City of Raymore

100 Municipal Circle · Raymore, MO. 64083

Phone · 816-892-3045 · Fax · 816-892-3093

ADDENDUM NO. 1

Raymore Activity Center: Project #17-229-201

All plan holders are hereby notified and agree by signature below, that the bid includes consideration of the following changes, amendments, and/or clarifications and costs associated with these changes and are included in the bid.

Pre-Bid Conference:

1. Agenda
    a. Attached to this Addendum
2. Attendance Sign-In Form
    a. Attached to this Addendum
3. Minutes
    a. All questions proposed at both the January 25th and 26th Pre-Bid Meetings are included and responded to within the Addendum items below

Addendum No. 1 – General Notes, Questions, and Clarifications:

1. **General Note: REVISED BID DUE DATE - THURSDAY, FEBRUARY 16TH, 2017 AT 10:00 am, IN THE EXECUTIVE CONFERENCE ROOM.**
2. **General Note:** Project Address should read 1011 S. Madison not 1101 S. Madison
3. **General Note:** Contractor and all subcontractor will be required to obtain an Occupational Permit License
4. **General Note:** Missouri Division of Labor Standards, Wage and Hour Section are attached.
5. **General Note:** All exposed plywood in the gymnasium noted under section 061000 can be found in section 062023 Interior Finish Carpentry.
6. **Question:** On sheet A301 is T.O. Steel (gym) 133'-4 ½" to the top of the rafter or the top of the purlins?
    a. **Response:** T.O. Steel (gym) 133'-4 ½" is to the bottom of the purlins
7. **Question:** On sheet A521 detail 14 calls specifications section 74113.16 for the metal roof panels. Where can we find specifications for this section?
    a. **Response:** Specifications for the metal roof panels can be found under section133419 Metal Building Systems.
8. **Question:** On sheet A521 detail 14 shows a wall and roof liner. Panel looks like a single line. What is intended here?
    a. **Response:** Clarification on the wall and roof liner are provided in the reissued spec section 133419 Metal Building Systems
9. **Question:** Has a subsurface soils investigation been completed, and if so, how is it available to bidders?
    a. **Response:** The Geotechnical Engineering Report and Geotechnical Engineering Report Addendum #1 are included in attachments.

10. **Question:** Is there a message schedule for signage specifically for required ADA panel signage?
    a. **Response:** Yes, a signage schedule can be found on sheet ID113
11. **Question:** The window shades are specified as both manual and motorized. The shades are not shown on the drawings. Which windows receive manual and which receive motorized?
    a. **Response:** Clarification on the window shades manual vs. motorized are provide in the reissued spec section 122413 Roller Window Shades. Drawings have also been updated to include window shades. Reference attached sheets.
12. **Question:** Please provide more information for: 1.Sheet ID211, detail 8 – what exactly do you want for the "vinyl graphic behind wood wall." Is the graphic installing before the wood wall? 2. All the vinyl film on the walls – please confirm that all vinyl film is installing on drywall/smooth walls.
    a. **Response 1:** All vinyl graphics are to be applied to drywalls with a minimum level 4 finish.
    b. **Response 2:** All vinyl graphics are to be installed prior to wood wall installation.
13. **Question:** What is the intent on Roof Panels and Wall Panels?
    a. **Response:** Clarification on Roof Panels and Wall Panels are provided in the reissued spec section 133419 Metal Building Systems
14. **Question:** The Plans call for a wall panel Type #1 and wall panel Type #2, the specs only have a single wall panel listed what Type is that and what is the other Type?
    a. **Response:** Clarification for wall panel Type #1 and Type #2 are provided in the reissued spec section 133419 Metal Building Systems
15. **Question:** The plans show the panels to be installed horizontally; this panel has a clip and doesn't really work in that application. Are the panels correct or is there supposed to be another panel type?
    a. **Response:** Clarification for overall wall panel system type are provided in the reissued spec section 133419 Metal Building Systems
16. **Question:** Is there a spec for the stucco panels listed for the alternate?
    a. **Response:** Clarification for the stucco panels listed for the alternate are provided in the reissued spec section 133419 Metal Building Systems
17. **Question:** Is the intent to have 3 separate, motorized bleachers - or - would you like to have all one set?
    a. **Response:** 3 separate sets are currently shown on the drawings. Combining them all into one set is acceptable if the general clearances and wall placement are the same as the 3 set option currently shown.
18. **Question:** Access control and cameras are shown on the prints for the Raymore project but there are no specifications. Can you provide clarification?
    a. **Response:** Only rough-in locations for the access controls and cameras are shown. The actual devices are owner provided.
19. **Question:** Will there be a Building Permit Fee?
    a. **Response:** Project will be exempt from the Building Permit Fee
20. **Question:** Who will be responsible for soil testing
    a. **Response:** The City of Raymore will be responsible for Soil Testing

21. **Question:** The roof panel system is specified as a 16" wide SLR painted architectural panel. But the roof is low slope, low profile, and will almost surely not be visible and therefore the expense of a painted architectural panel would be somewhat a waste. The owner could save considerable money by going with the standard 24" wide SSR standing seam galvalume panel. The drawings also make reference to section 74113.16 for roof panels, and that section does not exist in my set.
    a. **Response 1:** Reference reissued spec section 133419 Metal Building Systems for roof panel system.
    b. **Response 2:** Specifications for all metal roof panels noted as 74113.16 can be found in section133419 Metal Building Systems.
22. **Question:** Why is rigid insulation being depicted at wall section 2/A321? Is it actually required?
    a. **Response:** All rigid insulation shown under slab is to be installed as under slab insulation 072100. Updated details can be found on reissued sheet A321. Install 2'- 0" from the perimeter of the slab in and 2'- 0" from the perimeter of the slab down the footing.
23. **Question:** Does Contractor have any responsibility as far as receiving, unloading, and installing owner provided kitchen equipment?
    a. **Response:** No. All kitchen equipment to be provided and installed by owner.
24. **Question:** Who is to provide reception desk per Keynote A40 on A121?
    a. **Response:** The Reception Desk is included in the millwork package and detailed on ID442.
25. **Question:** Will paving mock-ups be required for the asphalt paving? Does layout note 6 on SP100 apply for asphalt?
    a. **Response:** Asphalt shop drawings are required.
26. **Question:** Does Sheet C101 reflect the full extent of the gravel drive to be installed?
    a. **Response:** The gravel drive is not to be constructed with this set of plans.
27. **Question:** Erosion Control Note 15 on C100 indicated that Excelsior Blankets required on slope 6:1 and greater but these blankets are not reflected anywhere else. If blankets are indeed required, can plans please reflect where?
    a. **Response:** See sheet C501 with turf requirement blankets added in plan view.
28. **Question:** Is temporary fencing to be provided around any portion of the project during construction?
    a. **Response:** Yes, this is included in section 015000
29. **Question:** With regards to 9/SP200, should some type of reinforcing be provided for this concrete curb?
    a. **Response:** Concrete curbs are to be reinforced per city standards for CG-2 standards.
30. **Question:** What type of gravel is to be provided at the gravel drive?
    a. **Response:** AB3 is acceptable for this application.
31. **Question:** With regards to 6/SP200, assume this applies to the asphalt walkway? Can an aggregate base be provided in lieu if lime? Will be hard to install lime in such a limited width.
    a. **Response:** Sidewalks to meet city standard for subgrade preparation and reinforcement.
32. **Question:** Shouldn't some type of cap flashing be provided atop the trash enclosure wall (2/SP202)?
    a. **Response:** Please assume through wall flashing be placed in any top cap on the trash enclosures.
33. **Clarification:** HDPE Benches per Keynote A6 on A121 refer to Section 105113; no such section provided
    a. **Response:** Specifications for HDPE Benches is included in Section 102113
34. **Clarification:** Plastic Cubbies per Keynote A30 refer you to Section 123623.13; no such section provided in specifications.
    a. **Response:** Specifications for Plastic Cubbies is included in Section 064116
35. **Clarification:** Sheet SP100 reflects asphalt walkway and gravel drive as alternates. Section 012300 does not reflect.
    a. **Response:** Please use the drawing sheets to reflect these alternates.

Addendum No. 1 – Specifications:

1. **SECTION 00 41 13 – BID FORM**
    a. ADD the attached section in its entirety
2. **SECTION 00 43 23 – ALTERNATES FORM**
    a. ADD the attached section in its entirety
3. **SECTION 01 23 00 – ALTERNATES**
    a. REVISE paragraph 3.1 to read as follows:
        i. "SCHEDULE OF ALTERNATES"
            1. "Add Alternate No. 1: Entry Trellis & Wood Canopy."
                a. "Base Bid: Include in the base bid amount all work required to fabricate, construct, and install entry trellis and wood canopy as indicted in Drawings and Specifications."
                b. "Alternate: Exclude from the base bid amount all work required to fabricate, construct, and install entry trellis and wood canopy as indicated on Drawings and Specifications."
            2. "Deduct Alternate No. 2: Metal Stucco Panel in lieu of Burnished CMU."
                a. "Base Bid: Include in the base bid amount all work required to provide burnished CMU along the south, east, and west facade of the facility as indicated in Drawings and Specifications."
                b. "Alternate: Deduct from the base bid amount all work required to provide burnished CMU along the south, east, and west facade of the facility as indicated in Drawings and Specifications. Add to the base bid amount all work required to provide and install metal panels with stucco finish in lieu of burnished CMU."
                    i. "For higher portion (gymnasium); Exterior elevation 1/A201 and details shall mirror exterior elevation 1/A202 and details. For lower portion (support spaces and lobby) of exterior elevation 1/A202 and 2/A201, all burnished CMU shall be replaced with metal stucco panel type 2."
4. **SECTION 02 41 16 – STRUCTURE DEMOLITION**
    a. This specification section and work is to be removed from the project.
5. **SECTION 03 30 00 – CAST-IN-PLACE CONCRETE**
    a. REPLACE section in its entirety with attached section with same name and number.
6. **SECTION 03 35 43 – POLISHED CONCRETE FINISHING**
    a. ADD the attached section in its entirety
7. **SECTION 04 20 00 – UNIT MASONRY**
    a. ADD the following paragraphs after paragraph 1.9.D.1.
        i. "Fully protect concrete masonry units against freezing by a weather-tight covering which shall also prevent accumulation of ice."
        ii. "Do not lay concrete masonry units when temperature of surrounding atmosphere is below 45 degrees F. unless adequate protection is provided."
    b. ADD the following paragraphs after paragraph 1.9.E.
        i. "Do not spread mortar beds more than 4 feet ahead of placing block units."
        ii. "Place block units within one minute of spreading mortar."
    c. ADD the following paragraphs after paragraph 2.3.B.
        i. "Finishes and appearance will comply with ASTM C90 standards section 7.1, 7.2, and 7.2.1."

d. ADD the following to list of Manufacturers after 2.4 D.1.b
    i. “Texas Building Products.”
    ii. “York Building Products.”
e. ADD the following to paragraph 2.4 D. 1. 6.
    i. “Onyx as Basis of Design.”
f. ADD the following section after 2.4 D.
    i. “Masonry Wall Insulation”
        1. “Molded Expanded Polystyrene (EPS) inserts.”
        2. “R-4 per inch.”
        3. “UL listed “non-toxic: product.”
        4. “Recyclable.”
        5. “Non CFC.”
        6. “Fluted for moisture migration.”
        7. “Designed and sized to fit into CMU cavity in block for inserts.”
        8. “Inserts are to include non-mortar interfering indents (vertically and horizontally.”

8. SECTION 06 20 23 – INTERIOR FINISH CARPENTRY

a. ADD the following after paragraph 1.2 A. 1.
    i. “Interior plywood paneling.”
b. ADD the following section after paragraph 2.3 A. 4.
    i. “PLYWOOD PANELING”
        1. “Veneer Plywood Paneling: Manufacturer’s stock hardwood plywood panels complying with HPVA HP-1”
            a. “Face Veneer Species and Cut: Sanded Pine. One side only.
            b. “Backing Veneer Species: Any hardwood compatible with face species.”
            c. “Construction: Veneer Core.”
            d. “Thickness: 5/32 inch ¾ inches.”
            e. “Panel Size: 48 by 96 inches.”
            f. “Glue Bond: Type II (interior).”
            g. “Finish: Transparent, UV-resistant, protective finish.”
c. ADD the following section after paragraph 3.5 A. 5.
    i. “PANELING INSTALLATION”
        1. “Plywood Paneling: Select and arrange panels on each wall to minimized noticeable variations in grain character and color between adjacent panels. Leave ¼-inch gap to be covered with trim at top, bottom, and openings. Install with uniform tight joints between panels.”
            a. “Attach panels to support with manufacturer’s recommended panel adhesive and fasteners as indicated on the drawings.
            b. Arrange panels with grooves and joints over supports. Fasten to supports with nails of type and spacing recommended by panel manufacturer. Use fasteners with prefinished heads matching groove color.

9. SECTION 07 72 53 – SNOW GUARDS

a. ADD the attached section in its entirety

10. SECTION 08 41 13 – ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

a. ADD the following to list of Manufacturers after 2.2 A.4
    i. "Manko Window System, Inc.”

11. **SECTION 09 27 13 – GLASS FIBER REINFORCED PLASTER FABRICATION**
    a. ADD the attached section in its entirety
12. **SECTION 09 30 00 – TILING**
    a. DISREGARD security notice at the footer of this section.
13. **SECTION 09 51 13 – ACOUSTICAL PANEL CEILINGS**
    a. REPLACE section in its entirety with attached section with same name and number.
14. **SECTION 09 65 19 – RESILIENT SPORTS FLOORING**
    a. REVISE header to read as follows:
        i. "SECTION 096519."
    b. REVISE paragraph 1.2 A. 2. To read as follows.
        i. "Contractor shall provide pricing for each resilient sport floor system: MAF-1 and RV-1. Owner will select one of the systems for installation in the gymnasium."
    c. ADD the following after paragraph 2.2 J.
        i. "Bleacher Blocks: Solid sections."
    d. REVISE paragraph 2.3 A. to read as follows.
        i. "Resilient Vinyl Sports Floor: Provide indoor resilient vinyl wood-look multipurpose sports floor by one of the following manufacturers:"
            1. "Tarkett: Omni Sport 5.0 mm as the Basis of Design."
            2. "Taraflex Sport M Plus by Gerflor."
            3. "Approved equal."
    e. ADD the following paragraph after 2.3 H.
        i. "Colors and Patterns: Lightly textured surface pattern. Color to be selected by Architect from full range of industry colors. Wood; Classis Oak as Basis of Design."
    f. ADD the following paragraph after 2.3 J.
        i. "Bleacher Blocks: HPL"
15. **SECTION 09 93 00 – STAINING AND TRANSPARENT FINISHING**
        i. REVISE paragraph 2.1 A.4. to read as follows.
            1. "Timber Pro Coatings; Timber Pro UV Natural Wood Stain Finish: Basis of Design."
16. **SECTION 10 21 13 – PLASTIC TOILET COMPARTMENTS & BENCHES**
    a. REVISE section name to read as follows.
        i. "Plastic Toilet Compartments & Benches."
    b. ADD the following paragraph after paragraph 1.3 B. 5.
        i. "Shop Drawings: For benches."
            1. Include plans, details, and attachment details."
    c. REVISE paragraph 1.3 D. to read as follows.
        i. "Samples for Initial Selection: For each type of toilet compartment and bench material indicated."
    d. ADD the following paragraph after paragraph 2.2 F. 1.
        i. "Solid Plastic Benches"
            1. "Manufacturers: Subject to compliance with requirements, provide products by one of the following:"
                a. "Accurate Partition Corp, ASI Group"
                b. "General Partitions Mfg. Coro."
                c. "Global Partitions; ASI Group"
                d. "Scranton Products."

e. "Approved Equal"
2. "Style: Provide HDPE benches of sizes indicated on Drawings."
3. "Color and Finish: Match Toilet Partitions."
4. "Support: Provide stainless steel posts and horizontal framing as required to support loads. Anchor posts to concrete slab."

e. ADD the following paragraph after paragraph 3.2 C.
i. "Benches: Anchor posts to concrete slab with expansion or chemical anchors. Field verify bench location with Architect and Owner. Clean benches and protect per manufacturer's recommendations until construction activities are complete."

17. SECTION 11 66 23 – GYMNASIUM EQUIPMENT

a. ADD the following to Basis of Design Manufacturers after 2.2 A.2.e
i. "Arizona Courtlines, Inc.: www.arizonacourtlines.com"
ii. "ADP Lemco, Inc.: www.adplemco.com"

b. ADD the following to Basis of Design Manufacturers after 2.3 A.2.e
i. "Arizona Courtlines, Inc.: www.arizonacourtlines.com"
ii. "ADP Lemco, Inc.: www.adplemco.com"

c. ADD the following to Basis of Design Manufacturers after 2.4 A.2.e
i. "Arizona Courtlines, Inc.: www.arizonacourtlines.com"
ii. "ADP Lemco, Inc.: www.adplemco.com"

18. SECTION 11 66 43 – INTERIOR SCOREBOARDS & CLOCKS

a. REVISE paragraph 2.1 D. 2. to read as follows:
i. "Pace Clock: 100 percent solid state electronics; fully lighted LED block numerals, 2 digits; wall mounted; UL listed;"

19. SECTION 11 66 53 – GYMNASIUM DIVIDERS

a. ADD the following to list of Manufacturers after 2.2 A.
i. "Arizona Courtlines, Inc.: www.arizonacourtlines.com"
ii. "ADP Lemco, Inc.: www.adplemco.com"

20. SECTION 12 24 13 – ROLLER WINDOW SHADES

a. REVISE paragraph 2.2 A. 4. to read as follows
i. "MechoShade Systems, Inc.: MechoShade, Thermoveil 2100 Series as Basis of Design."

b. REVISE paragraph 2.3 A. 4. to read as follows
i. "MechoShade Systems, Inc.: Electroshade, Thermoveil 2100 Series as Basis of Design."

c. REVISE paragraph 2.4 B. 8. to read as follows
i. "Color and Finish: Series 2100; White 2101."

21. SECTION 12 66 00 – TELESCOPING STANDS

a. ADD the following after paragraph 2.2 B. c.
i. "Interkal Spectator Seating World Wide"

22. SECTION 13 34 19 – METAL BUILDING SYSTEMS

a. REPLACE section in its entirety with attached section with same name and number.

Addendum No. 1 – Drawings:

1. **C101 – GENERAL PLAN LAYOUT (Replace sheet in its entirety with the attached)**
    a. The future expansion building outline has been shown on this sheet.
    b. The additional fire hydrant on Recreational Park Drive has been added.
2. **C200 – SITE PLAN (Replace sheet in its entirety with the attached)**
    a. The additional fire hydrant on Recreational Park Drive has been added.
3. **C400 – UTILITY PLAN (Replace sheet in its entirety with the attached)**
    a. The additional fire hydrant on Recreational Park Drive has been shown.
    b. The backflow prevention vault for the fire protection line has been relocated.
    c. The notes for fire lines have been updated.
    d. A proposed fire hydrant at the circle drive has been removed.
4. **C501 – EROSION CONTROL PLAN-CONST. (Replace sheet in its entirety with the attached)**
    a. (Lanklok S2 or approved equal) was added to the steeper slopes and drainage ways on the west side of the project site.
5. **A131 – CEILING PLAN (Replace sheet in its entirety with the attached)**
    a. Locations of manual and motorized roller shades have been shown.
6. **A141 – ROOF PLAN (Replace sheet in its entirety with the attached)**
    a. Roof drains have been relocated
    b. Parapet scuppers have been relocated and elevations noted
    c. Standing seam metal roof panel spec section note changed to 133419
    d. Snow Guards have been located and noted
7. **A201 – EXTERIOR ELEVATIONS (Replace sheet in its entirety with the attached)**
    a. Parapet scuppers have been relocated and elevations noted
    b. Exterior metal stucco panels have been dimensioned.
8. **A202 – EXTERIOR ELEVATIONS (Replace sheet in its entirety with the attached)**
    a. Concrete splash block located and noted at downspouts.
    b. Exterior metal stucco panels have been dimensioned.
9. **A301 – BUILDING SECTIONS (Replace sheet in its entirety with the attached)**
    a. Clerestory windows have been removed from the north side of the gymnasium
    b. Standing seam metal roof panel spec section note changed to 133419
10. **A302 – BUILDING SECTIONS (Replace sheet in its entirety with the attached)**
    a. Clerestory windows have been removed from the north side of the gymnasium
11. **A321 – WALL SECTIONS (Replace sheet in its entirety with the attached)**
    a. Detail 16/A521 has been added to wall section 2/A321 to show roller shade locations
    b. Details of under slab insulation have been revised.
12. **A322 – WALL SECTIONS (Replace sheet in its entirety with the attached)**
    a. Detail 3/A322 has been updated to reflect the changes to the parapet scupper location and elevation.
13. **A521 – SECTION DETAILS (Replace sheet in its entirety with the attached)**
    a. Detail 16/A521 has been added to show roller shade locations
14. **A522 – DETAILS (Replace sheet in its entirety with the attached)**
    a. Detail 2/A522 has been update to show roller shade location.

15. **MP101 – MECHANICAL AND PLUMBING ROOF PLAN (Replace sheet in its entirety with the attached)**
    a. REVISED storm pipe sizes per comment in email from Jon Woerner – Building Official dated 01/09/17.
    b. REVISED roof drain locations per architectural plans.
    c. REVISED condensate piping routing to terminate at roof drains.
16. **P121 – PLUMBING ENLARGED PLANS (Replace sheet in its entirety with the attached)**
    a. REVISED storm piping layout serving roof drains.
17. **E101 – POWER PLAN (Replace sheet in its entirety with the attached)**
    a. REMOVED power for window shades on the north elevation per architectural plans.
18. **E202 – ELECTRICAL PANEL SCHEDULES (Replace sheet in its entirety with the attached)**
    a. REMOVED circuit for window shades on the north elevation.

Attachments: Pre Bid Meeting Sign In Sheets, Pre Bid Meeting Agenda, Geotechnical Engineering Report, Geotechnical Engineering Report Addendum #1, Missouri Division of Labor Standards, 004113, 004323, 033000, 033543, 077253, 092713, 095113, 133419, C101, C200, C400, C501, A131, A141, A201, A202, A301, A302, A321, A322, A521, A522, MP101, P121, E101, E202.

Any other questions regarding this proposal shall be submitted to Kim Quade, CPPB by e-mail at kquade@raymore.com or by phone at (816) 892-3045. There will be no questions allowed after February 10th, 2017 at 5 p.m.

I hereby certify that the above have been considered and associated costs have been included in this bid.

Company Name: _____

By: _____

Title: _____

Address: _____

City, State, Zip: _____

Date: _____ Phone: _____

Signature of Bidder: _____

ADDENDUM MUST BE SUBMITTED WITH BID

END OF ADDENDUM

RFP 17-229-201 - Raymore Activity Center

SIGN IN SHEET

01/25/17 10:00 a.m.

