL CONFORM TO ASTM E1745, CLASS A, B, OR C AND BE A MINIMUM OF 10 MIL THICKNESS. THE VAPOR RETARDER SHOULD BE PLACED OVER THE PREPARED SUBGRADE. VAPOR RETARDER SHOULD BE OVERLAPPED 8 IN. AND TAPED AT THE JOINTS AND CAREFULLY FITTED AROUND SERVICE OPENINGS.

3.00 REINFORCED CONCRETE

3.01 ALL CONCRETE WORK SHALL CONFORM TO ACI 301-05, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS. DESIGN IS BASED ON ACI 318-05, BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE. DETAIL CONCRETE REINFORCEMENT AND ACCESSORIES IN ACCORDANCE WITH ACI 315, DETAILING MANUAL. DETAIL ALL CONCRETE WALLS AND BEAMS ON THE SHOP DRAWINGS IN ELEVATION UNLESS SPECIFICALLY APPROVED OTHERWISE. SUBMIT SHOP DRAWINGS FOR APPROVAL, SHOWING ALL FABRICATION DIMENSIONS AND LOCATIONS FOR PLACING REINFORCING STEEL AND ACCESSORIES. DO NOT BEGIN FABRICATION UNTIL SHOP DRAWINGS ARE COMPLETED AND REVIEWED.

3.02 UNLESS NOTED OTHERWISE, ALL CONCRETE SHALL BE NORMAL WEIGHT AND HAVE THE FOLLOWING MINIMUM 28 DAY COMPRESSIVE STRENGTHS:

- A. FOUNDATIONS 3500 PSI
- B. SLAB-ON-GRADE 3500 PSI

ALL CONCRETE SHALL HAVE ENTRAINED AIR, U.N.O. CONCRETE MAY CONTAIN A PROPERLY DESIGNED SUPERPLASTICIZER FOR WORKABILITY.

3.03 REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60 UNLESS NOTED OTHERWISE.

3.04 THE PROPOSED MATERIALS AND MIX DESIGN SHALL BE FULLY DOCUMENTED AND REVIEWED BY THE OWNER'S TESTING LABORATORY. RESPONSIBILITY FOR OBTAINING THE REQUIRED DESIGN STRENGTH IS THE CONTRACTOR'S.

3.05 USE OF CALCIUM CHLORIDE, CHLORIDE IONS, OR OTHER SALTS IN CONCRETE IS NOT PERMITTED.

3.06 CHAMFER OR ROUND ALL EXPOSED CORNERS A MINIMUM OF 3/4".

3.07 TIE ALL REINFORCING STEEL AND EMBEDMENTS SECURELY IN PLACE PRIOR TO PLACING CONCRETE. PROVIDE SUFFICIENT SUPPORTS TO MAINTAIN THE POSITION OF REINFORCEMENT WITHIN SPECIFIED TOLERANCE DURING ALL CONSTRUCTION ACTIVITIES. "STICKING" DOWELS INTO WET CONCRETE IS NOT PERMITTED.

3.08 PROVIDE CONTINUOUS REINFORCEMENT WHEREVER POSSIBLE; SPLICE ONLY AS SHOWN OR APPROVED; STAGGER SPLICE WHERE POSSIBLE; USE FULL TENSION SPLICE (CLASS "B") UNLESS NOTED OTHERWISE. DOWELS SHALL MATCH THE SIZE AND SPACING OF THE SPECIFIED REINFORCEMENT AND SHALL BE LAPPED WITH FULL TENSION SPLICES (CLASS "B") UNLESS NOTED OTHERWISE. TERMINATE BARS WITH STANDARD HOOKS.

3.09 REINFORCING STEEL SHALL HAVE THE FOLLOWING CONCRETE COVER UNLESS NOTED OTHERWISE (PER ACI 318-05 PAR.7.7.1):

A. CONCRETE AGAINST EARTH (NOT FORMED): 3"

- B. FORMED CONCRETE EXPOSED TO THE EARTH OR WEATHER:
 - 1. #6 THROUGH #18 BARS: 2"
 - 2. #5 BARS AND SMALLER: 1-1/2"

- C. CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
 - 1. SLABS AND WALLS: 1"
 - 2. BEAMS (STIRRUPS) AND COLUMNS (TIES): 1-1/2"

3.10 DO NOT PLACE DUCTS EXCEEDING ONE-THIRD THE SLAB OR WALL THICKNESS WITHIN THE SLAB OR WALL UNLESS SPECIFICALLY SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.

3.11 DO NOT WELD OR TACK WELD REINFORCING STEEL UNLESS APPROVED OR DIRECTED BY THE STRUCTURAL ENGINEER.

3.12 ALL REINFORCING STEEL PLACEMENTS SHALL BE REVIEWED BY A REGISTERED STRUCTURAL ENGINEER, OR BY A REPRESENTATIVE RESPONSIBLE TO HIM. (RE: ACI 318 PAR. 1.3.1)

4.00 STRUCTURAL STEEL

4.01 STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED ACCORDING TO AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ASD, LATEST EDITION.

4.02 SUBMIT SHOP DRAWINGS PREPARED IN ACCORDANCE WITH AISC MANUAL "DETAILING FOR STEEL CONSTRUCTION", LATEST EDITION. STEEL FABRICATOR SHALL SUPPLY ANCHOR BOLT LOCATION DRAWINGS. DO NOT BEGIN FABRICATION UNTIL SHOP DRAWINGS ARE COMPLETED AND REVIEWED.

4.03 STRUCTURAL STEEL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992. STRUCTURAL STEEL SHAPES, PLATES, ANGLES, AND CHANNELS SHALL CONFORM TO ASTM A36 UNLESS NOTED OTHERWISE. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE B, FY = 46 KSI, UNLESS NOTED OTHERWISE. STEEL PIPE SHALL CONFORM TO ASTM A501 OR ASTM A53, TYPE E OR S, GRADE B. ANCHOR BOLTS SHALL CONFORM TO ASTM A36 UNLESS NOTED OTHERWISE.

4.04 BOLTS SHALL CONFORM TO ASTM A325, 3/4-INCH DIAMETER MINIMUM, UNLESS NOTED OTHERWISE. BOLTS IN BEARING CONNECTIONS SHALL BE DESIGNATED TYPE N, TENSIONED, SNUG-TIGHT AS DEFINED BY AISC. BOLTS IN MOMENT CONNECTIONS AND IN TRUSSES SHALL BE DESIGNATED SLIP-CRITICAL (SC), FULLY TENSION SLIP-CRITICAL CONNECTIONS WITH DIRECT TENSION INDICATOR WASHERS INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTION.

4.05 USE PRE-QUALIFIED WELDED JOINTS AS PER AISC, AND AWS D1.1 "STRUCTURAL WELDING CODE." USE ONLY CERTIFIED WELDERS; ALL ELECTRODES SHALL CONFORM TO AWS A5 GRADE E70XX. BARE ELECTRODE AND GRANULAR FLUX SHALL CONFORM TO AWS A5, F70 AWS FLUX CLASSIFICATION. MINIMUM WELD SIZE TO BE 3/16" FILLET WELD, U.N.O.

4.06 CUTS, BOLTS, COPING, ETC. REQUIRED FOR WORK OR OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS AND MADE IN THE SHOP. CUTS OR BURNING HOLES IN STRUCTURAL STEEL MEMBERS IN THE FIELD WILL NOT BE PERMITTED.

4.07 SHOP CONNECTIONS NOT SPECIFICALLY DETAILED ON THE DRAWINGS MAY BE WELDED OR BOLTED. FIELD CONNECTIONS NOT SPECIFICALLY DETAILED ON THE DRAWINGS SHALL BE BOLTED, WHERE POSSIBLE.

4.08 ALTERNATE CONNECTION DETAILS MAY BE USED IF SUCH DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND ACCEPTANCE IS GRANTED. HOWEVER, THE ENGINEER SHALL BE THE SOLE JUDGE OF ACCEPTABILITY AND THE CONTRACTOR'S BID SHALL ANTICIPATE THE USE OF THE SPECIFIC DETAILS SHOWN ON THE DRAWINGS. IN ANY EVENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF SUCH ALTERNATE DETAILS, WHICH HE PROPOSES.

4.09 PROVIDE TEMPORARY BRACING OF STRUCTURAL FRAMING TO PROVIDE LATERAL SUPPORT UNTIL ALL PERMANENT BRACING MOMENT CONNECTIONS AND FLOOR AND ROOF DECKS (DIAPHRAGMS) ARE COMPLETELY INSTALLED.

4.10 STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND DRAWINGS RELATED TO OTHER TRADES. CONTRACTOR SHALL BE RESPONSIBLE TO CHECK AND COORDINATE DIMENSIONS, CLEARANCES, ETC. WITH THE WORK OF OTHER TRADES. THE STRUCTURAL STEEL CONTRACTOR SHALL PROVIDE FRAMING AROUND OPENINGS IN FLOOR AND ROOF SLAB AS INDICATED IN THE MECHANICAL AND ARCHITECTURAL DRAWINGS.

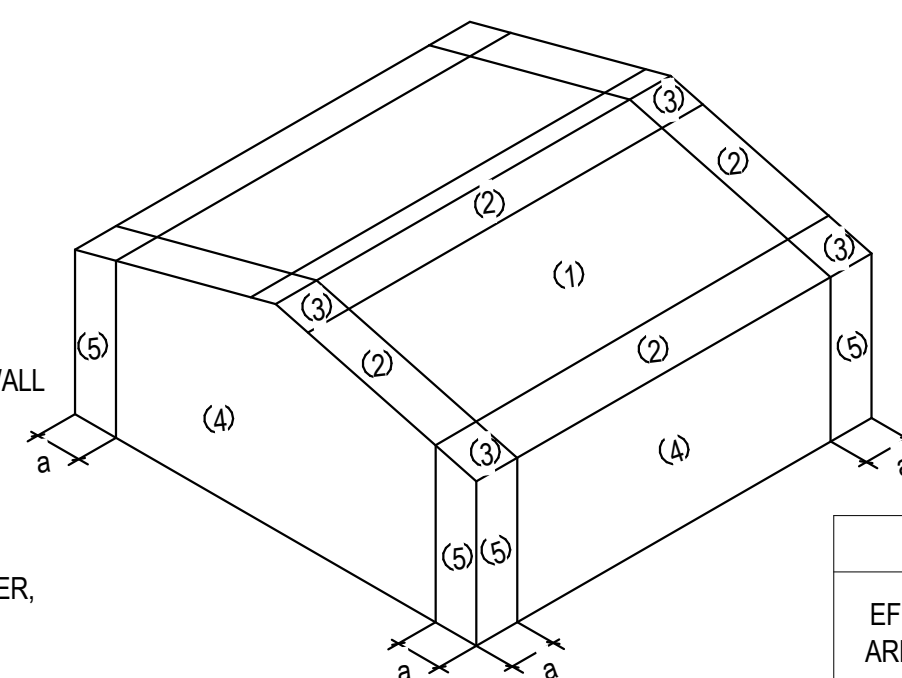
4.11 PAINT STRUCTURAL STEEL IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. DO NOT PAINT STEEL SURFACES TO BE ENCASED IN CONCRETE OR RECEIVE SPRAYED ON FIREPROOFING. CONNECTIONS DESIGNATED AS SLIP CRITICAL, OR TO BE WELDED.

5.00 COLD FORMED METAL FRAMING

5.01 COLD FORMED METAL STUDS: GALVANIZED STEEL PER ASTM A525, G90 COATING MEETING THE REQUIREMENTS OF ASTM A446 GRADE A, WITH A MINIMUM YIELD STRENGTH OF 33,000 PSI.

5.02 ALL STUDS INDICATED SHALL HAVE 1-5/8" WIDE FLANGES WITH A 1/2" LIP, U.N.O. ALL TRACK INDICATED SHALL HAVE 1-1/4" WIDE FLANGES.

5.03 ALL INTERIOR WALL STUDS SHALL BE 18 GA. MINIMUM.



WIND VELOCITY (MPH)	EXPOSURE CATEGORY	MEAN ROOF HEIGHT (FT.)	ROOF SLOPE	RISK CATEGORY	ENCLOSURE CATEGORY
160	B	15	3 ON 12	II	ENCLOSED

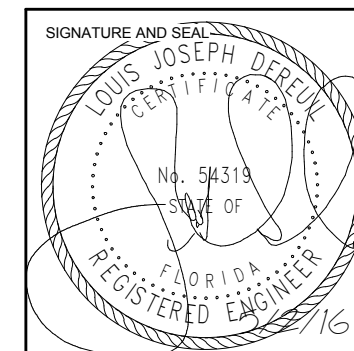
EFF. AREA (SQ. FT)	ROOF ZONE 1		ROOF ZONE 2		ROOF ZONE 3		WALL ZONE 4		WALL ZONE 5			
	W	E	W	E	W	E	W	E	W	E		
≤ 10	26.5	-42.1	26.5	-73.4	-85.9	26.5	-108.5	-144.4	46.1	-50.0	46.1	-61.7
50	21.1	-39.4	21.1	-59.7	-85.9	21.1	-92.1	-111.7	42.7	-46.6	42.7	-54.8
≥ 100	18.7	-38.2	18.7	-53.9	-85.9	18.7	-85.1	-97.6	39.2	-43.1	39.2	-47.9

NOTES:

- 1. FOR EFFECTIVE AREAS BETWEEN THOSE GIVEN ABOVE THE LOAD MAY BE INTERPOLATED, OTHERWISE USE THE LOAD ASSOCIATED WITH THE LOWER EFFECTIVE AREA.
- 2. THE EDGE STRIP, a = 5.5 FT.
- 3. PRESSURES SHALL BE APPLIED IN ACCORDANCE WITH THE FIGURE SHOWN ON THIS SHEET.
- 4. PRESSURES GIVEN ARE ULTIMATE LOADS TO BE USED WITH STRENGTH DESIGN. FOR SERVICE LOADS TO BE USED WITH ALLOWABLE STRESS DESIGN, MULTIPLY THE PRESSURES BY 0.60. SEE TABLES 2.3 AND 2.4 IN ASCE 7-10 FOR MORE INFORMATION ON LOAD COMBINATIONS.



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PSC WELDING SHOP
UNDERWOOD AVE., PENSACOLA, FL. 32504

NO.	DESCRIPTION

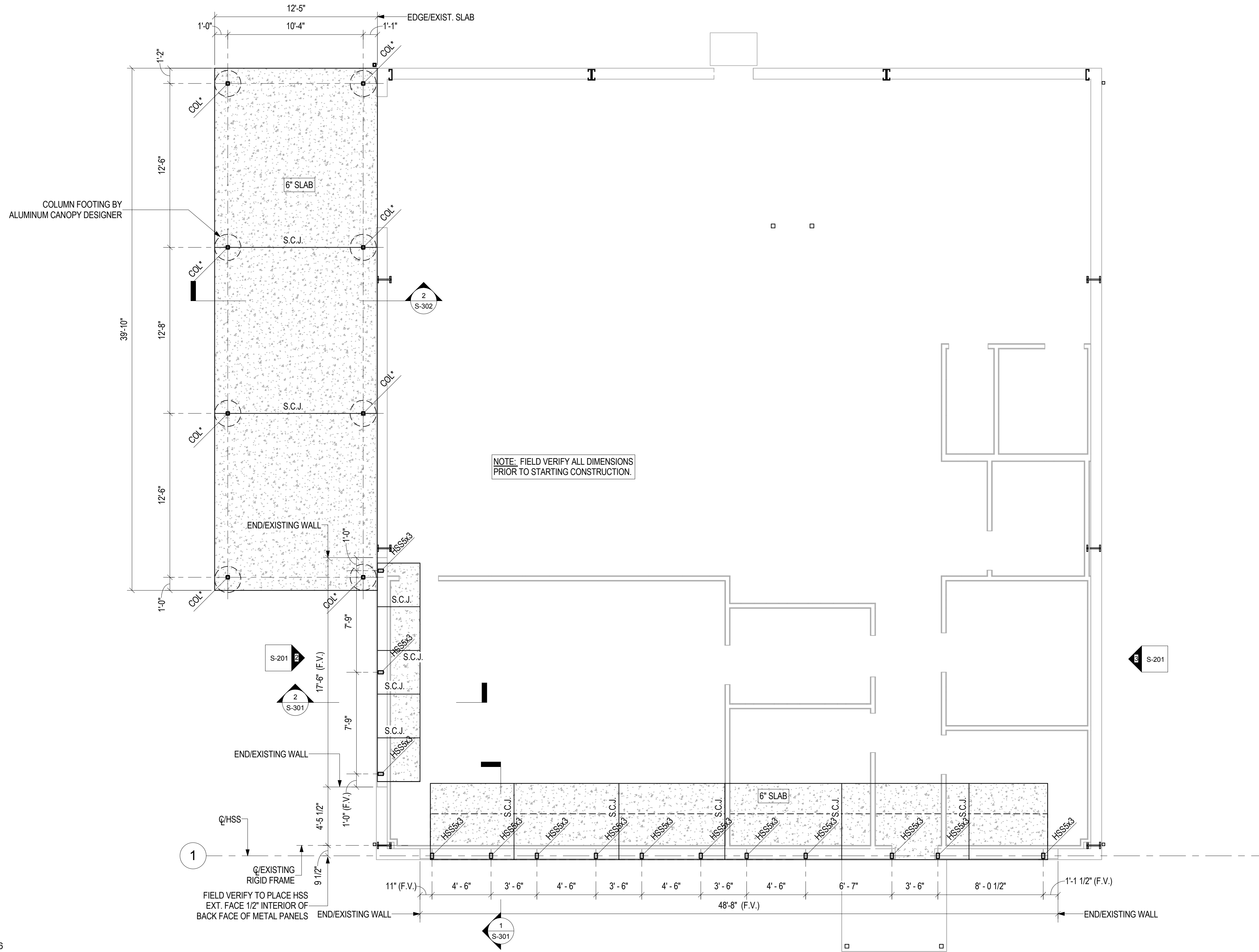
BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
GENERAL NOTES & WIND LOAD DIAGRAM

SHEET:
S-001

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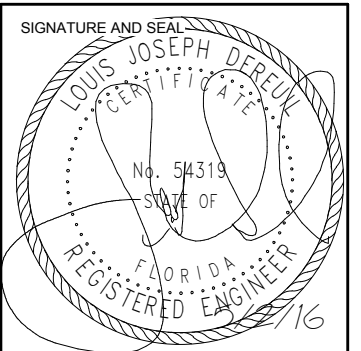
- HSS5x3 = HSS5x3x3/16
- COL* = COLUMN BY ALUMINUM CANOPY DESIGNER (SEE ARCH.)
- S.C.J. = SAWN CONTRACTION JOINT OR CONSTRUCTION JOINT; CONTRACTOR'S OPTION U.N.O.
- 6" SLAB = 6" MINIMUM THICKNESS SLAB-ON-GRADE REINFORCED WITH WWF 6x6 W2.9xW2.9 WITH 4" CLR. POSITIVE SUPPORT FROM BOTTOM OF SLAB. SLAB SHALL BE PLACED OVER A VAPOR BARRIER AND CAPILLARY BREAK AS INDICATED IN THE GENERAL NOTES SECTION 2.06 ON SHEET S-001.



1 SLAB-ON-GRADE PLAN
S-101 1/4" = 1'-0"



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PSC WELDING SHOP
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REVISIONS

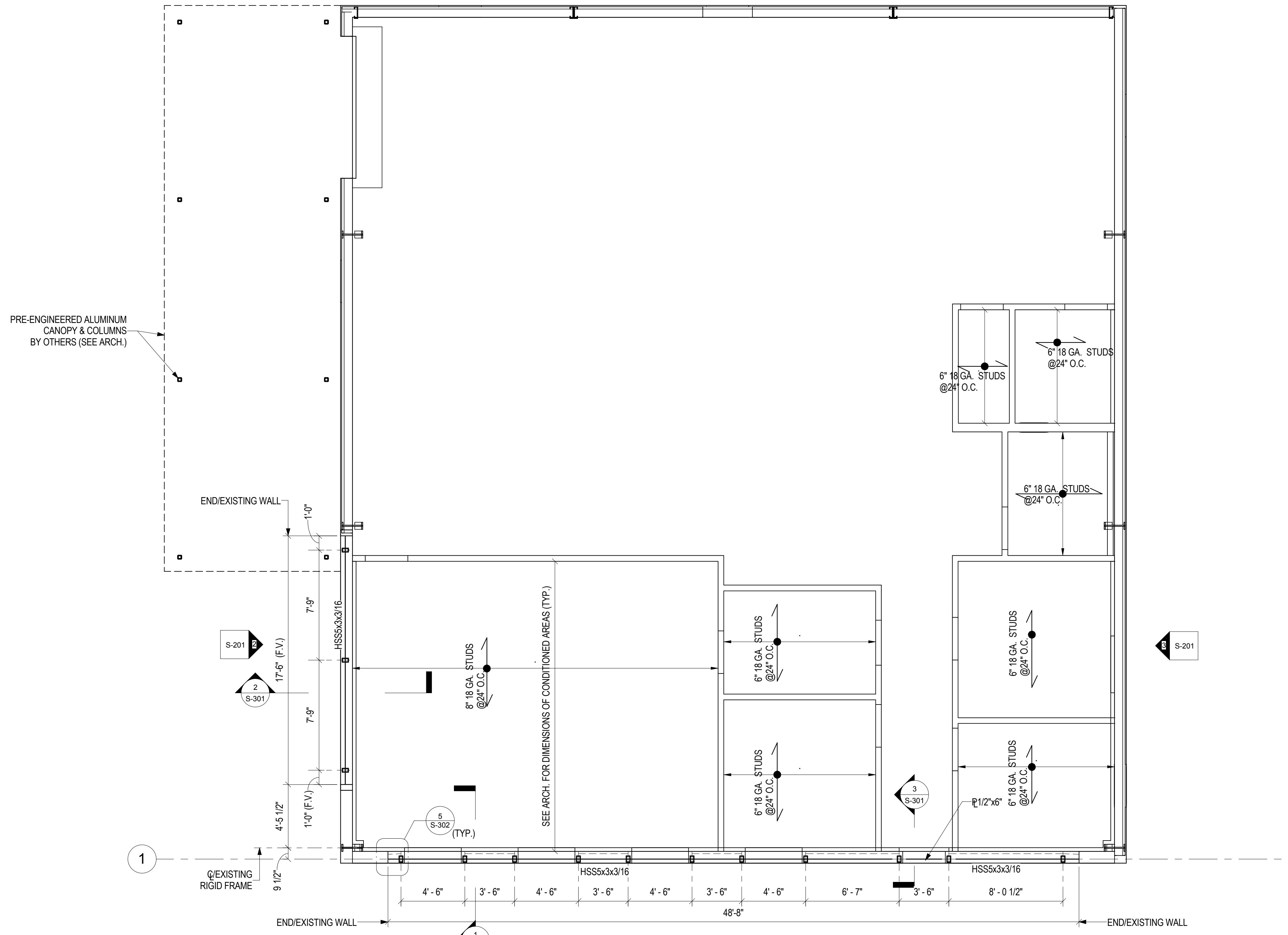
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SHEET DATE: 05/02/16

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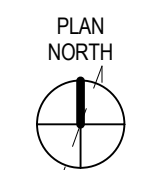
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S-101

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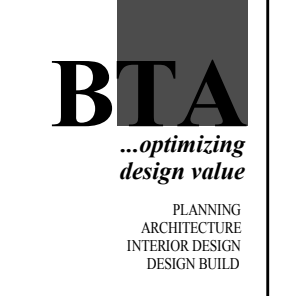
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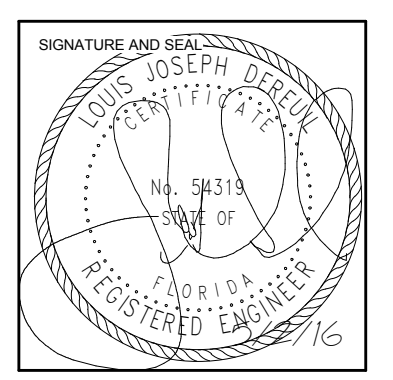
CEILING FRAMING DESIGN LOADS:
 DL = 20 PSF
 LL = 0 PSF



1 WALL & CEILING FRAMING PLAN
 S-110 1/4" = 1'-0"



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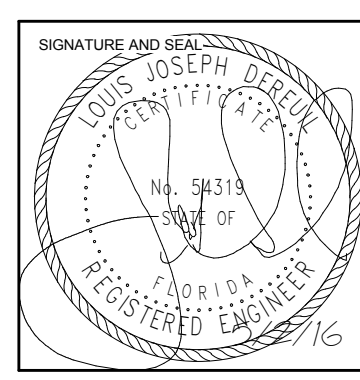
PSC WELDING SHOP
 UNDERWOOD AVE., PENSACOLA, FL. 32504

REVISIONS

BTA PROJECT NO: 142615.02
 SHEET DATE: 05/02/16

SHEET TITLE:
 WALL & CEILING FRAMING PLAN

SHEET:
 S-110



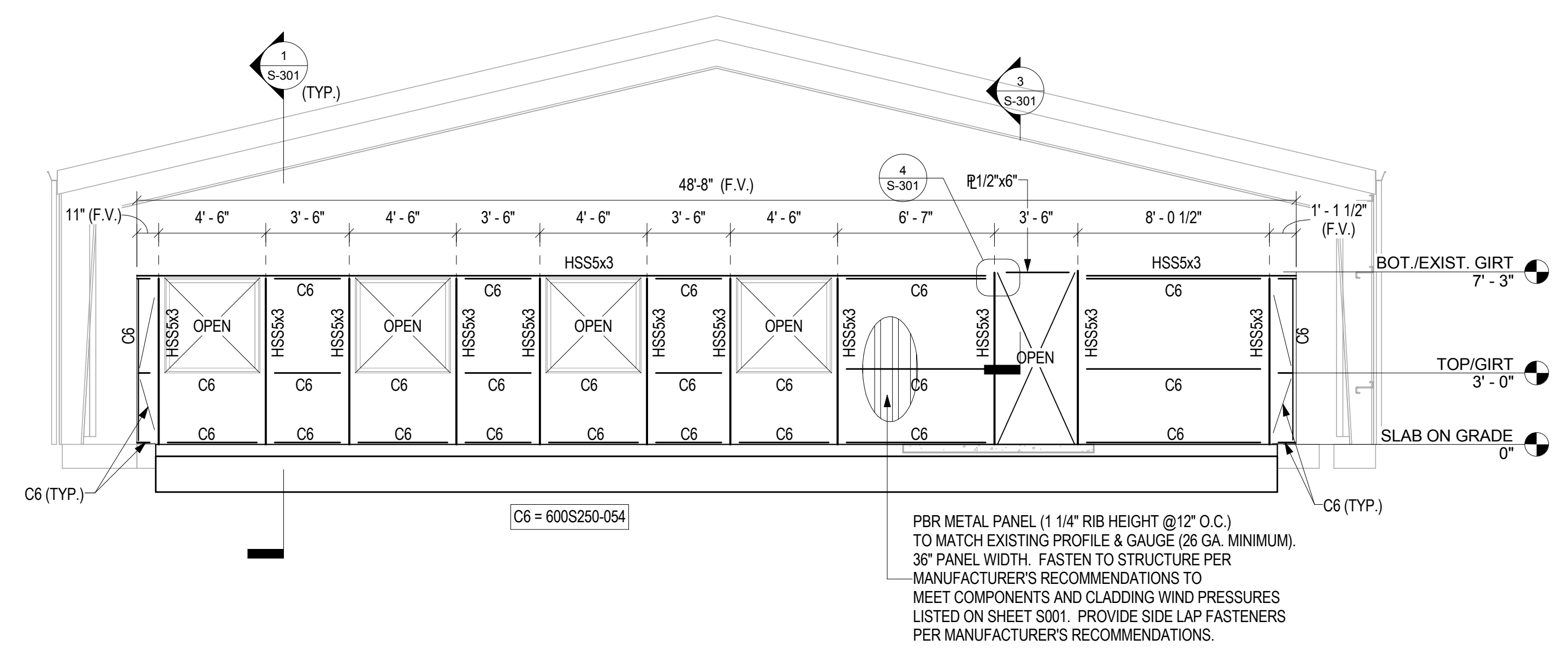
PSC WELDING SHOP
 UNDERWOOD AVE., PENSACOLA, FL. 32504

REVISIONS

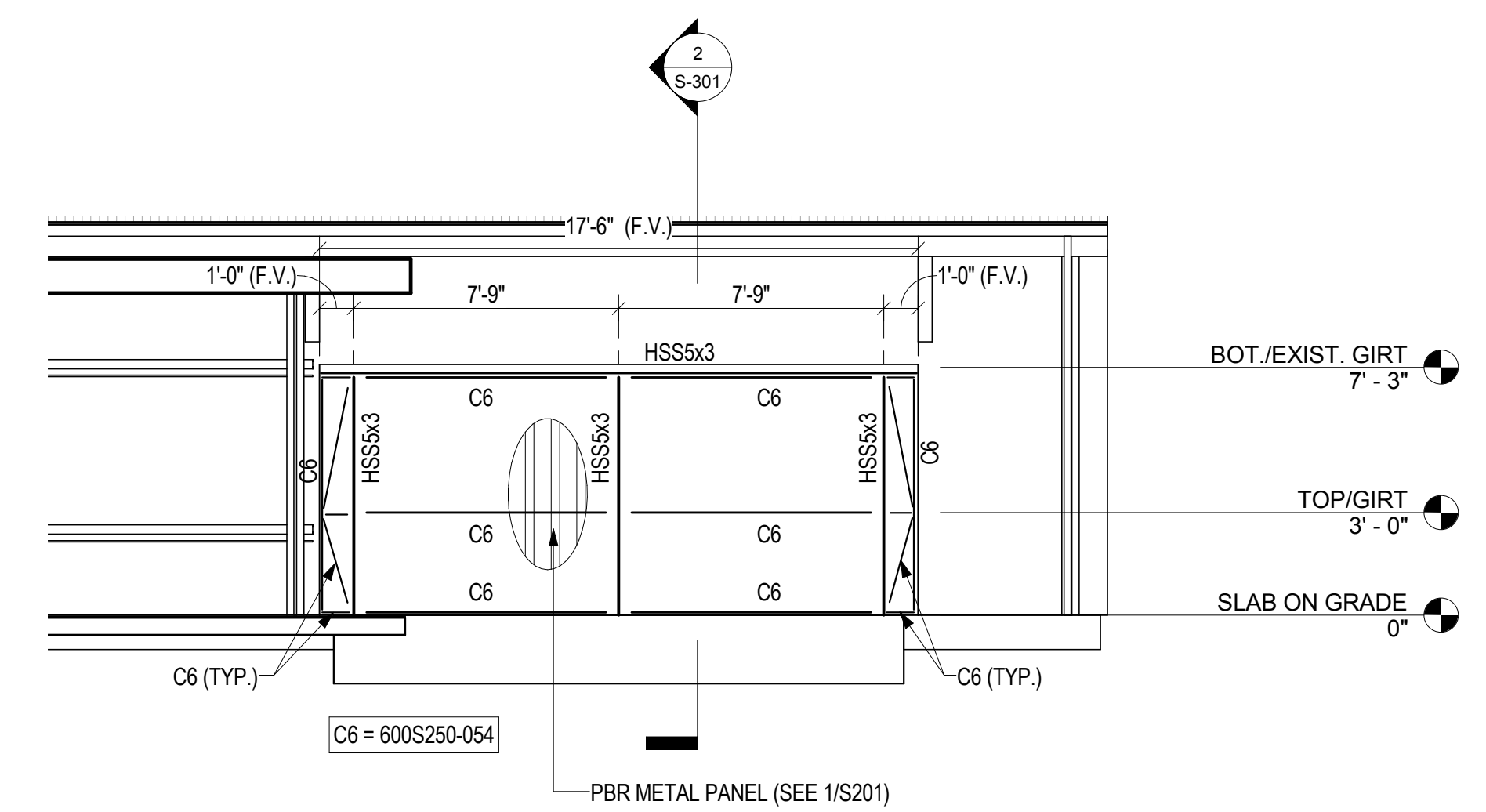
BTA PROJECT NO: 142615.02
 SHEET DATE: 05/02/16

SHEET TITLE:
WALL ELEVATIONS

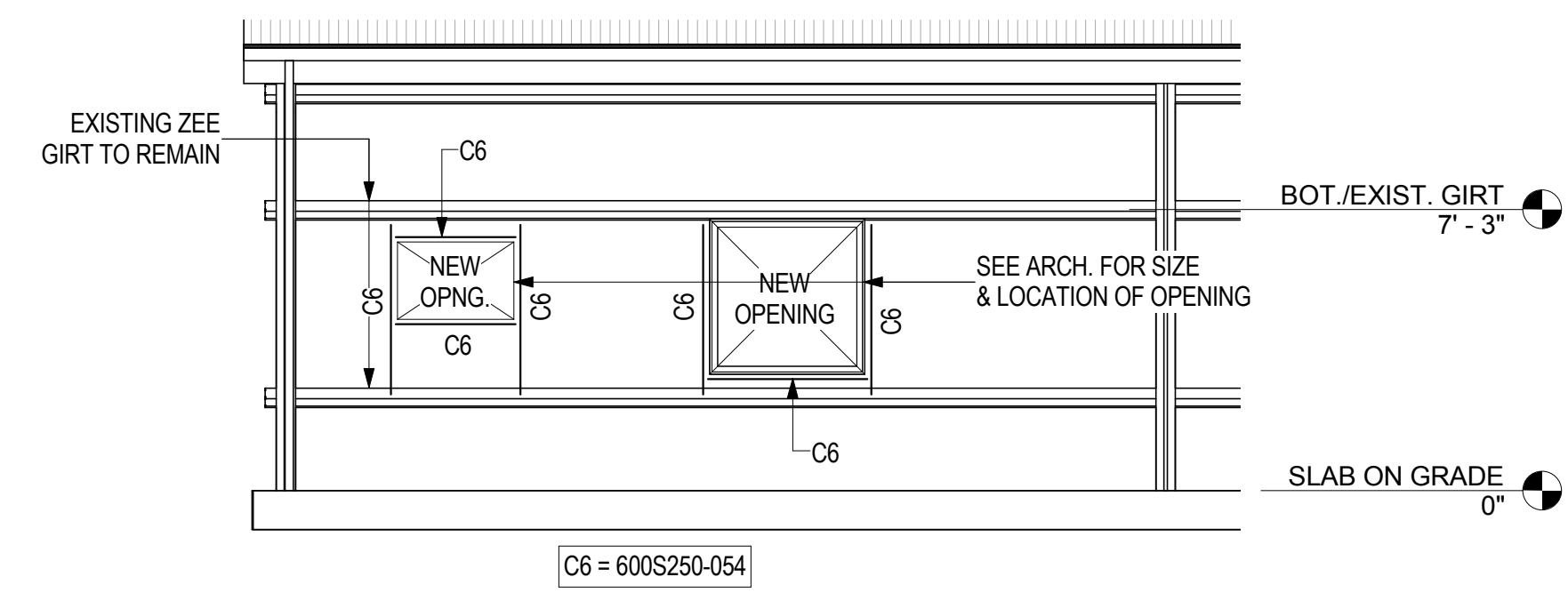
SHEET:
S-201



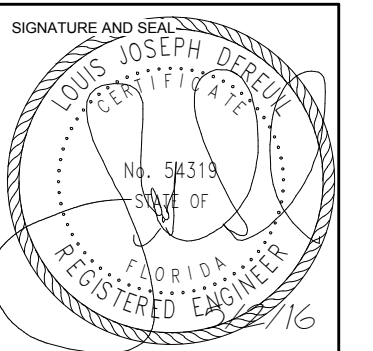
1 SOUTH ELEVATION
 S-201 1/4" = 1'-0"



2 WEST ELEVATION
 S-201 1/4" = 1'-0"



3 EAST ELEVATION
 S-201 1/4" = 1'-0"



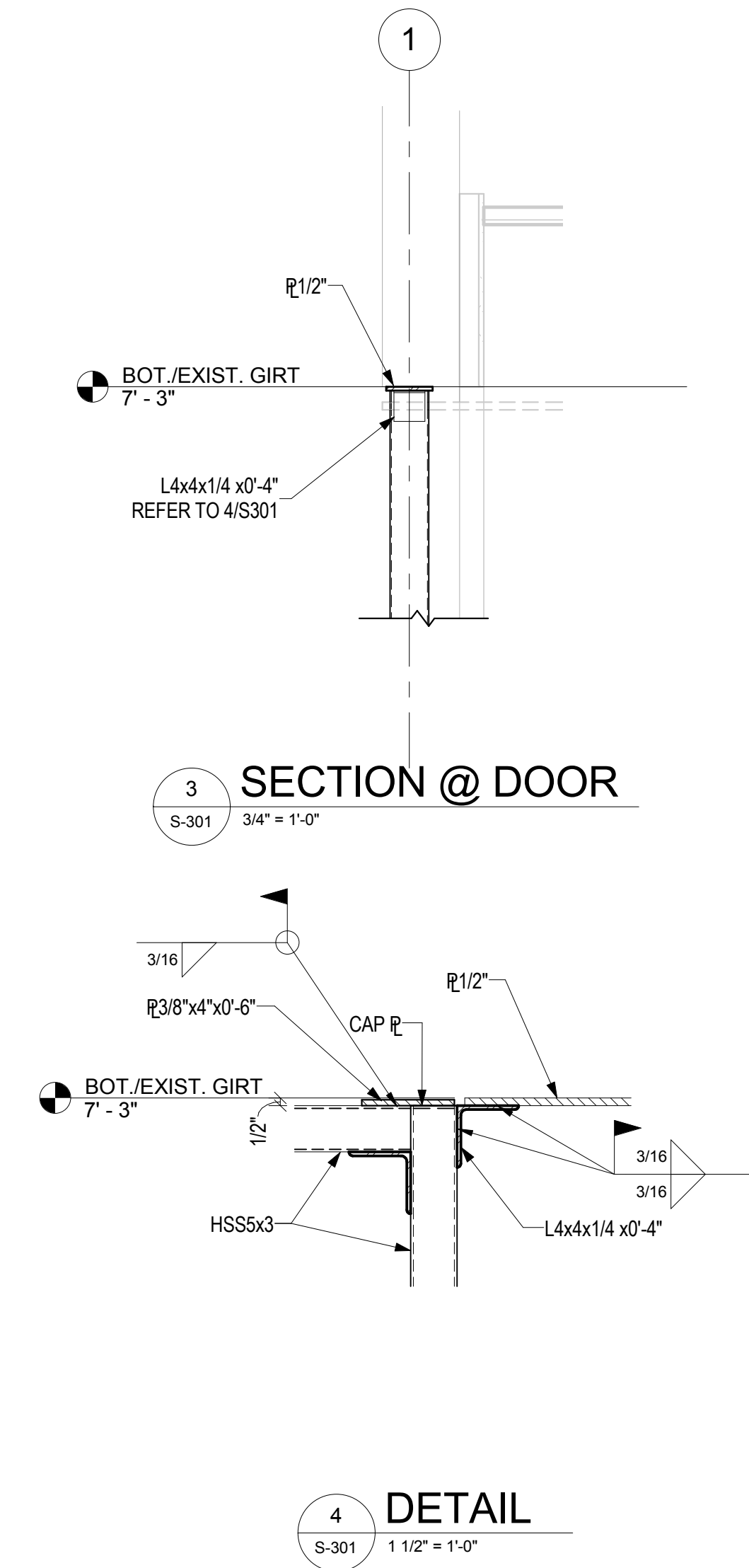
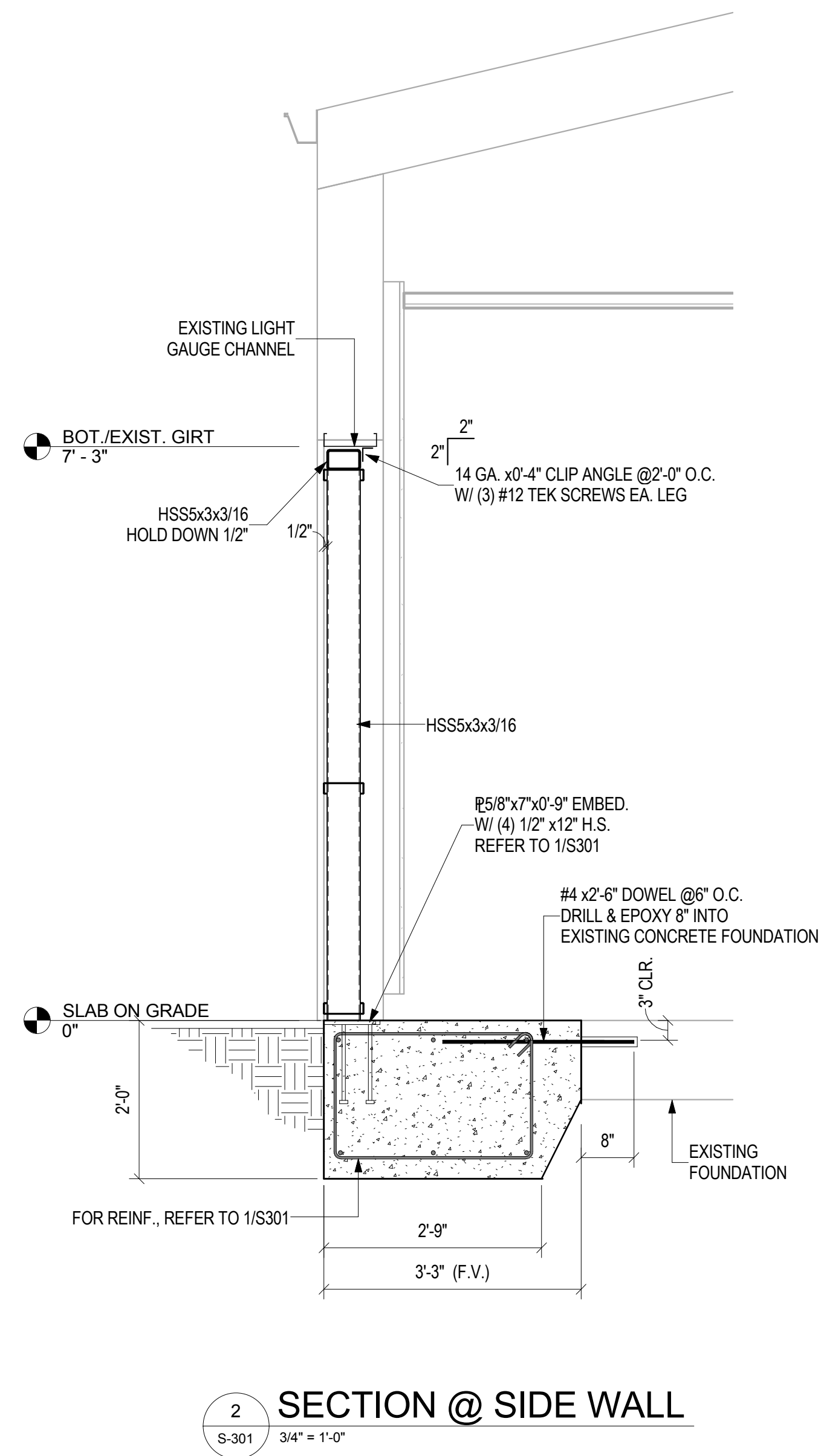
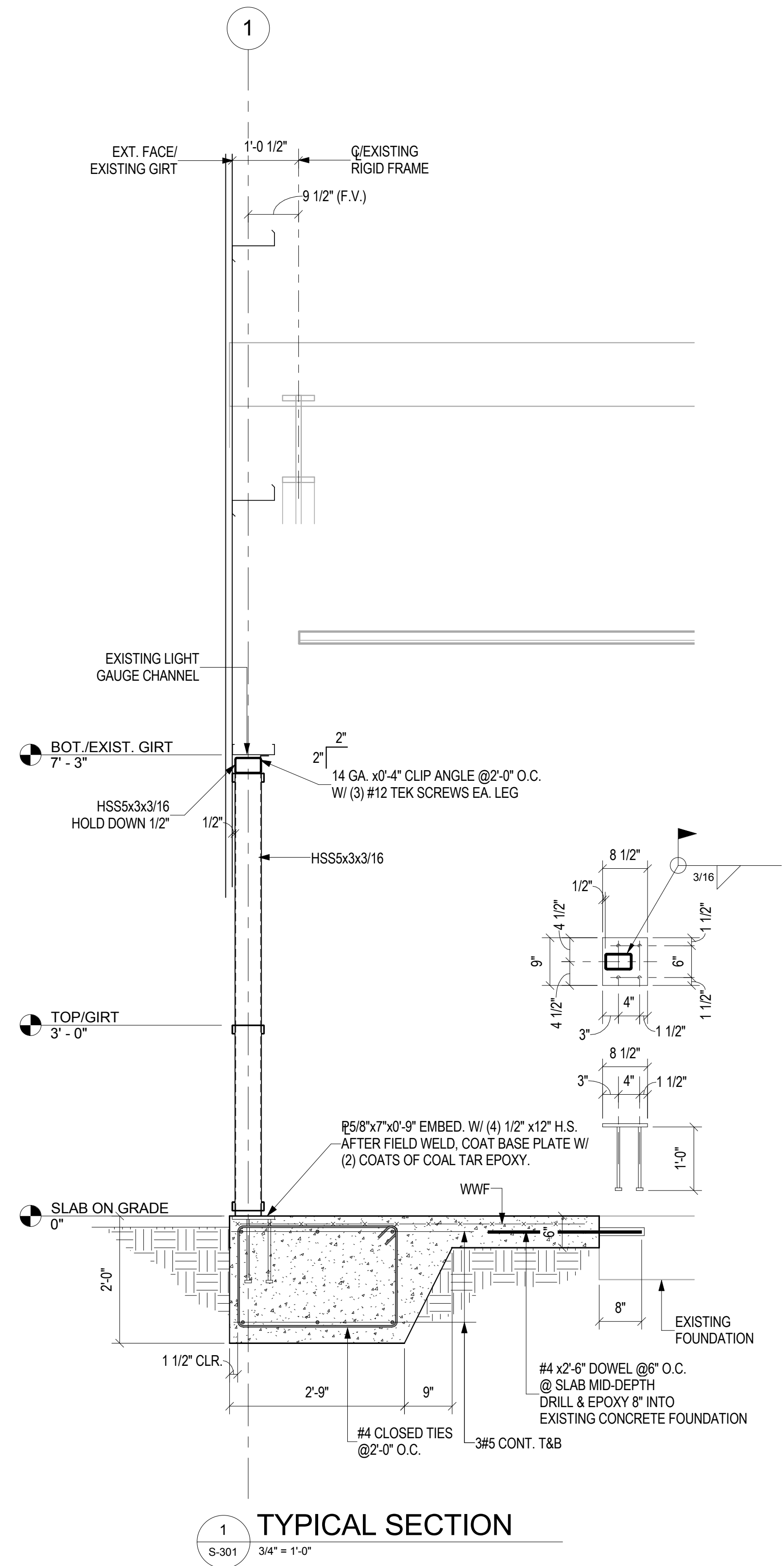
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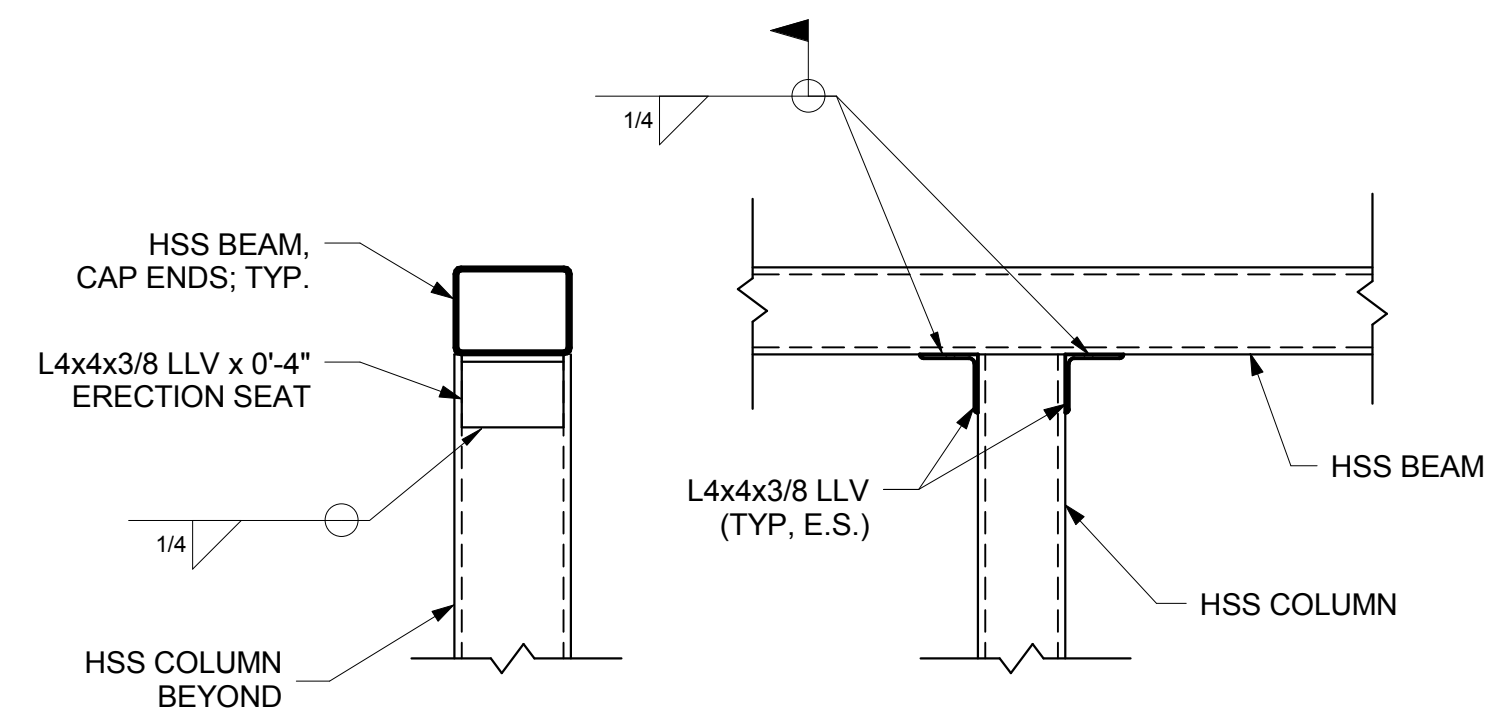
NO.	DESCRIPTION

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
SECTIONS & DETAILS

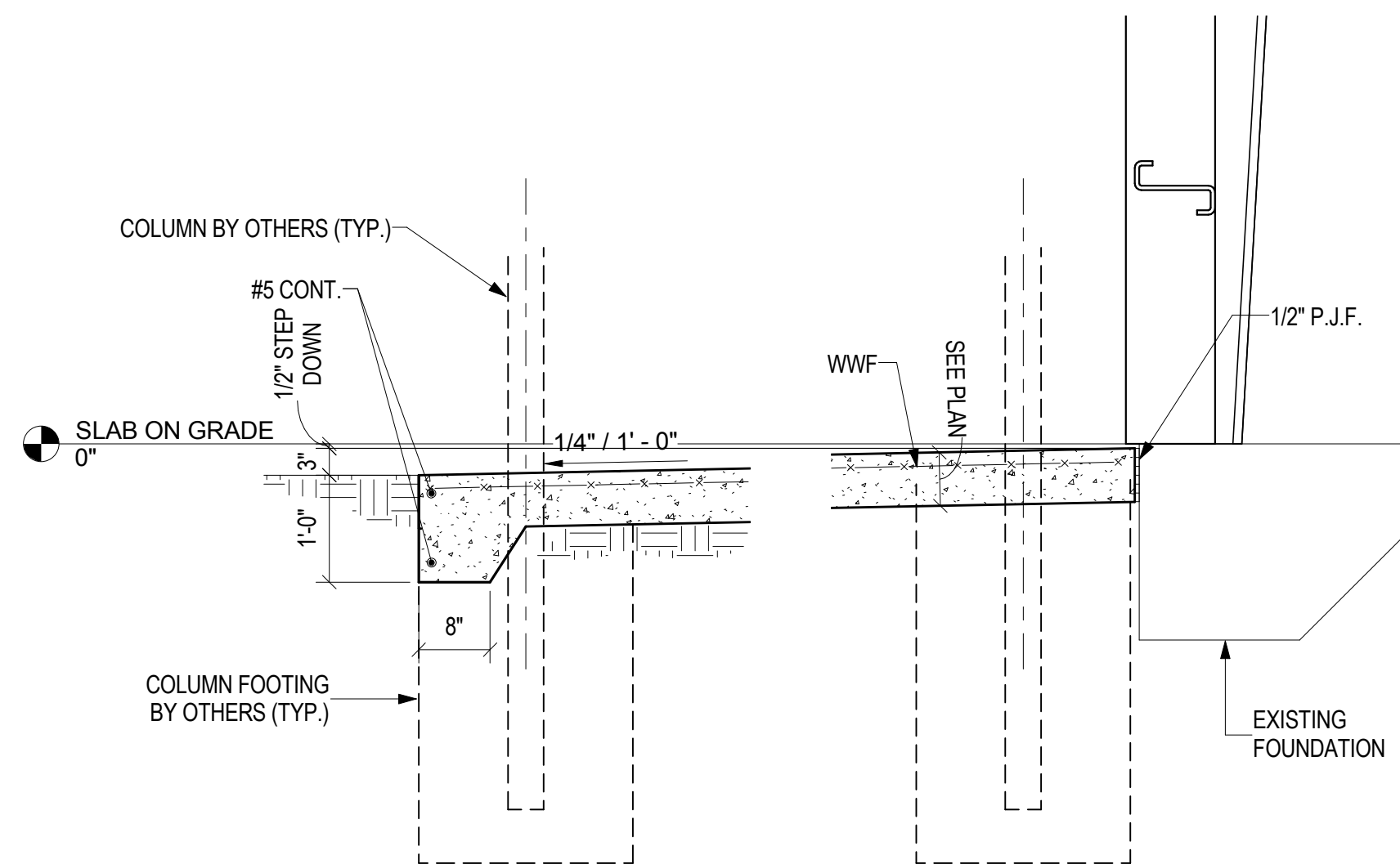
SHEET:
S-301



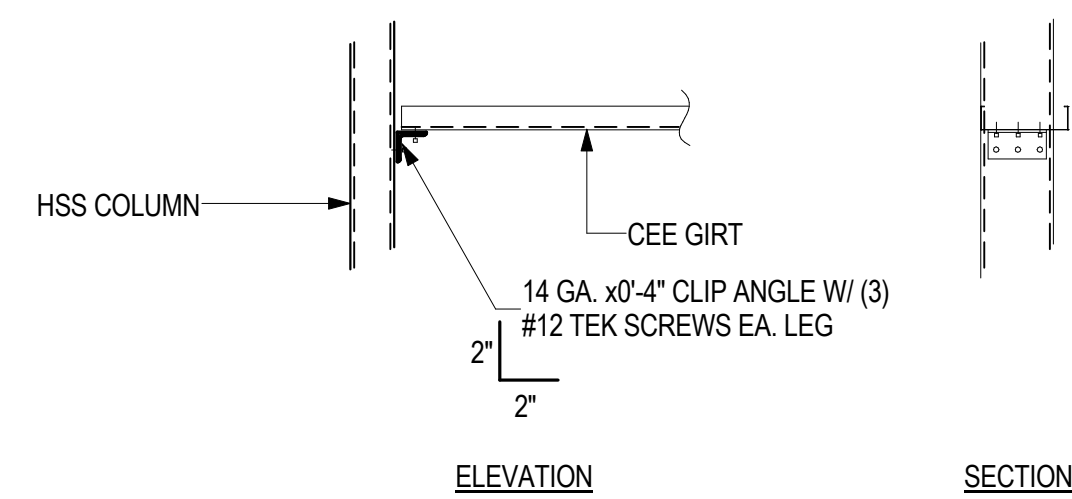


HSS BEAM TO HSS COLUMN, U.N.O.

1 TYPICAL CONNECTION DETAILS
S-302 1" = 1'-0"

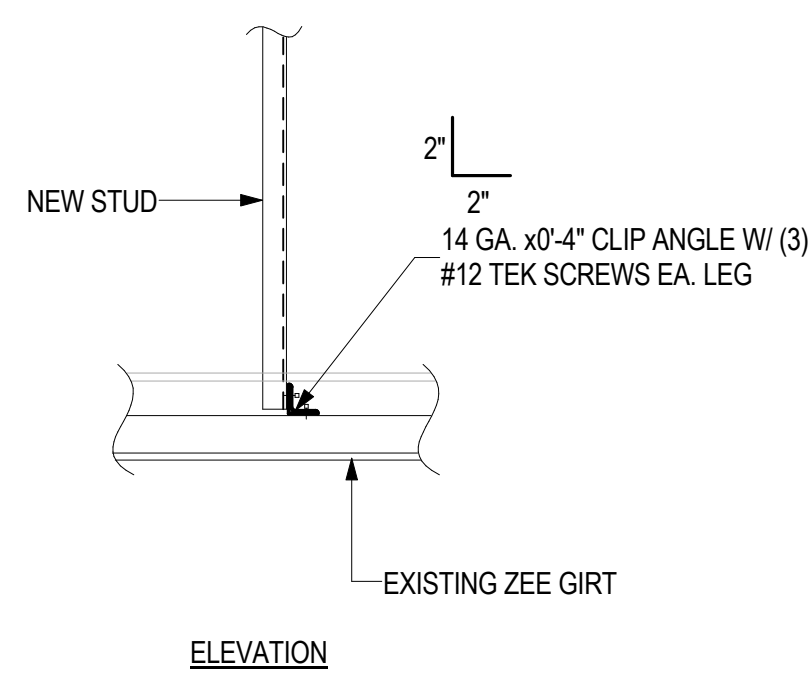


2 SECTION @ CANOPY
S-302 3/4" = 1'-0"

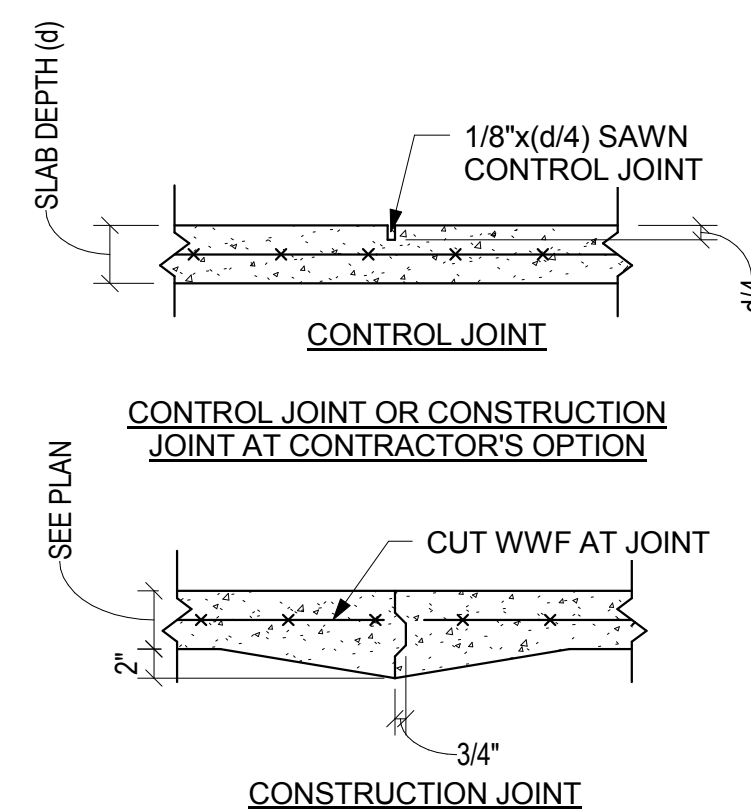


C6 GIRTS TO HSS COLUMN

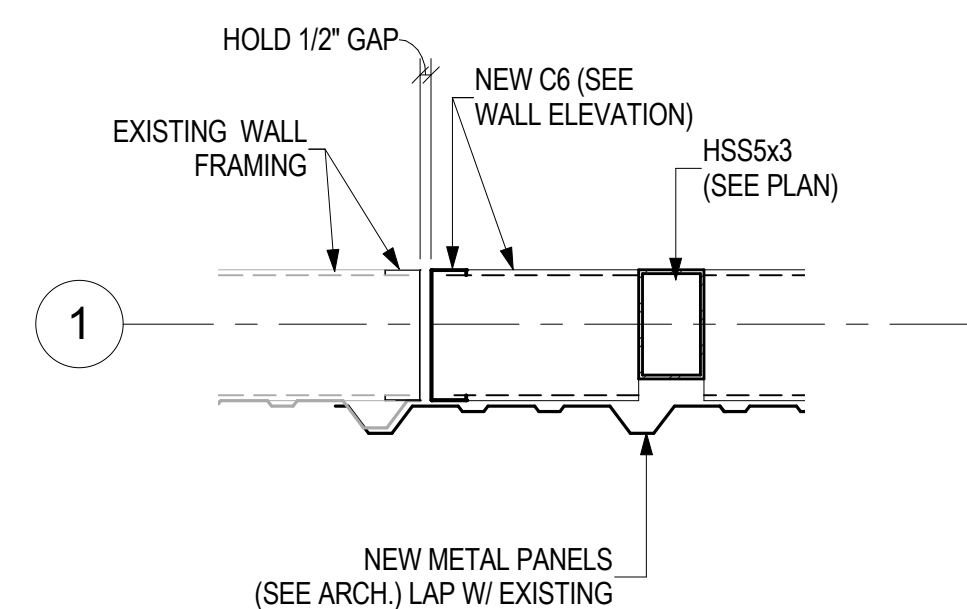
3 TYPICAL CONNECTION DETAILS
S-302 1" = 1'-0"



NEW STUD TO EXISTING GIRTS



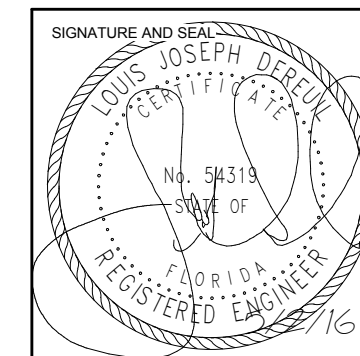
4 S.C.J. DETAILS
S-302 1" = 1'-0"



5 TYPICAL DETAIL @ WALL INFILL JAMB
S-302 1 1/2" = 1'-0"



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PSC WELDING SHOP
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REVISIONS

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
SECTIONS & DETAILS

SHEET:
S-302

REVISIONS:

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
LIFE SAFETY PLAN

SHEET:
A-001

LIFE SAFETY DATA - FLORIDA BUILDING CODE 2014 EDITION AND NFPA 101, LIFE SAFETY CODE - 2009

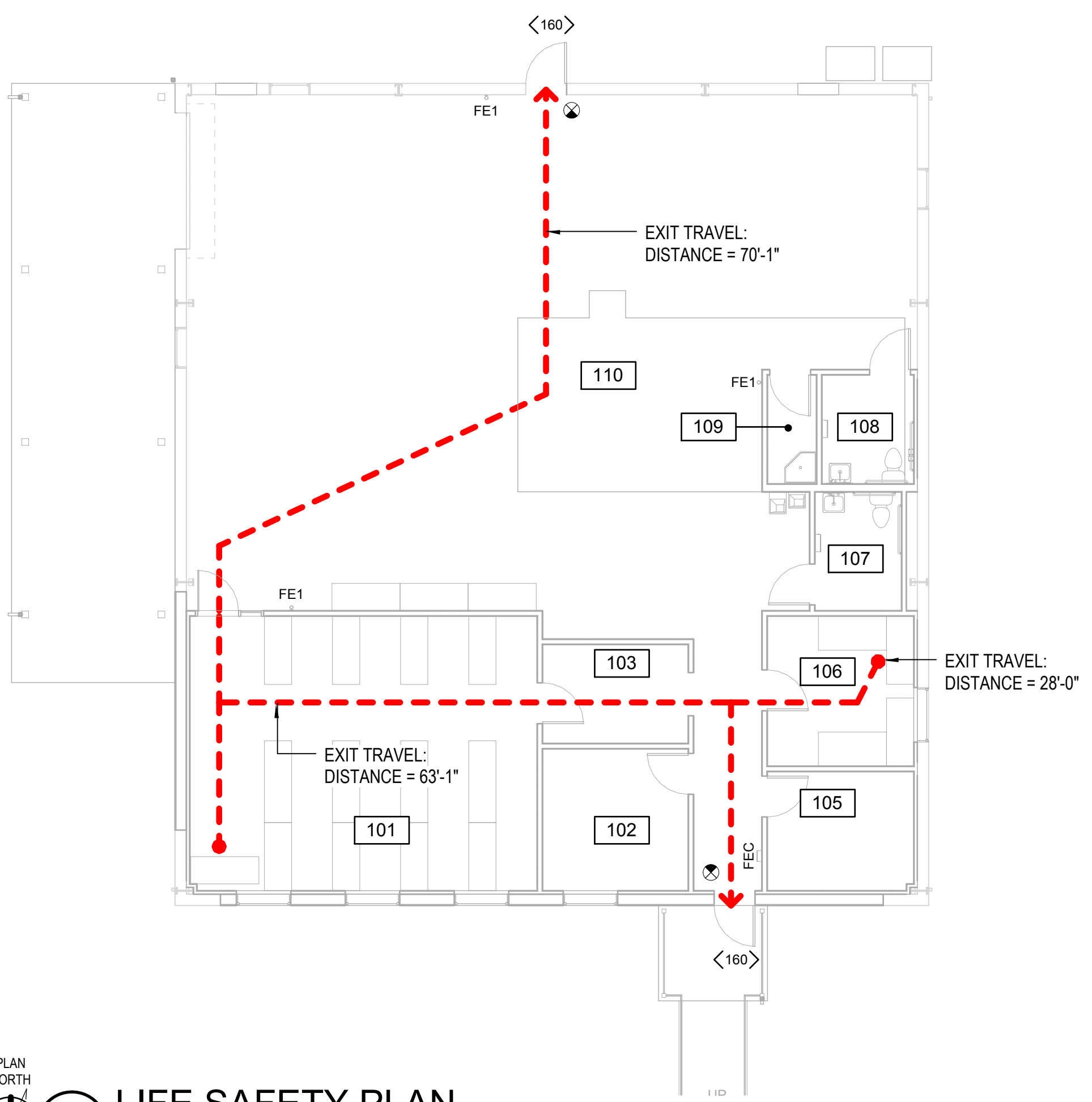
<p>OCCUPANCY CLASSIFICATION:</p> <p>FBC 304.1 BUSINESS OCCUPANCY (B) WELDING (F1)</p> <p>OCCUPANCY LOAD CALCULATIONS:</p> <p>BUSINESS = 100 GSF PER OCCUPANT 3,341 sq. ft. ÷ 100/GSF = 34 OCCUPANTS</p> <p>CONSTRUCTION: FBC TABLE 503 - TYPE II B (NON COMBUSTIBLE MATERIALS)</p> <p>FACILITY IS AN EXISTING METAL BUILDING NON-SPRINKLERED</p> <p>HEIGHT AND AREA ALLOWANCES: FBC TABLE 503</p> <p>ALLOWED: 3 FLOORS, 23,000 GSF, 55 FT. HEIGHT PROPOSED: 1 FLOOR, 3,341 GSF, 19 FT. HEIGHT</p> <p>NO SEPERATION REQUIRED BETWEEN (F1) WELDING SHOP AND (B) USES, PER TABLE 508.4</p> <p>FIRE RATED CONSTRUCTION: FBC TABLE 601</p> <p>STRUCTURAL FRAME = 0 HOUR BEARING WALLS = EXTERIOR = 0 HOUR INTERIOR = 0 HOUR</p> <p>NON-BEARING WALLS = EXTERIOR = 0 HOUR INTERIOR = 0 HOUR</p> <p>FLOOR CONSTRUCTION = 0 HOUR ROOF CONSTRUCTION = 0 HOUR</p>	<p>MEANS OF EGRESS:</p> <p>OCCUPANT LOAD: 34</p> <p>MINIMUM NUMBER OF EXITS:</p> <p>OCCUPANT LOAD = 34 MINIMUM NUMBER OF EXITS = 1 FBC 1021.2 EXITS PROVIDED IN DESIGN = 2</p> <p>MAXIMUM TRAVEL DISTANCE TO EXIT: 200 FEET FBC 1016.2</p> <p>COMMON PATH OF EGRESS TRAVEL = 75 FEET FBC 1014.3</p> <p>REQUIRED EGRESS WIDTHS = FBC TABLE 1005.1 = 0.2" PER OCCUPANT</p> <p>B OCCUPANCY = 34 OCCUPANTS = 7" REQUIRED OR MINIMUM 44" CORRIDOR PER FBC 1018 WITH 32" CLEAR WIDTH AT DOORS.</p> <p>A FIRE RESISTIVE CORRIDOR IS NOT REQUIRED PER FBC 1018.1 EXCEPTION 4.</p>
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WALL/PARTITION TYPES

<p>EXTERIOR WALL TYPES</p> <p>INFILL WALL TYPE "A"</p> <p>TYPE A: EXTERIOR METAL PANEL WITH 6" Z-GIRTS. MATCH EXISTING EXTERIOR PANEL CONSTRUCTION AND COLOR. PROVIDE VINYL FACED BATT INSULATION BETWEEN GIRTS.</p> <p>INFILL WALL TYPE "B"</p> <p>TYPE B: EXTERIOR METAL PANEL WITH 6" Z-GIRTS. MATCH EXISTING EXTERIOR PANEL CONSTRUCTION AND COLOR. 6" 20 GA. METAL STUDS AT 16" O.C. WITH SOUND BATT INSULATION EXTEND TO UNDERSIDE OF STRUCTURE ABOVE.</p> <p>WALL TYPE "C"</p> <p>TYPE C: EXISTING EXTERIOR METAL PANEL WALL. 2 1/2" 20 GA. METAL STUDS AT 16" O.C. WITH SOUND BATT INSULATION EXTEND TO UNDERSIDE OF STRUCTURE ABOVE.</p> <p>INFILL WALL TYPE "D"</p> <p>TYPE D: EXTERIOR METAL PANEL WITH 6" Z-GIRTS. MATCH EXISTING EXTERIOR PANEL CONSTRUCTION AND COLOR. 6" 20 GA. METAL STUDS AT 16" O.C. WITH SOUND BATT INSULATION EXTEND TO UNDERSIDE OF STRUCTURE ABOVE.</p>	<p>EXTERIOR WALL TYPES</p> <p>INFILL WALL TYPE "E"</p> <p>TYPE E: EXISTING EXTERIOR METAL PANEL WALL WITH 9 5/8" SPACE TO ENCLOSE COLUMN. 3 5/8" STUDS WITH 5/8" GYPSUM WALLBOARD AT INTERIOR</p> <p>INTERIOR PARTITION TYPES</p> <p>WALL TYPE "1"</p> <p>3-5/8" 20 GA GALVANIZED METAL STUDS @ 16" O.C. WITH 5/8" GYPSUM WALLBOARD ON BOTH SIDES. BRACE AS REQUIRED TO RESIST SPECIFIED LATERAL DEFLECTIONS. EXTEND TO UNDERSIDE OF STRUCTURE ABOVE</p> <p>PROVIDE SOUND BATTS AT WALL TYPE "1A"</p> <p>WALL TYPE "1" SERIES</p> <p>6" 20 GA GALVANIZED METAL STUDS @ 16" O.C. WITH 5/8" GYPSUM WALLBOARD ON BOTH SIDES. BRACE AS REQUIRED TO RESIST SPECIFIED LATERAL DEFLECTIONS. EXTEND TO UNDERSIDE OF STRUCTURE ABOVE</p>
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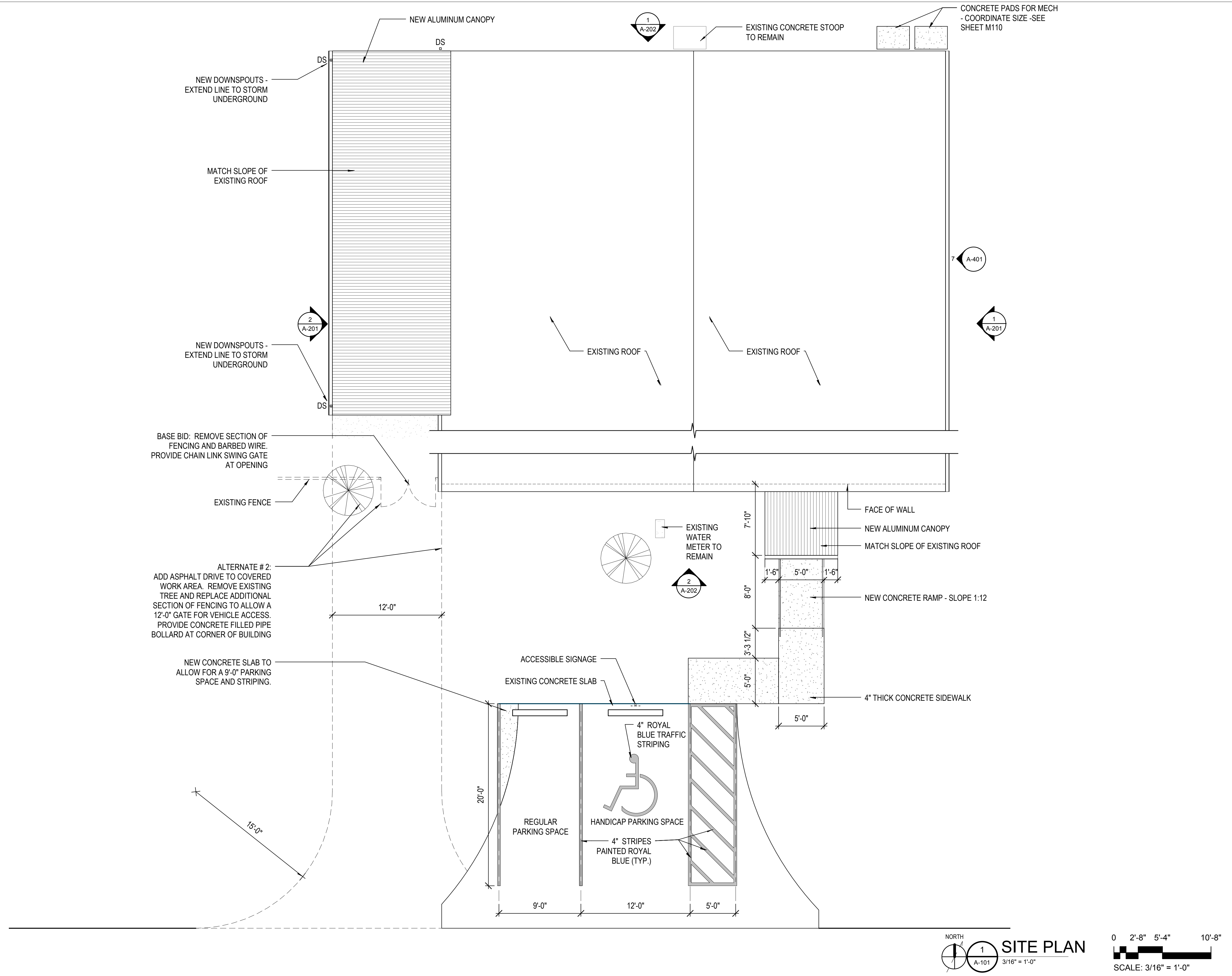
FLORIDA PRODUCT APPROVAL

COMPONENT	MANUFACTURER / AND PART #	FLORIDA PRODUCT APPROVAL #
EXTERIOR HOLLOW METAL DOOR	MANUF: CECO TRIO-E	FL # 4553
EXTERIOR DOUBLE-HUNG WINDOW	MANUF: ECCO 2700 SERIES	FL # 12912
NOTE: THE MANUFACTURER AND PARTS LISTED IN THIS TABLE IS NOT INTENDED TO LIMIT ACCEPTABLE MANUFACTURERS OR SYSTEMS. INSTEAD, THIS TABLE IS INTENDED TO ESTABLISH A BASIS OF DESIGN. IN ORDER TO BE CONSIDERED AS AN ACCEPTABLE EQUIVALENT, THE SYSTEM/COMPONENT MUST BE DESIGNED TO RESIST 140 MPH (MIN.) WIND SPEEDS AND +60 / -60 PSF (MIN.) PRESSURES.		



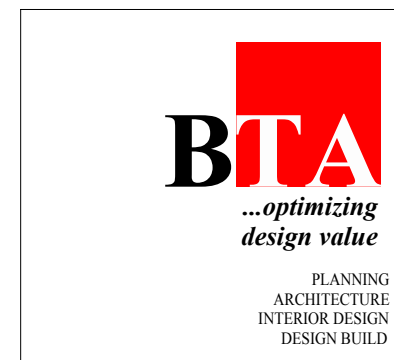
LIFE SAFETY LEGEND

	1 HOUR FIRE RATED WALL (WHERE INDICATED)
	2 HOUR FIRE RATED WALL (WHERE INDICATED)
	EXIT CAPACITY (OCCUPANTS)
	EXIT PATH NUMBER WITH SEGMENT TRAVEL DISTANCE AND DIRECTION OF TRAVEL. SEE EXIT DISTANCE CHART FOR TOTAL EXIT DISTANCES.
	FIRE RATING REQUIREMENT OF BUILDING ELEMENT
	EXIT SIGN (SHADED REGION INDICATES LIGHTED SIDE)
	ROOM NAME / NUMBER DESIGNATION
FE 1 =	PORTABLE FIRE EXTINGUISHER. REGULAR DRY CHEMICAL (SODIUM BICARBONATE BASED) FIRE EXTINGUISHER UL RATED 10-B.C 10LB NORMAL CAPACITY. ENAMELED-STEEL CONTAINER.
FEC =	FIRE EXTINGUISHER CABINET WITH FE 1 PORTABLE FIRE EXTINGUISHER.



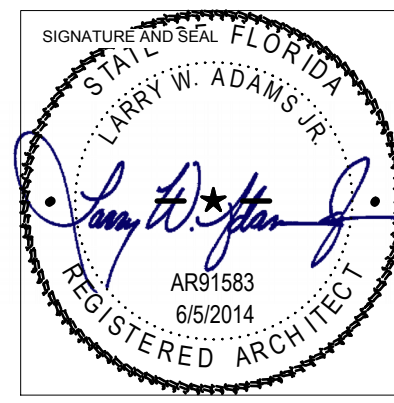
NORTH
 1
 A-101
SITE PLAN
 3/16" = 1'-0"

0 2'-8" 5'-4" 10'-8"
 SCALE: 3/16" = 1'-0"



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May 2, 2016



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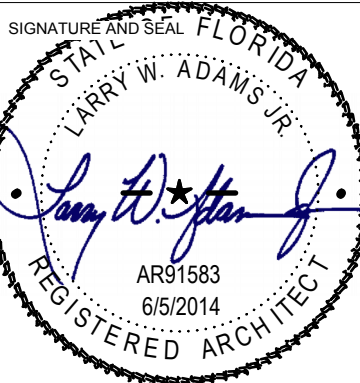
NO.	REVISIONS:

BTA PROJECT NO: 142615.02
 SHEET DATE: 05/02/16

SHEET TITLE:
ARCHITECTURAL SITE PLAN

SHEET:
A-101

May 2, 2016



PSC WELDING SHOP
UNDERWOOD AVE - PENSACOLA, FL 32504

NO.	REVISIONS

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
DEMO PLAN

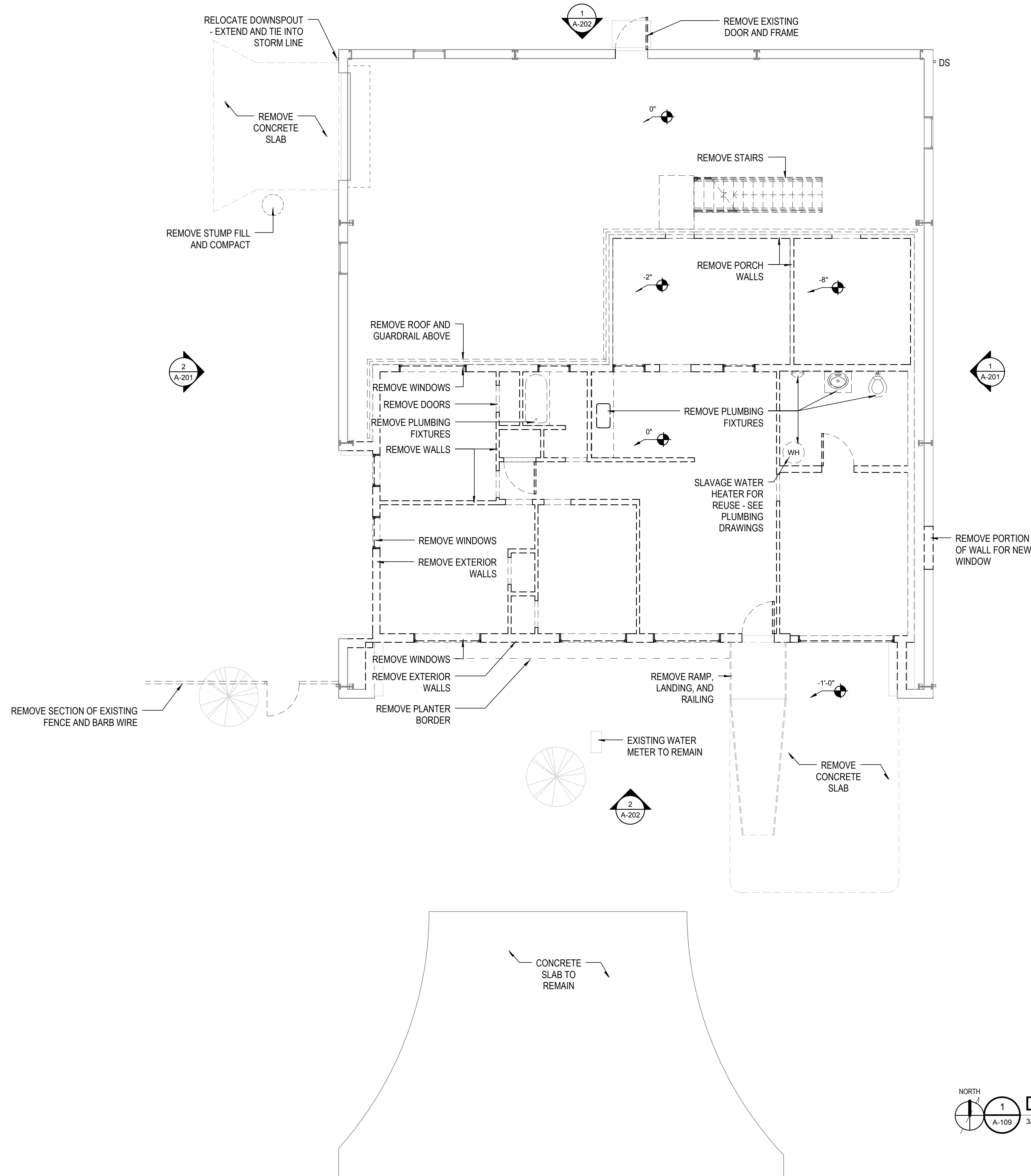
SHEET:
A-109

DEMOLITION NOTES

1. GENERAL DEMOLITION WORK TO THE EXISTING BUILDING FOR THE INSTALLATION OF NEW UTILITIES AND SERVICES SHALL BE INCLUDED IN THE SCOPE OF WORK. SAW-CUTTING AND EXCAVATION; FILLING AND PATCHING OF EXISTING CONCRETE FLOOR SLABS TO REMAIN AFTER INSTALLATION OF NEW UTILITIES AND SERVICES SHALL ALSO BE INCLUDED IN THE SCOPE OF WORK. REFER TO PLUMBING AND ELECTRICAL DRAWINGS FOR NEW UTILITIES AND SERVICES.
2. GENERAL NOTE: REMOVE WALLS, CEILING, ROOF, ETC. OF HOUSE INSIDE METAL BUILDING.
3. REFER TO ELECTRICAL, PLUMBING AND MECHANICAL DRAWINGS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

GRAPHIC LEGEND

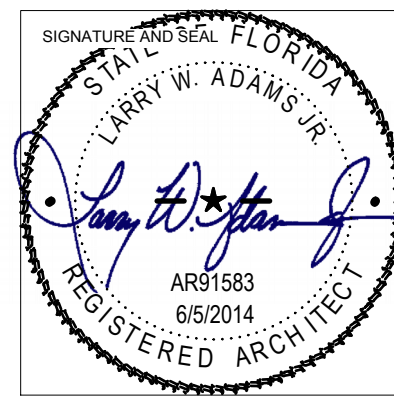
ROOM NAME	ROOM NAME / NUMBER DESIGNATION
101	ROOM NAME / NUMBER DESIGNATION
- - -	REMOVE EXISTING CONSTRUCTION (AS INDICATED WITH DASHED LINES)
— — —	EXISTING CONSTRUCTION TO REMAIN (AS INDICATED WITH LIGHT SOLID LINES)
⤵	EXISTING DOOR TO REMAIN
⤵	REMOVE EXISTING DOOR, FRAME AND HARDWARE



NORTH
1
A-109
DEMOLITION PLAN
3/16" = 1'-0"

0 2'-8" 5'-4" 10'-8"
SCALE: 3/16" = 1'-0"

May 2, 2016



PSC WELDING SHOP

UNDERWOOD AVE. PENSACOLA, FL. 32504

ROOM NO.	ROOM NAME	FLOOR		WALLS								CEILING	
		MAT	MAT	NORTH		EAST		SOUTH		WEST		MAT	COL
				MAT	COL	MAT	COL	MAT	COL	MAT	COL		
101	CLASSROOM	F1	R1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	P1	ACT.	A1
102	OFFICE	F1	R1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	P1	ACT.	A1
103	LOCKERS	F1	R1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	P1	ACT.	A1
104	HALLWAY	F1	R1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	P1	ACT.	A1
105	MECH/ELEC	F1	R1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	P1	N/A	
106	OFFICE	F1	R1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	P1	ACT.	A1
107	WOMEN'S ROOM	F1	R1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	WHITE
108	MEN'S ROOM	F1	R1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	WHITE
109	JAN	F1	R1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	P1	GYP.	WHITE
110	WELDING SHOP	F1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

FLOOR PLAN NOTES

- SEE SHEET A-001 FOR WALL CONSTRUCTION LEGEND.
- PROVIDE GYPSUM WALLBOARD CONTROL JOINTS @ 30'-0" OC MAX.
- PROVIDE BLOCKING IN WALLS FOR TOILET ACCESSORIES, AND OTHER WALL MOUNTED ITEMS.
- REFER TO WALL SECTIONS AND PLAN DETAILS FOR SPECIFIC WALL DIMENSIONS TO COLUMN LINE AND EXISTING CONSTRUCTION.
- PLAN DRAWINGS ARE GENERATED BY A CUT THROUGH THE WALL AT A HEIGHT OF APPROXIMATELY 48". COMPONENTS IN OR ON THE WALL ABOVE OR BELOW THIS PLANE MAY NOT BE IDENTIFIED IN THIS PLAN VIEW. SEE ELEVATION VIEWS FOR IDENTIFICATION OF ALL WALL COMPONENTS AND OPENINGS.

NOTE: ALL FURNISHINGS, WELDING BOOTHS AND EQUIPMENT ARE OWNER FURNISHED AND INSTALLED. ALL REQUIRED UTILITIES ARE INDICATED ON MEP DRAWINGS. LOCKERS AND TOILET ROOM ACCESSORIES WILL BE CONTRACTOR FURNISHED AND INSTALLED.

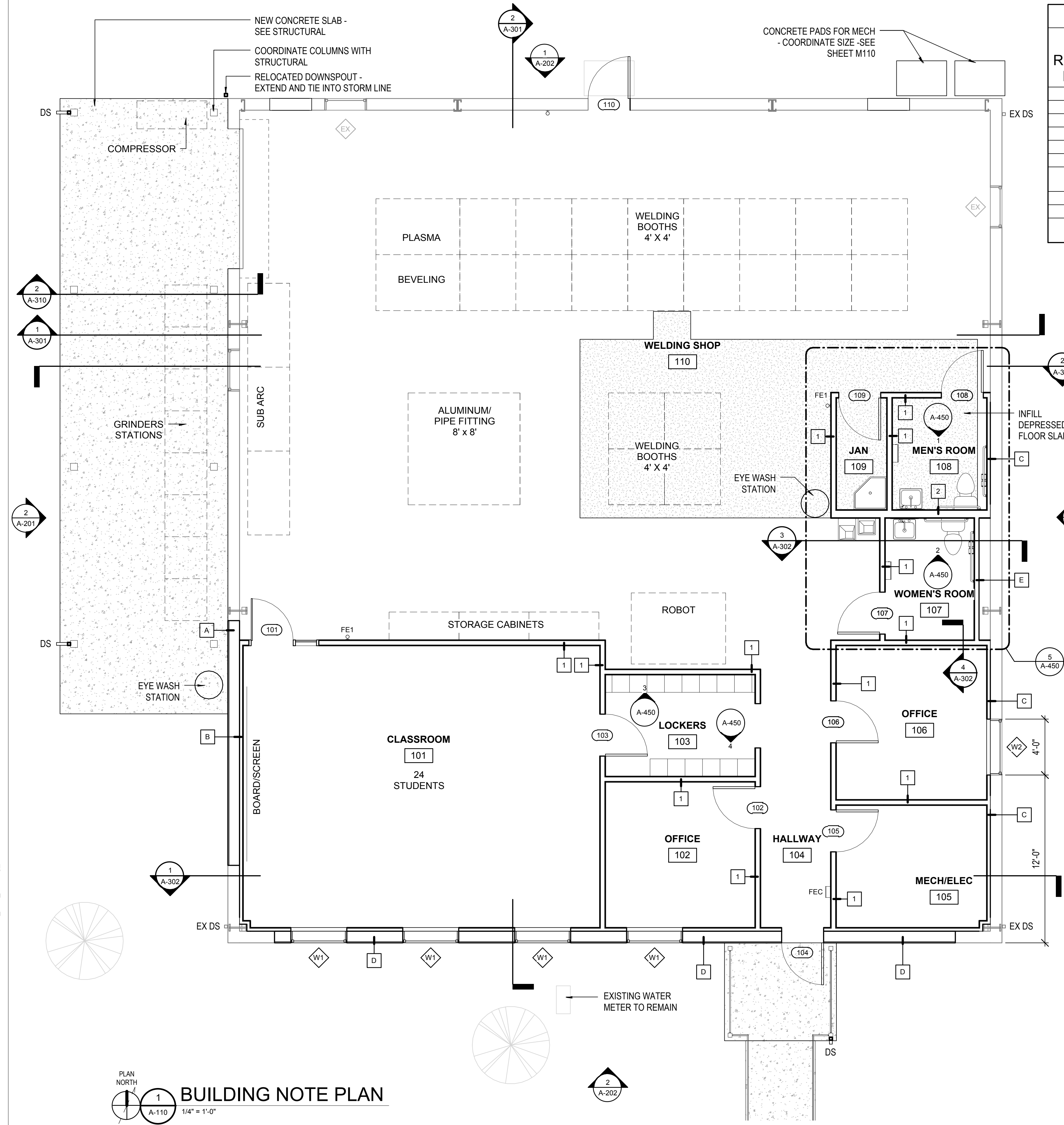
ROOM FINISH SCHEDULE

SW 6225 SLEEPY BLUE NEUTRAL WALLS - P1
 SW 6228 REFUGE DOORS/FRAMES - P2
 PATCRAFT SPHIRE 00410 CARPET - C1
 ROPPE COLONIAL BLUE - B1
 GYPSUM CEILING - GYP.
 ACT 2x2 ARMSTRONG - A1
 SEALED CONCRETE FLOORS - F1
 ROPPE COLONIAL BLUE - B1

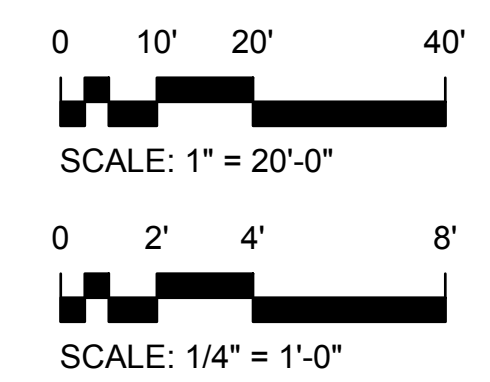
NOTE: ALL AREAS WITH GYPSUM WALLBOARD WALLS TO HAVE 4" RUBBER BASE: ROPPE COLONIAL BLUE

GRAPHIC LEGEND

ROOM NAME	ROOM NAME / NUMBER DESIGNATION
[101]	ROOM NAME / NUMBER DESIGNATION
[=====]	NEW WALL CONSTRUCTION, SEE WALL CONSTRUCTION LEGEND, SHEET A-001
[=====]	EXISTING WALL
[101]	DOOR NUMBER
[=====]	EXISTING DOOR TO REMAIN
[A]	WINDOW TYPE
[#]	WALL TYPE
[FEC]	FIRE EXTINGUISHER CABINET (SEMI-RECESSED) AND FIRE EXTINGUISHER
[FD]	FLOOR DRAIN
[ELEV 11.00]	FINISH FLOOR ELEVATION
[KB]	KNOX BOX, RECESSED
[DS]	NEW PREFINISHED METAL DOWNSPOUT
[EX DS]	EXISTING DOWNSPOUT
[HC]	HANDICAP ACCESSIBLE
[PS]	RECESSED CEILING MOUNTED PROJECTION SCREEN
[WB]	WHITE BOARD (4'X8')



PLAN NORTH
 1
 A-110
 1/4" = 1'-0"
BUILDING NOTE PLAN



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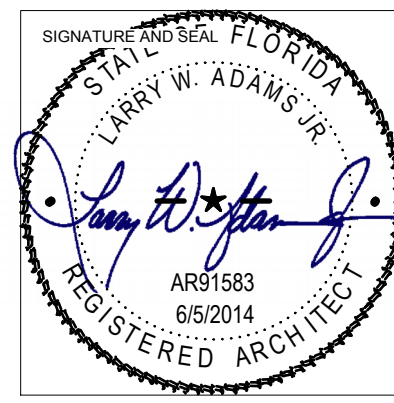
REVISIONS:

BTA PROJECT NO: 142615.02
 SHEET DATE: 05/02/16

SHEET TITLE:
BUILDING NOTE PLAN

SHEET:
A-110

May 2, 2016



PSC WELDING SHOP
UNDERWOOD AVE - PENSACOLA, FL 32504

NO.	REVISIONS

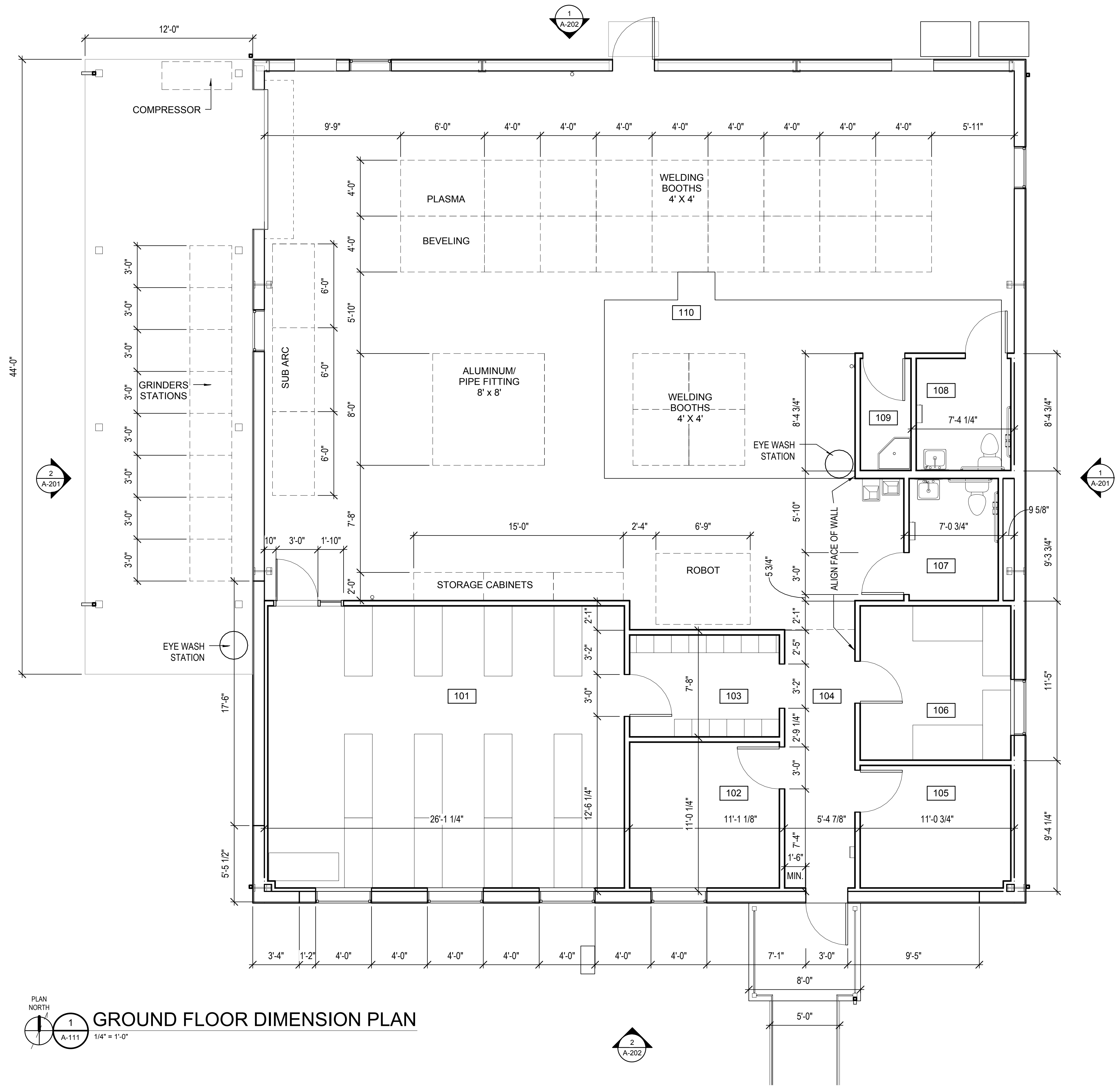
BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
**BUILDING
DIMENSION PLAN**

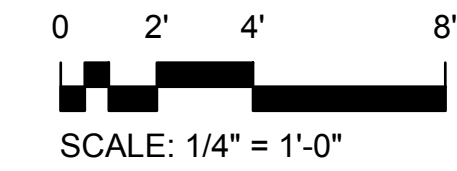
SHEET:
A-111

DIMENSION PLAN NOTES

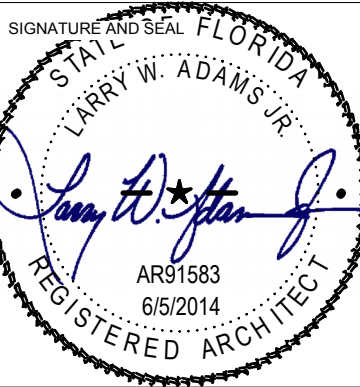
1. REFER TO WALL SECTIONS AND PLAN DETAILS FOR SPECIFIC WALL DIMENSIONS TO COLUMN GRID LINES AND EXISTING CONSTRUCTION.
2. SEE SHEET A-001 WALL CONSTRUCTION LEGEND FOR WALL TYPE DESCRIPTIONS.
3. ALL DIMENSIONS ARE FROM FACE OF CMU, FACE OF STUD, OR WHERE APPLICABLE, COLUMN GRIDLINE.



PLAN NORTH
1
A-111
GROUND FLOOR DIMENSION PLAN
1/4" = 1'-0"



May 2, 2016



PSC WELDING SHOP

UNDERWOOD AVE. PENSACOLA, FL. 32504

NO.	REVISIONS:

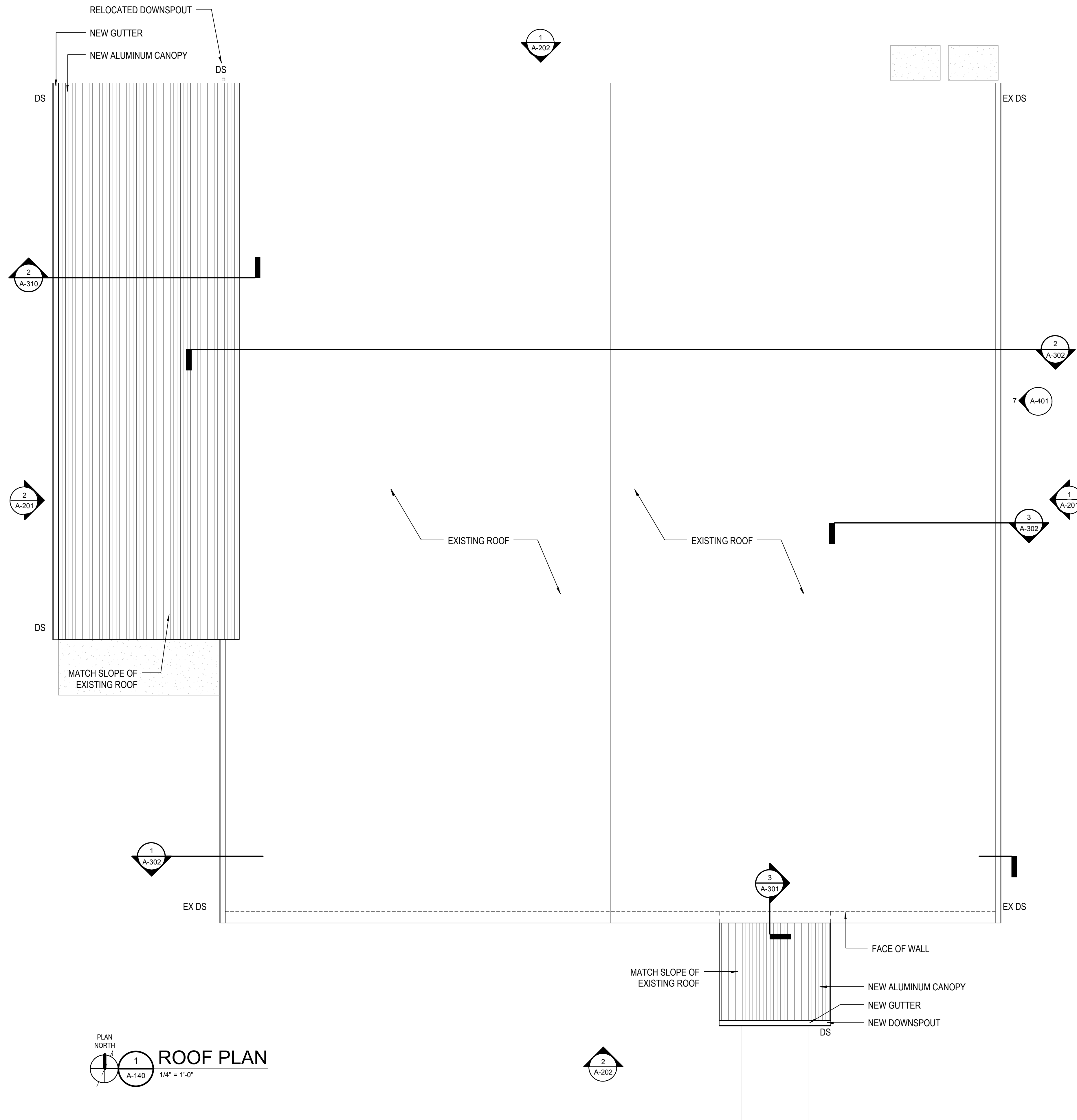
BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
ROOF PLAN

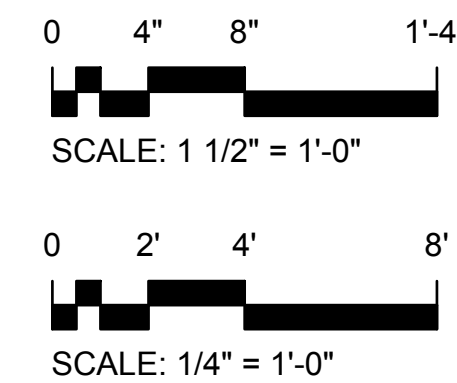
SHEET:
A-140

ROOF NOTES

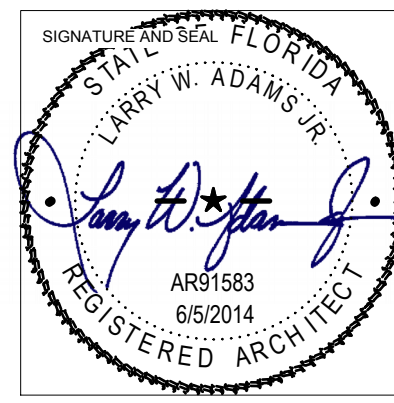
1. DOWNSPOUTS THAT EXTEND TO GRADE CONNECT TO STORMWATER PIPING AND SHALL TRANSITION TO STORMWATER PIPING VIA CAST IRON DOWNSPOUT BOOT SIMILAR OR EQUAL TO BARRYCRAFT "B25C".
2. SLOPE ALL GUTTERS TO DOWNSPOUTS.



PLAN NORTH
ROOF PLAN
1/4" = 1'-0"



May 2, 2016



PSC WELDING SHOP

UNDERWOOD AVE. PENSACOLA, FL. 32504

NO.	REVISIONS

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
CEILING PLAN

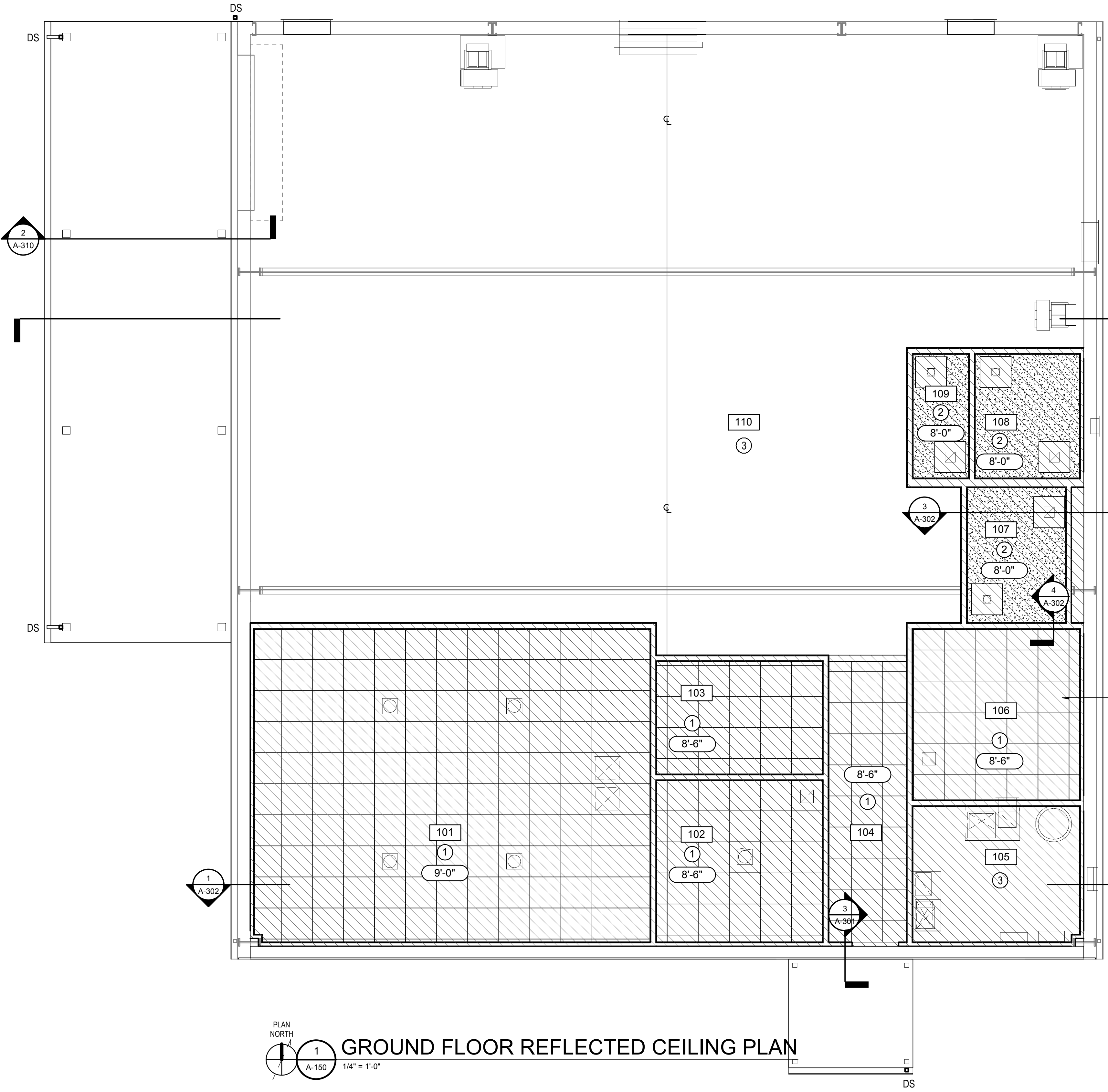
SHEET:
A-150

REFLECTED CEILING NOTES

1. ALL CEILING HEIGHTS ARE 9'-0" UNLESS NOTED OTHERWISE.
2. ALL HEADERS ARE TO BE 8" BELOW LOWEST ADJACENT CEILING UNLESS NOTED OTHERWISE.
3. PROVIDE MOISTURE RESISTANT GYPSUM WALL BOARD IN TOILET ROOMS.
4. PROVIDE ACCESS PANELS IN GYPSUM BOARD CEILING AT LOCATIONS REQUIRING MAINTENANCE ACCESS TO PLUMBING, MECHANICAL, AND ELECTRICAL COMPONENTS.
5. PROVIDE 2X4 ACOUSTICAL CEILING TILES IN ROOMS WHERE LAYOUT DOES NOT PERMIT AT LEAST A HALF 2X2 TILE.
6. ALL ELECTRICAL FIXTURES AND MECHANICAL VENTS SHALL BE CENTERED WITHIN CEILING TILES UNLESS NOTED OTHERWISE.

