

Wright & Dalbin Architects, Inc.

BID #10-024, CONSTRUCTION IMPROVEMENTS FOR THE JUVENILE JUSTICE CENTER EL PASO, TEXAS

ADDENDUM NUMBER FOUR

May 11, 2010

The following constitutes changes, deletions, additions, and/or clarifications to the contract documents for the project titled herein. This addendum is hereby made a part of and shall be attached to each set of Contract Documents. The Contractor on the proposal form shall acknowledge addendum. Unless specifically modified herein, all work shall remain as indicated in the Contract Documents.

COUNTY OF EL PASO, PURCHASING - QUESTIONS

1. Response to Addendum 4 questions are provided with this addendum.

TECHNICAL SPECIFICATIONS

1. Bid Proposal Form and Invitation for Bids: Replace pages 8 through 11 of project manual Volume I.
2. Table of Contents:
 - a. Add Section 13 70 16 – Bullet Resistant Storefront (6 pages) to Division 13 of the Table of Contents.
 - b. Add Section 23 08 00 – Commissioning of Mechanical (20 pages) to Division 23 of the Table of Contents.
 - c. Add Section 26 08 00 – Commissioning of Electrical (4 pages) to Division 26 of the Table of Contents.
3. Section 01 23 00 – Alternates:
 - a. Clarification: Alternate No. 4: Provide and install Toshiba TDP-S25U Mobile Projector or an approved equal. Detailed specification sheet provided with this addendum.
 - b. Clarification: Alternate No. 6: Provide and install Nuway Surface/Recessed System or an approved equal to meet manufacturer's specification sheet provided with this addendum.
 - c. Add: Alternate No. 8: Relocate twelve (12) palm trees within the project site as directed by Owner.
4. Section 01 91 00 – General Commissioning Requirements:
 - a. Rename Section 01 91 00 number to read 01 91 13 as per the Table of Contents
 - b. Revise Paragraph 1.5 Commissioning Process to read: "The Commissioning Plan, shall be provided within 60 days after Notice to Proceed. The commissioning plan provides guidance in the execution of the commissioning process. The requirements of specification Sections 23 08 00 and 26 08 00 shall

ADDENDUM NUMBER FOUR

supersede requirements of this section and will take precedence over the Commissioning Plan.”

- c. Revise Paragraph 1.6 A Responsibilities: Delete reference to LEED-related requirements.
5. Section 05 50 00 – Metal Fabrications: Add to Paragraph 1.2 Summary, item “5. Wrought Iron.”
6. Section 13 70 16 – Bullet Resistant Storefront: Add Section 13 70 16 provided with this addendum.
7. Section 08 45 23 – Translucent Panel Unit Systems: Remove and replace with Section 08 45 23 provided with this addendum.
8. Section 08 71 00 – Door Hardware: Remove and replace with Section 08 71 00 provided with this addendum.
9. Section 23 08 00 – Commissioning of Mechanical: Add Section 23 08 00 – Commissioning of Mechanical provided with this addendum.
10. Section 26 08 00 – Commissioning of Electrical: Add Section 26 08 00 – Commissioning of Electrical provided with this addendum.
11. Section 21 13 13, page 5, paragraph 3.2.G – Replace the entire sentence with the following: 3.2.G “Center heads in one direction in the ceiling tile.”

CONSTRUCTION DRAWINGS

1. Architectural:
 - A. Sheet G-101A – Fire Extinguisher Location 2nd Floor: Add Sheet G-101A provided with this addendum.
 - B. Sheet H-101A – First Floor Demolition Plan: Add Sheet H-101A provided with this addendum.
 - C. Interior Architecture:
 - 1) Replace Sheets AI-111 through AI-117 with sheets provided with this addendum.
 - 2) Replace Sheets AI-221 and AI-222 with sheets provided with this addendum.
2. Civil:
 - A. Sheet C-3:
 - 1) Delete all Keyed Notes and replace with Sheet C-3-A New Keyed Notes provided with this addendum.
 - 2) Delete keyed note 21 as shown on new Sheet C-3-B provided with this addendum.
 - B. Sheet C-5: Delete keyed note 27, add keyed note 26 as shown on Sheet C-5-A provided with this addendum.
 - C. Sheet C-12: Delete shown General Notes and replace with Sheet C-12-A New General Notes provided with this addendum.
 - D. Add detail sheets for Asphalt Pavement Parking Lot and Access Road; Curb & Gutter; Typical Concrete Sidewalk; Pavement Markings; Concrete Apron Detail; Arrow Pavement Markings; Handicapped Parking Sign; Stop Sign & Sign Post Installation;

Concrete Flume with Checkered Steel Cover Details; Handicapped Ramp; Handicapped Ramp with Wings; Handicapped Ramp Next to Parking Spaces; Truncated Domes; Concrete Flume Details and Typical Pre-Cast Wheel Stop given in Sheets A through S provided with this addendum.

3. Electrical:

- A. Add detail sheets for Partial Electrical Site Plan; Electrical Keyed Notes; Partial Electrical Site Plan & Electrical Keyed Notes; Partial Electrical Riser Diagram and Electrical Keyed Notes given in Sheets ED-1 through ED-4 provided with this addendum.



County of El Paso Purchasing Department
800 E. Overland Room 300
El Paso, Texas 79901
(915) 546-2048 / Fax: (915) 546-8180

ADDENDUM 4

To: All Interested Proposers
From: Linda Mena, Inventory Bid Technician
Date: May 11, 2010
Subject: BID # 10-024, Construction Improvements for the Juvenile Justice Center

The Purchasing Department received a question relating to the above referenced Bid; the response to the following question:

1. What is the engineer's estimate cost for this Bid?

A= \$4 Million

2. What is the estimate cost for this project?

A= Same as Question 1.

3. Section 015700, page 2, Item 1.7A; what type of security program will the contractor be required to follow? Will the contractor be required to have a security guard during the construction, day / night / weekends, of this project?

A= No security guard is required. Construction protection fencing around the construction site is to be provided with lockable access gates – provide key to Building Engineer, David Hajar. Outline staging and fencing will be provided on addendum 5.

4. Section 016205, page 1, part 2; this portion of the specifications makes reference to LEED requirements. Is this a "LEED Project" and as such will be constructed using LEED Registration requirements? If so, additional clarifications need to be provided to indicate what responsibilities the contractor will have for this project.

A= This is not a LEED project – and we have not found reference that this is a LEED Project in any sections.

5. Section 016235 also refers to LEED requirements. Is this a LEED Project?

A= Same as Question 4.

6. Section 0162335, page 5, item 3.1A; who will be required to pay for the power during the Building Flush Out?

A= See response to Question 9.

7. Section 017419 also refers to LEED requirements. Is this a LEED Project?

A= Same as Question 4. This section refers only to the waste management process.

8. Section 019100; see the following:

a. Page 4, item 1.6A; also refers to LEED requirements. Is this a LEED Project?

A= Same as Question 4.

b. Page 4, item C.1.b; indicates the General Contractor to pay for the commissioning. Does this include the Commissioning Authority (CA)? IF so, who is the CA that the Architect is indicating for the contractor to coordinate with?

A= Refer to Alternate # 3.

c. Page 6, item E; indicates the CA is not to be associated with the contractor. If this is the case besides the required coordination what fees will the GC be required to include in the bid?

A= CA to be hired as a subcontractor and not an employee of the General Contractor.

d. Page 6, item F; makes reference to the development of a commissioning plan, however item 1.5A on page 2 indicates the CA has developed the plan. Who is responsible for developing the plan?

A= Refer to Technical Specifications revised in this addendum.

e. Can the Test and Balance of the HVAC be performed through the Mechanical Subcontractor?

A= No, the Test and Balancing of HVAC shall be the responsibility of the General Contractor to avoid a conflict of interest issue of the TAB contractor obligated to the Mechanical subcontractor for his monies.

9. Since this project is an addition to the existing facility, will the contractor be allowed to tie-in and use the Owner's existing utilities during the construction of this project.

A= Yes, the electrical useage will be metered and billed to the contractor on a monthly basis. The contractor shall provide and install a three phase kwh/demand meter, manufactured by Energy Monitoring Products (E-Mon) Model #480800D or an approved equal. The meter shall be installed at existing switchboard MDB located in the Detention Building where indicated in Electrical Keyed Note #13 on Sheet E1.02. The meter shall be installed on panel "DP"

feeder prior to the start of any construction. The meter will measure the power usage on panel "DP" feeder.

10. Section 024116, is there any restriction as of time of day that the demolition can / cannot be performed?

A= demolition can be performed during normal working hours are from 7:00 am to 5:00 pm.

11. Section 024116, page 3, item 3.3A&B; does the Owner have a list of items they would like to salvage.

A= Alternate 8: Twelve (12) small trees or palm trees located at the front of the building are to be properly transplanted in a location on the site. The County will coordinate location and will provide maintenance once trees are transplanted.

Light fixtures (inside the demolition area), elevator equipment and all related accessories, existing closed circuit TV cameras and exterior light poles and fixtures are to be salvaged. Store on site for up to one week. Owner will pick up within one week of items been stored.

12. Section 044200, have reviewed the interior and exterior elevations along with the wall sections and have been unable to locate were the "Stone Veneer" is to be installed. Can you please provide further clarification? In addition, page 1, item 1.2A.1 and page 3 item 2.4; indicates veneer masonry anchors, however the exterior is tilt-up concrete panes. will this be a requirement?

A= Installation of stone veneer has been deleted from this Project.

13. Section 115213 does not include any information on the projectors that are to be provided under alternate #4. Are the projects by Owner or Contractor?

A= Provide and install Toshiba Model TDP-S25U (see attached product sheet) or an approved equal.

14. Section, 220500, page 2, item C; indicates utility fees that the contractor is responsible for. Since this is an addition to an existing facility will with apply? Has the documents been provided to and reviewed by the local utility companies? Who are the local Utility Company representatives and their phone numbers?

A= There is a natural gas high pressure line to be relocated and the contractor shall coordinate with the owner and Texas Gas to have this line relocated and pay for any associated fees. The contact representative at Texas Gas is Ivan Alcocer, 680-7238. No electrical fees are anticipated. A copy of the electrical site plan, electrical riser diagram and loads will be submitted to El Paso Electric Co. The electric utility contact representative (El Paso Electric Co) is provided on Sheet E1.01, Project General Electrical Note #12. The telephone utility representative is provided on attached supplementary Sheet ED-2, Project General Electrical Note #13, provided in this addendum.

15. Division 22 and 23; I am unable to locate the reference to commissioning within these divisions. As stated under Section 019100, page 4, item 1.6A it indicates additional requirements would be found in Divisions 22 & 23. Can you direct me to this information?

A= See Section 23 08 00 – Commissioning of Mechanical provided with this addendum.

16. Division 26; I am unable to locate the reference to commissioning within these divisions. As stated under Section 019100, page 4, item 1.6A it indicates additional requirements would be found in Divisions 26. Can you direct me to this information?

A= See Section 26 08 00 – Commissioning of Electrical provided with this addendum.

17. Alternate No. 6 indicates (Brise-Soleil), see specifications, however in reviewing the specifications I am unable to locate the Division & Section this material is specified. Can you direct me to the correct specification section for this material?

A= Refer to revision to Section 05 50 00 provided in this addendum and drawing Details No. B1 & A1 given in Sheet A-202.

18. Section 323225, have reviewed the drawings, both Civil and Architectural and have not been able to locate the location where this material is to be used. Can you please provide additional information as to its location?

A= Rock wall masonry is not a requirement of this Project.

19. Unable to locate the specification for the Floor Mats shown at the front entry. Can this information be provided?

A= Contractor shall provide and install Model NUWAY surface/recessed system from Matsinc.com, or an approved equal. Color to be selected by the Interior Designer from the manufacturer's standard color selections. See attached.

20. Alternate No. 7 indicates "concrete decorative bollards", however I am unable to locate the product information within the specifications as indicated. Can this information be provided?

A= Contractor shall provide and install Model CB12R; 36" height, cutoff grill & flat top per Architectural Area Lighting [Contemporary Concrete Bollards] or an approved equal.

Bollards are identified on the Lighting Plan, Sheet E3.01, as type "T" and "T1" lighting fixtures. The bollard manufacturer and catalog number are covered on page 7 of specification Section 26 51 00 in the Technical Specifications.

21. Since this is a County of El Paso project, will the Permit Fees be waived by the City of El Paso?

A= As per Jose Lopez Jr., County's Purchasing Dept, as stated at the Pre-Bid Meeting the permit fees are waived.

Plans

22. Sheet G-101, C3-2nd Floor Plan; no Fire Extinguisher are shown. Are they or are they not required within the 2nd floor area? If so, how many or what locations?

A= See attached 2nd Floor Sheet, titled G-101A.

23. During the demolition and new construction, as shown on Sheet H-101, what access will the contractor be required to provide, since the Owner will be cut off from the adjacent building to the North at ground level? In addition, will the door located at the southwest corner of the adjacent building be required to remain in use during the demolition and new construction or can it be closed until all construction is complete?

A= Contractor shall maintain the door indicated in attached sheet H-101A as an emergency exit until near the completion of his work and shall install new window as required.

Contractor shall provide temporary barrier at indicated at stairwell as shown on drawing H-101A; Contractor shall remove this barrier on completion of his work. Door located at SW corner of the adjacent building is to remain closed and shall be the responsibility of the Contractor for the duration of his work.

24. Sheet C-3; indicates the removal of the electrical and other site utility lines, however there is not a site electrical demolition plan to indicate what site utilities are to be abandoned in places or removed. Is one going to be provided? Also, note #10 indicates the contractor to remove the telephone pedestal. Is the pedestal a Telephone Company pedestal or a private one, owned by the county?

A= See Sheets C-3A and C3-B provided with this addendum. There is no Electrical Demolition Plan. Electrical demolition work has been included on project drawings Electrical Site Plan Part 1, Sheet E1.01 and Electrical Site Plan Part 2, Sheet E1.02. Area pole lights are the only items required to be removed. Supplementary Drawing Sheet Ed-1, provided with this addendum requires the removal of a telephone pedestal by A.T. & T.

25. Sheet L-3 and L-4 indicates two (2) new water meters. Are the meter furnished by the Owner? If not, has the documents been provided to the El Paso Water Utilities and a application been signed by the owner in order for the contractors to receive a cost for this work or will the Contractors be given a allowance to include in its bid for this work?

A= Provide a \$6,000 allowance for both meters. Documents have not been provided at this time and will be submitted to EPWU within the next two weeks. Irrigation and landscaping is to be provided for the off-site parking (off Delta Drive – see L2 and L4) and at the site as shown on L1 and L3 with Phase Two for future building site area as shown not to be included in the bid.

26. Sheet AC-101 and AC-102, Site Legend; indicates "New Rockwall". I have reviewed the drawings and have been unable to locate where this material is to be installed. Can you please provide a supplemental drawing indicating the location(s) where the rockwalls are needed? In addition, it is unclear what are the limits of the "New Chain Link Fencing" on this project. Can you provide a supplemental drawing that indicates its limits?

A= Same as Question 18.

27. Sheet P-101, General Note #6; indicated the contractor to pay for all Utility Connection and Extension Fees as well as Impact Fees and Developer Fees. Since this is an existing facility does this note apply. If this note does apply, has all the Utility Companies Applications completed and submitted, by the Owner, and plans provided in order for them to provide cost information to the contractors for this relocation work? In addition do you have a contact name and number for the individuals within the Utility Companies working on this project?

A= Same as Question 14.

28. Sheet P-102, Plumbing Demolition Notes #1 & #2; indicate to ONLY "coordinate with Texas Gas Utility". This conflicts with "General Note #6 on Sheet P-101. Which is correct?

A= Same as Question 14.

29. Sheet E5.01, Electrical Notes #11, #12, #21 and #22 the work associated with Alternate #2? If not, can you direct me to the correct sheet(s) where Alternate #2 information is indicated?

A= Keyed notes in question are part of the work associated with Alternate #2. As indicated in Section 01 23 00 – Alternates, page 1, all (new) surveillance cameras and wiring are to be furnished and installed as part of Alternate #2. Racework and power provisions for closed circuit tv (CCTV) system, to include relocating existing cameras, shall be provided in the Base Bid. This also applies to Second Floor special systems CCTV work on Sheet E5.02.

30. Sheet AI-114 and AI-115; shows millwork elevations, however, there are not cross sections through the items to determine how they are to be constructed. Can you please provide this information? It is our hope that the cross section may clear up the question to where the "Bullet Resistant Fiberglass" material is to be installed.

A= Bullet Resistant Fiberglass material is to be used as a clad for the Judge's Bench under the plywood finish millwork.

Contract Specifications

31. Section 137005; after several reviews of the drawings we am unable to locate the location(s) were this material is to be installed. Can you please indicate where this material will be installed?

A= Same as Question 30.

Additional questions

32.Can you quote the specification of our areas which are of Audio/Video, CCTV and Access control?

A= The requirements for the fire alarm system are covered in Section 28 30 00; the video surveillance system are covered in Section 28 20 00. The requirements for the access control are covered in Architectural Sections and to be issued by addendum. Electrical connections and installation requirements, associated with the referenced areas, can be found on the electrical project drawings E4.01, E4.02, E5.01, E5.02 and E7.0.

33. Are the interior frames to be hollow metal or storefront?

A= These shall be hollow metal frames as per the Door Schedule. Storefront will only be installed at the Security Office Room (No. 108).

34. Alt #5 calls for entrance glazing to be bullet resistant. There is no spec on the BR glass. Most BR glass will not fit into an aluminum storefront frame so the entire system would have to be Factory BR.

A= Refer to Section 13 00 66 attached to addendum.

35. Frames D, U1, U2 and U3 all show fiberglass panels. The only spec that might qualify for these are the shade canopies which are Kalwall. If this is the case, there might be a conflict on this portion as to who is supposed to supply and install these (who would be responsible for sizes, warranty, etc). Most Kalwall panels will not fit in storefront so the entire wall would have to be frame and panels by Kalwall. IF Kalwall does have a panel that will fit into storefront, this might still cause a conflict because Kalwall is a direct competitor with any glazing company (including ourselves) that also supply translucent panel systems and thus purchasing from them could cause issues with glazing contractor suppliers.

A= Frame D, will be Translucent Panel; U1,U2 and U3 are regular storefront glazing w/ Thermal break double pane, low-e storefront.

END OF ADDENDUM 4 QUESTIONS

BID FORM (LUMP SUM CONTRACT)

Place County of El Paso Purchasing Department

Date _____

Project No. 10-024

Proposal of _____ (hereinafter called Bidder), a corporation organized under the laws of the State of _____/a partnership/an individual doing business as _____(strike out inapplicable references).

To the _____ (hereinafter called Owner).

Gentlemen:

The Bidder, in compliance with your invitation for bids for the construction of the **Construction Improvements for the Juvenile Justice Center** that consists of the following:

The project consists of but is not limited to the following:

BASE BID: New additions of approximately 23,385 square-feet and 3,000 square-feet of renovation to be integrated and connected to the existing Juvenile Probation Department located at 6314 Delta Drive, El Paso, Texas 79905. Two new additions are a 2-story and a 1-story concrete tilt-up panels, steel frame, SBS modified bituminous roofing, aluminum storefront and fixed insulated windows, finishes, passenger elevator, landscaping and site improvements as per Plans and Specifications.

Having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies: and to construct the project in accordance with the Contract Documents within the time set forth herein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" by the Owner, **substantial completion of the project within 244 consecutive calendar days thereafter, and final completion of the project within 91 consecutive calendar days as stipulated in the specifications.** Bidder further agrees to pay as liquidated damages, the sum of **\$200.00** for each consecutive calendar day thereafter as hereinafter provided in the GENERAL CONDITIONS.

Bidder acknowledges receipt of the following addenda:

Date	Addendum Number
_____	_____
_____	_____
_____	_____

BASE PROPOSAL: Bidder agrees to perform all of Work described in Base Bid as necessary and work described in the specifications and shown on the plans for the sum of

Base Bid

(\$ _____) _____
(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern).

Alternates

Alternate No. 1: Provide and install a new day lighting dimming system in lieu of dual switch base bid system as shown on plans and specifications.

(\$ _____) _____
(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern).

Alternate No 2: Provide and install surveillance cameras and wiring as shown on plans and specifications.

(\$ _____) _____
(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern).

Alternate No 3: Provide new energy system commissioning as per plans and specifications.

(\$ _____) _____
(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern).

Alternate No 4: Provide and install new screens and projectors as shown on plans and specifications. Wiring and preparation for screens and projectors shall be included in Base Bid.

(\$ _____) _____
(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern).

Alternate No 5: Provide and install bulletproof glazing at front entrance doors and windows as shown on plans and specifications.

(\$ _____) _____
(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern).

Alternate No 6: Provide and install new decorative metal grille (brise-soleil) at entrance wall as shown on plans and specifications.

(\$ _____) _____
(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern).

Alternate No 7: Provide and install new concrete decorative bollards at selected areas as shown on plans and specifications.

(\$ _____) _____
(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern).

Alternate No 8: Relocate twelve (12) palm trees within the project site as directed by Owner.

(\$ _____) _____
(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern).

*** In the evaluation and comparison of bids, the lowest bidder will be determined based on the sum of the Base Bid and accepted Alternates.**

INVITATION FOR BIDS

(Must be modified if applicable State or local law so requires)

The County of El Paso will receive Bids for Construction Improvements for the Juvenile Justice Center, Bid #10-024, until 2:00 P.M., on Friday, May 28, 2010, at the County Purchasing Department, 800 East Overland, Rm 300, El Paso, Texas 79901 at which time and place all bids will be publicly opened and read aloud. Any questions or additional information required by interested vendors must be submitted in writing to the attention of the County Purchasing Agent before Tuesday, April 27, 2010 at 12:00 p.m. Questions can be faxed to (915)-546-8180.

A pre-bid conference and a walk-thru will be held on Wednesday, April 21, 2010 at 10:00 a.m. in the Gym of the Enrique Pena, Jr. Juvenile Justice Center located at 6400 Delta Drive, El Paso, Texas 79905.

Bids are invited upon the work as follow:

BASE BID: Bidder agrees to perform all work described in the Plans and Specifications.

ALTERNATES:

Alternate No. 1: Provide and install a new day lighting dimming system in lieu of dual switch base bid system as shown on plans and specifications.

Alternate No 2: Provide and install surveillance cameras and wiring as shown on plans and specifications.

Alternate No 3: Provide new energy system commissioning as per plans and specifications.

Alternate No 4: Provide and install new screens and projectors as shown on plans and specifications. Wiring and preparation for screens and projectors shall be included in Base Bid.

Alternate No 5: Provide and install bulletproof glazing at front entrance doors and windows as shown on plans and specifications.

Alternate No 6: Provide and install new decorative metal grille (brise-soleil) at entrance wall as shown on plans and specifications.

Alternate No 7: Provide and install new concrete decorative bollards at selected areas as shown on plans and specifications.

Alternate No 8: Relocate twelve (12) palm trees within the project site as directed by Owner.

Copies of the Contract Documents may be obtained for a non-refundable sum of **\$100.00** per set of the documents at the office of the County Purchasing Agent, 800 E. Overland, Rm. 300, El Paso, Texas 79901, telephone number (915) 546-2048. Payment for the Contract Documents may be by cash, check or money order payable to the order of El Paso County.

A certified check, payable to the order of El Paso County or a satisfactory Bid Bond in the amount equal to five percent (5%) of the total contract price, executed with a surety company authorized to do business in the State of Texas must be included in the bid package.

The Contractor must ensure that employees and applications for employment are not discriminated against because of their race, color, religion, sex, or national origin.

The County of El Paso reserves the right to reject any or all Bids or to waive any technicalities in the bidding process.

Bids may be held by the County of El Paso for a period not to exceed ninety (90) days, or such longer time as may be required by the funding agencies, from the date of the bid opening for the purpose of reviewing the bids and investigating the qualifications of Bidders, prior to awarding of the Contract.

SECTION 13 70 16 - BULLET RESISTANT STOREFRONT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Bullet Resistant Storefront System.
- B. Bullet Resistant Doors.

1.2 RELATED SECTIONS

- A. Section 05 10 00 - Structural Metal Framing; Panel Supporting Members
- B. Section 05 50 00 - Metal Fabrications; Panel Supporting Members.
- C. Section 08 71 00 - Door Hardware.

1.3 REFERENCES

- A. ASTM A 36 / A36 M - Standard Specification for Carbon Structural Steel.
- B. ASTM A 924 / A 924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- C. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- D. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- E. ASTM C 509 - Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
- F. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- G. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
- H. ASTM C 1172 - Standard Specification for Laminated Architectural Flat Glass.
- I. ASTM D 2000 - Standard Classification System for Rubber Products in Automotive Applications.
- J. ASTM E 1986 - Standard Test method for performance of exterior windows, curtain walls, doors and storm shutters impacted by missiles and exposed to cyclic pressure differentials.
- K. Aluminum Association Standard AA DAF-45 - Designation System for Aluminum Finishes.
- L. FEMA 320 - Taking Shelter From the Storm: Building a Safe Room Inside Your House. (Rated Tornado and Hurricane Storm Shelter Doors.)

- M. FEMA 361 - Design and Construction Guidance for Community Shelters. (Rated Tornado and Hurricane Storm Shelter Doors.)
- N. GANA - Glass Association of North America - Glazing Manual.
- O. NIJ Standard 0108.01 - (National Institute of Justice) Standard for Ballistic Resistant Protective Materials (September, 1985).
- P. UL 752 - Standard for Bullet Resisting Equipment (January 27, 1995)
- Q. GSA TS01 - US General Services Administration Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings; 2003.
- R. DOD UFC 4-010-01 - United Facilities Criteria (UFC) DOD Minimum Antiterrorism Standards for Buildings.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- C. Shop Drawings:
 1. Submit shop drawings prepared by the manufacturer showing plans, sections, elevations, layouts, profiles and product component locations, including anchorage, bracing, fasteners, accessories and finishes.
 2. Include dimensioned elevation of each type opening assembly in project; indicate sizes and locations of hardware, and lites if specified.
 3. Schedule: Indicate each opening assembly in project; cross-referenced to plans, elevations, and details.
- D. Calculations: Submit blast calculations by a qualified blast engineer to substantiate that the system design and anchorage meets or exceeds the minimum performance required.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- F. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified with a minimum documented experience of five years.

- B. Installer Qualifications: Company specializing in installation of products specified with minimum three years documented experience.
- C. Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, and manufacturer's installation instructions.
- D. Coordination of Work: Coordinate layout and installation of components with other construction.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's unopened, undamaged packaging, with manufacturer's labels intact.
- B. Remove wraps or covers from windows and frames upon delivery at the building site; clean and touch-up scratches or disfigurement caused by shipping or handling promptly.
- C. Store assemblies covered to protect them from damage but permitting air circulation.

1.7 SEQUENCING

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - United States Bullet Proofing
 - Armortex
 - North America Bullet Proof
 - Ballastica™ or equal

2.2 COMPONENTS

- A. Extruded Aluminum: ASTM B 221; 6061 alloy, T5 temper typical, 6061 alloy, T6 temper for extruded structural members.

- B. Sheet Aluminum: ASTM B 209, 5005 alloy, H15 or H34 temper.
- C. Sheet Steel: ASTM A 924/A 924M; galvanized to minimum G90.
- D. Steel Sections: ASTM A 36/A3 6M; shaped to suit mullion sections, galvanized.
- E. Internal framing fasteners Type 18-8 stainless steel.
- F. Neoprene glazing gaskets:
 - 1. Interior Glazing gaskets closed cell cellular neoprene conforming to ASTM C 509 Type II Option 1 with a 40-50 Shore A Durometer.
 - 2. Exterior Glazing gaskets solid neoprene conforming to ASTM C 864 with a 65-75 Shore A Durometer.
- G. Weatherstripping: Entrance manufacturer's standard types to suit application.
- H. Fasteners: Stainless steel or corrosion resistant steel.

2.3 BULLET RESISTANT STOREFRONT SYSTEMS

- A. Bullet Resistant Storefront System: All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members. Corner joinery shall consist of heavy duty extruded and keyed aluminum corner splines with continuous 3/8 inch diameter tie rod construction. Glazing must not be removable from the threat side of the door. Provide to dimension heights and widths indicated on the Drawings.
 - 1. System shall be designed to defeat ballistic assaults from a 44 magnum handgun in accordance with UL 752, Level 3.
 - 2. Aluminum Frames:
 - a. Frame Size 2-1/2 inches (64 mm) by 4-1/2 inches (114 mm).
 - 3. Glazing:
 - a. GCP 300: Glass/Polycarbonate Composite, nominal thickness 1-3/16 inch (30 mm), nominal weight 13.2 lbs/SF (64 kg/sm). Performance: UL 752, UL-3 (SPSA) 44 Mag. 240 Gr. Sp 1350-1485 fps.
- B. Bullet Resistant Door System: All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members. Corner joinery shall consist of heavy duty extruded and keyed aluminum corner splines with continuous 3/8 inch diameter tie rod construction. Glazing must not be removable from the threat side of the door. Provide to dimension heights and widths indicated on the Drawings.
 - 1. System shall be designed to defeat ballistic assaults from a 44 magnum handgun in accordance with UL 752, Level 3.
 - 2. Aluminum Doors:
 - a. Top rail and stile 2-3/4 inches (70 mm).
 - b. Bottom rail 8-1/2 inches (216 mm) including glass stops.
 - 3. Aluminum Door and Sidelight Frames and Extrusions:
 - a. Size 1.75 inches (44 mm) by 4 inches (102 mm).
 - b. Structural sections shall be .125 inches thickness.
 - 4. Glazing:

- a. GCP 300: Glass/Polycarbonate Composite, nominal thickness 1-3/16 inch (30 mm), nominal weight 13.2 lbs/SF (64 kg/sm). Performance: UL 752, UL-3 (SPSA) 44 Mag. 240 Gr. Sp 1350-1485 fps.
- 5. Door Hardware:
 - a. SELECT SL-11 or HD continuous aluminum gear hinge.
 - b. Adams Rite MS1850 deadlock with Adams Rite 4066 Series mortise thumb turn and or Keyed mortise cylinder.
 - c. 9 inch aluminum pull handle as selected by the Architect.
 - d. Door width aluminum push bar as selected by the Architect.
 - e. LCN 4000 series heavy duty door closer.

2.4 FACTORY FINISH

- A. Provide aluminum finishes in accordance with Aluminum Association Standard AA DAF-45.
- B. Clear Anodized Aluminum Surfaces: 204-R1 Class-II anodized aluminum coating.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install plumb, level, square, true to line, and without warp or rack.
- C. Provide all fasteners required for installation.
- D. Anchor frames securely in place to supports. Use attachment methods permitting adjustment for construction tolerances, irregularities, alignment, and expansion and contraction.
- E. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by Architect.
- F. Sheet Metal Flashing: Coordinate with sheet metal flashing as specified in Section 07 62 00.

- G. Joint Sealants: Install joint sealants as specified in Section 07 92 00.
- H. Adjust door equipment for correct function and smooth operation.
- I. Verify water and weather tight installation.
- J. Remove temporary protection.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's representative to verify that installation is in conformance to the manufacturer's recommendations.

3.5 CLEANING

- A. Clean interior and exterior glass surfaces promptly after installation in accordance with manufacturer's instructions.
- B. Remove excess joint sealant in accordance with sealant manufacturer's instructions.
- C. Do not use harsh cleaning materials or methods that would damage glazing or finish.

3.6 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 13 70 16

SECTION 23 08 00 –COMMISSIONING OF MECHANICAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Refer to Section 09 91 13 GENERAL COMMISSIONING REQUIREMENTS.
- B. The commissioning process does not take away from or reduce the responsibility of the installing contractors to provide a finished and fully functioning product. All parties affected by commissioning shall integrate the commissioning requirements into their work and coordinate fully with the Commissioning Plan.

1.2 COORDINATION

- A. Qualifications: The System Commissioning Manager (SCM) shall directly oversee the work. The SCM shall reside in the office that executes the work. The SCM shall have a minimum of ten [10] years experience in mechanical systems construction, Engineering, testing and balancing, and commissioning, and shall be a full-time Professional Mechanical Engineer (P.E.) with two [2] years minimum experienced registered in the state the project is located. The P.E. shall remain directly involved in the project including site time, inspections, testing, and meetings. The Systems Commissioning Manager (SCM) shall be responsible for the complete systems, heating systems, control system, cooling systems, air handling systems, piping and pumping systems, and all other systems installed under Division 21, 22, 23 (Mechanical) of the Specifications.

1.3 COMMISSIONING PROCESS

- A. Refer to Section 09 91 13 GENERAL COMMISSIONING REQUIREMENTS.

1.4 QUALITY ASSURANCE

- A. Refer to ASHRAE Guideline 1-1989, Guidelines for Commissioning of HVAC Systems, and Guideline 4-1993, Preparation of Operating and Maintenance Documentation for Building Systems.

1.5 SUBMITTALS

- A. The HVAC Commissioning Authority (CA) will submit to the owner for approval prior to starting the commissioning (Cx) process.
- B. Commissioning Plan.
- C. Division 21,22, 23 O&M Documentation Requirements and Administration Plan.
- D. Training Plan.

1.6 RESPONSIBILITIES

- A. Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS.

1.7 PRELIMINARY COMMISSIONING PLAN:

- A. Refer to Section 09 91 13 GENERAL COMMISSIONING REQUIREMENTS.

1.8 WARRANTY PERIOD

- A. Coordinate and supervise required deferred testing and deficiency corrections.
- B. Return to the site at 10 months into 12-month warranty period and review with facility staff the current building operation and the condition of outstanding issues related to the original commissioning. Also interview facility staff and identify problem or concerns they have operating the building as originally intended. Make suggestions for improvements and for recording these changes in the O&M manuals. Identify areas that may come under warranty or under the original construction contract. Assist facility staff in developing reports, documents and request for services to remedy outstanding problems.
- C. Equipment Suppliers
 - 1. Provide all requested submittal data, including detailed start-up, testing, and training procedures and specific responsibilities of the Owner to keep warranties in force.
 - 2. Assist in equipment testing per agreements with Subs.
 - 3. Include all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment according to these Contract Documents in the base bid price to the Contractor, except for stand-alone data-logging equipment that may be used by the CA.
 - 4. Provide information requested by CA regarding equipment sequence of operation and testing procedures and training.
 - 5. Review test procedures for equipment installed by factory representatives.
- D. Mechanical, Controls and TAB Contractors: (also see G, H, and I below) The commissioning responsibilities applicable to each of the mechanical, controls and TAB contractors of Division 15 are as follows (all references apply to commissioned equipment only):
 - 1. Construction and Acceptance Phases
 - a) Include the cost impact to the prime Division 15 contractor of commissioning in the contract price. See the "Preliminary Commissioning Plan" this section.
 - b) In each purchase order or subcontract written, include requirements for submittal data, testing, O&M data and training.
 - c) Attend a commissioning scoping meeting and other necessary meetings scheduled by the CA to facilitate the Cx process.
 - d) Provide limited assistance to the CA in preparation of the specific functional performance test procedures as specified in the Preliminary Commissioning Plan. Test procedures shall be coordinated with and integrated with other project requirements (e.g. boiler flue analysis). Subs shall review test procedures to ensure feasibility, safety and equipment protection and provide necessary written alarm limits to be used during the tests. Be prepared to test everything from components, to sub-systems, point to point, trending, and full integrated system.
 - e) Develop a full start-up and initial checkout plan using manufacturer's start-up procedures and the pre-functional checklists from the CA. Submit manufacturer's detailed start-up procedures and the full start-up plan and procedures and other requested equipment documentation to CA for review.

- f) During the start-up and initial check out process, execute pre-functional procedures provided by the CA.
 - g) Perform and clearly document all startup and system operational checkout procedures, providing a copy to the CA, including factory startups.
 - h) Address current owner punch list items before functional testing. Air and Water TAB shall be completed with discrepancies and problems remedied before functional testing of the respective air or water-related systems.
 - i) Provide skilled technicians to execute starting of equipment and to execute the functional performance tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.
 - j) Perform functional performance testing under the direction of the CA for the specified equipment. Assist the CA in interpreting the monitoring data, as necessary.
 - k) Correct deficiencies (differences between specified and observed performance) as interpreted by the CA and owner's representative and retest the equipment.
 - l) Prepare O&M manuals according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.
 - m) Prepare red-line as-built drawings.
 - n) Provide training of the Owner's operating personnel as specified.
 - o) Coordinate with equipment manufacturers to determine specific requirements to maintain the validity of the warranty.
2. Warranty Period
- a) Execute deferred functional performance testing, witnessed by the CA, according to the Specifications.
 - b) Correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in the warranty period.

E. Mechanical Contractor. The responsibilities of the HVAC mechanical contractor, in addition to those listed in previous sections are:

- 1. Provide factory start-up services where specified and provide skilled technicians during start-up for the following equipment:
 - a) Air handlers
 - b) Pumps
 - c) Chillers
 - d) Fans
- 2. Provide startup for all other HVAC equipment not listed above, excepting the control system.
- 3. Assist and cooperate with the TAB contractor and CA by:
 - a) Put all HVAC equipment and systems into full operation and continue the operation during each working day of TAB and commissioning, as required.
 - b) Include cost of sheaves and belts and installation that may be required by TAB.
 - c) Provide test holes in ducts and plenums where directed to allow air measurements and air balancing. Cover with an approved plug.
 - d) Provide temperature and pressure taps according to the Construction Documents for TAB and commissioning testing.
- 4. Install a "pete's" plug at each water sensor which is an input point to the control system.