No.	NAME	COMPANY	PHONE No.	E-Mail
1	M. Seymour	Bruner Contracting	816 474 4300	brunerco@swbell.net
2	A. Mallinson	Kohler Lawn & Outdoor	816 540 4400	kohleracm1@gmail.com
3	DAVID ANDERSON	CROSSLAND CONSTRUCTION	620-429-1414	bid@crossland.com
4	Andy Keidel	Fogel-Anderson	913.444.2381	akeidel@fogel-anderson.com
5	Andy Prosser	Prosser Wilbert Const	913-906-0104	aprosser@prosserwilbert.com
6	Brandon Deen	B. Deen Construction	816 795 3733	bdeen@bdeenconstruction.com
7	MICHAEL SCHMIDT	INFINITY SIGN	785·218·6987	michael@infsign.com
8	MATT LAIPPLE	MUSSELMAN & HALL	816-985-2679	MLAIPPLE@MANDH.NET
9	Ben Sampsen	Redline Fire	816) 835-1540	service@redlineautomatic.com
10	John Hunter	Westport Const. Co	660-885-2231	westport@WCCMO.com
11	Stacy Menhusen	All Systems	913-387-0260	smenhusen@allsyskc.com
12	Jeff Kempf	Rand Const.	816-421-4143	jeff.k@randsc.com

PLEASE INCLUDE BUSINESS CARD WITH E-MAIL ADDRESS

RFP 17-229-201 - Raymore Activity Center

SIGN IN SHEET

01/25/17 10:00 a.m.

No.	NAME	COMPANY	PHONE No.	E-Mail
1	MIKE HIMES	CRC	816 806 0224	MHIMES@CARPDC.ORG
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PLEASE INCLUDE BUSINESS CARD WITH E-MAIL ADDRESS

RFP 17-229-201 - Raymore Activity Center

SIGN IN SHEET

01/26/17 10:00 a.m.

No.	NAME	COMPANY	PHONE No.	E-Mail
1	KENNY HOY	GBA BUILDERS	913-608-1391	khoy@gbabuilders.com
2	STEVE DAMRON	GEOTECHNOLOGY	913 438 1900	SDAMRON@GEOTECHNOLOGY.COM
3	BRETT PHILLIPS	PHILLCO CONST LLC	816-844-9401	bphillips@phillco.biz
4	Alex Brunetti	Prosser Wilbert Construction	913-906-0104	abrunetti@prosserwilbert.com
5	Evan Krause	Prosser Wilbert Const	913-906-0104	ekrause@prosserwilbert.com
6	BOB BEAHLER	CRANE CONST. COM	816-387-7870	bob@crane-construction.com
7	KENT ISKEE	UHC	913-888-0076	DONNIE@UHC-HVAC.COM
8	RALPH PRUENTE	Straub	913-284-3488	rpruente@straubconstruction.com
9	Brad Booth	KES Construction	913-322-3450	brad@kesconstruction.net
10	DAN MARTIN	DH PACE	816-480-2601	DAN.MARTIN@DHPACE.COM
11	Kerry Winter	Excel Constructors	913-261-1000	Kerry.winter@excelconstructors.com
12	Kory Brinton	BRINTON	8163560922	Kory@brintonelectric.net
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RFP 17-229-201 - Raymore Activity Center

SIGN IN SHEET

01/26/17 10:00 a.m.

No.	NAME	COMPANY	PHONE No.	E-Mail
1	Pete Phillips	Larrison Const. Inc	816 353 0000	pphillips@larrisonconstruction.com
2	Megan Walter	Olsson Associates	913 381-1170	mwalter@olssonassociates.com
3	Jeremy Caster	Chief Heating & Cooling	816-246-4646	Jeremy@chiefhc.com
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City of Raymore

100 Municipal Circle · Raymore, MO. 64083
Phone · 816-892-3045 · Fax · 816-892-3093

Mandatory Pre Bid Conference Agenda
Raymore Activity Center RFP 17-229-201

Proposal Information

1. Sealed proposals must be received by February 9, 2017 at 10:00 AM. Please follow the "Instructions to Bidders" page of the RFP regarding submittal of the RFP.
2. We anticipate award of this contract in March, 2017. The contractor will have 310 calendar days from the issuance of the notice to proceed to complete the work.
3. This is a Request for Proposal. Award of an RFP is typically to the "lowest best most responsive" proposer. Price is a primary evaluation factor within an RFP but not the only evaluation factor.
4. The City has chosen to abide by MO Sunshine Law RSMo 610.021 item 12, regarding closed records. At the bid opening the only item that will be read aloud is the responder's name, there will be no bid amounts read at that time. Bid tabs will be released after Contract is complete.
5. Be sure to check for bond requirements within the RFP document.
6. After the bids are opened and checked for responsiveness we will be in contact with any potential contract awardees within 48 hours.
7. Insurance requirements – Please review Appendix B, Section C in the RFP for the City's insurance requirements. All insurance coverage must be at least what is listed within the RFP or better. The City does require $1,000,000 workers compensation from a single carrier.
8. Payments will be completed as follows - The City agrees to pay the Contractor for the completed work as follows: 95% of contract shall be paid within thirty (30) days of substantial completion of each section of this proposal – inspection and remediation, walk-through and acceptance by the City; a 5% retainage will be held until acceptance of the project by the Raymore City Council, at which time final payment will be made.
9. The contract will be subject to Cass County Prevailing Wage #23.
10. All proposers must be a plan holder with the City of Raymore or QuestCDN in order to bid on the project. All proposers must attend one of the mandatory pre bid meetings.

After today, any questions regarding this proposal shall be submitted to Kim Quade, Purchasing Specialist by email at Kquade@raymore.com or by phone at (816) 892-3045. There will be no questions allowed after February 3, 2017 at 5 pm.

Questions:

October 12, 2016

Edward Leans
City of Raymore
100 Municipal Circle
Raymore, MO 64083

RE: Raymore Gymnasium and Planned Expansion
Raymore, MO
Geotechnical Project # G20-16-215
Addendum to Report #1

Mr. Leans,

Kansas City Testing & Engineering has been requested to provide basic pavement recommendations for the referenced project.

PAVEMENT RECOMMENDATIONS

Specific information on the type and volume of traffic was unavailable at the time of this subsurface exploration. KCTE has provided recommendations for typical parking areas consisting primarily of automobile and light truck traffic. Typical pavement sections for this type of traffic and facility are provided herein. A more thorough analysis of the pavement thickness design can be performed if data relating to volume and type of traffic are made available. Based on previous experience with the soil types encountered in the proposed parking lot, a CBR value of 3 was estimated for the basis of recommendations for the design of parking and drive pavement sections.

Pavement Subgrade Preparation

Pavement subgrades should be prepared in accordance with the recommendations presented in section *5.0 Site Work Recommendations* of the original geotechnical report for the Gymnasium and Planned Expansion dated September 9, 2016. Construction scheduling, involving paving and grading by separate contractors, typically results in a time lapse between the end of grading operations and the commencement of paving. Disturbance, desiccation, and/or wetting of the subgrade between grading and paving can result in deterioration of the previously completed subgrade. A non-uniform subgrade can result in poor pavement performance and local failures relatively soon after pavements are constructed.

KCTE recommends that the pavement subgrades be proofrolled and the moisture content and density of the top 12 inches of subgrade be checked within two days prior to commencement of actual paving operations. If any significant event, such as precipitation, occurs after proofrolling, the subgrade should be reviewed by qualified personnel immediately prior to placing the pavement. The subgrade should be in its finished form at the time of the final review.

Typical Sections: Asphaltic Cement Concrete (ACC)

Full depth asphaltic concrete pavements for parking areas utilized primarily by automobile traffic should have a minimum thickness of 5 inches and drive lanes should have a minimum thickness of 7 inches. Full Depth asphaltic concrete pavements for parking areas and drives subject to heavy truck traffic loads should have a minimum thickness of 8 inches. All asphaltic concrete should be supported on a 4-inch thick granular base (MODOT Type 5 or equivalent). All asphaltic concrete pavements should be constructed with a minimum surface course thickness of 2 inches. The above sections represent

minimum design thicknesses and, as such, periodic maintenance should be anticipated.

Typical Sections: Portland Cement Concrete (PCC)

Portland cement concrete pavements are recommended for all loading dock areas, trash receptacle pads, drive approaches, and other areas where heavy wheel loads will be concentrated. We recommend that the concrete pavements in these areas have a minimum thickness of 8 inches. KCTE also recommends that a 4-inch leveling and drainage course of clean, crushed rock be placed below all concrete pavements. The pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub drainage or connection to a suitable gravity outfall should be provided to remove water from the granular base.

Construction Considerations

Construction traffic on the pavements has not been considered in the above noted typical sections. If construction scheduling dictates the pavements will be subject to traffic by construction equipment/vehicles, the pavement thickness should be reconsidered to include the effects of the additional traffic loading. Construction traffic should not be allowed on partially completed pavements as the pavements will not have adequate structural capacity and could be damaged.

Periodic maintenance of all of the pavements should be anticipated. This should include sealing of cracks and joints and by maintaining proper surface drainage to avoid ponding of water on or near the pavement areas.

Drainage Considerations

If the asphaltic concrete sections are to include a granular base, the granular thickness should be uniform and the pavement subgrade should be graded to provide positive drainage of the granular base section. The granular section should be graded to adjacent storm sewer inlets or drainage ditches and provisions should be made to provide drainage from the granular section into the storm sewer. Drainage of the granular base is particularly important where two different sections of pavements (such as full-depth asphaltic concrete and Portland cement concrete with aggregate base) abut, so that water does not pond beneath the pavements and saturate the subgrade soils.

The performance of pavements will be dependent upon a number of factors, including subgrade conditions at the time of paving, rainwater runoff, and traffic. Rainwater runoff should not be allowed to seep below pavements from adjacent areas. All pavements should be sloped approximately 1/4 inch per foot to provide rapid surface drainage. Proper drainage below the pavement section helps prevent softening of the subgrade and has a significant impact on pavement performance and pavement life. Therefore, we recommend that a granular blanket drain be constructed at all storm sewer inlets within the pavement areas. The blanket drain should consist of clean, crushed stone aggregate extending a minimum of 6 inches below pavement subgrade level. The blanket drains should extend radially a minimum of 8 feet from each of the storm sewer inlets. The grade within the blanket drain should be sloped toward the storm sewer inlet, and weep holes should be drilled through the inlet to provide drainage of the granular section into the inlet. Placement of geotextile filter fabric across the weep holes could be considered to prevent loss of aggregate through the weep holes. These recommendations are very important for long-term performance of the pavements. Because pavements typically have relatively low factors of safety, it will be very important that the specifications are followed closely during pavement construction.

Based on our experience with similar projects, irrigation systems are commonly installed in the landscaped areas adjacent to portions of the pavement areas. If such an irrigation system is to be installed, we recommend that consideration be given to installing subsurface drainage lines between

irrigated areas and the planned pavements. It has been our experience that the quantity of subsurface seepage originating from irrigated areas can be substantial and can adversely affect the performance of

the pavement subgrade. Therefore, consideration should be given to constructing edge drain lines along the pavements located adjacent to irrigated areas, to intercept and remove subsurface water flowing from beneath the pavements. These lines should be constructed behind the curblines, on the upgradient side of the pavements, and should be sloped to provide positive gravity flow to a suitable outfall.

Should you have any questions, please contact me at (913) 321-8100.

Sincerely,
Kansas City Testing and Engineering, LLC

Reviewed By:

Jacob Engler, E.I.
Engineer Intern

Adam M. McEachron, P.E.
Geotechnical Engineer

KANSAS CITY
TESTING & ENGINEERING, LLC
1308 Adams I Kansas City, Kansas 66103
913.321.8100 I kctesting.com

SUBSURFACE EXPLORATION
AND
GEOTECHNICAL ENGINEERING REPORT

GYMNASIUM AND PLANNED EXPANSION

RAYMORE, MISSOURI

PREPARED FOR

Mr. Edward Ieans
City of Raymore Public Works
100 Municipal Drive
Raymore, Missouri 64083

KCTE Project No. G20-16-215

September 9, 2016

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FIGURES

APPENDIXES

EXECUTIVE SUMMARY

Kansas City Testing & Engineering, LLC (KCTE) has completed the subsurface exploration for the proposed gymnasium and planned future expansion located in the northwest quadrant of the Raymore Recreation Park in Raymore, Missouri.

In general, the subsurface conditions encountered in the borings consist of native clay underlain by highly weathered shale bedrock and limestone bedrock. The native soils consist of dark brown, gray, and gray-brown fat clay with consistencies ranging from medium stiff to hard. No groundwater was encountered during this exploration. Limestone bedrock was encountered in Boring B-4 at a depth of approximately 31.5 feet below ground surface.

Based on the subsurface conditions encountered in the borings and a review of the available site development plans, the proposed gymnasium and planned future expansion could be supported on shallow foundations founded in native soils.

Recommendations related to design and construction for this project including site preparation, foundations, slab-on-grade, and other design considerations are included in the recommendations of this report.

This executive summary has been prepared to provide a general overview and should not be relied upon for any other purpose. All information about findings, recommendations, and other project information can only be found in the body of the report

1.0 INTRODUCTION

Kansas City Testing & Engineering, LLC (KCTE) has completed the subsurface exploration for the proposed gymnasium and planned future expansion located in the northwest quadrant of the Raymore Recreation Park in Raymore, Missouri. Mr. Edward Ieans with the City of Raymore authorized this exploration by signing KCTE's proposal number GP20-16-299 dated August 5, 2016.

The purpose of this geotechnical exploration was to evaluate the subsurface conditions and physical properties of the soils and bedrock underlying this area, and based on that information provide geotechnical recommendations for the design and construction of the proposed improvements.

The city of Raymore provided KCTE with an aerial plan of the property with the proposed building footprint and boring locations. At the time of this report, KCTE was not asked to include pavement recommendations in this report. If desired, KCTE can provide pavement recommendations related to the site upon request.

1.1 Site Description

The site is currently a relatively flat, grass-covered field sloping slightly downward from the east to west. The project site is bordered to the south by Recreation Drive, an access drive to the park, and is bordered to the west by South Madison Street. The project site location is shown on the attached *Figure 1 – Site Location Plan*.

1.2 Project Description

KCTE understands that the project will consist of the construction of a lightly to moderately loaded gymnasium with associated parking. A future expansion of the gymnasium is planned, but will be constructed at a later date. KCTE understands grading operations associated with this project to be minimal (two feet or less).

2.0 SUBSURFACE EXPLORTION

The site subsurface conditions were explored with six (6) borings drilled at the approximate locations shown on *Figure 2 – Boring Location Plan*. The borings were drilled on August 29 and August 30, 2016 using a ATV-mounted drill rig equipped with 3.25-inch diameter hollow stem augers. Soil samples were obtained from the borings during drilling using relatively undisturbed thin-walled (Shelby) tube samplers (ASTM D 1587). Three samples were obtained in the upper 10 feet of each boring and then at 5-foot intervals thereafter to the planned bottom of the boring or auger refusal. The borings were backfilled with auger cuttings upon completion.

A field log was prepared for each boring. These logs contain visual classifications of the materials encountered during drilling as well as an interpolation of the subsurface conditions between samples. Final boring logs included in Appendix A represent KCTE's interpretation of the field logs and may include modifications based on laboratory observations and tests of the field samples. The final logs describe the materials encountered, their approximate thickness, and the depths at which the samples were obtained. This information includes soil descriptions, stratifications, penetration resistances, locations of the samples, and laboratory test data. The stratifications shown on the boring logs represent the conditions only at the actual boring locations. Variations may occur and

should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual.

Field samples obtained from the borings were returned to the laboratory where they were visually classified and logged. Laboratory tests were performed in general accordance with ASTM procedures. The results of these tests are presented on the boring logs in Appendix B and in the lab results found in Appendix C of this report. The field and laboratory test results were utilized in the development of the geotechnical recommendations.

3.0 LABORATORY TESTING PROGRAM

Laboratory testing was performed on the soil samples to estimate pertinent engineering and index properties of the materials. Results of the laboratory tests are presented in Appendix C and on the boring logs in Appendix B. The laboratory testing program consisted of the following:

- Visual classification (ASTM Designation D 2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*)
- Moisture content tests (ASTM Designation D 2216, *Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass*)
- Atterberg limits tests (ASTM Designation D 4318, *Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils*)
- Dry Unit Weight (ASTM D 7263, *Standard Test Methods for Laboratory Determination of Density (Unit Weight) of Soil Specimens*)
- Unconfined compression tests on soil (ASTM Designation D 2166, *Standard Test Method for Unconfined Compressive Strength of Cohesive Soil*)

4.0 SUBSURFACE CONDITION

4.1 Site Specific Stratigraphy

In general, the surface conditions encountered in the borings consisted of approximately 6-inches of topsoil underlain by medium stiff to hard fat clay. In Borings B-1, B-5, and B-6, the fat clay extended to a depth of approximately 15 feet. Borings B-1, B-5, and B-6 were terminated in fat clay at a depth of approximately 15 feet below ground surface. In Boring B-4, the fat clay was underlain by shale bedrock at a depth of approximately 30 feet. The shale bedrock was underlain by limestone bedrock at a depth of approximately 31 feet. Boring B-4 was advanced to auger refusal on limestone bedrock at a depth of approximately 31.5 feet below ground surface. In Borings B-2 and B-3, the fat clay extended to a depth of approximately 12 feet and was underlain by approximately three (3) feet of highly weathered shale bedrock. Borings B-2 and B-3 were terminated in highly weathered shale bedrock at a depth of approximately 15 feet below ground surface.

4.2 Groundwater

Groundwater was not observed in the borings at the time of this exploration. However, the groundwater level may naturally fluctuate during construction depending upon the climate and the season. Groundwater levels may be higher or lower during construction or at other times during the

life of the project. If groundwater becomes an issue during construction, the geotechnical engineer should be allowed to amend these recommendations and can provide general recommendations for de-watering during construction.

5.0 GEOTEHNICAL CONCERNS

The following are potential geotechnical related concerns at this site that may affect the performance of the proposed construction, however, other concerns not identified in this exploration may be present. The following summarizes these concerns:

1. *Expansive Soils:* High plasticity clays are known to swell with the addition of water, and shrink during drying. High plasticity clays should be removed 24 inches below the bottom of all slabs-on-grade and replaced with low volume change (LVC) material to reduce the potential of future heaving and settlement issues. Consideration should be given to use of LVC or stabilization beneath pavements.

2. *Differential Settlement between Existing Building and Planned Future Expansion:* Differential settlement is likely to occur when an addition is rigidly connected to an existing structure, reference section *7.2 Estimated Settlement*. Design considerations should be taken to mitigate the amount of settlement.

6.0 SITE WORK RECOMMENDATIONS

The following geotechnical recommendations have been developed on the basis of the subsurface conditions encountered and KCTE's understanding of the proposed construction. Should changes in the project criteria occur, a review must be made by KCTE to evaluate if modifications to this report will be require.

These recommendations are provided on the basis that KCTE's present understanding of the scope of the project, as previously described, does not change and that no significant variations in the subsurface conditions occur from those reported in the final boring logs. The boring logs depict subsurface conditions only at the specified locations on the site.

6.1 Site Preparation

In general, initial site preparation should consist of the removal of any debris, vegetation, and other materials deemed unsuitable by the geotechnical engineer for use beneath structures or pavements. The contractor should stockpile these materials in designated areas that will not interfere with construction operations or existing facilities, or properly waste the material offsite. Some of these materials may be suitable for use in landscaping or in areas with no future construction plans.

After stripping and excavating to the proposed subgrade level or proposed start of fill level, soft zones should be undercut and replaced with properly compacted engineered fill.

The uppermost soils at this site had a moisture content at or above optimum moisture contents. Drying of these soils may be necessary to achieve a stable subgrade.

Subgrade preparation for fill areas should include scarifying the top 6 inches of the surface to provide better bonding. The subgrade should be dried or moisture conditioned as necessary and compacted to at least 95% of the material's maximum dry density in accordance with ASTM D698. After subgrade preparation and observations have been completed, fill placement may begin to establish construction grade.

The upper fine-grained soils encountered at this site are expected to be sensitive to disturbances caused by construction traffic and changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

The onsite clay soils have a moderate to high potential for expansion. In cut areas, all clay soils should be removed to a minimum depth of 18 inches below the floor subgrade elevation and replaced with low volume change (LVC) engineered fill. In building areas requiring fill to establish the building subgrade, the uppermost 18 inches of fill should consist of LVC engineered fill. The recommended LVC thickness is in addition to the 6-inch-thick mat of open-graded (clean) stone recommended in *8.0 Slabs on Grade* section of this report. The LVC engineered fill is recommended to reduce the potential for subgrade movement.

All slopes steeper than 5 horizontal to 1 vertical (5H:1V) in fill areas should be benched prior to placement of fill. The benching of slopes allows interlocking of the fill and the natural soils, and provides a platform for compaction of the fill. Benches should be cut at the fill progresses, and bench heights should be a maximum of 3 feet. Special consideration should be given to areas where bedrock is exposed in the bench cuts. Drainage measures may be required to collect and divert groundwater from the exposed bedrock prior to placing the new fill.

6.2 Engineered Fill

After subgrade preparation has been completed, fill placement may begin to establish construction grade. The first layer of fill material should be placed in a relatively uniform horizontal lift and be adequately keyed into the stripped and scarified subgrade soils. Fill materials should be free of organic or other deleterious material, and have a maximum particle size less than 3 inches in any direction. A densely graded, crushed stone, equivalent to KDOT AB-3 or MoDOT Type 5, is acceptable as engineered fill material. All fill material should be unfrozen and be approved by the geotechnical engineer. The geotechnical engineer should be notified at least 72 hours before fill is imported to the site, to sample and test the material. No imported material should be delivered to the site without proper sampling and testing.

Fill material should be placed in loose lifts having a maximum thickness of 8 inches and compacted to 95% of the maximum dry density in accordance with standard Proctor (ASTM D 698) at moisture contents between -2% and +3% of the optimum moisture content.

Backfill material over unsuitable soils (i.e., soft, wet, frozen, thawing, or spongy surface) or during unfavorable weather conditions should be prohibited. Where soil has been loosened or eroded by flooding or placement during rain, the damaged area should be removed and recompacted to the required density.

Placement of clay soils may be difficult during wet weather conditions. If the in-situ soils and imported clay soils are too wet and cannot be dried to near-optimum moisture within the construction schedule, they can be stabilized with the addition of lime or fly ash to provide a stable subgrade material. As an alternate to stabilized subgrade, granular material may be placed at the site surface to provide a working platform.

Backfilling of curbs, slab-on-grade, and other structures whose bearing surface is unprotected from water should be accomplished as soon as forms are removed to eliminate possibility of a loose

subbase below the structure. Permanent slopes greater than 3 horizontal to 1 vertical are not recommended.

6.3 Excavations and Trenches

Temporary slopes and excavations should conform to Occupational Safety and Health Administration (OSHA) Standards for the Construction Industry (29 CFR Part 1026, Subpart P). Excavations in native clay soils and any engineered fill should be possible with conventional excavation equipment. Deeper excavations in bedrock may be difficult, and rock excavation techniques will likely be required.