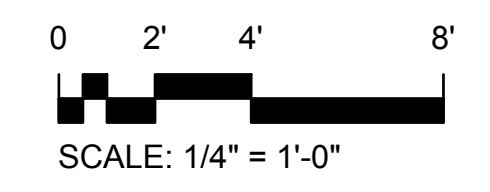
GRAPHIC LEGEND

- 1 2' X 2' SUSPENDED ACOUSTICAL TILE LAY-IN CEILING WITH GRID
- 2 SUSPENDED GYPSUM BOARD CEILING (PAINTED)
- 3 OPEN TO STRUCTURE ABOVE EXISTING CONDITIONS PAINT NOT REQUIRED
- 2 X 4 FLUORESCENT LIGHTING FIXTURE, SEE ELECTRICAL DRAWINGS
- FLUORESCENT LIGHTING FIXTURE, SEE ELECTRICAL DRAWINGS
- FLUORESCENT CEILING FIXTURE, SEE ELECTRICAL DRAWINGS
- LIGHTING FIXTURE (WALL MOUNTED), SEE ELECTRICAL DRAWINGS
- RECESSED LIGHTING FIXTURE, SEE ELECTRICAL DRAWINGS
- H.I.D. LIGHTING FIXTURE (RECESSED SOFFIT), SEE ELECTRICAL DRAWINGS
- EXTERIOR LIGHTING FIXTURE (WALL MOUNTED), SEE ELECTRICAL DRAWINGS
- CEILING DIFFUSER, SEE MECHANICAL DRAWINGS
- RETURN AIR GRILLE, SEE MECHANICAL DRAWINGS
- CEILING EXHAUST, SEE MECHANICAL DRAWINGS
- EXIT LIGHT, SEE ELECTRICAL AND LIFE SAFETY DRAWINGS FOR DIRECTIONAL INFORMATION
- VIDEO PROJECTOR MOUNT
- CEILING MOUNTED PROJECTION SCREEN (RECESSED)
- CEILING MOUNTED ACCESS PANEL, COORDINATE SIZE AND LOCATION W/ MECHANICAL DRAWINGS
- FIRE ALARM / MASS NOTIFICATION SYSTEM FLUSH MOUNTED CEILING SPEAKER, SEE ELECTRICAL DRAWINGS
- FIRE ALARM / MASS NOTIFICATION SYSTEM FLUSH MOUNTED CEILING SPEAKER WITH STROBE, SEE ELECTRICAL DRAWINGS
- INTRUSION ALARM SYSTEM PASSIVE INFRARED DETECTOR, SEE ELECTRICAL DRAWINGS
- LIGHTING CONTROL CEILING MOUNTED SENSOR, SEE ELECTRICAL DRAWINGS
- 9'-0" CEILING HEIGHT
- 101 ROOM NUMBER DESIGNATION

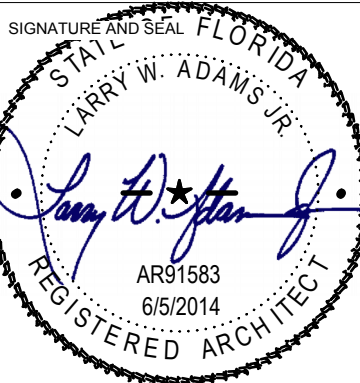


NOTE: HATCHED AREA TO RECEIVE ENCLOSURE ABOVE CEILING IN WHICH TO RUN DUCTWORK FOR CONDITIONED SPACES - SEE DETAILS A/302

PLAN NORTH
GROUND FLOOR REFLECTED CEILING PLAN
1/4" = 1'-0"



May 2, 2016



PSC WELDING SHOP
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REVISIONS:

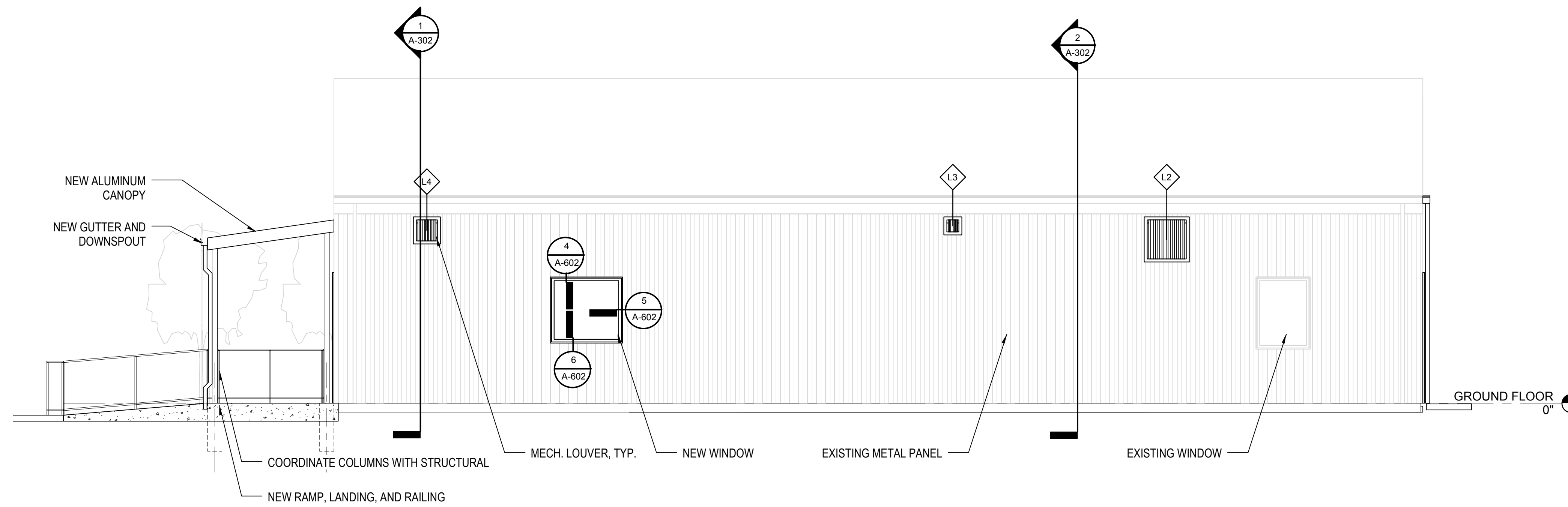
BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
**EXTERIOR
ELEVATIONS**

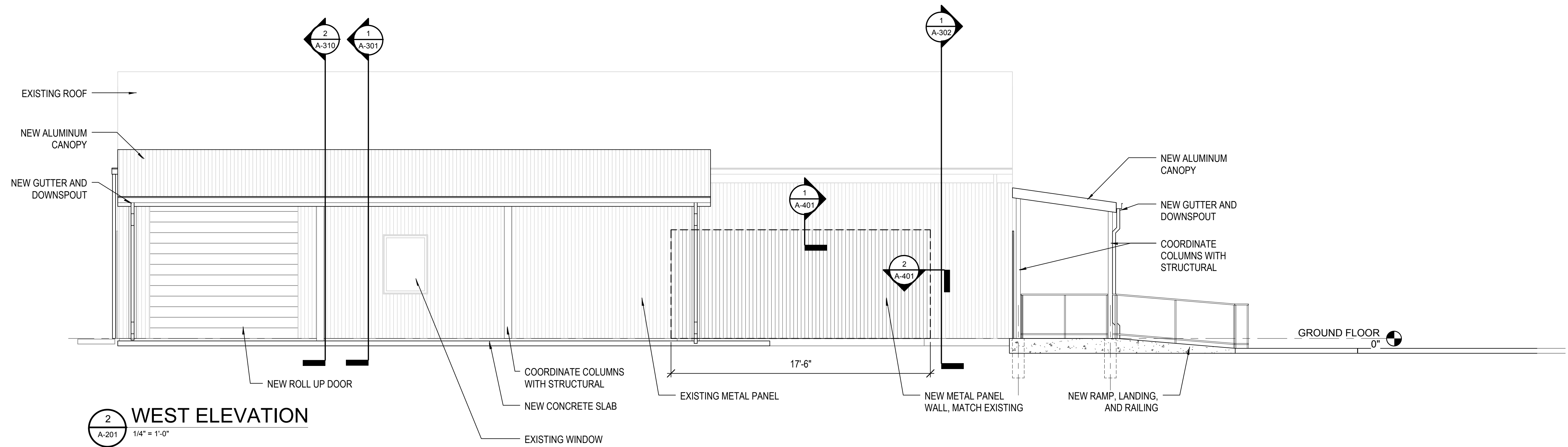
SHEET:
A-201

ELEVATION NOTES

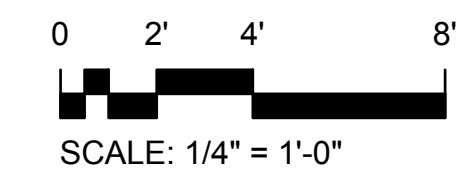
1. FOR EXTERIOR COLOR SCHEDULE, SEE BELOW THIS SHEET.
2. SEE ROOF PLAN A-140 FOR ALL ROOF SLOPE INFORMATION.
3. IN ADDITION TO NOTED LOCATIONS, ALL INSIDE CORNERS AT CMU VENEER SHALL HAVE CONTROL JOINTS WITH BACKER ROD AND SEALANT (COLOR TO MATCH SPLITFACE VENEER)
4. DOWNSPOUTS THAT EXTEND TO GROUND SHALL CONNECT TO UNDERGROUND STORMWATER PIPING.

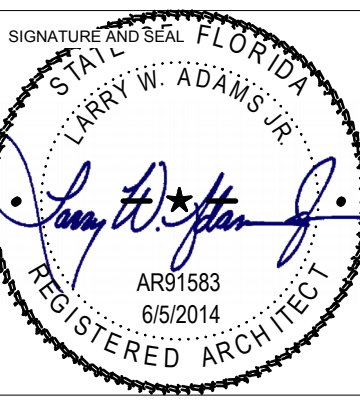


1 EAST ELEVATION
A-201 1/4" = 1'-0"



2 WEST ELEVATION
A-201 1/4" = 1'-0"





REVISIONS:

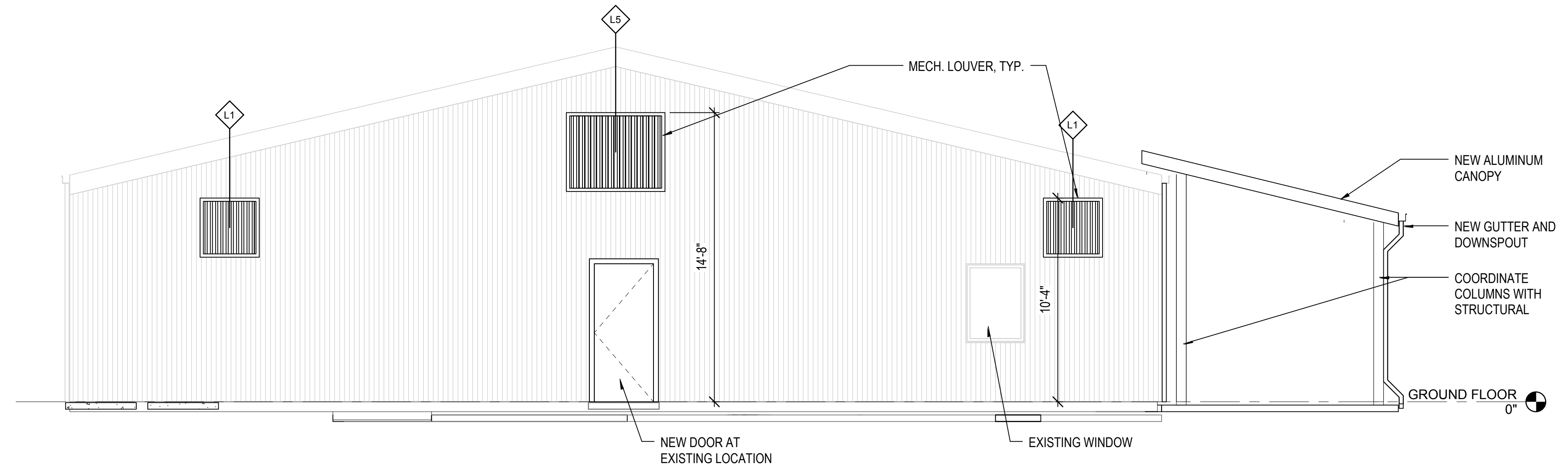
BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
**EXTERIOR
ELEVATIONS**

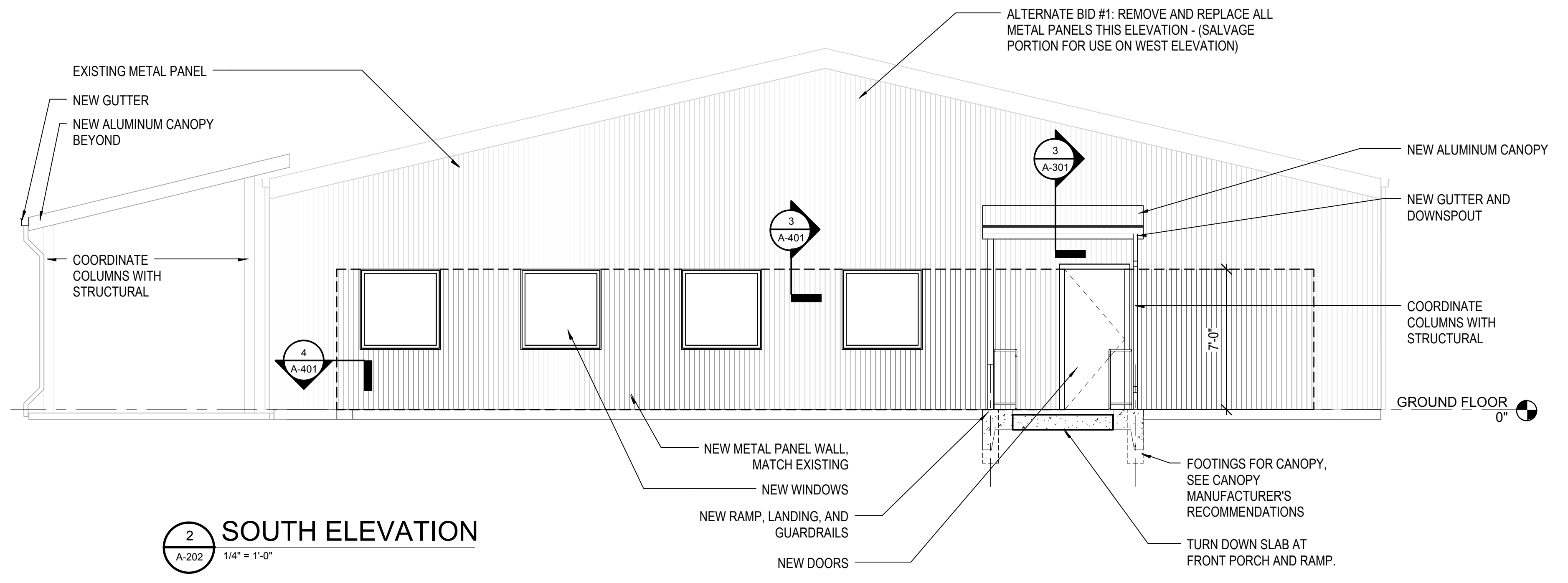
SHEET:
A-202

ELEVATION NOTES

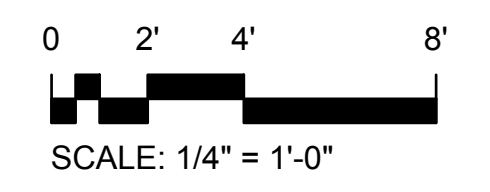
1. FOR EXTERIOR COLOR SCHEDULE, SEE BELOW THIS SHEET.
2. SEE ROOF PLAN A-140 FOR ALL ROOF SLOPE INFORMATION.
3. IN ADDITION TO NOTED LOCATIONS, ALL INSIDE CORNERS AT CMU VENEER SHALL HAVE CONTROL JOINTS WITH BACKER ROD AND SEALANT (COLOR TO MATCH SPLITFACE VENEER)
4. DOWNSPOUTS THAT EXTEND TO GROUND SHALL CONNECT TO UNDERGROUND STORMWATER PIPING.



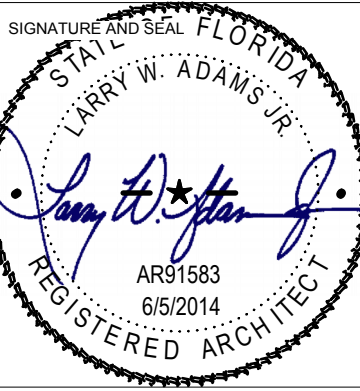
1 NORTH ELEVATION
A-202 1/4" = 1'-0"



2 SOUTH ELEVATION
A-202 1/4" = 1'-0"



May 2, 2016



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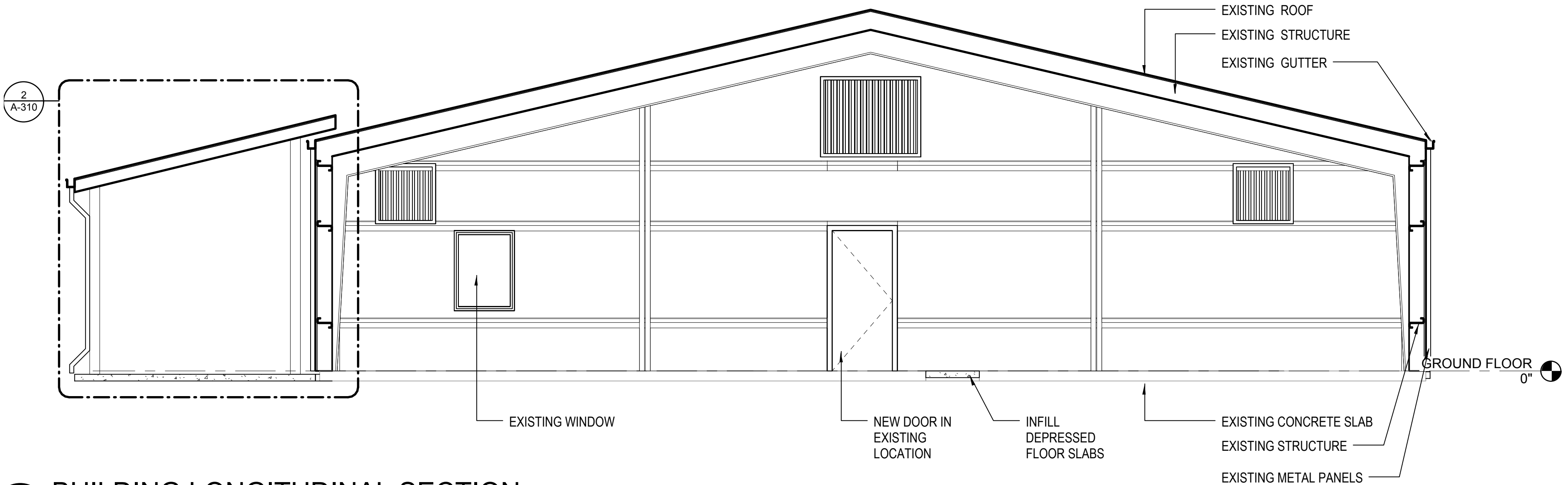
REVISIONS:

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

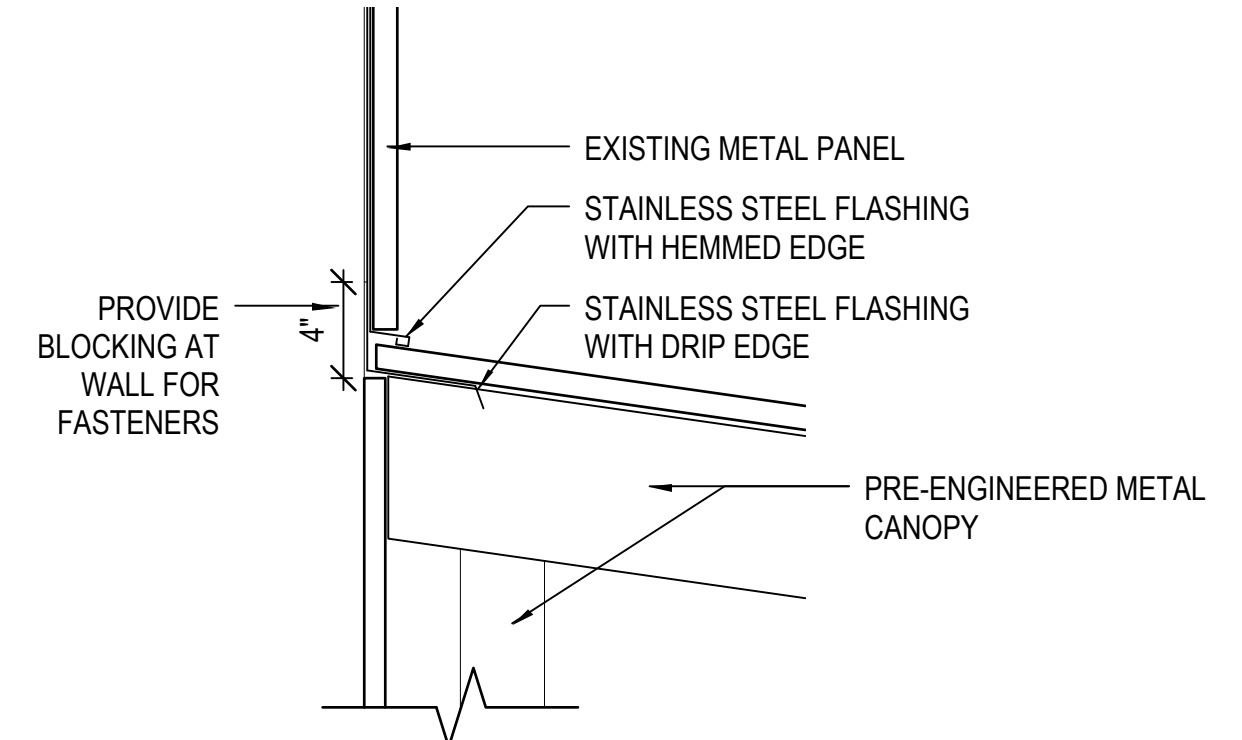
SHEET TITLE:
BUILDING SECTIONS

SHEET:
A-301

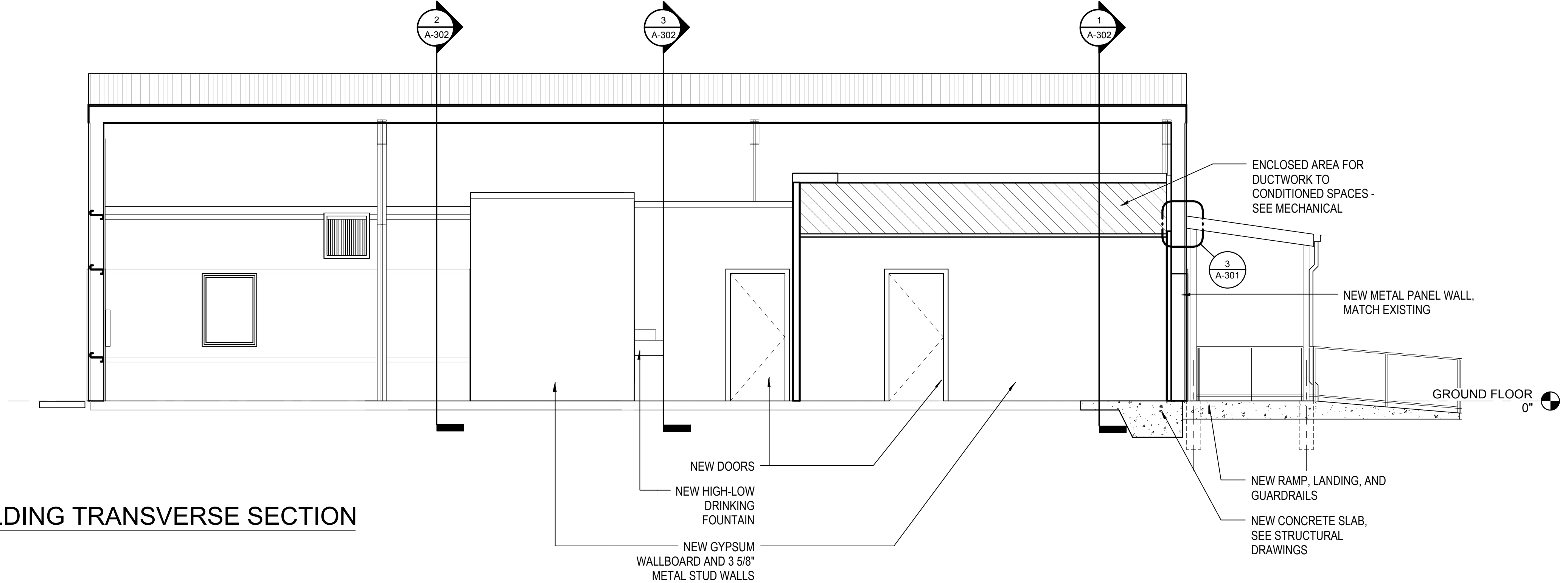
BUILDING SECTION NOTES
1. SEE ROOF PLAN A-140 FOR ALL ROOF SLOPE INFORMATION.
2. IN ADDITION TO NOTED LOCATIONS, ALL INSIDE CORNERS AT CMU VENEER SHALL HAVE CONTROL JOINTS WITH BACKER ROD AND SEALANT (COLOR TO MATCH SPLITFACE VENEER)



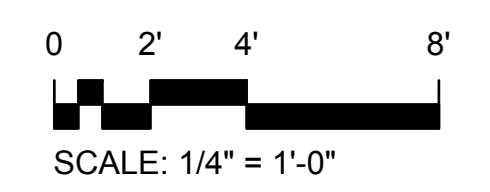
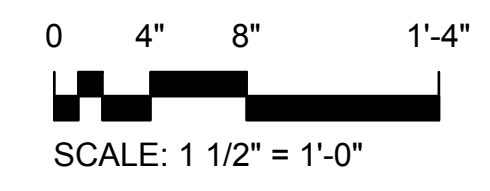
1 BUILDING LONGITUDINAL SECTION
A-301 1/4" = 1'-0"



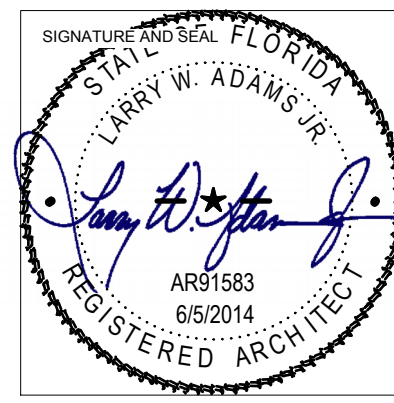
3 ENTRY CANOPY SECTION DETAIL
A-301 1 1/2" = 1'-0"



2 BUILDING TRANSVERSE SECTION
A-301 1/4" = 1'-0"



May 2, 2016



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REVISIONS:

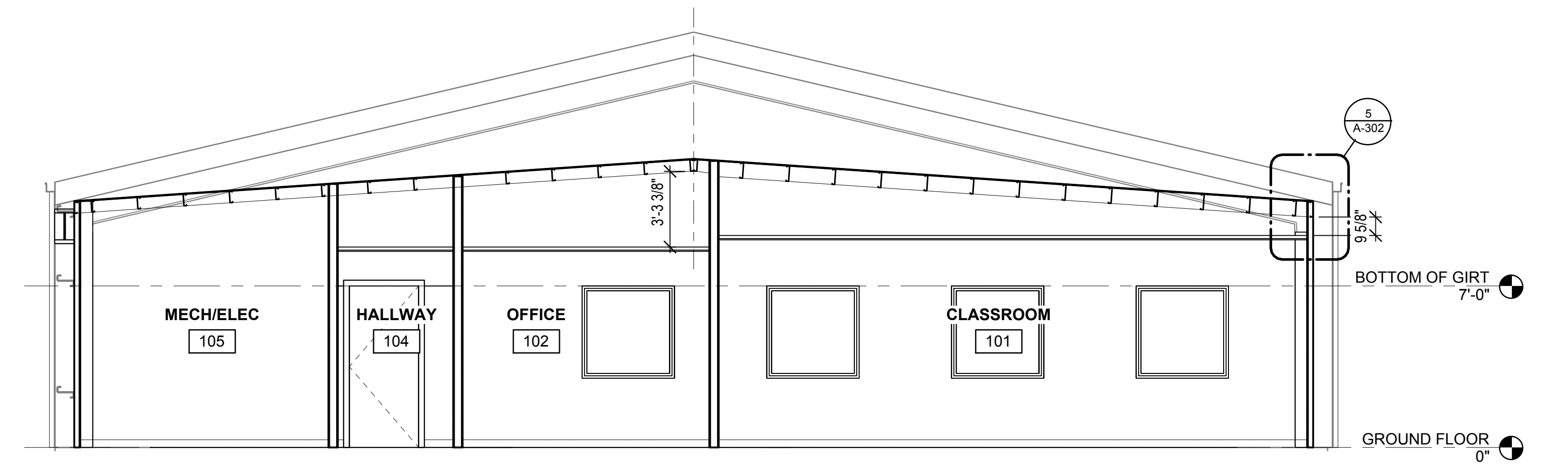
BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
BUILDING SECTIONS

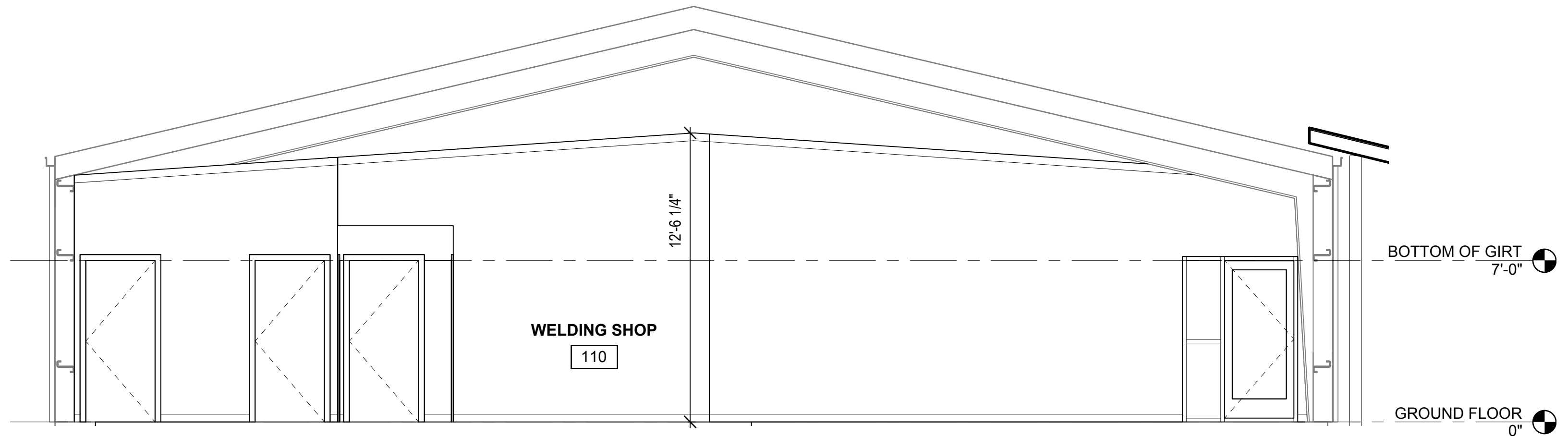
SHEET:
A-302

BUILDING SECTION NOTES

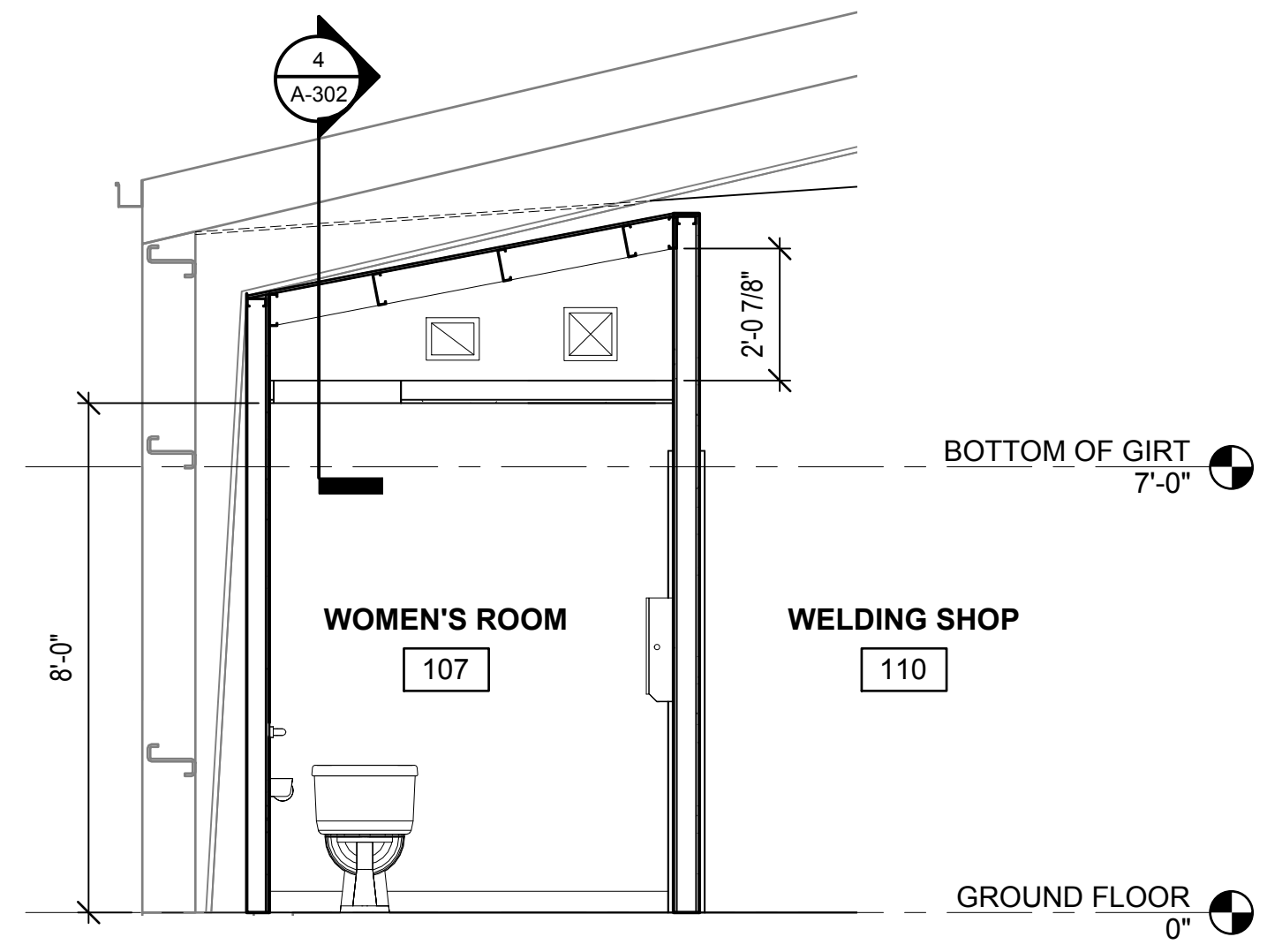
- SEE ROOF PLAN A-140 FOR ALL ROOF SLOPE INFORMATION.
- IN ADDITION TO NOTED LOCATIONS, ALL INSIDE CORNERS AT CMU VENEER SHALL HAVE CONTROL JOINTS WITH BACKER ROD AND SEALANT (COLOR TO MATCH SPLITFACE VENEER)



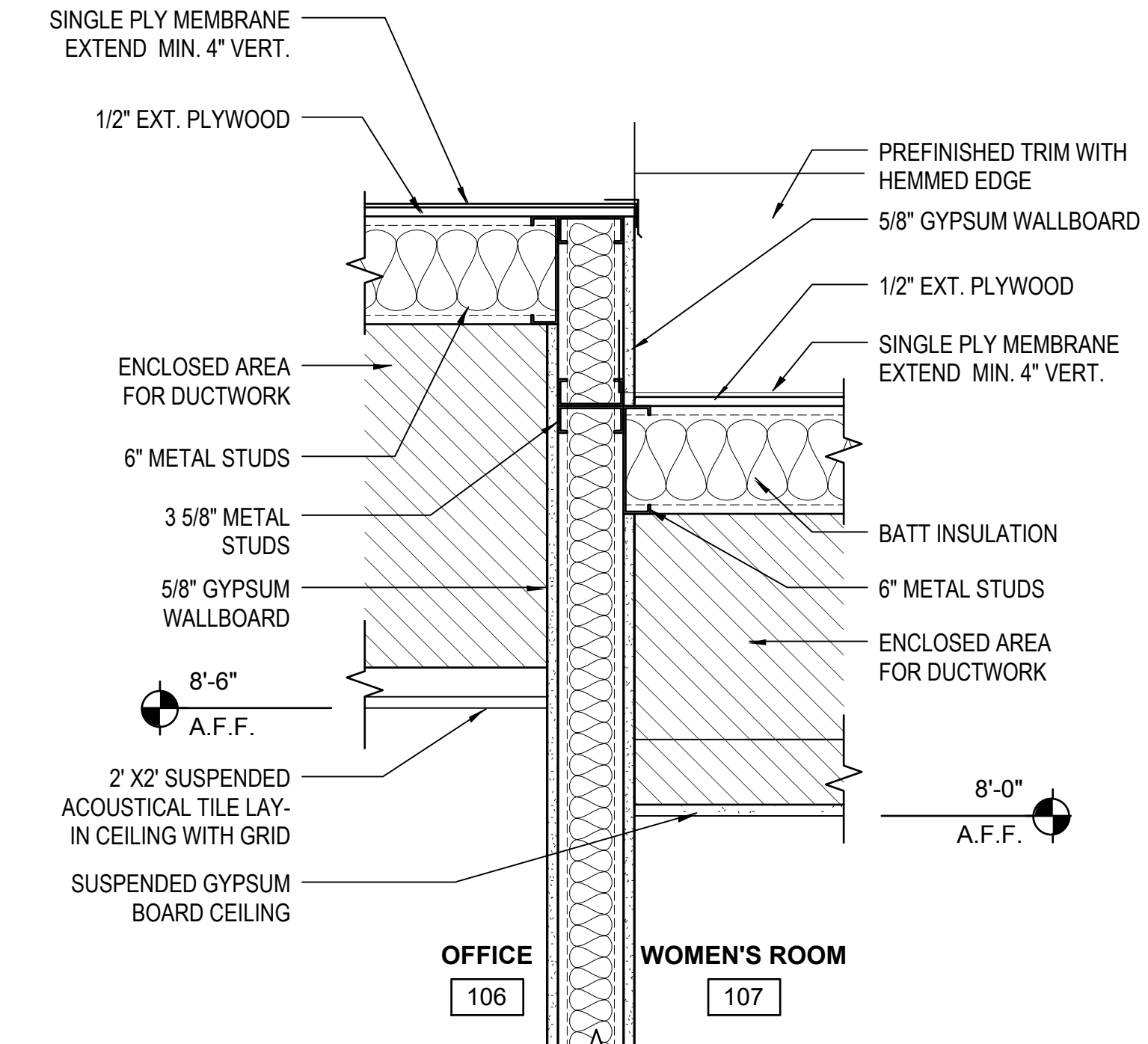
1 BUILDING LONGITUDINAL SECTION THRU OFFICES
A-302 1/4" = 1'-0"



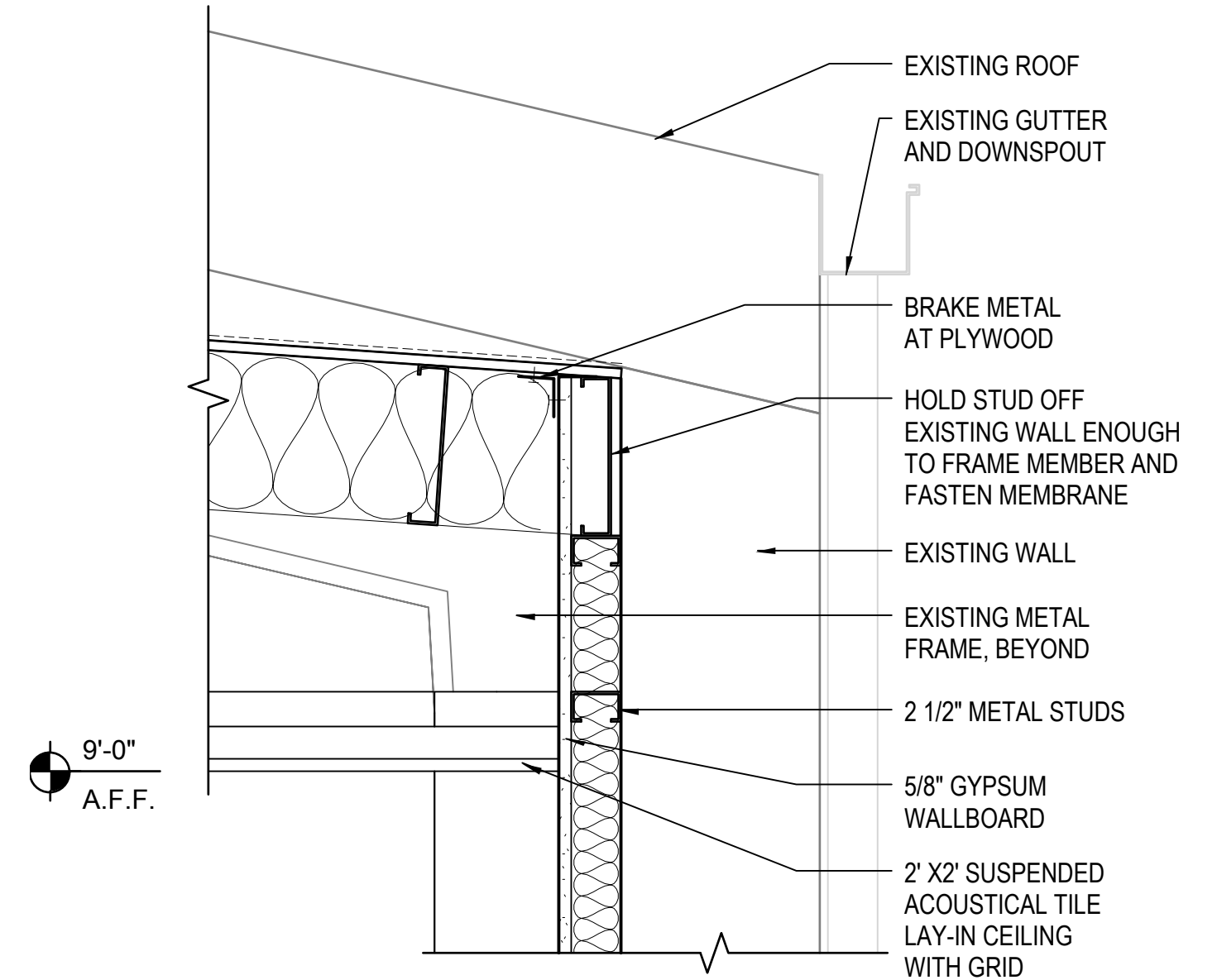
2 SOUTHERN INTERIOR ELEVATION
A-302 1/4" = 1'-0"



3 SECTION AT RESTROOMS
A-302 3/8" = 1'-0"

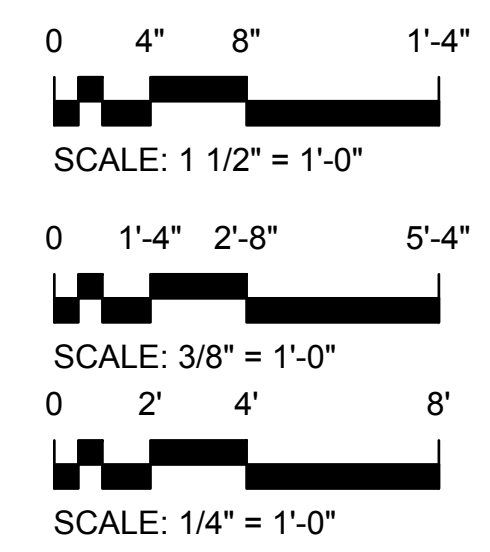


4 SECTION
A-302 1 1/2" = 1'-0"

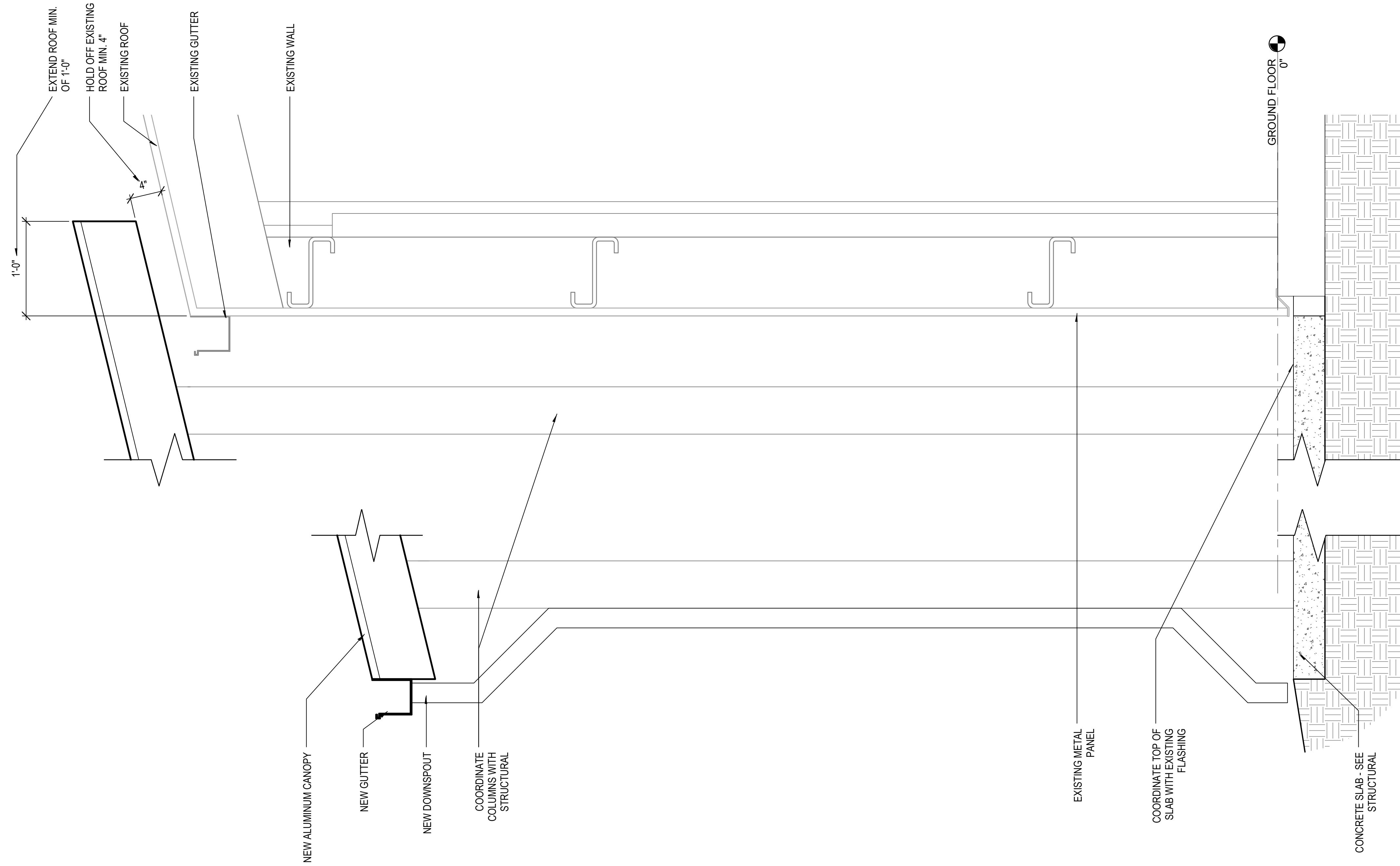


DETAIL AT EXISTING WALL/FURR OUT

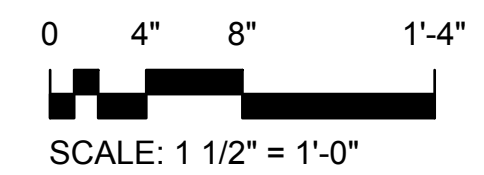
5
A-302 1 1/2" = 1'-0"



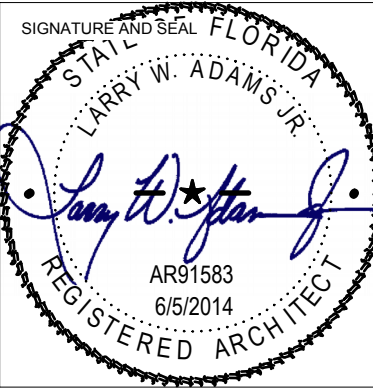
D:\Users\fortune\Documents\142615.02_PSC_Welding_Shop_NWICKERSHAM.rvt
5/3/2016 4:43:07 PM



2 WALL SECTION 2
A-310 1 1/2" = 1'-0"



May 2, 2016



PSC WELDING SHOP

UNDERWOOD AVE. PENSACOLA, FL. 32504

NO.	REVISIONS

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
WALL SECTIONS

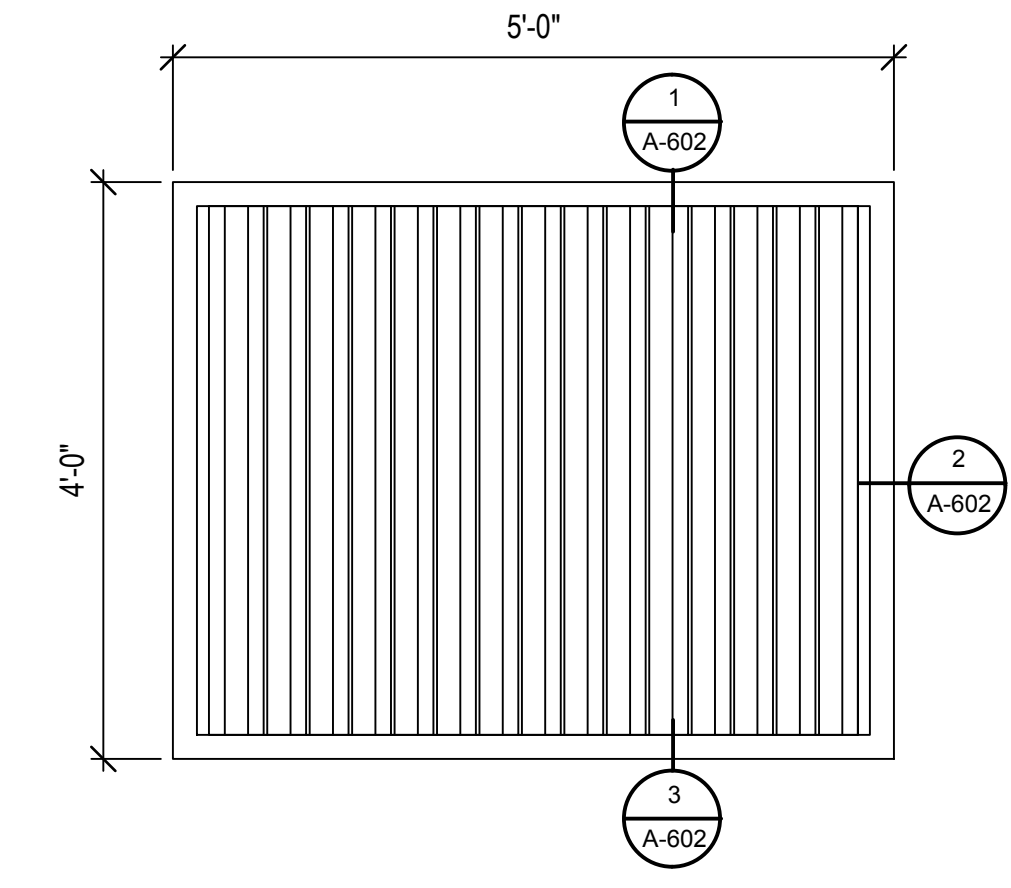
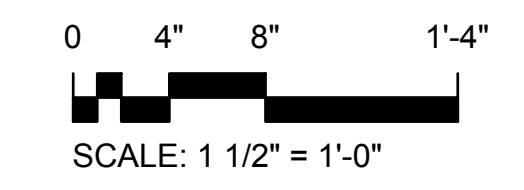
SHEET:
A-310

REVISIONS:

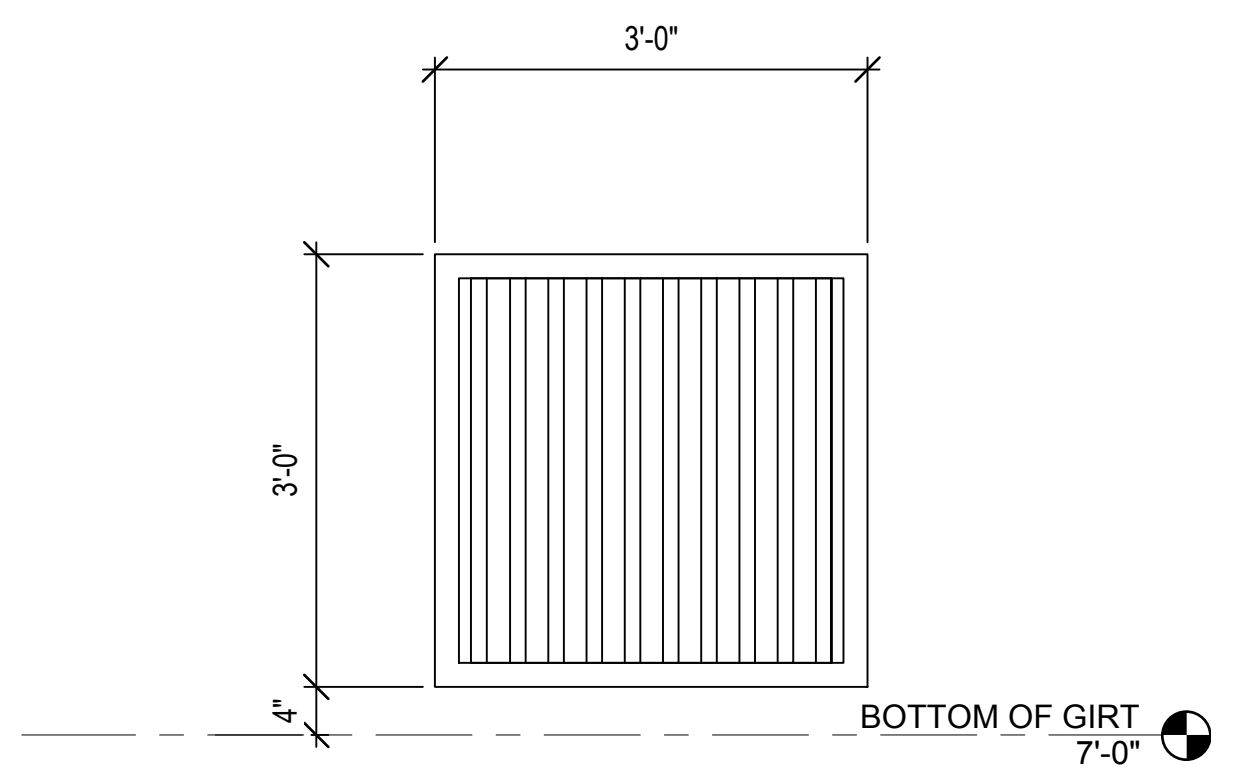
BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
WALL DETAILS

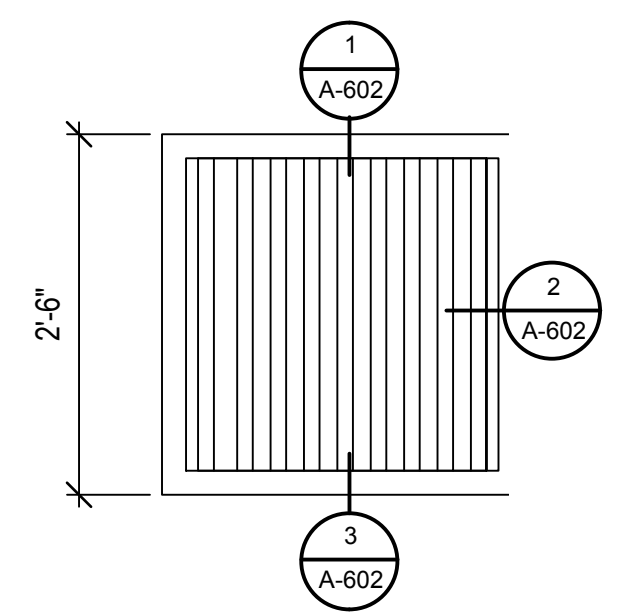
SHEET:
A-401



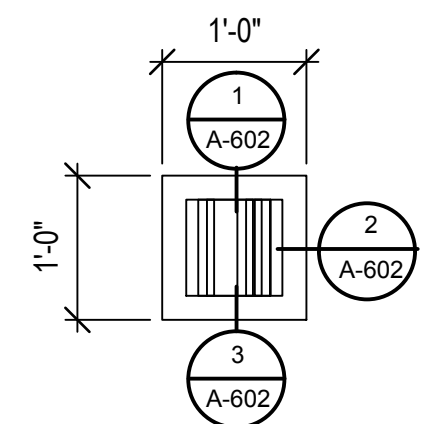
9 LOUVER ELEV - L5
A-401 3/4" = 1'-0"



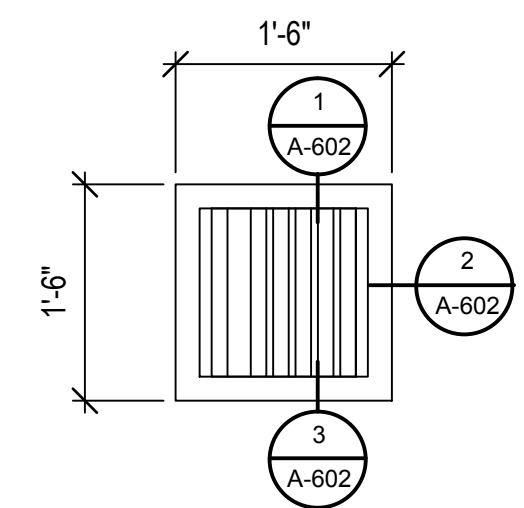
5 LOUVER ELEV - L1
A-401 3/4" = 1'-0"



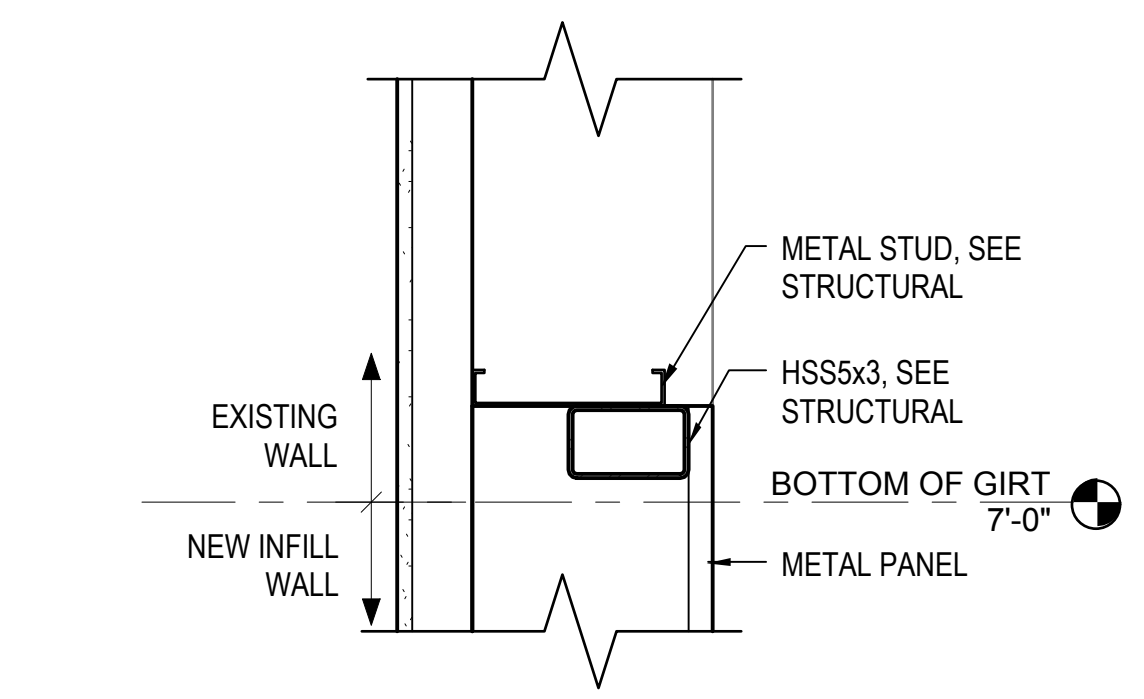
6 LOUVER ELEV - L2
A-401 3/4" = 1'-0"



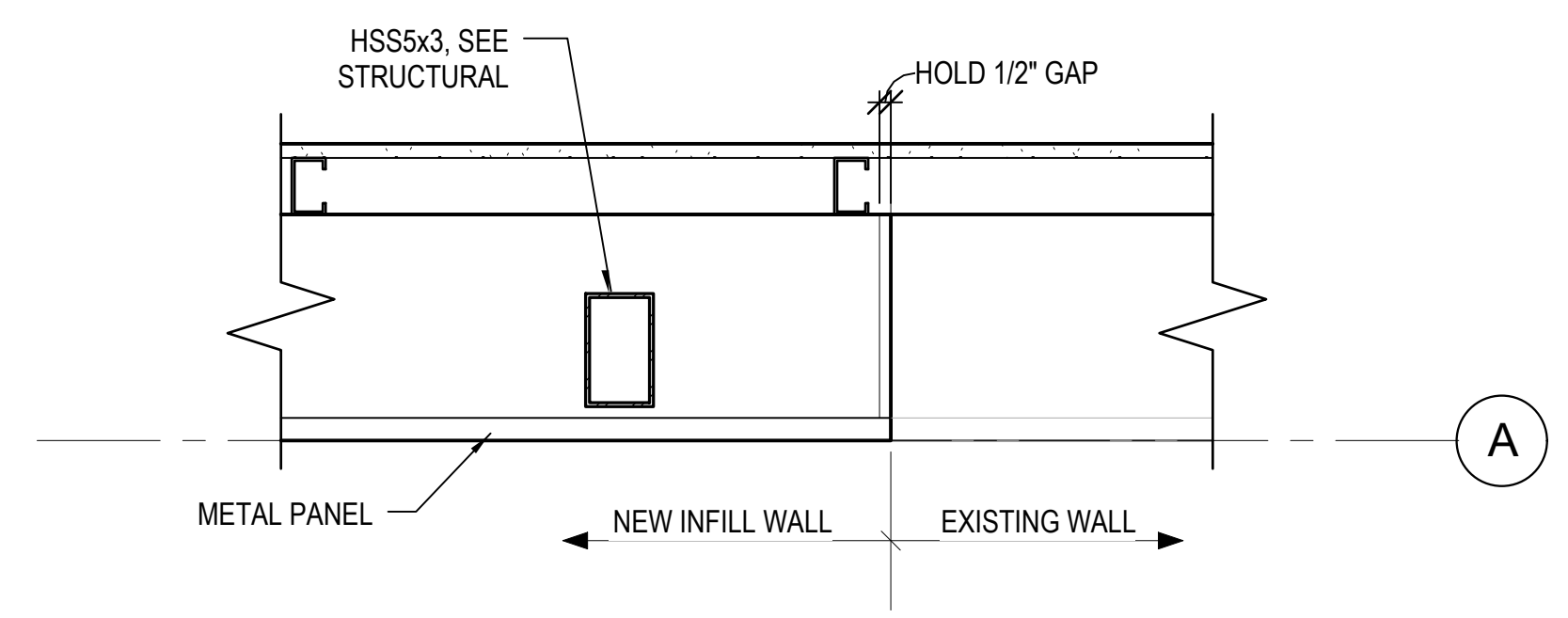
7 LOUVER ELEV - L3
A-401 3/4" = 1'-0"



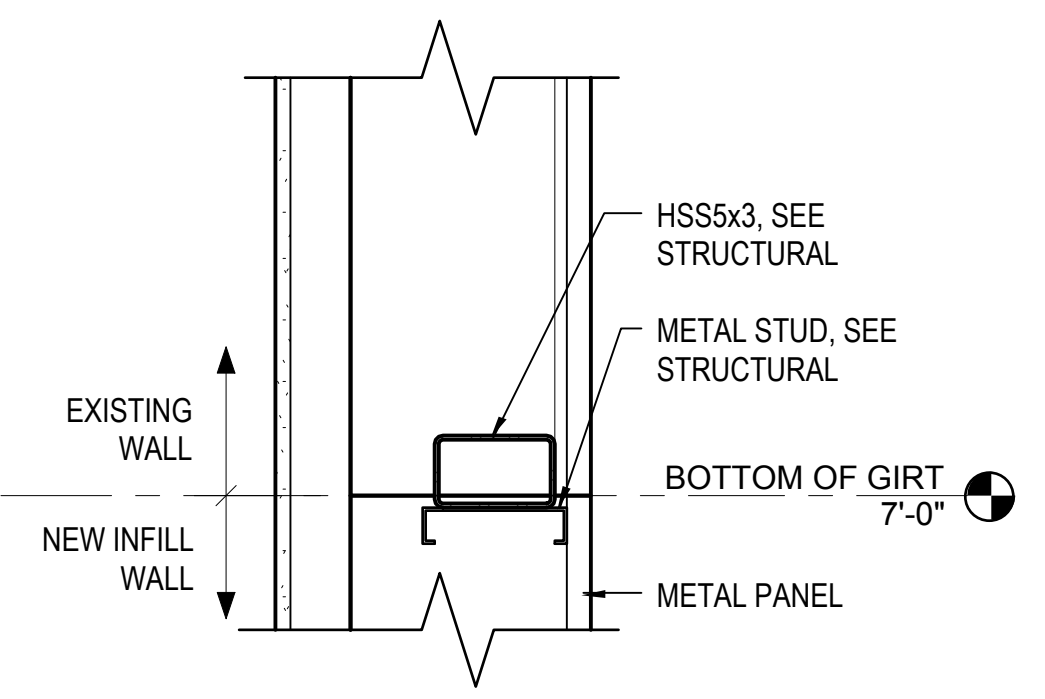
8 LOUVER ELEV - L4
A-401 3/4" = 1'-0"



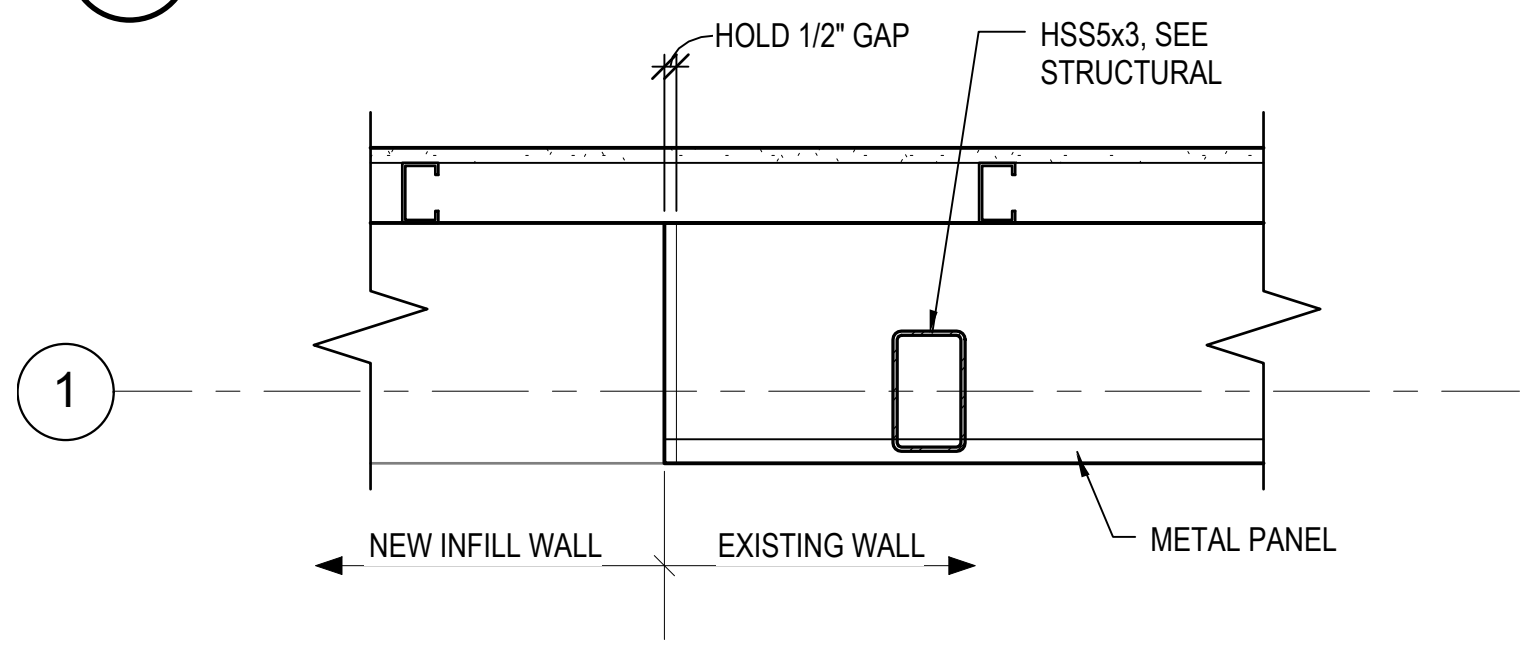
1 NEW/EXISTING SECTION
DETAIL - WEST WALL
A-401 1 1/2" = 1'-0"



2 NEW/EXISTING SECTION
DETAIL - WEST WALL
A-401 1 1/2" = 1'-0"

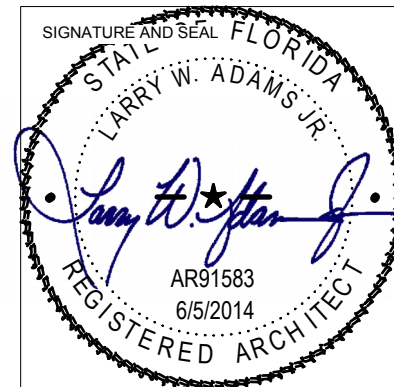


3 NEW/EXISTING SECTION
DETAIL - SOUTH WALL
A-401 1 1/2" = 1'-0"



4 NEW/EXISTING SECTION
DETAIL - SOUTH WALL
A-401 1 1/2" = 1'-0"

May 2, 2016



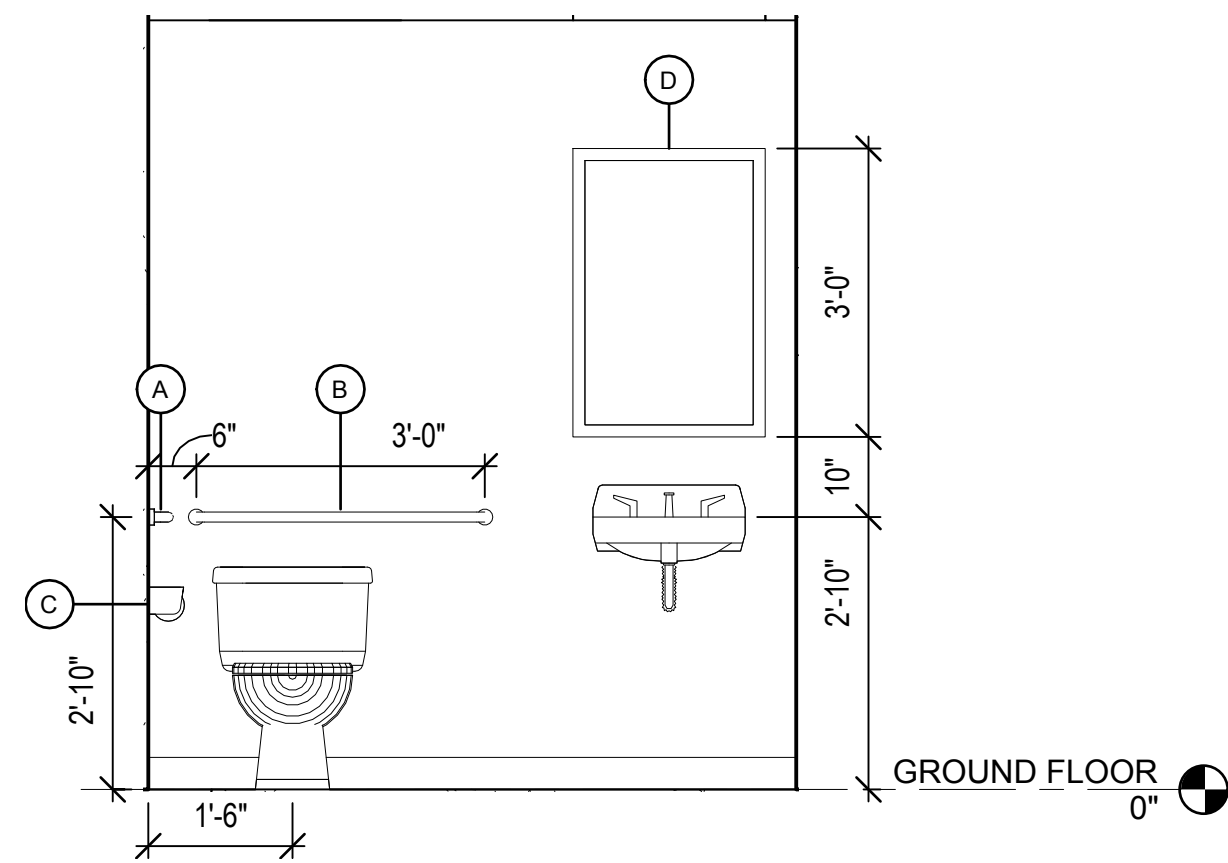
PSC WELDING SHOP
UNDERWOOD AVE. PENSACOLA, FL. 32504

REVISIONS:

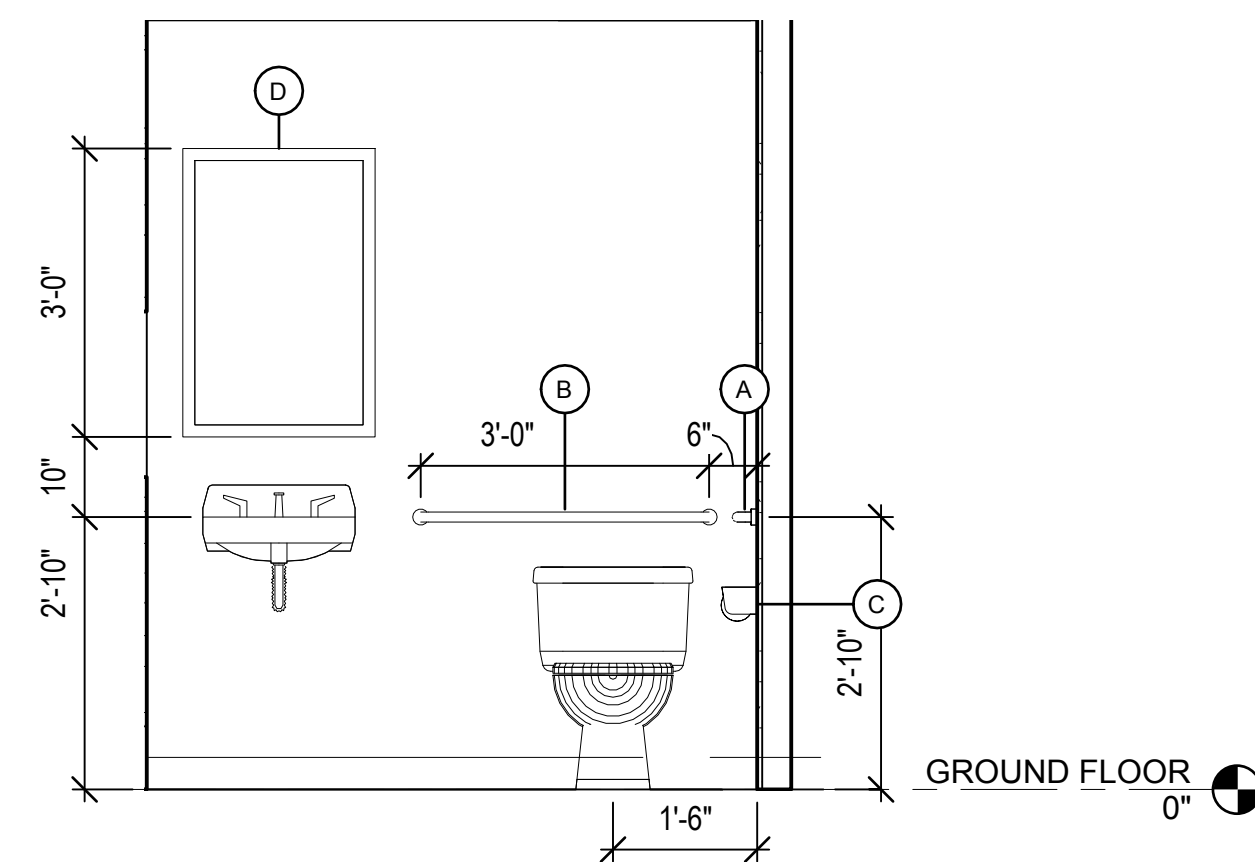
BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
INTERIOR ELEVATIONS

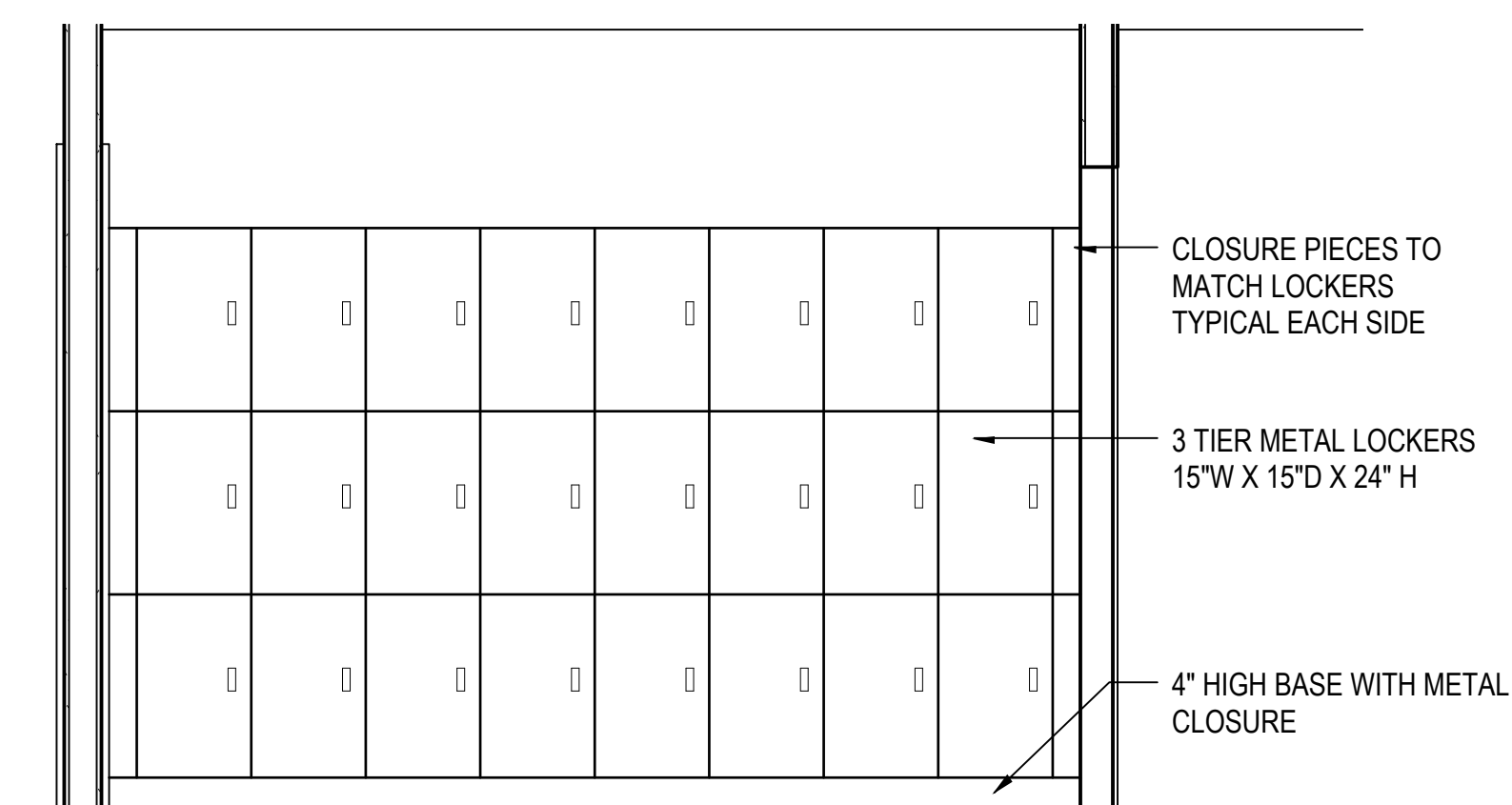
SHEET:
A-450



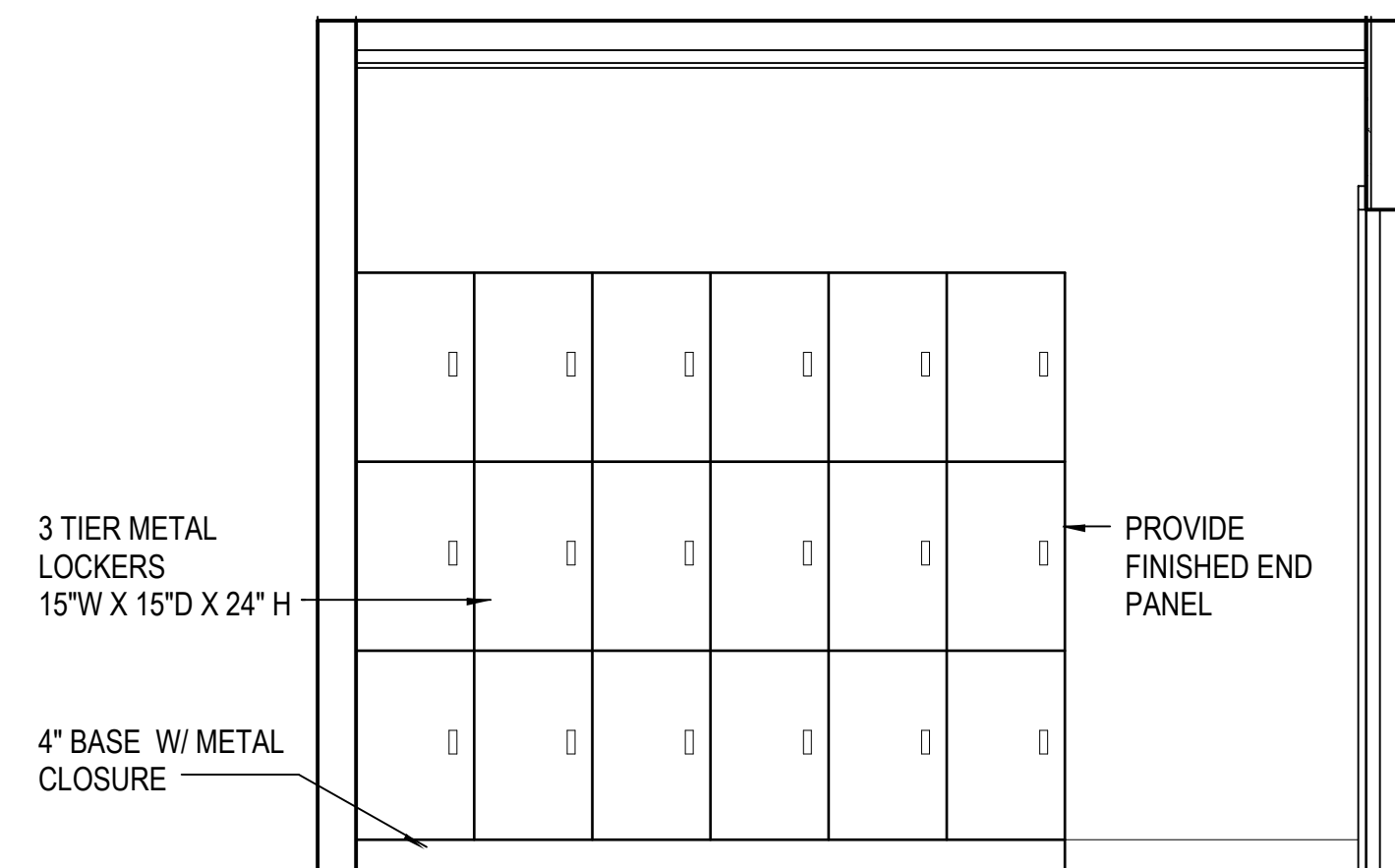
1 MEN'S ROOM ELEVATION
A-450 1/2" = 1'-0"



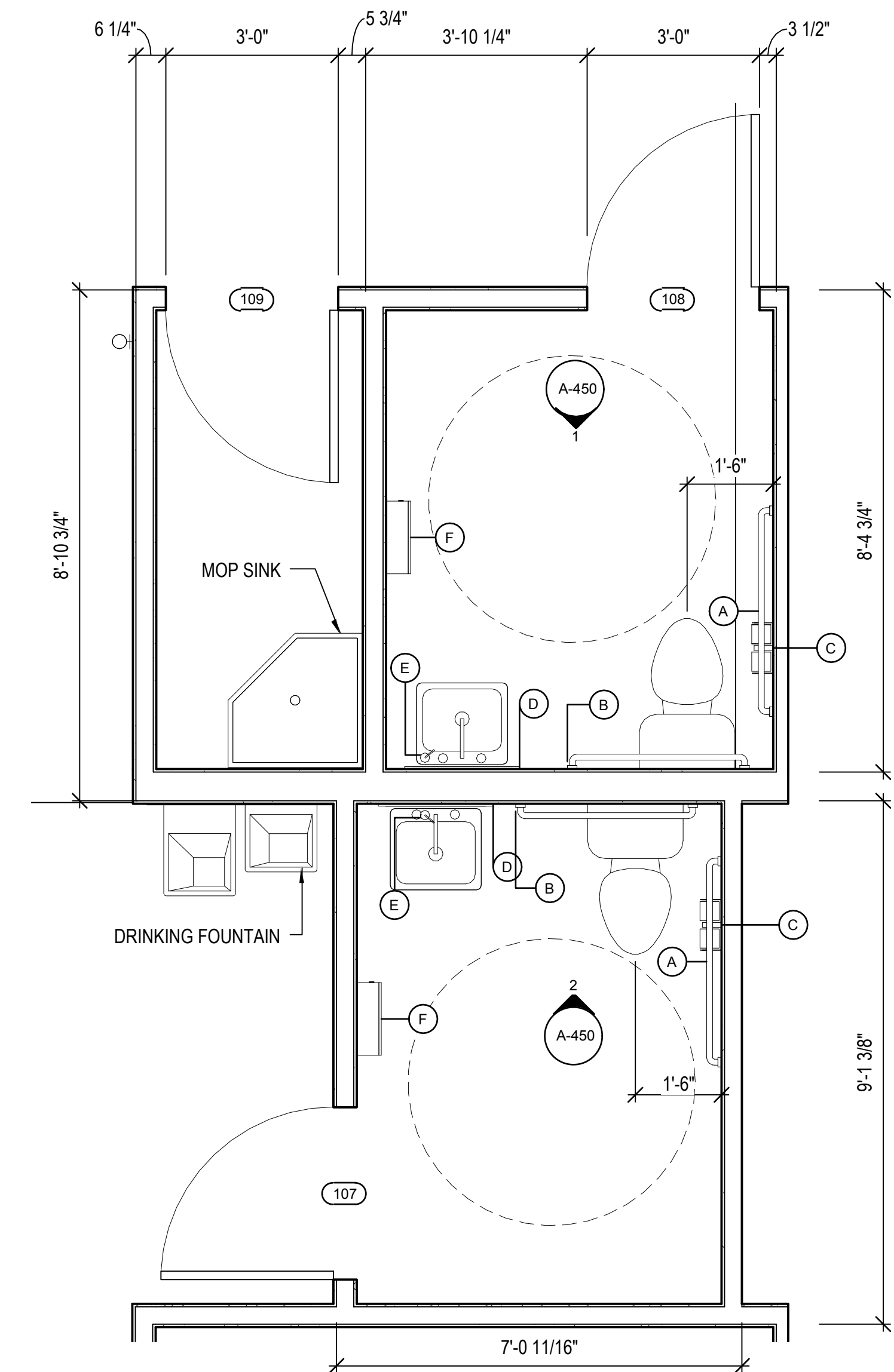
2 WOMEN'S ROOM ELEVATION
A-450 1/2" = 1'-0"



3 LOCKER ELEVATION
A-450 1/2" = 1'-0"

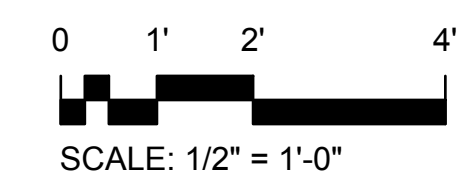


4 LOCKER ELEVATION 2
A-450 1/2" = 1'-0"

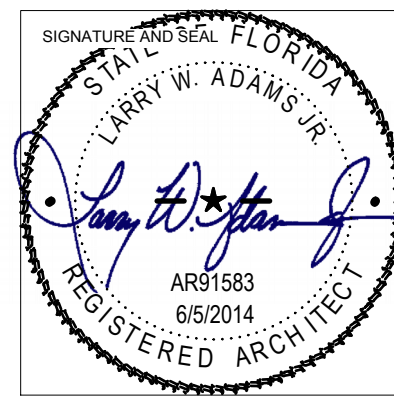


5 ENLARGED RESTROOM PLAN
A-450 1/2" = 1'-0"

RESTROOM ACCESSORY SCHEDULE					
MARK	ITEM/DESCRIPTION	ABBREV.	MFR.	COMMENTS	REMARKS
A	42" GRAB BAR	B-5806x42	BOBRICK		
B	36" GRAB BAR	B-5806x36	BOBRICK		
C	DUAL TOILET PAPER HOLDER	B-274	BOBRICK	OWNER FURNISHED/CONTRACTOR INSTALLED	SURFACE MOUNTED
D	24"x36" MIRROR	B-165 2436	BOBRICK		
E	LIQUID SOAP DISPENSER	B-822	BOBRICK	OWNER FURNISHED/CONTRACTOR INSTALLED	
F	PAPER TOWEL/WASTE REC.	B-369	BOBRICK		RECESSED



May 2, 2016



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UNDERWOOD AVE. PENSACOLA, FL. 32504

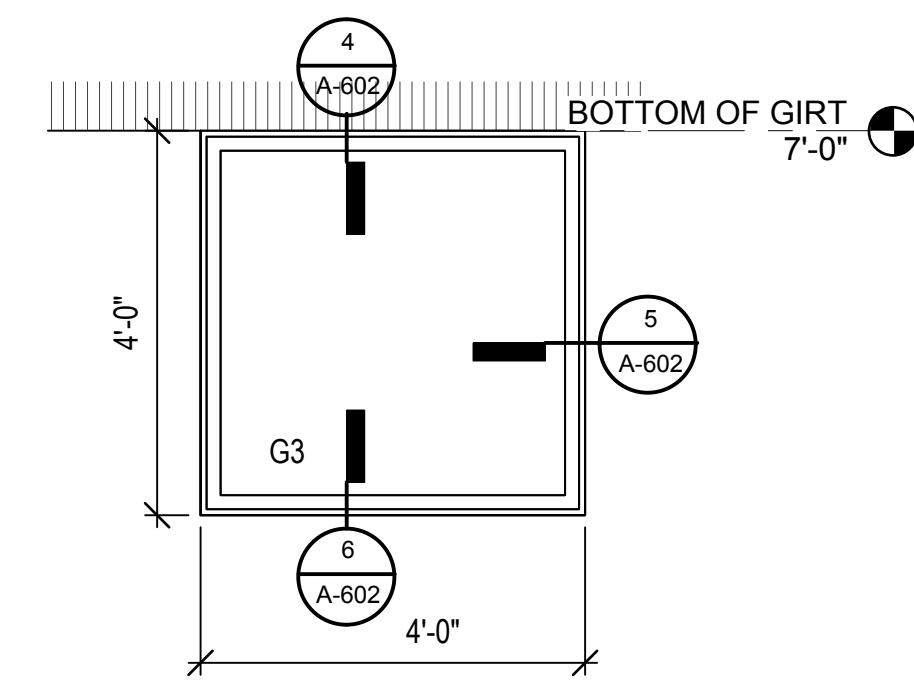
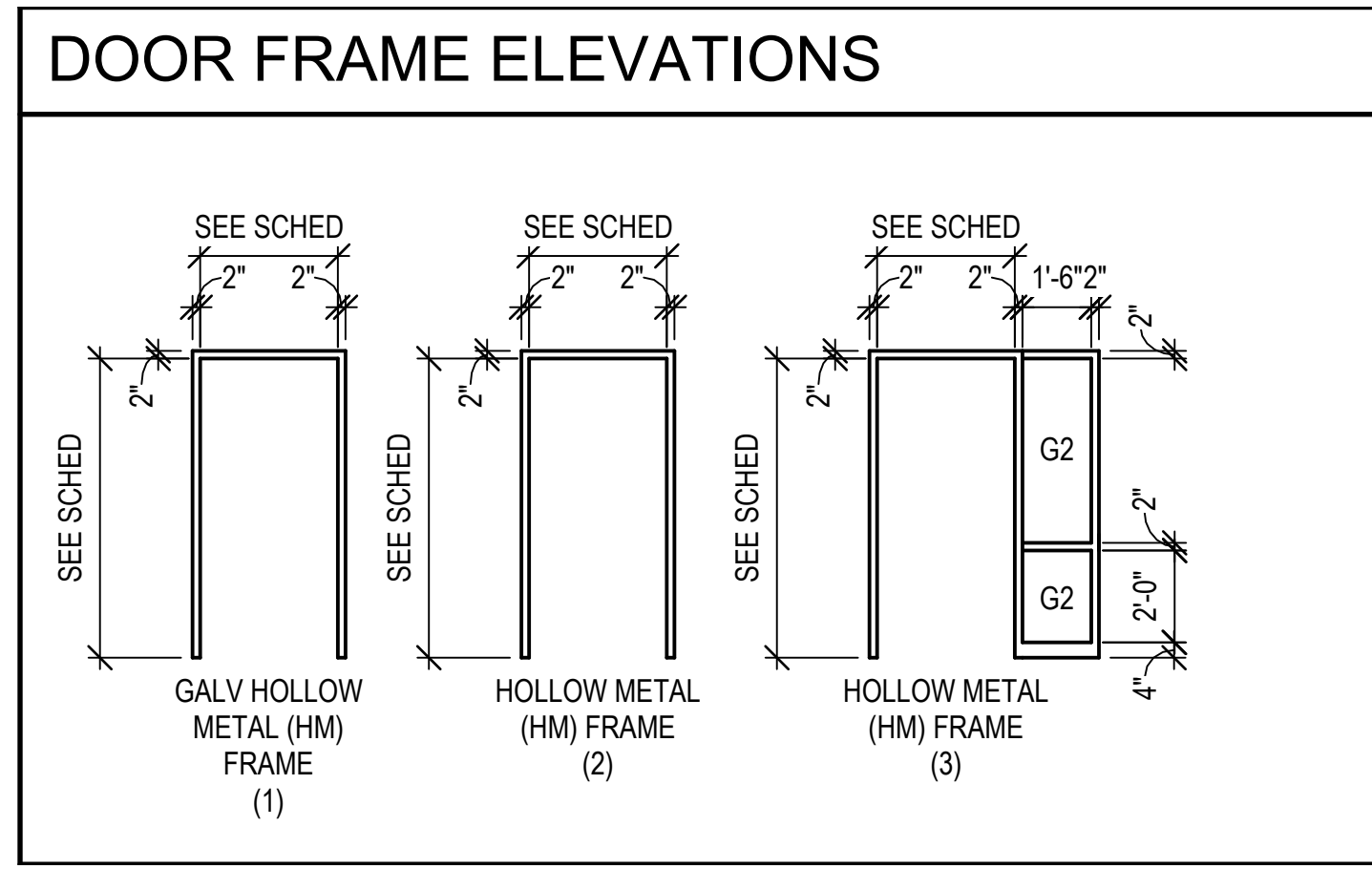
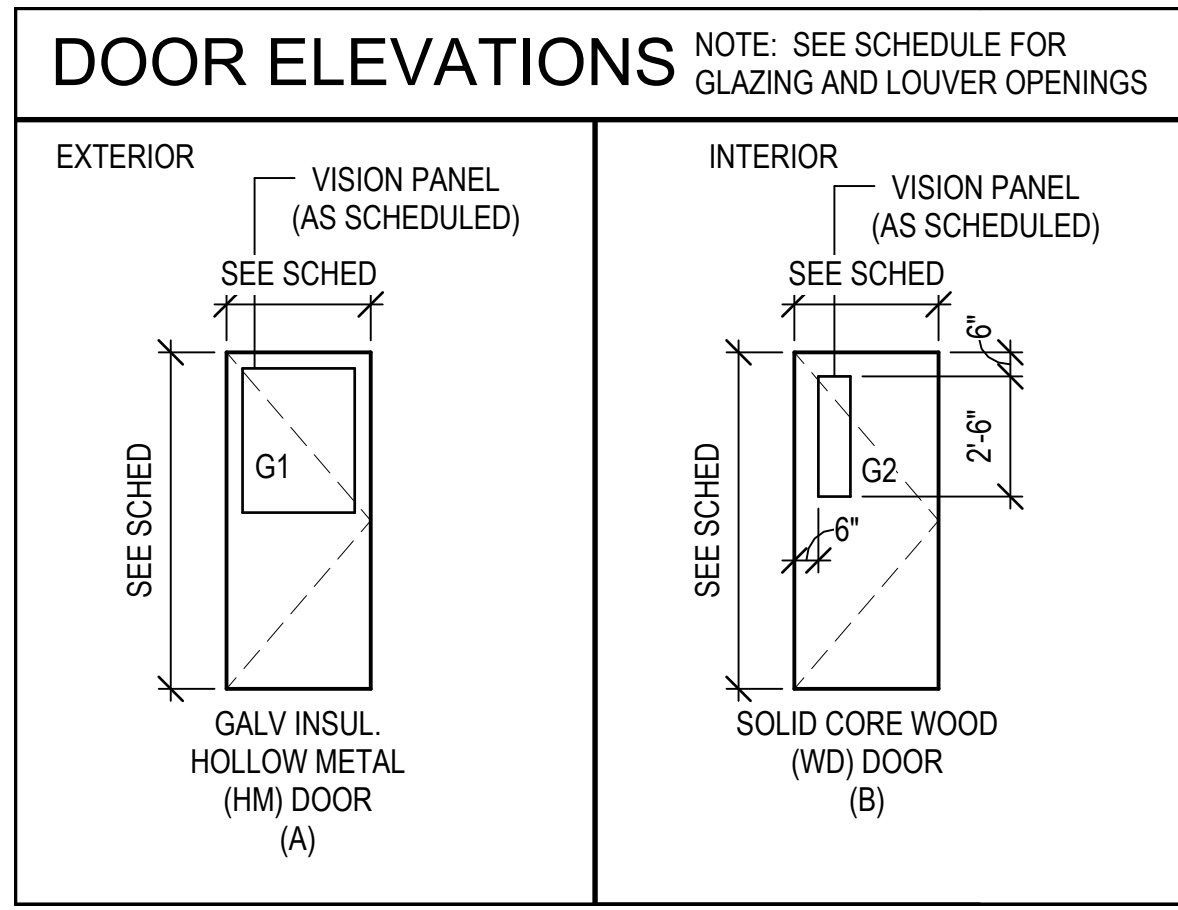
REVISIONS:

NO.	DESCRIPTION

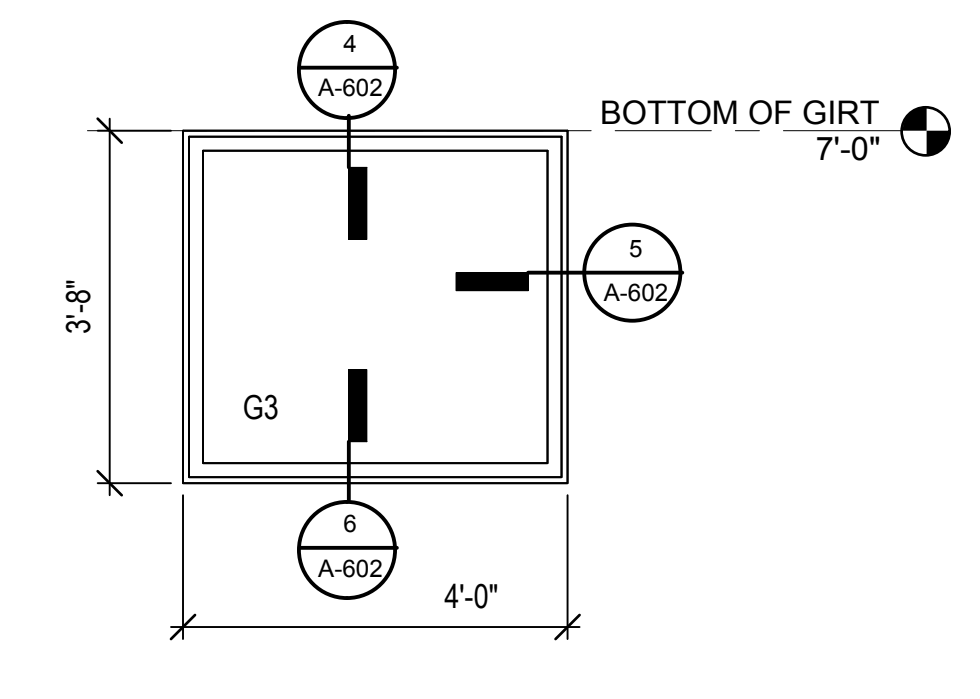
BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
OPENING
SCHEDULE AND
DETAILS

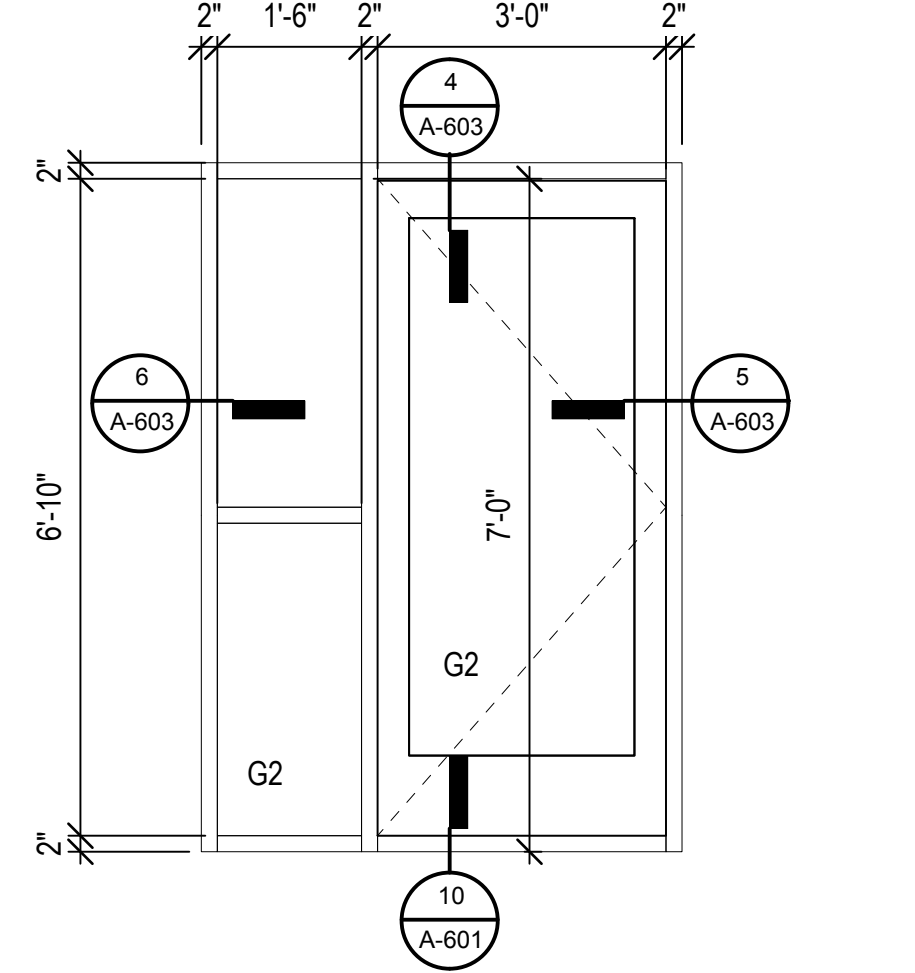
SHEET:
A-601



1 WINDOW ELEV - W1
1/2" = 1'-0"



2 WINDOW ELEV - W2
1/2" = 1'-0"



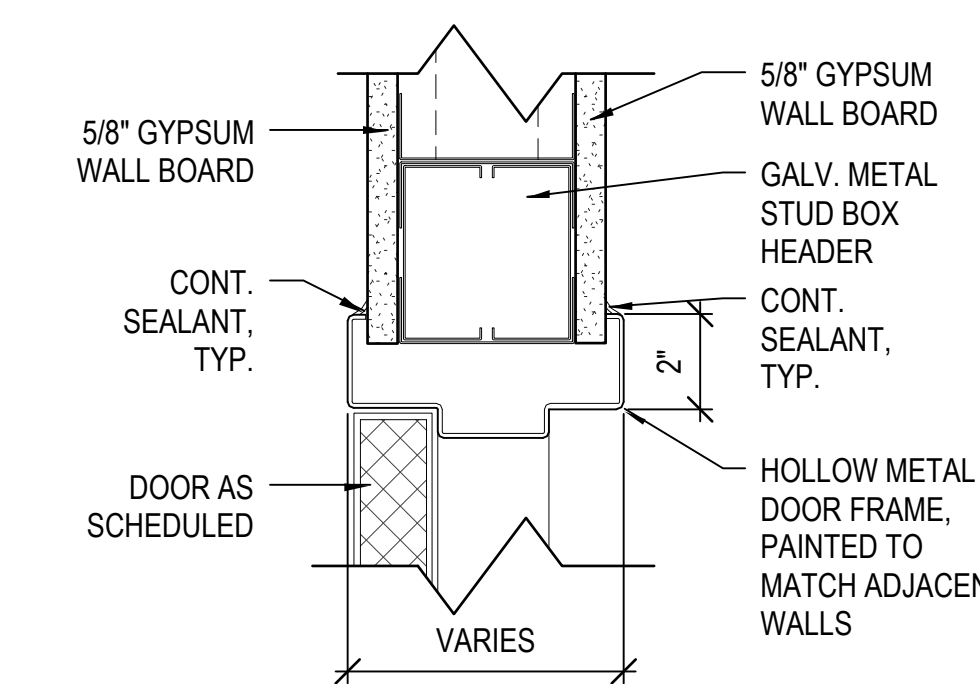
3 WINDOW INT. ELEV - W3
1/2" = 1'-0"

GLAZING LEGEND

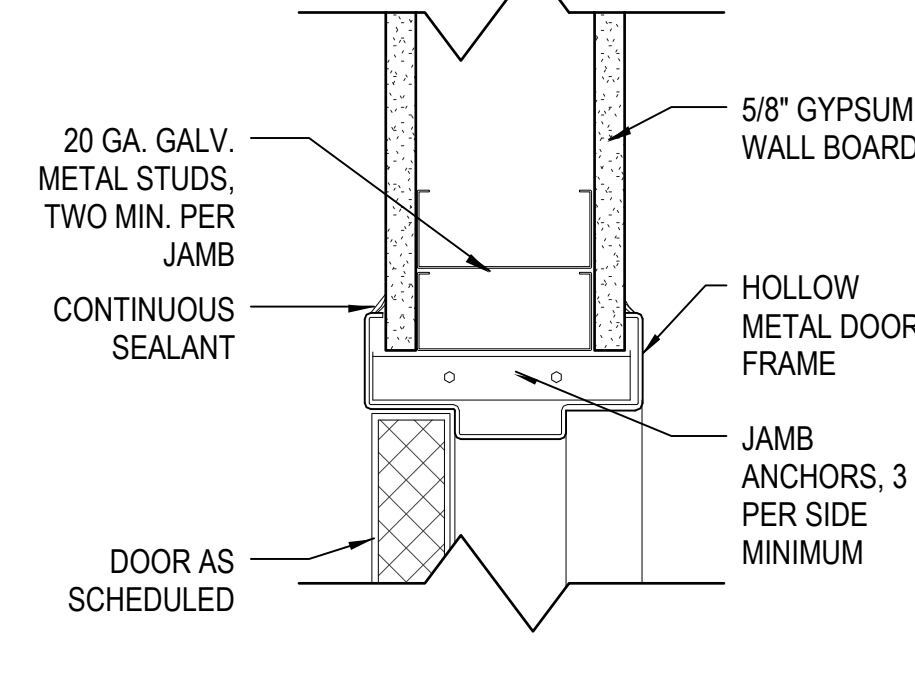
G1: LAMINATED GLASS (LOW E)
G2: 1/4" TEMPERED GLASS (CLEAR)
G3: 1 5/16" LAMINATED INSULATED IMPACT RESISTANT GLAZING (LOW E)

DOOR SCHEDULE

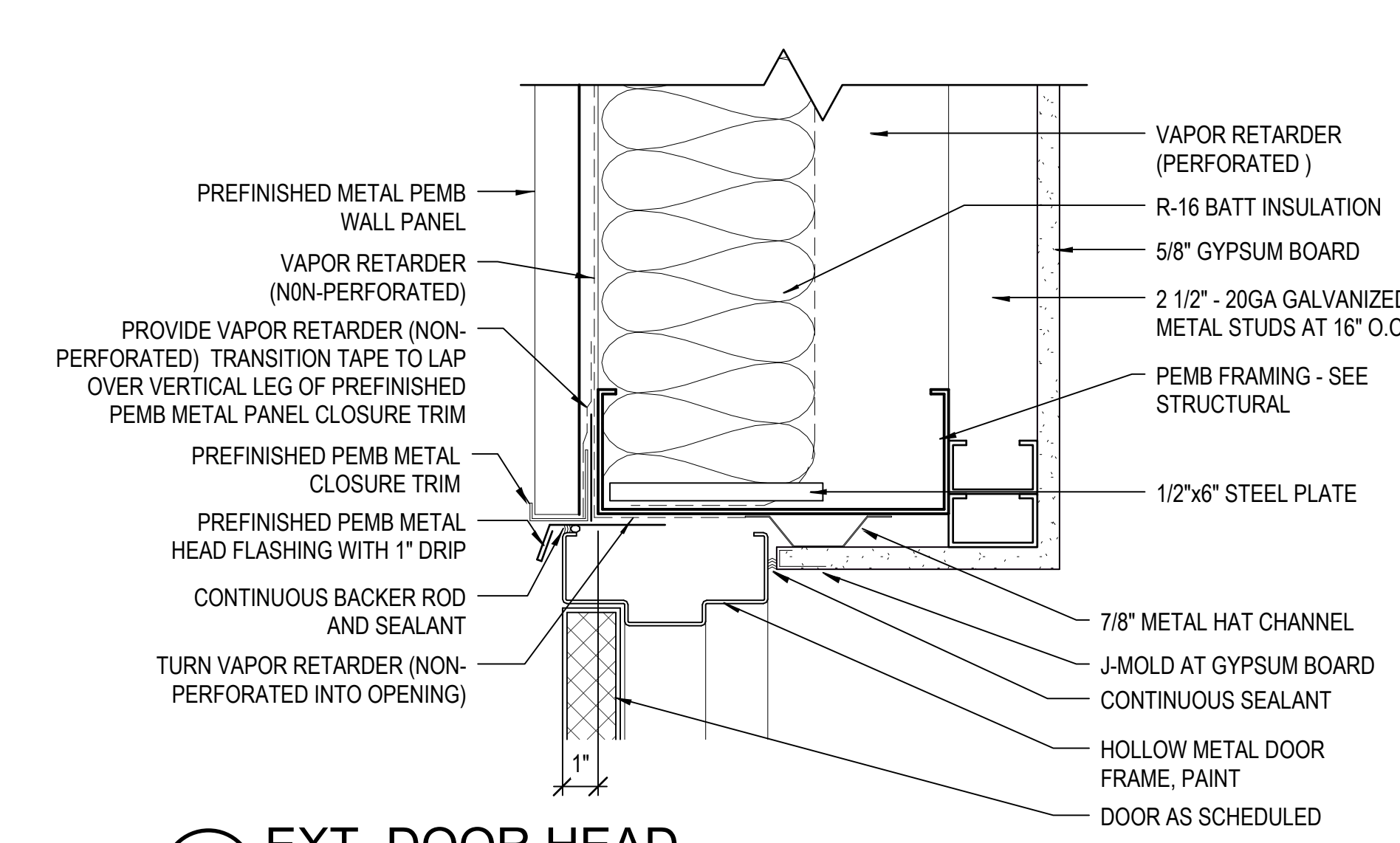
MARK	DOOR			FRAME			STC RATING	FIRE RATING	HARDWARE	COMMENTS										
	WD	HT	THK	MAT	ELEV	GLAZING					MAT	ELEV	HEAD	JAMB	SILL					
101	3'-0"	6'-10"	1 3/4"																	
102	3'-0"	7'-0"	1 3/4"	WD	B			HM	2	2/A-601	3/A-601							HW2		PROVIDE VINYL REDUCER STRIP AT THRESHOLD
103	3'-0"	7'-0"	1 3/4"	WD	B	6" X 24"		HM	2	2/A-601	3/A-601							HW2		PROVIDE VINYL REDUCER STRIP AT THRESHOLD
104	3'-0"	7'-0"	1 3/4"	HM	A	HALF LITE		HM	1	4/A-601	5&6/A-601	7/A-601						HW1		
105	3'-0"	7'-0"	1 3/4"	WD	B			HM	2	2/A-601	3/A-601							HW3		
106	3'-0"	7'-0"	1 3/4"	WD	B			HM	2	2/A-601	3/A-601							HW2		PROVIDE VINYL REDUCER STRIP AT THRESHOLD
107	3'-0"	7'-0"	1 3/4"	WD	B			HM	2	2/A-601	3/A-601							HW4		PROVIDE MARBLE THRESHOLD AT SILL
108	3'-0"	7'-0"	1 3/4"	WD	B			HM	2	2/A-601	3/A-601							HW4		PROVIDE MARBLE THRESHOLD AT SILL
109	3'-0"	7'-0"	1 3/4"	WD	B			HM	2	2/A-601	3/A-601							HW3		
110	3'-0"	7'-0"	1 3/4"	HM	A			HM	1	4/A-601	5&6/A-601	7/A-601						HW1		HEAD AND JAMB DETAILS SIMILAR (WITHOUT STUDS AND GYPSUM BOARD)