5. Prepare a preliminary schedule for Division 15 pipe and duct system testing, flushing and cleaning, equipment start-up and TAB start and completion for use by the CA. Update the schedule as appropriate.
6. Notify the CA when, pipe and duct system testing, flushing, cleaning, startup of each piece of equipment and TAB will occur. Be responsible to notify the CA, ahead of time, when commissioning activities not yet performed or not yet scheduled are, or will delay construction. **Be proactive in seeing that commissioning processes are executed and that the CA has the scheduling information needed to efficiently execute the commissioning process.**

F. Controls Contractor. The commissioning responsibilities of the controls contractor, in addition to those listed in previous sections are:

1. Assist and cooperate with the TAB contractor in the following manner:
 - a) Meet with the TAB contractor prior to beginning TAB and review the TAB plan to determine the capabilities of the control system toward completing TAB. Provide the TAB any needed unique instruments for setting control and instruct TAB in their use (hand-held control system interface for use around the building during TAB, etc.).
 - b) Have all CA required prefunctional checklists, calibrations, startup and selected functional tests of the system completed and approved by the CA prior to TAB.
 - c) Provide a qualified technician to operate the controls to assist the TAB contractor in performing TAB.
2. Assist and cooperate with the CA in the following manner:
 - a) Execute the functional testing of the controls system and other equipment as specified for the controls contractor in the Commissioning Plan.
 - b) Remain on-site and available for assistance with mechanical system functional tests for the equipment so specified in the Preliminary Commissioning Plan.
 - c) Execute all control system trend logs specified in Section 15800.
3. The controls contractor shall prepare a written plan indicating in a step-by-step manner, the procedures that will be followed to test, checkout and adjust the control system prior to functional performance testing. At minimum, the plan shall include for each system and subsystem controlled by the automatic controls:
 - a) System name.
 - b) List of devices with a brief description of functional purpose of each.
 - c) Step-by-step procedures for testing each controller after installation.
 - d) A description of the expected signal values transmitted by the sensor.
 - e) A description of the expected signal values transmitted by the controller to the controlled device or actuator.
 - f) A description of the full range of values, actions and feedback expected from the controlled device.
 - g) A description of the instrumentation required to test the system.
 - h) A description of the expected field adjustments for transmitter, controller, and control actuator should control responses fall outside of expected values.
 - i) A log sheet to document the process, including the expected and initial and final field-read values. This shall clearly indicate when a sensor or controller have "passed" and are operating within the contract parameters.
 - j) Indicate what tests on what systems should be completed prior to TAB using the control system for TAB work. Coordinate with the TAB contractor for this determination.
4. Provide a signed and dated certification to the CA and Owner upon completion of the

- checkout, prior to functional testing, that all system programming is complete as to all respects of the Contract Documents, excepting functional testing requirements.
5. Beyond the control points necessary to execute all documented control sequences, provide monitoring, control and virtual points as specified in Section 15800.
 6. List and clearly identify on the as-built drawings the locations of all static and differential pressure sensors (air and water pressure).

G. TAB Contractor. The duties of the TAB contractor, in addition to those listed in previous sections are:

1. Submit the outline of the TAB plan and approach to the CA, Owner and the controls contractor six weeks prior to starting the TAB. This plan will be developed after the TAB has some familiarity with the control system. Included in the approach, shall be an explanation of the intended use of the building control system and documentation forms. The controls contractor will comment on feasibility of the plan.
2. Submit weekly written reports of discrepancies, contract interpretation requests and lists of completed tests to the CA and Owner Representative.
3. Communicate in writing to the controls contractor all setpoint or sequence changes made or problems and discrepancies identified during TAB which affect the control system setup and operation.
4. Provide a draft TAB report within two weeks of completion. The report will contain a full explanation of the methodology, assumptions and the results in a clear format with designations of all uncommon abbreviations and column headings.
5. Provide the CA with any requested data, gathered, but not shown on the draft reports.
6. Provide a final TAB report to the CA with details, as in the draft.
7. Conduct functional performance tests and checks on the original TAB as specified for TAB in the Commissioning Plan.

1.9 RELATED WORK

- A. Specific commissioning requirements are given in all of the project documents. The commissioning agent will be familiar with the intent and requirements outlined throughout the project documents.

1.10 DEFINITIONS

- A. Refer to Section 09 91 13 GENERAL COMMISSIONING REQUIREMENTS..

1.11 SYSTEMS TO BE COMMISSIONED

- A. The following checked systems will be commissioned in this project:

Equipment and Systems	Functional Test Requirements Specified In:
<u>HVAC System</u>	
___ Air handlers	23 76 00
___ Testing, Adjusting and Balancing work	23 05 93
___ EMCS	23 09 23

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. Refer to Section 09 91 13 GENERAL COMMISSIONING REQUIREMENTS.

PART 3 - EXECUTION

3.1 MEETINGS

- A. Refer to Section 09 91 13 GENERAL COMMISSIONING REQUIREMENTS.

3.2 REPORTING

- A. Refer to Section 09 91 13 GENERAL COMMISSIONING REQUIREMENTS..

3.3 CLEANING

- A. Equipment and Equipment Rooms:
 1. Remove dust, dirt, rust, stains, and temporary covers.
 2. Foreign matter shall be blown, vacuumed, flushed, or cleaned out of and from new equipment, fixtures, piping, ductwork, pumps, fans, motors, bearings, devices, switches, controls, and panels.
 3. Clean and polish identification plates.
 4. In equipment rooms, clean equipment, ductwork, insulation, piping, conduit, and room surfaces from dust and dirt and maintain in a clean condition from date of substantial completion until final completion of work and corrective work.

3.4 SUBMITTALS

- A. Division 21, 22, 23 shall provide all submittal documentation to the CA and to the Owner as well as supplemental data requested by the CA.

3.5 START-UP, PRE-FUNCTIONAL CHECKLISTS AND INTIAL CHECKLIST

- A. Division 21, 22, 23 has start-up responsibility and is required to complete systems and sub-systems so they are fully functional, meeting the design objectives of the Contract Documents. The commissioning procedures and functional testing do not relieve or lessen this responsibility or shift that responsibility partially to the commissioning agent or Owner.
- B. Commissioning related functional testing is intended to begin upon completion of a system, sub-system, or phase. Beginning system testing before full completion, does not relieve the Contractor from fully completing the system, including all pre-functional checklists as soon as possible.

3.6 EQUIPMENT START-UP AND CHECK-OUT

- A. General:
- B. Verify readiness for start-up of each item of equipment on the basis of inspection,

including:

1. Adjustment of vibration isolators.
 2. Alignment of shafts and couplings.
 3. Direction of rotation by jogging motor.
 4. Completion of lubrication procedures.
 5. Piping and equipment properly connected.
 6. Equipment properly set.
 7. Wiring properly connected.
 8. Controls, safeties, and time switches properly set.
 9. Electrical overload relays appropriate for load.
 10. Electrical accessories properly installed and adjusted.
 11. Clean filters in place.
 12. Additional item checks as they apply to each piece of equipment
- C. Prepare first-run checklist for equipment, perform first-run observations and record findings.
1. Verify direction of motor rotation after final electrical connections.
 2. Measure ampere draw of electric motors and compare with nameplate rating and with overload heater ratings.
 3. Check additional items as they apply to each piece of equipment.
- D. Start-up equipment and check-out operation in accordance with manufacturer's published procedures and with the procedures specified herein.
1. Do not operate HVAC systems in a mode that would induce unconditioned, outside air into the building.
 2. Submit report on equipment start-up and check-out with data from recorded findings.
- E. Sensor Calibration Calibration of all sensors shall be included as part of the pre-functional checklists performed by the Contractors, similar to the following procedures:
1. All Sensors. Verify that sensors with shielded cable, are grounded only at one end. For sensor pairs that are used to determine a temperature or pressure difference, make sure they are reading within 0.2°F of each other for temperature and within a tolerance equal to 2% of the reading, of each other, for pressure. Tolerances for critical applications may be tighter.
 2. Sensors Without Transmitters-Standard Application Make a reading with a calibrated test instrument within 6 inches of the site sensor. Verify that the sensor reading (via the permanent thermostat, gage or building automation system (BAS)) is within the tolerances in the table below of the instrument-measured valve. If not, install offset in BAS, calibrate or replace sensor.
 3. Sensor With Transmitters-Standard Application Disconnect sensor. Connect a signal generator in place of sensor. Connect ammeter in series between transmitter and BAS control panel. Using manufacturer's resistance-temperature data, simulate minimum desired temperature. Adjust transmitter potentiometer zero until 4, mA is read by the ammeter. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the BAS. Reconnect sensor. Verify that the sensor reading (via the permanent thermostat, gage or building automation system (BAS)) is within the tolerances in the table below of the instrument-measures valve. If not, replace sensor and repeat. For pressure sensors, perform a similar

process with a suitable signal generator.

F. Execution of Pre-Functional Checklist and Startup

1. Two weeks prior to various phases of startup, the Subs and vendors schedule startup and checkout with Engineer, GC and CA. The performance of the Pre-Functional checklists, startup and checkout are directed and executed by the Sub or vendor. When checking off Pre-functional checklist, signatures (as certification) will be required of other Subs for verification of completion of their work.
2. The CA shall observe, at minimum, the procedures for each piece of primary equipment.
3. For lower-level components of equipment, (e.g., sensors, controllers), the CA shall observe a sampling of the Pre-Functional and start-up procedures.
4. The Subs and vendors shall execute startup and provide the CA with a signed and dated copy of the completed start-up and Pre-Functional tests and checklists.
5. Only individuals that have direct knowledge and witnessed that a line item tack on the Pre-Functional checklist was actually performed shall initial or check that item off. It is not acceptable for witnessing supervisors to fill out these forms.

G. Deficiencies, Non-Conformance and Approval in Checklists and Startup.

1. The Subs shall clearly list any outstanding items of the initial start-up and Pre-functional Procedures that were not completed successfully.
2. The CA review the report and submits either a non-compliance report or an approval form to the Subs. The CA shall work with the Subs and vendors to correct and retest deficiencies or uncompleted items. The CA will involve others as necessary. The installing Subs or vendors shall correct all areas that are deficient or incomplete in the checklists and tests in a timely manner, and shall notify the CA as soon as outstanding items have been corrected and resubmit an updated start-up report and a Statement of Correction on the original non-compliance report. When satisfactorily, completed, the CA recommends approval of the execution of the checklists and startup of each system to Engineer using a standard form.
3. Items left incomplete, which later cause deficiencies or delays during functional testing may result in backcharges to the responsible party.

3.7 FUNCTIONAL PERFORMANCE TESTING

- A. This sub-section applies to all commissioning functional testing for all divisions.
- B. The specific equipment and modes to be tested are represented by: the preliminary test forms in Appendix A of this section and any other sections where test requirements are found.
- C. The parties responsible to execute each test are Division 21, 22, 23 contractors and subs.
- D. Objectives and Scope. The objective of functional performance testing is to demonstrate that each system is operating according to the documented design intent and Contract Documents. Functional testing facilities bring the systems from a state of substantial completion to full dynamic operation. Additionally, during the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems.

In general, each system should be operated through all modes of operation (occupied, unoccupied, warm-up, cool-down, part- and full-load) where there is a specified system response. Verifying each sequence in the sequences of operation is required. Proper responses to such modes and conditions as power failure, freeze condition, low oil pressure, no flow, equipment failure, etc. shall also be tested. Contractor requirements are identified in the "Preliminary Commissioning Plan."

The functional testing period will be 10 working days this period will begin when all contractors and subs have certified that the installation is substantially complete. During this period, as a minimum there shall be a representative on site from the GC, the controls contractor, and the TAB for an equipment of 8 hours per day. These individuals will subject the system to a variety of operational modes and perform tests on systems and equipment at all levels.

- E. Development of Test Procedures Before test procedures are written, the CA shall obtain all requested documentation and a current list of change orders affecting equipment or systems, including an updated points list, program code, control sequences and parameters. Using the testing parameters and requirements in Appendix A the CA shall develop specific test procedures and forms to verify and document proper operation of each piece of equipment and system. Each Sub or vendor responsible to execute a test, shall provide a copy of the test procures to the sub(s) who shall review the tests for feasibility, safety, equipment and warranty protection. The CA will submit the tests to Engineer for review.

The CA shall review owner-contracted, factory testing or required owner acceptance tests which the CA in not responsible to oversee, including documentation format, and shall determine what further testing or format changes may be required to comply with the Specifications. Redundancy of testing shall be minimized.

The purpose of any given specific test is to verify and document compliance with the stated criteria of acceptance given on the test form.

The final test procedure forms developed by the CA shall include (but not be limited to) the following information.

1. System and equipment or component name(s)
2. Equipment location and ID number
3. Unique test ID number, and reference to unique Pre-functional checklist and start-up documentation ID number for the piece of equipment.
4. Date
5. Project name
6. Participating parties
7. Reference of the specification section describing the test requirements
8. Reference of the specific sequence of operations or other specified parameters being verified.
9. Formulas used in any calculations
10. Required pre-test field measurements
11. Instructions for setting up the test
12. Special cautions, alarm limits, etc.
13. Procedures to execute the test.
14. Acceptance criteria of proper performance.
15. A section for comments

16. Signatures and date block for the CA

F. Test Methods.

1. Functional performance testing and verification may be achieved by manual testing (persons manipulate the equipment and observe performance) or by monitoring the performance and analyzing the results using the control system or other methods. The CA may substitute specified methods or require an additional method to be executed, other than what was specified, with the approval of the Owner. The CA will determine which method is most appropriate for tests that do not have a method specified.
2. Simulated Conditions Simulated conditions shall be allowed, though timing the testing to experience actual conditions is encouraged wherever practical.
3. Overwritten Values. Overwritten sensor values to simulate a condition, such as overwriting the outside air temperature reading in a control system to be something other than it really is, shall be allowed, but shall be used with caution and avoided when possible. Simulating a condition is preferable. E.g., for the above case, by heating the outside air sensor with a hair blower rather than overwriting the value or by altering the appropriate setpoint to see the desired response. Before simulating conditions or overrating values, sensors, transducers and devices shall have been calibrated.
4. Simulated Signals Using a signal generator which creates a simulated signal to test and calibrate transducers and DDC constants is generally recommended over using the sensor to act as the signal generator via simulated conditions or overwritten values.
5. Altering Setpoints Rather than overwriting sensor values, and when simulating conditions is difficult, altering setpoints to test a sequence is acceptable. For example, when the outside air temperature is above 55F, temporarily change the lockout setpoint to be 2F above the current outside air temperature.
6. Indirect Indicators Relying on indirect indicators for responses or performance shall be allowed only after visually and directly verifying and documenting, over the range of the tested parameters, that the indirect readings through the control system represent actual conditions and responses. Much of this verification is completed during Pre-functional testing.
7. Setup Each function and test shall be performed under conditions that simulate actual conditions as close as is practically possible. The Sub executing the test shall provide all necessary materials, system modifications, etc. to produce the necessary flows, pressures, temperatures, etc. necessary to execute the test according to the specified equipment and systems, due to these temporary modifications, to their pre-test condition.
8. Sampling Multiple identical pieces of non-life-safety or otherwise non-critical equipment may be functionally tested using a sampling strategy. Significant application differences and significant sequence of operation differences in otherwise identical equipment invalidates their common identity. Noted that no sampling by Subs is allowed in Pre-functional checklist execution.

G. System and Equipment Acceptance Conditions:

General note: All commissioned systems and equipment will be subject to rigorous acceptance criteria consistent with the guidelines of the specification. Acceptance conditions for the DDC system are provided below as an example.

1. Calibration and testing: calibrate equipment and verify operation before the system

is placed on-line. Check each control point within the system by making a comparison between the control command at the operator console and field-controlled device. DDC control loops, interlocks, sequences, energy management programs, and alarms shall be tested and stable operation verified. Control loop parameters and tuning constants shall be adjusted to produce accurate, stable control system operation. Before obtaining permission to schedule the acceptance test, provide written certification that the installed complete system has been calibrated, tested and is ready to begin acceptance testing.

2. Acceptance test: conduct final acceptance test, with the Owner on site, on the complete and total installed and operational automation system to demonstrate that it is functioning in accordance with requirements specified herein. Demonstrate the correct operation of monitored and controlled points as well as the operation and capabilities of sequences, reports, specialized control algorithms, diagnostics, and software.
 - a) Final system acceptance will be based upon the completion of the following items:
 - (1) Completion of the installation of hardware and software items. Demonstrate complete operation of the system, including hardware and software, with no failures during a 10 consecutive day period. Obtain receipt from the Owner acknowledging no failures within the test period. Submit a daily log documenting tests, activities, and results.
 - (2) Satisfactory completion of the record drawings, and operating and maintenance manuals.
 - (3) Satisfactory completion of training programs.
 - b) Upon final acceptance, the warranty period shall begin.

H. The commissioning process generates a number of written work products described in various parts of the Specifications. These products and their sequence will aid in creating and understanding the role of Functional Performance Testing. In summary, the written products are:

<u>a) Product</u>	<u>Developed By:</u>
(1) Final Commissioning Plan	CA
(2) Meeting minutes	CA
(3) Commissioning schedules	CA with GC
(4) Equipment documentation submittals	Subs and GC
(5) Sequence clarifications	Subs and GC
(6) Pre-functional checklists	CA
(7) Start-up and initial checkout plan	Subs, GC, and CA
(8) Startup and initial checkout forms filled out	Subs, GC, and CA
(9) Final TAB report	TAB
(10) Issues log (deficiencies)	CA
(11) Commissioning Progress Record	CA
(12) Deficiency reports	CA
(13) Functional test forms	CA
(14) Filled out functional tests	CA
(15) O&M manuals	Subs and GC
(16) Commissioning record book	CA
(17) Overall training plan	CA
(18) Specific training agendas	Subs and GC
(19) Final commissioning report	CA

- I. Coordination and Scheduling. The Subs shall provide sufficient notice to the CA regarding their completion schedule for the Pre-Functional checklists and startup of all equipment and systems. The CA will schedule functional tests through Engineer, GC and affected Subs. The CA shall direct, witness and document the functional testing of all equipment and systems. The Contractors and Subs shall execute the tests.
- J. Problem Solving. The CA will recommend solutions to problems found, however the burden of responsibility to solve, correct and retest problems is with the GC, Subs, and Engineer.

3.8 DOCUMENTATION, NON-CONFORMANCE AND APPROVAL OF TEST

- A. Documentation The CA shall witness and document the results of all functional performance tests using the specific procedural forms developed for that purpose. Prior to testing, these forms are provided to Engineer for review and approval and to the Subs for review. The CA will include the filled out forms in the O&M manuals.
- B. Non-Conformance
 - 1. The CA will record the results of the functional test on the procedure or test form. All deficiencies or non-conformance issues shall be noted and reported to Engineer on a standard non-compliance form.
 - 2. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CA, in such cases the deficiency and resolution will be documented on the procedure form.
 - 3. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures. However, the CA will not be pressured into overlooking deficient work or loosening acceptance criteria to satisfy scheduling or cost issues, unless there is an overriding reason to do so at the request of Engineer.
 - 4. As tests progress and a deficiency is identified, the CA discusses the issue with the executing contractor.
 - a) When there is no dispute on the deficiency and the Sub accepts responsibility to correct it:
 - (1) The CA documents the deficiency and the Sub's response and intentions and they go on to another test or sequence. After the day's work, the CA submits the non-compliance reports to Engineer for signature, if required. A copy is provided to the Sub and CA. The Sub corrects the deficiency, signs the statement of correction at the bottom of the non-compliance form certifying that the equipment is ready to be retested and sends it back to the CA.
 - (2) The CA reschedules the test and the test is repeated.
 - b) If there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible:
 - (1) The deficiency shall be documented on the non-compliance form with the Sub's response and a copy given to Engineer and to the Sub representative assumed to be responsible.
 - (2) Resolutions are made at the lowest management level possible. Other parties are brought into the discussions as needed. Final interpretive authority is with Engineer. Final acceptance authority is with the Project

manager.

(3) The CA documents the resolution process.

(4) Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency, signs the statement of correction on the non-compliance form and provides it to the CA. The CA reschedules the test and the test is repeated until satisfactory performance is achieved.

5. Cost of Retesting.

a) The cost for the Sub to retest a pre-functional or functional test, if they are responsible for the deficiency, shall be theirs. If they are not responsible, any cost recovery for testing costs shall be negotiated with the GC.

b) For a deficiency identified, not related to any Pre-functional checklist or start-up fault, the following shall apply: The CA and Engineer will direct the retesting of the equipment once at no "charge" to the GC for their time. However, the CA's and Engineer's time for a second retest will be charged to the GC, who may choose to recover costs from the responsible Sub.

c) The time for the CA and Engineer to direct any retesting required because a specific Pre-functional checklist or start-up test item, reported to have been successfully completed, but determined during functional testing to be faulty, will be backcharged to the GC, who may choose to recover costs from the party responsible for executing the faulty Pre-Functional test.

d) Refer to the sampling section of Section 17100, Part 3.6 for requirements for testing and retesting identical equipment.

C. Failure Due to Manufacturer's Defects. If 10%, or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract Documents (mechanical or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by Engineer. In such case, the Contractor shall provide the Owner with the following:

1. Within one week of notification from Engineer, the Contractor or manufacturer's representative shall examine all other identical units making record of the findings. The findings shall be provided to Engineer within two weeks of the original notice.

2. Within two week of the original notification, the Contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.

3. Engineer will determine whether a replacement of all identical units or a repair is acceptable.

4. Two examples of the proposed solution will be installed by the Contractor and Engineer will be allowed to test the installations for up to one week, upon which Engineer will decide whether to accept the solution.

5. Upon acceptance, the Contractor and/or manufacturer shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

D. Approval. The CA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CA and by Engineer if necessary. The CA recommends acceptance of each test to Engineer using a

standard form. Engineer gives the final approval on each test using the same form, providing a signed copy to the CA and the Contractor.

3.9 OPERATION AND MAINTENANCE DOCUMENTATION PACKAGE – (O&M package shall be provided by the Division 21, 22, 23 contractor and verified by the commissioning agent.)

A. Standard O&M Manuals

1. The specific content and formal requirements for the standard O&M manuals are detailed in the Specifications as well as below.
2. CA Review and Approval: Prior to submittal completion, the CA shall review the O&M manuals, documentation and redline as-builds for systems that were commissioned to verify compliance with the Specifications. The CA will communicate deficiencies in the manuals to Engineer. The CA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

B. Commissioning Record in O&M Manuals.

1. The CA is responsible to compile, organize and index the following commissioning data by equipment into labeled, indexed and tabbed, three-ring binders and deliver it to the GC, to be included with the O&M manuals. Three copies of the manual will be provided. The format of the manuals shall be:

Tab 1	Commissioning Plan
Tab 2	Final Commissioning Report
Tab 3	System Type 1 (air handling units, heat recovery, etc.)
	Sub-Tab A Design narrative and criteria, sequences, approvals for equipment, and O&M information.
	Sub-Tab B Startup plan and report, approvals, corrections, blank Pre-functional checklists
	Colored Separator Sheets-for each equipment type (fans, pumps, chiller, etc.)
	Sub-Tab C Functional tests (completed), trending analysis, approvals and corrections, training plan, record and approvals, blank functional test forms and a recommended recommissioning schedule.
Tab 4	System Type 2...repeat as per System 1
2. Other documentation will be retained by the CA.

C. Operation and maintenance documentation, in hardback 3-ring loose-leaf binders except full size drawings, shall cover the plumbing, HVAC, electrical, and automatic temperature control systems. Documentation shall include the following: operations and maintenance documentation directory; emergency information; operation manual; maintenance manual; test reports; and construction documents.

D. Documentation shall be submitted to the Owner and the CA 1 month before systems start-up and commissioning, and shall be updated, revised and completed during, and at completion of, commissioning.

E. Documentation shall be typewritten and shall contain, at a minimum, the following information.

1. Introduction:
 - a) Project name, contractors' and subcontractors' names, addresses, and telephone and facsimile numbers.
 - b) Index.
2. Operations and Maintenance Documentation Directory:
 - a) Explanation of the identification system used, including lists of systems, equipment and component identifiers and names.
3. Emergency Information:
 - a) Information for technical and non-technical personnel about actions recommended during emergency situations to protect life and property and to minimize disruption to the building occupants. Emergencies shall, at a minimum, include:
 - b) Fire.
 - c) Security breach.
 - d) Power failure.
 - e) Plumbing overflow or rupture.
 - f) Cooling failure.
4. Operating Manual:
 - a) General Information:
 - b) Building function.
 - c) Building description.
 - d) Recommended operating standards and logs (per information and service standards).
5. Technical Information:
 - a) System description.
 - b) Operating routines and procedures.
 - c) Seasonal start-up and shutdown.
 - d) Special procedures.
 - e) Basic troubleshooting.
6. Maintenance Manual:
 - a) Descriptions (Specifications) of the equipment and components.
 - b) Description of function, as applicable: the function of the equipment, procedures before start-up, functional parameters (input, output) at the design load and at part loads, and performance verification procedures.
 - c) Recommended maintenance procedures and their recommended frequency.
 - d) Recommended list of spare parts, part numbers, and the place(s) from which they can be obtained.
 - e) Original purchase order number; date of purchase; name, address, and the telephone number of the vendor; and warranty information.
 - f) Installation information.
 - g) Any other information needed for the preparation of documents supporting the management of operation and maintenance programs.
 - h) Provide an itemized list in the form of a letter from the filter manufacturer certifying the replacement air filters for each piece of equipment. Include the filter description, part number and quantity of each filter required.
7. Test Reports:
 - a) Copies of tests and certifications performed during manufacture, construction, and commissioning, including, but not limited to the following:
 - b) Certification of installation of vibration isolation.
 - c) Certification of hydronic system cleaning.
 - d) Receipt for extra mechanical seals for pumps.

- e) Certification of alignment of pumps.
 - f) Certification of DDC system calibration and testing.
 - g) Receipt for DDC system training.
 - h) Receipt acknowledging no DDC system failures during test period.
 - i) Receipt for instruction of operating personnel.
 - j) Other reports as required in the project.
8. Construction Documents:
- a) Record (as-built) drawings.
 - b) Underground piping as-builts shall equal the quality included in drawing set.
 - c) Approved submittals.
 - d) Equipment identification charts and schedules.
 - e) Warranty certificates.
 - f) Inspection certificates.
 - g) Test, adjust and balance report.
 - h) Commissioning report.

F. Control System Documentation Requirements. In addition to documentation that may be specified elsewhere, the controls contractor shall compile and organize at minimum the following data on the control system in labeled 3-ring binders with indexed tabs.

- 1. Three copies of the controls training manuals.
- 2. Operating and Maintenance Manuals containing:
 - a) Specific instructions on how to perform and apply all functions, features, modes, etc. mentioned in the controls training sections of this specification and other features this system is capable of. These instructions shall be step-by-step. Indexes and clear tables of contents shall be included. Detailed instructions for programming and customizing control loops and algorithms shall be included.
 - b) Full as-built set of control drawings.
 - c) Full as-built sequence of operations for each piece of equipment.
 - d) Full points list.
 - e) Full print out of all schedules and set points after testing and acceptance of the system.
 - f) Marking of all system sensors and thermostats on the as-built floor plan and mechanical drawings with their control system designations.
 - g) Maintenance instructions, including sensor calibration requirements and methods by sensor type, etc.
 - h) Control equipment component submittals, parts lists, etc.
 - i) Warranty requirements.
 - j) Copies of all functional tests and calibrations

G. TAB Documentation Requirements. The TAB will compile and submit the following with other documentation that may be specified elsewhere in the Specifications.

- 1. Final report containing an explanation of the methodology, assumptions, test conditions and the results in a clear format with designations of all uncommon abbreviations and column headings.

H. Review and Approvals. Review of the commissioning related sections of the O&M manuals shall be made by the CA and by the Owner.

- I. Submit a receipt signed by the Owner acknowledging receipt of the operation and maintenance documentation package.

3.10 DIAGRAMS (Diagrams shall be provided by the Division 21, 22, 23 contractor and verified by the commissioning agent).

- A. Frame and mount the following information:

Information	Location
HVAC diagrams, start-stop Appropriate mechanical procedures, and valve schedules.	Mechanical Rooms
Automatic temperature control diagrams and sequences.	Adjacent to each control panel, and at each piece of equipment if separated
Appropriate control and interface drawings, including a simplified guide to local programming through the digital display unit, a directory of I/O points connected to that panel, and variables which may be displayed.	Posted on the inside cover of each DDC panel.

- B. Diagrams shall be typewritten or computer generated.
- C. Diagrams shall be as-built, and shall include interfaces and interlocks with other equipment.

3.11 RECORD DRAWINGS

- A. Coordinate with other specification requirements for record drawings.
- B. Concurrent with substantial completion, submit 2 sets of prints indicating field and as installed conditions of piping, ductwork, and equipment, and incorporating changes made during construction. Prints may be made from corrected reproducibles of shop drawings.
- C. A record of field and as-installed conditions shall be maintained at the site, shall be kept current throughout the Project, and shall be used in the preparation of the final record drawings.
- D. Record drawings shall include the manufacturer and model number of each piece of equipment.

3.12 MAINTENANCE

- A. Equipment operated prior to the date of substantial completion shall be maintained in accordance with manufacturer's recommendations. In addition, provide complete water treatment as directed by County maintenance for HVAC systems operated prior to date of substantial completion.

- 3.13 INSTRUCTION OF OPERATING PERSONNEL (Instruction and training shall be conducted by the Division 21, 22, 23 Contractor and administered by the Commissioning Agent.)
- A. Conduct formal instruction sessions for operating personnel. The session shall be conducted at the time of start-up and check-out and functional testing. Sessions shall be a minimum of 5 days. Sessions shall be conducted at the site.
 - B. Prepare and submit a syllabus describing an overview of the program, describing how the program will be conducted, when and where meetings are to be held, names and company affiliations of lecturers, description of contents and outline for each lecture, and recommended reference material and outside reading. Obtain direction from the Owner on which operating personnel shall be instructed in each system.
 - C. Sessions shall include:
 - 1. General familiarization and operating procedures for the entire plumbing and HVAC.
 - 2. Routine maintenance procedures for equipment.
 - 3. Specific operating and maintenance procedures for:
 - a) Automatic control systems.
 - D. Provide VHS format video tapes of training sessions.
 - E. Obtain a receipt acknowledging completion of each item of instruction.
 - F. The CA shall coordinate the training of Owner personnel for commissioned equipment or systems.
 - G. Mechanical Contractor. The mechanical contractor shall have the following training responsibilities:
 - 1. Provide the CA with a training plan four weeks before the planned training.
 - 2. Provide designated Owner personnel with comprehensive training in the understanding of the systems and the operation and maintenance of each major piece of HVAC equipment including, but not limited to, pumps, boilers, chillers, heat rejection equipment, air handling units, fans, terminal units, and controls.
 - 3. Training shall start with classroom sessions followed by hands on training on each piece of equipment, which shall illustrate the various modes of operation, including startup, shutdown, emergency, power failure, etc.
 - 4. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
 - 5. Classroom sessions shall include the use of overhead projections, slides, video and audio taped material as might be appropriate.
 - 6. The appropriate trade or manufacturer's representative shall provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing contractor or manufacturer's representative. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment are required. More than one party will be required to execute the training.
 - 7. The HVAC mechanical contractor will be required to be present at sessions they are not formally presenting at, to provide special information that might impact operation

- and maintenance.
8. The controls contractor shall attend sessions other than the controls training to discuss the interaction of the controls system as it relates to the equipment being discussed.
 9. The training sessions shall follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
 10. Classroom training shall:
 - a) Use the printed installation, operation and maintenance instruction material included in the O&M manuals.
 - b) Include a review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shut-down, seasonal changeover and any emergency procedures.
 - c) Discuss relevant health and safety issues and concerns.
 - d) Discuss warranties and guarantees.
 - e) Cover common troubleshooting problems and solutions.
 - f) Explain information included in the O&M manuals and the location of all plans and manuals in the facility.
 - g) Discuss any peculiarities of equipment installation or operation.
 - h) The format and training agenda in Guidelines for Commissioning HVAC Systems, ASHRAE, 1989 is recommended.
 11. Hands-on training shall include start-up, operation in all modes possible, shut-down and any emergency procedures of all pieces of equipment.
 12. The mechanical contractor shall fully explain and demonstrate the operation, function and overrides of any local packaged controls, not controlled by the central control system.
 13. The mechanical contractor shall provide at least a total of 16 hours of combined classroom and hands-on training in covering the above topics.
- H. Controls Contractor. The controls contractor shall have the following training responsibilities:
1. Provide the CA with a training plan four weeks before the planned training.
 2. The controls contractor shall provide designated Owner personnel training on the control system in this facility. The intent is to clearly and completely instruct the Owner on all the capabilities of the control system.
 3. Training manuals. Training manuals will be provided for each trainee with two extra copies left for the O&M manuals. Manuals shall include detailed description of the subject matter for each session. The manuals will cover all control sequences and have a definitions section that fully describes all words used in the manuals and in all software displays. Manuals will be approved by the CA. Copies of audiovisuals shall be delivered to the Owner.
 4. The training will be tailored to the needs and skill-level of the trainees.
 5. The trainers will be knowledgeable on the system and its use in buildings. For the on-site sessions, the most qualified trainer(s) will be used.
 6. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
 7. The controls contractor shall attend sessions other than the controls training to discuss the interaction of the controls system as it relates to the equipment being

discussed.

8. There shall be two training sessions:
 - a) Training I. The first training shall consist of 8 hours of actual training. This training may be held on-site or in the supplier's facility. If held off-site, the training may occur prior to final completion of the system installation. Upon completion, each student, using appropriate documentation, should be able to perform elementary operations and describe general hardware architecture and functionality of the system.
 - b) Training II. The second session shall be held on-site for a period of 16 hours of actual training after the completion of system commissioning. The session shall include instruction on:
 - (1) Specific hardware configuration of installed system and specific instruction for operating the installed system, including HVAC systems, and any interface with security and communication systems.
 - (2) Security levels, alarms, system start-up, shut-down, power outage and restart routines, changing setpoints and other typical changed parameters, overrides, freeze protection, manual operation of equipment, optional control strategies that can be considered, energy savings strategies and set points that if changed will adversely affect energy consumption, energy accounting, procedures for obtaining vendor assistance, etc.
 - (3) All trending and monitoring features, including setting up, executing, downloading, viewing both tabular and graphically and printing trends. Trainees will actually set-up trends in the presence of the trainer.
 - (4) Every screen shall be completely discussed, allowing time for questions.
 - (5) Use of keypad or plug-in laptop computer at the zone level.
 - (6) Use of remote access to the system via phone lines or networks.

3.14 LUBRICATION

- A. Prepare and submit a lubrication chart listing for each piece of equipment:
 1. Points requiring lubrication.
 2. Recommendations for a single manufacturer's lubricants with brand name and designation.
 3. Frequency of lubrication required.
- B. Lubricate each item of apparatus requiring lubrication prior to start-up in accordance with the manufacturer's recommendations.

END OF SECTION 23 08 00

SECTION 26 08 00 - COMMISSIONING OF ELECTRICAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The purpose of this section is to specify Electrical Contractor responsibilities in the commissioning process which are being directed by the CxA. Other electrical systems testing is required under the direction of the CM.
- B. The list of commissioned equipment and systems is found in Section 01 91 13.
- C. Commissioning requires the participation of Electrical Contractor to ensure that all systems are operating in a manner consistent with the Contract Documents. The general commissioning requirements and coordination are detailed in Division 01 91 13. Electrical Contractor shall be familiar with all parts of Division 01 91 13 and the commissioning plan issued by the CxA and shall execute all commissioning responsibilities assigned to them in the Contract Documents.

1.2 DEFINITIONS

- A. Refer to section 01 91 13.

1.3 RESPONSIBILITIES

- A. Electrical Contractors. The commissioning responsibilities applicable to the electrical contractor are as follows (*all references apply to commissioned equipment only*):
 - 1. Include the cost of commissioning in the contract price.
 - 2. In each purchase order or subcontract written, include requirements for submittal data, O&M data and training.
 - 3. Attend a commissioning scoping meeting and other necessary meetings scheduled by the CxA to facilitate the Cx process.
 - 4. Contractors shall provide normal cut sheets and shop drawing submittals to the CxA of commissioned equipment.
 - 5. Provide additional requested documentation, prior to normal O&M manual submittals, to the CxA for development of start-up and functional testing procedures.
 - a. Typically this will include detailed manufacturer installation and start-up, operating, troubleshooting and maintenance procedures, full details of any owner-contracted tests, full factory testing reports, if any, and full warranty information, including all responsibilities of the Owner to keep the warranty in force clearly identified. In addition, the installation and checkout materials that are actually shipped inside the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the Commissioning Agent.
 - b. The Commissioning Authority may request further documentation necessary for the commissioning process.
 - c. This data request may be made prior to normal submittals.
 - 6. Provide a copy of the O&M manuals submittals of commissioned equipment, through normal channels, to the CxA for review.

7. Contractors shall assist (along with the design engineers) in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
8. Provide assistance to the CxA in preparation of the specific performance test procedures. Subs shall review test procedures to ensure feasibility, safety and equipment protection and provide necessary written alarm limits to be used during the tests.
9. Develop a full start-up and initial checkout plan using manufacturer's start-up procedures and the startup verifications from the CxA. Submit manufacturer's detailed start-up procedures and the full start-up plan and procedures and other requested equipment documentation to CxA for review.
10. During the startup and initial checkout process, execute and document the electrical-related portions of the startup verifications provided by the CxA for all commissioned equipment.
11. Perform and clearly document all completed startup and system operational checkout procedures, providing a copy to the CxA.
12. Address current A/E punch list items before performance testing.
13. Provide skilled technicians to execute starting of equipment and to execute the performance tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.
14. Perform performance testing under the direction of the CxA for specified equipment in Section 01 91 13. Assist the CxA in interpreting the monitoring data, as necessary.
15. Correct deficiencies (differences between specified and observed performance) as interpreted by the CxA, CM and A/E and retest the equipment.
16. Prepare O&M manuals according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.
17. Prepare red-line as-built drawings for all drawings and final as-builts for contractor-generated coordination drawings.
18. Provide training of the Owner's operating personnel as specified.
19. Coordinate with equipment manufacturers to determine specific requirements to maintain the validity of the warranty.

