

ADDENDUM NUMBER ONE

Date: February 26, 2018

From: McAdams

Re: **UNC Charlotte CRI Entrance Improvements**
UNC Charlotte
CLT-17000

NOTICE TO BIDDERS:

Bidder is hereby notified that this Addendum shall become a part of the Contract Documents, and shall be attached to the Project Manual for the Project.

The following items are intended to revise and clarify the Drawings and the Project Manual.

The bidder shall ensure that his Sub-Bidders are in full receipt of the information contained herein.

ADDENDA ITEMS:

- | | |
|----------------------------|-----------|
| A. PRE-BID MEETING MINUTES | (1) ITEM |
| B. HUB FORMS | (1) ITEM |
| C. PROJECT MANUAL | (4) ITEMS |
| 1. Notice to Bidders | |
| 2. Contents | |
| 3. Seals | |
| 4. Specifications | |
| D. DRAWINGS | (5) ITEMS |
| 1. Sheet HD-1 | |
| 2. Sheet HD-2 | |
| 3. Sheet A-1 | |
| 4. Sheet A-2 | |
| 5. Sheet A-3 | |

END OF TITLE PAGE

**The John R. McAdams
Company, Inc.**

Raleigh / Durham, NC
2905 Meridian Parkway
Durham, North Carolina 27713
(919) 361-5000

Charlotte, NC
3436 Toringdon Way
Suite 110
Charlotte, North Carolina 28277
(704) 527-0800

PROJECT MANUAL

The following changes have been made to the project manual. The revised sections are included with this addendum and supersede the previous version. The following changes have been made to:

Clarification of two Unit Masonry Sections: There are two Specifications coded 042000 "Unit Masonry" one is stamped by the architect that includes the brick veneer, brick mortar, weeps, flashing, drainage material, etc.. The Structural Engineer has stamped 042020 "Unit Masonry 2" which includes the CMU, CMU mortar, grout, rebar, horizontal reinforcing, etc..

1. Notice to Bidders:
 - a. Corrected email for contact nlowe@mcadamsco.com
2. Contents
3. Seals
4. Specifications
 - a. Division 04, Section 042000 Unit Masonry:
 - i. Paragraph 2.3 Brick, B.1
 - b. Division 04, Section 042020 Unit Masonry 2:
 - i. Paragraph 2.2 Brick, C, item 4

DRAWINGS

1. Sheet HD-1:
 - Changed paver size to 4" x 8" x 2 ¼" to match prick pavers existing on site. Changes made to details 1 and 4.
2. Sheet HD-2:
 - Changed face brick call out on detail 3 to "Face brick to match portal building".
3. Sheet A-1:
 - Changed face brick call out on detail 3 to "Face brick to match portal building".
4. Sheet A-2:
 - Changed face brick call out on detail 3 to "Face brick to match portal building"
5. Sheet A-3:
 - Changed face brick call out on detail 3 to "Face brick to match portal building"



Meeting title: UNC Charlotte CRI Entrance Improvements – Pre-Bid Meeting

Date: February 20, 2017

Location: SAC Salon A

Attendance: See sign in sheet attached

Summary:

Agenda Overview

- I. Introductions
- II. Project Scope
- III. Project Manual
- IV. Project Plans
- V. Questions
- VI. Optional Site Walk

I. Introductions

- Plugged sign in sheet
- Questions to be emailed
- Update to contact email

II. Project Scope

- Existing conditions, expectation of contractor to coordinate with existing utilities
- Budget
- Construction Schedule, no construction during football and commencement

III. Project Manual

- Bidding Timeline
- Single prime, GC requirements
- Minority business guidelines
 - Special guest - Dorothy Vick – handout, role is to help find subs that meet the 10% minority business participation goal, deadline 2/26 at 5pm to notify Dorothy firms needed
 - No e-blast, call to follow up on email, maintain log
 - Quick pay requirement, 7 days to pay subs
 - Affidavit A or B (self-perform) to be included in bid package
 - She will ask for proof that you did some measures

IV. Project Plans

- Overview of master plan including add alternates
- Overview of base bid
- Access to site to be coordinated with John Neilson
- Highlighted ADA grading, towers
- Highlighted each add alternate
- Renderings of project
- Owner preferred brands/materials



- Lights to be stored and reused? Unless add alternates
- Unit prices

V. Questions

- Sign in sheet and presentation to be uploaded to UNCC site

VI. Optional Site Walk

UNC Charlotte
“Good Faith Effort” Requirements
CRI Entrance Improvements

This information is provided as a guide for firms who may be new to UNC Charlotte and may not be familiar with our expectations regarding minority business participation on University Managed Projects (UMP) projects. Bidders should be familiar with the ***Guidelines for Recruitment & Selection of Minority Businesses for Participation In University of North Carolina Construction Contracts***

Identification of HUB Certified/Minority Business Participation form – Only list minority firms that you will use as construction subcontractors, vendors, suppliers or professional service providers on this project. The bidder cannot list himself on this form as he cannot subcontract to himself. **Note:** This form should be submitted with your bid, even if left blank.

Affidavit A – Listing of Good Faith Efforts – the bidder is certifying that he has made a good faith effort to comply under those areas checked on the form. Do not check a Good Faith Effort item unless you can provide the following:

1. Contacting minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor or available on State or local government maintained lists **at least 10 days before the bid or proposal date** and notifying them of the nature and scope of the work to be performed.
Example: Copies of written (emailed or faxed) notification to minority businesses and copies of quotes/proposals received for work solicited to minority businesses. Notification should include, at a minimum, project location, location where plans and specifications may be obtained or viewed, trade or scopes of work for which subcontracts are being solicited, contact person within the prime contractor organization.

Be sure to maintain a telephone log to confirm that minority firms received your Invitation For Bid (IFB). The log should contain the date contacted, telephone number, and name of the individual representing the minority firm who acknowledged receipt of your IFB. ***Also maintain a telephone log to confirm that minority firms acknowledged a “bid/no bid” to your IFB.*** The log should contain the date contacted, telephone number, and name of the individual representing the minority firm who acknowledged “bid/no bid” to your IFB.

2. Making the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bid or proposals are due.
Copies of written (emailed or faxed) notification to minority businesses should include, at a minimum, project location, location where plans and specifications may be obtained or viewed, trade or scopes of work for which subcontracts are being solicited, contact person within the prime contractor organization.
3. Breaking down or combining elements of work into economically feasible units to facilitate minority participation.
Document steps taken to segment elements of work into economically feasible units to meet minority business availability. Identify sub-contractors/suppliers/consultants and scope of work involved in segmenting.

Be sure that you are soliciting quotes from **at least** three (3) minority firms in scopes of work that typically have adequate numbers of minority firms available that can perform the work required (hauling, concrete, flooring, masonry, painting, electrical suppliers, etc.). Do not solicit quotes from minority firms in those scopes of work that typically do not have minority firms available that can perform the work required (elevators, fire suppression systems, roofing, etc.). If there are minority firms that you typically use on your projects then by all means, feel free to use them, if you are sure you are receiving reasonable pricing and quality work.

4. Working with minority trade, community or contractor organization identified by the Office for Historically Underutilized Businesses (HUB) and included in the bid documents that provide assistance in recruitment of minority businesses. **Note:** Minority plan rooms are not applicable.
Provide a copy of meeting minutes between prime contractor and minority trade, community or contractor organization. At minimum the following topics should be discussed/reviewed during the meeting: project location; location where plans and specifications may be obtained or viewed; trade or scopes of work for which subcontracts are being solicited; bonding requirements; insurance requirements; prime contractor’s contact person; minority trade, community or contractor organization contact person; strategies to segment elements of the work into economically feasible units to meet minority business availability; strategies to increase minority business utilization through joint ventures and/or partnerships; notification that the meeting will be counted toward the contractor’s good faith effort.

Maintain a copy of the request, and have the date, telephone number and name of the individual who acknowledged receipt of your request and information regarding any/all assistance provided by the organization

5. Attending any pre-bid meetings scheduled by the public owner.
Attendance will be verified by conference sign-in sheet.
6. Providing assistance in getting required bonding or insurance or providing alternatives to bonding or insurance for subcontractors.

Have documentation describing the type of assistance provided or offered to minority businesses. Provide names and contacts of minority businesses to which assistance was offered and names of the contact person of bonding companies or financial institutions offering assistance.

Be sure to mention that assistance with bonding and/or insurance will be provided in your IFB.

7. Negotiating in good faith with interested minority businesses and not rejecting them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
Document number of bids received from minority businesses in the trade or scopes of work for which subcontracts are being solicited, the number of minority businesses that submitted low bids or proposals, the number of minority businesses the bidder has offered to negotiate prices or services, and the number of minority businesses the bidder has agreed to utilize on the project, outline steps taken.
8. Providing assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required or assisting minority businesses in obtaining the same unit pricing with the bidder's supplier.
Document names, addresses and telephone numbers of minority businesses to which assistance was offered, outline steps taken. Give dates assistance was offered and document outcome.
Be sure to mention that assistance with equipment, loan capital, lines of credit or joint pay agreements to secure loans, supplies, or letters of credit will be provided in your IFB.
9. Negotiating joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.
Provide a copy of joint venture or partnership arrangements between bidder and minority businesses.
10. Providing quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.
Provide a copy of quick pay agreements and/or policies and document the number of minority businesses that will utilize the quick pay agreement. Provide a copy of the quick pay agreement between bidder and minority businesses.
Be sure to mention that quick pay agreements will be provided to assist contractors with cash-flow demands in your IFB.

Note: Referencing the Good Faith Efforts listed above in your IFB is not enough. You must be able to document your efforts.

Affidavit B – Intent to Perform Contract with Own Workforce – In making this certification the bidder is stating that he does not customarily subcontract elements of this type project and normally performs and has the capability to perform and will perform all elements of the work on this project with his own current workforce. The bidder agrees to make a Good Faith Effort to utilize minority suppliers where possible. “**Self-performing**” means the contractor has all equipment, personnel and supplies on hand to perform the contract. If the contractor needs to purchase supplies or rent equipment and operators to perform the work, then the contractor **is not** self-performing and should make efforts to purchase supplies or equipment, or temporary labor from minority firms. **Note:** No other Affidavits are required if the Bidder meets this criteria.

Affidavit C – Portion of the Work to be Performed by HUB Certified/Minority Businesses – This form is to be submitted only by the apparent lowest responsible, responsive bidder with equal to or greater than 10% minority participation.

Affidavit D – Good Faith Efforts – This form is to be submitted only by the apparent lowest responsible, responsive bidder with less than 10% minority participation along with their backup documentation.

Minority-owned Pre-qualified Bidders – **must also** meet the minority participation goals set for the project. Work performed by the minority-owned pre-qualified bidder will be counted towards the minority participation goal **only if** the minority contractor is **self-performing** and submitted Affidavit B.

Certification Requirements – Ensure the minority firms you contact for subcontracting opportunities are listed in the Statewide Uniform Certification (SWUC) Vendor database as **only firms** listed in the SWUC Vendor database, at the time of contract award, **will be counted** towards the minority participation goal for this project. Go to <http://www.doa.nc.gov/hub/searchhub.aspx> for access to the SWUC Vendor database.

Assistance:

Email (**Email Subject: UNC Charlotte CRI Entrance Improvements**) the UNC Charlotte HUB Coordinator, Dorothy Vick (dlvick@uncc.edu) no later than **5:00 PM Monday, February 26, 2018** for the following:

1. **Assistance in finding certified minority firms who have worked on UNC Charlotte projects and who can perform the scopes of work (site work, concrete, electrical, etc.) you are seeking, and/or**
2. **A list of minority trade, community or contractor organizations** identified by the Office for Historically Underutilized Businesses that provide assistance in recruitment of minority businesses.

NOTICE TO BIDDERS

Sealed proposals will be received by the University of North Carolina – Charlotte in Charlotte, NC, in Room 119 of the Facilities Management/Police building (#55 on the campus map – <http://facilities.uncc.edu/maps>) until **2:00 pm on Thursday, March 13, 2018** and immediately thereafter publicly opened and read for the furnishing of labor, material and equipment entering into the construction of:

CRI Entrance Improvements The University of North Carolina at Charlotte

The project consists of improvements including site grading, landscaping, seat walls, utilities, and hardscapes that will be coordinated with the new CATS Blue Line Extension (BLE) road widening and additional utility re-location (date of re-location to be determined see section 2, division 1B capital projects supplemental conditions) that is happening along the N. Tryon St. streetscape. other Work indicated in the Contract Documents.

Bids will be received *for Single Prime contract*. All proposals shall be lump sum.

Please note that any bids delivered to the UNC Charlotte Facilities Management, Capital Projects must be received by 12:00 pm on bid day. After that, all bids will need to go to bid opening location.

Visitor parking is available in Lot 26. Visitors will need to obtain a parking pass from the FM reception area on the first floor and return to their car prior to the bid opening. Campus map is available for review at <http://maps.uncc.edu/>.

Non-Mandatory Pre-Bid Meeting

A non-mandatory pre-bid meeting will be held for all interested bidders on February 20, 2018 at 1:00 p.m. at the Cone University Center (#5 on the campus map). The meeting will address project specific questions, issues, bidding procedures, and bid forms. After the prebid meeting there will be a site visit to go over the project scope and locations. **This will be the only opportunity for contractors and their subcontractors to visit the site, so please have all interested parties in attendance.**

Visitor parking is located in the Cone Deck adjacent the Cone University Center.

Bidders' questions will be entertained in writing until 5:00 pm on Tuesday February 27, 2018. Address all questions to the designer, McAdams Company - Attn: Nick Lowe, nlowe@mcadamsc.com

Final addenda will be issued March 6, 2017 to all plan holders/bidders of record.

Complete plans, specifications and contract documents will be open for inspection at:

McAdams Company
3436 Toringdon Way, Suite 110
Charlotte, NC 28277
(704) 527-0800

UNC Charlotte
Facilities Management/Police Building
2nd Floor – Capital Projects
9151 Cameron Boulevard
Charlotte, NC 28223
(704) 687-0615

Or may be obtained from McAdams, upon deposit of fifty dollars (\$50) in cash or certified check. The full plan deposit will be returned to those bidders provided all documents are returned in good, usable condition within ten (10) days after the bid date.

Electronic copies of the plans, specifications and contract documents will also be provided electronically to all bidders. Contact for electronic plans and specifications is Nick Lowe (704) 527-0800, or nlowe@mcadamsco.com.

Electronic copies of the plans, specifications and contract documents are available at the following:

1. Construct Connect at content@constructconnect.com – (800) 364-2059.
2. North Carolina Offices of Dodge Data & Analytics (formerly McGraw-Hill Construction) – Customer Service – (800) 393-6343
3. Metrolina Minority Contractors Association (MMCA) – mmca@mmcaofcharlotte.org, (877) 526-6205

NOTE: The bidder shall include with the bid proposal the form *Identification of Minority Business Participation* identifying the minority business participation it will use on the project and shall include either *Affidavit A* or *Affidavit B* as applicable. Forms and instructions are included within the Proposal Form in the bid documents. Failure to complete these forms is grounds for rejection of the bid. (GS143-128.2c Effective 1/1/2002.)

All contractors are hereby notified that they must have proper license as required under the state laws governing their respective trades.

General contractors are notified that Chapter 87, Article 1, General Statutes of North Carolina, will be observed in receiving and awarding general contracts. General contractors submitting bids on this project must have license classification for Building Contractor with an unlimited license required by the NC General Contractors Licensing Board under [G.S. 87-1](#).

NOTE--SINGLE PRIME CONTRACTS: Under GS 87-1, a contractor that superintends or manages construction of any building, highway, public utility, grading, structure or improvement shall be deemed a “general contractor” and shall be so licensed. Therefore a single prime project that involves other trades will require the single prime contractor to hold a proper General Contractors license.

Each proposal shall be accompanied by a cash deposit or a certified check drawn on some bank or trust company, insured by the Federal Deposit Insurance Corporation, of an amount equal to not less than five percent (5%) of the proposal, or in lieu thereof a bidder may offer a bid bond of five percent (5%) of the bid executed by a surety company licensed under the laws of North Carolina to execute the contract in accordance with the bid bond. Said deposit shall be retained by the owner as liquidated damages in event of failure of the successful bidder to execute the contract within ten days after the award or to give satisfactory surety as required by law.

A performance bond and a payment bond will be required for one hundred percent (100%) of the contract price.

Payment will be made based on ninety-five percent (95%) of monthly estimates and final payment made upon completion and acceptance of work.

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of 30 days.

The owner reserves the right to reject any or all bids and to waive informalities.

Bidders who will not attend the Bid Opening need to ensure their sealed bids are delivered no later than **12:00 p.m. Thursday, March 13, 2018** to the following:

Mailed Proposals:

Attn: Ms. Joyce Clay – Capital Projects
The University of North Carolina at Charlotte
Facilities Management – Capital Projects
9201 University City Boulevard
Charlotte, NC 28223-0001

Or

Hand Delivered:

Attn: Ms. Joyce Clay – Capital Projects
Facilities Management/Police Building
2nd Floor – Capital Projects
9151 Cameron Boulevard
Charlotte, NC 28223
(704) 687-0615

Designer:
McAdams Company
3436 Toringdon Way, Suite 110
Charlotte, NC 28277
(704) 527-0800

Owner:
University of North Carolina at Charlotte
Facilities Management - Capital Projects
9201 University City Boulevard
Charlotte, NC 28223
(704) 687-0615

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.....	Notice to Bidders	
.....	Instructions to Bidders and General Conditions of the Contract	
.....	Supplementary General Conditions	
.....	MBE Guidelines for University of North Carolina Construction Contracts	
003132	Geotechnical Data	
.....	Report of Subsurface Exploration	

General Requirements Subgroup

DIVISION 01 - GENERAL REQUIREMENTS

011000	Summary of Work
012500	Substitution Procedures
013100	Project Management and Coordination
013200	Construction Progress Documentation
013233	Photographic Documentation
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015000	Temporary Facilities and Controls
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VOLUME 2

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DIVISION 03 - CONCRETE

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033053	Miscellaneous Cast-in-place Concrete

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047200	Cast Stone Masonry

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330500 Common Work Results for Utilities
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FORMS:

Form of Proposal

Identification of Minority Business Participation

.....Affidavit A – Listing of Good Faith Efforts

.....Affidavit B – Intent to Perform Contract with Own Workforce

.....Affidavit C – Portion of the Work to be Performed by HUB Certified/Minority Businesses

.....Affidavit D – Good Faith Efforts

Form of Bid Bond

Form of Construction Contract

Form of Performance Bond

Form of Payment Bond

Sheet for Attaching Power of Attorney

Sheet for Attaching Insurance Certificates

Approval by the University Attorney for the State of North Carolina through the University of North Carolina at Charlotte

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1.1 DESIGN PROFESSIONALS OF RECORD

ARCHITECT

Gary Hubler
#1111

The following Sections:

- 040110 Masonry Cleaning
- 042000 Unit Masonry
- 047200 Cast Stone Masonry
- 057000 Decorative Metal
- 071113 Bituminous Dampproofing
- 071326 Self-Adhering
Sheet Waterproofing
- 081113 Hollow Metal Doors and
Frames
- 084113 Aluminum-Framed Entrances
- 087110 Door Hardware
- 088000 Glazing
- 089119 Fixed Louvers
- 099113 Exterior Painting



CIVIL ENGINEER

Brandon Plunkett
#27475

The following Sections:

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- 334100 - Storm Utility Drainage Piping
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tection



LANDSCAPE
ARCHITECT

David Malcolm
#0969

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015639 - Temporary Tree and Plant
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329113 – Soil Preparation
329119 - Landscape Grading
329200 - Turf and Grasses
329300 – Plants
329450 - Structural Soil Cells
329455 - Soil Cell Filler Soil



STRUCTURAL
ENGINEER

Curtis L. Ensley
#26430

The following Sections:

033000 – CIP Concrete
042020 – Unit Masonry



ELECTRICAL
ENGINEER

Kim Humiston, PE
19586

The following Sections:
Division 26



SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Specification 042200 Concrete Unit Masonry.

1.2 SUMMARY

- A. Section Includes:
 - 1. Clay face brick.
 - 2. Mortar and grout.
 - 3. Embedded flashing.
 - 4. Miscellaneous masonry accessories.
- B. Products Installed but not Furnished under This Section:
 - 1. Cast-stone trim in unit masonry.
 - 2. Steel shelf angles for supporting unit masonry.
 - 3. Horizontal joint reinforcing.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
 - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 - 2. Stone Trim Units: Show sizes, profiles, and locations of each stone trim unit required.
 - 3. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
 - 4. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Initial Selection:

1. Pre-faced CMUs.
2. Clay face brick, in the form of straps of five or more bricks.
3. Colored mortar.
4. Weep holes/cavity vents.

D. Samples for Verification: For each type and color of the following:

1. Hollow brick, in the form of straps of five or more bricks.
2. Pigmented and colored-aggregate mortar. Make Samples using same sand and mortar ingredients to be used on Project.
3. Weep holes and cavity vents.
4. Accessories embedded in masonry.

1.6 INFORMATIONAL SUBMITTALS

A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

1. Submittal is for information only. Receipt of list does not constitute approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.