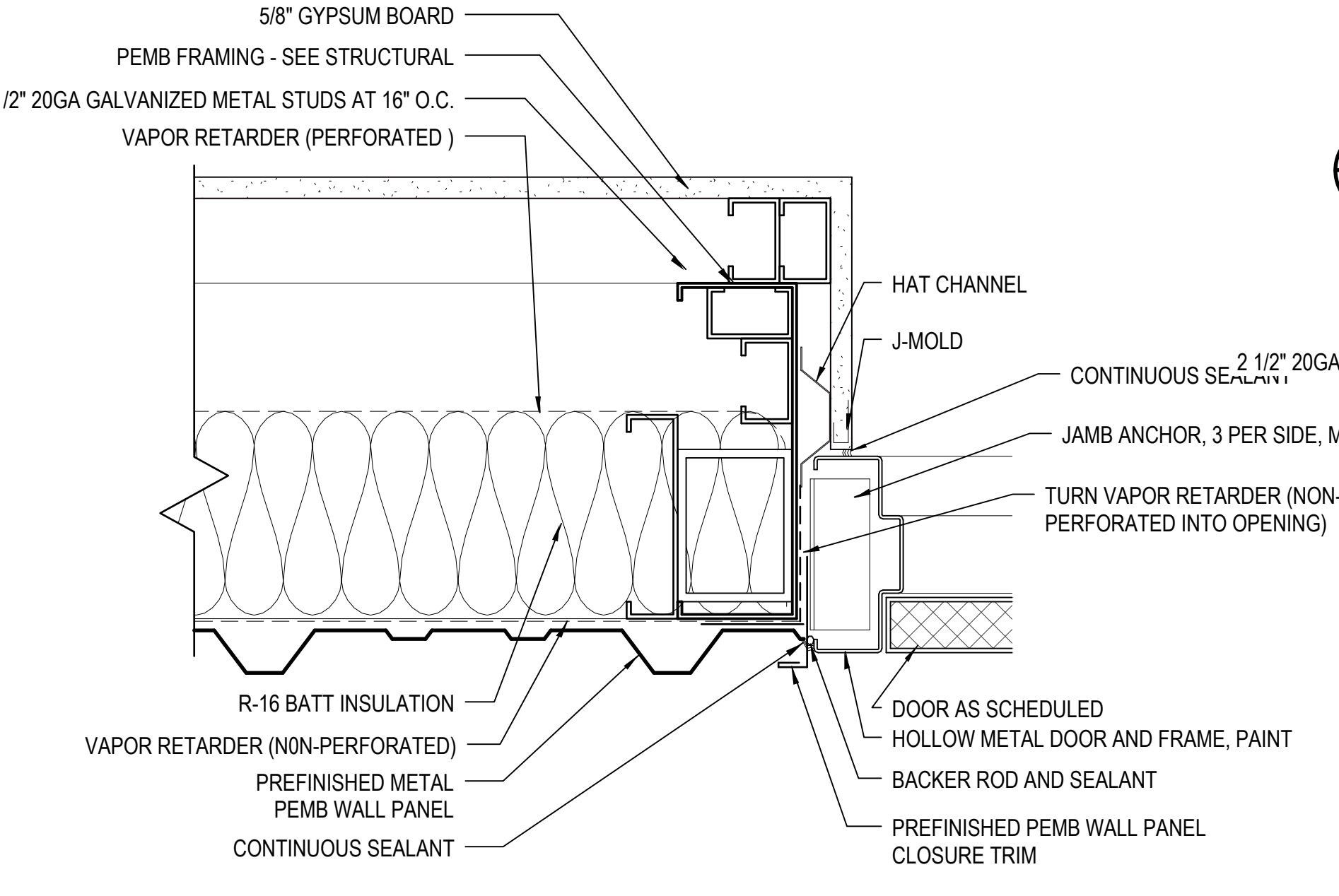
4 DOOR HEAD DETAIL
3" = 1'-0"



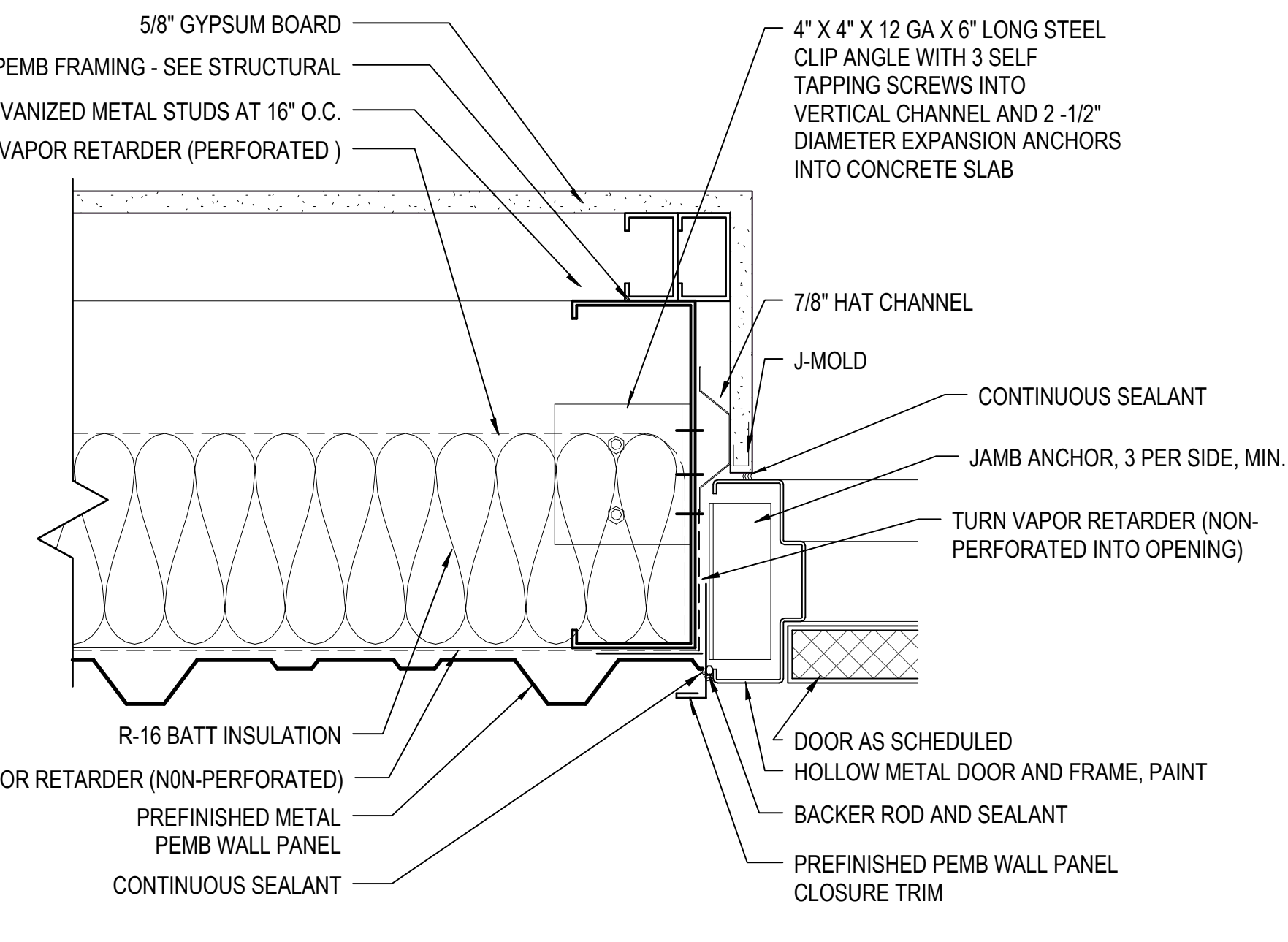
5 DOOR JAMB DETAIL
3" = 1'-0"



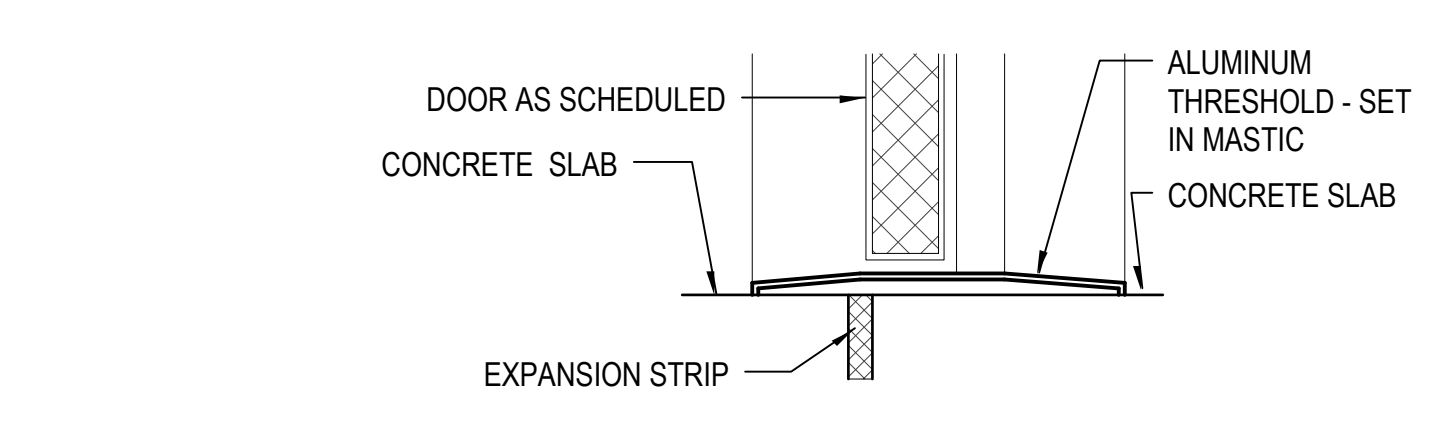
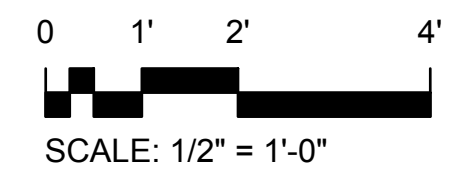
6 EXT. DOOR HEAD
3" = 1'-0"



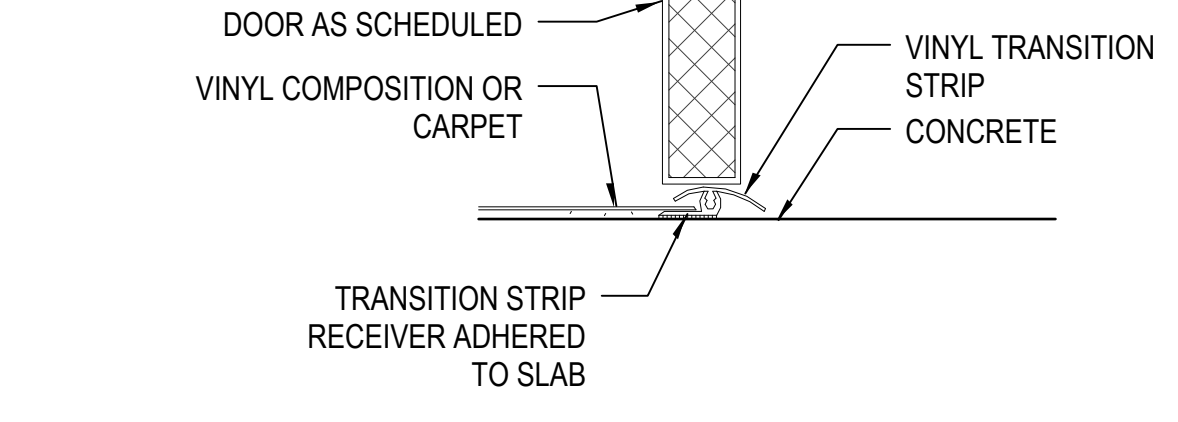
7 EXT. DOOR JAMB
3" = 1'-0"



8 EXT. DOOR JAMB AT SLAB
3" = 1'-0"

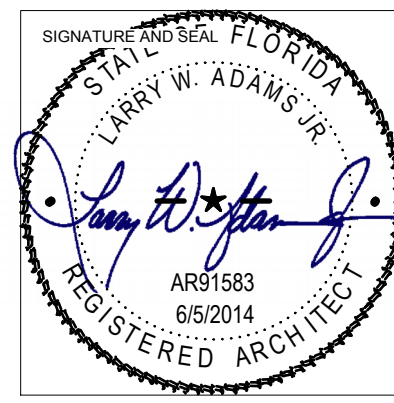


9 DOOR THRESHOLD
3" = 1'-0"



10 DOOR SILL DETAIL
3" = 1'-0"

May 2, 2016



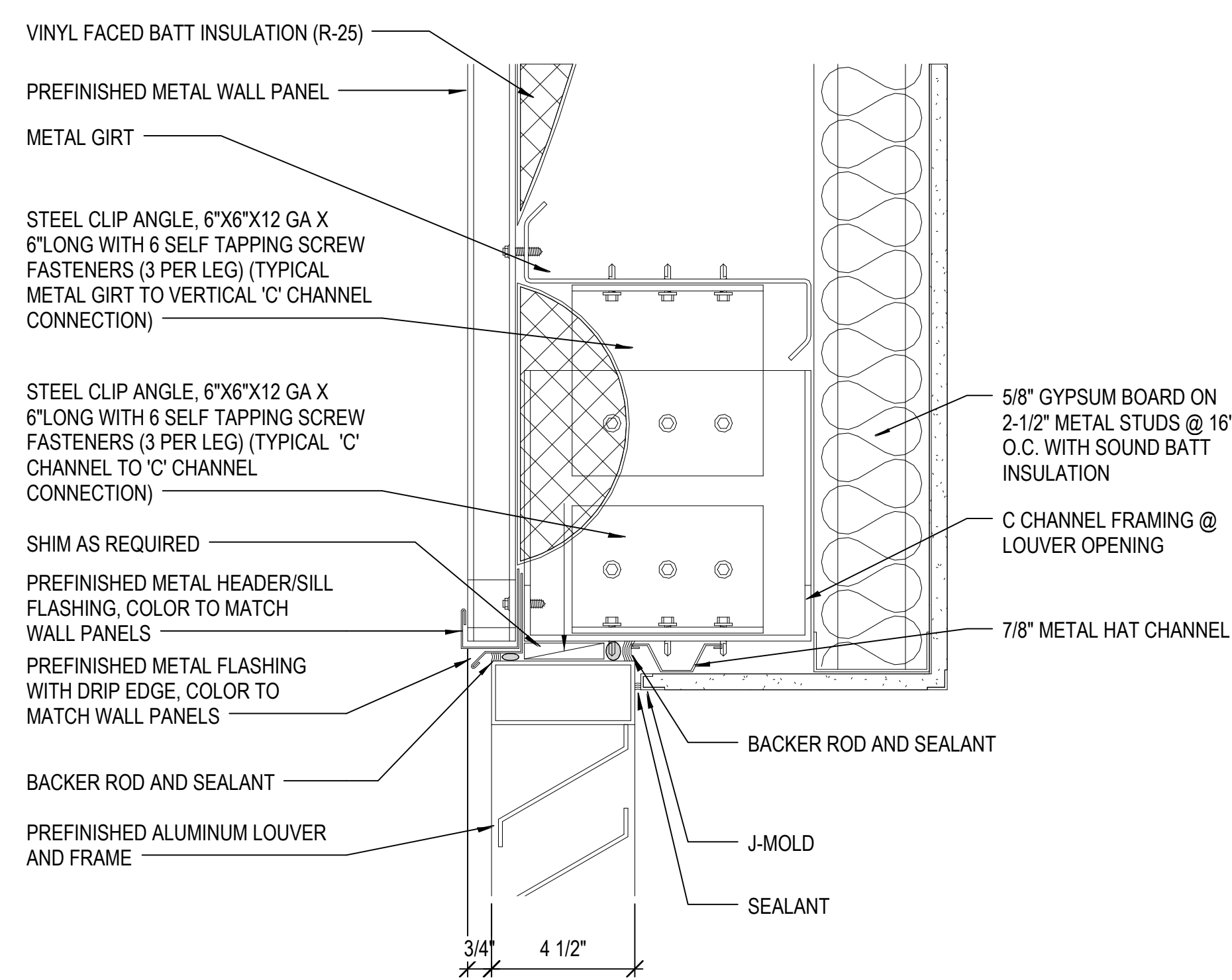
PSC WELDING SHOP
UNDERWOOD AVE. PENSACOLA, FL. 32504

REVISIONS:

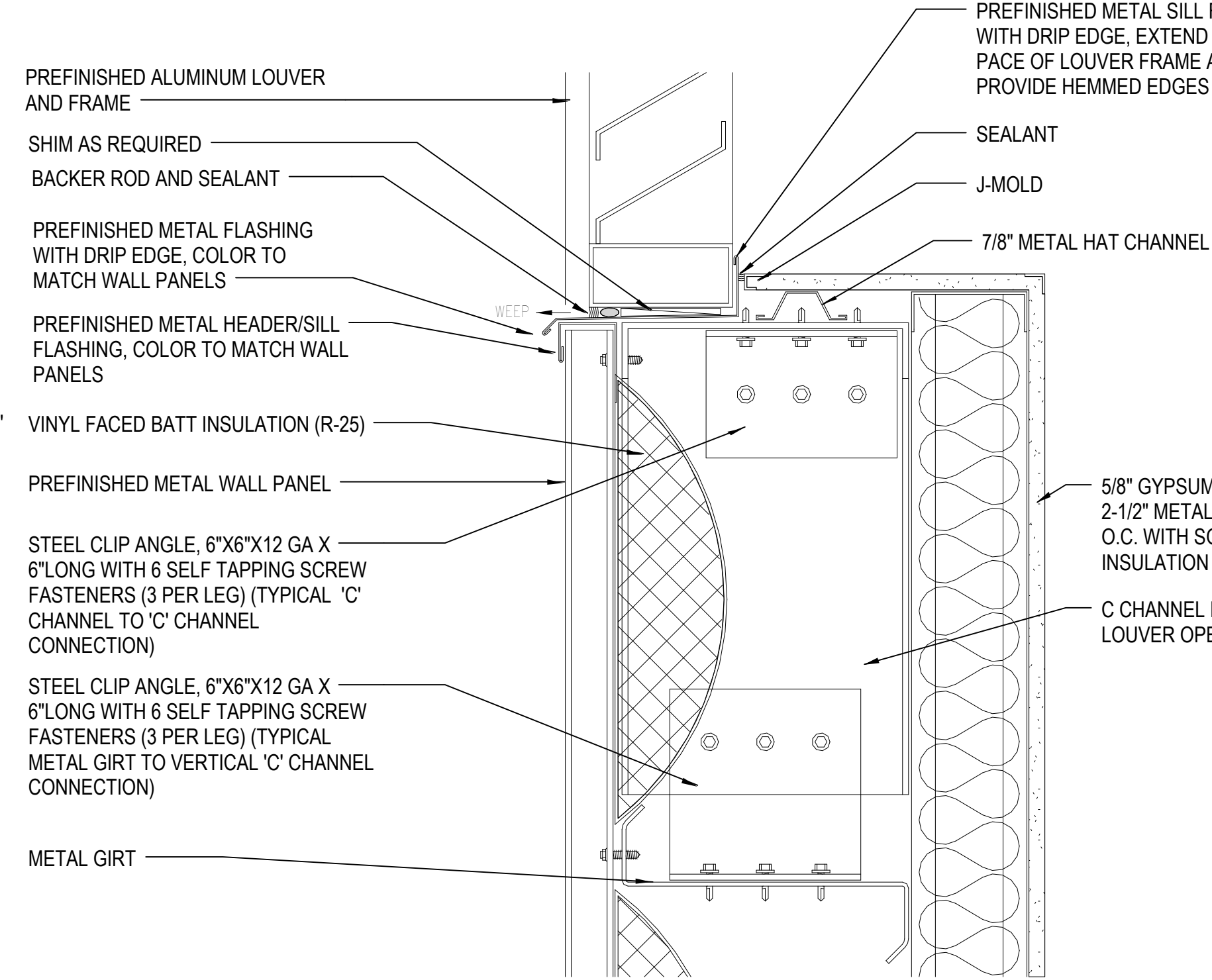
BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
DOOR AND WINDOW DETAILS

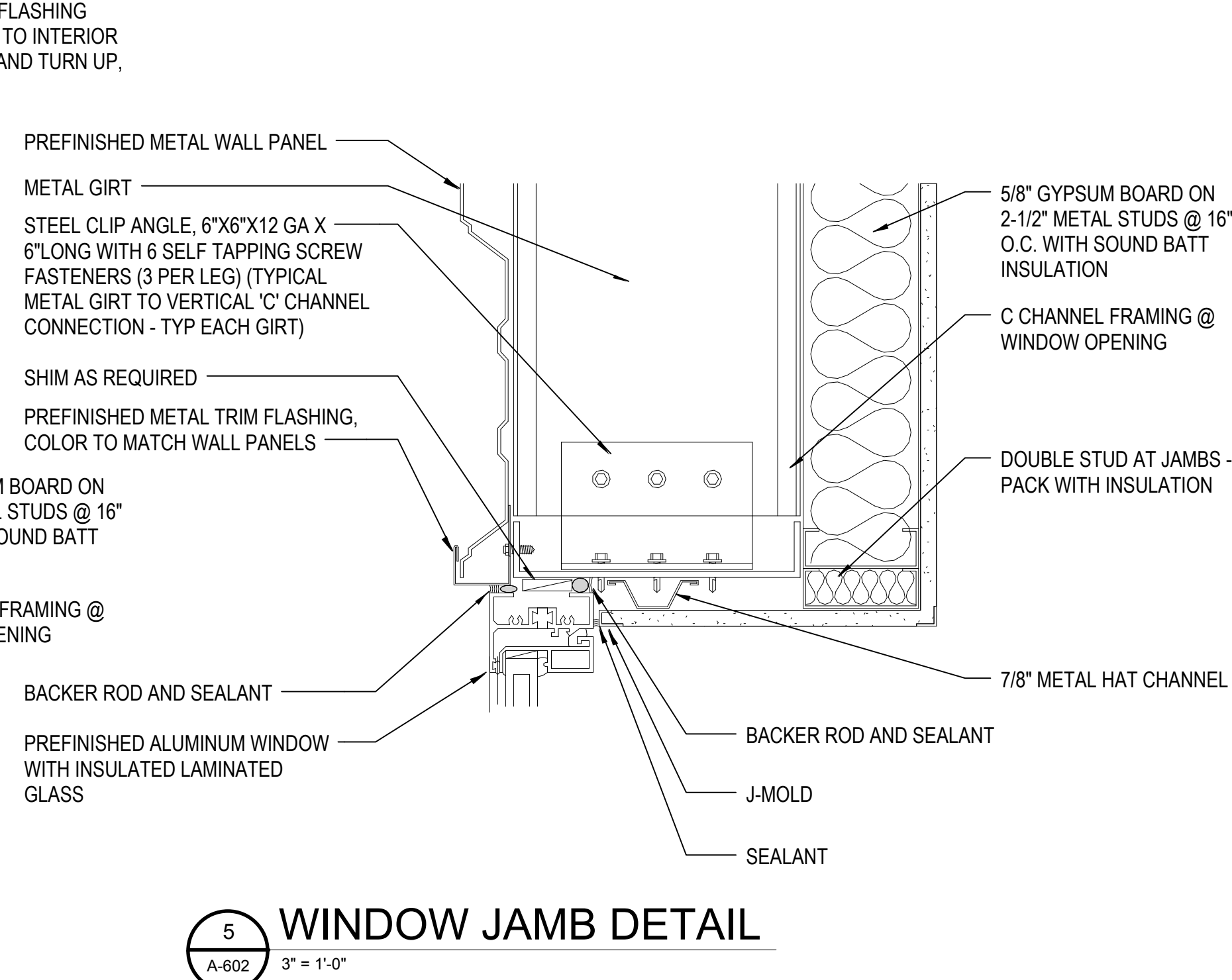
SHEET:
A-602



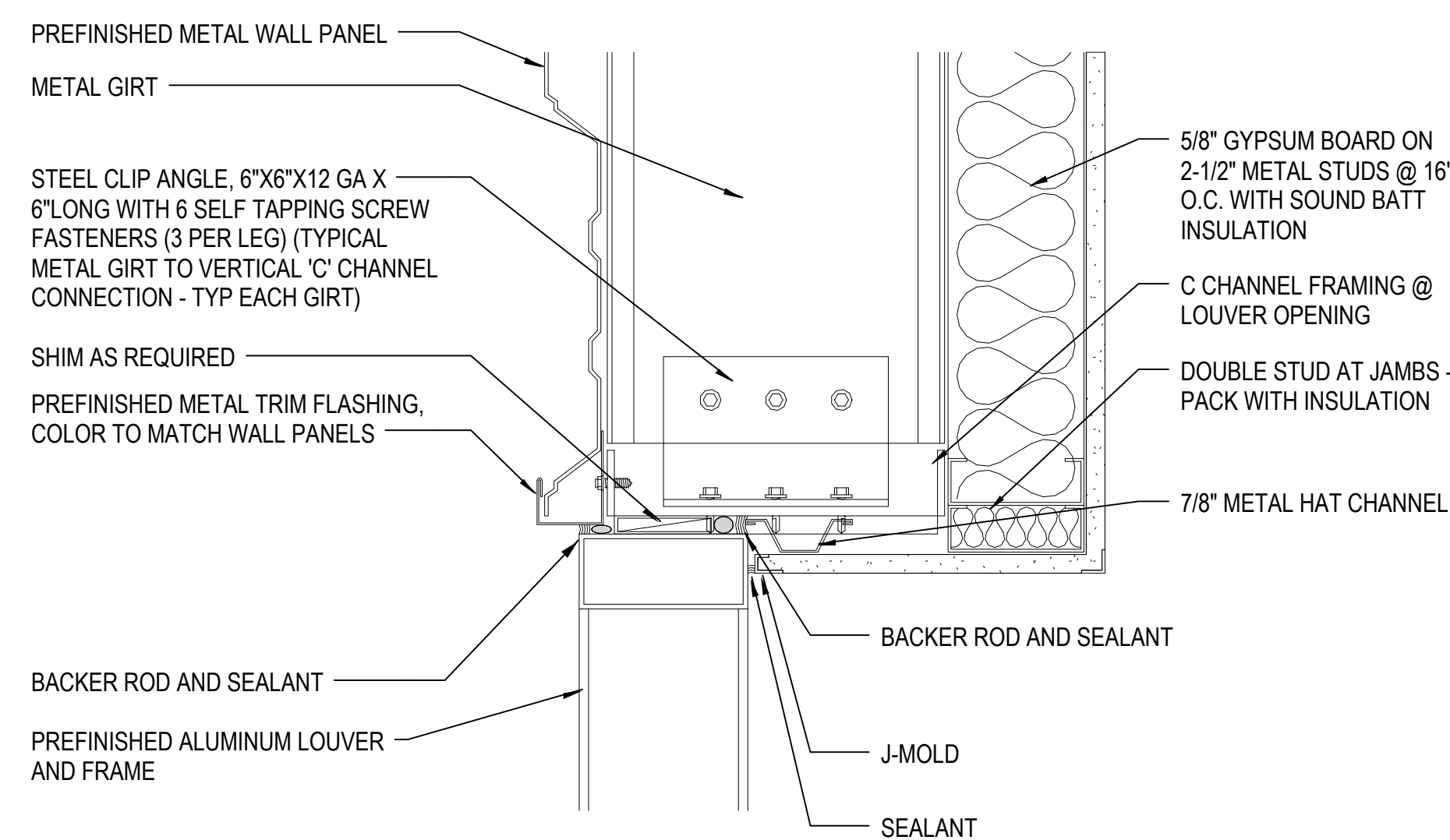
1 LOUVER HEAD DETAIL
A-602 3" = 1'-0"



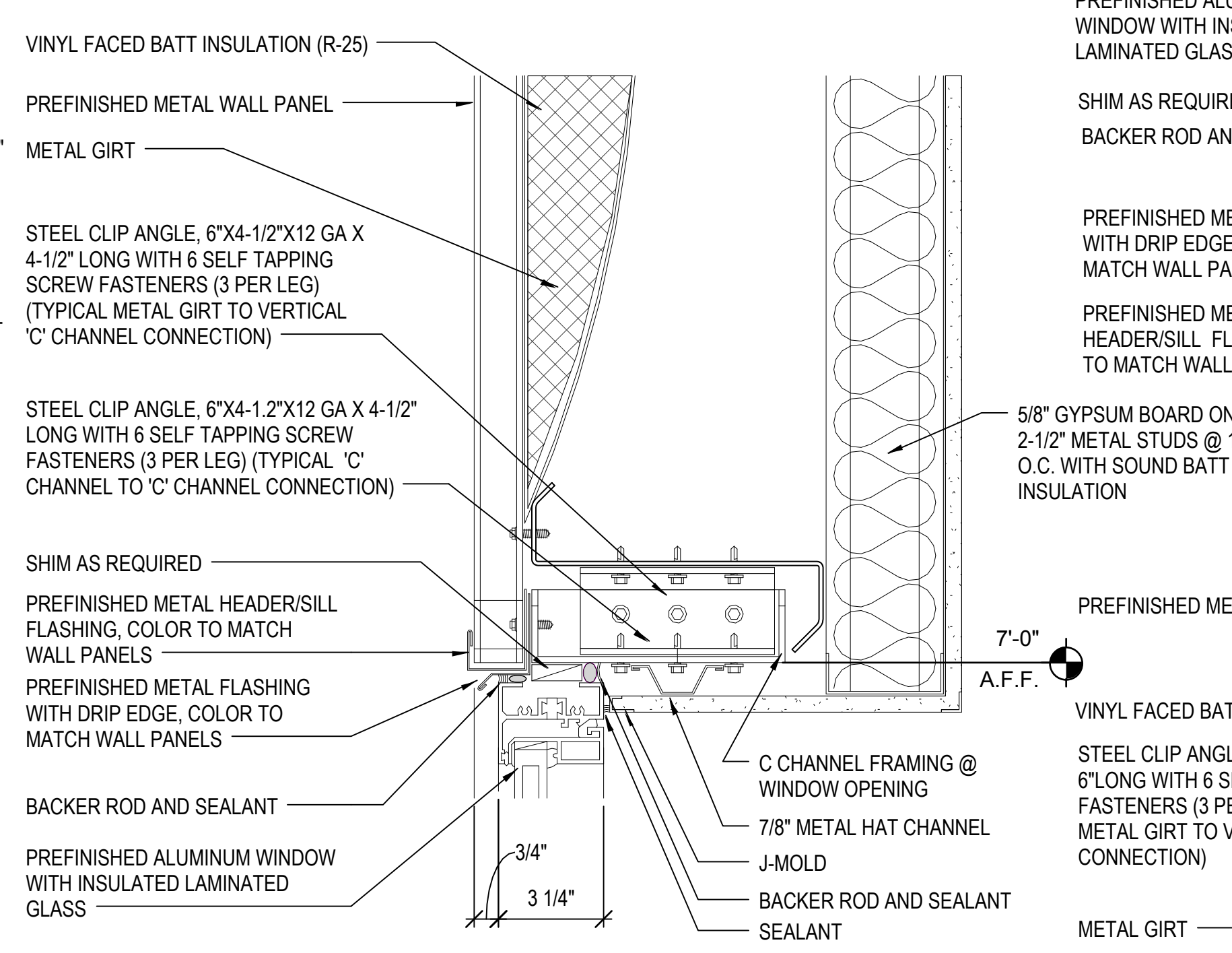
3 LOUVER SILL DETAIL
A-602 3" = 1'-0"



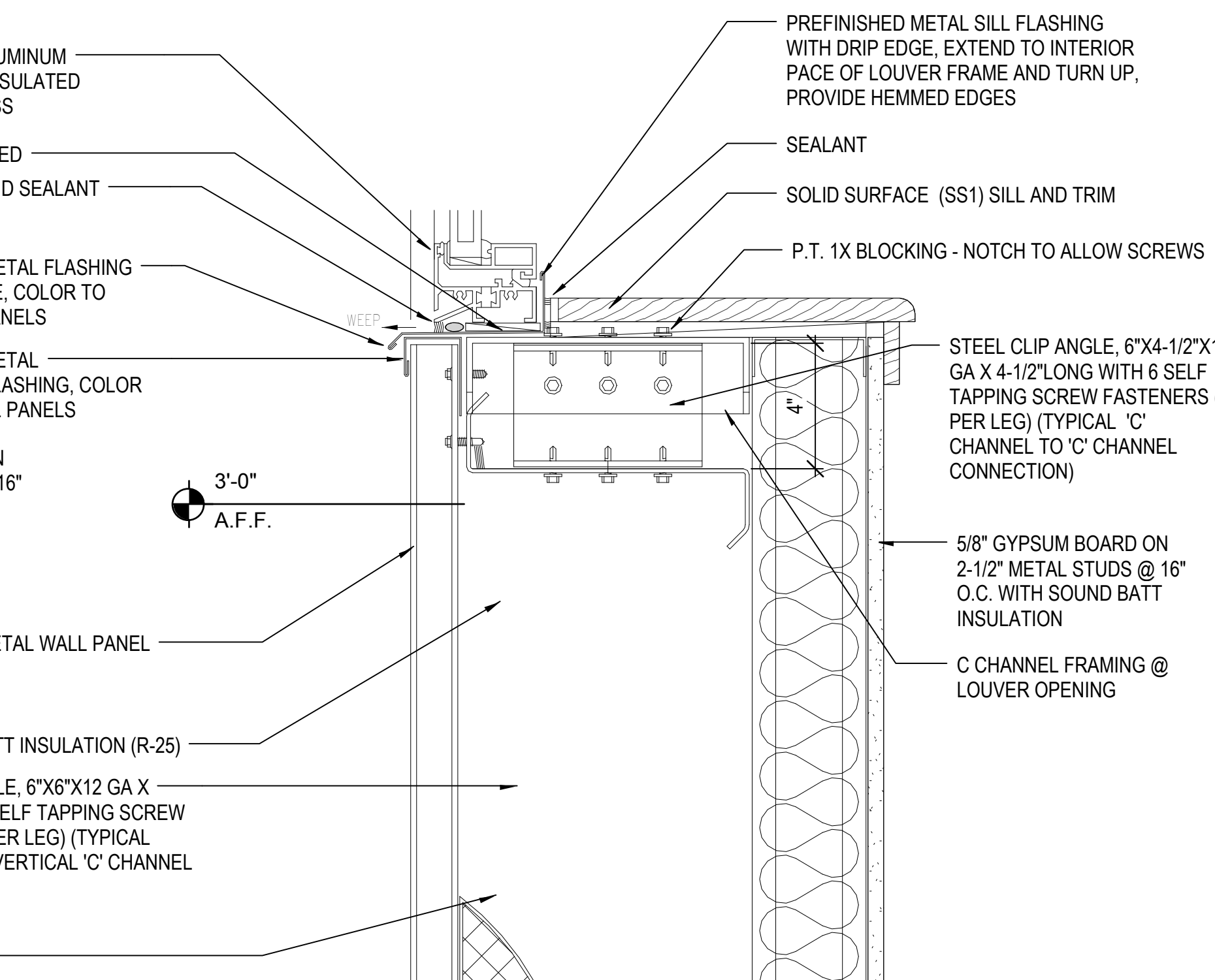
5 WINDOW JAMB DETAIL
A-602 3" = 1'-0"



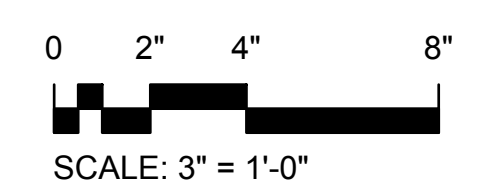
2 LOUVER JAMB DETAIL
A-602 3" = 1'-0"



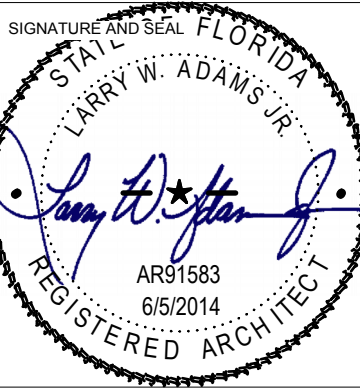
4 WINDOW HEAD DETAIL
A-602 3" = 1'-0"



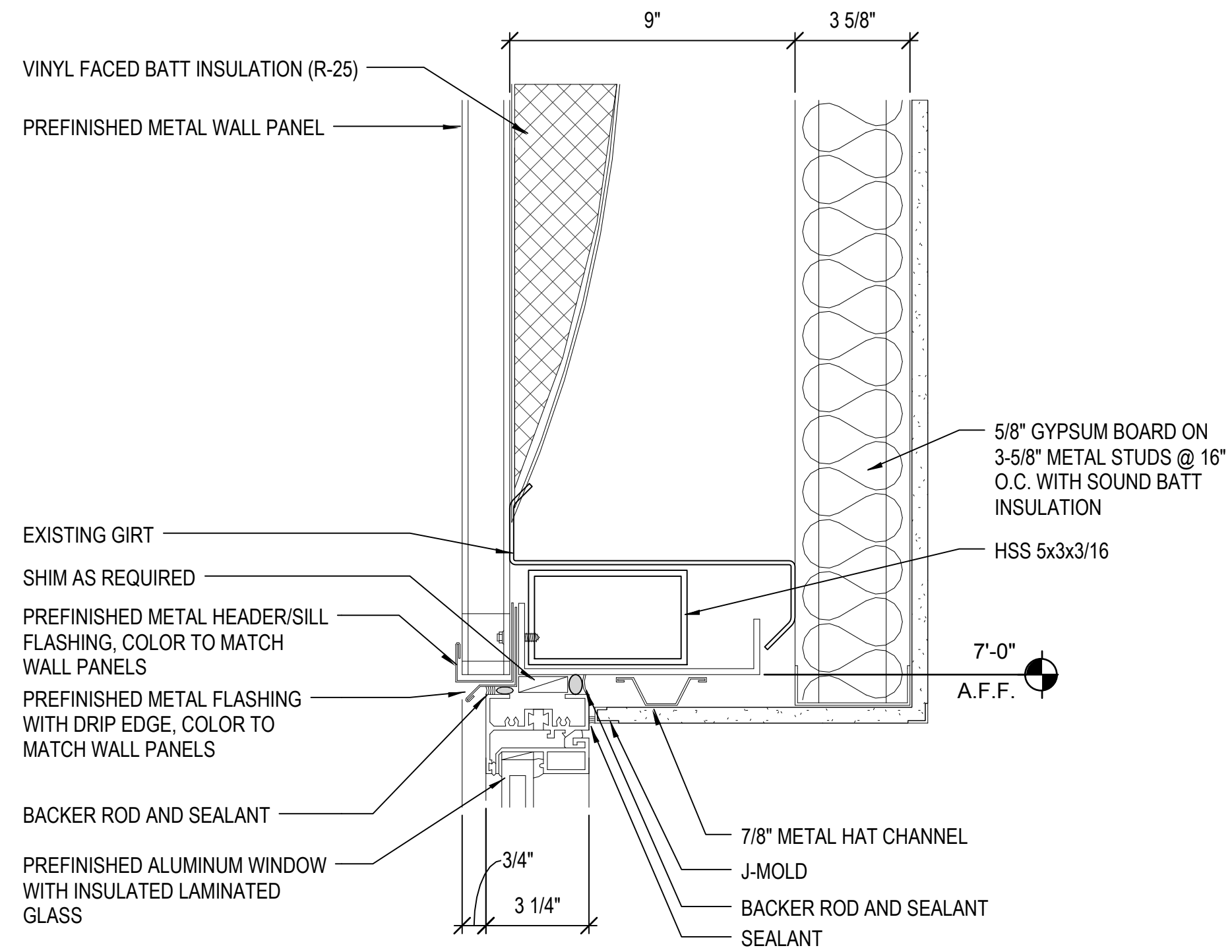
6 WINDOW SILL DETAIL
A-602 3" = 1'-0"



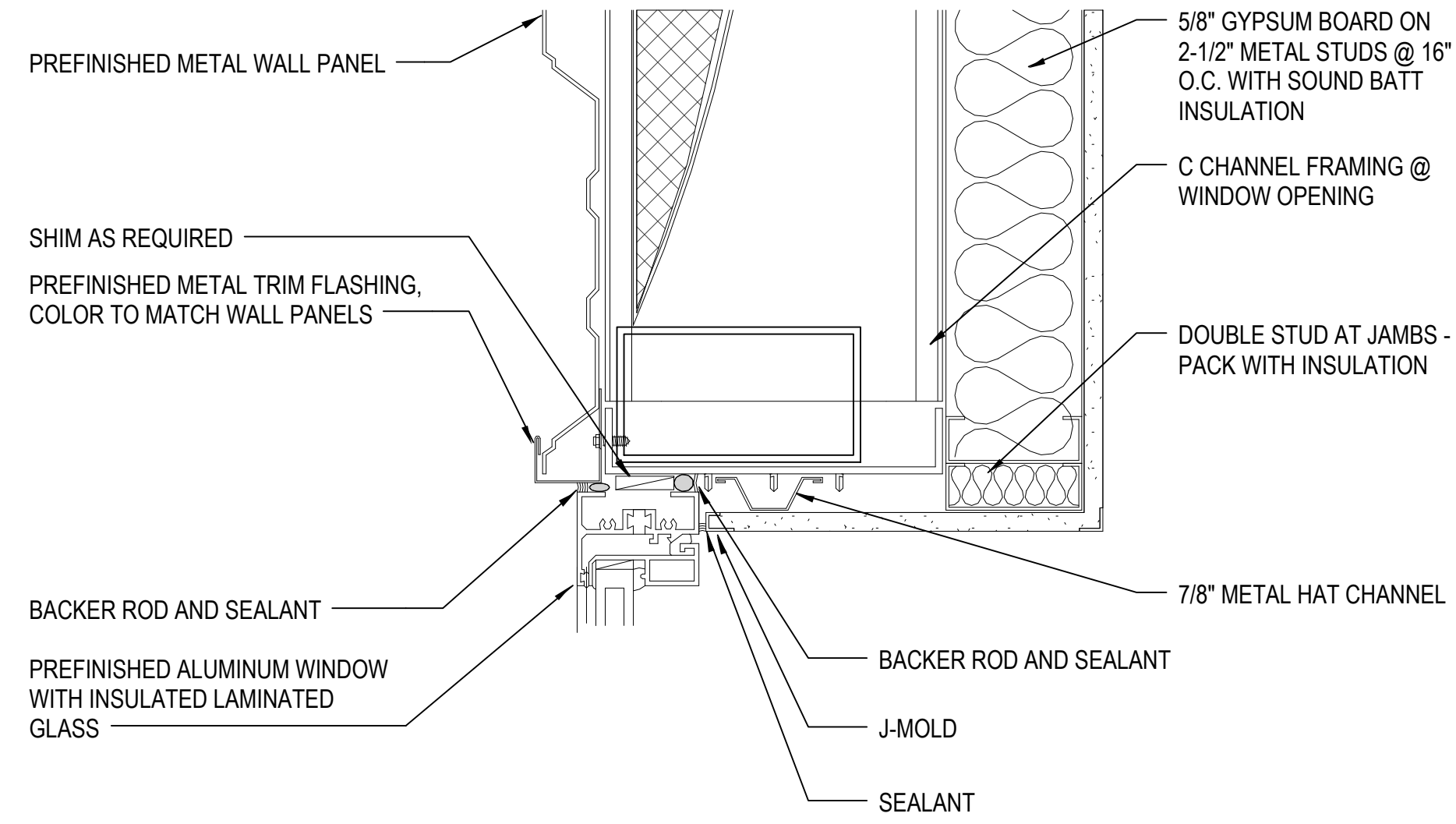
May 2, 2016



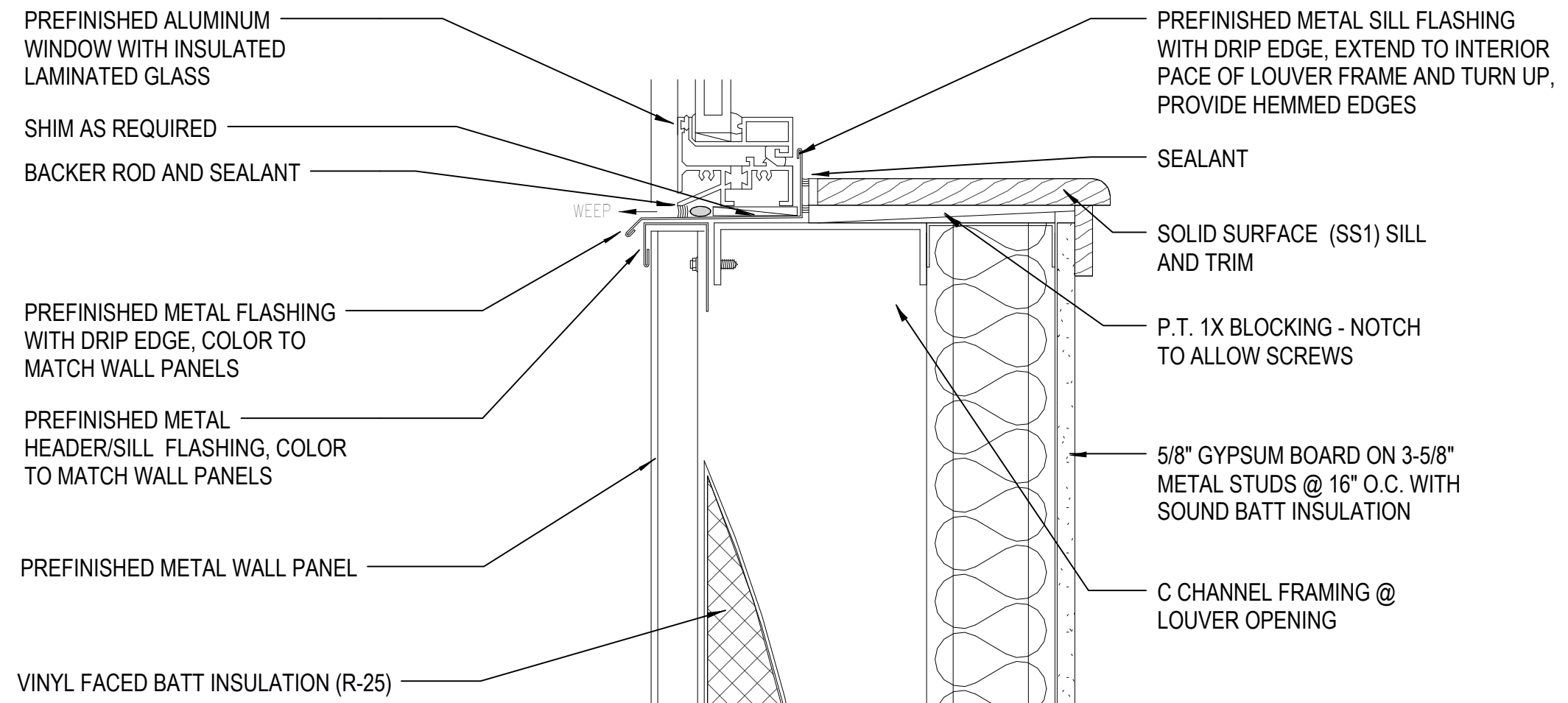
PSC WELDING SHOP
UNDERWOOD AVE. PENSACOLA, FL 32504



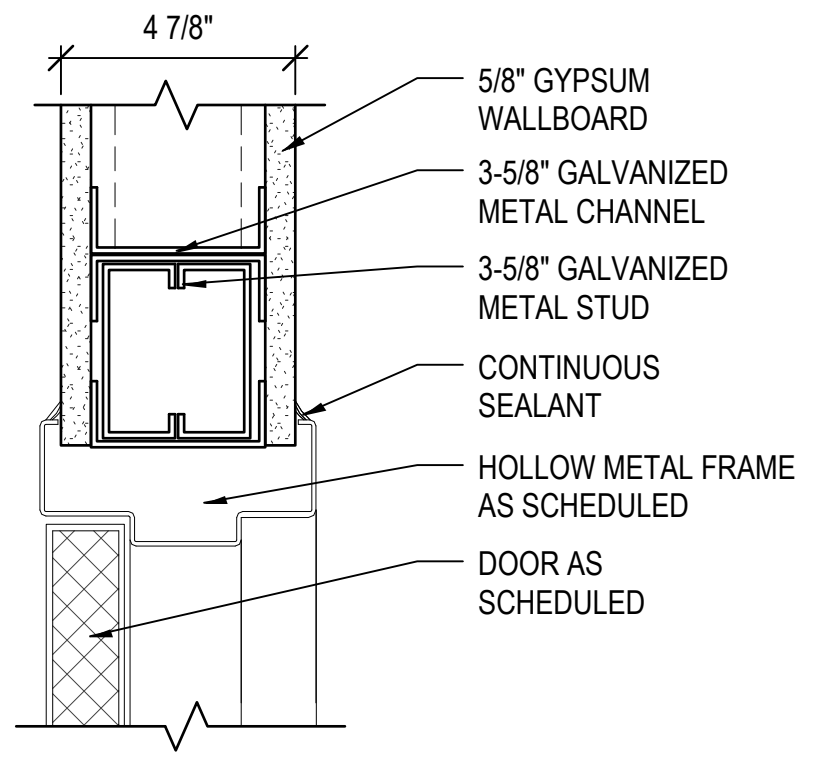
1 WINDOW HEAD DETAIL
A-603 3" = 1'-0"



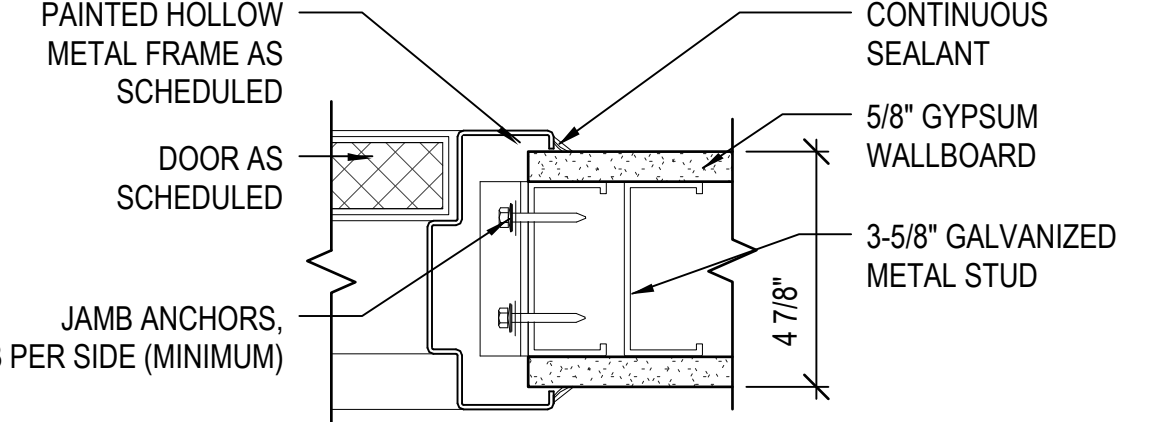
2 WINDOW JAMB DETAIL
A-603 3" = 1'-0"



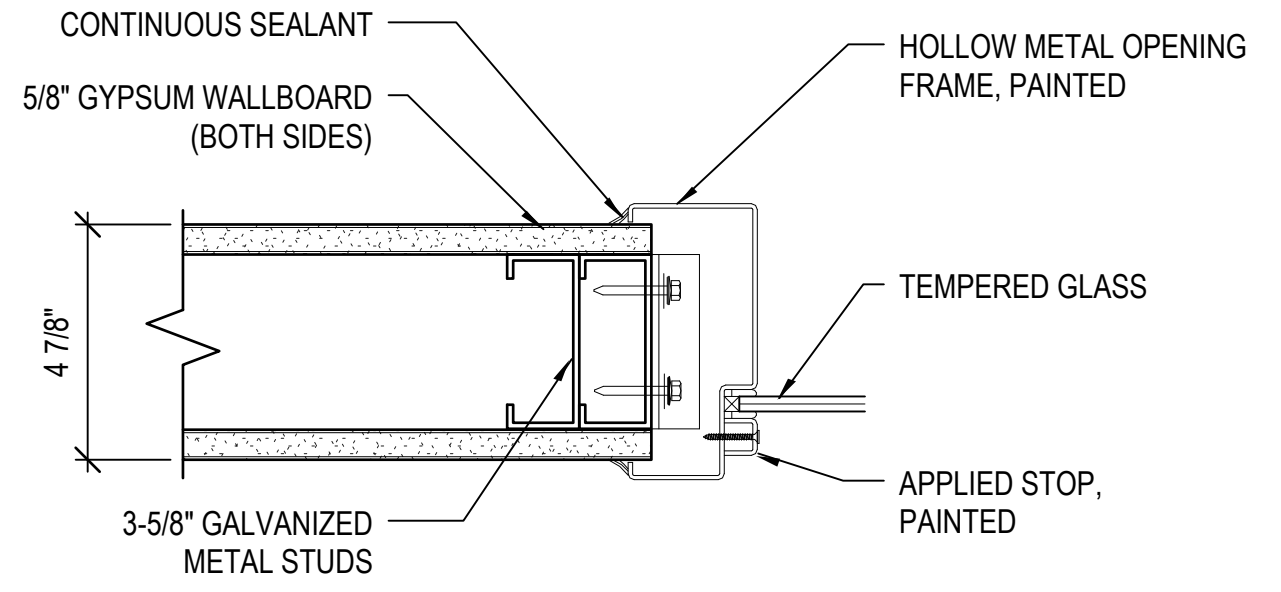
3 WINDOW SILL DETAIL
A-603 3" = 1'-0"



4 DOOR - INT. 3-5/8" HM HEAD
A-603 3" = 1'-0"



5 DOOR - INT. 3-5/8" HM JAMB
A-603 3" = 1'-0"



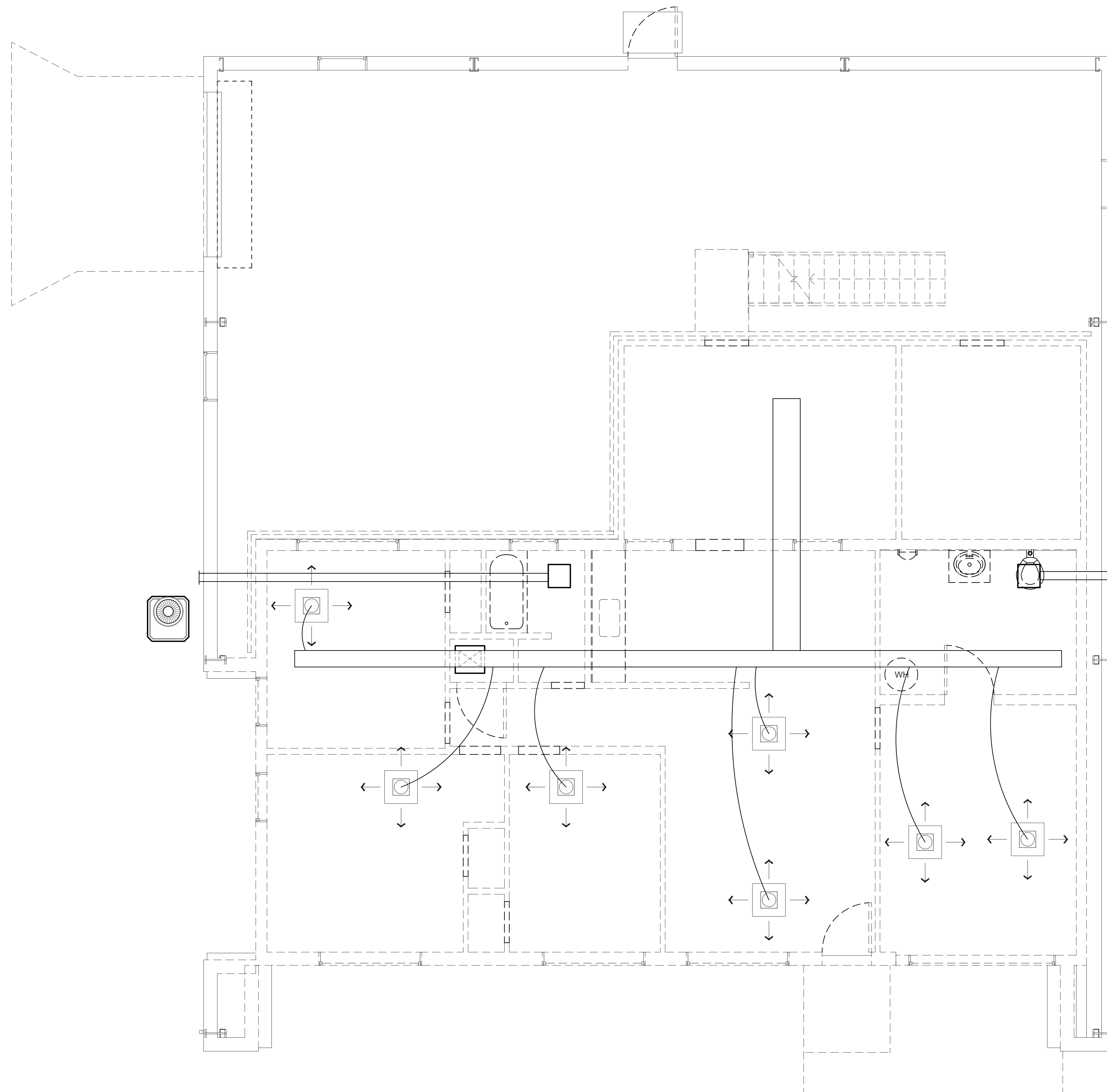
6 INT. CW JAMB - 3 5/8" STUD W/ GWB
A-603 3" = 1'-0"

NO.	REVISIONS:

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
**DOOR AND WINDOW
DETAILS**

SHEET:
A-603



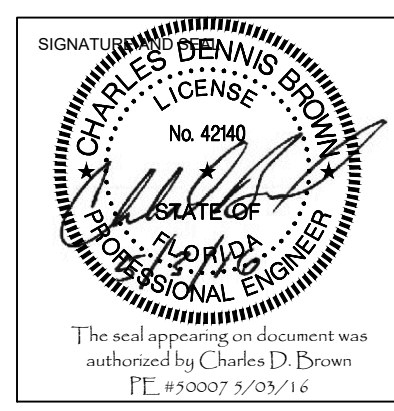
HVAC DEMOLITION PLAN
 SCALE: 1/4" = 1'-0"

GENERAL DEMOLITION NOTES

1. WITHOUT EXCEPTION, ALL ELECTRICAL AND MECHANICAL EQUIPMENT/MATERIALS NOTED TO BE DEMOLISHED IS THE PROPERTY OF THE OWNER AND SHALL BE TURNED OVER TO THE OWNER (DELIVERED TO LOCATION SELECTED BY THE OWNER). IF THE OWNER DOES NOT ELECT TO KEEP THE EQUIPMENT OR MATERIAL, THE CONTRACTOR SHALL REMOVE THAT EQUIPMENT/MATERIAL FROM THE SITE AND LEGALLY DISPOSE OF IT.
2. ALL REFRIGERANT TO BE RECLAIMED AND PROPERLY DISPOSED OF.
3. DEMOLISH ALL MECHANICAL EQUIPMENT WITHIN THE PROJECT AREA COMPLETE WHETHER SPECIFICALLY INDICATED ON THESE PLANS OR NOT, INCLUDING ALL RELATED ACCESSORIES, AND SUPPORT HARDWARE.
4. REMOVE EXISTING SPLIT SYSTEM UNIT (INDOOR AND OUTDOOR) COMPLETE - INCLUDING BUT NOT LIMITED TO DUCTWORK, DIFFUSERS, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, SUPPORT STRUCTURES, STRAPS, THERMOSTATS, CONDUITS, ETC. PATCH WALL/FLOOR/ROOF PENETRATIONS NOT UTILIZED FOR NEW WORK TO MATCH SURROUNDING.
5. DEMOLISH ALL FANS, WALL CAPS AND LOUVERS WITHIN THE PROJECT AREA. DEMOLISH COMPLETE, INCLUDING BUT NOT LIMITED TO LOUVERS, FANS, SLEEVES, ACCESSORIES, CONDUITS, ELECTRICAL, SWITCHES, CONTROL WIRING, ETC. INFILL, INSULATE AND SEAL ALL WALL OPENINGS UNLESS REUSED ON NEW WORK, SEE NEW WORK PLANS. SEE ARCHITECTURAL FOR ADDITIONAL DETAILS.
6. DEMOLISH ALL ROOF MOUNTED FANS, CAPS AND LOUVERS WITHIN THE PROJECT AREA. DEMOLISH COMPLETE, INCLUDING BUT NOT LIMITED TO ROOF CAPS, FANS, SLEEVES, ACCESSORIES, CONDUITS, ELECTRICAL, SWITCHES, CONTROL WIRING, ETC. INFILL, INSULATE AND SEAL ALL ROOF OPENINGS UNLESS REUSED ON NEW WORK, SEE NEW WORK PLANS. SEE ARCHITECTURAL FOR ADDITIONAL DETAILS.
7. DEMOLISH ALL HOT WATER HEATERS AND PIPING WITHIN THE PROJECT AREA. DEMOLISH ALL ASSOCIATED PIPING AND HANGARS WITHIN THE PROJECT AREA. DEMOLISH HEATERS AND PIPING COMPLETE, INCLUDING BUT NOT LIMITED TO HEATERS, PIPING, SLEEVES, SUPPORT HARDWARE, HANGARS, ACCESSORIES, CONDUITS, ELECTRICAL, SWITCHES, CONTROL WIRING, ETC. INFILL, INSULATE AND SEAL ALL WALL/FLOOR/ROOF OPENINGS UNLESS REUSED ON NEW WORK, SEE NEW WORK PLANS. SEE ARCHITECTURAL FOR ADDITIONAL DETAILS.



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PSC WELDING SHOP

UNDERWOOD AVE., PENSACOLA, FL, 32504

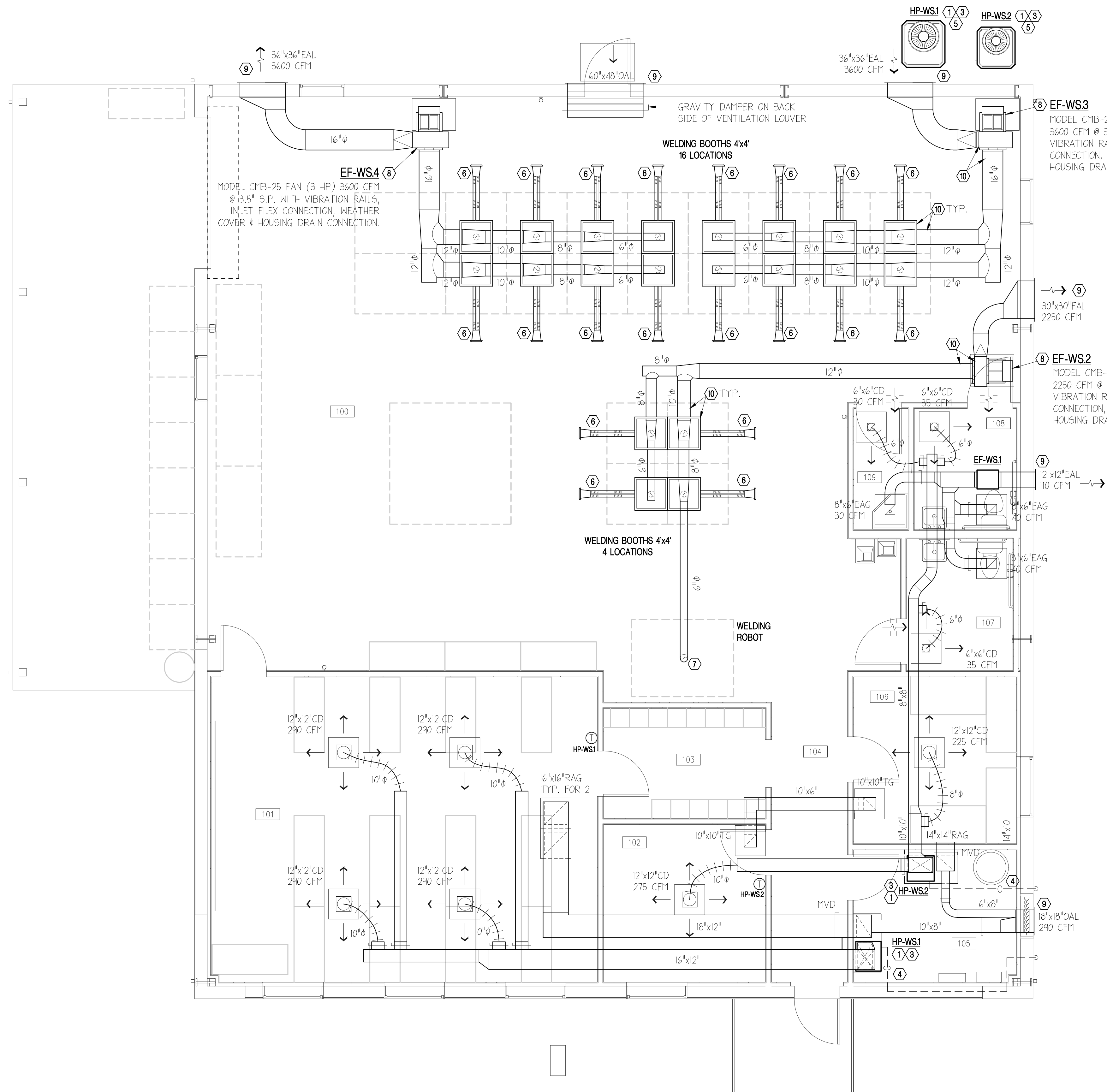
REVISIONS

BTA PROJECT NO: 142615.02
 SHEET DATE: 05/02/16

SHEET TITLE:
HVAC DEMOLITION

SHEET:
M-100

Premier
 Engineering Group, LLC
Brown, Cook & Galley
 410 W. Nine Mile Road, Suite A, Pensacola, Florida 32534
 Florida Certificate of Authorization #9306
 Phone: (850) 469-0405 Fax: (850) 432-0905
 Premier Project #15063



KEY NOTES:

- 1 PROVIDE ENGRAVED TAG ON THE FRONT OF ALL MECHANICAL EQUIPMENT (INDOOR AND OUTDOOR). SEE "TYPICAL MECHANICAL EQUIPMENT ENGRAVED TAG DETAIL."
- 2 PROVIDE 4" THICK CONCRETE EQUIPMENT PAD 4" LARGER (ALL SIDES) THAN MECHANICAL EQUIPMENT. PAD SHALL HAVE 3/4" CHAMFER EDGES, PAINT VERTICAL EDGES OF CONCRETE FOUNDATION PAD WITH YELLOW PAINT.
- 3 ROUTE REFRIGERANT PIPING INTO INSIDE OF MECHANICAL ROOM AND THEN TO EACH AIR HANDLER. SEE FLOORPLANS ON THIS SHEET FOR AIR HANDLER LOCATIONS. INSULATE ENTIRE LENGTH OF EACH REFRIGERANT SUCTION PIPE WITH 3/4" THICK FLEXIBLE UNICELLULAR INSULATION. COORDINATE EXACT LOCATIONS OF ALL REFRIG. PIPE SLEEVES IN THE FIELD WITH THE ARCHITECT PRIOR TO POURING MECHANICAL PAD. COORDINATE SLEEVES WITH OTHER TRADES IN THE FIELD PRIOR TO POURING THE SLAB.
- 4 ROUTE 1-1/4" CONDENSATE PIPING TO EXTERIOR EAST WALL AND SPILL ON GRADE. PROVIDE REMOVABLE CLEANOUTS AT CHANGES OF DIRECTION IN CONDENSATE PIPING.
- 5 OUTDOOR UNITS SHALL HAVE VERTICAL AND HORIZONTAL CLEARANCES, INCLUDING DISTANCE FROM ADJACENT UNITS FOR SERVICE AND AIRFLOW AS RECOMMENDED BY THE MANUFACTURER. COORDINATE ACTUAL PAD DIMENSIONS BASED ON REQUIRED UNIT SPACING.
- 6 CAR-MON MODEL WX5-055 WELDING EXHAUST ARM WITH HAND DAMPER & CEILING PLATFORM. LOCATE ABOVE WELDING BOOTHS.
- 7 CAR-MON MODEL WX5-055 WELDING EXHAUST ARM WITH HAND DAMPER & CEILING PLATFORM. LOCATE ABOVE WELDING ROBOT.
- 8 PROVIDE FAN WITH WALL MOUNTING BRACE AND PROVIDE STRUCTURAL BRACING TO SUPPORT FAN FROM METAL BUILDING SYSTEM.
- 9 SEE ARCHITECTURAL FOR LOUVER MOUNTING HEIGHT.
- 10 MOUNT EQUIPMENT AND DUCTWORK UP HIGH, PROVIDE ADDITIONAL STRUCTURE TO SUPPORT FROM BUILDING STRUCTURE.

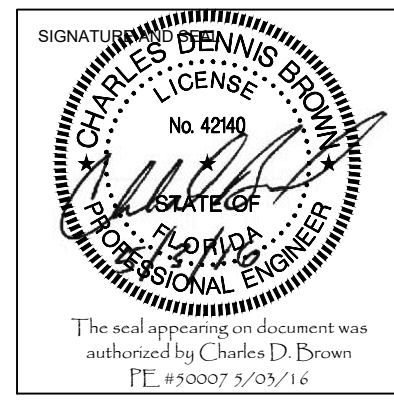
UNIT TYPICAL NOTES:

- TYPICAL ALL UNITS, SEE SCHEDULES FOR CAPACITIES AND BASIS OF DESIGN.
- ALL INDOOR UNITS:
- PROVIDE MANUAL VOLUME DAMPER IN VERTICAL SECTION OF THE RETURN AIR DUCTWORK, SEE "SPLIT SYSTEM INDOOR UNIT INSTALLATION DETAIL" ON SHEET M402.
 - PROVIDE ENGRAVED TAG ON THE FRONT OF ALL MECHANICAL EQUIPMENT (INDOOR AND OUTDOOR). SEE "TYPICAL MECHANICAL EQUIPMENT ENGRAVED TAG DETAIL."
 - ROUTE REFRIGERANT PIPING INTO INSIDE OF MECHANICAL ROOM AND THEN TO EACH AIR HANDLER. SEE FLOORPLANS ON THIS SHEET FOR AIR HANDLER LOCATIONS. INSULATE ENTIRE LENGTH OF EACH REFRIGERANT SUCTION PIPE WITH 3/4" THICK FLEXIBLE UNICELLULAR INSULATION. COORDINATE EXACT LOCATIONS OF ALL REFRIG. PIPE SLEEVES IN THE FIELD WITH THE ARCHITECT PRIOR TO POURING MECHANICAL PAD. COORDINATE SLEEVES WITH OTHER TRADES IN THE FIELD PRIOR TO POURING THE SLAB.
- ALL OUTDOOR UNITS:
- OUTDOOR UNITS SHALL HAVE VERTICAL AND HORIZONTAL CLEARANCES, INCLUDING DISTANCE FROM ADJACENT UNITS FOR SERVICE AND AIRFLOW AS RECOMMENDED BY THE MANUFACTURER. COORDINATE ACTUAL PAD DIMENSIONS BASED ON REQUIRED UNIT SPACING.
 - PROVIDE 4" THICK CONCRETE EQUIPMENT PAD 4" LARGER (ALL SIDES) THAN MECHANICAL EQUIPMENT UNLESS INDICATED OTHERWISE (I.E. EQUIPMENT MOUNTED ON ISOLATED CONCRETE FOUNDATION).
 - PROVIDE ENGRAVED TAG ON THE FRONT OF ALL MECHANICAL EQUIPMENT (INDOOR AND OUTDOOR). SEE "TYPICAL MECHANICAL EQUIPMENT ENGRAVED TAG DETAIL."

HVAC NEW WORK PLAN
SCALE: 1/4" = 1'-0"



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PSC WELDING SHOP

UNDERWOOD AVE., PENSACOLA, FL, 32504

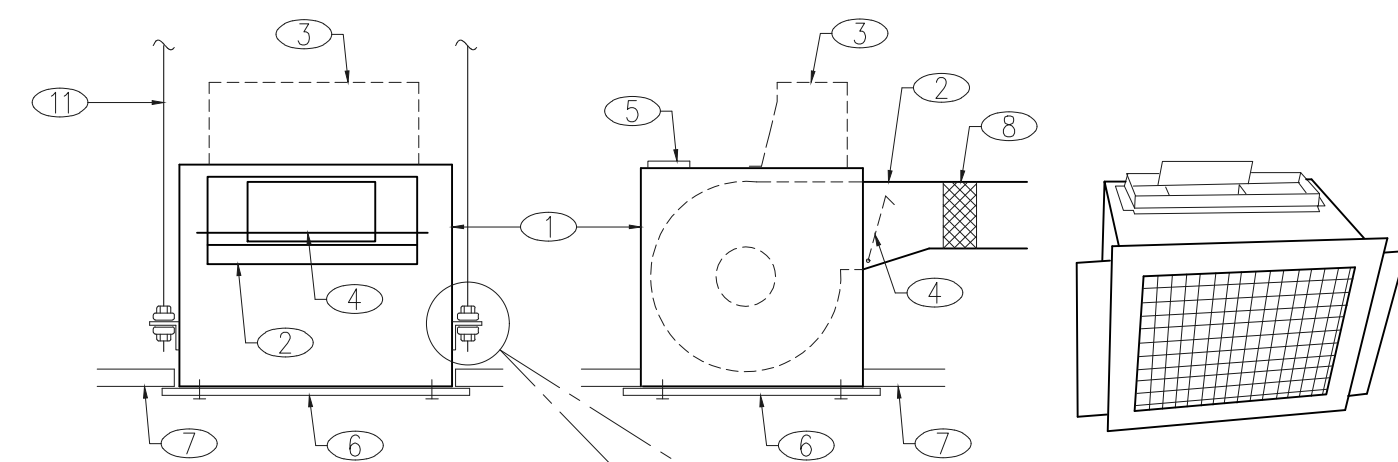
REVISIONS

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
HVAC NEW WORK FLOORPLAN

SHEET:
M-110

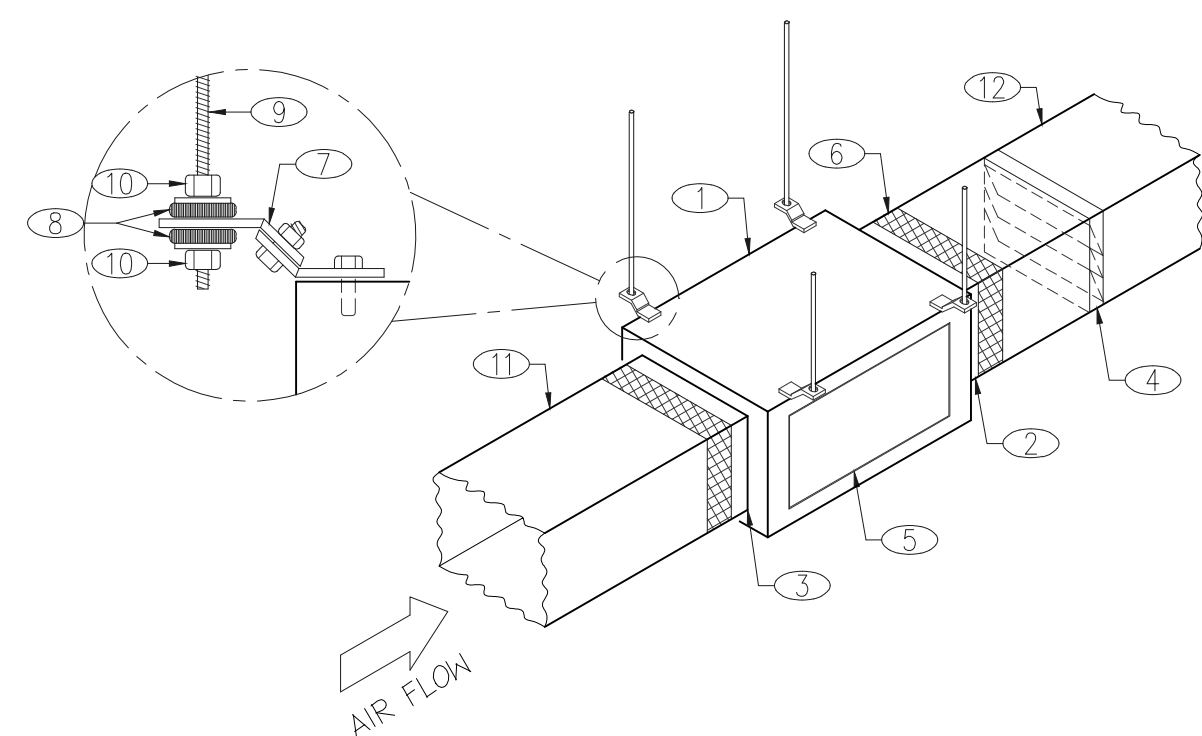
Premier
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Brown, Cook & Gaffey
410 W. Nine Mile Road, Suite A, Pensacola, Florida 32534
Florida Certificate of Authorization #P3008
Phone: (850) 469-0405 Fax: (850) 432-0905
Premier Project #15063



- ① GALVANIZED STEEL HOUSING
- ② HORIZONTAL DISCHARGE DUCT CONNECTION
- ③ OPTIONAL VERTICAL DISCHARGE
- ④ BACKDRAFT DAMPER
- ⑤ EXTERNAL ELECTRICAL ACCESS COVER
- ⑥ REMOVABLE CEILING GRILLE
- ⑦ CEILING CONSTRUCTION
- ⑧ FLEXIBLE DUCT CONNECTOR
- ⑨ ADJUSTABLE MOUNTING FLANGE
- ⑩ VIBRATION ISOLATOR, TOP AND BOTTOM
- ⑪ 3/16" DIAMETER THREADED HANGER RODS, TOTAL OF FOUR, SUPPORT FROM BUILDING STRUCTURE
- ⑫ NUT AND WASHER

CEILING EXHAUST FAN INSTALLATION DETAIL

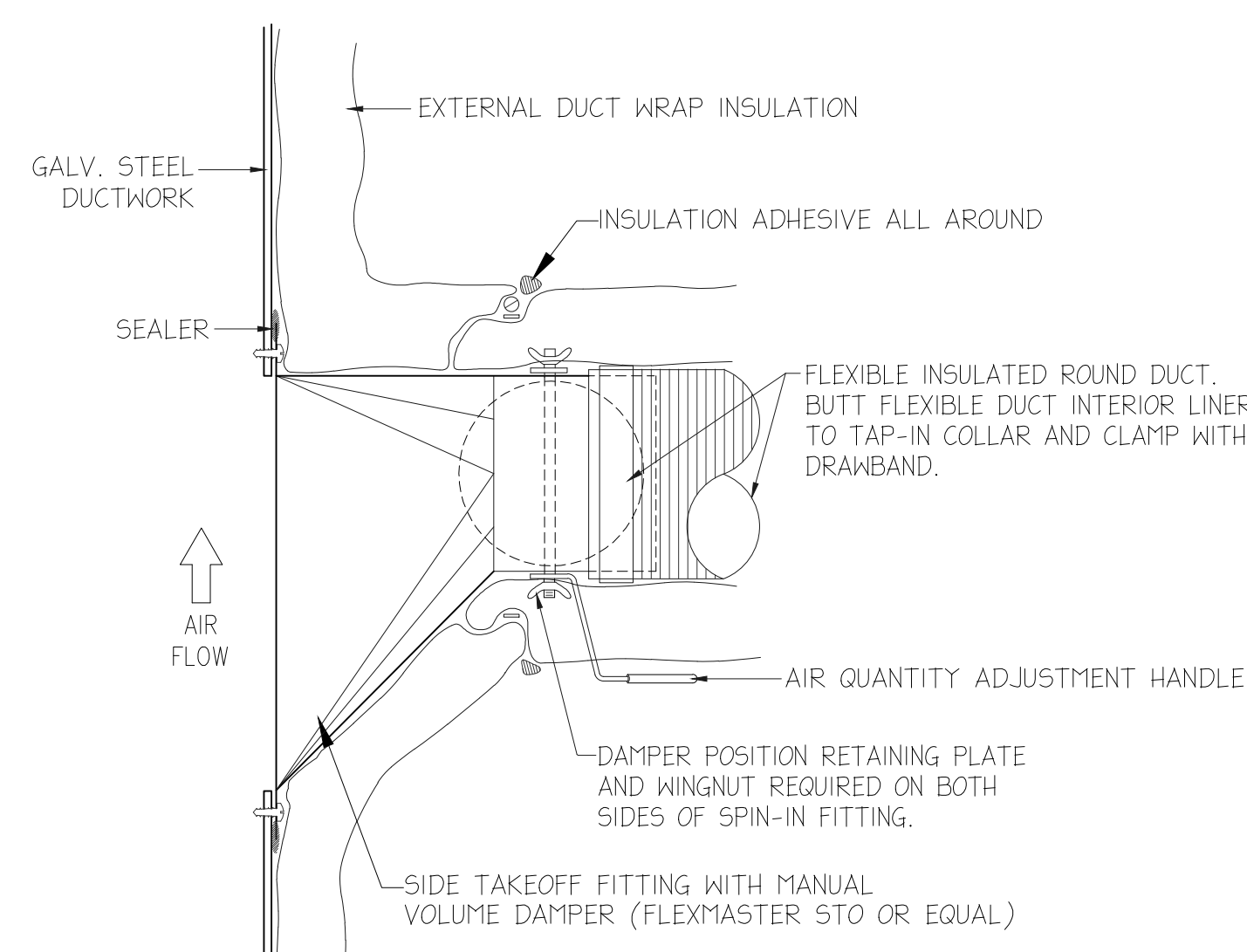
NOT TO SCALE



- ① GALVANIZED STEEL HOUSING
- ② HORIZONTAL DISCHARGE COLLAR
- ③ HORIZONTAL INLET COLLAR
- ④ GRAVITY BACKDRAFT DAMPER
- ⑤ ACCESS PANEL (BOTH SIDES)
- ⑥ FLEXIBLE DUCT CONNECTOR
- ⑦ MOUNTING ANGLE BRACKET
- ⑧ VIBRATION ISOLATOR, TOP & BOTTOM
- ⑨ ALL THREADED HANGER ROD, TOTAL OF FOUR, SUPPORT FROM BUILDING STRUCTURE, SIZE PER MANUFACTURER'S RECOMMENDATION
- ⑩ NUT AND WASHER
- ⑪ INLET DUCT
- ⑫ DISCHARGE DUCT

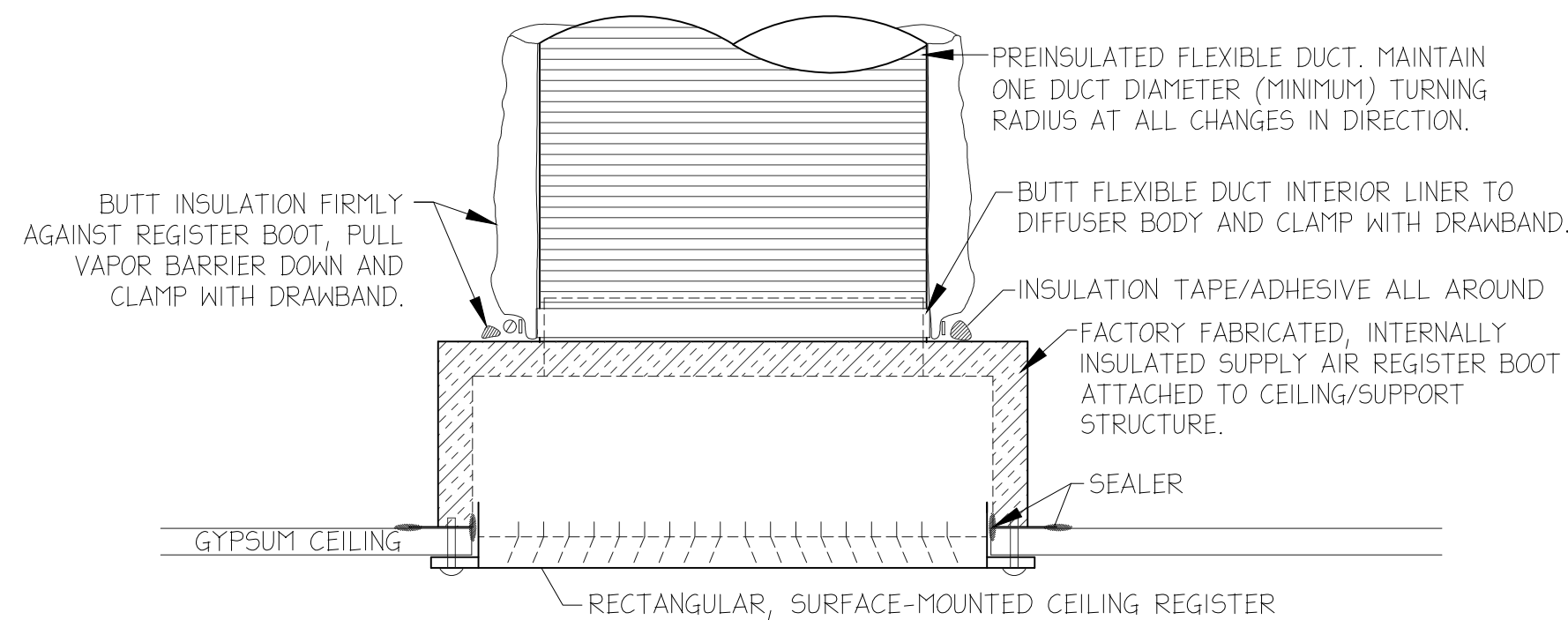
CENTRIFUGAL SQUARE INLINE FAN INSTALLATION DETAIL

NOT TO SCALE



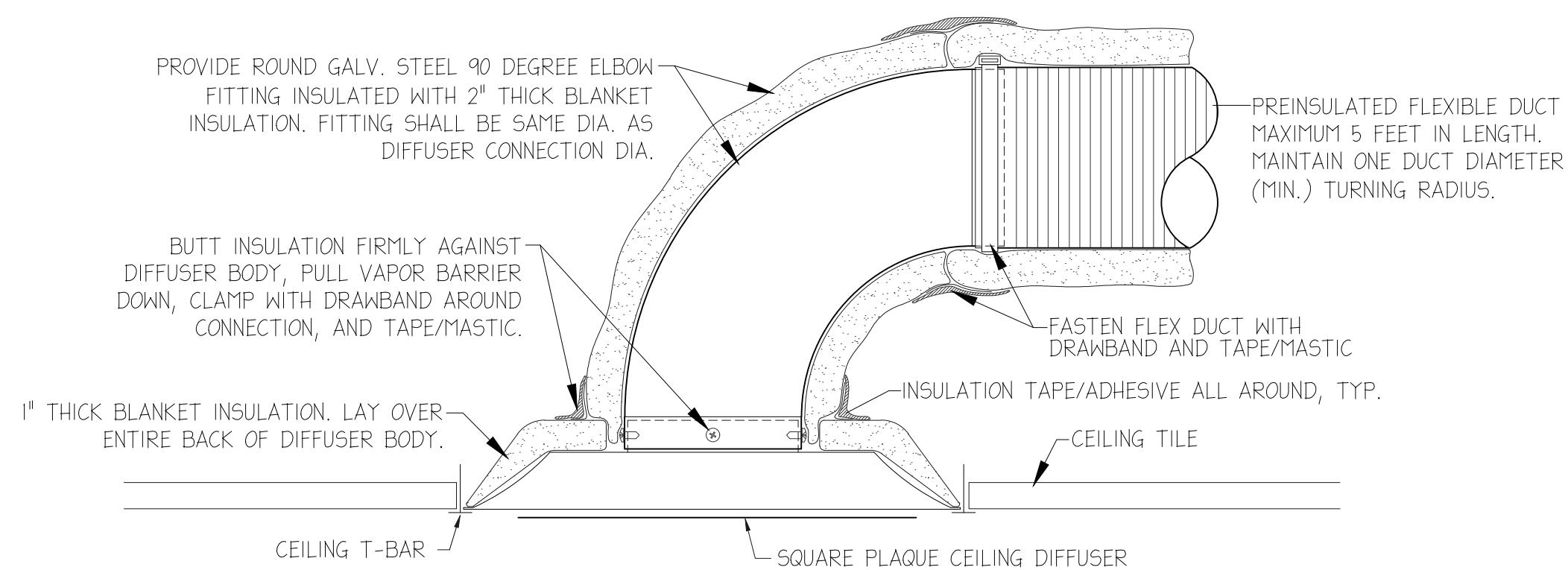
ROUND DUCT TAP-IN MOUNTING DETAIL

NOT TO SCALE



GYPSUM CEILING AIR REGISTER INSTALLATION DETAIL

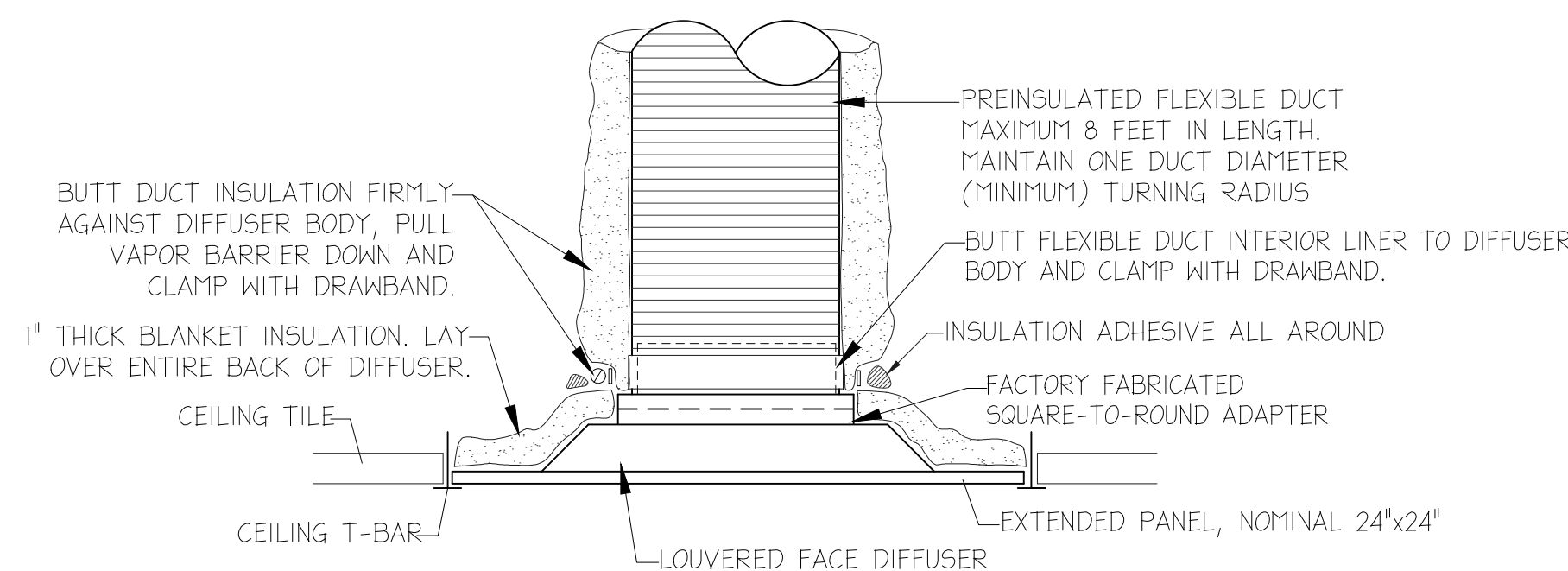
NOT TO SCALE



CEILING DIFFUSER INSTALLATION DETAIL

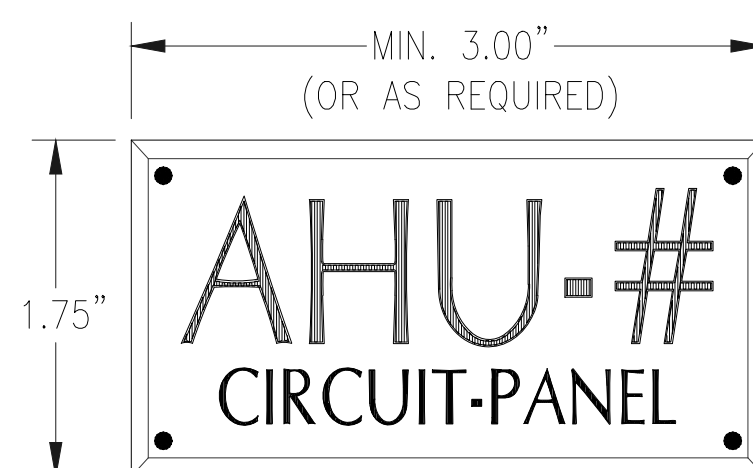
NOT TO SCALE

(FOR TIGHT CEILING SPACES)



TYPICAL LOUVERED FACE CEILING DIFFUSER MOUNTING DETAIL

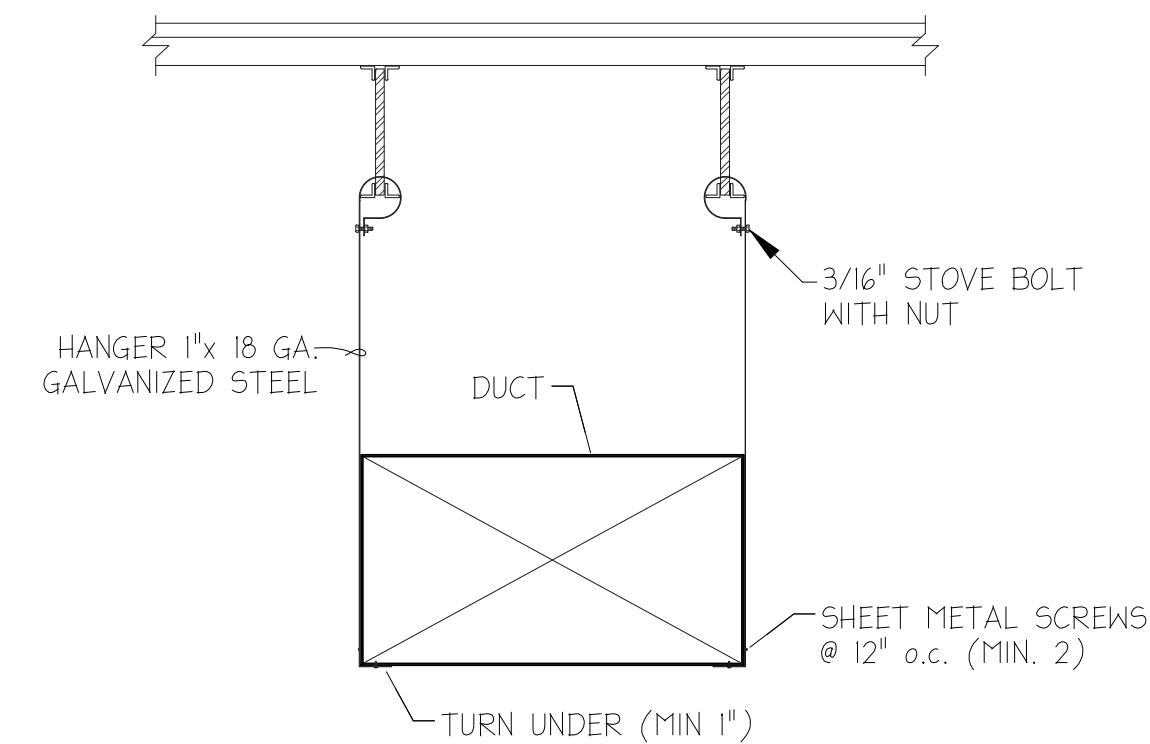
NOT TO SCALE



ENGRAVED PLASTIC TAG WITH 1" HIGH WHITE LETTERS ON BLACK BACKGROUND. TAG SHALL HAVE ALL EDGES BEVELED AND SMOOTH. SECURE TAG WITH STAINLESS POP RIVETS AT VISIBLE LOCATION ON MECHANICAL EQUIPMENT. LABEL ALL INDOOR AND OUTDOOR EQUIPMENT WITH NOTATION SHOWN ON PLANS.

TYPICAL EQUIPMENT ENGRAVED TAG DETAIL

NOT TO SCALE

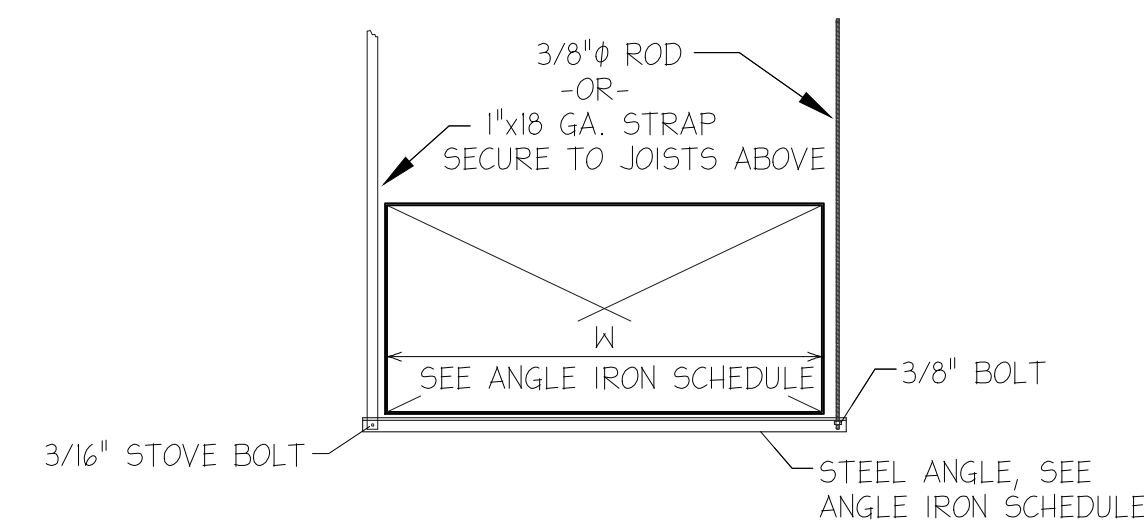


TYPICAL DUCTWORK HANGER DETAIL

NOT TO SCALE

TYPE-1 (DUCT WIDTH 30" AND LESS)

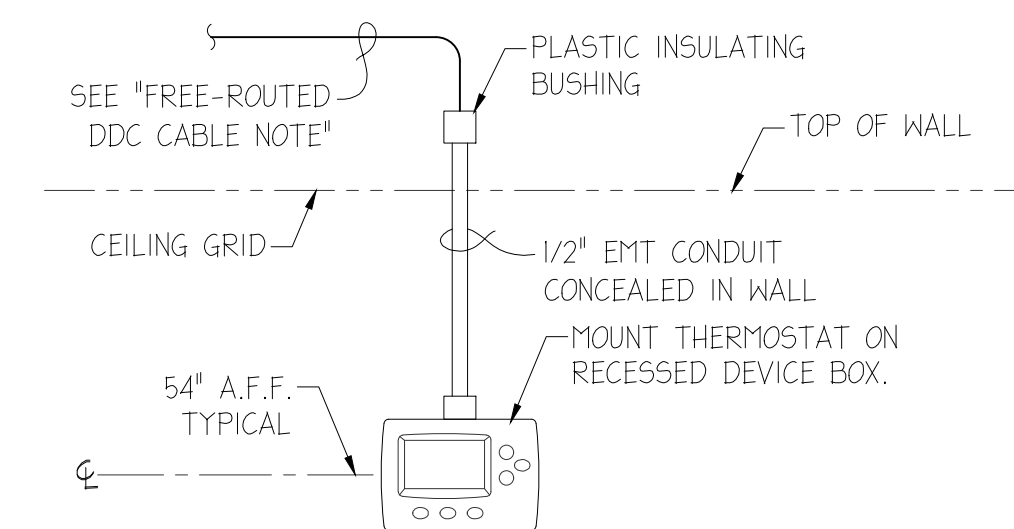
ANGLE IRON SCHEDULE	
W	ANGLE SIZE
31" THRU 42"	1-1/2" x 1-1/2" x 1/8"
43" THRU 60"	1-1/2" x 1-1/2" x 1/8"
61" THRU 84"	2" x 2" x 1/4"
85" & OVER	2" x 2" x 1/4"



TYPICAL DUCTWORK HANGER DETAIL

NOT TO SCALE

TYPE-2 (DUCT WIDTH 31" AND OVER)



TYPICAL SPACE THERMOSTAT INSTALLATION DETAIL

NOT TO SCALE

NEW WALLS

REVISIONS

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:

HVAC DETAILS

SHEET:

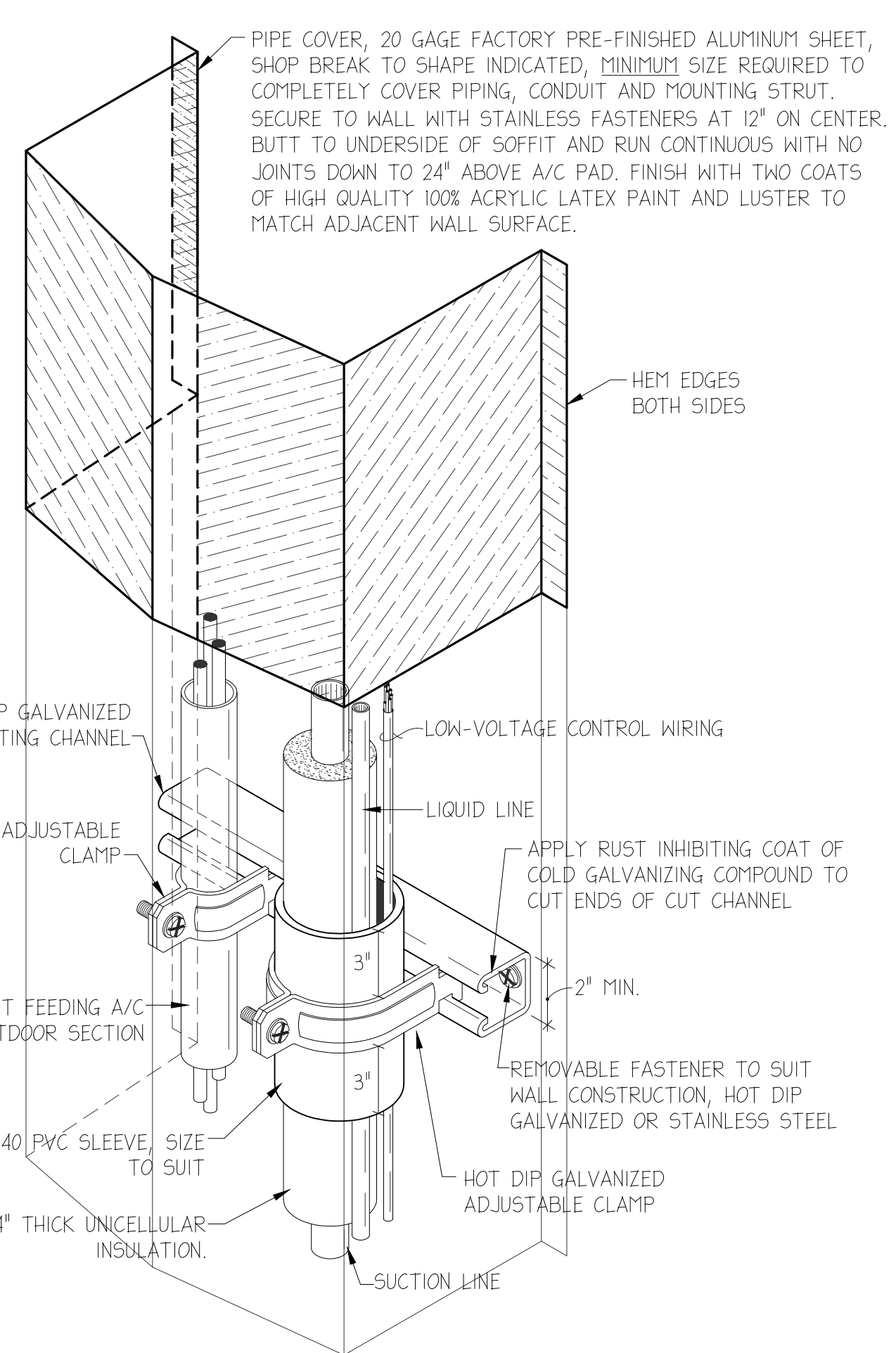
M-501

REVISIONS	

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

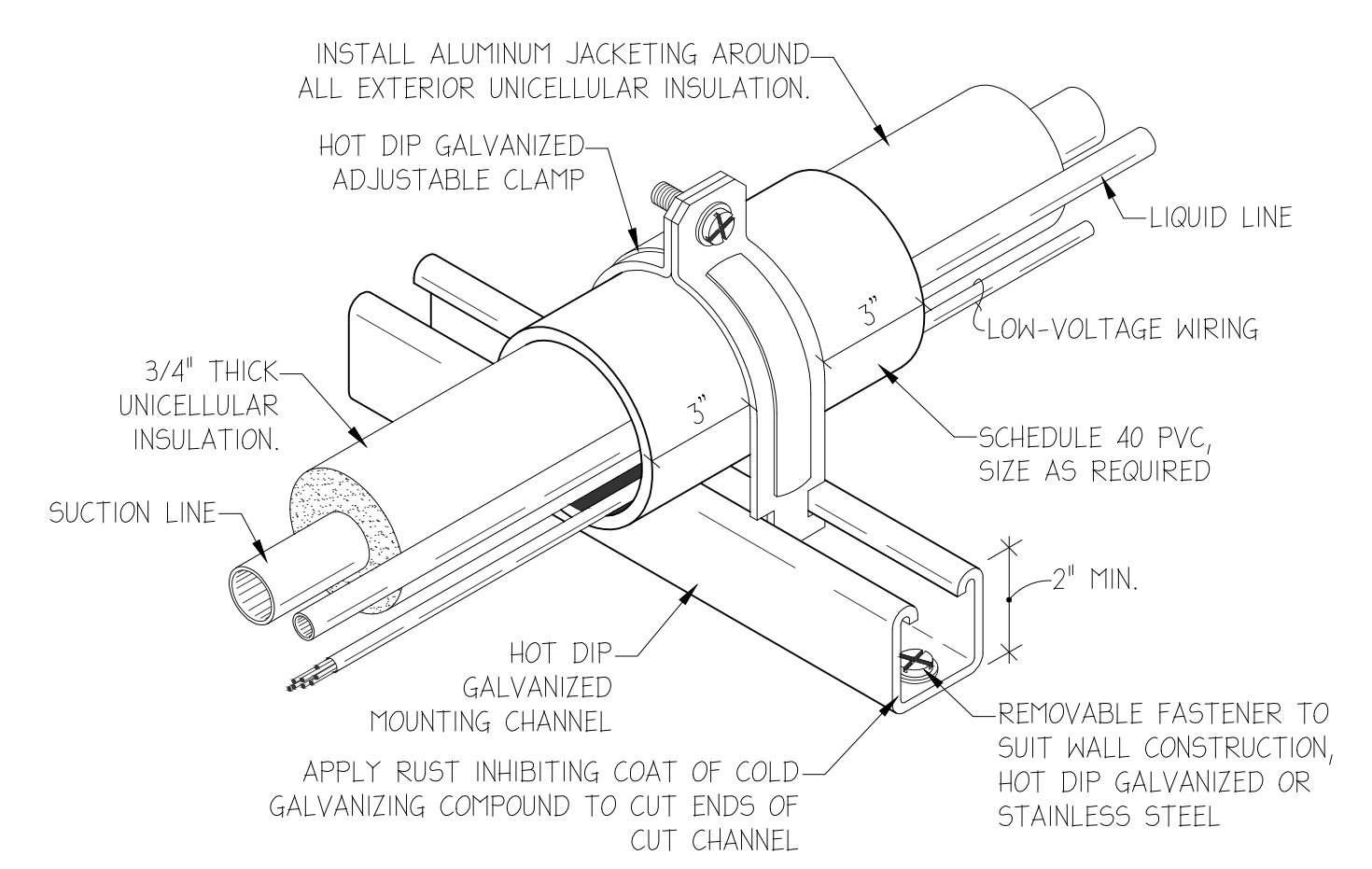
SHEET TITLE:
HVAC DETAILS

SHEET:
M-502



REFRIGERANT PIPE MOUNTING DETAIL
NOT TO SCALE
EXTERIOR WALL APPLICATION

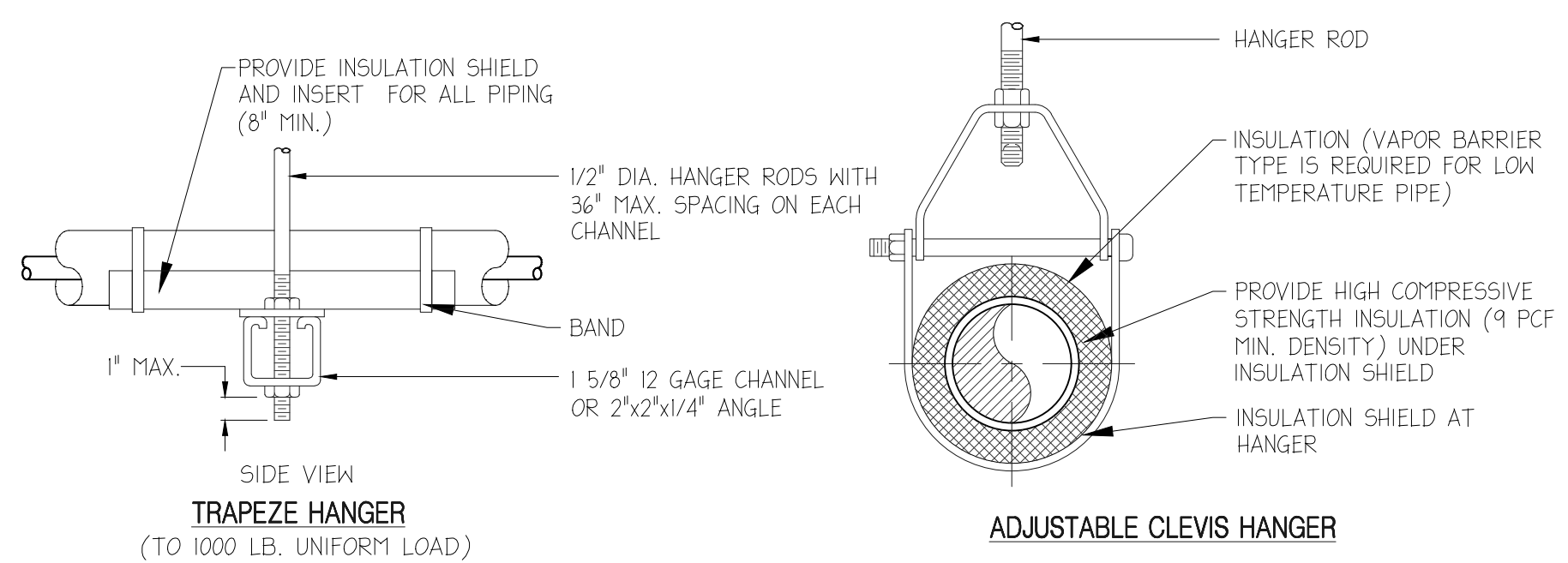
NOTE !
RUN PIPING AND CONDUIT AS CLOSE TOGETHER AS PRACTICAL, AND SIZE ALUMINUM PIPE COVER AS SMALL AS POSSIBLE. WHERE CONDENSATE DRAIN IS SHOWN TURNING DOWN OUTSIDE OF EXTERIOR WALL ALONG WITH PIPING, SIZE COVER TO CONCEAL CONDENSATE DRAIN ALONG WITH PIPING AND CONDUIT.