Excavations should be kept dry during subgrade preparation. Storm water runoff should be controlled and removed to prevent severe erosion of the subgrade and eliminate free standing water. Subgrade that has been rendered unsuitable from erosion or excessive wetting should be removed and replaced with controlled fill.

Trenches should be excavated so that pipes and culverts can be laid straight at uniform grade between the terminal elevations. Trench width should provide adequate working space and sidewall clearances. Trench subgrade should be removed and replaced with engineered fill if found to be wet, soft, loose, or frozen. Trench subgrade should be compacted to a minimum of 95% of the maximum dry density in accordance with ASTM D 698 at moisture contents between -2% to +3% of the optimum moisture content.

Granular bedding materials for pipes, such as well-graded sand or gravel, may be used provided that the bottom of the trench is graded so that water flows away from structure. Open-graded granular bedding may be used provided that a separation geotextile is used at the subgrade interface. Bedding material should be graded to provide a continuous support beneath all points of the pipe and joints. Embedment material should be deposited and compacted uniformly and simultaneous on each side of the pipe to prevent lateral displacement. Compacted control fill material will be required for the full depth of the trench above the embedment material. No backfill should be deposited or compacted in standing water.

Precautions should be taken by the contractor to avoid undermining the newly constructed foundations or existing building foundations. If needed, shoring and excavations supports should be designed to account for the existing structure loads.

7.0 FOUNDATION RECOMMENDATIONS

7.1 Allowable Bearing Pressure

Spread footings and continuous wall footings founded in native soils may be proportioned for a maximum allowable bearing pressure of 2,000 pounds per square foot (psf). The allowable bearing pressure is based on a factor of safety of approximately three (3) with respect to shear failure of the foundation bearing materials. Some soft soils were encountered at the anticipated foundation bearing level. Where soft soils are encountered, the footings should be extended to the depth at which suitable soil is encountered.

Continuous wall footings should have a minimum width of 16 inches, and isolated spread footings should have a minimum width of 30 inches. Trench footings should have a minimum width of 16 inches to facilitate cleaning and evaluation of the bearing surface. Exterior footings and footings founded in unheated portions of the structures should be supported a minimum of 36 inches below

final exterior grade to provide protection against frost penetration. Footings should be earth-formed, poured in neat excavations.

7.2 Estimated Settlements

Long-term structural settlement for spread footings designed and constructed as outlined above (including the recommended undercut) should be minor, 1-inch or less. Differential settlements should occur gradually across the proposed gymnasium and be on the order of 3/4-inch or less.

In the case of the future expansion, the addition of a new structure to an existing structure can lead to differential settlement issues between the two buildings, because it is likely that the existing structure has undergone the majority of its settlement prior to being joined with the new addition. The addition is susceptible to settling independently of the existing building, resulting in differential settlement. The previously estimated amount of settlement for the gymnasium will be the same for the planned future expansion; however, this settlement will be in the form of differential settlement between the existing building (the gymnasium) and the planned future expansion. If this amount of settlement between the existing building and the new addition is not tolerable, then measures to mitigate the anticipated settlement should be implemented.

7.3 Construction Considerations

The base of all footing excavations should be free of all water and loose material prior to placing concrete. Concrete should be placed as soon as possible after excavating so that excessive drying or disturbance of bearing materials does not occur. Should the materials at bearing level become excessively dry or saturated, it is recommended that the affected material be removed prior to placing concrete.

It is also recommended that all footing excavations be evaluated and tested by a geotechnical engineer immediately prior to placement of foundation concrete. Unsuitable areas identified at this time should be corrected. Corrective procedures would be dependent upon conditions encountered and may include deepening of foundation elements, or undercutting of unsuitable materials and replacement with engineered fill.

8.0 SLABS ON GRADE

After the excavation of the undocumented fill, observation and/or testing should be performed to identify soft or unstable soils that should be removed and replaced prior to replacing the excavation with engineered controlled fill.

The upper 24-inches of the soil below the gravel base should consist of low volume change (LVC) soils with liquid limits less than 45 and a plasticity index below 25**.** The on-site soils at the locations sampled during this exploration generally do meet these requirements. Import soils or crushed stone used for the LVC layer in the building pad should be tested prior to placement of the drainage layer. Compaction of low swell potential soil or crushed stone under the slab should be to 95 percent of the maximum dry density as determined by ASTM D 698 at a moisture content between 0 and +4 percent of the optimum. It is very important that the subgrade soils be maintained at or above standard Proctor optimum moisture content until concrete is placed. Any rutted subgrade should be repaired prior to placement of crushed stone to avoid a potential water trap and subsequent sub grade movement.

KCTE recommends that a minimum 6-inch-thick mat of open-graded (clean) stone, with maximum particle size of ¾-inch and less than 5 percent passing the No. 4 sieve (ASTM D448, No. 467, No. 57, No. 67, or similar material) be placed beneath the floor slab to enhance the drainage. This material can be counted in the 24" of LVC required. The granular layer will ease construction, provide capillary break and aid in drainage. To remove any potential water collected under the slab, KCTE recommends a permanent dewatering system (i.e., sump pump) be installed during the installation of the crushed stone base course.

To reduce the effects of differential movement, slabs-on-grade should not be rigidly connected to columns, walls, or foundations unless it is designed to withstand the additional resultant forces. Floor slabs should not extend beneath exterior doors or over foundation grade beams, unless saw cut at the beam after construction. Expansion joints may be used to allow unrestrained vertical movement of the slabs. The floor slabs should be designed to have an adequate number of joints to reduce cracking resulting from differential movement and shrinkage. KCTE suggests joints be provided on a minimum spacing of 15 feet on center.

9.0 DRAINAGE

The site should be graded so that surface water flows away from structures. Where sidewalks or paving do not immediately adjoin the structure, protective slopes of at least 5% for a minimum of 10 feet from the perimeter walls are recommended. Roof drains, downspouts should also be directed away from buildings.

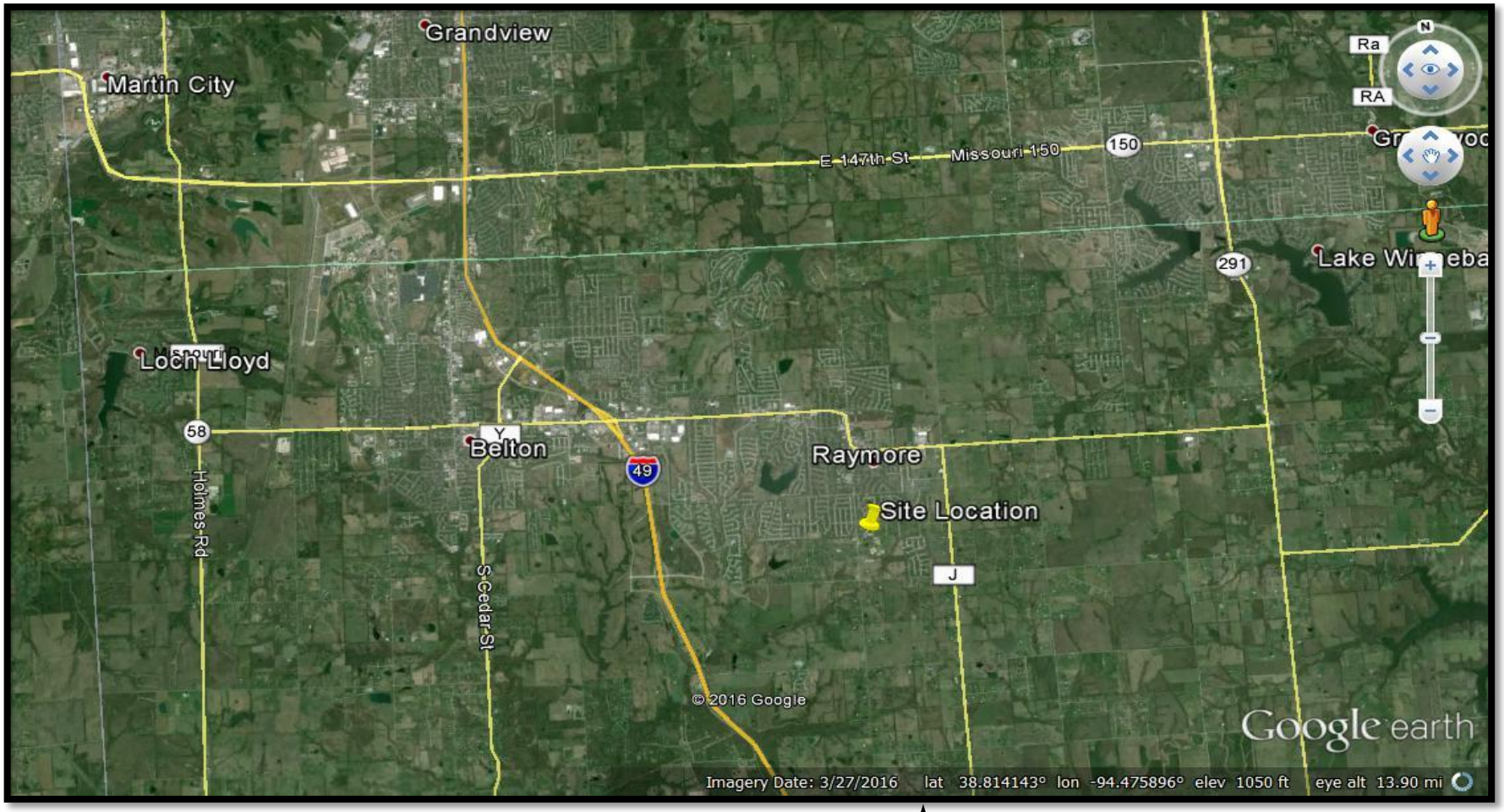
The site should also be graded to avoid water flows, concentrations, or pools behind foundations. If swales are designed at the top of the walls, proper line and slope should be considered to avoid any flow down behind walls. Special attention to sources of storm water from building roofs, gutter downspouts, paved areas draining to one point, is needed.

10.0 LIMITATIONS

This report is presented in broad terms to provide an assessment of the subsurface conditions and their potential effect on lightly to moderately loaded structures. Any changes in the design or location of the proposed structure should be assumed to invalidate the conclusions and recommendations given in this report until we have had the opportunity to review the changes and, if necessary, modify our conclusions and recommendations accordingly. It is recommended that the geotechnical engineer be afforded the opportunity of a general review of the final design plans and specifications prior to construction in order to determine if they are consistent with the conclusions and recommendations given in this report. Particular details of foundation design, construction specifications or quality control may develop, and we would be pleased to respond to any questions that you may have regarding these details.

This report has been prepared with generally accepted geotechnical engineering practices used in this area at the time the report was prepared. No other warranty, expressed or implied, is made. The preliminary recommendations are based upon the data obtained from the borings drilled at the approximate locations shown in Figure 2. The nature and extent of the subsurface variations between borings may not become evident until excavation is performed. If during construction, soil, bedrock, fill, or groundwater conditions appear to be different than described in this preliminary report, we should be notified immediately so that re-evaluation of our recommendations may be made. On-site observation of foundation construction and sub-grade preparation by KCTE is recommended. The scope of our services did not include any environmental assessment or

investigation for the presence of hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site.



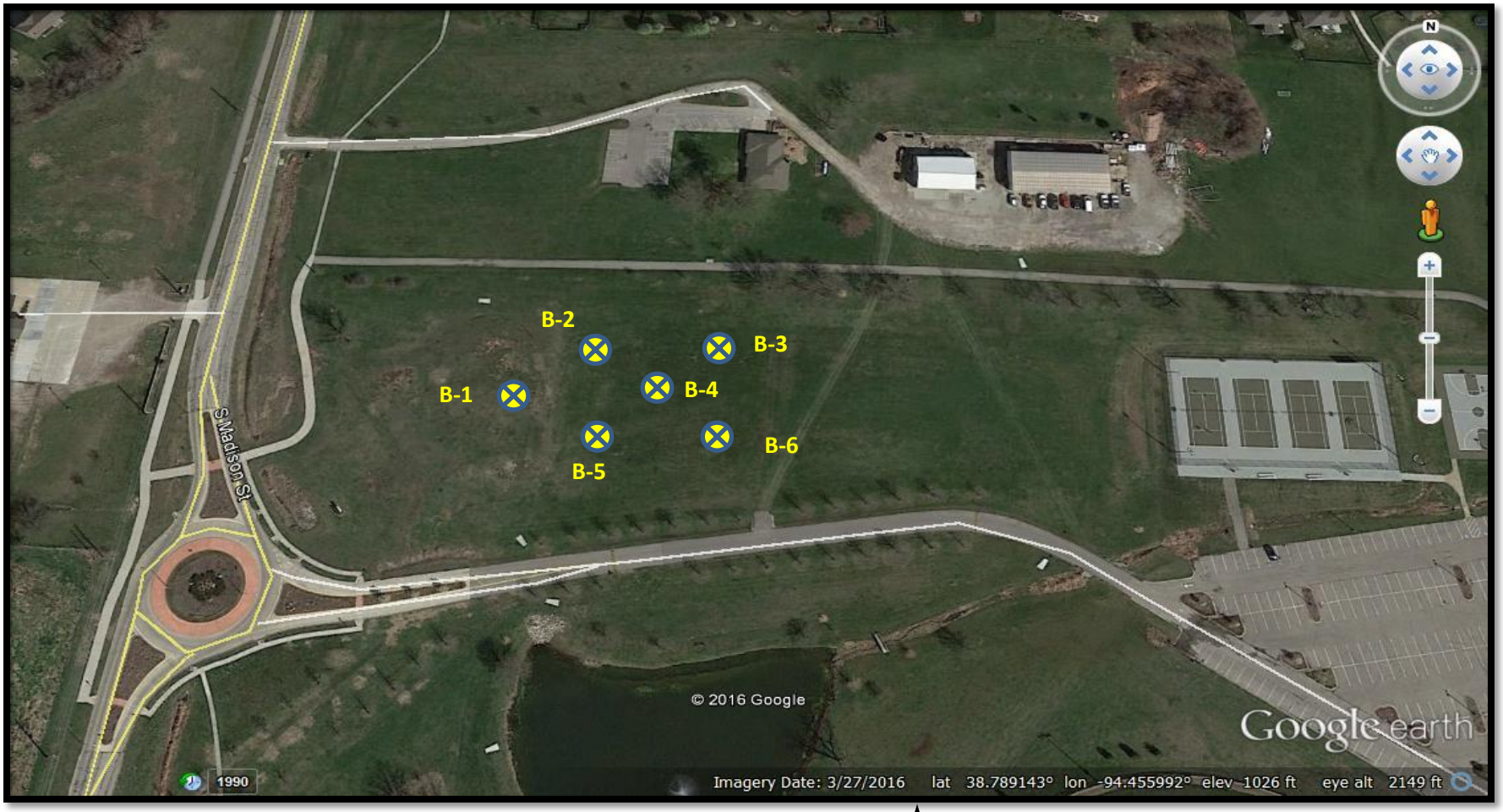
North

Figure 1
Site Location Plan
Gymnasium and Future Expansion
Raymore, Missouri

Note: Figures are adopted from Google Earth

Date: 9/9/2016
Project Number: G20-16-215

KANSAS CITY TESTING & ENGINEERING, LLC
1308 Adams Street
Kansas City, Kansas 66103
www.kctesting.com



North

Figure 2
Boring Location Plan
Gymnasium and Future Expansion
Raymore, Missouri

Note: Figures are adopted from Google Earth

Date: 9/9/2016
Project Number: G20-16-215

KANSAS CITY TESTING & ENGINEERING, LLC
1308 Adams Street
Kansas City, Kansas 66103
www.kctesting.com

APPENDIX A

BORING LOGS

Kansas City Testing and Engineering, LLC
1308 Adams Street
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-1

CLIENT City of Raymore Public Works Department
PROJECT NAME Gymnasium and Future Expansion
PROJECT NUMBER G20-16-215
PROJECT LOCATION Raymore, Missouri
DATE STARTED 8/29/16 **COMPLETED** 8/29/16
GROUND ELEVATION _____ **HOLE SIZE** 3.25 inches
DRILLING CONTRACTOR KCTE
GROUND WATER LEVELS:
DRILLING METHOD 3.25 Inch Hollow Stem Auger
AT TIME OF DRILLING --- No Water Encountered
LOGGED BY AK **CHECKED BY** Jacob Engler
AT END OF DRILLING --- No Water Encountered
NOTES
AFTER DRILLING --- No Water Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	UNCONF COMPR. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	Pocket Pen. (tsf)
0		TOPSOIL										
		FAT CLAY- very stiff, dark brown with rootlets	ST 1	50		7443	94	24.6	66	25	41	
		stiff, gray mottled brown with iron nodules below 3'	ST 2	50		2234	93	25.7				
5												
			ST 3	50		2514	101	23.6				
10												
		medium stiff below 12'	ST 4	50		1814	13	850.6				
15												

Bottom of borehole at 15.0 feet.

Kansas City Testing and Engineering, LLC
1308 Adams Street
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-2

CLIENT City of Raymore Public Works Department
PROJECT NAME Gymnasium and Future Expansion
PROJECT NUMBER G20-16-215
PROJECT LOCATION Raymore, Missouri
DATE STARTED 8/29/16 **COMPLETED** 8/29/16
GROUND ELEVATION _____ **HOLE SIZE** 3.25 inches
DRILLING CONTRACTOR KCTE
GROUND WATER LEVELS:
DRILLING METHOD 3.25 Inch Hollow Stem Auger
AT TIME OF DRILLING --- No Water Encountered
LOGGED BY AK **CHECKED BY** Jacob Engler
AT END OF DRILLING --- No Water Encountered
NOTES
AFTER DRILLING --- No Water Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	UNCONF COMPR. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	Pocket Pen. (tsf)
0		TOPSOIL										
		FAT CLAY- very stiff, dark brown with rootlets	ST 1	75		4610	95	21.8				
		stiff, gray mottled brown with iron nodules below 3'	ST 2	75		2300	93	27.7				
5												
		shaley below 8'	ST 3	50		3414	99	27.5				
10												
		HIGHLY WEATHERED SHALE BEDROCK- stiff, gray mottled brown with iron nodules	ST 4	50		3455	99	27.6				
15												

Bottom of borehole at 15.0 feet.

Kansas City Testing and Engineering, LLC
1308 Adams Street
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-3

CLIENT City of Raymore Public Works Department
PROJECT NAME Gymnasium and Future Expansion
PROJECT NUMBER G20-16-215
PROJECT LOCATION Raymore, Missouri
DATE STARTED 8/29/16 **COMPLETED** 8/29/16
GROUND ELEVATION _____ **HOLE SIZE** 3.25 inches
DRILLING CONTRACTOR KCTE
GROUND WATER LEVELS:
DRILLING METHOD 3.25 Inch Hollow Stem Auger
AT TIME OF DRILLING --- No Water Encountered
LOGGED BY AK **CHECKED BY** Jacob Engler
AT END OF DRILLING --- No Water Encountered
NOTES
AFTER DRILLING --- No Water Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	UNCONF COMPR. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	Pocket Pen. (tsf)
0		TOPSOIL										
		FAT CLAY- hard, dark brown with rootlets	ST 1	50		10070	100	19.6				
		stiff, gray mottled brown with iron nodules below 3'	ST 2	75		3986	98	26.1				
5												
		shaley below 8'	ST 3	63		2593	98	27.6				
10												
		HIGHLY WEATHERED SHALE BEDROCK- stiff, gray mottled olive-brown with iron nodules	ST 4	63		3933	96	31.6				
15												

Bottom of borehole at 15.0 feet.

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BORING NUMBER B-4

CLIENT City of Raymore Public Works Department
PROJECT NAME Gymnasium and Future Expansion
PROJECT NUMBER G20-16-215
PROJECT LOCATION Raymore, Missouri
DATE STARTED 8/30/16 **COMPLETED** 8/30/16
GROUND ELEVATION _____ **HOLE SIZE** 3.25 inches
DRILLING CONTRACTOR KCTE
GROUND WATER LEVELS:
DRILLING METHOD 3.25 Inch Hollow Stem Auger
AT TIME OF DRILLING --- No Water Encountered
LOGGED BY AK **CHECKED BY** Jacob Engler
AT END OF DRILLING --- No Water Encountered
NOTES
AFTER DRILLING --- No Water Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	UNCONF COMPR. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	Pocket Pen. (tsf)
0		TOPSOIL										
		FAT CLAY- hard, dark brown with rootlets	ST 1	75		9022	101	24.0	56	25	31	
		stiff, gray mottled brown with iron nodules below 3'	ST 2	50		2635	97	24.2				
5												
		moist below 8'	ST 3	63		2308	94	26.9				
10												
		shaley below 12'	ST 4	50		1594	99	26.5				
15												
20												
25												
30		SHALE BEDROCK										
		LIMESTONE BEDROCK										

Refusal at 31.5 feet.
Bottom of borehole at 31.5 feet.

Kansas City Testing and Engineering, LLC
1308 Adams Street
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-5

CLIENT City of Raymore Public Works Department
PROJECT NAME Gymnasium and Future Expansion
PROJECT NUMBER G20-16-215
PROJECT LOCATION Raymore, Missouri
DATE STARTED 8/30/16 **COMPLETED** 8/30/16
GROUND ELEVATION _____ **HOLE SIZE** 3.25 inches
DRILLING CONTRACTOR KCTE
GROUND WATER LEVELS:
DRILLING METHOD 3.25 Inch Hollow Stem Auger
AT TIME OF DRILLING --- No Water Encountered
LOGGED BY AK **CHECKED BY** Jacob Engler
AT END OF DRILLING --- No Water Encountered
NOTES
AFTER DRILLING --- No Water Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	UNCONF COMPR. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	Pocket Pen. (tsf)
0		TOPSOIL										
		FAT CLAY- stiff, dark brown with rootlets	ST 1	50		3972	98	28.9				
		medium stiff, gray mottled brown with iron nodules below 3'	ST 2	50		1643	97	25.3				
5												
		stiff below 8'	ST 3	50		3707	96	28.9				
10												
		shaley below 12'	ST 4	50		1658	95	29.7				
15												

Bottom of borehole at 15.0 feet.

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BORING NUMBER B-6

CLIENT City of Raymore Public Works Department
PROJECT NAME Gymnasium and Future Expansion
PROJECT NUMBER G20-16-215
PROJECT LOCATION Raymore, Missouri
DATE STARTED 8/30/16 **COMPLETED** 8/30/16
GROUND ELEVATION _____ **HOLE SIZE** 3.25 inches
DRILLING CONTRACTOR KCTE
GROUND WATER LEVELS:
DRILLING METHOD 3.25 Inch Hollow Stem Auger
AT TIME OF DRILLING --- No Water Encountered
LOGGED BY AK **CHECKED BY** Jacob Engler
AT END OF DRILLING --- No Water Encountered
NOTES
AFTER DRILLING --- No Water Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	UNCONF COMPR. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	Pocket Pen. (tsf)
0		TOPSOIL										
		FAT CLAY- medium stiff, dark brown with rootlets	ST 1	50		1770	88	31.0				
		stiff, gray mottled brown with iron nodules below 3'	ST 2	21		3091	98	27.0				
5												
10												
15												

Bottom of borehole at 15.0 feet.