B. Qualification Data: For testing agency.

C. Material Certificates: For each type and size of the following:

1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
 - c. For exposed brick, include test report for efflorescence according to ASTM C 67.
 - d. For surface-coated brick, include test report for durability of surface appearance after 50 cycles of freezing and thawing according to ASTM C 67.
 - e. For masonry units, include data and calculations establishing average net-area compressive strength of units.
2. Cementitious materials. Include name of manufacturer, brand name, and type.
3. Mortar admixtures.
4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
5. Grout mixes. Include description of type and proportions of ingredients.

D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.

2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.
- F. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
- B. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.
 1. Build sample panels for each type of exposed unit masonry construction in sizes approximately 48 inches long by 36 inches high by full thickness.
 2. Build sample panels facing south.
 3. Where masonry is to match existing, build panels adjacent and parallel to existing surface.
 4. Clean exposed faces of panels with masonry cleaner indicated.
 5. Protect approved sample panels from the elements with weather-resistant membrane.
 6. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
 - a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Architect specifically approves such deviations in writing.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
 - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe, and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

2.3 BRICK

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
 - 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 - 2. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- B. Clay Face Brick: Facing brick complying with ASTM C 216.
 - 1. Provide products by one of the following manufacturers:
 - a. Meridian Brick
 - b. Palmetto
 - c. Taylor Clay
 - 2. Grade: SW.
 - 3. Type: FBS.
 - 4. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 6600 psi.
 - 5. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested according to ASTM C 67.
 - 6. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
 - 7. Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing according to ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet.
 - 8. Size (Actual Dimensions): 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.
 - 9. Application: Use where brick is exposed unless otherwise indicated.
 - 10. Color and Texture: Provide units with texture and color to match face brick at adjacent buildings, Portal (ref. Hanson "Special Morrocroft") and Bioinformatics (ref. Hanson "Special Morrocroft").

2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
 - 1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979/C 979M. Use only pigments with a record of satisfactory performance in masonry mortar.
- E. Colored Cement Products: Packaged blend made from portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.
 - 1. Colored Portland Cement-Lime Mix:
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Lafarge North America Inc.; Eaglebond Portland & Lime (#394). or a comparable product by one of the following:
 - 1) Holcim (US) Inc.
 - 2) Lehigh Hanson; HeidelbergCement Group.
 - 2. Formulate blend as required to produce color to match Hunt Hall.
 - 3. Pigments shall not exceed 10 percent of portland cement by weight.
- F. Aggregate for Mortar: ASTM C 144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
 - 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 - 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- G. Aggregate for Grout: ASTM C 404.
- H. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. BASF Corporation-Construction Systems.
 - b. Euclid Chemical Company (The); an RPM company.

c. Grace Construction Products; W.R. Grace & Co. -- Conn.

I. Water: Potable.

2.5 EMBEDDED FLASHING MATERIALS

A. Flexible Flashing: Use the following unless otherwise indicated:

1. Stainless Steel-Laminated Flashing: Stainless steel core with polymer fabric laminated to one stainless steel face with non-asphalt adhesive. Use where flashing is fully concealed in masonry.

a. Basis-of-Design Product: Subject to compliance with requirements, provide York Manufacturing, Inc ; Multi-Flash SS. or a comparable product by one of the following:

- 1) Illinois Products, Inc.; IPCO Stainless Fabric Flashing
- 2) STS Coatings, Inc.; Gorilla Flash Stainless Fabric
- 3) TK Products, Inc.; TK TWF

2. Characteristics:

- a. Stainless Steel Type: 304, ASTM A167.
- b. Fabric: Polymer fabric laminated to back face of stainless steel core.
- c. Puncture Resistance: 2,500 lbs average.
- d. Tensile Strength: 100,000 psi minimum average.

3. Special Warranty

- a. Manufacturer: Warrant flexible flashing material for life of the wall.
- b. Begin warranty at Date of Final Acceptance.

4. Accessories:

- a. Mastic/sealant: One part 100% solids, solvent free formulated silyl-terminated polyether (STPE), ASTM C920-11, Type S, Grade NS, Class 50.
- b. Termination Bar: 1" 26 gauge stainless steel bar or 1" resin (York T-96).
- c. Splice, Outside & Inside Corner and End Dam: Type 304, 26 gauge stainless steel.

B. Application: Unless otherwise indicated, use the following:

1. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a sealant stop or flexible flashing with a metal sealant stop.
2. Where flashing is fully concealed, use flexible flashing.

C. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.6 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.
- B. Preformed Control-Joint Gaskets: Made from [styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805] [or] [PVC, complying with ASTM D 2287, Type PVC-65406] and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).
- D. Weep/Cavity Vent Products: Use one of the following unless otherwise indicated:
 - 1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.
 - a. Products: Subject to compliance with requirements, provide one of the following:
 - 1) Advanced Building Products Inc.; Mortar Maze Cell Vent.
 - 2) Heckmann Building Products, Inc.; No. 85 Cell Vent.
 - 3) Hohmann & Barnard, Inc; QV Quadro-Vent.
 - 4) Wire-Bond; Cell Vent.
- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Advanced Building Products Inc.; Mortar Break II.
 - b. Heckmann Building Products, Inc.; Weep-Thru Mortar Deflector.
 - c. Hohmann & Barnard, Inc; Mortar Trap.
 - d. Mortar Net USA, Ltd; Mortar Net.
 - e. Wire-Bond;Cavity Net II.
 - 2. Configuration: Provide strips, not less than 1 inch, full depth of cavity and 10 inches high, with dovetail-shaped notches or dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.

2.7 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Use portland cement-lime mortar unless otherwise indicated.
 - 3. For exterior masonry, use portland cement-lime mortar.
 - 4. For reinforced masonry, use portland cement-lime mortar.

5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
 - C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
 1. For masonry below grade or in contact with earth, use Type S.
 2. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
 - D. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.
 1. Mix to match Architect's sample.
 2. Application: Use colored-aggregate mortar for exposed mortar joints with the following units:
 - a. Concrete face brick.
 - b. Clay face brick.
 - c. Hollow brick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
 2. Verify that foundations are within tolerances specified.
 3. Verify that reinforcing dowels are properly placed.
 4. Verify that substrates are free of substances that impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- C. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- D. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet or 1/2-inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.

5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- G. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- H. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
 1. Install compressible filler in joint between top of partition and underside of structure above.
 2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.
 3. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay CMUs as follows:
 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
 2. Bed webs in mortar in all courses of piers, columns, and pilasters.

3. Bed webs in mortar in grouted masonry, including starting course on footings.
 4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
 5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
 - C. Cut joints flush where indicated to receive waterproofing or air barriers unless otherwise indicated.
 - D. Tool expose joints at face brick to "gravevine joint" when thumbprint hard, using a jointer specifically designed for this shape.

3.6 CAVITY WALLS

- A. Bond wythes of cavity walls together using one of the following methods:
 1. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 1.77 sq. ft. of wall area spaced not to exceed 16 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches of openings and space not more than 36 inches apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.
 - a. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) ties.
 - b. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) ties to allow for differential movement regardless of whether bed joints align.
 2. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.
 - a. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties to allow for differential movement regardless of whether bed joints align.
 3. Header Bonding: Provide masonry unit headers extending not less than 3 inches into each wythe. Space headers not more than 8 inches clear horizontally and 16 inches clear vertically.
 4. Masonry-Veneer Anchors: Comply with requirements for anchoring masonry veneers.
- B. Bond wythes of cavity walls together using bonding system indicated on Drawings.
- C. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.
- D. Parge cavity face of backup wythe in a single coat approximately 3/8 inch thick. Trowel face of parge coat smooth.

3.7 ANCHORED MASONRY VENEERS

- A. Anchor masonry veneers to wall framing and concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:
 - 1. Embed connector sections and continuous wire in masonry joints.
 - 2. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
 - 3. Space anchors as indicated, but not more than 18 inches o.c. vertically and 24 inches o.c. horizontally, with not less than one anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around perimeter.
- B. Provide not less than 1 inch of airspace between back of masonry veneer and CMU.
 - 1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

3.8 CONTROL AND EXPANSION JOINTS

- A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry as follows:
 - 1. Install preformed control-joint gaskets designed to fit standard sash block.
- C. Form expansion joints in brick as follows:
 - 1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
 - 2. Build flanges of factory-fabricated, expansion-joint units into masonry.
 - 3. Build in compressible joint fillers where indicated.
 - 4. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Section 079200 "Joint Sealants."
- D. Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 079200 "Joint Sealants," but not less than 3/8 inch.
 - 1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.9 LINTELS

- A. Install steel lintels where indicated.

- B. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
- C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.
- D. Steel lintels shall be galvanized by the hot dip process per ASTM A 123/ A123M.

3.10 FLASHING, WEEP HOLES, AND CAVITY VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install cavity vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
 2. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under air barrier, lapping at least 4 inches. Fasten upper edge of flexible flashing to sheathing through termination bar.
 3. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
 4. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
 5. Install metal sealant stops with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
 6. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
 7. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
 8. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.
- C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.
- D. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.

1. Use specified weep/cavity vent products to form weep holes.
2. Space weep holes 24 inches o.c. unless otherwise indicated.
3. Cover cavity side of weep holes with plastic insect screening at cavities insulated with loose-fill insulation.
4. Trim wicking material flush with outside face of wall after mortar has set.
5. Fill cavities full height by placing pea gravel in cavities as masonry is laid, so that at any point, masonry does not extend more than 24 inches above top of pea gravel.

E. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

F. Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products to form cavity vents.

1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

3.11 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

3.12 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

B. Inspections: Special inspections according to Level B in TMS 402/ACI 530/ASCE 5.

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

E. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.

F. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

G. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

- H. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.
- I. Prism Test: For each type of construction provided, according to ASTM C 1314 at 7 days and at 28 days.

3.13 PARGING

- A. Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of 3/4 inch. Dampen wall before applying first coat, and scarify first coat to ensure full bond to subsequent coat.
- B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot. Form a wash at top of parging and a cove at bottom.
- C. Damp-cure parging for at least 24 hours and protect parging until cured.

3.14 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 - 5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
 - 6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
 - 7. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
 - 8. Clean stone trim to comply with stone supplier's written instructions.
 - 9. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.15 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 - 1. Crush masonry waste to less than 4 inches in each dimension.
 - 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."
 - 3. Do not dispose of masonry waste as fill within 18 inches of finished grade.
- C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 042020 - UNIT MASONRY (Structural Concrete and Masonry - ARP)

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes unit masonry assemblies for the tower elements and seat walls consisting of the following:
 - 1. Concrete masonry units.
 - 2. Decorative concrete masonry units.
 - 3. Face brick.
 - 4. Reinforcing steel.
 - 5. Masonry joint reinforcement.
 - 6. Ties and anchors.
 - 7. Embedded flashing.
 - 8. Miscellaneous masonry accessories.
 - 9. Cavity-wall insulation.
- B. Related Sections include the following:
 - 1. Division 04, Section "Masonry Mortar and Grout" for masonry mortar and grout used in assembly specified in this section.
 - 2. Division 05, Section "Expansion Control" for metal expansion joint covers.
 - 3. Division 07, Section "Bituminous Dampproofing" for dampproofing applied to cavity face of backup wythes of cavity walls.
 - 4. Division 07, Section "Sheet Metal Flashing and Trim" for exposed sheet metal flashing.
 - 5. Division 07, Section "Firestopping" for firestopping at tops of masonry walls and at penetrations in masonry walls.
 - 6. Division 07, Section "Joint Protection" for preformed expansion joint gaskets and joint sealants.
 - 7. Division 08, Section "Louvers and Vents" for wall vents.
- C. Products furnished, but not installed, under this Section include the following:
 - 1. Dovetail slots for masonry anchors, installed under Division 03, Section "Cast-in-Place Concrete."
 - 2. Anchor sections of adjustable masonry anchors for connecting to structural frame, installed under Division 05, Section "Structural Steel Framing."
- D. Products installed, but not furnished, under this Section include the following:
 - 1. Steel lintels for unit masonry, furnished under Division 05, Section "Metal Fabrications."
 - 2. Manufactured reglets in masonry joints for metal flashing, furnished under Division 07, Section "Sheet Metal Flashing and Trim."
 - 3. Hollow-metal frames in unit masonry openings, furnished under Division 08, Section "Hollow Metal Doors and Frames."
- E. Allowances: Furnish the following under the allowances indicated, as specified in Division 01, Section "Allowances":
 - 1. Face brick under the Face Brick Allowances.

1.2 SUBMITTALS

- A. Product Data: For the following:
 - 1. Weep holes/vents in color to match mortar color.
 - 2. Each type and size of joint reinforcement.
 - 3. Each type and size of anchor, tie, and metal accessory.

- B. Samples: Submit samples of concrete masonry units showing the full range of anticipated colors and textures.
 - 1. Architect must approved texture of units prior to ordering.
- C. Samples: Submit samples of decorative concrete masonry units for selection.
- D. Qualification Data: For parties listed in Quality Assurance article.
 - 1. Submit Installing Subcontractor's qualifications with submittal of Subcontractor List.
 - 2. Submit installing masonry foreman's qualifications prior to commencing masonry work.
- E. Certificates: For fire-resistance rated concrete masonry units. Submit current UL certificate.
- F. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements. Submit upon request of Architect.
- G. Brick and mortar manufacturer's written acceptance of proposed proprietary masonry cleaning product.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Experienced masons with 3 years minimum experience performing similar work, under the direction of a full-time on site masonry foreman with minimum 5 years experience performing similar work.
- B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1093 to conduct the testing indicated, as documented according to ASTM E 548.
- C. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
- D. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.
- E. Mockups: Before installing unit masonry, build mockups to verify selections and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Locate mockups on site, to present the elements specified in each section in proper relationship to each other.
 - 2. Build mockups for the following types of masonry in sizes approximately 48 inches long by 48 inches high by full thickness, including face and backup wythes and accessories. Include a full-height control joint in each mockup.
 - a. Each type of exposed unit masonry construction.
 - b. Typical exterior wall with lower corner of window opening. Make opening approximately 12 inches wide by 16 inches high.
 - c. Typical exterior wall with through-wall flashing installed for a 24-inch length in corner of mockup approximately 16 inches down from top of mockup, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing). Include ties, anchors, and cavity drainage material.
 - d. Typical interior unit masonry wall.
 - 3. Clean exposed faces of mockups with masonry cleaner as specified.
 - 4. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 - 5. Protect accepted mockups from the elements with weather-resistant membrane.
 - 6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 7. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.

8. Demolish and remove mockups when directed.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.5 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 1. Protect base of walls from rain-splashed mud and from mortar splatter by coverings spread on ground and over wall surface.
 2. Protect sills, ledges, and projections from mortar droppings.
 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
- E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required.
 1. When ambient temperature exceeds 100 deg F, or 90 deg F with a wind velocity greater than 8 mph, do not spread mortar beds more than 48 inches ahead of masonry. Set masonry units within one minute of spreading mortar.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. General: Provide shapes indicated and as follows:
 1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
- B. Concrete Masonry Units: ASTM C 90 and as follows:
 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.

2. Weight Classification: Light weight conforming to ASTM C 331. All lightweight aggregate used shall be expanded shale, clay or slate, produced by the rotary kiln process.
 3. All units shall be free of organic impurities that will cause rusting, staining, or pop outs and shall contain no combustible matter. Use of coal cinder aggregate/bottom ash or similar waste products will not be allowed.
 4. Size (Width): Manufactured to the following dimensions:
 - a. 4 inches nominal; 3-5/8 inches actual.
 - b. 6 inches nominal; 5-5/8 inches actual.
 - c. 8 inches nominal; 7-5/8 inches actual.
 - d. 12 inches nominal; 11-5/8 inches actual.
 5. Exposed Faces: Manufacturer's standard color.
 - a. Where units are to be left exposed, provide manufacturer's full range of colors and textures for approval by Architect.
 - b. Edges: Provide units with crisp edges matching approved sample.
 6. Products: Subject to full compliance with the requirements, provide units from one of the following manufacturers:
 - a. Johnson Concrete.
 - b. Adams.
 - c. Cemex.
 - d. Or approved equal.
- C. Concrete Masonry Units: Fire Resistance Certified Units: ASTM C 90 and as follows:
1. Weight Classification: Light weight.
 2. Provide units certified under UL263 and UL618.
 3. Size (Width): Manufactured to the following dimensions:
 - a. 4 inches nominal; 3-5/8 inches actual.
 - b. 6 inches nominal; 5-5/8 inches actual.
 - c. 8 inches nominal; 7-5/8 inches actual.
 - d. 12 inches nominal; 11-5/8 inches actual.
 4. Products: Subject to full compliance with the requirements, provide units from one of the following manufacturers:
 - a. Johnson Concrete.
 - b. Adams.
 - c. Cemex.
 - d. Or approved equal.
- D. Decorative Concrete Masonry Units: ASTM C 90 and as follows:
1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.
 2. Weight Classification: Normal weight.
 3. Size: Manufactured to dimensions indicated for nondecorative units.
 4. Finish: Exposed faces of the following general description matching color, pattern, and texture of Architect's samples.
 - a. Normal-weight aggregate, ground finish.
 - b. Normal-weight aggregate, split-face finish.
 - c. Normal-weight aggregate, split-ribbed finish.
 - d. Lightweight aggregate, standard finish, scored vertically so units laid in running bond appear as square units laid in stacked bond.
 - e. Lightweight aggregate, standard finish, triple scored vertically so units laid in running bond appear as vertical units laid in stacked bond (soldier courses).

5. Products: Subject to compliance with requirements, provide decorative concrete masonry units from one of the following manufacturers which is judged by the Architect as an acceptable match for the basis of design product indicated:
 - a. Adams Products Co:
 - 1) Decorative Concrete Masonry Unit: DCMU#1: 4 x 8 x 16 inch split **face**.
 - b. Johnson Concrete Products.
 - c. Hodges Concrete Products.
 - d. Cemex Masonry Products.
6. Integral Water Repellent: Provide units made with liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive according to ASTM E 514, with test period extended to 24 hours, show no visible water or leaks on the back of the test specimen.
 - a. Products: Subject to compliance with requirements, provide one of the following:
 - 1) Block Plus W-10; Addiment Inc.
 - 2) Dry-Block; W. R. Grace & Co., Construction Products Division.
 - 3) Substitutions per Document 0 21 13 Instructions to Bidders.

2.2 BRICK

- A. General: Provide shapes indicated and as follows for each form of brick required:
 1. Provide units without cores or frogs and with exposed surfaces finished for ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces.
- B. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
 1. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 2. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- C. Face Brick: ASTM C 216, Grade SW, Type FBS, and as follows:
 1. Initial Rate of Absorption: Per ASTM C 216.
 2. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
 3. Size: Manufactured to the following actual dimensions:
 - a. Modular: 3-1/2 to 3-5/8 inches wide by 2-1/4 inches high by 7-1/2 to 7-5/8 inches long.
 4. Products: Subject to compliance with requirements, provide brick from one of the following manufacturers which is judged an acceptable match by the Architect for the basis of design product indicated:
 - a. Taylor Clay Products Co.
 - b. Palmetto Brick Co.
 - c. Meridian.
 - d. Statesville Brick Co.

2.3 REINFORCING STEEL

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement 1; or ASTM A 617/A 617M, Grade 60.

2.4 MASONRY JOINT REINFORCEMENT

- A. General: ASTM A 951 and as follows:
 1. Hot-dip galvanized, carbon-steel wire for both interior and exterior walls.
 2. Wire Size for Side Rods: W1.7 or 0.148-inch diameter.

3. Wire Size for Cross Rods: W1.7 or 0.148-inch diameter.
 4. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units where indicated.
- B. For multi-wythe masonry, provide types as follows:
1. Adjustable (2-piece) type with single pair of side rods and cross ties spaced not more than 16 inches o.c. and with separate adjustable veneer ties engaging the cross ties. Cross ties are either U-shaped with eyes or rectangular. Space side rods for embedment within each face shell of backup wythe and size adjustable ties to extend at least halfway through outer wythe but with at least 5/8-inch cover on outside face.
 - a. Provide truss-type joint reinforcement with straight or adjustable veneer tie as required, engaging cavity insulation with pintles.

2.5 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Mortar Cement: ASTM C 1329.
- D. Pigmented Mortar: Colored cement-lime formulation as required to produce the color indicated.
 1. Colored Portland Cement-Lime Mix:
 2. Products:
 - a. Blue Circle Cement; Eaglebond.
 - b. Glen-Gery Corporation; Color Mortar Blend.
 - c. Holnam, Inc.; Rainbow Mortamix Custom Color Cement/Lime.
 - d. Lafarge Corporation; Centurion Colorbond PL.
 - e. Lehigh Portland Cement Co.; Lehigh Custom Color Portland/Lime.
 - f. Riverton Corporation (The); Riverton Portland Cement Lime Custom Color.
- E. Aggregate for Mortar:
 1. ASTM C 144; except for joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
 2. Colored-Mortar Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.
- F. Aggregate for Grout: ASTM C 404.
- G. Integral Water Repellent
 1. Either of the following:
 - a. "Mortar Tite"; Addiment, Inc.
 - b. "Dry-Block"; W. R. Grace & Co.
- H. Mortar Pigments:
 1. Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes.
 2. Use only pigments with a record of satisfactory performance in masonry mortar.
 3. Products:
 - a. Davis Colors; True Tone Mortar Colors.
 - b. Lafarge Corporation; Centurion Pigments.
 - c. Solomon Grind-Chem Services, Inc.; SGS Mortar Colors.
- I. Epoxy Pointing Mortar: ASTM C 395, epoxy-resin-based material formulated for use as pointing mortar for structural-clay tile facing units.

J. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by the manufacturer for use in masonry mortar of composition indicated.

1. Products:

- a. Euclid Chemical Co.; Accelguard 80.
- b. Grace, W. R. & Co., Construction Products Division; Morseled.
- c. Sonneborn, Div. of ChemRex, Inc.; Trimix-NCA.

K. Water: Potable.

2.6 MORTAR AND GROUT MIXES

A. General:

1. Do not use admixtures, unless otherwise indicated.
2. Do not use calcium chloride in mortar or grout.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification.

1. Limit cementitious materials in mortar to portland cement, mortar cement, and lime.
2. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type S.

C. Pigmented Mortar:

1. Select and proportion pigments with other ingredients to produce color required. Limit pigments to the following percentages of cement content by weight:
2. For portland cement-lime mortar, not more than 10 percent.

D. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 5 of ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.

2.7 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors, specified in subsequent articles, made from materials that comply with this Article, unless otherwise indicated.

B. Hot-Dip Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.

C. Steel Sheet, Galvanized after Fabrication: ASTM A 366/A 366M cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153.

D. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.8 BENT WIRE TIES

A. General: Rectangular units with closed ends and not less than 4 inches wide. Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches long may be used for masonry constructed from solid units or hollow units laid with cells horizontal.

1. Where coursing between wythes does not align, use adjustable ties composed of 2 parts; 1 with pintles, the other with eyes; with maximum misalignment of 1-1/4 inches.

B. Wire: Fabricate from 1/4-inch- diameter, hot-dip galvanized steel wire.

2.9 ADJUSTABLE ANCHORS FOR CONNECTING TO STEEL FRAME

A. General: Provide two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section: Crimped 1/4-inch- diameter, hot-dip galvanized steel wire anchor section for welding to steel or as specified in the construction drawings.
2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.25-inch- diameter, hot-dip galvanized steel wire.

2.10 ANCHORS FOR CONNECTING TO CONCRETE

- A. General: Provide two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
1. Anchor Section: Dovetail anchor section formed from 0.0966-inch- thick, steel sheet, galvanized after fabrication.
 2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.25-inch- diameter, hot-dip galvanized steel wire.

2.11 RIGID ANCHORS

- A. General: Fabricate from steel bars as follows:
1. 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins.
 2. Finish: Hot-dip galvanized to comply with ASTM A 153.

2.12 ADJUSTABLE MASONRY-VENEER ANCHORS

- A. General: Provide two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:
1. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.
- B. Seismic Masonry-Veneer Anchors: Units consisting of a metal anchor section and a connector section designed to engage a continuous wire embedded in the veneer mortar joint, complying with the following requirements. Seismic requirements shall meet IBC requirements for SCD (Seismic Design Category) D.
1. Anchor Section: Gasketed, rib-stiffened, sheet metal plate with screw holes top and bottom, 2-3/4 inches wide by 3 inches high; with projecting tabs having slotted holes for inserting vertical legs of wire tie specially formed to fit anchor section. Size wire tie to extend at least 1-1/2 inches into veneer but with at least 5/8-inch cover on outside face.
 2. Connector Section: Sheet metal clip welded to wire tie with integral tabs designed to engage continuous wire.
 3. Fabricate sheet metal anchor sections and other sheet metal parts from 0.0677-inch- thick, steel sheet, galvanized after fabrication.
 4. Fabricate wire connector sections from 0.1875-inch-diameter, hot-dip galvanized steel wire.
 5. Continuous Wire: 0.1875-inch- diameter, hot-dip galvanized steel wire.
- C. Steel Drill Screws for Steel Studs: ASTM C 954 except manufactured with hex washer head and neoprene washer, No. 10 diameter by length required to penetrate steel stud flange by not less than 3 exposed threads, and with the following corrosion protective coating:
1. Organic polymer coating with salt-spray resistance to red rust of more than 800 hours per ASTM B 117.
- D. Steel Tapping Screws for Concrete Masonry: Self-tapping screws with specially designed threads for tapping and wedging into masonry, with hex washer head and neoprene washer, 3/16-inch diameter by 1-1/2-inch length, and with the following corrosion-protective coating:
1. Organic polymer coating with salt-spray resistance to red rust of more than 500 hours per ASTM B 117.
- E. Products: Subject to compliance with requirements, provide one of the following:
1. Seismic Masonry-Veneer Anchors:

- a. D/A 213S; Dur-O-Wal, Inc.
- b. DW-10-X-Seismicclip; Hohmann & Barnard, Inc.
- c. RJ-711 with Wire-Bond clip; Masonry Reinforcing Corporation of America.
- 2. Screw Attached Seismic Masonry Veneer System for use with ties mounted through the face of rigid insulation in light gauge metal stud wall assemblies:
 - a. Standard Ties:
 - 1) Hohman and Barnhard: DW-10-X Seal Veneer Anchor.
 - 2) Heckmann – Posi-tie
 - b. Seismic Ties:
 - 1) Hohman and Barnhard DW-10-X Seismic Clip Interlock System with 9 gauge continuous joint reinforcement wire.
 - 2) Heckmann – Posi-tie with seismic tie and continuous 9 gauge wire joint reinforcing.]
- 3. Organic-Polymer-Coated, Steel Drill Screws:
 - a. Dril-Flex; Elco Industries, Inc.
 - b. Traxx; ITW-Buildex.

2.13 MISCELLANEOUS ANCHORS

- A. Unit Type Inserts in Concrete: Cast-iron or malleable-iron inserts of type and size indicated.
- B. Dovetail Slots: Furnish dovetail slots with filler strips, of slot size indicated, fabricated from 0.0336-inch, galvanized steel sheet.
- C. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:
 - 1. Headed bolts.
 - 2. Nonheaded bolts, bent in manner indicated.

2.14 CONCEALED FLASHING:

- A. Copper-Laminated Flashing: Manufacturer's standard laminated flashing consisting of 7-oz./sq. ft. sheet copper bonded with asphalt between 2 layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.
- B. Asphalt-Coated Copper Flashing (Contractor option): Manufacturer's standard product consisting of 7-oz./sq. ft. sheet copper coated with flexible asphalt. Use only where flashing is fully concealed in masonry.
- C. Adhesives, Primers, Prefabricated Corner Units, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by the flashing manufacturer for bonding flashing sheets to each other and to substrates.
- D. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Copper-Laminated Flashing:
 - a. Copper Fabric Flashing; Advanced Building Products, Inc.
 - b. Copper Fabric; AFCO Products, Inc.
 - c. H & B C-Fab Flashing; Hohmann & Barnard, Inc.
 - d. Type FCC-Fabric Covered Copper; Phoenix Building Products.
 - e. Copper Fabric Flashing; Polytite Manufacturing Corp.
 - f. Copper Fabric Flashing; Sandell Manufacturing Co., Inc.
 - g. York Copper Fabric Flashing; York Manufacturing, Inc.
 - 2. Asphalt-Coated Copper Flashing:
 - a. Cop-R-Cote; Advanced Building Products, Inc.
 - b. Cop-A-Cote; AFCO Products, Inc.
 - c. H & B C-Coat Flashing; Hohmann & Barnard, Inc.

- d. Type ACC-Asphalt Bituminous Coated; Phoenix Building Products.
- e. Coated Copper Flashing; Polytite Manufacturing Corp.
- f. Coated Copper Flashing; Sandell Manufacturing Co., Inc.
- g. Copperseal; York Manufacturing, Inc.

2.15 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.
- B. Preformed Control-Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
 - 1. Styrene-Butadiene-Rubber Compound: ASTM D 2000, Designation M2AA-805.
 - 2. PVC: ASTM D 2287, Type PVC-65406.
- C. Plastic Weep Hole/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, designed to fill head joint with outside face held back 1/8 inch from exterior face of masonry, in color selected from manufacturer's standard.
- D. Vinyl Weep Hole/Vent: One-piece, offset, T-shaped units made from flexible, injection-molded PVC, designed to fit into a head joint and consisting of a louvered vertical leg, flexible wings to seal against ends of masonry units, and a top flap to keep mortar out of the head joint; in color approved by Architect to match that of mortar.
- E. Cavity Drainage Material: 1/2-inch- thick, min. 10-inches high, free-draining mesh; made from polyethylene strands and shaped to avoid being clogged by mortar droppings.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cav Clear: Masonry Mat.
 - b. Sandell Mfg: Mortar Web.
 - c. Advanced Building Products: Mortar Break.
 - d. Mortar Net USA: Mortar Net.

2.16 CAVITY-WALL INSULATION

- A. Extruded-Polystyrene Board Insulation: Rigid, cellular, polystyrene thermal insulation with closed cells and integral high-density skin; formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C 578, Type IV.
 - 1. Provide 1 1/2 inch thick material unless otherwise indicated.
- B. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.17 MASONRY CLEANERS

- A. Use cleaning methods and materials specifically recommended by brick and mortar manufacturers. Select from the following:
 - 1. Job-Mixed Detergent Solution: Solution of 1/2-cup dry measure tetrasodium polyphosphate and 1/2-cup dry measure laundry detergent dissolved in 1 gal. of water.
 - 2. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
 - a. Submit brick and mortar manufacturer's written acceptance of proposed cleaner.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
 - 2. Verify that foundations are within tolerances specified.
 - 3. Verify that reinforcing dowels are properly placed.
 - 4. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.
- D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
 - 1. Mix units from several pallets or cubes as they are placed.
- F. Wetting of Brick: Wet brick before laying if the initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at the time of laying.

3.3 CONSTRUCTION TOLERANCES

- A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:
 - 1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet, nor 1/2 inch maximum.
 - 2. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, nor 1/2 inch maximum.
 - 3. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet, nor 1/2 inch maximum.
 - 4. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
 - 5. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
 - 1. One-half running bond with vertical joint in each course centered on units in courses above and below.

2. As indicated on Drawings.
- C. Bullnose Corners: Provide bullnose units at all exposed interior outside corners. Select bullnose units whose texture matches the texture of adjoining units.
- D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- E. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond or one-third-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar before laying fresh masonry.
- F. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
- G. Fill space between hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.
- H. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
- I. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
- J. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.
 1. Install compressible filler in joint between top of partition and underside of structure above.
 2. Wedge non-load-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.

3.5 BONDING OF MULTIWYTHE MASONRY

- A. Use masonry joint reinforcement installed in horizontal mortar joints to bond wythes together.
- B. Corners: Provide interlocking masonry unit bond in each wythe and course at corners, unless otherwise indicated.
 1. Provide continuity with masonry joint reinforcement at corners by using prefabricated "L" units as well as masonry bonding.
- C. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
 1. Provide rigid metal anchors not more than 24 inches o.c. If used with hollow masonry units, embed ends in mortar-filled cores.

3.6 MORTAR BEDDING AND JOINTING

- A. Lay hollow masonry units as follows:
 1. With full mortar coverage on horizontal and vertical face shells.
 2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
 3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
- B. Lay solid brick-size masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
 1. At cavity walls, bevel beds away from cavity, to minimize mortar protrusions into cavity. As work progresses, trowel mortar fins protruding into cavity flat against the cavity face of the brick.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.7 CAVITIES

- A. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.
 - 1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.
- B. Coat cavity face of backup wythe to comply with Division 07, Section "Bituminous Dampproofing."
- C. Installing Cavity-Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
 - 1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.8 MASONRY JOINT REINFORCEMENT

- A. General: Provide continuous masonry joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
 - 1. Space reinforcement not more than 16 inches o.c.
 - 2. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings.
 - a. Reinforcement above is in addition to continuous reinforcement.
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.9 ANCHORING MASONRY TO STRUCTURAL MEMBERS

- A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
 - 1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
 - 2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.10 ANCHORING MASONRY VENEERS

- A. Anchor masonry veneers to wall framing with seismic masonry-veneer anchors to comply with the following requirements:
 - 1. Fasten each anchor section through sheathing to wall framing with two metal fasteners of type indicated.
 - 2. Embed tie sections in masonry joints.
 - 3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
 - 4. Space anchors as indicated, but not more than 18 inches o.c. vertically and 24 inches o.c. horizontally, with not less than 1 anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around the perimeter.

3.11 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joints in unit masonry where indicated or, if not indicated, at intervals not greater than 30 feet. Build-in related items as masonry progresses. Do not form a continu-

ous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

- B. Form control joints (**CJ**) in concrete masonry as follows:
 - 1. Fit bond-breaker strips into hollow contour in ends of concrete masonry units on one side of control joint. Fill resultant core with grout and rake joints in exposed faces, or install preformed control-joint gaskets designed to fit standard sash block.
 - 2. Install temporary foam-plastic filler in head joints on exposed sides of construction for installation of sealant and backer rod specified in Division 07, Section "Joint Protection." Keep joint free and clear of mortar, and remove filler when unit masonry is complete.
- C. Form building expansion joints (**BEJ**) in concrete masonry and brick made from clay or shale as follows:
 - 1. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete.
- D. Form expansion joints (**EJ**) in brick made from clay or shale as follows:
 - 1. Build in joint fillers of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Division 07, Section "Joint Protection." Keep joint free and clear of mortar.
- E. Build in horizontal, pressure-relieving joints where indicated; construct joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Division 07, Section "Joint Protection."
 - 1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

3.12 LINTELS

- A. Install steel lintels where indicated.
- B. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

3.13 FLASHING, WEEP HOLES, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
- B. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Unless otherwise indicated, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
- C. Install flashing as follows:
 - 1. At multiwythe masonry walls, including cavity walls, extend flashing from exterior face of outer wythe of masonry, through outer wythe, turned up a minimum of 8 inches, and through inner wythe to within 1/2 inch of the interior face of the wall in exposed masonry. Where interior surface of inner wythe is concealed by furring, carry flashing completely through inner wythe and turn flashing up approximately 2 inches, unless otherwise indicated.
 - 2. At lintels and shelf angles, extend flashing a minimum of 4 inches into masonry at each end. At heads and sills, extend flashing a minimum of 4 inches at ends and turn flashing up not less than 2 inches to form a pan.
 - 3. Cut flashing off flush with face of wall after masonry wall construction is completed.
- D. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:
 - 1. Use plastic weep hole/vents or vinyl weep hole/vents to form weep holes.
 - 2. Use wicking material to form weep holes above flashing in brick sills. Turn wicking down at lip of sill to be as inconspicuous as possible.
 - 3. Space weep holes 24 inches o.c.
- E. Cavity Drainage Material: Place cavity drainage material immediately above flashing in cavities.

- F. Install vents in vertical head joints at the top of each continuous cavity at spacing indicated. Use plastic weep hole/vents or vinyl weep hole/vents to form vents.
 - 1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.
- G. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

3.14 FIELD QUALITY CONTROL

- A. Owner will engage a qualified independent testing agency to perform field quality-control testing indicated below.
 - 1. Payment for these services will be made by Owner.
 - 2. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.
- B. Mortar properties will be tested per ASTM C 780.
- C. Grout will be sampled and tested for compressive strength per ASTM C 1019.

3.15 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Clean brick by the bucket-and-brush hand-cleaning method described in BIA Technical Notes No. 20, using job-mixed detergent solution.
 - 4. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.

3.16 MASONRY WASTE DISPOSAL

- A. Recycling: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Disposal as Fill Material: Dispose of clean masonry waste, including broken masonry units, waste mortar, and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.
 - 1. Crush masonry waste to less than 4 inches in each dimension.
 - 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Division 31, Section "Earthwork."
 - 3. Do not dispose of masonry waste as fill within 18 inches of finished grade.
- C. Excess Masonry Waste: Remove excess, clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 Method of Measurement: Measurement of Masonry related item(s) (Section 042000) shall be measured for payment per the unit indicated in the Itemized Proposal.
- 4.2 Basis of Payment: Payment for Masonry related item(s) (Section 042000) shall be paid at the contract unit price indicated in the Itemized Proposal. The price shall constitute full compensation for furnishing labor, materials, equipment, incidental items, expenses, complete and in place as specified by the Contract Documents and Standard Specifications.