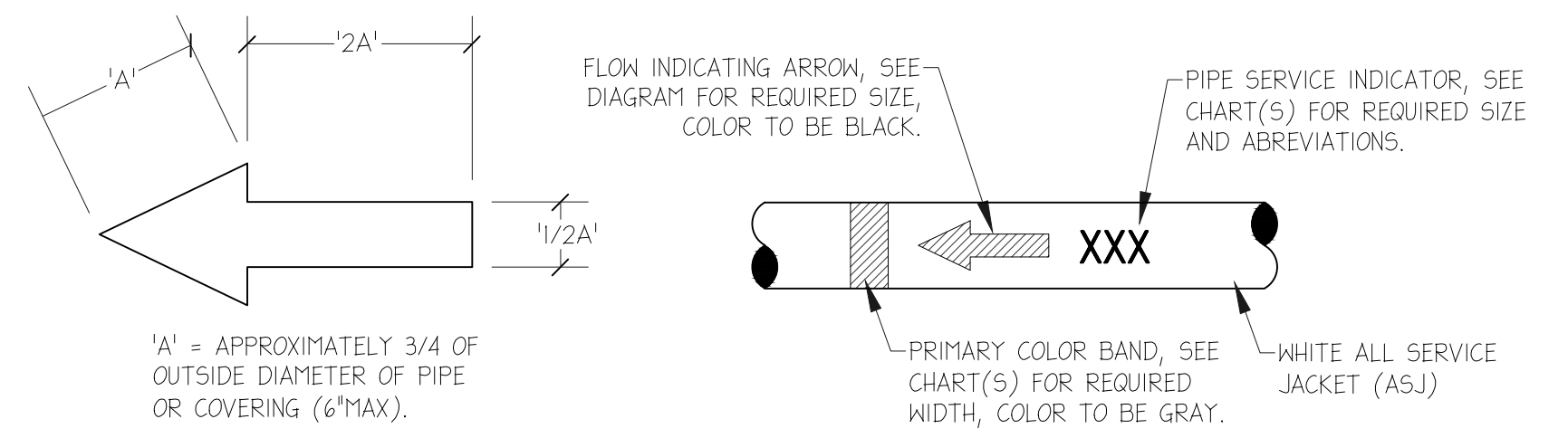
REFRIGERANT PIPE MOUNTING DETAIL
NOT TO SCALE

MAXIMUM PIPE/TUBING SUPPORT SPACING											
NOM. SIZE	IN.	THRU 3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"
PIPE	FT.	7	7	7	9	10	11	12	14	16	17
TUBING	FT.	5	6	7	8	8	9	10	12	13	14

NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.



TYPICAL PIPE HANGER INSTALLATION DETAIL
NOT TO SCALE

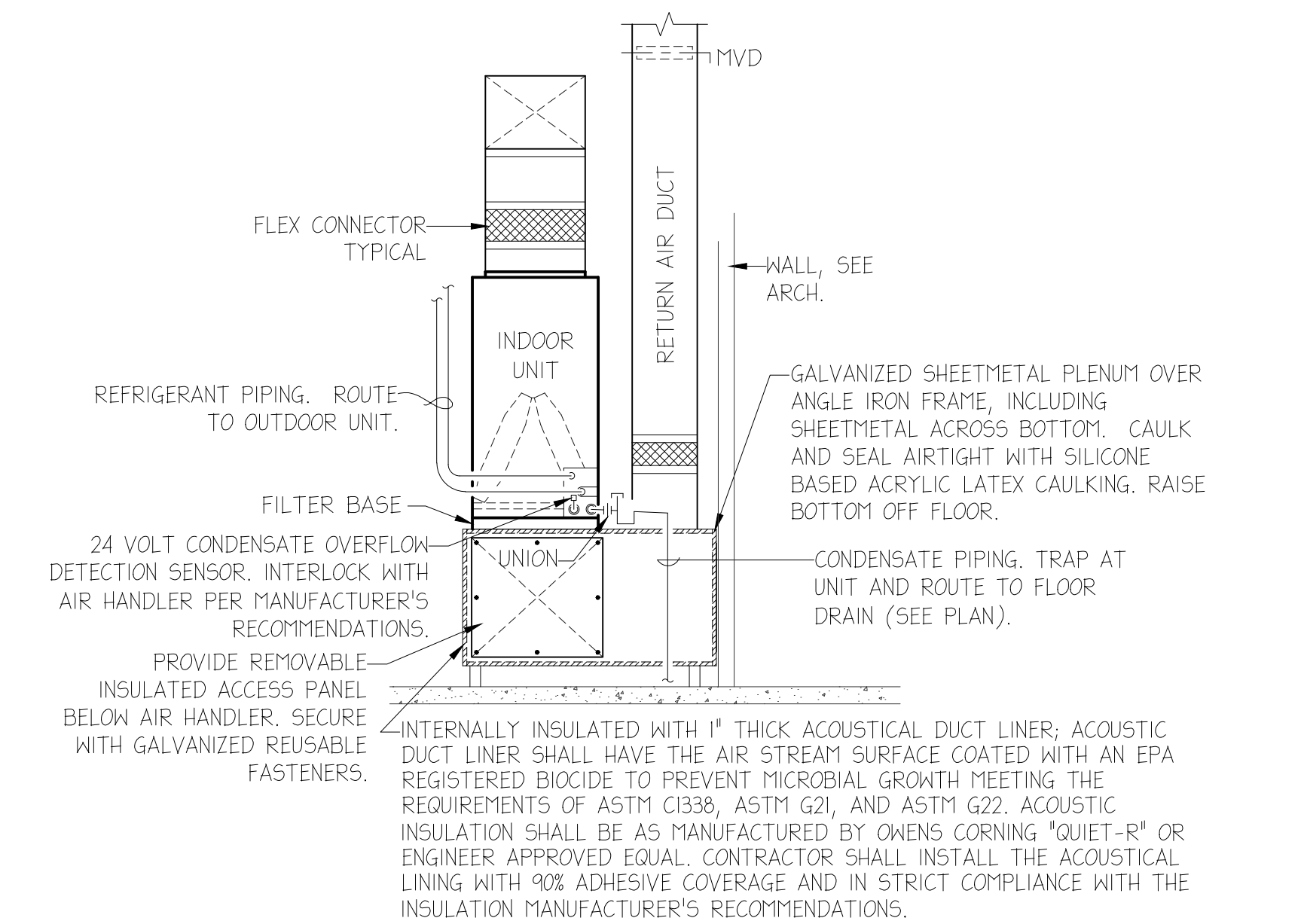


REQUIRED SIZE OF STENCIL LETTERS & WARNING BANDS		
O.D. OF PIPE OR OUTER COVER	HT. OF LETTERS (IN.)	WIDTH OF BAND
LESS THAN 1-1/2"	1/2"	1"
1-1/2" TO 3-1/2"	3/4"	1"
3-1/2" TO 6"	1-1/4"	2"
6" TO 9"	2"	2"
9" TO 13"	3"	2"
OVER 13"	3-1/2"	6"

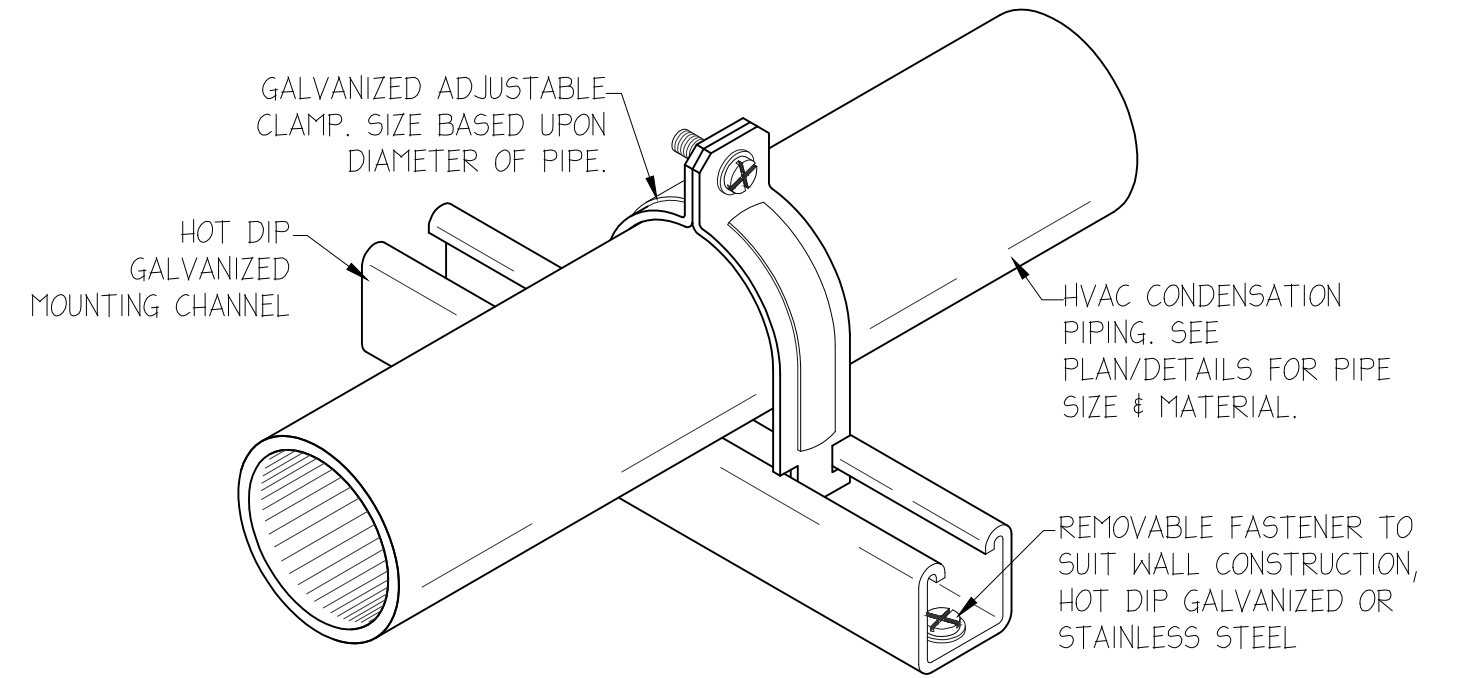
PIPE SERVICE ABBREVIATIONS	
PIPE SERVICE	ABBREVIATION
CHILLED WATER SUPPLY / RETURN	CWS / CWR
HEATING WATER SUPPLY / RETURN	HWS / HWR

Notes
1 LOCATE BANDS, SERVICE INDICATOR AND FLOW ARROW EVERY 10'-0", ADJACENT TO ALL OPERATING ACCESSORIES (VALVES, STRAINERS, PUMPS, ETC) AND WHERE PIPE PASSES THROUGH WALLS.

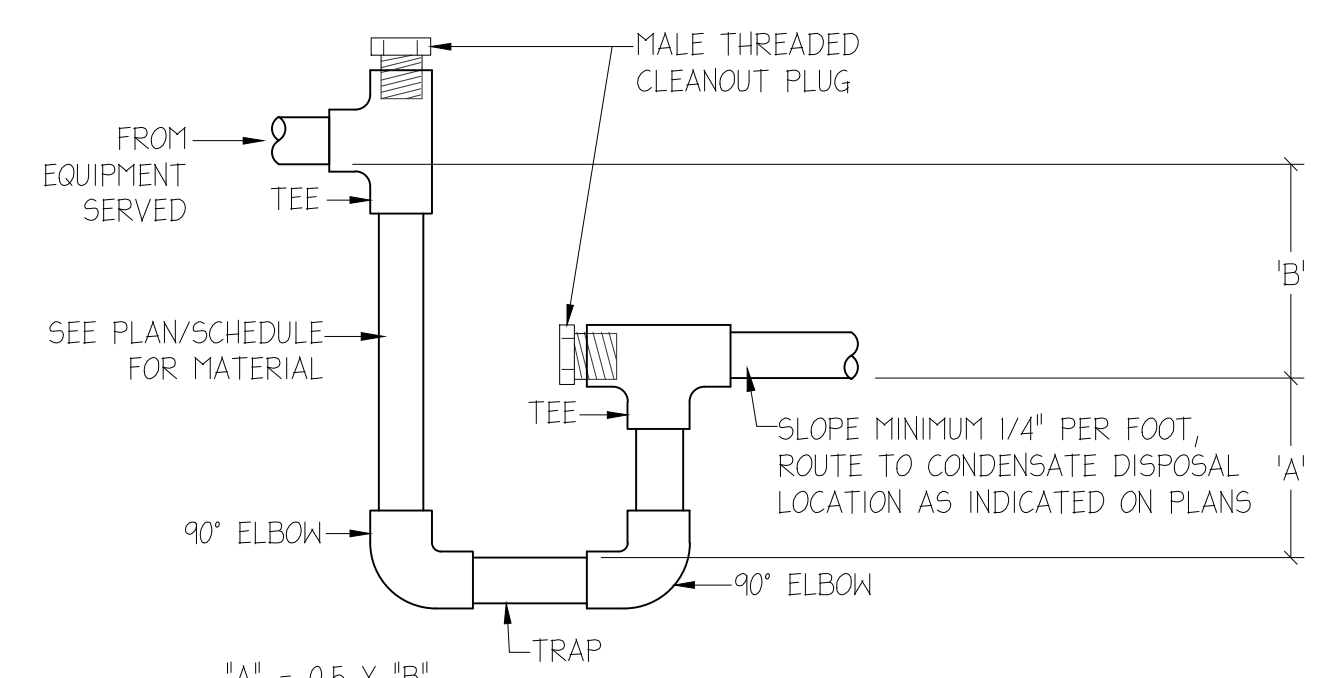
Alternate Identification Markers
AT CONTRACTOR'S OPTION SELF-ADHESIVE PIPE IDENTIFICATION MARKERS AND FLOW DIRECTION INDICATORS SHALL BE PERMISSIBLE IN LIEU OF PAINT-APPLIED MARKERS PER MIL-STD-101B. CONTRACTOR SHALL SUBMIT SAMPLES OF ADHESIVE LABELS TO BE USED TO ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.



SPLIT SYSTEM INDOOR UNIT INSTALLATION DETAIL
NOT TO SCALE



CONDENSATE PIPING SUPPORT DETAIL
NOT TO SCALE



"A" = 0.5 X "B"
"B" = INTERNAL STATIC PRESSURE + 1" MINIMUM.

CONDENSATE DRAIN DETAIL
NOT TO SCALE

SPLIT SYSTEM AIR TO AIR HEAT PUMP UNIT SCHEDULE

MARK	LOCATION	INDOOR SECTION										OUTDOOR SECTION(S)						ARI COOLING DATA ③			ARI HEATING DATA ⑤		AUXILIARY HEATER DATA						BASIS OF DESIGN ⑬		REMARKS	
		TOTAL AIR CFM	OUTSIDE AIR CFM	EXTERNAL STATIC PRESSURE INCHES W.G.	MAXIMUM FAN HORSEPOWER	ELECTRICAL DATA ⑪			FILTER DATA			COMPRESSOR		CONDENSER FANS		ELECTRICAL DATA ⑪			TOTAL MINIMUM NET CAPACITY BTU/HR	SENSIBLE MINIMUM NET CAPACITY BTU/HR	MINIMUM S.E.E.R.	MINIMUM HIGH TEMP. ARI RATING @ 47 Fdb		TYPE	TOTAL KW	NO. OF STEPS	ELECTRICAL DATA ⑪			INDOOR UNIT		OUTDOOR UNIT
						VOLTS	PHASE	Hz	MAXIMUM FACE VELOCITY - FPM	TYPE	THICK	QUANTITY	MAXIMUM RATED LOAD AMPS EA.	QUANTITY	MAXIMUM FULL LOAD AMPS EA.	VOLTS	PHASE	Hz				CAPACITY BTU/HR	C.O.P.				VOLTS	PHASE	Hz			
HP-WS.1	SEE PLANS	1,160	255	0.5 ①	1/2	208	1	60	450	②	1"	1	13.6	1	0.86	208	3	60	42,000	32,200	13.0	39,500	3.2	④	10.8	2	208	1	60	TEM16A0D42H41SA	4TWA3042B3000A	⑤⑥⑦⑧⑨⑩⑫⑬⑭
HP-WS.2	SEE PLANS	630	35	0.5 ①	1/3	208	1	60	450	②	1"	1	6.4	1	0.7	208	1	60	18,800	14,100	14.5	17,100	3.6	④	5.76	1	208	1	60	TEM16A0B24H21SA	4TWR5018GI	⑤⑥⑦⑧⑨⑩⑫⑬⑭

SPLIT SYSTEM HEAT PUMP UNIT NOTES:

- | | | | | |
|---|--|---|---|---|
| <p>① DOES NOT INCLUDE PRESSURE DROP THROUGH FILTERS OR ELECTRIC RESISTANCE HEATER.</p> <p>② DISPOSABLE</p> <p>③ S.E.E.R. - SEASONAL ENERGY EFFICIENCY RATIO. RATED IN ACCORDANCE WITH AMERICAN REFRIGERATION INSTITUTE (ARI) STANDARD 210/240 AT ARI STANDARD CONDITIONS.</p> <p>④ ELECTRIC RESISTANCE. KW INDICATED IS RATED AT VOLTAGE INDICATED.</p> <p>⑤ PROVIDE REMOTE CONDENSING UNIT WITH COIL GUARDS.</p> | <p>⑥ REFRIGERANT PIPING SIZE, ROUTING, AND CONFIGURATION SHALL BE AS RECOMMENDED BY MANUFACTURER OF HEAT PUMP UNIT. INSULATE ENTIRE LENGTH OF EACH SUCTION LINE WITH MINIMUM 3/4" THICK UNICELLULAR FOAM INSULATION.</p> <p>⑦ PROVIDE REMOTE CONDENSING UNITS WITH FACTORY ANTI-SHORT CYCLE (TIME DELAY ON RESTART) CONTROLS.</p> <p>⑧ CONDENSATE PIPE SHALL BE 1" SCHED. 40 PVC. TRAP AT UNIT AND ROUTE TO FLOOR DRAIN. CONSTRUCT ALL TRAPS FROM TEES WITH A CAP ON EACH TEE.</p> | <p>⑨ ROUTE REFRIGERANT AND CONDENSATE PIPING TO ALLOW CONVENIENT ACCESS TO HEAT PUMP INDOOR UNIT FOR SERVICING. ALLOW A MINIMUM OF 3'-0" IN FRONT OF ALL ACCESS PANELS.</p> <p>⑩ NOT USED</p> | <p>⑪ UNITS AND CONTROLS SHALL BE SETUP SUCH THAT THE ELECTRICAL HEAT IS THE SECOND STAGE OF HEAT AND IS LOCKED OUT ANY TIME THE COMPRESSOR IS OPERATING EXCEPT WHEN THE UNIT IS IN DEFROST MODE.</p> <p>⑫ PROVIDE UNITS WITH PHASE PROTECTION.</p> <p>⑬ TRANE OR EQUAL BY CARRIER OR LENNOX</p> | <p>⑭ PROVIDE WITH FACTORY CONTROL VOLTAGE TRANSFORMER.</p> <p>⑮ PROVIDE WITH SPACE THERMOSTAT WITH LOCAL SETPOINT ADJUST, SPACE TEMPERATURE DISPLAY, ON/OFF INTERFACE TO DDC SYSTEM, AND LOCAL TIMED OVERRIDE BUTTON (SET FOR 2 HOURS).</p> |
|---|--|---|---|---|

FAN SCHEDULE

MARK	TYPE ①	DRIVE ②	SERVICE ③	LOCATION	INTERLOCKS	PERFORMANCE DATA				ELECTRICAL DATA			REMARKS ⑤	
						AIR FLOW CFM	EXTERNAL STATIC PRESS. INCHES WC	MAXIMUM RPM	MAX SONES	MINIMUM HORSEPOWER	VOLTS	PHASE		HERTZ
EF-WS.1	ILF	DD	EA	SEE PLANS	HP-WS.2	110	0.25	1470	1.2	27 WATTS	208	1	60	COOK MODEL GN-242 ④⑥⑦

FAN SCHEDULE NOTES:

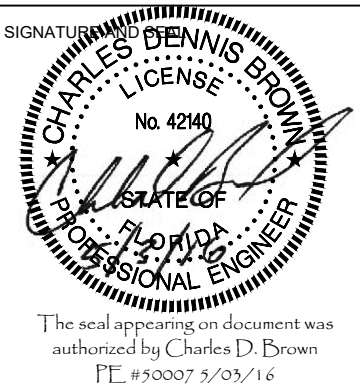
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|--|---|--|
| <p>① ILF - INLINE FAN</p> <p>② DD - DIRECT DRIVE</p> <p>③ EA - EXHAUST AIR</p> | <p>④ PROVIDE FAN WITH A SPEED CONTROLLER FOR AIR FLOW BALANCING. MOUNT CONTROLLER ON FAN HOUSING.</p> <p>⑤ PROVIDE MANUFACTURER AND MODEL LISTED OR APPROVED EQUAL.</p> | <p>⑥ PROVIDE FAN WITH FACTORY MOUNTED DISCONNECT SWITCH.</p> <p>⑦ PROVIDE WITH FACTORY BACKDRAFT DAMPER.</p> |
|--|---|--|

EQUIPMENT SCHEDULES NOTES

1. ALL HVAC EQUIPMENT SHALL BE PROVIDED THRU THE RESPECTIVE MANUFACTURER'S REP FIRM COVERING THE GEOGRAPHICAL AREA IN WHICH THE PROJECT IS LOCATED. IN NO CASE WILL EQUIPMENT BE ACCEPTED THAT IS SOLD THRU A COMPANY THAT IS NOT THE MANUFACTURER'S REP FOR THE SPECIFIC PRODUCT BEING PROVIDED IN THE AREA OF THE PROJECT.
2. REFER TO FINAL ENGINEER APPROVED CONTRACTOR'S SUBMITTALS/RESUBMITTALS FOR ALL ACTUAL CAPACITY, FLOW AND PERFORMANCE DATA TO BE USED FOR EQUIPMENT STARTUP, TEST & BALANCE AND COMMISSIONING WORK.
3. MANUFACTURERS MUST MEET ALL REQUIREMENTS INCLUDING FACTORY INSTALLED OPTIONS. FIELD MODIFICATION TO MEET THESE REQUIREMENTS WILL NOT BE ALLOWED.
4. MANUFACTURERS FOUND UNABLE TO MEET THE CONTRACT DOCUMENT AND PROJECT SCHEDULING REQUIREMENTS WILL BE REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER.



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PSC WELDING SHOP

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REVISIONS

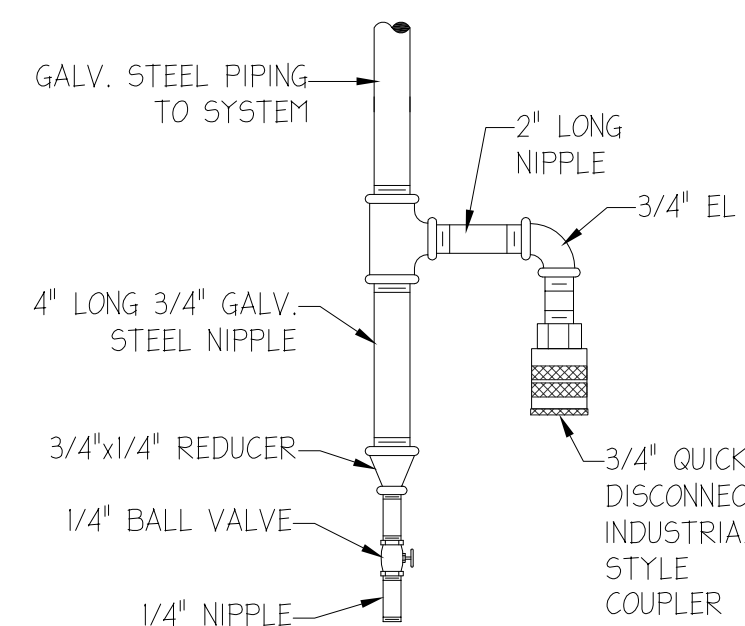
BTA PROJECT NO: 142615.02
 SHEET DATE: 05/02/16

SHEET TITLE:
HVAC SCHEDULES

SHEET:
M-601

General Plumbing Notes:

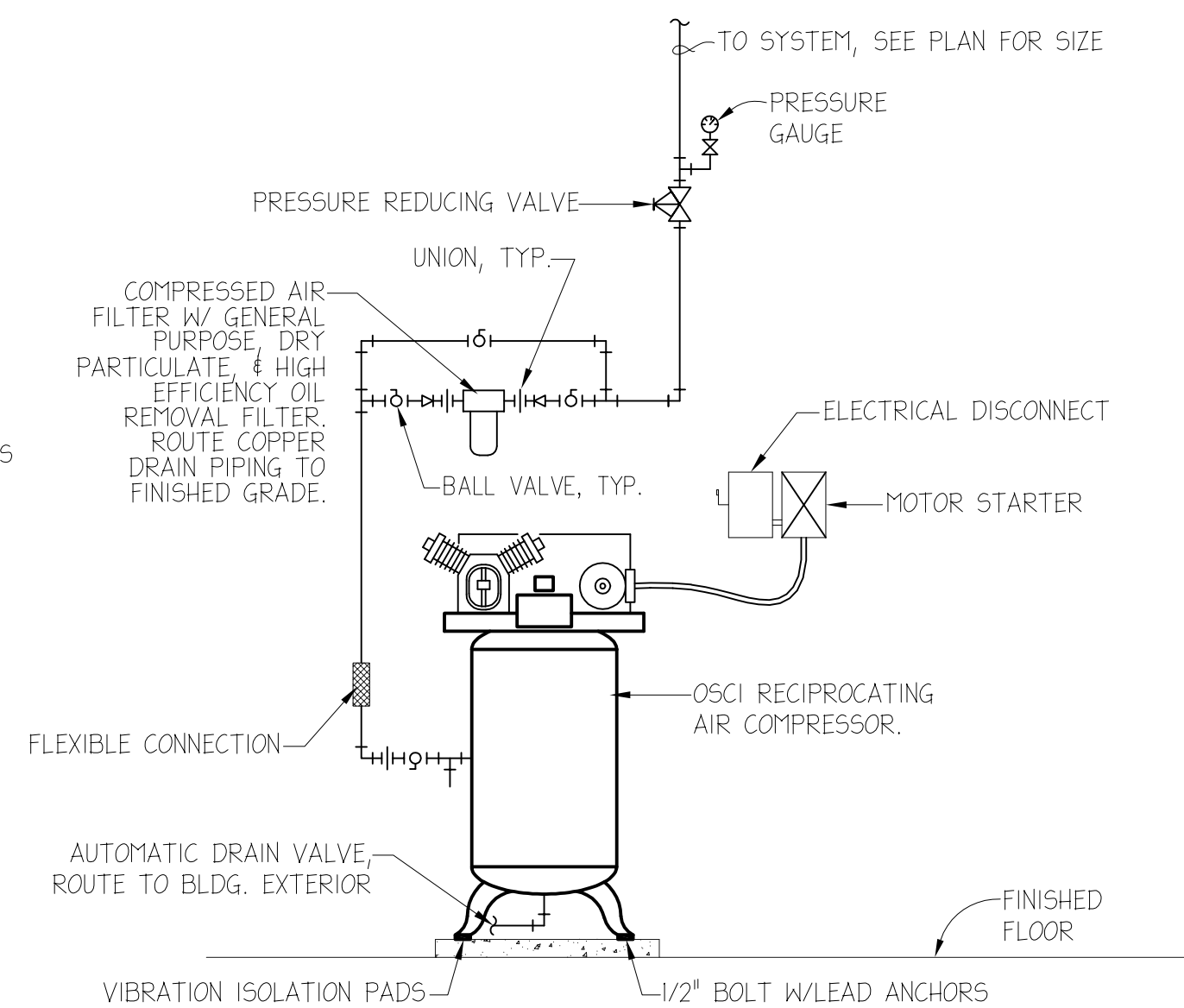
- THE CONTRACTOR SHALL EXECUTE ALL WORK SO THAT IT PROCEEDS WITH A MINIMUM INTERFERENCE WITH OTHER TRADES.
- VERIFY EXACT PLUMBING FIXTURE ROUGH-IN AND FINAL HVAC EQUIPMENT REQUIREMENTS IN THE FIELD.
- ALL COMPRESSED AIR PIPE AND FITTINGS ABOVE FINISH FLOOR SHALL BE SCHEDULE 40 GALVANIZED STEEL.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FINAL CONNECTIONS TO PLUMBING FIXTURES. THIS RESPONSIBILITY INCLUDES, BUT IS NOT LIMITED TO, FURNISHING AND INSTALLING ALL TRAPS, DRAINS, AND SUPPLIES WITH STOPS. FURNISH AND INSTALL PLUMBING FIXTURES INDICATED OR SPECIFIED, COMPLETE WITH ALL EQUIPMENT, FITTINGS, TRIM AND ACCESSORIES INDICATED OR SPECIFIED. EXPOSED WATER PIPING TO FIXTURES SHALL BE CHROME-PLATED BRASS, IPS. ADJUST WATER FLOW THROUGH ALL FIXTURES TO PROVIDE PROPER FLUSHING ACTION WITH THE LEAST AMOUNT OF WATER. FAUCETS SHALL HAVE UNDERDECK AND/OR ESCUTCHEON PLATES, IF REQUIRED, TO STABILIZE FAUCET WITHIN FIXTURE.
- COORDINATE ROUTING OF WATER SUPPLY, WASTE, AIR, & VENT PIPING WITH OTHER TRADES.
- THE PLUMBING CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AND OTHER TRADES ALL REQUIRED OPENINGS AND EXCAVATIONS.
- ALL ITEMS PROJECTING THROUGH THE ROOF SHALL BE FLASHED A MINIMUM OF 12" ABOVE THE ROOF. ALL VENTS SHALL BE A MINIMUM OF 10 FEET FROM ANY OUTSIDE AIR INTAKE.
- ACCESS PANEL: WHERE FITTINGS REQUIRING MAINTENANCE OR ISOLATION VALVES ARE LOCATED ABOVE NON-ACCESSIBLE CEILINGS OR SOFFITS (EXAMPLE PLASTER, METAL, OR GYPSUM BOARD), INSTALL AN ALL STEEL CEILING ACCESS DOOR IN CEILING DIRECTLY BELOW EACH SUCH FITTING/VALVE. PROVIDE ACCESS DOORS FACTORY PRIMED FOR PAINTING. FINISH PAINT WITH TWO COATS ENAMEL AFTER INSTALLATION TO MATCH CEILING, SOFFIT, OR WALL COLOR/SHEEN.
- FLOOR DRAIN/SINK SPECIAL NOTE: IN ALL SPACES WHERE FLOOR DRAINS/SINKS ARE SHOWN, DRAINS SHALL BE SET AT LOW POINTS OF FLOOR WITH GRADUAL AND EVEN FLOOR SLOPE TO DRAIN. POCKETS IN THE FLOOR SHALL NOT BE ALLOWED AROUND FLOOR DRAINS/SINKS. PRIOR TO SETTING FLOOR DRAIN/SINK ELEVATIONS, THE PLUMBING CONTRACTOR SHALL REVIEW THE FLOOR SLOPES SHOWN ON THE ARCHITECTURAL AND STRUCTURAL DRAWINGS, AND SHALL CLOSELY COORDINATE TOP OF DRAIN ELEVATIONS WITH THE GENERAL CONTRACTOR AND THE FLOOR SLAB INSTALLER. LIQUIDS SHALL POSITIVELY FLOW TO FLOOR DRAINS/SINKS IN ALL LOCATIONS - STANDING WATER AT ANY POINT SHALL NOT BE ACCEPTABLE. COORDINATE FINAL LOCATION & ELEVATION WITH ARCHITECT PRIOR TO ROUGH-IN.
- ALL FLOOR DRAINS & FLOOR SINKS NOT RECEIVING SINK FIXTURE DRAINAGE SHALL HAVE A 6" DEEP SEAL AND TRAPS WITH TRAP PRIMERS AS REQUIRED BY CODE. CONTRACTOR TO ENSURE THAT EACH FLOOR DRAIN/SINK DOES NOT EXTEND ABOVE THE ADJACENT FLOOR SURFACE. AN ACCESS PANEL MUST BE INSTALLED IF THE TRAP PRIMER FITTING IS LOCATED INSIDE A WALL OR ABOVE A HARD CEILING. COORDINATE OPENINGS WITH ARCHITECT. CONTRACTOR MAY INSTALL WATER CLOSET FLUSH VALVE OR LAVATORY TYPE PRIMER FITTINGS TO SERVE RESTROOM FLOOR DRAINS. INSTALL IN INCONSPICUOUS LOCATIONS. CONTRACTOR TO ENSURE THAT EACH TRAP PRIMER VALVE IS CLEANED AND FREE OF DEBRIS JUST PRIOR TO PROJECT COMPLETION.
- PROVIDE STOPS AND SHOCK ABSORBERS IN ACCORDANCE WITH PDI AND ASSE 1010. AN ACCESS PANEL MUST BE INSTALLED IF WATER HAMMER ARRESTOR IS LOCATED INSIDE A WALL OR ABOVE A HARD CEILING. COORDINATE OPENINGS WITH ARCHITECT.
- PROVIDE AN ACCESS PANEL IF ISOLATION/SHUTOFF VALVE OR FITTING REQUIRING MAINTENANCE IS LOCATED INSIDE A WALL OR ABOVE A HARD CEILING. ALL VALVES/SERVICABLE FITTINGS SHALL BE LOCATED WITHIN REACH OF ACCESS DOOR OR LAY-IN CEILING SYSTEM (18" MAX.). COORDINATE OPENINGS WITH ARCHITECT.
- PROVIDE DIELECTRIC UNIONS AT ALL DISSIMILAR METAL CONNECTIONS.
- INSULATE DOMESTIC WATER AND WASTE PIPING UNDER ALL LAVATORIES AND SINKS USING "LAVGUARD2 E-Z SERIES" MOLDED VINYL PIPING COVERS. COVER ALL PIPING, FITTING, VALVES, AND TRAPS EXPOSED TO VIEW.
- ROUTE ALL PIPING AS HIGH AS POSSIBLE AND SO AS TO CAUSE MINIMAL INTERFERENCE FOR MAINTENANCE OF ALL EQUIPMENT. UNLESS OTHERWISE NOTED, ALL WATER SUPPLY PIPING IS ROUTED ABOVE THE CEILING AND BELOW ATTIC/ROOF INSULATION.
- PROVIDE SHUTOFF VALVE TO EACH SILLCOCK WITH VALVE IDENTIFICATION AS REQUIRED BY CODE.
- ALL P-TRAPS SHALL BE 17-GAGE CAST BRASS.
- CONTRACTOR TO VERIFY ALL LOCATIONS OF ROOF PENETRATIONS WITH ARCHITECTURAL DRAWINGS.
- FIRE-STOP ALL PIPE PENETRATIONS OF FIRE AND SMOKE RATED ENCLOSURES. SEE ARCHITECTURAL DWGS. AND COORDINATE WITH ARCHITECT AND GENERAL CONTRACTOR IN THE FIELD.
- PVC WILL NOT BE ALLOWED IN RETURN AIR PLENUMS.
- PROVIDE VENT THROUGH ROOF MINIMUM 10'-0" FROM HVAC INTAKE.
- MARK CEILING TILES AT VALVES & EQUIPMENT AS DIRECTED BY OWNER.
- ALL WASTE PIPING SHOWN IS BELOW AN EXISTING SLAB. CONTRACTOR SHALL VISIT THE SITE AND VERIFY ALL REQUIRED DEMOLITION, NEW WORK, AND REQUIRED BORING UNDER EXISTING SLABS AND STRUCTURES, WHERE SAW CUTTING IS REQUIRED, PATCH FLOOR AFTER NEW WORK IS INSTALLED TO MATCH SURROUNDING SLAB & FINISHED FLOORING. THIS TO INCLUDE SOIL TREATMENT BELOW SLAB.
- EXISTING UTILITY INFORMATION WAS DETERMINED THROUGH NON-DESTRUCTIVE SITE INVESTIGATION AND ORIGINAL CONSTRUCTION DOCUMENTS. CONTRACTOR SHALL VERIFY ALL EXISTING WASTE AND WATER SUPPLY PIPE SIZES, LOCATIONS, AND DIRECTIONS OF FLOW IN THE FIELD PRIOR TO CONNECTING ANY NEW PIPING. ANY DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL EXISTING CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
- CONTRACTOR TO PROVIDE NECESSARY WORK TO ENSURE ALL EXISTING STORM/WASTE/WATER PIPES ARE COMPLETELY FREE OF BLOCKAGES BEFORE CONNECTING NEW SYSTEM TO EXISTING.
- PATCH ALL ABANDONED/UNUSED WALL/FLOOR/ROOF PENETRATIONS TO MATCH SURROUNDING.
- COORDINATE CONNECTIONS TO ALL MACHINES PROVIDED BY THE FABRICATION EQUIPMENT SUPPLIER, INCLUDING ANY NECESSARY FITTINGS SUCH AS PRESSURE REDUCING VALVES, CONNECTION TYPES, SHUTOFF VALVES, ETC. COORDINATE ALL REQUIREMENTS/CONNECTIONS WITH THE FABRICATION EQUIPMENT SUPPLIER & MANUFACTURER IN THE FIELD. PROVIDE ALL FITTINGS FOR A COMPLETE INSTALLATION WHETHER SPECIFICALLY SHOWN OR NOT. THIS TO INCLUDE PIPE STANDS TO SUPPORT VERTICAL PIPING NOT ADJACENT TO WALL.



AIR OUTLET CONNECTION DETAIL

NOT TO SCALE

NOTE:
ALL BALL VALVES IN COMPRESSED AIR PIPING SYSTEM SHALL HAVE STAINLESS STEEL BALL AND TRIM.



COMPRESSED AIR SYSTEM PIPING DIAGRAM

NOT TO SCALE

NOTE:
ALL PIPE, FITTINGS, FILTERS, REGULATORS, LUBRICATORS, ETC... SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.

Plumbing Legend:

	WASTE PIPING. SIZED AS SHOWN.		PIPING TURNED DOWN		FS	FLOOR SINK W/ HALF GRATE, BEEHIVE STRAINER, & TRAP PRIMER UNLESS OTHERWISE NOTED. OUTLET SIZE AS SHOWN. ZURN 1900 OR APPROVED EQUAL.
	WASTE VENT PIPING (V). SIZED AS SHOWN.		FPWH/VB	3/4" FREEZEPROOF WALL HYDRANT WITH VACUUM BREAKER.	VTR	VENT THROUGH ROOF. SIZED AS SHOWN.
	COLD WATER PIPING (CW). SIZED AS SHOWN.		HB/VB	3/4" CHROME PLATED HOSE BIBB WITH VACUUM BREAKER & LOOSE KEY OPERATOR	EW#	ELECTRIC WATER HEATER. SEE SCHEDULE AND INSTALLATION DETAIL.
	HOT WATER PIPING (HW). SIZED AS SHOWN.		HB	3/4" HOSE BIBB WITH VACUUM BREAKER	P-#	PLUMBING FIXTURE NUMBER. SEE SCHEDULE ON THIS SHEET.
	SD		WCO	WALL CLEANOUT	AAV	AIR ADMITTANCE VALVE
	CA		FCO	FLOOR CLEANOUT	A.F.F.	ABOVE FINISHED FLOOR
	T		GCO	GROUND CLEANOUT	N.O.	NORMALLY OPEN
	P-TRAP		FD	FLOOR DRAIN W/ FLUSH STRAINER. OUTLET SIZE AS SHOWN. ZURN 415 "TYPE B" OR APPROVED EQUAL.	N.C.	NORMALLY CLOSED
	BALL VALVE FOR SHUT-OFF SERVICE.		FD-R	FLOOR DRAIN W/ RECESSED STRAINER. OUTLET SIZE AS SHOWN. ZURN 415 "TYPE I" (7-1/2" DIA. TOP) OR APPROVED EQUAL. TOP OF RECESSED STRAINER TO BE FLUSH W/ FLOOR.	FV	FIELD VERIFY
	BALANCING VALVE. TOUR & ANDERSSON MODEL STAD OR APPROVED EQUAL.					CONNECTION OF NEW TO EXISTING
	CHECK VALVE.					
	PIPING TURNED UP					
	PIPING TURNED DOWN					

PLUMBING FIXTURE CONNECTION SCHEDULE

MARK #	FIXTURE TYPE	MANUFAC. & MODEL	CONNECTIONS			REMARKS
			WASTE	CW	HW	
P-1	WATER CLOSET	KOHLER -	3"	1/2"	-	FLOOR MOUNTED, TANK-TYPE, ELONGATED WATER CLOSET, 1.6GPF, W/ OPEN FRONT SEAT WITHOUT COVER. (HC)
P-2	WALL MOUNTED LAVATORY (HC)	KOHLER -	1-1/4" X 1-1/2"	1/2"	1/2"	VIT. CHINA, PROVIDE WITH CONCEALED ARMS SUPPORT AND ZURN Z8101 CENTERSSET FAUCET, METAL LEVER HNDLS., GRID STRNR., & OFFSET P-TRAP. PROVIDE POINT OF USE MIXING VALVE FOR LAVATORY. MOUNT BELOW FIXTURE AND ADJUST VALVE TO NOT EXCEED 110°F.
P-3	JANITOR'S SERVICE SINK	STERN WILLIAMS HL-1800-BP	3"	1/2"	1/2"	24"x24"x12" DEEP TERRAZZO SERVICE SINK WITH 6" FRONT DROP, STAINLESS STEEL INTEGRAL CAST CAP, GRID STRAINER, SPLASH GUARDS, AND T45 BRASS B-0665-BSTR W/ VACUUM BREAKER & SPRING CHECKS.
P-4	ELECTRIC WATER COOLER (HC)	HALSEY-TAYLOR HTV8BL-Q	1-1/2"	1/2"	-	SELF CONTAINED, HI-LOW DESIGN, 8.8 GPH CAPACITY (80°F AMB. AIR), 4.0 FULL LOAD AMPS, 370 RATED WATT USAGE.
P-5	EMERGENCY EYE/FACE WASH	-	1-1/2"	1/2"	-	WALL MOUNTED EYEWASH. FIXTURE TO HAVE STAINLESS STEEL BOWL, SPRAY HEADS, INLET STRAINER, & PUSH HANDLE.

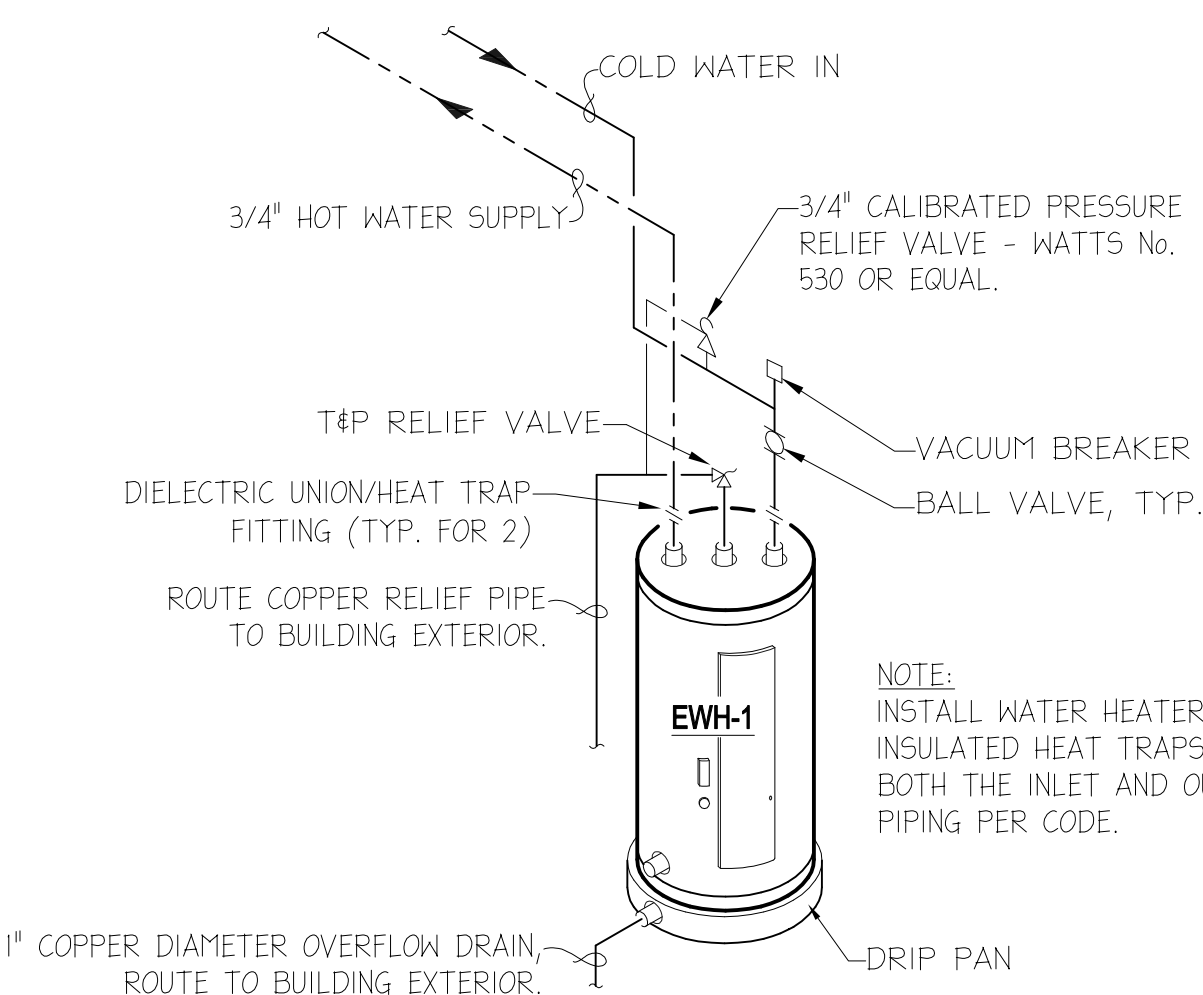
- (HC) DENOTES FIXTURE TO BE DESIGNED, MANUFACTURED AND MOUNTED FOR HANDICAPPED ACCESSIBILITY.
- PROVIDE MANUFACTURERS AND MODEL NUMBERS LISTED ABOVE OR APPROVED EQUALS IN STRICT ACCORDANCE WITH ARCHITECTURAL INTERIOR & RESTROOM ELEVATIONS FOR PROPER MOUNTING/FIXTURE HEIGHTS.

ELECTRIC WATER HEATER SCHEDULE

MARK	GAL.	ELECTRICAL DATA				REMARKS ①②③
		VOLTS	PHASE	HERTZ	KW	
EW#-1	40	208	1	60	4.5/4.5	EXISTING

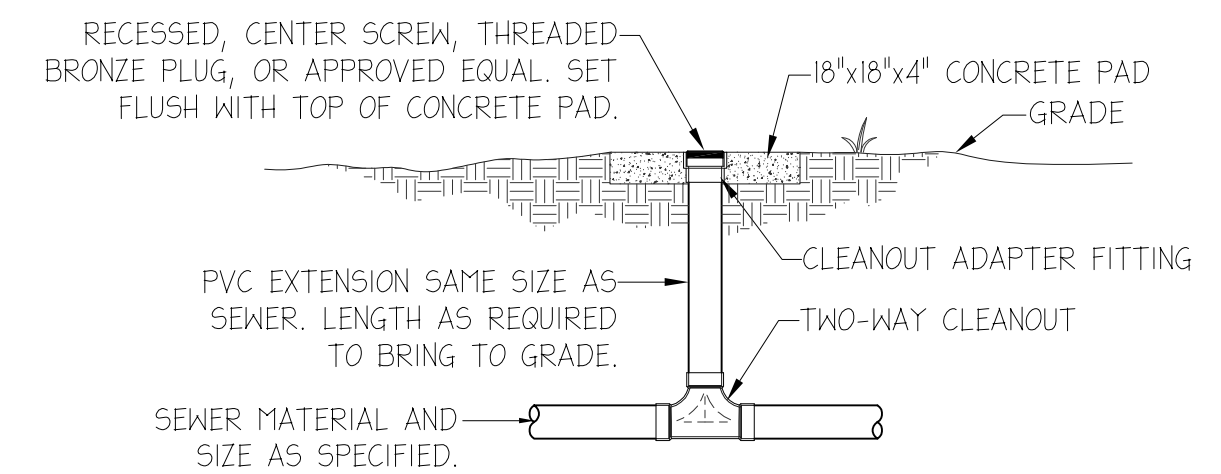
WATER HEATER SCHEDULE NOTES:

- EW# DESIGN BASED ON COMMERCIAL ELECTRIC WATER HEATER OR APPROVED EQUAL.
- FIELD VERIFY AVAILABLE VOLTAGE/ PHASE PRIOR TO ORDERING.
- SET TEMPERATURE TO 130° UNLESS OTHERWISE NOTED



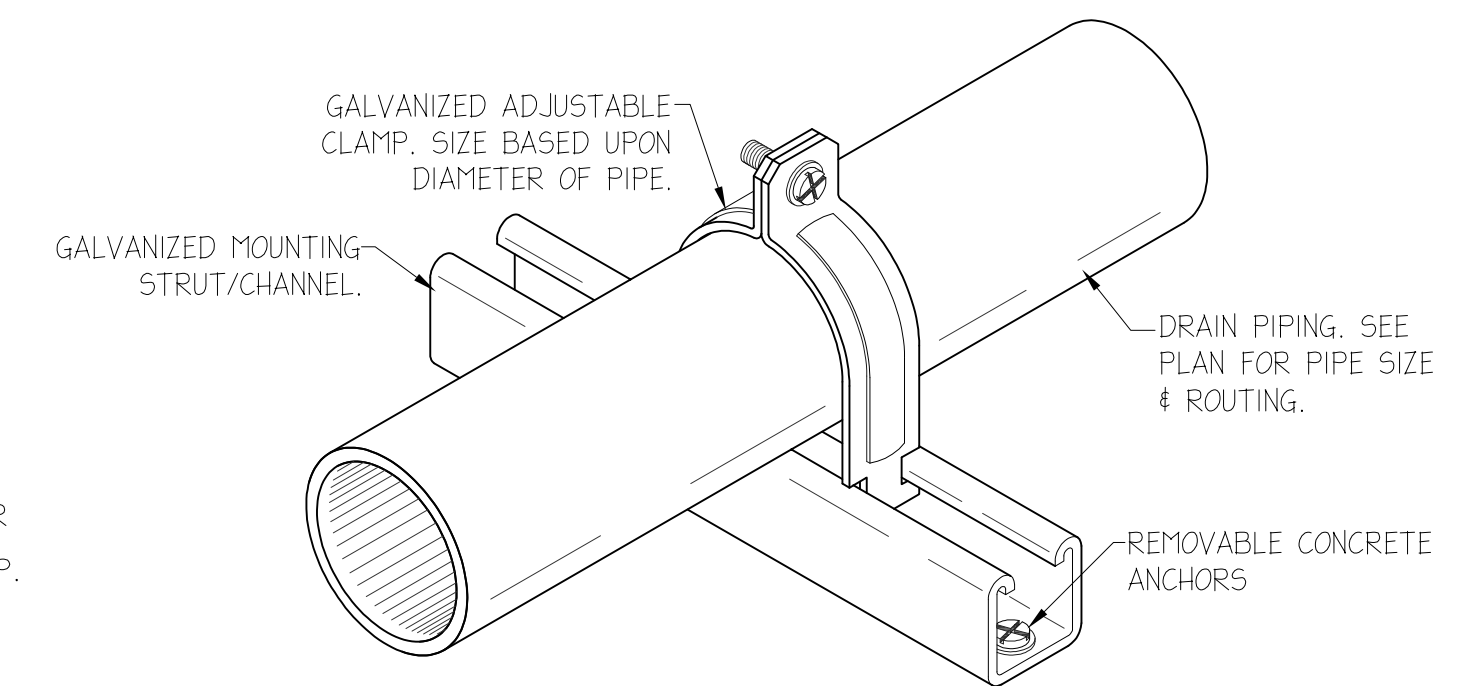
ELECTRIC WATER HEATER INSTALLATION DETAIL

NOT TO SCALE



GROUND LEVEL CLEANOUT DETAIL

NOT TO SCALE



DRAIN PIPING SUPPORT DETAIL

NOT TO SCALE

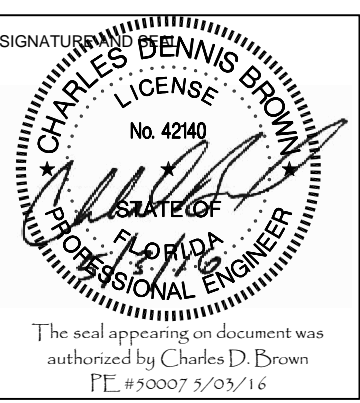
Premier
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Premier Project #15063



PLANNING
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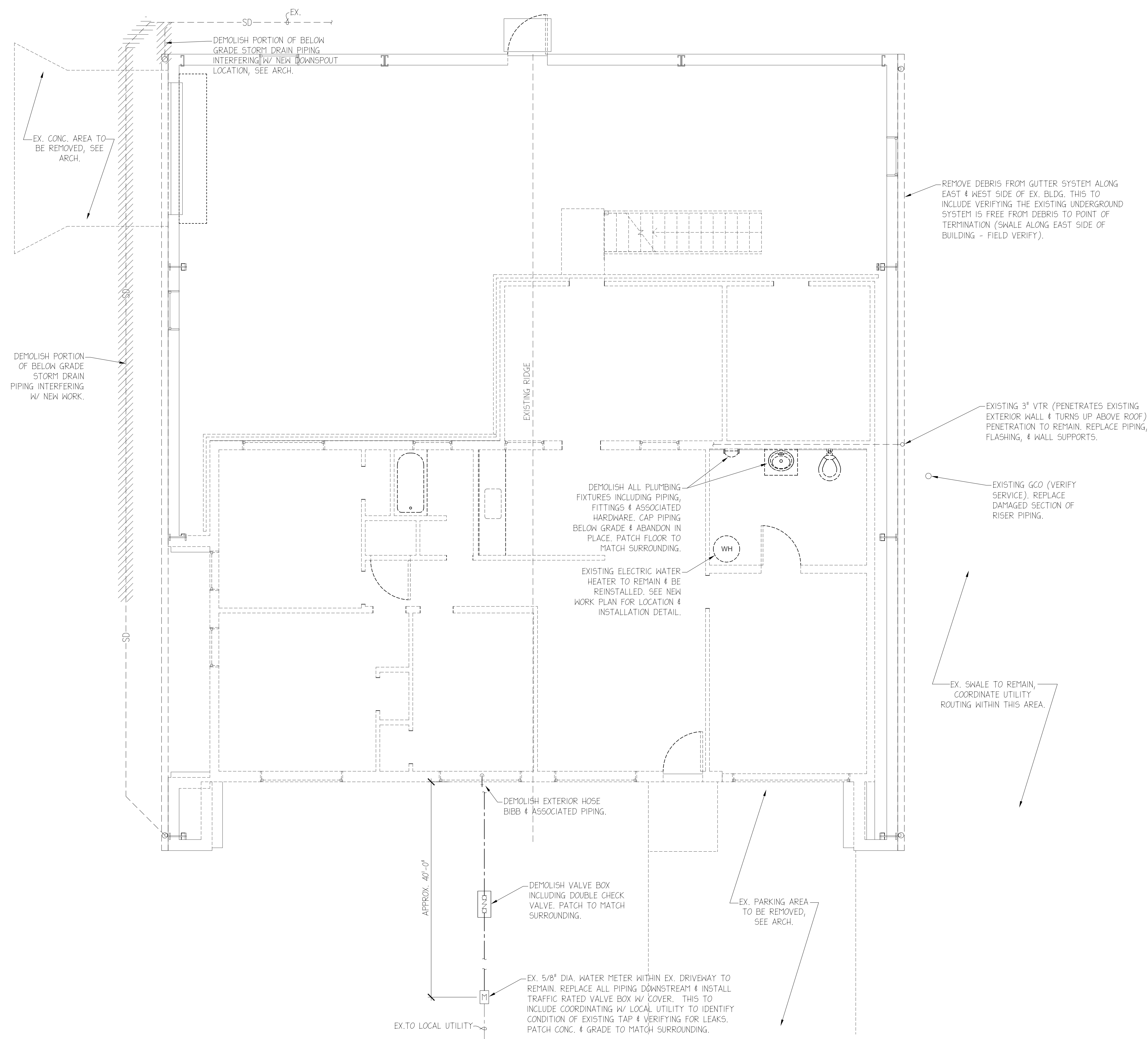
UNDERWOOD AVE., PENSACOLA, FL. 32504

REVISIONS:

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
PLUMBING NOTES, DETAILS, & LEGEND

SHEET:
P-001



DEMOLISH PORTION OF BELOW GRADE STORM DRAIN PIPING INTERFERING W/ NEW WORK.

EX. CONC. AREA TO BE REMOVED, SEE ARCH.

DEMOLISH PORTION OF BELOW GRADE STORM DRAIN PIPING INTERFERING W/ NEW DOWNSPOUT LOCATION, SEE ARCH.

REMOVE DEBRIS FROM GUTTER SYSTEM ALONG EAST & WEST SIDE OF EX. BLDG. THIS TO INCLUDE VERIFYING THE EXISTING UNDERGROUND SYSTEM IS FREE FROM DEBRIS TO POINT OF TERMINATION (SWALE ALONG EAST SIDE OF BUILDING - FIELD VERIFY).

EXISTING 3" VTR (PENETRATES EXISTING EXTERIOR WALL & TURNS UP ABOVE ROOF) PENETRATION TO REMAIN. REPLACE PIPING, FLASHING, & WALL SUPPORTS.

EXISTING GGO (VERIFY SERVICE). REPLACE DAMAGED SECTION OF RISER PIPING.

DEMOLISH ALL PLUMBING FIXTURES INCLUDING PIPING, FITTINGS & ASSOCIATED HARDWARE. CAP PIPING BELOW GRADE & ABANDON IN PLACE. PATCH FLOOR TO MATCH SURROUNDING.

EXISTING ELECTRIC WATER HEATER TO REMAIN & BE REINSTALLED. SEE NEW WORK PLAN FOR LOCATION & INSTALLATION DETAIL.

EX. SWALE TO REMAIN, COORDINATE UTILITY ROUTING WITHIN THIS AREA.

DEMOLISH EXTERIOR HOSE BIBB & ASSOCIATED PIPING.

DEMOLISH VALVE BOX INCLUDING DOUBLE CHECK VALVE. PATCH TO MATCH SURROUNDING.

EX. 5/8" DIA. WATER METER WITHIN EX. DRIVEWAY TO REMAIN. REPLACE ALL PIPING DOWNSTREAM & INSTALL TRAFFIC RATED VALVE BOX W/ COVER. THIS TO INCLUDE COORDINATING W/ LOCAL UTILITY TO IDENTIFY CONDITION OF EXISTING TAP & VERIFYING FOR LEAKS. PATCH CONC. & GRADE TO MATCH SURROUNDING.

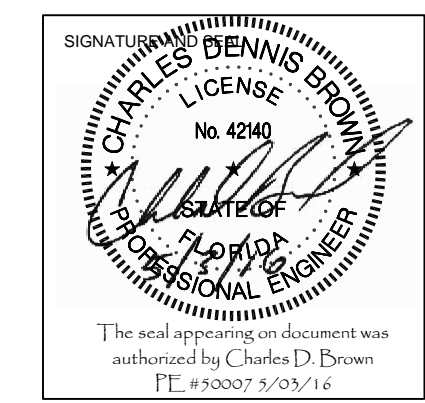
EX. PARKING AREA TO BE REMOVED, SEE ARCH.

EX. TO LOCAL UTILITY

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



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REVISIONS:

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
PLUMBING DEMOLITION PLAN

SHEET:
P-101

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Premier Project #15063

REVISIONS:

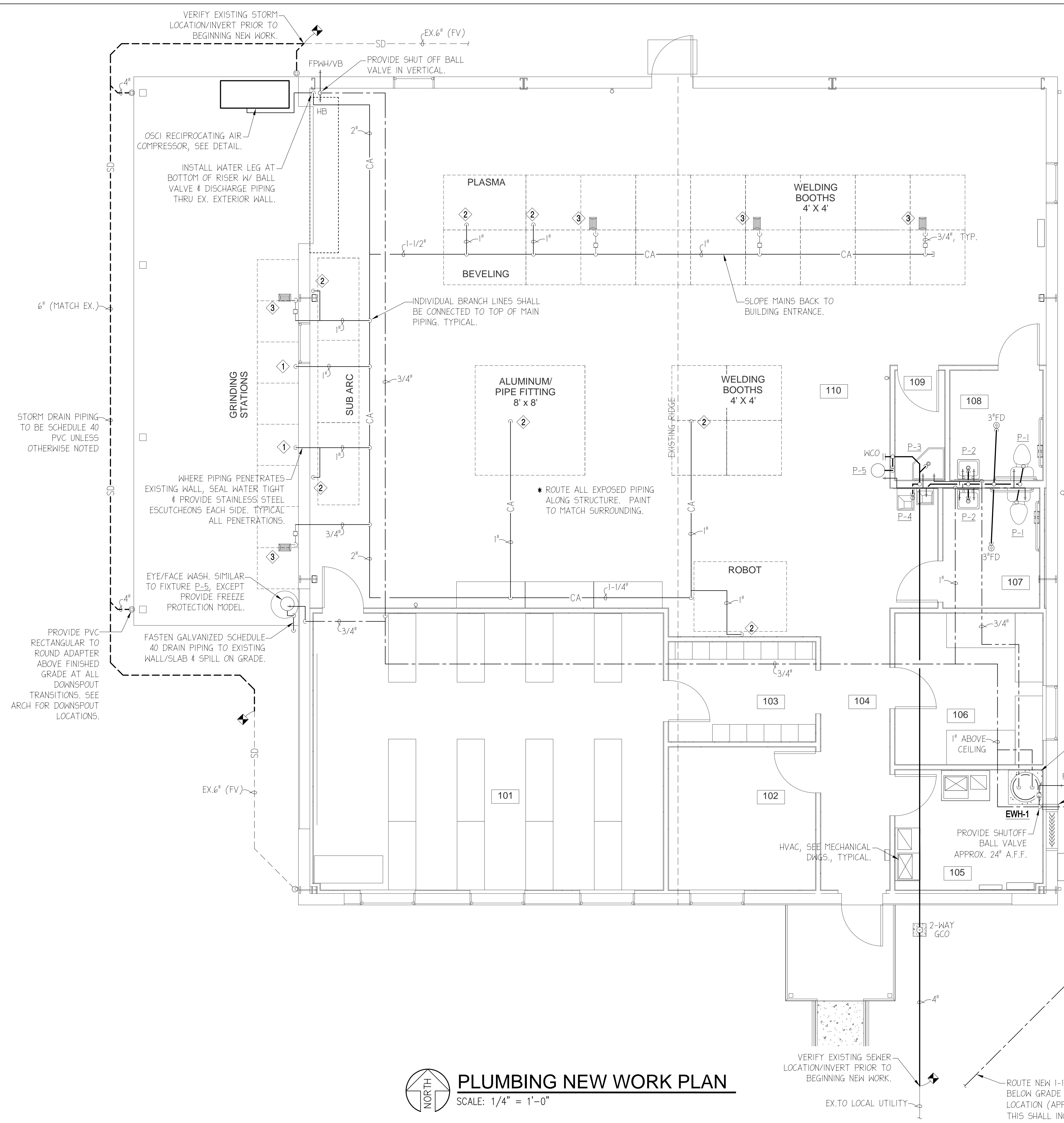
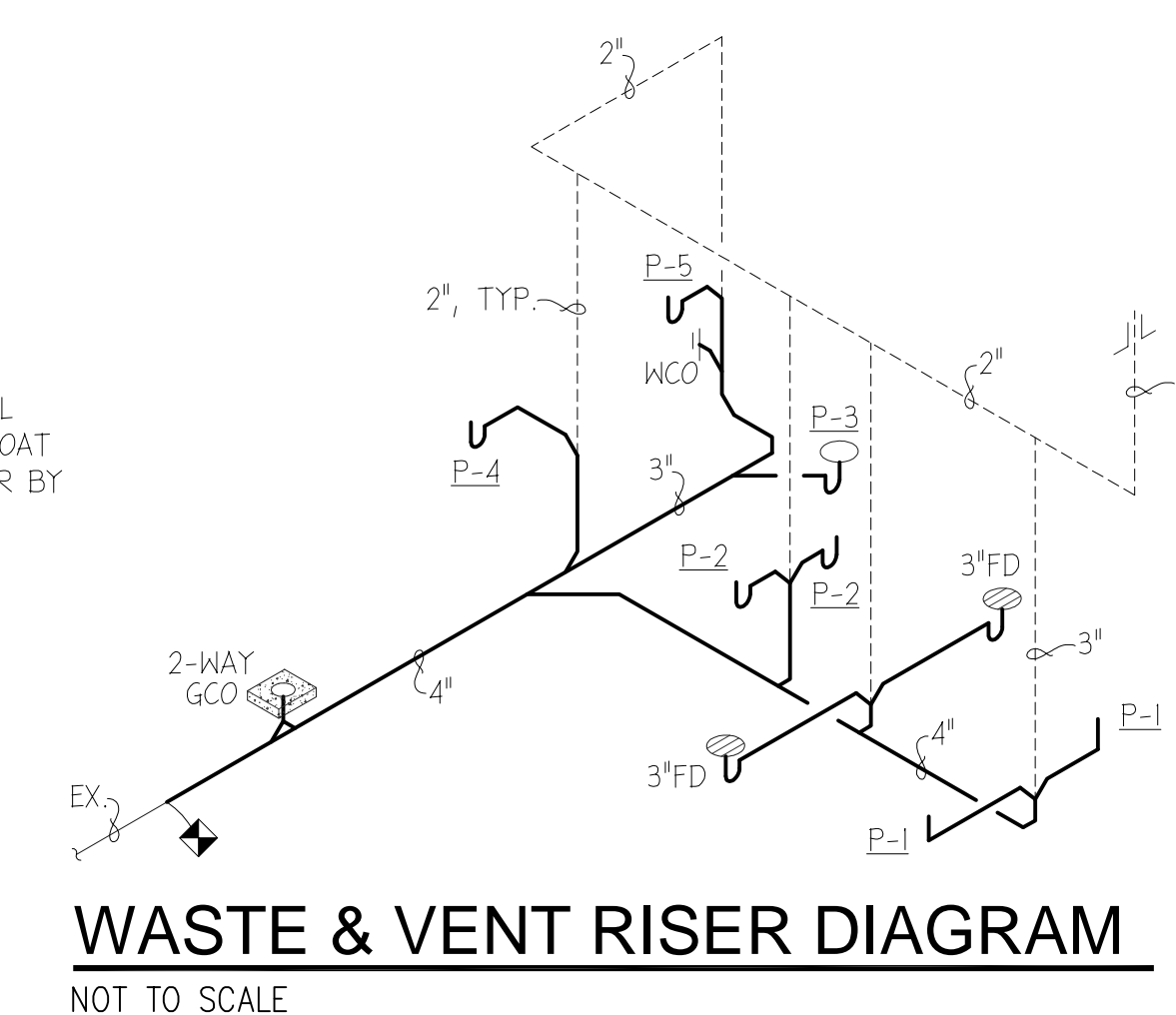
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SHEET DATE: 05/02/16

SHEET TITLE:
PLUMBING NEW WORK PLAN

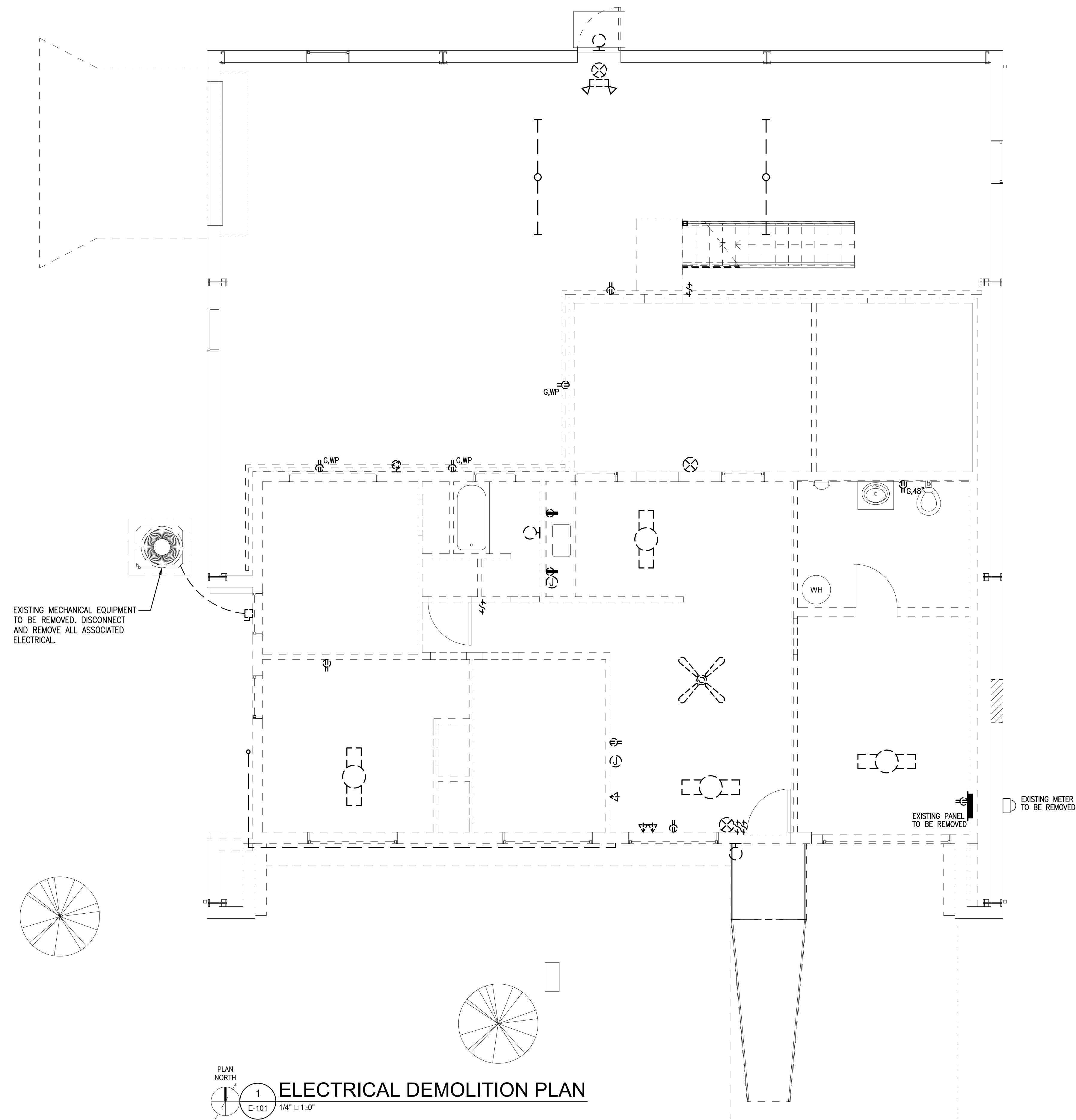
SHEET:
P-201

KEY NOTES:

- 1 INSTALL 3/4" COMPRESSED AIR DROP AND TERMINATE W/ INDUSTRIAL STYLE QUICK DISCONNECT APPROX. 2' A.F.F. CONNECT TO OSCI EQUIPMENT W/ NEW FITTINGS & FLEXIBLE CONNECTIONS. COORDINATE EXACT ROUGH-IN LOCATION AND QUICK DISCONNECT FITTING TYPE W/ OWNER. SEE AIR OUTLET CONNECTION DETAIL.
- 2 INSTALL 3/4" COMPRESSED AIR DROP AND TERMINATE W/ INDUSTRIAL STYLE QUICK DISCONNECT APPROX. 6' A.F.F. CONNECT TO OSCI EQUIPMENT W/ NEW FITTINGS & FLEXIBLE CONNECTIONS. COORDINATE EXACT ROUGH-IN LOCATION AND QUICK DISCONNECT FITTING TYPE W/ OWNER. SEE AIR OUTLET CONNECTION DETAIL.
- 3 RETRACTABLE COMPRESSED AIR HOSE REELS SHALL CONNECT TO HEADER TERMINATION VIA 3/4" X 3' HYDRAULIC HOSE W/ 3/4"-NPT BRASS BALL VALVES FOR ISOLATING THE HOSE REEL. PROVIDE W/ ADJUSTABLE BALL STOPS FOR SETTING DISPENSE POINT HEIGHT. COORDINATE TERMINATION/QUICK DISCONNECT FITTING TYPE & FINAL INSTALLATION LOCATION W/ OWNER.



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



EXISTING MECHANICAL EQUIPMENT TO BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED ELECTRICAL.

EXISTING METER TO BE REMOVED

EXISTING PANEL TO BE REMOVED

ELECTRICAL LEGEND – DEMOLITION PLAN

- FLUORESCENT LIGHTING FIXTURE TO BE REMOVED
- WALL MOUNTED LIGHTING FIXTURE TO BE REMOVED
- FLUORESCENT STRIP LIGHTING FIXTURE TO BE REMOVED
- EXIT LIGHT TO BE REMOVED
- EMERGENCY LIGHT FIXTURE TO BE REMOVED
- LIGHTING SWITCH TO BE REMOVED
- DUPLEX RECEPTACLE TO BE REMOVED
- ABOVE COUNTER DUPLEX RECEPTACLE TO BE REMOVED
- VOICE/DATA OUTLET TO BE REMOVED
- JUNCTION BOX TO BE REMOVED
- ELECTRICAL PANEL TO BE REMOVED
- DISCONNECT SWITCH BE REMOVED
- EXPOSED CONDUIT TO BE REMOVED

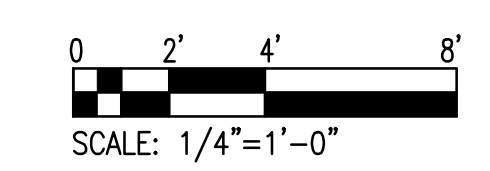
GENERAL DEMOLITION NOTES

1. WHERE EXISTING OUTLETS, FIXTURES, DEVICES, ETC. ARE TO BE REMOVED, REMOVE ALL ASSOCIATED WIRING AND CONDUIT BACK TO SOURCE (UNLESS SPECIFICALLY NOTED TO BE REUSED).
2. SEE MECHANICAL DEMOLITION PLANS FOR MECHANICAL EQUIPMENT TO BE REMOVED. REMOVE ALL ASSOCIATED CONNECTIONS AND CIRCUITS BACK TO SOURCE.
3. FLUORESCENT LAMPS AND BALLASTS SHALL BE REMOVED FROM FIXTURES AND DISPOSED OF BY THE CONTRACTOR.
4. REMOVE ALL CEILING MOUNTED DEVICES INCLUDING BUT NOT LIMITED TO EXIT SIGNS, OCCUPANCY SENSORS, OVERHEAD PROJECTORS, PROJECTION SCREENS, ETC TO ALLOW FOR REPLACEMENT OF CEILING AND COMPLETION OF ALL NEW WORK.
5. DURING CONSTRUCTION, CONTRACTOR SHALL PROTECT EXISTING SYSTEMS, IF ANY, WHICH ARE TO REMAIN (I.E. SECURITY SYSTEM, TELE/DATA SYSTEM, CATV SYSTEM, ETC.). EXISTING DEVICES SHALL BE PROTECTED DURING CONSTRUCTION AND EXISTING CONDUIT/WIRING SYSTEMS SHALL BE REWORKED AS REQUIRED TO COORDINATE WITH NEW CONSTRUCTION.
6. ELECTRICAL OUTLETS INCLUDING BUT NOT LIMITED TO RECEPTACLES, LIGHT FIXTURES, MECHANICAL EQUIPMENT, EXTERIOR LIGHTING, ETC. WHICH ARE NOT BEING REMOVED SHALL REMAIN AS IS. CONTRACTOR SHALL MAINTAIN CONTINUITY OF CIRCUITS WHICH SERVE THESE OUTLETS AND SHALL EXTEND CIRCUITING AS REQUIRED.
7. COORDINATE ALL ELECTRICAL DEMOLITION WORK WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.

PLAN NORTH

1
E-101 1/4" = 1'-0"

ELECTRICAL DEMOLITION PLAN

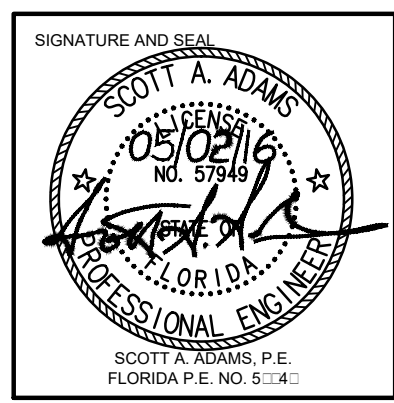


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05/02/16



PSC WELDING SHOP

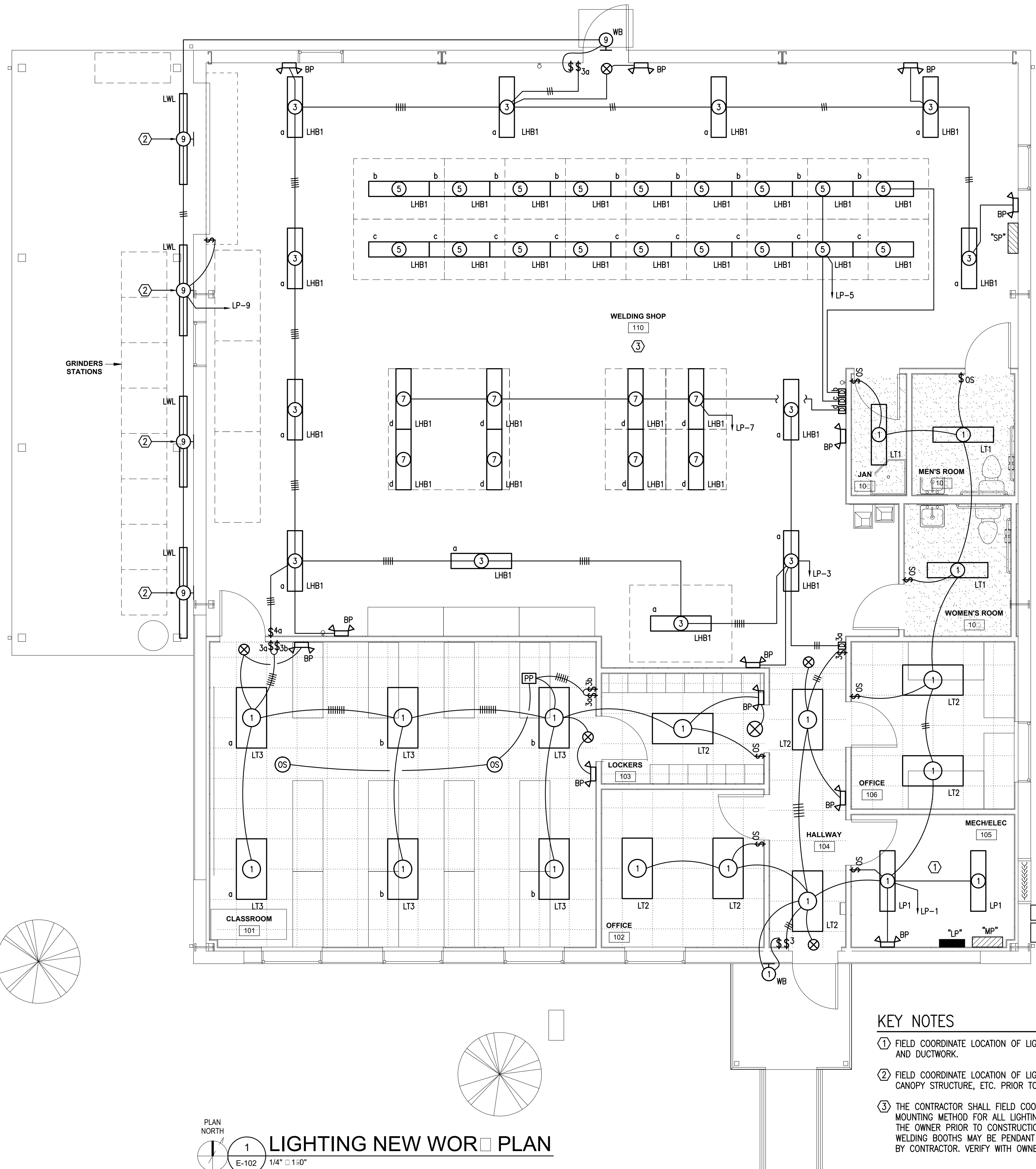
UNDERWOOD AVE., PENSACOLA, FL 32504

REVISIONS:

BTA PROJECT NO: 142615.02
 SHEET DATE: 05/02/16

SHEET TITLE:
ELECTRICAL DEMOLITION PLAN

SHEET:
E-101



LIGHTING FIXTURE SCHEDULE

MARK	MANUFACTURER AND CATALOG No.	LAMPS No. TYPE	MOUNTING	REMARKS
BP	CHLORIDE #CTX6	2-5.4W TUNG	WALL	PROVIDE WITH EMERGENCY BATTERY BACKUP
LHB1	H.E. WILLIAMS #EGL2-4-L107/840-HIAFR-SSMRB-SSLATCH-DIM-UNV	89W LED	SURFACE	4000K, 10,000 LUMENS (1)
LP1	H.E. WILLIAMS #76-4-L32/840-WG7611-DRV-120	28W LED	SURFACE	4000K, 3,200 LUMENS W/WIRE GUARD
LT1	H.E. WILLIAMS #50-F-S14-LED-L45/840-S-AF12125-DRV-UNV	47W LED	RECESSED - FLANGED	4000K, 4,500 LUMENS
LT2	H.E. WILLIAMS #50-G-S24-LED-L65/840-S-AF12125-DRV-UNV	76W LED	RECESSED - GRID	4000K, 6,500 LUMENS
LT3	H.E. WILLIAMS #50-G-S24-LED-L90/840-S-AF12125-DRV-UNV	94W LED	RECESSED - GRID	4000K, 9,000 LUMENS
LWL	LUMINAIRE #AEL72-55WHO-120-4000K-DP-BZH	52W LED	WALL - 9'-0" A.F.F.	4000K, 5744 LUMENS, WET LOCATION LISTED, VANDAL RESISTANT, FULL CUT-OFF
WB	GARCO #101L-16L-700-NWG1-3-120-BZ	37W LED	WALL	4000K, 3800 LUMENS, WET LOCATION LISTED
⊗	CHLORIDE #CXL-3-R-W	1.2W LED	SURFACE - WALL CEILING	PROVIDE WITH EMERGENCY BATTERY BACKUP

NOTE: SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER 14 DAYS PRIOR TO BID FOR WRITTEN APPROVAL AS EQUAL.

NOTES:

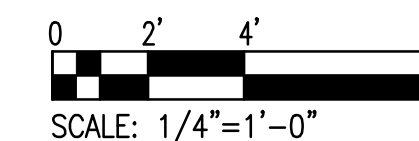
- (1) PROVIDE LIGHTING FIXTURES WITH ALL ACCESSORIES REQUIRED FOR A RIGID PENDANT MOUNT INCLUDING BUT NOT LIMITED TO MOUNTING BARS, STEMS, ETC.

KEY NOTES

- (1) FIELD COORDINATE LOCATION OF LIGHTING FIXTURES WITH MECHANICAL EQUIPMENT AND DUCTWORK.
- (2) FIELD COORDINATE LOCATION OF LIGHTING FIXTURES WITH ARCHITECTURAL DRAWINGS, CANOPY STRUCTURE, ETC. PRIOR TO ROUGH-IN.
- (3) THE CONTRACTOR SHALL FIELD COORDINATE THE LOCATION, MOUNTING HEIGHT, AND MOUNTING METHOD FOR ALL LIGHTING FIXTURES IN WELDING SHOP ROOM 110 WITH THE OWNER PRIOR TO CONSTRUCTION. (NOTE: LIGHTING FIXTURES DIRECTLY ABOVE WELDING BOOTHS MAY BE PENDANT MOUNTED OR MOUNTED TO UNISTRUT SUPPORT BY CONTRACTOR. VERIFY WITH OWNER.)

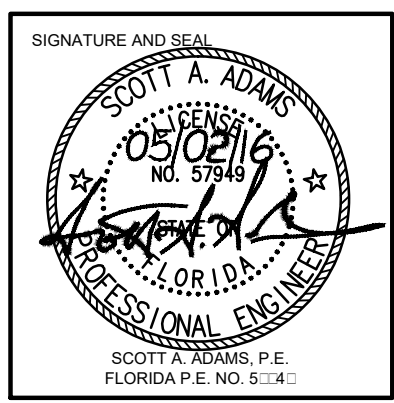
PLAN NORTH

1
 E-102 1/4" = 1'-0"
LIGHTING NEW WORK PLAN



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05/02/16



PSC WELDING SHOP

UNDERWOOD AVE. PENSACOLA, FL. 32504

REVISIONS:

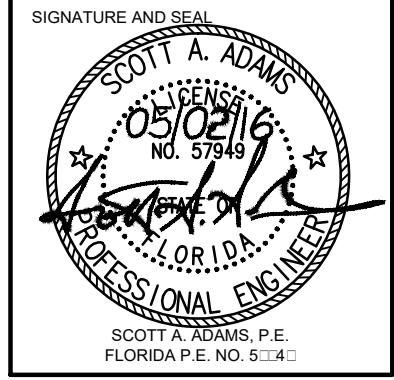
NO.	DATE	DESCRIPTION

BTA PROJECT NO: 142615.02
 SHEET DATE: 05/02/16

SHEET TITLE:
LIGHTING NEW WORK PLAN

SHEET:
E-102

05/02/16



PSC WELDING SHOP

UNDERWOOD AVE., PENSACOLA, FL. 32504

REVISIONS:

NO.	DESCRIPTION

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
POWER □ SIGNAL NEW WOR □ PLAN

SHEET:
E-103

ELECTRICAL LEGEND

- LP1 ○ NOMINAL 1'x4' LED LIGHTING FIXTURE, CIRCUIT 1, MARK LP1 (TYPICAL)
- NOMINAL 1'x6' LED WALL MOUNTED LIGHTING FIXTURE
- NOMINAL 2'x4' LED LIGHTING FIXTURE
- WALL MOUNTED LED LIGHTING FIXTURE
- SURFACE OR PENDANT MOUNTED LED LIGHTING FIXTURE
- LED STRIP LIGHTING FIXTURE
- ⊗ EXIT LIGHT WITH EMERGENCY BATTERY UNIT, CONNECT TO LOCAL UNSWITCHED LIGHTING CIRCUIT
- ⊕ EMERGENCY LIGHTING FIXTURE WITH BATTERY PACK, CONNECT TO LOCAL UNSWITCHED LIGHTING CIRCUIT
- ⊕ SINGLE POLE LIGHTING SWITCH, MOUNT 46" A.F.F.
- ⊕ SINGLE POLE LIGHTING SWITCH, CONTROLS OUTLETS MARKED "G", ETC.
- ⊕ THREE-WAY LIGHTING SWITCH, MOUNT 46" A.F.F.
- ⊕ THREE-WAY LIGHTING SWITCH, CONTROLS OUTLETS MARKED "G", ETC.
- ⊕ 1200W DIMMER SWITCH, PHILLIPS #SR1200ZTUNV, MOUNT 46" A.F.F., CONTROLS OUTLETS MARKED "G", ETC.
- ⊕ DUAL TECHNOLOGY OCCUPANCY SENSOR LIGHTING SWITCH, MOUNT 46" A.F.F.
- ⊕ DUAL TECHNOLOGY CEILING MOUNTED MOTION SENSOR HUBBELL OMNID1000 OR APPROVED EQUAL. PROVIDE POWER PACK. PROVIDE WIRING IN CONDUIT FROM SENSOR TO POWER PACK PER MANUFACTURER'S RECOMMENDATIONS.
- ⊕ DUPLEX RECEPTACLE, MOUNT 18" A.F.F. UNLESS NOTED OTHERWISE
- ⊕ DUPLEX RECEPTACLE, MOUNTED ABOVE COUNTERTOP
- ⊕ GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE, MOUNT 18" A.F.F. UNLESS NOTED OTHERWISE
- ⊕ GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE WITH WEATHERPROOF COVER
- ⊕ QUADRAPLEX RECEPTACLE, MOUNT 18" A.F.F. UNLESS NOTED OTHERWISE
- ⊕ DUPLEX RECEPTACLE ON CORD/REEL
- ⊕ SPECIAL PURPOSE RECEPTACLE. VERIFY NEMA TYPE (VOLTAGE, PHASE, AMPS) WITH ACTUAL EQUIPMENT PROVIDED
- ⊕ EMERGENCY POWER-OFF PUSHBUTTON (EPO) TO DE-ENERGIZE ALL SHOP EQUIPMENT WHEN PRESSED
- ⊕ JUNCTION BOX
- ⊕ NON-FUSED DISCONNECT SWITCH
- LIGHTING AND APPLIANCE PANELBOARD - SURFACE MOUNTED
- PANELBOARD - SURFACE MOUNTED
- CONDUIT RUN CONCEALED ABOVE CEILING OR IN WALLS
- - - CONDUIT RUN BELOW GRADE OR IN SLAB
- HOMERUN TO PANELBOARD ANY CIRCUIT WITHOUT FURTHER DESIGNATION = 2#12, 1#12 GRD 1/2"C, -H- = 3#12, 1#12 GRD, 1/2"C, ETC.

NOTE:
FIELD VERIFY LOCATION, MOUNTING, MOUNTING HEIGHT, ETC FOR ALL EQUIPMENT WITH OWNER AND ARCHITECT/ENGINEER PRIOR TO ROUGH-IN.

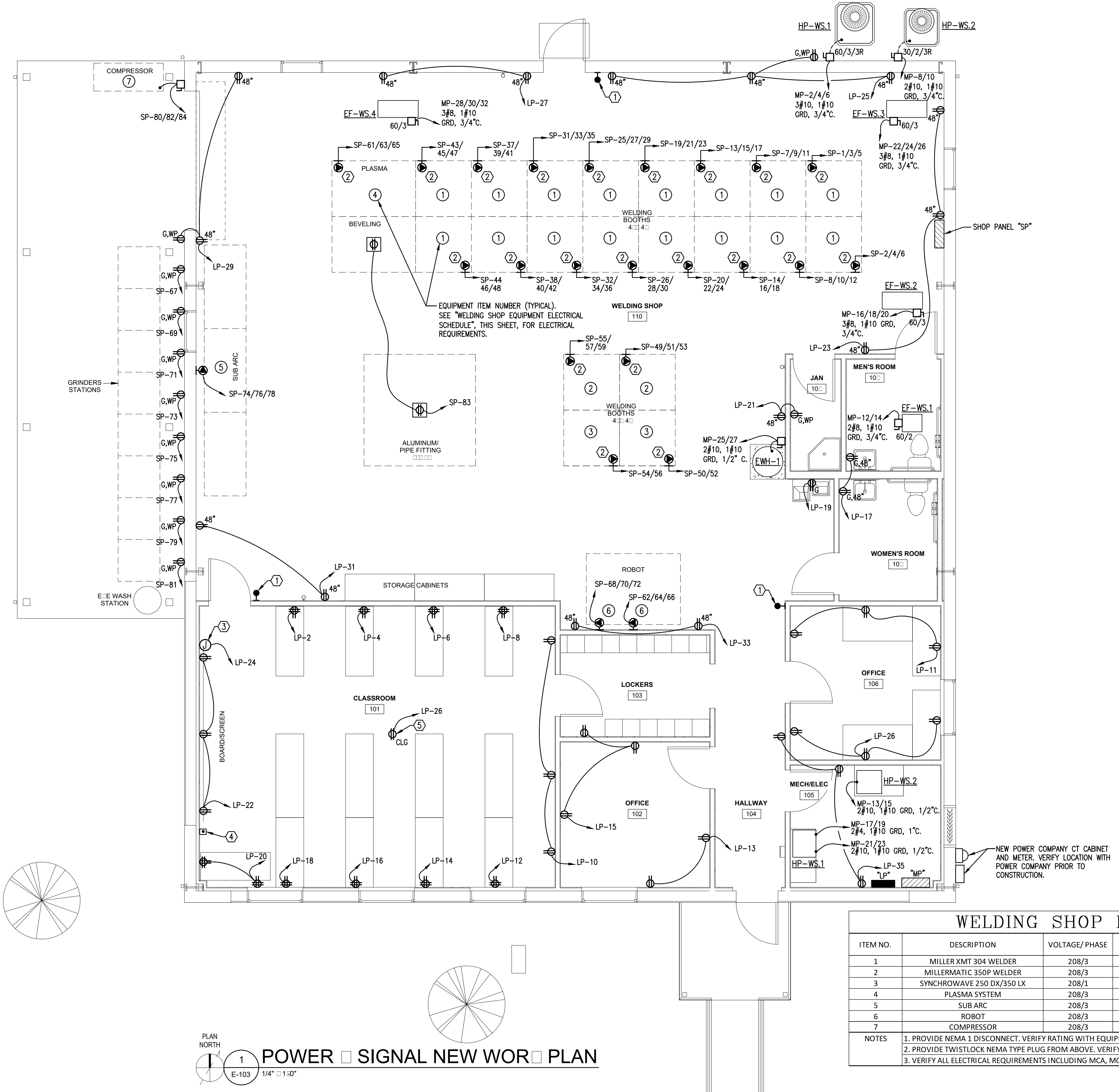
KEY NOTES

- ① "EPO" - EMERGENCY POWER-OFF PUSHBUTTON.
- ② PROVIDE SPECIAL TWIST-LOCK NEMA TYPE RECEPTACLE (TO BE VERIFIED WITH ACTUAL EQUIPMENT PROVIDED). PROVIDE UNISTRUT SUPPORT ABOVE WELDING BOOTH TO SUPPORT RECEPTACLE.
- ③ PROVIDE 120 VOLT CIRCUIT TO MOTORIZED PROJECTION SCREEN.
- ④ UP-DOWN CONTROL BUTTON FOR MOTORIZED PROJECTION SCREEN. MOUNT AT 48" A.F.F. PROVIDE 4#12, 1#12 GRD TO MOTORIZED PROJECTION SCREEN.
- ⑤ PROVIDE DUPLEX RECEPTACLE FLUSH MOUNTED IN CEILING TILE FOR OVERHEAD PROJECTOR.

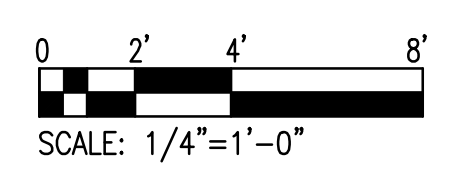
WELDING SHOP EQUIPMENT ELECTRICAL SCHEDULE

ITEM NO.	DESCRIPTION	VOLTAGE/ PHASE	MCA	LOAD (kVA)	WIRING	PANEL FED FROM	CIRCUIT BREAKER	DISCONNECT	NOTES
1	MILLER XMT 304 WELDER	208/3	42.0	9.83	3#6,#10G,1"C	"SP"	70/3	CORD/PLUG	2,3
2	MILLERMATIC 350P WELDER	208/3	43.0	9.92	3#6,#10G,1"C	"SP"	70/3	CORD/PLUG	2,3
3	SYNCHROWAVE 250 DX/350 LX	208/1	41.0	5.73	2#6,#10G,1"C	"SP"	70/2	CORD/PLUG	2,3
4	PLASMA SYSTEM	208/3	56.0	14.41	3#4,#8G,1 1/4"C	"SP"	80/3	CORD/PLUG	2,3
5	SUB ARC	208/3	60.0	15.00	3#4,#8G,1 1/4"C	"SP"	80/3	CORD/PLUG	2,3
6	ROBOT	208/3	45.0	10.00	3#6,#10G,1"C	"SP"	70/3	CORD/PLUG	2,3
7	COMPRESSOR	208/3	58.0	16.64	3#4,#8G,1 1/4"C	"SP"	100/3	100/3/3R	1,3

NOTES
1. PROVIDE NEMA 1 DISCONNECT. VERIFY RATING WITH EQUIPMENT PROVIDED.
2. PROVIDE TWISTLOCK NEMA TYPE PLUG FROM ABOVE. VERIFY RATING WITH EQUIPMENT PROVIDED.
3. VERIFY ALL ELECTRICAL REQUIREMENTS INCLUDING MCA, MOCP, WIRE SIZE, CORD/PLUG OR DISCONNECT RATING, ETC WITH ACTUAL EQUIPMENT PROVIDED.



PLAN NORTH
1
E-103 1/4" = 1'-0"



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208Y/120 VOLT, 3Ø, 4W
1,000 AMP MAIN BREAKER
SERVICE ENTRANCE RATED

CIRCUIT BREAKER PANEL SCHEDULE MAIN PANEL "MP"

SURFACE MOUNTED
PROVIDE WITH INTEGRAL
SURGE SUPPRESSION

CKT	LOAD DESCRIPTION	BREAKER POLE	AMP	LOAD KVA	BREAKER AMP	POLE	LOAD DESCRIPTION	CKT	
1								2	
3	PANEL "SP"	3	800	253.27	6.23	35	HP-WS.1 (OUTDOOR UNIT)	① 4	
5					1.50	15	HP-WS.2 (OUTDOOR UNIT)	① 6	
7					3.89	40	EF-WS.1	② 8	
9	PANEL "LP"	3	150	17.17				10	
11								12	
13	HP-WS.2 (INDOOR UNIT)	①	2	25	4.18			② 14	
15								16	
17	HP-WS.1(INDOOR UNIT-CKT.1)	①	2	60	8.61	6.02	35	3 EF-WS.2	② 18
19								20	
21	HP-WS.1(INDOOR UNIT-CKT.2)	①	2	25	3.60			② 22	
23					6.02	35	3 EF-WS.3	② 24	
25	EW-1	②	2	30	4.50			② 26	
27								28	
29					6.02	35	3 EF-WS.4	② 30	
31	SPARE	3	100					32	
33								34	
35					200	3	SPARE	36	
37	SPARE	3	100					38	
39					200	2	SPACE	40	
41	SPARE	1	20					42	

TOTAL CONNECTED LOAD: 318.27 KVA
MINIMUM INTERRUPTING CAPACITY: 22,000 AMPS SYMMETRICAL

① PROVIDE HACR TYPE CIRCUIT BREAKER. FIELD VERIFY SIZE & RATING WITH EQUIPMENT PROVIDED.
② FIELD VERIFY CIRCUIT BREAKER RATING WITH EQUIPMENT PROVIDED.

208Y/120 VOLT, 3Ø, 4W
225 AMP M.L.O.

CIRCUIT BREAKER PANEL SCHEDULE PANEL "LP"

SURFACE MOUNTED
PROVIDE WITH INTEGRAL
SURGE SUPPRESSION

CKT	LOAD DESCRIPTION	BREAKER POLE	AMP	LOAD KVA	BREAKER AMP	POLE	LOAD DESCRIPTION	CKT	
1	LIGHTS - CLASSRM/OFFICES/TLTS	1	20	1.40	0.36	20	1	RECEPTS - CLASSROOM DESK	2
3	- WELDING SHOP			1.07	0.36			- CLASSROOM DESK	4
5	- WELDING SHOP			1.60	0.36			- CLASSROOM DESK	6
7	- WELDING SHOP			0.71	0.36			- CLASSROOM DESK	8
9	- OUTSIDE/GRINDERS			0.25	0.54			- CLASSROOM DESK	10
11	RECEPTS - OFFICE 106			0.54	0.36			- CLASSROOM DESK	12
13	- OFFICE 102			0.36	0.36			- CLASSROOM DESK	14
15	- OFFICE 102/LOCKERS			0.54	0.36			- CLASSROOM DESK	16
17	- WOMEN'S/MEN'S			0.36	0.36			- CLASSROOM DESK	18
19	E.W.C. - SHOP			0.60	0.72			- INSTRUCTOR'S DESK	20
21	RECEPTS - SHOP/JANITOR			0.36	0.54			- CLASSROOM DESK	22
23	- SHOP-EAST WALL			0.54	0.60			MOTORIZED SCREEN-CLASSROOM	24
25	- SHOP-NORTH WALL			0.72	0.54			RECEPTS - OFFICE 106	26
27	- SHOP-NORTH WALL			0.36	-			SPARE	28
29	- SHOP-WEST WALL			0.54	-				30
31	- SHOP-WEST/SOUTH WALL			0.36	-				32
33	- SHOP-SOUTH WALL			0.36	-				34
35	- MECH/ELECT/HALL			0.54	-				36
37	SPARE			-	-				38
39	SPACE			-	-			SPACE	40
41				-	-				42

TOTAL CONNECTED LOAD: 17.17 KVA
MINIMUM INTERRUPTING CAPACITY: 22,000 AMPS SYMMETRICAL

208Y/120 VOLT, 3Ø, 4W
800 AMP MAIN BREAKER
WITH SHUNT TRIP

CIRCUIT BREAKER PANEL SCHEDULE PANEL "SP"

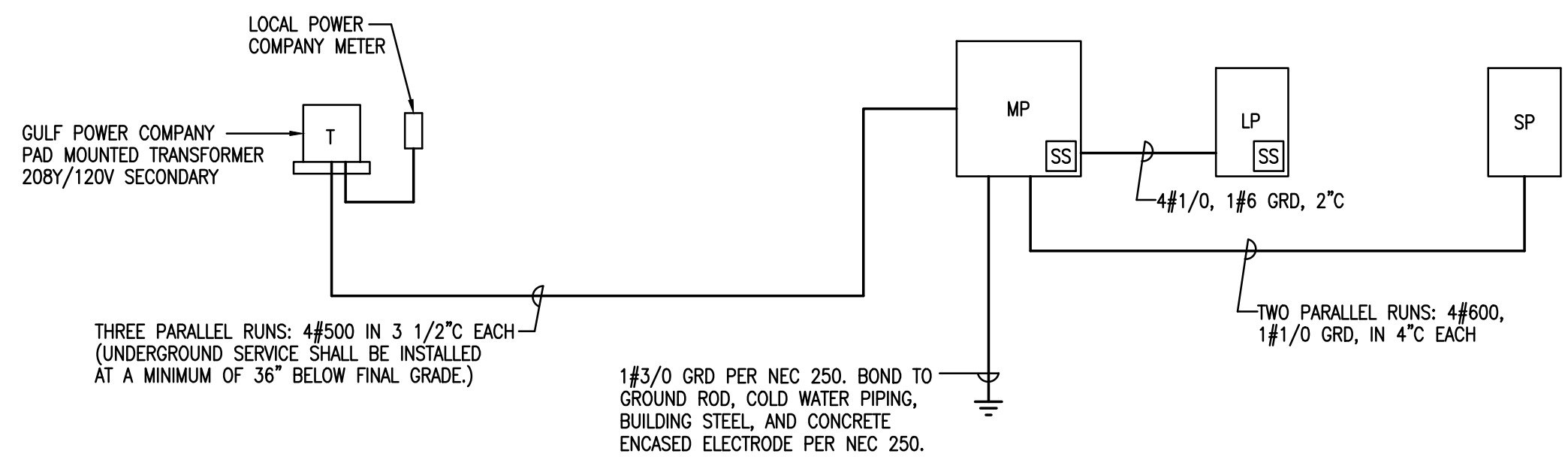
SURFACE MOUNTED

CKT	LOAD DESCRIPTION	BREAKER POLE	AMP	LOAD KVA	BREAKER AMP	POLE	LOAD DESCRIPTION	CKT	
1								2	
3	WELDER (MILLER XMT 304)	①	3	70	9.83	9.83	70	3 WELDER (MILLER XMT 304)	① 4
5								6	
7								8	
9	WELDER (MILLER XMT 304)	①	3	70	9.83	9.83	70	3 WELDER (MILLER XMT 304)	① 10
11								12	
13								14	
15	WELDER (MILLER XMT 304)	①	3	70	9.83	9.83	70	3 WELDER (MILLER XMT 304)	① 16
17								18	
19								20	
21	WELDER (MILLER XMT 304)	①	3	70	9.83	9.83	70	3 WELDER (MILLER XMT 304)	① 22
23								24	
25								26	
27	WELDER (MILLER XMT 304)	①	3	70	9.83	9.83	70	3 WELDER (MILLER XMT 304)	① 28
29								30	
31								32	
33	WELDER (MILLER XMT 304)	①	3	70	9.83	9.83	70	3 WELDER (MILLER XMT 304)	① 34
35								36	
37								38	
39	WELDER (MILLER XMT 304)	①	3	70	9.83	9.83	70	3 WELDER (MILLER XMT 304)	① 40
41								42	
43								44	
45	WELDER (MILLER XMT 304)	①	3	70	9.83	9.83	70	3 WELDER (MILLER XMT 304)	① 46
47								48	
49					5.73	70	2	WELDER (MILLER SYNCHROWAVE)	① 50
51	WELDER (MILLERMATIC 350P)	①	3	70	9.92				52
53					5.73	70	2	WELDER (MILLER SYNCHROWAVE)	① 54
55									56
57	WELDER (MILLERMATIC 350P)	①	3	70	9.92		20	1 SPARE	58
59							20	1 SPARE	60
61									62
63	PLASMA (HYPERTHERM)	①	3	80	14.41	10.00	70	3 ROBOT	① 64
65									66
67	GRINDER	①	1	20	1.80				68
69	GRINDER	①	1	20	1.80	10.00	70	3 ROBOT	① 70
71	GRINDER	①	1	20	1.80				72
73	GRINDER	①	1	20	1.80				74
75	GRINDER	①	1	20	1.80	15.00	80	3 SUB ARC	① 76
77	GRINDER	①	1	20	1.80				78
79	GRINDER	①	1	20	1.80				80
81	GRINDER	①	1	20	1.80	16.64	100	3 COMPRESSOR	① 82
83	RECEPTS-BEVELING/PIPEFITTING	①	1	20	1.50				84

TOTAL CONNECTED LOAD: 253.27 KVA
MINIMUM INTERRUPTING CAPACITY: 22,000 AMPS SYMMETRICAL

① FIELD VERIFY CIRCUIT BREAKER RATING WITH EQUIPMENT PROVIDED.

NOTE: INTERCONNECT ALL EMERGENCY POWER-OFF (EPO) PUSHBUTTONS WITH MAIN BREAKER SHUNT TRIP SUCH THAT PANEL IS DE-ENERGIZED UPON ACTIVATION OF ANY ONE OF THE PUSHBUTTONS.



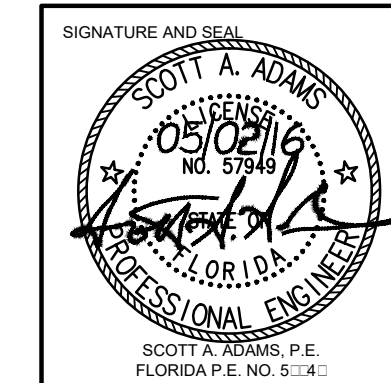
NOTES:
COORDINATE LOCATION OF PAD MOUNTED TRANSFORMER, CTS, AND METER WITH GULF POWER COMPANY PRIOR TO CONSTRUCTION.
COORDINATE METERING REQUIREMENTS WITH GULF POWER COMPANY AND PROVIDE ALL REQUIRED EQUIPMENT.

POWER RISER DIAGRAM

NOT TO SCALE

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05/02/16



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UNDERWOOD AVE. PENSACOLA, FL. 32504

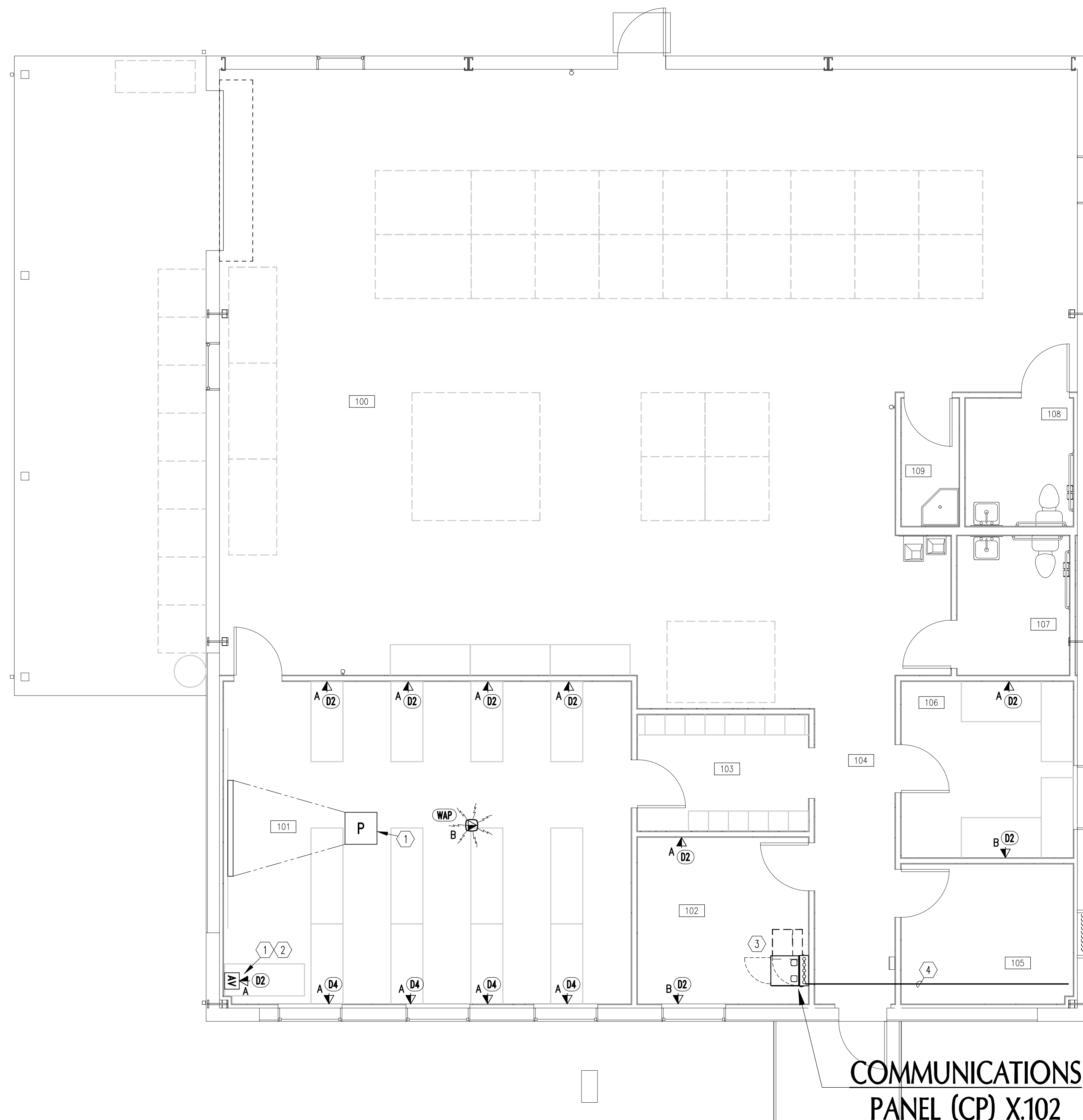
REVISIONS:

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
POWER RISER
DIAGRAM
ELECTRICAL
SCHEDULES

SHEET:

E-104



COMMUNICATIONS NEW WORK FLOOR PLAN KEY NOTES:

- 1 CLASSROOM A/V SYSTEM OUTLETS. PROVIDE NEW 'D2' OUTLET MOUNTED IN ABOVE TEACHER/PRESENTER STATION AND NEW 'D2' 'WAP' OUTLET MOUNTED IN SINGLE GANG OPENING IN PROJECTOR SUPPORT PLATE. ELECTRICAL CONTRACTOR PROVIDE TWO NEW DUPLEX POWER RECEPTACLES AT TEACHER/PRESENTER STATION AND NEW QUAD POWER RECEPTACLE IN NEW PROJECTOR SUPPORT PLATE. SEE DETAIL SHEETS. COLOR MATCH 'D2' OUTLET AND POWER DEVICE AND PLATE TO PROJECTOR SUPPORT PLATE (OFFICE WHITE). COORDINATE PROJECTOR PLATE LOCATION BASED ON OWNER SUPPLIED PROJECTOR AND LAPTOP.
- 2 AV CONNECTION FACEPLATE, MOUNT ON EXTRA DEEP 4"x4" BOX. PROVIDE 2" CONDUIT IN WALL AND ABOVE CEILING TO PROJECTOR LOCATION FOR CABLE PASS-THRU. FACEPLATE CONNECTORS SHALL BE COORDINATED WITH THE OWNER BASED ON THE OWNER SUPPLIED PROJECTOR AND LAPTOP.
- 3 NEW COMMUNICATIONS CABINET. COORDINATE EXACT LOCATION WITH FINAL FURNITURE LAYOUT.
- 4 2" BACKBONE CONDUIT TO EXTERIOR WALL CLOSEST TO EXISTING SERVICE ENTRY.