B. Electrical Acceptance Testing Contractor: The commissioning responsibilities are listed below in addition to the item below.

1. Provide a copy of all testing documentation to the CxA for review.
2. Coordinate with the CxA for witnessing of the electrical acceptance testing.
3. Provide the CxA with the final short circuit study and all testing after A/E approval for inclusion into the final Cx Report

C. Warranty Period

1. Execute seasonal or deferred functional performance testing, witnessed by the CxA, according to the specifications.
2. Correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

1.4 RELATED WORK

- A. Refer to Section 01 91 13 for systems to be commissioned and functional testing requirements.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. Electrical Contractor shall provide all test equipment necessary to fulfill the testing requirements of this Division.
- B. Refer to Section 01 91 13 for additional Electrical Contractor requirements.

PART 3 - EXECUTION

3.1 SUBMITTALS

- A. Electrical Contractor shall provide submittal documentation relative to commissioning to the CxA as requested by the CxA. Refer to Section 01 91 13 for additional Electrical Contractor requirements.

3.2 STARTUP

- A. The electrical contractors shall follow the start-up and initial checkout procedures listed in the Responsibilities list in this section and in 01 91 13. Electrical Contractor has start-up responsibility and is required to complete systems and sub-systems so they are fully functional, meeting the design objectives of the Contract Documents. The commissioning procedures and performance testing do not relieve or lessen this responsibility or shift that responsibility partially to the commissioning agent or Owner.
- B. Performance testing is intended to begin upon completion of a system. Performance testing may proceed prior to the completion of systems, or sub-systems at the discretion of the CxA and CM. Beginning system testing before full completion does not relieve the Contractor from fully completing the system, including all startup verifications as soon as possible.

3.3 PERFORMANCE TESTS

- A. Refer to Section 01 91 13 for a list of systems to be commissioned and for a description of the process for specific details on the required performance tests.

3.4 TESTING DOCUMENTATION, NON-CONFORMANCE AND APPROVALS

- A. Refer to Section 01 91 13 for specific details on non-conformance issues relating to startup verification and tests.
- B. Refer to Section 01 91 13 for issues relating to functional performance tests.

3.5 OPERATIONS AND MAINTENANCE (O&M) MANUALS

- A. Electrical Contractor shall compile and prepare documentation for all equipment and systems and deliver to the GC for inclusion in the O&M manuals, according to Division 01.

- B. The CxA shall receive a copy of the O&M manuals for review.

3.6 TRAINING OF OWNER PERSONNEL

- A. The GC shall be responsible for training coordination and scheduling and ultimately to ensure that training is completed. Refer to Section 01 91 13 for additional details.
- B. The CxA shall assist the GC with overseeing and approving the content and adequacy of the training of Owner personnel for commissioned equipment. Refer to Section 01 91 13 for additional details.

3.7 DEFERRED TESTING

- A. Unforeseen Deferred Tests. If any check or test cannot be completed due to the building structure, required occupancy condition or other deficiency, execution of checklists and functional testing may be delayed upon approval of the PM. These tests will be conducted in the same manner as the seasonal tests as soon as possible. Services of necessary parties will be negotiated.
- B. Seasonal Testing. During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the appropriate Subs, with facilities staff and the CA witnessing. Any final adjustments to the O&M manuals and as-builds due to the testing will be made.

3.8 WRITTEN WORK PRODUCTS

- A. Written work products of Contractors will consist of the startup and initial checkout plan described in Section 01 91 13 and the filled out startup, initial checkout and startup verification.

END OF SECTION 26 08 00

SECTION 08 45 23 - TRANSLUCENT PANEL UNIT SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the 1" insulated translucent sandwich panel system and accessories, factory unitized, as shown and specified. Work includes providing and installing:
 - 1. Flat factory prefabricated 1" structural insulated translucent sandwich panels.
 - 2. Aluminum installation system with gasketing.
 - 3. Mounting bracket and complete aluminum awning enclosure system.

- B. Related Sections:
 - 1. Structural Steel/Concrete/Rough Carpentry: Section 05 50 00
 - 2. Flashing and Sheet Metal: Section 07 62 00
 - 3. Sealants: Section 07 92 00
 - 4. Glazing: Section 08 81 00

1.2 SUBMITTALS

- A. Submit manufacturer's product data. Include construction details, material descriptions, profiles and finishes of components.

- B. Submit shop drawings. Include elevations, details, and dimensions to other work.

- C. When requested, submit samples for each exposed finish required, in same thickness and material indicated per work and size. If finishes involve normal color variations, include sample sets consisting of two or more units showing the range of variations.

- D. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.

- E. Submit current product test reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products.
 - 1. Test reports required are:
 - a. Flame Spread and Smoke Developed (UL 723).
 - b. Burn Extent (ASTM D-635)
 - c. Color Difference (ASTM D-2244 or Q-Trac)
 - d. Abrasion/Erosion Resistance (ASTM D-4060)
 - e. Impact Strength (UL 972)
 - f. Tensile Strength (ASTM C-297 after aging by ASTM D-1037)
 - g. Bond Shear Strength (ASTM D-1002)
 - h. Beam Bending Strength (ASTM E-72)
 - i. Insulation U-Factor (NFRC-100-2004)

1.3 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Quality control inspections and required testing shall be conducted at least once each year and shall include manufacturing facilities, sandwich panel components and production sandwich panels for conformance with "Acceptance Criteria for Sandwich Panels" as regulated by the ICC-ES.
- B. Installer's Qualifications: Installation shall be by an experienced installer, which has been in the business of installing specified panel systems for at least five consecutive years and can show evidence of satisfactory completion of projects of similar scope.
- C. Performance Requirements: The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.

1.4 DELIVERY STORAGE AND HANDLING

- A. Deliver panel system, components and materials in manufacturer's standard protective packaging. Store panels on the long edge, several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

1.5 WARRANTY

- A. Submit manufacturer's and installer's written warranty agreeing to repair or replace panel system work which fails in materials or workmanship within one (1) year of the date of delivery. Failure of materials or workmanship shall include leakage, excessive deflection, deterioration of finish in excess of normal weathering, defects in accessories, insulated translucent sandwich panels and other components of the work performed.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Major Industries, as Distributed by Storefront Specialties, 505-884-6560
- B. Kalwall Corporation or approved equal.

2.2 PANEL COMPONENTS

A. Face Sheets

1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.
 - a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
2. Flammability of interior face sheets:
 - a. Flame spread: Underwriters Laboratories (UL) listed flame spread rating no greater than 50 and smoke developed no greater than per UL 723.
 - b. Burn extent by ASTM D-635 shall be no greater than 1".
 - c. Face sheets shall not deform, deflect or drip when subjected to fire or flame.
 - d. Face sheets shall not delaminate per IBC and NBC.
3. Weather ability of exterior face sheets:
 - a. Color stability: Full thickness of the exterior face sheet shall not change color more than 3.0 CIE Units DELTA E by ASTM D-2244 with and without a protective

- film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching. Q-Trac ASTM test is acceptable.
- b. Erosion barrier: Exterior face shall have a permanent glass erosion barrier embedded beneath the surface to provide long-term resistance to reinforcing fiber exposure when tested in accordance with ASTM D-4060.
- 4. Appearance:
 - a. Exterior face sheets: Smooth, 0.070" thick and Crystal in color.
 - b. Interior face sheets: Smooth, 0.045" thick and Crystal in color.
 - c. Insulation: Insulation to be colored to match one of Major Industry's standard colors per final architect's selection. For e.g. Red, blue green, etc...
 - d. Face sheets shall not vary +/- 10% in thickness and be uniform in color.
- 5. Strength: Exterior face sheet shall be uniform in strength, impenetrable by hand held pencil and repel an impact equal to 50 ft. lbs. without fracture or tear when impacted by a 3-1/4" diameter, 5 lb. free-falling ball per UL 972.

B. Grid Core

- 1. Aluminum I-beam grid core shall be of 6063-T6 or 6005-T5 alloy and temper with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be no less than 7/16". The I-beam grid shall be machined to tolerances of not greater than +/- .002".

C. Laminate Adhesive

- 1. Heat and pressure resin type adhesive engineered for structural sandwich panel use, with minimum 25-years field use. Adhesive shall pass testing requirements specified by the International Code Council "Acceptance Criteria for Sandwich Panel Adhesives."
- 2. Minimum tensile strength of 750 PSI when the panel assembly is tested by ASTM C-297 after two (2) exposures to six (6) cycles each of the aging conditions prescribed by ASTM D-1037. Minimum shear strength per ASTM D.

2.3 PANEL CONSTRUCTION

- A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets resin laminated to a grid core of mechanically interlocking aluminum I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge.
 - 1. Thickness: 1"
 - 2. Light transmission: 43%.
 - 3. Solar heat gain coefficient: 0.50
 - 4. U- factor by NFRC certified laboratory: 0.45 with aluminum I-beam.
 - 5. Grid pattern: Nominal 12" x 24" shoji.
 - 6. Insulation: Colored insulation per manufacturer's standard colors, for e.g. red, blue, green, etc...

2.4 BATTENS AND PERIMETER CLOSURE SYSTEM

- A. Closure system: Extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system. Set perimeter framing to provide weather-tight construction.

- B. Fasteners: 300 series stainless steel screws for aluminum closures, excluding final fasteners to the building.
- C. Panels shall be deflect no more than 1.9" at 30 psf in 10' 0" span per ASTM E-72.

2.5 AWNINGS

- A. Awnings shall be designed specifically for inclusion in the 1" translucent panel unit wall system and factory utilized to panels.
 - 1 Performance: Awnings shall pass IBC 2003 code requirements for wind loads requirements of 90 mph and at uniform load of 82.5 psf, air infiltration at 6.24 psf of .03 cfm/ft and no water entry at 8.25 psf.
 - 2 Finish of all exposed aluminum: Class 1 Clear anodized.
 - 3 Construction: All frame members shall be of heavy gauge 6063-T5 extruded aluminum. Frame sections shall be coped and joined by stainless steel screws at each corner. All joints exposed to the weather shall be sealed with an elastic compound. All openings shall be double weather-stripped using T-slot bulb gaskets to insure minimum air infiltration.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, supporting structure and installation conditions. Do not proceed with panel erection until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Metal Protection:
 - 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
 - 2. Where aluminum will contact masonry, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.

3.3 INSTALLATION

- A. Install the panel system in accordance with the manufacturer's installation recommendations and approved shop drawings. Anchor component parts securely by permanent mechanical attachment system. Accommodate thermal and mechanical movements. Set perimeter framing to provide weather-tight construction.

3.4 CLEANING

- A. Clean the panel system inside and outside, immediately after installation, according to manufacturer's written recommendations.

END OF SECTION 08 45 23

SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes furnishing and installation of door hardware for doors specified in "Hardware Sets" and required by actual conditions. Including screws, bolts, expansion shields, electrified door hardware, and other devices for proper application of hardware.
- B. Where items of hardware are not specified and are required for intended service, such omission, error or other discrepancy shall be submitted to Architect 14 calendar days prior to bid date for clarification by addendum.
- C. Products supplied but not installed under this Section:
 - 1. Cylinders and auto operators for aluminum doors will be furnished under this Section, but installed under Division 8-Entrances and Storefronts.
 - 2. Final replacement of cylinder cores to be installed by Owner.
- D. Related Divisions:
 - 1. Division 6 Section Finish Carpentry
 - 2. Division 8 Section Metal Doors and Frames
 - 3. Division 8 Section Wood and Plastic Doors
 - 4. Division 8 Section Entrances and Storefronts
 - 5. Division 26 Section Electrical

1.02 REFERENCES

- A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI):
 - 1. ANSI/BHMA A156.1 Butts & Hinges (2006)
 - 2. ANSI/BHMA A156.2 Bored & Preassembled Locks & Latches (2003)
 - 3. ANSI/BHMA A156.3 Exit Devices (2001)
 - 4. ANSI/BHMA A156.4 Door Controls - Closers (2000)
 - 5. ANSIBHMA A156.5 Auxiliary Locks (2001)
 - 6. ANSIBHMA A156.6 Architectural Door Trim (2005)
 - 7. ANSI/BHMA A156.7 Template Hinge Dimensions (2003)
 - 8. ANSIBHMA A156.8 Door Controls - Overhead Stops and Holders (2005)
 - 9. ANSIBHMA A156.13 Mortise Locks & Latches (2005)
 - 10. ANSI/BHMA A156.16 Auxiliary Hardware (2002)
 - 11. ANSI/BHMA A156.18 Materials & Finishes (2006)
 - 12. ANSIBHMA A156.19 Power Assist & Low Energy Power Operated Doors (2007)
 - 13. ANSIBHMA A156.21 Thresholds (2006)
 - 14. ANSIBHMA A156.22 Door Gasketing Systems (2005)
 - 15. ANSI/BHMA A156.26 Continuous Hinges (2006)

16. ANSI/BHMA A156.28 Keying Systems (2008)

- B. International Code Council/American National Standards Institute (ICC/ANSI):
 - 1. ICC/ANSI A117.1 Standards for Accessible and Usable Buildings and Facilities (2003).
- C. Underwriters Laboratories, Inc. (UL):
 - 1. UL 10C Positive Pressure Fire Test of Door Assemblies
 - 2. UL 1784 Air Leakage Test of Door Assemblies
- D. Door and Hardware Institute (DHI):
 - 1. DHI Publication — Keying Systems and Nomenclature
 - 2. DHI Publication — Abbreviations and Symbols
 - 3. DHI Publication — Installation Guide for Doors and Hardware
 - 4. DHI Publication — Sequence and Format of Hardware Schedule
- E. National Fire Protection Agency (NFPA)
 - 1. NFPA 70 National Electrical Code
 - 2. NFPA 80 Standard for Fire Doors and Other Opening Protectives (2007)
 - 3. NFPA 101 Life Safety Code (2006)
 - 4. NFPA 105 Standard for the Installation of Smoke Door Assemblies (2003)
- F. Building Codes
 - 1. IBC 2006 International Building Code
 - 2. Local Building Code

1.03 SUBMITTALS

- A. Shop Drawings:
 - 1. Hardware schedule shall be organized in vertical format illustrated in DHI Publications Sequence and Formatting for the Hardware Schedule. Include abbreviations and symbols page according to DHI Publications Abbreviations and Symbols. Complete nomenclature of items required for each door opening as indicated.
 - 2. An Architectural Hardware Consultant who shall affix seal attesting to completeness and correctness, shall review hardware schedule prior to submittal.
- B. Submit manufacturers catalog sheet on design, grade and function of items listed in hardware schedule. Identify specific hardware item per sheet, provide index, and cover sheet.
- C. Coordination:
 - 1. Distribute door hardware templates to related Divisions within 14 calendar days of approved hardware schedule.
- D. Electrified Hardware: Provide electrical information to include voltage, and amperage requirements for electrified door hardware, description of operation, and riser diagrams.

1. Description of operation for each electrified opening to include description of component functions including location, sequence of operation and interface with other building control systems.
- E. After hardware submittal is approved, provide for each Electrified opening, 3 copies of point to point diagrams.
- F. Closeout Submittals: Submit to Owner in a three ring binder.
1. Warranties.
 2. Maintenance and operating manual.
 3. Maintenance service agreement
 4. Record documents.
 5. Copy of approved hardware schedule.
 6. Copy of approved keying schedule with bitting list.
 7. Hardware supplier name, phone number and fax.

1.04 QUALITY ASSURANCE

- A. Hardware supplier shall employ an Architectural Hardware Consultant who shall be available at reasonable times during course of work for Project hardware consultation.
- B. Door hardware shall conform to ICC/ANSI A117.1.
- C. Fire Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL 10C, unless otherwise indicated.
- D. Smoke and Draft Control Door Assemblies: *Where* smoke and draft control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
- E. Door hardware shall *be* certified to ANSI/BHMA standards as noted, participate and be listed in BHMA Certified Products Directory.
- F. Pre-installation Meeting: Comply with requirements in Division 1 Section "Project Meetings."
1. Convene meeting seven calendar days before installation. Participants affiliated by requirements of this Section shall be advised by the Contractor to attend a scheduled meeting.
 2. Contractor, installer, material supplier, electrical contractor, security consultant and fire alarm consultant.
 3. Include in conference decisions regarding proper installation methods and procedures for receiving and handling hardware.
 4. Review sequence of operation for each type of electrified door hardware, inspect, and discuss electrical roughing-in and other preparatory work performed by other trades.
 5. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
- G. Installer Qualifications: Specialized in performing installation of this Section and shall

have 5 years minimum documented experience.

- H. Hardware listed in 3.07 Hardware Schedule is intended to establish a type and grade.
- I. The State Texas requires installers of electronic or electric operated hardware to be installed by licensed companies in conformance with Vernon's Civil Statutes, Art.4413 (29bb). Private Security Act. The licensee as required by the provisions of the Private Security Act, Article 4413 (29bb) V.A.C.S. as amended, require a licensee to maintain on file with the Texas Commission on Private Security a Certificate of Insurance as proof of a policy of public liability insurance executed by a local agent licensed in the State of Texas or a Certificate of Insurance as proof or surplus lines coverage procured in compliance with the Texas Insurance Code, through a surplus lines agent resident and licensed in the State of Texas. The installing Company shall provide the General Contractor a copy of the License Certificate issued by the Texas Commission of Private Security. The installers shall be regularly engaged technicians in the employment of the Hardware Subcontractor.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Provide a clean, dry and secure room for hardware delivered to Project but not yet installed.
- B. Furnish hardware with each unit marked and numbered in accordance with approved finish hardware schedule. Include door and item number for each type of hardware.
- C. Pack each item complete with necessary parts and fasteners in manufacturer's original packaging.
- D. Deliver permanent key, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to Owner shall be established at "Keying Conference."

1.06 WARRANTY

- A. General Warranty: Owner may have under provisions of the Contract Documents and shall be an addition and run concurrent with other warranties made by Contractor under requirements of the Contract documents.
- B. Special Warranty: Warranties specified in this article shall not deprive Owner of other rights. Contractor, hardware supplier, and hardware installer shall be responsible for servicing hardware and keying related problems.
 - 1. Ten years for manual door closers.
 - 2. Five years for mortise, auxiliary and bored locks.
 - 3. Five years for exit devices.
 - 4. Two years for electromechanical door hardware.
- C. Products judged defective during warranty period shall be replaced or repaired in accordance with manufacturer's warranty at no cost to Owner. There is no warranty against defects due to improper installation, abuse and failure to exercise normal maintenance.

PART 2- PRODUCTS

2.01 HINGES

- A. Hinges and continuous hinges shall be of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Standards: Products to be certified by the following:

1. Hinges: ANSI/BHMA A156.1
2. Template Hinge Dimensions: ANSI/BHMA A156.7
3. Continuous Hinges: ANSI/BHMA A156.26

C. Butt Hinges:

1. Hinge weight and size unless otherwise indicated in hardware sets:
 - a. Doors up to 36 inches wide and up to 1-3/4 inches thick provide hinges with a minimum thickness of .134 inches and a minimum of 4-1/2 inches in height.
 - b. Doors from 36 inches wide up to 42 inches wide and up to 1-3/4 inches thick provide hinges with a minimum thickness of .145 inches and a minimum of 5 inches in height
 - c. For doors from 42 inches wide up to 48 inches wide and up to 1-3/4 inches thick provide hinges with a minimum thickness of .180 inches and a minimum of 5 inches in height.
 - d. Doors greater than 1-3/4 inch thick provide hinges with a minimum thickness of .180 inches and a minimum of 5 inch height_
 - e. Width of hinge is to be minimum required to clear surrounding trim.
2. Base material unless otherwise indicated in hardware sets:
 - a. Exterior Doors: 304 Stainless Steel, Brass or Bronze material.
 - b. Interior Doors: Steel material.
 - c. Fire Rated Doors: Steel or 304 Stainless Steel materials.
3. Quantity of hinges per door:
 - a. Doors up to 60 inches in height shall have 2 hinges.
 - b. Doors 60 inches up to 90 inches in height shall have 3 hinges.
 - c. Doors 90 inches up to 120 inches in height shall have 4 hinges.
 - d. Doors over 120 inches in height add 1 additional hinge per each additional 30 inches in height
4. Hinge design and options unless otherwise indicated in hardware sets:
 - a. Hinges are to be of a square corner five-knuckle design, flat button tips and have ball bearings unless otherwise indicated in hardware sets.
 - b. Out-swinging exterior and out-swinging access controlled doors shall have non-removable pins (NRP) to prevent removal of pin while door is in closed position.
 - c. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
 - d. Provide mortar boxes for frames that require any electrically modified hinges if not an integral part of frame.
 - e. When shims are necessary to correct frame or door irregularities, provide metal shims only.

5. Acceptable Manufactures:

1. HAGER
2. McKINNEY
3. STANLEY
4. BOMMER

D. Continuous Geared Hinges:

1. Hinge weight and size requirements unless otherwise indicated in hardware sets:

- a. Choose proper weight of hinge according to manufacturer's recommendations taking into consideration weight of door, weight of finish hardware applied to door, location and frequency of usage.
- b. Size of hinge to be 1 inch less door height.

2. Base material: Stainless steel dry lubricant

3. Acceptable Manufactures:

1. McKINNEY
2. SELECT
3. PEMKO
4. PBB

2.02 FLUSH BOLTS AND COORDINATORS

- A. Labeled openings: Provide automatic or constant latching flush bolts per hardware schedule for inactive leaf of pairs of doors. Provide dust proof strikes for bottom bolt.
- B. Non-Labeled openings: Provide two flush bolts for inactive leaf of pairs of doors per hardware schedule. Top bolt shall not be more than 78 inches centerline from floor. Provide dust proof strike for bottom bolt.
- C. Acceptable Manufactures:
 1. Hager Companies: 2830/291 D/280X
 2. Rockwood: 557/1842/570
 3. Trimco: 3913/3810/3911

2.03 MORTISE LOCKS AND LATCHES

- A. Locks and latches shall be of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Standards: Product to be certified and listed by following:
 1. ANSI/BHMA A156.13 Series 1000 Certified to Grade 1 for Operational and Security.
- C. Lock and latch function numbers and descriptions of manufactures series as listed in hardware sets.
- D. Material and Design:

1. Lock cases from fully wrapped, 12 gauge steel, Zinc dichromate for corrosion resistance.
2. Non-handed, field reversible without opening lock case.
3. Break away spindles to prevent unlocking during forced entry or vandalism.
4. Levers are to be Zinc cast, Forged Brass or Stainless Steel and plated to match finish designation in hardware sets.
5. Sectional Roses are to be of solid Brass or Stainless Steel material and have a minimum diameter of 2-7/16 inches.
6. Escutcheons are to be of solid Brass or Stainless Steel material.
7. Armor fronts are to be self-adjusting to accommodate a square edge door or a standard 1/8inch beveled edge door.

E. Latch and Strike:

1. Stainless Steel latch bolt with minimum of 3/4inch throw and deadlocking for keyed and exterior functions.
2. Strike is to fit a standard ANSI A115 prep, measuring 1-1/4inch x 4-7/8inch with proper lip length to protect surrounding trim.
3. Deadbolts to be 1-3/4 inches total length with a minimum of a 1inch throw and ³/₄inch internal engagement when fully extended and made of Stainless Steel material.

F. Acceptable Manufactures:

1. SARGENT: Mortise Locks Strikes and Fronts Series (No Subs) To match existing

2.04 WIDE STILE EXIT DEVICES

- A. Shall be touch pad type type, finish to match balance of door hardware. Exit Devices shall be of one manufacturer as listed for continuity of design and consideration of warranty.
 1. Standards: Manufacturer to be certified by the following:
 2. Exit Devices: ANSI/BHMA A156.3 Grade 1
 3. UL labeled panic exit hardware.
 4. UL labeled fire exit hardware.
- B. Touch pad shall extend a minimum of one half-door width. Freewheeling lever design shall match design of locks levers. Exit device to mount flush with door.
- C. Components:
 1. Covers and end caps shall be brass, bronze, or stainless steel.
 2. Chassis shall be aluminum.
- D. Lock and Latch Functions: Function numbers and descriptions of manufacturer's series and lever styles indicated in door hardware sets.
- E. Mounting:
 1. 5 inch minimum stile width required for double doors with surface vertical rod devices.

2. 5-3/8inch minimum stile width required for single.
3. 5inch minimum stile width required for double door with rim devices and hardware mullion.
4. 5-3/4inch minimum stile width required for double door with rim devices and a 2" mullion.
5. Exit device shall not cross light kit. Lower device or raise light kit per code.

F. Fasteners:

1. Wood and machine screws and thru-bolts.

G. Acceptable Manufactures:

1. SARGENT 80 Series (No Sub) To match existing

2.05 CYLINDERS AND KEYING

- A. Cylinders shall be of one manufacturer as listed far continuity of design and consideration of warranty.

B. Standards:

1. DHI Handbook "Keying systems and nomenclature" (1989)

2.05 CYLINDERS AND KEYING

- A. Cylinders shall be of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards:

1. DHI Handbook "Keying systems and nomenclature" (1989)

C. Cylinders:

1. Manufacturer's standard tumbler type, six-pin or seven-pin IC core.
2. Shall be furnished with cams/tailpieces as required for locking device that is being furnished for project is being furnished for project.

D. Keying

1. Contact Owner with representative from hardware supplier to establish a keyingconference. Verify keyway, visual key identification, number of master keys and keys per lock. Provide keying system per Owners instructions.
2. Copy of Owners approved keying schedule shall be submitted to Owner and Architect with documentation of which keying conference was held and Owners sign-off.
3. Provide a bitting list to Owner of combinations as established, and expand to
4. twenty five percent for future use or as directed by Owner.
5. Key into Owner's existing keying system if applicable.
6. Keys to be shipped to Owner's representative, individually tag per keying conference.
7. Provide visual key control identification on keys.
8. Provide interchangeable cores with construction cores as required.

E. Acceptable manufactures:

1. Sargent 8200 Mortise Locks restricted keyway. (No Sub) To match existing

2.06 PUSH PLATES AND PULL PLATES

A. Push plates: .050inch thick, square corner and beveled edges with counter sunk screw holes. Width and height as stated in Hardware schedule.

B. Acceptable Manufactures:

1. Hager Companies: 305
2. Rockwood: 70
3. Trimco: 1001

C. Pull plates: .050inch thick, square corner and beveled edges. Width and height as stated in door schedule, ³/₄inch diameter pull, with clearance of 2-1/2 inches from face of door.

D. Acceptable Manufactures:

1. Hager Companies: H33
2. Rockwood: 105 x 70
3. Trimco: 1003

2.07 ELECTRIC STRIKES

A. Provide for use with type of locks shown on hardware schedule.

B. Provide power supply to filter and regulate voltage to electric strike. Verify voltage with Division 26.

C. Standards: Manufacturer to be certified by the following:

1. ANSI/BHMA A156.31 Electric Strikes and Frame Mounted Actuators
2. UL listed as Burglary-Resistant Electric Door Strike.
3. UL listed for Fire Doors and Frames where applicable.

D. Acceptable Manufactures:

1. Security Door Controls: 30-4 or 45-45U Series

2.08 CLOSERS (Exterior)

A. Shall be product of one manufacturer. Unless otherwise indicated on hardware schedule, comply with manufacturer's recommendation for size of closer, depending on width of door, frequency of use, atmospheric pressure, ADAAG requirements, and fire rating.

B. Standards: Manufacturer to be certified and or listed by the following:

1. Closers ANSI/BHMA A156.4 Grade 1
2. ADD AG
3. ICC/ANSI A117.1
4. UL/cUL listed up to 3 hours.
5. UL10C Positive Pressure Rated

- C. Provide cast iron non-handed bodies with full plastic covers.
 - 1. Closers shall have separate staked adjustable valve screws for latch speed, sweep speed, and backcheck. Provide Tri-Pack arms and brackets for regular arm, top jamb, and parallel arm mounting for each closer.

- D. Components:
 - 1. One-piece seamless steel spring tube to seal in hydraulic fluid.
 - 2. Double heat-treated steel tempered springs.
 - 3. Precision-machined heat-treated steel piston.
 - 4. Triple heat-treated steel spindle.
 - 5. Full rack and pinion operation.

- E. Mounting:
 - 1. Out swing doors shall have surface parallel arm mount closers except where noted on hardware schedule.
 - 2. In swing doors shall have surface regular arm mount closers except where noted on hardware schedule.
 - 3. Provide brackets and shoe supports for aluminum doors and frames to mount fifth screw.
 - 4. Furnish drop plates where top rail conditions on door do not allow for mounting of closer and where backside of closer is exposed through glass.

- F. Size closers in compliance with requirements for accessibility (ADAAG). Comply with following maximum opening force requirements.
 - 1. Interior hinged openings: 5.0 lbs.
 - 2. Exterior hinged openings: 8.5 lbs.
 - 3. Fire Rated Openings: Minimum opening force allowable by authority having jurisdiction.

- G. Fasteners: Provide self-reaming and self-tapping wood and machine screws and sex nuts and bolts for each closer.

- H. Acceptable manufactures:
 - 1. Hager Companies: 5100 Series
 - 2. LCN: 4040 Series
 - 3. Sargent: 281 Series

2.09 CLOSERS (Interior)

- A. Shall be product of one manufacturer. Unless otherwise indicated on hardware schedule, comply with manufacturer's recommendations for size of closer, depending on width of door, frequency of use, atmospheric pressure, ADAAG requirements, and fire rating.
- B. Standards: Manufacturer to be certified by the following:

1. Closers ANSI/BHMA A156.4 Grade 1
 2. ADAAG
 3. ICC/ANSI A117.1
 4. UUCUL Listed up to 3 hours
 5. UL10C Positive Pressure Rated
- C. Provide aluminum non-handed bodies with full plastic covers. Closer shall have separate staked adjustable valve screws for latch speed, sweep speed, and backcheck. Provide Tri-Pack arms and brackets for regular arm, top jamb, and parallel arm mounting for each closer.
- D. Components:
1. Double heat-treated steel, tempered springs.
 2. Precision machined, heat-treated steel piston.
 3. Triple heat-treated steel spindle.
 4. Full rack and pinion operation.
- E. Mounting:
1. Out swing doors shall have surface parallel arm mount closers except where noted on hardware schedule.
 2. In swing doors shall have surface regular arm mount closers except where noted on hardware schedule.
 3. Provide brackets and shoe supports for aluminum doors and frames to mount fifth screw.
 4. Furnish drop plates where top rail conditions on door do not allow for mounting of closer and where backside of closer is exposed through glass.
- F. Size closers in compliance with requirements for accessibility (ADAAG). Comply with following maximum opening force requirements.
1. Interior hinged openings: 5.0 lbs.
 2. Exterior hinged openings: 8.5 lbs.
 3. Fire Rated Openings: Minimum opening force allowable by authority having jurisdiction.
- G. Fasteners: Provide self-reaming and self-tapping wood and machine screws and sex nuts and bolts for each closer.
- H. Acceptable manufactures:
1. Hager Companies: 5200 Series
 2. Norton: 8000 Series
 3. Sargent: 281 Series

2.10 AUTOMATIC OPERATORS

- A. Shall be of one manufacturer as listed for continuity of design and consideration

of warranty. Unless otherwise indicated on hardware schedule, comply with manufacturer's recommendation for size of closer, depending on width of door, frequency of use, atmospheric pressure, ADAAG requirements, and fire rating.

B. Standards:

1. ANSI/BHMA A156.19
2. ICC/ANSI A117.1

C. Materials and design:

1. Shall be full rack and pinion design.
2. Self contained electrical control unit, including necessary transformers, relays, rectifiers, and other electronic component for proper operation and switching. Relays shall be plug-in type for individual replacement and connecting harnesses shall have interlocking plugs. Control shall also include time delay for normal cycle.
3. On pair of doors, either door to be opened manually without the other door opening.
4. Shall have separate staked adjustable valve screws for latch speed, sweep speed, and backcheck.
5. Provide conventional closer opening and closing forces unless operator motor is operated.
6. Have delay switches for motor activation, exit device latch retraction interfacing and hold open times. Hold open times to be adjustable from 0-30 seconds in 5 second intervals.
7. Vestibule sequencing input for operation of two or more units.
8. Power open door to full open position up to 110 degrees, capable of 180 degrees if manually opened.
9. Integral obstruction detection for closing and opening cycle.

D. Actuators: opening cycle shall be activated by pressing switches with international symbol of accessibility and "PRESS TO OPERATE DOOR" engraved on faceplate. Switches shall be installed in standard 2-gang electrical wall box and placed in a location in compliance with ANSI A117.1, Switches may be wall mounted or mounted on a free standing post or guard rail.

E. Signage: Provide signage in according to the requirements of ANSIVMA A156.19.

F. Acceptable manufacture:

1. Norton: 6900 Series.
2. LCN: 4600 Series
3. Sargent 4000 Series

2.11 PROTECTIVE TRIM

A. For single doors, size two inches less door width (LDW) on push side of door, and one inch less on pull side of door by 8inch high. For pairs of doors, size one 0_ inch less door width (LDVV) on push side of door, and 1/2 inch on pull side of do r by 8inch high.

B. Standards: Manufacturer to be certified by the following:

1. Architectural Door Trim: ANSI/BHMA A156.6
 2. UL
- C. Armor plates, stretcher plates, kick plates, and mop plates shall be 0.050inch thick stainless steel, beveled four edges, and countersunk holes.
- D. Fasteners: Supply #6 x 5/8inch oval head screws, unless otherwise noted.
- E. Acceptable Manufactures:
1. Hager Companies: 194S
 2. Rockwood: K1050 x B4E
 3. Trimco: KO-050

2.12 STOPS AND HOLDERS

- A. Wall Stops: Provide door stops wherever necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall stops when walls possible. Door stops and holders mounted in concrete floor or masonry shall have stainless steel machine screws and lead expansion shields.
- B. Acceptable Manufactures:
1. Hager Companies: 241 F/236W
 2. Rockwood: 440/409
 3. Trimco: 1214/1270 series
- C. Overhead stops and holders: Provide overhead stop and holders for doors that open against equipment casework sidelights and other objects that would make wall stops/holders and floor stops/holders inappropriate. Provide sex bolt attachments for mineral core wood door applications.
- D. Acceptable Manufacturers
1. Rixson: 1 Series/9 Series
 2. Glynn Johnson: 100 Series/90 Series
 3. Sargent 690 Series/590 Series
- E. Standards: Manufacturer to be certified by the following: 1. Stops and Bumpers: ANSI/BHMA A156.8

2.13 DOOR GASKETING AND WEATHERSTRIP

- A. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing where indicated on hardware schedule. Provide noncorrosive fasteners for exterior applications.
1. Perimeter gasketing: Apply to head and jamb, forming seal between door and frame.
 2. Meeting stile gasketing: Fasten to meeting stiles, forming seal when doors are in closed position.
 3. Door bottoms: Apply to bottom of door, forming seal with threshold or floor when door is in closed position.

- 4. Sound Gasketing: Cutting or notching for stop mounted hardware not permitted.
- B. Standards: Manufacturer to be certified by the following:
 - 1. Door Gasketing *and* Edge Seal Systems: ANS1/BHMA A156.22
- C. Smoke-Labeled Gasketing: Comply with NFPA 105 listed, labeled, and acceptable to authorities having jurisdiction, for smoke control indicated. 1. Provide smoke labeled gasketing on 20 minute rated doors and on smoke rated doors.
- D. Fire-Rated Gasketing: Comply with NFPA 80 listed, labeled, and acceptable to Authorities Having Jurisdiction, for fire ratings indicated.
- E. Comply with UBC 7-2 and UL10C positive pressure where frame applied intumescent seals are required.
- F. Acceptable Manufactures:
 - 1. Perimeter Gasketing:
 - a. Hager Companies: 721S/881S
 - b. National Guard: 160 AV
 - c. Pemko: 290
 - 2. Meeting Stile:
 - a. Hager Companies: 802S
 - b. National Guard: B606
 - c. Pemko: 18061
 - 3. Door Bottoms:
 - a. Hager Companies: 750S/770S
 - b. National Guard: 198 NA
 - c. Pemko: 315/345

2.14 THRESHOLDS

- A. Secured with lead expansion shields and stainless steel machine screws. Notched in field to fit frame by hardware installer. Refer to Drawings for special details.
- B. Standards: Manufacturer to be certified by the following:
 - 1. Thresholds: ANSI/BHMA A156.21
 - 2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).
- C. Acceptable Manufactures:
 - 1. Hager Companies: 413S/520S
 - 2. National Guard: 425E
 - 3. Pemko:271/2005

2.15 SILENCERS

- A. Where smoke, light, or weather seal are not required, provide three silencers per single door frame, two per double door frame and four per Dutch door frame.
- B. Acceptable Manufactures:

1. Hager Companies: 307D
2. Rockwood: 608
3. Trimco: 2525

2.16 KEY CABINET

- A. Provide key cabinet by Lund Equipment, Telkee Incorporated, or Key Control.
- B. Key control system:
 1. Include two sets of key tags, hooks, labels, and envelopes.
 2. Contain system in metal cabinet with baked enamel finish, surface mounted to wall.
 3. Capacity shall be able to hold actual quantities of keys, plus 25 percent.
 4. Provide tools, instruction sheets and accessories required to complete installation.