APPENDIX B

LABORATORY RESULTS

Kansas City Testing and Engineering, LLC
1308 Adams Street
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

SUMMARY OF LABORATORY RESULTS

CLIENT City of Raymore Public Works Department **PROJECT NAME** Gymnasium and Future Expansion

PROJECT NUMBER G20-16-215 **PROJECT LOCATION** Raymore, Missouri

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Class-ification	Water Content (%)	Dry Density (pcf)	Satur-ation (%)	Void Ratio
B-1	1.0	66	25	41				24.6	93.6		
B-1	3.0							25.7	93.3		
B-1	8.0							23.6	100.9		
B-1	13.0							850.6	12.6		
B-2	1.0							21.8	94.6		
B-2	3.0							27.7	93.4		
B-2	8.0							27.5	98.6		
B-2	13.0							27.6	99.4		
B-3	1.0							19.6	99.7		
B-3	3.0							26.1	98.1		
B-3	8.0							27.6	98.3		
B-3	13.0							31.6	95.7		
B-4	1.0	56	25	31				24.0	100.7		
B-4	3.0							24.2	96.7		
B-4	8.0							26.9	94.4		
B-4	13.0							26.5	98.7		
B-5	1.0							28.9	98.0		
B-5	3.0							25.3	97.1		
B-5	8.0							28.9	95.8		
B-5	13.0							29.7	95.1		
B-6	1.0							31.0	88.1		
B-6	3.0							27.0	97.8		

Kansas City Testing and Engineering, LLC
1308 Adams Street
Kansas City, KS 66103
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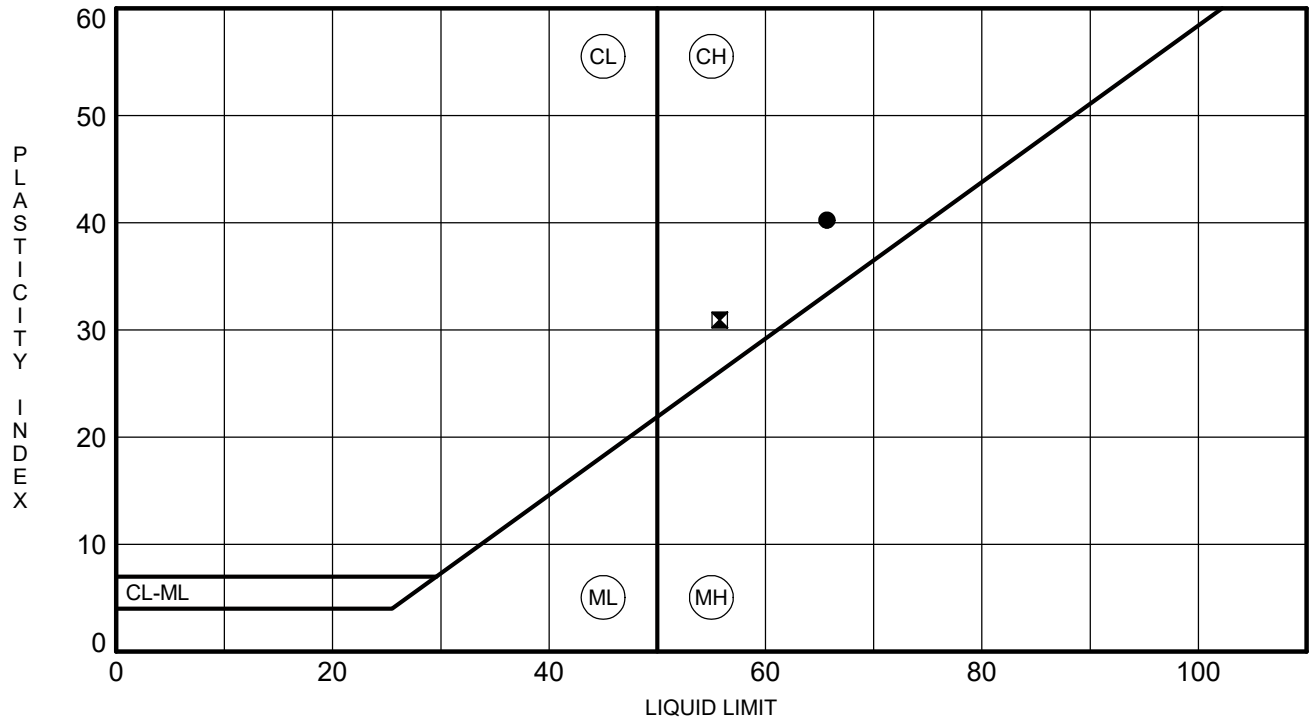
ATTERBERG LIMITS' RESULTS

CLIENT City of Raymore Public Works Department
PROJECT NAME Gymnasium and Future Expansion
PROJECT NUMBER G20-16-215
PROJECT LOCATION Raymore, Missouri



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-1**	**1.0**	**66**	**25**	**41**		
⊠	**B-4**	**1.0**	**56**	**25**	**31**		

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1308 Adams Street
Kansas City, KS 66103
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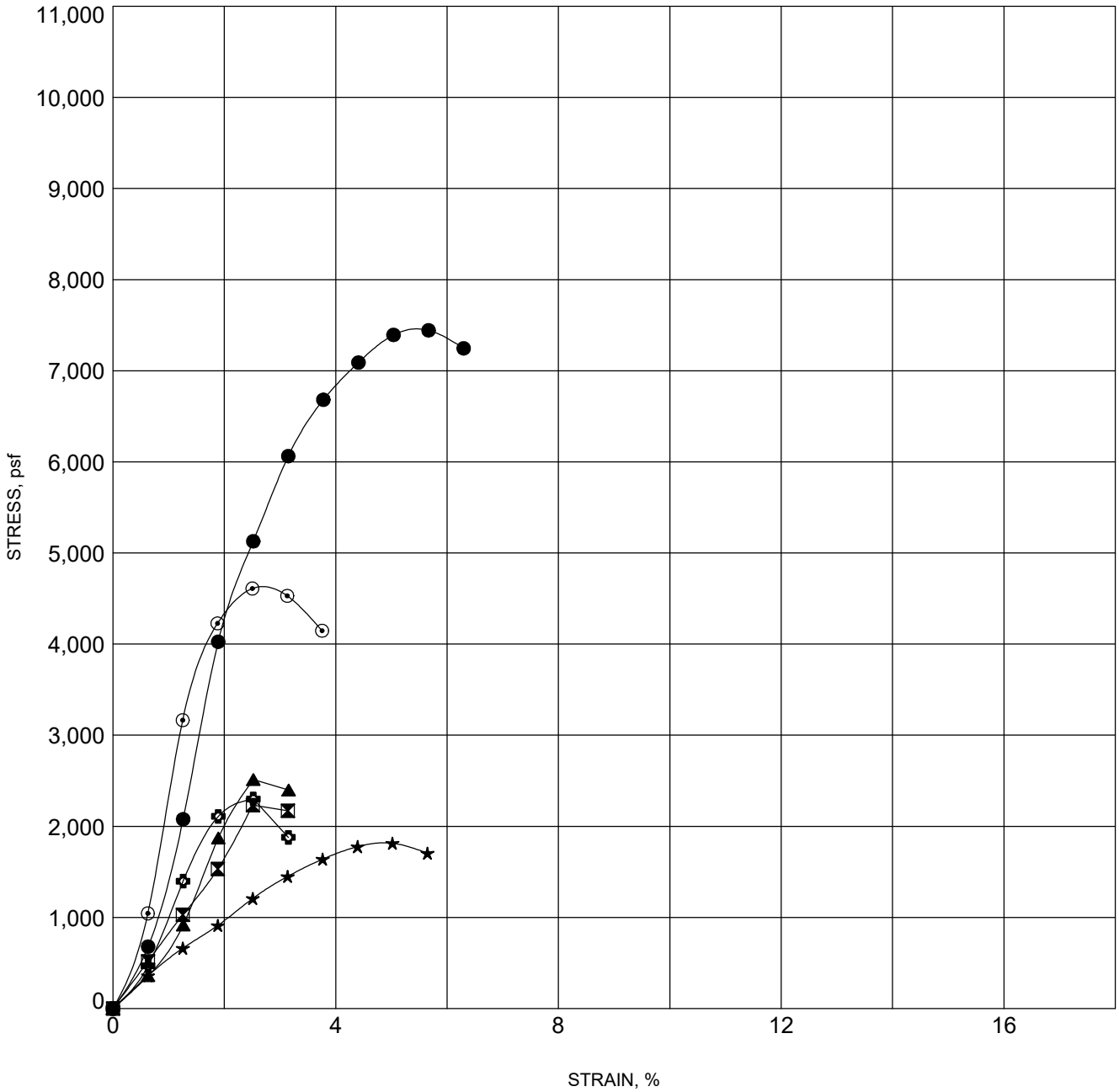
UNCONFINED COMPRESSION TEST

CLIENT City of Raymore Public Works Department
PROJECT NAME Gymnasium and Future Expansion
PROJECT NUMBER G20-16-215
PROJECT LOCATION Raymore, Missouri



BOREHOLE		DEPTH	Classification	γ_d	MC%
●	B-1	1.0		94	25
⊠	B-1	3.0		93	26
▲	B-1	8.0		101	24
★	B-1	13.0		13	851
⊙	B-2	1.0		95	22
✿	B-2	3.0		93	28

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UNCONFINED COMPRESSION TEST

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PROJECT NAME Gymnasium and Future Expansion
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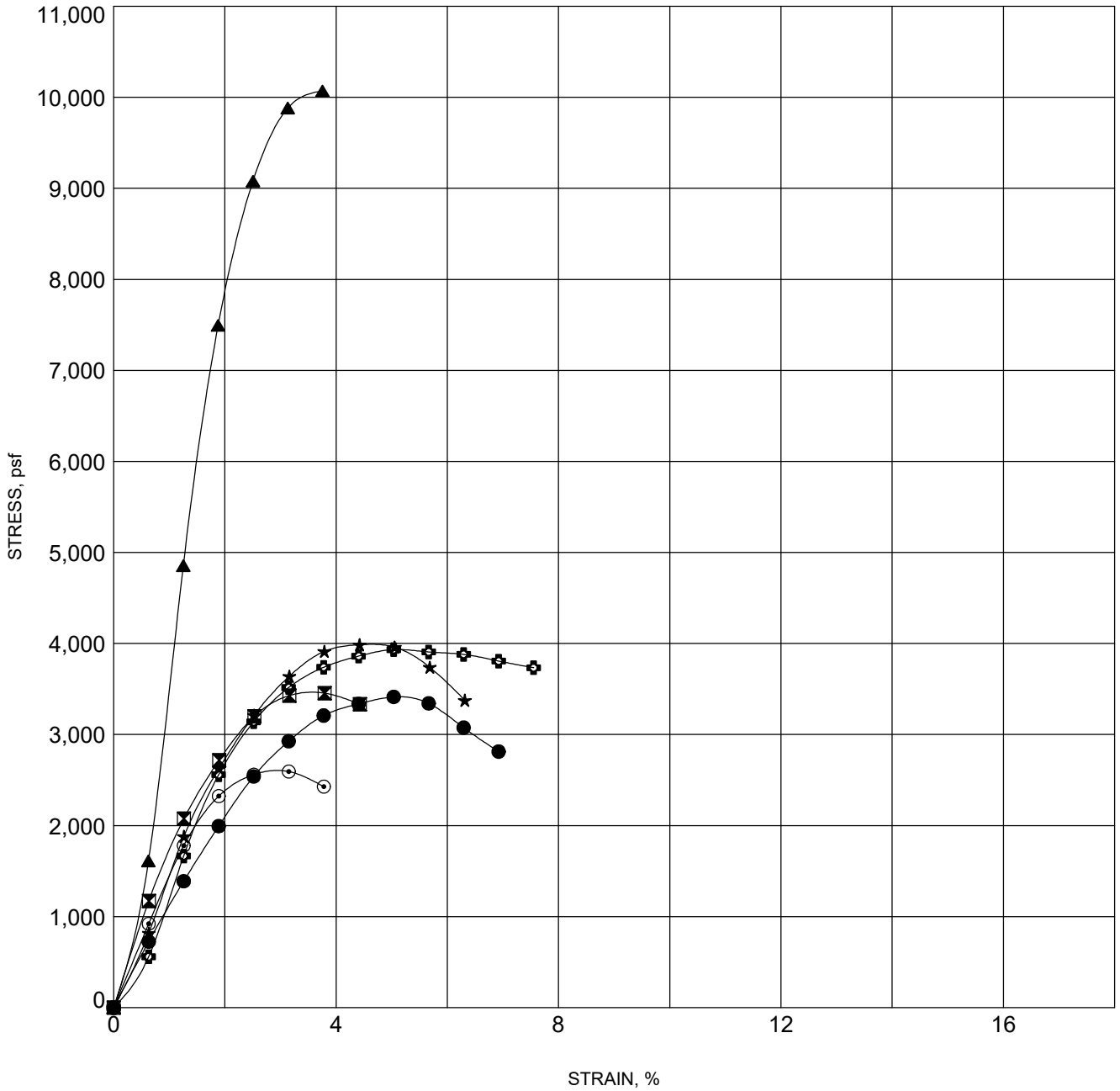

BOREHOLE		DEPTH	Classification	γ_d	MC%
●	B-2	8.0		99	28
⊠	B-2	13.0		99	28
▲	B-3	1.0		100	20
★	B-3	3.0		98	26
⊙	B-3	8.0		98	28
✿	B-3	13.0		96	32

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UNCONFINED COMPRESSION TEST

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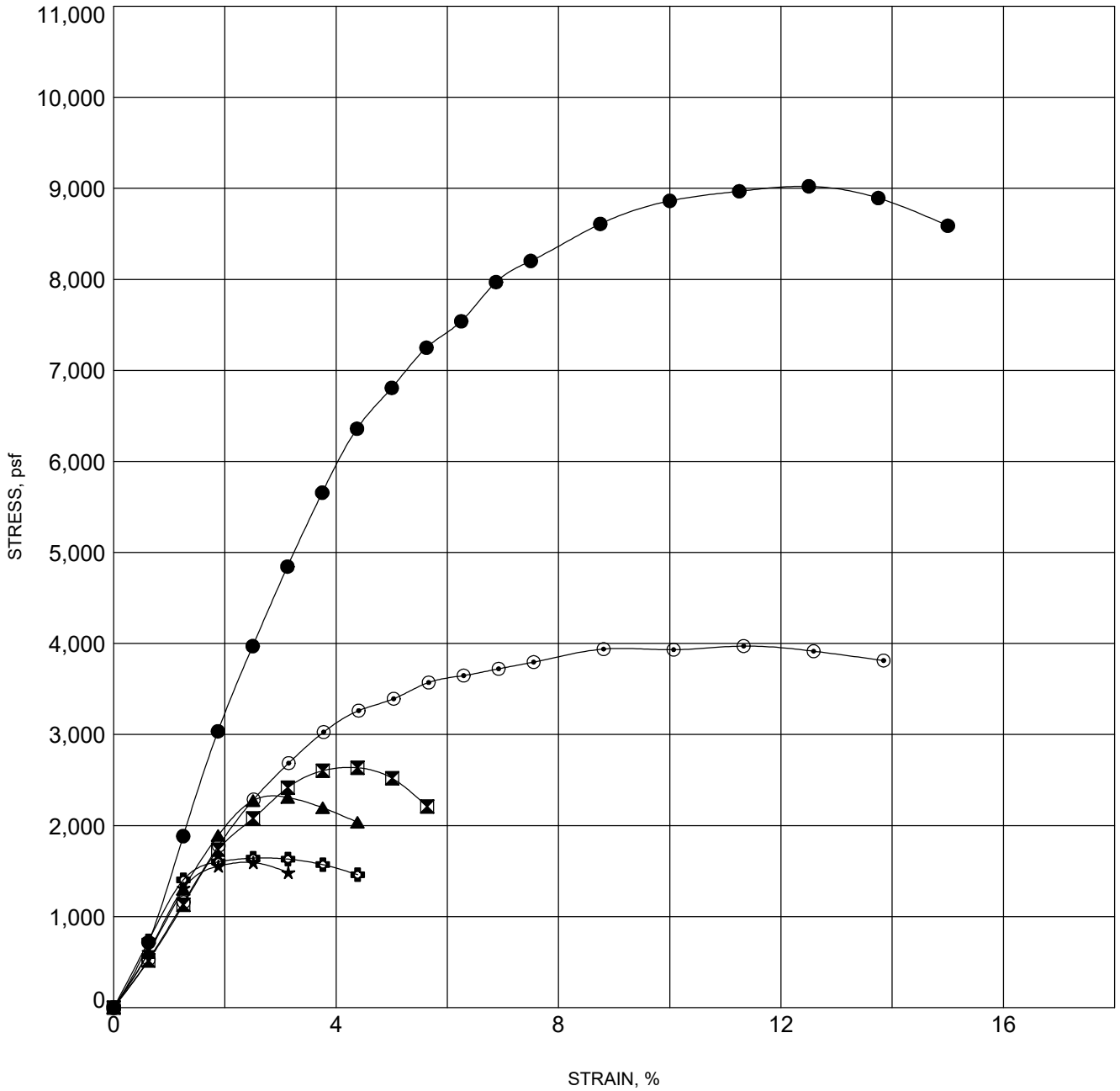
PROJECT NAME Gymnasium and Future Expansion
PROJECT NUMBER G20-16-215
PROJECT LOCATION Raymore, Missouri



BOREHOLE		DEPTH	Classification	γ_d	MC%
●	B-4	1.0		101	24
⊠	B-4	3.0		97	24
▲	B-4	8.0		94	27
★	B-4	13.0		99	27
⊙	B-5	1.0		98	29
✿	B-5	3.0		97	25

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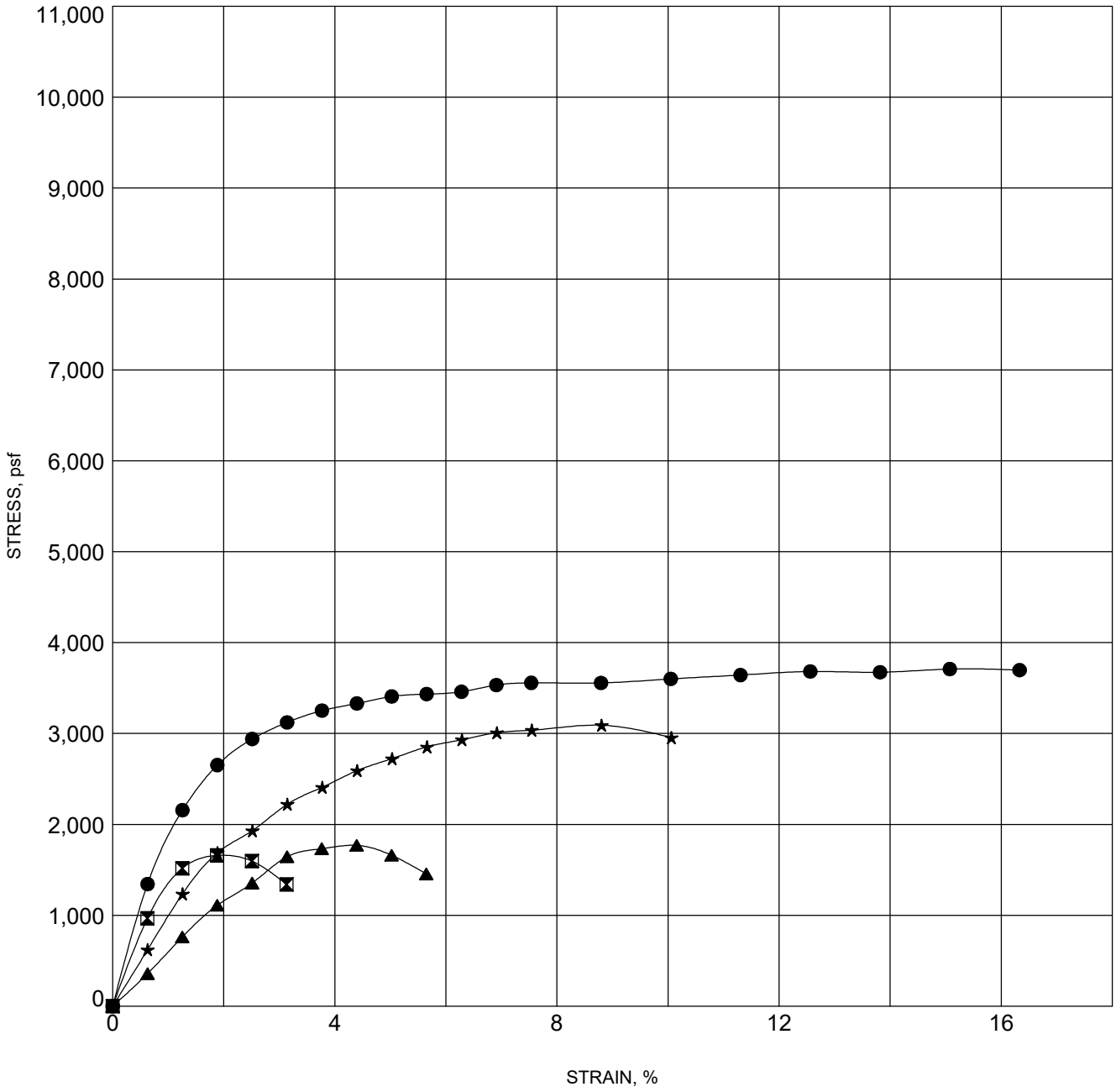
UNCONFINED COMPRESSION TEST

CLIENT City of Raymore Public Works Department
PROJECT NAME Gymnasium and Future Expansion
PROJECT NUMBER G20-16-215
PROJECT LOCATION Raymore, Missouri



BOREHOLE		DEPTH	Classification	γ_d	MC%
●	B-5	8.0		96	29
⊠	B-5	13.0		95	30
▲	B-6	1.0		88	31
★	B-6	3.0		98	27

Missouri
Division of Labor Standards

WAGE AND HOUR SECTION

JEREMIAH W. (JAY) NIXON, Governor

Annual Wage Order No. 23

Section 019

CASS COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by
John E. Lindsey, Director
Division of Labor Standards

This Is A True And Accurate Copy Which Was Filed With The Secretary of State: **March 10, 2016**

Last Date Objections May Be Filed: **April 11, 2016**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	** Date of Increase	*	Basic Hourly Rates	Over-Time Schedule	Holiday Schedule	Total Fringe Benefits
Asbestos Worker (H & F) Insulator	10/16		$36.97	52	53	$25.45
Boilermaker	7/16		$35.93	57	7	$28.33
Bricklayer and Stone Mason	6/16		$34.35	58	39	$18.72
Carpenter	6/16		$37.25	63	68	$16.10
Cement Mason			$31.24	65	4	$18.54
Communication Technician			$33.65	47	72	$16.26 + 10%
Electrician (Inside Wireman)			$36.69	13	72	$16.95 + 10%
Electrician (Outside-Line Construction\Lineman)			$41.52	125	65	$5.00 + 34.5%
Lineman Operator			$38.37	125	65	$5.00 + 34.5%
Groundman			$26.76	125	65	$5.00 + 34.5%
Elevator Constructor	7/16	a	$44.515	26	54	$31.531
Glazier			$33.12	88	32	$16.68
Ironworker	6/16		$32.00	50	4	$28.45
Laborer (Building):						
General	6/16		$27.15	30	4	$15.45
First Semi-Skilled	6/16		$27.55	30	4	$15.45
Second Semi-Skilled	6/16		$27.95	30	4	$15.45
Lather			USE CARPENTER RATE			
Linoleum Layer and Cutter	6/16		$34.97	46	67	$16.10
Marble Mason			$34.24	25	4	$14.18
Marble Finisher			$24.11	25	4	$8.85
Millwright			USE CARPENTER RATE			
Operating Engineer						
Group I	8/16		$38.44	85	4	$16.02
Group II	8/16		$37.63	85	4	$16.02
Group III	8/16		$32.08	85	4	$16.02
Group III-A	8/16		$36.29	85	4	$16.02
Group IV						
Group V	8/16		$33.68	85	4	$16.02
Painter	6/16		$28.54	37	4	$16.56
Pile Driver			USE CARPENTER RATE			
Pipe Fitter	9/16		$43.08	2	33	$21.57
Plasterer			$31.60	68	4	$16.25
Plumber	6/16		$42.64	45	33	$21.04
Roofer \ Waterproofer	6/16		$32.55	95	2	$17.09
Sheet Metal Worker	8/16		$40.20	17	22	$21.71
Sprinkler Fitter - Fire Protection	11/16		$36.74	14	4	$19.62
Terrazzo Worker			$34.24	25	4	$14.18
Terrazzo Finisher			$24.11	25	4	$8.85
Tile Setter			$34.24	25	4	$14.18
Tile Finisher			$24.11	25	4	$8.85
Traffic Control Service Driver			$15.35	48	49	$2.71
Truck Driver-Teamster						
Group I			$30.09	100	4	$10.90
Group II			$30.09	100	4	$10.90
Group III			$30.29	100	4	$10.90
Group IV			$30.29	100	4	$10.90

Fringe Benefit Percentage is of the Basic Hourly Rate

**Annual Incremental Increase

Building Construction Rates for
CASS County Footnotes

Section 019

OCCUPATIONAL TITLE	** Date of Increase	Basic Hourly Rates	Over-Time Schedule	Holiday Schedule	Total Fringe Benefits

* Welders receive rate prescribed for the occupational title performing operation to which welding is incidental.