WALL/FLOOR PENETRATION NOTE

FIRE-RATED WALLS AND FLOORS:
THE CONTRACTOR SHALL FIRESTOP ALL PENETRATIONS OF ALL FLOORS AND ALL WALLS THAT EXTEND TO THE UNDERSIDE OF THE FLOOR OR ROOF DECK ABOVE. FIRESTOPPING SHALL BE ACCOMPLISHED USING UL CLASSIFIED SYSTEMS WITH FIRE RATING EQUAL TO OR GREATER THAN THE FIRE RATING OF THE FLOOR OR WALL ASSEMBLY PENETRATED. FIRESTOP SYSTEMS SHALL BE 3M, NELSON OR ENGINEER APPROVED EQUAL. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS. THE CONTRACTOR SHALL SUBMIT A MANUFACTURER'S STANDARD DETAIL FOR EACH TYPE OF FIRE-RATED WALL AND FLOOR PENETRATION REQUIRED FOR THIS PROJECT.

INTERIOR NON FIRE-RATED WALLS:
ALL OPENINGS IN WALLS THAT DO NOT EXTEND TO THE UNDERSIDE OF THE FLOOR OR ROOF DECK ABOVE SHALL BE SLEEVED, REPAIRED AND COMPLETELY SEALED WITH MATERIALS TO MATCH THE WALL CONSTRUCTION.

EXTERIOR WALLS:
SLEEVE WALL OPENING WITH SECTION OF SCHEDULE 40 PVC CONDUIT SIZED TO ACCEPT CONDUIT WITH ±1/4" ANNULAR SPACE FOR CAULK. SEAL BETWEEN SLEEVE AND CONDUIT WITH BACKER AND DOUBLE APPLICATION OF CLEAR LIFETIME SILICONE CAULK (BOTH SIDES). REPAIR WALL OPENING AROUND SLEEVE WITH NON-SHRINK HYDRAULIC GROUT FINISHED SMOOTH TO WALL SURFACE (BOTH SIDES). FINISH PAINT TO MATCH EXISTING BUILDING WALL COLOR.

FIRESTOPPING NOTE

THE CONTRACTOR SHALL FIRESTOP ALL PENETRATIONS OF ALL FLOORS AND ALL WALLS WHICH EXTEND TO THE UNDERSIDE OF THE FLOOR OR ROOF DECK ABOVE. FIRESTOPPING SHALL BE ACCOMPLISHED USING UL CLASSIFIED SYSTEMS WITH FIRE RATING EQUAL TO OR GREATER THAN THE FIRE RATING OF THE FLOOR OR WALL ASSEMBLY PENETRATED. FIRESTOP SYSTEMS SHALL BE 3M, NELSON OR ENGINEER APPROVED EQUAL. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS. THE CONTRACTOR SHALL SUBMIT A MANUFACTURER'S STANDARD DETAIL FOR EACH TYPE OF FLOOR AND WALL PENETRATION REQUIRED FOR THIS PROJECT. ALL OTHER PENETRATIONS OR OPENINGS IN NON-FIRE RATED WALLS SHALL BE REPAIRED AND SEALED WITH MATERIALS TO MATCH THE CONSTRUCTION OF THE WALL.

THE CONTRACTOR SHALL PROVIDE DETAILS FOR EACH DIFFERENT TYPE OF FIRESTOP ASSEMBLY REQUIRED TO THE BUILDING OFFICIAL FOR APPROVAL PRIOR TO INSTALLATION. EACH DETAIL SHALL INCLUDE THE TEST ASSEMBLY NUMBER AND A DESCRIPTION OF THE MATERIALS TO BE USED. HAVE APPROVED FIRESTOPPING DETAILS AVAILABLE AT PROJECT SITE AT TIME OF INSPECTION.

GENERAL CONDUIT PATHWAYS NOTE

RUN ALL CABLING IN CONDUIT PATHWAYS AS INDICATED, EXCEPT WHERE CONTRACTOR ELECTS TO INSTALL ADDITIONAL CONDUIT NOT INDICATED ON DRAWINGS. THE CONTRACTOR AGREES TO USE THE CONDUIT SYSTEM AS SHOWN, OR SHALL PROVIDE ADDITIONAL CONDUIT (AT NO ADDITIONAL COST TO THE OWNER) AS REQUIRED TO PROPERLY INSTALL ALL CABLING INDICATED, WITHOUT DAMAGE TO CABLING. THE ENTIRE CABLING PLANT SHALL BE TESTED TO THE REQUIREMENTS OF THE SPECIFICATIONS FOR THIS PROJECT AND SHALL BE CERTIFIED BY THE CONTRACTOR. ALL CONDUIT SHALL CONFORM TO REQUIREMENTS OF THE CONTRACT DOCUMENTS, WHETHER SPECIFICALLY SHOWN ON THE DRAWINGS OR NOT.

**COMMUNICATIONS
PANEL (CP) X.102**

COMMUNICATIONS NEW WORK PLAN
SCALE: 1/4" = 1'-0"

SIGNATURE AND SEAL

PSC WELDING SHOP

UNDERWOOD AVE., PENSACOLA, FL, 32504

REVISIONS

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:

COMMUNICATIONS
NEW WORK

SHEET:

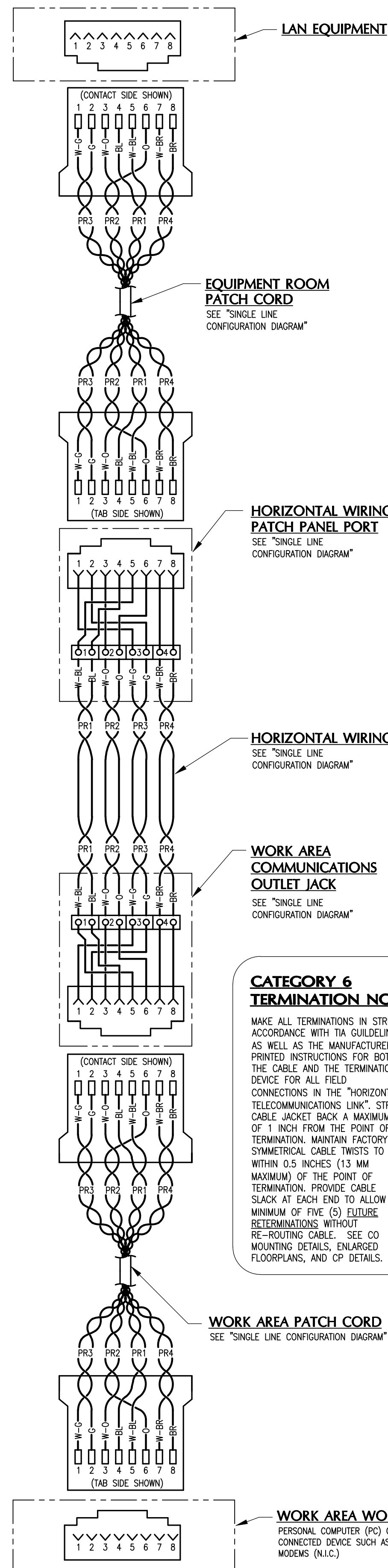
T-100



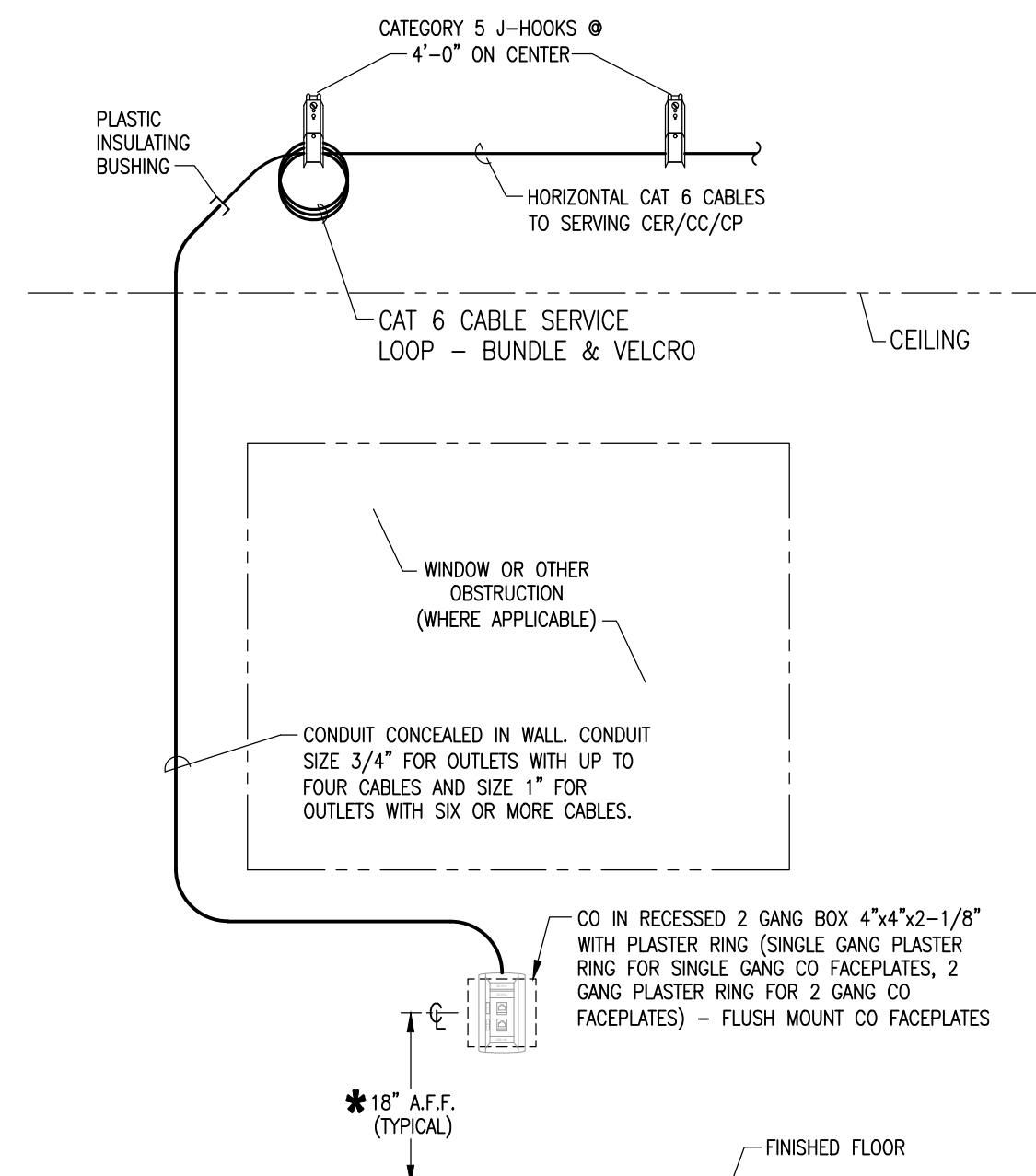
Premier
Engineering Group, LLC
Brown, Cook & Gaffey

GREG COOK, RCD
EXPIRES 12/31/16
Reg. No. 162967R

410 W. Nine Mile Road, Suite A, Pensacola, Florida 32534
Florida Certificate of Authorization #9306
Phone: (850) 469-0405 Fax: (850) 432-0905
Premier Project #15063



**TYPICAL POINT-TO-POINT WIRING DIAGRAM
WORK AREA WORKSTATION TO LAN EQUIPMENT
CATEGORY 6 "HORIZONTAL TELECOMMUNICATIONS CHANNEL"**
NOT TO SCALE

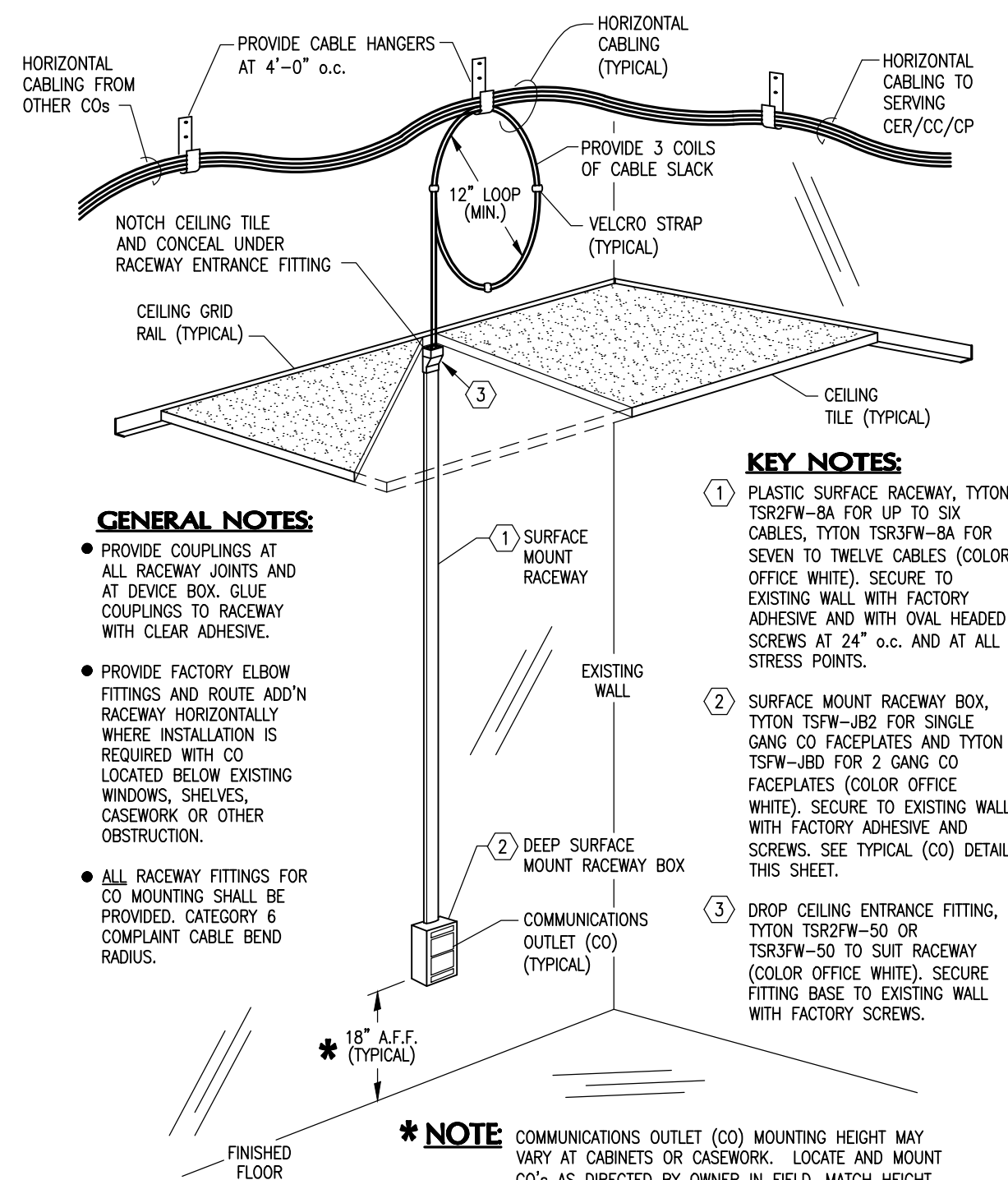


***NOTES:**

- 1) COMMUNICATIONS OUTLET (CO) MOUNTING HEIGHT MAY VARY AT CABINETS OR CASEWORK. LOCATE AND MOUNT CO'S AS DIRECTED BY ARCHITECT IN FIELD. MATCH HEIGHT OF ADJACENT ELECTRICAL POWER OUTLETS.
- 2) MOUNTING HEIGHT OF COMMUNICATIONS OUTLET (CO) SHOWN TO BE MOUNTED ABOVE COUNTER (AC) SHALL BE COORDINATED WITH THE ARCHITECT AND THE GENERAL CONTRACTOR IN THE FIELD PRIOR TO ROUGH-IN.
- 3) REFER TO ARCHITECTURAL DRAWINGS INTERIOR ELEVATIONS FOR CASEWORK DRAWINGS.

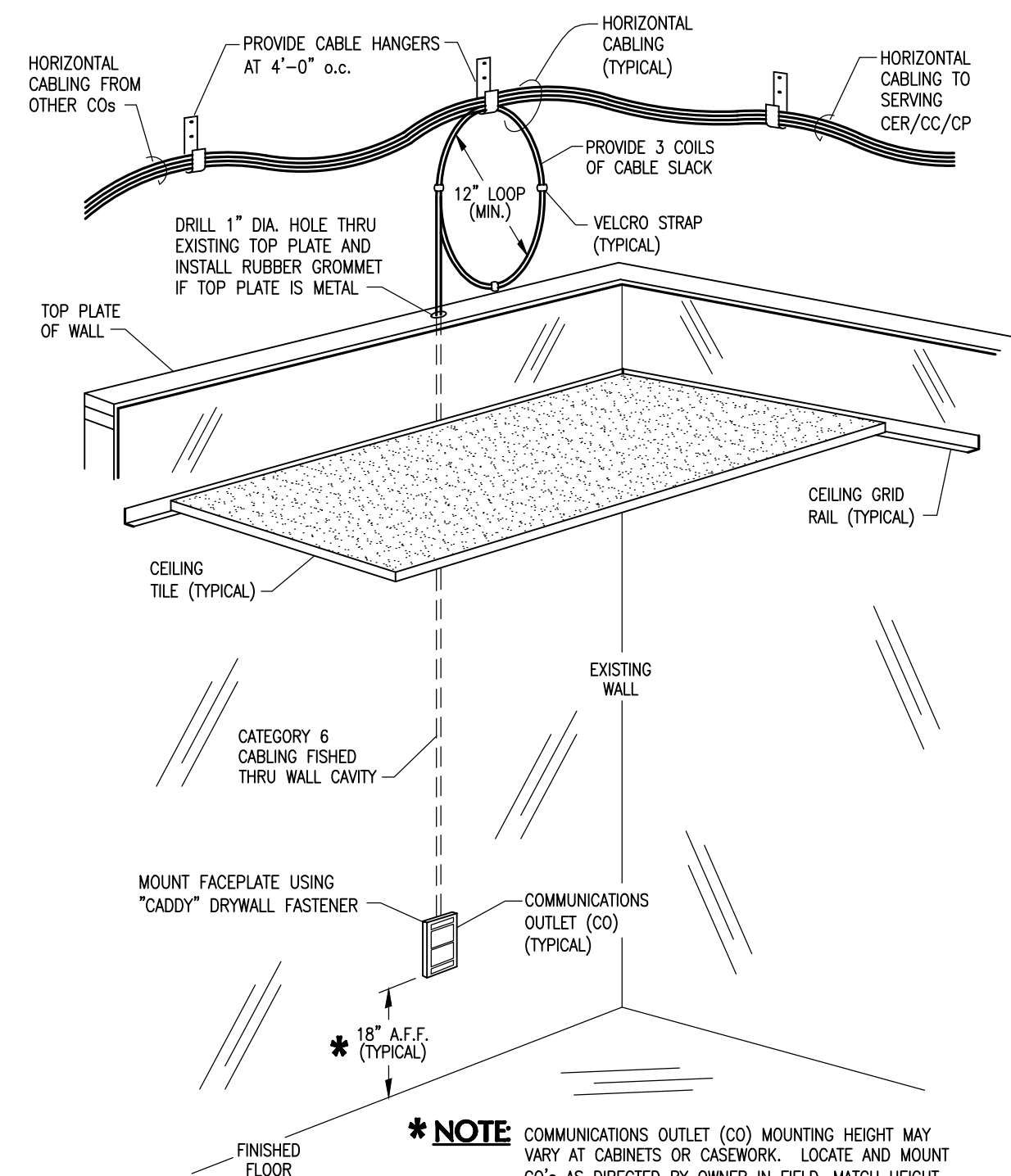
TYPICAL FLUSH MOUNT COMMUNICATIONS OUTLET (CO) MOUNTING DETAIL - NEW WALLS
NOT TO SCALE

◀ D2 ▶ D4



TYPICAL SURFACE MOUNT COMMUNICATIONS OUTLET (CO) MOUNTING DETAIL - EXISTING WALLS
NOT TO SCALE

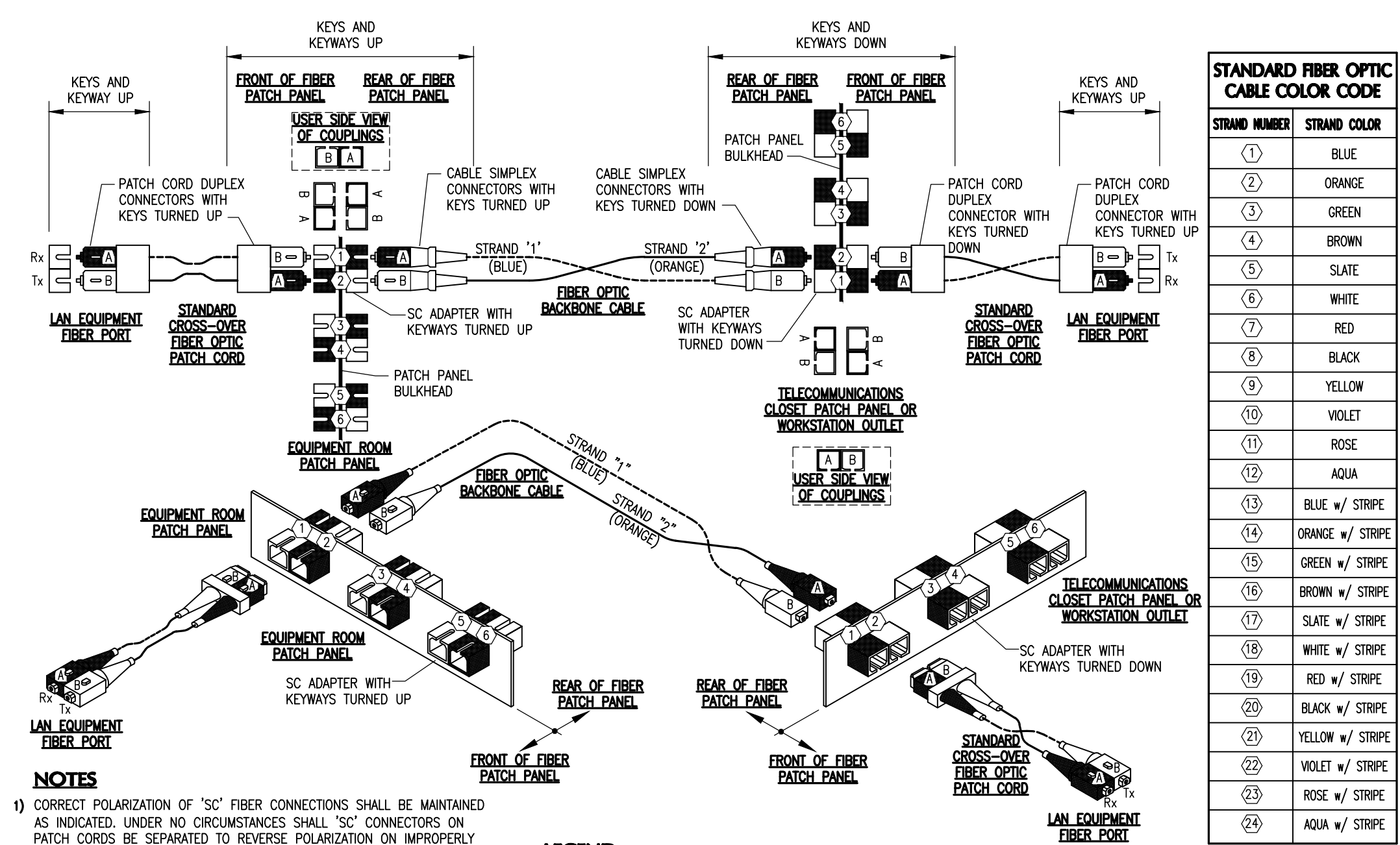
APPLICATION NOTE:
MAY BE USED ONLY AT EXISTING WALLS FOR INDIVIDUAL COMMUNICATIONS OUTLETS ONLY IN LOCATIONS WHERE OUTLETS ARE NOT GROUPED TOGETHER AND WHERE CABLING CANNOT BE FISHERD THRU EXISTING WALL SPACE AND SURFACE MOUNT INSTALLATION IS SPECIFICALLY APPROVED (ON A CASE-BY-CASE BASIS) BY ENGINEER.



TYPICAL FLUSH MOUNT COMMUNICATIONS OUTLET (CO) MOUNTING DETAIL - EXISTING WALLS
NOT TO SCALE

APPLICATION NOTE:
MANDATORY METHOD OF INSTALLATION IN EXISTING WALLS FOR ALL COMMUNICATIONS OUTLETS IN ALL LOCATIONS. MANDATORY EXCEPT WHERE SURFACE MOUNTING IS SPECIFICALLY APPROVED BY ENGINEER.

FIBER OPTIC CABLE POINT-TO-POINT CONNECTION DIAGRAM - SC CONNECTORS



STANDARD FIBER OPTIC CABLE COLOR CODE	STAND NUMBER	STAND COLOR
1	1	BLUE
2	2	ORANGE
3	3	GREEN
4	4	BROWN
5	5	SLATE
6	6	WHITE
7	7	RED
8	8	BLACK
9	9	YELLOW
10	10	VIOLET
11	11	ROSE
12	12	AQUA
13	13	BLUE w/ STRIPE
14	14	ORANGE w/ STRIPE
15	15	GREEN w/ STRIPE
16	16	BROWN w/ STRIPE
17	17	SLATE w/ STRIPE
18	18	WHITE w/ STRIPE
19	19	RED w/ STRIPE
20	20	BLACK w/ STRIPE
21	21	YELLOW w/ STRIPE
22	22	VIOLET w/ STRIPE
23	23	ROSE w/ STRIPE
24	24	AQUA w/ STRIPE

Bullock Tice Associates
909 East Cervantes Suite B
Pensacola, FL 32501
AAC000174
www.bullocktice.com
Fax: 850.432.5208
Phone: 850.434.5444

SIGNATURE AND SEAL

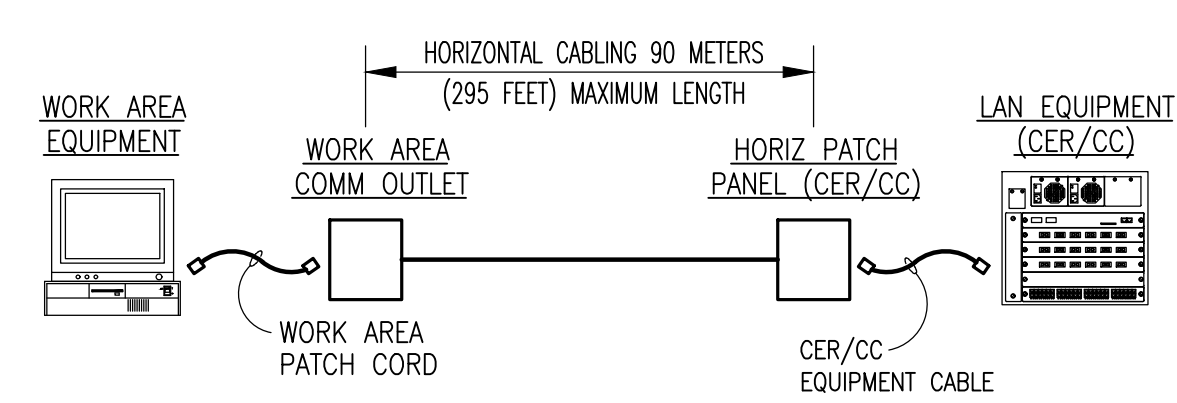
PSC WELDING SHOP
UNDERWOOD AVE., PENSACOLA, FL, 32504

REVISIONS

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:
COMMUNICATIONS DETAILS

SHEET:
T-501



TIA-568B ALLOWS A TOTAL OF 10 METERS (33 FEET) FOR THE TOTAL OF THE WORK AREA PATCH CORD, THE CER/CC EQUIPMENT CABLE, AND A SECOND EQUIPMENT CABLE OR PATCH CORD IN THE CER/CC. THE DESIGN FOR THIS PROJECT DOES NOT UTILIZE A SECOND EQUIPMENT CABLE OR PATCH CORD IN THE CER/CC.

HORIZONTAL CABLING CHANNEL

SIGNATURE AND SEAL

PSC WELDING SHOP
UNDERWOOD AVE., PENSACOLA, FL, 32504

REVISIONS

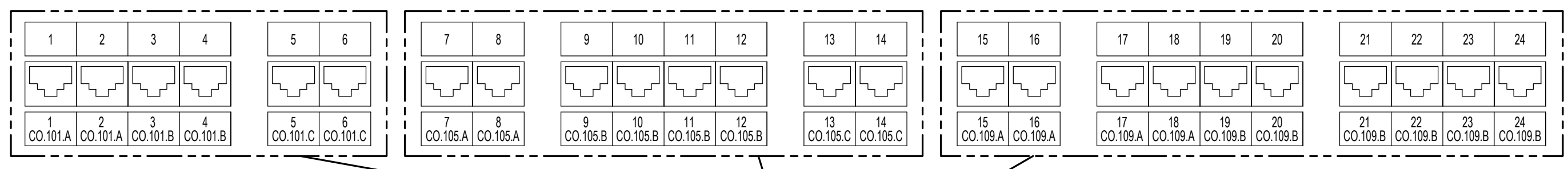
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SHEET DATE: 05/02/16

SHEET TITLE:
**COMMUNICATIONS
DETAILS**

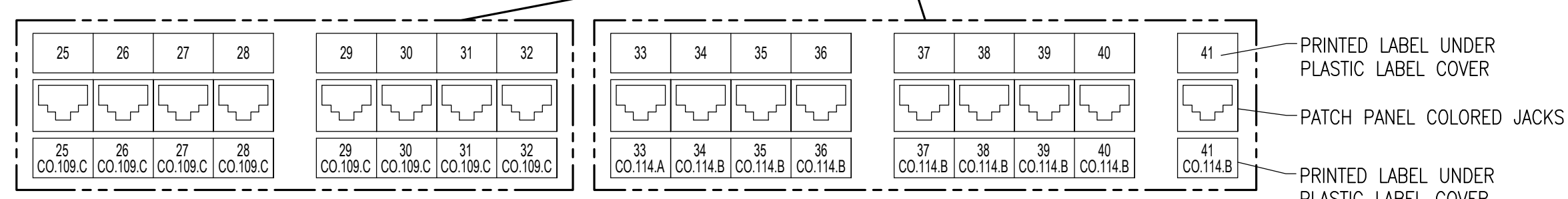
SHEET:
T-502

CATEGORY 6 HORIZONTAL TELECOMMUNICATIONS CHANNEL LABELING REQUIREMENTS (TYPICAL FOR ALL COs)

- 1) TERMINATE CATEGORY 6 HORIZONTAL CABLING ON HORIZONTAL PATCH PANELS IN NUMERICAL ORDER BY ROOM NUMBER. REFER TO FLOOR PLANS AND "COMMUNICATIONS OUTLET (CO) SCHEDULE" FOR ROOM NUMBER AND LOCATION. TERMINATE JACKS FOR EACH 'CO' SEQUENTIALLY IN ORDER OF 'CO' COLOR CODE (RED - BLUE - GREEN - YELLOW - VIOLET - ORANGE - INTERNATIONAL GRAY - ELECTRIC IVORY). WHERE A ROOM HAS MORE THAN ONE 'CO' GROUP SEQUENTIALLY IN ORDER OF ALPHABETICAL OUTLET IDENTIFIER (A - B - C - D - ETC.).
- 2) PROVIDE FACTORY PAPER-IN-PLASTIC LABEL FOR EACH ROW, WITH PRINTED VERTICAL SUBDIVISIONS THAT PHYSICALLY MATCH LIMITS OF MODULAR JACKS WHEN INSTALLED IN PATCH PANELS.
- 3) IDENTIFY EACH HORIZONTAL PATCH PANEL MODULAR JACK AS INDICATED. TEXT SHALL BE GENERATED ON LASER PRINTER AND SHALL BE MINIMUM 10.5 POINT ARIAL NARROW FONT BOLD (ENGINEER WILL PROVIDE FONT). WHERE CONNECTIONS ARE NOT USED (AT ENDS OF PARTIALLY POPULATED PATCH PANELS), LEAVE LABELS BLANK FOR FUTURE EXPANSION.
- 4) PROVIDE OVERALL IDENTIFICATION TAG FOR EACH HORIZONTAL PATCH PANEL IN ACCORDANCE WITH "HORIZONTAL PATCH PANEL I.D. NOMENCLATURE". TAG CONSTRUCTION AND LAYOUT SHALL BE PER "TYPICAL HORIZONTAL PATCH PANEL LAMINATED I.D. TAG DETAIL".

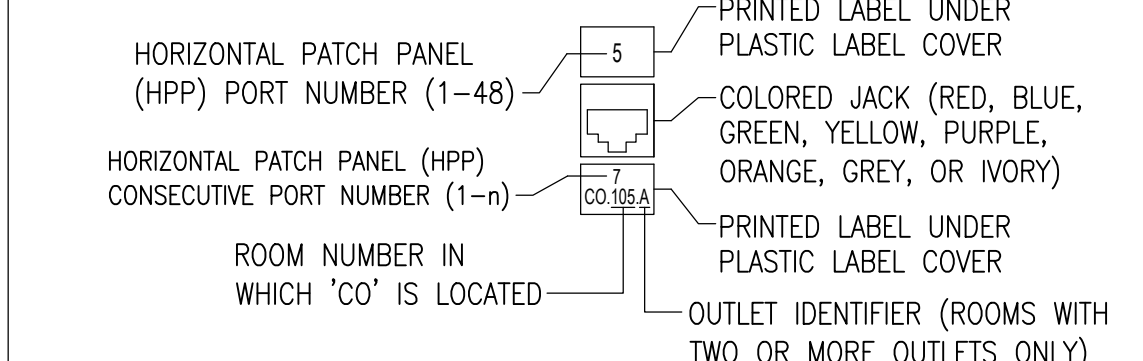


CATEGORY 6 HORIZONTAL PATCH PANEL HPP1 IN CER.1.100

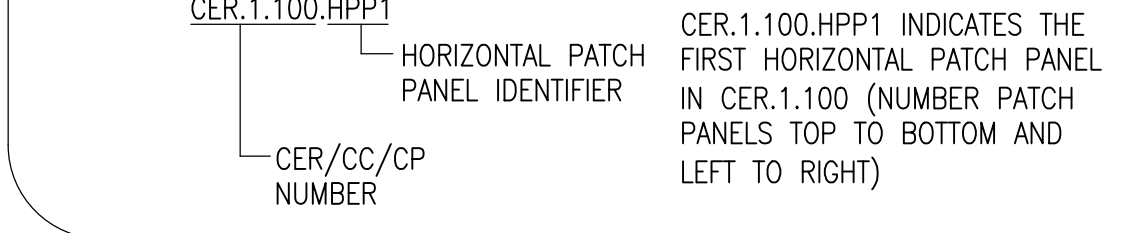


SAMPLE LABELING - HORIZONTAL PATCH PANEL HPP1

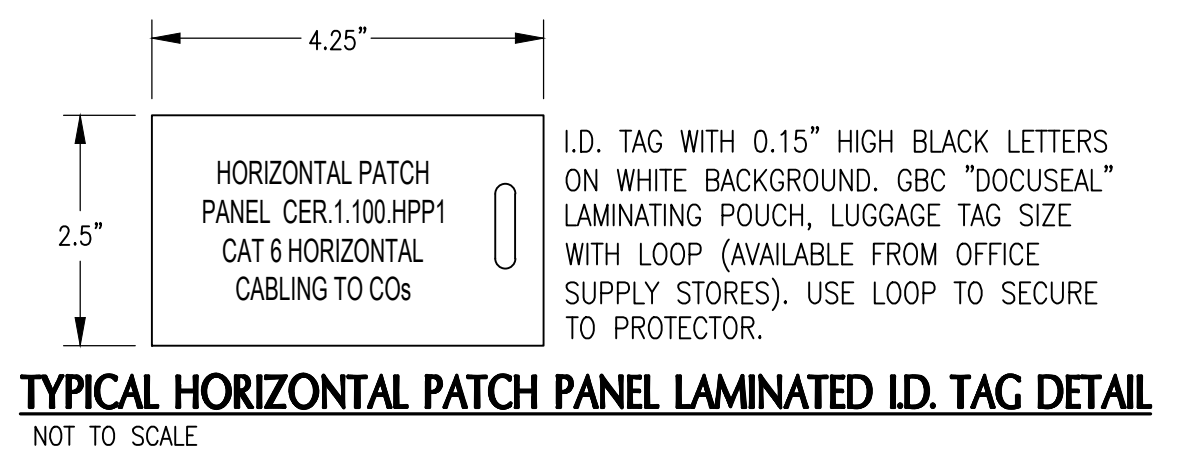
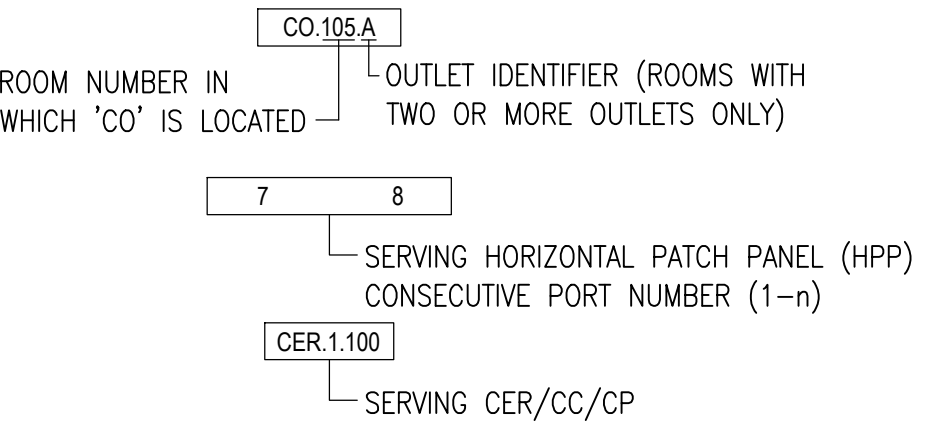
HORIZONTAL PATCH PANEL PORT LABELING NOMENCLATURE



HORIZONTAL PATCH PANEL I.D. NOMENCLATURE

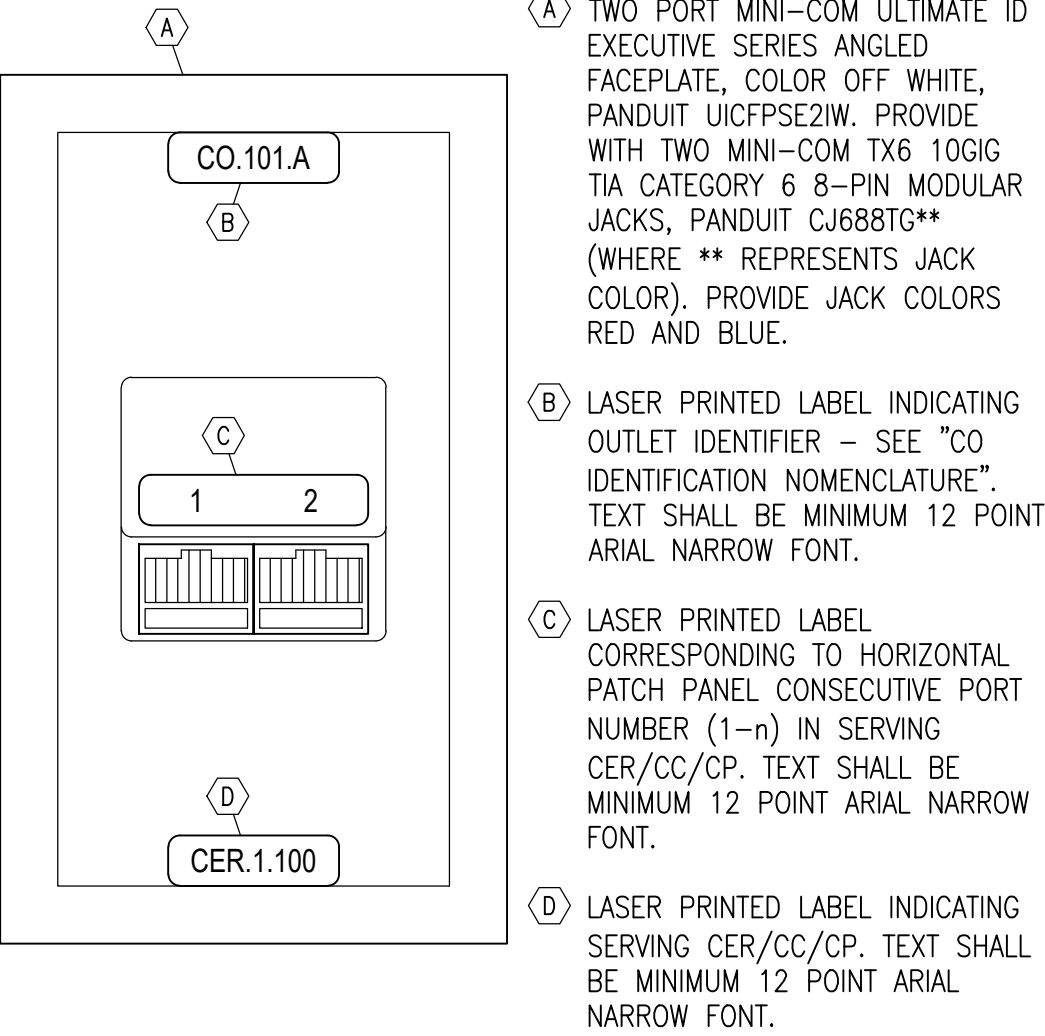


CO IDENTIFICATION NOMENCLATURE



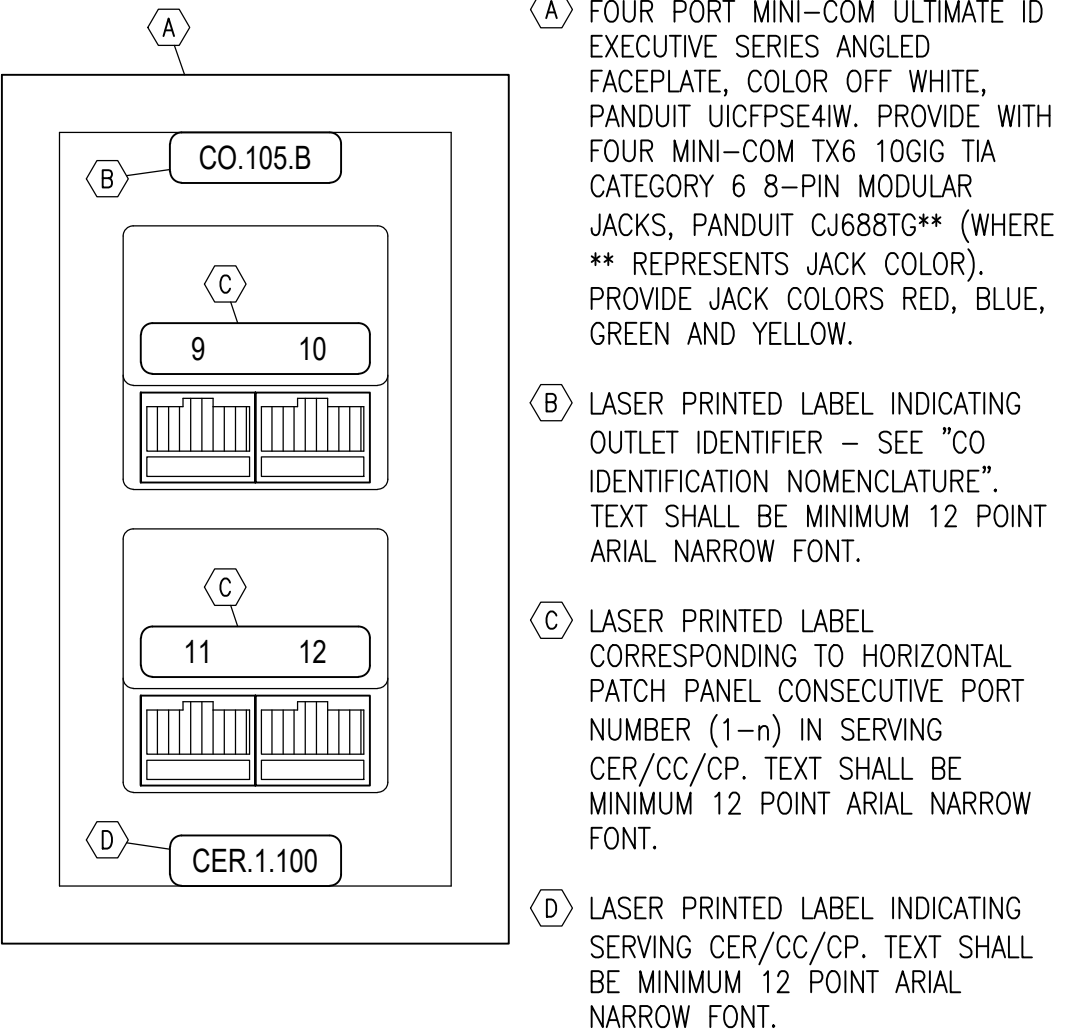
PROTOTYPAL LABELING NOTE
LABELING INDICATED IS PROTOTYPAL AND INTENDED TO ILLUSTRATE IDENTIFICATION METHODOLOGY FOR ANY PROJECT. ROOM NUMBERS, OUTLET TYPES AND OUTLETS QUANTITIES INDICATED HAVE NO DIRECT RELATIONSHIP TO THIS PROJECT.

TYPE "D2" CO KEY NOTES:



TYPE "D2" COMMUNICATIONS OUTLET (CO)
NOT TO SCALE (D2 = TWO DATA/VOICE) ◀ D2

TYPE "D4" CO KEY NOTES:

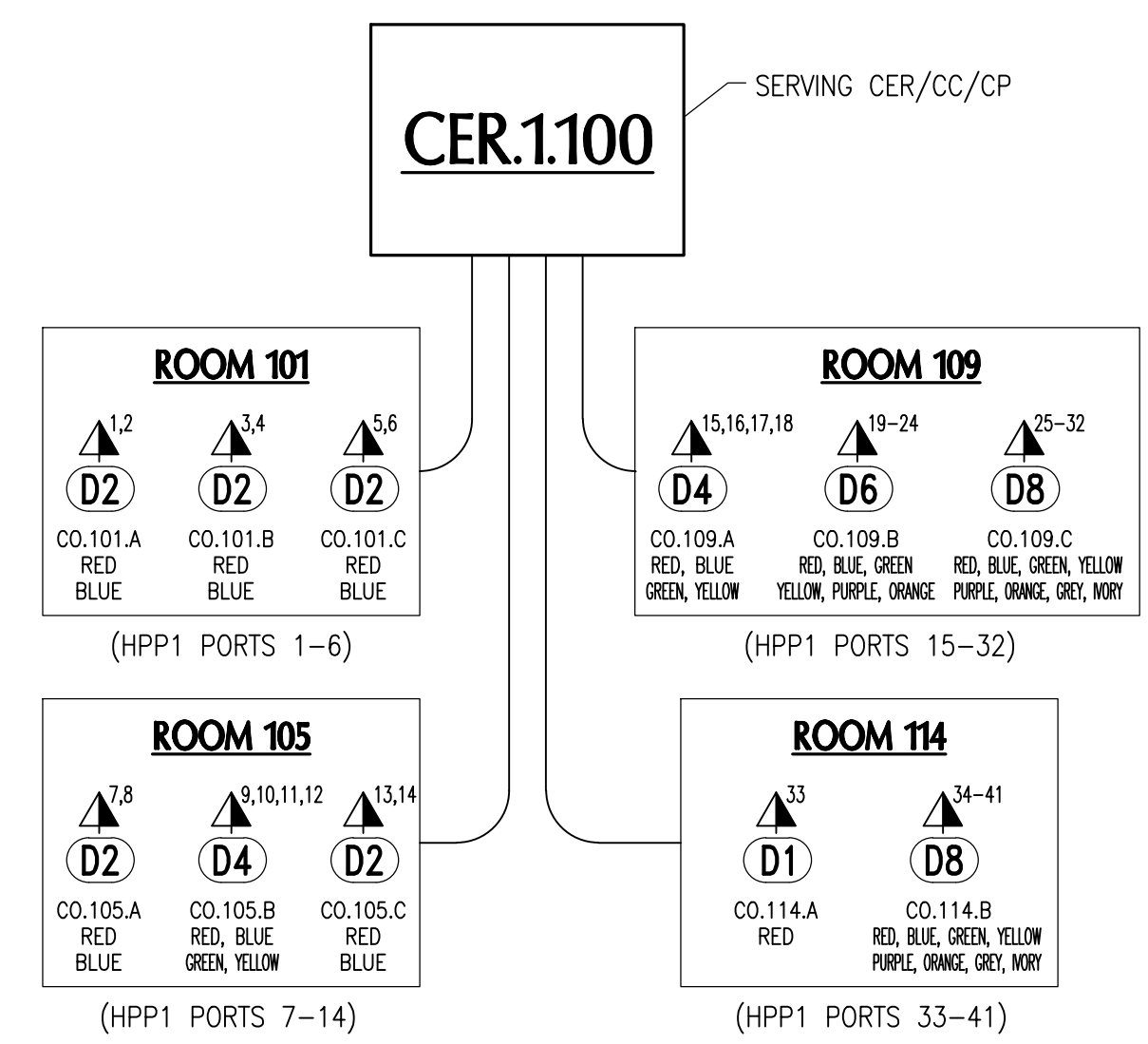


TYPE "D4" COMMUNICATIONS OUTLET (CO)
NOT TO SCALE (D4 = FOUR DATA/VOICE) ◀ D4

GENERAL LABELING NOTE
1) ALL COs, PROTECTOR BLOCKS, VOICE BLOCKS, AND HORIZONTAL PATCH PANELS SHALL BE LABELED USING THE FINAL "FISH" ROOM NUMBERS. OBTAIN FINAL "FISH" ROOM NUMBERS FROM THE ARCHITECT PRIOR TO LABELING.
2) ALL LABELS FOR COs, PROTECTOR BLOCKS, VOICE BLOCKS, AND HORIZONTAL PATCH PANELS SHALL BE PRODUCED USING FACTORY LABEL SHEETS FOR LASER PRINTERS MANUFACTURED FOR THE SPECIFIC DEVICE.

GENERAL TEXT WIDTH NOTE
1) USE ARIAL NARROW FONT, WHICH IS VERY COMPRESSED BY WIDTH. IF ADDITIONAL WIDTH COMPRESSION IS REQUIRED FOR UNUSUALLY LONG LABELS, USE THE MS WORD FORMAT-FONT-CHARACTER SPACING-CONDENSED-BY X POINTS (USE POINT REDUCTIONS OF LESS THAN ONE IN TENTHS OF A POINT - USE NO MORE REDUCTION THAN REQUIRED TO FIT LABEL).
2) LABELING TEMPLATES IN MS WORD ARE AVAILABLE FROM THE ENGINEER.

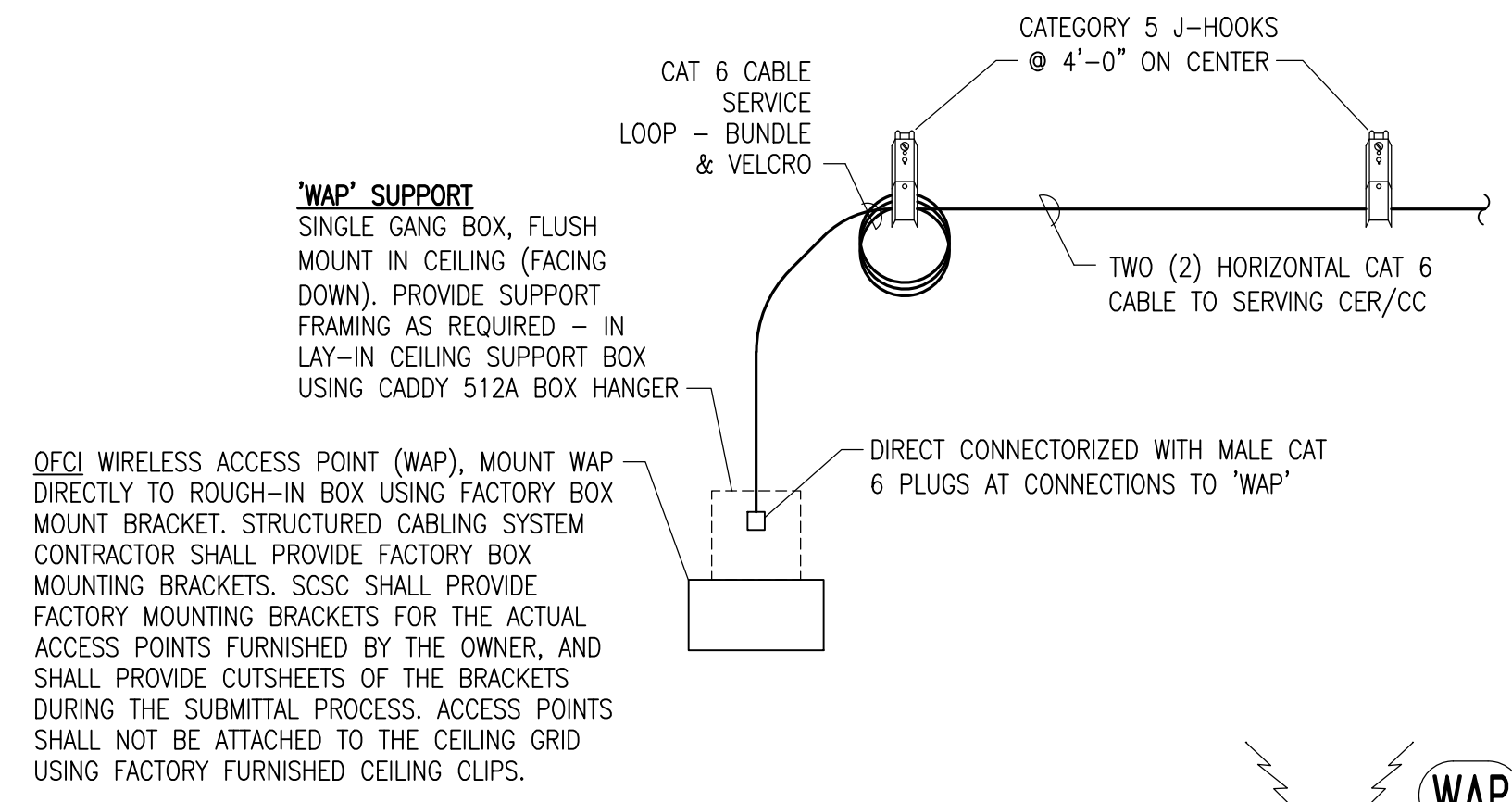
FACEPLATE COLOR NOTE
VERIFY ALL FACEPLATE COLORS WITH THE OWNER'S PROJECT MANAGER PRIOR TO PRE-INSTALLATION SUBMITTALS. PROVIDE ALTERNATE COLOR STANDARD WITH THE MANUFACTURER AT NO ADDITIONAL COST TO THE OWNER IF SO DIRECTED. COORDINATE WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.



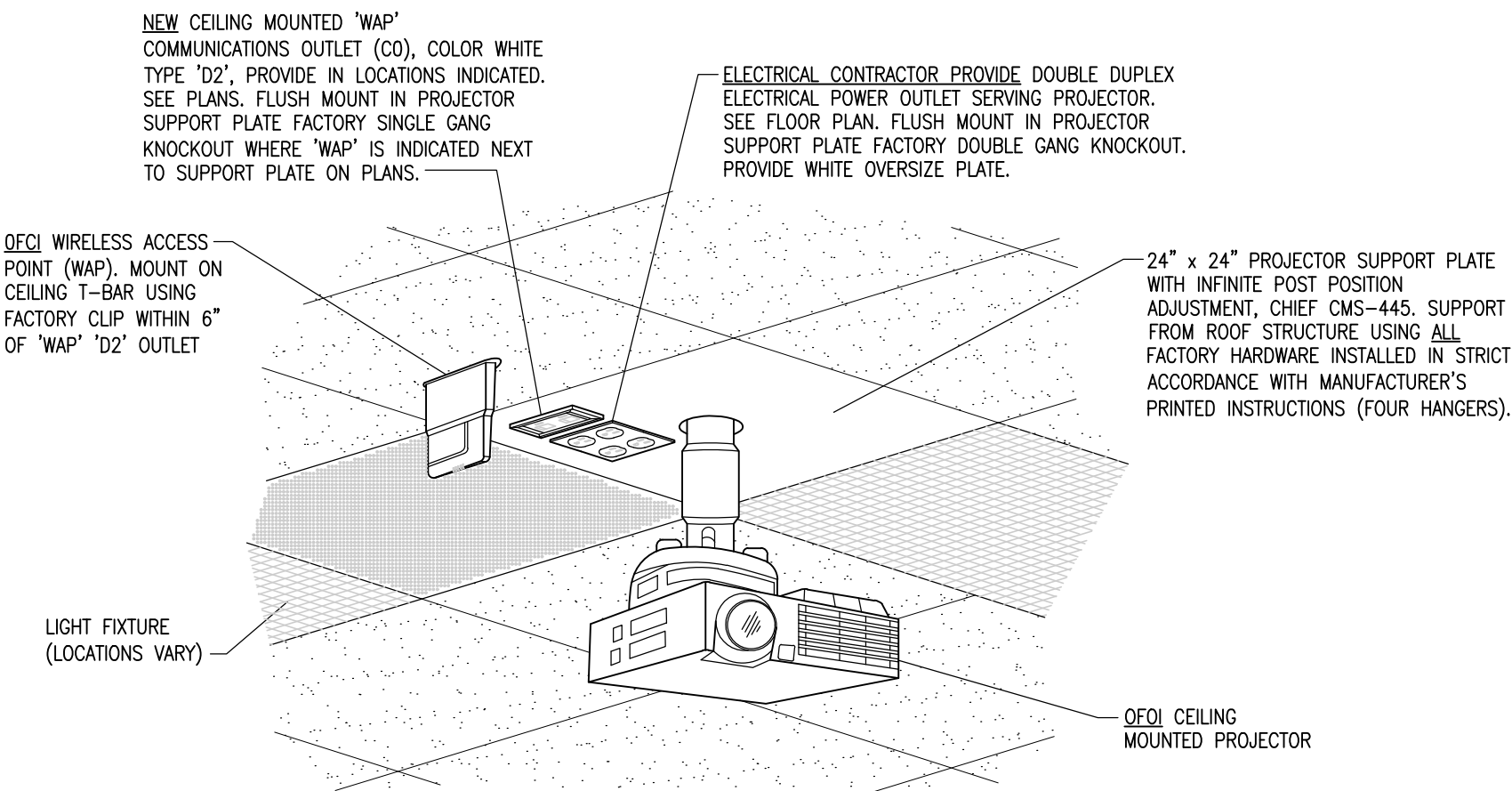
PROTOTYPAL LABELING NOTE
LABELING INDICATED ON THIS SHEET IS PROTOTYPAL AND INTENDED TO ILLUSTRATE IDENTIFICATION METHODOLOGY FOR ANY PROJECT. ROOM NUMBERS, OUTLET TYPES AND OUTLETS QUANTITIES INDICATED HAVE NO DIRECT RELATIONSHIP TO THIS PROJECT.

PROTOTYPAL LABELING GUIDE COMMUNICATIONS OUTLETS
NOT TO SCALE

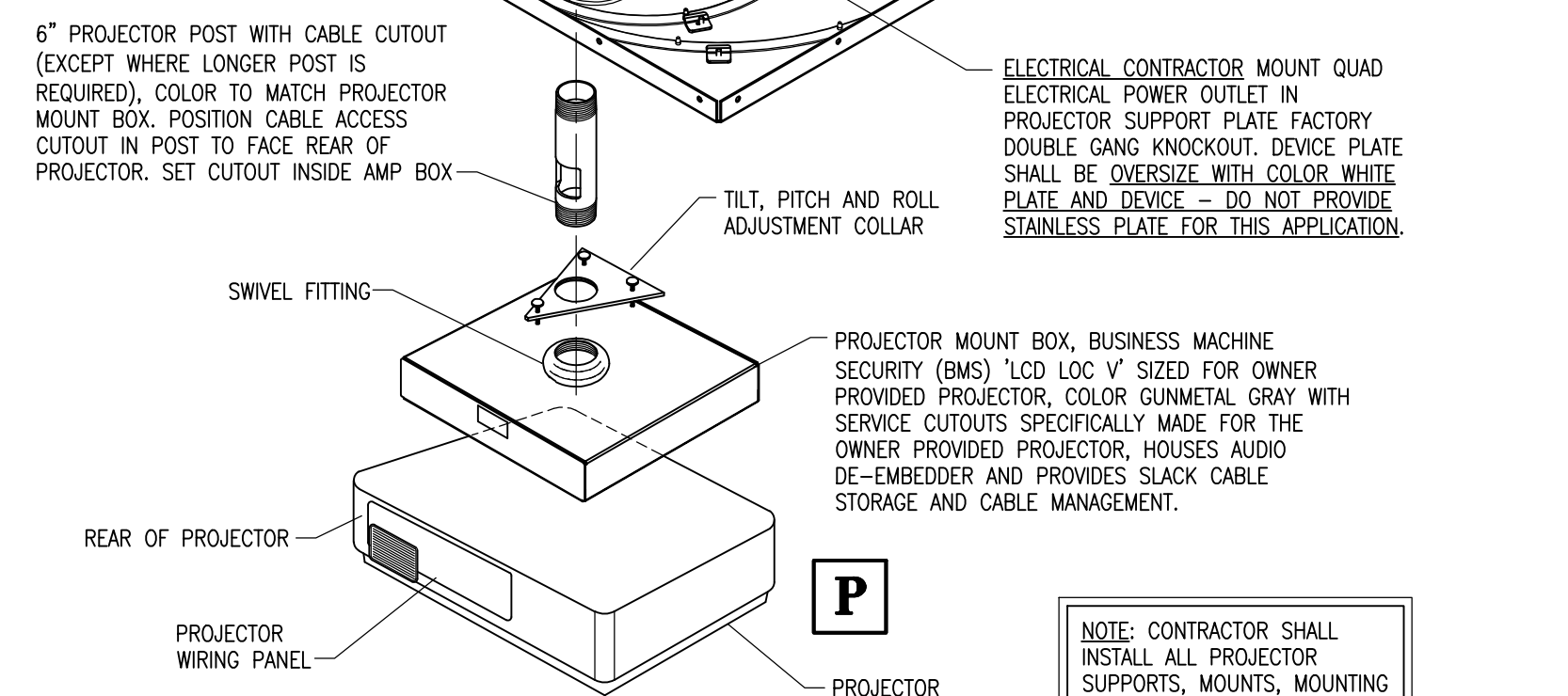
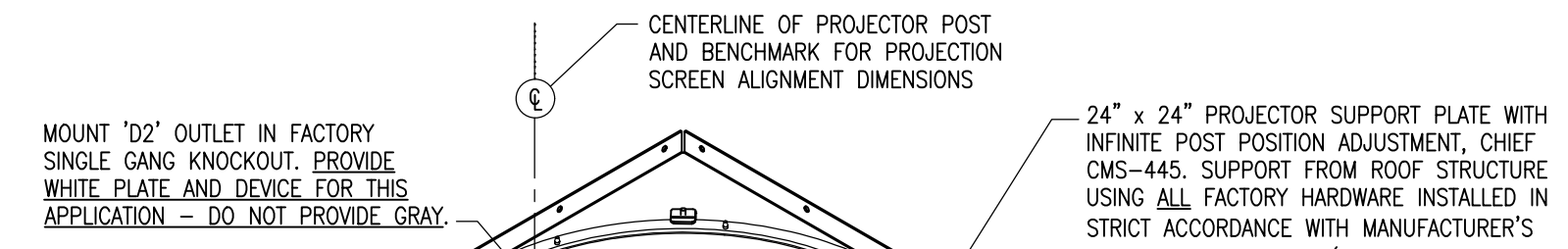
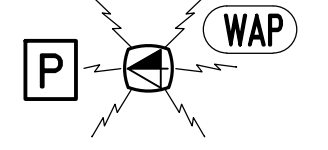
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LABELING INDICATED ON THIS SHEET IS PROTOTYPAL AND INTENDED TO ILLUSTRATE IDENTIFICATION METHODOLOGY FOR ANY PROJECT. ROOM NUMBERS, OUTLET TYPES AND OUTLETS QUANTITIES INDICATED HAVE NO DIRECT RELATIONSHIP TO THIS PROJECT.



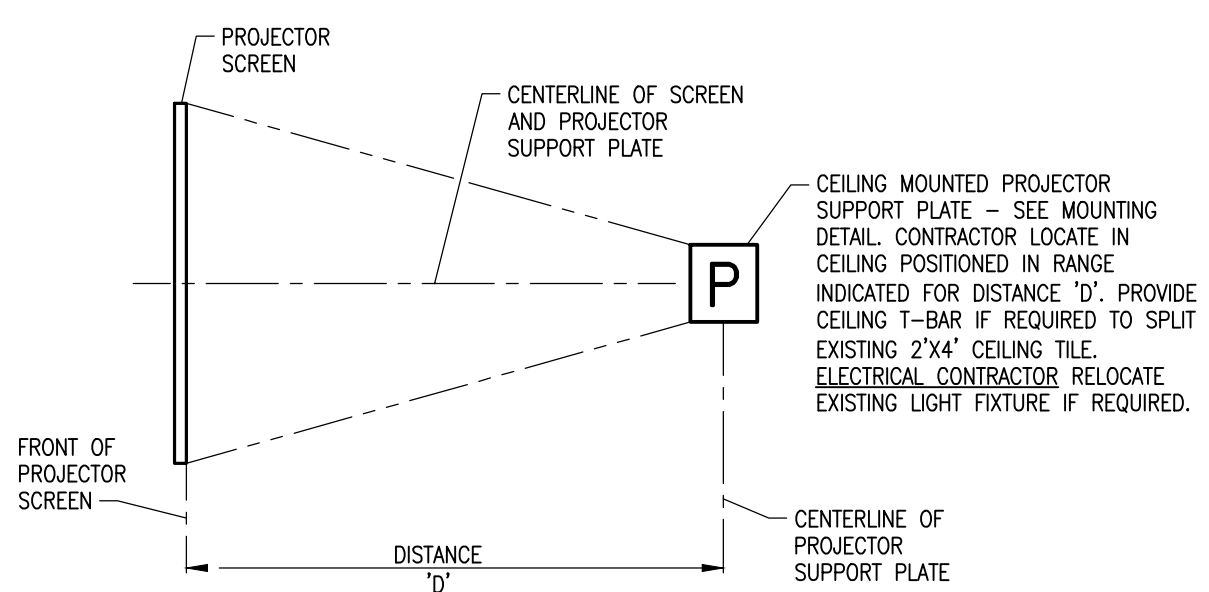
LAY-IN CEILING MOUNT WIRELESS ACCESS POINT (WAP) MOUNTING DETAIL
NOT TO SCALE



TYPICAL CEILING LAYOUT - PROJECTOR SUPPORT PLATE and WAP MOUNTING
NOT TO SCALE

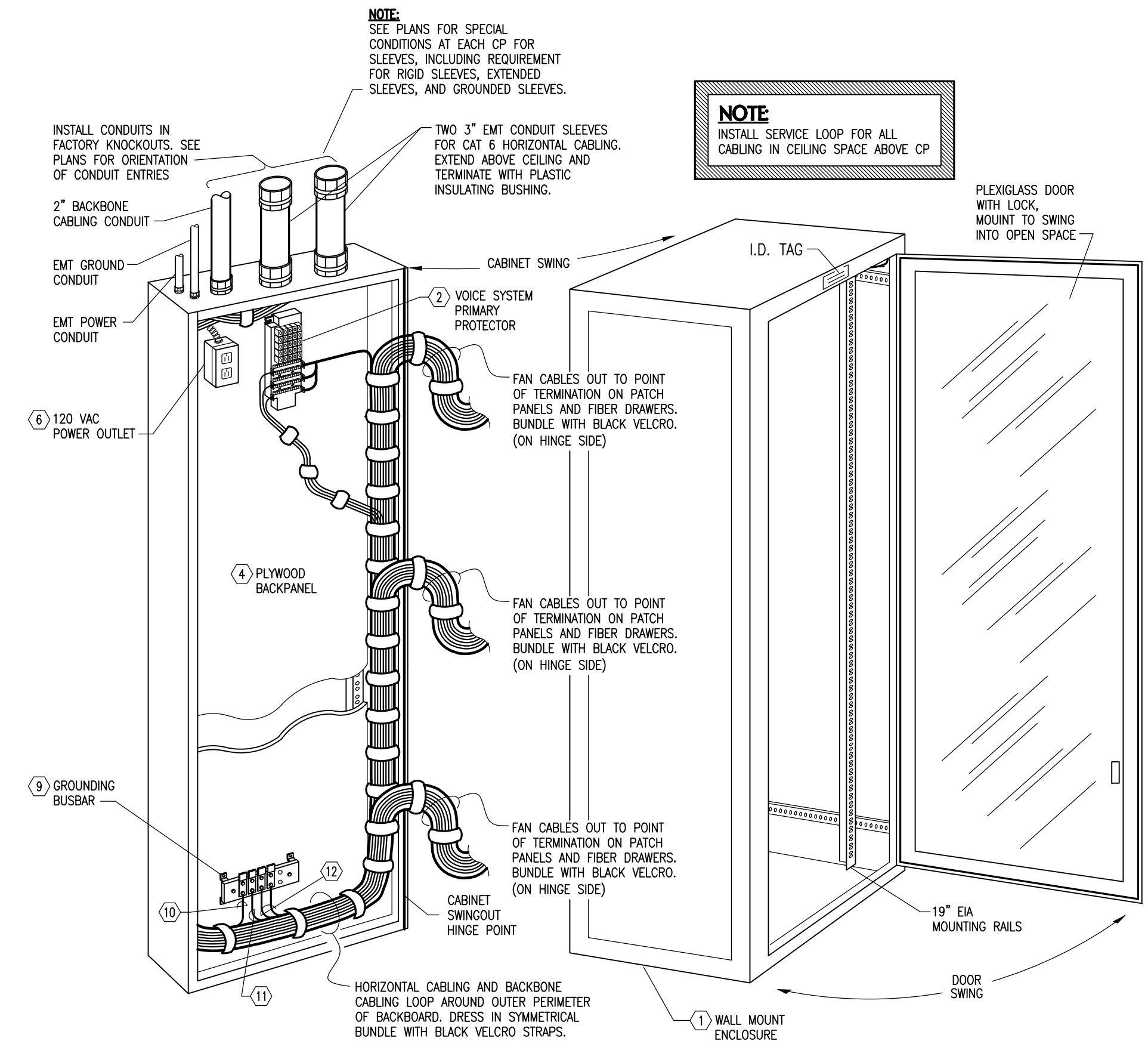


TYPICAL PROJECTOR MOUNTING DETAIL - LAY-IN CEILING
NOT TO SCALE

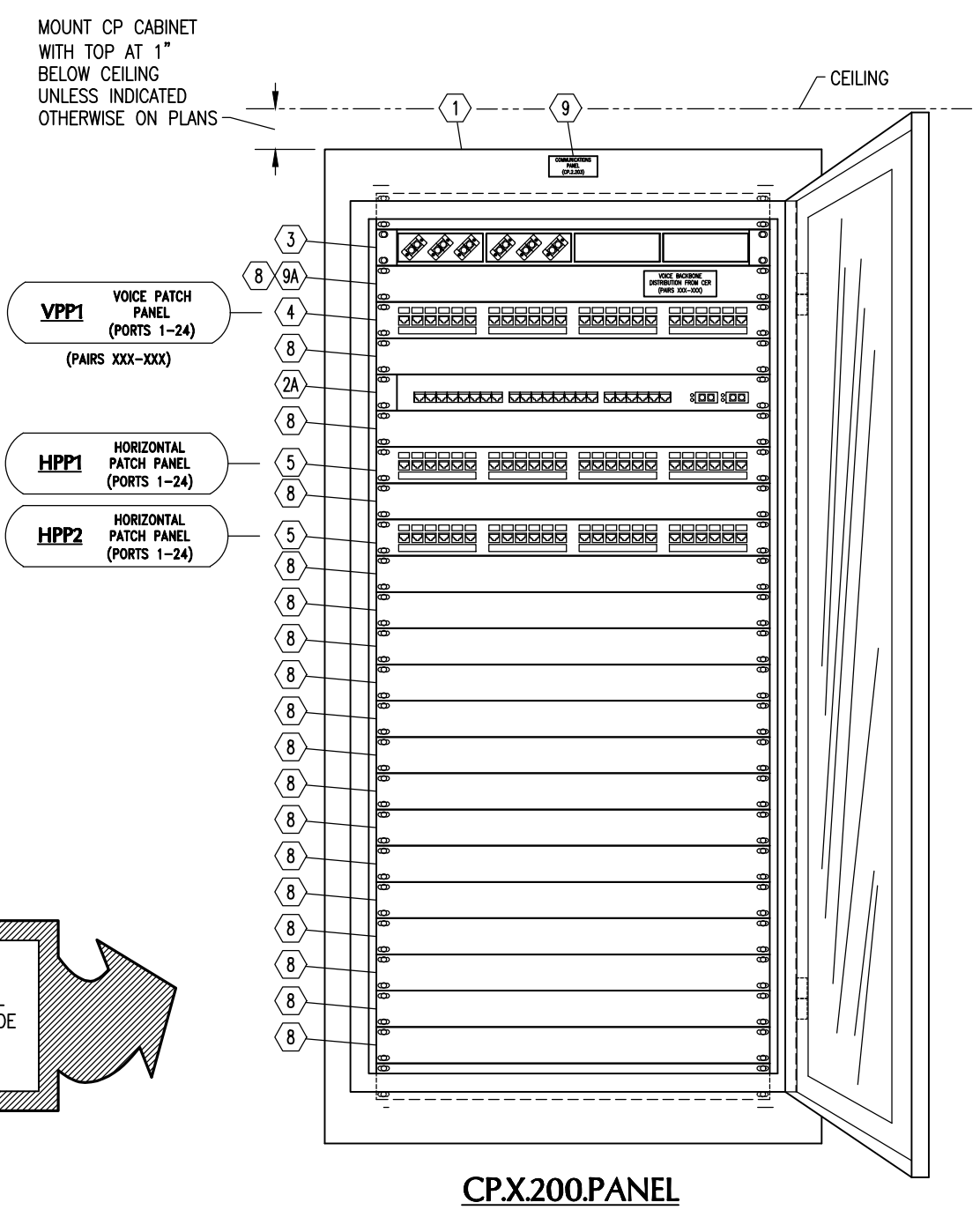


PROJECTOR SUPPORT PLATE LOCATION GUIDE
NOT TO SCALE

PROJECTOR PLATE DISTANCE 'D'	
SCREEN WIDTH	DISTANCE 'D'
VARIABLES	VARIABLES, PROVIDE PROJECTOR MANUFACTURER NUMBER TO ENGINEER

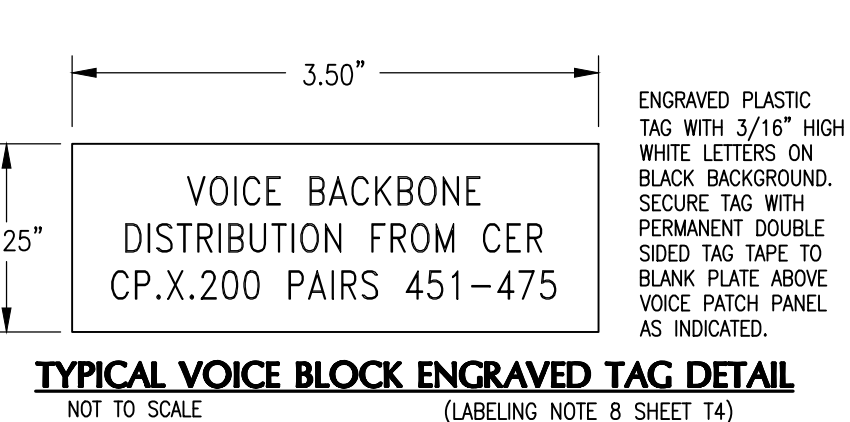
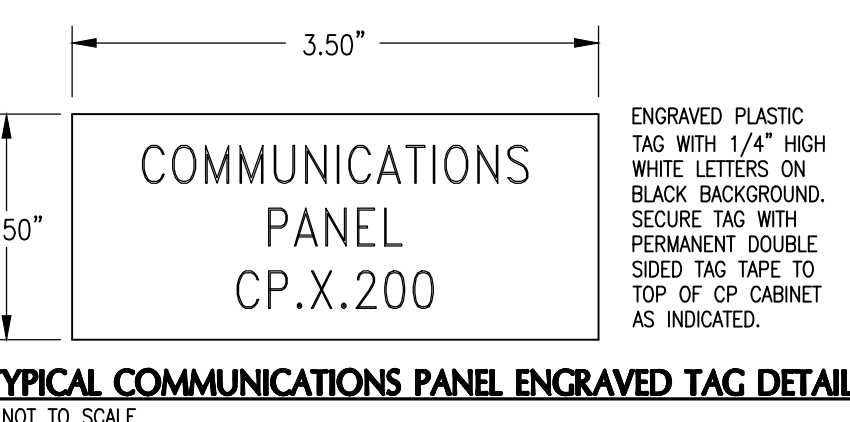
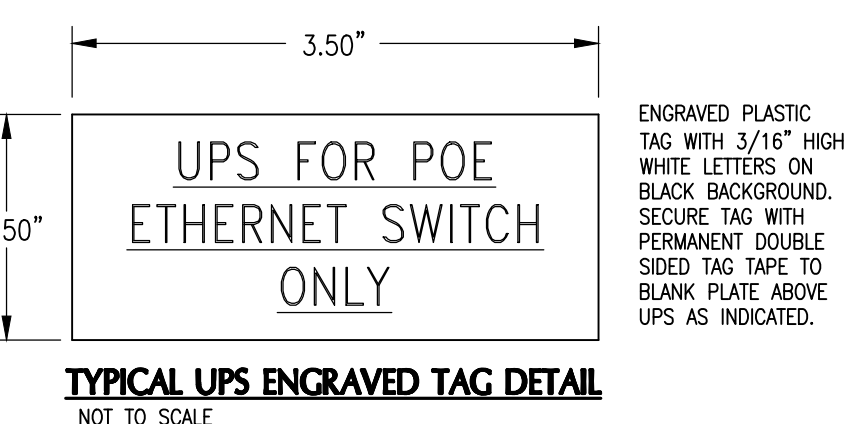


COMMUNICATIONS PANEL (CP) TYPICAL INSTALLATION DETAILS
SCALE: 1-1/2" = 1'-0"



COMMUNICATIONS PANEL (CP) TYPICAL DETAILS
SCALE: 1-1/2" = 1'-0"

- CP EQUIPMENT KEY NOTES:**
- WALL MOUNT/SWING OUT CABINET, 48" (H) x 24" (W) x 24" (D) ENCLOSURE GREAT LAKES GL48WS WITH 48WS-02 DOOR AND 48WS-11 LOUVERED SIDE PANELS. PROVIDE TWO Pairs EIA MOUNTING RAILS FOR SWINGOUT CABINET SECTION AND ONE ADDITIONAL PAIR EIA MOUNTING RAILS FOR BACKPANEL MOUNTING. ALL RAILS SHALL HAVE A UNIVERSAL 5/8", 5/8", 1/2" ALTERNATING HOLE PATTERN. PROVIDE WITH FACTORY SMOKED PLEXIGLASS DOOR WITH INTEGRAL LOCK/KEY (48WS-02), LOUVERED SIDE PANELS (48WS-11) AND FAN ASSEMBLY WITH FAN GUARD AND TWO 75 CFM FANS (7217WS IBM WHITE). CABINET COLOR SHALL BE FACTORY WHITE (IBM WHITE) FINISH.
 - CONTRACTOR FURNISHED CONTRACTOR INSTALLED (CFCI): POE ENABLED ETHERNET SWITCH. SEE "DATA SYSTEM SINGLE LINE CONFIGURATION DIAGRAM".
 - FIBER DRAWER FOR BACKBONE CABLE, RACK MOUNT. SEE "DATA SINGLE LINE CONFIGURATION DIAGRAM".
 - 24 PORT PRE-CONNECTORIZED VOICE BACKBONE PATCH PANEL (VPP). SEE "VOICE SINGLE LINE CONFIGURATION DIAGRAM". PROVIDE PANOUT WMBR1 CABLE BAR ON BACK OF RACK, STRAP 25 PAIR VOICE CABLE TO CABLE BAR.
 - 24 PORT CATEGORY 6 HORIZONTAL PATCH PANEL (HPP). SEE "DATA SINGLE LINE CONFIGURATION DIAGRAM".
 - SINGLE RACK SPACE BLANK FILLER PLATE, COLOR BLACK, CHATSWORTH 30026-701.
 - IDENTIFICATION TAG AT TOP OF PANEL. SEE "TYPICAL COMMUNICATIONS PANEL ENGRAVED TAG DETAIL".
 - VOICE WIRING BLOCK TAG. SEE "TYPICAL VOICE WIRING BLOCK ENGRAVED TAG DETAIL".



CP GROUNDING NOTES:

- ALL GROUND CONNECTIONS SHALL BE MADE WITH HEAVY DUTY 2 HOLE COMPRESSION LUGS (HARGER GECLB4-2C FOR #4AWG, GECLB6-2C FOR #6AWG) AND 3/8" SS HEX HEAD CAP SCREWS WITH SS LOCKING NUTS (TWO 3/8" SS SCREWS AND NUTS PER 2 HOLE LUG).
- PROVIDE GROUNDING BUSBAR IN EACH CP AS INDICATED. ELECTRICAL CONTRACTOR GROUND EACH BUSBAR TO THE BUILDING MAIN ELECTRICAL SERVICE GROUND (BUILDING IN WHICH THE CP IS LOCATED) WITH #4 AWG INSULATED (GREEN) SOLID COPPER GROUNDING CONDUCTOR. ELECTRICAL CONTRACTOR RUN #4 AWG CONDUCTOR FROM BUSBAR LOCATION TO BUILDING MAIN ELECTRICAL SERVICE GROUND IN EMT CONDUIT AND PROVIDE INSULATED GROUNDING BUSBAR - WALLEABLE BRON. STEEL CITY #86-807 AT BOTH CONDUIT ENDS AND GROUND EACH END PER NEC. GROUNDING TO BUILDING STRUCTURE, CONDUITS, UTILITY PIPING, OR ELECTRICAL SUBPANELS IN LIEU OF BONDING TO BUILDING MAIN ELECTRICAL SERVICE GROUND IS NOT ACCEPTABLE.
- GROUND CP CABINET TO BUSBAR WITH #6 AWG INSULATED (GREEN) SOLID COPPER GROUNDING CONDUCTOR. IF CP HAS FACTORY GROUNDING POST PROVIDE HEAVY DUTY SINGLE HOLE COMPRESSION LUG (HARGER GECLX SERIES) WITH HOLE SIZE TO MATCH POST. IF CP DOES NOT HAVE FACTORY GROUNDING POST PROVIDE HEAVY DUTY 2 HOLE COMPRESSION LUG (HARGER GECLB6-2C SERIES) AND SECURE TO CP MAIN INTERIOR FRAME WITH TWO 3/8" SS HEX HEAD CAP SCREWS WITH SS LOCKING NUTS - DRILL TWO 7/16" HOLES IN FRAME AND REMOVE PAINT WITH FILE TO ENSURE ELECTRICAL CONTACT.
- GROUND VOICE PROTECTOR BLOCK TO BUSBAR WITH #6 AWG INSULATED (GREEN) SOLID COPPER GROUNDING CONDUCTOR. AT PROTECTOR END, PROVIDE HEAVY DUTY SINGLE HOLE COMPRESSION LUG (HARGER GECLX SERIES) WITH HOLE SIZE TO MATCH FACTORY GROUNDING POST.
- GROUND PA SYSTEM PROTECTOR BLOCK TO BUSBAR WITH #6 AWG INSULATED (GREEN) SOLID COPPER GROUNDING CONDUCTOR. AT PROTECTOR END, PROVIDE HEAVY DUTY SINGLE HOLE COMPRESSION LUG (HARGER GECLX SERIES) WITH HOLE SIZE TO MATCH FACTORY GROUNDING POST.
- GROUND ITV SURGE PROTECTOR TO BUSBAR WITH #6 AWG INSULATED (GREEN) SOLID COPPER GROUNDING CONDUCTOR. AT PROTECTOR END, PROVIDE HEAVY DUTY SINGLE HOLE COMPRESSION LUG WITH HOLE SIZE TO MATCH FACTORY GROUNDING POST.
- PROVIDE UL LISTED CONDUIT GROUNDING BUSHING ON END OF BACKBONE CONDUIT AND GROUND TO BUSBAR WITH #6 AWG INSULATED (GREEN) COPPER GROUNDING CONDUCTOR. PLASTIC INSULATING BUSHING IS ALSO REQUIRED.

CP INSTALLATION DETAIL KEY NOTES:

- WALL MOUNT/SWINGOUT CABINET. SEE "CP EQUIPMENT KEY NOTES" THIS SHEET. MOUNT ENCLOSURE TO WALL USING THE MANUFACTURER'S APPROVED HARDWARE. HARDWARE SIZES AND INSTALLATION INSTRUCTIONS. SEE "CP LOCATION AND MOUNTING NOTES" THIS SHEET.
- VOICE SYSTEM PRIMARY PROTECTOR. SEE "VOICE SYSTEM SINGLE LINE CONFIGURATION DIAGRAM".
- PLYWOOD BACKPANEL, 1/2" THICK A-C GRADE. PREP PLYWOOD WITH TWO COATS "KILZ" PRIMER AND PAINT WITH TWO COATS SEMI-GLOSS GREY ENAMEL PAINT (FIRE RETARDANT). SIZE BACKPANEL TO MAXIMUM INSIDE DIMENSIONS OF THE RIGHT, LEFT AND BOTTOM OF ENCLOSURE AND 4" FROM THE TOP. MOUNT BACKBOARD TO ENCLOSURE ON ONE SET OF 19" EIA MOUNTING RAILS.
- BY ELECTRICAL CONTRACTOR: 120 VAC DUPLEX SURGE SUPPRESSION POWER RECEPTACLE ON DEDICATED CIRCUIT. MOUNT SINGLE GANG BOX IN CP AS INDICATED, EXTEND 1/2" FLEXIBLE METALLIC CONDUIT FROM BOX UP THRU RACEWAY TO JUNCTION BOX ABOVE CEILING, THEN RUN TO SERVING POWER PANEL - SEE ELECTRICAL DRAWINGS.
- ITV SURGE PROTECTOR. SEE "ITV SINGLE LINE CONFIGURATION DIAGRAM".
- ITV TAPS, SPLITTERS, ATTENUATORS, AND EQUALIZERS (AS APPLICABLE). SEE "ITV SINGLE LINE CONFIGURATION DIAGRAM".
- GROUNDING BUSBAR, HARGER GBB-14410G WITH TWO ROWS OF 7/16" HOLES AT 1" SPACING EACH WAY. MAKE ALL CONNECTIONS WITH TWO HOLE LONG BARREL COMPRESSION LUGS AND BOND TO BUSBAR WITH TWO 3/8" SS HEX HEAD CAP SCREWS WITH SS LOCKING NUTS. SEE "CP GROUNDING NOTES" AND "VOICE SYSTEM SINGLE LINE CONFIGURATION DIAGRAM".
- BY ELECTRICAL CONTRACTOR: #4 AWG TO BUILDING MAIN ELECTRICAL SERVICE GROUND. SEE "CP GROUNDING NOTES".
- #6 AWG TO GROUND CP CABINET. SEE "CP GROUNDING NOTES".
- #6 AWG TO GROUND VOICE PROTECTOR BLOCKS. SEE "CP GROUNDING NOTES".

CP GENERAL NOTES:

CABLE ROUTING: ROUTE CABLES WITHIN CP AS INDICATED. PROVIDE WIRE MANAGEMENT ON BACKPANELS AND ON RACKS AS INDICATED AND AS REQUIRED TO FACILITATE ORGANIZED ROUTING OF CABLING AND PATCH CORDS. THE FINISHED INSTALLATION SHALL MEET THE APPROVAL OF THE ENGINEER FOR OVERALL QUALITY OF WORKMANSHIP, ORGANIZATION, AND NEATNESS OF APPEARANCE. SEE SINGLE LINE DIAGRAMS FOR CABLE TYPES, QUANTITIES AND CONNECTIONS.

CP LAYOUT: CP ARRANGEMENT AND EQUIPMENT LOCATIONS INDICATED ARE DRAWN TO SCALE. DO NOT MODIFY LAYOUT WITHOUT PRIOR APPROVAL OF ENGINEER. USE ALL BLACK HARDWARE ON FACE OF RACKS.

CP FASTENERS: ALL ATTACHMENTS MADE TO RACKS SHALL HAVE THREADED SCREWS, BOLTS AND ANY OTHER ROUGH SURFACES INSTALLED IN DIRECTION AWAY FROM ANY COMMUNICATIONS CABLING. USE ONLY THREADED FASTENERS - TAPPING SCREWS ARE NOT ACCEPTABLE. ALL MOUNTING SCREWS ON FACE OF RACKS SHALL BE BLACK.

CP PATCH CORD ROUTING: SEE SINGLE LINE DIAGRAMS AND SPECIFICATIONS. BUNDLE WITH BLACK VELCRO STRAPS AT 6" ON CENTER (COLOR BLACK). BUNDLE FIBER OPTIC, VOICE, AND DATA PATCH CORDS SEPARATELY.

CATEGORY 6 TERMINATIONS: MAKE ALL TERMINATIONS IN STRICT ACCORDANCE WITH TIA GUIDELINES AS WELL AS THE MANUFACTURER'S PRINTED INSTRUCTIONS FOR BOTH THE CABLE AND THE TERMINATION DEVICE FOR ALL FIELD CONNECTIONS IN THE "HORIZONTAL CABLING CHANNEL". STRIP CABLE JACKET BACK A MAXIMUM OF 1 INCH FROM THE POINT OF TERMINATION. MAINTAIN FACTORY SYMMETRICAL CABLE TWISTS TO WITHIN 0.5 INCHES (1/2 INCH MAXIMUM) OF THE POINT OF TERMINATION. PROVIDE CABLE SLACK AT EACH END TO ALLOW MINIMUM OF FIVE (5) FUTURE RETERMINATIONS WITHOUT RE-ROUTING CABLE. SEE CO MOUNTING DETAILS, BACKBOARD ELEVATIONS, AND CP DETAILS.

CP LOCATION and MOUNTING NOTES:

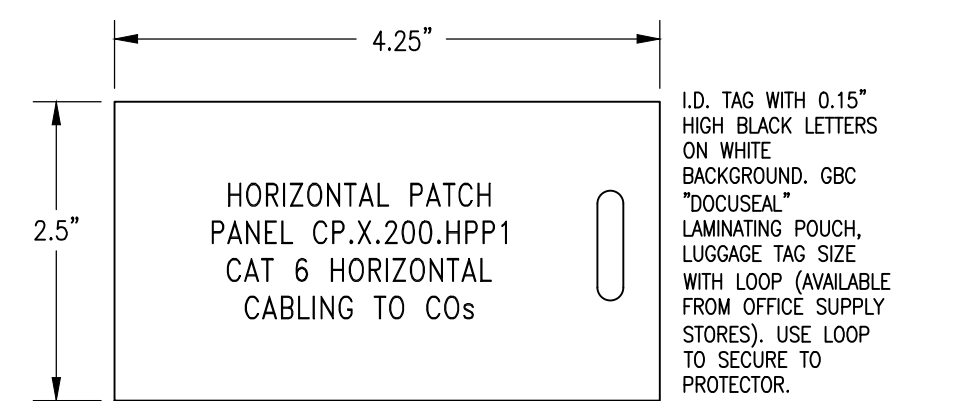
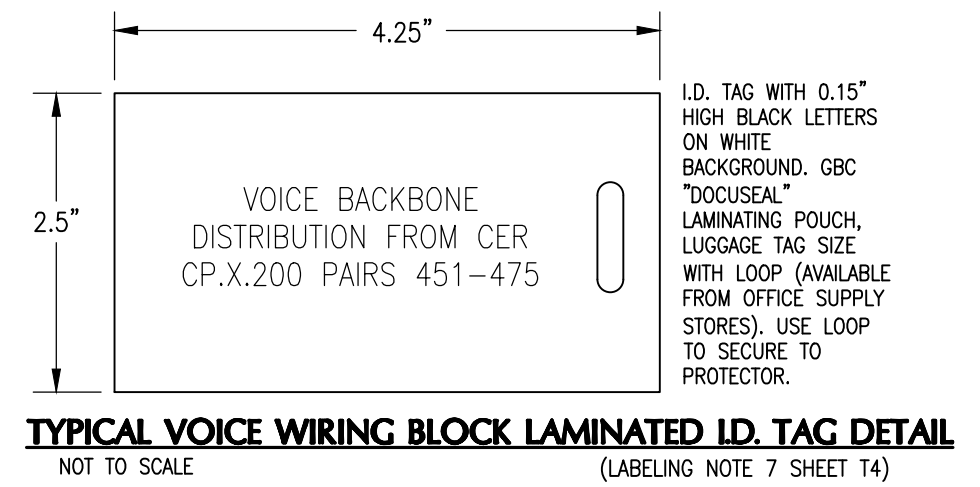
THE CONTRACTOR SHALL MOUNT COMMUNICATIONS PANELS ANYWHERE WITHIN THE PHYSICAL LIMITS OF THE ROOM IN WHICH THEY ARE INDICATED OR AT ALTERNATE CP LOCATIONS INDICATED ON PLANS AT NO ADDITIONAL COST TO THE OWNER. COMMUNICATIONS PANELS ARE LOCATED IN SPACES WITH LIMITED CLEARANCES. THE CONTRACTOR SHALL COORDINATE THE EXACT LOCATION OF EACH CP WITH THE OWNER'S PROJECT MANAGER PRIOR TO RUNNING CONDUIT AND MOUNTING CABINETS. EACH CP SHALL BE LOCATED DIRECTLY ABOVE PERMANENTLY PLACED CASEWORK TO MINIMIZE THE POTENTIAL FOR ACCIDENTAL CONTACT BY SPACE OCCUPANTS.

WHEN LOCATING CPs, PARTICULAR ATTENTION SHALL BE GIVEN OBSTRUCTIONS THAT MAY HINDER THE DUAL SWING-OUT FUNCTION OF THE CP CABINETS. PANEL DOOR SWING DIRECTION CAN BE ADJUSTED BY FLIPPING THE PANEL 180 DEGREES BEFORE MOUNTING ON WALL. FINAL MOUNTING SHALL PROVIDE FULL ACCESS TO INTERIOR OF CABINET REAR AS INDICATED ON PLANS.

THE ORIENTATION OF THE BACKBONE CONDUIT AND HORIZONTAL SLEEVES ENTERING THE TOP OF EACH CP MAY VARY TO SUIT FIELD CONDITIONS. SEE PLAN FOR CONDUIT ORIENTATION.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE BEST METHOD OF MOUNTING AND FASTENING EACH CP IN THE FIELD TO ENSURE THE STRUCTURAL INTEGRITY OF THE CP INSTALLATION. THE CONTRACTOR SHALL UTILIZE THE TYPES AND SIZES OF FASTENERS BEST SUITED TO EACH APPLICATION, AND SHALL PROVIDE SUPPLEMENTAL REINFORCING OF THE SUPPORTING WALL AS REQUIRED TO ACHIEVE ADEQUATE SUPPORT.

THE CONTRACTOR SHALL PROTECT CPs BY ENCAPSULATION IN PLASTIC THROUGHOUT THE CONSTRUCTION PROCESS TO MINIMIZE THE POTENTIAL FOR INTRUSION OF CONSTRUCTION DUST AND DEBRIS. INTERIOR CP COMPONENTS INCLUDING PATCH PANELS, SURGE PROTECTORS, AND ELECTRONICS SHALL NOT BE INSTALLED UNTIL THE LATTER STAGES OF THE PROJECT WHEN MOUNTING OF CPs, INSTALLATION OF FINISHED BACKBOARDS, AND INSTALLATION OF CONDUITS, POWER AND GROUNDS ARE ALL COMPLETE.



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SIGNATURE AND SEAL

PSC WELDING SHOP

UNDERWOOD AVE., PENSACOLA, FL, 32504

REVISIONS

NO.	DESCRIPTION

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:

COMMUNICATIONS DETAILS

SHEET:

T-503

Premier Engineering Group, LLC
Browns, Cook & Gally

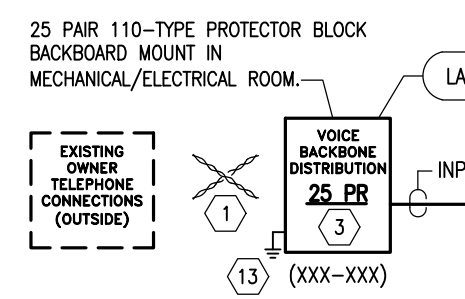
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Premier Project #P15063

GREG COOK, RDD
EXPIRES 12/31/16
Reg. No. 02297R

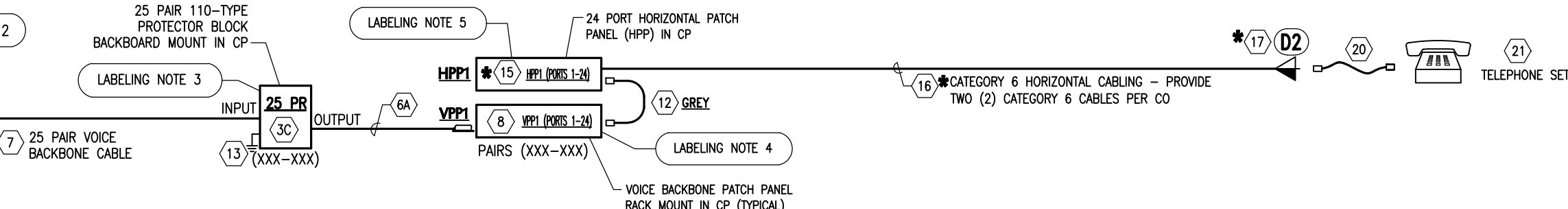
VOICE SYSTEM SINGLE LINE KEY NOTES:

1. A TELEPHONE SYSTEM PROVIDER UNDER SEPARATE CONTRACT WILL PROVIDE CROSS-CONNECTS TO STATION CONNECTIONS IN EXISTING ROOM 3,40 ALONG WITH ANY EXPANSION TO THE EXISTING TELEPHONE SWITCH WITH REQUIRED PROGRAMMING (N.I.C.). SCSS ASSIST TELEPHONE SYSTEM PROVIDER AND PROVIDE ALL PATCHING.
2. SIEMON 566M1-50 66 BLOCK WITH 89D BRACKET, BACKBOARD MOUNT ON EXISTING VOICE BACKBOARD NEXT TO EXISTING VOICE STATION BLOCKS.
3. PRIMARY PROTECTOR, AVAYA 489AC1-25 110 STYLE 25 PAIR PROTECTOR BLOCK WITH 110 BLOCK INPUT AND 110 BLOCK OUTPUT. PROVIDE WITH 25 SOLID STATE PROTECTOR UNITS, AVAYA 4C1S. SEE "VOICE LABELING NOTES".
- 3X. 25 PAIR TELEPHONE CABLE BUILDING ENTRANCE VOICE PROTECTOR BLOCK WITH 110 STYLE CONNECTORS (INPUT & OUTPUT), AVAYA 110M41-25. PROVIDE WITH 25 SOLID STATE PROTECTOR UNITS, AVAYA 4C1S.
6. ESSEX OR GENERAL CABLE 1010 25 PAIR CATEGORY 3 TELEPHONE CABLE, CMR JACKET, CUSTOM LENGTH, PUNCH ONE END DOWN ON 66 BLOCK. PUNCH OTHER END DOWN ON PROTECTOR BLOCK UPPER (OUTPUT) 110 BLOCK. FIELD CONNECTORIZE OTHER END WITH 50-PIN TELCO CONNECTOR WITH GOLD PLATED CONTACTS, STANDARD TELCO PINOUT, FOR CONNECTION TO PRE-WIRED MODULAR PATCH PANEL, GENDER TO SUIT BLOCK CONNECTOR.
7. ESSEX OR GENERAL CABLE ANMM 25 PAIR CATEGORY 3 DIRECT BURIAL GRADE GEL-FILLED TELEPHONE SHIELDED BACKBONE CABLE. RUN CONTINUOUS WITH NO SPLICES. GROUND SHIELD EACH END.
8. 24 PORT FACTORY PRE-CONNECTORIZED MODULAR VOICE PATCH PANEL, CATEGORY-3, WITH (24) EIGHT PIN MODULAR JACKS, EACH WITH ONE PAIR USOC WIRING PINOUT, PANOUT VP24382725. PROVIDE WITH 24 FACTORY TELEPHONE ICON TABS, COLOR GREY. SEE "VOICE LABELING NOTES".
12. EQUIPMENT ROOM VOICE PATCH CORDS, FACTORY TERMINATED AND TESTED CATEGORY-5a (MINIMUM) FOUR PAIR 100-OHM UNSHELDED TWISTED PAIR (UTP) CABLE WITH 24 GAGE STRANDED COPPER CONDUCTORS, COLOR GREY. PROVIDE WITH 8-PIN MODULAR PLUG ON BOTH ENDS AND TIA 568A PIN/PAIR ASSIGNMENTS, SIEMON MC8-8-T-XX-04. FIELD BUILT OR ASSEMBLED PATCH CORDS WILL NOT BE ACCEPTED. PROVIDE PATCH CORD QUANTITIES AND LENGTHS AS SCHEDULED THIS SHEET. PROVIDE DOCUMENTATION OF FACTORY TESTING AT SUBMITTAL.
13. SOLID COPPER INSULATED GROUNDING CONDUCTOR, #6 AWG. FOR GROUNDING AT CER, BOND TO BACKBOARD MOUNTED MAIN GROUNDING BUSBAR. AT ROOM 1.23A BOND TO EXISTING GROUND.
15. TIA CATEGORY 6 HORIZONTAL PATCH PANEL, 24 PORT, TIA 568A PINOUT, SIEMON HD6-24. PROVIDE WITH FACTORY PLASTIC LABEL HOLDERS, DESIGNATION LABELS, REAR CABLE MANAGERS, AND MOUNTING HARDWARE. PROVIDE COLORED SNAP-IN BLANK TAB (SIEMON TAB-XX) FOR EACH MODULAR JACK, COLOR TO MATCH CORRESPONDING JACK IN COMMUNICATIONS OUTLET (CO).
16. TIA CATEGORY 6 HORIZONTAL CABLING, 4 PAIR UTP, 23 GAGE SOLID COPPER CONDUCTORS. MAXIMUM INSTALLED LENGTH 90 METERS (295'). PROVIDE DOCUMENTATION OF CURRENT UL CERTIFICATION WITH SUBMITTALS. PROVIDE WITH CMR (RISER) JACKET, COLOR GREY. SEE SCHEDULE THIS SHEET FOR APPROVED CABLES.
17. TYPE "D2" COMMUNICATIONS OUTLET (CO) WITH TWO (2) CATEGORY 6 8-PIN MODULAR JACKS. SEE PLANS AND DETAILS.
20. HEAVY DUTY COMMERCIAL GRADE SILVER SATIN TELEPHONE LINE CORDS TOTAL OF FIFTEEN (15). SCSS PROVIDE LENGTHS TO SUIT TELEPHONE LOCATIONS WITH MINIMAL EXCESS CORD LENGTH. COORDINATE INSTALLATION WITH TELEPHONE SYSTEM PROVIDER. TURN UNUSED LINE CORDS OVER TO OWNER'S PROJECT MANAGER.
21. BY TELEPHONE SYSTEM PROVIDER (N.I.C.): TELEPHONE SETS. CONTRACTOR PROVIDE ALL PATCHING IN RACKS AND ASSIST TELEPHONE SYSTEM PROVIDER IN PLACING SETS AND PROFESSIONALLY INSTALLING LINE CORDS.

EXISTING VOICE DEMARC



COMMUNICATIONS PANEL - CPX102



VOICE SYSTEM SINGLE LINE CONFIGURATION DIAGRAM

NOT TO SCALE

NOTE: RUN ALL CABLES CONTINUOUS BETWEEN TERMINATION POINTS INDICATED WITH NO INTERMEDIATE SLICES OR TERMINATIONS.

VOICE LABELING NOTES:

1. CONTRACTOR PROVIDE ANNOTATED ADOBE .PDF FILES OF AS-BUILT DRAWINGS, ALL TEL SHEETS. PROVIDE 3 BOUND 1/2 SIZE HARD COPY PLOTS AND 3 CD'S WITH .PDF FILES. STORE IN DOCUMENTATION SHELF IN CER.
2. PROVIDE FACTORY ROW LABELS (GREEN) WHICH DESIGNATE PAIR COUNTS IN 5 PAIR INCREMENTS (FACTORY LABELED 1-5, 6-10, 11-15 AND SO ON THRU 21-25, 46-50 OR 96-100 AS APPLICABLE). PROVIDE ENGRAVED PLASTIC TAG MOUNTED ON PROTECTOR BLOCK FRONT COVER. TAG SHALL INDICATE "VOICE BACKBONE DISTRIBUTION" AND OVERALL CABLE PAIR COUNTS. FOR TAG FABRICATION, SEE "TYPICAL VOICE BLOCK ENGRAVED TAG DETAIL". FOR PAIR COUNTS SEE THIS SHEET.
3. PROVIDE FACTORY ROW LABELS (GREEN) WHICH DESIGNATE PAIR COUNTS IN 5 PAIR INCREMENTS (FACTORY LABELED 1-5, 6-10, 11-15 AND SO ON THRU 21-25, 46-50 OR 96-100 AS APPLICABLE). PROVIDE ENGRAVED PLASTIC TAG MOUNTED ON PROTECTOR BLOCK FRONT COVER. TAG SHALL INDICATE "VOICE BACKBONE DISTRIBUTION" AND OVERALL CABLE PAIR COUNTS. FOR TAG FABRICATION, SEE "TYPICAL VOICE BLOCK ENGRAVED TAG DETAIL". FOR PAIR COUNTS SEE THIS SHEET.
4. VOICE BACKBONE DISTRIBUTION PATCH PANEL IS FACTORY NUMBERED PORTS 1-24 OR 1-48. PROVIDE ENGRAVED PLASTIC TAG MOUNTED ON RACK BLANK ABOVE BLOCK. TAG SHALL INDICATE "VOICE BACKBONE DISTRIBUTION FROM CER.6.615". THE CO SERVED AND CABLE PAIR COUNTS. FOR INSTALLATION DETAILS SEE "COMMUNICATION RACK ELEVATIONS". FOR TAG FABRICATION, SEE "TYPICAL VOICE BLOCK ENGRAVED TAG DETAIL". FOR PAIR COUNTS SEE THIS SHEET.
5. SEE TYPICAL LABELING DETAILS FOR LABELING OF HORIZONTAL PATCH PANELS.
6. LABEL TO MATCH EXISTING WIRING BLOCK.

IN ADDITION PROVIDE LAMINATED PAPER I.D. TAG ATTACHED TO RIGHT SIDE OF PROTECTOR WITH FLEXIBLE LOOP (BICO/GBC LUGGAGE TAG WITH LOOP). I.D. TAG SHALL INDICATE "VOICE BACKBONE DISTRIBUTION FROM CER AND CABLE PAIR COUNTS. FOR TAG FABRICATION AND TEXT LAYOUT, SEE "TYPICAL VOICE WIRING BLOCK LAMINATED I.D. TAG DETAIL" FOR PAIR COUNTS SEE THIS SHEET.

PRIMARY PROTECTOR ORIENTATION:

OUTPUT = PROTECTED; TERMINATE ON UPPER 110 BLOCK
INPUT = UNPROTECTED (BACKBONE CABLE); TERMINATE ON LOWER 110 BLOCK

VOICE PATCH CORD SCHEDULE

TYPE	LENGTH/QTY	LENGTH/QTY	LENGTH/QTY	LENGTH/QTY	LENGTH/QTY
(12)	3' / 5	5' / 5	7' / 5	-- / --	-- / --

VOICE PATCH CORD SCHEDULE NOTES:

1. VERIFY ALL PATCH CORD QUANTITIES AND LENGTHS WITH OWNER'S PROJECT MANAGER PRIOR TO INSTALLATION AND PROVIDE COPY OF RECEIPT SIGNED BY OWNER'S PROJECT MANAGER IN O&M MANUALS.
2. SEE SPECIFICATIONS FOR DETAILED REQUIREMENTS FOR PATCH CORD DELIVERY AND INSTALLATION. THE STRUCTURED CABLING SYSTEM CONTRACTOR SHALL ASSIST THE TELEPHONE SYSTEM PROVIDER IN INSTALLING PATCH CORDS FOR EACH TELEPHONE INSTRUMENT. ALL PATCH CORDS SHALL BE INSTALLED IN WIRE MANAGEMENT HARDWARE, UTILIZING LENGTHS THAT MAKE CONNECTIONS REQUIRED WITHOUT EXCESS STORAGE IN WIREWAYS. ALL PATCH CORDS SHALL BE NEATLY ROUTED, BUNDLED AND SECURED AT 6" ON CENTER WITH BLACK VELCRO STRAPS. BUNDLE VOICE PATCH CORDS SEPARATELY. DO NOT BUNDLE WITH DATA PATCH CORDS.
3. PROVIDE EXCEL SPREADSHEET IDENTIFYING CONNECTIONS MADE. SEE SPECIFICATIONS.

APPROVED CATEGORY 6 HORIZONTAL CABLES

APPLICATION	MANUFACTURER	PART NUMBER	UL JACKET	JACKET COLOR
RISER	COMMSCOPE	ULTRAPIPE BECMR	CMR	GREY
	GENERAL	GENSPEED 6500 7133329	CMR	GREY
	HITACHI	HI-NET SUPRA 30022-8	CMR	GREY
	SUPERIOR ESSEX	NEXTGAIN 54-246-3A	CMR	GREY
	MOHAWK	GigALAN M57422	CMR	GREY
	MOLEX	CAA-0183-08	CMR	GREY

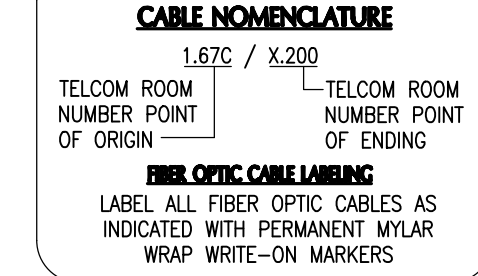
CATEGORY 6 TERMINATION NOTE

MAKE ALL TERMINATIONS IN STRICT ACCORDANCE WITH TIA GUIDELINES AS WELL AS THE MANUFACTURER'S PRINTED INSTRUCTIONS FOR BOTH THE CABLE AND THE TERMINATION DEVICE FOR ALL FIELD CONNECTIONS IN THE "HORIZONTAL TELECOMMUNICATIONS LINK". STRIP CABLE JACKET BACK A MAXIMUM OF 1 INCH FROM THE POINT OF TERMINATION. MAINTAIN FACTORY SYMMETRICAL CABLE TWISTS TO WITHIN 0.5 INCHES (13 MM MAXIMUM) OF THE POINT OF TERMINATION. PROVIDE CABLE SLACK AT EACH END TO ALLOW MINIMUM OF FIVE (5) FUTURE RETERMINATIONS WITHOUT RE-ROUTING CABLE. SEE CO MOUNTING DETAILS, BACKBOARD ELEVATIONS, AND CP DETAILS.

*** NOTE I**

HORIZONTAL WIRING, HORIZONTAL PATCH PANELS, 8-PIN MODULAR JACKS AND COMMUNICATIONS OUTLETS (COs) INDICATED IN VOICE SYSTEM SINGLE LINE AND DATA SINGLE LINE ARE THE SAME DEVICES/EQUIPMENT SHOWN USED FOR EITHER VOICE OR DATA SERVICE.