END OF SECTION 04 20 00



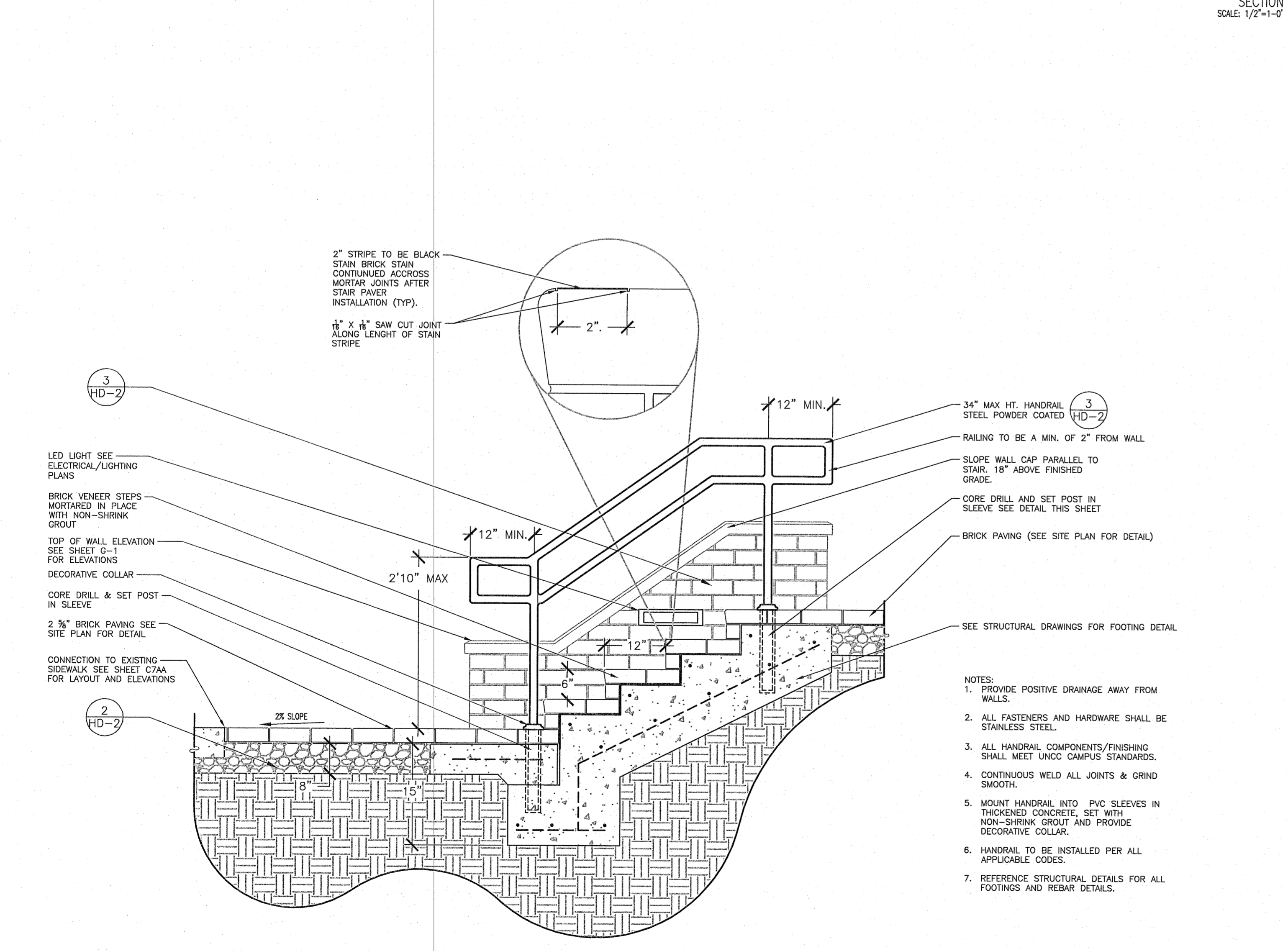
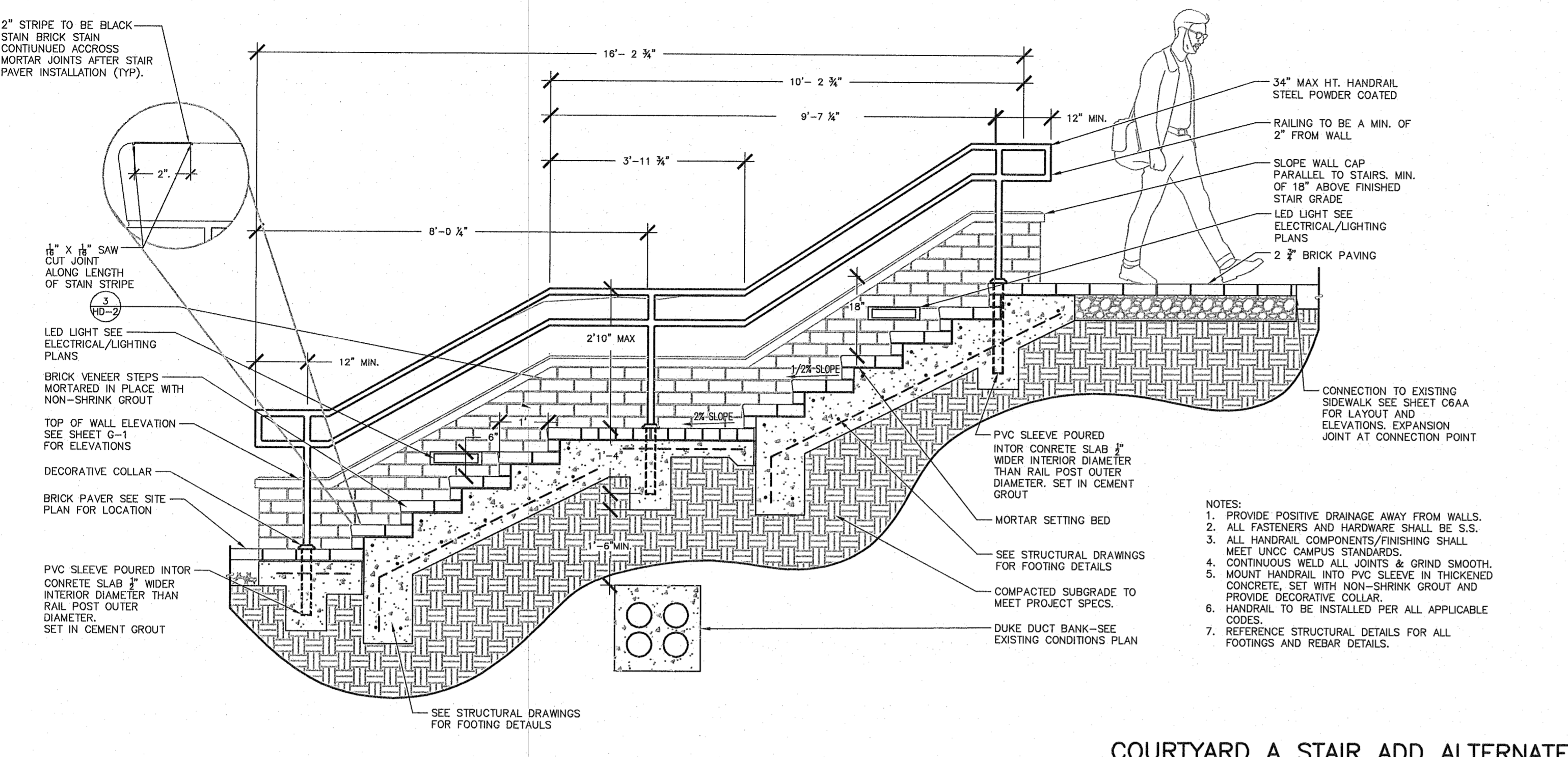
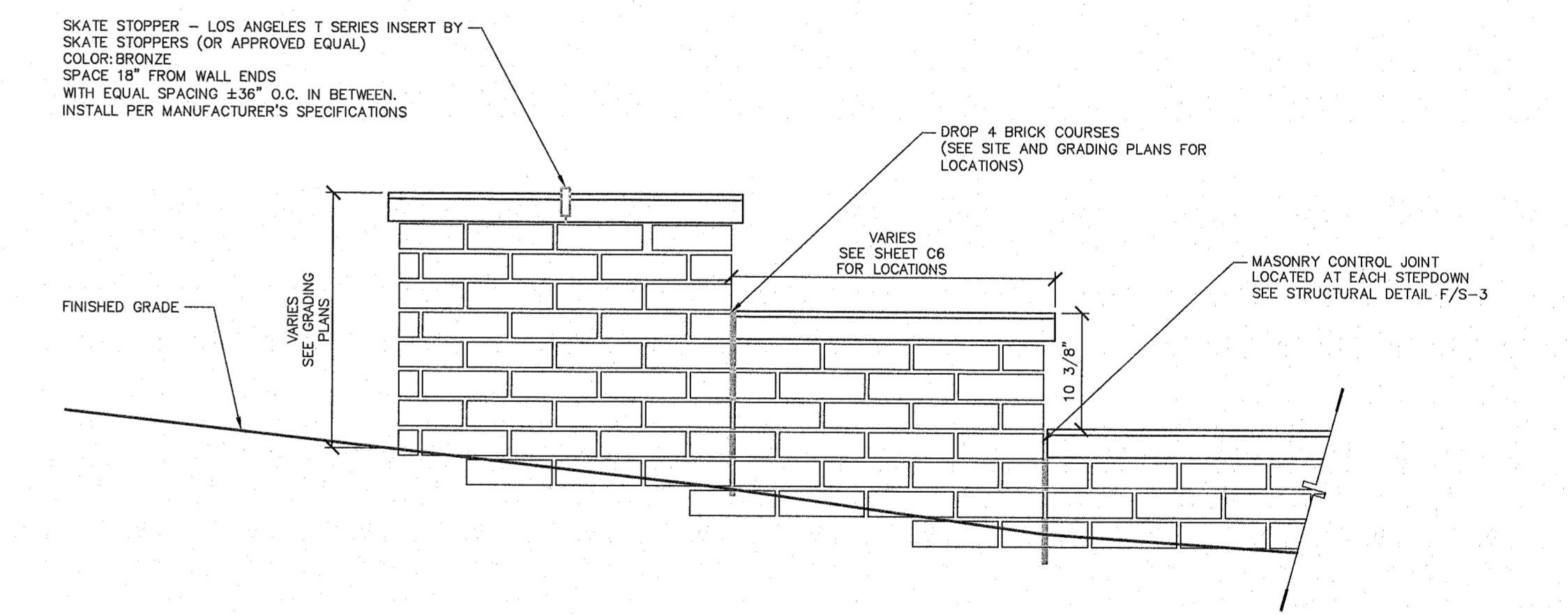
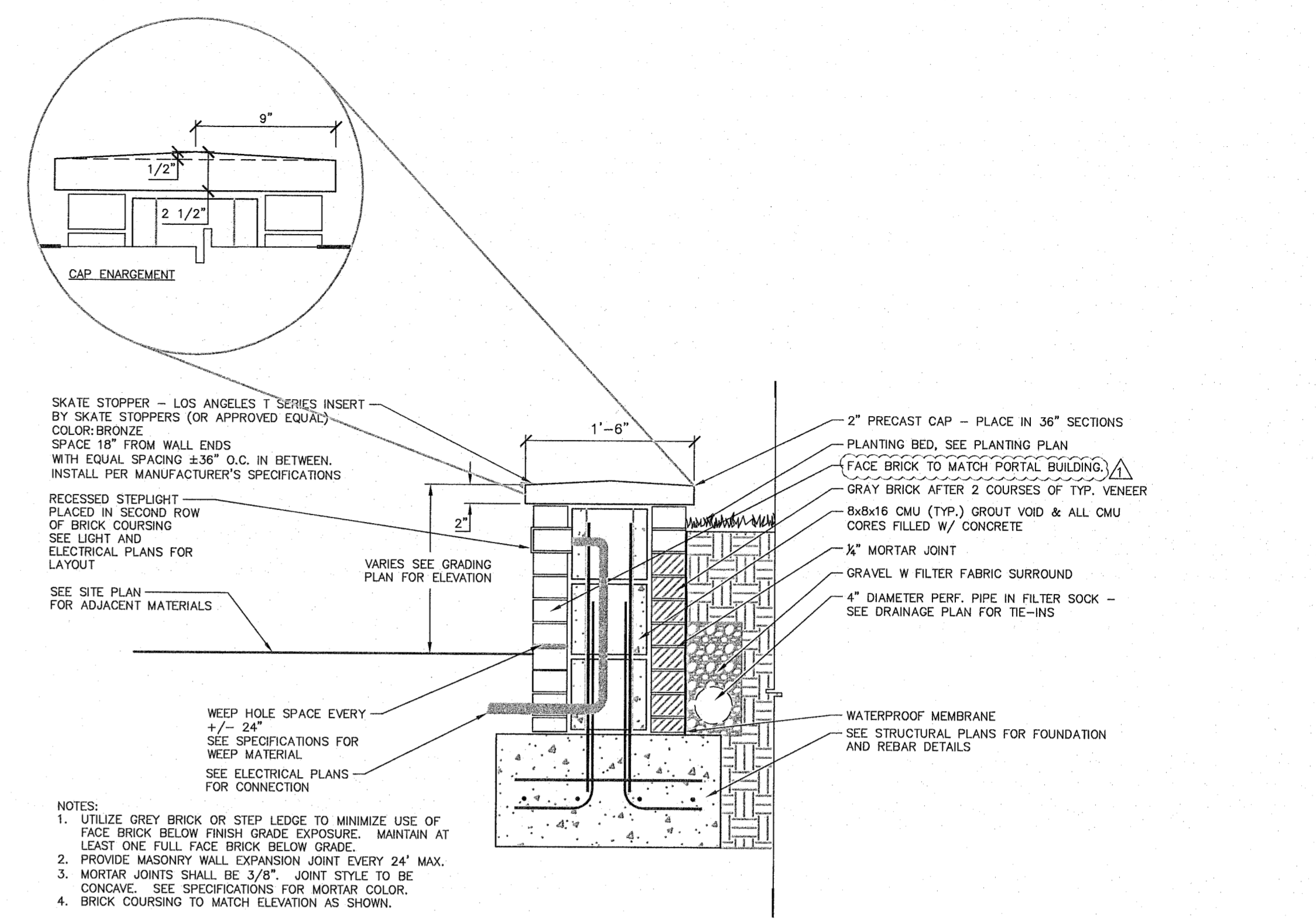
REVISIONS:

NO.	DESCRIPTION

OWNER:
 UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
 CHARLOTTE, NC 28223

CRI ENTRANCE IMPROVEMENTS
CONSTRUCTION DRAWINGS
 CHARLOTTE, MECKLENBURG COUNTY, NORTH CAROLINA
HARDSCAPE DETAILS

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 DRAWN BY: ANL
 SCALE: VARIES
 DATE: 2018-02-05
 SHEET No. **HD-2**

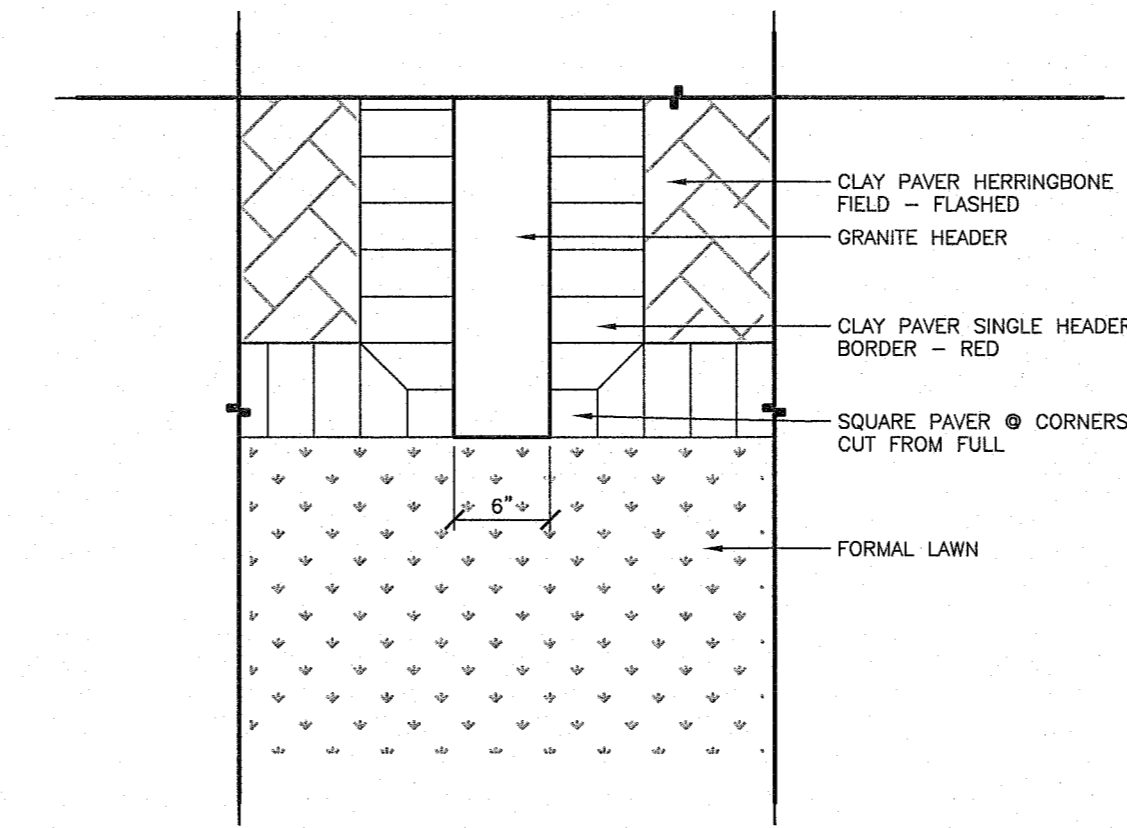
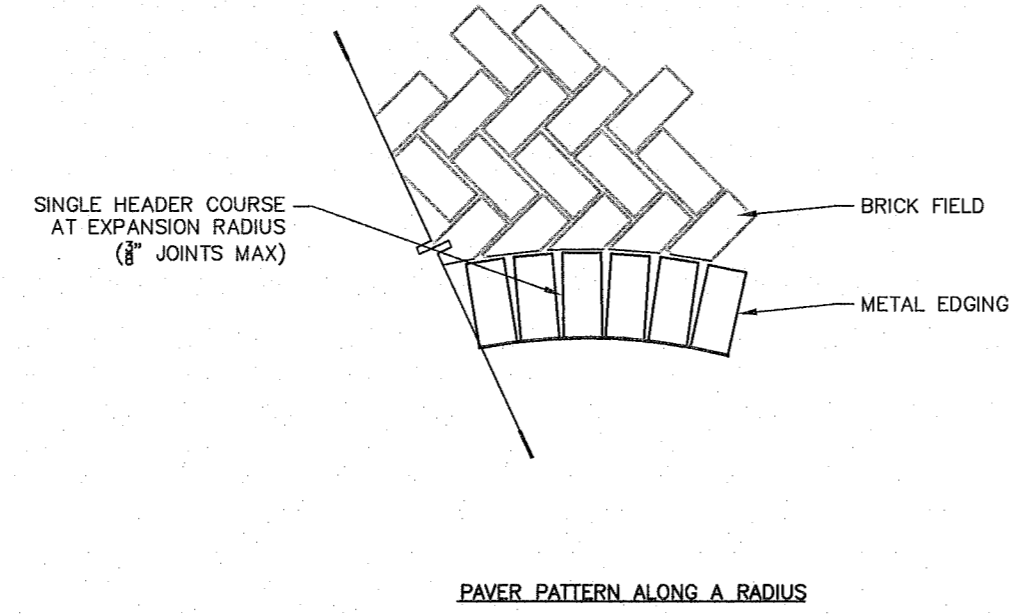
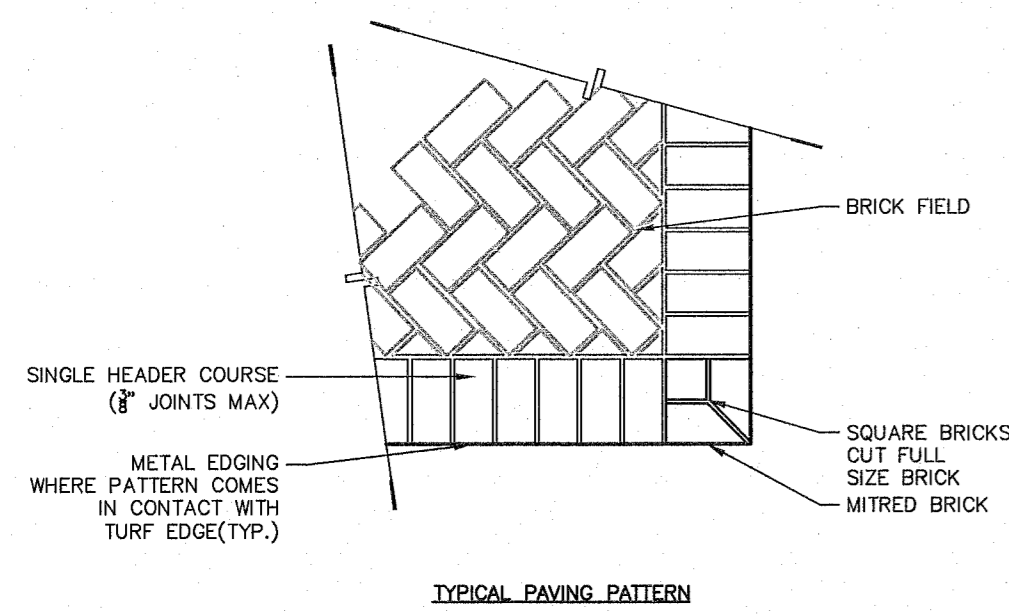


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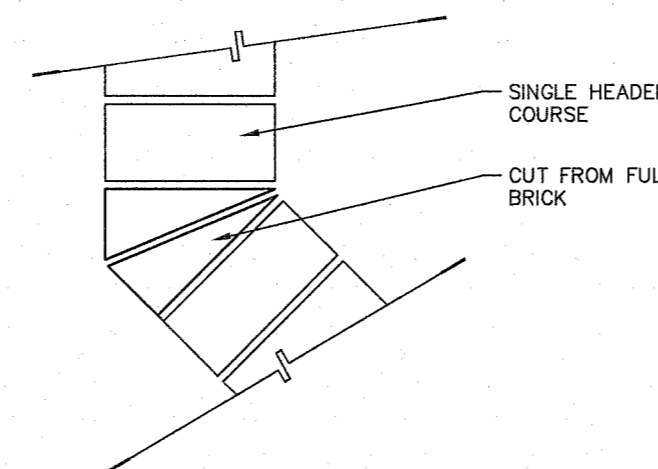
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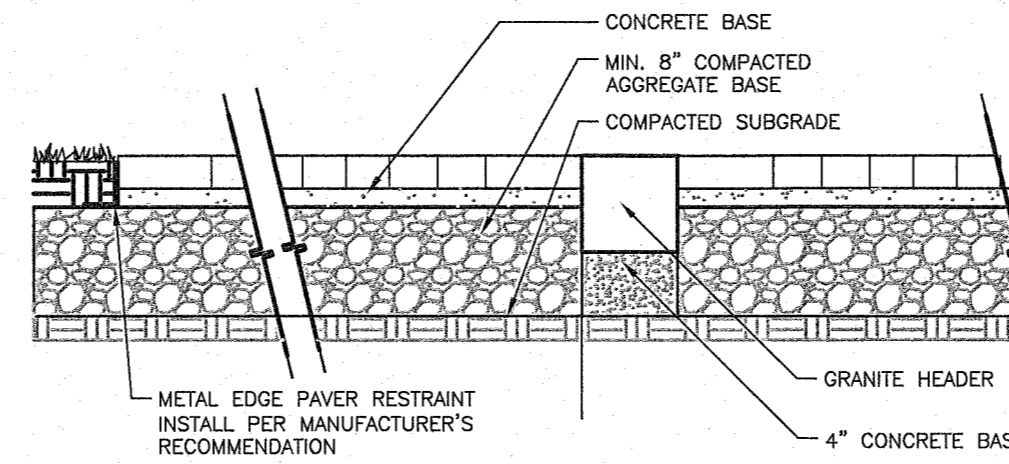
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- NOTES:
1. SEE SITE PLAN FOR PAVER PATTERN DIRECTION
 2. CLAY PAVERS SHALL HAVE 1/8\"/>
 - 3. ALL WALKS SHALL HAVE POSITIVE DRAINAGE. SEE GRADING PLAN



BRICK PATTERNING
PLAN
SCALE: 1'-0\"/>



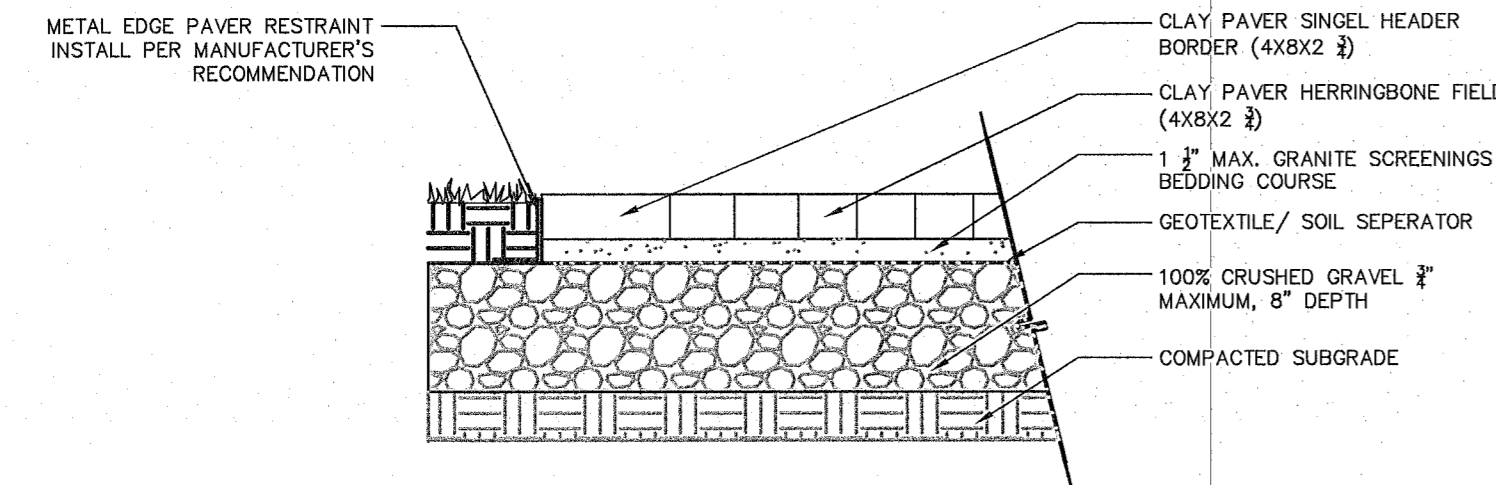
- NOTES:
1. SEE SITE PLAN FOR PAVER PATTERN DIRECTION.
 2. CLAY PAVERS SHALL HAVE 1/8\"/>
 - 3. ALL WALKS SHALL HAVE POSITIVE DRAINAGE. SEE GRADING PLAN.