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

a - Vacation: Employees over 5 years - 8%; Employees under 5 years - 6%

REPLACEMENT PAGE
CASS COUNTY
BUILDING CONSTRUCTION - OVERTIME SCHEDULE

FED: Minimum requirement per Fair Labor Standards Act means time and one-half (1 ½) shall be paid for all work in excess of forty (40) hours per work week.

NO. 2: Means the maximum of eight (8) hours shall constitute a day's work beginning at 8:00 a.m. to 12:00 noon, 12:30 p.m. to 4:30 p.m. The maximum work week shall be forty (40) hours beginning Monday at 8:00 a.m. and ending Friday at 4:30 p.m. Because of traffic, parking or other circumstances, the hours of work on any project may be any continuous 8½ hours period (8 hours of work plus 30 minutes for lunch) between 7:00 a.m. and 4:30 p.m. When circumstances warrant and when it is mutually beneficial and agreed to, the Employer may institute a work week consisting of four (4) consecutive ten (10) hour days, between the hours of 7:00 a.m. and 6:00 p.m. Monday through Thursday, with one-half (½) hour allowed for a lunch period each day. Friday may be used as a make-up day. After ten (10) hours in a workday, or forty (40) hours in a workweek, overtime shall be paid at a rate of one and one-half (1½) times the regular rate of pay. Overtime performed Monday through Saturday shall be paid at the rate of one and one-half (1½) times the regular rate of pay. Sundays and recognized holidays shall be paid at the double (2) time rate of pay. Labor Day shall be paid at triple (3) time. Shift work may be performed at the option of the Contractor. However, whenever shift work is performed it must cover a period not less than (5) consecutive working days. The day shift shall work a regular eight (8) hours shift as outlined above. Employees working a second shift shall receive an additional $0.25 above the regular hourly rate and perform seven and one-half (7½) hours work for eight (8) hours pay. Third shift employees shall be paid an additional $0.50 above the regular hourly rate and work seven (7) hours for eight (8) hours pay. In the event a first shift is not required, a second and third shift employee shall receive an additional 15% of the base rate and receive pay for actual hours worked.

NO. 13: Means a regular workday shall consist of eight (8) hours between 8:00 a.m. and 4:30 p.m. Forty (40) hours, within five (5) days -- Monday through Friday inclusive -- shall constitute the regular workweek. The Employer may alter the above stated hours by two (2) hours for an early starting and quitting time only, not to exceed eight (8) hours of work in any one day. When job conditions dictate and as required by the customer, the Employer shall be allowed to establish a four (4) day, ten (10) hour per day work week. This work week is defined as Monday through Thursday, with a Friday make-up day. The normal work day under a ten (10) hour four (4) day work week shall be from 7:00 a.m. to 6:00 p.m., with a one hour starting variance. The make-up day of Friday shall be instituted for specific reasons such as loss of production due to weather and/or holidays. All hours worked in excess of ten (10) hours per day or forty (40) hours per week or hours worked outside the normal work week shall be paid at the applicable overtime rate. The first four (4) hours of overtime after the normal workday, each day Monday through Friday and the first ten (10) hours of overtime on Saturdays shall be paid for at one and one-half (1½) times the regular straight time rate of pay. All other work performed outside of the regularly scheduled working hours and outside of the first ten (10) hours worked on Saturdays shall be paid for at double (2) the regular straight time rate of pay. Sundays and the recognized holidays shall be paid for at double (2) the regular straight time rate of pay, if worked. When so elected by the contractor, multiple shifts of at least five (5) days duration may be worked. When two (2) or three (3) shifts are worked: The first shift (day shift) shall be worked between the hours of 8:00 a.m. and 4:30 p.m. Workmen on the "day shift" shall receive eight (8) hours pay at the regular hourly rate for eight (8) hours work. The second shift (swing shift) shall be worked between the hours of 4:30 p.m. and 12:30 a.m. Workmen on the "swing shift" shall receive eight (8) hours pay at the regular hourly rate plus 10% for seven and one-half (7 ½) hours work. The third shift (graveyard shift) shall be worked between the hours of 12:30 a.m. and 8:00 a.m. Workmen on the "graveyard shift" shall receive eight (8) hours pay at the regular hourly rate plus 15% for seven (7) hours work. A lunch period of thirty (30) minutes shall be allowed on each shift. All overtime work required after the completion of a regular shift shall be paid at one and one-half (1½) times the "shift" hourly rate.

NO. 14: Means eight (8) hours per day shall constitute a day's work. The regular starting time shall be 8:00 a.m., and the regular quitting time shall be 4:30 p.m.; lunch time shall be twelve (12) o'clock noon to 12:30 p.m. The regular starting time may, by mutual consent of employees on the job site, and the employer, be between 7:00 a.m. and 9:00 a.m. with appropriate adjustments made to the regular quitting time and lunch time. All time worked before the regular starting time and after the regular quitting time, Monday through Friday, shall be paid at the rate of time and one-half (1½). Four (4) days at ten (10) hours a day may be worked at straight time. All work commencing with the beginning of the established work day on Saturday shall be paid at the rate of time and one-half (1½). All work commencing with the beginning of the established work day on Sundays and/or Holidays shall be paid at the rate of double (2) time.

REPLACEMENT PAGE
CASS COUNTY
BUILDING CONSTRUCTION - OVERTIME SCHEDULE

NO. 17: Means the regular working day shall consist of eight (8) hours of labor between 7:00 a.m. and 3:30 p.m. and the regular work week shall consist of five (5) consecutive eight (8) hour days of labor beginning on Monday and ending with Friday of each week. All full-time or part-time labor performed during such hours shall be recognized as regular working hours and paid for at the regular hourly rate. Except as otherwise provided, all work performed outside of regular working hours during the regular work week, shall be at double (2) times the regular rate. Working hours may be varied by two (2) hours. When circumstances warrant and when it is mutually beneficial and agreed to by interested parties, the Employer may institute a work week consisting of four (4) consecutive ten (10) hour days, between the hours of five (5) a.m. and six (6) p.m., Monday through Thursday, with one-half (1/2) hour allowed for a lunch period each day. Friday may be used as a make-up day. The make-up day will be voluntary, and a decision not to work may not be held against the employee. When working four (4) ten (10) hour day's overtime will be paid at the time and one-half (1½) rate for the eleventh (11^{th}) and twelfth (12^{th}) hour, all other work will be paid at the double (2) time rate of pay. The first two (2) hours of overtime, Monday through Friday, and the first eight (8) hours on Saturday shall be at time and one-half (1½) for all work. All other overtime shall be at double (2) time. The first two (2) hours of overtime must be concurrent with the regular work day; two (2) hours prior to or following the regular work day are at time and one-half (1½). The regular workday (as previously defined) on Saturday is paid at time and one-half (1½). Work performed outside of the regular Saturday work day is at double (2) time. All work performed on recognized holidays, or days locally observed as such, and Sundays shall be paid at the double (2) time rate of pay.

NO. 25: Means regular working hours of eight (8) hours shall constitute a working day between the hours of 8:00 a.m. to 4:30 p.m. in a forty (40) hour working week of Monday through Friday. Employment on Saturday, Sunday and legal holidays, and employment before or after the regular working hours shall be considered overtime. Employment on Saturday, Sunday and legal holidays shall be paid for at twice (2) the regular hourly rate. Employment from 4:30 p.m. to 12:00 midnight, Monday through Friday, shall be paid for at one and one-half (1½) times the regular hourly rate. From 12:00 midnight until 8:00 a.m. on any day shall be paid for at twice (2) the regular hourly rate.

NO. 26: Means that the regular working day shall consist of eight (8) hours worked between 6:00 a.m., and 5:00 p.m., five (5) days per week, Monday to Friday, inclusive. Hours of work at each jobsite shall be those established by the general contractor and worked by the majority of trades. (The above working hours may be changed by mutual agreement). Work performed on Construction Work on Saturdays, Sundays and before and after the regular working day on Monday to Friday, inclusive, shall be classified as overtime, and paid for at double (2) the rate of single time. The employer may establish hours worked on a jobsite for a four (4) ten (10) hour day work week at straight time pay for construction work; the regular working day shall consist of ten (10) hours worked consecutively, between 6:00 a.m. and 6:00 p.m., four (4) days per week, Monday to Thursday, inclusive. Any work performed on Friday, Saturday, Sunday and holidays, and before and after the regular working day on Monday to Thursday where a four (4) ten (10) hour day workweek has been established, will be paid at two times (2) the single time rate of pay. The rate of pay for all work performed on holidays shall be at two times (2) the single time rate of pay.

NO. 30: Means Monday through Sunday shall constitute the work week. Regular starting time shall be 8:00 A.M., except when the work week is scheduled as a week with starting time advanced or delayed. Starting time may be advanced or delayed by the employer up to two (2) hours from the regular starting time. Eight (8) hours shall constitute the work day. All work performed prior to or after the regular eight (8) hour work day, as described above, and all work performed on Saturday shall be paid at time and one-half (1½) the regular rate. In the event that a scheduled eight (8) hour work day is missed (not to include holidays) because of events out of the control of the contractor, then that missed work day may be made up at straight time the following Saturday. It is recognized that not all employees working on a Saturday make-up day will have worked the same number of hours during the regular work week. It is further recognized that any work after the forty (40) hours in a week must be paid at time and one-half (1½). Saturday make-up day shall not be used to make up for time lost due to recognized holidays. The employer may establish a 4-10's schedule on projects (4 days with 10 hours per day). If using a 4-10's schedule, a Friday make-up day is allowed. If using a 4 (10) schedule, any work more than ten (10) hours in a day or forty (40) hours in a work week shall be paid at the time and one-half (1½) rate. Friday make-up day shall not be used to make up for time lost due to recognized holidays. All work performed on Sundays or holidays shall be paid at the double (2) time rate.

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NO. 37: The Employer may choose, at his discretion, to work five eight hour days or four ten hour days with a Friday make-up day, Monday through Friday at straight time. Overtime shall be paid after eight (8) hours when working "five eights" and after ten hours when working "four tens". All work performed on Sundays and recognized holidays shall be paid for at the rate of double (2) time. All Saturday work shall be paid for at the rate of time and one-half (1½) the regular wage rate. All night work during the regular work week other than the above-mentioned days shall be paid for at the rate of time and one-half (1½) the regular wage scale until midnight and double (2) time after midnight except make-up time will be allowed under the following condition: In the event of inclement weather on exterior projects which prevents working the full regular eight (8) hour day, forty (40) hour work week schedule, a Saturday make-up day can be granted. Then said work on Saturday shall be paid at the straight time rate of pay up to a maximum total of forty (40) hours per week.

NO. 45: Means eight (8) hours shall constitute a day's work, beginning at 8:00 a.m. and ending at 4:30 p.m. The regular work week shall be forty (40) hours, beginning Monday, 8:00 a.m. and ending at 4:30 p.m. Friday. Because of traffic, parking and other circumstances, the hours of work on any project may begin as early as 6:00 a.m. with eight (8) hours worked between 6:00 a.m. and 4:30 p.m. When circumstances warrant and when it is mutually beneficial and agreed to, the employer may institute a work week consisting of four (4) consecutive ten (10) hour days, between the hours of 7:00 a.m. and 6:00 p.m., Monday through Thursday. Friday may be used as a make-up day. After ten (10) hours in a workday, or forty (40) hours in a workweek, overtime shall be paid at a rate of one and one-half (1½) times the regular rate of pay. All overtime Monday through Saturday shall be paid at the rate of time and one-half (1½) the regular rate of pay. Sunday and recognized holidays shall be paid at double (2) time. Labor Day shall be paid at triple (3) time. Shift work may be performed at the option of the Contractor. However, whenever shift work is performed it must cover a period not less than (5) consecutive working days. The day shift shall work a regular eight (8) hours shift as outlined above. The hourly rate for second shift (seven and one-half hours worked for eight hours paid) shall be twenty-five cents ($0.25) over and above the hourly rate. The hourly rate for third shift (seven hours worked, eight hours paid) shall be fifty cents ($0.50) above the hourly rate. If no first shift is worked, second and third shift employees shall receive an additional fifteen percent (15%) over and above the hourly rate for actual hours worked.

NO. 46: Means the regular work day shall be eight (8) hours from 6:00 a.m. to 6: 30 p.m. Starting time may be between 6:00 a.m. and 10:00 a.m. The regular work week shall be forty (40) hours, beginning between 6:00 a.m. and 10:00 a.m. on Monday and ending between 2:30 p.m. and 6:30 p.m. on Friday. All hours in excess of the regular work day and work week shall be considered overtime. Overtime on days recognized as regular work days and on Saturday shall be paid for at the rate of time and one-half (1½) the regular rate. Sunday and recognized holidays shall be paid for at the rate of double time (2) for time worked. The Employer may establish a work week consisting of four (4) days, Monday through Thursday, each day consisting of ten (10) hours at straight time rate of pay. The 4-10's must run for a period of at least four (4) days.

NO 47: Means a regular workday shall consist of eight (8) hours between 6:00 a.m. and 6:30 p.m. Forty (40) hours, within five (5) days -- Monday through Friday or Tuesday through Saturday inclusive -- shall constitute the regular workweek. The Employer may alter the above stated hours by two (2) hours for an early starting and quitting time only, not to exceed eight (8) hours of work in any one day. The Employer shall be allowed to establish a four (4) day, ten (10) hour per day work week. This work week is defined as Monday through Thursday, with a Friday make-up day. The normal work day under a ten (10) hour four (4) day work week shall be from 7:00 a.m. to 6:00 p.m. All hours worked in excess of ten (10) hours per day or forty (40) hours per week or hours worked outside the normal work week shall be paid at the applicable overtime rate. The first four (4) hours of overtime after the normal workday, each day Monday through Friday and the first ten (10) hours of overtime on Saturdays shall be paid for at one and one-half (1½) times the regular straight time rate of pay. All other work performed outside of the regularly scheduled working hours and outside of the first ten (10) hours worked on Saturdays shall be paid for at double (2) the regular straight time rate of pay. Sundays and the recognized holidays shall be paid for at double (2) the regular straight time rate of pay, if worked. When so elected by the contractor, multiple shifts of at least five (5) days duration may be worked. When two (2) or three (3) shifts are worked: The first shift (day shift) shall be worked between the hours of 8:00 a.m. and 4:30 p.m. Workmen on the "day shift" shall receive eight (8) hours pay at the regular hourly rate for eight (8) hours work. The second shift (swing shift) shall be worked between the hours of 4:30 p.m. and 12:30 a.m. Workmen on the "swing shift" shall receive eight (8) hours pay at the regular hourly rate plus 10% for seven and one-half (7 ½) hours work. The third shift (graveyard shift) shall be worked between the hours of 12:30 a.m. and 8:00 a.m. Workmen on the "graveyard shift" shall receive eight (8) hours pay at the regular hourly rate plus 15% for seven (7) hours work. A lunch period of thirty (30) minutes shall be allowed on each shift. All overtime work required after the completion of a regular shift shall be paid at one and one-half (1½) times the "shift" hourly rate.

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NO. 48: Means the regularly scheduled work week shall be five (5) consecutive days, Monday through Friday or Tuesday through Saturday. Eight (8) hours shall constitute a day's work. Starting time shall not be earlier than 7:00 a.m. nor later than 10:00 a.m. Forty (40) hours shall constitute a week's work. Overtime at the rate of time and one-half (1½) will be paid for all work in excess of forty (40) hours in any one work week. On the Monday through Friday schedule, all work performed on Saturday will be time and one-half (1½) unless time has been lost during the week, in which case Saturday will be a make up day to the extent of the lost time. On the Tuesday through Saturday schedule, all work performed on Monday will be time and one-half (1½) unless time has been lost during the week, in which case Monday will be a make-up day to the extent of the lost time. Any work performed on Sunday will be double (2) time. If employees work on any of the recognized holidays, they shall be paid time and one-half (1½) their regular rate of pay for all hours worked.

NO. 50: Means eight (8) hours constitute a normal day's work Monday through Friday. Any time worked over eight (8) hours will normally be paid at time and one-half (1½) except for exclusions stated in some following additional sentences. The Employer, at his discretion, may start the work day between 6:00 a.m. and 9:00 a.m. Any schedule chosen shall be started at the beginning of the work week (Monday) and used for at least five days. Work may be scheduled on a four (4) days a week (Monday through Thursday) at ten (10) hours a day schedule. If such a schedule is employed, then Friday may be used as a make-up day when time is lost due to inclement weather. Time and one-half (1½) shall be paid for any work in excess of eight (8) hours in any regular work day Monday through Friday unless working 4-10's, then time and one-half (1½) after ten (10) hours. All work performed on Saturday will be time and one-half (1½). Double (2) time shall be paid for all work on Sundays and recognized holidays.

NO. 52: Means the regular workweek shall consist of five (5) eight (8) hour days, Monday through Friday. The regular workday shall consist of an eight (8) hour period, to be worked between the agreed upon starting time and ending no later than 4:30 p.m. The agreed upon starting time shall be any time between the hours of 6:00 a.m. and 8:00 a.m. The option exists for the employer to use a four (4) day, ten (10) hour work week. Days worked shall be Monday through Thursday or Tuesday through Friday. If the job requires men on duty all five (5) days, then part of the crew may work the first four (4) days and the remainder of the crew may work the last four (4) days. Hours each day shall be from 7:00 a.m. to 5:30 p.m. Interested parties on the project must agree to this clause before it may be used. Once this clause has been put into effect, it shall remain as long as the majority of the Employees on the project and the Employer agree to keep it. The four (4) day clause shall not be used to circumvent a Holiday. Except as otherwise provided, all work performed outside the regular working hours and performed during the regular work week (Monday through Friday) shall be at the following rates of pay:

Holidays-New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, Christmas Day (or days observed as such) shall be recognized as Holidays that shall be paid at two (2) times the regular rate of pay.

Labor Day-No work shall be performed on Labor Day except in special cases of emergency. Rate of pay shall be at three (3) times the regular rate of pay.

Overtime-Work performed outside of the regular work day (the regular work day shall consist of an eight (8) hour period, to be worked between the agreed upon starting time and ending not later than 4:30 p.m. The agreed upon starting time shall be any time between the hours of 6:00 a.m. and 8:00 a.m., by mutual consent of the interested party's.), shall be:

A. Hours worked Monday through Friday, the first two (2) hours of overtime will be paid at time and one-half (1½). All other overtime will be paid at the double (2) time rate.
B. The first ten (10) hours worked on Saturday will be paid at time and one-half (1½), with all other hours to be paid at the double (2) time rate.
C. Sundays and Holidays (except Labor Day) shall be paid at the double (2) time rate.

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NO. 57: Means eight (8) hours per day shall constitute a day's work and forty (40) hours per week, Monday through Friday, shall constitute a week's work. The regular starting time shall be 8:00 a.m. If a second or third shift is used, the regular starting time of the second shift shall be 4:30 p.m. and the regular starting period for the third shift shall be 12:30 a.m. These times may be adjusted by the employer. The day shift shall work a regular eight (8) hours shift as outlined above. Employees working a second shift shall receive an additional $0.25 above the regular hourly rate and perform seven and one-half (7½) hours work for eight (8) hours pay. Third shift employees shall be paid an additional $0.50 above the regular hourly rate and work seven (7) hours for eight (8) hours pay. When circumstances warrant, the Employer may change the regular workweek to four (4) ten-hour days at the regular time rate of pay. All time worked before and after the established workday of eight (8) hours, Monday through Friday, and all time worked on Saturday shall be paid at the rate of time and one-half (1½) except in cases where work is part of an employee's regular Friday shift. All time worked on Sunday and recognized holidays shall be paid at the double (2) time rate of pay except in cases where work is part of an employee's previous day's shift. For all overtime hours worked $27.04 of the fringe benefits portion of the prevailing wage shall be paid at the same overtime rate at which the cash portion of the prevailing wage is to be paid. The remaining $1.29 of the fringe benefit portion of the prevailing wage may be paid at straight time.