2.17 MISCELLANEOUS

- A. Power Supply for Proximity Readers:
 1. Power Supply for Proximity Readers to be 12/24VDC with 5 amp output. Located in central location . Coordinate with Section 13200 and Section 16000 for junction boxes and conduit placement
- B. Acceptable Manufacturers:
 1. Schlage SBB-SAPS
 2. Schlage SBB
- C. Proximity Reader:
 1. To use Keyfobs - small that attach to key rings, or Proximity Cards - vertical slot for badging and fits in wallet. Up to 10,000 users, have three lights for visual access validations, field selectable Fail Safe/Fail Secure; deny access without retrieving user token, and 12VDC. Provide the Desktop Programmer software that will work with Microsoft Office. Provide training on the use of this software.
- D. Acceptable Manufacturers:
 1. Schlage SXF 1550

2.18 FINISHES

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if within range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples.
- B. Comply with base material and finish requirements indicated by BHMA designations in hardware schedule.

PART 3 — EXECUTION

3.01 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install hardware per manufacturer's instructions and in compliance with:
 - 1. NFPA 80.
 - 2. NFPA 105.
 - 3. ICC/ANSI A117.1.
 - 4. ANSI/BHMA A115.
 - 5. UL1 OC/UBC7-2
 - 6. Local building code.
 - 7. Approved shop drawings.
 - 8. Approved finish hardware schedule.
- B. Do not install surface mounted items until finishes have been completed on substrates involved. Set unit level, plumb and true to line location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

3.03 FIELD QUALITY CONTROL

- A. Material supplier to schedule final walk through to inspect hardware installation ten business days before final acceptance of Owner. Material supplier shall provide a written report detailing discrepancies of each opening to General Contractor within seven calendar days of walk through.

3.04 ADJUSTMENT, CLEANING AND DEMONSTRATING

- A. Adjustment: Adjust and check each opening to ensure proper operation of each item of finish hardware. Replace items that cannot be adjusted to operate freely and smoothly or as intended for application at no cost to Owner.
- B. Cleaning: Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturers level of finish quality at no cost to Owner.
- C. Demonstration: Conduct a training class for building maintenance personnel demonstrating the adjustment, operation of mechanical and electrical hardware. Special tools for finished hardware to be turned over and explained usage at this meeting.

3.05 PROTECTION

- A. Leave manufacturer's protective film intact and provide proper protection for all other finish hardware items that do not have protective material from the manufacture until Owner accepts Project as complete.

3.06 HARDWARE SCHEDULE

SET #001.00

Doors: 001-A, 001-B

1 Exit Device	16 55 63 8504 F 862	32D	SA
2 Mortise Cylinder	63 41 HA KEYWAY X 3 KEYS	26D	SA
1 Closer	4642 REG	AL	LC
1 Wall Actuator	8310-856T	LC	
1 Weather Ring	8310-800	LC	

NOTE: Remainder of hardware complete by the aluminum door manufacture, verify type of cylinder, cam and finish.

SET #002.00

Doors: 002, 004

1 Closer	4642 REG	AL	LC
1 Wall Actuator	8310-856T	LC	

NOTE: Remainder of hardware complete by the aluminum door manufacture. Coordinate with the aluminum door supplier and the electrical subcontractor. Installation and testing by the hardware subcontractor, all wiring, J-boxes, by the electrical subcontractor.

SET #003.00

Doors: 101B, 111D, 145, 146

1 Continuous Hinge	MCK-FM300 7'0"	32D	MC
1 Exit Device	16 63 8813 F ETL HA KYWY TB X 3 KEYS	32D	SA
1 Closer	281 PSH TB	EN	SA
1 Kick Plate	KO050 10" x 34"	630	TR
1 Drip Cap	16 A FATT 40"		NA
1 Saddle Threshold	425 E 36"	AL	NA
1 Gasketing	160 VA FATT 1 x 36" 2 x 84"		NA

SET #004.00

Doors: 142, 143A

1 Continuous Hinge	MCK-FM300 7'0"	32D	MC
1 Exit Device	55 63 8804 F ETL HA KYWY TB X 3 KEYS	32D	SA
1 Closer	281 PSH TB	EN	SA
1 Kick Plate	KO050 10" x 34"	630	TR
1 Electric Power Transfer	MCK-EPT	MC	
1 Boxed Power Supply	BPS-24-2	SECU	
1 Proximity Reader	SXF1550	CH	LO
1 Bright Blue Reader Interface	SBB-RI	LO	
1 Gasketing	160 VA FATT 1 x 36" 2 x 84"	NA	

1	Drip Cap	16 A FATT 40"	NA	
1	Saddle Threshold	425 E 36"	AL	NA
1	Door Sweep	198 NA 36"	NA	

NOTE: Furnish and install electrified panic exit device and card access system as specified.
All electrical wiring to the door, J-boxes etc by the electrical subcontractor. Installation,
hook-up and testing of card access system and panic exit by the hardware contractor.

SET #005.00

Doors: 111B, 228B

3	Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1	Exit Device	12 63 8813 F ETL HA KEYWAY TB X 3 KEYS	32D	SA
1	Closer	281 UO TB	EN	SA
1	Kick Plate	KO050 10" x 34"	630	TR
1	Door Stop	1214	626	TR
1	Gasketing	2525 B-17 17'	NA	
1	Door Sweep	198 NA 36"	NA	

SET #006.00

Doors: 101A, 109

3	Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1	Lockset	63 8237 LNL HA KEYWAY X 3 KEYS	32D	SA
1	Closer	281 UO TB	EN	SA
1	Wall Bumper	1270WV	626	TR
1	Gasketing	2525 B-17 17'	NA	

SET #007.00

Doors: 102, 104, 105, 110, 120, 137, 218

3	Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1	Lockset	63 8204 LNL HA KEYWAY X 3 KEYS	32D	SA
1	Closer	281 UO TB	EN	SA
1	Kick Plate	KO050 10" x 34"	630	TR
1	Door Stop	1214	626	TR
1	Gasketing	2525 B-17 17'		NA

SET #008.00

Doors: 103

3	Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1	Passage Set	8215 LNL	32D	SA
1	Closer	281 UO TB	EN	SA
1	Kick Plate	KO050 10" x 34"	630	TR
1	Kick Plate	KO050 4" x 34"	630	TR
1	Door Stop	1214	626	TR
1	Gasketing	2525 B-17 17'		NA

SET #009.00

Doors: 106, 107, 219, 220

3 Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1 Pull Plate	1015-3	630	TR
1 Closer	281 UO TB	EN	SA
1 Push Plate	1001-3	630	TR
1 Kick Plate	KO050 10" x 34"	630	TR
1 Kick Plate	KO050 4" x 34"	630	TR
1 Door Stop	1214	626	TR
1 Gasketing	2525 B-17 17'	NA	

SET #010.00

Doors: 212

3 Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1 Lockset	63 8204 LNL HA KEYWAY X 3 KEYS	32D	SA
1 Overhead Holder	1548H	26D	SA
1 Gasketing	2525 B-17 17'	NA	

SET #011.00

Doors: 111A

6 Hinges	TA2314 4 1/2 X 4 1/2	32DMC	
1 Exit Device	12 63 NB 8713 F ETL HA KEYWAY X 3 KEYS	32DSA	
1 Exit Device	12 NB 8740 F ETL	32DSA	
2 Closer	281 UO TB	EN SA	
2 Kick Plate	KO050 10" x 34"	630 TR	
2 Door Stop	1214	626 TR	
1 Gasketing	2525 B-20 20'	NA	
1 Astragal Set	144 SA SET 84"	NA	

NOTE: Wood doors mortised for concealed astragals

SET #012.00

Doors: 207

6 Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1 Lockset	63 8237 LNL HA KEYWAY X 3 KEYS	32D	SA
2 Closer	281 UO TB	EN	SA
2 Kick Plate	KO050 10" x 34"	630	TR
2 Door Stop	1214	626	TR
1 Astragal Set	144 SA SET 84"	NA	
1 Gasketing	2525 B-20 20'	NA	

NOTE: Wood doors mortised for concealed astragals

SET #013.00

Doors: 111C

6 Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
2 Flush Bolt	3916	626	TR
1 Lockset	63 8237 LNL HA KEYWAY X 3 KEYS	32D	SA
2 Overhead Holder	1547H	26D	SA
1 Door Stop	1214	626	TR
1 Wall Bumper	1270WV	626	TR
1 Dustproof Strike	3910	630	TR
1 Gasketing	2525 B-20 20'	NA	
1 Astragal	139 SS 84"	US32D	NA

NOTE: Install on back side of inactive door.

SET #014.00

Doors: 112, 113, 116, 117, 118, 119, 121, 122, 123A, 123B, 123C, 124A, 124B, 124C, 129A, 129B, 132, 133A, 133B, 136

3 Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1 Lockset	63 8205 LNL HA KEYWAY X 3 KEYS	32D	SA
1 Closer	281 UO TB	EN	SA
1 Kick Plate	KO050 10" x 34"	630	TR
1 Wall Bumper	1270WV	626	TR
1 Coat Hook	0751	32D	ASII
1 Gasketing	2525 B-17 17'	NA	

SET #015.00

Doors: 115, 127, 128, 140, 141, 144, 201, 202, 203, 204, 205, 206, 208, 209, 210, 211, 213, 215, 216, 217, 222, 223, 224, 225, 226, 227

3 Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1 Lockset	63 8205 LNL HA KEYWAY X 3 KEYS	32D	SA
1 Wall Bumper	1270WV	626	TR
1 Coat Hook	0751	32D	ASII
1 Gasketing	2525 B-17 17'	NA	

SET #016.00

Doors: 100

3Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1Exit Device	16 63 8813 F ETL HA KEYWAY TB X 3 KEYS	32D	SA
1Closer	281 UO TB	EN	SA
1Kick Plate	KO050 10" x 34"	630	TR
1Door Stop	1214	626	TR
1Gasketing	2525 B-17 17'	NA	

SET #017.00

Doors: 214A, 214B

3	Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1	Privacy Set	8266 LNL	32D	SA
1	Closer	281 UO TB	EN	SA
1	Kick Plate	KO050 10" x 34"	630	TR
1	Wall Bumper	1270WV	626	TR
1	Gasketing	2525 B-17 17'	NA	

SET #018.00

Doors: 143B

3	Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1	Lockset	63 8237 LNL HA KEYWAY X 3 KEYS	32D	SA
1	Closer	281 UO TB	EN	SA
1	Kick Plate	KO050 10" x 34"	630	TR
1	Door Stop	1214	626	TR
1	Gasketing	2525 B-17 17'	NA	

SET #019.00

Doors: 130, 131, 134, 135, 138

3	Hinges	TA2314 4 1/2 X 4 1/2	32D	MC
1	Privacy Set	8266 LNL	32D	SA
1	Closer	281 UO TB	EN	SA
1	Wall Bumper	1270WV	626	TR
1	Coat Hook	0751	32D	ASII
1	Gasketing	2525 B-17 17'	NA	

SET #020.00

Doors: 108

2	Mortise Cylinder	63 41 HA KEYWAY X 3 KEYS	26D	SA
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NOTE: All hardware by the door manufacture except the masterkeyed cylinders. Coordinate type, cam, finish etc with the door supplier.

SET #021.00

Doors: 125, 126, 139

1	Continuous Hinge	MCK-FM300 7'0" HT SECURITY STUDS TXS	32D	MC
1	Lockset	36 63 68 9217 LNL HA KEYWAY X 3 KEYS	32D	SA
1	Closer	36 281 UO	EN	SA
1	Kick Plate	KO050 10" x 34"	630	TR
1	Door Stop	1209	630	TR
1	Gasketing	2525 B-17 17'	NA	

NOTE: Mount on corridor side, not in the holding cell.

SET #022.00

Doors: 228C

1	Continuous Hinge	MCK-FM300 7'0"	32D	MC
1	Exit Device	16 63 8813 F ETL HA KEYWAY TB X 3 KEYS	32D	SA
1	Closer	281 PSH TB	EN	SA
1	Kick Plate	KO050 10" x 34"	630	TR
1	Stop w/ Weld Plate	1207 W/ WELD PLATE & THRU BOLTS	626	TRIM
1	Gasketing	160 VA FATT 1 x 36" 2 x 84"	NA	
1	Drip Cap	16 A FATT 40"	NA	
1	Saddle Threshold	425 E 36"	AL	NA
1	Door Sweep	198 NA 36"	NA	

SET #023.00

Doors: 228A

1	Exit Device	55 56 63 8504 F ETL HA KEYWAY TB X 3 KEYS	32D	SA
1	Electric Power Transfer	MCK-EPT	MC	
1	Boxed Power Supply	BPS-24-2	SECU	
1	Proximity Reader	SXF1550	CH	LO
1	Bright Blue Reader Interface	SBB-RI	LO	

NOTE: All hardware by the aluminum door manufacture except the electrified panic exit device and the card access system. The hardware contractor shall furnish and install, hook-up and test the electrified panic exit device and the card access system as specified. All electrical wiring to the door, J-boxes etc by the electrical subcontractor.

SET #024.00

Doors: KEY-CAB

1	Key Cabinet	1201-A	LUND	
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NOTE: Install key cabinet as directed by the architect.

SET #025.00

Doors: CRD ACCESS

1	Bright Blue Controller	SBB		LO
1	Power Supply	SBB-SAPS		SCHL
200	Cards	SXF 7510		SCHL

NOTE: The computer for access control operation furnished by owner to intergrate into the owners existing network system.

SET #026.00

Doors: ELEVATOR

1	Proximity Reader	SXF1550	CH	LO
1	Bright Blue Reader Interface	SBB-RI	LO	

NOTE: All hardware by the elevator contractor except the card access system. The hardware contractor shall furnish as specified, hook-up and test the card access system. Coordinate installation with the elevator contractor. All wiring, J-boxes to the elevator by the electrical subcontractor.

SET #027.00

Doors: 155

1	Exit Device	55 56 63 8504 F ETL HA KEYWAY TB X 3 KEYS	32D	SA
1	Electric Power Transfer	MCK-EPT	MC	
1	Proximity Reader	SXF1550	CH	LO
1	Bright Blue Reader Interface	SBB-RI	LO	

NOTE: Existing aluminum door and frame. Hardware contractor furnish as specified and install, hook-up and test the card access system and the electrified panic exit device. Remove existing Adams-Rite locking device and patch the aluminum door as necessary to accomodate the new hardware. All wiring, J-boxes etc to the door by the electrical subcontractor.

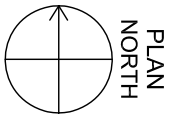
SET #028.00

Doors: 156

1	Exit Device	55 63 8804 F ETL HA KEYWAY TB X 3 KEYS	32D	SA
1	Boxed Power Supply	BPS-24-2	SECU	
1	Proximity Reader	SXF1550	CH	LO
1	Bright Blue Reader Interface	SBB-RI	LO	

NOTE: Existing hollow metal door. Hardware contractor to furnish as specified and install, hook-up and test the new electrified panic exit device and card access system. All wiring, J-boxes etc to the door by the electrical subcontractor.

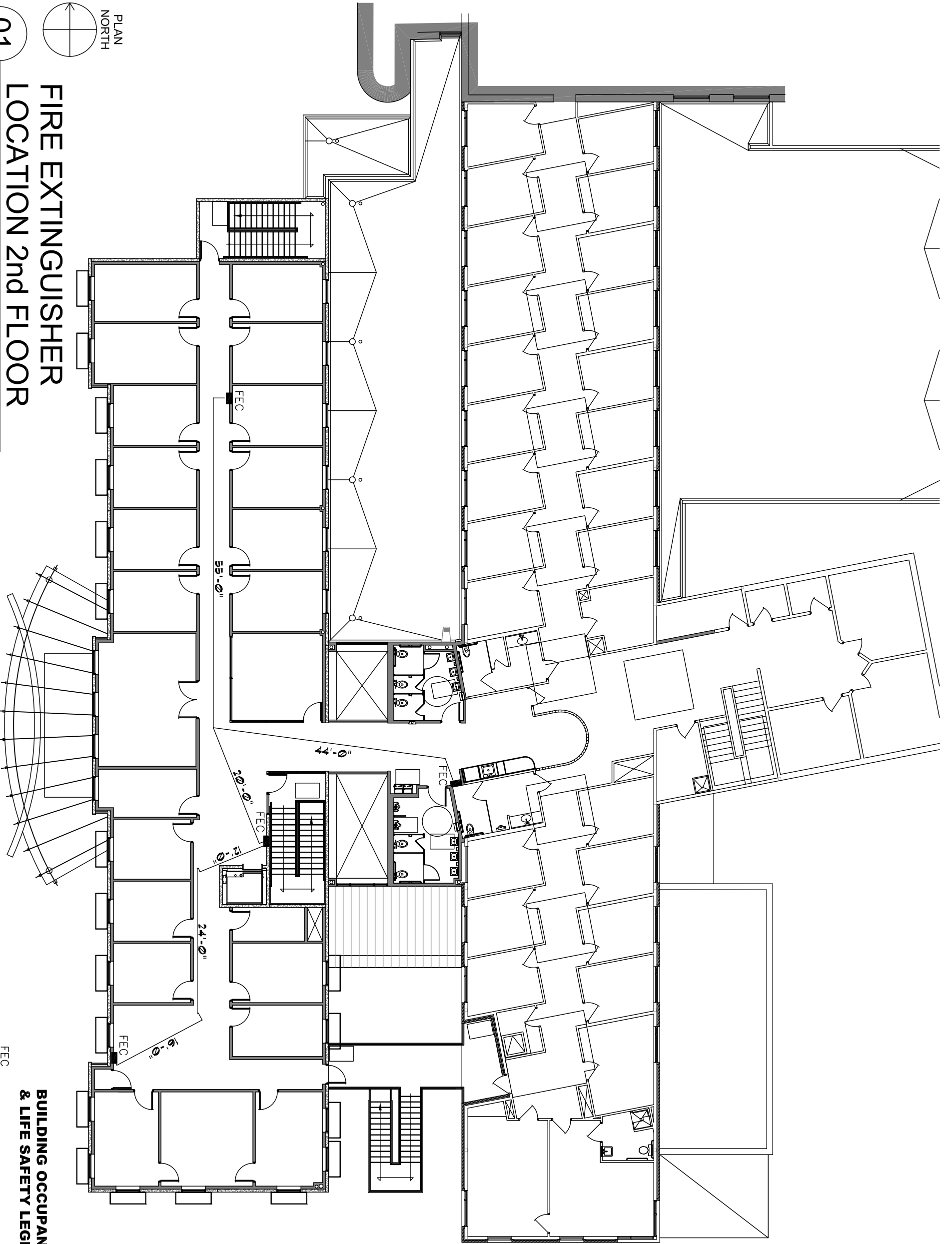
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01

FIRE EXTINGUISHER LOCATION 2nd FLOOR

SCALE: 1/16" = 1'-0"



BUILDING OCCUPANCY & LIFE SAFETY LEGEND

FEC
RECESSED FIRE EXTINGUISHER CABINET

JUDGE ENRIQUE H. PEÑA JR. JUVENILE JUSTICE CENTER

6314 DELTA DR., EL PASO, TX 79905

	00.00.00
	00/00/0000
	AS SHOWN

G-101A
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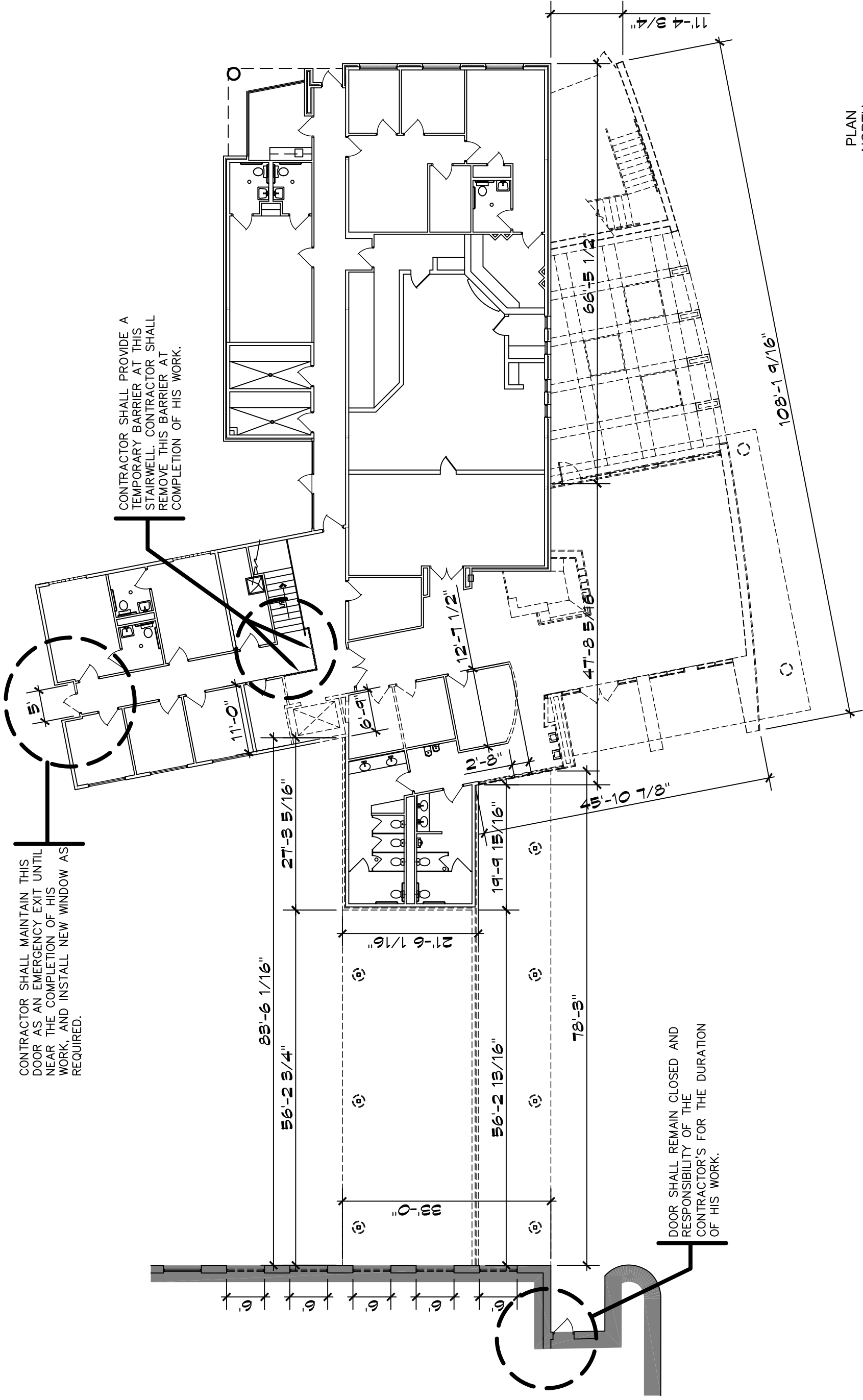
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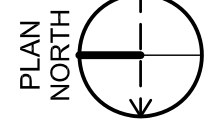
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JUVENILE JUSTICE CENTER
6314 DELTA DR., EL PASO, TX 79905



CONTRACTOR SHALL MAINTAIN THIS DOOR AS AN EMERGENCY EXIT UNTIL NEAR THE COMPLETION OF HIS WORK, AND INSTALL NEW WINDOW AS REQUIRED.

CONTRACTOR SHALL PROVIDE A TEMPORARY BARRIER AT THIS STAIRWELL. CONTRACTOR SHALL REMOVE THIS BARRIER AT COMPLETION OF HIS WORK.

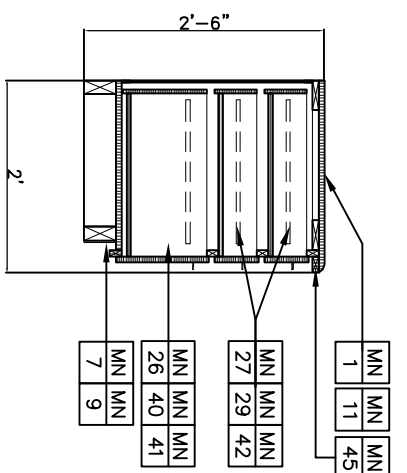
DOOR SHALL REMAIN CLOSED AND RESPONSIBILITY OF THE CONTRACTOR'S FOR THE DURATION OF HIS WORK.



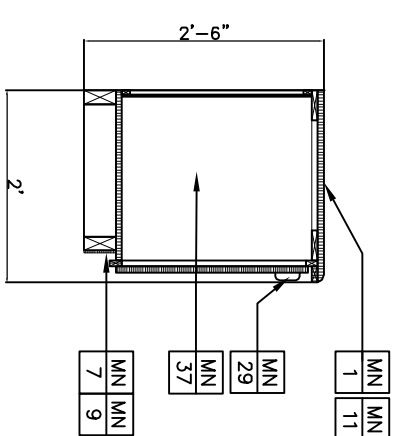
FIRST FLOOR DEMOLITION PLAN

SCALE: 1/16" = 1' - 0"

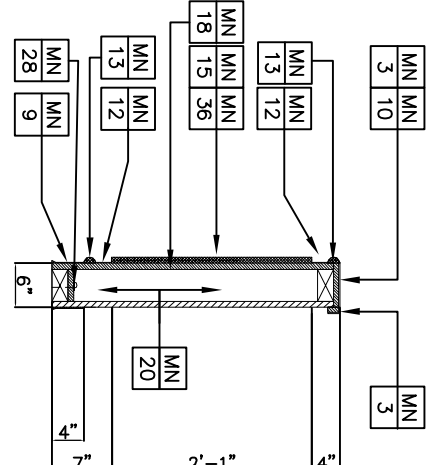
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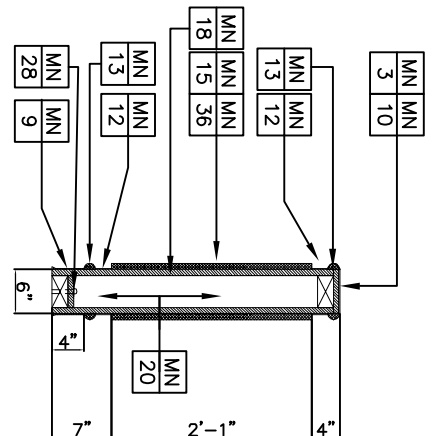
K DETAIL - MILLWORK
COURT ROOM 123 & 124
(WITNESS & COURT REPORTER)



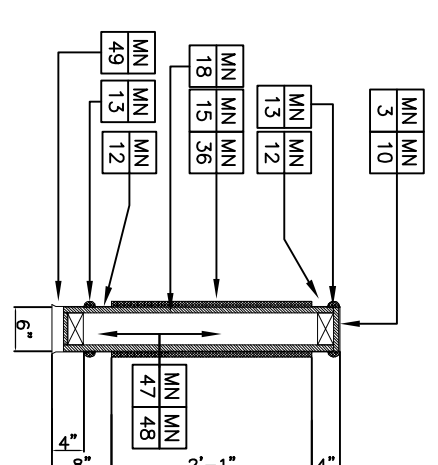
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COURT ROOM 123 & 124
(WITNESS & COURT REPORTER)



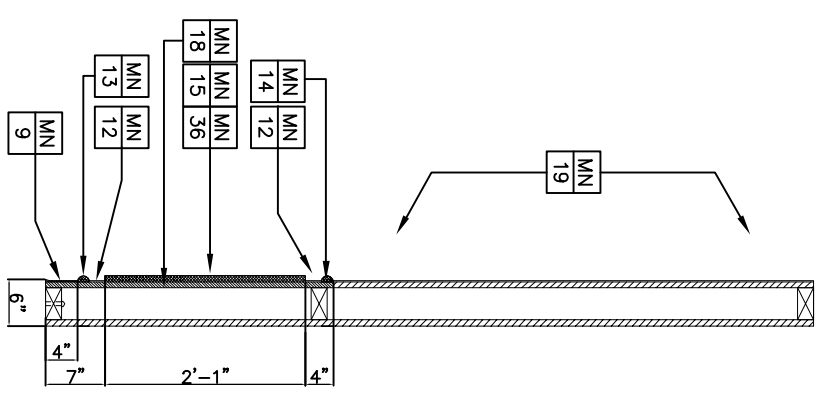
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COURT ROOM 123 & 124 (JURY SEATING)



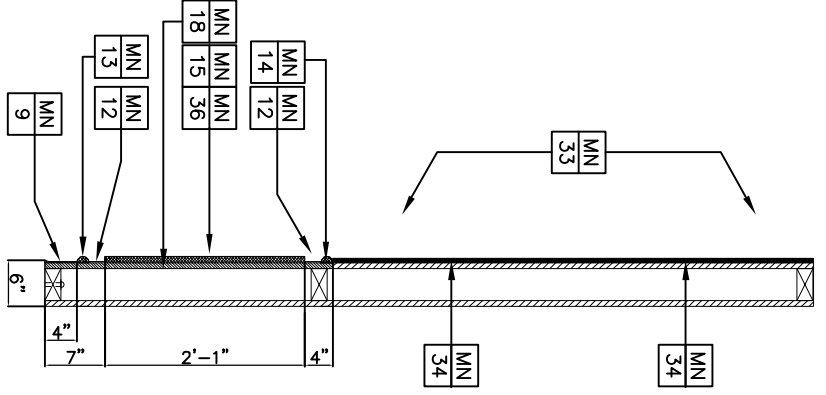
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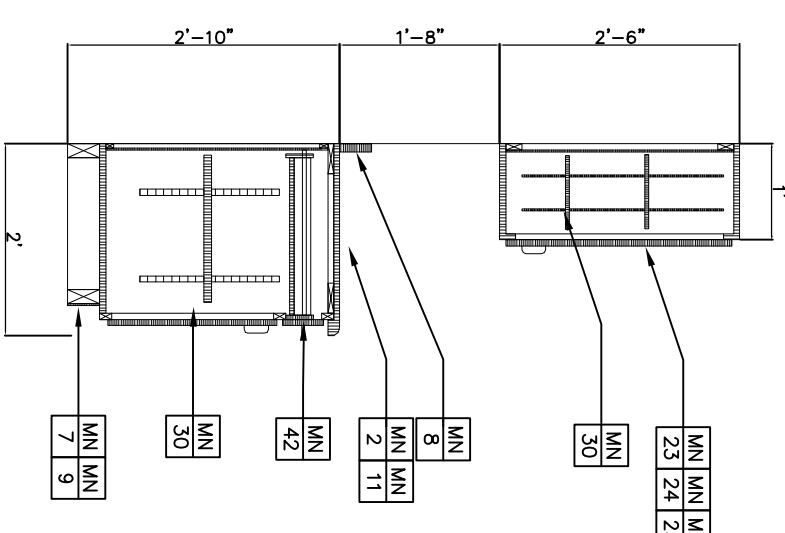
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COURT ROOM 123 & 124 (SWING DOOR)



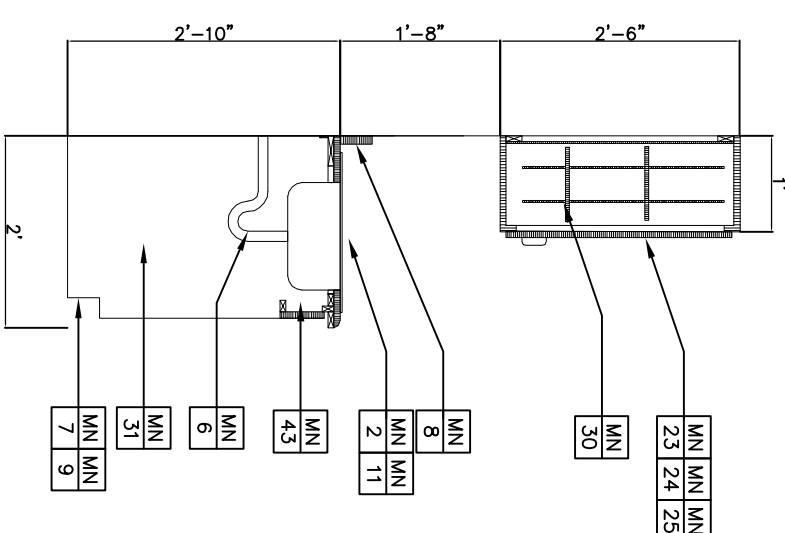
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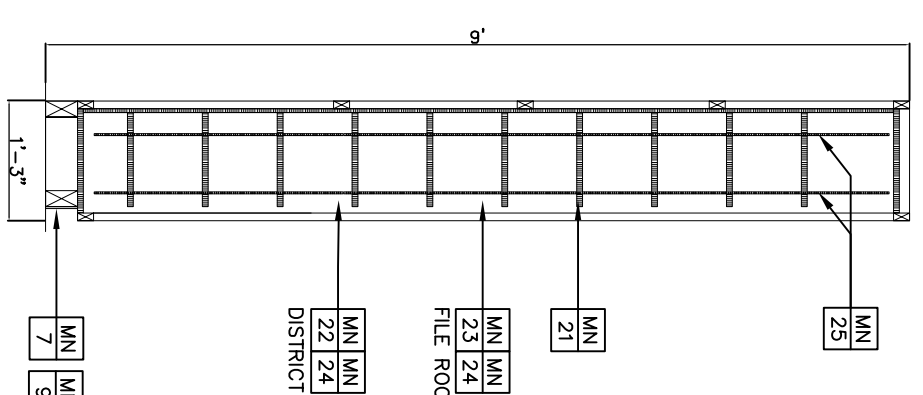
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COURT ROOM 123 & 124 (36\"/>



R DETAIL - MILLWORK
BREAK ROOM 103 (WARNING 109, RM 111)



S DETAIL - MILLWORK
BREAK ROOM 103 & WARNING 109



T DETAIL - MILLWORK
FILE ROOM 115 & DISTRICT CLERK 116

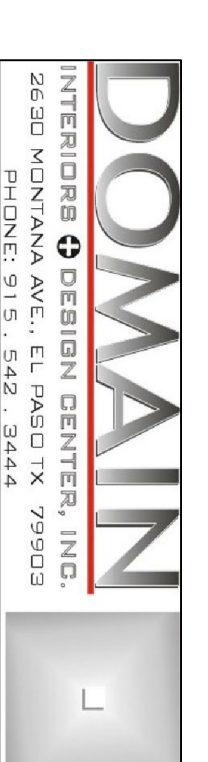
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4	5/4\"/>
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7	4\"/>
8	4\"/>
9	VINYL BASE FINISH
10	1\"/>
11	1\"/>
12	2\"/>
13	1-1/2\"/>
14	1-1/2\"/>
15	1-1/2\"/>
16	1-1/2\"/>
17	1-1/2\"/>
18	3/4\"/>
19	3/4\"/>
20	3/4\"/>
21	FULL HEIGHT SHELVING
22	EXPOSED SHELVING TO BE FINISHED WITH LAMINATE FINISH
23	CABINET INTERIORS TO BE FINISHED WITH MELAMINE FINISH
24	CABINET SHELVING OVER 24\"/>
25	FULL EXTENSION DRAWER ON BALL BEARING GLIDES
26	3/4\"/>
27	3/4\"/>
28	PROVIDE LOCK ON DOOR AND/OR DRAWER
29	PROVIDE LOCK ON DOOR AND/OR DRAWER
30	PROVIDE FINISHED END PANELS (TOP, BOTTOM AND SIDES) WITH LAMINATE
31	PROVIDE FINISHED END PANELS (TOP, BOTTOM AND SIDES) WITH LAMINATE
32	2\"/>
33	ACoustICAL PANELS (W-)
34	PROVIDE ZEPHYRUS TO SECURE ACOUSTICAL PANELS TO WALL
35	PROVIDE ZEPHYRUS TO SECURE ACOUSTICAL PANELS TO WALL
36	WOOD PANELING TO BE SECURED WITH LIQUID WALLS TO REDUCE WALL HOLES
37	FINISHED BACKING
38	SHELVING NOT TO EXCEED SPAN OF 36 INCHES
39	PROPOSED WINDOW LOCATION
40	PROPOSED WINDOW LOCATION WITH HANGERS FOR END USER FILES
41	11\"/>
42	5\"/>
43	5\"/>
44	PARTION WALL TO BE SECURED TO ADJACENT WALL WITH TOGGLE BOLTS.
45	BULLET RESISTANT FIREGLASS
46	BULLET RESISTANT FIREGLASS
47	2 X 4 FRAME TO BE FINISHED WITH PLYWOOD
48	1-1/2\"/>
49	1-1/2\"/>
50	NO USBD

JUVENILE PROBATION DEPARTMENT FIRST FLOOR
MILLWORK DETAILS, SCALE: 1/2" = 1'-0"