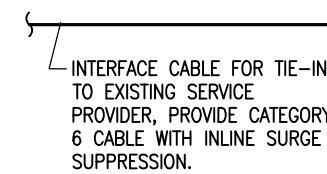
FIBER OPTIC BACKBONE CABLE NOMENCLATURE



DATA SYSTEM SINGLE LINE KEY NOTES:

24. OWNER FURNISHED CONTRACTOR INSTALLED (CFC): MANAGED LAYER 3 POE ETHERNET WORKGROUP SWITCH, 48 UTP ONE GIGABIT POE PORTS AND ONE TO GIGABIT UPLINK PORT. MOUNT IN RACK, PROVIDE STARTUP/CONFIGURATION PER MANUFACTURER'S PRINTED INSTRUCTIONS AND PROGRAM WITH IP ADDRESS SUPPLIED BY OWNER (BRIAN JOHNSON).
26. OWNER FURNISHED CONTRACTOR INSTALLED (CFC): WIRELESS ACCESS POINT.
8. EQUIPMENT ROOM DATA PATCH CORDS, FACTORY TERMINATED AND TESTED CATEGORY-6 (MINIMUM) FOUR PAIR 100-OHM UNSHELDED TWISTED PAIR (UTP) CABLE WITH 24 GAGE STRANDED COPPER CONDUCTORS, COLOR BLACK WITH MATCHING FACTORY BOOT EACH END. PROVIDE WITH 8-PIN MODULAR PLUG ON BOTH ENDS AND TIA 568A PIN/PAIR ASSIGNMENTS, SIEMON MC8-8-T-XX-01. FIELD BUILT OR ASSEMBLED PATCH CORDS WILL NOT BE ACCEPTED. PROVIDE PATCH CORD QUANTITIES AND LENGTHS AS SCHEDULED THIS SHEET. PROVIDE DOCUMENTATION OF FACTORY TESTING CATEGORY-6 REQUIREMENTS AT SUBMITTAL.
- 8A. EQUIPMENT ROOM PATCH CORDS BETWEEN POE SWITCH AND HORIZONTAL PATCH PANEL PORTS SERVING WIRELESS ACCESS POINTS, FACTORY TERMINATED AND TESTED CATEGORY-6 (MINIMUM) FOUR PAIR 100-OHM UNSHELDED TWISTED PAIR (UTP) CABLE WITH 24 GAGE STRANDED COPPER CONDUCTORS, COLOR RED WITH MATCHING FACTORY BOOT EACH END. PROVIDE WITH 8-PIN MODULAR PLUG ON BOTH ENDS AND TIA 568A PIN/PAIR ASSIGNMENTS, SIEMON MC8-8-T-XX-03. FIELD BUILT OR ASSEMBLED PATCH CORDS WILL NOT BE ACCEPTED. PROVIDE PATCH CORD QUANTITIES AND LENGTHS AS SCHEDULED THIS SHEET. PROVIDE DOCUMENTATION OF FACTORY TESTING CATEGORY-6 REQUIREMENTS AT SUBMITTAL.
9. TIA CATEGORY 6 HORIZONTAL PATCH PANEL, 24 PORT, TIA 568A PINOUT, SIEMON HD6-24. PROVIDE WITH FACTORY PLASTIC LABEL HOLDERS, DESIGNATION LABELS, REAR CABLE MANAGERS, AND MOUNTING HARDWARE. PROVIDE COLORED SNAP-IN BLANK TAB (SIEMON TAB-XX) FOR EACH MODULAR JACK, COLOR TO MATCH CORRESPONDING JACK IN COMMUNICATIONS OUTLET (CO).
10. TIA CATEGORY 6 HORIZONTAL CABLING, 4 PAIR UTP, 24 GAGE SOLID COPPER CONDUCTORS. MAXIMUM INSTALLED LENGTH 90 METERS (295'). PROVIDE DOCUMENTATION OF CURRENT UL CERTIFICATION WITH SUBMITTALS. PROVIDE WITH CMR (RISER) JACKET, COLOR GREY. SEE SCHEDULE THIS SHEET FOR APPROVED CABLES.
11. TYPE "D2" COMMUNICATIONS OUTLET (CO) WITH TWO (2) CATEGORY 6 8-PIN MODULAR JACKS. SEE PLANS AND DETAILS.
- 11A. TYPE "WAP" COMMUNICATIONS OUTLET (CO) WITH TWO (2) CATEGORY 6 8-PIN MODULAR JACKS. SEE PLANS AND DETAILS.
12. WORKSTATION PATCH CORDS, FACTORY TERMINATED AND TESTED CATEGORY-6 (MINIMUM) FOUR PAIR 100-OHM UNSHELDED TWISTED PAIR (UTP) CABLE WITH 24 GAGE STRANDED COPPER CONDUCTORS, COLOR YELLOW WITH MATCHING FACTORY BOOT EACH END. PROVIDE WITH 8-PIN MODULAR PLUG ON BOTH ENDS AND TIA 568A PIN/PAIR ASSIGNMENTS, SIEMON MC8-8-T-XX-05. FIELD BUILT OR ASSEMBLED PATCH CORDS WILL NOT BE ACCEPTED. PROVIDE PATCH CORD QUANTITIES AND LENGTHS AS SCHEDULED THIS SHEET. PROVIDE DOCUMENTATION OF FACTORY TESTING CATEGORY-6 REQUIREMENTS AT SUBMITTAL.

EXISTING EXTERIOR SERVICE PROVIDER

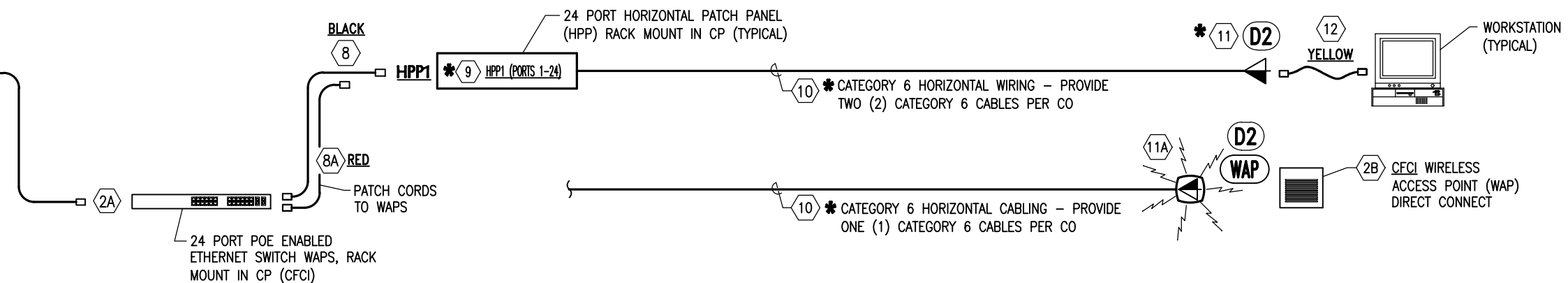


TYPE	LENGTH/QTY	LENGTH/QTY	LENGTH/QTY	LENGTH/QTY	LENGTH/QTY
(8)	1' / 5	1.5' / 15	3' / 2	-- / --	-- / --
(8A)	1' / 2	3' / 2	-- / --	-- / --	-- / --
(12)	5' / 6	7' / 2	10' / 1	-- / --	-- / --

DATA PATCH CORD SCHEDULE NOTES:

1. FURNISH PATCH CORDS TO OWNER LOOSE PRIOR TO INSTALLATION. VERIFY ALL QUANTITIES AND LENGTHS WITH OWNER'S PROJECT MANAGER AND PROVIDE SIGNED COPY OF RECEIPT TO ENGINEER AT PROJECT SUBSTANTIAL COMPLETION.
2. SEE SPECIFICATIONS FOR DETAILED REQUIREMENTS FOR PATCH CORD DELIVERY AND INSTALLATION. ALL PATCH CORDS SHALL BE NEATLY ROUTED, BUNDLED AND SECURED AT 6" ON CENTER WITH BLACK VELCRO STRAPS. BUNDLE DATA PATCH CORDS SEPARATELY. DO NOT BUNDLE WITH VOICE PATCH CORDS. BUNDLE FIBER OPTIC PATCH CORDS SEPARATELY FROM COPPER PATCH CORDS.
3. PROVIDE EXCEL SPREADSHEET IDENTIFYING CONNECTIONS MADE. SEE SPECIFICATIONS.

COMMUNICATIONS PANEL - CPX.102



DATA SYSTEM SINGLE LINE CONFIGURATION DIAGRAM

NOT TO SCALE

NOTE: RUN ALL CABLES CONTINUOUS BETWEEN TERMINATION POINTS INDICATED WITH NO INTERMEDIATE SLICES OR TERMINATIONS.

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REVISIONS

BTA PROJECT NO: 142615.02
SHEET DATE: 05/02/16

SHEET TITLE:

COMMUNICATIONS
SINGLE LINE
DIAGRAM

SHEET:

T-601



Premier
Engineering Group, LLC
Brian, Cook & Gully

GREG COOK, RDD
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Premier Project #P15063

WELDING SHOP RENOVATIONS PENSACOLA STATE COLLEGE

PROJECT SPECIFICATIONS

**BULLOCK TICE ASSOCIATES INC.
AAC 000174**

142615.02

MARCH 2016

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

002113	INSTRUCTIONS TO BIDDERS
004100	BID FORM
004102	DRUG-FREE WORKPLACE CERTIFICATION
004103	PUBLIC ENTITY CRIMES STATEMENT
004300	LIST OF SUBCONTRACTORS
004313	BID BOND
005200	AGREEMENT FORMS
006113	PERFORMANCE BOND AND PAYMENT BOND
007200	GENERAL CONDITIONS
007380	WEATHER DELAY LOG
007400	PAYMENT
009000	SUPPLEMENTARY GENERAL CONDITIONS

DIVISION 01 - GENERAL REQUIREMENTS

011000	SUMMARY
012300	ALTERNATES
012500	SUBSTITUTION PROCEDURES
012600	CONTRACT MODIFICATION PROCEDURES
012900	PAYMENT PROCEDURES
013100	PROJECT MANAGEMENT AND COORDINATION
013200	CONSTRUCTION PROGRESS DOCUMENTATION
013300	SUBMITTAL PROCEDURES
014000	QUALITY REQUIREMENTS
014200	REFERENCES
015000	TEMPORARY FACILITIES AND CONTROLS
016000	PRODUCT REQUIREMENTS
017419	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
017700	CLOSEOUT PROCEDURES
017823	OPERATION AND MAINTENANCE DATA
017839	PROJECT RECORD DOCUMENTS
017900	DEMONSTRATION AND TRAINING

DIVISION 02 - EXISTING CONDITIONS

024119	SELECTIVE DEMOLITION
--------	----------------------

DIVISION 03 - CONCRETE

033000	CAST-IN-PLACE CONCRETE
--------	------------------------

DIVISION 05 – METALS (See Structural drawings for notes on steel at wall infills)

051200 STRUCTURAL STEEL FRAMING
054000 COLD FORMED METAL FRAMING
055213 PIPE AND TUBE RAILINGS

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

079200 JOINT SEALANTS

DIVISION 08 - OPENINGS

081113 HOLLOW METAL DOORS AND FRAMES
081416 FLUSH WOOD DOORS
085113 ALUMINUM WINDOWS
087100 DOOR HARDWARE
088000 GLAZING
089119 FIXED LOUVERS

DIVISION 09 - FINISHES

092216 NON-STRUCTURAL METAL FRAMING
092900 GYPSUM BOARD
095113 ACOUSTICAL PANEL CEILINGS
096513 RESILIENT BASE AND ACCESSORIES
096813 TILE CARPETING
099113 EXTERIOR PAINTING
099123 INTERIOR PAINTING

DIVISION 10 - SPECIALTIES

101100 VISUAL DISPLAY UNITS
104413 FIRE PROTECTION CABINETS
104416 FIRE EXTINGUISHERS
105113 METAL LOCKERS
105300 ALUMINUM COVERED WALKWAYS

DIVISION 12 - FURNISHINGS

122113 HORIZONTAL LOUVER BLINDS

DIVISION 13 - SPECIAL CONSTRUCTION

133419 METAL BUILDING SYSTEMS

DIVISION 22 - PLUMBING

220050 PLUMBING
220060 PLUMBING FIXTURES AND TRIM

DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING

230050 MECHANICAL GENERAL REQUIREMENTS
230080 INSULATION OF MECHANICAL SYSTEMS
230350 SPLIT SYSTEM HEAT PUMP UNITS
230750 EXHAUST FANS
230850 DUCTWORK AND DUCTWORK ACCESSORIES
230950 TESTING, ADJUSTING AND BALANCING

DIVISION 26 - ELECTRICAL

260000 ELECTRICAL
260100 ELECTRICAL METHODS AND BASIC MATERIALS
260200 RACEWAY SYSTEMS
260300 WIRE, CABLE, AND DEVICES
260400 SERVICE AND DISTRIBUTION
260500 LIGHTING
260680 TRANSIENT VOLTAGE SURGE SUPPRESSION

DIVISION 31 - EARTHWORK

313116 TERMITE CONTROL

DIVISION 33 – UTILITIES (See Notes on Drawings)

END OF TABLE OF CONTENTS

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SECTION 002113 - INSTRUCTIONS TO BIDDERS

PROCUREMENT OF DOCUMENTS:

Refer to Section 00 11 00 - Invitation to Bid.

EXAMINATION OF DOCUMENTS AND SITE:

Bidders shall carefully examine the Bidding Documents, the existing facility and the construction site to obtain first hand knowledge of the existing conditions. Each bidder shall fully inform himself prior to bidding as to all existing conditions and limitations under which the work is to be performed.

INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS:

Each Bidder shall examine the Bidding Documents carefully; and, no later than seven (7) days prior to the date for receipt of Bids, he/she shall make a written request to the Architect for interpretation or correction of any ambiguity, inconsistency or error which he may discover. All interpretations or corrections will be issued as addenda. The Architect and/or Owner will not be responsible for oral clarifications. Only written addenda will become a part of the contract documents. Should any conflicts exist in the contract specifications and/or drawings, the most stringent of the items in conflict shall apply.

SUBSTITUTIONS:

Each Bidder represents that his Bid is based upon the materials and equipment described in the Bidding Documents. No substitution will be considered unless written request has been submitted to and received by the Architect for approval at least ten (10) days prior to the date for receipt of Bids. In addition to the manufacturers printed literature, each request shall include a complete description of the proposed substitute, the name of the material or equipment for which it is to be substituted, drawings, cuts, performance test data and any other data or information necessary for a complete evaluation.

If the Architect approves any proposed substitution, such approval will be set forth in an addendum. The contractor is responsible for ensuring that the prices provided include all items suitable for this project.

FAMILIARITY WITH LAWS:

The Bidder shall be familiar with all Federal, State and local laws, ordinances, rules and regulations affecting the work. Ignorance of them on the part of the Bidder shall in no way relieve him from responsibility of complying with the requirements stated therein.

FLORIDA PRODUCTS AND LABORS:

The Bidder's attention is called to Section 255.04, Florida Statutes, which requires that on public building contracts, Florida products and labor shall be used wherever price and quality are equal.

BASIS OF BID:

The Bidder shall include with his Bid all unit cost items, quantity estimates and alternates indicated on the Bid Form. Failure to comply may be cause for rejection.

If the Owner wishes to learn the relative or additional construction cost of an alternative use type of material, or an increase or decrease in scope of the project, these items will be defined as alternates and will be specifically described by the Drawings and/or Specifications. Alternates will be listed in the Bid Form in such a manner that the Bidder shall be able to clearly indicate what sums he will add to or deduct from his Base Bid.

Such alternates may or may not be accepted, but if so, it is the intention of the Owner to accept them in any order or combination he chooses and not necessarily in the order listed on the Bid Form.

No segregated Bids or assignments will be considered.

PREPARATION AND SUBMISSION OF BIDS:

Bid Form: (Submit in triplicate) Bidders shall submit an original and two copies.

Each Bidder shall use the Bid Form supplied and/or bound herein and indicate his Bid prices thereon in the proper spaces for the entire Work and for the alternatives on which he bids. Any erasures or other corrections in the Bid must be explained or noted over the signature of the Bidder. Bids containing any conditions, or irregularities of any kind may be rejected by the Owner.

List of Subcontractors:

The Contractor shall, with his bid, submit to the Owner a list of all his subcontractors. This list shall include each company name, if it is a subcontractor, the character of his work or the materials it supplies, the address and telephone number and the name of the person with whom the Contractor is dealing.

Bid Guarantee - Five Percent (5%):

Bids shall be accompanied by a Bid Guarantee which shall be a Bid Bond, Cashier's Check, or Bank Draft, made payable to:
Pensacola State College

Such check or bond shall be submitted with the understanding that it shall guarantee that the Bidder will not withdraw his Bid for a period of thirty (30) days after the scheduled closing time for the receipt of Bids; that, if in accordance with the form of agreement included as part of the Contract Documents; that the required bond will be given; and that, in the event of the withdrawal of Bid within said period, or failure to enter into Contract and give bond within ten (10) days after he has received notice of acceptance of his Bid, and receipt of Contract Agreement, the Bidder shall be liable to the Owner for the full amount of the Bid Guarantee as representing the damage to the Owner on account of the default of the Bidder in any particular thereof.

The Bid Guarantee shall be returned by mail to all except the three lowest Bidders after the formal opening of Bids. The Owner reserves the right to hold the Bid guarantee of the lowest three Bidders until after they have executed the Contract with the accepted Bidder and the Performance and payment Bond have been certified by the Owner.

If the Owner fails to issue an "Acceptance of Bid" to a Bidder within thirty (30) days after the date of the opening of the Bids, then the Bid Guarantee of any Bidder will be returned upon his request.

Submission of Bids:

Submit Bid in an opaque, sealed envelope. Identify the envelope with project name and name of Bidder. Submit in accordance with Invitation to Bid.

BIDDER'S QUALIFICATIONS:

1. The apparent successful bidder shall, upon the request of the Architect, furnish documentation of the following:
 - a. He or She shall meet the Contractor's Qualifications listed in Article 15010.1.
 - b. He or She is currently registered with or hold an unexpired Certificate issued by the Florida Construction Industry Licensing Board in accordance with current applicable regulations, Licensing of Construction Industry, Florida Statutes.
 - c. He or She presently maintains a permanent bona fide place of business practicing this type of work and has had the appropriate experience.
 - d. He or She has available, or can obtain, adequate equipment and financial resources to undertake and execute the Contract properly and expeditiously, in accordance with present day practices.
 - e. All subcontractors shall be fully licensed in the State of Florida and shall be bondable. Submit copies of current license and documentation from bonding company showing compliance.
 - f. He or She shall submit with the Bid the enclosed document entitled "Sworn Statement under Section 287.133(3) (a), Florida Statutes. On Public Crimes".
2. The apparent successful bidder shall also, at the request of the Architect, submit a fully executed "Contractor's Qualification Statement" AIA Document A305. Copies of A305 are available for examination at the office of the Architect.

LICENSE:

In accordance with Chapter 489.113, Florida Statutes, all individuals or entities engaging in and providing construction services shall be licensed in the State of Florida for that activity. This license requirement includes general and sub-contractors.

The successful low bidder shall be required to submit a list of all contractors to be involved in said project with applicable license numbers (see form included in these documents), including a photographic copy of current license certificates. Submittal of proof of license shall be made with, and as a part of signed contract.

Prime Contractor shall submit proof of licensure with the Bid Form. Failure to submit required proof of license shall be cause for Owner to reject bid as non-responsive, and award bid to second lowest qualified bidder.

DISQUALIFICATION OF BIDDER:

More than one Bid from an individual, firm, partnership, corporation or association under the same or different names will not be considered. Reasonable grounds for believing that a Bidder is interested in more than one Bid for the same will cause the rejection of all Bids which such Bidder is believed to be interested. Bids will be rejected if there is reason to believe that collusion exists between Bidders. Bids in which the prices are obviously unbalanced may be rejected.

MODIFICATION OF BID:

Bid modifications will be accepted from Bidders if addressed to the Owner at the place where Bids are to be received and if received prior to the opening of the Bids. Modifications may be in written or telegraphic form. Modifications will be acknowledged by the Owner before opening of formal Bids.

WITHDRAWAL OF BIDS:

Bids may be withdrawn by written or telegraphic request received from Bidders prior to the time fixed for opening. Negligence on the part of the Bidder in preparing the Bid confers no right for the withdrawal of the Bid after it has been opened.

RECEIPT OF OPENING BIDS:

Bids will be opened publicly at the time and place stated in the Invitation. The person whose duty it is to open them will decide when the specified time has arrived and no Bids received thereafter will be considered. No responsibility shall be attached to any person for the premature opening of a Bid not properly addressed and identified.

At the time fixed for the opening of Bids, the contents of the Bid Form will be made public for the information of the Bidders and other interested, who may be present either in person or by representative.

REJECTION OF BIDS:

The Owner reserves the right to reject any or all Bids when such rejection is in the interest of the Owner, and to reject the Bid of a Bidder, in the Architect's opinion, who is not in a position to perform the Contract, or whose list of subcontractors is improperly prepared.

AWARD OF CONTRACT:

The Contract will be awarded within thirty (30) days to the lowest qualified Bidder, provided his Bid is reasonable and it is in the best interest of the Owner to accept it.

The Owner reserves the right to waive any informality in Bids received when such a waiver is in the best interest of the Owner.

BUILDING PERMIT:

A permit will be issued to the Contractor by the Facilities Planning and Construction Department of Pensacola State College.

SECURITY:

The Contractor shall be responsible for maintaining security, and the contractor shall be responsible for replacement or repair of items and/or equipment stolen, lost or damaged while the building security is under the care of the Contractor. The Contractor shall be responsible for having a job superintendent present whenever work is in progress. The Contractor shall not change superintendent without the Owners approval.

SPECIAL POLICY AND PROCEDURES:

Contractor and subcontractor personnel are not permitted to use the campus facilities.

Smoking is not permitted in any campus facility.

Profane language or improper behavior will result in immediate termination from the construction site.

The Contractor shall erect temporary barricades and fencing as required to keep the unauthorized out of the construction area, and provide signs that read. "This area is a designated construction site; anyone who trespasses on this property commits a felony per Florida Statute 810.09(2d).

END OF SECTION 00 21 13

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SECTION 004100 - BID FORM

TO: **District Board of Trustees
Pensacola Junior College, Florida
1000 College Boulevard
Pensacola, Florida 32504**

REFERENCE: **WELDING SHOP RENOVATION
PENSACOLA JUNIOR COLLEGE - PENSACOLA CAMPUS**

Gentlemen:

The undersigned, hereinafter called "Bidder", having visited the site of the proposed Project and having become familiar with the local conditions, nature and extent of the Work, and having examined carefully the drawings and the Project Manual, proposes to furnish all labor, material, equipment and other items, facilities, and services for the proper execution and completion of the above referenced project, in full accordance with the Contract Documents prepared by Bullock Tice Associates, 909 E Cervantes Street, Pensacola, FL 32501 in full accordance with the Invitation to Bid, Instruction to Bidders, Agreement, Technical Specification, and all other documents relating thereto on file in the Office of the Architect and if awarded the Contract, to complete said Work within the time limits specified for the following bid price.

PROVIDE NUMERICAL AND WRITTEN DOLLAR AMOUNTS

BASE BID: _____ (\$ _____)
Dollar Amount Included in Base Bid

ALTERNATE BID NO. 1: _____ (\$ _____)
Dollar Amount to ADD or SUBTRACT to/from Base Bid (Circle ADD or SUBTRACT)

ALTERNATE BID NO. 2: _____ (\$ _____)
Dollar Amount to ADD or SUBTRACT to/from Base Bid (Circle ADD or SUBTRACT)

There is enclosed a certified check, cashier's check, treasurer's check, bank draft, or Bid Bond in the amount of not less than five percent (5%) of the Base Bid payable to Pensacola Junior College, as a guarantee for the purpose set out in the Instructions to Bidders.

The bidder hereby agrees that:

- a. The above Proposal shall remain in full force and effect for a period of thirty (30) calendar days after the time of the opening of this Proposal and that the Bidder will not revoke or cancel this Proposal or withdraw from the competition within the said thirty (30) calendar days.
- b. In the event the contract is awarded to this Bidder, the Bidder will enter into a formal written Agreement with the Owner in accordance with the accepted bid within ten (10) calendar days after said agreement is submitted to the Bidder and will furnish to the Owner a Performance Bond and a Labor and Material Payment Bond with good and sufficient sureties, satisfactory to the Owner, in the amount of 100% of the accepted bid, on the forms and terms required in the construction documents. The Bidder further agrees that in the event of the bidder's default or breach of any of the agreements of this Proposal, the bid deposit shall be forfeited as liquidated damages.

- c. The Bidder must agree to commence work within ten (10) calendar days after the written "Notice to Proceed" and substantially complete the work within ninety 90 consecutive calendar days. Bidder must further agree to fully complete the work, including any and all punch list items within thirty (30) calendar days from the date of substantial completion. The number of days allowed for construction includes an allowance for time missed due to inclement weather.
- d. Liquidated damages shall be assessed against the final payment in the amount of \$850.00 for each consecutive calendar day the Contractor is late in achieving Substantial Completion and \$425.00 for each consecutive day the Contractor is late in achieving Final Completion.
- e. The Contractor shall list on a separate page the 'List of Subcontractors' and submit the list with his bid as required by 00 21 13, Page 2.
- f. All work shall comply with applicable codes, specifications, local ordinances and industry standards including, but not limited to the handling, removal, and disposal of fluorescent bulbs and ballasts. Provide Pensacola State College with a copy of the "Waste Manifest".

Acknowledgment is hereby made or receipt to the following Addenda issued during the bidding period.

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Florida Construction Industries Licensing Board Certification

(Name of Holder)
(Certification Number)

Signed and sealed this _____ day of _____, 20_____.

Check accordingly: Firm Name: _____

We operate as _____

Individual Owner () By: _____

Partnership () Title: _____

Corporation () Address: _____

Telephone: _____ FAX: _____

Attachments: 00 41 01 – TRENCH SAFETY ADDENDUM

WELDING SHOP RENOVATIONS
PENSACOLA STATE COLLEGE

142615.02

00 42 50 – DRUG-FREE WORKPLACE CERTIFICATION
00 41 03 – PUBLIC ENTITY CRIMES STATEMENT
00 43 13 – BID BOND

END

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SECTION 004102 – DRUG-FREE WORKPLACE CERTIFICATION

- A. A copy of the Drug Free Certification form is included in these bid documents as required by the Pensacola Junior College Board of Trustees.
- B. A copy of the Drug-Free Certification form is contained herein. The completed form must be submitted in the bid submittal along with the other required documents.

DRUG-FREE WORKPLACE CERTIFICATION

The below signed bidder certifies that it has implemented a Drug-Free Workplace Program. In order to have a Drug-Free Workplace Program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling rehabilitation and employee assistance programs and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under proposal a copy of the statement specified in subsection 1.
4. In the statement specified in subsection 1., notify the employees that, as a condition of working on the commodities or contractual services that are under proposal, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation occurring in the workplace no later than five (5) working days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in drug abuse assistance or rehabilitation program of such is available in the employee's community, by any employee who is convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign this statement, I certify that this firm complies fully with the above Drug-Free Workplace requirements.

DATE: _____

COMPANY: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE: _____

TELEPHONE: _____

SIGNATURE: _____ NAME
(PRINTED): _____

TITLE: _____

END OF SECTION 00 41 02

SECTION 004103 - PUBLIC ENTITY CRIMES STATEMENT

- A. The following information is included in these bid documents as required by Florida Statute.
- B. All invitations to bid as defined by Section 287.012(11), Florida Statutes; requests for proposals as defined by Section 287.012(16), Florida Statutes; and any contract document described by Section 287.058, Florida Statutes, shall contain a statement informing persons of the provisions of paragraph (2)(a) of Section 287.133, Florida Statutes.
- C. A copy of the Sworn Statement form is contained herein. The completed form shall be submitted in the bid submittal along with the other required documents.

**SWORN STATEMENT UNDER SECTION 287.133 (3) (A)
FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES**

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Proposal or Contract for
2. This sworn statement is submitted by
whose business address is

and (if applicable) Federal Employer Identification Number (FEIN) is _____ (If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement:
3. My name is _____ and my relationship to the entity named above is
4. I understand that a "public entity crime" as defined in Paragraph 287.133 (1) (g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or any agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.
5. I understand that "convicted" or "convicted" as defined in paragraph 287.133 (1) (b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime with or without an adjudication of guilt, in any federal or state trial court of records relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilty or nolo contendere.
6. I understand that an "affiliate" as defined in Paragraph 287 .133 (1) (a), Florida Statutes, means:
 1. A predecessor or successor of a person convicted of a public entity crime; or
 2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term " affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one of shares constituting a controlling income among persons when not for fair interest in another person, or a pooling of equipment or income among persons when not for fair market value under an length agreement, shall be a prima facie case that one person controls another person. A person who knowingly convicted of a public entity crime, in Florida during the preceding 36 months shall be considered an affiliate.

- 7. I understand that a "person" as defined in paragraph 287 .133 (1) (e), Florida Statutes, means any natural person or entity organized under the laws of the state or of the United States with the legal power to enter into a binding contract provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.
- 8. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies)

_____ Neither the entity submitting this sworn statement, nor any officers, directors, executive, partners, shareholders, employees. member, or agents who are active in management of the entity, nor affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989 And (please attach a copy of the final order)

_____ The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in public interest to remove the person or affiliate from the convicted vendor list. (please attach a copy of the final order.)

_____ The person or affiliate has not been placed on the convicted vendor list. (Please describe any action taken by, or pending with, the department of General Services.)

(Signature)

Date:

STATE OF FLORIDA
COUNTY OF

PERSONALLY APPEARED BEFORE ME, the undersigned authority, _____ who, after first being sworn by me, affixed his/her signature at the space provided above on this _____ day of _____, 20____, and is personally known to me, or has provided _____ as identification.

Notary Public

My Commission expires:

END OF SECTION 004103

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SECTION 004300 - LIST OF SUBCONTRACTORS

(List of Sub-Contractor's proposed for this project will be required at time of bidding.

TO: _____

This list is an integral part of the Bid submitted by:

Name and address of Contractor: _____

for the renovation of the Welding Shop, Pensacola Junior College District Board of Trustees, Pensacola Junior College.

The undersigned, hereafter called "Bidder", lists below the names of the subcontractors who will perform the phases of the work indicated:

<u>Division:</u>	<u>Name of Subcontractor:</u>
Concrete Work	_____
Structural Steel	_____
Carpentry	_____
Painting	_____

The undersigned declares that he/she has fully investigated each subcontractor listed and has determined to his/her own complete satisfaction that such subcontractor maintains a fully equipped organization, capable, technically and financially, of performing the pertinent work, and that he/she has made similar installation in a satisfactory manner.

FIRM: _____
(Name of Firm)

BY: _____
(Signature of Bidder)

(Name of Bidder)

TITLE: _____
(Title of Bidder)

DATE: _____

END OF SECTION 004300

SECTION 004313 – BID BOND

- A. The “Bid Bond”, The American Institute of Architect’s (AIA) Document A310-1970, 1970 Edition, two (2) pages, and (AIA) Document D401 – 2003 “Certification of Document’s Authenticity,” one (1) page is for reference only. Document shall be issued, as modified, on this Project as the Agreement Form. Copy upon request,

END OF SECTION 004313

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SECTION 005200 – AGREEMENT FORMS

The “Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment is a Stipulated Sum,” The American Institute of Architects (AIA) Document A101-1997, 2007, is for reference only. Document shall be issued, as modified, on this Project as the Agreement Form. Copy upon request.

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SECTION 006113 – PERFORMANCE BOND AND PAYMENT BOND

- A. The “Performance Bond” and the “Payment Bond”, The American Institute of Architect’s (AIA) Document A312-1984, 1984 Edition, seven (7) pages, “Additions and Deletions Report for AIA Document A312 – 1984,” one (1) page and (AIA) Document D401 – 2003 “Certification of Document’s Authenticity,” one (1) page, is for reference only. Copy upon request.

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SECTION 007200 – GENERAL CONDITIONS

The “General Conditions of the Contract for Construction” The American Institute of Architects (AIA) Document A201-2007, is for reference only. Document shall be issued, as modified, on this Project as the Agreement Form. Copy upon request.

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SECTION 007380 - WEATHER DELAY LOG

- A. Project: [Project # and Name]
- B. Date:
- C. Weather Event:
- D. Work On Progress:
- E. Is the work on the Critical Path?
- F. Length of Delay:
- G. If the work is not on the Critical Path, how many days of delay until this work category will be on the Critical Path?

Instructions:

1. The above information is required to be submitted with each payment request on a monthly basis.
2. This information will be required as back-up to grant a Time Extension request for delays caused by weather events.
3. Direct delays for work stoppages that are on the critical path will be given accordingly.
4. Delays for work not on the critical path shall be logged and delay logs for that category of work shall be accumulated and submitted in the event the work enters the critical patch and causes a delay of the project.
5. Delays will be granted only on the basis of adverse effect on the Critical Path of work for the project.

References:

CONTRACT FOR CONSTRUCTION, EXHIBIT C, DIVISION 1 (CONTRACT)

8. Any time or day lost to a weather related delay including wet ground conditions, rain, other forms of precipitation, and cold weather conditions, shall be an extension to the construction time regardless whether the period is under normal or adverse weather conditions.

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION – A201

Article 4.3.7.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

Submitted by:

Signature:

General Contractor:

END OF SECTION 007380

SECTION 007400 – PAYMENT

The “Payment”, The American Institute of Architect’s (AIA) Document G702-1992 Edition, one (1) page, G703-1992 Edition, one (1) page and G704–2000 one (1) page, included herein and shall be used, on this Project for application and process of payment is for reference only. Document shall be issued, as modified, on this Project as the Agreement Form. Copy upon request.

END OF SECTION 007400

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SECTION 009000 - SUPPLEMENTARY GENERAL CONDITIONS

SCOPE: The following supplements modify, change, delete or add to the "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION", AIA Document A201, 2007 Edition. Those portions of this document which remain unaltered by these supplements shall remain in effect as published.

ARTICLE 1: GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.9 (ADD) Unless otherwise expressly stated, wherever in the Contract Documents the work 'provide' is used, it shall mean furnished and installed in place, complete and tested.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.4 (ADD) the following: "If a discrepancy occurs on drawings, in specifications, or between drawings and specifications, the greater quantity or value takes precedence."

ARTICLE 3: CONTRACTOR

3.5 WARRANTY:

3.5.1 (ADD) The warranty herein guarantees the proper operation of all structures, components and systems constructed or installed by the contractor for a period of one year after the date of substantial completion.

If within the guarantee period, repairs or changes are required in connection with the guarantee work, which in the opinion of the Architect is rendered necessary as the result of the use of materials, equipment, or workmanship, which are defective, or inferior, or not in accordance with the terms of the Contract, the Contractor shall, promptly upon receipt of notice from the Owner, and without expense to the Owner, proceed to:

Place in satisfactory condition in every particular all of such guaranteed work, correct all defects therein; and

Make good all damages to the structure or site, or equipment or contents thereof which, in the opinion of the Architect are the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, or the equipment and contents or structures or site disturbed in fulfilling any such guarantee.

3.18 INDEMNIFICATION:

3.18.1 (REVISE) "The Contractor shall, for the sum of one hundred dollars (\$100.00) and other good and valuable consideration paid by the Owner and Architect, individually, receipt of which is hereby acknowledged by the Contractor, indemnify and hold harmless the Owner and Architect and their agents and employees from and against all claims, damages, losses and expenses, including attorney's fees, out of or resulting from the performance of the work provided that such claims, damage, loss or expense: (1) is attributable to bodily injury, sickness, disease or death, or injury to or destruction of tangible property other than the work itself, including the loss of use resulting there-from, and (2) is caused in whole or in part by a

negligent act or omission of the Contractor, subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any one of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. This obligation shall not be construed to reduce or negate any other right or obligation of indemnity which would otherwise exist as to any party or person described in Paragraph 3.18.”

ARTICLE 5: SUBCONTRACTORS

5.2.2 Substitute the following for Subparagraph 5.2.2:

"The Contractor shall not contract with any person or entity declared ineligible under Federal laws or regulations from participating in federally assisted construction projects or to whom the Owner or the Architect has made reasonable objection under the provisions of Subparagraph 5.2.1. The Contractor shall not be required to contract with anyone to whom has a reasonable objection."

ARTICLE 7: CHANGES IN WORK

7.1 General

7.1.1 (ADD) "Maximum percentages of overhead and profit which may be added by the Contractor to actual costs of such changes in the work are specifically set forth as follows:

For all work done by his organization, or subsidiaries of his organizations, including work traditionally considered as subcontractor work, the Contractor may add 15% of his actual costs for combined overhead and profit.

For any work performed by a subcontractor or forces under the respective subcontractor including any sub-subcontractors or persons not in the direct employ of the subcontractor, a total of 15% of the cost of the change, with 10% to be assigned to the subcontractor and any forces under him and the General Contractor may add 5% of the above subcontractor's cost for his overhead and profit.

The above percentages shall be considered reasonable allowance for overhead and profit due to the contractor.

The Contractor shall submit receipts or other evidence showing his costs and his right to the payment claims. All changes in work shall be provided with a detailed cost breakdown indicating material and labor units for all work to be performed. In addition, the cost breakdown shall contain all current tax and labor burden. The allowable amount for the material tax shall be 7.25% and for labor burden shall be 30%.

ARTICLE 11: INSURANCE AND BONDS

11.1 CONTRACTORS LIABILITY INSURANCE

11.1.2 (ADD) "The Contractor shall not commence any work in connection with this agreement until he has obtained all of the following types of insurance with the Owner as additional named insured and such insurance has been approved by the Owner, nor shall the Contractor allow

any subcontractor to commence work on his subcontract until all similar insurance required of the subcontractor to commence work on his subcontract has been obtained and approved.

All insurance policies shall be with insurers qualified and doing business in Florida.

THE CONTRACTOR SHALL PROCURE AND MAINTAIN FOR THE LIFE OF THIS CONTRACT:

1. Workers Compensation and Employers' Liability as follows:
 - a. WC Statutory Limits per FS 440
 - b. E.L. - Each Accident \$500,000
 - c. E.L. Disease – Each Employee \$500,000
 - d. E.L. Disease – Policy Limit \$500,000
2. Comprehensive General Liability with minimum limits as follows:
 - a. Each Occurrence - \$ 1,000,000
 - b. Damage to Rented Premises (Each occurrence)- \$100,000
 - c. Medical Expense (Any one person) \$5,000
 - d. Personal Advertising Injury - \$1,000,000
 - e. General Aggregate - \$3,000,000
 - f. Products-Completed Aggregate - \$3,000,000
 - g. General Aggregate applies to Per Project
3. Automobile Liability providing coverage on any auto to include all owned, hired and non-owned vehicle with following minimum limits:
 - a. Combined Single Limit (Each Accident) - \$2,000,000 OR
 - b. Bodily Injury per person - \$500,000, Bodily Injury per Accident - \$1,000,000, Property Damage per Accident - \$500,000
4. Excess/Umbrella Liability on Occurrence Form with following limit:
 - a. \$5,000,000 each occurrence
 - b. \$10,000,000 aggregate
 - c. Retention /Deductible - \$10,000

11.1.2 (ADD) "The Contractor liability policy shall provide "XCU" (Explosion, Collapse, Underground Damage) coverage for those classifications in which they are included.

Broad Form Property Damage shall be required on Contractor's public liability so that completed operations coverage extends to work performed by the Contractor.

11.1.5 (ADD) Builders Risk Insurance: Contractor shall purchase and maintain in effect a completed value builder's risk policy issued by an admitted carrier in an amount equal to the full completed value of the project. Such insurance shall be issued on an all risk form. Deductible shall not exceed \$5,000. The Contractor shall be responsible for any deductible amounts.

11.4.3 (ADD) The Contractor shall furnish a Performance Bond in an amount equal to one hundred percent (100%) of the Contract Sum as security for the faithful performance of this Contract and also a Labor and Material Payment Bond in an amount not less than one hundred percent (100%) of the Contract Sum or in a penal sum not less than that prescribed by State, Territorial or local law, as security for the payment of persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract. The Performance Bond and the Labor and Material Payment Bond may be in one or in separate instruments in accordance with local law and shall be delivered to the Owner not later than the date of execution of the Contract. The premium for the required bonds shall be paid by the Contractor. "These bonds shall be executed on behalf of the Contractor in the same manner and by the same person who executed the agreement.

11.4.4 (ADD) "To be acceptable as surety on Performance and Payment Bonds, a surety company shall comply with the following provisions:

The Surety Company must be admitted to do business in the State of Florida. The surety Company shall have been in business and have a record of successful continuous operations for at least five years. The Surety Company shall have at least the following minimum ratings:

Contract Amount	Policy Holders	Required Rating
0 - 100,000	B	CLASS VII
100,000 - 500,000	A	CLASS VIII
500,000 - 750,000	A	CLASS IX
750,000 - 1,000,000	A	CLASS X
1,000,000 - 1,250,000	A	CLASS XI
1,250,000 - 1,500,000	A	CLASS XI
1,500,000 - 2,000,000	A	CLASS XII
2,000,000 - 2,500,000	A	CLASS XII

*From Best's key rating guide.

Best's Policy Holder's Rating of "A" and "B" (which signifies A--Excellent, and B-Good, based upon good underwriting, economic management, adequate reserves for undisclosed liabilities, net resources for unusual stock and sound investment) or an equivalent rating from the Insurance Commissioner, if not rated by Best's. Neither the Surety Company nor any reinsurer shall expose itself to any loss on any one risk in an amount exceeding ten (10%) percent of its surplus to policyholders.

In the case of a surety insurance company, there shall be deducted in addition to the deduction for reinsurance, the amount assumed by any co-surety, the value of any security deposited, pledged or held subject to the content of the Surety and for the protection of the Surety."

Furnish in triplicate a Performance Bond and a Payment Bond, each in the amount of 100% of the Contract Sum, written by a surety licensed to do business in the state where the Project is located. The prescribed form of the Performance Bond and Payment Bond is AIA Document A313.

ARTICLE 15: CLAIMS AND DISPUTES

15.4 ARBITRATION- Delete sections 15.4 through 15.4.4.3 in their entirety.

END OF SECTION 00 90 00

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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 PROJECT INFORMATION

- A. Project Identification: Welding Shop Renovations
 - 1. Project Location: Pensacola State College Main Campus
- B. Owner: Pensacola State College.
 - 1. Owner's Representative: Diane Baxter.
- C. Architect: Bullock Tice Architects, Inc.
- D. Architect's Consultants:
 - 1. Structural: Joe DeReuil Associates, Inc.
 - 2. Mechanical: Premier Engineering Group, Inc.
 - 3. Electrical: Adams Consulting Engineering, Inc.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
 - 1. Project consists of demolition of house within metal building, completion of metal building and new interior fitout to include welding shop, classroom and support spaces. A new covered area and entry will be constructed.
- B. Type of Contract.
 - 1. Project will be constructed under a single prime contract.

1.4 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

1.5 WORK RESTRICTIONS

- A. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
1. Notify Construction Manager not less than five days in advance of proposed utility interruptions.
 2. Obtain Construction Manager's written permission before proceeding with utility interruptions.

1.6 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Metal Siding

1. Base Bid: Retain existing metal siding on South elevation, provide new at infills on South and West elevations.
2. Alternate: Remove existing metal siding from South Elevation, salvage and reinstall on West elevation, and provide all new metal siding on South elevation (for color matching).

B. Alternate No. 2: Driveway

1. Base Bid: Remove section of fencing and provide chain link fence swing gate at opening.
2. Alternate: Remove existing tree, remove larger section of gate and provide vehicle access gate and bollard at corner of building. Provide new asphalt drive from road to edge of concrete canopy.

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions made after award of the Contract.
 - 1. Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each prime contractor.
- B. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
 - 2. Division 01 Section "Reference Standards and Definitions" specifies the applicability of industry standards to products specified.
- C. Division 01 Section "Submittals" specifies requirements for submitting the Contractor's Construction Schedule and the Submittal Schedule.

1.3 DEFINITIONS

- A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: ***Changes in products, materials, equipment, manufacturer, or methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions.*** The following are not considered to be requests for substitutions:
 - 1. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
 - 2. Revisions to the Contract Documents requested by the Owner or Architect.
 - 3. Specified options of products and construction methods included in the Contract Documents.
 - 4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 ACTION SUBMITTALS

- A. Substitution Request Submittal: The Architect will consider requests for substitution if received within 45 days after commencement of the Work. Requests received more than 45 days after commencement of the Work may be considered or rejected at the discretion of the Architect.
- B. If retaining last option in "Substitution Request Form" Subparagraph below, insert a sample of the form to be used in Project Manual.
1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for change-order proposals.
 2. Identify the product or manufacturer or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.
 3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors that will be necessary to accommodate the proposed substitution.
 - b. The manufacturer's certification that the design documents (drawings and specifications) have received their complete technical review and that all changes and/or modifications required to accommodate this requested substitution have been identified within this submittal and meet the manufacturer's complete recommendations for product and/or system installation (See a. above).
 - c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.
 - d. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - g. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - h. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.
 - i. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
 4. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within two weeks of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within three weeks of receipt of request, or two weeks of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a change order.
 - a. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Conditions: The Architect will receive and consider the Contractor's request for substitution when extensive revision to the Contract Documents are not required, when proposed changes are in keeping with the general intent of the Contract Documents, when the request is timely, fully documented, and properly submitted and when one or more of the following conditions are satisfied, as determined by the Architect. If the above following conditions are not satisfied, the Architect will return the request(s) without action except to record noncompliance with these requirements. The specified product, manufacturer(s) or method of construction cannot be provided within the Contract Time. The Architect will not consider the request if the product or method cannot be provided as a result of the Contractor's failure to pursue the Work promptly or coordinate activities properly, as determined by the Architect.
1. The specified product, manufacturer(s) or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 2. The specified product, manufacturer(s) or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
 3. The specified product, manufacturer(s) or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
 4. The specified product, manufacturer(s) or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.
 5. Where a proposed substitution involves more than one prime contractor, each contractor shall cooperate with the other contractors involved to coordinate the Work, provide uniformity and consistency, and assure compatibility of products.
 6. The requested substitution is directly related to an "or approved equal" clause or similar language in the Contract Documents and/or offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. ***The Owner's additional responsibilities may include compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.***
- B. COST: THE COST OF SUBSTITUTION REQUEST EVALUATION BY THE ARCHITECT/CONSULTANT IS THE CONTRACTOR'S RESPONSIBILITY EXCEPT FOR CONDITIONS 1., 2., 3., 4., AND 5. LISTED ABOVE UNLESS INCOMPATIBILITY AND/OR COORDINATION DEFICIENCIES ARE THE RESULT OF THE CONTRACTOR'S PREVIOUS SELECTIONS (SEE COMPATIBILITY OF OPTIONS, SECTION 01600) AS DETERMINED SOLELY BY THE ARCHITECT. THE 'COST' OF EVALUATION WILL BE BASED UPON THE ACTUAL TIME EXPENDED IN THIS EFFORT TIMES THE ARCHITECT'S AND CONSULTANT'S CURRENT BILLING RATE AT THE TIME THE EVALUATION IS DONE. THIS 'COST' WILL BECOME A PART OF THE CONTRACT AS A "DEDUCT CHANGE ORDER" REGARDLESS OF THE OUTCOME OF THE SUBSTITUTION EVALUATION.

- C. The Contractor's submittal and the Architect's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents *do not constitute an acceptable or valid request for substitution, nor do they constitute approval. Any and all deviations proposed from the Contract Documents (drawings and/or specifications) shall be so identified and submitted in accordance with this specification section "012500 – SUBSTITUTION PROCEDURES".*

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section specifies administrative and procedural requirements for handling and processing contract modifications.
 - 1. Division 01 Section "Submittals" for requirements for the Contractor's Construction Schedule.
 - 2. Division 01 Section "Applications for Payment" for administrative procedures governing Applications for Payment.
 - 3. Division 01 Section "Product Substitutions" for administrative procedures for handling requests for substitutions made after award of the Contract.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 CHANGE ORDER PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal requests issued by the Architect are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
 - 2. Within 20 days of receipt of a proposal request, submit an estimate of cost necessary to execute the change to the Architect for the Owner's review.
 - a. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.

- B. Contractor-Initiated Work Change Proposals: When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose a claim by submitting a request to the Architect. Note, however, that a discrepancy in the documents is not considered a latent or unforeseen condition. See the "Supplementary General Conditions" for clarification regarding this issue.
1. Include a statement outlining reasons for the claim and the effect on the Work. Provide a complete description of the claim. Indicate the effect on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Any and all claims shall be submitted on the form at the end of this specification section. A claim made by any other method or documentation will not be recognized or acknowledged.

1.5 ALLOWANCES

- A. Allowance Adjustment: For allowance-cost adjustment, base each Change Order Proposal on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place. Where applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
1. Include installation costs in the purchase amount only where indicated as part of the allowance.
 2. When requested, prepare explanations and documentation to substantiate the margins claimed.
 3. Submit substantiation of a change in scope of work claimed in the Change Orders related to unit-cost allowances.
 4. The Owner reserves the right to establish the actual quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or the Contractor's handling, labor, installation, overhead, and profit. Submit claims within 21 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. The Owner will reject claims submitted later than 21 days.
1. Do not include the Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in Contract Documents.
 2. No change to the Contractor's indirect expense is permitted for selection of higher or lower-priced materials or systems of the same scope and nature as originally indicated.

1.6 CHANGE ORDER PROCEDURES

- A. Upon Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: When the Owner and the Contractor disagree on the terms of a Proposal Request, the Architect may issue a Construction Change Directive on AIA Form G714. The Construction Change Directive instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

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SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process the Contractor's Applications for Payment.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
 - 3. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 4. Schedules: The Contractor's Construction Schedule and Submittal Schedule are specified in Division 01 Section "Submittals."

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
 - 1. Submit the schedule of values to Architect at earliest possible date but no later than 7 days before the date scheduled for submittal of initial Applications for Payment.
 - 2. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments; provide subschedules showing values coordinated with each phase of payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.

Arrange schedule of values consistent with format of AIA Document G703 in tabular form with separate columns to indicate the following for each item listed:

- a. Related Specification Section or Division.
 - b. Description of Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value.
- 1) Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
2. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Break principal subcontract amounts down into several line items.
 3. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 4. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. Include written approval from the Owner in advance for materials and equipment suitably stored off-site, and requirements for insurance, storage, and transportation.
 5. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 6. Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Retain first subparagraph below; revise to suit Project. Owner's financial advisors usually insist on this requirement. See Evaluations for discussion on overhead distribution.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

- B. Payment Application Times: Each progress-payment date is indicated in the Agreement. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 > as form for Applications for Payment. Identical Contractor developed formats may be used if approved prior to the first application for payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 - 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Architect.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from subcontractors, sub-subcontractors and suppliers for the construction period covered by the previous application.
 - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit conditional final or full waivers.
 - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 - 4. Waiver Delays: Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the application.
 - a. Submit final Applications for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 - 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 - 1. List of subcontractors.
 - 2. Schedule of values.
 - 3. Contractor's construction schedule (preliminary if not final).
 - 4. Initial progress report.
 - 5. Certificates of insurance and insurance policies.

6. Data needed to acquire the Owner's insurance.
 7. Initial settlement survey and damage report, if required.
- H. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
 2. Administrative actions and submittals that shall precede or coincide with this application include:
 - a. Warranties (guarantees) and maintenance agreements.
 - b. Maintenance instructions.
 - c. Final cleaning.
 - d. Application for reduction of retainage and consent of surety.
 - e. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.
 - f. As-built documents.
- I. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
1. Completion of Project closeout requirements.
 2. Completion of items specified for completion after Substantial Completion.
 3. Ensure that unsettled claims will be settled.
 4. Ensure that unacceptable incomplete Work and will be completed without undue delay.
 5. Transmittal of required Project construction records to the Owner.
 6. Certified property survey.
 7. Proof that taxes, fees, and similar obligations were paid.
 8. Removal of temporary facilities and services.
 9. Removal of surplus materials, rubbish, and similar elements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
1. Preconstruction conferences.
 2. Progress meetings.
 3. Coordination meetings.
 4. General project coordination procedures.
 5. Conservation.
 6. Administrative and supervisory personnel.
 7. Cleaning and protection.
- B. Related Requirements:
1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
 2. Division 01 Section "Coordination" for procedures for coordinating project meetings with other construction activities.
 3. Division 01 Section "Submittals" for submitting the Contractor's Construction Schedule.
 4. Division 01 Section "Materials and Equipment" for coordinating general installation.
 5. Division 01 Section "Contract Closeout" for coordinating contract closeout.
 6. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 SUBMITTALS

- A. Staff Names: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers.
1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

1.4 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Preparation and submittal of coordination drawings is the sole responsibility of the Contractor and is necessary if the review of the Architect/Engineer is desired in regard to coordination and/or sequencing of the work. The design drawings prepared by the Architect/Engineer are diagrammatic in nature and therefore cannot be relied upon for specific locations of each component (unless it is numerically noted as to its 3 dimensional location). Coordination including identifying the specific location and sequence of each component is the Contractors responsibility. A change order will not be recognized for the repair or additional cost of the work associated with the Contractor's failure to coordinate and sequence the work properly.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.

1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.

2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- D. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number.
1. Project name.
 2. Name and address of Contractor.

3. Name and address of Architect.
 4. RFI number including RFIs that were dropped and not submitted.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.
- E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.6 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Preparation of record documents.
 - l. Use of the premises and existing building.

- m. Work restrictions.
 - n. Working hours.
 - o. Owner's occupancy requirements.
 - p. Responsibility for temporary facilities and controls.
 - q. Procedures for moisture and mold control.
 - r. Procedures for disruptions and shutdowns.
 - s. Construction waste management and recycling.
 - t. Parking availability.
 - u. Office, work, and storage areas.
 - v. Equipment deliveries and priorities.
 - w. First aid.
 - x. Security.
 - y. Progress cleaning.
3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Progress Meetings: Conduct progress meetings at biweekly intervals.
- 1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.

- 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 GENERAL COORDINATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.2 CLEANING AND PROTECTION

- A. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration at Substantial Completion.
- B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.
- C. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
 1. Excessive static or dynamic loading.
 2. Excessive internal or external pressures.
 3. Excessively high or low temperatures.
 4. Thermal shock.
 5. Excessively high or low humidity.

6. Air contamination or pollution.
7. Water or ice.
8. Solvents.
9. Chemicals.
10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staining, and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
18. Combustion.
19. Electrical current.
20. High-speed operation.
21. Improper lubrication.
22. Unusual wear or other misuse.
23. Contact between incompatible materials.
24. Destructive testing.
25. Misalignment.
26. Excessive weathering.
27. Unprotected storage.
28. Improper shipping or handling.
29. Theft.
30. Vandalism.

END OF SECTION 013100

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SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's construction schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Site condition reports.
 - 7. Special reports.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting schedules and reports.
 - 2. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Architect.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file, where indicated.
 - 2. PDF electronic file.
- B. Startup construction schedule.
 - 1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 - 3. Total Float Report: List of all activities sorted in ascending order of total float.
 - 4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.
- F. Construction Schedule Updating Reports: Submit with Applications for Payment.

- G. Daily Construction Reports: Submit at monthly intervals.
- H. Material Location Reports: Submit at monthly intervals.
- I. Site Condition Reports: Submit at time of discovery of differing conditions.
- J. Special Reports: Submit at time of unusual event.
- K. Qualification Data: For scheduling consultant.

1.5 QUALITY ASSURANCE

- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
 - 1. Review software limitations and content and format for reports.
 - 2. Verify availability of qualified personnel needed to develop and update schedule.
 - 3. Discuss constraints, including work stages interim milestones.
 - 4. Review submittal requirements and procedures.
 - 5. Review time required for review of submittals and resubmittals.
 - 6. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 7. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
 - 8. Review and finalize list of construction activities to be included in schedule.
 - 9. Review procedures for updating schedule.

1.6 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of final completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 - 2. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 - 3. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 - 4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 - 5. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
 - 1. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Building flush-out.
 - m. Startup and placement into final use and operation.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

- E. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
 - 1. See Section 012900 "Payment Procedures" for cost reporting and payment procedures.
- F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
 - 1. Unresolved issues.
 - 2. Unanswered Requests for Information.
 - 3. Rejected or unreturned submittals.
 - 4. Notations on returned submittals.
 - 5. Pending modifications affecting the Work and Contract Time.
- G. Recovery Schedule: When periodic update indicates the Work is [14] <Insert number> or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- H. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 STARTUP CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Startup Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's construction schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 60 days after date established for the Notice to Proceed.

- a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and commissioning.
 - j. Punch list and final completion.
 - k. Activities occurring following final completion.
 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
 5. Cost- and Resource-Loading of CPM Schedule: Assign cost to construction activities on the CPM schedule. Do not assign costs to submittal activities. Obtain Architect's approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project record documents, LEED documentation, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.

- a. Each activity cost shall reflect an appropriate value subject to approval by Architect.
 - b. Total cost assigned to activities shall equal the total Contract Sum.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Main events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the schedule of values).
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.
- H. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
 4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

2.4 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Accidents.
 8. Meetings and significant decisions.
 9. Unusual events (see special reports).
 10. Stoppages, delays, shortages, and losses.
 11. Meter readings and similar recordings.
 12. Emergency procedures.
 13. Orders and requests of authorities having jurisdiction.
 14. Change Orders received and implemented.
 15. Construction Work Change Directives received and implemented.
 16. Services connected and disconnected.
 17. Equipment or system tests and startups.
 18. Partial completions and occupancies.
 19. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
1. Material stored prior to previous report and remaining in storage.
 2. Material stored prior to previous report and since removed from storage and installed.
 3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or

effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final completion percentage for each activity.

- B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

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SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals, including the following:
 - 1. Contractor's construction schedule.
 - 2. Shop Drawings.
 - 3. Product Data.
 - 4. Samples.
 - 5. Quality assurance submittals.

- B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:
 - 1. Permits.
 - 2. Applications for Payment.
 - 3. Performance and payment bonds.
 - 4. Insurance certificates.
 - 5. List of subcontractors.

- C. Related Requirements:
 - 1. Division 01 Section "Applications for Payment" specifies requirements for submittal of the Schedule of Values.
 - 2. Division 01 Section "Coordination" specifies requirements governing preparation and submittal of required Coordination Drawings.
 - 3. Division 01 Section "Project Meetings" specifies requirements for submittal and distribution of meeting and conference minutes.
 - 4. Division 01 Section "Contract Closeout" specifies requirements for submittal of Project Record Documents and warranties at project closeout.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.

- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

- C. Field samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the Work will be judged.
- D. Mockups are full-size assemblies for review of construction, coordination, testing, or operation; they are not Samples.

1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic copies of digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals (when requested).
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal.
 - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 - 4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 - 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Name of subcontractor.
 - f. Name of supplier.

- g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
- a. Transmittal Form for Paper Submittals: Use AIA Document G810.
 - b. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
 - 1) Project name.
 - 2) Date.
 - 3) Destination (To:).
 - 4) Source (From:).
 - 5) Name and address of Architect.
 - 6) Name of Contractor.
 - 7) Name of firm or entity that prepared submittal.
 - 8) Names of subcontractor, manufacturer, and supplier.
 - 9) Category and type of submittal.
 - 10) Submittal purpose and description.
 - 11) Specification Section number and title.
 - 12) Specification paragraph number or drawing designation and generic name for each of multiple items.
 - 13) Drawing number and detail references, as appropriate.
 - 14) Indication of full or partial submittal.
 - 15) Transmittal number, numbered consecutively.
 - 16) Submittal and transmittal distribution record.
 - 17) Remarks.
 - 18) Signature of transmitter.
 - c. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

- E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
 4. Transmittal Form for Electronic Submittals: Use software-generated form from electronic project management software acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Contractor.
 - e. Name of firm or entity that prepared submittal.
 - f. Names of subcontractor, manufacturer, and supplier.
 - g. Category and type of submittal.
 - h. Submittal purpose and description.
 - i. Specification Section number and title.
 - j. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Related physical samples submitted directly.
 - n. Indication of full or partial submittal.
 - o. Transmittal number, numbered consecutively.
 - p. Submittal and transmittal distribution record.
 - q. Other necessary identification.
 - r. Remarks.
 5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
 - a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
- F. Options: Identify options requiring selection by Architect.
- G. Deviations: Identify deviations from the Contract Documents on submittals.
- H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
 - J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart-type, contractor's construction schedule. Submit final schedule within 30 days after the date established for "Commencement of the Work."
 1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. *Use the same breakdown of units of the Work as indicated in the "Schedule of Values."*
 2. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
 3. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
 4. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.
- B. Phasing: On the schedule, show how requirements for phased completion to permit partial occupancy by the Owner affect the sequence of Work.
- C. Work Stages: Indicate important stages of construction for each major portion of the Work, including submittal review, testing, and installation.
- D. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.
- E. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
 1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

- F. Schedule Updating: Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.5 SHOP DRAWINGS

- A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. **Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings.** Standard information prepared without specific reference to the Project is not a Shop Drawing.
- B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:
 - 1. Dimensions.
 - 2. Identification of products and materials included by sheet and detail number.
 - 3. Compliance with specified standards.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.
 - 6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 36 by 48 inches (890 by 1220 mm).
 - 7. Do not use Shop Drawings without an appropriate final stamp indicating action taken.

1.6 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, and standard color charts.
 - 1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. **Highlighting by marker only is not acceptable.** Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
 - g. Maintenance and long term care instructions.
 - h. Manufacturer's requirements for material handling and storage prior to installation.
 - 2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

1.7 SAMPLES

- A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.
1. Submit Samples for review of size, kind, color, pattern, and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
 - a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least 3 multiple units that show approximate limits of the variations.
 - b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
 2. Preliminary Submittals: Submit a full set of choices where Samples are submitted for selection of color, pattern, texture, or similar characteristics from a full range of choices available.
 - a. The Architect will review and return preliminary submittals with the Architect's notation, indicating selection and other action.
 3. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit two (2) sets. The Architect will return one set marked with the action taken.
 4. Maintain sets of Samples, as returned, at the Project Site, for quality comparisons throughout the course of construction.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
- B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

1.8 QUALITY ASSURANCE SUBMITTALS

- A. Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

- B. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, ***submit a notarized certification from the manufacturer certifying compliance with specified requirements.***

1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

1.9 ARCHITECT'S ACTION

- A. Except for submittals for the record or information, where action and return is required, the Architect will review each submittal, mark to indicate action taken, and return promptly.

1. Compliance with specified characteristics is the Contractor's responsibility. Additionally the General Contractor is required to review and approve each submittal for compliance with the contract documents prior to submitting same to the Architect.

- B. Action Stamp: The Architect will stamp each submittal with a uniform, action stamp. The Architect will mark the stamp appropriately to indicate the action taken, as follows:

1. Final Unrestricted Release: When the Architect marks a submittal "***Furnish as Submitted***" the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.
2. Final-But-Restricted Release: When the Architect marks a submittal "***Furnish as Corrected***" the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance.
3. Returned for Resubmittal: When the Architect marks a submittal "***Rejected, Revise and Resubmit***," do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.
 - a. Do not use, or allow others to use, submittals marked "***Rejected, Revise and Resubmit***" at the Project Site or elsewhere where Work is in progress.
 - b. Do not allow submittals or samples to be placed on the jobsite unless they have been forwarded to the Architect and have been duly processed.
4. Other Action: Where a submittal is for information or record purposes or special processing or other activity, the Architect will return the submittal marked "Action Not Required."

- C. Unsolicited Submittals: The Architect will return unsolicited submittals to the sender without action.

WELDING SHOP RENOVATIONS
PENSACOLA STATE COLLEGE

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PART 2 - PRODUCTS (Not Used.)

PART 3 - EXECUTION (Not Used.)

END OF SECTION 013300

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SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.
- C. Related Requirements:
 - 1. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
 - 2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
 - 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply

with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
 - 3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.7 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.

12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.8 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect and Commissioning Authority, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
 4. Demonstrate the proposed range of aesthetic effects and workmanship.
 5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 7. Demolish and remove mockups when directed unless otherwise indicated.

1.9 QUALITY CONTROL

- A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

- B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- C. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect, Commissioning Authority and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect, Commissioning Authority, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 - 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 - 4. Facilities for storage and field curing of test samples.
 - 5. Delivery of samples to testing agencies.
 - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
 1. Distribution: Distribute schedule to Owner, Architect, Commissioning Authority, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.10 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Statement of Special Inspections attached to this Section, and as follows:

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's, Commissioning Authority's, reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.

- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
- J. Installer: An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
 - 1. The term experienced, when used with the term Installer, means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special

requirements indicated, and having complied with requirements of the authority having jurisdiction.

2. Trades: Using terms such as carpentry does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as carpenter. It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.
 - a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

- K. Testing Agencies: A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Conflicting Requirements: Where compliance with 2 or more standards is specified and where the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different but apparently equal and uncertainties to the Architect for a decision before proceeding.
 1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.
- D. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. AABC - Associated Air Balance Council; www.aabc.com.
 2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
 3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
 4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
 5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
 6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
 7. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org.
 8. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
 9. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
 10. AF&PA - American Forest & Paper Association; www.afandpa.org.
 11. AGA - American Gas Association; www.aga.org.
 12. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
 13. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
 14. AI - Asphalt Institute; www.asphaltinstitute.org.
 15. AIA - American Institute of Architects (The); www.aia.org.
 16. AISC - American Institute of Steel Construction; www.aisc.org.
 17. AISI - American Iron and Steel Institute; www.steel.org.
 18. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
 19. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
 20. ANSI - American National Standards Institute; www.ansi.org.
 21. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
 22. APA - APA - The Engineered Wood Association; www.apawood.org.
 23. APA - Architectural Precast Association; www.archprecast.org.
 24. API - American Petroleum Institute; www.api.org.
 25. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
 26. ARI - American Refrigeration Institute; (See AHRI).
 27. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
 28. ASCE - American Society of Civil Engineers; www.asce.org.
 29. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
 30. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
 31. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
 32. ASSE - American Society of Safety Engineers (The); www.asse.org.
 33. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
 34. ASTM - ASTM International; (American Society for Testing and Materials International); www.astm.org.
 35. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
 36. AWEA - American Wind Energy Association; www.awea.org.

37. AWI - Architectural Woodwork Institute; www.awinet.org.
38. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
39. AWPA - American Wood Protection Association; (Formerly: American Wood-Preservers' Association); www.awpa.com.
40. AWS - American Welding Society; www.aws.org.
41. AWWA - American Water Works Association; www.awwa.org.
42. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
43. BIA - Brick Industry Association (The); www.gobrick.com.
44. BICSI - BICSI, Inc.; www.bicsi.org.
45. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.com.
46. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
47. BOCA - BOCA; (Building Officials and Code Administrators International Inc.); (See ICC).
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bwfbadminton.org.
49. CDA - Copper Development Association; www.copper.org.
50. CEA - Canadian Electricity Association; www.electricity.ca.
51. CEA - Consumer Electronics Association; www.ce.org.
52. CFFA - Chemical Fabrics & Film Association, Inc.; www.chemicalfabricsandfilm.com.
53. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
54. CGA - Compressed Gas Association; www.cganet.com.
55. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
56. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
57. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
58. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
59. CPA - Composite Panel Association; www.pbmdf.com.
60. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
61. CRRC - Cool Roof Rating Council; www.coolroofs.org.
62. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
63. CSA - Canadian Standards Association; www.csa.ca.
64. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
65. CSI - Construction Specifications Institute (The); www.csinet.org.
66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
67. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
68. CWC - Composite Wood Council; (See CPA).
69. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
70. DHI - Door and Hardware Institute; www.dhi.org.
71. ECA - Electronic Components Association; www.ec-central.org.
72. ECAMA - Electronic Components Assemblies & Materials Association; (See ECA).
73. EIA - Electronic Industries Alliance; (See TIA).
74. EIMA - EIFS Industry Members Association; www.eima.com.
75. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
76. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
77. ESTA - Entertainment Services and Technology Association; (See PLASA).
78. EVO - Efficiency Valuation Organization; www.evo-world.org.
79. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.

80. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
81. FM Approvals - FM Approvals LLC; www.fmglobal.com.
82. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
83. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarooft.com.
84. FSA - Fluid Sealing Association; www.fluidsealing.com.
85. FSC - Forest Stewardship Council U.S.; www.fscus.org.
86. GA - Gypsum Association; www.gypsum.org.
87. GANA - Glass Association of North America; www.glasswebsite.com.
88. GS - Green Seal; www.greenseal.org.
89. HI - Hydraulic Institute; www.pumps.org.
90. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
91. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
92. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
93. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
94. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
95. IAS - International Approval Services; (See CSA).
96. ICBO - International Conference of Building Officials; (See ICC).
97. ICC - International Code Council; www.iccsafe.org.
98. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
99. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
100. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
101. IEC - International Electrotechnical Commission; www.iec.ch.
102. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
103. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
104. IESNA - Illuminating Engineering Society of North America; (See IES).
105. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
106. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
107. IGSHA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
108. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
109. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
110. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
111. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
112. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
113. ISO - International Organization for Standardization; www.iso.org.
114. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
115. ITU - International Telecommunication Union; www.itu.int/home.
116. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
117. LMA - Laminating Materials Association; (See CPA).
118. LPI - Lightning Protection Institute; www.lightning.org.
119. MBMA - Metal Building Manufacturers Association; www.mbma.com.
120. MCA - Metal Construction Association; www.metalconstruction.org.
121. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
122. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
123. MHIA - Material Handling Industry of America; www.mhia.org.

124. MIA - Marble Institute of America; www.marble-institute.com.
125. MMPA - Moulding & Millwork Producers Association; (Formerly: Wood Moulding & Millwork Producers Association); www.wmmpa.com.
126. MPI - Master Painters Institute; www.paintinfo.com.
127. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
128. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
129. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
130. NADCA - National Air Duct Cleaners Association; www.nadca.com.
131. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
132. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
133. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
134. NCMA - National Concrete Masonry Association; www.ncma.org.
135. NEBB - National Environmental Balancing Bureau; www.nebb.org.
136. NECA - National Electrical Contractors Association; www.necanet.org.
137. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
138. NEMA - National Electrical Manufacturers Association; www.nema.org.
139. NETA - InterNational Electrical Testing Association; www.netaworld.org.
140. NFHS - National Federation of State High School Associations; www.nfhs.org.
141. NFPA - NFPA; (National Fire Protection Association); www.nfpa.org.
142. NFPA - NFPA International; (See NFPA).
143. NFRC - National Fenestration Rating Council; www.nfrc.org.
144. NHLA - National Hardwood Lumber Association; www.nhla.com.
145. NLGA - National Lumber Grades Authority; www.nlga.org.
146. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
147. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
148. NRCA - National Roofing Contractors Association; www.nrca.net.
149. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
150. NSF - NSF International; (National Sanitation Foundation International); www.nsf.org.
151. NSPE - National Society of Professional Engineers; www.nspe.org.
152. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
153. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
154. NWFA - National Wood Flooring Association; www.nwfa.org.
155. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
156. PDI - Plumbing & Drainage Institute; www.pdionline.org.
157. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
158. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
159. RFCI - Resilient Floor Covering Institute; www.rfci.com.
160. RIS - Redwood Inspection Service; www.redwoodinspection.com.
161. SAE - SAE International; (Society of Automotive Engineers); www.sae.org.
162. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
163. SDI - Steel Deck Institute; www.sdi.org.
164. SDI - Steel Door Institute; www.steeldoor.org.
165. SEFA - Scientific Equipment and Furniture Association; www.sefalabs.com.
166. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
167. SIA - Security Industry Association; www.siaonline.org.
168. SJI - Steel Joist Institute; www.steeljoist.org.

169. SMA - Screen Manufacturers Association; www.smainfo.org.
170. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
171. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
172. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
173. SPIB - Southern Pine Inspection Bureau; www.spib.org.
174. SPRI - Single Ply Roofing Industry; www.spri.org.
175. SRCC - Solar Rating and Certification Corporation; www.solar-rating.org.
176. SSINA - Specialty Steel Industry of North America; www.ssina.com.
177. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
178. STI - Steel Tank Institute; www.steeltank.com.
179. SWI - Steel Window Institute; www.steelwindows.com.
180. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
181. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
182. TCNA - Tile Council of North America, Inc.; (Formerly: Tile Council of America); www.tileusa.com.
183. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
184. TIA - Telecommunications Industry Association; (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
185. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
186. TMS - The Masonry Society; www.masonrysociety.org.
187. TPI - Truss Plate Institute; www.tpinst.org.
188. TPI - Turfgrass Producers International; www.turfgrasssod.org.
189. TRI - Tile Roofing Institute; www.tilerroofing.org.
190. UBC - Uniform Building Code; (See ICC).
191. UL - Underwriters Laboratories Inc.; www.ul.com.
192. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
193. USAV - USA Volleyball; www.usavolleyball.org.
194. USGBC - U.S. Green Building Council; www.usgbc.org.
195. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
196. WASTEC - Waste Equipment Technology Association; www.wastec.org.
197. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
198. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
199. WDMA - Window & Door Manufacturers Association; www.wdma.com.
200. WI - Woodwork Institute; (Formerly: WIC - Woodwork Institute of California); www.wicnet.org.
201. WMMPA - Wood Moulding & Millwork Producers Association; (See MMPA).
202. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
203. WPA - Western Wood Products Association; www.wwpa.org.

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

1. DIN - Deutsches Institut für Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.
4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

1. COE - Army Corps of Engineers; www.usace.army.mil.
2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD - Department of Defense; <http://dodssp.daps.dla.mil>.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FAA - Federal Aviation Administration; www.faa.gov.
8. FG - Federal Government Publications; www.gpo.gov.
9. GSA - General Services Administration; www.gsa.gov.
10. HUD - Department of Housing and Urban Development; www.hud.gov.
11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; <http://eetd.lbl.gov>.
12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
13. SD - Department of State; www.state.gov.
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18. USP - U.S. Pharmacopeia; www.usp.org.
19. USPS - United States Postal Service; www.usps.com.

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
2. DOD - Department of Defense; Military Specifications and Standards; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

- F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. CBHF - State of California; Department of Consumer Affairs; Bureau of Electronic Appliance and Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
 2. CCR - California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
 3. CDHS - California Department of Health Services; (See CDPH).
 4. CDPH - California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
 5. CPUC - California Public Utilities Commission; www.cpuc.ca.gov.
 6. SCAQMD - South Coast Air Quality Management District; www.aqmd.gov.
 7. TFS - Texas Forest Service; Forest Resource Development and Sustainable Forestry; <http://txforestservicetamu.edu>.

1.5 SUBMITTALS

- A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

1.6 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 16-Division format and MASTERFORMAT numbering system.
- B. Specification Content: This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:
1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
 - a. The words "*shall be*" are implied wherever a colon (:) is used within a sentence or phrase.

WELDING SHOP RENOVATIONS
PENSACOLA STATE COLLEGE

142615.02

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection facilities.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Water service and distribution.
 - 2. Temporary electric power and light.
 - 3. Telephone service.
 - 4. Sanitary facilities, including drinking water.
- C. Support facilities include, but are not limited to, the following:
 - 1. Field offices and storage sheds.
 - 2. Temporary roads and paving.
 - 3. Temporary enclosures.
 - 4. Temporary project identification signs and bulletin boards.
 - 5. Waste disposal services.
 - 6. Rodent and pest control.
 - 7. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities include, but are not limited to, the following:
 - 1. Barricades at existing streets.
 - 2. Sidewalk bridge or enclosure fence for the site.
 - 3. Environmental protection.

1.3 SUBMITTALS

- A. Temporary Utilities: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
- B. Implementation and Termination Schedule: Within 15 days of the date established for commencement of the Work, submit a schedule indicating implementation and termination of each temporary utility.

1.4 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
 - 1. Building code requirements.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police, fire department, and rescue squad rules.
 - 5. Environmental protection regulations.
- B. Standards: Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."
 - 1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code."
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

- A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. If acceptable to the Architect, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.
- B. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry."
 - 1. For job-built temporary offices, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
 - 2. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sizes and thicknesses indicated.

3. For fences and vision barriers, provide minimum 3/8-inch- (9.5-mm-) thick exterior plywood.
 4. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch- (16-mm-) thick exterior plywood.
- C. Gypsum Wallboard: Provide gypsum wallboard on interior walls of temporary offices.
- D. Roofing Materials: Provide UL Class A standard-weight asphalt shingles or UL Class C mineral-surfaced roll roofing on roofs of job-built temporary offices, shops, and sheds.
- E. Paint: Comply with requirements of Division 9 Section "Painting."
1. For job-built temporary offices, shops, sheds, fences, and other exposed lumber and plywood, provide exterior-grade acrylic-latex emulsion over exterior primer.
 2. For sign panels and applying graphics, provide exterior-grade alkyd gloss enamel over exterior primer.
 3. For interior walls of temporary offices, provide 2 coats interior latex-flat wall paint.
- F. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.
- G. Water: Provide potable water approved by local health authorities.
- H. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
- I. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- J. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.
1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.
 - 1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
 - 3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.
 - 4. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect. Neither the Owner nor Architect will accept cost or use charges as a basis of claims for Change Orders.
 - 5. The Contractor shall furnish all temporary light and power complete with all wiring, lamps and similar equipment, as required for the completion of the work. The Contractor shall pay for all current for all temporary lighting for all trades.
- B. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction until permanent water service is in use.
 - 1. Sterilization: Sterilize temporary water piping prior to use.
- C. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnects, automatic ground-fault interrupters, and main distribution switch gear.
 - 1. Install electric power service underground, except where overhead service must be used.
 - 2. Power Distribution System: Install wiring overhead and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 Volts, ac 20 Ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.
- D. Temporary Lighting: When overhead floor or roof deck has been installed, provide temporary lighting with local switching.
 - 1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.
- E. Temporary Telephones: Provide temporary telephone service throughout the construction period for all personnel engaged in construction activities. Install telephone on a separate line for each temporary office and first-aid station.

1. At each telephone, post a list of important telephone numbers.
- F. Sanitary facilities include temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
- G. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.
- H. Drinking-Water Facilities: Provide containerized, tap-dispenser, drinking-water units, including paper supply.
 1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F (7 to 13 deg C).
- I. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
- J. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Locate field offices, storage sheds, and other temporary construction and support facilities for easy access.
 1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B. Provide incombustible construction for offices, shops, and sheds located within the construction area or within 30 feet (9 m) of building lines. Comply with requirements of NFPA 241.
- C. Field Offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project Site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip offices as follows:
 1. Furnish with a desk and chairs, a 2-drawer file cabinet, plan table, and plan rack. Also provide a conference table with a minimum of eight chairs.
- D. Storage and Fabrication Sheds: Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on-site.

- E. Temporary Paving: Construct and maintain temporary roads and paving to support the indicated loading adequately and to withstand exposure to traffic during the construction period. Locate temporary paving for roads, storage areas, and parking where the same permanent facilities will be located. Review proposed modifications to permanent paving with the Architect.
 - 1. Paving: Comply with Division 2 Section "Hot-Mixed Asphalt Paving" for construction and maintenance of temporary paving.
 - 2. Coordinate temporary paving development with subgrade grading, compaction, installation and stabilization of subbase, and installation of base and finish courses of permanent paving.
 - 3. Install temporary paving to minimize the need to rework the installations and to result in permanent roads and paved areas without damage or deterioration when occupied by the Owner.
 - 4. Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration, and supervision.

- F. Project Identification and Temporary Signs: Prepare project identification and other signs of size indicated. Install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs.
 - 1. Project Identification Signs: Provide an eight foot square single surfaced sign. Engage an experienced sign painter to apply graphics. Comply with details to be furnished by Architect.
 - 2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.

- G. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

- B. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
 - 1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

- C. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 - 2. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.
 - 2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at the temporary entrances, as required by the governing authority.
 - 3. At Substantial Completion, clean and renovate permanent facilities used during the construction period including, but not limited to, the following:
 - a. Replace air filters and clean inside of ductwork and housings.
 - b. Replace significantly worn parts and parts subject to unusual operating conditions.
 - c. Replace lamps burned out or noticeably dimmed by hours of use.

3.6 MOLD AND MILDEW PREVENTION

- A. Moisture Control:

1. To avoid the development and growth of mold and mildew during construction and after building occupancy, keep building materials dry from date of delivery until final completion. Materials such as concrete masonry units in exterior walls which cannot reasonably be kept dry, are exceptions. Procedures are specified elsewhere for protecting CMU during construction.
2. Protect building materials from rain, ground water, capillary action, Contractor's cleaning moisture, condensation, and other wetting sources.
3. Material to be protected by moisture control include inside faces of exterior sheathing, insulation, gypsum board, plywood, interior finishes, interior wood products and the like.
4. Provide temperature and humidity control before, during, and after placing interior finish materials. After the building is "dried in" and openings to the exterior are closed up, temporary temperature and humidity control system or primary building HVAC system shall be started and shall be operated 24 hours per day for 3 days or until interior conditions are maintained at 72 to 75 degrees F and 40 to 50 % RH. Install interior finishes while maintaining these conditions. Maintain positive interior pressure and dehumidification. Operate temperature and humidity control system continuously until final completion and acceptance by the Owner.
5. After HVAC system operation is commenced, make moisture tests on all walls of each room of the building. Moisture readings on gypsum board in excess of 0.4% are considered excessive. In spaces where such readings are observed, make and record readings in representative locations such as 1/2, 1/2 and 3/4 of the way up the walls in various locations. Map out areas where wet materials are located and remove and replace finish materials that cannot be brought to acceptable moisture content within one week.
6. Regarding moisture content of CMU allowed and drying out requirements, acceptable moisture content shall be obtained and documented prior to cover-up or finishing of exposed CMU surface.
7. After initial Test and Balance of HVAC system and final completion is accomplished, remove, discard, and replace filters, clean interior of ductwork and coils, leaving entire HVAC system in the same condition as at start-up. Notify Architect when this work is being completed, allowing for inspection of the system.

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
 - 1. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.
 - 2. General closeout requirements are included in Section "Project Closeout."
 - 3. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections of Divisions 02 through 48.
 - 4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- C. Separate Prime Contracts: Each prime Contractor is responsible for warranties related to its own Contract.
- D. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for requests for substitutions.
 - 2. Division 01 Section "Reference Standards and Definitions" specifies the applicability of industry standards to products specified.
 - 3. Division 01 Section "Submittals" specifies requirements for submittal of the Contractor's Construction Schedule and the Submittal Schedule.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.

3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
 4. Foreign Products: As distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.
 5. Materials: Products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
 6. Equipment: Product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

- A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.
1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within fifteen days of completion of that designated portion of the Work.
- B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Architect for approval prior to final execution.
1. Refer to individual Sections of Divisions-2 through -16 for specific content requirements, and particular requirements for submittal of special warranties.
- C. Form of Submittal: At Final Completion compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- D. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.
2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS, the Project title or name, and the name of the Contractor".
3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.4 QUALITY ASSURANCE

- A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
- B. Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products or manufacturers for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
 1. Each prime contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate contractors.
 2. If a dispute arises between prime contractors over concurrently selectable, but incompatible products, the Architect will determine which products shall be retained and which are incompatible and must be replaced.
- C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
 1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
 2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

- E. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

- B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Semiproprietary Specification Requirements: Where Specifications name 2 or more products or manufacturers, provide 1 of the products indicated. ***No substitutions will be permitted.***
 - a. Where Specifications specify products or manufacturers by name, accompanied by the term "or equal" or "or approved equal," ***comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product and/or manufacturer.***
4. Nonproprietary Specifications: When Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. ***Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product or manufacturer.***
5. Performance Specification Requirements: Where Specifications require compliance with performance requirements only, and do not provide a list of acceptable products and/or

manufacturers, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated.

- a. Manufacturer's recommendations may be contained in published product literature or by the manufacturer's certification of performance.
6. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items. The use of the word "standard" in this context is defined as all colors offered by a manufacturer in their published literature and would not include the creation of a specially mixed color for this specific project not typically available.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
 - 1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

3.2 SCHEDULE OF WARRANTIES

- A. Provide warranties and bonds as specified in individual sections of the Technical Specifications.

END OF SECTION 016000

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SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Disposing of nonhazardous construction waste.
- B. Related Requirements:
 - 1. Section 042000 "Unit Masonry" for disposal requirements for masonry waste.
 - 2. Section 311000 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.
- D. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.
- E. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project record document submittal.
 - 3. Maintenance manual submittal.
 - 4. Submittal of warranties.
 - 5. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 02 through 48

1.3 SUBSTANTIAL COMPLETION PROCEDURES

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
 - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.
 - a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
 - 2. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
 - 3. Obtain and submit releases enabling the Owner unrestricted use of the Work. Include occupancy permits, operating certificates, and similar releases.
 - 4. Complete final cleanup requirements, including touchup painting.
 - 5. Touch up and otherwise repair and restore marred, exposed finishes.

- B. Inspection Procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfulfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
 - 1. The Architect will repeat inspection when requested and assured that the Work is substantially complete.
 - 2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
 - 1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
 - 2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
 - 3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, endorsed and dated by the Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Architect.
 - 4. Submit consent of surety to final payment.
 - 5. Submit a final liquidated damages settlement statement.
 - 6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location.
- B. Record Drawings: Maintain a clean, undamaged set of reproducible prints of Contract Drawings and Shop Drawings. The cost of this set is the responsibility of the Contractor. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 - 1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
 - 2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
 - 3. Note related change-order numbers where applicable.
 - 4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

- C. Record Product Data: Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.
 - 1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
 - 2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
 - 3. Upon completion of markup, submit complete set of record Product Data to the Architect for the Owner's records.

- D. Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2-inch (51-mm), 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
 - 1. Emergency instructions.
 - 2. Copies of warranties.
 - 3. Inspection procedures.
 - 4. Shop Drawings and Product Data.
 - 5. Submit an overall maintenance schedule with routine maintenance requirements identified starting at Substantial Completion and key referenced to specific maintenance procedures and instructions.
 - 6. Organize this schedule by Specification Division and include weekly, monthly, and yearly maintenance requirements. Include a reference to where maintenance procedures are located within the manuals providing for each routine service requirement. Extract a specific maintenance schedule for each individual manual provided and place this schedule in the front of each manual.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion:

- a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - e. Clean transparent materials, including glass in windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - f. Remove labels that are not permanent.
- C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.
- D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Operation manuals for systems, subsystems, and equipment.
 - 3. Product maintenance manuals.
 - 4. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Section 019113 "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.
 - 3. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect and Commissioning Authority will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

- B. Format: Submit operations and maintenance manuals in the following format:
1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
 2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect, through Construction Manager, will return two copies.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect and Commissioning Authority will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.
1. Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Contractor has delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
 - 1. Product name and model number. Use designations for products indicated on Contract Documents.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function.
 - 5. Operating characteristics.
 - 6. Limiting conditions.
 - 7. Performance curves.
 - 8. Engineering data and tests.
 - 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
 - 1. Startup procedures.
 - 2. Equipment or system break-in procedures.
 - 3. Routine and normal operating instructions.
 - 4. Regulation and control procedures.
 - 5. Instructions on stopping.
 - 6. Normal shutdown instructions.
 - 7. Seasonal and weekend operating instructions.
 - 8. Required sequences for electric or electronic systems.
 - 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.3 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent,

and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.

- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.

- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of marked-up record prints and one pdf electronic files of record prints.
- B. Record Specifications: Submit one paper copy and annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy and annotated PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Reports: Submit written report indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Annotated PDF electronic file with comment function enabled.
 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 3. Refer instances of uncertainty to Architect and Construction Manager for resolution.
- C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file and paper copy.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file and paper copy.
 - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file and one paper copy.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.
- B. Related Requirements:
 - 1. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.
- C. Unit Price for Instruction Time: Length of instruction time will be measured by actual time spent performing demonstration and training in required location. No payment will be made for time spent assembling educational materials, setting up, or cleaning up. See requirements in Section 012200 "Unit Prices."

1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name and address of videographer.
 - c. Name of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Date of video recording.
 2. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
 3. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
 4. At completion of training, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
1. Inspect and discuss locations and other facilities required for instruction.
 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 3. Review required content of instruction.
 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.6 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
 - 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.

- b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
- a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
- a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
- a. Diagnostic instructions.
 - b. Test and inspection procedures.
7. Maintenance: Include the following:
- a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
8. Repairs: Include the following:
- a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.

- e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
 - 3. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Construction Manager, with at least fourteen days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.
- F. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Video: Provide minimum 640 x 480 video resolution converted to format file type acceptable to Owner, on electronic media.
 1. Electronic Media: Read-only format compact disc acceptable to Owner, with commercial-grade graphic label.
 2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
 3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
 4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:
 - a. Name of Contractor/Installer.
 - b. Business address.
 - c. Business phone number.
 - d. Point of contact.
 - e. E-mail address.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
 1. Film training session(s) in segments not to exceed 15 minutes.
 - a. Produce segments to present a single significant piece of equipment per segment.
 - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
 - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
 1. Furnish additional portable lighting as required.
- E. Narration: Describe scenes on video recording by dubbing audio narration off-site after video recording is recorded. Include description of items being viewed.
- F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION 017900

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

1.2 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.3 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

- A. Schedule of selective demolition activities with starting and ending dates for each activity.
- B. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.5 CLOSEOUT SUBMITTALS

- A. Inventory of items that have been removed and salvaged.

1.6 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.7 FIELD CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.
- F. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.8 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

- B. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off utilities with utility companies.
 - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 4. Disconnect, demolish, and remove plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 4. Maintain fire watch during and for at least 8 hours after flame-cutting operations.
 - 5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 6. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 CLEANING

- A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

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SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes.
- B. See Division 2 Section "Earthwork" for drainage fill under slabs-on-grade.

1.2 SUBMITTALS

- A. Product Data: For each manufactured material and product indicated.
- B. Design Mixes: For each concrete mix indicated.
- C. Shop Drawings: Include details of steel reinforcement placement including material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports.
- D. Material certificates.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- B. Comply with ACI 301, "Specification for Structural Concrete," including the following, unless modified by the requirements of the Contract Documents.
 - 1. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.
 - 2. Formwork and form accessories.
 - 3. Steel reinforcement and supports.
 - 4. Concrete mixtures.
 - 5. Handling, placing, and constructing concrete.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Formwork: Furnish formwork and form accessories according to ACI 301.

B. Steel Reinforcement:

1. Reinforcing Bars: ASTM A 615 Grade 60, deformed.
2. Plain-Steel Wire: ASTM A 82, as drawn.
3. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

C. Concrete Materials:

1. Portland Cement: ASTM C 150, Type I or II or I/II.
2. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding 1-1/2-inch nominal size.
3. Water: Complying with ASTM C 94.
4. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches long.

D. Admixtures:

1. Air-Entraining Admixture: ASTM C 260.
2. Water-Reducing Admixture: ASTM C 494, Type A.
3. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
4. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

A. Vapor Barrier: ASTM E 1745, Class A, Not less than 10 mils thick.

1. Sheet Vapor Barrier: Permeance of less than 0.01 Perms [$\text{grains}/(\text{ft}^2 \cdot \text{hr} \cdot \text{inHg})$] as tested in accordance with ASTM E 1745 Section 7. Include manufacturer's recommended polyethylene pressure-sensitive seam tape and vapor-proofing mastic.

B. Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.

C. Curing Materials:

1. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
2. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf.
3. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
4. Water: Potable.
5. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

2.2 CONCRETE MIXES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Compressive Strength (28 Days): As indicated on sheet S-001 on the contract drawings.
 2. Slump: 4 to 6 inches, or as indicated on the approved mix design.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 4 to 6 percent at any exterior exposed structural concrete.

2.3 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with ASTM C 94 and ASTM C 1116.
1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Formwork: Design, construct, erect, shore, brace, and maintain formwork according to ACI 301.
- B. Vapor Retarder: Install, protect, and repair vapor-retarder sheets according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.
1. Lap joints 6 inches and seal with manufacturer's recommended tape.
- C. Steel Reinforcement: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- D. Joints: Construct joints true to line with faces perpendicular to surface plane of concrete.
1. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated S.C.J. on the structural contract drawings or as approved by Engineer of Record.
 2. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - a. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

3. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
 - a. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
 - b. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- E. Tolerances: Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

3.2 CONCRETE PLACEMENT

- A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.
- B. Consolidate concrete with mechanical vibrating equipment.

3.3 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.
 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Completely remove fins and other projections.
 1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
 2. Apply smooth-rubbed finish, defined in ACI 301, to smooth-formed finished concrete.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.4 FINISHING UNFORMED SURFACES

- A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.
 - 1. Do not further disturb surfaces before starting finishing operations.
- C. Scratch Finish: Apply scratch finish to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, and other bonded cementitious floor finish, unless otherwise indicated.
- D. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing.
- E. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, paint, or another thin film-finish coating system.
- F. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic tile is to be installed by thin-set methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.
- G. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
- H. Flat Floor Finishes
 - 1. In accordance with ACI MCP SET Part 2, construct in accordance with one of the methods recommended in Table 7.15.3, "Typical Composite FF/FL Values for Various Construction Methods." ACI MCP SET Part 1 for tolerances tested by ASTM E1155M or ASTM E1155. These requirements are based upon the latest FF/FL method. Where flooring finish materials require more stringent FF/FL values than those listed below, it shall be the responsibility of the contractor to provide additional approved surface preparation prior to floor covering installation, as required. It is the sole responsibility of the contractor to provide additional approved substrate surface preparation prior to flooring installation if values below are not met at initial testing. Contractor shall submit recommended repair procedure for approval. Initial Structural Floor slabs shall conform to the following ACI F-number requirements unless noted otherwise:
 - a. Initial Structural Slab on Grade (except as noted in item b. below)
 - 1) Specified overall values – FF30/FL23 minimum
 - 2) Minimum Local Values – FF17/FL15 minimum
- I. Measurement of Floor Tolerances
 - 1. Test floor slabs for initial structural floor slab requirements within 24 hours of the final troweling. Submit test results to Contracting Officer within 12 hours after collecting data. Floor flatness inspector shall provide a tolerance report which includes:
 - a. Name of Project
 - b. Name of Contractor
 - c. Date of Data Collection
 - d. Date of Tolerance Report
 - e. A key plan showing location of data collected

- f. Results required by ASTM E1155M and/or ASTM E1155

3.5 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions occur before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Cure formed and unformed concrete for at least seven days as follows:
1. Moisture Curing: Keep surfaces continuously moist with water or continuous water-fog spray or absorptive cover, water saturated and kept continuously wet.
 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: The Contractor will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Tests will be performed according to ACI 301.
1. Testing Frequency: One composite sample for each day's pour of each concrete mix exceeding 5 cu. yd, but less than 25 cu. yd, plus one set for each additional 50 cu. yd. or fraction thereof.
 2. Testing Frequency: At least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.
 3. Test Cylinders: A minimum of four (4) shall be cast for each composite sample. Test one (1) at seven (7) days, two (2) at twenty-eight (28) days and hold one (1) as a spare.
- B. Measurement of Floor Tolerances
1. Test floor slabs for initial structural floor slab requirements within 24 hours of the final troweling. Submit test results to Contracting Officer within 12 hours after collecting data. Floor flatness inspector shall provide a tolerance report which includes:
 - a. Name of Project
 - b. Name of Contractor

- c. Date of Data Collection
- d. Date of Tolerance Report
- e. A key plan showing location of data collected
- f. Results required by ASTM E1155M and/or ASTM E1155

END OF SECTION 033000

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SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes structural steel.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components and railings (as designed by delegated design engineer), splices, holes, welds, and bolts.
- C. Signed and Sealed Shop Drawings and Calculations: Provide signed and sealed shop drawings and calculations for all delegated designs including railings. Delegated Design Engineer shall be licensed in the project state.
- D. Mill certificates.
- E. Welding certificates.

1.3 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- C. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC 303.
 - 2. AISC 360.
 - 3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.4 STORAGE AND PROTECTION

- A. Store steel members off ground and protect steel members and packaged materials from erosion and deterioration.
- B. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Connections: Provide connections required by the Contract Documents.
 - 1. Select and complete connections using schematic details indicated and AISC 360.

2.2 MATERIALS

- A. Structural-Steel Shapes, Plates, and Bars: ASTM A 36, carbon steel or ASTM A 572, Grade 50, high-strength, low-alloy columbium-vanadium steel. See construction drawings.
- B. Cold-Formed Structural-Steel Tubing: ASTM A 500, Grade B.
- C. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers, uncoated. All high-strength bolts shall be twist-off type torque indicating bolts.
- D. Typical Shop Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer, except where noted in "Shop Priming" below.
- E. Nonmetallic, Shrinkage-Resistant Grout: Premixed, ASTM C 1107, of consistency suitable for application.

2.3 GROUT

- A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.
- B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.4 FABRICATION

- A. Fabricate and assemble structural steel in shop to greatest extent possible. Fabricate structural steel according to AISC specifications referenced in this Section and in Shop Drawings.
 - 1. Comply with fabrication tolerance limits in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel.
 - 2. Shop install and tighten high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
 - a. Connection Type: Bolts shall be twist-off type torque indicating bolts.

3. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.
- B. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

2.5 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
 2. Surfaces to be field welded or receive headed shear studs.
 3. Surfaces of high-strength bolted, slip-critical connections.
 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 5. Galvanized surfaces.
 6. Surfaces enclosed in interior construction.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 1. SSPC-SP 2, "Hand Tool Cleaning."
 2. SSPC-SP 3, "Power Tool Cleaning."
 3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Examination: Verify elevations of concrete and masonry bearing surfaces and locations of anchorages for compliance with requirements.
- B. Erect structural steel accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section.

- C. Base and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen surfaces before setting base and bearing plates. Clean bottom surface of base and bearing plates and set on wedges, shims, or setting nuts as required.
 - 1. Tighten anchor bolts, cut off wedges or shims flush with edge of base or bearing plate, and pack grout solidly between bearing surfaces and plates.
- D. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- E. Install and tighten high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
 - 1. Connection Type: Bolts shall be twist-off type torque indicating bolts.
- F. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.
- G. Field Touch-Up and Repair: All areas damaged during shipping, storage (scaling rust), welding and erection shall be cleaned in accordance with SSPC-SP 11 Power Tool Cleaning to Bare Metal to remove all loose or damaged coatings, rust and any other foreign matter. Contractor shall field apply primer and paint system as required based on location per section 2.2B above.

3.3 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
 - 1. Verify structural-steel materials and inspect steel frame joint details.
 - 2. Verify weld materials and inspect welds.
 - 3. Verify connection materials and inspect high-strength bolted connections.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Bolted Connections: Inspect bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Field Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.

END OF SECTION 051200

SECTION 054000 – COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specifications sections, apply to the work of this section.

1.2 WORK INCLUDED:

- A. Furnish all labor, material, services and equipment necessary to complete all cold formed steel framing work shown on the drawings and/or as specified elsewhere, included but not limited to: Load Bearing Steel Studs, and Steel Roof Joists.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Design and provide cold-formed metal framing, including hat channel purlins and ceiling framing, capable of withstanding design loads within limits and under conditions indicated.
- B. Design Loads: As required by the Florida Building Code, 2014.
- C. Design framing system to provide for movement of framing members without damage or over stressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F (67 deg C).

1.4 SUBMITTALS

- A. The following items shall be furnished by the contractor prior to fabrication:
- B. Shop Drawings
 - 1. Submit drawings for review which include: Cross sections, plans and/or elevations depicting component types and location for each unique framing application; Connection details depicting fastener type, quantity, location and other information to assure proper installation; Contractors electing to install prefabricated/prefinished frames, shall submit drawings depicting panel configurations, dimensions, components, locations and construction sequence.
- C. Certifications
 - 1. Submit statements from the framing manufacturer certifying conformance with applicable standards outlined herein.
- D. Literature

1. Submit technical literature prepared by the framing manufacturer.

1.5 QUALITY ASSURANCE

- A. Install Qualifications: An experienced installer who has completed cold-formed metal framing similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Mill certificates signed by steel sheet producer or test reports from a qualified independent testing agency indicating steel sheet complies with requirements, including uncoated steel thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and galvanized-coating thickness.
- C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
- D. Welding: Qualify procedures and personnel according to AWS D1.1, AStructural Welding CodeBSteel,@ and AWS D1.3, AStructural Welding CodeBSheet Steel.@
- E. AISI Specifications: Comply with AISI=s ASpecification for the Design of Cold-Formed Steel Structural Members@ and the following for calculating characteristics of cold-formed metal framing:
 1. CCFSS Technical Bulletin: AAISI Specification Provisions for Screw Connections.@
- F. Comply with HUD=s APrescriptive Method for Residential Cold-Formed Steel Framing.@
- G. Standards: Products and installation shall meet the requirements of the following standards:

American Iron and Steel Institute (AISI) Specification for the Design of Cold Formed Steel Structural Members, 1986 edition & 1989 addendum.
American Welding Society (AWS) Specification for Welding Sheet Steel in Structures, D1.3.
American Society of Testing Materials (ASTM)
- H. Specifications:
 1. A-653 Standard Specification for Sheet Steel, Zinc (Galvanized) or Zinc-iron Alloy-2.2 Coated (Galvannealed) by the Hot-Dip Process.
 2. C-955 Standard Specification for Load Bearing (Transverse and Axial) Steel Studs, Runner (Track) and Bracing and Bridging, for Screw Application of Gypsum Board and Metal Plaster Bases.

PART 2 - MATERIAL

2.1 GENERAL

- A. Minimum size of Studs shall be as shown on design drawings. Supplier will be responsible

for providing studs which meet the specified performance criteria.

- B. All galvanized studs (and/or) joists and all galvanized track, bridging, end closures and accessories shall be formed from steel that corresponds to the requirements of ASTM A653, SQ Grade 33, with a minimum yield of 33,000 psi.
- C. All studs, joists and accessories shall be formed from steel having a G-60 galvanized coating or equivalent, meeting ASTM A653 and C955.
- D. The physical and structural properties referenced on the drawings shall be considered the minimum permitted for all framing members.

2.2 FABRICATION

- A. Prior to prefabrication of framing, the contractor shall submit fabrication and erection drawings to the architect to obtain approval. Drawings shall be sealed by a registered engineer.
- B. Framing components may be pre-assembled into panels prior to erecting. Prefabricated panels shall be square with components attached in a manner as to prevent racking.
- C. All framing components shall be cut squarely for attachment to perpendicular members, or as required for an angular fit against abutting members. Members shall be held positively in place until properly fastened.
- D. Axially loaded studs shall be installed in a manner which will assure that ends of the studs are positioned in the track with a minimum gap, prior to stud and track attachment.
- E. Provide insulation equal to that specified elsewhere in all double jamb studs and double header members which will not be accessible to the insulation contractor.

2.3 CONNECTIONS

- A. Welds: Welds shall be of the type, size and location shown in the contract documents or approved shop drawings. Welded connections shall be performed in accordance with the American Welding Society (AWS) Specification for Welding Sheet Steel in Structures, D1.3.
- B. Welders, welding operations and welding procedures shall be qualified in accordance with AWS D1.3. Consult applicable AWS specifications for information regarding safe welding procedures. Welds shall be cleaned and coated with rust inhibitive galvanizing paint.
- C. Screws: Screws shall be of the type, size and location shown in the contract documents or approved shop drawings. Screw penetration through joined materials shall not be less than three exposed screw threads.

- D. Contractor shall refer to installation instructions published by the screw manufacturer and ASTM C954 for minimum spacing and edge distance requirements and torque requirements.
- E. Concrete Anchors:
 - 1. Types: Anchor bolts, epoxy bolts, wedge expansion bolts, screw type concrete fasteners, powder actuated fasteners; Shear and tension capacities of the fasteners must be verified for the application in question. Bearing capacity of the supported element should be checked in accordance with the AISI Specification.
 - 2. Concrete anchors shall not be installed until full compressive strength is obtained. Contractor shall refer to instructions published by the anchor manufacturer for minimum spacing, edge distance and concrete embedment and additional installation requirements.
- F. Substitutions:
 - 1. The contractor may substitute fasteners of equivalent specifications and load carrying capacities.

PART 3 - EXECUTION

3.1 ERECTION (EXTERIOR NON LOAD-BEARING)

- A. Handling and lifting of prefabricated panels shall be done in a manner as to not cause distortion in any member.
- B. Tracks shall be securely anchored to the supporting structure as shown on the plans.
- C. At track butt joints, abutting pieces of track shall be securely anchored to a common structural element, or they shall be butt-welded or spliced together.
- D. Studs shall be plumbed, aligned and securely attached to the flanges or webs of both upper and lower tracks.
- E. Jack studs or cripples shall be installed below window sills, above window and door heads, at free standing stair rails and elsewhere to furnish support, and shall be securely attached to supporting members.
- F. Wall stud bridging shall be attached using clips to prevent stud rotation. Bridging rows shall be spaced according to the following schedule. Walls up to 10'-0" height one row at mid-height. Wall exceeding 10'-0" height bridging rows spaced not to exceed 5'-0" on-center.
- G. Provision for structure vertical movement shall be provided where indicated on the plans using the Vertical Slide Clip or other means in accordance with the product manufacturer=s recommendations.

- H. Horizontal blocking (Metal Framing) shall be installed at all exterior walls for attachments of gypsum sheathing.

END OF SECTION 05400

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SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum pipe and tube railings.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

- a. Uniform load of 50 lbf/ ft. applied in any direction.
- b. Concentrated load of 200 lbf applied in any direction.
- c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

- a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
- b. Infill load and other loads need not be assumed to act concurrently.

2.2 METALS, GENERAL

- A. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.
 - 1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

2.3 ALUMINUM

- A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.
- B. Extruded Bars and Tubing: ASTM B 221, Alloy 6063-T5/T52.
- C. Extruded Structural Pipe and Round Tubing: ASTM B 429/B 429M, Alloy 6063-T6.
- D. Drawn Seamless Tubing: ASTM B 210, Alloy 6063-T832.
- E. Plate and Sheet: ASTM B 209, Alloy 6061-T6.
- F. Die and Hand Forgings: ASTM B 247, Alloy 6061-T6.
- G. Castings: ASTM B 26/B 26M, Alloy A356.0-T6.

2.4 FASTENERS

- A. General: Provide the following:
 - 1. Aluminum Railings: Type 304 stainless-steel fasteners.
- B. Cast-in-Place Anchors: Provide cast in place anchors, fabricated from corrosion resistant material with capability to sustain, without failure, a load equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488.

2.5 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.6 FABRICATION

- A. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- B. Form work true to line and level with accurate angles and surfaces.
- C. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 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 flux immediately.
 - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- D. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.
- E. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
- F. Form changes in direction by bending or by inserting prefabricated elbow fittings.
- G. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- H. Close exposed ends of railing members with prefabricated end fittings.
- I. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
- J. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

2.7 ALUMINUM FINISHES

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

- B. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
 - 1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

3.2 ANCHORING POSTS

- A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- C. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.

END OF SECTION 055213

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Nonstaining silicone joint sealants.
3. Mildew-resistant joint sealants.
4. Latex joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

A. Preconstruction field-adhesion-test reports.

1.4 PRECONSTRUCTION TESTING

A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Compatibility Testing: Use ASTM C 1087 to determine sealant compatibility when in contact with glazing and gasket materials.
3. Stain Testing: Use ASTM C 1248 to determine stain potential of sealant when in contact with masonry substrates.

1.5 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

- A. Silicone, M, P, 100/50, T, NT: Multicomponent, pourable, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type M, Grade P, Class 100/50, Uses T and NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Meadows, WR Inc; Deck-o-Seal.
 - b. Pacific Polymers, Inc; Elast O Seal 227 Type I (Pourable)

2.3 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
- B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dow Corning Corporation; 790.
 - b. GE Silicones; SilProf LM SCS2700.
 - c. Tremco; Spectrem 1 (Base).
 - d. Sonneborn; Omniseal.

2.4 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Pecora Corporation; 898.
 - b. Tremco Incorporated; Tremsil 600 White.
- C. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bostik Findlay Chem Calk 600
 - b. Pecora Corporation; AC-20+
 - c. Sonnborn; Sonoloc
 - d. Tremco Incorporated; Tremflex 834.

2.5 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, non-staining latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Pecora Corporation; AC-20 FTR Acoustical Sealant.
 - b. United States Gypsum Co.; Sheetrock Acoustical Sealant.

2.6 JOINT-SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer. Backings must be nonstaining and compatible with joint substrates, sealants, primers and other joint fillers and are approved for applications indicated by sealant manufacturer's based on field experience and laboratory testing.

2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

3.2 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with ASTM C 1193 and joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

- 1. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.3 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior horizontal nontraffic and traffic isolation and contraction joints in cast-in-place concrete slabs.

- 1. Joint Sealant: Single-component pourable neutral-curing silicone sealant.
 - 2. Joint-Sealant Color: As selected.

- B. Joint-Sealant Application: Exterior vertical joints between dissimilar materials.

- 1. Joint Sealant: Single-component neutral- and basic-curing silicone sealant.
 - 2. Joint-Sealant Color: As selected.

- C. Joint-Sealant Application: Exterior perimeter joints between metal and frames of doors, windows and louvers.

- 1. Joint Sealant: Single-component neutral- and basic-curing silicone sealant.
 - 2. Joint-Sealant Color: As selected.

- D. Joint-Sealant Application: Exterior control and expansion joints in ceilings and other overhead surfaces.

- 1. Joint Sealant: Single-component neutral- and basic-curing silicone sealant.
 - 2. Joint-Sealant Color: As selected.

- E. Joint-Sealant Application: Exterior control and expansion joints in horizontal traffic surfaces of concrete paving units.

- 1. Joint Sealant: Multicomponent pourable polysulfide sealant.
 - 2. Joint-Sealant Color: As selected.

- F. Joint-Sealant Application: Interior perimeter joints of exterior openings.

- 1. Joint Sealant: Latex sealant.
 - 2. Joint-Sealant Color: As selected.

- G. Joint-Sealant Application: Interior joints between plumbing fixtures and adjoining walls, floors, and counters.

- 1. Joint Sealant: Single-component mildew-resistant neutral-curing silicone sealant.
 - 2. Joint-Sealant Color: White.

- H. Joint-Sealant Application: Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
 - 1. Joint Sealant: Latex sealant.
 - 2. Joint-Sealant Color: As selected.

- I. Joint-Sealant Application: Joints at walls of music classroom, interior and at wall to desk.
 - 1. Joint Sealant: Acoustical sealant.
 - 2. Joint-Sealant Color: As selected.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes hollow-metal work.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.
- C. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Steel Doors and Frames: Subject to compliance with requirements, provide products by one of the following:
 - 1. Ceco Door; ASSA ABLOY.
 - 2. Curries Company; ASSA ABLOY.
 - 3. Steelcraft; an Allegion brand.

2.2 INTERIOR FRAMES

- A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2
 - 1. Physical Performance: Level B according to SDI A250.4.
 - 2. Frames:
 - a. Materials: Metallic-coated, steel sheet, minimum thickness of 0.053 inch with A40 (EF 120) coating.
 - b. Construction: Full profile welded.

3. Exposed Finish: Prime.

2.3 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.

1. Physical Performance: Level B according to SDI A250.4.
2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches.
 - c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch, with minimum A40 coating.
 - d. Edge Construction: Model 1, Full Flush.
 - e. Core: Manufacturer's standard insulation material.
3. Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.
4. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 coating.
 - b. Construction: Full profile welded.
5. Exposed Finish: Prime.

2.4 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.5 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Power-Actuated Fasteners in Concrete: From corrosion-resistant materials.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).
- I. Glazing: Section 088000 "Glazing."
- J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat.

2.6 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 - 1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Sidelight Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 - 4. Jamb Anchors: Provide number and spacing of anchors as follows:

- a. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Four anchors per jamb from 60 to 90 inches high.
- 5. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.
 - 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
 - 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 - 4. Provide loose stops and moldings on inside of hollow-metal work.
 - 5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.7 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard factory applied, rust-inhibiting primer.
 - 1. Shop Primer: SDI A250.10.

2.8 ACCESSORIES

- A. Mullions: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - b. Install frames with removable stops located on secure side of opening.
 - c. Install door silencers in frames before grouting.
 - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - f. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
 4. Installation Tolerances: Adjust hollow-metal 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.
- B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
 - c. At Bottom of Door: 5/8 inch. Coordinate with door bottom hardware where applicable.

- d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.
- 2. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
- C. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
 - 1. 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.