MANUFACTURER INFORMATION

BRICK PAVER
CLAY PAVER FIELD & BORDERS
ENGLISH EDGE
BY PINE HALL BRICK (OR APPROVED EQUAL)
FIELD:
SIZE: 4\"/>

METAL EDGE PAVER RESTRAINT
4000 SERIES HEAVY DUTY \"L\" SHAPED ALUMINUM EDT RESTRAINT BY CURV-RITE (OR APPROVED EQUAL)
SIZE: 4\"/>

GRANITE HEADER
PLAN/SECTION
SCALE: NTS



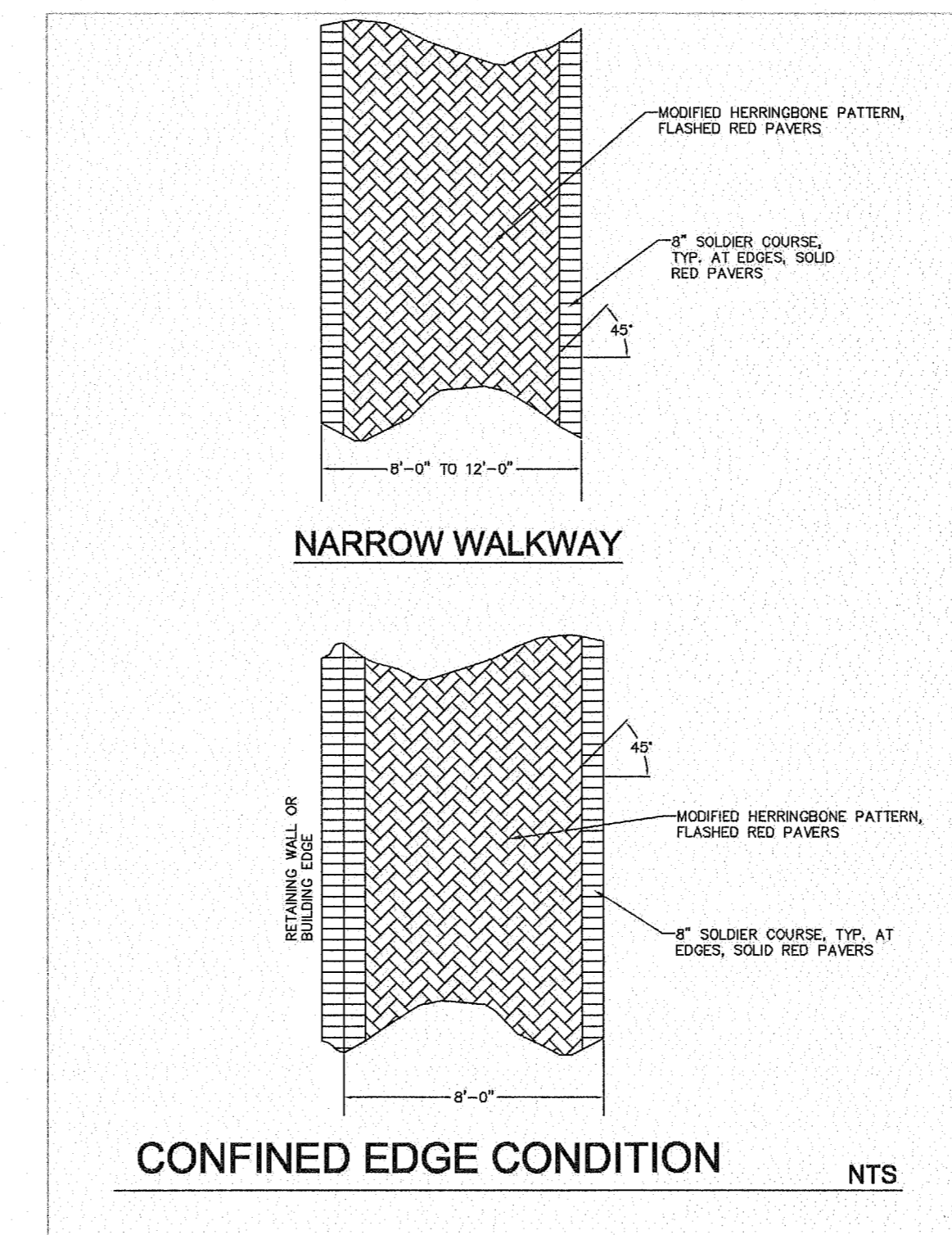
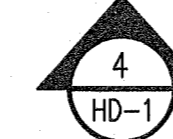
- NOTES:
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 2. CLAY PAVERS SHALL HAVE 1/8\"/>
 - 3. ALL WALKS SHALL HAVE POSITIVE DRAINAGE. SEE GRADING PLAN

MANUFACTURER INFORMATION

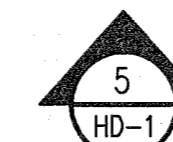
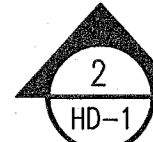
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CLAY PAVER FIELD & BORDERS
ENGLISH EDGE
BY PINE HALL BRICK (OR APPROVED EQUAL)
FIELD:
SIZE: 4\"/>

METAL EDGE PAVER RESTRAINT
4000 SERIES HEAVY DUTY \"L\" SHAPED ALUMINUM EDT RESTRAINT BY CURV-RITE (OR APPROVED EQUAL)
SIZE: 4\"/>

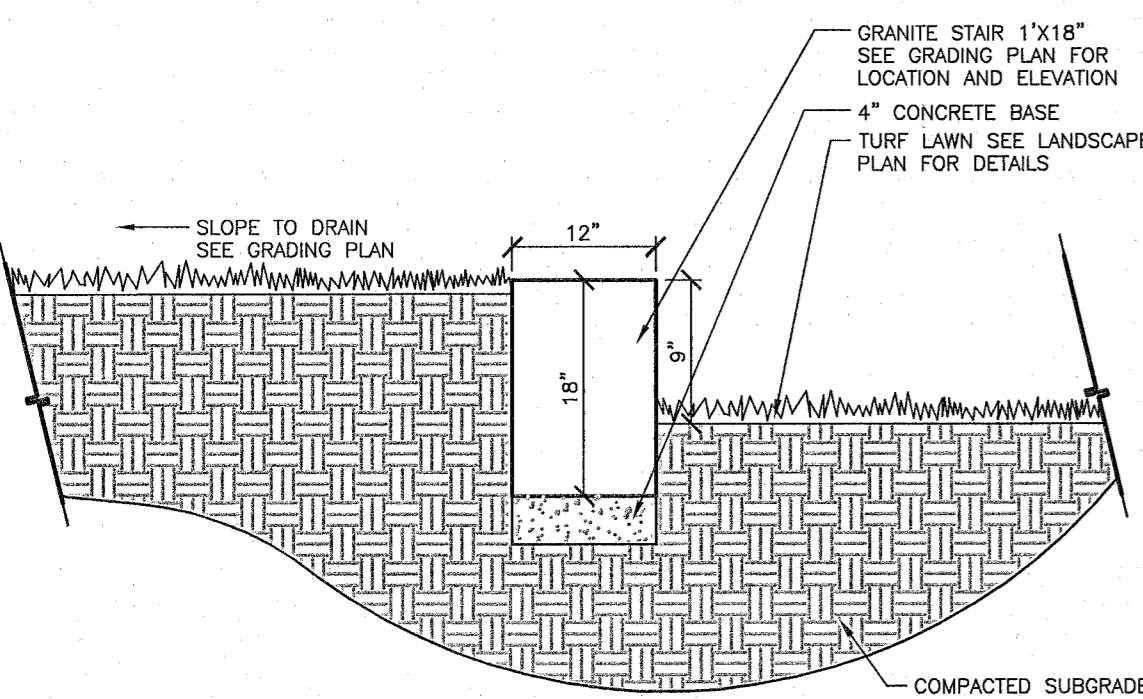
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SECTION
SCALE: 1'-0\"/>



GRANITE CURB STAIR
SECTION
SCALE: 1'-0\"/>



BRICK PAVER COURSING
SECTION
SCALE: NTS



CONFINED EDGE CONDITION NTS

NARROW WALKWAY

- GENERAL DETAIL NOTES:**
1. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND REPORT ANY DISCREPANCIES AND UNUSUAL CONDITIONS TO DESIGNER PRIOR TO CONSTRUCTION.
 2. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH FEDERAL, STATE, AND LOCAL CODES AND REGULATIONS.
 3. THESE NOTES SHALL APPLY TO ALL DETAILS INCLUDED IN THE SET OF CONTRACT DOCUMENTS.
 4. ALL CONCRETE SHALL BE 3,000 PSI OR PER PROJECT SPECIFICATIONS/GEOTECH REQUEST.
 5. CONSTRUCT WATER-TIGHT EXPANSION JOINTS WHERE WALKS MEET CURBS, STEPS, WALLS, OR FIXED SLABS.
 6. BOLTS, THREADED RODS, WASHERS, NUTS AND ALL BUILDING HARDWARE SHALL BE HOT-DIPPED GALVANIZED.
 7. ALL THROUGH BOLTS TO BE SMOOTH SHAFT WITH GALVANIZED NUTS, BOLTS AND WASHERS.
 8. ALL NAILS SHALL BE HOT DIPPED GALVANIZED. FINISH NAILS SHALL BE ANNULAR ALLOY ALUMINUM.
 9. ALL WELDS CONTINUOUS.
 10. INSTALL ALL SITE FURNISHINGS PLUM, LEVEL, TRUE TO LINE AND AT ELEVATIONS INDICATED.
 11. RESTORE DAMAGED FINISHES AND REPLACE DAMAGED OR DEFECTIVE UNITS.
 12. SUBMIT SHOP DRAWINGS, PRODUCT DATA AND MAINTENANCE DATA FOR APPROVAL PRIOR TO PURCHASING, FABRICATION AND INSTALLATION.
 13. CONTRACTOR TO PROVIDE MOCK-UPS FOR ALL SITE PAVING TO BE USED THROUGHOUT PROJECT TO DEMONSTRATE ALL JOINT PATTERNS.
 14. CONTRACTOR TO PROVIDE SHOP DRAWINGS TO DESIGNER OF ALL REQUIRED WALL.
 15. ALL AGGREGATE BASE SHALL BE COMPACTED TO PROJECT SPECIFICATIONS.
 16. GRANITE TO HAVE FINE, UNIFORM GRAIN AND LIGHT GRAY IN COLOR. CONTRACTOR TO SUBMIT SAMPLE FOR APPROVAL.

THE JOHN R. MCADAMS COMPANY, INC.
9486 Torrington Way
Suite 110
Charlotte, North Carolina 28277
License No.: C-0298
(800) 753-5646 • McAdamsCo.com



REVISIONS:

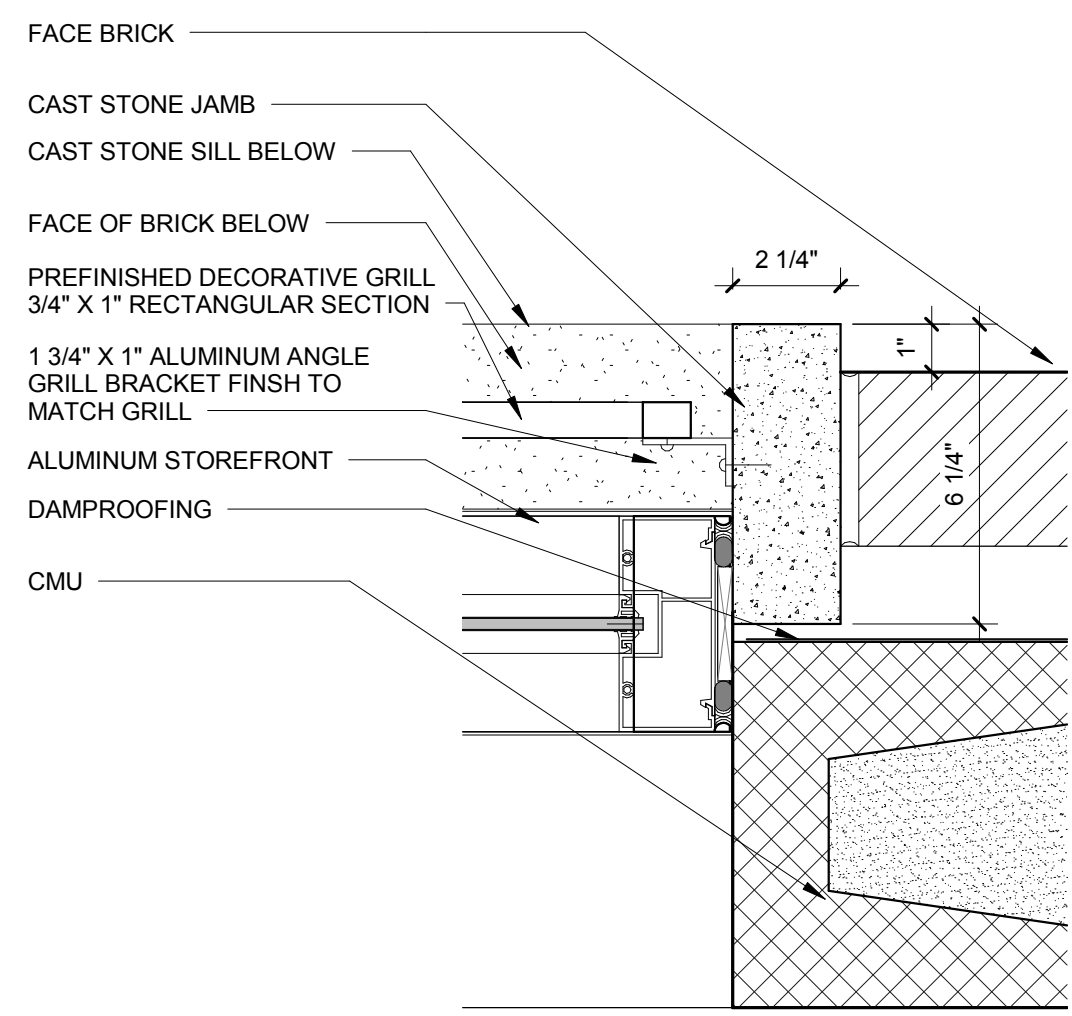
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OWNER:
UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
CHARLOTTE, NC 28223

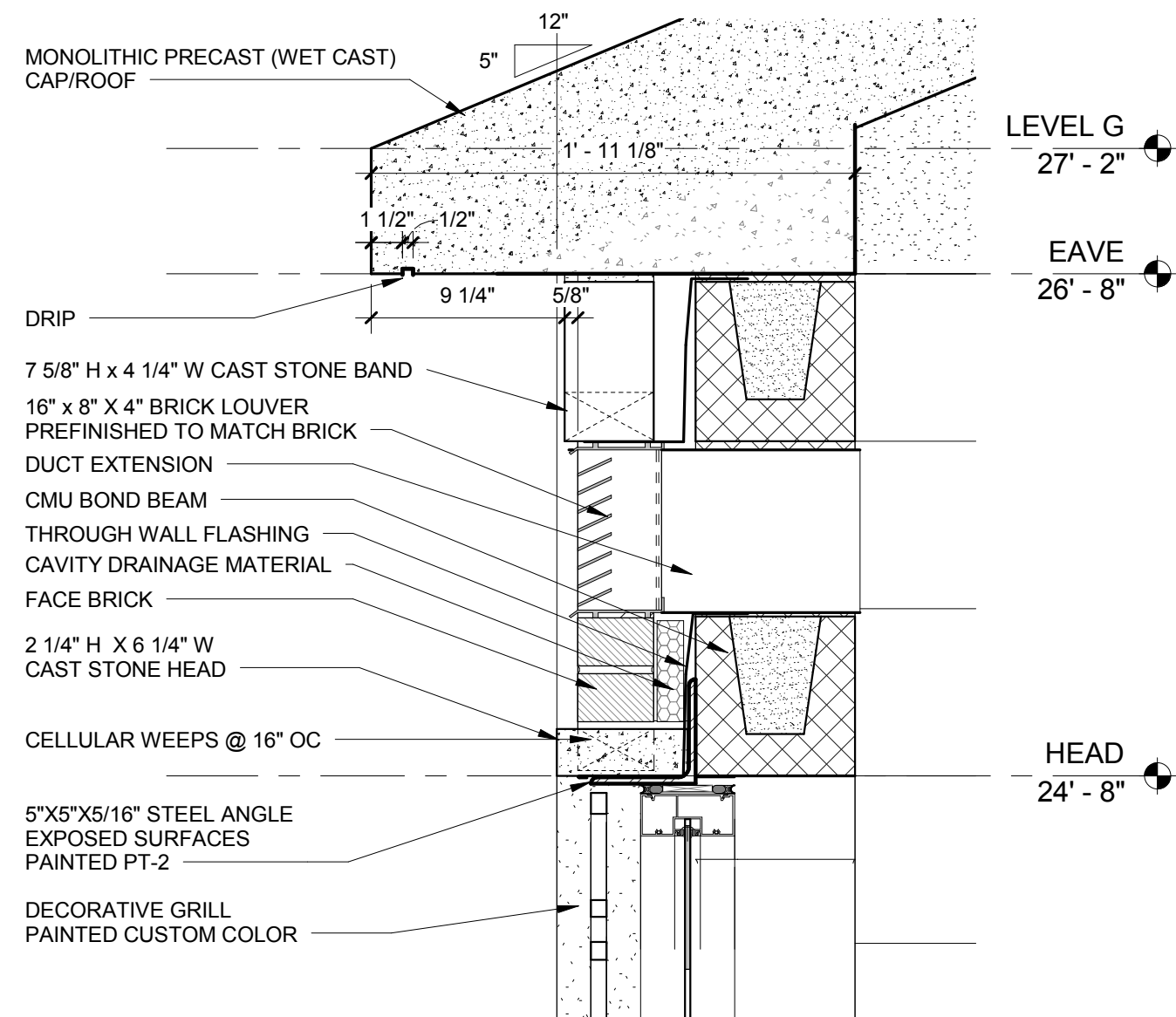
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CHARLOTTE, MECKLENBURG COUNTY, NORTH CAROLINA
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SHEET NO.:	HD-1