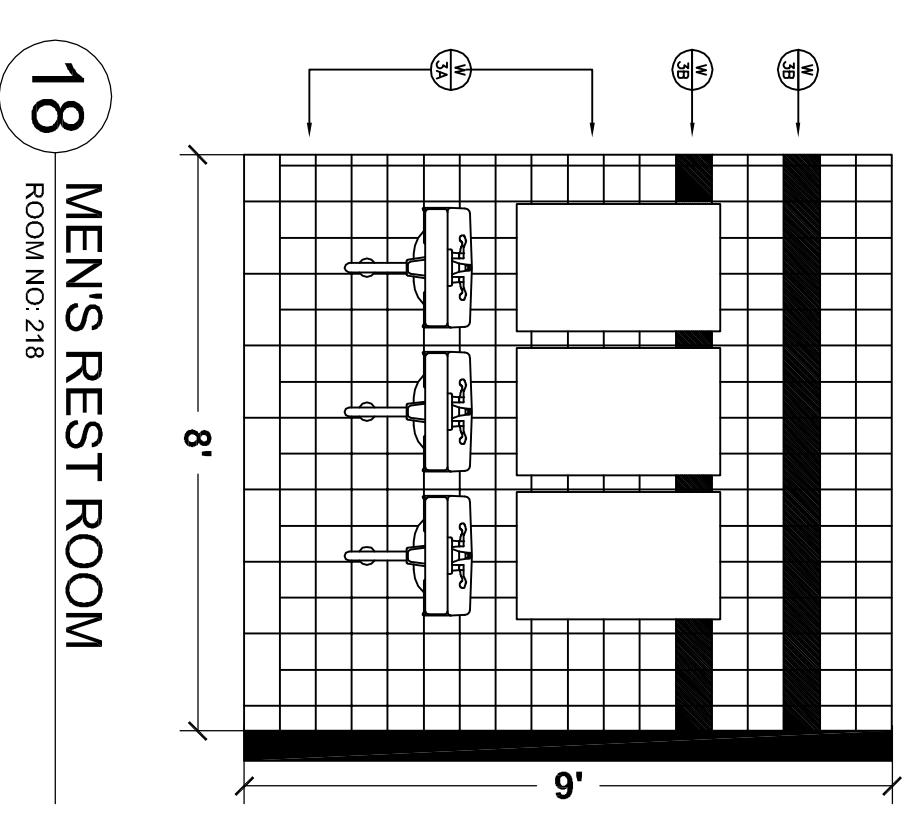
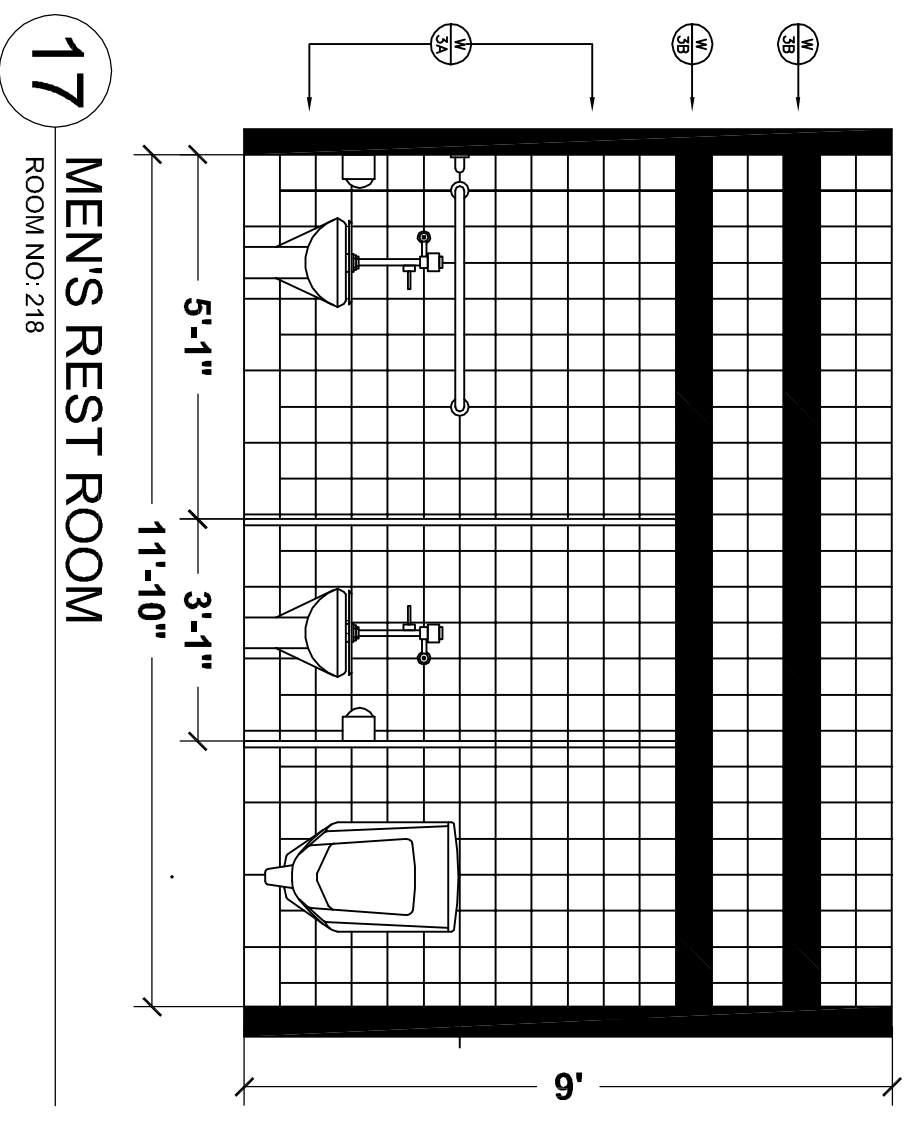
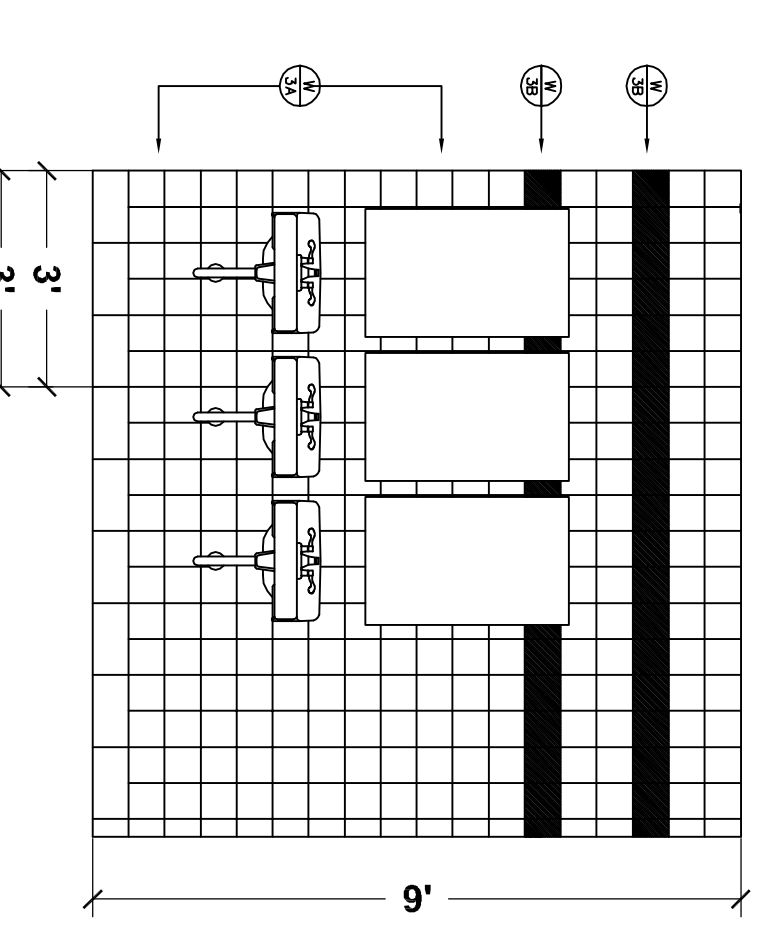
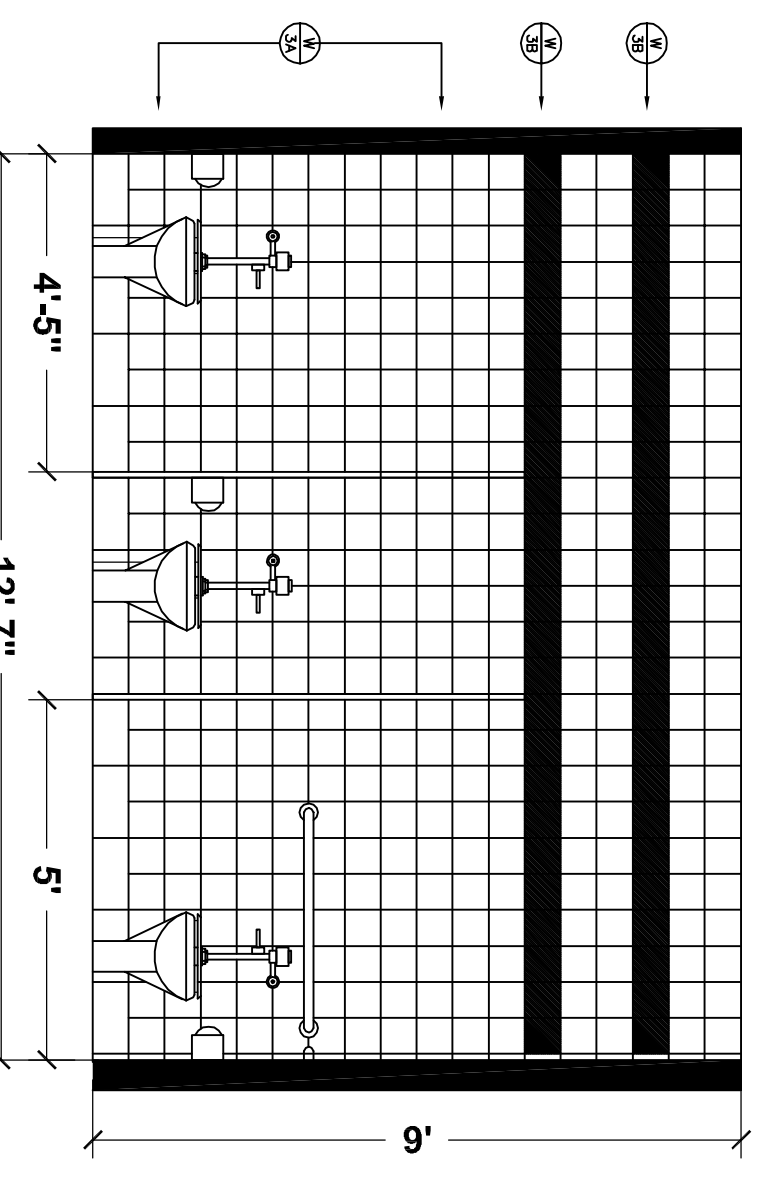
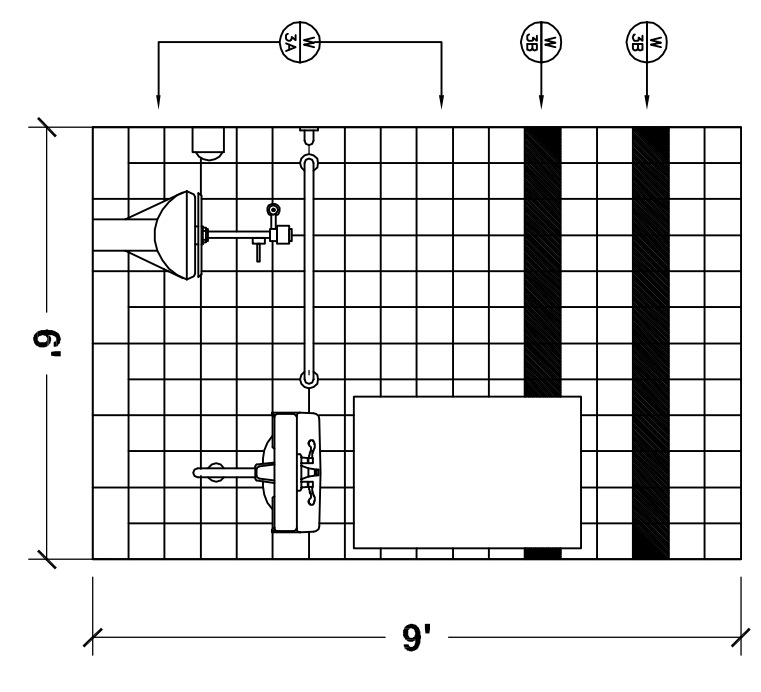
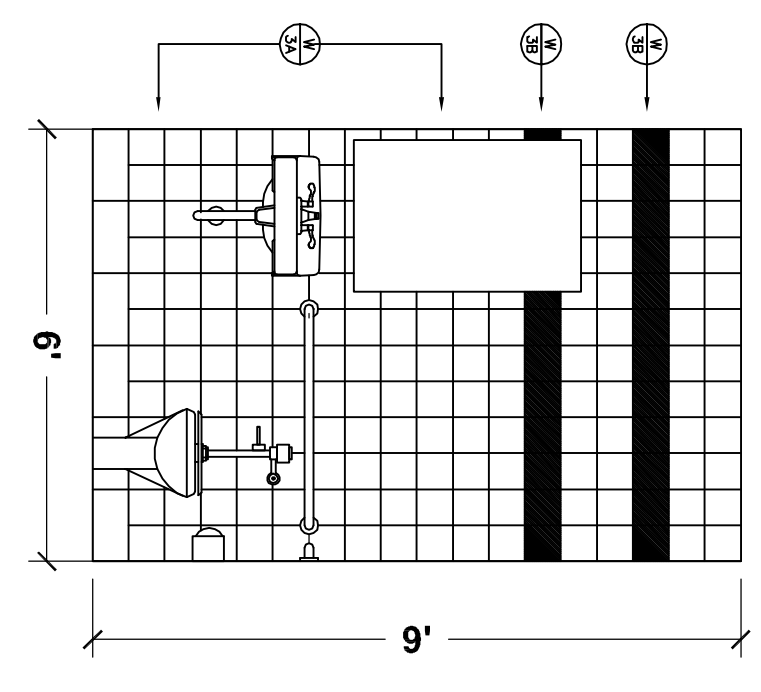
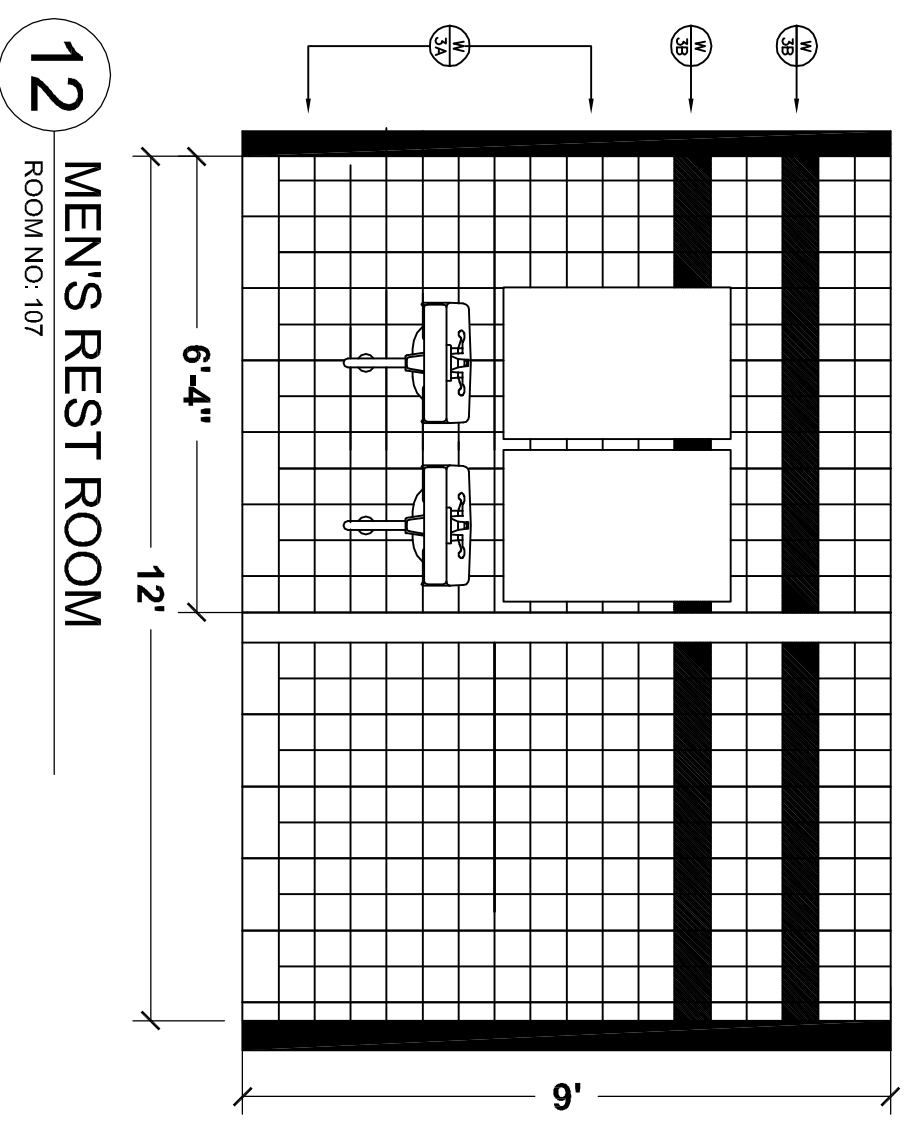
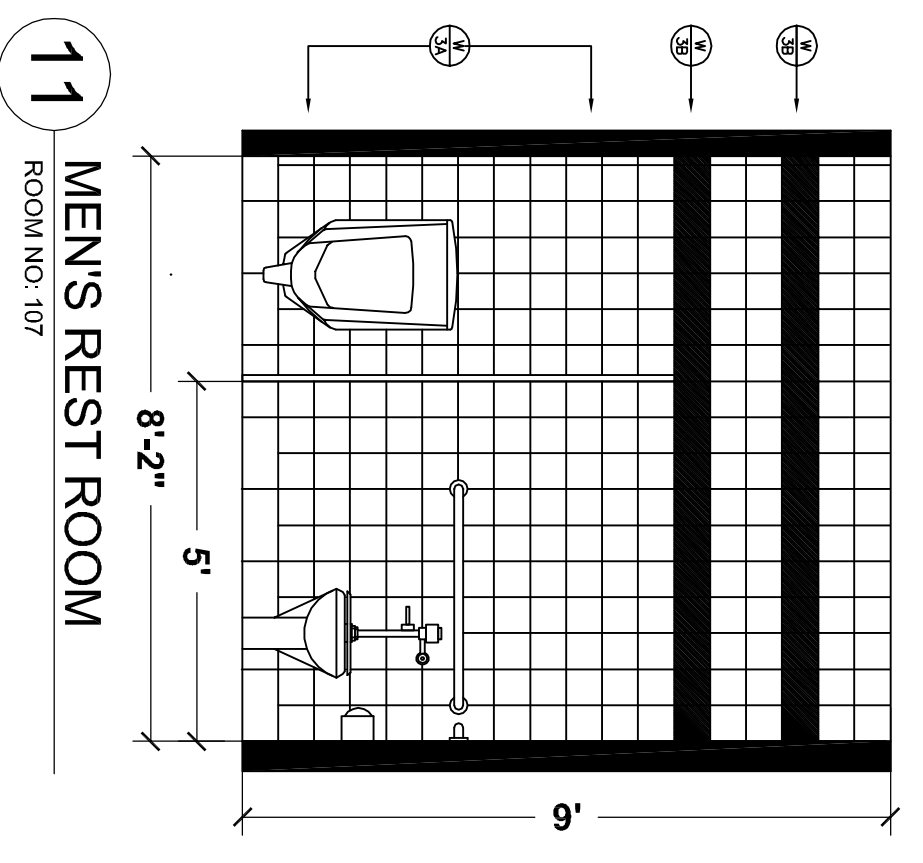
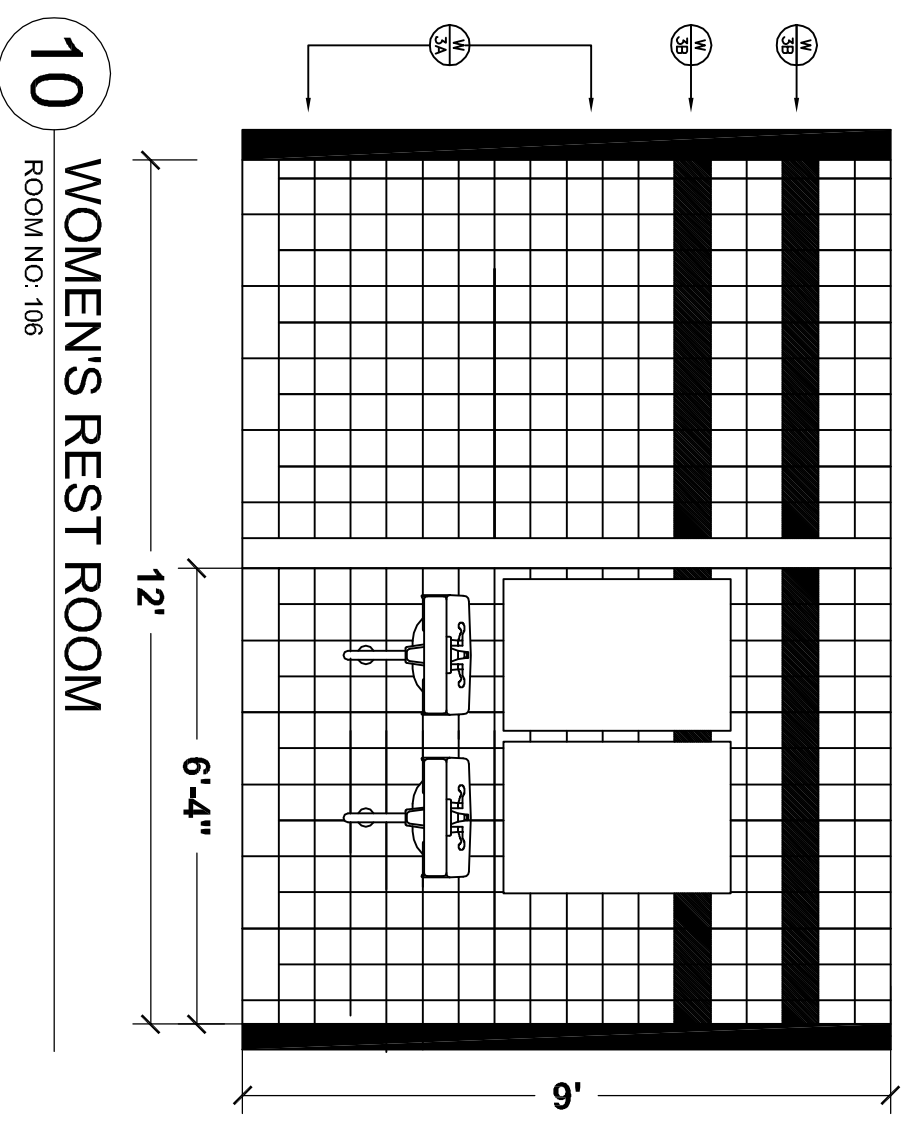
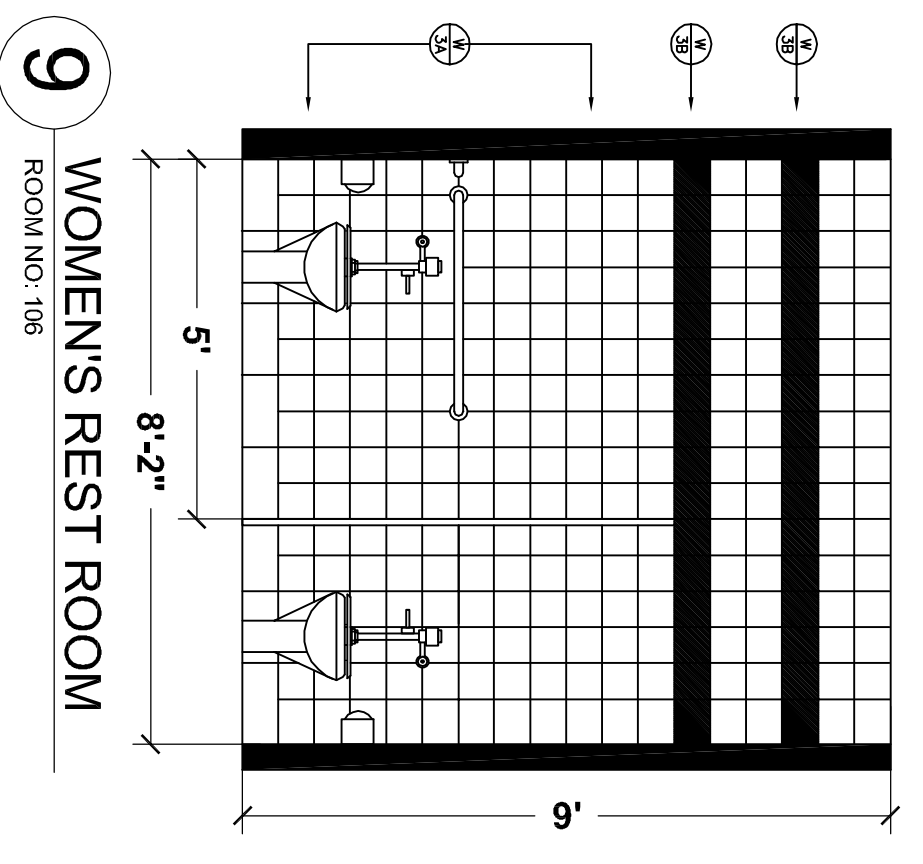
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Juvenile Probation Department
Addition
JUDGE ENRIQUE H. PEÑA JR
JUVENILE JUSTICE CENTER
6314 Delta Drive, El Paso TX, 79905
El Paso County