3.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- E. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Factory finishing flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Requirements:

1. Section 088000 "Glazing" for glass view panels in flush wood doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of door. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Dimensions and locations of cutouts.
4. Undercuts.
5. Requirements for veneer matching.
6. Doors to be factory finished and finish requirements.

C. Samples: For factory-finished doors.

1.3 INFORMATIONAL SUBMITTALS

A. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is a certified participant in AWI's Quality Certification Program.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Algoma Hardwoods, Inc.
 2. Buell Door Company
 3. Eggers Industries.
 4. Oshkosh Door Company.
 5. Weyerhaeuser Company

2.2 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards."
1. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.
- B. WDMA I.S.1-A Performance Grade:
1. Extra Heavy Duty.
- C. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.
- D. Particleboard-Core Doors:
1. Particleboard: ANSI A208.1, Grade LD-1 or Grade LD-2, made with binder containing no urea-formaldehyde.
 2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
 3. Provide doors with glued-wood-stave or structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

- A. Interior Solid-Core Doors:
1. Grade: Premium, with Grade A faces.
 2. Species: Red oak.
 3. Cut: Plain sliced (flat sliced).
 4. Match between Veneer Leaves: Book match.
 5. Assembly of Veneer Leaves on Door Faces: Running match.
 6. Core: Particleboard glued wood stave or structural composite lumber.

7. Construction: Five plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.
8. Construction: Seven plies, either bonded or nonbonded construction.

2.4 LIGHT FRAMES AND LOUVERS

- A. Wood-Veneered Beads for Light Openings: Manufacturer's standard wood-veneered noncombustible beads matching veneer species of door faces and approved for use in doors of fire-protection rating if indicated. Include concealed metal glazing clips where required for opening size and fire-protection rating indicated.

2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- B. Factory machine doors for hardware that is not surface applied.
- C. Openings: Factory cut and trim openings through doors.
 1. Light Openings: Trim openings with moldings of material and profile indicated.
 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."

2.6 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors that are indicated to receive transparent finish.
- C. Transparent Finish:
 1. Grade: Premium.
 2. Finish: AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" System 5, conversion varnish or as standard for manufacturer.
 3. Finish: WDMA TR-4 conversion varnish.
 4. Staining: None required match existing.
 5. Effect: Open-grain finish.
 6. Sheen: Satin.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hardware: For installation, see Section 087100 "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
 - 1. Install smoke- and draft-control doors according to NFPA 105.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION 081416

SECTION 085113 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes aluminum windows for exterior locations.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include plans, elevations, sections, accessories, and details of installation, including anchor, flashing, and sealant installation.
- C. Samples: For each exposed product and for each color specified, 2 by 4 inches in size.
- D. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.
- E. Test Results: Confirming windows and installation requirements to meet design pressure identified within structural drawings.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Sample warranties.

1.4 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Mockup may be part of permanent construction.

1.5 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period:
 - a. Window: 10 years from date of Substantial Completion.
 - b. Glazing Units: 10 years from date of Substantial Completion.
 - c. Aluminum Finish: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Windows to match existing in appearance. Basis-of-Design is EFCO 2700 Series.

2.2 WINDOW PERFORMANCE REQUIREMENTS

- A. Product Standard: AAMA/WDMA/CSA 101/I.S.2/A440.
 - 1. Minimum Performance Class: HC.
 - 2. Minimum Performance Grade: Minimum performance class indicated and as required to meet identified structural pressures.
- B. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.30 Btu/sq. ft. x h x deg F.
- C. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, showing a CRF of 45.

2.3 ALUMINUM WINDOWS

- A. Types: Project contains fixed windows.
- B. Frames and Sashes: Thermally broken aluminum extrusions complying with AAMA/WDMA/CSA 101/I.S.2/A440.
- C. Laminated Insulating-Glass Units: ASTM E 2190.
 - 1. Glass: See Specification 08 80 00, Glazing.
- D. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
- E. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.
 - 1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.4 ACCESSORIES

- A. Subsills: Thermally broken, extruded-aluminum subsills in configurations indicated on Drawings.

2.5 FABRICATION

- A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- B. Glaze aluminum windows in the factory.
- C. Weather strip each operable sash to provide weathertight installation.
- D. Provide weep holes and internal passages to conduct infiltrating water to exterior.
- E. Provide water-shed members above side-hinged sashes and similar lines of natural water penetration.
- F. Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design wind loads of window units.
- G. Complete fabrication, assembly, finishing, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.6 ALUMINUM FINISHES

- A. High-Performance Organic Finish (Three-Coat Fluoropolymer): Thermocured system consisting of inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight complying with AAMA 2605.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range of colors.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

- E. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
- F. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- G. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 085113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Mechanical door hardware for the following:
 - a. Swinging doors.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Details of electrified door hardware.
- C. Other Action Submittals:
 - 1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware. Coordinate keypad/card reader entry to match existing on new exterior doors.
 - a. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
 - b. Content: Include the following information:
 - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
 - 2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
 - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
 - 4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.
 - 2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the

course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

- B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as follows:
 - 1. For door hardware, an Architectural Hardware Consultant (AHC).
- C. Source Limitations: Provide electrified door hardware from the same manufacturer as existing system.
- D. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
 - 1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at the tested pressure differential of 0.3-inch wg (75 Pa) of water.
- E. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- F. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- G. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22.2 N).
 - 2. Comply with the following maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - 3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
 - 4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
- H. Keying Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination."

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver keys to General Contractor's Project Manager.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.
 - a. Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.
 - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products or products equivalent in function and comparable in quality to named products.
 - 2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.

2.2 HINGES

- A. Hinges: BHMA A156.1.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hager Companies.
 - b. McKinney Products Company; an ASSA ABLOY Group company.
 - c. Stanley Commercial Hardware; a division of Stanley Security Solutions.
 - 2. Provide stainless steel hinges with non-removable pins at exterior doors.

2.3 MECHANICAL LOCKS AND LATCHES

- A. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
- B. Bored Locks: BHMA A156.2; Grade 1; Series 4000.
 - 1. Basis of Design: Schlage to match existing.

2.4 AUXILIARY LOCKS

- A. Bored Auxiliary Locks: BHMA A156.5: Grade 1; with strike that suits frame.
 - 1. Basis of Design: Schlage to match existing.

2.5 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
 - 1. Manufacturer: Equal to Best.
 - a. Number of Pins: Seven.
 - b. Permanent Cores: Manufacturer's standard finish face to match lockset.
- B. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.

2.6 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
 - 1. Existing System:
 - a. Grand master key locks to Owner's existing system.
- B. Keys: Nickel silver.
 - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
 - a. Notation: "DO NOT DUPLICATE."
 - 2. Quantity: In addition to one extra key blank for each lock, provide the following:

- a. Cylinder Change Keys: Three.
- b. Grand Master Keys: Five.

2.7 SURFACE CLOSERS

- A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Basis of Design: LCN.

2.8 MECHANICAL STOPS AND HOLDERS

- A. Wall- and Floor-Mounted Stops: BHMA A156.16.

1. Basis of Design: Ives.

2.9 DOOR GASKETING

- A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot (0.000774 cu. m/s per m) of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

1. Basis of Design: Pemko.

2.10 THRESHOLDS

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

1. Basis of Design: Pemko.

2.11 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

2. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
3. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
4. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.12 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
- B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
- C. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- D. 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. Do not install surface-mounted items until finishes have been completed on substrates involved.
 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- E. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- F. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as indicated in keying schedule.
- G. Key Control System: Tag keys and place them on markers and hooks in Owner's key control system cabinet, as determined by final keying schedule.
- H. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."
- I. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- J. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- K. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- L. 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 referenced accessibility requirements.

3.2 FIELD QUALITY CONTROL

- A. Independent Architectural Hardware Consultant: Owner will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

3.3 DOOR HARDWARE SCHEDULE

HW-1 DOORS 104, 110

1-1/2 PR	HINGES	A5111
1	LOCKSET	F84
1	DEADBOLT	EQUAL TO BEST 7 PIN
1 SET	WEATHERSTRIPPING	EQUAL TO PEMKO 303AV
1	DOOR BOTTOM	EQUAL TO PEMKO 345A
1	THRESHOLD	EQUAL TO PEMKO 181AV
1	CLOSERS	C02011
1	FLOOR STOP	F518

HW-2 DOORS 101, 102, 103, 106

1-1/2 PR	HINGES	A8112
1	LOCKSET	F84
1 SET	GASKETING	EQUAL TO PEMKO 303AV
1	DOOR BOTTOM	EQUAL TO PEMKO 345A
1	WALL STOP	L02251

HW-3 DOORS 105, 109

1-1/2 PR	HINGES	A8112
1	LOCKSET	F86
1	CLOSER	C02011
1	WALL STOP	L02251

HW-4 DOORS 107, 108

1-1/2 PR	HINGES	A8112
1	LOCKSET	F76
1	CLOSERS	C02011
1	WALL STOP	L02251

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Glass for windows, doors and sidelights.
 - 2. Glazing sealants and accessories.

1.2 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- C. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Preconstruction adhesion and compatibility test report.

1.5 QUALITY ASSURANCE

- A. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
 - 1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

1.7 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

- B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

- C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to products indicated in Schedules at the end of Part 3.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.
- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the International Building Code and ASTM E 1300.
 - 1. Design Wind Pressures: As indicated on Drawings.
- D. Windborne-Debris-Impact Resistance: Exterior glazing shall comply with basic-protection testing requirements in ASTM E 1996 for Wind Zone 3 when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on Project and shall be installed in same manner as glazing indicated for use on Project.

1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade.
- E. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- F. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
 2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.2 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

2.3 GLASS PRODUCTS

- A. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

2.4 LAMINATED GLASS

- A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.

2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. Interlayer Color: Clear unless otherwise indicated.

2.5 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
 1. Sealing System: Dual seals.
 2. Spacer: Manufacturer's standard spacer material and construction.

2.6 GLAZING SEALANTS

- A. General:
 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50/25, Use NT.

2.7 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 1. AAMA 804.3 tape, where indicated.
 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. 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.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

- 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, then to jambs. Cover horizontal framing joints by applying tapes to jambs, 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. Apply heel bead of elastomeric sealant.
- F. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.4 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.5 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. 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.
 - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.

3.6 MONOLITHIC GLASS SCHEDULE

- A. Glass Type GL-1: Clear fully tempered float glass.
 - 1. Minimum Thickness: 1/4 inch.
 - 2. Safety glazing required.

3.7 INSULATING-LAMINATED-GLASS SCHEDULE

- A. Glass Type: Low-E-coated, clear insulating laminated glass.
 - 1. Basis-of-Design Product:
 - a. Guardian Industries Corporation
 - b. Libby Owens Ford
 - c. PPG Industries
 - d. Cardinal IG
 - e. Spectrum Glass Products
 - 2. Overall Unit Thickness: 1-1/4 inch.
 - 3. Minimum Thickness of Outdoor Lite: 1/4 inch.
 - 4. Outdoor Lite: Fully tempered float glass.
 - 5. Interspace Content: Air.
 - 6. Indoor Lite: Clear laminated glass with two plies of fully tempered float glass.
 - a. Minimum Thickness of Each Glass Ply: 1/4 inch.
 - b. Interlayer Thickness: 0.090 inch Large Missile Impact Resistant.
 - 7. Low-E Coating: Pyrolytic on second surface.

8. Winter Nighttime U-Factor: .35 maximum.
9. Summer Daytime U-Factor: .38 maximum.
10. Visible Light Transmittance: 70% percent minimum.
11. Solar Heat Gain Coefficient: .41 maximum.

END OF SECTION 088000

SECTION 089119 - FIXED LOUVERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes fixed, extruded-aluminum louvers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
- C. Samples: For each type of metal finish required.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on tests performed according to AMCA 500-L.
- B. Windborne-debris-impact-resistance test reports.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.
 - 1. Wind Loads: Determine loads based on pressures as indicated on Drawings.
- B. Windborne-Debris-Impact Resistance: Louvers located within 30 feet of grade shall pass enhanced-protection, large-missile testing requirements in ASTM E 1996 when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than louvers indicated for use on Project.

- C. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

2.2 FIXED, EXTRUDED-ALUMINUM LOUVERS

- A. Vertical, Wind-Driven-Rain-Resistant Louver:
 - 1. Basis of Design: Ruskin Company, EME6325D.
 - 2. Louver Depth: 6 inches.
 - 3. Frame and Blade Nominal Thickness: Not less than 0.060 inch for blades and 0.080 inch for frames.
 - 4. Louver Performance Ratings:
 - a. Free Area: Not less than 6.5 sq. ft. for 48-inch-wide by 48-inch-high louver.
 - b. Air Performance: Not more than 0.15-inch wg static pressure drop at 900 fpm free-area velocity.
 - c. Wind-Driven Rain Performance: Point of water penetration not less than 900 fpm.
 - 5. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.3 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
 - 1. Screen Location for Fixed Louvers: Interior face.
 - 2. Screening Type: Insect screening.
- B. Louver Screen Frames: Same type and form of metal as indicated for louver to which screens are attached.

2.4 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Fasteners: Use types and sizes to suit unit installation conditions.
 - 1. Use Phillips flat-head screws for exposed fasteners unless otherwise indicated.
 - 2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
 - 3. For color-finished louvers, use fasteners with heads that match color of louvers.
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.5 FABRICATION

- A. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
- B. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.6 ALUMINUM FINISHES

- A. High-Performance Organic Finish: Three-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- D. Protect unpainted galvanized and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

3.2 ADJUSTING

- A. Restore louvers damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

END OF SECTION 089119

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SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior gypsum board assemblies.
2. Suspension systems for interior gypsum ceilings and soffits.

1.2 ACTION SUBMITTALS

- ##### A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- ##### A. Fire-Test-Response Characteristics: Provide materials and construction identical to those tested according to ASTM E 119.
- ##### B. STC-Rated Assemblies: Provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413.

2.2 FRAMING SYSTEMS

- ##### A. Steel Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners of equivalent minimum base-metal thickness.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Clark Steel Framing Systems.
 - b. Dales Industries, Inc.
 - c. Dietrich Industries, Inc.
 - d. National Gypsum Company.
 2. Minimum Base-Metal Thickness: As indicated on Drawings.
 3. Depth: As indicated on Drawings.
- ##### B. Firestop Tracks: Manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

- C. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Metal Thickness: .0747 inch (14 ga).
- D. Cold-Rolled Channel Bridging: Steel, 0.053-inch minimum base-metal thickness, with minimum 1/2-inch-wide flanges.
 - 1. Depth: 1-1/2 inches.
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch-thick, galvanized steel.

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.
- B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- C. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch and minimum 1/2-inch-wide flanges.
 - 1. Depth: As indicated on Drawings.

2.4 AUXILIARY MATERIALS

- A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide foam gasket.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C 841 that apply to framing installation.
 - 2. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.2 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 - 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
 - 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.3 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

- C. Suspend hangers from building structure as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - 3. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. American Gypsum.
 - 2. Georgia-Pacific Building Products.
 - 3. National Gypsum Company.
 - 4. United States Gypsum Company.
- B. Gypsum Wallboard: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.
- C. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.

D. Gypsum Ceiling Board: ASTM C 1396/C 1396M.

1. Thickness: 1/2 inch.
2. Long Edges: Tapered.

E. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.

1. Core: As indicated.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.3 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Plastic.

2.4 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

2.5 AUXILIARY MATERIALS

A. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

B. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing).

C. Acoustical Joint Sealant: ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings as demonstrated by testing according to ASTM E 90.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Pecora Corporation.
 - b. United States Gypsum Company.
2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

- A. Comply with ASTM C 840.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- D. Install trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
 - 1. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- E. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
- H. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

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SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for ceilings.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Evaluation reports.
- C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
 - 2. Smoke-Developed Index: 450 or less.

2.2 ACOUSTICAL PANEL CEILINGS, GENERAL

- A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 15 percent.
- B. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.
- C. Acoustical Panel Standard: Comply with ASTM E 1264.
- D. Metal Suspension System Standard: Comply with ASTM C 635.
- E. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

2.3 ACOUSTICAL PANELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. CertainTeed Corporation.
 - 3. USG Interiors Inc., subsidiary of USG Corporation.
- B. Classification: ACT 1, Type VI, Form 2, Pattern E.
- C. Color: White.
- D. LR: .90.
- E. NRC: .75, Type E-400 mounting according to ASTM E 795.
- F. CAC: 35.
- G. AC: 170.
- H. Edge/Joint Detail: Reveal sized to fit flange of exposed suspension-system members.
- I. Thickness: 3/4 inch (19 mm).
- J. Modular Size: 24 by 24 inches (610 by 610 mm).

2.4 METAL SUSPENSION SYSTEM

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. CertainTeed Corporation.
 - 3. USG Interiors Inc., subsidiary of USG Corporation.

- B. Standard, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation; with prefinished 9/16-inch- (15-mm-) wide metal caps on flanges.
 - 1. Structural Classification: Intermediate-duty system.
 - 2. End Condition of Cross Runners: Override (stepped) type.
 - 3. Face Design: Flat, flush.
 - 4. Cap Material: Steel or aluminum cold-rolled sheet.
 - 5. Cap Finish: Painted white.

- C. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

- B. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.
 - 1. Arrange directionally patterned acoustical panels as indicated on reflected ceiling plans.

END OF SECTION 095113

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SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient base.
 - 2. Resilient molding accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC-RUBBER BASE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Flexco.
 - 3. Johnsonite; a Tarkett company.
- B. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).
 - 1. Group: I (solid, homogeneous).
 - 2. Style and Location:
 - a. Style A, Straight: Provide in areas with carpet.
 - b. Style B, Cove: Provide in areas with resilient flooring.
- C. Thickness: 0.125 inch.
- D. Height: 4 inches.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Preformed.
- G. Inside Corners: Preformed.

- H. Colors: As selected by Architect from full range of industry colors and as specified on drawings.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until they are the same temperature as the space where they are to be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.2 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. Preformed Corners: Install preformed corners before installing straight pieces.

3.3 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

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SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes modular, tufted carpet tile.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Type of subfloor.
 - 3. Type of installation.
 - 4. Pattern of installation.
 - 5. Pattern type, location, and direction.
 - 6. Pile direction.
- C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

- B. Fire-Test-Response Ratings: Where indicated, provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104.

1.8 FIELD CONDITIONS

- A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

1.9 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.
 - 3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Patcraft 10316 - Paseo.
- B. Color: As indicated on drawings (00410 Sapphire).
- C. Pattern: Monolithic.
- D. Fiber Content: 100 percent nylon 6, 6.
- E. Fiber Type: Eco Solution Q Nylon.
- F. Pile Characteristic: Multi-level pattern loop.
- G. Density: 8597 oz./cu yd..
- H. Pile Thickness: .134 for finished carpet tile according to ASTM D 6859.
- I. Stitches: 11 stitches per inch.

- J. Gage: 1/12 ends per inch.
- K. Surface Pile Weight: 32 oz./sq. yd.
- L. Primary Backing/Backcoating: Manufacturer's standard composite materials.
- M. Secondary Backing: Eco Worx.
- N. Size: 24 by 24 inches.
- O. Applied Soil-Resistance Treatment: SSP Shaw Soil Protection.
- P. Antimicrobial Treatment: Manufacturer's standard material.
- Q. Performance Characteristics: As follows:
 - 1. Appearance Retention Rating: Severe traffic, 3.5 minimum according to ASTM D 7330.
 - 2. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm.
 - 3. Dry Breaking Strength: Not less than 100 lbf according to ASTM D 2646.
 - 4. Tuft Bind: Not less than 10 lbf according to ASTM D 1335.
 - 5. Delamination: Not less than 4 lbf/in. according to ASTM D 3936.
 - 6. Dimensional Tolerance: Within 1/32 inch of specified size dimensions, as determined by physical measurement.
 - 7. Dimensional Stability: 0.2 percent or less according to ISO 2551 (Aachen Test).
 - 8. Resistance to Insects: Comply with AATCC 24.
 - 9. Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 165.
 - 10. Colorfastness to Light: Not less than 4 after 40 AFU (AATCC fading units) according to AATCC 16, Option E.
 - 11. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.
 - 12. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.
 - 13. Emissions: Provide carpet tile that complies with testing and product requirements of CRI's "Green Label Plus" program.
 - 14. Emissions: Provide carpet tile that complies with the product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
 - 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Preparation: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- E. Installation: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- F. Installation Method: As recommended in writing by carpet tile manufacturer.
- G. Maintain dye lot integrity. Do not mix dye lots in same area.
- H. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- I. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- J. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- K. Install pattern parallel to walls and borders.
- L. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- M. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."

END OF SECTION 096813

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:

- 1. Galvanized metal.

1.2 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples: For each type of paint system and each color and gloss of topcoat.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Exterior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.
- D. Colors: As indicated in a color schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

- A. Galvanized-Metal Substrates:
 - 1. Latex System:
 - a. Prime Coat: Primer, galvanized, water based, MPI #134.
 - 1) Basis of Design: Sherwin Williams Kem Kromix Universal Primer.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11.
 - 1) Basis of Design: Sherwin Williams DTM Acrylic Coating B66-1200 Series.

END OF SECTION 099113

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SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Steel and iron.
 - 2. Galvanized metal.
 - 3. Gypsum board.

1.2 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples: For each type of paint system and in each color and gloss of topcoat.

1.4 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.
- D. Colors: As indicated in a color schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Wood: 15 percent.
 - 2. Gypsum Board: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 INTERIOR PAINTING SCHEDULE

- A. Steel Substrates (Interior and Exterior Metal Doors and Frames):
 - 1. Latex System, Alkyd Primer:
 - a. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #76.

- 1) Basis of Design: Sherwin Williams Kem Kromik Universal Primer.
- b. Prime Coat: Shop primer specified in Section where substrate is specified.
- c. Intermediate Coat: Latex, interior, matching topcoat.
- d. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5), MPI #54.

- 1) Basis of Design: Sherwin Williams DTM Acrylic Coating B66-1200 Series.

B. Gypsum Board Substrates:

1. Latex over Latex Sealer System:

- a. Prime Coat: Primer sealer, latex, interior.

- 1) Sherwin Williams High Build Primer B28W601.

- b. Prime Coat: Latex, interior, matching topcoat.
- c. Intermediate Coat: Latex, interior, matching topcoat.
- d. Topcoat: Latex, interior, flat (MPI Gloss Level 1) (at ceilings).

- 1) Basis of Design: Sherwin Williams ProMar 200 Latex Flat B30-W200 Series.

- e. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5).

- 1) Basis of Design: Sherwin Williams ProMar 200 Latex Semi-gloss B31 W200 Series.

END OF SECTION 099123

SECTION 101100 - VISUAL DISPLAY UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Visual display board assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For visual display units.

1. Include plans, elevations, sections, details, and attachment to other work.
2. Show locations of panel joints.

C. Samples: For each type of visual display unit indicated.

D. Product Schedule: For visual display units.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 WARRANTY

A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Life of the building.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 50 or less.

2.2 VISUAL DISPLAY BOARD ASSEMBLY

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Claridge Products and Equipment, Inc.
 2. Polyvision Corporation.
- B. Visual Display Board Assembly: Factory fabricated.
1. Assembly: Markerboard and tackboard.
 2. Corners: Square.
 3. Width: As indicated on Drawings.
 4. Height: As indicated on Drawings.
- C. Markerboard Panel: Porcelain-enamel-faced markerboard panel on core indicated.
1. Color: White.
- D. Tackboard Panel: Natural-cork tackboard panel on core indicated.
- E. Aluminum Frames and Trim: Fabricated from not less than 0.062-inch-thick, extruded aluminum; standard size and shape.
1. Field-Applied Trim: Manufacturer's standard, snap-on trim with no visible screws or exposed joints.
 2. Aluminum Finish: Clear anodic finish.
- F. Joints: Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, balanced around center of board, as acceptable to Architect.
- G. Combination Assemblies: Provide manufacturer's standard exposed trim between abutting sections of visual display panels.

2.3 MARKERBOARD PANELS

- A. Porcelain-Enamel Markerboard Panels: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction, consisting of moisture-barrier backing, core

material, and porcelain-enamel face sheet with high-gloss finish. Laminate panels under heat and pressure with manufacturer's standard, flexible waterproof adhesive.

1. Particleboard Core: 3/8 inch thick; with 0.015-inch-thick, aluminum sheet backing.

2.4 TACKBOARD PANELS

A. Tackboard Panels:

1. Facing: 1/16-inch-thick natural cork.
2. Core: 1/4-inch-thick hardboard.

2.5 MATERIALS

- A. Porcelain-Enamel Face Sheet: PEI-1002, with face sheet manufacturer's standard two- or three-coat process.
- B. Natural-Cork Sheet: Seamless, single-layer, compressed fine-grain cork sheet; bulletin board quality; face sanded for natural finish.
- C. Hardboard: ANSI A135.4, tempered.
- D. Particleboard: ANSI A208.1, Grade M-1.
- E. Extruded Aluminum: ASTM B 221, Alloy 6063.
- F. Adhesives for Field Application: Mildew-resistant, nonstaining adhesive for use with specific type of panels, sheets, or assemblies; and for substrate application; as recommended in writing by visual display unit manufacturer.
 1. Adhesives shall have a VOC content of 50 g/L or less.

2.6 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
- B. Field-Assembled Visual Display Board Assemblies: Coordinate field-assembled units with grounds, trim, and accessories indicated. Join parts with a neat, precision fit.

1. Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, balanced around center of board, as acceptable to Architect as indicated on approved Shop Drawings.
 2. Where size of visual display board assemblies or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by Architect from manufacturer's standard structural support accessories to suit conditions indicated.
- C. Factory-Fabricated Visual Display Board Assemblies: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display board assemblies with fasteners at not more than 16 inches o.c. Secure tops and bottoms of boards to walls.

END OF SECTION 101100

SECTION 104413 - FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes fire-protection cabinets for portable fire extinguishers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For fire-protection cabinets.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.4 COORDINATION

- A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.
- B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

1.5 SEQUENCING

- A. Apply vinyl lettering on field-painted fire-protection cabinets after painting is complete.

PART 2 - PRODUCTS

2.1 FIRE-PROTECTION CABINET

- A. Cabinet Type: Suitable for fire extinguisher.
 - 1. Manufacturers: Basis-of-Design (to match existing):
 - a. JL Industries, Inc.; 1017V17.
- B. Cabinet Construction: Nonrated.
- C. Cabinet Material: Cold-rolled steel sheet.

- D. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
 - 1. Rolled-Edge Trim: 3 inch backbend depth.
- E. Cabinet Trim Material: Steel sheet.
- F. Door Material: Steel sheet.
- G. Door Style: Vertical duo panel with frame.
- H. Door Glazing: Tempered float glass (clear).
- I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
- J. Accessories:
 - 1. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location.
 - a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
 - 1) Location: Applied to cabinet door.
 - 2) Application Process: Pressure-sensitive vinyl letters.
 - 3) Lettering Color: Red.
 - 4) Orientation: Vertical.
- K. Materials:
 - 1. Cold-Rolled Steel: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
 - a. Finish: Baked enamel or powder coat.
 - b. Color: Match existing.
 - 2. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.2 FABRICATION

- A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.
- B. Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.
- C. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
- D. Identification: Apply vinyl lettering at locations indicated.
- E. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

END OF SECTION 104413

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SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.5 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet indicated.
 - 1. Basis-of-Design:
 - a. JL Industries, Inc.; Cosmic 10E
 - 2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B.
- B. Multipurpose Dry-Chemical Type: UL-rated 4A-60BC nominal capacity, with monoammonium phosphate-based dry chemical in manufacturer's standard enameled container.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

END OF SECTION 104416

SECTION 105113 - METAL LOCKERS – BASE BID

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Knocked-down corridor lockers.
2. Welded corridor lockers.

1.2 ACTION SUBMITTALS

A. Product data.

B. Shop Drawings: Include plans, elevations, sections, details, attachments to other work, and locker identification system and numbering sequence.

C. Samples: For each color specified.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.

1. Warranty Period for Knocked-Down Metal Lockers: [**Two**] <Insert number> years from date of Substantial Completion.
2. Warranty Period for Welded Metal Lockers: [**Lifetime**] [**10 years**] <Insert years> from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Requirements: For lockers indicated to be accessible, comply with applicable provisions in [**the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines**] [**and**] [**ICC A117.1**].

2.2 KNOCKED-DOWN CORRIDOR LOCKERS

1. Basis-of-Design Product: Subject to compliance with requirements, provide ASI Storage Solutions; ASI Group or comparable product by the following:
 - a. Penco
 - b. Republic.
- B. Doors: One piece; fabricated from 16 gauge nominal-thickness steel sheet; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.
 1. Doors less than 12 inches wide may be fabricated from 0.048-inch nominal-thickness steel sheet.
 2. Doors for box lockers less than 15 inches wide may be fabricated from 0.048-inch nominal-thickness steel sheet.
 3. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches wide; welded to inner face of doors.
 4. Stiffeners: Manufacturer's standard full-height stiffener fabricated from 0.048-inch nominal-thickness steel sheet; welded to inner face of doors.
 5. Door Style: Vented panel as follows:
 - a. Louvered Vents: No fewer than three louver openings at top and bottom for double-tier lockers.
- C. Body: Assembled by riveting or bolting body components together. Fabricate from unperforated steel sheet with thicknesses as follows:
 1. Tops, Bottoms, and Intermediate Dividers: 24 gauge, with single bend at sides.
 2. Backs and Sides: 24 gauge thickness, with full-height, double-flanged connections.
 3. Shelves: 24 gauge thickness, with double bend at front and single bend at sides and back.
- D. Frames: Channel formed; fabricated from 16 gauge thickness steel sheet; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral, full-height door strikes on vertical main frames.
- E. Hinges:
 1. Continuous Hinges: Manufacturer's standard, steel, full height.
- F. Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond door face; pry and vandal resistant.

1. Multipoint Latching: Finger-lift latch control designed for use with built-in combination locks, built-in key locks, or padlocks; positive automatic latching and prelocking.
 - a. Latch Hooks: Equip doors 48 inches and higher with three latch hooks and doors less than 48 inches high with two latch hooks; fabricated from 0.105-inch nominal-thickness steel sheet; welded or riveted to full-height door strikes; with resilient silencer on each latch hook.
 - b. Latching Mechanism: Manufacturer's standard, rattle-free latching mechanism.
- G. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch high.
- H. Hooks: Manufacturer's standard ball-pointed type hooks, aluminum or steel; zinc plated.
- I. Continuous Sloping Tops: Fabricated from manufacturer's standard thickness, but not less than 0.036-inch nominal-thickness steel sheet.
 1. Closures: Hipped-end type.
- J. Individual Sloping Tops: Fabricated from 0.024-inch nominal-thickness steel sheet.
- K. Recess Trim: Fabricated from 0.048-inch nominal-thickness steel sheet.
- L. Filler Panels: Fabricated from manufacturer's standard thickness, but not less than 0.036-inch nominal-thickness steel sheet.
- M. Boxed End Panels: Fabricated from 0.060-inch nominal-thickness steel sheet.
- N. Finished End Panels: Fabricated from 0.024-inch nominal-thickness steel sheet.
- O. Center Dividers: Fabricated from 0.024-inch nominal-thickness steel sheet.
- P. Materials:
 1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
- Q. Finish: Baked enamel or powder coat.
 1. Color: As selected by Architect from manufacturer's full range.

2.3 FABRICATION

- A. Fabricate metal lockers square, rigid, without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.
- B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments. Factory weld frame members of each metal locker together to form a rigid, one-piece assembly.
- C. Equipment: Provide each locker with an identification plate and the following equipment:

1. Double-Tier Units: One double-prong ceiling hook and two single-prong wall hooks.
- D. Knocked-Down Construction: Fabricate metal lockers using nuts, bolts, screws, or rivets for nominal assembly at Project site.
- E. Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections; with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld main locker groups into one-piece structures. Grind exposed welds flush.
- F. Accessible Lockers: Fabricate as follows:
 1. Locate bottom shelf no lower than 15 inches above the floor.
 2. Where hooks, coat rods, or additional shelves are provided, locate no higher than 48 inches above the floor.
- G. Continuous Sloping Tops: Fabricated in lengths as long as practical, without visible fasteners at splice locations; finished to match lockers.
- H. Recess Trim: Fabricated with minimum 2-1/2-inch face width and in lengths as long as practical; finished to match lockers.
- I. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.
- J. Boxed End Panels: Fabricated with 1-inch-wide edge dimension, and designed for concealing fasteners and holes at exposed ends of nonrecessed metal lockers; finished to match lockers.
- K. Finished End Panels: Designed for concealing unused penetrations and fasteners, except for perimeter fasteners, at exposed ends of nonrecessed metal lockers; finished to match lockers.
- L. Center Dividers: Full-depth, vertical partitions between bottom and shelf; finished to match lockers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install lockers level, plumb, and true; shim as required, using concealed shims.
 1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
 2. Anchor single rows of metal lockers to walls near top and bottom of lockers.
 3. Anchor back-to-back metal lockers to floor.
- B. Knocked-Down Lockers: Assemble with standard fasteners, with no exposed fasteners on door faces or face frames.

- C. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
1. Attach recess trim to recessed metal lockers with concealed clips.
 2. Attach filler panels with concealed fasteners.
 3. Attach sloping-top units to metal lockers, with closures at exposed ends.

END OF SECTION 105113

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SECTION 10530 – ALUMINUM WALKWAY COVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The requirements of Division 1 specifications shall apply to work specified in the section.

1.2 REFERENCES

- A. Florida Building Code 2014.
- B. ASCE 7-10, Minimum Design Loads for Buildings and Other Structures
- C. Aluminum Design Manual 2015
- D. Local governing codes and standards for site location

1.3 GENERAL DESCRIPTION OF WORK

- A. Work in this section shall include design, fabrication, and installation of pre-engineered, pre-finished aluminum protective covers and foundation footer design. All work shall be in accordance with the shop drawings and this specification section.

1.4 SUBMITTALS

- A. Shop Drawings – Submit complete shop drawings signed and sealed by a registered professional Florida Engineer including:
 - 1. Overall canopy layout dimensions
 - 2. Cut section details including elevation, layout dimensions, and connection details
 - 3. Flashing details pertaining to aluminum canopy
 - 4. Concrete footing and/or canopy anchorage details
- B. Product Data – Submit manufacturer’s product information, specifications, and installation instructions for the aluminum canopy.
- C. Samples – Submit color selection samples of actual coated aluminum material or actual anodized aluminum material.
- D. Certification – Provide letter of compliance certifying that the proposed canopy design and layout meets or exceeds all applicable loadings (ex: wind load, rain live load, dead load, snow load) for the job location (city & state) in accordance with FBC 2011 and ASCE 7-05.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum five years experience in design, fabrication, and production of aluminum protective covers.
- B. Components shall be assembled in shop to greatest extent possible to minimize field assembly.
- C. Aluminum protective cover, including material and workmanship, shall be warranted from defects for a period of one year from date of completion of aluminum protective cover installation.

PART 2 - PRODUCTS AND MATERIALS

2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Gulf South Metals
17869 Samantha Drive
Foley, AL 36535
- B. Equivalent systems by other manufacturers will be approved for substitution by addendum if the following conditions are met:
 - 1. Manufacturer must submit complete company literature and information to the architect for review 7 days prior to bid.
 - 2. Manufacturer must submit complete proposed canopy system details, including sizes and strength values of all members to be used, signed and sealed by a registered Florida Engineer.
- C. All canopy components must be manufactured from extruded aluminum.

2.2 DESIGN & ASSEMBLY

- A. Aluminum protective cover shall be mechanically fastened using internally welded brackets and concealed stainless steel fasteners. Welded connections can be used if shipping allows.
- B. Canopy shall use perimeter extruded gutter and extruded decking running perpendicular to length of canopy concrete. Extruded Decking shall be a roll-locked design where the extruded cap and pan shall interlock to make a rigid structure. Crimped decking is not allowed
- C. Canopies shall drain from the decking to the perimeter gutter, into downspouts and discharge at the bottom of the columns.
- D. Columns are to be locked into the post footer using a single piece of rebar, approximately 7" long, running through the bottom of the column below finished floor.

2.3 MATERIALS

A. Columns

1. Provide clear acrylic protection or bituminous paint protection between the aluminum column and the concrete footer.

B. Decking

1. Where decking is run parallel to walkway, the ends of the pans shall be welded closed where decking does not terminate into a drain beam.

C. Flashing

1. Flashing shall be made of aluminum sheet painted to match the color of the canopy. Minimum flashing thickness shall be 0.040" thick.

D. Gutters and Downspouts

1. Gutters will have integral design to provide a finished edge at perimeter.
2. Gutters and Downspouts will be provided by canopy manufacturer of materials matching columns and beams.

2.4 FASTENERS

- ### A.
- All fasteners shall be stainless steel with neoprene washers and rivets are 3/16" aluminum.

2.5 FINISHES

- ### A.
- Kynar 500 70% PVDF.

1. Color is to be as selected by architect from manufacturer's standard color chart.

PART 3 - INSTALLATION AND EXECUTION

3.1 ERECTION

- ### A.
- Canopies are to be installed according to approved shop drawings and plans.
- ### B.
- The entire structure shall be installed straight, true, and plumb according to standard construction procedures.
- ### C.
- Canopies shall be installed with positive and negative slope of 1/8" per foot to allow water drainage from top of canopy to draining columns and eliminate ponding.

- D. Columns shall have weep holes installed at top of concrete to remove condensation from post. Minimum weep hole size shall be 1/4" in diameter.
 - 1. All joints, corners, and connections shall be tight and clean.
 - 2. All exposed fasteners are to be painted to match the canopy color.
 - 3. Decking is to be aligned and secured to aluminum frame structure.

3.2 COLUMN FOOTINGS

- A. Styrofoam blockouts shall be provided by the canopy manufacturer and installed by the General Contractor.
- B. General Contractor shall pour the required footer size around the Styrofoam blockouts provided by the manufacturer. Coordinate with structural drawings and manufacturer's recommendations.
- C. Canopy installer is to remove the Styrofoam after footer has cured, set column in cavity, and fill with minimum 2000 psi grout to level of finished concrete slab.

3.3 CLEANING

- A. All canopy surfaces exposed are to be cleaned after installation is complete.
- B. Surplus materials and debris shall be removed from the jobsite after installation is complete.

3.4 PROTECTION

- A. General Contractor shall ensure protection of installed aluminum canopies from other construction so that canopies are without damage at time of substantial completion of project.

END OF SECTION

SECTION 122113 - HORIZONTAL LOUVER BLINDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Horizontal louver blinds with aluminum slats.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication and installation details for horizontal louver blinds.
- C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Product test reports.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 HORIZONTAL LOUVER BLINDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Bali
 - 2. Hunter Douglas
 - 3. Levolor Contract; Riviera 1 inch.
- B. Aluminum Slats:
 - 1. Width: 1 inch (25 mm).
 - 2. Thickness: Manufacturer's standard.
 - 3. Spacing: Manufacturer's standard.

- C. Slat Features:
 - 1. Lift-Cord Rout Holes: Minimum size required for lift cord and located near back (outside) edge of slat to maximize slat overlap and minimize light gaps between slats.
- D. Headrail:
 - 1. Manual Lift Mechanism:
 - a. Lift-Cord Lock: Variable; stops lift cord at user-selected position within blind full operating range.
 - b. Operator: Extension of lift cord(s) through lift-cord lock mechanism to form cord pull.
 - 2. Manual Tilt Mechanism: Enclosed worm-gear mechanism and linkage rod that adjusts ladders.
 - a. Tilt: Full.
 - b. Operator: Clear-plastic wand.
 - 3. Manual Lift-Operator and Tilt-Operator Lengths: Length required to extend to 48 inches (1219 mm) above floor level when blind is fully closed.
 - 4. Manual Lift-Operator and Tilt-Operator Locations: Right side and left side of headrail, respectively.
- E. Bottom Rail: Matching slats.
 - 1. Type: Bottom contoured to minimize light gaps.
- F. Ladders: Braided cord.
- G. Valance: Manufacturer's standard.
- H. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
 - 1. Type: Overhead or End.
 - 2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.
- I. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.
- J. Side Channels and Perimeter Light Gap Seals: Manufacturer's standard.
- K. Colors, Textures, Patterns, and Gloss:
 - 1. Slats: As selected by Architect from manufacturer's full range.
 - 2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated.

2.2 HORIZONTAL LOUVER BLIND FABRICATION

- A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
 - 1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4 inch (6 mm) per side or 1/2 inch (13 mm) total, plus or minus 1/8 inch (3.1 mm). Length equal to head-to-sill dimension of opening in which blind is installed less 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Locate so exterior slat edges are not closer than 1 inch (25 mm) from interior faces of glass and not closer than 1/2 inch (13 mm) from interior faces of glazing frames through full operating ranges of blinds.
 - 2. Install mounting and intermediate brackets to prevent deflection of headrails.
 - 3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.
- C. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.
- D. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.

END OF SECTION 122113

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SECTION 133419 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal wall panels.
2. Thermal insulation.
3. Accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of metal building system component.
- B. Shop Drawings: For metal building system components. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each type of exposed finish required.
- D. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

- A. Material test reports.
- B. Source quality-control reports.
- C. Field quality-control reports.
- D. Warranties: Sample of special warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer.
1. Accreditation: According to the International Accreditation Service's AC472.

2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.
 - B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
 - C. Preinstallation Conference: Conduct conference at Project site.
- 1.6 WARRANTY
- A. Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 METAL BUILDING SYSTEM PERFORMANCE

- A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Metal building systems shall be designed according to procedures in MBMA's "Metal Building Systems Manual."
 1. Design Loads: As indicated on Drawings.
 2. Deflection Limits: Design metal building system assemblies to withstand design loads with deflections no greater than the following:
 - a. Metal Wall Panels: Horizontal deflection of 1/180 of the span.
 - b. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.
 3. Metal panel assemblies shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ASTM E 1592.
- C. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

- D. Air Infiltration for Metal Wall Panels: Air leakage through assembly of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) of wall area when tested according to ASTM E 283 at static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa).
- E. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 2.86 lbf/sq. ft. (137 Pa).

2.2 STRUCTURAL-STEEL FRAMING

- A. Existing framing to remain. Refer to Structural drawings and Division 05 Specifications for infills.

2.3 METAL WALL PANELS

- A. Profile to match building, exposed-fastener metal wall panels; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
 - 1. Material: Aluminum-zinc alloy-coated steel sheet, 0.034-inch (0.86-mm) nominal thickness.
 - a. Exterior Finish: Three-coat fluoropolymer.
 - b. Color: As selected by Architect from manufacturer's full range.
 - 2. Panel profile, coverage and rib spacing to match existing building.

2.4 THERMAL INSULATION

- A. Faced Metal Building Insulation: ASTM C 991, Type II, glass-fiber-blanket insulation; 0.5-lb/cu. ft. (8-kg/cu. m) density; 2-inch- (51-mm-) wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.

2.5 ACCESSORIES

- A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
 - 1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- B. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

- C. Flashing and Trim: Formed from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.
- D. Downspouts: Formed from 0.022-inch (0.56-mm) nominal-thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- (3-m-) long sections, complete with formed elbows and offsets.
 - 1. Mounting Straps: Fabricated from same material and finish as gutters.

2.6 FABRICATION

- A. General: Design components and field connections required for erection to permit easy assembly.
 - 1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
- B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.
- C. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

PART 3 - EXECUTION

3.1 ERECTION OF STRUCTURAL FRAMING

- A. Refer to Structural drawings and Division 05 Specifications for infills.

3.2 METAL PANEL INSTALLATION, GENERAL

- A. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
 - a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
 - 2. Install metal panels perpendicular to structural supports unless otherwise indicated.
 - 3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
 - 4. Locate and space fastenings in uniform vertical and horizontal alignment.

5. Locate metal panel splices over, but not attached to, structural supports with end laps in alignment.
 6. Lap metal flashing over metal panels to allow moisture to run over and off the material.
- B. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.
1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
- D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants recommended by metal panel manufacturer.
1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.3 METAL WALL PANEL INSTALLATION

- A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
 2. Shim or otherwise plumb substrates receiving metal wall panels.
 3. When two rows of metal panels are required, lap panels 4 inches (102 mm) minimum.
 4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
 5. Rigidly fasten base end of metal wall panels and allow eave end free movement due to thermal expansion and contraction. Predrill panels.
 6. Flash and seal metal wall panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
 7. Install screw fasteners in predrilled holes.
 8. Install flashing and trim as metal wall panel work proceeds.
 9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated; or, if not indicated, as necessary for waterproofing.
 10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.

11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

3.4 THERMAL INSULATION INSTALLATION

- A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.
 1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
 2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
 3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
- B. Inspect existing building and repair or replace any flashing damaged insulation.

3.5 DOOR AND FRAME INSTALLATION

- A. General: Install doors and frames plumb, rigid, properly aligned, and securely fastened in place. Coordinate installation with wall flashings and other components. Seal perimeter of each door frame with elastomeric sealant used for metal wall panels.

3.6 WINDOW INSTALLATION

- A. General: Install windows plumb, rigid, properly aligned, without warp or rack of frames or sash, and securely fasten in place according to manufacturer's written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each window frame with elastomeric sealant used for metal wall panels.
 1. Separate dissimilar materials from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in AAMA/WDMA/CSA 101/I.S.2/A440.
- B. Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.
- C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

3.7 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
 1. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
 2. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying

rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1524 mm) o.c. in between.
1. Provide elbows at base of downspouts to direct water away from building.
 2. Tie downspouts to underground drainage system indicated.
 3. Refer to drawings for location of new metal building downspouts.

END OF SECTION 133419

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SECTION 220050 - PLUMBING

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS

Section 23 00 50, "Mechanical General Requirements," applies to this section, with the additions and modifications specified herein. Any requirements shown or specified on the project drawings related to the equipment of this section also applies to this section.

1.2 SUBMITTALS

Submit the following:

1.2.1 Manufacturer's Catalog Data

- a. Pipe and fittings
- b. Valves
- c. Plumbing fixtures
- d. Hot water heaters
- e. Circulation pumps
- f. Pipe supports (hangers)
- g. Drains
- h. Water hammer arresters

1.2.3 Certificates of Compliance

- a. Pipe and fittings
- b. Valves

1.3 QUALITY ASSURANCE

Plumbing systems including fixtures, equipment, materials, installation, and workmanship shall be in accordance with the Florida Plumbing Code except as modified herein. In the Plumbing Code referred to herein, the advisory provisions shall be considered to be mandatory, as though the word "shall" had been substituted for the word "should" wherever it appears. Capacity of equipment shall be not less than that indicated.

PART 2 PRODUCTS

2.1 DRAIN, WASTE, AND VENT (DWV) PIPING

Fittings shall be long radius fittings, except fittings in vent piping may be short radius fittings. Minimum size piping shall be 2 inches for buried piping and 1.5 inches for aboveground piping.

2.1.1 Buried Piping

Provide piping up to but not more than 6 inches above ground or floor slab on grade.

2.1.1.1 Plastic Pipe, Fittings, and Solvent Cement

a. Polyvinyl Chloride (PVC) System: ASTM D 2665. Underground installation shall be in accordance with ASTM D 2321.

2.1.1.2 Cast-iron Pipe and Fittings

a. Cast-Iron Hub and Spigot Pipe and Fittings, ASTM A74 with ASTM C564 or CISPI HSN rubber compression gasket joints or caulked and leaded joints. Cast Iron pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute.

2.1.2 Aboveground Piping

2.1.2.1 Cast-Iron Hubless Pipe and Fittings

CISPI 301 or ASTM A 888 with CISPI 310, ASTM C 1277, and ASTM C 564 coupling joints. Cast Iron pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute.

2.1.2.2 Cast-Iron Hub and Spigot Pipe and Fittings

ASTM A 74 with ASTM C 564 rubber compression gasket joints, conforming to ASTM C 1563; or caulked and leaded joints. Cast Iron pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute.

2.1.2.3 Plastic Pipe, Fittings, and Solvent Cement Polyvinyl Chloride (PVC) System

ASTM D 2665

2.1.3 Drains

ANSI A112.21.1M; provide cast-iron drains and clamping rings for use with membrane waterproofing. Provide P-traps for each floor drain.

2.1.3.1 Flush Strainer Floor Drains or Hub Drains

Provide with double drainage flange, perforated or slotted cast bronze or nickel bronze strainer, and adjustable collar. Drains of sizes 2, 3, and 4 inches shall have strainers with minimum free

drainage area of 5, 11, and 18 square inches, respectively. Provide trap primer connections on all floor drains and hub drains.

2.1.3.2 Floor Sinks

Provide 12 inch by 12 inch floor sinks constructed of cast iron or stainless steel as indicated on drawings. Floor sinks shall have minimum 8 inch deep sump, non-tilt, loose set half grate with 1/2 inch square openings and anti-splash interior dome strainer. Provide trap primer connections on all floor sinks. Floor sinks shall be Zurn model Z1901 or model Z1751 as indicated on drawings or approved equals

2.1.3.2 Roof Drains

Roof drains shall be low profile type, 15 inch overall diameter with pipe connection sizes as shown on drawings. Drains shall have cast iron body with combined flashing clamp and gravel stop and a removable cast iron dome. Drains shall have adjustable extension to accommodate insulated roof deck. Provide roof drains with an under-deck clamp. Drains indicated for use as emergency overflow drains shall be provided with 2" internal water dam. Roof drains shall be Zurn model Z100 or approved equal.

2.2 DOMESTIC WATER PIPING

2.2.1 Buried Piping and Aboveground Piping

2.2.1.1 Copper Tubing

ASTM B 88, Type K, with ANSI B16.18 or ANSI B16.22 solder joint fittings using silver solder and flux containing not more than 0.2 percent lead; or with ANSI B16.26 flared joint fittings. ASTM B 88, Type L may be provided for aboveground piping.

2.2.2 Valves

2.2.2.1 Check Valves

MSS SP-80, Class 125, swing check (all valves shall be American made).

2.2.2.2 Ball Valves

Full port design, copper alloy. Valves shall have two-position lever handles. (All valves shall be American made).

2.2.3 Dielectric Connections

Provide at connections between copper and ferrous metal piping materials. ASTM F 441, Schedule 80, CPVC threaded pipe nipples, 4-inch minimum length, may be provided for dielectric connections in pipe sizes 2 inches and smaller.

2.2.4 Water Hammer Arresters

PDI WH201, ANSI A112.26.1M, or ASSE 1010.

2.3 MISCELLANEOUS PIPING MATERIALS

2.3.1 Pipe Nipples

ASTM A733, copper alloy for use in copper tubing and hot-dip galvanized Schedule 80 steel pipe for use in steel piping.

2.3.2 Flanges

ANSI B16.1, Class 125, for use in ferrous piping; ANSI B16.22 or ANSI B16.24 for use in copper tubing; with full face flat type synthetic rubber gaskets.

2.3.3 Escutcheon Plates

One piece or split hinge type metal plates for piping passing through floors, walls, and ceilings in exposed spaces, chromium-plated finish on copper alloy plates in finished spaces, paint finish on plates in unfinished spaces, and with set screws or other approved positive means to anchor plates in place securely.

2.3.4 Solder

Use only lead-free solder for all copper fittings.

2.3.5 Pipe Sleeves

2.3.5.1 Sleeves in Masonry and Concrete Walls, Floors, Roofs

ASTM A 53, Schedule 40 or Standard Weight, hot-dip galvanized steel pipe sleeves. Core drilling of masonry and concrete may be provided in lieu of pipe sleeves when cavities in the core-drilled holes are completely grouted smooth.

2.3.5.2 Sleeves in Non-Masonry or -Concrete Walls, Floors, and Roofs

Hot-dip galvanized steel sheet having a nominal weight of not less than 0.90 pound per square foot. Provide 26 gauge galvanized steel sheet.

2.3.6 Pipe Hangers and Supports

Provide MSS SP-58 and MSS SP-69, Type 1 or 6, of the adjustable type, except as modified herein or indicated otherwise. Attachments to steel W or S beams shall be with Type 21, 28, 29, or 30 clamps. Attachments to steel angles and channels (with web vertical) shall be with Type 20 clamp with a beam clamp channel adaptor. Attachments to steel channel (with web horizontal) shall be with drilled hole on centerline and double nut and washer. Attachments to concrete shall be with Type 18 insert or a drilled hole with expansion anchor. Attachments to wood shall be as indicated. Hanger rods and attachments shall be full size of the hanger threaded diameter. Provide Type 40

insulation protection shields for insulated piping. Provide steel support rods. Provide nonmetallic, hair felt, or plastic piping isolators between copper tubing and the hangers.

2.3.7 Access Doors

Provide 12- by 12-inch factory prefabricated and primed flush face steel access doors including steel door frame with continuous hinges and turn-screw-operated latch. Door frame shall be for installation in plaster and masonry walls. Furnish doors under this section to provide proper access to concealed valves; install doors under the appropriate section of this specification.

2.4 FIXTURES, FITTINGS, ACCESSORIES, AND SUPPLIES

Provide control-stop valves in each supply to each fixture. The finish of fittings, accessories, and supplies exposed to view shall be chromium-plated per ASME A112.18.1M. Provide special roughing-in for wheelchair fixtures. Plumbing fixtures shall be as indicated on drawings, see Plumbing Fixture Schedule.

2.5 AIR ADMITTANCE VALVES

Air admittance valves shall be approved as a vent termination for any individual vent, common vent, circuit vent, loop vent, island fixture vent, vent stack or stack vent that is provided to prevent siphonage of a fixture trap. Air admittance valves shall be installed in an accessible location. Install valves in accordance with the manufacturer's installation instructions. Valves shall be installed in the vertical, upright position after rough-in and pressure testing of the DWV system. Valves shall have protective screening on the inside and outside to protect the sealing membrane from insects and debris. Air admittance valves shall have a lifetime warranty.

2.6 HOSE BIBBS

- A. Hose Bibb (HB): ASSE 1011, Bronze wall faucet with anti-siphon protection and removable handwheel or tee-handle, 0.75 inch external hose thread outlet with automatic draining vacuum breaker. Hose bibbs shall be Woodford Model 24 series or approved equal.
- B. Freezeproof Wall Hydrant (FPWH/VB): ASSE 1019, freezeless type wall faucet with anti-siphon protection and removable handwheel or tee-handle, 0.75 inch external hose thread outlet with automatic draining vacuum breaker. Hydrant shall be contained in exterior box with locking cover. Hydrant shall be of sufficient length to extend through walls and place the valve seat inside the building. Bonnet and valve stem shall be removable from outside of the building. Hydrant and box shall have brass finish. Freezeproof wall hydrants shall be Woodford Model B65 series or approved equal.

2.7 HOT WATER HEATER

Water heater types and capacities shall be as indicated. Each water heater shall have replaceable anodes. Each water heater shall have controls with an adjustable range. Provide all gas-fired water heaters with UL and Florida Building Code – Gas approved flue venting systems.

2.8 PUMPS

Select the pump so that the operating point on the characteristic performance curve for the impeller size to be furnished will be to the left (shut-off side) of and not more than 5 percent below the point of maximum efficiency for the impeller to be furnished. Provide with strainer on inlet of pump and check valve on discharge.

2.8.1 Inline Water Pumps

Standard head capacity, service water distribution system. Provide factory assembled and tested pumps constructed of materials suitable for hot domestic water service.

PART 3 EXECUTION

3.1 INSTALLATION

Installation of plumbing systems including fixtures, equipment, materials, and workmanship shall be in accordance with the Florida Plumbing Code, except as modified herein. When fixtures require both hot water and cold water supplies, provide the hot water supply to the left of the cold water supply. Plastic piping shall not penetrate fire walls or fire floors and shall be used on one side of fire walls and fire floors not closer than 6 inches to the penetration. Plastic piping shall not be permitted within return air plenum spaces above suspended ceilings.

3.1.1 Threaded Connections

Jointing compound for pipe threads shall be polytetrafluoroethylene (PTFE) pipe thread tape, pipe cement and oil, or PTFE powder and oil; apply only on male threads. Provide exposed ferrous pipe threads with one coat of primer applied to a minimum dry film thickness of 1.0 mil.

3.1.2 Solder End Valves

Remove stems and washers and other item subject to damage by heat during installation. Reassemble valve after soldering is completed. Valves without heat sensitive arts do not require disassembly but shall be opened at least two turns during soldering.

3.1.3 Pipe Supports (Hangers)

Provide additional supports at the concentrated loads in piping between supports, such as for inline water pumps and flanged valves.

3.1.3.1 Piping to Receive Insulation

Provide temporary wood spacers between the insulation protection shield and the pipe in order to properly slope the piping and to establish final elevations. Temporary wood spacers shall be of the same thickness as the insulation to be provided under Section 23 00 80, "Insulation of Mechanical Systems."

3.1.3.2 Maximum Spacing Between Supports

- a. Vertical Piping: Support piping at each floor, but at not more than 10-foot intervals, with pipe riser clamps or offset pipe clamps.
- b. Horizontal Piping: Support cast-iron piping at 5-foot intervals, except for pipe exceeding 5-foot length, provide supports at intervals equal to the pipe length but not exceeding 10 feet. Support steel piping and copper tubing as follows:

MAXIMUM SPACING (FEET)

Nominal Pipe Size (inches)	One and under	1.25	1.5	2	2.5	3	3.5	4	5	6
Steel Pipe	7	8	9	10	11	12	13	14	16	17
Copper Tube	6	7	8	8	9	10	11	12	13	14

3.1.4 Installation of Pipe Sleeves

Provide pipe sleeves where piping passes through walls, floors, roofs, and partitions. Secure sleeves in proper position and location during construction. Provide sleeves of sufficient length to pass through entire thickness of walls, floors, roofs, and partitions. Provide not less than 0.25-inch space between exterior of piping or pipe insulation and interior of sleeve or core-drilled hole. Firmly pack space with mineral wool insulation and caulk at both ends of the sleeve or core-drilled hole with plastic waterproof cement which will dry to a firm but pliable mass, or provide a mechanically adjustable segmented elastomeric seal. Seal both ends of penetrations through fire walls and fire floors to maintain fire resistive integrity with UL listed fill, void, or cavity material. Extend sleeves in floor slabs 3 inches above the finished floor, except sleeves are not required where DWV piping passes through concrete floor slabs located on grade.

3.2 FIELD QUALITY CONTROL

3.2.1 Inspections

Prior to initial operation, inspect piping system for compliance with drawings, specifications, and manufacturer's submittals.

3.2.2 Field Testing

Before final acceptance of the work, test each system as in service to demonstrate compliance with the contract requirements. Perform the following tests in addition to the tests specified in the Florida Plumbing Code and as required by the local authority having jurisdiction, except as modified herein. Correct defects in the work provided by the Contractor, and repeat tests until work is in compliance with contract requirements.

3.2.2.1 Domestic Water Piping

Before applying insulation, hydrostatically test each piping system at not less than 100 psig with

no leakage or reduction in gauge pressure for 2 hours.

3.2.2.2 DWV Piping

Before the installation of fixtures, cap ends of each system, fill piping with water to the roof, and allow to stand until a thorough inspection has been made. If the system is tested in sections, each opening shall be plugged and each section tested with not less than a 10-foot head of water. After plumbing fixtures have been set and their traps filled with water, subject the entire sanitary system to a final air pressure test of not more than 1.0 inch of water column. The entire system shall be proven absolutely tight under such test.

3.3 DISINFECTION

Disinfect new water piping in accordance with AWWA C651. Fill piping systems with solution containing minimum of 50 parts per million of available chlorine and allow solution to stand for minimum of 24 hours. Flush solution from the systems with clean water until maximum residual chlorine content is not greater than 0.2 parts per million or residual chlorine content of domestic water supply.

END OF SECTION 220050

SECTION 220060 - PLUMBING FIXTURES AND TRIM

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide fixtures complete with trim.
- B. Provide connections to equipment installed in this contract. Connect to roughing indicated.

PART 2 - PRODUCTS

2.1 FIXTURE CONNECTIONS

- A. Lavatory connections shall be 1-1/4" type M copper arm with 1-1/4" C-MIP adapter at stack.
- B. Sink connections shall be type M copper tube with wrought copper or brass fittings.

2.2 PLUMBING FIXTURES

- A. Furnish and install plumbing fixtures indicated or specified, complete with all equipment, fittings, trim and accessories indicated or specified.
- B. Exposed piping to fixtures:
 - 1. Exposed piping for water shall be chrome-plated brass, IPS.
- C. Stops shall be provided for all fixtures and equipment, and shall be Kohler, McGuire, Eljer, Chicago, Speakman or T&S.
- D. All faucets shall be American Standard, Delta, Kohler, Just, Eljer or Central Brass

PART 3 - EXECUTION

3.1 PROTECTION OF FIXTURES

- A. Provide plastic cover over fixtures after installation to prevent spilling of paint, abuse by workmen or other defacing of fixtures.
- B. All chipped, cracked, deformed, scratched or defaced fixtures shall be replaced. Repaired or painted over enamel cracks or chipped places **WILL NOT BE ACCEPTABLE**.

3.2 CLEANING OF FIXTURES

- A. All fixtures shall be cleaned prior to final inspections. Remove all dirt, paint, grease, etc., from within water closet bowls, lavatories, urinals and sinks. Remove all stains from fixtures.
- B. Fixtures that are stained and cannot be cleaned shall be replaced.

- C. Clean all aerators and strainers.

3.3 ADJUSTING FIXTURES

- A. Adjust water flow through all fixtures to provide proper flushing action with the least amount of water.

END OF SECTION 220060

SECTION 230050 - MECHANICAL GENERAL REQUIREMENTS

PART1 - GENERAL

1. CONTRACTORS QUALIFICATIONS

NOTE: The mechanical contractor must be a state certified mechanical contractor (CMC) with a permanent office located within 100 miles of the project site from which installation & warranty work will be performed will be accepted. The state certified mechanical contractor's qualifying agent (individual holding the CMC license) shall be a full-time employee of the contractor and shall be in responsible charge of the project from start to finish.

- 1.1 General: Wherever the word "sub-contractor" or "firm" is used in these sub-paragraphs, it shall mean the contractor/sub-contractor of record for the installations used for proficiency qualification.
- 1.2 Location: The firm which performs the installation of the work under this section shall be one who maintains an established, experienced organization with a permanent, manned office.
- 1.3 Plumbing Experience: The firm's proficiency in the installation and adjustment of plumbing systems shall have been demonstrated by the successful performance of work as specified herein on at least three commercial or institutional buildings, each containing a minimum of 10 plumbing fixtures. The firm shall have been in business performing services as specified herein, for at least 3 years.
- 1.4 HVAC Experience: The Mechanical Contractor's proficiency in the installation, start-up, adjustment, and maintenance of air conditioning systems shall have been demonstrated by the successful performance of work as specified herein on at least three systems each with ducted air distribution, and refrigerant piping of 100 tons capacity or greater. The Mechanical Contractor shall have Certified Mechanical Contractor Licensed personnel, instruments, tools, and equipment to perform the installation, balancing, and maintenance service specified. The Mechanical Contractor shall have been active in performing services as specified herein, for at least 5 years.
- 1.5 Test and Balance: The firm's proficiency in the test and balance of the air conditioning systems shall have been demonstrated by the successful performance of work as specified herein on at least three systems each with ducted air distribution, and refrigerant piping of 100 tons capacity or greater, incremental units excluded. The firm shall have trained personnel, instruments, tools, and equipment to perform the testing and balancing service specified. The firm shall have been in business performing services as specified herein, for at least 3 years and be independent of the mechanical contractor and shall be an active member of AABC or NEBB.
- 1.6 Fire Protection: The firm's proficiency in the installation and adjustment of fire protection systems shall have been demonstrated by the successful performance of work as specified herein on at least three commercial or institutional buildings, each involving fire protection systems of the size and complexity as those required for this project. The firm shall have been in business performing services as specified herein, for at least 3 years.

2. GENERAL REQUIREMENTS

Requirements specified herein are minimum. All equipment, when installed, shall perform equal to or exceed specified requirements.

This section applies to all sections of Divisions 21, 22 and 23, "Mechanical" of this project specification, unless specified otherwise in the individual section. Any requirements shown or specified on the project drawings related to the equipment of this section also applies to this section. Any conflicts which may arise between the drawings and the specifications shall be interpreted by the Engineer in the best interest of the Owner.

3. ARCHITECTURAL AND/OR STRUCTURAL REQUIREMENTS

Refer to the specifications and Architectural drawings for additional requirements pertaining to work under this discipline. Notify Architect/Engineer if conflicts exist for clarification.

4. DEFINITIONS

Manufacturers Representatives: Wherever MANUFACTURERS REPRESENTATIVE is referred to in this division of these specifications, said representative shall be regularly employed by the manufacturer to perform similar activities to those called for herein, which indicates his competence in that field of work.

Concealed: Where the word concealed is used in this division, it shall mean items above ceilings, in attics, in crawl spaces, in chases, in tunnels, in cabinet work, and under counters or equipment so as to be not visible from an elevation of 5 feet at a horizontal distance of 10 feet.

Finished Spaces or Areas: Where finished spaces or areas are referred to in this division, it shall mean all spaces except concealed spaces or mechanical rooms unless otherwise noted.

Extended Warranties: Where extended warranties beyond contractor's one (1) year warranty are specified, the additional warranty time shall start at the end of the contractor's one (1) year warranty.

Provide: Furnish and install.

Control & Interlock Wiring: All wiring, both line voltage and low voltage, other than power wiring from electrical distribution panel, through the primary control device, to the item of equipment.

Primary Control Device: That ONE device for any item of equipment which interrupts power flow during normal operation. Where magnetic starters are provided, they are the primary control. For items not switched by starters, the primary control device will be that ONE thermostat, time clock, manual switch, aquastat, P.E. switch, or relay performing the primary switching.

Code Reference: Where reference is made to a code or ASTM without a date indicated, the date shall be the latest date or edition as of the date of the opening of bids.

Diagrammatic: A drawing that shows arrangement and relationship (as of parts), i.e.: A diagrammatic drawing uses symbols rather than pictorial representation of pipes, ducts, conduit and other items shown and are not necessarily to scale. Arrangement, location and sizes shown are firm.

Readily Accessible: Where items are specified to be readily accessible, they shall be available for maintenance or use in space, above a lay-in ceiling or through an access door from floor elevation, or by standing on an 8-foot ladder.

Noted, Indicated or Shown: Where the terms "Noted", "Indicated" or "Shown" are used in these specifications, the words "in the specifications or on the plans" shall be inferred.

Detail: Where reference is made to a Detail, the Detail shall be on the plans unless otherwise noted.

Specifications: Where reference is made to these specifications, it shall be inferred in this section of specifications.

Notification by Contractor, and Instructions to Contractor: Where reference is made in these specifications to notification by the Contractor or instructions given to the Contractor, it shall be inferred that the Architect/Engineer shall be the instructor or shall be notified, as the case exists.

Division or Section Reference: Where reference is made to another division or section within this division, refer to specifications table of contents for division, section, or page number.

Flow Diagram: A single-line, two-dimension, non-sealed drawing depicting arrangement and sequence of equipment, valves, controls, thermometers, gauges, and other specialty devices in a pipe or duct system.

5. CLEARANCE ABOVE ELECTRICAL SWITCHGEAR AND ELECTRICAL PANELS

Clearance above electrical switchgear and electrical panels shall be maintained by mechanical system so that no mechanical ducts, pipes, vents or equipment is routed above or across the space directly above this equipment in conformance with N.E.C.

6. CODES AND ORDINANCES

6.1 **General:** Where requirements of these specifications exceed specified codes and ordinances, conform to these specifications. Materials and equipment included in Underwriters Label Service shall bear that label. Electrical equipment shall be U.L. approved as installed.

6.2 **Permits:** Obtain all permits, paying all fees in connection therewith. At completion, have work inspected by proper authorities and furnish the Architect for the Owner an inspection certificate showing approval of installation.

6.3 **Plumbing:** Conform to the Florida Plumbing Code.

6.4 **Energy:** Conform to the Florida State Energy Code for Buildings.

6.5 **Mechanical:** Conform to the Florida Mechanical Code.

6.6 **NFPA:** All applicable NFPA codes not to be limited to NFPA 101, NFPA 90A, NFPA 90B.

7. HOLLOW SPACES USED AS DUCTS OR PLENUMS

All materials of systems installation exposed in hollow spaces used as ducts or plenums shall have

a flame spread rating of 25 or less and a smoke development rating of 50 or less.

8. SHOP DRAWINGS

8.1 General: Contractor shall check data to ensure compliance with specifications prior to submitting. Submittal shall be assembled in complete sets in hard back three-ring binders, by trade, and bound with numbered index sheets and tabs. Submittal data shall be submitted at one time unless unavailable drawings would delay job progress. Data shall include capacities, complete installation instructions, dimensional data and electrical data, BHP, motor HP, operating weights and load distribution at mounting points.

8.2 Identification: All submittal data shall be identified by a cover sheet showing project name, specification sections, drawing or detail number, room number, date, revision date, contractor and subcontractor's organization and project manager with phone number, the model, style and size of item being submitted with manufacturer's representative, salesman (or preparer who can answer questions), and phone number. Manufacturer's standard drawings shall be modified by deletions or additions to show only items applicable to this project.

8.2.1 Review: The Contractor agrees that submittals of equipment and material and shop drawings of equipment and material layouts required under provisions of these specifications and processed by the Architect/Engineer are not Change Orders. The purpose of submittals is to demonstrate that the Contractor understands the design concept of the project by indicating the equipment and materials he intends to furnish and install, and by detailing the installation he intends to achieve.

The Contractor shall conform to the requirements of the Contract Documents unless a change order is issued. The Contractor shall identify on each submittal and in letterform to the Architect/Engineer any and all deviations from the contract documents.

Any submittal or shop drawings not conforming to the Contract Documents without this identification and notification shall be assumed to be marked "Revise and Resubmit" (Contractor acknowledges this by the submission), and the Contractor shall promptly re-submit said submittal so as to be in full compliance with the Contract Documents.

Failure of the Contractor to provide this information during the shop drawings phase shall make the Contractor responsible for all changes to achieve compliance with the Contract Documents without additional compensation.

8.2.2 Items to be Submitted:

Tabulation of Power Wiring Requirements: Within 20 Days of Notice to Proceed, provide a Tabulation of Power Wiring Requirements of all proposed equipment, including H.P., amps, voltage, phase and KW, tabulated on a separate sheet. A copy of the tabulation shall be transmitted independently to the general contractor, Architect/Engineer, and to all affected trades. (Refer to Electrical Drawings for electrical provisions for equipment.)

Plumbing System Components:

Submit all components required for complete installation of Plumbing system designed and specified herein and as required by the engineer of record.

HVAC System Components:

Submit all components required for complete installation of HVAC system designed and specified herein and as required by the engineer of record.

9. TRADE NAMES

When reference is made in the Contract Documents to trade names, brand names, or to the names of manufacturers, such references are made solely to indicate that products of that description may be furnished and are not intended to restrict competitive bidding. If it is desired to use products of trade or brand names or of manufacturer's names which are different from those mentioned in the Contract Documents, application for the approval of the use of such products must reach the hands of the Architect/Engineer at least ten days prior to the date set for the opening of bids. The latter provision is a restriction, which applies only to the party making a submittal. Therefore, the aforesaid restriction does not inhibit the Architect/Engineer from adding trade names, brand names or names of manufacturers by addendum. The burden of proving acceptability of a proposed product for use in place of a product or products designated by trade names or names, brand name or names, or by the name or names of manufacturers in the contract documents rests on the party submitting the request for approval. The written application for approval of a proposed product must be accompanied by technical data, which the party requesting approval desires to submit in support of his application. The Architect/Engineer will give consideration to reports from reputable independent testing laboratories verified experience records showing the reputation of the proposed product with previous users, evidence of reputation of the manufacturer for prompt delivery, evidence of reputation of the manufacturer for efficiency in servicing its products, or any other written information that is helpful in the circumstances. The application to the Architect/Engineer for approval of a proposed product must be accompanied by a schedule setting forth in which respects the materials or equipment submitted for consideration differ from the materials or equipment designated in the Contract Documents. The degree of proof required for approval of a proposed product as acceptable for use in place of a named product or named products is that amount of proof necessary to convince a reasonable person beyond all doubt. To be approved, a proposed product must also meet or exceed all express requirements of the Contract Documents. If the submittal is approved by the Architect/Engineer an addendum will be issued to all prospective bidders. Issuance of an addendum is a representation to all bidders that the Architect/Engineer in the exercise of his professional discretion established that the product submitted for approval is acceptable and meets or exceeds all express requirements. In the event a submittal shall have been rejected by the Architect/Engineer and there shall have been a request for a conference as provided in this article pursuant to which conference the said submittal shall have been found to comply with the requirements of this article, a separate addendum covering the said submittal will be issued prior to the opening of bids. In order for the Architect/Engineer to prepare an addendum intelligently, an application for approval of a product must be accompanied by a copy of the published recommendations of the manufacturer for the installation of the product together with a complete schedule of changes in the Contract Documents, if any, which must be made in other work in order to permit the use and installation of the proposed product in accordance with the recommendations of the manufacturer of the product. Unless requests for approvals of other products have been received and approvals have been published by addendum in accordance with the above procedure, the successful bidder may furnish no products of any trade names, brand names, or manufacturer's names except those designated in the contract documents. Any party who alleges that rejection of a submittal is the result of bias, prejudice, caprice, or error on the part of the Architect/Engineer may request a conference with a representative of the Owner, provided: That the request for said conference, submitted in writing,

shall have reached the Owner at least five days prior to the date set for the opening of bids, time being of the essence.

10. SUBSTITUTIONS

All costs incurred by acceptance of substitutions shall be borne by Contractor. Should any proposed substitute equipment require services in addition to or in excess of services provided in the Contract Documents, these services shall be provided at no extra cost to the Owner.

Request for approval of a proposed product (substitution) shall be accompanied by a schedule setting forth in which respects the materials or equipment submitted for consideration differ from the materials or equipment designated in the Contract Documents and from the design intent, a minimum of 10 days prior to bid date. If there are no deviations or changes required to the design, the submittal shall be accompanied by the following statement: "The proposed material or equipment submitted for approval requires no changes to the Contract Documents to achieve the design intent." Lack of the schedule or statement will result in automatic disapproval of the request.

11. INSTRUCTIONS

- 11.1 Instructions: Instruct operating personnel designated by Owner in operation and maintenance of systems prior to the request for final inspection. A manufacturer's service representative shall provide the instructions for each piece of equipment on system. A manufacturer's sales representative is not acceptable. (Instructor shall not be a sales person, but shall be one with service experience on a continuing basis, knowledgeable about the subject equipment.) The Contractor shall give notice to the Architect/Engineer not less than 10 days of the anticipated date of instruction to allow planning by the Owner. The Contractor shall request the instruction date not less than 5 days of the desired date for coordination with the Owner. Operating manual for the equipment/systems on which instructions are being given shall be in the possession of the operating personnel not less than 5 days prior to the date of instruction. The Contractor shall give an orientation session to operating personnel for achieving familiarity (not instructions) of the systems approximately 3 days prior to the instruction date. The Contractor's representative giving instruction shall be knowledgeable in the equipment/systems.

Provide signed statement from operating personnel and school personnel certifying orientation and instructions have been received. Provide typed sequence of operation to be inserted in the maintenance manuals.

12. WARRANTIES: Provide manufacturer's warranties prior to final observation.

13. NOISE AND VIBRATION: When in operation, the system shall be free from abnormal noise and vibration.

14. MANUFACTURER'S RECOMMENDATIONS

All equipment shall be installed in accordance with manufacturer's published installation instructions shipped with the equipment. In the event there is a discrepancy between these specifications or plans and the manufacturer's instructions, no work shall be performed until additional instructions are received. After final balancing, equipment with belt drive shall have their belts operating in the mid-80% position of the adjustable sheave.

15. SERVICE CONNECTIONS

15.1 General: Prior to excavation for or installation of any piping, determine location, invert and size at connection. Advise Architect/Engineer of any discrepancies discovered.

15.2 Water Service: Connect to existing. Pay all costs.

15.3 Sanitary Sewer: Connect to existing. Pay all costs.

16. SITE UTILITIES

16.1 General: The information shown on the plans is based upon the best information available. Prior to performing any work on the site, the Contractor shall contact appropriate authorities and stake out all underground services in area of excavation. Notify Architect/Engineer of any discrepancies.

16.2 Recording: The Contractor shall record the exact location and depth of any existing underground utilities uncovered and all new underground utilities installed under this contract. Dimensions shall be from permanent structures and depth from a benchmark.

16.3 Disposition: At the completion of the installation of the utilities, the set of record drawings shall be transmitted to the Architect/Engineer for prompt review.

17. TEMPORARY HEAT

Ducted air handling systems shall not be placed into operation for testing or for temporary heat until all walls in areas served by the system have been prepared for painting and the building is broom clean. Portable heaters may be used for temporary heat if required during construction at Contractor expense.

18. SPACE CONDITIONS

All apparatus shall fit into the available spaces in the building and must be introduced into the building so as not to cause damage to the structure. Equipment larger than access to equipment spaces shall be disassembled into sub-assemblies for installation. Where deviations from the plans are required in order to conform to the space limitations, such changes shall be made at no additional cost to the Owner, and shall be subject to approval. All equipment requiring service shall be made accessible. Coordinate piping and ductwork installation to avoid conflict with other trades.

19. DRAWINGS

Plans are diagrammatic and show the location of the equipment, ducts, and pipes, and are not to be scaled. All dimensions shall be verified at the building site. Prefabrication and/or installation of work from drawings shall be at Contractor's risk. Refer to Architectural plans for exact building dimensions and details.

20. CUTTING AND PATCHING

Cut or core drill, where specified, openings in new work for the installation of the mechanical

system. Patching shall be performed by the trade whose work is cut. Contractor shall lay out and install his work ahead of the work of other trades wherever possible.

21. PRESSURE TESTS

21.1 General: Provide 48 hours notification in advance of any test. Test shall be maintained at conditions specified but, in no event, for less than 8 hours minimum duration, unless otherwise noted. Hydrostatic pressure test shall maintain pressure without change, except that due to temperature change. Complete test prior to insulating. Leaks shall be repaired, defective materials replaced, and system shall be retested. No water pressure test shall be conducted in freezing weather where subject to freezing. Strike all joints in copper and steel piping under pressure test. Conduct tests prior to connecting to equipment or isolate equipment from system. Submit affidavit of pressure tests compliance to Engineer.

21.1.1 Domestic Water System: Hydrostatic test; 150 PSIG.

21.1.2 Soil, Waste and Vent System: Static test; 5 feet minimum head. Test system in its entirety or in sections. Plug all openings except highest opening above roof. Water shall be kept in the system, or in the portion under test, for at least one (1) hour before inspection starts; the system shall be tight at all points.

21.1.3 Refrigerant Piping:

Pressure test; 200 PSIG and 150 PSIG dry nitrogen on high and low sides respectively; 6 hours minimum duration.

Vacuum test; 500 microns; 15 minutes minimum duration.

Break vacuum with dry nitrogen and re-evacuate to 500 microns.

Break vacuum with dry nitrogen and re-evacuate to 500 microns.

Break vacuum with refrigerant charge.

21.1.4 Medium and High Pressure Ductwork: Test in accordance with SMACNA HVAC Air Duct Leakage Test Manual, 1985 Edition. Ducts shall be tested at 4" W.C. and provide Class A leakage seal.

22. CONNECTIONS INTO EXISTING UTILITIES

Where connecting to a utility or service, verify location, sizes, materials, fluid being handled and inverts or elevation of all existing utilities and confirm that new pipes being routed to existing utilities can be installed conforming to code and as shown. Notify Engineer of any conflicts or discrepancies prior to purchasing any materials or performing any work, extension of work or connection, with the exception of excavation or other work to provide access to the concealed utility.

23. COMPLETION OF WORK

23.1 General: See General Conditions.

- 23.1.1 Incomplete Work: Prior to starting the observation process at “substantial” or other observations where work is observed, the Contractor shall give the Engineer a list of work not completed, reason for incompleteness, and date when said work will be completed.
- 23.1.2 Observation: At substantial, the entire system shall be demonstrated to be in specified working condition. The following shall be available during the observation:
- a. Test and Balance Report.
 - b. Contractor Representative.
 - c. Mechanic with hand tools.
 - d. Specified test data.
 - e. Certificates.
 - f. Controls Manufacturer's Representative.
 - g. Complete Specifications and Drawings with all addenda and revisions.
 - h. Operating and Maintenance Manuals.
 - i. Punch list indicating disposition of all items with initials of person confirming completion.
- 23.1.3 Uncovering of Concealed Work: Floor cleanouts shall be opened for inspection and then reclosed. Other concealed areas shall be opened upon request, where access is provided.

24. RECORD DRAWINGS

- 24.1 Responsibility: The Contractor shall retain one set of clean drawings for recording all changes or modifications regarding relocation of pipe, valves, ductwork and equipment, and actual size of installed equipment, ductwork and piping in red ink. Underground utilities shall be dimensioned from permanent structures and depths recorded.
- 24.2 Disposition: At the completion of the installation of the utilities, the set of record drawings and one set of reproducible of equipment room shop drawings shall be transmitted to the Architect/Engineer for prompt review.

25. OPERATING AND MAINTENANCE MANUALS

- 25.1 Three (3) bound and indexed Operating and Maintenance Manuals shall be prepared by the Contractor for all equipment and be submitted for approval a minimum of one month prior to “substantial”. Two (2) approved copies shall be delivered to the operating personnel at final observation.

Each Manual shall be compiled as follows: Data shall be bound in smooth surface hard back commercial quality three-ring notebooks with project identification shown on the front cover and binding back. Identification labels shall be typed and adhered.

Notebooks shall have 9 1/2-inch by 11 1/2-inch covers with back width to permit the covers to lie parallel or to converge, and have not less than 1 1/2-inch back width.

Index divider sheets of heavy Manila paper shall be inserted between each section of the Manual with a 2-inch x 1/3-inch ready-cut shield tab attached to each sheet for identification of sections. Data sheets and diagrams shall be 8 1/2-inch x 11-inch or be mounted on 8 1/2-inch x 11-inch sheets of 16-pound paper if smaller, with reinforced 11-inch mechanically perforated edge.

Drawings and diagrams larger than 8 1/2-inch by 11-inch shall be folded up from the bottom to form a height of 11 inches and folded to the left to form a width of 8 1/2 inches.

- 25.2 Index sheets shall be provided in the order listed with the following identifications typed in capital letters:

PLUMBING FIXTURES.
SYSTEM DISCRETE HVAC COMPONENTS:
(Air Handlers, etc.)
AIR DISTRIBUTION.
FANS.
FILTERS.
WATER DISTRIBUTION.
CONTROLS.
TEST AND BALANCE REPORTS.
WATER HEATER.
CERTIFICATES.
VALVES AND PIPING SPECIALTIES.

- 25.3 Each Manual shall contain the following information, data and drawings:

- a. List of contents. Insert under front cover.
- b. Copy of reviewed submittals, equipment and materials.
- c. Manufacturer's installation, operating and maintenance instructions for each item of equipment with moving parts listed under SHOP DRAWINGS including recommended frequency of inspections and maintenance for one year's period of time.
- d. Manufacturer's list of renewal parts for each item of equipment with recommended stock items and quantities indicated.
- e. Control diagrams, electrical interlock diagrams, and control valve lists.
- f. Copy of shop drawings showing layouts and construction details.
- g. Copy of Test and Balance Reports including list of instruments and description of methods employed.

26. PROTECTION OF MATERIALS AND EQUIPMENT

- 26.1 Delivery and Storage: Equipment and materials shall be carefully handled, properly stored, and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations and as approved by the Engineer. Damaged or defective items shall be replaced. Equipment will not be delivered to the job site unless it can be stored inside the building or in an enclosed area such as a trailer or warehouse.

- a. Deliver, store, protect, and handle products to site according to manufacturer's recommendations.
- b. Deliver materials to site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- c. Store insulation in original wrapping and protect from weather and construction traffic.
- d. Protect insulation against dirt, water, chemical, and mechanical damage.

- 26.2 Maintenance of Filters: The contractor shall be responsible for maintaining all air filters until final acceptance of the building. If part of the building is occupied prior to final acceptance, the

Contractor shall be responsible for maintaining any air filters in systems that do not serve occupied areas. No air system shall be operated at any time without air filters, and filters shall not be allowed to become overloaded with dust and dirt.

- 26.3 Throwing Filters: Install new set of filters prior to test and balance. Provide spare set of filters at final observation.
- 26.4 During Construction: Pipe opening shall be closed with caps or plugs, floor drains excluded which shall be taped. All equipment shall be covered and protected against water, dirt and chemical or mechanical injury.
- 26.5 Prior to Final Observation: All materials and equipment shall be cleaned. Chipped or scraped paint shall be retouched to match. All dents and sags in ductwork and equipment casings shall be straightened.
- 26.6 Equipment Painting: Equipment which has been damaged beyond the point of retouching or has been retouched not to match shall be painted to match factory finish.
- 26.7 Potable Water System:
- 26.7.1 General: Flush all debris and pipe compound from domestic water system.
- 26.7.2 Disinfection: Disinfection shall be in accordance with Environmental Protection Division, Florida Department of Environmental Protection, "Rules for Safe Drinking Water."
- 26.7.3 Sterilization: Domestic water piping system shall be sterilized, complying with Federal Specifications BB-C-120. Work shall be performed by licensed operator.
- 26.7.4 Water Sample Certification: Water samples from the sterilized piping system shall be tested and approved by the local Health Department.
- 26.8 Non-domestic Water Systems:
- 26.8.1 Clean before being put into operation and before being connected to the distribution loop as follows:
- 26.8.2 General:
- Flush all debris and pipe compound from each piping system. Fill system with water and liquid TRI-SODIUM PHOSPHATE in a ration of 1-pound of phosphate for every 50 gallons of water; bleed all air from system and circulate at high operating temperature or building temperature, whichever is highest, for forty-eight (48) hours minimum; drain the system, clean all strainers and refill with fresh water; circulate for four (4) hours minimum and check pH; drain the system, refill with fresh water and circulate for four (4) hours minimum; repeat the latter until the pH drops to pH of city water, approximately 7.4. Remove startup strainer. Fill system and treat as specified below.
- Chilled Water System: Treat systems with Nitrite Boron in a concentration of 2000 PPM to provide a pH of 7 to 9.

27. CERTIFICATES

For main HVAC system components and controls, start-up, testing, and placing into operation shall be performed by the field representatives of the manufacturers, and certificates of the manufacturers shall be provided on the letterheads of the manufacturers in which the manufacturer certifies that the equipment has been installed in strict compliance with the manufacturers recommendations and is operating properly. The manufacturers shall list in the certificate the item or items furnished to the job. The Contractor shall coordinate the performance of the aforesaid services and shall, in all cases where the equipment of two or more manufacturers tie in and function together, such as controls and air conditioning apparatus, require the field representative to perform simultaneously the initial start-up, the testing, and the placing of their equipment into operation. Start-up is defined as putting the equipment into action. Testing is defined as performing such testing as is stipulated in the Contract Documents to be performed. Placing into operation is defined as operating the equipment for a sufficient period of time for the determination to be made that it is performing properly. Notification shall be given 48 hours in advance of start-up.

Upon completion of all mechanical work, the Contractor shall submit a certificate stating that all mechanical systems have been tested and that the installation and performance of all systems conform to the requirements of the Contract Documents.

28. MOTORS

28.1 General: All motors shall have all copper windings and leads. (Aluminum is not allowed.) Motors for base mounted pumps and belt driven equipment shall have cast iron yoke and bearing housings. All motors shall have rated horsepower at least 10 percent above indicated brake horsepower of equipment including belt losses and inlet vane losses.

28.2 High Efficiency Motors

28.2.1 High Efficiency Single-Phase Motors

Unless otherwise specified, single-phase fractional-horsepower alternating-current motors shall be high efficiency types corresponding to the applications listed in NEMA MG 11.

28.2.2 High Efficiency Polyphase Motors

Unless otherwise specified, polyphase motors shall be selected based on high efficiency characteristics relative to the applications as listed in NEMA MG 10. Additionally, polyphase squirrel-cage medium induction motors with continuous ratings shall meet or exceed energy efficient ratings in accordance with Table 12-6C of NEMA MG 1. Motors shall be NEMA Design Type B with NEMA Class B insulation. Motors specified to be high efficiency shall be minimum 92 percent efficient.

28.3 Protection: All single-phase motors shall have integral overload protection in accordance with the National Electrical Code.

28.4 Voltages: Refer to Electrical Drawings for voltage and phase.

29. STARTERS AND CONTACTORS

- 29.1 General: Provide starters for all motors furnished hereunder unless otherwise noted. Unless otherwise noted, all three phase motors shall be provided with combination starter and circuit breaker. Starters shall be NEMA type starters. IEC type starters are not allowed.
- 29.2 Enclosures: NEMA 1 indoors; NEMA 3R outdoors; unless otherwise noted.
- 29.3 Accessories: See Control Section for sequence of operation.
- 29.4 Phase Failure/Phase Reversal Protection: Provide for all motors above 3 HP. Symcom, Inc., Motor Saver Model 100, Wagner Model WPC-444.
- 29.5 Combination Starters with Circuit Breakers, Three Phase Single or Two Speed Motors: Circuit breaker shall be adjustable magnetic trip type with 10,000 amp minimum symmetrical amps interrupting capacity. Breaker operating mechanism shall be lockout type. Contactor shall be magnetic across-the-line type with H.O.A. switch in cover of NEMA 1 enclosure. Square D class 8539; Cutler-Hammer type AN40 or A41; Westinghouse Type A206; Furnas Class 18; Allen Bradley 513 or 522; Joslyn-Clark Bulletin 6020. Provide two auxiliary contacts (minimum).
- 29.6 Overload Elements: All legs of multi-phase starters shall be protected with overload elements. Overload elements shall be sized in accordance with National Electrical Code.
- 29.7 Coils: All holding coils shall operate on 120 volts. On 208-volt starters, coil voltage shall be obtained by neutral conductors. Provide built-in control transformer on all 480-volt starters.
- 29.8 Pilot Lights: Provide a pilot light with red jewel in cover, lit when starter is closed, for all motor starters. Pilot light bulb shall be replaceable.
- 29.9 Relays: Mechanically held type with number of poles and arrangement as noted, in NEMA 1 enclosure unless otherwise noted. Allen-Bradley 700PL; Cutler-Hammer D26; Square D 8501 type LL; Joslyn-Clark Bulletin 7305.
- 29.10 Starters Specified Under Electrical: See Electrical drawings for starters in motor control center and any other starters specified under Electrical Work.
- 29.11 Manufacturers: Square D, Allen-Bradley, Cutler-Hammer, Furnas or Joslyn-Clark of description and model numbers indicated.
- 30. PIPING IDENTIFICATION
- 30.1 General: Provide stenciled piping identification similar to existing identification, and direction markers. Installation shall be after completion of thermal insulation work and painting.
- 30.2 Materials: All piping systems specified under this Division within the building shall be identified with clear block letters stenciled on the outside surface of pipe or pipe covering to indicate contents by abbreviated letters, and direction of flow.
- 30.3 Schedule: Provide a Piping Identification Schedule framed under glass.
- 30.4 Locations:

30.4.1 Mechanical Equipment Rooms and exposed in other rooms than Mechanical Rooms:

- a. Within 18-inches of each valve.
- b. Within 3'- 0" of each 90° elbow, tee, connection to equipment or vessel and point where pipe enters shaft or pierces outside wall.
- c. At not over 5' intervals along all exposed piping.

30.4.2 Above Suspended Ceilings:

- a. Within 18-inches of each valve or valve assembly.
- b. At tees, identify both main and branch within 3 feet of tee.
- c. Within 3-feet of each 90° elbow.

30.5 Direction Markers:

Material - Painted in gloss enamel.

Color - Black, unless otherwise noted in Painting Section.

Location - Arrow adjacent to each band to indicate flow away from band.

30.6 Lettering:

30.6.1 Letters: 1/2-inch high on pipe OD or pipe covering OD 3/4-inch thru 1 1/4-inch, 3/4-inch high on pipe OD 1 1/2-inch and 2-inch, 1 1/4-inch high on pipe OD 2 1/2-inch thru 6-inch, 2 1/2-inch high on pipe OD of 8 and 10 inches, 3 1/2-inch high on pipe OD over 10 inches.

30.7 Directional Arrows: 4-inch long and 1/2-inch wide.

Letters shall be black on white or light color finishes, white on dark color finishes. Refer to Painting if pipe is to be painted.

Legend:

<u>System</u>	<u>Abbreviation</u>	<u>Background Color</u>
Domestic Cold Water	DW	Green

31. VALVE LOCATION

All valves shall be accessible after completion of construction.

32. DUCT ACCESS DOORS LABELING

Access doors to fire dampers and smoke dampers shall be labeled in accordance with NFPA 90A.

33. NAMEPLATES

33.1 General: Provide for all equipment, motor starters, remote push button stations, insertion type thermostats, thermostats interval timers, night thermostats, remote bulb thermometers, filter gauges, terminal units, fan-powered units, fans, panel mounted controls, manual damper operators,

and all other equipment specified.

33.1.1 Designation: The name of each piece of equipment or usage shall be etched in 1/4-inch maximum, 1/8-inch minimum height letters and mounted on or adjacent to piece of equipment.

33.1.2 Type: White core black Bakelite secured with epoxy glue.

34. EXISTING/NEW WORK

Where new work is specified tying into old work and materials are different from existing, the Contractor shall request a clarification from the Engineer prior to performing the work.

35. EQUIPMENT BELT AND COUPLING GUARDS

Provide guards shielding the perimeter and face of all new belt drives, shafts and couplings. Provide openings opposite drive and driven shafts to permit use of revolution counter. Guards for fans shall be supported from the fan and mounting base, independent of the floor or housekeeping pad.

36. VALVE LOCATION

All valves shall be accessible after completion of construction.

37. DUCT ACCESS DOORS LABELING

Access doors to fire dampers and smoke dampers shall be labeled in accordance with NFPA 90A.

38. NAMEPLATES

38.1 General: Provide for all equipment, motor starters, thermostats, controls, night thermostats, fans, panel mounted controls, manual damper operators, and all other equipment specified.

38.1.2 Designation: The name of each piece of equipment or usage shall be etched in 1/4-inch maximum, 1/8-inch minimum height letters and mounted on or adjacent to piece of equipment.

38.1.3 Type: White core black bakelite secured with epoxy glue.

39. FERROUS FASTENERS

All ferrous fasteners not having a corrosion resistant plated finish shall be painted to prevent rust.

40. EQUIPMENT BELT AND COUPLING GUARDS

Provide guards shielding the perimeter and face of all new belt drives, shafts and couplings. Provide openings opposite drive and driven shafts to permit use of revolution counter. Guards for fans shall be supported from the fan and mounting base, independent of the floor or housekeeping pad.

41. INSTALLATION OF EQUIPMENT

Install and connect all appliances, equipment, and appurtenances as specified, indicated or required in accordance with the manufacturer's instructions and recommendations. Furnish and install complete auxiliary piping, water seals, valves, electric connections, and similar items, recommended by the manufacturer or as required for proper operation.

42. DEMOLITION PLAN FOR CLARIFICATION

The demolition plan has been prepared to assist the contractor in determining the scope of demolition work and should not be construed to be all of the demolition required. The contractor shall visit job site (after carefully reviewing the contract documents) and determine exact areas and quantities of existing material to be removed to accomplish new construction.

43. INDOOR AIR QUALITY

Portions of the building will be in use and occupied during construction. Contractor shall schedule work and provide temporary ventilation and/or isolation to insure that fumes from welding, other construction tasks, and out-gassing from construction materials do not migrate to occupied areas.

END OF SECTION 230050

SECTION 230080 - INSULATION OF MECHANICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

Section 23 00 50, "Mechanical General Requirements," applies to this section, with the additions and modifications specified herein. Any requirements shown or specified on the project drawings related to the materials of this section also applies to this section.

1.2 DEFINITIONS

1.2.1 Finished Spaces

Spaces used for habitation or occupancy where rough surfaces are plastered, paneled, or otherwise treated to provide a pleasing appearance.

1.2.2 Unfinished Spaces

Spaces used for storage or work areas where appearance is not a factor, such as unexcavated spaces and crawl space.

1.2.3 Concealed Spaces

Spaces out of sight. For example, above ceilings; below floors; between double walls; furred-in areas; pipe and duct shafts; and similar spaces.

1.2.4 Exposed

Open to view. For example, pipe running through a room and not covered by other construction.

1.2.5 Fugitive Treatments

Treatment subject to deterioration due to aging, moisture, high humidity, oxygen, ozone, and heat. Fugitive materials are entrapped materials that can cause deterioration, such as solvents and water vapor.

1.2.6 Outside

Open to view up to 5 feet beyond the exterior side of walls, above the roof, and unexcavated or crawl spaces.

1.2.7 Conditioned Space

An area, room or space normally occupied and being heated or cooled for human habitation by any equipment.

1.3 SUBMITTALS

Submit the following:

1.3.1 Manufacturer's Catalog Data

- a. Insulation
- b. Jackets
- c. Casings
- d. Vapor-barrier materials
- e. Accessory materials

1.3.2 Certificates of Compliance

- a. Insulation
- b. Jackets
- c. Casings
- d. Vapor-barrier materials
- e. Accessory materials

Submit standards compliance labels on each container or package.

1.4 QUALITY ASSURANCE

Every package or standard container of insulation, jackets, cements, adhesives, and coatings delivered to the project site shall have the manufacturer's stamp or label attached giving name of manufacturer, brand and description of material. Insulation packages and containers shall be asbestos-free.

1.5 FLAME-SPREAD AND SMOKE-DEVELOPED RATINGS

In accordance with NFPA 255, ASTM E84 or UL 723, the materials shall have a flame-spread rating of not more than 25 and a smoke-developed rating of not more than 50.

1.5.1 Materials Tests

Test factory-applied materials as assembled. Field-applied materials may be tested individually. Use no fugitive or corrosive treatments to impart flame resistance. UL label or satisfactory certified test report from a testing laboratory will be required to indicate that fire hazard ratings for materials proposed for use do not exceed those specified. Flameproofing treatments subject to deterioration due to effects of moisture or high humidity are not acceptable.

1.5.2 Materials Exempt From Fire-Resistant Rating Nylon Anchors.

1.5.3 Special Exempt Materials

Materials exempt from fire-resistant rating when installed in outside locations, buried, or encased in concrete: PVC casing and glass-fiber-reinforced plastic casing.

PART 2 - PRODUCTS

2.1 PIPING INSULATION

Piping systems, except buried pipe requiring insulation, types of insulation required, and insulation thickness shall be as listed in Tables I and II herein. Except for flexible unicellular insulation, insulation thickness as specified in Table II shall be one inch greater for insulated piping systems located outside. Unless otherwise specified, insulate all fittings, flanges, and valves, except valve stems, hand wheels, and operators. Provide factory premolded, precut, or field-fabricated insulation of the same thickness and conductivity as insulation on adjacent piping. Insulation exterior shall be factory cleanable, grease resistant, non-flaking and non-peeling. Pipe insulation shall conform to the referenced publications in Table I.

2.1.1 Flexible Unicellular Insulation

ASTM C534. Provide adhesive as recommended by insulation manufacturer.

2.1.2 Piping Insulation Finishes

2.1.2.1 All-Purpose Jacket

Except unicellular insulation, provide a factory applied all-purpose jacket with or without integral vapor barrier as required by the service. Provide jackets in exposed locations with a white surface suitable for field painting. Allow a maximum water vapor permeance of 0.05 perm in accordance with ASTM E96, a puncture resistance of not less than 50 Beach units, and a minimum tensile strength of 35 pounds-force per inch of width in accordance with ASTM D828.

2.1.2.2 Vapor-Barrier Material

Resistant to flame, moisture penetration, and mold growth. Provide vapor-barrier material on pipe insulation as required in Table I.

2.1.2.3 Metal Jackets

Provide a moisture-barrier lining for metal jackets located outside.

- a. Aluminum Jackets: ASTM B209, Alloy 3003 or 3004 Temper H14, 0.016- inch thick, smooth.

2.1.2.4 Vinyl Lacquer

Vinyl lacquer finish or equivalent recommended for unicellular insulation located outside.

2.2 HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS INSULATION

Provide insulation on ducts, plenums, filter boxes and casings of Heating, Ventilating and Air Conditioning Systems (HVAC.)

2.2.1 Duct Insulation in Concealed Spaces

Blanket flexible mineral fiber insulation conforming to ASTM C553, Type 1, Class B-3, 1.0 pound per cubic foot nominal, 2.0 inches thick. Provide flexible insulation in concealed spaces only.

2.2.2 Duct Insulation Not in Concealed Spaces

Mineral fiber in accordance with ASTM C612, Class 2 (maximum surface temperature 400 degrees F), 6 pcf (pounds per cubic foot) average, one inch thick.

2.2.3 Duct Insulation Finishes

2.2.3.1 All-Purpose Jacket

Provide a factory applied all-purpose jacket with or without integral vapor barrier as required by the service. In exposed locations, provide jackets with a white surface suitable for field painting. All-purpose jacket shall have a maximum water vapor permance of 0.05 perm per ASTM E96; a puncture resistance of not less than 50 Beach units; and a tensile strength of not less than 35 pounds-force per inch of width in accordance with ASTM D828.

2.2.3.2 Vapor-Barrier Material

Material shall be resistant to flame, moisture penetration, and shall not support mold growth. Provide vapor barrier on HVAC duct insulation.

2.3 ADHESIVES, SEALANTS, AND COATING COMPOUNDS

2.3.1 Insulation and Vapor Barrier Adhesive

Provide ASTM C916, Type I or Type II adhesive for securing insulation to metal surfaces and for vapor barrier lap only in building interior. Provide Type I when an adhesive in which the vehicle is nonflammable in the liquid (wet) state and which will pass the edge-burning test is required. Provide Type II when an adhesive in which the vehicle is nonflammable in the liquid (wet) state and which will not pass the edge-burning test is required.

2.3.2 Lagging Adhesive

For bonding fibrous glass cloth to unfaced fibrous glass insulation; for bonding cotton brattice cloth to faced and unfaced fibrous glass insulation board; for sealing edges of and bounding fibrous glass tape to joints of fibrous glass board; or for bonding lagging cloth to thermal insulation, or Class 2, for attaching fibrous glass insulation to metal surfaces.

2.3.3 Mineral Fiber Insulation Cement

ASTM C195, thermal conductivity 0.85 maximum at 200 degrees F mean when tested in accordance with ASTM C177.

2.4 ACCESSORIES

2.4.1 Staples

ASTM A167, Type 304 stainless steel outside-clinch type.

2.4.2 Insulation Bands

½-inch wide; 0.021-inch galvanized steel or 0.018 inch stainless steel.

2.4.3 Anchor Pins

Provide anchor pins and speed washers recommended by insulation manufacturer.

2.4.4 Glass Cloth and Tape

Tape shall be 4-inch wide rolls. In lieu of glass cloth and tape, open weave glass membrane may be provided.

2.4.5 Wire

Soft annealed stainless steel, 0.047-inch nominal diameter.

PART 3 - EXECUTION

3.1 PREPARATION

Do not insulate materials until system tests have been completed and surfaces to be insulated have been cleaned of dirt, rust, and scale and dried. Insulate return ducts, outside air intakes and supply ducts to the room outlets, flexible runouts, plenums, casings, filter boxes, coils, fans, and the portion of air terminals not in the conditioned spaces. Ensure full range of motion of equipment actuators. Modify insulation to avoid obstruction with valve handles, safety relief's, and other such items. Allow adequate space for pipe expansion. Install insulation with jackets drawn tight and cement down on longitudinal and end laps. Do not use scrap pieces where a full-length section will fit. Insulation shall be continuous through sleeves, wall and ceiling openings, except at fire dampers in duct systems. Extend surface finishes to protect surfaces, ends, and raw edges of insulation. Apply coatings and adhesives at the manufacturer's recommended coverage per gallon. Individually insulate piping and ductwork. Provide a moisture and vapor seal where insulation terminates against metal hangers, anchors and other projections through the insulation on surfaces for which a vapor seal is specified. Keep insulation dry during application of finish. Bevel and seal the edges of exposed insulation. Unless otherwise indicated, do not insulate the following:

- a. Factory pre-insulated flexible ductwork;
- b. Factory insulated ductwork, plenums, casings, mixing boxes, filter boxes;

- c. Vibration isolating connections;
- d. Adjacent insulation;
- e. ASME stamps;
- f. Fan name plates; and
- g. Access plates in fan housings.

3.2 PIPING INSULATION

3.2.1 Pipe Insulation (Except Unicellular Insulation)

Place sections of insulation around the pipe and joints tightly butted into place. The jacket laps shall be drawn tight and smooth. Secure jacket with fire resistant adhesive factory applied self sealing lap, or stainless steel outward clinching staples spaced not over 4 inches on centers and 2 inch minimum from edge of lap. Cover circumferential joints with butt strips, not less than 3 inches wide, of material identical to the jacket material. Overlap longitudinal laps of jacket material not less than 1 2 inches. Adhesive used to secure the butt strip shall be the same as used to secure the jacket laps. Apply staples to both edges of the butt strips. When a vapor barrier jacket is required, as indicated in Table I, or on the ends of sections of insulation that butt against flanges, unions, valves, fittings, and joints, use a vapor barrier coating conforming to manufacturer's recommendations. Apply this vapor barrier coating at all longitudinal and circumferential laps. Patch damaged jacket material by wrapping a strip of jacket material around the pipe and cementing, stapling, and coating as specified for butt strips. Extend the patch not less than 1 2 inches past the break in both directions. At penetrations by pressure gauges and thermometers, fill the voids with the vapor barrier coating for outside service. Seal with a brush coat of the same coating. Do not use staples to secure jacket laps on pipes carrying fluid medium at temperatures below 35 degrees F. Where penetrating roofs, insulate piping to a point flush with the top of the flashing and seal with the vapor barrier coating. Butt tightly the exterior insulation to the top of the flashing and interior insulation. Extend the exterior metal jacket 2 inches down beyond the end of the insulation. Seal the flashing and counter flashing underneath with the vapor barrier coating.

3.2.2 Flexible Unicellular Insulation

Bond cuts, butt joints, ends, and longitudinal joints with adhesive conforming to manufacturer's recommendations. Miter 90-degree turns and elbows, tees, and valve insulation. Where pipes penetrate firewalls, provide mineral-fiber insulation inserts and sheet metal sleeves. Insulate flanges, unions, valves, and fittings in accordance with manufacturer's published instructions. Apply two coats of vinyl lacquer finish to flexible unicellular insulation in outside locations.

3.2.3 Hangers and Anchors

Pipe insulation shall be continuous through pipe hangers. Where pipe is supported by the insulation, provide MSS SP-58, Type 40 galvanized steel shields of MSS SP-58, Type 39 protection saddles conforming to MSS SP-69. Where shields are used on pipes 2 inches and larger, provide insulation inserts at points of hangers and supports. Insulation inserts shall be of calcium silicate, cellular glass

(minimum 8 pcf), molded glass fiber (minimum 8 pcf), or other approved material of the same thickness as adjacent insulation. Inserts shall have sufficient compressive strength to adequately support the pipe without compressing the inserts to a thickness less than the adjacent insulation. Insulation inserts shall cover the bottom half of the pipe circumference 180 degrees and be not less in length than the protection shield. Vapor-barrier facing of the insert shall be of the same material as the facing on the adjacent insulation. Seal inserts into the insulation with manufacturer's recommended weatherproof coating; or vapor barrier coating, as applicable. Where protection saddles are used, fill all voids with the same insulation material as used on the adjacent pipe.

3.2.4 Sleeves and Wall Chases

Where penetrating interior walls, extend a metal jacket 2 inches out on either side of the wall and secure on each end with a band. Where penetrating floors, extend a metal jacket from a point below the back-up material to a point 10 inches above the floor with one band at the floor and one not more than one inch from end of metal jacket. Where penetrating exterior walls, extend the metal jackets through the sleeve to a point 2 inches beyond the interior surface of the wall.

3.3 DUCTS (HVAC) INSULATION

3.3.1 Rigid Insulation

Secure rigid insulation by impaling over pins or anchors located not more than 3 inches from joint edges of boards, spaced not more than 12 inches on centers and secure with washers and clips. Spot weld anchor pins or attach with a waterproof adhesive especially designed for use on metal surfaces. Apply insulation with joints tightly butted. Neatly bevel insulation around nameplates and access plates and doors. Each pin or anchor shall be capable of supporting a 20-pound load. Cut off protruding ends of pins, after clips are sealed with coating compound conforming to manufacturer's recommended vapor barrier coating and reinforced with open weave glass membrane.

3.3.2 Flexible Blanket Insulation

Apply insulation with all joints tightly butted. Secure insulation to ductwork with adhesive in 6-inch wide strips on 12-inch centers. Staple laps of jacket with outward clinching staples and seal with foil scrim kraft (FSK) tape. For ductwork over 24 inches on horizontal duct runs, provide pins, washers and clips. Provide pins on sides of vertical ductwork being insulated. Space pins and clips on 18-inch centers and not more than 18 inches from duct corners. Carry insulation over standing seams and trapeze-type hangers. Install speed washers with pins and pin trimmed to washer. Sagging of flexible duct insulation will not be permitted. Cut off protruding ends of pins after clips are secured and sealed with coating compound conforming to manufacturer's recommended vapor barrier coating. In cold air ducts, vapor seal all joints and staple as specified.

3.3.3 Insulation Finishes and Joint Sealing

Fill all breaks, punctures, and voids with vapor barrier coating compound conforming to manufacturer's recommended vapor barrier coating. Vapor seal all joints by embedding a single layer of 3-inch wide open weave glass membrane, 20 by 20 mesh maximum size between two 1/16-inch wet film thickness coats of vapor barrier coating compound. Draw glass fabric smooth and tight with a 1 2-inch overlap. At jacket penetrations such as hangers, thermometers, and damper operating rods, fill voids in the insulation with vapor barrier coating. Brush a coat of vapor barrier coating where required on HVAC ducts. Provide vapor barrier jacket continuous across seams, reinforcing, and

projections. Where height of projections is greater than insulation thickness, carry insulation and jacket over the projection.

3.3.4 Access Plates and Doors

On acoustically lined ducts, plenums, and casings, provide insulation on access plates and doors. On externally insulated ducts, plenums, and casings, provide insulation-filled hollow steel panels and doors for access openings. Bevel insulation around access plates and doors.

3.4 FIELD INSPECTION

Visually inspect to ensure that materials provided conform to specifications. Inspect installations progressively for compliance with requirements.

TABLE I

Insulation Material For Piping

<u>Service</u>	<u>Material</u>	<u>Spec</u>	<u>Type</u>	<u>Class</u>	<u>Vapor</u>
				<u>Barrier</u>	<u>Required</u>
A/C Condensate Drains and Refrigerant Lines	Flexible Unicellular	ASTM C534	I or II		No
Domestic Water Above Ceilings (Hot or Cold)	Mineral Fiber	ASTM C547	I or II		Yes
Sewer pipes from Floor Drains serving AHUs, Roof Drains and Emergency Overflow Drain Leaders (Including Underside of Roof Drain Fittings)(Blanket Type Ductwrap)	Mineral Fiber	ASTM C553	I	B-3	Yes
Exposed Domestic Water Piping and Drains in Areas for Handicap Personnel	Flexible Unicellular	ASTM C534	I or II		No

TABLE II

Piping Insulation Wall Thickness

Tube and Pipe Size (Inches)

<u>Service</u>	<u>Material</u>	<u>¼ to 1-1/4</u>	<u>1-1 /2 to 3</u>	<u>3-1/2 to 5</u>	<u>6" & Larger</u>
AC Condensate Drains, Refrigerant Lines and Exposed Drains	Flexible Unicellular	¾	¾	¾	--
Domestic Water Above Ceilings (Hot or Cold)	Mineral Fiber	1	1	1	--
Sewer Pipe from Drains Receiving Condensate, Horizontal Roof Drain Leaders and Emergency Overflow Drains Including Underside of Roof Drain Fittings	Mineral Fiber	2	2	2	2

Note: Insulation on piping installed outdoors or within unconditioned spaces shall be increased by one inch above size shown in Table II.

END OF SECTION 230080

SECTION 230350 - SPLIT SYSTEM HEAT PUMP UNITS

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

Section 23 00 50, "Mechanical General Requirements", applies to this section with the additions and modifications specified herein. Any requirements shown or specified on the project drawings related to the equipment of this section also applies to this section.

1.2 SUBMITTALS

Submit the following:

1.2.1 Manufacturer's Catalog Data

a. Split System Heat Pump Units

1.2.2 Operation and Maintenance Manuals

a. Split System Heat Pump Units

1.3 SAFETY

Comply with OSHA 29 CFR 1910.