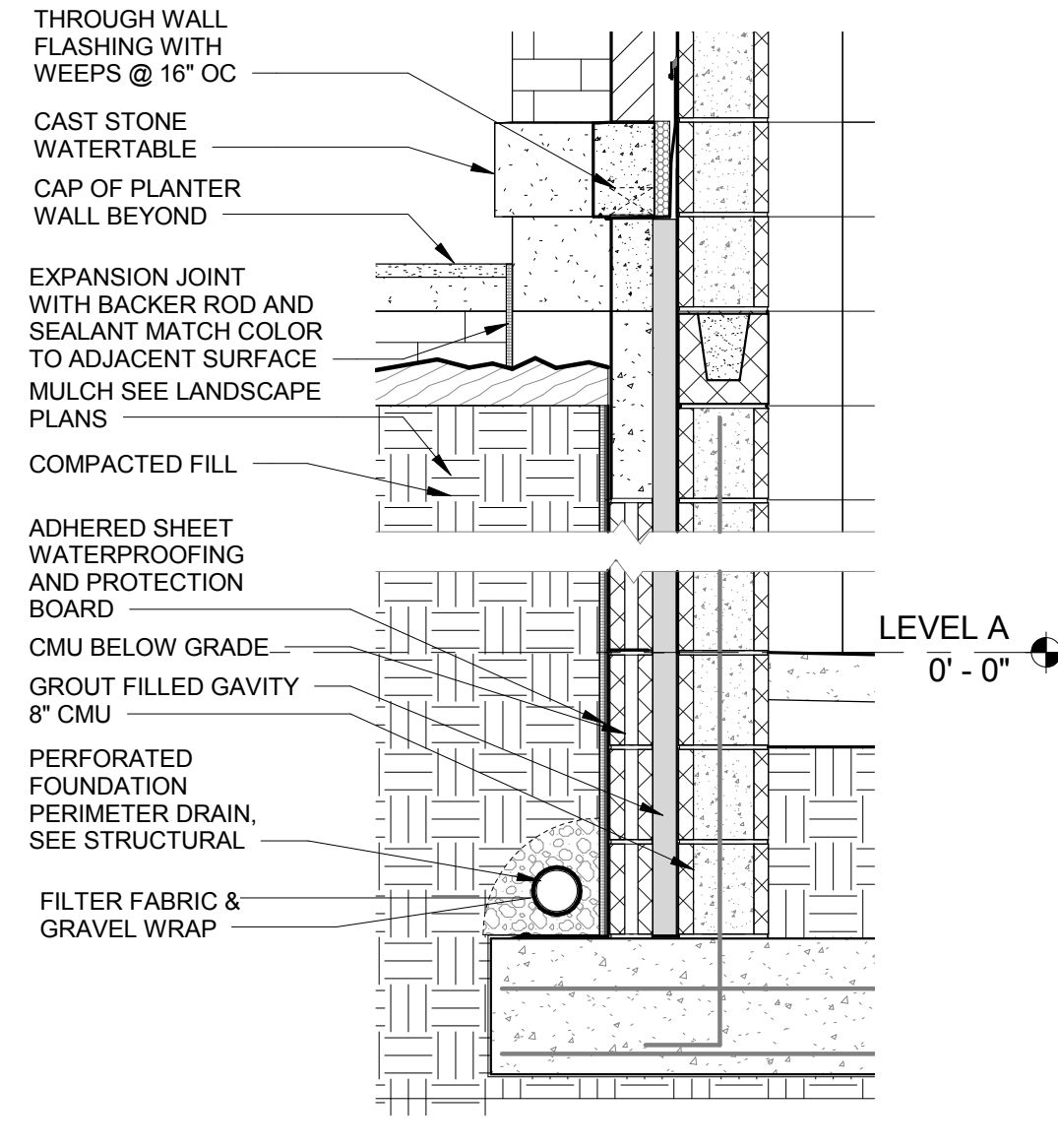
McAdams



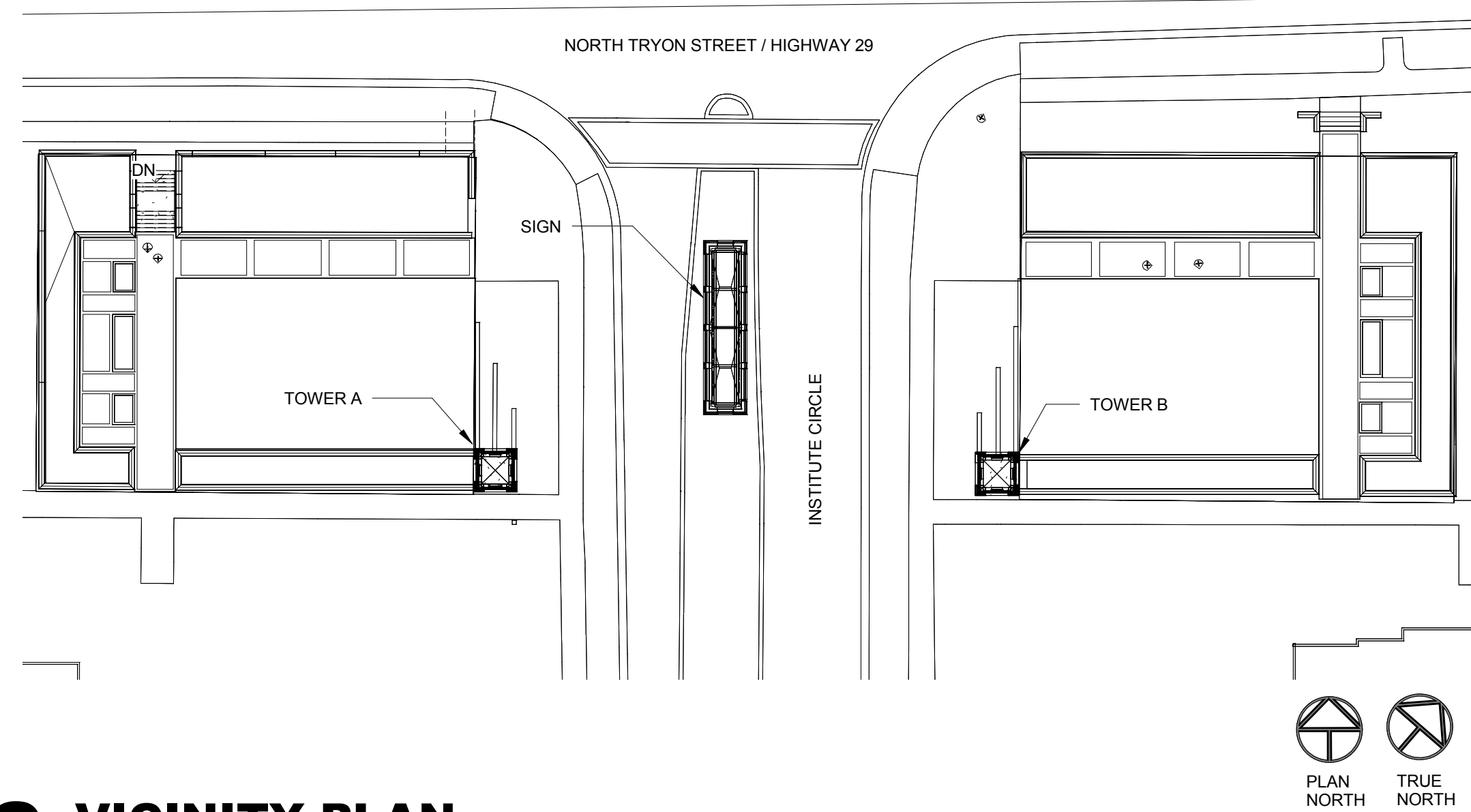
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SCALE: 3" = 1'-0"



4 DETAIL HEAD / EAVE
SCALE: 1 1/2" = 1'-0"



5 SECTION @ PLANTER
SCALE: 3/4" = 1'-0"



6 VICINITY PLAN
SCALE: 1/32" = 1'-0"

GENERAL NOTES

- PROJECT INCLUDES TWO IDENTICAL TOWERS. THE EAST TOWER A IS SHOWN AND THE WEST TOWER B IS OPPOSITE HAND.
- MASONRY DIMENSIONS ARE NOMINAL TO FACE OF MASONRY.
- SLOPE TOP OF PRECAST 1/4" / 12" MINIMUM
- FACE BRICK SHALL MATCH SIZE, COLOR AND TEXTURE OF THE EXISTING PORTAL BUILDING. PROVIDE SAMPLES FOR OWNER AND ARCHITECT APPROVAL 14 CALENDAR DAYS PRIOR TO BID DATE.

WINDOW TAG (1t) PLAN VIEW CONTROL / EXP. JOINT

DOOR TAG (101) WALL TAG (W42.1)

EQUIPMENT TAG (1i) COLUMN GRID (0)

ROOM TAG Room name (101) ROOM SCHEDULE NO.

CEILING TAG (APC) 1'-0" MATERIAL HEIGHT AFF

DETAIL SECTION (XX-XXXXX) DETAIL NO. SHEET NO. DIRECTION OF VIEW

ELEVATION CALLOUT (1 Ref) 1 Ref (A101) 1 Ref SHEET NO.

DETAIL AREA CALLOUT (1 SIM) DETAIL NO. SHEET NO. DETAIL AREA

WALL & BUILDING SECTION CALLOUT (A101) DIRECTION OF VIEW DETAIL NO. SHEET NO.

SECTION ELEVATION LEVEL NAME (100'-0") ELEVATION ABOVE FIRST FLOOR GRADE

SPOT ELEVATION (1'-0")

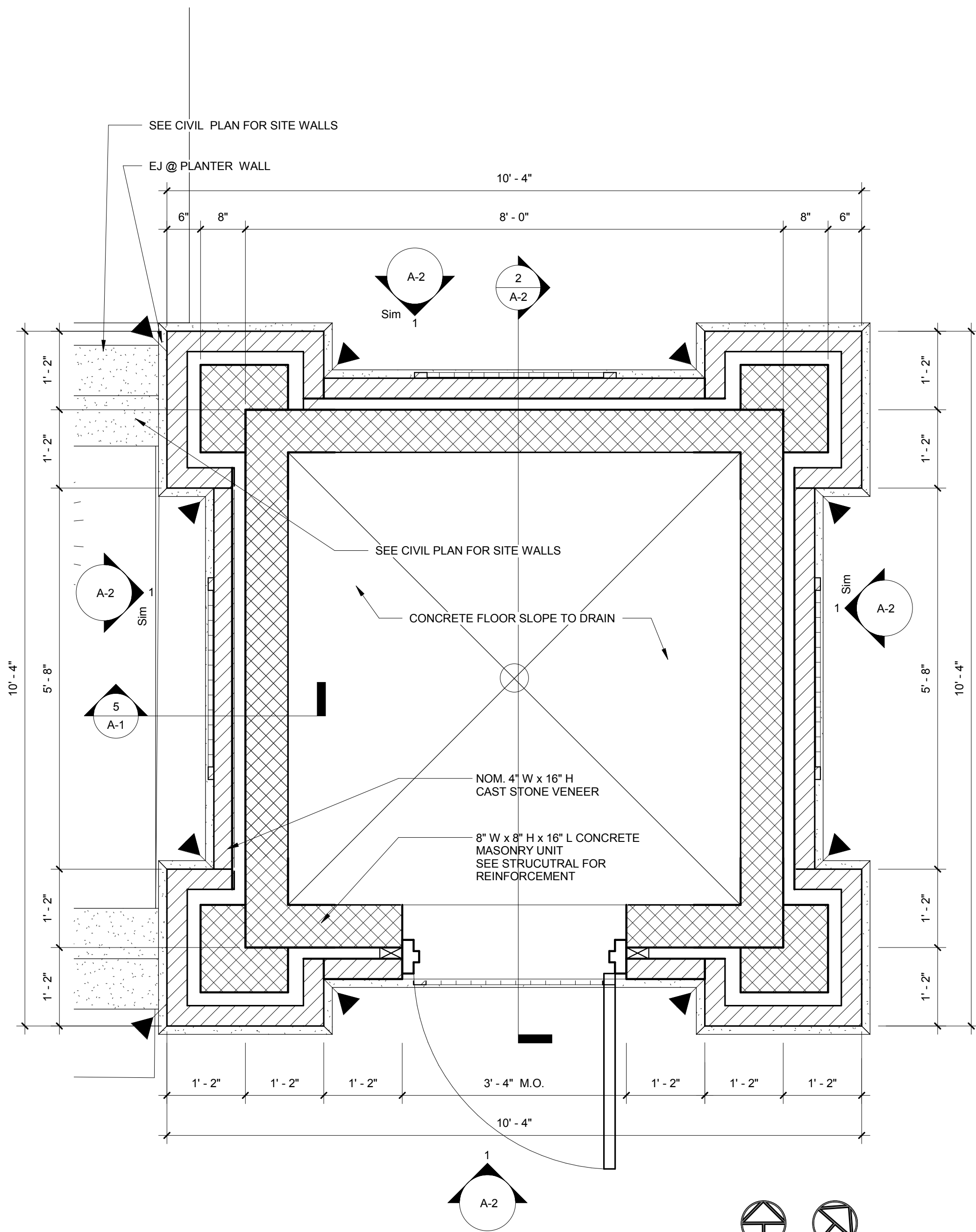
BRICK (SECTION)

CONCRETE OR PRECAST

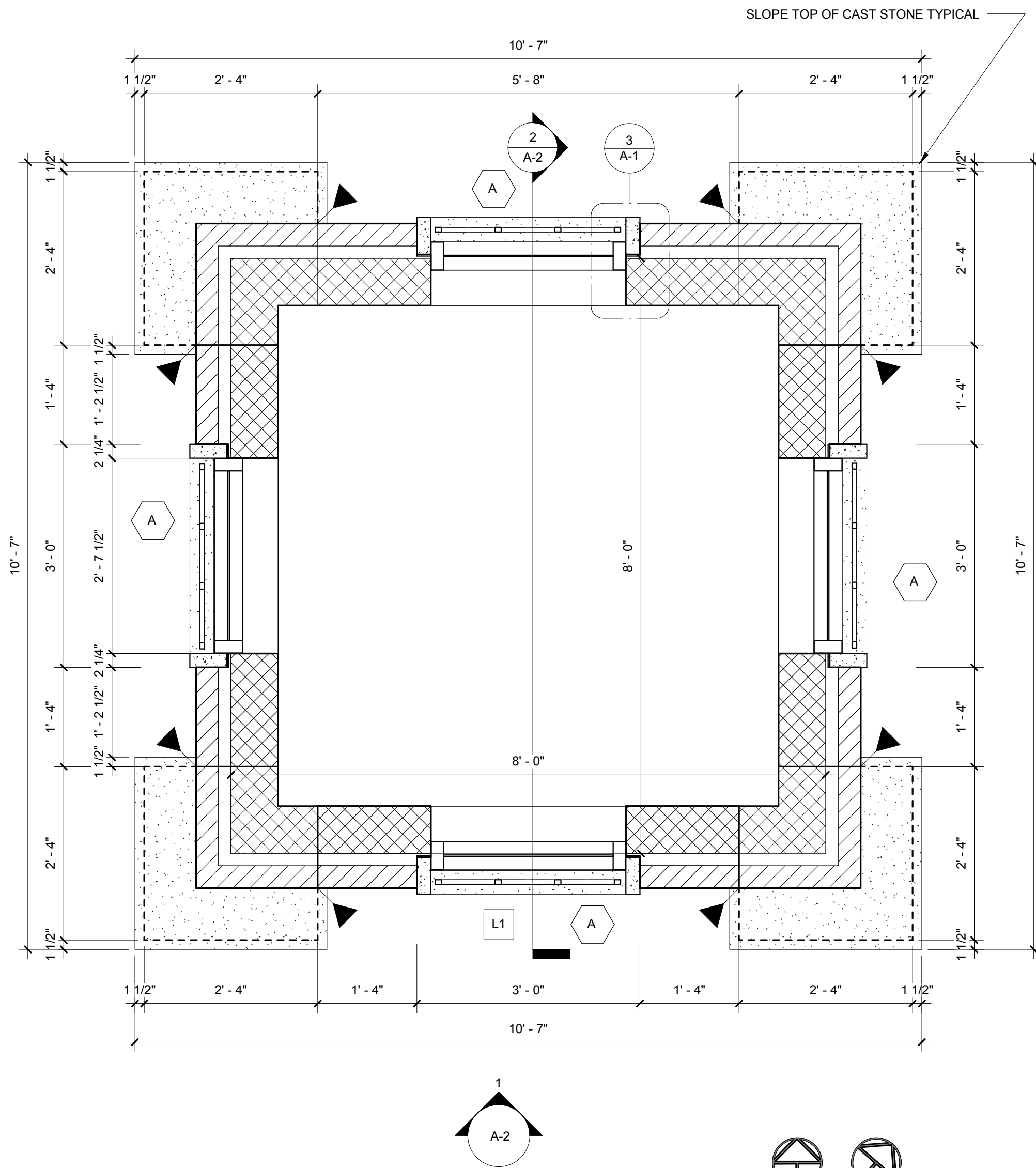
CMU (SECTION)

EARTH

SYMBOLS LEGEND
SCALE: 12" = 1'-0"