NO. 58: Means eight (8) consecutive hours, between 6:00 a.m. and 5:30 p.m., shall constitute a day's work. Five (5) days work, Monday through Friday, shall constitute a normal work week. Work performed in excess of eight (8) hours per day or eight hours beyond normal starting time for that project excluding lunch Monday through Friday, and all work performed on Saturday, shall be paid for the rate of time and one-half (1½). When Sundays and recognized holidays are worked, the worker(s) shall be paid at the rate of double (2) time. Work may be scheduled on a four (4) days a week (Monday through Thursday) at ten (10) hours a day schedule at straight time. A Friday make-up day is available if time is lost due to inclement weather and at least sixteen (16) hours, but not more than thirty (30) hours, were worked during the week.

NO. 63: Means eight (8) hours shall constitute the regular work day between time that may be advanced or delayed by two (2) hours on either side of 8:00 AM. The Employer may establish a work week consisting of four (4) days, Monday through Thursday, each day consisting of ten (10) hours straight time. The four (4) tens (10s) must run for a period of at least four (4) days, Monday through Thursday. All work on Friday on a four (4) tens (10) project will be paid at the rate of time and one-half (1½). All work performed on Saturday shall be paid at time and one-half (1½). All work performed on Sundays and recognized holidays must be paid at double (2) time. All work performed prior to or after the regular eight (8) hour work day, or ten (10) hour work day, as described above shall be paid at time and one-half (1½) the regular rate.

NO. 65: Means Monday through Sunday shall constitute the work week. Regular starting time shall be 8:00 a.m., with one half hour for lunch between three and one-half (3½) and five (5) hours after starting time. The starting time may be advanced by two (2) hours or delayed one (1) hour by the employer from the regular starting time. All work performed before the advanced starting time and during the half hour lunch shall be paid at the overtime rate of time and one-half (1½). Work performed outside these hours shall be paid at the overtime rate of time and one-half (1½), except as provided otherwise below. All work performed on Sundays or recognized holidays shall be paid at the double (2) time rate. When the start time is delayed past 9:00 a.m., the employee's pay shall start at 9:00 a.m. and all time, after the normal quitting time (5:30 p.m.), shall be paid at the overtime rate. Eight (8) hours shall constitute the work day. All work performed prior to or after the regular eight (8) hour work day, as described above, and all work performed on Saturday shall be paid at time and one-half (1½) the regular rate. In the event that a scheduled eight (8) hour work day is missed (not including recognized holidays) because of inclement weather, then that missed work day may be made up at straight time on the following Saturday. It is recognized that not all employees working on a Saturday make-up day will have worked the same number of hours during the regular work week. It is further recognized that any work after forty (40) hours must be paid at time and one-half (1½). The employer may establish a 4-10's schedule on projects (4 days with 10 hours per day at straight time). In order to use the 4-10's schedule, the employer must schedule the 4-10's for a minimum of one (1) week. If using a 4-10's schedule, a Friday make-up day is allowed.

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NO. 68: Means Monday through Sunday shall constitute the work week. Regular starting time shall be 8:00 a.m., with one half hour for lunch between three and one-half and five hours after starting time. The starting time may be advanced or delayed by the employer up to one hour from the regular starting time. All work performed before the advance starting time and during the half hour lunch shall be paid at the overtime rate of time and one-half (1½). Work performed outside these hours shall be paid at the overtime rate of time and one-half (1½), except as provided otherwise below. All work performed on Sundays or holidays shall be paid at the double (2) time rate. Eight (8) hours shall constitute the work day. All work performed prior to or after the regular eight (8) hour work day, as described above, and all work performed on Saturday shall be paid at time and one-half (1½) the regular rate, except as hereinafter described. In the event that a scheduled eight (8) hour work day is missed (not including recognized holidays) because of inclement weather, then that missed work day may be made up at straight time on the Saturday in the week of the pay period. It is recognized that not all employees working on a Saturday make-up day will have worked the same number of hours during the regular work week. It is further recognized that any work after forty (40) hours must be paid at time and one-half (1½). The employer may establish a 4-10's schedule on projects (4 days with 10 hours per day at straight time). In order to use the 4-10's schedule, the employer must schedule the 4-10's for a minimum of one (1) week. If using a 4-10's schedule, a Friday make-up day is allowed.

NO. 85: Means the work week shall be Monday through Sunday. Eight (8) hours shall constitute a day's work to begin between 6:00 a.m. and 9:00 a.m. and end between 2:30 p.m. to 5:30 p.m. Employees required to work during their lunch period shall receive the overtime rate. Employees shall receive time and one-half (1½) for all time they are required to work prior to their normal starting time or after eight (8) hours or normal quitting time Monday through Friday, or all day on Saturday. If an Employer has started the work week on a five day, eight hours a day schedule, and due to inclement weather misses any time, then he may switch to a nine or ten hours a day schedule, at straight time, for the remainder of that work week in order to make up for the lost time (10-hour make-up day). All work over ten (10) hours a day or over forty (40) hours a week must be paid at time & one-half (1½). Sundays and recognized holidays shall be paid at the double (2) time rate of pay. A contractor may alter the regular work week to four (4) ten (10) hour days at straight time rate of pay. To do this the scheduled 4-10's must be worked at least one full week and the regular workweek shall be Monday through Thursday with Friday being a make-up day at straight time for days missed in the regular workweek due to inclement weather. If 5-8's are being worked, Saturday may be used as a make-up day at straight time if inclement weather prevents work during the normal work week.

NO. 88: Means the regular work week shall consist of five (5) eight (8) hour days, 7:00 a.m. to 3:30 p.m., Monday through Friday, except when the work week is scheduled as a 4-10's week or as a week with start time advanced or delayed as described below. The starting time may be advanced or delayed by one hour on either side of 7:00 a.m. The advanced or delayed starting time must run for a period of at least five (5) days. The Employer may establish a work week consisting of four (4) days, during the regular work week, each day consisting of ten (10) hours at straight time. The 4-10's must run for a period of at least four (4) days. Time and one-half (1½) shall be paid for any work in excess of eight (8) hours in any regular work day Monday through Friday (or ten hours in a 4-10's week), the first eight (8) hours of a Saturday, and it shall be at time and one-half (1½) for the Friday and Saturday following Thanksgiving. Double (2) time shall be paid for the following time worked on Sunday, New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day, as well as any work in excess of eight (8) hours on a Saturday and the Saturday of a three-day weekend (except the Saturday following Thanksgiving).

NO. 95: Means a regular workday shall consist of eight and one-half (8½) hours elapsed time, including one-half hour for lunch. The crew starting times shall be flexible within the period of daylight to 8:00 a.m. Any work performed over ten (10) hours of elapsed time per day including one-half hour for lunch and/or any work performed over forty (40) hours at the straight time rate in one week shall be paid at time and one-half (1½) the straight time rate. Saturday shall be a voluntary make-up day at straight time at the discretion of the contractor and with the consent of the employees. Sunday and recognized holidays shall be paid for at double (2) time.

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NO. 100: Means eight (8) hours shall constitute a day's work, and five (5) continuous eight-hour days shall constitute a week's work, Monday through Friday. Time and one-half (1½) the regular hourly rate shall be paid for all work performed in excess of eight (8) hours in any one day or forty (40) hours in any one week. Starting time shall be between 6:00 a.m. and 9:00 a.m. All work over eight (8) hours in a regular 5-day 8-hour schedule shall be at the appropriate overtime rate. All time worked before the regular scheduled starting time shall be paid for at the rate of time and one-half (1½) and shall not apply to regular shift. All time worked after eight (8) hours in any one day or after 5:30 p.m., whichever comes first, shall be paid at the time and one-half (1½) rate. An Employer, at his option, may elect to work four (4) ten (10) hour days, Monday through Thursday, at straight time. All such work must be done at least one week in duration. All work over ten (10) hours in one day or forty (40) hours in a week shall be at the overtime rate. Any employee who is scheduled to work on any regular work day but is prevented from working because of weather conditions, shall be permitted to work on Saturday (Friday if working 4-10's) as a make-up day at the straight time rate of pay. When an employee is required to work on any recognized holiday they shall receive the double (2) time rate for all time that they are required to perform work. All time worked from 12:00 Midnight Saturday to 12:00 Midnight Sunday shall be paid for at the rate of double (2) time on single shift.

NO. 125: Eight (8) hours of work between the hours of 8:00 a.m. and 4:30 p.m. shall constitute a work day. Forty (40) hours within the five (5) days, Monday through Friday inclusive, shall constitute the work week. Starting time may be adjusted not to exceed two (2) hours. Work performed outside of the aforementioned will be paid at the applicable overtime rate. When starting time has been adjusted, all other provisions concerning the work day shall be adjusted accordingly. The overtime rate of pay shall be one and one-half (1½) times the regular rate of wages, other than on Sundays, holidays and from Midnight until 6:00 a.m., which will be paid at double (2) the straight time rate.

CASS COUNTY
HOLIDAY SCHEDULE – BUILDING CONSTRUCTION

NO. 2: All work performed on New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day, or the days observed as such, shall be paid at the double time rate of pay.

NO. 4: All work done on New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas Day shall be paid at the double time rate of pay. If any of the above holidays fall on Sunday, Monday will be observed as the recognized holiday. If any of the above holidays fall on Saturday, Friday will be observed as the recognized holiday and holidays falling on Sunday will be observed on the following Monday.

NO. 7: The following days are assigned days and are recognized as holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day. If a holiday falls on a Sunday, it shall be observed on the following Monday. If a holiday falls on a Saturday, it shall be observed on the preceding Friday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This is applied to protect Labor Day. When a holiday falls during the normal workweek, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week. However, no reimbursement for these eight (8) hours is to be paid to the workman unless worked. If workman are required to work the above enumerated holidays or days observed as such, or on Sunday, they shall receive double (2) the regular rate of pay for such work.

NO. 22: All work performed on New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day, or days locally observed as such, and Sunday shall be recognized as holidays. If a holiday falls on Saturday, Friday shall be observed; if it falls on Sunday, Monday shall be observed. All work performed on holidays shall be paid at the double (2) time rate of pay.

NO. 32: All work performed for the Friday and Saturday following Thanksgiving shall be paid at the time and one-half (1½) rate of pay. All work performed on Sundays, New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day shall be paid at the double (2) time rate of pay. When one of the above holidays falls on Sunday, the following Monday shall be observed and when one of the above holidays falls on Saturday, the preceding Friday shall be observed.

NO. 33: All work done on New Year's Day, Memorial Day, Fourth of July, Thanksgiving Day and Christmas Day shall be paid at the double time rate of pay. Labor Day shall be paid at the triple (3) time rate of pay. If the holiday falls on Sunday, the following Monday will be observed; if the holiday falls on Saturday, the preceding Friday will be observed.

NO. 39: No work shall be done on the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas. Any of these holidays falling on Sunday, the following Monday shall be a holiday, and any of these holidays falling on Saturday, the preceding Friday shall be a holiday.

NO. 49: The following days shall be observed as legal holidays: New Year's Day, Decoration Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day, Employee's birthday and two (2) personal days. The observance of one (1) of the personal days to be limited to the time between December 1 and March 1 of the following year. If any of these holidays fall on Sunday, the following Monday will be observed as the holiday and if any of these holidays fall on Saturday, the preceding Friday will be observed as the holiday. If employees work on any of these holidays they shall be paid time & one-half (1½) their regular rate of pay for all hours worked.

NO. 53: All work done on New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, Christmas Day or days observed as such for these holidays shall be paid at the double (2) time rate of pay. No work shall be performed on Labor Day except in special cases of emergency, and then the rate of pay shall be at three (3) times the regular rate of pay. When a holiday falls on a Sunday, the following Monday shall be observed as the holiday. When a holiday falls on Saturday, the preceding Friday shall be observed as the holiday.

NO. 54: All work performed on New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day, and Christmas Day shall be paid at the double (2) time rate of pay. When a holiday falls on Saturday, it shall be observed on Friday. When a holiday falls on Sunday, it shall be observed on Monday.

CASS COUNTY
HOLIDAY SCHEDULE – BUILDING CONSTRUCTION

NO. 65: Work performed on New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day, or days celebrated as such, shall be paid at the double time rate of pay. If the holiday falls on Saturday, it will be observed on Friday; if the holiday falls on Sunday, it will be observed on Monday, and shall be paid for at double (2) the regular straight time rate of pay.

NO. 67: All work performed on New Year's Day, Memorial Day, Christmas Day, Fourth of July and Thanksgiving Day, from midnight to midnight, shall be paid for at the rate of double time (2) the basic rate of pay if required to work in addition to any other pay otherwise required hereunder as holiday pay. Positively no work shall be performed on Labor Day. Martin Luther King's Birthday, Veteran's Day, and the day after Thanksgiving Day shall be considered optional holidays, and if the Employer and employees agree that work will be performed on that day, no premium pay will be required. Should any of the above holidays fall on Saturday, the holiday will be observed on Friday. Should any of the above holidays fall on Sunday, the holiday will be observed on Monday.

NO. 68: All work performed on New Year's Day, Decoration Day (Memorial Day), Independence Day (Fourth of July), Labor Day, Thanksgiving Day, Christmas Day, or days observed as such, shall be paid at the rate of double (2) time. When a holiday falls on a Saturday, Friday shall be observed. When a holiday falls on a Sunday, Monday shall be observed. No work shall be performed on the Fourth of July or Labor Day except to save life or property. Where one of the holidays specified falls or is observed during the work week, then all work performed over and above thirty-two (32) hours in that week shall be paid at the rate of time and one-half (1½).

NO. 72: All work performed on New Year's Day, Memorial Day (last Monday in May), Independence Day, Labor Day, Thanksgiving Day and Christmas Day shall be paid for at double (2) the regular straight time rate of pay. Any one of the above listed holidays falling on Sunday shall be observed on the following Monday and paid for at double (2) the regular straight time rate of pay, if worked. Any one of the above listed holidays falling on Saturday shall be observed on the prior Friday and paid for at double (2) the regular straight time rate of pay, if worked. No work shall be performed on Labor Day except in case of emergency.

OCCUPATIONAL TITLE	* Date of Increase	Basic Hourly Rates	Over-Time Schedule	Holiday Schedule	Total Fringe Benefits
Carpenter	6/16	$37.25	1	17	$16.10
Cement Mason		$31.12	3	2	$16.20
Electrician (Outside-Line Construction\Lineman)		$41.52	18	24	$5.00 + 34.5%
Lineman Operator		$38.37	18	24	$5.00 + 34.5%
Lineman - Tree Trimmer		$21.64	31	30	$5.00 + 27.5%
Groundman		$26.76	18	24	$5.00 + 34.5%
Groundman - Tree Trimmer		$17.50	31	30	$5.00 + 27.5%
Laborer					
General Laborer	6/16	$29.14	3	2	$14.77
Skilled Laborer	6/16	$30.35	3	2	$14.77
Millwright	6/16	$37.25	1	17	$16.10
Operating Engineer					
Group I	6/16	$35.82	3	2	$15.99
Group II	6/16	$34.78	3	2	$15.99
Group III	6/16	$34.78	3	2	$15.99
Group IV	6/16	$30.31	3	2	$15.99
Oiler-Driver	6/16	$33.66	3	2	$15.99
Pile Driver	6/16	$37.25	1	17	$16.10
Traffic Control Service Driver		$15.35	27	26	$2.71
Truck Driver-Teamster					
Group I	6/16	$30.89	3	2	$14.45
Group II	6/16	$30.89	3	2	$14.45
Group III	6/16	$30.89	3	2	$14.45
Group IV	6/16	$30.89	3	2	$14.45

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate sheet.

CASS COUNTY
OVERTIME SCHEDULE - HEAVY CONSTRUCTION

FED: Minimum requirement per Fair Labor Standards Act means time and one-half (1 ½) shall be paid for all work in excess of forty (40) hours per work week.

NO. 1: Means (8) hours shall constitute the regular work day between time that may be advanced or delayed by two (2) hours on either side of 8:00 AM. The Employer may establish a work week consisting of four (4) days, Monday through Thursday, each day consisting of ten (10) hours straight time. The four (4) tens (10s) must run for a period of at least four (4) days, Monday through Thursday. All work on Friday on a four (4) tens (10) project will be paid at the rate of time and one-half (1½). All work performed on Saturday shall be paid at time and one-half (1½). All work performed on Sundays and recognized holidays must be paid at double (2) time. All work performed prior to or after the regular eight (8) hour work day, or ten (10) hour work day, as described above shall be paid at time and one-half (1½) the regular rate.

NO. 3: Means a regular work week shall consist of not more than forty (40) hours of work and all work performed over and above ten (10) hours per day or forty (40) hours per week shall be paid at the rate of time & one-half (1½). Workers shall receive time and one-half (1½) for all work performed on Sundays and recognized holidays. Double (2) time shall be paid for work performed on Sundays or recognized holidays when and only if any other craft employees of the same employer at work on that same job site are receiving double (2) time pay for that Sunday or Holiday work. A work day is to begin between 6:00 a.m. and 9:00 a.m. at the option of the Employer except when inclement weather or other conditions beyond the reasonable control of the Employer prevents work, in which event, the starting time may be delayed, but not later than 12:00 noon. Where one of the recognized holidays falls or is observed during the work week, then all work performed over and above thirty-two (32) hours in that week shall be paid at the rate of time and one-half (1½).

NO: 18: Eight (8) hours of work between the hours of 8:00 a.m. and 4:30 p.m. shall constitute a work day. Forty (40) hours within the five (5) days, Monday through Friday inclusive, shall constitute the work week. Starting time may be adjusted not to exceed two (2) hours. Work performed outside of the aforementioned will be paid at the applicable overtime rate. When starting time has been adjusted, all other provisions concerning the work day shall be adjusted accordingly. The overtime rate of pay shall be one and one-half (1½) times the regular rate of wages, other than on Sundays, holidays and from Midnight until 6:00 a.m., which will be paid at double (2) the straight time rate.

NO. 27: Means the regularly scheduled work week shall be five (5) consecutive days, Monday through Friday or Tuesday through Saturday. Eight (8) hours shall constitute a day's work. Starting time shall not be earlier than 7:00 a.m. nor later than 10:00 a.m. Forty (40) hours shall constitute a week's work. Overtime at the rate of time and one-half (1½) will be paid for all work in excess of forty (40) hours in any one work week. On the Monday through Friday schedule, all work performed on Saturday will be time and one-half (1½) unless time has been lost during the week, in which case Saturday will be a make up day to the extent of the lost time. On the Tuesday through Saturday schedule, all work performed on Monday will be time and one-half (1½) unless time has been lost during the week, in which case Monday will be a make-up day to the extent of the lost time. Any work performed on Sunday will be double (2) time. If employees work on any of the recognized holidays, they shall be paid time and one-half (1½) their regular rate of pay for all hours worked.

NO. 31: Means the overtime rate shall be time and one-half the regular rate for work over forty (40) hours per week. Sundays and Holidays shall be paid at double the straight time rate. All employees performing work on affected properties during or following emergencies shall receive the applicable rate of pay for the first sixteen (16) consecutive hours and all hours worked in excess of sixteen (16) consecutive hours shall be paid at double time until broken by an eight (8) hour rest period. Should an employee be called back to work within two hours of his normal quitting time, the previous hours worked shall count toward the above sixteen (16) hour provision.

CASS COUNTY
HOLIDAY SCHEDULE – HEAVY CONSTRUCTION

NO. 2: All work performed on New Year's Day, Decoration Day (Memorial Day), Independence Day (Fourth of July), Labor Day, Thanksgiving Day and Christmas Day, or days observed as such, and Sundays shall be paid at the rate of time and one-half (1½). Double (2) time shall be paid for work on Sundays or recognized holidays when and only if other craft employees of the same employer at work on that same job site are receiving double (2) time pay for that Sunday or holiday work. No work shall be performed on Labor Day, except in case of jeopardy of life or property. This rule is applied to protect Labor Day. When one of the above holidays falls on a Saturday, the preceding Friday shall be observed; when the holiday falls on a Sunday, the following Monday shall be observed. Where one of the specified holidays falls or is observed during the work week, then all work performed over and above thirty-two (32) hours in that week shall be paid at the rate of time and one-half (1½).

NO. 17: All work performed on New Year's Day, Decoration Day (Memorial Day), Independence Day (Fourth of July), Labor Day, Thanksgiving Day, Christmas Day, or days observed as such, shall be paid at the rate of double (2) time. When a holiday falls on a Saturday, Friday shall be observed. When a holiday falls on a Sunday, Monday shall be observed. No work shall be performed on the Fourth of July or Labor Day except to save life or property. Where one of the holidays specified falls or is observed during the work week, then all work performed over and above thirty-two (32) hours in that week shall be paid at the rate of time and one-half (1½).

NO. 24: Work performed on New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day, or days celebrated as such, shall be paid at the double time rate of pay. If the holiday falls on Saturday, it will be observed on Friday; if the holiday falls on Sunday, it will be observed on Monday, and shall be paid for at double (2) the regular straight time rate of pay.

NO. 26: The following days shall be observed as legal holidays: New Year's Day, Decoration Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day, Employee's birthday and two (2) personal days. The observance of one (1) of the personal days to be limited to the time between December 1 and March 1 of the following year. If any of these holidays fall on Sunday, the following Monday will be observed as the holiday and if any of these holidays fall on Saturday, the preceding Friday will be observed as the holiday. If employees work on any of these holidays they shall be paid time & one-half (1½) their regular rate of pay for all hours worked.

NO. 30: All work performed on New Year's Day, Decoration Day, Fourth of July, Labor Day, Christmas Day, Thanksgiving Day and Day after Thanksgiving or days celebrated for the same.

SECTION 004113 - BID FORM - STIPULATED SUM (SINGLE-PRIME CONTRACT)

1.1 BID INFORMATION

A. Bidder: _____.

B. Project Name: Raymore Parks Activity Center.

C. Project Location: 1101 S. Madison Street Raymore, Missouri 64083.

D. Owner: City of Raymore.

E. Architect: SFS Architecture, Inc.

F. Architect Project Number: 15930.

1.2 CERTIFICATIONS AND BASE BID

A. Base Bid, Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by sfs architecture and Architect's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:

1. _____ Dollars

($_____).

2. The above amount may be modified by amounts indicated by the Bidder on the attached Document 004323 "Alternates Form."

1.3 BID GUARANTEE

A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 60 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid amount above:

1. _____ Dollars

($_____).

B. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

1.4 ITEMIZED PRICE BREAKDOWN

A. Provide a breakdown of the bid amount for the following the portions of the Work indicated:

1. Pre-Engineered Metal Building Systems: _____.

2. Resilient Sports Flooring (**MAF-1**)_____.

3. Resilient Sports Flooring (**RV-1**):_____.

1.5 TIME OF COMPLETION

A. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Johnson County Parks and Recreation Department, and shall fully complete the Work within 240 calendar days.

1.6 ACKNOWLEDGEMENT OF ADDENDA

A. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

1. Addendum No. 1, dated _____.

2. Addendum No. 2, dated _____.

1.7 BID SUPPLEMENTS

A. The following supplements are a part of this Bid Form and are attached hereto.

1. Bid Form Supplement - Alternates:

a. Alternate No 1 bid amount:_____.

b. Alternate No. 2 bid amount:_____.