100% CONSTRUCTION DOCUMENTS FOR REGULATORY APPROVAL, PERMITTING, AND CONSTRUCTION



DOMAIN
INTERIORS & DESIGN CENTER, INC.
2620 WESTERN BLVD., SUITE 100
PHOENIX, AZ 85029

CONSULTANTS

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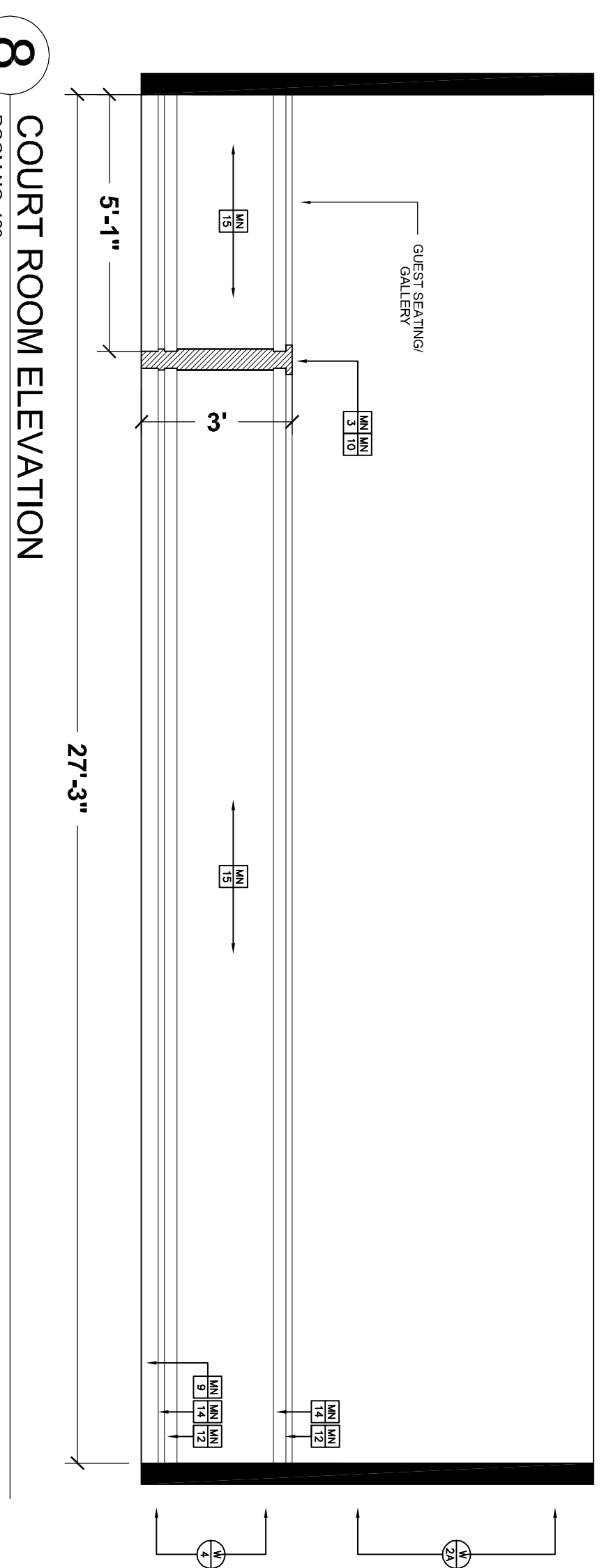
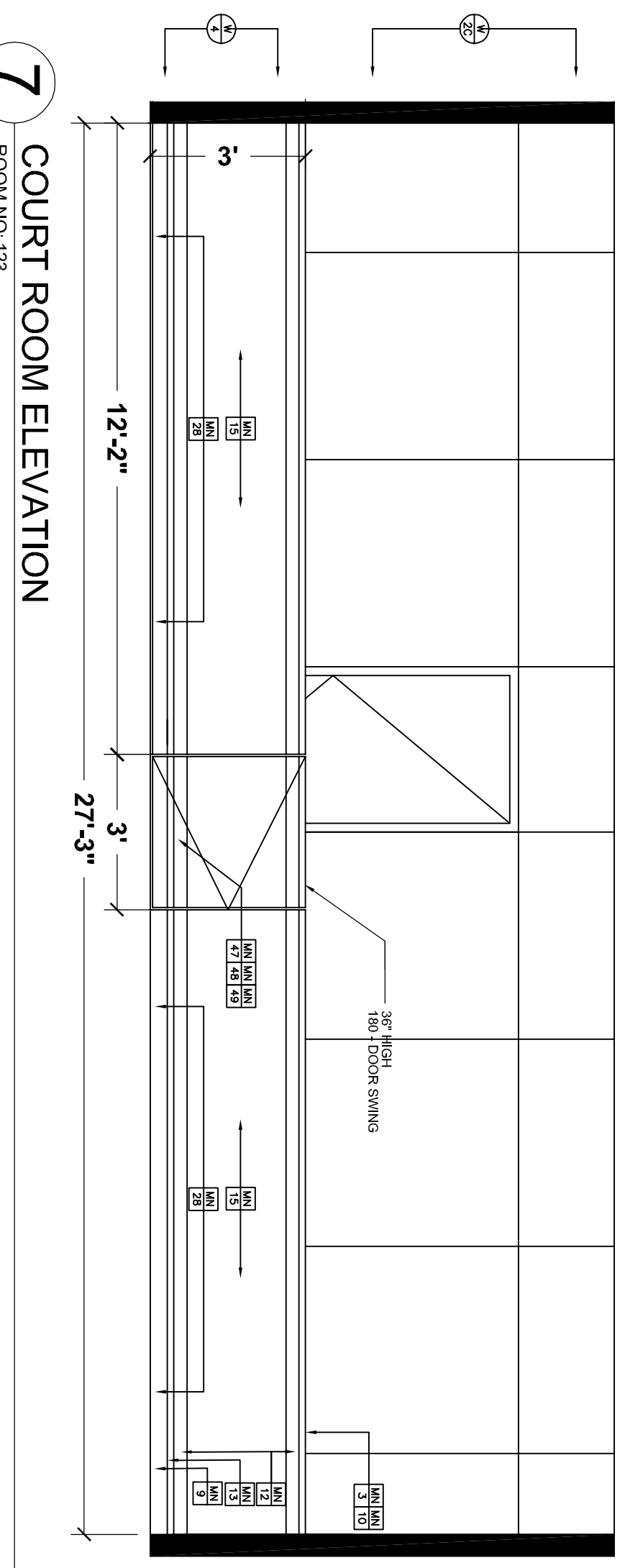
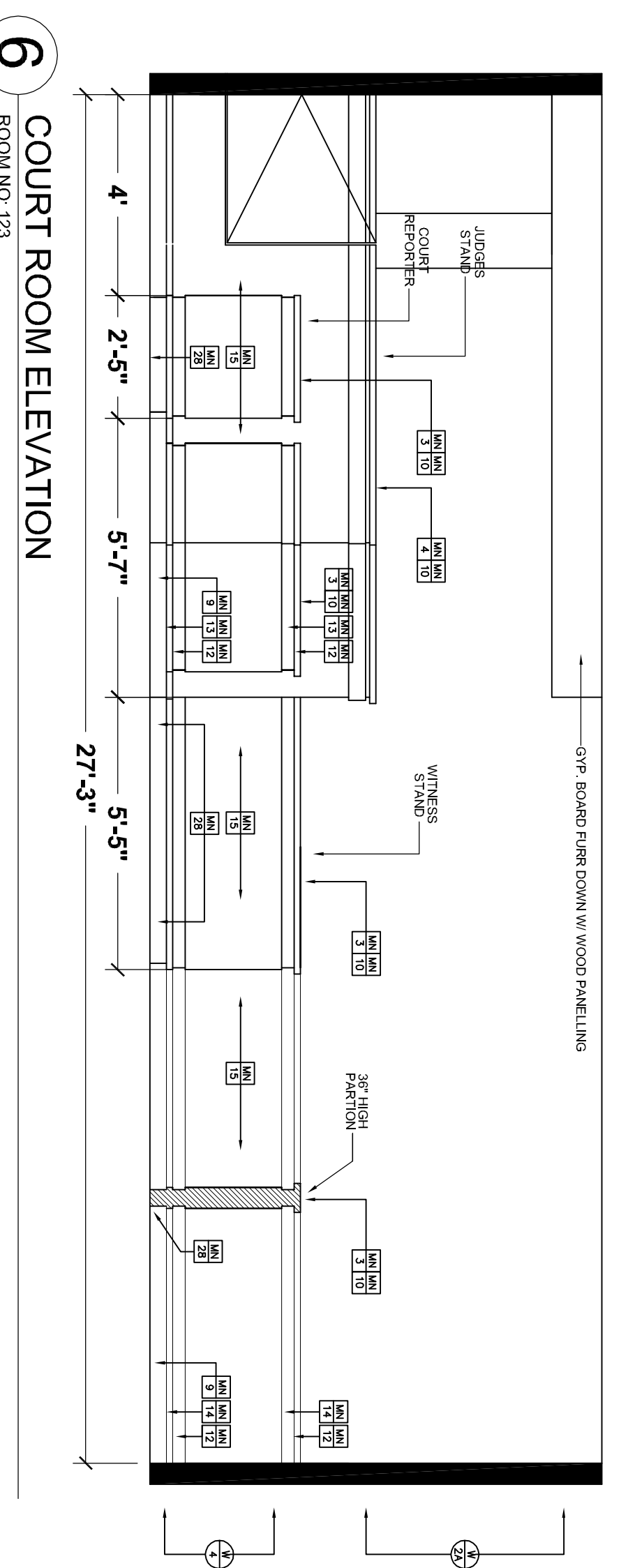
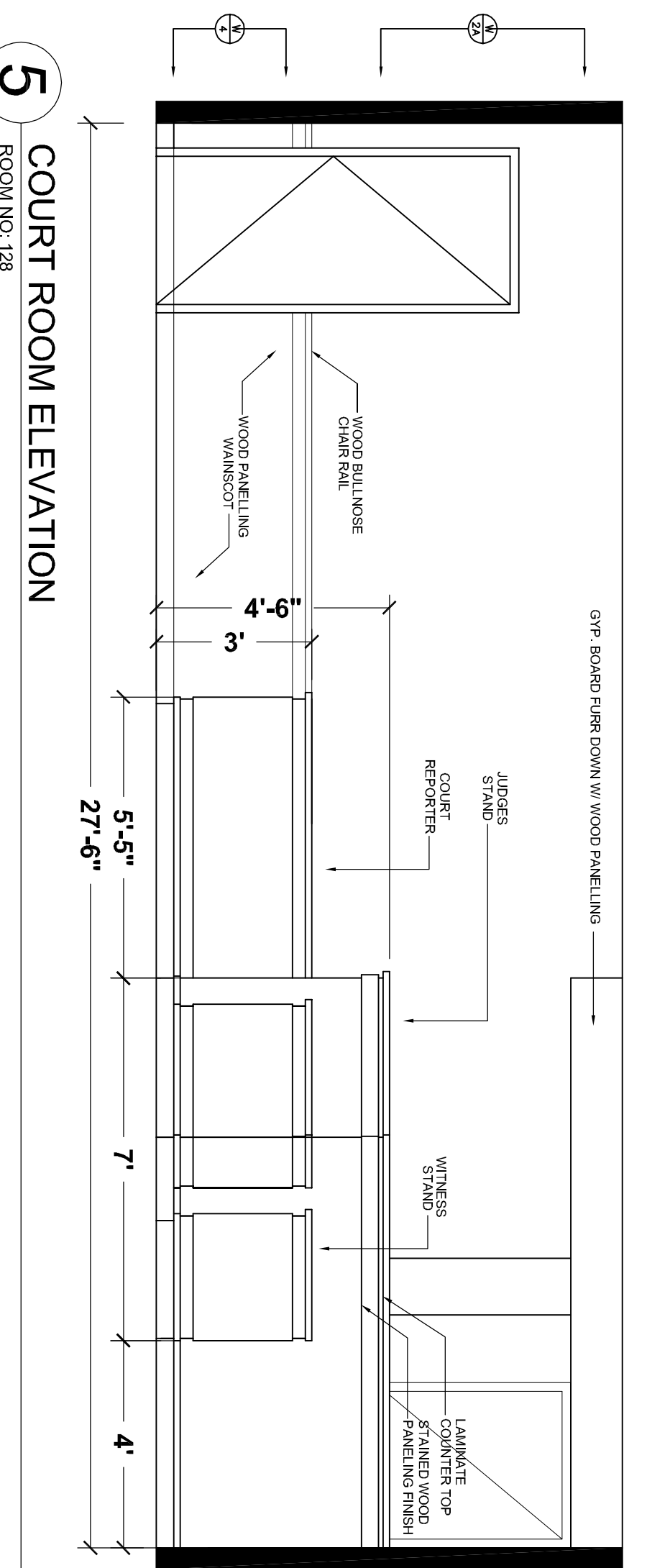
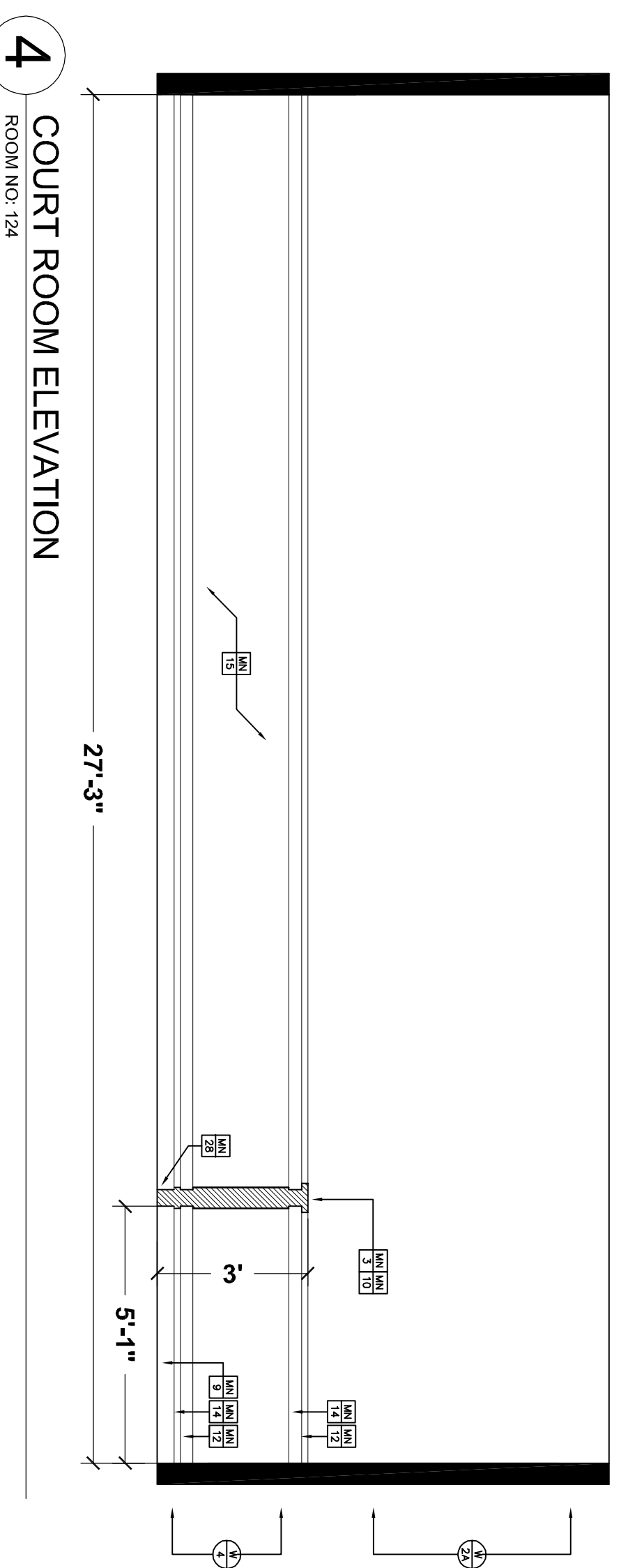
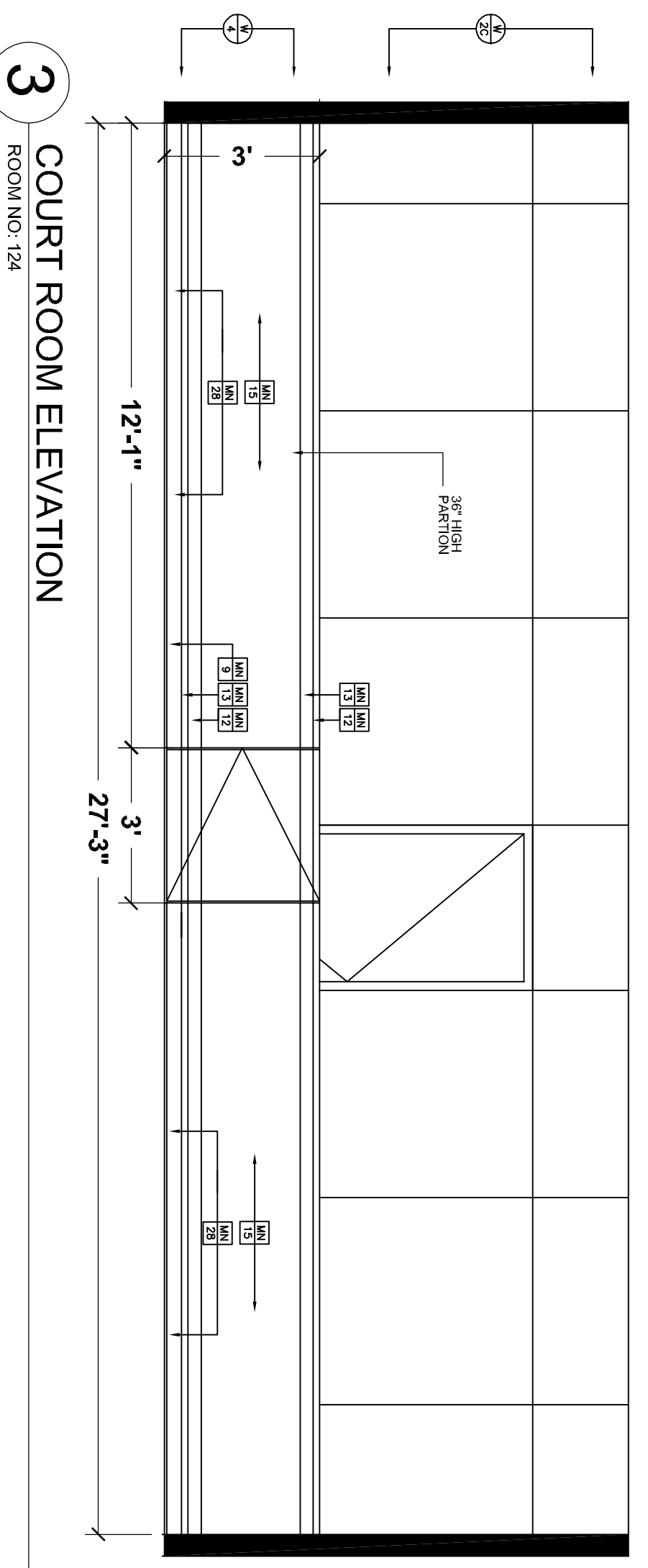
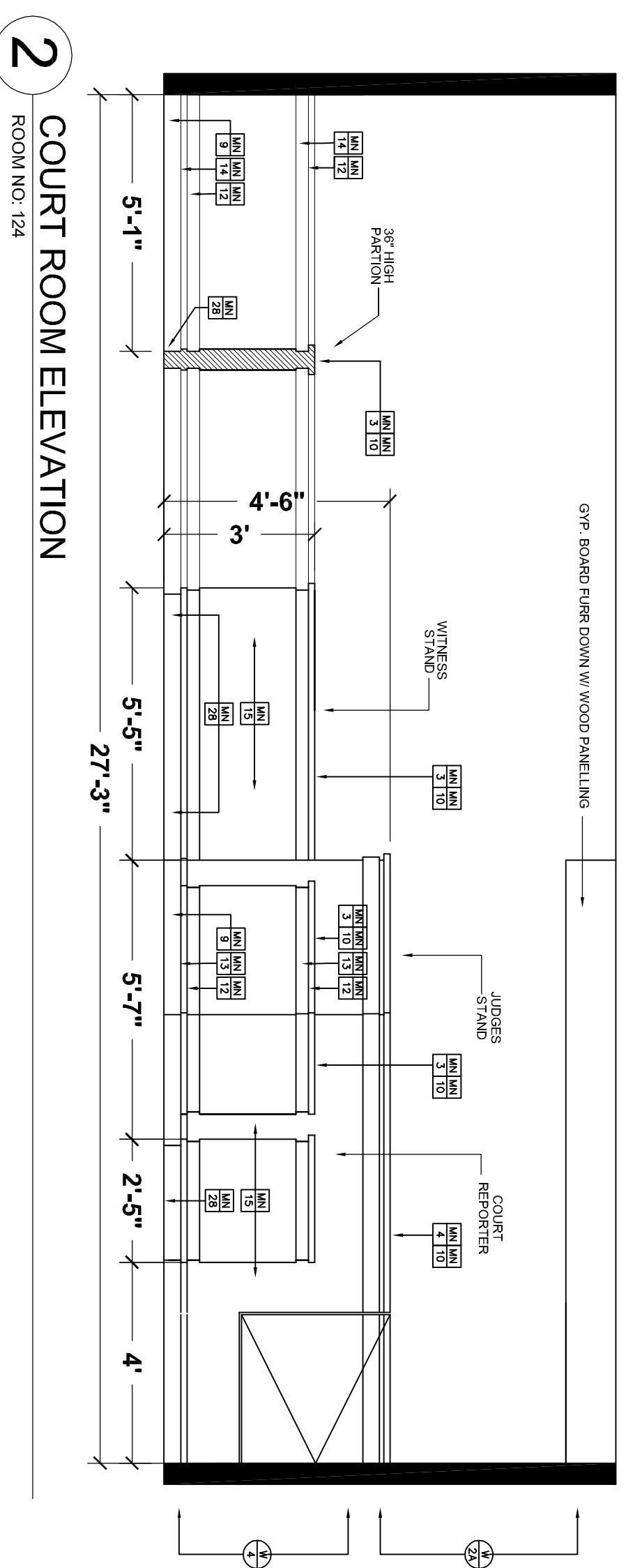
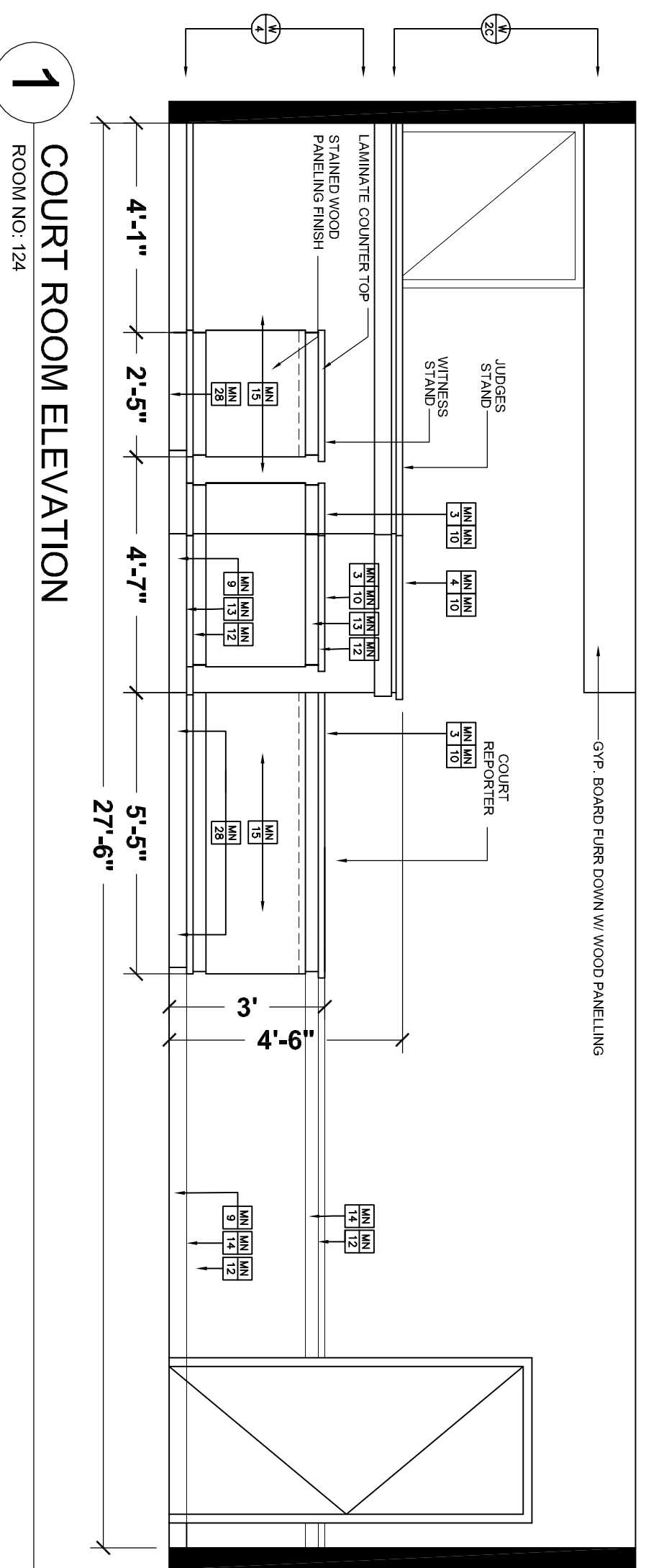
REVISIONS

NO.	DATE	BY	REVISIONS

Juvenile Probation Department
Addition
JUDGE ENRIQUE H. PEÑA JR.
JUVENILE JUSTICE CENTER
6314 Della Drive, El Paso TX, 79905
El Paso County

08.05.59
JANUARY 2010
AS SHOWN

AI-116
SHEET OF

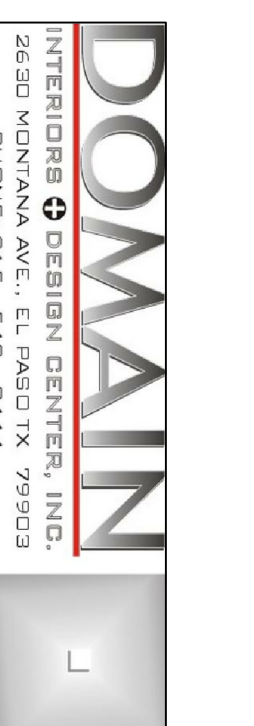


CODE	DESCRIPTION
1	36" HIGH COUNTER TOP
2	36" HIGH TRANSACTION TOP /TOP CAP
3	36" HIGH TRANSACTION TOP /TOP CAP
4	36" WIDE KNEESPACE ON TOP
5	36" WIDE KNEESPACE W/ ADA COMPLIANT BRANN COVER
6	4" TOP KICK ASH INTEGRATED INTO COUNTER TOP
7	VINYL BASE FINISH
8	TOP CAP WITH LAMINATE FINISH (GT-1)
9	LAMINATE COUNTERTOP (GT-FINISH (GT-2)
10	1-1/2" WOOD BALKNOSE-CHAIR RAIL
11	1-1/2" WOOD BALKNOSE- WHITE OAK
12	1-1/2" WOOD BALKNOSE- WHITE OAK
13	1-1/2" WOOD BALKNOSE- WHITE OAK
14	1-1/2" WOOD BALKNOSE- WHITE OAK
15	1-1/2" WOOD BALKNOSE- WHITE OAK
16	1-1/2" WOOD BALKNOSE- WHITE OAK
17	1-1/2" SELF-EDGE WITH LAMINATE FINISH (GT-1)
18	1-1/2" SELF-EDGE WITH LAMINATE FINISH (GT-1)
19	1-1/2" SELF-EDGE WITH LAMINATE FINISH (GT-1)
20	1-1/2" SELF-EDGE WITH LAMINATE FINISH (GT-1)
21	1-1/2" SELF-EDGE WITH LAMINATE FINISH (GT-1)
22	1-1/2" SELF-EDGE WITH LAMINATE FINISH (GT-1)
23	1-1/2" SELF-EDGE WITH LAMINATE FINISH (GT-1)
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48	1-1/2" SELF-EDGE WITH LAMINATE FINISH (GT-1)
49	1-1/2" SELF-EDGE WITH LAMINATE FINISH (GT-1)
50	1-1/2" SELF-EDGE WITH LAMINATE FINISH (GT-1)

100% CONSTRUCTION DOCUMENTS FOR REGULATORY APPROVAL, PERMITTING, AND CONSTRUCTION



WRIGHT & DALBIN, INC.
 2375 WINDYBROOK DRIVE, SUITE 100, WINDYBROOK, TEXAS 75087
 PHONE: 972.344.1111 FAX: 972.344.1112
 WWW.WRIGHTANDDALBIN.COM



DOMAIN INTERIORS & DESIGN CENTER, INC.
 2630 WINDYBROOK DRIVE, SUITE 100, WINDYBROOK, TEXAS 75087
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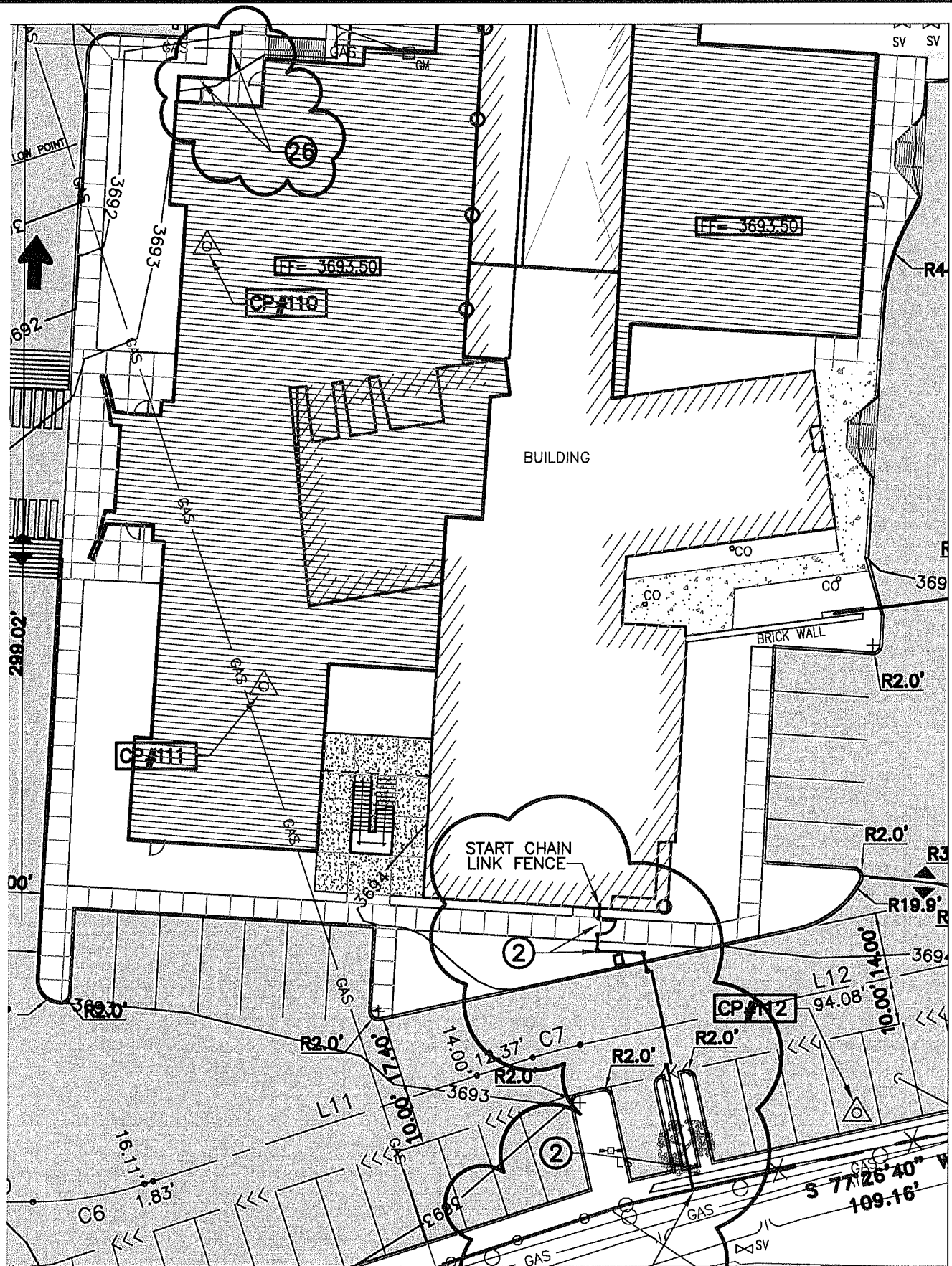
Juvenile Probation Department
 Addition
 JUDGE ENRIQUE H. PEÑA JR.
 JUVENILE JUSTICE CENTER
 6314 Delta Drive, El Paso TX, 79905
 El Paso County

08.05.59
 JANUARY 2010
 AS SHOWN
 SHEET OF
AI-114

JUVENILE PROBATION DEPARTMENT FIRST FLOOR
 INTERIOR ELEVATIONS, SCALE: 3/8" = 1'-0"

NEW KEYED NOTES:

- ① EXISTING ASPHALT PAVEMENT TO BE REMOVED AND DISPOSED BY CONTRACTOR.
- ② EXISTING CONCRETE CURB AND GUTTER TO BE SAWCUT, REMOVED AND DISPOSED BY CONTRACTOR (TYP.)
- ③ EXISTING TREES, SHRUBS, PINES, PALMS TO BE REMOVED AND DISPOSED BY CONTRACTOR.
- ④ EXISTING RETAINING WALL WITH CHAINLINK FENCE TO BE REMOVED AND DISPOSED BY CONTRACTOR.
- ⑤ EXISTING CONCRETE DRIVEWAY/CONC. SWALE TO BE SAWCUT, REMOVED AND DISPOSED BY CONTRACTOR.
- ⑥ EXISTING CONCRETE SIDEWALK TO BE SAWCUT, REMOVED AND DISPOSED BY CONTRACTOR. (TYPICAL)
- ⑦ EXISTING CONCRETE FLUME TO BE REMOVED AND DISPOSED BY CONTRACTOR.
- ⑧ EXISTING HANDRAILS TO BE REMOVED AND SALVAGED BY CONTRACTOR.
- ⑨ EXISTING LIGHT POLE TO BE REMOVED AND SALVAGED BY CONTRACTOR.
- ⑩ EXISTING TELEPHONE PEDESTAL AND SLAVAGED TO BE REMOVED BY CONTRACTOR.
- ⑪ EXISTING PIPE BOLLARD TO BE REMOVED AND SALVAGED BY CONTRACTOR.
- ⑫ EXISTING SIGN TO BE REMOVED AND SALVAGED BY CONTRACTOR.
- ⑬ EXISTING SIGN TO BE REMOVED AND RELOCATED BY CONTRACTOR.
- ⑭ EXISTING BUILDING UNIT TO BE REMOVED AND SALVAGED BY CONTRACTOR.
- ⑮ EXISTING SPRINKLER VALVES TO BE REMOVED AND RELOCATED (APPROX. 9.25 FT. TO THE SOUTH) BY CONTRACTOR.
- ⑯ EXISTING MORTARED ROCK RIP-RAP TO BE REMOVED AND DISPOSED BY CONTRACTOR.
- ⑰ EXISTING GATE TO BE REMOVED AND SALVAGED BY CONTRACTOR.
- ⑱ EXISTING BRICK WALL TO BE SAWCUT, REMOVED AND DISPOSED BY CONTRACTOR.
- ⑲ EXISTING GUY WIRE TO BE REMOVED AND RELOCATED BY UTILITY OWNER.
- ⑳ EXISTING CONCRETE RIP-RAP TO BE SAWCUT, REMOVED AND DISPOSED BY CONTRACTOR.
- ㉑ EXISTING CONCRETE CURB/CONC. SIDEWALK TO REMAIN.
- ㉒ EXISTING CONCRETE FLUME TO REMAIN.
- ㉓ EXISTING GUARD POLES TO REMAIN.
- ㉔ NOT USED.
- ㉕ EXISTING PIPE BOLLARDS TO BE REMOVED AND SALVAGED BY CONTRACTOR.
- ㉖ EXISTING PINES/TREES TO BE REMOVED AND REPLANTED BY CONTRACTOR. CONTRACTOR TO COORDINATE WITH OWNER FOR NEW LOCATION OF PINES/TREES.
- ㉗ EXISTING GATE ACCESS CONTROL BOX TO BE REMOVED AND SALVAGED BY CONTRACTOR.
- ㉘ AREA TO BE CLEARED OF VEGETATION AND GRADED TO NEW FINISH ELEVATIONS BY CONTRACTOR.



② NEW 14' SECURITY CHAINLINK FENCE AND 5' WIDE GATE.
SEE SHEET C-11 FOR DETAIL.

②⑥ PROPOSED HANDRAIL AND CONCRETE STEM WALL.
LENGTH= 28.5', SEE SHEET C-8 FOR DETAILS.

SHEET C-5-A

NEW GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS A (3000 PSI AT 28 DAYS) AND MEET MATERIAL REQUIREMENTS OF "CAST IN PLACE CONCRETE" OF THE SPECIFICATIONS, UNLESS OTHERWISE INDICATED.
2. ALL REINFORCING STEEL SHALL BE GRADE 60 AND MEET "REINFORCING STEEL" OF THE SPECIFICATIONS.
3. CURING SHALL BE MADE BY THE IMPERVIOUS MEMBRANE METHOD AND SHALL MEET THE MATERIAL AND CONSTRUCTION REQUIREMENTS ON "PLACING, FINISHING & CURING CONCRETE" OF THE SPECIFICATIONS.
4. CONTRACTOR IS REQUIRED TO ATTEND A PRE-CONSTRUCTION CONFERENCE AND SHALL NOTIFY THE ENGINEER 24 HOURS PRIOR TO CONSTRUCTION AND PRIOR TO INSPECTION REQUESTS FOR SUBGRADE, BASE, AND CONCRETE PLACEMENT.
5. CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING INTEGRITY OF ALL EXISTING UTILITIES DURING CONSTRUCTION AND WILL BE RESPONSIBLE FOR REPAIRING ALL UTILITIES BROKEN DURING CONSTRUCTION AND ALL COSTS ASSOCIATED WITH THE REPAIRING INCLUDING IRRIGATION, PAVEMENT MARKINGS, WATER LINES, GAS LINES, ELECTRICAL LINES, AND OTHER UNDERGROUND UTILITIES.
6. LABORATORY TESTING SHALL BE PERFORMED BY AN APPROVED INDEPENDENT TESTING LABORATORY, AT THE OWNER'S EXPENSE. THE FOLLOWING TEST SCHEDULE SHALL BE ADHERED TO:
 - A. SUBGRADE MOISTURE AND DENSITY TEST AT THE RATE OF ONE PER EACH 500 FOOT SPACING; A MINIMUM OF 6 DENSITY TESTS FOR THIS PROJECT.
 - B. FLEXIBLE BASE P.I., L.L. AND GRADATION OF MATERIAL USED, MOISTURE AND DENSITY TEST PER LIFT ON SAME SPACING AS SUBGRADE.
 - C. COMPACTED FILL TESTS SHALL BE A MAXIMUM OF 15. TESTING SHALL BE PROVIDED FOR 12" LIFT, 1 TEST PER 300 LINEAR FEET OF ROAD AND PARKING LOT MAX.
 - D. CONCRETE -- ONE CONCRETE COMPRESSIVE STRENGTH TEST (4 CYLINDERS EACH) FOR EACH DRAINAGE STRUCTURE AND TWO SETS FOR EVERY 800 LINEAR FEET OF CURB WORK.ALL PAVING AND DRAINAGE TESTING IS THE OWNER'S RESPONSIBILITY AND COST. COPIES OF ALL TEST RESULTS SHALL BE FURNISHED TO THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FAILURE EXPENSES AND RE-TESTING (SEE SPECIFICATIONS SECTION 01 45 00 QUALITY CONTROL, PART 1.3.A.2 AND PART 1.3.B).
7. PROOF ROLLING -- ALL SUB-GRADE AND EACH LIFT OF BASE MATERIAL SHALL BE PROOF-ROLLED TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EQUIPMENT AND OPERATORS FOR PROOF-ROLLING. SOFT AND YIELDING AREAS DISCOVERED SHALL BE CORRECTED BY THE CONTRACTOR PRIOR TO PRIME COAT AND SURFACE TREATMENT APPLICATIONS.
8. FINISH GRADING OF SUBGRADE AND BASE FOR THE CURBS SHALL BE THE CONTRACTOR'S RESPONSIBILITY. SOILS REPORT BORINGS MAY BE AVAILABLE UPON REQUEST FOR INFORMATION ONLY.
9. SURFACE STRUCTURES SUCH AS WATER VALVES, MANHOLES, ALL FENCES, DRIVEWAYS, SIDEWALKS, LANDSCAPING, POWER POLES, ETC. ARE SHOWN ON THE PLANS AS VISIBLE AT THE TIME OF THE SURVEY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SAFEGUARD AND MAINTAIN ANY AND ALL SURFACE STRUCTURES DURING THE COURSE OF WORK AND TO REPLACE OR REPAIR THOSE ITEMS WHICH ARE DAMAGED BY THE CONTRACTOR WITH LIKE OR BETTER QUALITY.
10. EXISTING UNDERGROUND FACILITIES ARE SHOWN AS REFLECTED IN VISIBLE SURFACE FEATURES AND RECORDS OF THE VARIOUS UTILITY COMPANIES. THE CONTRACTOR SHALL VERIFY THE LOCATION AND GRADE OF THE UTILITIES WELL AHEAD OF EXCAVATION OPERATION AND SHALL BE RESPONSIBLE FOR THE PROTECTION OF SAME DURING THE COURSE OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESEARCHING EXISTING UTILITIES LOCATION NOT SHOWN ON THE PLANS AND SHALL BE RESPONSIBLE FOR REPLACING ANY DAMAGED UTILITY LINES INCLUDING IRRIGATION LINES, SPRINKLER SYSTEMS, AND ALL OTHER UNDERGROUND UTILITIES.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING A TRAFFIC CONTROL PLAN TO THE CITY TRAFFIC DIVISION. THE TCP SHALL BE IN ACCORDANCE WITH THE TMUTCD AND SHALL BE SUBMITTED AT LEAST 2 WEEKS BEFORE CONSTRUCTION.
12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL SIGNS AND BARRICADES ARE PROPERLY INSTALLED AND MAINTAINED. THE CONTRACTOR SHALL ESTABLISH A CITY-ACCEPTABLE WORK PLAN WHICH ACCOMMODATES TRAFFIC MOVEMENT DURING CONSTRUCTION. IF IN THE OPINION OF THE ENGINEER, THE SIGNS AND BARRICADES DO NOT CONFORM TO ESTABLISHED STANDARDS OR ARE INCORRECTLY PLACED OR ARE INSUFFICIENT TO PROTECT THE GENERAL PUBLIC, THE ENGINEER SHALL HAVE THE OPTION TO STOP THE OPERATIONS UNTIL SUCH TIME AS CONDITIONS ARE CORRECTED.
13. CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION TO DETERMINE THE LOCATION OF EXISTING UTILITIES. CONTACT:
DIG-TESS 1-800-344-8377
EL PASO ELECTRIC CO. (915) 543-2278
SOUTHWESTERN BELL (915) 595-5305
TIME WARNER CABLE (915) 775-7426
EL PASO WATER UTILITIES / PSB (915) 594-5652
TEXAS GAS CO. (915) 680-7329
14. CONTRACTOR SHALL BE RESPONSIBLE FOR SAW CUTTING EXISTING ASPHALT AND CONCRETE CURBS AND REPLACING IN KIND WHEN GRADING.
15. ANY UNDERGROUND ACTIVE INFRASTRUCTURE DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR PAID BY THE CONTRACTOR.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR BUILDING ALL RAMPS IN ACCORDANCE WITH APPLICABLE AMERICAN WITH DISABILITIES ACT (ADA) & TEXAS ACCESSIBILITY STANDARDS (TAS) REGULATION AND REQUIREMENTS.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR BUILDING ALL SIDEWALKS IN ACCORDANCE WITH APPLICABLE AMERICAN WITH DISABILITIES ACT (ADA) & TEXAS ACCESSIBILITY STANDARDS (TAS) REGULATION AND REQUIREMENTS.
18. CONTRACTOR SHALL COMPLY WITH SECTION 13.08.170, "EXCESSIVE PAVING CUTS" AS PER EL PASO MUNICIPAL CODE (THE CITY ENGINEER SHALL DIRECT THAT THE STREET BE REPAVED BY THE DEVELOPER OR THE OWNER OF THE SUBDIVISION, IN GENERAL, ACTIONS WHICH RESULT IN SIX PAVING CUTS WITHIN A DISTANCE OF FIVE HUNDRED FEET OR LESS, SHALL BE CONSIDERED IN EXCESS.)
19. THE CONTRACTOR SHALL PROVIDE A CONSTRUCTION STAGING AND TRAFFIC ACCESS FOR EMERGENCY AND MAINTENANCE VEHICLES DURING CONSTRUCTION.
20. THE EXISTING POND IN THE SOUTHWEST CORNER OF THE PROPERTY (SHOWN ON SHEET C-1) IN THE NEW PARKING LOT AREA HAS BEEN SUBSTANTIALLY BACKFILLED BY THE OWNER RESULTING ON LESS FILL THAN SHOWN ON PLANS. CONTRACTOR MUST TAKE THIS INTO CONSIDERATION FOR THIS PHASE BID QUANTITIES AND COST. CONTRACTOR HAS TO VERIFY POND GROUND ELEVATIONS AND PROVIDE BID QUANTITIES CALCULATIONS TO THE ARCHITECT FOR REVIEW.
21. ALL SALVAGED ITEMS BY CONTRACTOR AS INDICATED ON THE CONTRACT DOCUMENTS SHALL REMAIN THE PROPERTY OF EL PASO COUNTY. CONTRACTOR SHALL INFORM THE COUNTY OF EL PASO OF PLACE AND TIME FOR EL PASO COUNTY PERSONNEL TO PICK UP.

SHEET C-12-A

04/29/2010

2" HOT-MIX ASPHALTIC CONCRETE
SURFACE COURSE (HMAC) Tx DOT ITEM
340, TYPE C, GRADE 3, AS PER ASTM D-1557

STANDARD CURB
AND GUTTER

VARIES SEE PLANS

12" SELECT FILL
AS SPECIFIED UNDER EARTHWORK
SECTION AND AS APPROVED BY THE
ENGINEER WITH 95% COMPACTION
AS PER ASTM D-1557

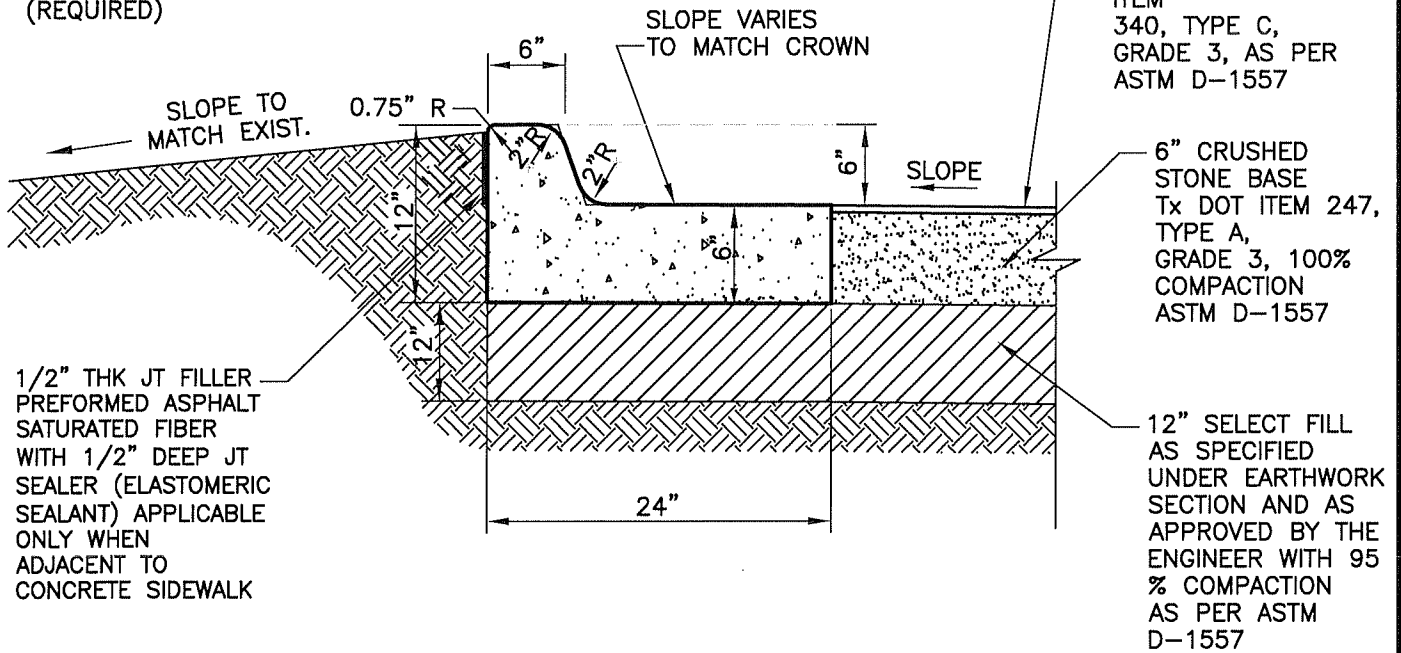
6" CRUSHED STONE BASE
Tx DOT ITEM 247, TYPE A,
GRADE 3, 100% COMPACTION
ASTM D-1557

**ASPHALT PAVEMENT PARKING LOT
AND ACCESS ROAD**

N.T.S.