1 FLOOR PLAN
SCALE: 3/4" = 1'-0"



2 PLAN ABOVE PILASTERS
SCALE: 3/4" = 1'-0"

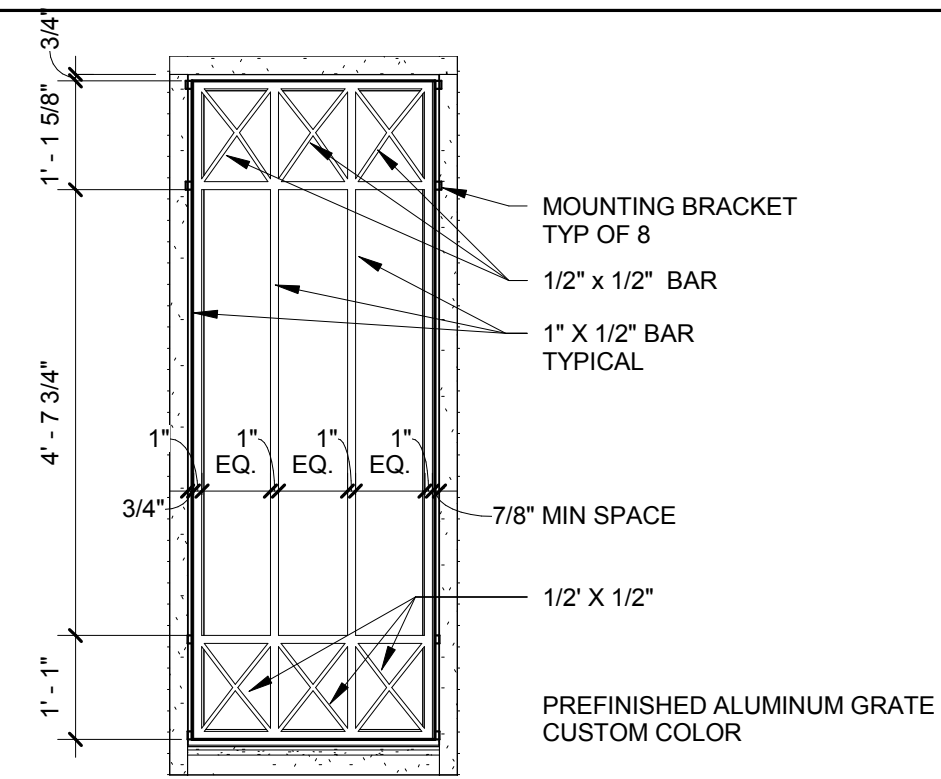
NO.	DATE	DESCRIPTION
1	2018-0226	ADD 1

NO.	DATE	DESCRIPTION
1	2018-0226	ADD 1

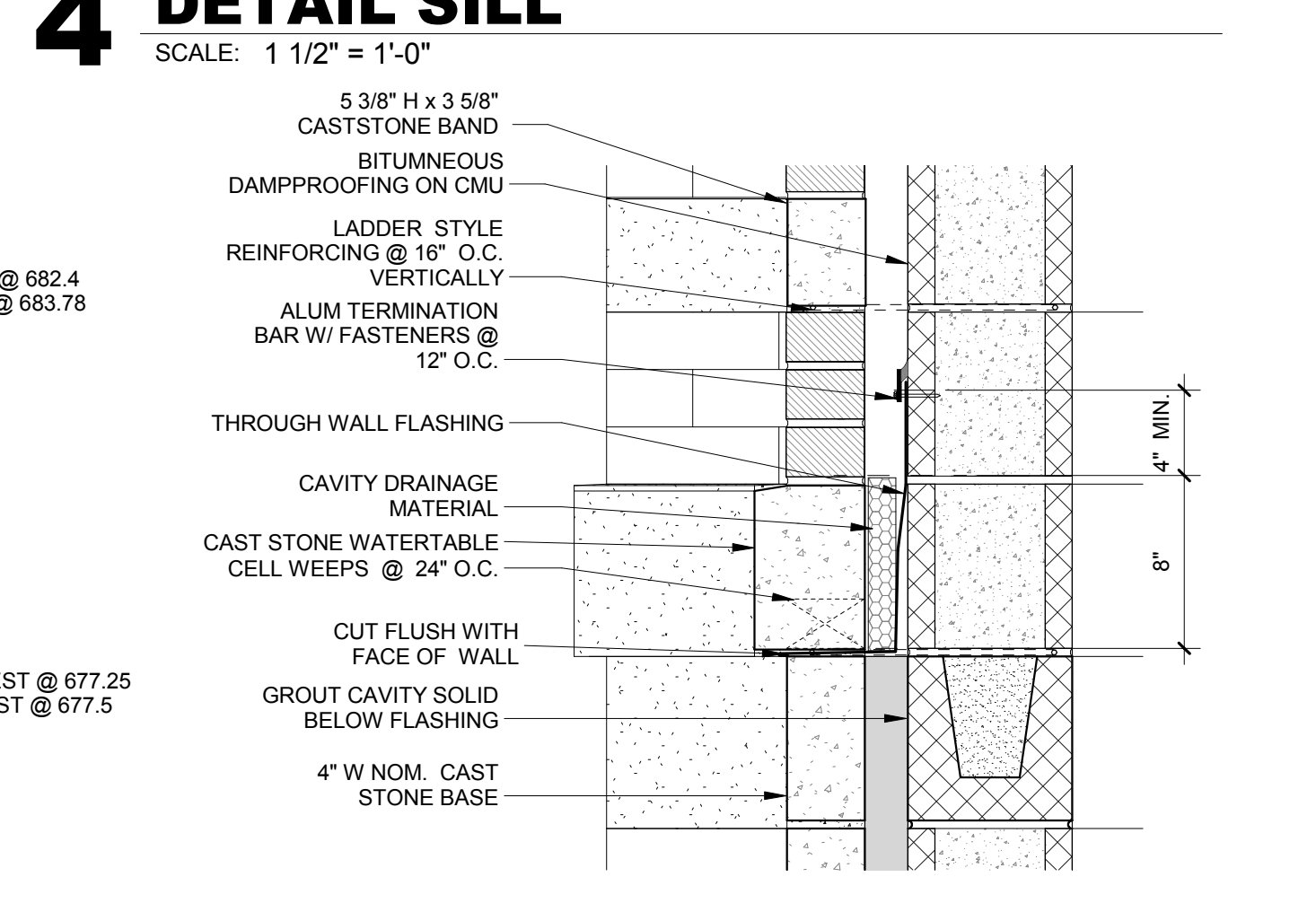
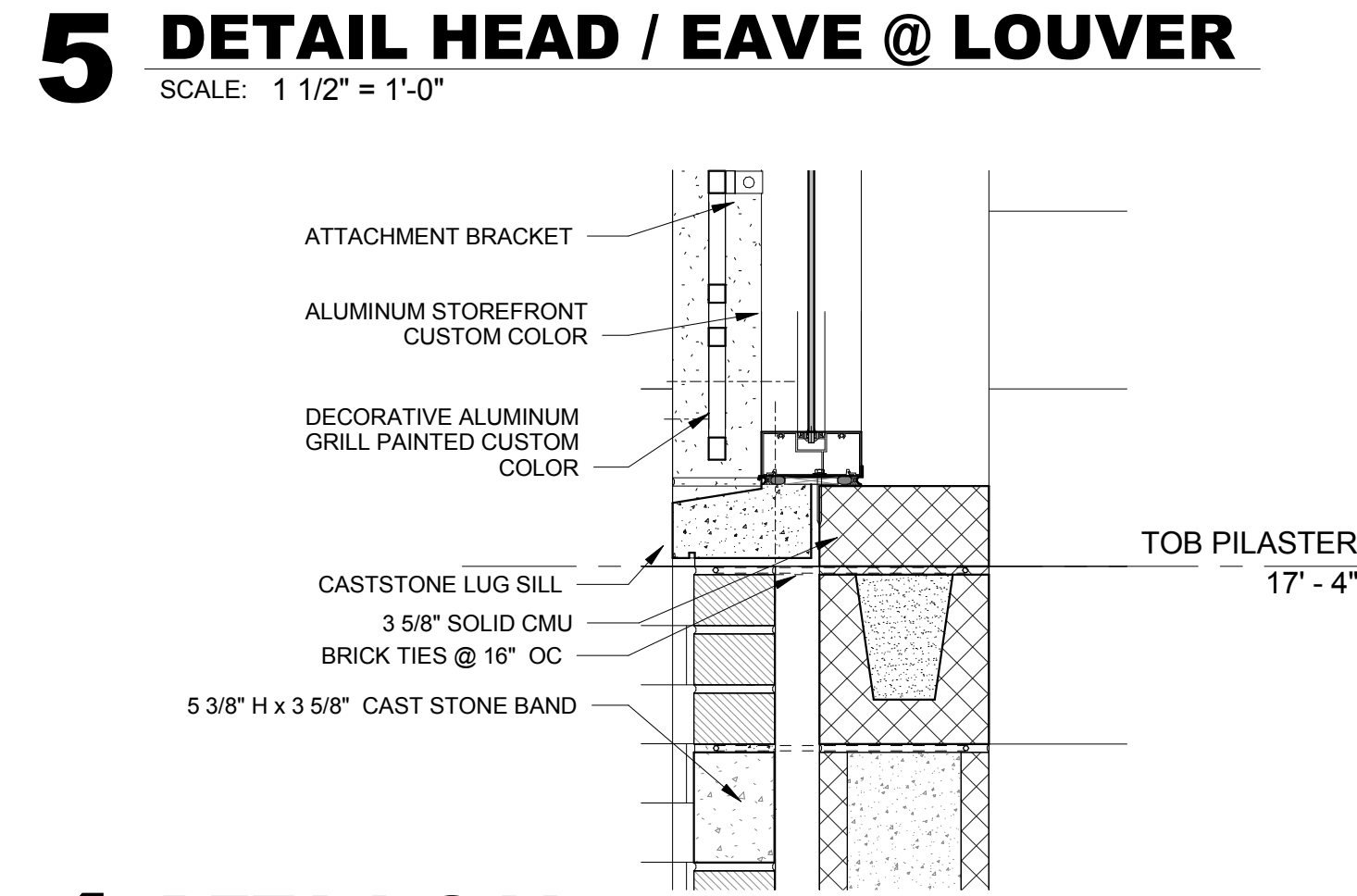
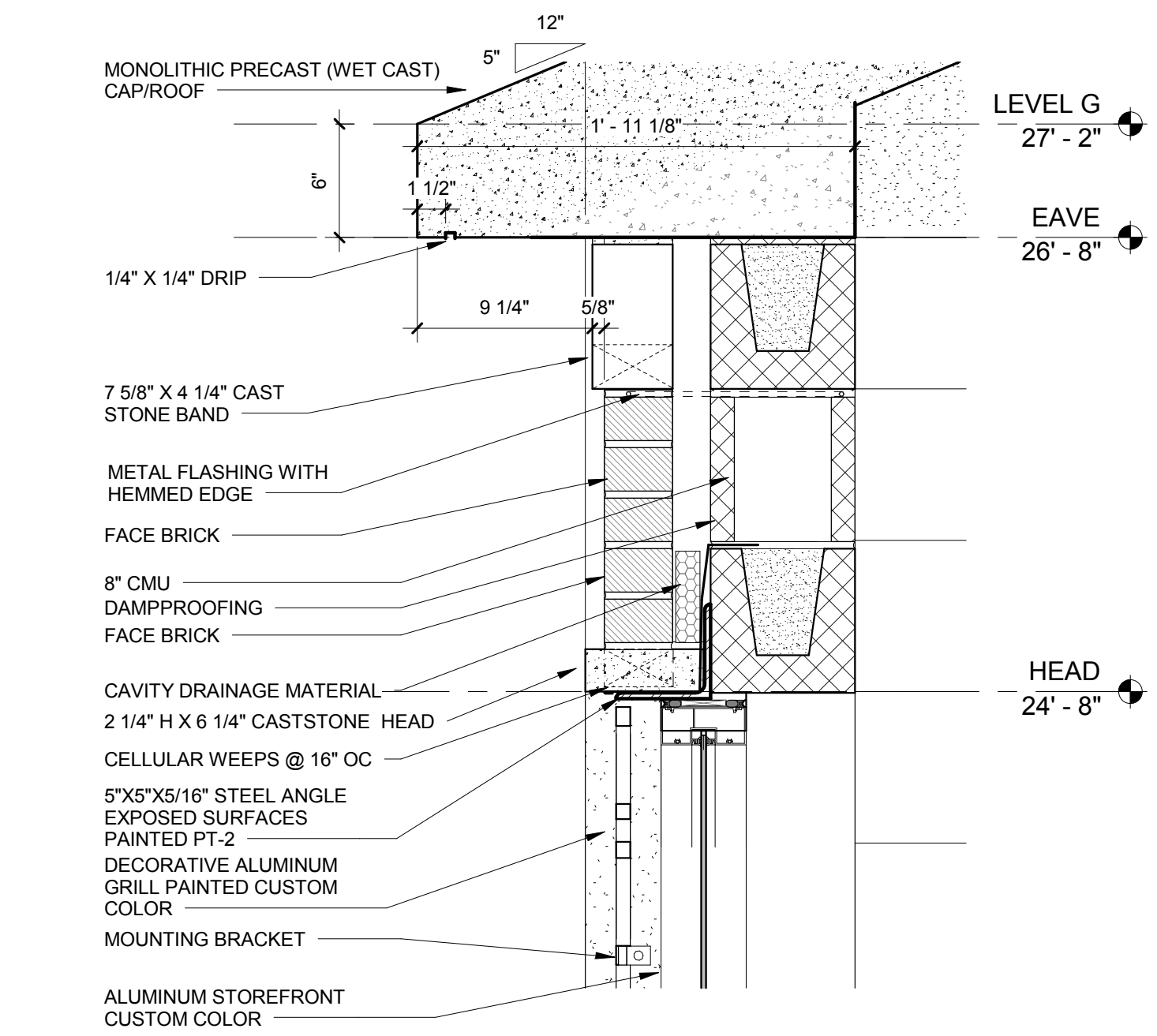
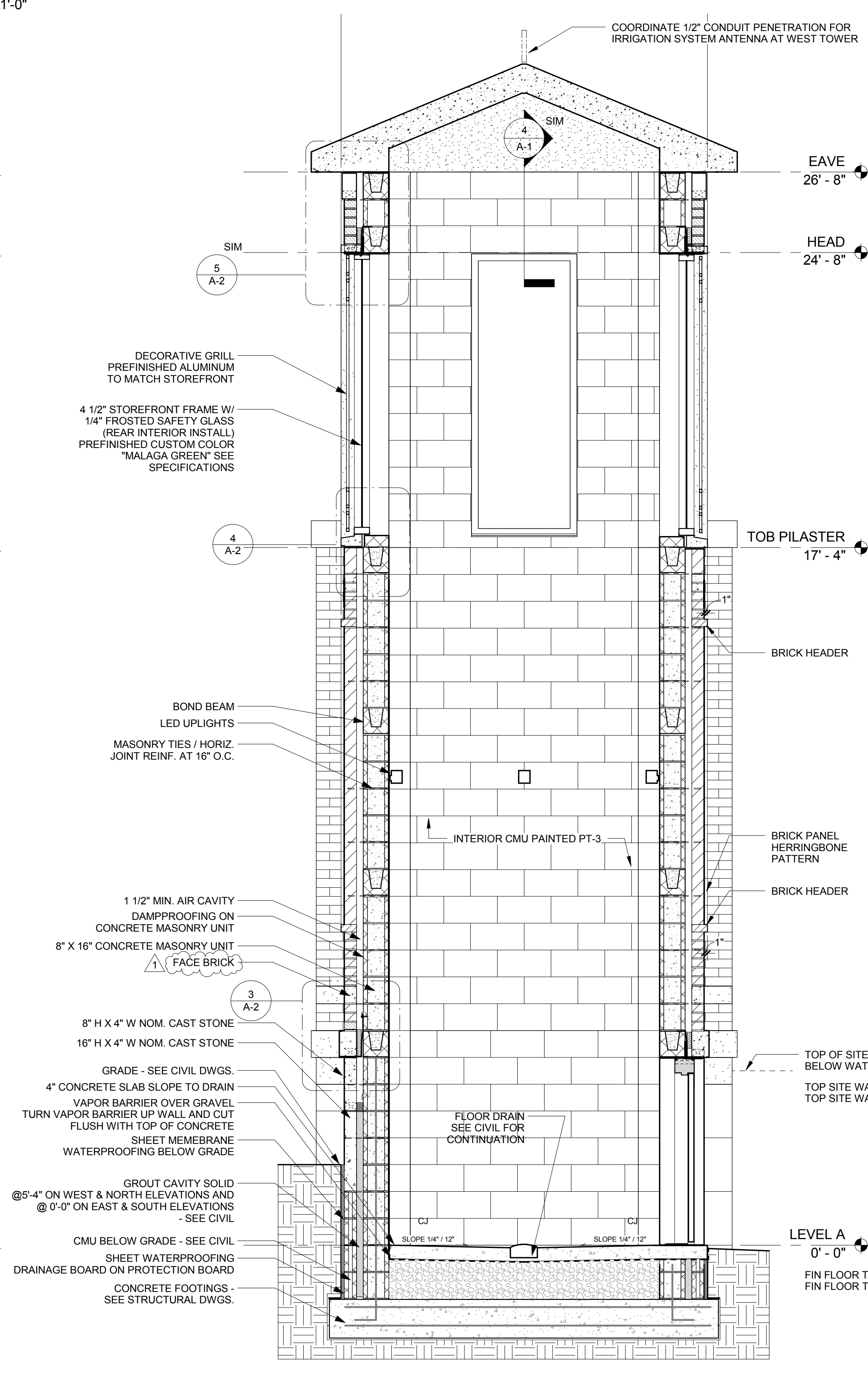
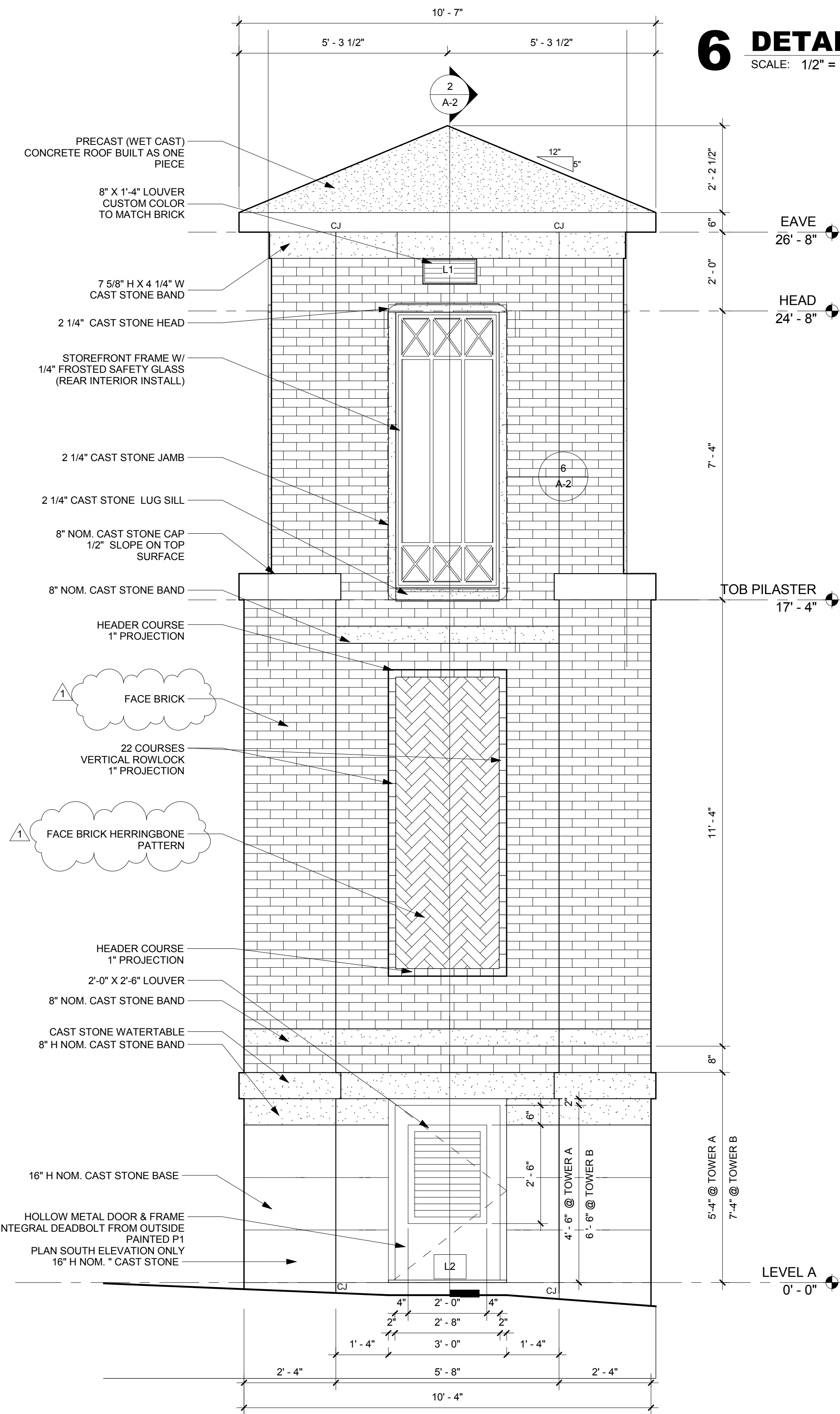
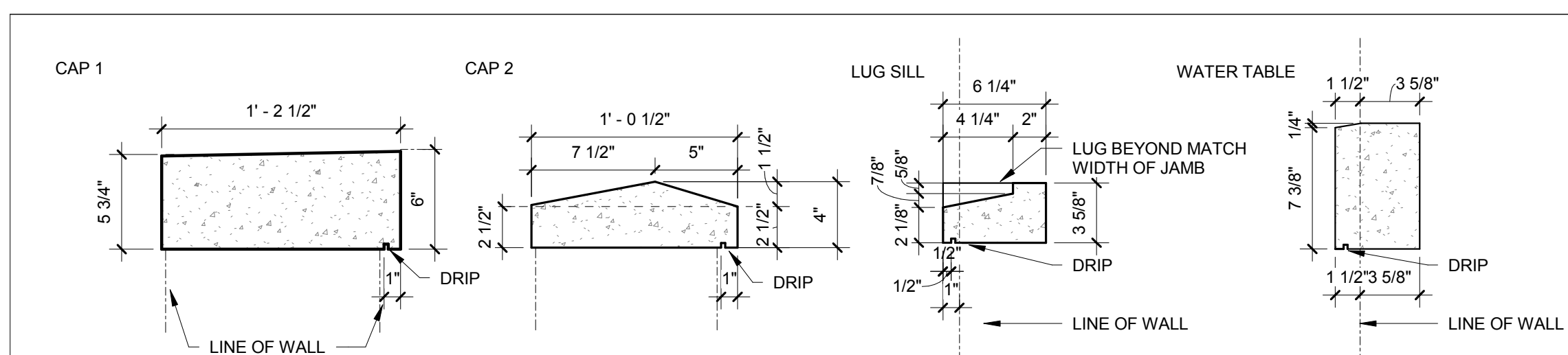
UNIVERSITY OF
NORTH CAROLINA
AT CHARLOTTE
CHARLOTTE, NC 28213

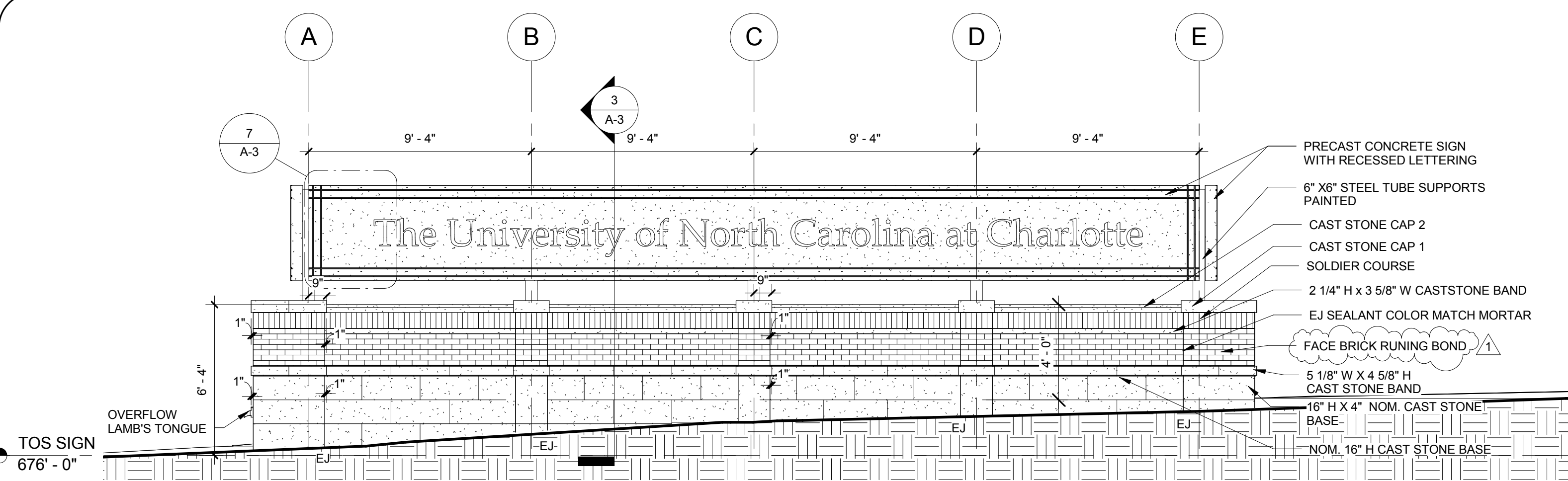
UNCC CRI ENTRY
BID SET - NOT FOR CONSTRUCTION
CHARLOTTE, MECKLENBURG COUNTY, NORTH CAROLINA
Elevation & Section