2. Bid Form Supplement - Bid Bond Form (AIA Document A310).

1.8 CONTRACTOR'S LICENSE

A. The undersigned further states that it is a duly licensed contractor, for the type of work proposed, in the State of Kansas, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

1.9 SUBMISSION OF BID

A. Respectfully submitted this ____ day of _____, 2017.

B. Submitted By:_____(Name of bidding firm or corporation).

C. Authorized Signature:_____(Handwritten signature).

D. Signed By:_____(Type or print name).

E. Title:_____(Owner/Partner/President/Vice President).

F. Witness By:_____(Handwritten signature).

G. Attest:_____(Handwritten signature).

H. By:_____(Type or print name).

I. Title:_____(Corporate Secretary or Assistant Secretary).

J. Street Address:_____.

K. City, State, Zip:_____.

L. Phone:_____.

M. License No.:_____.

N. Federal ID No.:_____(Affix Corporate Seal Here).

END OF DOCUMENT 004113

SECTION 004323 - ALTERNATES FORM

1.1 BID INFORMATION

A. Bidder: _____.

B. Prime Contract: _____.

C. Project Name: Raymore Parks Activity Center.

D. Project Location: 1101 S. Madison Street Raymore, Missouri 64083.

E. Owner: City of Raymore.

F. Architect: SFS Architecture, Inc.

G. Architect Project Number: 15930.

1.2 BID FORM SUPPLEMENT

A. This form is required to be attached to the Bid Form.

1.3 DESCRIPTION

A. The undersigned Bidder proposes the amount below be added to or deducted from the Base Bid if particular alternates are accepted by Owner. Amounts listed for each alternate include costs of related coordination, modification, or adjustment.

1. Cost-Plus-Fee Contract: Alternate price given below includes adjustment to Contractor's Fee.

B. If the alternate does not affect the Contract Sum, the Bidder shall indicate "NO CHANGE."

C. If the alternate does not affect the Work of this Contract, the Bidder shall indicate "NOT APPLICABLE."

D. The Bidder shall be responsible for determining from the Contract Documents the affects of each alternate on the Contract Time and the Contract Sum.

E. Owner reserves the right to accept or reject any alternate, in any order, and to award or amend the Contract accordingly within [**60**] days of the Notice of Award unless otherwise indicated in the Contract Documents.

F. Acceptance or non-acceptance of any alternates by the Owner shall have no affect on the Contract Time unless the "Schedule of Alternates" Article below provides a formatted space for the adjustment of the Contract Time.

1.4 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Entry Trellis & Wood Canopy:

1. ADD____ DEDUCT____ NO CHANGE____ NOT APPLICABLE____.

2. _____ Dollars ($_____).

3. ADD____ DEDUCT____ calendar days to adjust the Contract Time for this alternate.

B. Alternate No. 2: Metal Stucco Panel in lieu of Burnished CMU:

1. ADD____ DEDUCT____ NO CHANGE____ NOT APPLICABLE____.

2. _____ Dollars ($_____).

3. ADD____ DEDUCT____ calendar days to adjust the Contract Time for this alternate.

1.5 SUBMISSION OF BID SUPPLEMENT

A. Respectfully submitted this ____ day of _____, 2017.

B. Submitted By:_____(Insert name of bidding firm or corporation).

C. Authorized Signature:_____(Handwritten signature).

D. Signed By:_____(Type or print name).

E. Title:_____(Owner/Partner/President/Vice President).

END OF DOCUMENT 004323

SECTION 033000 - CAST-IN-PLACE CONCRETE

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.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Slabs-on-grade.

B. Related Sections:
1. Division 31 Section “Earth Moving” for drainage fill under slabs-on-grade.
2. Division 32 Sections “Concrete Paving” for concrete pavement and walks.
3. Section 033543 “Polished Concrete Finishing”.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Architect.

E. Samples: For vapor retarder.

F. Qualification Data: For Installer.

G. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Curing compounds.
6. Floor and slab treatments.
7. Bonding agents.
8. Adhesives.
9. Vapor retarders.
10. Repair materials.

H. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
1. Aggregates.
   a. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
2. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
3. Field quality -control reports.
4. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete,"
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 Grade 420, deformed.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.2 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I/II.

B. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

2.4 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.5 VAPOR RETARDERS

A. Plastic Vapor Retarder: ASTM E 1745, Class A, with minimum permeance of 0.02 perms. Include manufacturer's recommended adhesive or pressure-sensitive tape.

1. Available Products:

a. Stego Industries, LLC; Stego Wrap 15 mil
b. W.R. Meadows; W.R. Meadows Perminator 15 mil
c. Reef Industries, Inc.; Griffolyn 15 mil.

B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch 37.5-mm sieve and 0 to 5 percent passing a No. 8 2.36-mm sieve.

C. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a 3/8-inch 9.5-mm sieve, 10 to 30 percent passing a No. 100 0.15-mm sieve, and at least 5 percent passing No. 200 0.075-mm sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Axim Italcementi Group, Inc.; CATEXOL CimFilm.
b. BASF Construction Chemicals - Building Systems; Confilm.
c. ChemMasters; SprayFilm.
d. Conspec by Dayton Superior; Aquafilm.
e. Dayton Superior Corporation; Sure Film J-74.
f. Edoco by Dayton Superior; BurkeFilm.
g. Euclid Chemical Company The, an RPM company; Eucobar.
h. Kaufman Products, Inc.; Vapor-Aid.
i. Lambert Corporation; LAMBCO Skin.

j. L&M Construction Chemicals, Inc.; E-CON.
k. Meadows, W. R., Inc.; EVAPRE.
l. Metalcrete Industries; Waterhold.
m. Nox-Crete Products Group; MONOFILM.
n. Sika Corporation; SikaFilm.
o. SpecChem, LLC; Spec Film.
p. Symons by Dayton Superior; Finishing Aid.
q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
r. Unitex; PRO-FILM.
s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. 305 g/sq. m when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

2.7 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch 3.2 mm and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch 3.2 to 6 mm or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi 29 MPa <Insert strength> at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch 6.4 mm and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch 3.2 to 6 mm or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi 34.5 MPa <Insert strength> at 28 days when tested according to ASTM C 109/C 109M.

2.8 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 15 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.9 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3500 psi 24.1 MPa at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 4 inches 100 mm for concrete with verified slump of 2 to 4 inches 50 to 100 mm before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch 25 mm.

B. Interior Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi 24.1 MPa at 28 days.
2. Minimum Cementitious Materials Content: 560 lb/cu. yd..
3. Slump Limit: 4 inches 100 mm , plus or minus 1 inch 25 mm.

C. Exterior Slab-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4500 psi at 28 days.
2. Air Content: 6 percent plus or minus 1 percent.

2.10 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.11 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F 30 and 32 deg C, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F 32 deg C, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

B. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch 3.2 mm for smooth-formed finished surfaces.

C. Construct forms tight enough to prevent loss of concrete mortar.

D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

E. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

F. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

G. Chamfer exterior corners and edges of permanently exposed concrete as indicated

H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches 150 mm and seal with manufacturer's recommended tape.

B. Granular Course: Place below vapor retarder and compact with mechanical equipment to elevation tolerances of plus 0 inch 0 mm or minus 3/4 inch 19 mm.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches 38 mm into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- 3.2-mm- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches 150 mm into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F 4.4 deg C for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F 32 deg C at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.7 FINISHING FORMED SURFACES

A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view.

3.8 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Polished Concrete Finish: Refer to section 033543 for polished concrete finishing where indicated.

C. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch 6 mm in one direction.

1. Apply scratch finish to surfaces indicated.

D. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated.

E. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated.

2. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- 3.05-m- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch 3.2 mm.

F. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

G. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.9 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h 1 kg/sq. m x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Apply cure and seal compound to exposed edges of building slab foundation.

D. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

E. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

F. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

a. Water.
b. Continuous water-fog spray.

c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch 300-mm lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches 300 mm, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.10 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one six months. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches 50 mm deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.11 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 1.18-mm sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch 13 mm in any dimension to solid concrete. Limit cut depth to 3/4 inch 19 mm. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar

before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch 0.25 mm wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch 6 mm to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch 25 mm or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch 19-mm clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch 25 mm or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.12 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Steel reinforcement placement.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Verification of concrete strength.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. 4 cu. m, but less than 25 cu. yd. 19 cu. m, plus one set for each additional 50 cu. yd. 38 cu. m or fraction thereof.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F 4.4 deg C and below and when 80 deg F 27 deg C and above, and one test for each composite sample.
5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
6. Compression Test Specimens: ASTM C 31/C 31M.

   a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
   b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

7. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

   a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
   b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi 3.4 MPa.
10. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
12. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Measure floor and slab flatness and levelness according to ASTM E 1155 ASTM E 1155M within 24 hours of finishing.

END OF SECTION 033000

SECTION 033543 - POLISHED CONCRETE FINISHING

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.

1.2 SUMMARY

A. Section includes polished concrete finishing.

1. Concrete for polished concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, initial finishing, and curing is specified in Section 033000 "Cast-in-Place Concrete."

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for concrete not designated as polished concrete.

1.3 DEFINITIONS

A. Design Reference Sample: Sample designated by Architect in the Contract Documents that reflects acceptable surface quality and appearance of polished concrete.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with polished concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Cast-in-place concrete subcontractor.
e. Polished concrete finishing Subcontractor.

2. Review cold- and hot-weather concreting procedures, curing procedures, construction joints, concrete repair procedures, concrete finishing, and protection of polished concrete.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Polishing Schedule: Submit plan showing polished concrete surfaces and schedule of polishing operations for each area of polished concrete before start of polishing operations. Include locations of all joints, including construction joints.

C. Samples for Initial Selection: For each type of product requiring color selection.

D. Samples for Verification: For each type of exposed color.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Repair materials.
2. Stain materials.
3. Liquid floor treatments.

1.7 QUALITY ASSURANCE

A. Field Sample Panels: After approval of verification sample and before casting concrete, produce field sample panels to demonstrate the approved range of selections made under Sample submittals. Produce a minimum of three sets of full-scale panels, approximately 48 by 48 inches (1200 by 1200 mm) minimum, to demonstrate the expected range of finish, color, and appearance variations.

1. Locate panels as indicated or, if not indicated, as directed by Architect.
2. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed Work.
3. Demolish and remove field sample panels when directed.

B. Mockups: Before casting concrete, build mockups to verify selections made under Sample submittals and to demonstrate typical joints, surface finish, tolerances, and standard of workmanship. Build mockups to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
2. Demonstrate curing, finishing, and protecting of polished concrete.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatments for Polished Concrete Finish: Clear, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and is suitable for polished concrete surfaces.

PART 3 - EXECUTION

3.1 POLISHING

A. Polish: Match design reference sample.

B. Apply polished concrete finish system to cured and prepared slabs to match accepted mockup.

1. Machine grind floor surfaces to receive polished finishes level and smooth and to depth required to reveal aggregate to match approved mockup.
2. Apply reactive stain for polished concrete in polishing sequence and according to manufacturer's written instructions.
3. Apply penetrating liquid floor treatment for polished concrete in polishing sequence and according to manufacturer's written instructions, allowing recommended drying time between successive coats.
4. Apply penetrating stain for polished concrete in polishing sequence and according to manufacturer's written instructions.
5. Continue polishing with progressively finer-grit diamond polishing pads to gloss level, to match approved mockup.
6. Control and dispose of waste products produced by grinding and polishing operations.
7. Neutralize and clean polished floor surfaces.

END OF SECTION 033543

SECTION 077253 - SNOW GUARDS

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.

1.2 SUMMARY

A. Section Includes:
   1. Rail-type, seam-mounted snow guards.

1.3 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for snow guards.

B. Shop Drawings: Include roof plans showing layouts and attachment details of snow guards.

   1. Include details of rail-type snow guards.
   2. Include calculation of number and location of snow guards based on snow load, roof slope, roof type, components, spacings, and finish.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Performance Requirements: Provide snow guards that withstand exposure to weather and resist thermally induced movement without failure, rattling, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

   1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

B. Structural Performance:

   1. Snow Loads: As indicated on Drawings.

2.2 RAIL-TYPE SNOW GUARDS

A. Seam-Mounted, Rail-Type Snow Guards:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Alpine SnowGuards, a division of Vermont Slate & Copper Services, Inc; SnowMax or a comparable product by one of the following:

    a. LMCurbs.
    b. S-5! Attachment Solutions; Metal Roof Innovations, Ltd.
    c. Sno-Gem, Inc.
    d. Snow Management Systems.

2. Description: Snow guard rails fabricated from metal pipes, bars, or extrusions, anchored to brackets and equipped with one rail with color-matching inserts of material and finish used for metal roofing.
3. Material and Finish: Aluminum; Bone White.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, snow guard attachment, and other conditions affecting performance of the Work.

1. Verify compatibility with and suitability of substrates including compatibility with existing finishes or primers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean and prepare substrates for bonding snow guards.

B. Prime substrates according to snow guard manufacturer's written instructions.

3.3 INSTALLATION

A. Install snow guards according to manufacturer's written instructions.

B. Attachment for Standing-Seam Metal Roofing:

1. Do not use fasteners that will penetrate metal roofing, or fastening methods that void metal roofing finish warranty.
2. Seam-Mounted Metal Snow Guard Pads: Stainless-steel clamps attached to vertical ribs of standing-seam metal roof panels.

END OF SECTION 077253

SECTION 092713 - GLASS-FIBER-REINFORCED PLASTIC PANELS

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.

1.2 SUMMARY

A. Section includes factory-fabricated, glass-fiber-reinforced plastic panels for interior applications.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and assembly of glass-fiber-reinforced plastic panels.
3. Indicate location of control joints.

C. Samples: For each exposed product and for each color and texture specified.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM D 5319.

1.5 FIELD CONDITIONS

A. Environmental Conditions:

1. Comply with ASTM D 5319.
2. Do not deliver or install glass-fiber-reinforced plastic panels until building is enclosed, wet-work is complete, and HVAC system is operating and continuously maintaining temperature and relative humidity at levels intended for building occupants.

B. Conditioning: Acclimatize glass-fiber-reinforced plastic panels to ambient temperature and humidity of spaces in which they will be installed. Remove packaging and move units into installation spaces not less than 48 hours before installing them.

1.6 REFERENCE STANDARDS

A. Refer to the following standards for the GFRP panels.
1. 9 CFR 416.2 - Regulatory Requirements Under the Federal Meat Inspection Act and the Poultry Products Inspection Act, Part 416-Sanitation.
2. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
3. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of Barcol Impressor.
4. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
5. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
7. ISO 846 - Plastics - Evaluation of the Action of Microorganisms.

PART 2 - PRODUCTS

2.1 GLASS-FIBER-REINFORCED PLASTIC PANELS

A. Panels: Molded, glass-fiber-reinforced plastic units complying with ASTM D 5319.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane Composites, Inc.: www.cranecomposites.com.
b. Glasteel: www.glasteel.com.
c. Kemlite: www.kemlite.com.
d. Marlite: www.marlite.com.
e. Nudo Products, Inc.: www.nudo.com. FiberLite LP-S9 FR as Basis of Design.
2.

B. Finish: Refer to Finish Plan and Schedule for GFRP panel texture and color.

C. Surface Burning Characteristics: Flame Spread Index of 25, maximum; Smoke Developed Index of 450, maximum; when whole system is tested in accordance with ASTM E84.

D. Fire Rating: Class A.

E. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

F. Scratch Resistance: Barcol hardness score of not less than 35, when tested in accordance with ASTM D2583.

G. Impact Strength: Not less than 6 ft-lb/in, when tested in accordance with ASTM D256.

H. Sanitation and Cleanability: Comply with 9 CFR 416.2.

I. Chemical Cleanability: Excellent chemical resistance to common cleaners and detergents when tested in accordance with ISO 2812-1.

J. Biological Resistance: Rating of 0, when tested in accordance with ISO 846.

K. Trim: Vinyl; color coordinating with panel.

2.2 AUXILIARY MATERIALS

A. Adhesives: As recommended in glass-fiber-reinforced plastic panel manufacturer's written instructions.

B. Sealant: Silicone, color to match GFRP panel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Substrates shall comply with manufacturer’s flatness criteria.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. ASTM C 1467/C 1467M establishes requirements for substrate preparation, erection tolerances, and finishing.

B. Install panels in accordance with manufacturer's instructions.

C. Cut and drill panels with carbide tipped saw blades or drill bits, or cut with snips.

D. Apply adhesive to the back side of the panel using trowel recommended by adhesive manufacturer.

E. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.

F. Install panels with manufacturer's recommended gap for panel field and corner joints.

G. Place trim on panel before fastening edges, if required.

H. Fill channels in trim with sealant before attaching to panel.

I. Install trim with adhesive and screws or nails as required.

J. Seal gaps at floor, ceiling, and between panels with specified sealant to prevent moisture intrusion.

K. Remove excess sealant as paneling is installed..

END OF SECTION 092713

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

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.

1.2 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each component indicated, prepared on Samples of sizes indicated below:

1. Acoustical Panels: Set of 6-inch-square Samples of each type, color, pattern, and texture.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Units: Full-size panels equal to **5** percent of quantity installed.
2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping or damaging units in any way.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Class A according to ASTM E 1264.
2. Smoke-Developed Index: 50 or less.

2.3 ACOUSTICAL PANELS ACT-1

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc.: Dune 1777 as Basis of Design.
2. Rockfon (Roxul Inc.).
3. United States Gypsum Company.
4. **CertainTeed Saint-Gobain**

B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

C. Classification: Provide panels as follows:
1. Type and Form: Type III, mineral fiber with paint; Form 2.
2. Pattern: C E.
3. Fire Class: A.

D. Color: White.

E. Light Reflectance (LR): Not less than 0.80.

F. Noise Reduction Coefficient (NRC): Not less than 0.50.

G. Edge/Joint Detail: Beveled tegular.

H. Thickness: 5/8 inch minimum.

I. Modular Size: 24 by 48 inches.

J. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273, ASTM D 3274, or ASTM G 21 and evaluated according to ASTM D 3274 or ASTM G 21.

2.4 ACOUSTICAL PANELS ACT-2

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Armstrong World Industries: Ceramaguard Fine Fissured 608 as Basis of Design.
2. United States Gypsum Company.
3. Approved equal.

B. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E 1264 classifications as designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

C. Classification: Provide tiles as follows:

1. Type and Form: Type XX, mineral base; high density, ceramic-like composition
2. Pattern: CE (perforated, small holes and lightly textured).
3. Fire Class: A.

D. Color: White.

E. Light Reflectance (LR): Not less than 0.80.

F. Ceiling Attenuation Class (CAC): Not less than 40.

G. Noise Reduction Coefficient (NRC): Not less than 0.55.

H. Edge/Joint Detail: Square.

I. Thickness: 5/8 inch.

J. Modular Size: 24 inches by 48 inches.

K. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273, ASTM D 3274, or ASTM G 21 and evaluated according to ASTM D 3274 or ASTM G 21.

2.5 METAL SUSPENSION SYSTEM MS-1 (ACT-1 ceilings)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc.: Suprafine 9/16 inch XL as Basis of Design.
2. Chicago Metallic Corporation.
3. United States Gypsum Company.

B. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M and designated by type, structural classification, and finish indicated.

C. Narrow-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; pre-painted, electrolytically zinc coated, or hot-dip galvanized, G30 coating designation; with prefinished 9/16-inch-wide metal caps on flanges.

1. Structural Classification: Intermediate-duty system.
2. End Condition of Cross Runners: butt-edge type.
3. Face Design: Flat, flush.
4. Cap Material: Cold-rolled steel.
5. Cap Finish: Painted white.

2.6 METAL SUSPENSION SYSTEM MS-2 (ACT-2 ceilings)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Armstrong World Industries: Prelude XL 15/16 exterior rated as Basis of Design.
2. Chicago Metallic.
3. United States Gypsum Company.
4. Approved equal.

B. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, fully concealed, metal suspension system and accessories of type, structural classification, and finish indicated that complies with applicable requirements in ASTM C 635/C 635M.

1. High-Humidity Finish: Provide coating tested and classified for "severe environment performance" according to ASTM C 635/C 635M.

C. Direct-Hung, Double-Web Suspension System: Main and cross runners roll formed from and capped with cold-rolled steel sheet, prepainted, hot-dip galvanized, G90 coating designation.

1. Structural Classification: Heavy-duty system.
2. End Condition of Cross Runners: butt-edge type.
3. Face Design: Flat, flush.
4. Cap Material: Cold-rolled galvanized steel.
5. Cap Finish: Painted white.

2.7 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated.

B. Wire Hangers, Braces, and Ties: Provide wires as follows:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than **0.106-inch-**diameter wire.

2.8 METAL EDGE TRIM

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc.
2. Chicago Metallic Corporation.
3. United States Gypsum Company.

B. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

1. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.
2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
3. Provide metal trim with high-humidity finish to match MS-2 components at ACT-2 ceilings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

A. Install acoustical panel ceilings according to ASTM C 636/C 636M**,** seismic design requirements, and manufacturer's written instructions.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
7. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
1. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
2. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

3.4 ERECTION TOLERANCES

A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.

B. Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

3.5 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 133419 - METAL BUILDING SYSTEMS

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.

1.2 SUMMARY

A. Section Includes:

1. Structural-steel framing.
2. Metal roof panels.
3. Metal wall panels.
4. Metal soffit panels.
5. Thermal insulation.
6. Accessories.

B. Related Requirements:

1. Section 075423 “Thermoplastic Polyolefin (TPO) Roofing” for roof system provided by pre-engineered metal building manufacturer at lower building volume.
2. Section 081113 “Hollow Metal Doors and Frames” for exterior doors and frames.
3. Section 084113 “Aluminum-Framed Entrances and Storefronts” for entrance doors and glazed storefront systems.

1.3 DEFINITIONS

A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in standards referenced by this Section.

1.4 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-rod inserts into foundation walls and footings. Anchor rod installation, concrete, reinforcement, and formwork requirements are specified in Section 033000 "Cast-in-Place Concrete."

B. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.5 PREINSTALLATION MEETING

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to metal building systems including, but not limited to, the following:

    a. Condition of foundations and other preparatory work performed by other trades.
    b. Structural load limitations.
    c. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
    d. Required tests, inspections, and certifications.
    e. Unfavorable weather and forecasted weather conditions and impact on construction schedule.

2. Review methods and procedures related to metal roof panel assemblies including, but not limited to, the following:

    a. Compliance with requirements for purlin and rafter conditions, including flatness and attachment to structural members.
    b. Structural limitations of purlins and rafters during and after roofing.
    c. Flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect metal roof panels.
    d. Temporary protection requirements for metal roof panel assembly during and after installation.
    e. Roof observation and repair after metal roof panel installation.