A

MAX. SLOPE 3:1
 MIN. SLOPE 1/4"/FT (TYPICAL)
 ALLEY AND DRIVEWAY 8:1 (UP ONLY)
 (REQUIRED)



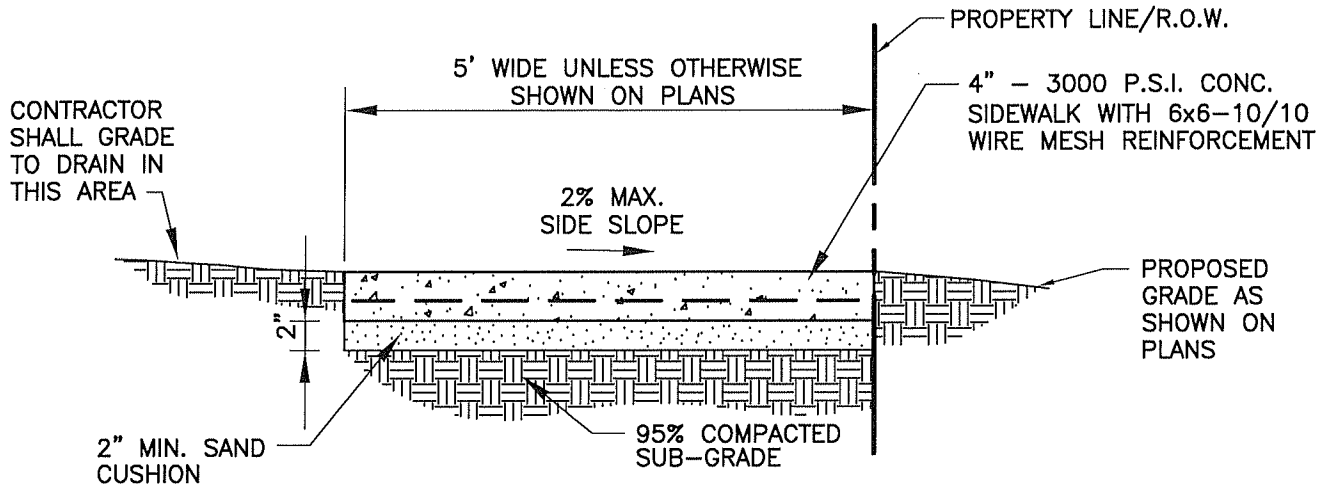
C

CURB & GUTTER

N.T.S.

CURB & GUTTER NOTES:

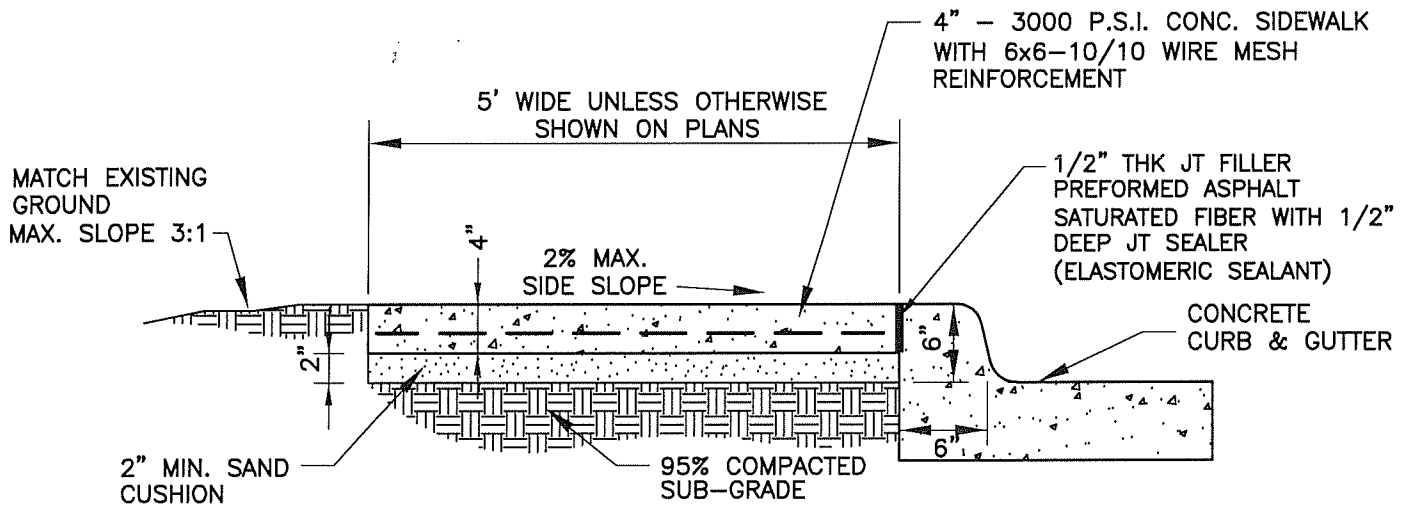
1. CONCRETE SHALL BE 3000 P.S.I. MIN.
2. DUMMY JOINT REQUIRED AT 10' O.C. FOR CURB & GUTTER AND 5' O.C. FOR SIDEWALK.
3. EXPANSION MATERIAL AND SEALANT REQUIRED AT CURB RETURNS WITH 1/2" PREMOLDED ASPHALT IMPREGNATED EXPANSION MATERIAL OR EQUAL.
4. EXPANSION JOINTS AND SEALANT REQUIRED AT 50' O.C. WHEN FORMING FOR CURBS.



D

TYPICAL CONCRETE SIDEWALK

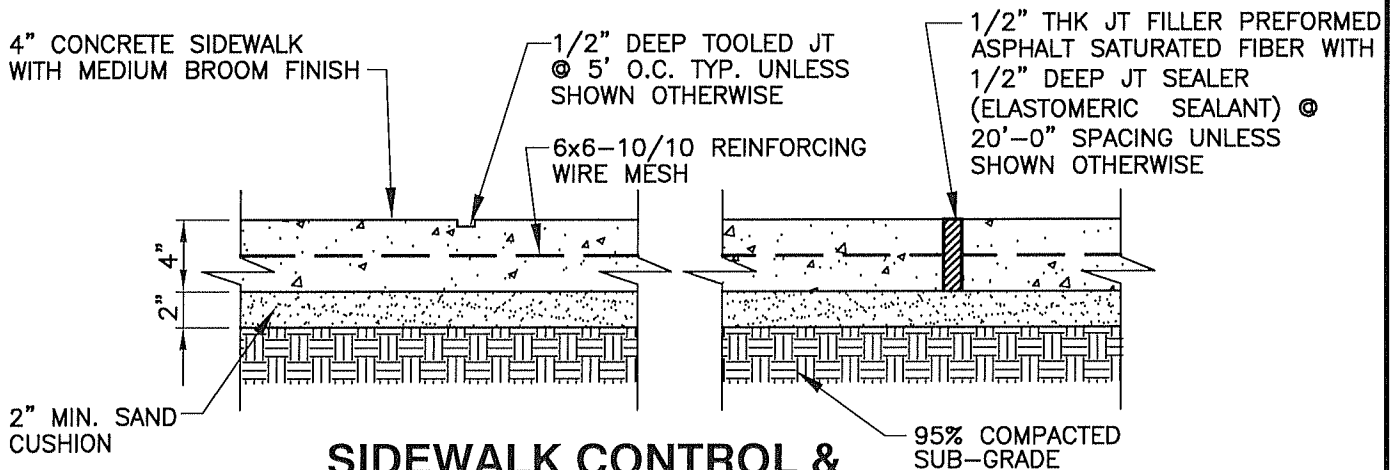
N.T.S.



D

CONCRETE SIDEWALK ALONG THE CURB

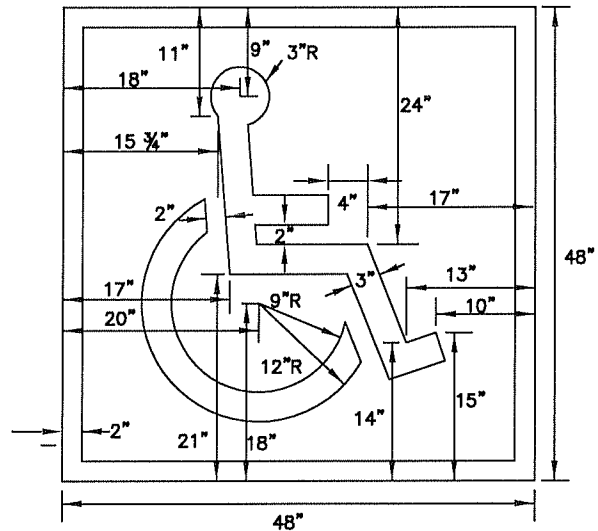
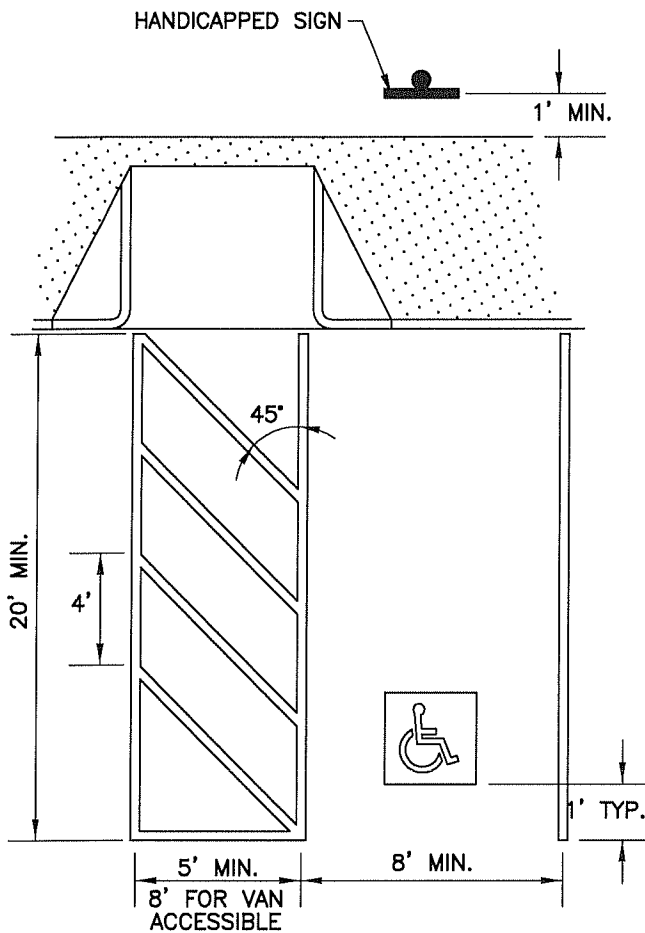
N.T.S.



D

SIDEWALK CONTROL & EXPANSION JOINT DETAIL

N.T.S.



INTERNATIONAL HC
SYMBOL — PAINTED
(PAINT SYMBOL BELOW ONTO
PAVED SURFACE WITH 2
COATS OF WHITE TRAFFIC
PAINT MANUFACTURED PER
Tx DOT SPECIFICATIONS)

SYMBOL & BORDER: WHITE
BACKGROUND: BLUE

PAVEMENT MARKING SYMBOL

N.T.S.

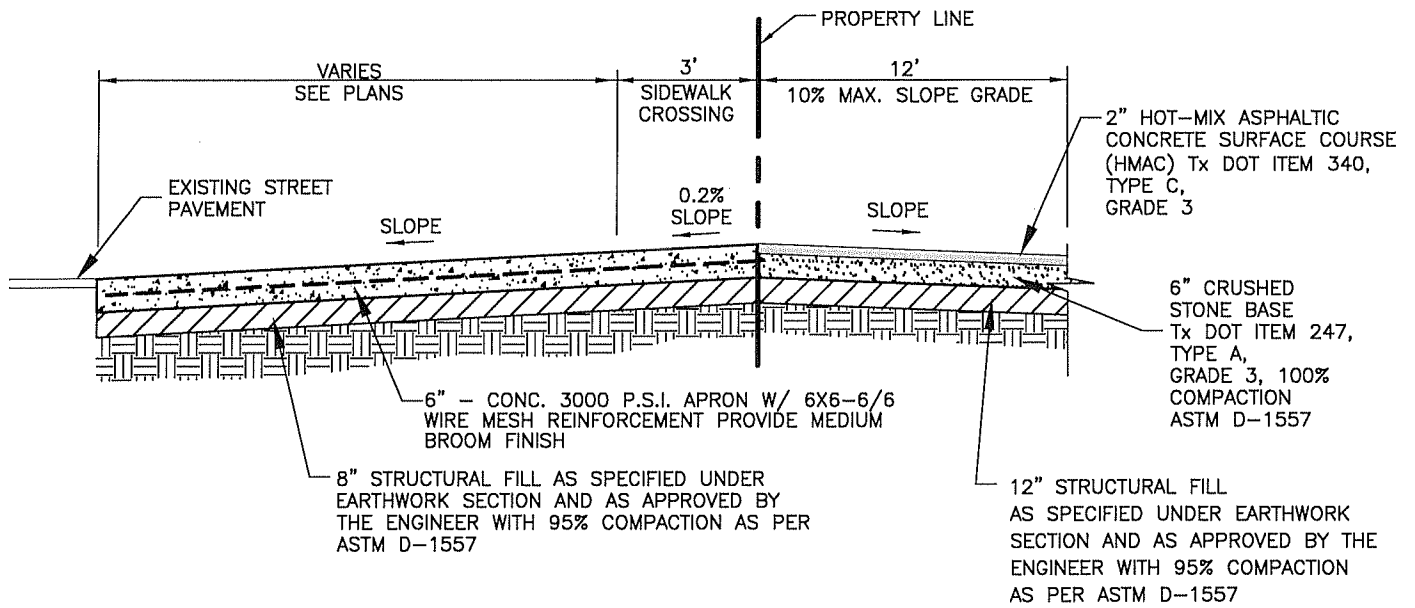
GENERAL NOTES:

- All parking space limit lines shall be 4" solid white lines.
- Aisle markings shown are examples only. Other methods to indicate a NO PARKING area are acceptable. Aisle markings shall be white.
- Dimensions of limit lines, aisle markings, and symbol (with or without background) may vary + 10%.
- Pavement marking symbols (with background):
 - are REQUIRED unless stated elsewhere in the plans,
 - should be placed toward the far end of the parking spaces so as to be visible to motorists in the travel lane,
 - may be painted or prefabricated material, and
 - shall be 48" x 48" minimum.
- With approval of the Engineer, prefabricated pavement marking symbols with background of other dimensions exceeding the 48" x 48" minimum may be used. Alternative designs shall include a proportion sized symbol of accessibility, and shall conform to the illustrated colors for background, symbol and border.
- An R7-8 sign:
 - shall be REQUIRED for each accessible parking space,
 - shall NOT be placed between two accessible parking spaces,
 - shall NOT be placed in a location that restricts movement of wheelchairs within the adjacent sidewalk, and
 - shall have a minimum mounting height of 7 feet. If mounted to wall or located so as not to be near pedestrian traffic minimum mounting height may be 7 feet.
- Post mounted signs should be placed approximately 1 foot (or greater) behind the curb to prevent damage from vehicle overhang.
- Signs may be mounted directly to an adjacent wall of a building when post mounting is impractical.
- Parking and crosswalk lanes shall be painted color contrast surface with 2 coats of white traffic paint manufactured per specifications.

E

PAVEMENT MARKINGS

N.T.S.



SECTION "T"

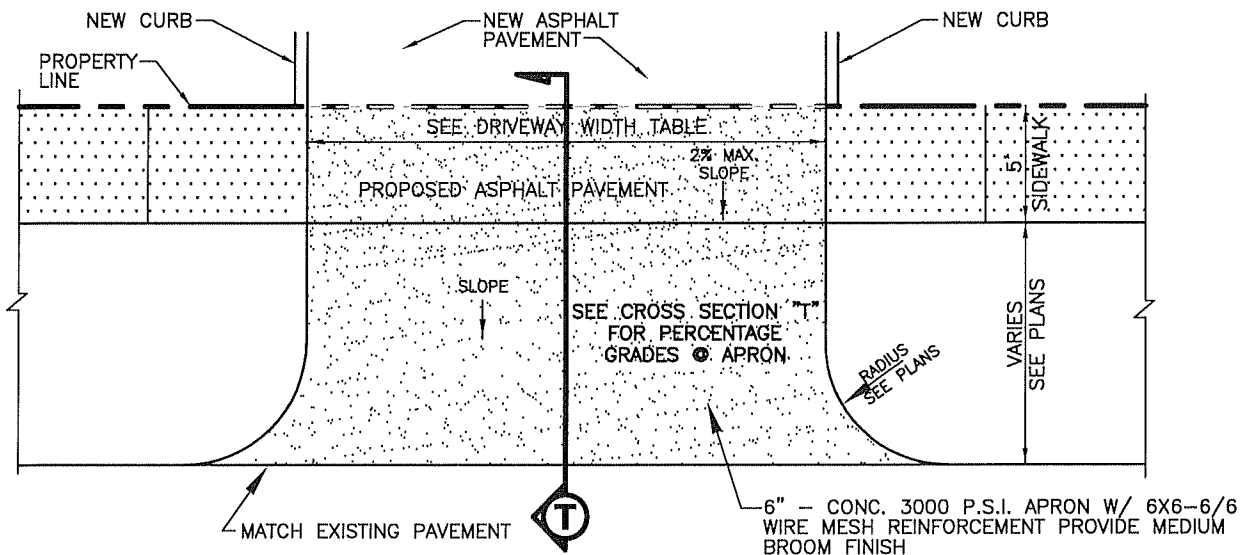
N.T.S.

DRIVEWAY NOTES:

CONTRACTOR SHALL BE RESPONSIBLE FOR SAW CUTTING EXISTING ASPHALT AND CONCRETE DRIVEWAYS AND REPLACING IN KIND WHEN GRADING.

IF CONCRETE DRIVEWAY IS TO BE REPLACED A 6" CONCRETE WITH W.W.F. WILL BE PROVIDED.

SIDEWALKS CROSS SLOPE MUST BE NO MORE THAN 2%



DRIVEWAY WIDTH TABLE		
	MIN.	MAX.
COMERCIAL/INDUSTRIAL	25'	35'

COMERCIAL/INDUSTRIAL
6" CONC. WITH 6x6-6/6

1/2" APPROVED EXPANSION JOINT MATERIAL
SIDEWALKS CROSS SLOPE MUST BE NO MORE THAN 2%

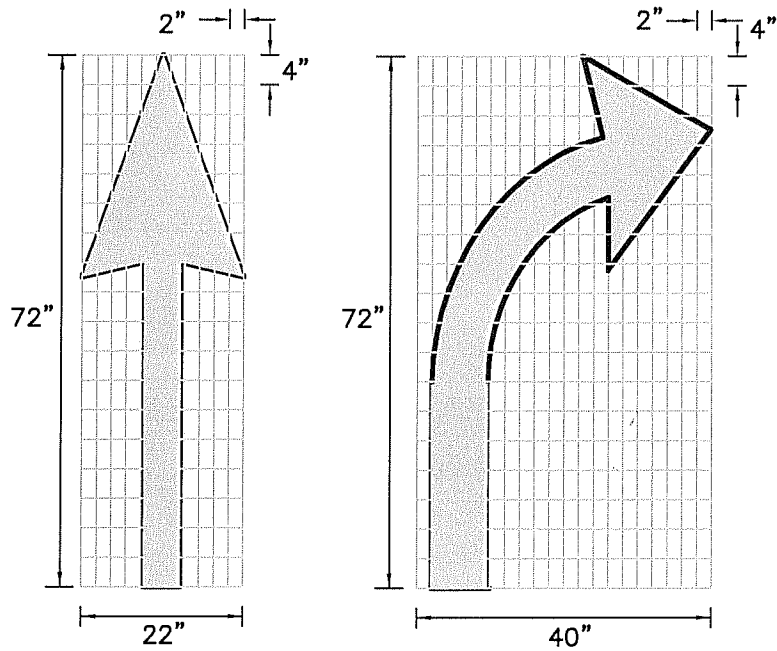
APRON NOTES:

CONTRACTOR SHALL BE RESPONSIBLE FOR SAW CUTTING EXISTING ASPHALT AND REPLACING IN KIND WHEN GRADING.

CONCRETE APRON DETAIL

F

N.T.S.



NOTES:

PAINT ARROW COLOR CONTRAST SURFACE WITH 2 COATS OF
 WHITE TRAFFIC PAINT MANUFACTURED PER TX.D.O.T. SPECIFICATIONS

G

ARROW PAVEMENT MARKINGS

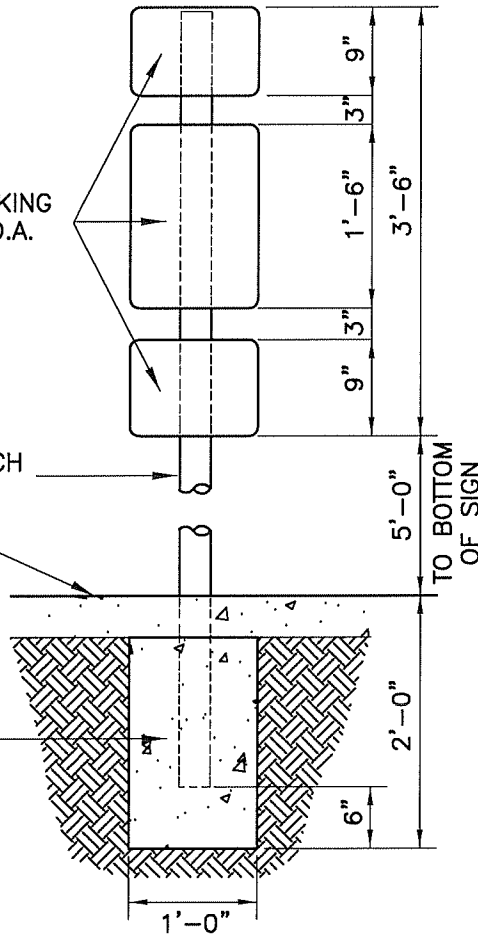
N.T.S.

HANDICAP PARKING SIGNS PER A.D.A. REQUIREMENTS

2 1/4" DIAMETER STEEL TUBE PAINT TO MATCH "ROOF GREEN"

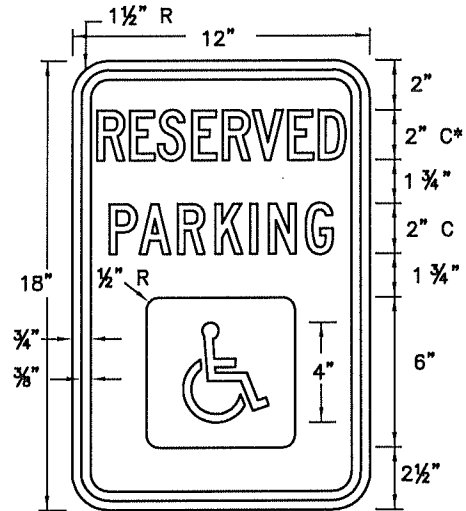
CONCRETE WALK

2500 P.S.I. CONCRETE FOOTING



H.C. ACCESSIBLE PARKING SIGN

N.T.S.

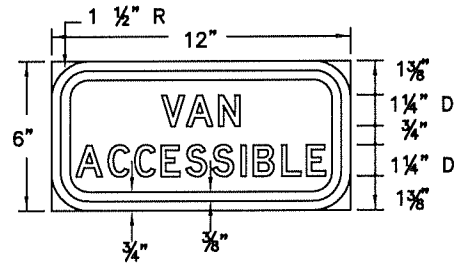


R7-8a

LEGEND AND BORDER: GREEN

WHITE SYMBOL ON BLUE BACKGROUND

BACKGROUND: WHITE



R7-8 plaque

LEGEND AND BORDER: GREEN
BACKGROUND: WHITE

GENERAL SIGN NOTES:

The Alphabets and lateral spacing between letters and numerals shall conform with the Texas "Manual on Uniform Traffic Control Devices for Streets and Highways", latest edition, and any approved changes thereto. Lateral spacing of text shall provide a balanced appearance. All materials shall conform to Department Specifications.

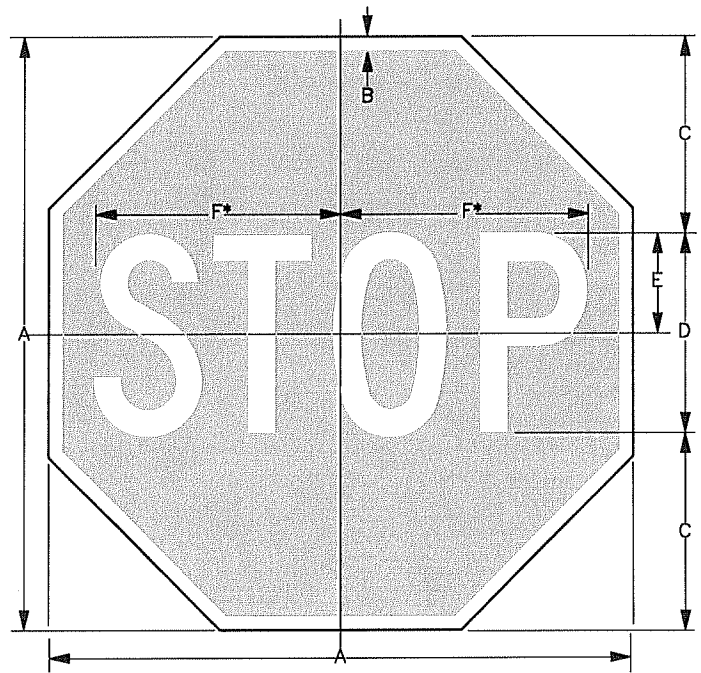
Legend shall be applied by screening process of black and/or transparent colored ink, cut-out black vinyl non-reflective decal sheeting and/or reflective sheeting or combination thereof. Background shall be white reflective sheeting (Type C).

Sign blanks shall be one piece 0.08 inch thick sheet aluminum alloy (Type A), unless otherwise noted elsewhere in the plans.



HANDICAPPED PARKING SIGN

N.T.S.



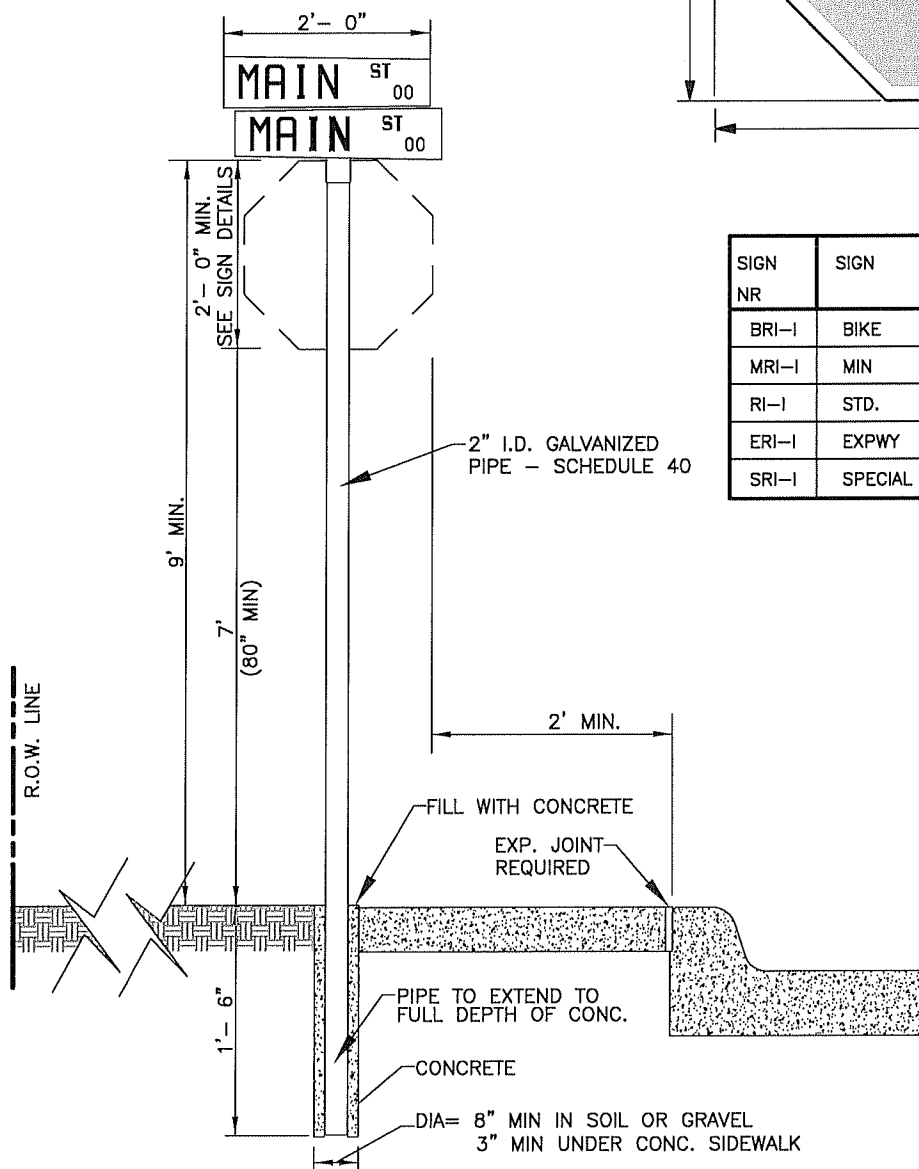
R1-1

* REDUCE SPACING 40%

SIGN NR	SIGN	DIMENSIONS INCHES					
		A	B	C	D	E	F
BRI-1	BIKE	18	3/8	6	6C	3	7-3/4
MRI-1	MIN	24	5/8	8	8C	4	10
RI-1	STD.	30	3/4	10	10C	5	12-1/2
ERI-1	EXPWY	36	7/8	12	12C	6	15
SRI-1	SPECIAL	48	1-1/4	16	16C	8	20

COLORS

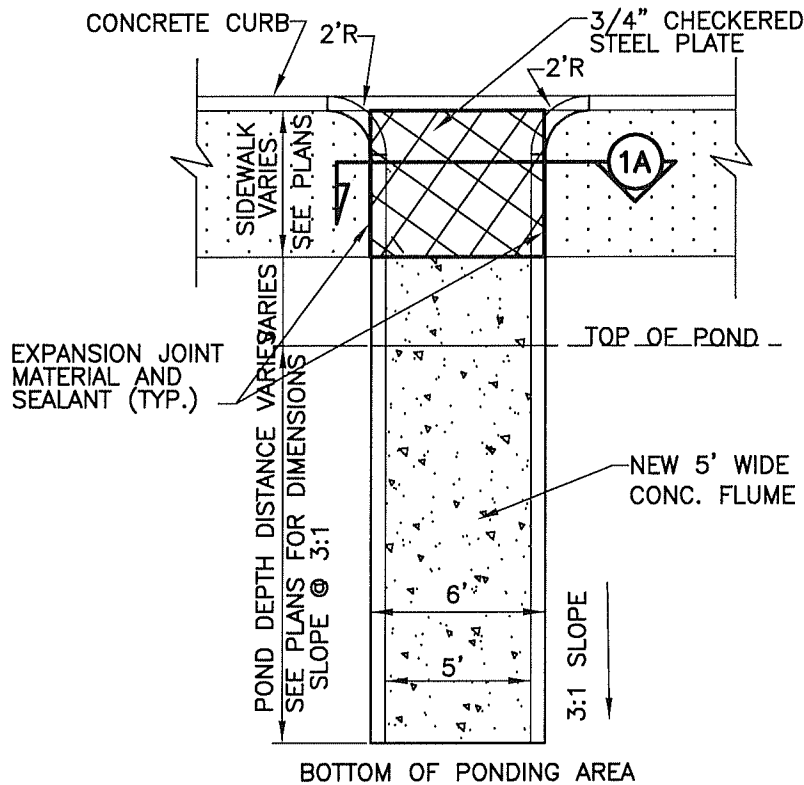
LEGEND -WHITE (REFL)
BACKGROUND -RED (REFL)



STOP SIGN & SIGN POST INSTALLATION

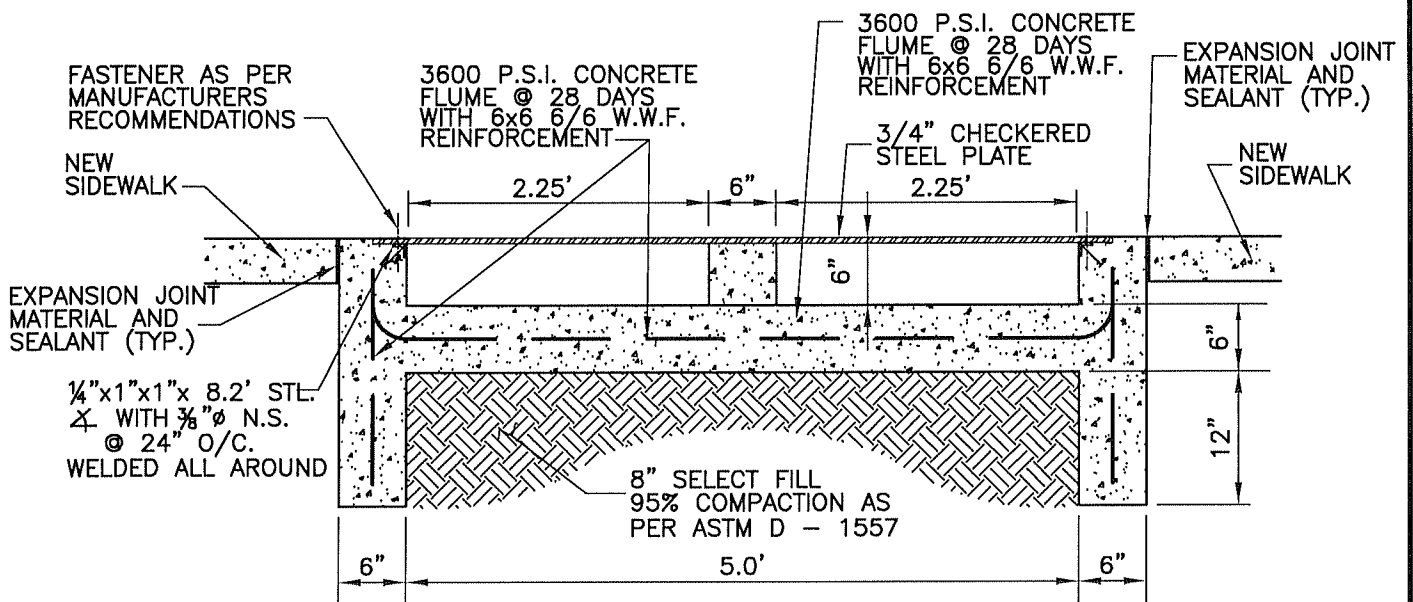


N.T.S.



PLAN VIEW

N.T.S.



SECTION "1A"

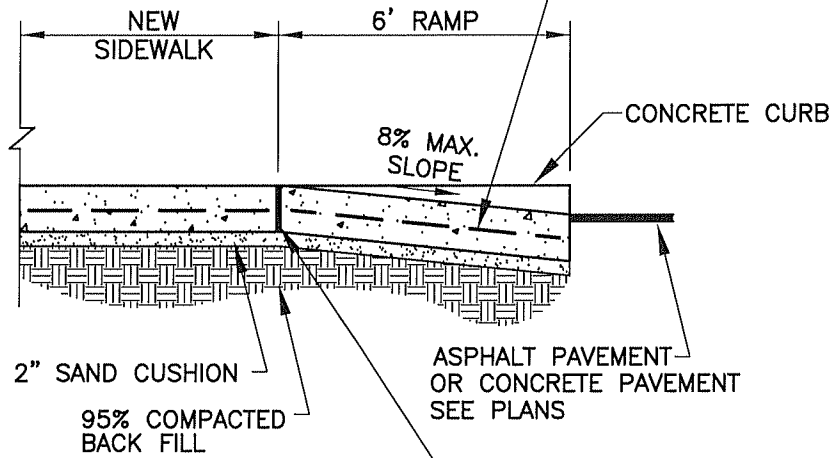
N.T.S.

CONCRETE FLUME WITH CHECKERED STEEL COVER DETAILS

K

N.T.S.

4" CONC. RAMP
WITH 6x6-6/6 WIRE MESH REINFORCEMENT



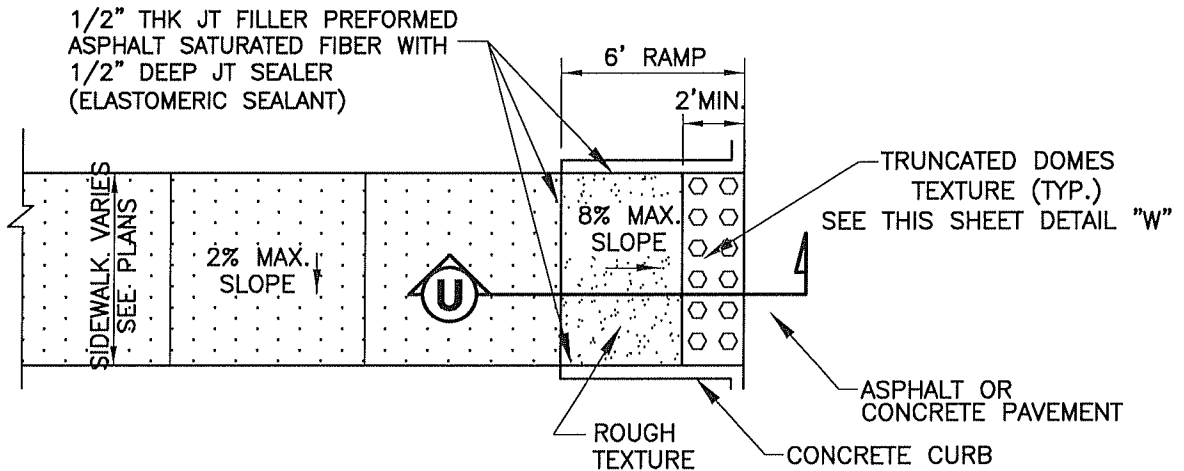
2" SAND CUSHION

95% COMPACTED
BACK FILL

1/2" THK JT FILLER PREFORMED
ASPHALT SATURATED FIBER WITH
1/2" DEEP JT SEALER
(ELASTOMERIC SEALANT)

SECTION "U"

N.T.S.