1.4 Refer to Division-26 sections for the following work; not work of this section.

1.4.1 Power supply wiring from power source to power connection on unit. Include starters, disconnects, and required electrical devices, except where specified as furnished, or factory installed by manufacturer.

1.4.2 Interlock wiring between electrically operated equipment units; and between equipment and field-installed control devices.

1.5 Control wiring specified as work of Division-23 for Automatic Temperature Controls is work of that section.

1.6 CODES AND STANDARDS:

1.6.1 AMCA Compliance:

Test and rate units in accordance with AMCA standards.

1.6.2 NFPA Compliance:

Provide split system unit internal insulation, adhesives, and coatings having flame spread rating not over 25 and smoke developed rating no higher than 50; and complying with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".

1.6.3 UL and NEMA Compliance:

Provide electrical components required as part of units, which have been listed and labeled by UL and comply with NEMA Standards.

1.6.4 NEC Compliance:

Comply with National Electrical Code (NFPA 70) as applicable to installation and electrical connections of ancillary electrical components of outside air units.

1.6.5 ASHRAE Compliance:

Construct and install refrigerant coils in accordance with ASHRAE 15 "Safety Code for Mechanical Refrigeration".

1.6.6 Coordination:

The contractor shall be responsible for coordinating unit type, orientation, connections, installation clearances, and the like with the manufacturer and in the field. Units shall be placed so that space is available for access to all components requiring regular or infrequent maintenance. Piping and ductwork shall be installed clear of motor service space, filter removal space, access door swings, removable panel space, and the like. Installations, which do not meet these requirements, shall be corrected at no additional cost to the Owner.

1.7 SPLIT SYSTEM HEAT PUMP UNIT SUBMITTALS:

1.7.1 Product Data:

Submit manufacturer's technical product data for split system heat pump units showing dimensions, weights, capacities, certified ratings, fan performance curves with operating point clearly indicated, motor electrical characteristics, metal gauges, finishes of materials, and installation instructions.

1.7.2 Wiring Diagrams:

Submit manufacturer's electrical requirements for power supply wiring to split system heat pump units. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory installed and portions to be field installed.

1.7.5 Maintenance Data:

Submit maintenance instructions, including instructions for lubrication, filter replacement, motor and drive replacement, and spare parts lists. Include this data, product data, shop drawings, and wiring diagrams in Operation and Maintenance manuals.

PART 2 – PRODUCTS

2.1 SPLIT SYSTEM HEAT PUMP UNITS:

Split system heat pumps shall be UL approved, rated in accordance with ARI 210/240 and shall be designed as a complete system by one manufacturer. Units shall utilize R-410A refrigerant

2.1.1 Acceptable Manufacturers:

Provide split system heat pump units as manufactured by Trane, Lennox, York or Engineer approved equal shall be considered provided the construction specifications, capacities and performance criteria are met. Units shall have overall dimensions as indicated and fit into the space available with adequate clearance for service as determined by the Engineer. Basis of design is Trane air handling units with remote heat pump unit. All units shall be provided with necessary transformers and electrical components to create a complete system.

2.1.2 Air Handler:

Provide factory fabricated and factory tested indoor blower unit with belt-driven or direct drive fan, multi-speed blower motor, direct expansion coil, condensate drain pan, electric heater, connections for supply and return air ductwork and all necessary controls, transformers, etc as required for a complete system and as indicated on the drawings. Air handlers shall be UL listed and internally lined with fiber glass insulation with a minimum thermal insulation value of R-4.2. Coils shall be constructed of copper tubes mechanically expanded into enhanced surface aluminum fins. Fans shall be forward curved, dynamically and statically balanced. Electric heaters shall be factory installed and include all safeties and controls.

2.1.3 Outdoor Heat Pump Unit:

Provide efficiencies as indicated on the drawings for the heat pumps units. Provide units with PVC coated steel coil guard or louvered panels to protect condenser coil from damage. Provide hermetic compressor with contactor and low pressure switch. Units shall have factory installed filter driers and anti-recycle time delays. Units shall have microprocessor controlled defrost control systems. Compressors shall be mounted on rubber isolators to reduce operating sounds. Units shall be capable of cooling down to 30°F outdoor ambient temperatures. Provide all 3-phase equipment with low-voltage, over-voltage and phase failure protection.

2.1.4 Filter Rack:

Provide factory fabricated, filter rack for each split system heat pump unit designed to mount in the return air ductwork. Field fabricated units will not be acceptable. Filter racks shall have removable access door and shall be designed for 1” thick pleated throwaway filters. Provide two filters for each unit, one installed and one spare.

2.1.5 Warrantee:

Provide full one year warrantee including all parts, labor, travel, etc. as required to completely warrantee all split system heat pumps systems for one year. In addition to one

year warrantee, all compressors shall include a five year parts only warrantee.

2.2 DUCTWORK

See section 23 08 50, "Ductwork and Ductwork Accessories."

2.3 MOTORS AND MOTOR STARTERS

NEMA MG 1, NEMA ICS 2, and NEMA ICS 6, respectively, with electrical characteristics as indicated. Motors shall be open drip proof.

PART 3 – EXECUTION

3.1 INSTALLATION

Install air distribution equipment as indicated and in accordance with the manufacturer's instructions. Provide clearance for inspection, repair, replacement, and service (minimum of 24" all sides). Electrical work shall conform to NFPA 70 and Division 16, "Electrical." Provide overload protection in the operating disconnect switches and magnetic starters.

3.2 PROTECTION OF EQUIPMENT

Deliver equipment to site in sealed containers or weatherproof wrap. Mechanical equipment spaces shall be ready to receive units prior to shipment. Follow manufacturer's printed instructions for unloading and moving equipment. Handle and place equipment with care to avoid damage to casing or structural components. Protect equipment during construction with coverings, and build temporary catwalks over units when workmen require overhead access in unit location.

The contractor shall be fully responsible for protection of heat pump units throughout the construction process and until final acceptance by the Engineer. Damaged units shall be removed and replaced by the contractor with new units meeting the requirements of these specifications. The replacement shall be at no additional cost to the Owner and with no increase in the contract time.

3.3 GENERAL

Examine areas and conditions under which heat pump units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer. Install heat pump units where indicated, in accordance with equipment manufacturer's published installation instructions, and with recognized industry practices, to ensure that units comply with requirements and serve intended purposes.

3.4 COORDINATION

Coordinate with other work, including ductwork, floor construction and piping, as necessary to interface installation of air handling units with other work.

3.5 ACCESS

Provide access space around air handling units for service as indicated, but in no case less than that recommended by manufacturer.

3.6 ELECTRICAL WIRING

Install electrical devices furnished by manufacturer but not specified to be factory mounted. Furnish copy of manufacturer's wiring diagram submittal to electrical Installer. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-16 sections. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.

3.7 PIPING CONNECTIONS

Provide piping, valves, accessories, gages, and supports as recommended by the manufacturer. Provide trapped, condensate drain piping from each drain connection and extend independently to disposal point as part of this section's work.

3.8 DUCT CONNECTIONS

Refer to Division-15 Air Distribution sections and the drawings. Provide ductwork, accessories, and filter racks as indicated.

3.9 TESTING

Upon completion of installation of heat pump units, start-up and operate equipment to demonstrate capability and compliance with requirements. Field correct malfunctioning units, then retest to demonstrate compliance.

3.10 START-UP PROCEDURES:

3.10.1 Contractor Responsibilities:

At a minimum the Contractor shall perform the following start-up checks, coordinate with the manufacturer of the heat pump unit furnished for additional start-up items to be performed:

1. Check that the unit is completely and properly installed with ductwork connected.
2. Check that all construction debris is removed and filters are clean.
3. Check that all electrical work is complete and properly terminated.
4. Check that all electrical connections are tight and that the proper voltage is connected. Phase imbalance must not exceed 2%. (call electrical contractor for correction)
5. Check that the condensate drain is trapped and meets Engineer's depth requirements.
6. Rotate the shaft by hand to be sure it is free.
7. Start and run fan. Observe the rotation. If the fan operates backward, have the electrical contractor reverse two legs of the three-phase supply power.

3.11 SPARES

Provide two complete sets of filters for each unit. Spare filters shall be neatly stored in the mechanical space of the unit for which they were furnished.

3.12 TESTING AND BALANCING

After specified start-up procedures and preliminary tests are complete the Contractor shall test, adjust, and balance the heat pump unit and air distribution equipment in accordance with Section 23 09 50, "Testing, Adjusting, and Balancing".

END OF SECTION 230350

SECTION 230750 - EXHAUST FANS

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

Section 23 00 50, "Mechanical General Requirements," applies to this section with the additions and modifications specified herein. Any requirements shown or specified on the project drawings related to the equipment of this section also applies to this section.

1.2 SUBMITTALS

Submit the following:

1.2.1 Manufacturer's Catalog Data

- a. Exhaust Fans
- b. Supply Fans
- c. Relief Hoods

Include sound rating data and sound power level for all octave-band center frequencies or loudness level.

1.2.2 Operation and Maintenance Manuals

- a. Exhaust Fans
- b. Supply Fans
- c. Relief Hoods

1.3 SAFETY

Comply with OSHA 29 CFR 1910.

1.4 Refer to Division-26 sections for the following work; not work of this section.

1.4.1 Power supply wiring from power source to power connection on unit. Include starters, disconnects, and required electrical devices, except where specified as furnished, or factory installed by manufacturer.

1.4.2 Interlock wiring between electrically operated equipment units; and between equipment and field-installed control devices.

1.5 Control wiring specified as work of Division-23 for Automatic Temperature Controls is work of that section.

1.6 CODES AND STANDARDS:

1.6.1 AMCA Compliance:

Test and rate air terminal units and exhaust fans in accordance with AMCA standards.

1.6.2 ARI Compliance:

Test and rate air terminal units and exhaust fans in accordance with applicable ARI standards (latest published editions), and ARI 410 for coils, display certification symbol on units of certified models.

1.6.3 NFPA Compliance:

Provide air terminal unit internal insulation, adhesives, and coatings having flame spread rating not over 25 and smoke developed rating no higher than 50; and complying with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".

1.6.4 UL and NEMA Compliance:

Provide electrical components required as part of equipment, which have been listed and labeled by UL and comply with NEMA Standards.

1.6.5 NEC Compliance:

Comply with National Electrical Code (NFPA 70) as applicable to installation and electrical connections of ancillary electrical components of air handling equipment.

1.6.6 Coordination:

The contractor shall be responsible for coordinating air terminal unit and exhaust fan type, orientation, connections, installation clearances, and the like with the manufacturer and in the field. Units shall be placed so that space is available for access to all components requiring regular or infrequent maintenance. Ductwork shall be installed clear of motor service space, access door swings, removable panel space, and the like. Installations, which do not meet these requirements, shall be corrected at no additional cost to the Owner.

1.7 FAN SUBMITTALS:

1.7.1 Product Data:

Submit manufacturer's technical product data for air handling equipment showing dimensions, weights, capacities, certified ratings, fan performance curves with operating point clearly indicated, motor electrical characteristics, metal gauges, finishes of materials, and installation instructions.

1.7.2 Computer Data:

Submit computer-generated data (inputs and outputs) indicating ARI certified capacities for applicable equipment. Submit equipment sound power levels based on test qualified according to AMCA 300 and ANSI S1.31 and S1.32.

1.7.3 Shop Drawings:

Submit assembly-type shop drawings showing unit dimensions, weight loadings, required clearances, construction details, and field connection details.

1.7.4 Wiring Diagrams:

Submit manufacturer's electrical requirements for power supply wiring to air handling equipment. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory installed and portions to be field installed.

1.7.5 Maintenance Data:

Submit maintenance instructions, including instructions for lubrication, filter replacement, motor and drive replacement, and spare parts lists. Include this data, product data, shop drawings, and wiring diagrams in Operation and Maintenance manuals.

PART 2 – PRODUCTS

2.1 FANS

Sound rating per AMCA 300; statically and dynamically balanced, with air capacities, brake horsepower, fan types, fan arrangement, sound power levels or loudness level, and static pressure, as indicated on the drawings. Provide guard (bird) screens for outdoor inlets and outlets. Equip with automatic (backdraft) dampers where indicated. Have thermal overload protection in the operating disconnect switches within the building. Construct housings and fan wheels of aluminum or steel, except as specified otherwise. Provide factory fabricated roof curbs with fans (except when drawings indicate existing curbs). Curbs shall be designed to accommodate for structural roof slope where required. Curbs shall be minimum of 18 inches high. Where fans are indicated to be interlocked with thermostats, the mechanical contractor shall supply the thermostat and coordinate installation with the electrical contractor.

2.1.1 Roof Mounted Kitchen Hood Exhaust Fan:

Spun aluminum exhaust fans shall be direct drive upblast type. The fan wheel shall be centrifugal backward inclined, constructed of aluminum and shall include a wheel cone carefully matched to the inlet cone for precise running tolerances. Wheels shall be statically and dynamically balanced at the factory. The fan housing shall be constructed of heavy gauge aluminum with a rigid internal support structure and a bird screen.

Motors shall be mounted on vibration isolators – out of the air stream. Fresh air for motor cooling shall be drawn into the motor compartment through a large space between the fan shroud and the motor cover. Motors shall be readily accessible for maintenance.

A disconnect switch shall be factory installed and wired from the fan motor to a junction box. A conduit chase shall be provided through the base to the motor compartment for ease of electrical wiring.

All fans shall bear the AMCA Certified Ratings Seal for sound and air performance. Each fan shall bear a permanently affixed manufacturer's engraved metal nameplate containing the model number and individual serial number for future identification. Fans shall be installed in accordance with NFPA 96.

Fans shall be manufactured by Captive Aire, Loren Cook, Greenheck or engineer approved equal.

2.1.2 Ceiling Mounted and Inline Exhaust Fans:

Ceiling mounted and inline exhaust fans shall be of the centrifugal direct drive type. The fan housing shall be constructed of heavy gauge galvanized steel. The housing interior shall be lined with ½ inch acoustical insulation. The outlet duct collar shall include an aluminum back draft damper and shall be adaptable for horizontal or vertical discharge. The designer grille shall be constructed of high-impact non-yellowing polystyrene.

The access for wiring shall be external. The motor disconnect shall be internal and of the plug-in type. The motor shall be mounted on vibration isolators. The fan wheel(s) shall be of the forward curved centrifugal type and dynamically balanced. All fans shall bear the AMCA Certified Ratings Seal for sound and air performance and shall be UL/cUL Listed.

Where indicated on drawings, provide solid-state speed controller, factory mounted and wired within or on the cabinet for test and balancing.

Ceiling Mounted and Inline Exhaust Fans shall be GEMINI as manufactured by Cook or approved equal by Greenheck. All wall caps, louvers, roof caps and roof curbs required by these fans, shall be furnished by the Contractor.

2.1.3 Roof Mounted Exhaust Fans:

Spun aluminum exhaust fans shall be direct drive down blast type. The fan wheel shall be centrifugal backward inclined, constructed of 100% aluminum, including a precision machined cast aluminum hub. An aerodynamic aluminum inlet cone shall be provided for maximum performance and efficiency. Wheels shall be statically and dynamically balanced at the factory. The fan shall be of bolted and welded construction utilizing corrosion resistant fasteners. The spun aluminum structural components shall be constructed of minimum 16 gauge marine alloy aluminum, bolted to a rigid aluminum support structure. The aluminum base shall have continuously welded curb cap corners for maximum leak protection. The discharge baffle shall have a rolled bead for added strength. An integral conduit chase shall be provided through the curb cap and into the motor compartment to facilitate wiring connections. The motor shall be enclosed in a weather-tight compartment, separated from the exhaust airstream. Unit shall bear an engraved aluminum nameplate. Nameplate shall indicate design CFM and static pressure.

Motors shall be heavy duty type with permanently lubricated sealed bearings and furnished at the specified voltage, phase and enclosure.

A disconnect switch shall be factory installed and wired from the fan motor to a junction box. A conduit chase shall be provided through the base to the motor compartment for ease of electrical

wiring.

All fans shall bear the AMCA Certified Ratings Seal for sound and air performance. Each fan shall bear a permanently affixed manufacturer's engraved metal nameplate containing the model number and individual serial number for future identification.

Fans shall be manufactured by Loren Cook, Greenheck or engineer approved equal.

2.1.4 In-line Centrifugal Fans

AMCA 210 with AMCA seal and UL label. Each fan shall be designed for in-line mounting in ductwork with air entering and leaving the fan axially. The fan housing shall be minimum 20 gauge-galvanized steel with ½ inch thick acoustical fibrous glass insulation. Inlet and outlet collars shall be provided for connection of the fan housing to ductwork. The fan wheel shall have centrifugal backward inclined blades, shall be of aluminum construction, and shall be belt driven. The fan motor shall be permanently lubricated with built in thermal overload protection and shall be provided with vibration isolating mounts. One side of the fan housing shall be equipped with a hinged access door assembly supporting the motor, fan wheel, and inlet cone. The access door shall swing out for fan service without dismantling the fan in any way. Flexible wiring leads shall be provided from the fan motor to a factory mounted external junction box and disconnect switch permitting the access door to be opened without disconnecting the field wiring.

Fans shall be manufactured by Loren Cook, Greenheck or engineer approved equal.

2.1.5 Roof Mounted Relief Hoods:

Hoods shall be spun aluminum, roof mounted gravity ventilators. The unit shall be bolted and welded construction utilizing corrosion resistant fasteners. The spun aluminum structural components shall be constructed of minimum 16 gauge marine alloy aluminum, bolted to a rigid aluminum support structure. The aluminum base shall have continuously welded curb cap corners for maximum leak protection. The spun aluminum baffle shall have a rolled bead for added strength. Birdscreen constructed of ½" mesh shall be mounted across the air opening. Unit shall bear an engraved aluminum nameplate. Nameplate shall bear the design CFM and static pressure. Provide with factory fabricated roof curb designed for the specific roofing application.

Fans shall be manufactured by Loren Cook, Greenheck or engineer approved equal.

2.2 DUCTWORK

Section 23 08 50, "Ductwork and Ductwork Accessories."

All kitchen hood exhaust ductwork shall be all continuously welded stainless steel construction in strict accordance with NFPA 96 and the 2010 FLORIDA BUILDING CODE – MECHANICAL SECTION 506.

All dishwasher exhaust ductwork shall be all continuously welded stainless steel construction in strict accordance with NFPA 96.

2.3 MOTORS AND MOTOR STARTERS

NEMA MG 1, NEMA ICS 2, and NEMA ICS 6, respectively, with electrical characteristics as indicated. Motors shall be open drip proof.

PART 3 – EXECUTION

3.1 INSTALLATION

Install air distribution equipment as indicated and in accordance with the manufacturer's instructions. Provide clearance for inspection, repair, replacement, and service. Electrical work shall conform with NFPA 70 and Division 26, "Electrical." Provide overload protection in the operating disconnect switches and magnetic starters.

3.2 PROTECTION OF EQUIPMENT

Deliver equipment to site in sealed containers or weatherproof wrap. Mechanical equipment spaces shall be ready to receive units prior to shipment. Air handling units shall not be stored outdoors. Follow manufacturer's printed instructions for unloading and moving equipment. Handle and place equipment with care to avoid damage to casing or structural components. Protect equipment during construction with coverings, and build temporary catwalks over equipment when workmen require overhead access in unit location.

The contractor shall be fully responsible for protection of air handling equipment throughout the construction process and until final acceptance by the Engineer. Damaged equipment shall be removed and replaced by the contractor with new equipment meeting the requirements of these specifications. The replacement shall be at no additional cost to the Owner and with no increase in the contract time.

3.3 GENERAL

Examine areas and conditions under which air handling equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer. Install air handling equipment where indicated, in accordance with equipment manufacturer's published installation instructions, and with recognized industry practices, to ensure that units comply with requirements and serve intended purposes.

3.4 COORDINATION

Coordinate with other work, including ductwork, floor construction and piping, as necessary to interface installation of air handling units with other work.

3.5 ACCESS

Provide access space around air handling equipment for service as indicated, but in no case less than that recommended by manufacturer.

3.6 ELECTRICAL WIRING

Install electrical devices furnished by manufacturer but not specified to be factory mounted. Furnish copy of manufacturer's wiring diagram submittal to electrical Installer. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-26 sections. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.

3.7 DUCT CONNECTIONS

Refer to Division-23 Air Distribution sections and the drawings. Provide ductwork, accessories, and flexible connections as indicated.

Field installed flexible duct connectors are not required if air handling equipment is provided with factory installed internal fan discharge flexible connectors.

3.8 TESTING

Upon completion of installation of air handling units, start-up and operate equipment to demonstrate capability and compliance with requirements. Field correct malfunctioning units, then retest to demonstrate compliance.

3.9 SPARES

Provide one spare set of belts for each belt-driven exhaust fan, obtain receipt from Owner that belts have been received.

3.10 TESTING AND BALANCING

After preliminary tests, test, adjust, and balance the air handling and distribution equipment in accordance with Section 23 09 50, "Testing, Adjusting, and Balancing HVAC Systems".

END OF SECTION 230750

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SECTION 230850 - Ductwork and Ductwork Accessories

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

Section 23 00 50, "General Mechanical Requirements," applies to this section with the additions and modifications specified herein. Any requirements shown or specified on the project drawings related to the equipment of this section also applies to this section.

1.2 SUBMITTALS

Submit the following.

1.2.1 Manufacturer's Catalog Data

1. Dampers
2. Flexible ducts and connectors
3. Diffusers, registers and grilles

1.3 QUALITY ASSURANCE

SMACNA Duct Construction Manuals: The SMACNA recommendations shall be considered as mandatory requirements. Substitute the word "shall" for the word "should" in these manuals.

1.4 PRESSURE-VELOCITY CLASSIFICATION

SMACNA HVACDCS, Section 1, and as indicated.

PART 2 - PRODUCTS

2.1 BASIC MATERIALS

2.1.1 Galvanized Steel Sheets

ASTM A527/527M; coating designation G90.

2.1.2 Galvanized Steel Hot Dipped After Fabrication

ASTM A123.

2.1.3 Corrosion Resisting (Stainless) Steel Sheets

ASTM A167.

2.2 DUCTS OF PRESSURE CLASSES 3-INCH OR LESS WATER GAUGE

Construction, metal gauge, hangars and supports, and reinforcements shall conform with SMACNA HVACDCS. Ductwork shall be airtight and shall not vibrate or pulsate when system is in operation. Air leakage shall be less than 5 percent of the system capacity. Construct ductwork of galvanized steel. All major duct runs shall be pressure tested for leakage prior to insulating. Coordinate with test and balance contractor.

2.2.1 Curved Elbows

Make a centerline radius not less than 1 ½ times the width or diameter of the duct.

2.2.2 Joints

Make airtight. No dust marks from air leaks shall show at duct joints or connections to grilles, registers, and diffusers. All duct joints and sealing of duct joints shall comply with applicable sections of the current Florida Mechanical Code.

2.2.3 Laps

Make laps at joints in the direction of airflow. Space button-punch or bolt-connection in standing seams at fixed centers not greater than 6 inches. Longitudinal locks or seams, known as "button-punch snap-lock," may be used in lieu of Pittsburg Lock, but will not be permitted on aluminum ducts.

2.2.4 Fittings

Elbows, vaned elbows, take-offs, branch connections, transitions, splitters, volume dampers, fire dampers, flexible connections, and access doors shall conform with SMACNA HVACDCS, Section 2.

2.3 KITCHEN HOOD EXHAUST AND DISHWASHER EXHAUST DUCTS

All kitchen hood exhaust ductwork shall be all continuously welded stainless steel construction in strict accordance with NFPA 96 and the 2010 FLORIDA BUILDING CODE – MECHANICAL SECTION 506.

All dishwasher exhaust ductwork shall be all continuously welded stainless steel construction in strict accordance with NFPA 96.

2.4 FLEXIBLE DUCTS AND CONNECTORS

UL 181, Class I, UL listed, SMACNA HVACDCS, and additional requirements herein specified. Use to connect between rigid ducts and outlets or terminals. There shall be no erosion, de-lamination, loose fibers, or odors from the ducts into the air stream. At 250 degrees F, minimum-rating pressures shall be 6 inches water positive and 4 inch negative, up to 5,000 fpm flexible ducts. Flexible ducts shall be maximum 8 feet in length. Minimum bend radius shall be 1 ½ the duct diameter.

2.4.1 Materials

Corrosion resistant galvanized steel helix formed and mechanically locked to fabric. Liner shall be constructed of a CPE inner film with sound attenuating properties. Flexible ducts shall be Flexmaster

Type 8M or approved equal.

2.4.2 Insulation and Vapor Barrier

ASTM C553; minimum one-inch nominal thickness. Sheathe the insulation with a fire retardant reinforced aluminum material vapor barrier having a maximum water vapor permeance of 0.05 perm in accordance with ASTM E96, Procedure A. Coat ends of insulation with cement to prevent erosion and delamination.

2.5 DIFFUSERS, REGISTERS, AND GRILLES

2.5.1 Material and Finishes

Construct diffusers, registers, and grilles of steel. Exterior and exposed edges shall be rolled, or otherwise stiffened and rounded. Steel parts shall be factory zinc phosphate treated prior to priming and painting or have a baked-on enamel finish. Colors shall be selected or approved by Architect. Location of all diffusers, registers and grilles shall be as indicated on reflected ceiling plans. Manufacturers shall be Titus, Nailor, or Price.

2.5.2 Room NC Criteria

All supply / exhaust / return / relief air diffusers, registers and grilles shall not exceed the following room noise criteria (NC) as published in manufacturer's catalog test data:

Classrooms	20
All Other Spaces	25

2.5.3 Ceiling Diffusers

Equip with baffles or other devices required to provide proper air distribution pattern. Except for linear air diffusers, internal parts shall be removable through the diffuser neck for access to the duct and without the use of special tools.

2.5.3.1 Ceiling Diffusers (CD)

Construct each ceiling diffuser of four or more concentric elements designed to deliver air in a generally horizontal direction without excess smudging of the ceiling. Ceiling diffusers shall be four-way blow unless otherwise indicated on drawings with arrows. The interior elements of ceiling diffusers shall be square. Diffusers for lay-in 2' X 2' ceiling grid shall be provided with extended panel. Round duct connection and face size shall be as shown on drawings. Diffusers shall be Titus TDC or approved equal.

2.5.3.2 Curved Blade Ceiling Register (CR)

Curved blade ceiling registers shall be of the sizes and mounting types shown on the plans. Registers shall have curved deflectors which are individually adjustable from the face of the register to regulate air volume and angle of discharge. Registers shall be built in 1, 2, 3, or 4-way discharge patterns. The registers shall be constructed of 0.051 aluminum with miscellaneous steel components.

The register finish shall be # 26 white. The finish shall be an anodic acrylic paint, baked 315 degrees F

for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100 hour ASTM D117 Corrosive Environments Salt Spray Test without creepage, blistering, or deterioration of film. The paint must pass a 250 hour ASTM-870 Water Immersion Test. The paint must also pass the ASTM D-2794 Reverse Impact Cracking Test with a 50 inch pound force applied.

Opposed blade volume damper shall be constructed of heavy gauge steel and shall be operable from the face of the register.

The manufacturer shall provide published performance data for the diffuser. The diffuser shall be tested in accordance with ANSI/ASHRAE Standard 70-1991. Curved blade ceiling diffusers shall be Titus model 250-AA or approved equal. Provide registers with extended panel designed to install in 2x2 lay-in ceiling.

2.5.4 Return Air Registers (RAR)

Return air registers shall have fixed blades spaced every 3/4" and with a deflection angle of 35 degrees. Construction shall be steel with a 1-1/4" wide border on all sides. Screw holes shall be countersunk for a neat appearance. Corners shall be welded with full penetration resistance welds. Provide registers with an opposed blade volume damper constructed of heavy gauge steel. Damper shall be operable from the face of the register. Return air registers shall be Titus Model 350RL or approved equal.

2.5.5 Return Air Grilles (RAG)

Construct and finish as specified above for return air registers, except that volume dampers shall be omitted.

2.5.6 Side Wall Supply Air Register (SWR)

Aluminum supply registers shall be of the double deflection type for the sizes and mounting types shown on the plans. The deflection blades shall be parallel to the short dimension of the register. All supply grilles shall be constructed with a 1-1/4" heavy aluminum border having a minimum thickness of 0.040" – 0.050". Outer borders shall be assembled and interlocked at the four corners and mechanically staked to form a rigid frame. Screw holes shall be recessed for a neat appearance.

Blades shall be constructed of heavy duty aluminum and shall be contoured to a specifically designed airfoil cross-section to meet published performance data. Hollow blades are not acceptable – blades must be solid. Blades shall be spaced 3/4" apart and shall extend completely through the side frame on each side to ensure stability throughout the complete CFM range of the register. Blades shall be individually adjustable without loosening or rattling and shall be securely held in place with tension wire.

Opposed blade volume damper shall be constructed of heavy gauge steel and shall be operable from the face of the register.

The grille finish shall be # 26 white. The finish shall be an anodic acrylic paint, baked 315 degrees F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100 hour ASTM D117 Corrosive Environments Salt Spray Test without creepage, blistering, or deterioration of film. The paint must pass a 250 hour ASTM-870 Water Immersion Test. The paint must also pass the ASTM D-2794 Reverse Impact Cracking Test with a 50 inch pound force applied.

The manufacturer shall provide published performance data for the grille. The register shall be tested in accordance with ANSI/ASHRAE Standard 70-1991. Side wall supply air registers shall be Titus model 272FS or approved equal by Price.

2.5.7 Filtered Return Air Grilles (FRAG)

Filtered return air grilles shall have fixed blades spaced every 3/4" and with a deflection angle of 35 degrees. Construction shall be steel with a 1-1/4" wide border on all sides. Screw holes shall be countersunk for a neat appearance. Corners shall be welded with full penetration resistance welds. Filtered return air grilles shall be Titus Model 350RLF or approved equal.

2.6 DUCT SLEEVES AND PREPARED OPENINGS

2.6.1 Duct Sleeves and Closure Collars

Fabricate from minimum 20-gauge galvanized steel.

2.6.2 Prepared Openings

Provide one-inch clearance between the duct and the sleeve.

2.7 DEFLECTORS

For round ducts taking off from rectangular ducts, provide factory fabricated, galvanized sheet metal, side take-off fittings. These fittings shall have butterfly dampers and locking quadrant operators and shall have 45-degree entry fitting (no scoops) to minimize turbulence.

2.8 ACCESS DOORS

Weld doorframe in place. Door shall be rigid and airtight with neoprene gaskets and two or more steel hinges and tension fasteners. Provide doors as large as practical. Mount doors, if possible, so that air pressure holds them closed.

2.9 DAMPERS

Construct dampers with two gauges heavier than ducts in which installed. Except as modified herein, the construction shall be of galvanized steel with interlocking edges and maximum 10-inch blade width. Conform with SMACNA HVACDCS. Dampers shall be opposed-blade type.

2.9.2 Splitter and Manual Volume Dampers

Balancing, factory-fabricated type. Equip dampers with accessible mechanism such as quadrant operators or 3/16-inch rods brought through the side of ducts with locking setscrew and bushing. Where quadrant operators are used they shall be chrome plated or enamel painted with all exposed edges rounded.

2.9.3 Fire Dampers (FD)

2.9.3.1 Fire Dampers – Multiple Blade Dynamic Fire Damper (1-1/2 hour)

Furnish and install at locations show on plans multiple blade fire dampers constructed and tested in accordance with UL Safety Standard 555 that meet or exceed the following specifications. Damper frame shall be constructed using the Uni-frame Design Concept (UDC) and shall be a minimum of 16 gage galvanized steel formed into a structural hat shaped steel channel structurally superior to 13 gage channel frame. The blades shall be single piece airfoil shaped with 14 gage equivalent thickness. Bearings shall be stainless steel sleeve turning in an extruded hole in the frame

Each damper shall have a 1-1/2 hour fire protection rating, 165F fusible link, and shall have been tested to close under dynamic airflow conditions in a multiple section size with pressures up to 8" and velocities up to 4,000 fpm. Dampers shall be AMCA licensed for air performance and shall bear the AMCA Certified Ratings Seal.

Dampers shall include an all welded steel sleeve (16" length) and retaining angles furnished by the damper manufacturer to ensure appropriate installation. Provide factory fabricated square to round transitions where required. Dampers shall be Ruskin Model FD60 or approved equal by Greenheck.

2.9.4 Automatic Fire-Smoke Dampers (FSD)

Provide combination fire smoke dampers meeting or exceeding the following specifications. Frame shall be a minimum of 16 gauge-galvanized steel formed into a structural hat channel shape with tabbed corners for reinforcement. Damper blades shall be airfoil shaped single piece construction with 14 gauge equivalent thickness. Bearings shall be stainless steel sleeve turning in an extruded hole in the frame. Blade edge seals shall be silicone rubber and galvanized steel mechanically locked into blade edge. Blade action shall be parallel blade type.

Each combination fire smoke damper shall be 1 ½ hour fire rated under UL Standard 555, and shall further be classified by Underwriters Laboratories as a Leakage Rated Damper for use in smoke control systems under the latest version of UL555S, and bear a UL label attesting to same. Damper manufacturer shall have tested, and qualified with UL, a complete range of damper sizes covering all dampers required by this specification. Testing and UL qualifying a single damper size is not acceptable. The leakage rating under UL555S shall be no higher than leakage class 1 (4 cfm/ft. at 1" w.g. and 8 cfm/ft. at 4" w.g.)

As part of the UL qualification, dampers shall have demonstrated a capacity to operate (to open and close) under HVAC system operating conditions, with pressure of at least 8" w.g. in the closed position, and 4000 fpm air velocity in the open position.

In addition to the leakage ratings already specified herein, the combination fire smoke dampers and their actuators shall be qualified under UL555S to an elevated temperature of 250°F, 350°F, or 450°F depending upon the actuator. Appropriate electric actuators shall be installed by the damper manufacturer at time of damper fabrication. Damper and actuator shall be supplied as a single entity, which meets all applicable UL555 and UL555S qualifications for both dampers and actuators. Manufacturer shall provide factory-assembled sleeve of 16" minimum length. Factory supplied welded sleeve shall be 20 gauge for dampers through 84" wide and 18 gauge above 84" wide. Damper and actuator assembly shall be factory cycled 10 times to assure operation.

All fire smoke dampers shall be equipped with a "controlled closure" heat-actuated release device to prevent duct and HVAC component damage. Instantaneous damper closure is unacceptable. Dampers shall be Ruskin Model FSD60 or approved equal by Greenheck.

2.9.5 Automatic Smoke Dampers (SD)

Provide smoke dampers meeting or exceeding specifications for combination fire and smoke dampers without the fire damper requirements. Dampers shall be Ruskin Model SD60 or approved equal by Greenheck.

PART 3 - EXECUTION

3.1 INSTALLATION

Installation shall conform to NFPA 90A, SMACNA HVACDCS and Florida Building Code, Mechanical. Provide mounting and supporting of ductwork and accessories including, but not limited to, structural supports, hangers, vibration isolators, stands, clamps and brackets, access doors, and dampers. Use electrical isolation between dissimilar metals. Electrical isolation may be fluorinated elastomers or sponge-rubber gaskets. Install ductwork accessories as indicated in accordance with the manufacturer's printed instruction. Allow clearance for inspection, repair, replacement, and service.

3.1.1 Ductwork

When air distribution systems are operated, there shall be no chatter, vibration, or dust marks. After ducts are thermally or acoustically insulated, ensure airflow area equal to duct cross section dimensions indicated.

3.1.1.1 Field Changes to Ductwork

Those required to suit the sizes of factory-fabricated equipment actually furnished, shall be designed to minimize expansion and contraction. Use gradual transitions in field changes as well as modifications to connecting ducts. Provide jumper ducts for discharging air into duct junctions as indicated.

3.1.1.2 Dampers

When installed on ducts to be thermally insulated, equip each damper operator with stand-off mounting brackets, bases, or adapters to provide clearance between the duct and operator not less than the thickness of insulation. Standoff mounting items shall be integral with the operator or standard accessory of damper manufacturer.

3.1.1.3 Deflectors

Provide in square elbows, duct-mounted supply outlets, take-off or extension collars to supply outlets, and tap-in branch-off connections. Adjust supply outlets to provide air volume and distribution as indicated or specified.

3.1.1.4 Access Doors

Provide for automatic dampers, volume dampers, fire dampers, coils, thermostats, temperature controllers, valves, and other concealed apparatus requiring service and inspection in the duct systems. Access doors shall be provided on both the entering and leaving sides of duct mounted hot water or electric heating coils for inspection and cleaning.

3.1.1.5 Duct Sleeves and Prepared Openings

Provide for ductwork penetrations through which metallic ductwork passes.

1. Duct Sleeves: Allow one-inch clearance between duct and sleeve or one-inch clearance between insulation and sleeve for insulated ducts, except at grilles, registers, and diffusers.
2. Prepared Openings: Allow one-inch clearance between duct and opening or one-inch clearance between insulation and opening for insulated ducts, except at grilles, registers, and diffusers.
3. Closure Collars: Provide minimum 4 inches wide on each side of the ductwork penetrations where sleeves or prepared openings are installed. Fit collars snugly around ducts and insulation. Grind smooth edges of collar to preclude tearing or puncturing insulation covering or vapor barrier. Use nails with maximum 6-inch centers on collars.
4. Fire Partitions: Seal duct penetrations of fire rated partitions (not requiring fire dampers) tight with U.L. classified form type sealant having a flame spread rating of 20 in accordance with ASTM E-84-80.

3.1.1.6 Packing

Pack with mineral fiber in spaces between sleeve or opening and duct or duct insulation.

3.1.2 Duct Hangers and Supports

SMACNA HVACDCS, Section 4. Unless otherwise indicated, provide not less than two one- by 1/16-inch galvanized strap-iron hangers spaced one on each side of duct. Anchor risers in the center of the vertical run to allow ends of riser free vertical movements. Attach supports only to structural framing members and concrete slabs. Do not anchor supports to metal decking unless a means is provided and approved for preventing the anchors from puncturing the metal decking. Where supports are required between structural framing member, provide suitable intermediate metal framing. Where C clamps are used, use retainer clips.

3.1.2.1 Flexible Ducts

Support ducts by hangers every 3 feet, unless supported by ceiling construction. Use stretch flexible air ducts to smooth out corrugations, and long radius elbows, where possible, using a minimum length to make connections. Flexible duct installation shall comply with general duct installation notes on the project drawings.

3.1.3 Inspection Plates and Test Holes

Provide, where required, in ductwork or casings for all balance measurements. Test holes shall be factory fabricated, airtight, and non-corrosive with screw cap and gasket. Extend cap through insulation.

3.1.4 Cleaning of Ducts

Remove all debris and dirt from ducts and wipe clean. Before installing air outlets, use air handler to blow dry air through entire system at maximum attainable velocity. Provide temporary air filters for this operation.

3.2 FIELD QUALITY CONTROL

The Contractor is responsible for the administration and direction of tests. Furnish instruments, equipment, connecting devices, and personnel for the tests. Notify Architect 5 days before inspection or testing is scheduled. Correct all defects in work. Repeat tests until the work is in compliance.

3.2.1 Balancing and Testing of Air Systems

Air and water systems shall be tested and adjusted by a certified Test and Balance Contractor. The Mechanical Contractor shall coordinate and provide assistance to test and balance contractor as required.

END OF SECTION 230850

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SECTION 230950 - Testing, Adjusting and Balancing

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

The work includes testing, adjusting, and balancing (TAB) of heating, ventilating, and cooling (HVAC) air and water distribution systems including equipment, ducts, and piping which are located within, on, under, between, and adjacent to buildings. The test and balance contractor shall be a subcontractor to the mechanical engineer.

- 1.1.1 Test and balance all fans, outside air units, split heat pump systems, mini-split air conditioning units, VRV systems, split system air conditioning units with electric heat, and all other equipment indicated on the drawings whether specifically listed here or not. Test and Balance for proper operation, airflows, and system capacities.

Systems shall be tested, adjusted, and balanced (TAB'd) in compliance with this section.

- 1.1.2 Systems shall be TAB'd in compliance with this section. Piping insulation shall terminate immediately adjacent to each flow control valve, automatic control valve, or device. For chilled water, the ends of pipe insulation and the space between ends of pipe insulation and piping shall be sealed with waterproof vapor barrier coating. After completion of work under this section, the flow control valves and devices shall be insulated under Section 15250, "Insulation for Mechanical Systems."

1.2 DEFINITIONS

1. Field check group: One or more systems of the same basic type; the subgroup of a "field check group" is a "system."
2. Out-of-tolerance data: Pertains only to field checking of certified DALT or TAB report. The term is defined as a measurement taken during field checking which does not fall within the range of plus 5 to minus 5 percent of the original measurement reported on the certified TAB report for a specific parameter.

1.3 SUBMITTALS

Submit following:

1.3.1 Statements

1. Independent TAB agency personnel qualifications
2. Design review report
3. Advanced notice for TAB fieldwork

1.3.1.1 Independent TAB Agency Personnel Qualifications

Submit following for approval.

1. Independent AABC or NEBB certified TAB agency:
 - (1) TAB agency: AABC registration number and expiration date of current certification; or NEBB certification number and expiration date of current certification.
 - (2) TAB team supervisor: Name and copy of AABC or NEBB TAB supervisor certificate and expiration date of current certification.
 - (3) Current certificates: Registrations and certifications shall be current, and valid for the duration of this contract. Certifications, which expire prior to completion of the TAB work, shall be renewed in a timely manner so that there is no lapse in registration or certification. TAB agency or TAB team personnel without a current registration or current certification shall not perform TAB work on this contract.

1.3.1.2 Design Review Report

Submit typed report describing omissions and deficiencies in the HVAC system's design that would preclude the TAB team from accomplishing the duct leakage testing work and the TAB work requirements of this section. Provide a complete explanation including supporting documentation detailing the design deficiency. State that no deficiencies are evident if that is the case.

1.3.1.3 Advanced Notices

1. Submit "Advanced Notice of Commencement of TAB Field Work" in writing.

1.3.2 Field Test Reports

Submit certified reports in the specified format including the following data.

Certified TAB report

1.3.2.1 Certified TAB Report

1. Temperatures: On each TAB report form reporting TAB work accomplished on HVAC thermal energy transfer equipment, include the indoor and outdoor dry bulb temperature range and indoor and outdoor wet bulb temperature range within which the TAB data was recorded.
2. Instruments: List the types of instruments actually used to measure the tab data. Include in the listing each instrument's unique identification number, calibration date, and calibration expiration date.
3. Certification: Include the typed name of the TAB supervisor and the dated signature of the TAB supervisor.

1.4 QUALITY ASSURANCE

1.4.1 Modifications of References

Accomplish work in accordance with referenced publications of AABC or NEBB except as modified by this section. In the references referred to herein, consider the advisory or recommended provisions to be mandatory, as though the word "shall" had been substituted for the words "should" or "could" or "may" wherever they appear.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 TAB PROCEDURES

3.1.1 TAB Field Work

Test, adjust, and balance the listed HVAC systems to the state of operation indicated on and specified in the contract design documents. Provide instruments and consumables required to accomplish the TAB work. Conduct TAB work, including sound measurement work, on the listed HVAC systems in conformance with the AABC NSTSB, or NEBB PSTABES, and NEBB PSMSV, except as modified by this section:

1. Maintenance and calibration of instruments.
2. Accuracy of measurements.
3. Air distribution systems TAB work:
 - (1) Air handling unit systems – Test and balance the supply, return and outside air of each air handling unit as indicated on the drawings.
 - (2) Balance supply, return, outside air, transfer air, and exhaust air streams in all main, branch and runout ducts out to terminal devices.
 - (3) Provide all other test and balance work as required for fully functional systems.
4. TAB work within seasonal limitations:
 - (1) Performance tests: Accomplish proportionate balancing TAB work on the air distribution systems and water distribution systems, in other words, accomplish adjusting and balancing of the air flows and water flows, any time during the duration of this contract, subject to the limitations specified elsewhere in this section. However, accomplish, within the following seasonal limitations, TAB work on HVAC systems, which directly transfer thermal energy.
5. Workmanship: Conduct TAB work on specified HVAC systems until measured parameters are within plus or minus 10 percent of the design values, that is, the values specified or indicated on the contract documents.
6. Deficiencies: Strive to meet the intent of this section to maximize the performance of the

equipment as designed and installed. However, if deficiencies in equipment design or installation prevent TAB work from being accomplished within the range of design values provide written notice as soon as possible to the Owner and Engineer describing the deficiency and recommended correction. Responsibility for correction of installation deficiencies is the Mechanical Contractor's. If a deficiency is in equipment design, call the TAB team supervisor for technical assistance. Responsibility for reporting design deficiencies to the Mechanical Contractor is the TAB team supervisor's.

3.1.2 Data From TAB Field Work

After completion of the TAB fieldwork, prepare the TAB field data for TAB supervisor's review and certification. The TAB work and thereby the TAB report shall be considered incomplete until the TAB work is accomplished to within the accuracy range specified in the paragraph titled, "Workmanship".

3.2 MARKING OF SETTINGS

Permanently mark the settings of HVAC adjustment devices including valves, splitters, and dampers so that adjustment can be restored if disturbed at any time. The permanent markings shall indicate the settings on the adjustment devices, which result in the data, reported on the submitted certified TAB report.

3.3 MARKING OF TEST PORTS

The TAB team shall permanently and legibly mark and identify the location points of the duct test ports. If the ducts have exterior insulation, these markings shall be made on the exterior side of the duct insulation.

END OF SECTION 23 09 50

SECTION 260000 – ELECTRICAL

1. RELATED DOCUMENTS: The Electrical General Requirements are supplementing and applicable to Division 26 Sections and shall apply to all phases of work specified herein, shown on the Drawings, or required to provide a complete installation of electrical systems. Section 26 is sub-divided for convenience only. Associated work specified in other Sections:

- 260100 - Electrical Methods and Basic Materials
- 260200 - Raceway Systems
- 260300 - Wire, Cable and Devices
- 260400 - Service and Distribution
- 260500 - Lighting
- 260680 - Transient Voltage Surge Suppression System

2. JOB CONDITIONS:

- A. SITE INSPECTIONS: Before submitting proposals, each bidder should visit the site and fully familiarize himself with all job conditions and shall be fully informed as to the extent of his work. No consideration will be given after bid opening date for alleged misunderstanding as to the requirements of work involved in connecting to the utilities or as to requirements of materials to be furnished.
- B. EXISTING CONDITIONS: All utilities, existing system and conditions shown on the plans as existing are approximate, and the Contractor shall verify before any work is started.
- C. SCHEDULED INTERRUPTIONS: Planned interruptions of utilities service, to any facility affected by this contract, shall be carefully planned and approved by Engineer at least ten (10) days in advance of the requested interruption. The Contractor shall not interrupt services until the Engineer has granted specific approval. The request shall indicate services to be affected, date and time of interruption and duration of outage. Request for interruption of service will not be approved until all equipment and materials required for the completion of that particular phase of work are on the job site. The work may have to be scheduled after normal working hours.
- D. ACCIDENTAL INTERRUPTIONS: All excavation and/or remodeling work required shall be performed with care so as not to interrupt other existing services (water, gas, electrical, sewer, sprinklers, etc.). If accidental utility interruption resulting from work performed by the Contractor occurs, service shall be immediately restored to its original condition without delay, by and at the expense of the Contractor, using skilled workmen of the trade required.
- E. MAINTAINING SERVICE:
 - (1) Any existing service (or operating system) which must be interrupted for any length of time shall be supplied with a temporary service if necessary for continuation of the normal operation of this facility.
 - (2) Any existing system or part of an existing system currently in operation shall remain so after all additions or renovations are made and all work is complete.

3. REGULATORY REQUIREMENTS:

- A. **CODES, PERMITS AND INSPECTIONS:** The installation shall comply with all state and federal laws and ordinances applicable to electrical installation and with the regulations of the latest published edition of the National Electric Code where such regulations do not conflict with those laws and ordinances. The Contractor shall obtain permits, and after completion of the work, shall furnish the Engineer a certificate of final inspection and approval from the applicable local inspection department. Make necessary changes to plans and specifications to meet code standards at no additional cost to the Owner. Any charges by a utility for providing service as shown shall be included in the bid and paid by the Contractor including any additions or revisions in service locations or details.
- B. **DRAWINGS AND SPECIFICATIONS:** The drawings and these specifications are complementary each to the other. What is called for by one shall be as binding as if called for by both. Omissions from the drawings and specifications of details of work which are evidently necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such work. In any case of discrepancy in the figures or catalog numbers, the matter shall be submitted to the Architect, who shall promptly make a determination in writing. Any adjustment by the Contractor shall be at the Contractor's own risk and expense. Electrical drawings are diagrammatic only. Do not scale these drawings. All equipment shall be installed in accordance with manufacturer's recommendations and any conflicting data shall be verified before bidding.
- C. **LETTERS CERTIFYING COMPLIANCE AND REVIEW:** The Contractor's bid shall be accompanied by a letter stating that these Documents will be revised, as required by any legal authority having jurisdiction and by any serving utility, with no additional cost to the Owner. As soon as practical after bidding, and before any work is commenced, the Contractor shall meet with all legal authorities having jurisdiction, review all materials and details of this project and agree on any required revisions. A letter shall be written to the Architect listing the names, dates, places of such review, the revisions required (at no additional cost). A copy of the letter shall also be sent to the reviewing authority. The Contractor shall also meet with each serving utility and repeat the above procedure. A letter certifying each meeting shall be written also with the information as described above. The Contractor shall after completion of the work, furnish the Architect a certificate of final inspection and approval from the applicable local inspection department. Make necessary changes to plans and specifications to meet code standards at no additional cost to the Owner.

4. SYSTEMS COORDINATION AND COOPERATION:

- A. **INTERFACING WITH OTHER CRAFTS:** It shall be the responsibility of the Contractor to cooperate and coordinate with all other crafts working on this project. This Contractor shall do all cutting, trenching, backfill and structural removals to permit entry of the electrical system components. The General Contractor shall do all patching and finishing. The Architect's representative shall render a decision in writing as to space allotment in congested areas. No claims for "extras" due to such decisions shall be allowed, even though the work has already been installed. When the Contractor submits for approval any item or equipment, he shall determine for himself whether or not it will fit the space

provided. If, after installation of any equipment, wiring or other items, it is determined that ample maintenance or passage space has not been provided, then the Contractor shall rearrange this work and/or furnish other equipment even though the equipment installed has been approved. A 1/2" = 1'0" scaled drawing of all electrical rooms and rooms containing electrical panels shall be submitted 10 calendar days prior to bid for approval by the Engineer of Record and submitted again with the electrical shop drawings showing the proposed location of all equipment in each room. The Contractor shall verify that all electrical panels have clearances required by code and thickness of walls are adequate for all flush mounted panels. SPACE ALLOCATION IN THESE ROOMS IS CRITICAL. ALSO SUBMIT ELEVATIONS OF EACH MAJOR WALL.

- B. EQUIPMENT FURNISHED UNDER OTHER SECTIONS: This Contractor shall furnish and install, complete electrical roughing-in and connections to all equipment furnished under other sections and as indicated on drawings. THIS INCLUDES ALL OUTLETS, PULL BOXES, HANDHOLES, CONDUIT, LADDER RACEWAY, SURFACE RACEWAYS, AND PULLSTRING AS SHOWN ON MECHANICAL, ELECTRICAL, FIRE ALARM, INTERCOM, AND TELECOMMUNICATIONS/STRUCTURED CABLING DRAWINGS. All such equipment shall be set in place as work of other sections.
- C. HEATING AND AIR CONDITIONING:
- (1) The Contractor shall furnish all branch circuit wiring to motors and control panels or centers including disconnects, receptacles, switches, and appurtenances to which the system at the units may be connected, to provide a complete system of wiring for power. Control equipment and control circuit wiring is specified in the Mechanical Section.
 - (2) Control devices to be included in the branch circuit, except those furnished integral with the equipment, will be delivered by the Heating and Air Conditioning Contractor and installed by the Electrical Contractor.
- D. POOLS AND RELATED EQUIPMENT:
- (1) The Contractor shall furnish all feeders, electrical panels, branch circuit wiring to all pumps, motors, control panels, disconnects, receptacles, switches, pool grounding and bonding system, and appurtenances to which the system at the units may be connected, to provide a complete system and operational system for both the indoor and outdoor pools and the lazy river and their respective systems. Electrical requirements and control equipment and control circuit wiring shall be as required by the pool consultant's documents which shall be obtained by the Contractor.
5. WORKMANSHIP: All work shall be executed in a neat and substantial manner by skilled workman, well qualified, and regularly engaged in the type of work required. Substandard work shall be removed and replaced by the Contractor at no cost to the Owner.
6. APPROVAL OF MATERIALS AND EQUIPMENT:

- A. **PRIOR-SUBMITTALS:** The Contractor shall base his proposal on the materials specified herein and on the drawings. Reference to a particular product by manufacturer, trade name, or catalog number establishes the quality standards of material and equipment required for this installation and is not intended to exclude products equal in quality and similar design. The Engineer of Record reserves the sole right to decide the equality of materials proposed for use in lieu of these specified. It shall be the Contractor's responsibility to furnish the information and data sufficient to establish the quality and utility of the items in question, including furnishing of samples if required. If other equipment manufacturers determine that their equipment will fit in the space and meet the recommended clearances, suit all job conditions, equal or exceed the quality of the specified items, then a request may be made in writing to the Architect at least ten (10) days prior to bid date for permission to be included in the approved equipment list. All data required for evaluation shall accompany the above letter.
- B. **SUBMITTALS:**
- (1) **Shop Drawings:** The Contractor shall submit a list of items proposed for use. He shall also submit catalog data and shop drawings on proposed systems and their components, panelboards, safety switches, starters and contactors, transformers, lighting fixtures, and wiring devices. Where substitutions alter the design or space requirements, the Contractor shall defray all items of cost for the revised design and construction including costs to all allied trades involved. Data shall be submitted within thirty (30) days after the contract is awarded. Provide six (6) copies of shop drawings as a minimum unless the General Conditions requires a greater number of copies. Each submittal data section shall be covered with an index sheet listing Contractor, supplier, etc., and an index to the enclosed submittals.
 - (2) **As-Built Drawings:** Upon completion of the project, the Contractor shall furnish a complete set of the drawings which formed a part of the contract and include all revisions, sketches, etc., which may have been required during the construction.
 - (3) **Operating and Maintenance Manuals:** At completion of the work, furnish three (3) copies of written operation instructions which shall include manufacturer's descriptive bulletins, operating and maintenance manuals and parts lists of all equipment installed. Also include in such instructions, the specified size and capacity ratings of all equipment installed. Each set of instructions shall be assembled into a suitable loose-leaf type binder and presented to the Architect for delivery to the Owner.
 - (4) Each major section of submittals such as power, equipment, lighting equipment, fire alarm, etc., shall be secured in a booklet or stapled with a covering index which lists the following information:
 - a. General contractor w/phone number and project manager.
 - b. Sub-contractor w/phone number and project manager.
 - c. Supplier of equipment w/phone number and person responsible for this project.

- d. Index of each item covered in submittal and model number.
- e. Any deviation from contract documents shall be specifically noted on submittal cover index and boldly on specific submittal sheet.

(5) ELECTRICAL AND MECHANICAL/PLUMBING EQUIPMENT COORDINATION:

The electrical power equipment submittals shall be accompanied by a letter verifying coordination of electrical services for all mechanical and plumbing equipment requiring power. The letter shall follow the format listed below.

To: _____
 (General Contractor)

Re: _____
 (Project name and location)

We the undersigned subcontractors certify that we have coordinated the electrical requirements for mechanical and plumbing equipment as evidenced by the coordination chart listed herein.

Item	Load full load amps	1 phase or 3 phase	number of electrical connections	max overcurr protection	min overcurr protection	breaker proposed	circuit proposed

The above list details all required electrical connections for mechanical equipment.

Signed: _____

For: _____
 Mechanical Subcontractor

The above list details all required electrical connections for plumbing equipment.

Signed: _____

For: _____
 Plumbing Subcontractor

The above list of equipment has been reviewed and the required connections are being provided. (Any exceptions or request for direction shall be listed here)

Signed: _____

For: _____

Electrical Subcontractor

7. PRODUCT DELIVERY, STORAGE AND HANDLING

- A. PROTECTION: Take necessary precautions to protect all material, equipment, apparatus and work from damage. Failure to do so to the satisfaction of the Architect will be sufficient cause for the rejection of the material, equipment or work in question. Contractor is responsible for the safety and good condition of the materials installed until final acceptance by the owner.
- B. CLEANING: Conduit openings shall be capped or plugged during installation. Fixtures and equipment shall be tightly covered and protected against dirt, moisture, chemical and mechanical injury. At the completion of the work the fixtures, material and equipment shall be thoroughly cleaned and delivered in condition satisfactory to the Architect.

8. TESTING AND BALANCING: Make tests that may be required by the Owner or the Architect in connection with the operation of the electrical system in the buildings. Balance all single-phase loads connected to all panelboards in the buildings to insure approximate equal divisions of these loads on the main secondary power supply serving the buildings. All tests shall be made in accordance with the latest standards of the IEEE and the NEC. The installation shall be tested for performance, grounds and insulation resistance. A "megger" type instrument shall be used. Contractor shall perform circuit continuity and operational tests on all equipment furnished or connected by Contractor.

All pool bonding and grounding components including but not limited to grounding and bonding conductors, grounding and bonding connections, ground rods, etc shall be witnessed by the Engineer of Record prior to covering or enclosing. All grounding and bonding connections below grade shall be made by CADWELD exothermically welded connections. The tests shall be made in the presence of the Engineer of Record or his representative. The Contractor shall provide all testing equipment and all costs shall be borne by him. Written reports shall be made of all tests. All faults shall be corrected immediately.

A letter shall be written giving the following:

- A. Measured amps on each phase of each panel.
- B. Resistance to ground of each grounding electrode.
- C. Measured voltage phase to phase and phase to neutral at each panel.
- D. Ground continuity and polarity instrument used.
- E. Resistance to ground of entire pool grounding and bonding system including main service entrance grounding electrode system.

9. OPERATING AND MAINTENANCE INSTRUCTIONS/AS BUILT DRAWINGS:
- A. Four (4) complete sets of instructions containing the manufacturer's operating and maintenance instructions for each piece of equipment shall be furnished to the Owner. Each set shall be permanently bound and shall have a hard cover. One complete set shall be furnished at the time that the test procedure is submitted, and remaining sets shall be furnished before the Contract is completed. Flysheets shall be placed before instructions covering each subject. The instruction sheets shall be approximately 8-1/2" by 11" with large sheets of Drawings folded in. The instructions shall include information for major pieces of equipment and systems.
 - B. Upon completion of the work and at the time designated, the services of one project engineer shall be provided by the Contractor to instruct the representative of the Owner in the operation and maintenance of the systems.
 - C. This Contractor shall provide as-built Drawings at the completion of the job. Drawings shall show all significant changes in equipment, wiring, routing, location, etc. All underground conduit routing shall be accurately indicated with locations dimensioned.
10. GUARANTEE AND SERVICE: Upon completion of all tests and acceptance, the Contractor shall furnish the Owner a written guarantee covering the electrical work done for a period of one (1) year from date of acceptance. Guarantee includes equipment capacity and performance ratings specified without excessive noise levels. Upon notice from the Architect or the Owner, the Contractor shall, during the guarantee period, rectify and replace any defective material or workmanship and repair any damage caused thereby without additional cost.

END OF SECTION

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SECTION 260100 – ELECTRICAL METHODS AND BASIC MATERIALS

I. GENERAL

1. SECTION INCLUDES:

- A. SUPPORTS
- B. EXCAVATION, TRENCHING, AND BACKFILLING
- C. CUTTING AND PATCHING
- D. EQUIPMENT CONNECTION
- E. IDENTIFICATION OF EQUIPMENT
- F. CLEANING AND PAINTING

II. PRODUCTS

1. SUPPORTS:

- A. FRAMING STEEL: Galvanized or painted rolled steel of standard shapes and sizes.
- B. MANUFACTURED CHANNEL: Hot dipped galvanized with all hardware required for mounting as manufactured by Unistrut, Steel City, or approved equal.
- C. MISCELLANEOUS HARDWARE: Standard sizes treated for corrosion resistance.

2. IDENTIFICATION:

- A. NAMEPLATES: Laminated black micarta with ¼" high engraved white letters.
- B. PANEL DIRECTORIES: Typewritten under plastic cover in metal circuit directory holder permanently welded to door by manufacturer. Stick-on or adhesive metal holders shall not be allowed.
- C. WIRE AND CABLE MARKERS: Cloth, split sleeve, or tubing type.

III. EXECUTION

1. INSTALLATION

- A. Products shall be installed in accordance with manufacturer's instructions.
- B. Install support systems sized and fastened to accommodate weight of equipment and conduit, including wiring, which they carry.

- (1) Fasten hanger rods, conduit clamps, and outlet junction boxes to building structure using pre-cast insert system, expansion anchors, preset inserts, beam clamps, or spring steel clips.
 - (2) Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion and anchors on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.
 - (3) Do not fasten supports to piping, ceiling support wires, ductwork, mechanical equipment, or conduit.
 - (4) Do not use powder-actuated anchors.
 - (5) Do not drill structural steel members without written consent from the Architect.
 - (6) Fabricate supports from structural steel or steel channel.
 - (7) Install surface mounted cabinets and panel boards with minimum of four anchors.
 - (8) Provide steel channel supports to stand cabinets one inch off wall in wet locations.
 - (9) Bridge studs top and bottom with channels to support flush mounted cabinets and panel boards in stud walls.
- C. Excavating, trenching, and backfilling shall be accomplished as indicated on the Drawings or where required to install systems and/or equipment.
- (1) Trenches for all underground conduits or equipment shall be excavated to the required depths. Where soft, wet, or unstable soil is encountered, the bottom of the trench shall be filled with 6 inches of compacted gravel and sand fill. All trench bottoms shall be tamped hard. Trenches shall be shored as required to meet OSHA requirements and general safe working conditions.
 - (2) After conduits or equipment have been inspected and approved by the Architect and prior to backfilling, all forms shall be removed and the excavation shall be cleaned of all trash and debris. Material for backfilling shall consist of the excavation, or borrow of sand, gravel, or other materials approved by the Architect and shall be free of trash, lumber or other debris. Backfill shall be placed in horizontal layers, not exceeding 9 inches in depth and properly moistened to approximate optimum requirements. Each layer shall be compacted by hand, or machine tamped to a density equivalent to surrounding soil. Backfill shall be brought to suitable elevation above ground to provide for anticipated settlement and shrinkage. All paving broken up shall be repaired and returned to the original condition.

- (3) All underground conduits shall have an underground (metal foil) tape installed 12 inches above conduit identified as ELECTRICAL to aid in future location of conduit.
 - (4) All underground conduits shall have an underground red tape installed 12" above conduit.
- D. CUTTING AND PATCHING: This Contractor shall provide all cutting, digging, etc., incident to his work and shall make all required repairs thereafter to the satisfaction of the Architect, but in no case shall the Contractor cut into any major structural element, beam, or column without written approval of the Architect.
- (1) Pavements, sidewalks, roads, curbs, walls, ceilings, floors, and roofs shall be sawcut, patched, repaired and/or replaced as required to permit the installation of the electrical work. Existing concrete floors and other slabs, which require vertical piercing for installation of conduit raceways shall be neatly core drilled. The Contractor shall carefully lay out his drilling in advance and arrange it to minimize exposed work.
 - (2) The Contractor shall bear the expense of all cutting, patching, painting, repairing, or replacing of the work of other trades required because of his fault, error, or tardiness or because of any damage done by him.
 - (3) All patching, and finishing shall be performed by the General Contractor.
- E. Make electrical connections to equipment in accordance with equipment manufacturer's instructions.
- (1) Verify that wiring and outlet rough-in work is complete and that equipment is ready for electrical connection, wiring, and being energized.
 - (2) Make wiring connections in control panel or in wiring compartment of pre-wired equipment. Provide interconnecting wiring where indicated.
 - (3) Install and connect disconnect switches, controllers, control stations, and control devices as indicated.
 - (4) Make conduit connections to equipment using flexible conduit. Use liquid-tight flexible conduit in damp or wet locations.
 - (5) Install pre-fabricated cord set where connections with attachment plug is indicated or specified, or use attachment plug with suitable strain-relief clamps.
 - (6) Provide suitable strain-relief clamps for cord connections to outlet boxes and equipment connection boxes.
- F. Identify electrical distribution and control equipment, and loads served, to meet regulatory requirements and as specified herein.

- (1) Degrease and clean surface to receive nameplates.
- (2) Secure nameplates to equipment fronts using screws or rivets with edges parallel to equipment lines.
- (3) Each new and existing panel shall have an external nameplate. Disconnect switches, starters or similar devices shall have a micarta engraved nameplate mechanically affixed with rivets indicating the load served and the location, such as "A/C 2" or "A/C 3 above ceiling". Letters shall be 1/4" white on a black background. Panels shall be designated in this manner:

"Panel A
120/208 Volts
3 Phase 4 Wire
Served from Panel MP"

- (4) Panel directories shall accurately indicate load served and location of load.
 - (5) Engrave plates as indicated on the Drawings.
- G. Raceway junction boxes for each system shall be identified by painting the inside of the junction box cover for exposed work and both sides of the covers for concealed work according to the following code:

Receptacle Circuits	Black
120 V. Lighting Circuits	White
277 V. Lighting Circuits	Orange
208 or 240 V. Power & Misc.	Green
480 V. Power & Misc.	Brown
Fire Alarm System	Red
Intercom System	Yellow

If the established color code at this site conflicts with the above or other trades, the contractor shall so state in a letter outlining his proposed colors to maintain conformity

- H. Install wire markers on each conductor in panel board gutters, boxes, and at load connections.
- (1) Use distribution panel and branch circuit or feeder number to identify power and lighting circuits.
 - (2) Use control wire number as indicated on schematic and interconnection diagrams or equipment manufacturer's shop drawings to identify control wiring.
- I. Cleaning and Painting: The respective Contractors for the various phases of work shall clear away all debris, surplus materials, etc., resulting from their work or operations, leaving the job and equipment furnished in the clean first class condition.

- (1) All fixtures and equipment shall be thoroughly cleaned of plaster, stickers, rust, stains and other foreign matter or discoloration, leaving every part in an acceptable condition ready for use.
- (2) The Contractor shall refinish and restore to the original condition and appearance, all electrical equipment, which has sustained damage to manufacturer's prime and finish coats or enamel or paint. Materials and workmanship shall be equal to the requirements described for other painting.

END OF SECTION

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SECTION 260200 - RACEWAY SYSTEMS

I. GENERAL

1. SECTION INCLUDES:

- A. CONDUIT AND CONDUIT FITTINGS
- B. ELECTRICAL BOXES AND FITTINGS
- C. WIREWAY
- D. SERVICE FITTINGS

II. PRODUCTS

1. CONDUIT AND FITTINGS:

A. CONDUIT:

- (1) Metal conduit: Galvanized steel.
- (2) Metal tubing: Galvanized steel.
- (3) Flexible Conduit: Steel.
- (4) Liquid-tight Flexible Conduit: Flexible steel conduit with PVC jacket.
- (5) Plastic Conduit and Tubing: NEMA TC 2; PVC. Use Schedule 40 conduit.

B. CONDUIT FITTINGS:

- (1) Conduit Fittings and Conduit Bodies: NEMA FB 1. Conduit fittings shall be steel threaded type.
- (2) Tubing Fittings: NEMA FB 1. Tubing fittings to be steel compression type for conduit up to 2" in diameter and set screw type for conduit 2-1/2" and larger.
- (3) Flexible Conduit Fittings: NEMA FB 1. Flexible conduit fittings to be steel set screw or screw-in type.
- (4) Liquid-tight Flexible Conduit Fittings: NEMA FB 1. Liquid-tight flexible conduit fittings shall be steel compression type.
- (5) Plastic Fittings and Conduit Bodies: NEMA TC 3.

2. ELECTRICAL BOXES:

A. BOXES:

- (1) Sheet Metal: NEMA OS 1; galvanized steel 4" or 4-11/16" square. Provide galvanized plaster/tile ring for recessed outlet boxes.
 - (2) Cast Metal: Aluminum or cast ferroalloy, deep type, gasketed cover, threaded hubs.
- B. FLOOR BOXES for Installation in Cast-in-Place Concrete Floors: See electrical and telcom drawings for requirements.
- C. LARGE ENCLOSURES: NEMA 250; Type 4, steel enclosures with manufacturer's standard enamel finish and cover, held closed screws.
- D. LARGE CAST METAL BOXES:
- (1) Surface-mounted Type: NEMA 250; Type 4 and Type 6, flat-flanged, surface mounted junction box; galvanized cast iron or cast aluminum box and cover with ground flange, neoprene gasket, and stainless steel cover screws.
 - (2) Underground Type: NEMA 250; Type 4 flanged, recessed cover box for flush mounting; galvanized cast iron box and plain cover with neoprene gasket and stainless steel cover screw.
3. WIREWAY:
- A. ENCLOSURE: General purpose or raintight type with knockouts.
 - B. COVER: Screw type with full gasketing.
 - C. FITTINGS: Lay-in type with removable cover and drip shield for outdoor installation.
 - D. FINISH: Rust inhibiting primer coating with enamel finish.
4. SERVICE FITTINGS:
- A. FLUSH FLOOR BOX COVERS:
- (1) Cover material: Brass.
 - (2) Duplex Convenience Receptacle: Duplex flap opening hinged with holding screw.
 - (3) Communications: 2-1/8" X 1" combination threaded opening.
 - (4) Provide brass finish protective rings and carpet flanges.

III. EXECUTION

1. EXAMINATION AND PREPARATION:

- A. Examine supporting surfaces to determine that surfaces are ready to receive work.
- B. Electrical boxes shown on Drawings are approximate locations unless dimensioned. Obtain verification from Architect of floor box locations and locations of outlets prior to rough-in. Outlets may be relocated to a distance of ten feet prior to rough-in with no additional cost to the Owner.

2. INSTALLATION:

- A. Use conduit and tubing for raceways in the following locations:
 - (1) Underground Installations: Rigid steel conduit, painted with two coats of epoxy asphaltic paint or schedule 40 PVC.
 - (2) Installations in Concrete: Rigid steel conduit or rigid non-metallic conduit (schedule 40).
 - (3) Exposed Outdoor Locations: Rigid steel conduit or IMC.
 - (4) Wet Interior Locations: Rigid steel conduit, IMC, or electrical metallic tubing. Use threaded or raintight fittings for conduit.
 - (5) Concealed Dry Interior Locations: Rigid steel conduit or electrical metallic tubing.
 - (6) Exposed Dry Interior Locations: Rigid steel conduit or electrical metallic tubing.
 - (7) MC type cable is prohibited. The Contractor may offer a “value engineering” savings to the owner as a line item in their respective bid for MC cable to be allowed subject to code restrictions for branch circuits where applicable.
- B. Size raceways for conductor type installed.
 - (1) Minimum Size Conduit: 3/4” in underground locations, 1/2” in all other locations.
 - (2) Maximum Size Conduit in Slab Above Grade: 1 – inch; do not route conduits larger than 3/4” to cross each other.
- C. Arrange conduit and tubing to maintain headroom and to present a neat mechanical appearance.
 - (1) Route exposed raceway parallel and perpendicular to walls and adjacent piping.
 - (2) Maintain minimum 6 inch clearance to piping and 12 inch clearance to heat surfaces such as flues, steam piping, and heating appliances.

- (3) Maintain required fire, acoustic, and vapor barrier rating when penetrating walls, floors, and ceilings.
 - (4) Route conduit through roof openings for piping and ductwork where possible; otherwise, route through roof jack with pitch pocket.
 - (5) Group in parallel runs where practical. Use rack constructed of steel channel. Maintain spacing between raceways or de-rate circuit ampacities to NFPA 70 requirements.
 - (6) Use conduit hangers and clamps; do not fasten with wire or perforated pipe straps.
 - (7) Use conduit bodies to make sharp changes in direction.
 - (8) Terminate all conduits with insulated bushings.
 - (9) Use suitable caps to protect installed raceway against entrance of moisture and dirt.
 - (10) Provide a pull cord in all empty raceways.
 - (11) Install expansion joint fittings where raceway crosses building expansion joints.
 - (12) Install plastic conduit and tubing in strict accordance with the manufacturer's recommendations. When plastic conduit is installed, use galvanized rigid elbows for 90 degree bends.
- D. Install electrical boxes as shown on the Drawings, and as required for splices, taps, wire pulling, equipment connections and regulatory requirements.
- (1) Use cast outlet box in exterior locations, wet locations, and exposed interior locations
 - (2) Use large enclosure for interior pull and junction boxes larger than 12 inches in any dimension.
 - (3) Locate and install electrical boxes to allow access. Provide access panels if required.
 - (4) Locate and install electrical boxes to maintain headroom and to present a neat mechanical appearance.
 - (5) Install pull boxes and junction boxes above accessible ceilings or in unfinished areas.
 - (6) Provide knockout closure for unused openings.

- (7) Align wall-mounted outlet boxes plumb and level for switches, and similar devices.
 - (8) Coordinate mounting heights and locations of outlets above counters and backsplashes
 - (9) Install lighting outlets to locate luminaries as shown on the Drawings.
- E. Use recessed outlet boxes in finished areas where indicated.
- (1) Secure boxes to interior wall and partition studs, accurately positioning to allow for surface finish thickness, and plaster/tile ring installation.
 - (2) Use stamped steel stud bridges for flush outlets in hollow stud wall, and adjustable steel channel fasteners for flush ceiling outlet boxes.
 - (3) Locate boxes in masonry walls to require cutting corner only. Coordinate masonry cutting to achieve neat openings for boxes
 - (4) Do not install boxes back-to-back in walls; provide 6 inch separation, minimum. In acoustic-rated walls provide 24 inch separation minimum.
 - (5) Do not damage insulation.
- F. Install wireway in accordance with manufacturer's instructions.
- (1) Bolt wireway to wall using two-piece hangers or steel channels fastened to the wall or on a self-supporting structure. Install level.
 - (2) Mount raintight gutter in horizontal position only.
- G. Install floor boxes in accordance with manufacturer's instructions.
- (1) Set boxes level and flush with finish flooring material.
 - (2) Use adjustable cast floor boxes for all floor box installations.
- H. Install service fittings in accordance with manufacturer's instructions.
- I. Interface outlet boxes, service fittings, floor boxes, etc. with connection of equipment.
- I. See Division 27 specifications for communications conduit and raceway systems requirements. All communications conduits shall be metal, of the type as described in these specifications unless noted otherwise in Division 27 specifications.
- J. The Contractor shall be responsible for providing and installing all conduit and raceway systems for all systems including but not limited to lighting, power, fire alarm system, intercom system, communications systems, mechanical systems, and HVAC control systems. Coordinate location, quantities, sizes and requirements with respective contractor for such systems.

END OF SECTION

SECTION 260300 - WIRE, CABLE, AND DEVICES

I. GENERAL

1. RELATED DOCUMENTS:

- A. Section 26000 – Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

2. SECTION INCLUDES:

- A. WIRE AND CABLE
- B. WIRING DEVICES

II. PRODUCTS

1. WIRE AND CABLE:

A. BUILDING WIRE:

- (1) Feeder and Branch Circuits 10 AWG and Smaller: Copper, solid conductor, 600 volt insulation, THHN/THWN.
- (2) Feeder and Branch Circuits 8 AWG and 6 AWG: Copper, stranded conductor, 600 volt insulation, THHN/THWN.
- (3) Feeder and Branch Circuit larger than 6 AWG: Copper, stranded, conductor, 600 volt insulation, THW.
- (4) Control Circuits: Copper, stranded conductor, 600 volt insulation, THHN/THWN.

B. REMOTE CONTROL SIGNAL CABLE:

- (1) Control Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600 volt insulation, rated 60 degree C, individual conductors twisted together, shielded, and covered with PVC jacket.
- (2) Control Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volt insulation, rated 60 degree C, individual conductors twisted together, shielded, and covered with PVC jacket; UL listed.

- C. CORDS: Oil – resistant thermoset insulated multi – conductor flexible cord with identified equipment grounding conductor, suitable for extra hard usage in damp locations.

2. WIRING DEVICES AND WALLPLATES:

A. MANUFACTURERS:

- (1) Hubbell.
- (2) Legrand.

B. WALL SWITCHES: AC general use, quiet – operating snap switch rated 20 amperes and 120/277 volts AC, with plastic toggle handle.

- (1) Single Pole Switch: Hubbell 1221
- (2) Double Pole Switch: Hubbell 1222
- (3) Three Way Switch: Hubbell 1223
- (4) Four Way Switch: Hubbell 1224
- (5) Pilot Light Type: Lighted handle, Model 1221-PL manufactured by Hubbell.
- (6) Color: To be selected by Architect from standard colors.

C. RECEPTACLE:

- (1) Convenience Receptacle Configuration: Type 5-20R, plastic face. Model 5362 manufactured by Hubbell.
- (2) Specific Purpose Receptacle: Configuration indicated on Drawings with black plastic face.
- (3) Provide straight-blade receptacles to NEMA WD 1.
- (4) Provide locking-blade receptacles to NEMA WD 5.
- (5) GFCI Receptacles: Duplex convenience receptacle with integral ground fault current interrupter. Model GF-5362 manufactured by Hubbell.
- (6) Color: To be selected by Architect from standard colors.

D. WALL DIMMER: Rotary dial type, color to be selected by Architect. Model C-2000 manufactured by Lutron. Rating of 2000 watts. Verify voltage.

E. WEATHERPROOF COVER PLATE: Gasketed cast metal with hinged gasketed device covers rated raintight while in use in accordance with Article 410-57 of the National Electrical Code.

F. ATTACHMENT PLUG CAP: Match receptacle configuration provided for equipment connection.

- G. CLOCKS: Battery operated Quartz clocks shall be provided as noted on the drawings. Clocks shall have a 12" dial, black gothic numerals and red sweep second hand. Clock shall operate on one or two AA batteries. The initial batteries shall be lead calcium.

III. EXECUTION:

1. EXAMINATION AND PREPERATION:

- A. Verify that interior of building has been physically protected from weather.
- B. Verify that mechanical work which is likely to injure conductors has been completed.
- C. Completely and thoroughly swab raceway system before installing conductors.

2. INSTALLATION:

A. WIRING METHODS:

- (1) Concealed Interior Locations: Building wire in raceway.
- (2) Exposed Interior Locations: Building wire in raceway.
- (3) Above Accessible Ceilings: Building wire in raceway.
- (4) Wet or Damp Interior Locations: Building wire in raceway.
- (5) Exterior Locations: Building wire in raceway.
- (6) Underground Locations: Building wire in raceway.

- B. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 14 AWG for control wiring.

- (1) Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 100 feet; and for 20 ampere, 277 volt branch circuit home runs longer than 200 feet.

- C. Neatly train and secure wiring inside boxes, equipment and panelboards.
- D. Use UL listed wire pulling lubricant for pulling conductors in raceways.
- E. Protect exposed cables.
- F. Support cables above accessible ceilings to keep them from resting on ceiling tiles.
- G. Make splices, taps, and terminations to carry full ampacity of conductors without perceptible temperature rise.
- H. Terminate spare conductors with electrical tape.

- I. Devices shall mount flush or as indicated on the Drawings.
 - J. Install wiring devices in accordance with manufacturer's instructions.
 - (1) Install wall switches 48 inches above floor, "OFF" position down.
 - (2) Install wall dimmers 48 inches above floor. De-rate ganged dimmers as instructed by manufacturer. Do not use a common neutral, provide a separate neutral for each dimmed circuit.
 - (3) Install convenience receptacles 18 inches above floor, 6 inches above counters or splashbacks, with grounding pole on bottom. Verify typical mounting heights with Engineer prior to construction and field coordinate with telcom outlets. Advise the Engineer of any conflicts prior to rough-in.
 - (4) Install GFCI receptacles at all outdoor locations and all indoor locations as required by NFPA70, and as indicated.
 - (5) Install specific purpose receptacles at heights shown on Drawings.
 - K. Install wall plates flush and level.
 - (1) Install decorative plates on switch, receptacle, telephone, television and blank outlets in finished areas.
 - (2) Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
 - (3) Install weatherproof coverplates on all devices/boxes in wet or outdoor locations.
3. FIELD QUALITY CONTROL:
- A. Perform field inspection and testing of circuits under provisions of Section 16000.
 - (1) Inspect wire and cables for physical damage and proper connection.
 - (2) Torque test conductor connections and terminations to manufacturer's recommended values.
 - (3) Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

END OF SECTION

SECTION 260400 - SERVICE AND DISTRIBUTION

I. GENERAL

1. SECTION INCLUDES:

- A. GROUNDING AND BONDING
- B. SERVICE ENTRANCE
- C. UTILITY REQUIREMENTS
- D. SWITCHBOARDS
- E. PANELBOARDS
- F. ENCLOSED SWITCHES
- G. FUSES
- H. CONTACTORS

2. SERVICE TYPE DESCRIPTION: Electric Service System shall be as indicated on drawings and served from an underground service lateral derived from a pad mounted transformer served by an underground primary service.

3. PROJECT CONDITIONS: Verify field measurements for the equipment to ensure proper fit within the space provided.

4. UTILITY REQUIREMENTS:

A. The serving utility is Gulf Power Company.

(1) The Owner will pay for all assessments, service charges, fees, etc. from the utility for service requirements.

5. EQUIPMENT APPLICATION: All equipment and materials shall have ratings established by a recognized independent agency or laboratory. The Contractor shall apply the items used on this project within those ratings and application shall be subject to any stipulations or exceptions established by the independent agency or laboratory. Use of equipment or materials in applications beyond that certified by the agency or beyond that recommended by the manufacturer shall be cause for removal and replacement of such misapplied items.

II. PRODUCTS

1. GROUNDING MATERIALS:

A. GROUND ROD: 16 feet x $\frac{3}{4}$ " diameter, copper clad steel, sectional driven.

- B. GROUND CONNECTORS: Approved ground clamp manufactured of cast bronze construction with matching bolts, nuts, and washers.
 - C. EXOTHERMIC WELDS: Materials shall be from the same source. Welding process shall be Cadweld or approved equal.
 - D. GROUNDING CONDUCTORS: Green colored and coded insulated copper (#12 AWG minimum) or bare soft drawn copper as indicated on Drawings.
2. SWITCHBOARD:
- A. SWITCHBOARD: NEMA PB2.
 - (1) Line and Load Terminations: Accessible from the front only of switchboard, suitable for conductor materials used.
 - (2) Main Sections Devices: Individually mounted.
 - (3) Distribution Section Devices: Panel mounted
 - B. BUSSING:
 - (1) Bus Material: Tin-plated Copper sized in accordance with NEMA PB2.
 - (2) Bus Connections: Accessible from front for maintenance.
 - (3) Ground Bus: Copper.
 - C. ENCLOSURE: Type 1 General Purpose as shown on the Drawings.
 - (1) Align sections at rear.
 - (2) Height: 96 inches.
 - (3) Finish: Manufacturer's standard light gray enamel over external surfaces.
 - D. FUTURE PROVISIONS:
 - (1) Fully equip spaces for future devices with bussing and bus connection provisions; continuous current rating as indicated on the Drawings.
 - (2) Do not taper main bus rating.
 - E. SWITCHING AND OVER-CURRENT PROTECTION DEVICES:
 - (1) Molded Case Circuit Breakers: NEMA AB 1.

- (2) Solid State Molded Case Circuit Breakers: NEMA AB 1; with electronic sensing, timing and tripping circuits for adjustable trip settings; ground fault trip; instantaneous trip and adjustable short time trip.

F. SWITCHBOARD INSTRUMENTS:

- (1) Ammeter and Voltmeter: Mount in face of switchboard with phase selector switch. Customer metering shall be Eaton Cutler-Hammer IQ 250, CTs, with display or approved equal.
- (2) Load Monitoring Meters: Provide factory CTs, meters, wiring, etc integral to switchboards for sub-metering of various electrical loads (lighting, mechanical, etc). Meters shall be Eaton Cutler-Hammer IQ 250 or approved equal. Provide all accessories required for a complete and functional installation.

G. PRIOR-APPROVAL SUBMITTALS:

- (1) The pre-approved manufacturers listed below shall submit scaled shop drawings including plan views and elevations and data sheets of all switchboards to the Engineer of Record 10 calendar days prior to bid for approval. The submittals shall include but not be limited to all circuit breakers, customer metering, sub-metering, etc.

H. MANUFACTURERS:

- (1) Square D Company
- (2) Eaton Cutler – Hammer
- (3) General Electric

3. PANELBOARDS:

A. DISTRIBUTION PANELBOARDS: NEMA PB 1; circuit breaker type.

- (1) Bus Material: Tin-plated Copper.
- (2) Ground Bus: Tin-plated Copper.
- (3) Enclosures: Type 1 or 3R as shown on the Drawings.
- (4) Mounting: Surface or flush mount as indicated on the Drawings.
- (5) Door: Hinged with lock. Door assembly shall be hinged to enclosure for panels rated 250 amps or larger. All panels shall be door-in-door construction.
- (6) Circuit Breakers: Bolt-on, ratings as shown on Drawings. Branch circuit breakers shall not be allowed in sub-feed positions.

- (7) Mains: Main breakers shall be located in main position. Main breakers shall not be allowed in branch or sub-feed positions.
- B. LIGHT AND POWER PANELBOARDS: NEMA PB 1; circuit breaker type.
- (1) Bus Material: Tin-plated Copper.
 - (2) Ground Bus: Tin-plated Copper.
 - (3) Enclosures: Type 1 or 3R as shown on the Drawings.
 - (4) Mounting: Surface or flush mount as indicated on the Drawings.
 - (5) Door: Hinged with lock. All panels shall be door-in-door construction.
 - (6) Circuit Breakers: Bolt-on, ratings as shown on Drawings. Branch circuit breakers shall not be allowed in sub-feed positions.
 - (7) Mains: Main breakers shall be located in main position. Main breakers shall not be allowed in branch or sub-feed positions.
- C. ACCESSORIES: Provide panel and branch device accessories as indicated on the Drawings
- D. FUTURE PROVISIONS: Where space provisions are indicated on the Drawings, provide bussing, bus extensions, etc. required to mount future circuit breakers. Where spare provisions are indicated on the Drawings, provide circuit breakers complete and ready for connection.
- E. MANUFACTURERS:
- (1) Square D Company
 - (2) Eaton Cutler – Hammer
 - (3) General Electric
4. FUSES:
- A. Service Entrance/Feeder Circuits – 600 Amp and smaller.
- (1) U.L. Class RK1
 - (2) Current Limiting
 - (3) 200,000 amp RMS Interrupt Rating
 - (4) Voltage Rating: As required for system compatibility

- B. Motor, Motor Controller, Transformer and Inductive Circuits.
 - (1) U.L. Class RD1, Time Delay
 - (2) Current Limiting
 - (3) 200,000 amp RMS Interrupt Rating
 - (4) Voltage Rating: As required for system compatibility
 - C. MANUFACTURERS:
 - (1) Square D Company
 - (2) Cutler – Hammer
 - (3) General Electric
5. ENCLOSED CIRCUIT BREAKERS:
- A. CIRCUIT BREAKER: NEMA AB 1; Voltage and Accessories as indicated on Drawings.
 - B. ENCLOSURES: Code gauge steel, NEMA 1 or 3R as required.
 - C. MANUFACTURERS:
 - (1) Square D Company
 - (2) Eaton Cutler – Hammer
 - (3) General Electric
6. CONTACTORS:
- A. MECHANICALLY HELD CONTACTORS: NEMA ICS 2; mechanically held, electrically operated.
 - B. ELECTRICALLY HELD CONTACTORS: NEMA ICS 2; electrically held, electrically operated.
 - C. COIL OPERATING VOLTAGE: 120 volts, 60 Hz.
 - D. ENCLOSURES: NEMA ICS 6; Type 1 or 3R as required.
 - E. MANUFACTURERS
 - (1) Square D Company
 - (2) Eaton Cutler – Hammer

(3) General Electric

III. EXECUTION

1. EXAMINATION AND PREPARATION:

- A. Make arrangements with utility company to obtain permanent electrical service to the facility. Provide CT Cabinet and Meter base as required by utility for service connection.

2. INSTALLATION:

- A. Install utility services in accordance with utility company standards and requirements.

(1) Underground Service: Install service entrance conduits and conductors from the utility service point to the service equipment as shown on the Drawings. The underground services shall be installed in concrete encased ductbank. The Contractor shall verify and coordinate the location of the power company pad mounted transformer with the local power company and the Engineer of Record prior to bid. The Contractor's bid shall include all cost associated with the underground service from pad mounted transformer location dictated by local power company.

(2) Provide lugs on utility transformer spaces sized to accommodate service entrance conductors.

- B. Install equipment in accordance with manufacturer's instructions.

C. Except where specifically indicated otherwise, all exposed non-current-carrying metallic parts of electrical equipment, metallic raceway systems, and service neutral of the electrical system shall be grounded.

(1) Equipment grounding shall be accomplished by installing a separate grounding conductor in each raceway of the system. The Conductor shall be provided with a distinctive green insulation or marker and shall be sized in accordance with Article 250 of the National Electrical Code.

(2) The electrical system grounding electrode connection shall be made at the main service equipment and shall be extended to the point of entrance of the metallic cold water service. A suitable ground clamp shall make connection to the water pipe. If flanged pipes are encountered, connection shall be made on the street side of the flange connection. If the metallic water service is coated with an insulating material or there is no metallic water service to the building, ground connection shall be made to additional ground rods as required by resistance tests, at the exterior of the building driven full length into the earth.

(3) The maximum resistance of the driven ground shall be tested with a ground resistance Megger and shall not exceed 25 ohms under normally dry conditions. If this cannot be obtained with a single rod, additional or parallel rods shall be installed 7'-6" on center until 25 ohms or less is achieved without connection to the building water piping. A typewritten test report shall be written.

- D. Install panelboards to NEMA PB 1.1.
- F. Provide permanent phenolic labels fastened with rivets for all panelboards, and distribution equipment.
- G. Provide permanent label for each breaker/switch position fastened with rivets by factory in switchboards. Stick-on labeling will not be allowed.
- H. Provide permanent circuit numbers fastened with rivets by factory for all panelboards. Stick-on labeling will not be allowed.
- I. Provide updated typewritten directory inside panel door for all panelboards.
- J. All switchboards and panelboards shall be fully rated for KAIC value as indicated. Series rating is prohibited.
- K. All switchboards shall be installed on concrete housekeeping pads.

END OF SECTION

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SECTION 260500 - LIGHTING

I. GENERAL

1. RELATED DOCUMENTS:

- A. Section 26000 – Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

2. SECTION INCLUDES:

- A. LUMINAIRES
- B. SHIELDING MEDIA
- C. LAMPS
- D. BALLASTS
- E. EXIT SIGNS
- F. EMERGENCY LIGHTING UNITS
- G. PHOTOCELLS
- H. TIME SWITCHES
- I. LIGHTING CONTACTORS
- J. LED BOARDS
- K. LED DRIVERS

II. PRODUCTS

1. LUMINAIRES:

A. LUMINAIRE SCHEDULE:

- (1) Product requirements for each luminaire are specified in luminaire schedule on Drawings.

B. ACCESSORIES: Provide required accessories for mounting and operation of each luminaire as indicated.

- (1) Recessed Luminaires: Provide trim type suitable for ceiling system in which luminaire is installed.

(2) Thermal Protection: Provide thermal protection devices to meet NFPA 70 requirements.

(3) Surface Luminaires: Provide spacers and brackets required for mounting.

C. LAY-IN TROFFERS:

(1) Door Frame: Aluminum .050", extruded with mitered corners. Latches to be fully enclosed, spring loaded, cam type. Door frame shall be fully gasketed.

(2) Housing: Cold rolled steel, 22 gauge minimum with smooth effect mitered corners.

(3) Finish: Painted after fabrication with 90% reflective glossy white thermosetting powder coat.

2. SHIELDING MEDIA:

A. PRISMATIC LENS FOR FLUORESCENT TROFFERS:

(1) Material: Clear virgin acrylic.

(2) Type: Prismatic cones, pattern 12 straight flat prisms.

(3) Thickness: .156" minimum.

B. PRISMATIC LENS FOR FLUORESCENT WRAP AROUND FIXTURES:

(1) Material: Clear virgin acrylic.

(2) Type: Sides-linear prisms, bottom-pyramidal prisms.

(3) Hinging: Either side.

3. LAMPS:

A. DESCRIPTION:

(1) Incandescent Lamps: 130 volts, inside frosted, shape as scheduled. Halogen lamps frosted or clear as scheduled.

(2) Fluorescent Lamps: Size and wattage as scheduled, 4100°K temperature and CRI ≥ 75 .

(3) High Pressure Sodium HID Lamps: Clear or coated per luminaire manufacturer's recommendation. Suitable for ballast furnished in luminaire for all burning positions.

(4) Reflector Lamp Beam Patterns: Conform to ANSI C78.379.

4. BALLASTS:

- A. FLUORESCENT BALLASTS: Provide electronic fluorescent ballasts suitable for use under installation conditions listed for each luminaire.
- (1) Ballasts shall meet the requirements of the General Communications Commission Rule and Regulations, Part 18, Class A.
 - (2) Ballasts shall not contain Polychlorinated Biphenyls (PCB's).
 - (3) Ballasts shall have a power factor of 95% minimum.
 - (4) Ballasts shall be UL listed, Class P, and sound rated "A".
 - (5) Ballasts shall have a frequency of operation of 20 kHz or greater, and operate without visible flicker.
 - (6) Where applicable, ballasts shall meet minimum efficiency standards of Public Law No. 100-357, National Appliance Energy Conservation Amendments of 1988.
 - (7) Ballasts case temperature shall not exceed 25°C temperature rise over 40°C ambient. Ballasts cast temperature must not exceed 85°C.
 - (8) Ballasts shall withstand line transient as defined in ANSI/IEEE C 62.41, Category A.
 - (9) Input third harmonic current content shall not exceed 10%.
 - (10) Ballasts shall be manufactured by Advance, Magnetek, or Motorola.
- B. COMPACT FLUORESCENT BALLASTS: Provide solid state electronic ballasts suitable for use under installation conditions listed for each luminaire.
- (1) Ballasts shall be high power factor.
 - (2) Ballasts shall meet the requirements of the General Communications Commission Rule and Regulations, Part 18, Class A.
 - (3) Ballasts shall be UL listed, Class P, and sound rated "A".
 - (4) Ballasts shall have a frequency of operation of 20 kHz or greater, and operate without visible flicker.
 - (5) Where applicable, ballasts shall meet minimum efficiency standards of Public Law No. 100-357, National Appliance Energy Conservation Amendments of 1988.
 - (6) Ballasts case temperature shall not exceed 25°C temperature rise over 40°C ambient. Ballasts cast temperature must not exceed 85°C.

- (7) Ballasts shall withstand line transient as defined in ANSI/IEEE C 62.41, Category A.
- (8) Input third harmonic current content shall not exceed 10%.
- C. HID BALLASTS: Provide HID ballast suitable for use under installation conditions and type of each luminaire.
 - (1) Voltage: As scheduled.
 - (2) Power Factor: High power factor.
 - (3) Description: ANSI C82.4.
 - (4) Integral Equipment: Ballast to be mounted internally of the luminaire.
- 5. EXIT SIGNS:
 - A. DESCRIPTION: Exit sign fixture.
 - (1) Lamps: Manufacturer's standard.
 - (2) Voltage: 120/277 volt as scheduled.
 - B. CONSTRUCTION:
 - (1) Face: Stencil face with red letters.
 - (2) Directional Arrows: Universal for field adjustment.
 - (3) Mounting: Universal for field selection.
 - (4) Exterior: Shall have a mechanical connection (bolts and screws) between the fixture housing and the canopy base.
 - C. EMERGENCY POWER SUPPLY: Integral, listed for emergency lighting use.
 - (1) Battery: Lead calcium or nickel cadmium type.
 - (2) Battery Charger: Dual-rate type.
 - (3) Indicators and Controls: AC ON; test switch.
 - D. WARRANTY: 5-year full fixture.
- 6. INCANDESCENT EMERGENCY LIGHTING UNITS:

- A. DESCRIPTION: Self-contained emergency lighting unit.
 - (1) Input Voltage: 120/277 volts as scheduled.
 - (2) Battery: Lead calcium type.
 - (3) Battery Charger: Dual-rate type.
 - (4) Lamps: Sealed beam PAR, DC type or halogen.
 - B. INDICATORS AND CONTROLS: AC ON; recharging, test switch.
 - C. ELECTRICAL CONNECTION: Conduit connection.
 - D. WARRANTY: 5-year full fixture.
7. PHOTOCELL SWITCH:
- A. MANUFACTURERS:
 - (1) Precision
 - (2) Tork
 - (3) Paragon
 - B. DESCRIPTION: Photocell switch manufactured to NEMA ICS 2.
 - C. RATINGS:
 - (1) Contact Ratings: 1800 VA at 120/277 volts.
 - (2) Sensitivity: Field adjustable from 3 to 10 foot-candles.
 - D. ENCLOSURE: Gasketed, cast aluminum or ferrous alloy box with conduit hub.
8. TIME SWITCH:
- A. MANUFACTURERS:
 - (1) Precision
 - (2) Tork
 - (3) Paragon
 - B. DESCRIPTION: Clock timer manufactured to NEMA ICS 2, with astronomical dial, 12-hour spring wound carry over, and day skipping feature.
 - C. RATINGS:

- (1) Contact Ratings: 20 ampere per pole, number of poles as indicated on Drawings.
- (2) Coil Voltage: 120 volts, 60 Hz.
- (3) Dial Timer: Seven (7) day.
- (4) Enclosure: NEMA 1 or 3R as required.

9. CONTACTORS:

A. MANUFACTURERS:

- (1) Square "D" Company
- (2) Cutler-Hammer
- (3) General Electric Company

B. LIGHTING CONTACTORS: NEMA ICS 2; mechanical held, electrically operated.

- (1) Coil Operating Voltage: 120 volts, 60 Hz.
- (2) Enclosures: NEMA ICS 6; Type 1, general purpose.
- (3) Multi-pole, 20 amp rating, number of poles as indicated on the Drawings.

10. LED LIGHTING FIXTURES:

A. DESCRIPTION: Self-contained emergency lighting unit.

- (1) Input Voltage: 120/277 volts as scheduled.
- (2) LED Lamp Life: Minimum 100,000 hours
- (3) Battery Charger: Dual-rate type.
- (4) Lamps: Sealed beam PAR, DC type or halogen.

B. SPARES: For each type of LED lighting fixture provide additional complete spare lighting fixtures equal to 3% of total quantity installed and 5% spare components (LED boards and drivers) of total quantity installed. (As a minimum provide at least two (2) complete spare lighting fixtures and (5) spare components, LED boards and drivers, for each LED type fixture).

C. ELECTRICAL CONNECTION: Conduit connection.

D. WARRANTY: Minimum 5-year full fixture.

III. EXECUTION

1. EXAMINATION AND PREPARATION: Examine adjacent surfaces to determine that surfaces are ready to receive work.
2. INSTALLATION:
 - A. Install luminaires and accessories in accordance with manufacturer's instructions.
 - (1) Provide pendant accessory to mount suspended luminaires at height indicated. Use swivel hangers on sloped ceilings.
 - (2) Support surface mounted luminaires from ceiling structure; provide auxiliary support across ceiling structure support. Fasten to prohibit movement.
 - (3) Install recessed luminaires to permit removal from below. Install luminaires so that there is no light leakage around fixture trim. Support fixtures in accordance with Article 410-16 C of the National Electrical Code.
 - (4) Install lamps in luminaires and lampholders.
3. ADJUSTING AND CLEANING:
 - A. Align luminaires and clean lenses and diffusers at completion of work.
 - B. Aim adjustable luminaires and lampholders as indicated or as directed.
 - C. Adjust directional arrows on exit signs to meet approval of authority having jurisdiction.
 - D. Clean paint splatters, dirt and debris from installed luminaires.
 - E. Relamp luminaires which have failed lamps at completion of work.
 - F. Touch up luminaire and pole finish at completion of work.
 - G. Adjust relays, timers, photo controls, etc. to achieve specified or directed operation.

END OF SECTION

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SECTION 260680 - TRANSIENT VOLTAGE SURGE SUPPRESSION

I. GENERAL

1. RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this Section.

2. SUMMARY:

- A. This Section includes transient voltage surge suppressors for low-voltage power (< 600 Volts) equipment. All surge suppression shall be integral to switchboard or panelboard and shall be of the same manufacturer as the switchboard or panelboard.
- B. Related Sections include the following:
 - (1) Division 26 Section "Wiring Devices" for devices with integral transient voltage surge suppression.
 - (2) Division 26 Section "Panelboards" for locations which require installation at the panel or sub-panel level.
 - (3) Division 26 Section "Switchboards" for locations which require installation at the Service Entrance Switchboard.

3. SUBMITTALS:

- A. PRODUCT DATA: For each type of product indicated. Include rated capacities, shipping, installed and operating weights, furnished specialties; and options.
- B. PRODUCT CERTIFICATIONS: Signed by manufacturers of transient voltage suppression devices, certifying that products furnished comply with the following testing and labeling requirements:
 - (1) UL 1449 Listing classifications, and clamping voltage rating for each mode of protection.
 - (2) ANSI/IEEE C62.41 and C62.45 Category C3 clamping voltage.
 - (3) Sequential surge survivability per ANSI/IEEE C62.45.
 - (4) Dimensions and weights.
 - (5) Recommended connection wiring diagram.
- C. Submittals shall include a copy of these specifications with each section marked with either "C" for comply or "D" for deviation. A written explanation shall be provided for each deviation.

- D. WARRANTIES: Special warranties specified in this Section.
4. QUALITY ASSURANCE:
- A. Product must be made by a company engaged in the manufacture of such devices in the USA for a minimum of five years.
 - B. SOURCE LIMITATIONS: Obtain suppression devices and accessories through one source from a single manufacturer.
 - C. PRODUCT OPTIONS: Drawings indicate size, dimensional requirements, and electrical performance of suppressors and are based on the specific system indicated. Other manufacturers' products complying with requirements may be considered by the engineer/architect greater than 14 days prior to bid. Samples may be required for approval. Refer to Division 1 Section "Substitutions".
 - D. ELECTRICAL COMPONENTS, DEVICES AND ACCESSORIES: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - E. IEEE COMPLIANCE: Comply with ANSI/IEEE C62.41, "IEEE Guide for Surge Voltages in Low Voltage AC Power Circuits" and test devices in accordance with ANSI/IEEE C62.45, "IEEE Guide for Surge Suppressor Testing".
 - F. NEMA COMPLIANCE: Comply with NEMA LS-1 "Low Voltage Surge Protective Devices".
 - G. UL COMPLIANCE: Comply with UL 1449 Rev. 2 "Transient Voltage Surge Suppressors".
5. PROJECT CONDITIONS:
- A. PLACING INTO SERVICE: Do not energize or connect service entrance equipment or panelboards to their sources until the surge protective devices are installed and connected.
 - B. EXISTING UTILITIES: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - (1) Notify Architect not less than two days in advance of proposed utility interruptions.
 - (2) Do not proceed with utility interruptions without Architect's written permission.
 - C. SERVICE CONDITIONS: Rate surge protective devices for continuous operation under the following conditions, unless otherwise indicated:
 - (1) Maximum Continuous Operating Voltage: Not less than 125 % of nominal system operating voltage for 120/240 Single Phase or 120/208 VAC Wye systems, Not less than 115 % for 277/480 VAC Wye or 480 VAC Delta systems.

- (2) Operating Temperature: 30 to 120 deg F. (0 to 50 degrees C)
- (3) Humidity: 0 to 95 %, noncondensing.
- (4) Altitude: Less than 20,000 feet (6,000 m) above sea level.

6. COORDINATION:

- A. Coordinate location of field mounted surge suppressors to allow adequate clearances for maintenance.
- B. Coordinate location of field mounted surge suppressors to allow for the shortest ground wire possible.

7. WARRANTY:

- A. **GENERAL WARRANTY**: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. **SPECIAL WARRANTY**: Written warranty, executed by manufacturer agreeing to repair or replace components of surge suppressors that fail in materials or workmanship within five years from date of Substantial Completion.

8. EXTRA MATERIALS:

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - (1) Replaceable Protection Modules: One of each size and type installed for Service Entrance Units.

II. PRODUCTS

1. MANUFACTURERS:

- A. **AVAILABLE MANUFACTURERS**: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:
- B. **MANUFACTURERS**: Subject to compliance with requirements, provide products by one of the following:
 - (1) Eaton
 - (2) GE
 - (3) Square D

2. SERVICE ENTRANCE SUPPRESSORS:

- A. Integral LED indicator lights showing proper operation of each module, visible without opening the enclosure door.
- B. Utilizing metal oxide varistor technology.
- C. Internal cartridge fuses with solidly mounted fuse holders rated at a minimum of 200 KA interrupting capacity.
- D. Including thermal protection for each component, which is continuously monitored.
- E. Nema 3R style enclosure suitable for indoor or outdoor installation.
- F. UL CLAMPING MODES: L-L, L-N, N-G.
- G. SURGE CAPACITY PER MODE: 80,000 Amps (160,000 Amps industry rating).
- H. SURVIVABILITY OF CATEGORY C SURGES: 1000 sequential occurrences.
- I. MAXIMUM UL 1449 RATING, EACH MODE: 400 for 120/240, 120/208, 800 for 277/480 systems.
- J. EMI/RFI NOISE REJECTION: 50dB Common Mode, 40 dB Normal Mode.
- K. CONNECTION METHOD: Parallel.
- L. UL 1449 SUPPRESSED VOLTAGE RATINGS (SVR) AS FOLLOWS:
- M. PROVIDE AUDIBLE ALARM WITH EACH SUPPRESSOR

Mode	120/240 Volt Single Phase	120/208 Volt Wye	277/480 Volt Wye	480 Volt Delta
L-N	330 V	330 V	700 V	N/a
L-G	330 V	330 V	700 V	1,500 V
N-G	330 V	330 V	700 V	N/a

3. PANELBOARD SUPPRESSORS :

- A. LED indicator lights for power and protective status.
- B. Utilizing metal oxide varistor technology.
- C. U.L. 1283 Listed. Integral EMI/RFI Filter providing up to 54 dB of attenuation from 20 kHz to 100 MHz.
- D. Internal fuses rated at a minimum of 200 KA interrupting capacity.

- E. Including thermal protection for each component, which is continuously monitored.
- F. Integral Form C Contacts for remote indication of suppression status via connection to building management system (provided by others).
- G. Nema 3R style enclosure suitable for indoor or outdoor installation.
- H. UL CLAMPING MODES: L-L, L-N, N-G.
- I. SURGE CAPACITY PER MODE : 30,000 Amps (60,000 Amps industry rating).
- J. SURVIVABILITY OF CATEGORY C SURGES: 1000 impulses without clamping drift.
- K. UL 1449 SUPPRESSED VOLTAGE RATINGS (SVR) AS FOLLOWS:
- L. PROVIDE AUDIBLE ALARM WITH EACH SUPPRESSOR.

Mode	120/240 Volt Single Phase	120/208 Volt Wye	277/480 Volt Wye
L-N	330 V	330 V	600 V
L-G	330 V	330 V	600 V
N-G	330 V	330 V	600 V

III. EXECUTION

1. INSTALLATION OF SURGE PROTECTIVE DEVICES:

- A. Install devices at service entrance on load side, with ground lead bonded to service entrance ground.
- B. Provide multipole, 60 amp breaker as a dedicated disconnect for the suppressor at Service Entrance location, unless otherwise indicated on drawings.
- C. Install devices for panelboards with conductors between suppressor and points of attachment as short and as straight as possible. Do not exceed manufacturer's recommended lead length.
- D. Provide multipole, 30 Amp breaker as a dedicated disconnect for the suppressor at panelboard locations, unless otherwise indicated on drawings.
- E. Mount suppressor as close to switchgear and panelboard point of connection, either surface or flush mount as required. Do not mount internal to switchgear to facilitate future maintenance and/or replacement.
- F. Install the TVSS using manufacturer provided leads when provided or with #6 AWG conductors when not manufacturer provided. Conductors are to be as short and straight as possible. Conductors are to be twisted. Install in accordance with the TVSS manufacturer's recommended practice and in compliance with applicable codes.

2. CONNECTIONS:

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3. FIELD QUALITY CONTROL:

- A. TESTING: Contractor shall perform the following field quality control testing:
 - (1) After installing the surge protective devices, but before electrical circuitry has been energized, test for compliance with requirements.
 - (2) Complete start-up checks and voltage verifications according to manufacturer's written instructions.
 - (3) Perform visual and mechanical inspection on each unit. Certify that units are installed per manufacturer's recommendations.
- B. Repair or replace malfunctioning units. Retest after repairs or replacements are made.

4. DEMONSTRATION:

- A. Engage a manufacturer's representative to demonstrate proper operation of the system and to train owner's maintenance personnel in proper evaluation of suppressor condition and procedure to repair or replace defective devices.
 - (1) Review operation and maintenance manuals.
 - (2) Review performance specifications of devices supplied to show they comply with specifications herein.
 - (3) Schedule training with Owner, through Architect or General Contractor, with at least seven days advance notice.
 - (4) Provide letter to owner that states units are installed per manufacturer's recommended installation procedures and system is functioning properly and warranty is initiated.

END OF SECTION

**SURGE SUPPRESSION
SUBMITTAL CHECKLIST**

TYPE _____

	<u>SPEC'D</u>	<u>SUB</u>
PEAK SURGE CURRENT	_____	_____
CLAMPING VOLTAGE	_____	_____
LN	_____	_____
NG	_____	_____
LL	_____	_____
OTHER	_____	_____
PULSE LIFE	_____	_____
EMI/RFI	_____	_____
SIZE MOV'S (MM DIAM)	_____	_____
NUMBER OF MOV'S/PHASE	_____	_____
MONITORING	_____	_____
CONNECTION	_____	_____
BREAKER	_____	_____
IN-LINE FUSES	_____	_____
INTEGRAL FUSES	_____	_____
FULL WARRANTY	_____	_____

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SECTION 313116 - TERMITE CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Soil treatment.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include the EPA-Registered Label for termiticide products.

1.3 INFORMATIONAL SUBMITTALS

- A. Product certificates.

- B. Soil Treatment Application Report: Include the following:

1. Date and time of application.
2. Moisture content of soil before application.
3. Termiticide brand name and manufacturer.
4. Quantity of undiluted termiticide used.
5. Dilutions, methods, volumes used, and rates of application.
6. Areas of application.
7. Water source for application.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A specialist who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located and who employs workers trained and approved by manufacturer to install manufacturer's products.

1.5 WARRANTY

- A. Soil Treatment Special Warranty: Manufacturer's standard form, signed by Applicator and Contractor, certifying that termite control work consisting of applied soil termiticide treatment will prevent infestation of subterranean termites, including Formosan termites (*Coptotermes formosanus*). If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT

- A. Termiticide: EPA-Registered termiticide acceptable to authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aventis Environmental Service USA LP; Termidor.
 - b. Bayer Environmental Science: Premise 75.
 - c. Dow AgroScience LLC; Dursloan, TC Equity.
 - d. FMC Corp, Agricultural Products Group, Taistar, Prevail, FT, Torpedo.
 - e. Syngenta.
 - 2. Service Life of Treatment: Soil treatment termiticide that is effective for not less than five years against infestation of subterranean termites.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove extraneous sources of wood cellulose and other edible materials, such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations.
- B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated.

3.2 APPLYING SOIL TREATMENT

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Distribute treatment uniformly. Apply treatment at the product's EPA-Registered Label volume and rate for maximum specified concentration of termiticide to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction.
 - 1. Slabs-on-Grade and Basement Slabs: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
 - 2. Foundations: Soil adjacent to and along the entire inside perimeter of foundation walls; along both sides of interior partition walls; around plumbing pipes and electric conduit penetrating the slab; around interior column footers, piers, and chimney bases; and along the entire outside perimeter, from grade to bottom of footing.

3. Crawlspace: Soil under and adjacent to foundations. Treat adjacent areas, including around entrance platform, porches, and equipment bases. Apply overall treatment only where attached concrete platform and porches are on fill or ground.
 4. Masonry: Treat voids.
 5. Penetrations: At expansion joints, control joints, and areas where slabs and below-grade walls will be penetrated.
- B. Post warning signs in areas of application.
- C. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

END OF SECTION 313116