PROJECT NO.	2512
CHECKED BY:	GRL
DRAWN BY:	MAH/GEP
DATE:	02-26-2018
SHEET:	A-2

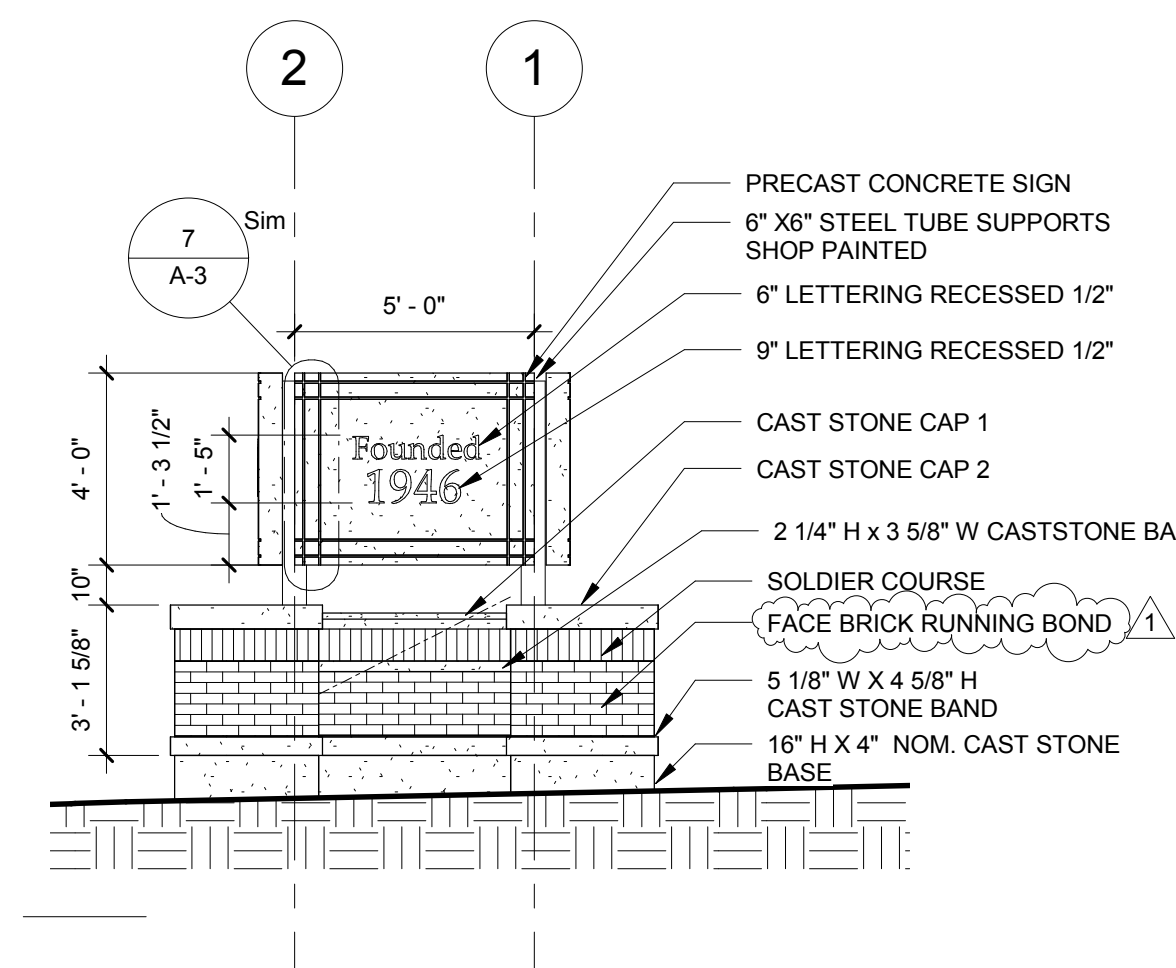


7 CAST STONE SPECIAL SHAPES
SCALE: 1 1/2" = 1'-0"

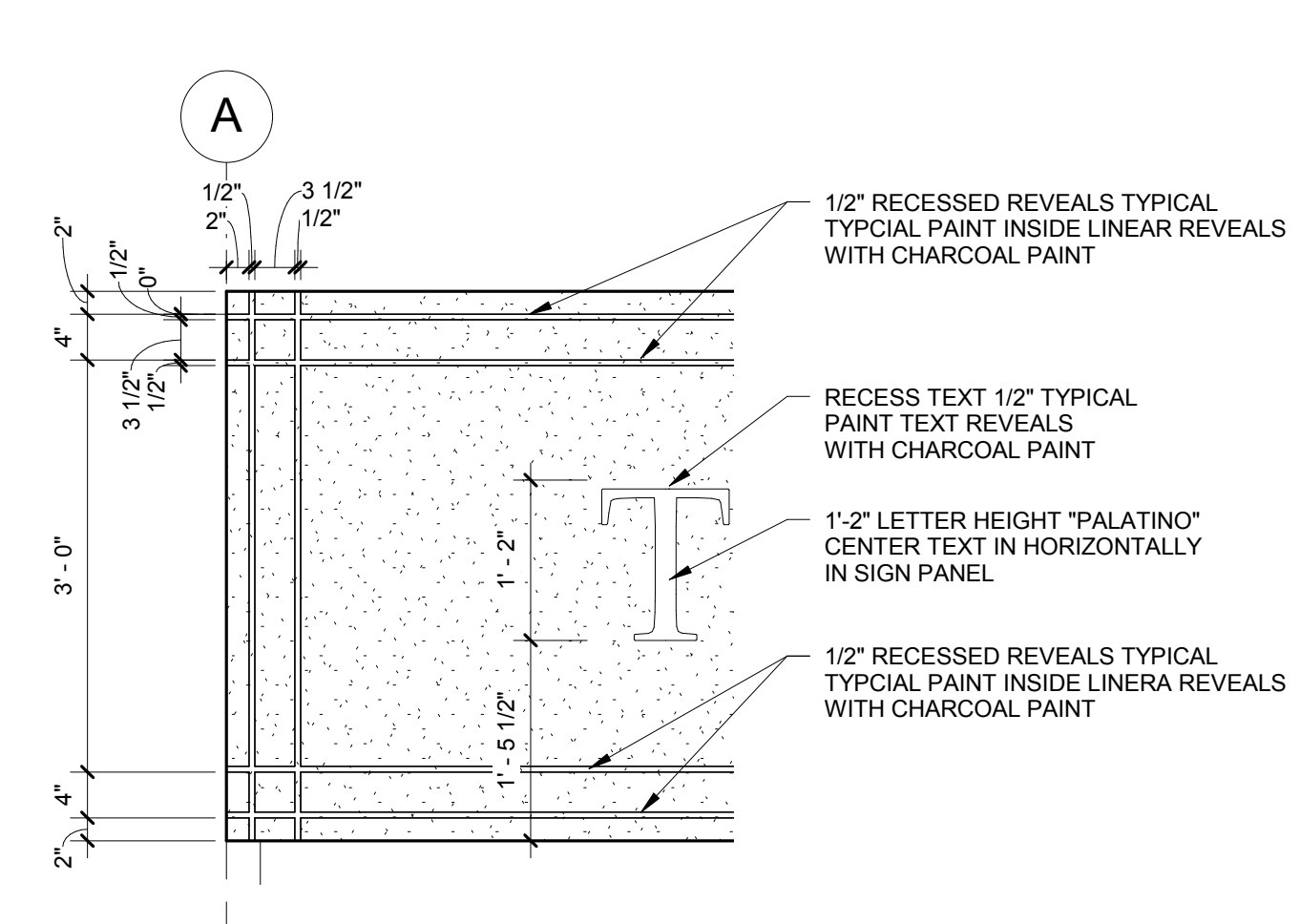




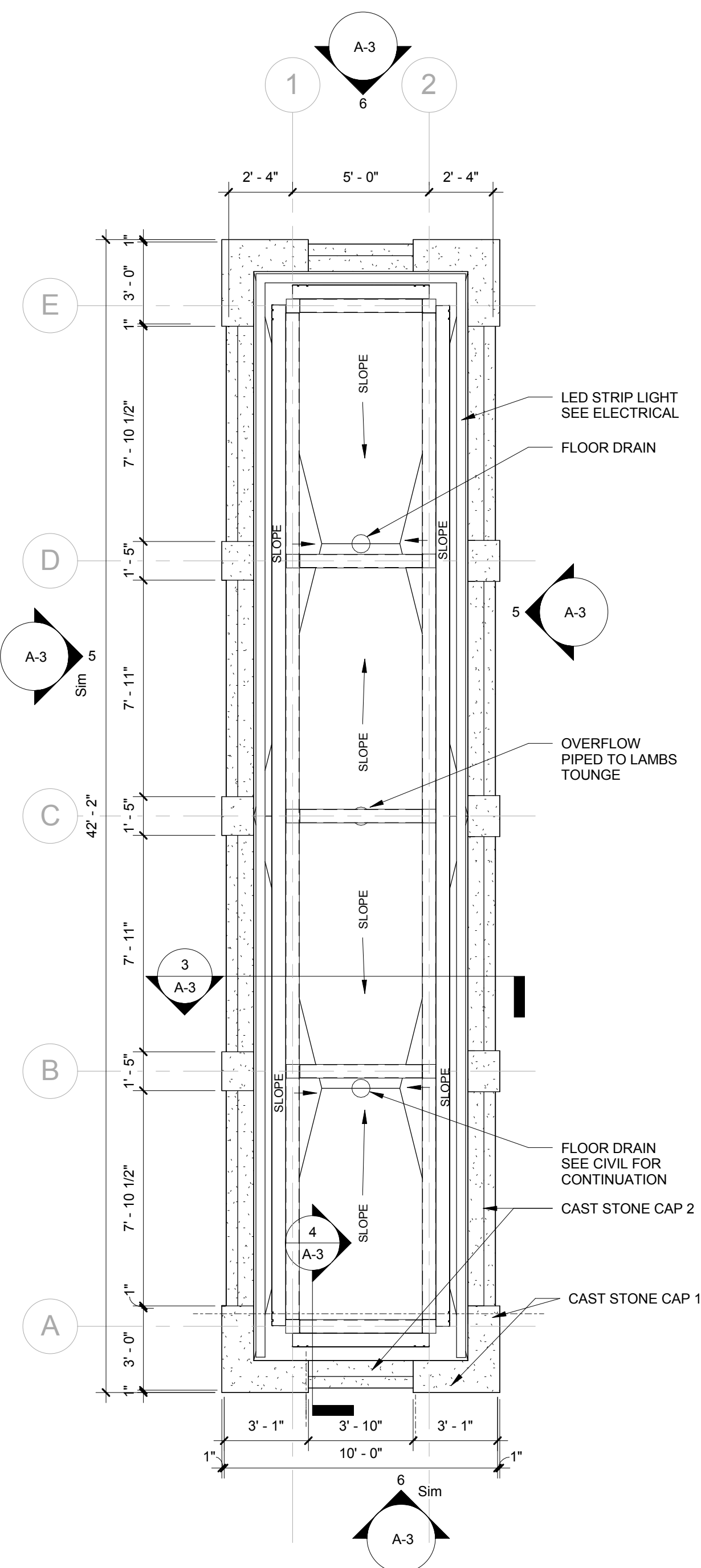
5 SIGN SIDE ELEVATION
SCALE: 1/4" = 1'-0"



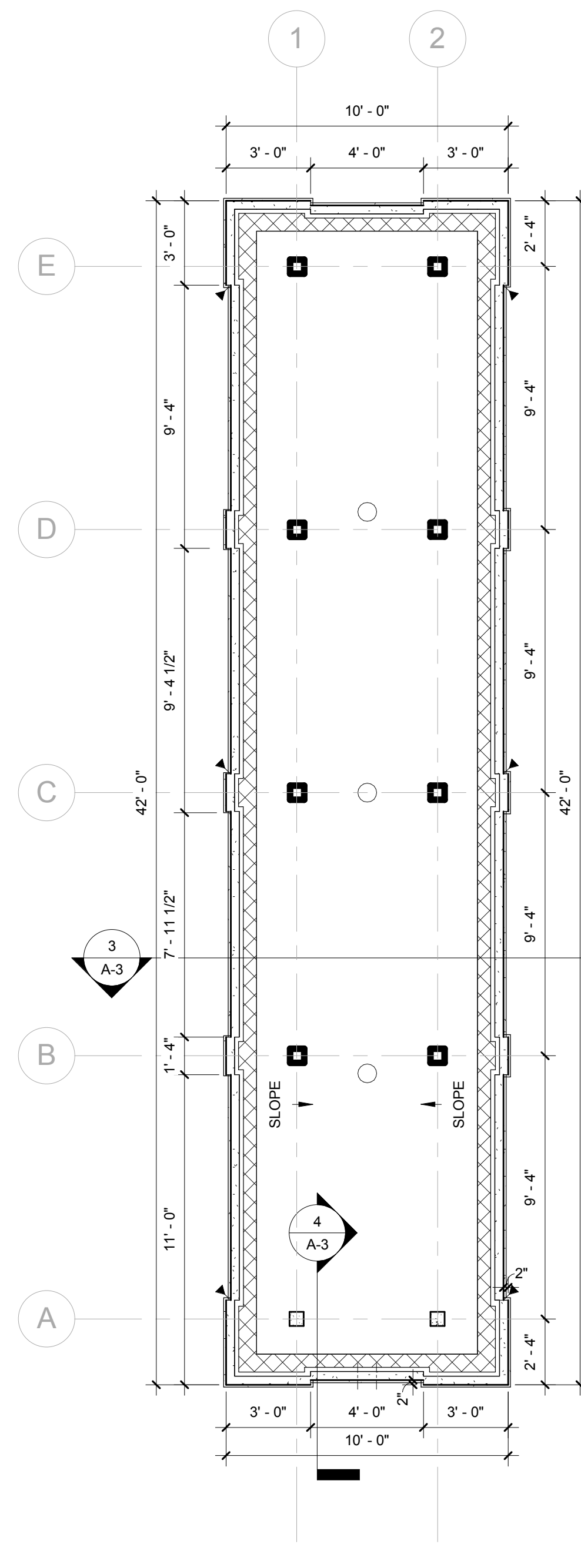
6 SIGN END ELEVATION
SCALE: 1/4" = 1'-0"



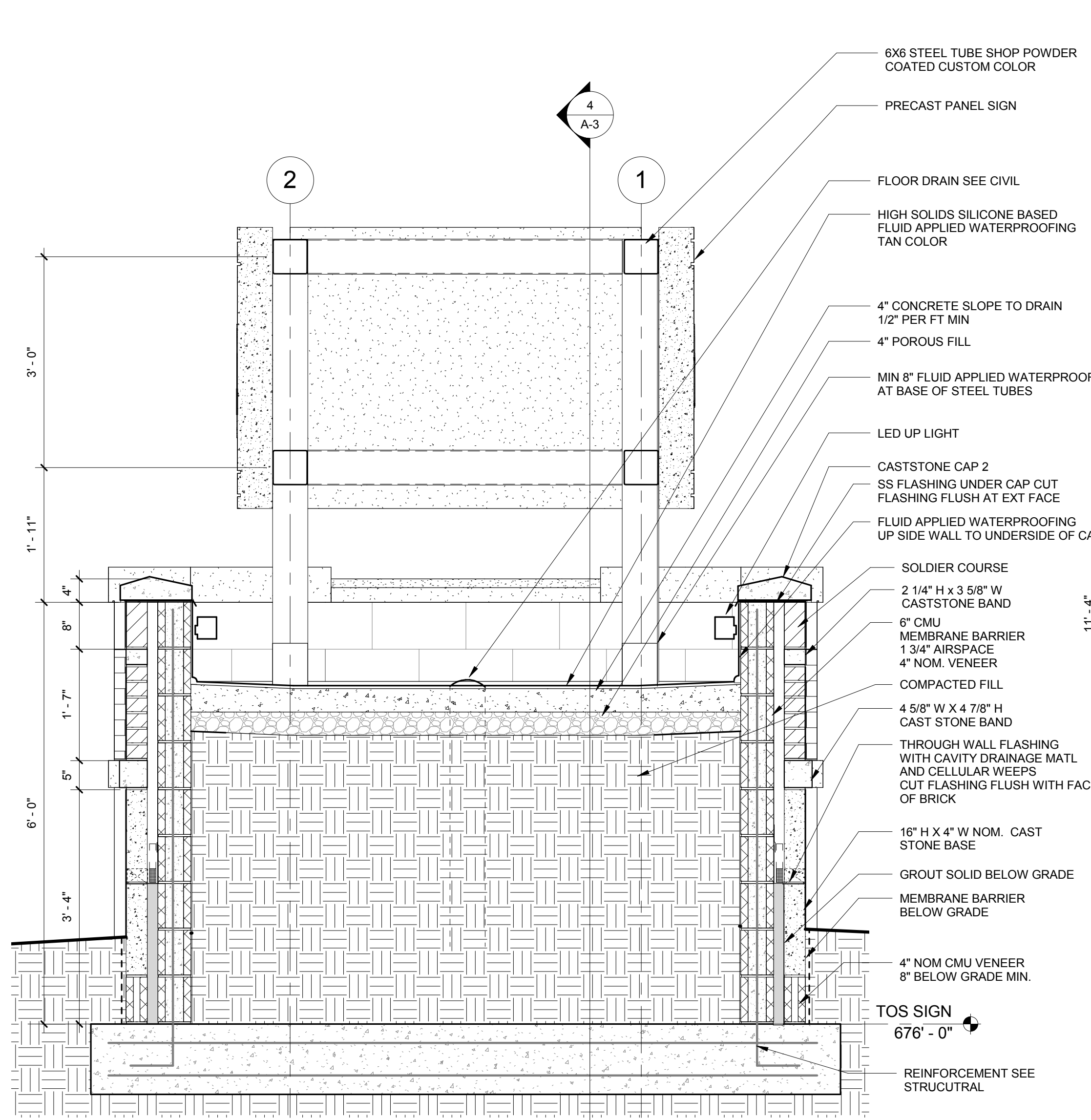
7 DETAIL SIGN
SCALE: 3/4" = 1'-0"



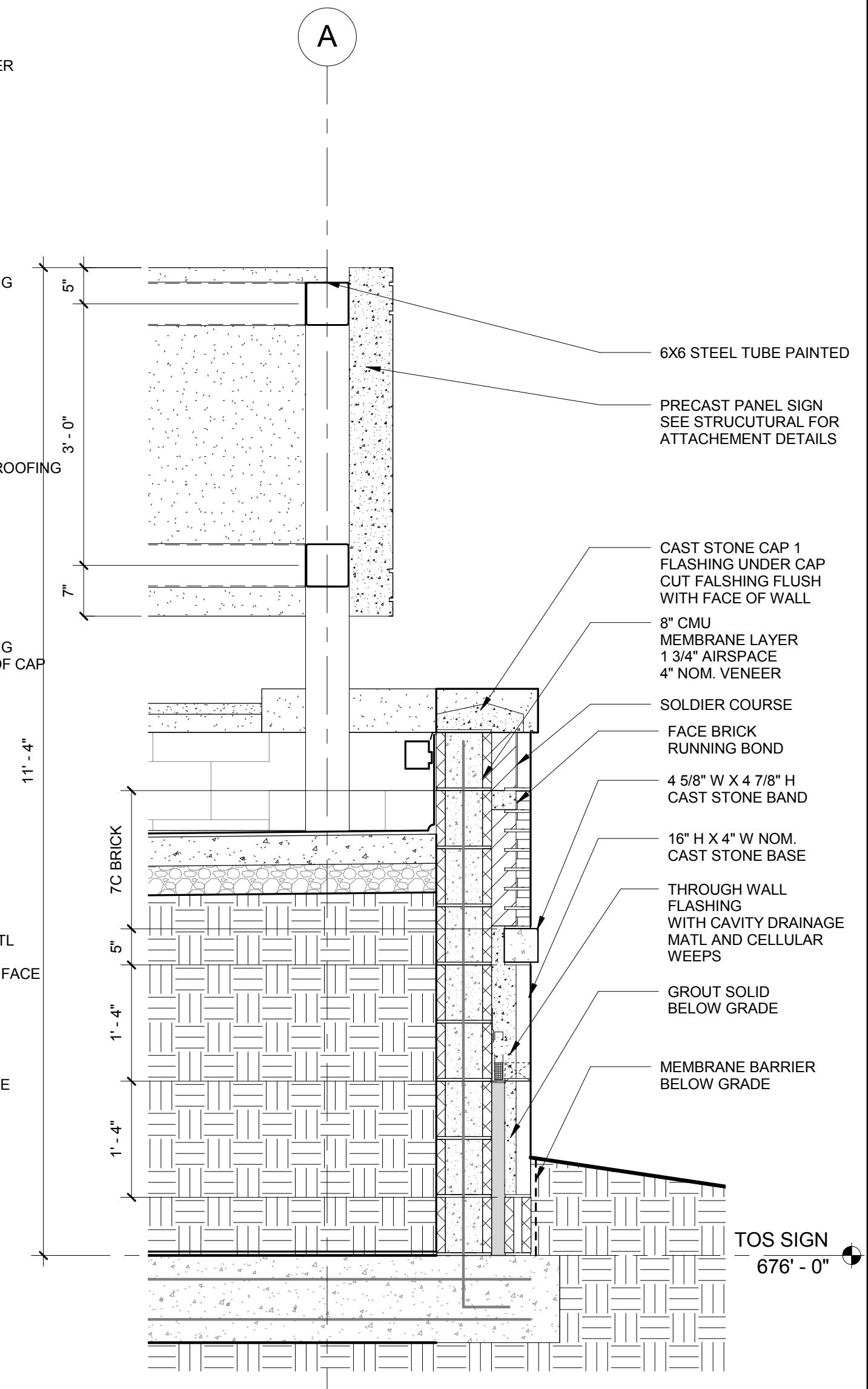
1 SIGN PLAN
SCALE: 1/4" = 1'-0"



2 SIGN BASE
SCALE: 1/4" = 1'-0"



3 SECTION SIGN @ B
SCALE: 3/4" = 1'-0"



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

NO.	DATE	DESCRIPTION
1	2018-02-26	ADD 1