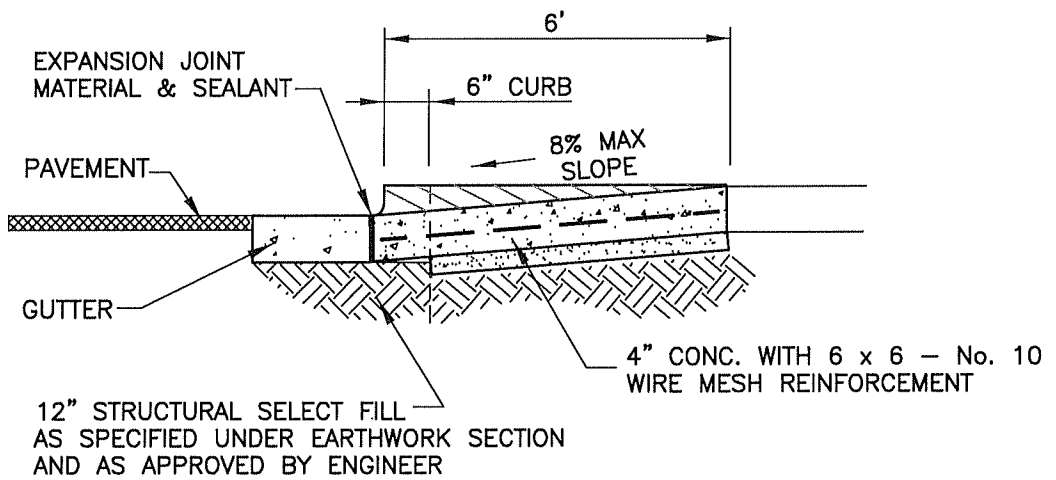


M

HANDICAPPED RAMP

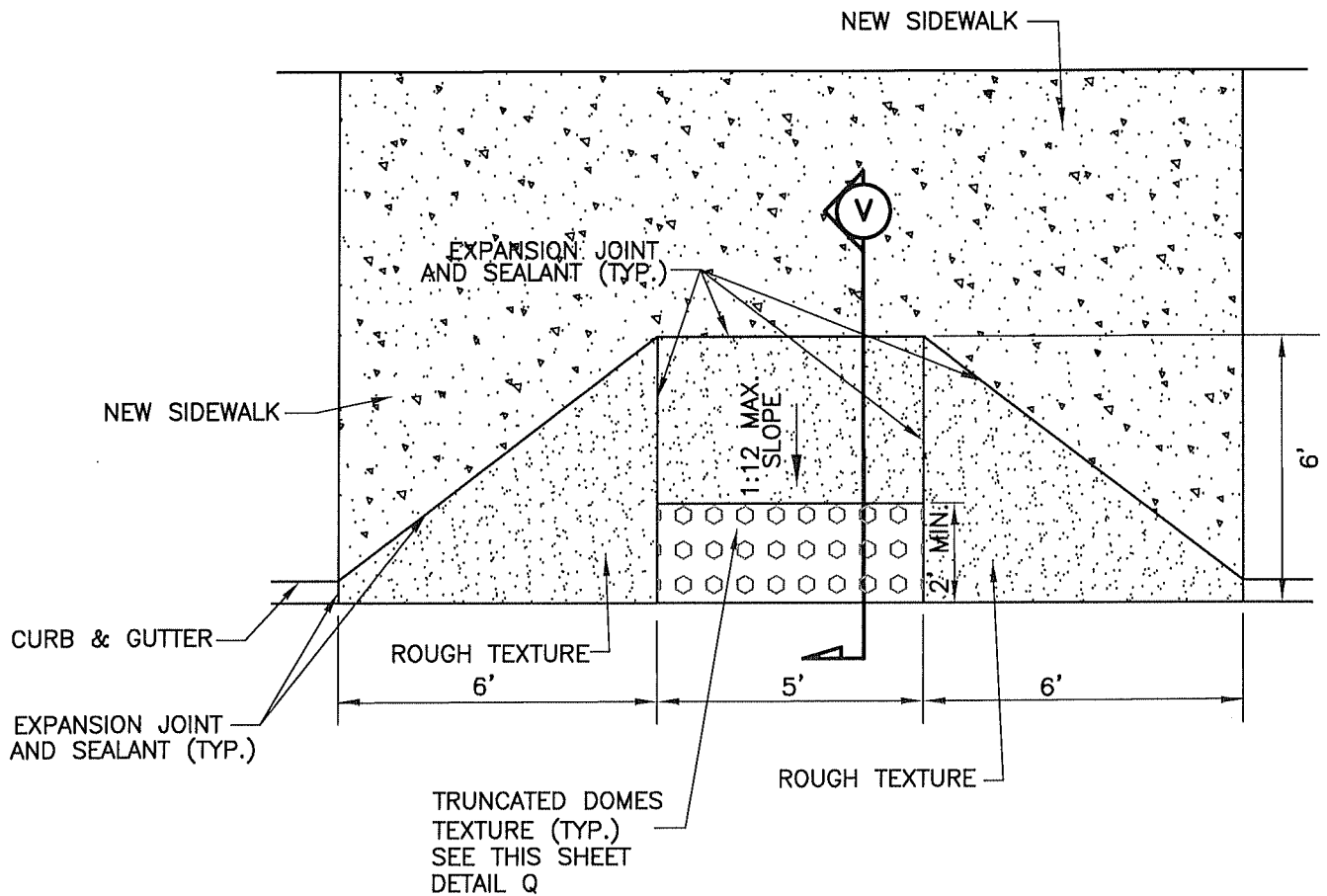
SEE DETAIL "Q" FOR TRUNCATED DOMES AND RAMP NOTES

N.T.S.



SECTION "V"

N.T.S.

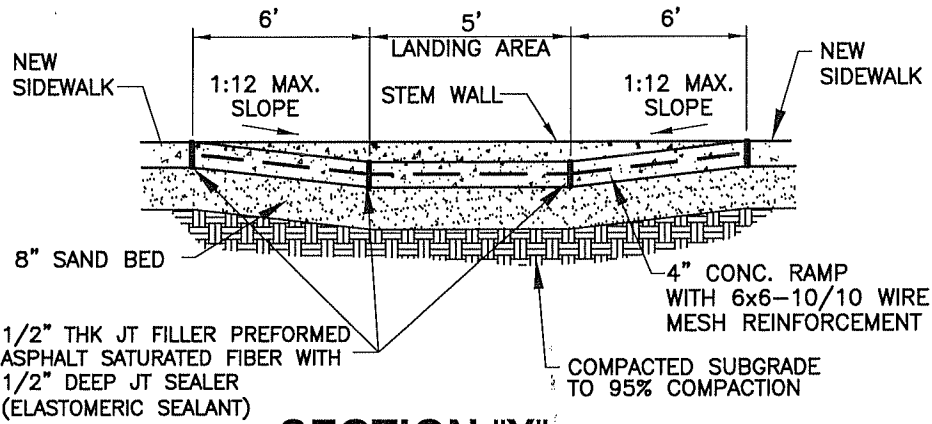


HANDICAPPED RAMP WITH WINGS



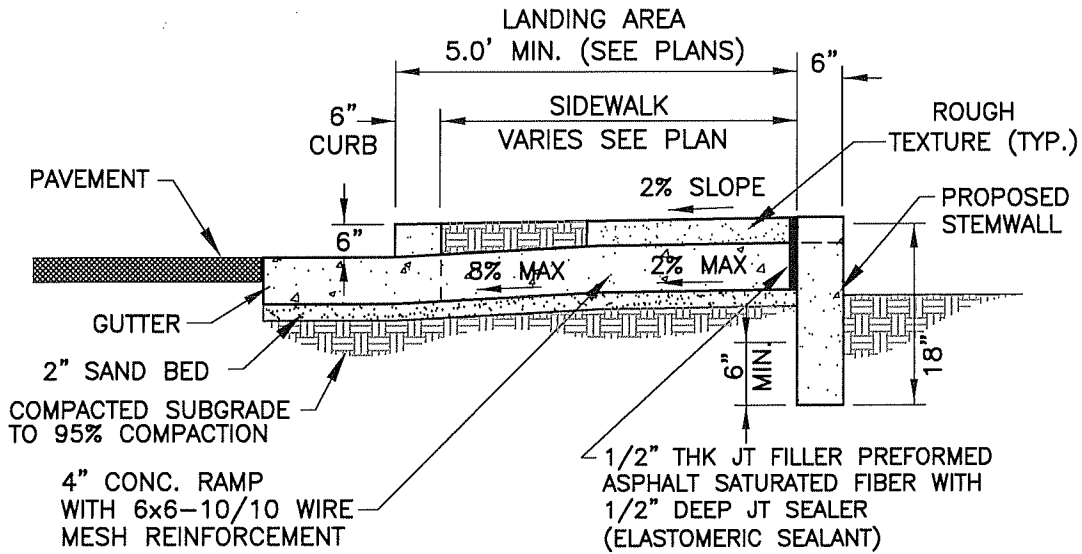
SEE DETAIL "Q" FOR TRUNCATED DOMES AND RAMP NOTES

N.T.S.



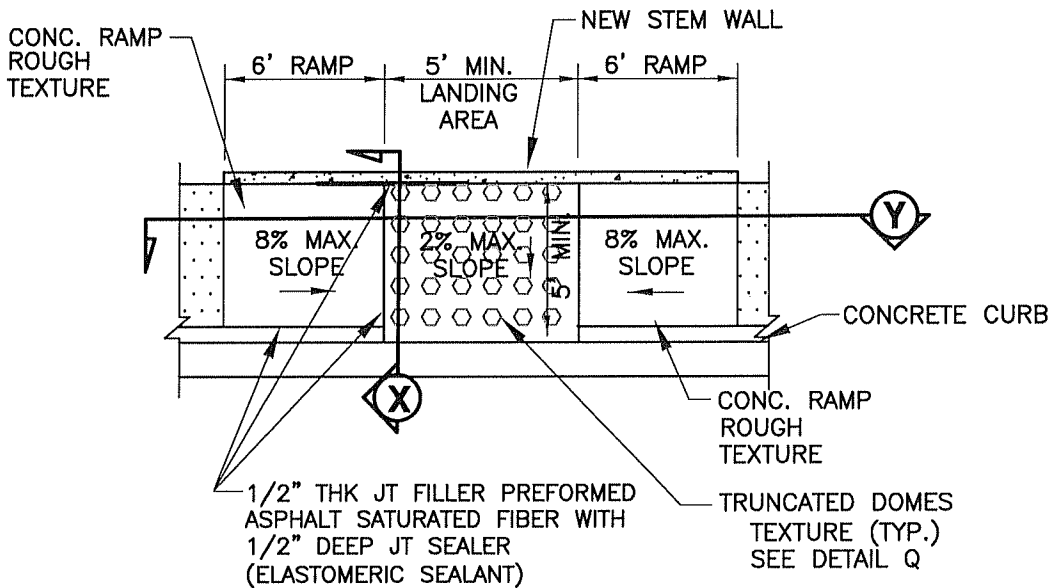
SECTION "Y"

N.T.S.



SECTION "X"

N.T.S.

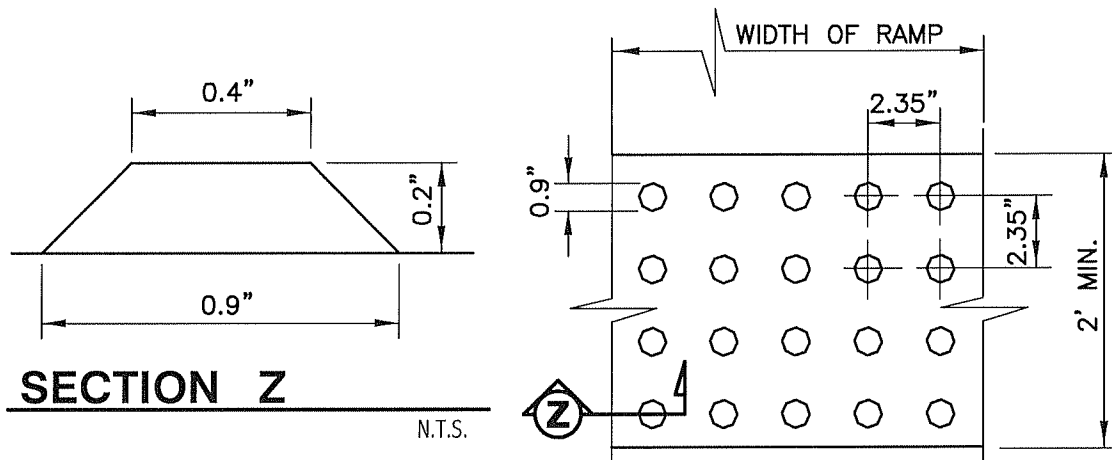


HANDICAPPED RAMP NEXT TO PARKING SPACES

P

SEE DETAIL "Q" FOR TRUNCATED DOMES AND RAMP NOTES

N.T.S.



NOTES:

DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES.

MATERIAL AS APPROVED BY THE CITY OF EL PASO ENGINEERING DEPARTMENT.



TRUNCATED DOMES

N.T.S.

RAMP NOTES:

PROVIDE RAMPS AS SHOWN, WHERE NOTED ON THE PLANS.

RAMP RUN SLOPE WILL NOT EXCEED 1:12 OR 1 in. IN 1 ft.

RAMP SURFACE SHALL BE OF ROUGH TEXTURE:

Texture shall consist of exposed crushed stone aggregate, roughened concrete, rubber, raised abrasive strips, or grooves extending the full width and depth of the curb ramp. Surfaces that are raised, etched, or grooved in a way that would allow water to accumulate are prohibited.

SIDE SLOPES WILL NOT EXCEED 1:50 OR 2% (MAX.).

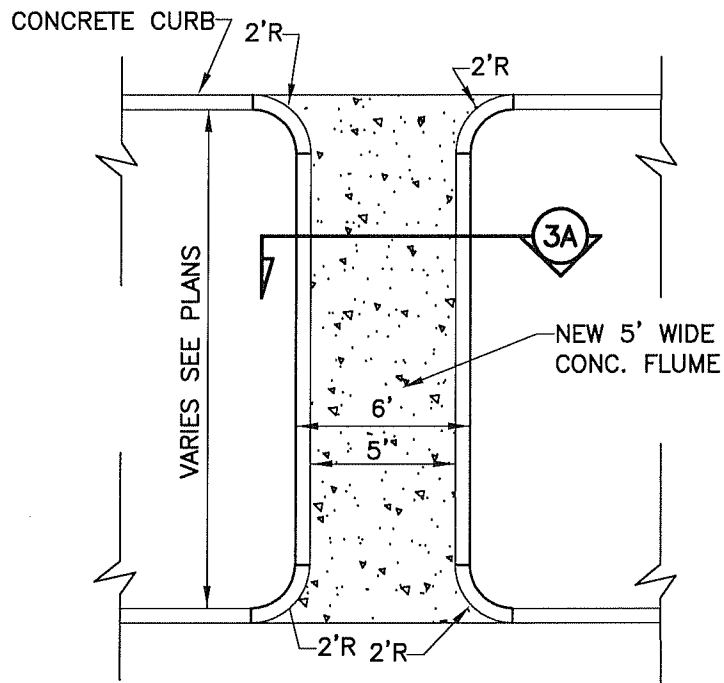
PAINT CURB RAMP COLOR CONTRAST SURFACE WITH CONCRETE INTEGRATED PIGMENT COLOR (RED).

TRANSITIONS FROM RAMPS TO WALKS, GUTTERS, OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.

ADJOINING SLOPE SHALL NOT EXCEED 1:20 OR 5%.

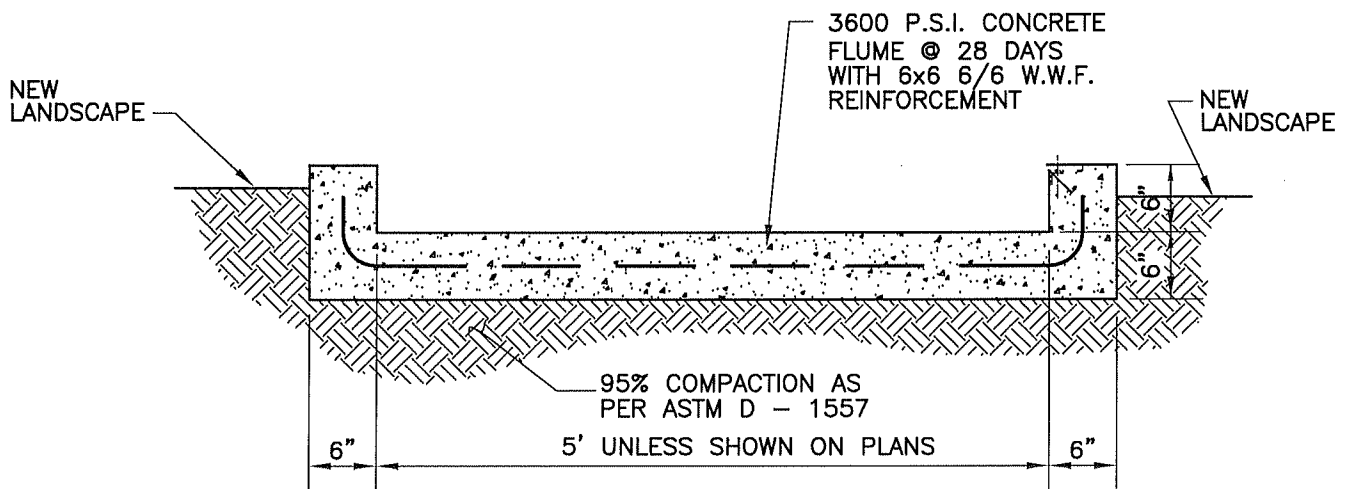
PROTRUDING OBJECTS SHALL NOT REDUCE THE CLEAR WIDTH (36") OF AN ACCESSIBLE ROUTE OR MANEUVERING SPACE.

MAXIMUM SLOPES OF ADJOINING GUTTERS, ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP, OR ACCESSIBLE ROUTE SHALL NOT EXCEED 1:20 OR 5%.



PLAN VIEW

N.T.S.



SECTION "3A"

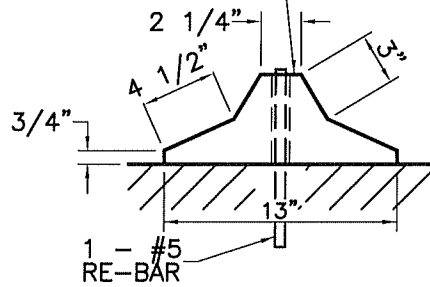
N.T.S.

CONCRETE FLUME DETAILS

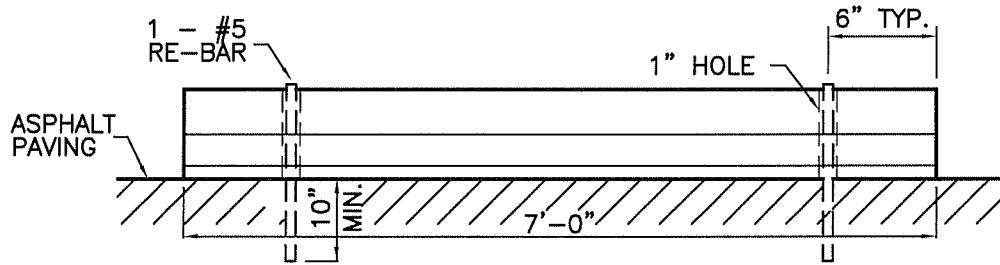
R

N.T.S.

WHEEL STOP, TO BE EQUAL
OR AS APPROVED BY THE
ENGINEER



SIDE VIEW



FRONT VIEW

S

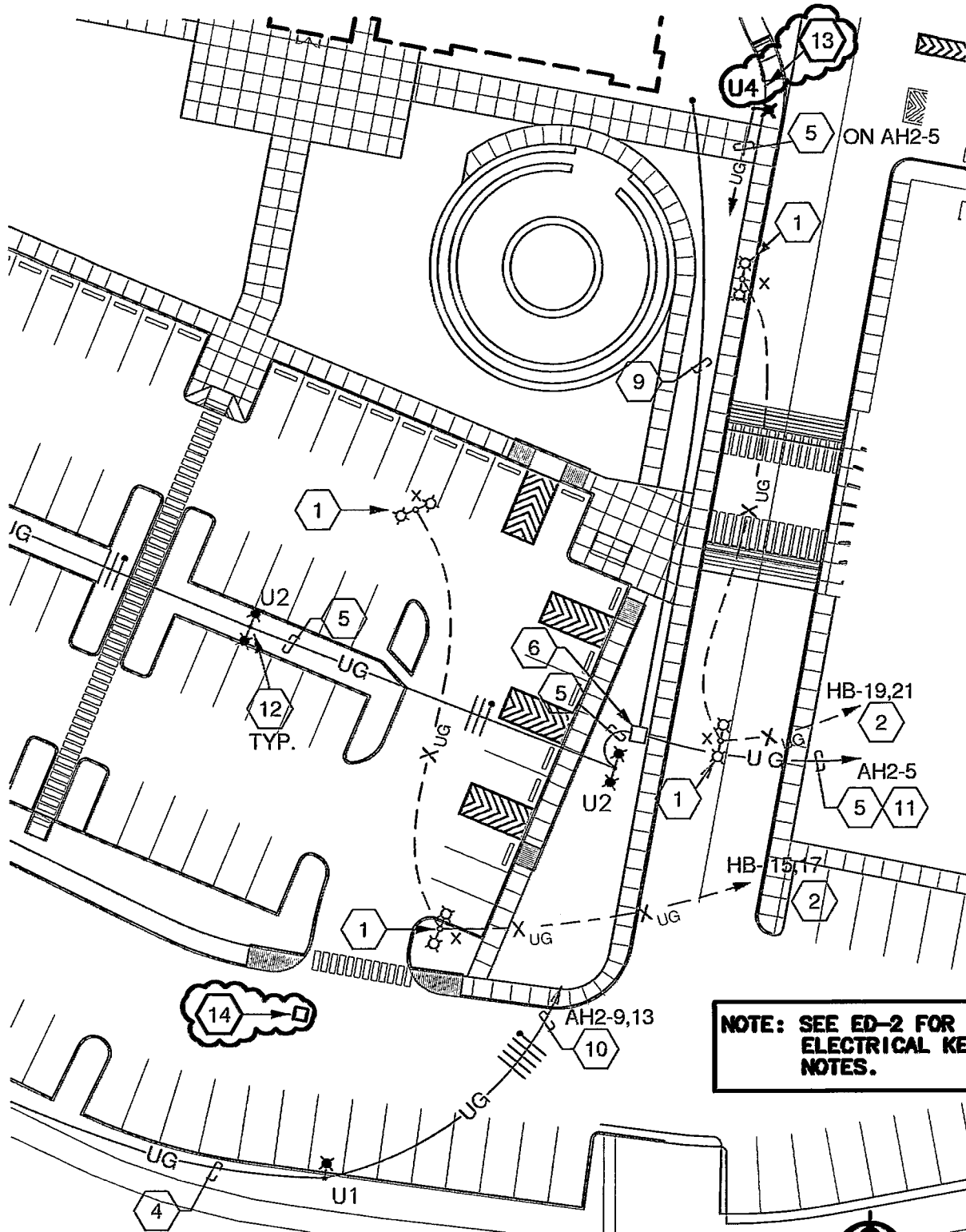
TYP. PRE-CAST WHEEL STOP

N.T.S.

FINAL ESTIMATE

BID # 10-024, CONSTRUCTION IMPROVEMTS FOR THE JUVENILE JUSTICE CENTER

	Item	Unit	Quantity
1	Pavement Removal	S.Y.	6444
2	Concrete Sidewalk Removal	S.Y.	721
3	Concrete Curb & Gutter Removal	L.F.	2647
4	Concrete Driveways Removal	S.Y.	706
5	Rock Rip- Rap Removal	S.Y.	21
6	Concrete Flume Removal	S.Y.	132
7	Handrail Removal	L.F.	59
8	Signs Removal & Relocate	EA	3
9	Retaining Wall w/Chain link Fence Removal	L.F.	159
10	Pipe bollard Removal	EA	4
11	Sawcut Concrete (Exist Sidewalk & Driveway)	L.F.	383
12	Building Unit Removal	EA	2
13	Brickwall Removal	L.F.	18
14	Pine Tree Removal & Replant	EA	22
15	Concrete Rip-Rap Removal	S.Y.	237
16	Gate Removal	EA	1
17	Storm Sewer Pipe (24" Dia) (RCP) (CL III) (any depth)	L.F.	649
18	Trench Safety System (5' to 10')	L.F.	475
19	Drainage inlet (TY I) (2 Grates)	EA	2
20	J. Box w/Inlet (TY II) (2 Grates)	EA	1
21	Street & P.Lot Excavation	S.Y.	15598
22	Structural Fill (12")	S.Y.	15598
23	Concrete Curb & Gutter	L.F.	8035
24	New Chain Link Sec. Fence (w/gates)	L.F.	24
25	New Chain Link Sec. Fence (w/ sliding gate)	L.F.	80
26	Crush Stone Base (6" thick)	S.Y.	15598
27	Prime Coat	S.Y.	14458
28	Hot Mix Asphalt Tic Concrete Paving	S.Y.	14458
29	Concrete Driveways	S.Y.	174
30	Concrete Sidewalks	S.Y.	1768
31	Concrete Wheelchair Curb Ramps	EA	15
32	Concrete Wheel Stop	EA	9
33	Concrete Stemwall w/handrails	L.F.	29
34	Concrete Flume	S.Y.	6
35	Conc. Flume w/steel Plate s/walk crossing	EA	2
36	Traffic & H/C Sign	EA	13
37	Paving Markings	L.F.	6342
38	Traffic Control (including T.C. Plan)	LSUM	
39	Temporary Erosion Control (Sw3P)	LSUM	



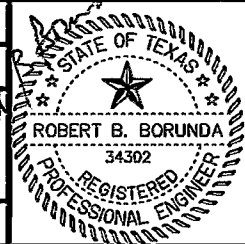
NOTE: SEE ED-2 FOR ELECTRICAL KEYED NOTES.

PARTIAL ELECTRICAL SITE PLAN

1' = 40'-0"



DRAWING TITLE: PARTIAL ELECTRICAL SITE PLAN		
PROJECT: EL PASO COUNTY JUVENILE JC ADDITION		
<input type="checkbox"/> SUPPLEMENTARY DRAWING NO. _____	_____	
<input type="checkbox"/> CHANGE ORDER NO. _____	ITEM _____	_____
<input checked="" type="checkbox"/> SHEET ED-1	REF. SHEET. E1.01	_____
SHEET 1 OF 4	DATE: 05-03-10	JOB NO. 28031



The seal appearing on this document was authorized by Robert B. Borunda, P.E. 34302, on 5/4, 2010

BORUNDA & ASSOCIATES, INC.
CONSULTING ENGINEERS
 6801 COMMERCE AVE. UNIT A3
 EL PASO, TEXAS 79915-1026
 P.O. BOX 370085
 TBPE REG. No. F-372
 OFFICE: (915)781-1711 FAX: (915)781-1773

PROJECT GENERAL ELECTRICAL NOTES:

13 THE AT & T CONSULTANT FOR THIS PROJECT IS RICHARD MARTINEZ 595-5122.

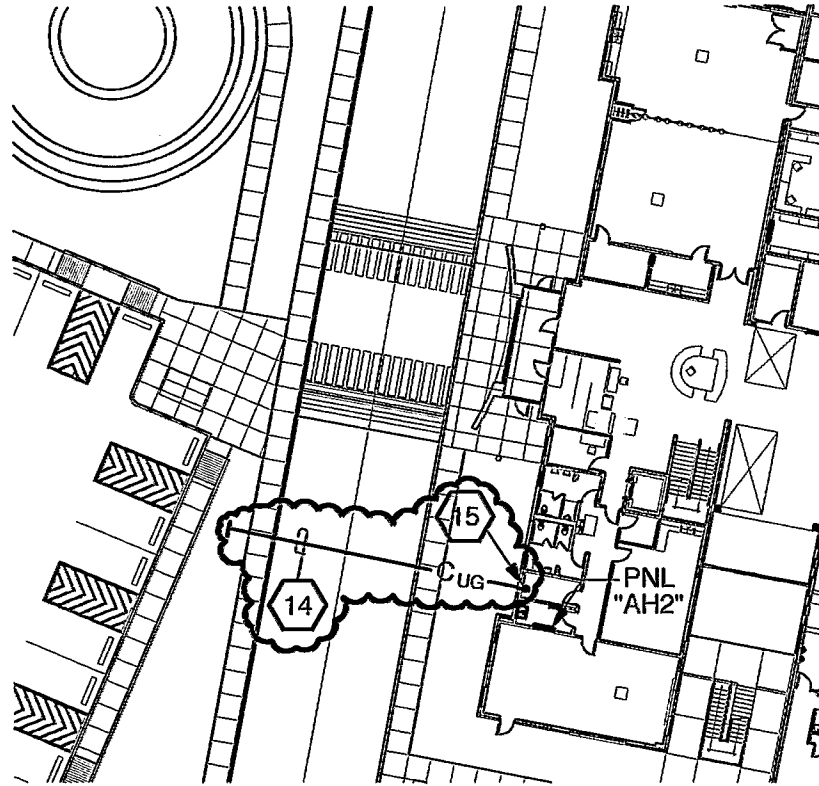
ELECTRICAL KEYED NOTES:

- 13 FIXTURE TYPE 'U4' IS SAME AS TYPE 'U2' EXCEPT WITH ONE LUMINAIRE ONLY. LUMINAIRE MUST FACE DRIVEWAY.
- 14 APPROXIMATE LOCATION OF EXISTING (ABANDONED) TELEPHONE/COMMUNICATIONS PEDESTAL TO BE REMOVED. COORDINATE REMOVAL WITH TELEPHONE UTILITY COMPANY.

DRAWING TITLE: ELECTRICAL KEYED NOTES - E1-01		
PROJECT: EL PASO COUNTY JUVENILE JC ADDITION		
<input type="checkbox"/> SUPPLEMENTARY DRAWING NO. _____		
<input type="checkbox"/> CHANGE ORDER NO. _____ ITEM _____		
<input checked="" type="checkbox"/> SHEET ED-2	REF. SHEET. E1.01	
SHEET <u>2</u> OF <u>4</u>	DATE: <u>05-03-10</u>	JOB. NO. <u>28031</u>

ROBERT B. BORUNDA
34302
REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS

The seal appearing on this document was authorized by Robert B. Borunda, P.E. 34302, on <u>5/4</u> , 20 <u>10</u> .
BORUNDA & ASSOCIATES, INC. CONSULTING ENGINEERS 6801 COMMERCE AVE. UNIT A3 EL PASO, TEXAS 79915-1026 P.O. BOX 370065 TBPE REG. No. F-372 OFFICE: (915)781-1711 FAX: (915)781-1773



PARTIAL ELECTRICAL SITE PLAN

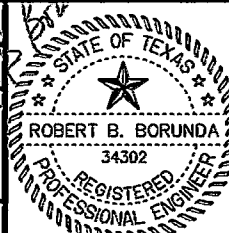



1' = 40'-0"



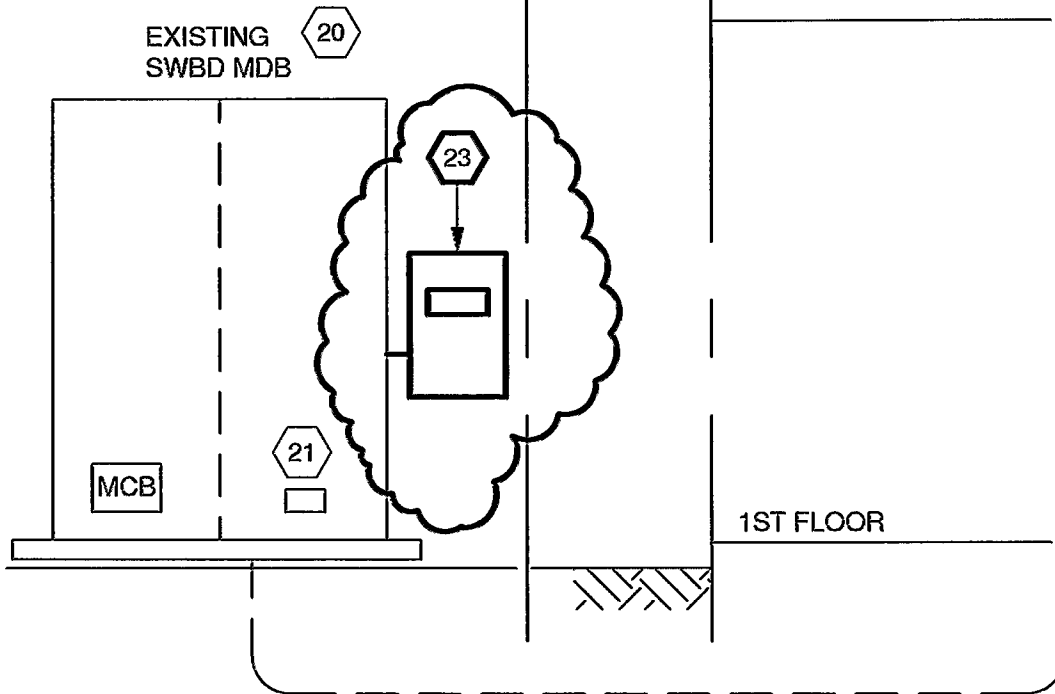
ELECTRICAL KEYED NOTES:

- 14 EXTEND TWO(2) 4" EMPTY COMMUNICATION CONDUITS FROM I.T. ROOM, UNDERGROUND TO 3'-0" BEYOND SIDEWALK. CAP CONDUITS.
- 15 TERMINATE CONDUIT 6" UP AGAINST ROOM WALL AND CAP.

DRAWING TITLE: PARTIAL ELECTRICAL SITE PLAN				The seal appearing on this document was authorized by Robert B. Borunda, P.E. 34302, on <u>5/4</u> , 2010.	
PROJECT: EL PASO COUNTY JUVENILE JC ADDITION				 BORUNDA & ASSOCIATES, INC. CONSULTING ENGINEERS 6801 COMMERCE AVE. UNIT A3 EL PASO, TEXAS 79915-1026 P.O. BOX 370065 TBPE REG. No. F-372 OFFICE: (915)781-1711 FAX: (915)781-1773	
<input type="checkbox"/> SUPPLEMENTARY DRAWING NO. _____	_____				
<input type="checkbox"/> CHANGE ORDER NO. _____	ITEM _____				
<input checked="" type="checkbox"/> SHEET ED-3	REF. SHEET. E1.02				
SHEET <u>3</u> OF <u>4</u>	DATE: <u>05-03-10</u>	JOB. NO. <u>28031</u>			

POST
ADJUDICATION
BUILDING

2ND FLOOR

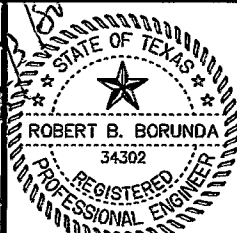



PARTIAL ELECTRICAL RISER DIAGRAM

NOT TO SCALE

ELECTRICAL KEYED NOTES:

- 23 PROVIDE A THREE PHASE, 277/480V, 800A KWH/DEMAND METER, E-MON #480800D KIT. METER SHALL BE CONNECTED TO MONITOR POWER FROM NEW PANEL "DP" FEEDER. METER WILL REQUIRE VOLTAGE CONNECTION WHICH CAN BE OBTAINED FROM A SPARE BREAKER WITHIN THE EXISTING SWITCHBOARD. MAKE ALL NECESSARY ELECTRICAL CONNECTIONS. METER SHALL BE INSTALLED AND OPERATING PRIOR TO USING POWER FOR PROJECT CONSTRUCTION PHASE.

DRAWING TITLE: PARTIAL ELECTRICAL RISER DIAGRAM				The seal appearing on this document was authorized by Robert B. Borunda, P.E. 34302, on <u>5/4</u> , 20 <u>10</u> .
PROJECT: EL PASO COUNTY JUVENILE JC ADDITION				
<input type="checkbox"/> SUPPLEMENTARY DRAWING NO. _____	_____	_____	 BORUNDA & ASSOCIATES, INC. CONSULTING ENGINEERS 6801 COMMERCE AVE. UNIT A3 EL PASO, TEXAS 79915-1026 P.O. BOX 370065 TBPE REG. No. F-372 OFFICE: (915)781-1711 FAX: (915)781-1773	
<input type="checkbox"/> CHANGE ORDER NO. _____ ITEM _____	_____	_____		
<input checked="" type="checkbox"/> SHEET <u>ED-4</u>	REF. SHEET. <u>E6.00</u>			
SHEET <u>4</u> OF <u>4</u>	DATE: <u>05-03-10</u>	JOB. NO. <u>28031</u>		