3. Review methods and procedures related to metal wall panel assemblies including, but not limited to, the following:

    a. Compliance with requirements for support conditions, including alignment between and attachment to structural members.
    b. Structural limitations of girts and columns during and after wall panel installation.
    c. Flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
    d. Temporary protection requirements for metal wall panel assembly during and after installation.
    e. Wall observation and repair after metal wall panel installation.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of metal building system component.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

    a. Metal roof panels.
    b. Metal wall panels.
    c. Metal soffit panels.
    d. Thermal insulation and vapor-retarder facings.
    e. Louvers.

B. Shop Drawings: Indicate components by others. Include full building plan, elevations, sections, details and the following:

1. Anchor-Rod Plans: Submit anchor-rod plans and templates before foundation work begins. Include location, diameter, and minimum required projection of anchor rods

required to attach metal building to foundation. Indicate column reactions at each location.

2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
3. Metal Roof and Wall Panel Layout Drawings: Show layouts of panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, clip spacing, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.

    a. Show roof-mounted.
    b. Show wall-mounted items including personnel doors, storefront, louvers, and lighting fixtures.

4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:

    a. Flashing and trim.
    b. Gutters.
    c. Downspouts.
    d. Parapet scuppers.

C. Samples for Initial Selection: For units with factory-applied finishes.

D. Samples for Verification: For the following products:

1. Panels: Nominal 12 inches long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
2. Flashing and Trim: Nominal 12 inches long. Include fasteners and other exposed accessories.

E. Door Schedule: For doors and frames. Use same designations indicated on Drawings. Include details of reinforcement.

1. Door Hardware Schedule: Include details of fabrication and assembly of door hardware. Organize schedule into door hardware sets indicating complete designations of every item required for each door or opening.
2. Keying Schedule: Detail Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.

F. Delegated-Design Submittal: For metal building systems.

1. Include analysis data indicating compliance with performance requirements and design data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For erector and manufacturer.

B. Welding certificates.

C. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:

1. Name and location of Project.
2. Order number.
3. Name of manufacturer.
4. Name of Contractor.
5. Building dimensions including width, length, height, and roof slope.
6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
7. Governing building code and year of edition.
8. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
10. Building-Use Category: Indicate category of building use and its effect on load importance factors.

D. Erector Certificates: For qualified erector, from manufacturer.

E. Material Test Reports: For each of the following products:

1. Structural steel including chemical and physical properties.
2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
3. Tension-control, high-strength, bolt-nut-washer assemblies.
4. Shop primers.
5. Nonshrink grout.

F. Field quality-control reports.

G. Surveys: Show final elevations and locations of major members. Indicate discrepancies between actual installation and the Contract Documents. Have surveyor who performed surveys certify their accuracy.

H. Sample Warranties: For special warranties.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panel finishes to include in maintenance manuals.

1.9 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer.

1. Accreditation: Manufacturer's facility accredited according to the International Accreditation Service's AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems."
2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.

B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3, "Structural Welding Code - Sheet Steel."

D. Land Surveyor Qualifications: A professional land surveyor who practices in jurisdiction where Project is located and who is experienced in providing surveying services of the kind indicated.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Protect foam-plastic insulation as follows:

1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.
3. Complete installation and concealment of foam-plastic materials as rapidly as possible in each area of construction.

1.11 FIELD CONDITIONS

A. Weather Limitations: Proceed with panel installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

1.12 WARRANTY

A. Special Warranty on Metal Panel Finishes: Manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Varco-Pruden Buildings; a division of BlueScope Buildings North America, Inc.; or a comparable product by one of the following:

1. ACI Building Systems, Inc.
2. Alliance Steel, Inc.
3. American Buildings Company; a Nucor Company.
4. Butler Manufacturing Company; a division of BlueScope Buildings North America, Inc.
5. Ceco Building Systems; an NCI company.
6. Nucor Building Systems.
7. Star Building Systems; a division of NCI Building Systems, Inc.

B. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

2.2 SYSTEM DESCRIPTION

A. Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.

B. Primary-Frame Type:

1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.

A. End-Wall Framing: Engineer end wall on west side along grid line 'I' to be expandable. Provide primary frame, capable of supporting full-bay design loads, and end-wall columns.

B. Secondary-Frame Type: Manufacturer's standard purlins and joists and exterior-framed girts.

C. Eave Height: Manufacturer's standard height, as indicated by nominal height on Drawings.

D. Bay Spacing: As indicated on Drawings.

E. Roof Slope: As indicated on Drawings.

F. Roof System: Manufacturer's standard standing-seam, vertical-rib, metal roof panels.

1. Profile: Tapered rib, double-lock.
2. Thickness: 24-gauge minimum.

G. Exterior Wall System: Manufacturer's standard concealed-fastener, flush-profile, metal wall panels.

1. Profile: Flush profile, PBR as Basis of Design.
2. Thickness: 24-gauge minimum.

2.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal building system.

B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."

1. Design Loads: As indicated on Drawings.
2. Deflection and Drift Limits: Design metal building system assemblies to withstand serviceability design loads without exceeding deflections and drift limits recommended in AISC Steel Design Guide No. 3 "Serviceability Design Considerations for Steel Buildings."
3. Deflection and Drift Limits: No greater than the following:

a. Purlins and Rafters: Vertical deflection of 1/240 of the span.
b. Girts: Horizontal deflection of 1/180 of the span.
c. Metal Roof Panels: Vertical deflection of 1/240 of the span.
d. Metal Wall Panels: Horizontal deflection of 1/180 of the span.
e. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.
f. Lateral Drift: Maximum of 1/200 of the building height.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

D. Fire Propagation Characteristics: Exterior wall assemblies containing foam plastics pass NFPA 285 fire test.

E. Structural Performance for Metal Roof and Wall Panels: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Wind Loads: As indicated on Drawings.

F. Air Infiltration for Metal Roof Panels: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 1680 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

G. Air Infiltration for Metal Wall Panels: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

H. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

I. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

J. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.

1. Uplift Rating: UL 60.

K. Energy Star Listing: Roof panels that are listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.

L. Energy Performance: Provide roof panels according to one of the following when tested according to CRRC-1:

1. Three-year, aged, solar reflectance of not less than 0.55 and emissivity of not less than 0.75.

M. Thermal Performance for Opaque Elements: Provide the following maximum U-factors and minimum R-values when tested according to ASTM C 1363 or ASTM C 518:

1. Roof:
   a. R-Value: 25.

2. Walls:
   a. R-Value: 15.

2.4 STRUCTURAL-STEEL FRAMING

A. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings."

B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."

C. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

D. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafters, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.

1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.

   a. Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.

2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
3. Frame Configuration: Single gable.
4. Exterior Column: Partial straight then tapered as indicated in Drawings.
5. Rafter: Tapered.

E. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:

1. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet.
2. End-Wall Rafters: C-shaped, cold-formed, structural-steel sheet; or I-shaped sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.

F. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating, to comply with the following:

1. Purlins: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; minimum 2-1/2-inch- wide flanges.

   a. Depth: As needed to comply with system performance requirements.
2. Girts: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum 2-1/2-inch- wide flanges.

   a. Depth: As required to comply with system performance requirements.

3. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; to provide adequate backup for metal panels.
4. Flange Bracing: Minimum 2-by-2-by-1/8-inch structural-steel angles or 1-inch- diameter, cold-formed structural tubing to stiffen primary-frame flanges.
5. Sag Bracing: Minimum 1-by-1-by-1/8-inch structural-steel angles.
6. Base or Sill Angles: Manufacturer's standard base angle, minimum 3-by-2-inch, fabricated from zinc-coated (galvanized) steel sheet.
7. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
8. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
9. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.

G. Bracing: Provide adjustable wind bracing using any method as follows:

1. Rods: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50; or ASTM A 529/A 529M, Grade 50; minimum 1/2-inch- diameter steel; threaded full length or threaded a minimum of 6 inches at each end.
2. Cable: ASTM A 475, minimum 1/4-inch- diameter, extra-high-strength grade, Class B, zinc-coated, seven-strand steel; with threaded end anchors.
3. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.

4. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels.

H. Anchor Rods: Headed anchor rods as indicated in Anchor Rod Plan for attachment of metal building to foundation.

I. Materials:

1. W-Shapes: ASTM A 992/A 992M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
3. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
4. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
5. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B or C, structural tubing.
6. Structural-Steel Sheet: Hot-rolled, ASTM A 1011/A 1011M, Structural Steel (SS), Grades 30 through 55, or High-Strength Low-Alloy Steel (HSLAS) or High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F), Grades 45 through 70; or cold-rolled, ASTM A 1008/A 1008M, Structural Steel (SS), Grades 25 through 80, or HSLAS, Grades 45 through 70.
7. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80, or HSLAS or HSLAS-F, Grades 50 through 80; with G60 coating designation; mill phosphatized.
8. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

    a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80, or HSLAS or HSLAS-F, Grades 50 through 80; with G90 coating designation.
    b. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, SS, Grade 50 or 80; with Class AZ50 coating.

9. Joist Girders: Manufactured according to "Standard Specifications for Joist Girders," in SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders"; with steel-angle, top- and bottom-chord members, and end- and top-chord arrangements as indicated on Drawings and required for primary framing.
10. Steel Joists: Manufactured according to "Standard Specifications for Open Web Steel Joists, K-Series," in SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders"; with steel-angle, top- and bottom-chord members, and end- and top-chord arrangements as indicated on Drawings and required for secondary framing.
11. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A, carbon-steel, hex-head bolts; ASTM A 563 carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.

    a. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.

12. Structural Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563 heavy-hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.

    a. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.

13. High-Strength Bolts, Nuts, and Washers: ASTM A 490, Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with spline ends; ASTM A 563 heavy-hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers, plain.
14. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex-head steel structural bolts with spline ends.

    a. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50.

15. Unheaded Anchor Rods: ASTM F 1554, Grade 36.

    a. Configuration: Straight.
    b. Nuts: ASTM A 563h hex carbon steel.
    c. Plate Washers: ASTM A 36/A 36M carbon steel.
    d. Washers: ASTM F 436 hardened carbon steel.
    e. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.

16. Headed Anchor Rods: ASTM A 307, Grade A.

    a. Configuration: Straight.
    b. Nuts: ASTM A 563 hex carbon steel.
    c. Plate Washers: ASTM A 36/A 36M carbon steel.
    d. Washers: ASTM F 436 hardened carbon steel.
    e. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.

17. Threaded Rods: ASTM A 307, Grade A.

    a. Nuts: ASTM A 563h ex carbon steel.
    b. Washers: ASTM A 36/A 36M carbon steel.
    c. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.

J. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.

1. Clean and prepare in accordance with SSPC-SP2.
2. Coat with manufacturer's standard primer. Apply primer to primary and secondary framing to a minimum dry film thickness of 1 mil.

    a. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil on each side.

2.5 METAL ROOF PANELS

A. Standing-Seam, Trapezoidal-Rib, Metal Roof Panels: Formed with raised trapezoidal ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

    a. Exterior Finish: Two-coat fluoropolymer.
    b. Color: Almond.

2. Clips: Two-piece floating to accommodate thermal movement.

3. Joint Type: Mechanically seamed.
4. Panel Coverage: 24 inches.
5. Panel Height: 3 inches.
6. Uplift Rating: UL 60.

B. Finishes:

1. Exposed Coil-Coated Finish:
   a. Two-coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

C. Liner Panel and insulation system (at Gymnasium 112 only):

1. Provide as basis of design: Simple Saver System

2.6 METAL WALL PANEL, **TYPE 1**

A. Concealed-Fastener, Flush Textured-Profile, Metal Wall Panels: Formed with vertical panel edges and textured surface; with flush joint between panels; with 1-inch- wide flange for attaching interior finish; designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 24 gauge minimum nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

   a. Exterior Finish: Stucco-like embossed finish.
   b. Color: Regal White

2. Panel Coverage: 16 inches.

3. Panel Pattern Orientation: Horizontal install as indicated on Drawings.
4. Texture: Stucco embossed.
5. Panel Length: As indicated on Drawings.

B. Interior Liner Panel and Insulation System (at Gymnasium 112 only):

1. Provide as basis of design: Simple Saver System.

C. Finishes:

1. Exposed Coil-Coated Finish:
   a. Two-coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.7 METAL WALL PANEL, **TYPE 2**

A. Concealed-Fastener, Flush Textured-Profile, Metal Wall Panels: Formed with vertical panel edges and textured surface; with flush joint between panels; with 1-inch- wide flange for attaching interior finish; designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 24 gauge minimum nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Exterior Finish: Stucco-like embossed finish.
b. Color: Ash

2. Panel Coverage: 16 inches.

3. Panel Pattern Orientation: Horizontal install as indicated on Drawings.
4. Texture: Stucco embossed.
5. Panel Length: As indicated on Drawings.

B. Interior Liner Panel and Insulation System (at Gymnasium 112 only):

1. Provide as basis of design: Simple Saver System.

C. Finishes:

1. Exposed Coil-Coated Finish:
a. Two-coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.8 METAL SOFFIT PANELS

A. General: Provide factory-formed metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.

B. Metal Soffit Panels: Match profile and material of metal wall panels.

1. Finish: Match finish and color of metal wall panels.

2.9 THERMAL INSULATION

A. Faced Metal Building Insulation (excluding Gymnasium 112): ASTM C 991, Type II, glass-fiber-blanket insulation; 0.5-lb/cu. ft. density; 2-inch- wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.
   1. Walls: R-19 minimum. Provide reinforced, athletic type facing where exposed.
   2. Roof: R-32 simple saver, banded fabric full cavity insulation system.

B. Faced, Polyisocyanurate Board Insulation: ASTM C 1289, Type I (foil facing), Class 2, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, based on tests performed on unfaced core. Provide units tested for interior exposure without an approved thermal barrier.

C. Retainer Strips: For securing insulation between supports, 0.025-inch nominal-thickness, formed, metallic-coated steel or PVC retainer clips colored to match insulation facing.

D. Vapor-Retarder Facing: ASTM C 1136, with permeance not greater than 0.02 perm when tested according to ASTM E 96/E 96M, Desiccant Method.
   1. Composition: White polypropylene film facing and fiberglass-polyester-blend fabric backing.

E. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.10 ROOF DECK

A. Roof Deck **Type 1**: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:

   1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G90 zinc coating.
   2. Deck Profile: Type B.
   3. Profile Depth: 1-1/2 inches.
   4. Design Uncoated-Steel Thickness: 20 gauge.
   5. Span Condition: As indicated.
   6. Side Laps: Overlapped.

2.11 ACOUSTICAL ROOF DECK

A. Acoustical Roof Deck **Type 2**: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:

   1. Galvanized and Shop-Primed Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G60 zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.
      a. Color: White.
   2. Deck Profile: Type 3DR, deep rib.
   3. Profile Depth: 3 inches.
   4. Design Uncoated-Steel Thickness: 20 gauge.
   5. Span Condition: As indicated.

6. Side Laps: Overlapped or interlocking seam at Contractor's option.
7. Acoustical Perforations: Deck units with manufacturer's standard perforated vertical webs.
8. Sound-Absorbing Insulation: Manufacturer's standard premolded roll or strip of glass or mineral fiber.

    a. Factory install sound-absorbing insulation into cells of cellular deck.

2.12 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.

1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
2. Clips: Manufacturer's standard, formed from stainless-steel sheet, designed to withstand negative-load requirements.
3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from stainless-steel sheet or nylon-coated aluminum sheet.
4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
6. Thermal Spacer Blocks: Where metal panels attach directly to purlins, provide thermal spacer blocks of thickness required to provide 1-inch standoff; fabricated from extruded polystyrene.

C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same material as metal wall panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

4. Plywood: Provide DOC PS1, exterior grade plywood at parapet walls, ½ inch thick minimum.
5. Weather/Air Barrier: Provide high-build, vapor permeable modified bituminous or synthetic polymer liquid applied air barrier over wall sheathing as recommended by manufacturer.

D. Flashing and Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match adjacent metal panels.

1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
2. Opening Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 24-gauge minimum nominal uncoated steel thickness, prepainted with coil coating. Trim head and jamb of door, window and storefront openings, and head, jamb, and sill of other openings.

E. Gutters: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- long sections, sized according to SMACNA's "Architectural Sheet Metal Manual." Provide gutter size per UPC table 1106.3.

1. Gutter Supports: Fabricated from same material and finish as gutters.
2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.

F. Downspouts: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- long sections, complete with formed elbows and offsets. Provide downspout size per UPC and as required to drain gutters.

1. Mounting Straps: Fabricated from same material and finish as gutters.

G. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch- wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof. Fabricate from one of the following materials:

1. Aluminum: 0.032 inch thick.
2. Stainless Steel: 0.019 inch thick.
3. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.

H. Roof Ventilators: Gravity type, complete with hardware, flashing, closures, and fittings.

1. Continuous or Sectional-Ridge Type: Factory-engineered and -fabricated, continuous unit; Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match metal roof panels. Fabricated in minimum 10-foot- long sections. Provide throat size and total length indicated, complete with side baffles, ventilator assembly, end caps, splice plates, and reinforcing diaphragms.

a. Bird Screening: Galvanized steel, 1/2-inch- square mesh, 0.041-inch wire; or aluminum, 1/2-inch- square mesh, 0.063-inch wire.
b. Throat Size: 9 inches.

I. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

J. Materials:

1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.

    a. Fasteners for Metal Roof Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with a stainless-steel cap or zinc-aluminum-alloy head and EPDM sealing washer.
    b. Fasteners for Metal Wall Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws.
    c. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
    d. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

2. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
3. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
4. Metal Panel Sealants:
    a. Joint Sealant: ASTM C 920; one part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

2.13 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.

1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.

1. Make shop connections by welding or by using high-strength bolts.
2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
4. Weld clips to frames for attaching secondary framing if applicable, or punch for bolts.

5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll forming or break forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.

1. Make shop connections by welding or by using non-high-strength bolts.
2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

2.14 SOURCE QUALITY CONTROL

A. Special Inspection: Owner will engage a qualified special inspector to perform source quality control inspections and to submit reports.

1. Accredited Manufacturers: Special inspections will not be required if fabrication is performed by an IAS AC472-accredited manufacturer approved by authorities having jurisdiction to perform such Work without special inspection.

a. After fabrication, submit copy of certificate of compliance to authorities having jurisdiction, certifying that Work was performed according to Contract requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.

1. Engage land surveyor to perform surveying.

C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

A. Erect metal building system according to manufacturer's written instructions and drawings.

B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.

1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt type and joint type specified.

a. Joint Type: Snug tightened or pretensioned as required by manufacturer.

G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.

1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.

2. Locate and space wall girts to suit openings such as doors and glazed storefront systems.
3. Provide supplemental framing at entire perimeter of openings, including doors, glazed storefront systems, louvers, ventilators, and other penetrations of roof and walls.

H. Steel Joists and Joist Girders: Install joists, girders, and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders," joist manufacturer's written instructions, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Joist Installation: Weld joist seats to supporting steel framework.
5. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

I. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.

1. Tighten rod and cable bracing to avoid sag.
2. Locate interior end-bay bracing only where indicated.

J. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

K. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.

1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.

D. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cut metal panels as required for doors, glazed storefront systems, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.

    a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.

2. Install metal panels perpendicular to structural supports unless otherwise indicated.
3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate metal panel splices over structural supports with end laps in alignment.
6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

E. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

F. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.

1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.5 METAL ROOF PANEL INSTALLATION

A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.

1. Install ridge caps as metal roof panel work proceeds.
2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.

B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.

1. Install clips to supports with self-drilling or self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
4. Rigidly fasten eave end of metal roof panels and allow ridge end free movement for thermal expansion and contraction. Predrill panels for fasteners.
5. Provide metal closures at rake edges and each side of ridge caps.

C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

D. Metal Roof Panel Installation Tolerances: Shim and align metal roof panels within installed tolerance of 1/4 inch in 20 feet on slope and location lines and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 METAL WALL PANEL INSTALLATION

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
2. Shim or otherwise plumb substrates receiving metal wall panels.
3. When two rows of metal panels are required, lap panels 4 inches minimum.
4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
5. Rigidly fasten base end of metal wall panels and allow eave end free movement for thermal expansion and contraction. Predrill panels.
6. Flash and seal metal wall panels with weather closures at eaves and rakes, and at perimeter of all openings. Fasten with self-tapping screws.
7. Install screw fasteners in predrilled holes.
8. Install flashing and trim as metal wall panel work proceeds.
9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated on Drawings; if not indicated, as necessary for waterproofing.
10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

C. Installation Tolerances: Shim and align metal wall panels within installed tolerance of 1/4 inch in 20 feet, noncumulative; level, plumb, and on location lines; and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.7 METAL SOFFIT PANEL INSTALLATION

A. Provide metal soffit panels the full width of soffits. Install panels perpendicular to support framing.

B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

3.8 THERMAL INSULATION INSTALLATION

A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.

1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.

2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
4. Install blankets straight and true in one-piece lengths. Install vapor retarder over insulation, with both sets of facing tabs sealed, to provide a complete vapor retarder.

B. Blanket Roof Insulation: Comply with the following installation method:
1. Over-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Install layer of filler insulation over first layer to fill space formed by metal roof panel standoffs. Hold in place by panels fastened to standoffs.

a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.

2. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

C. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal wall panels fastened to secondary framing.

1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
2. Sound-Absorption Insulation: Where sound-absorption requirement is indicated for metal liner panels, cover insulation with polyethylene film and provide inserts of wire mesh to form acoustical spacer grid.

3.9 DOOR AND FRAME INSTALLATION

A. General: Install doors and frames plumb, rigid, properly aligned, and securely fastened in place according to manufacturers' written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each door frame with elastomeric sealant used for metal wall panels.

B. Door Hardware:

1. Install surface-mounted items after finishes have been completed at heights indicated in DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
3. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
4. Set thresholds for exterior doors in full bed of sealant complying with requirements for concealed mastics specified in Section 079200 "Joint Sealants."

3.10 STOREFRONT INSTALLATION

A. General: Install glazed storefront systems plumb, rigid, properly aligned, without warp or rack of frames or sash, and securely fasten in place according to manufacturer's written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each frame with elastomeric sealant used for metal wall panels.

1. Separate dissimilar materials from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in AAMA/WDMA/CSA 101/I.S.2/A440.

B. Set sill members in bed of sealant or with gaskets, for weathertight construction.

C. Install storefront system and components to drain condensation, water penetrating joints, and moisture migrating within glazed storefront system to the exterior.

3.11 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.

1. Provide elbows at base of downspouts to direct water away from building.

E. Parapet Scuppers: Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

1. Anchor scupper closure trim flange to exterior wall and seal with elastomeric sealant to scupper.

F. Continuous Roof Ventilators: Set ventilators complete with necessary hardware, anchors, dampers, weather guards, rain caps, and equipment supports. Join sections with splice plates and end-cap skirt assemblies where required to achieve indicated length. Install preformed filler strips at base to seal ventilator to metal roof panels.

G. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.12 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform field quality control special inspections and to submit reports.

B. Product will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.13 ADJUSTING

A. Doors: After completing installation, test and adjust doors to operate easily, free of warp, twist, or distortion.

3.14 CLEANING AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

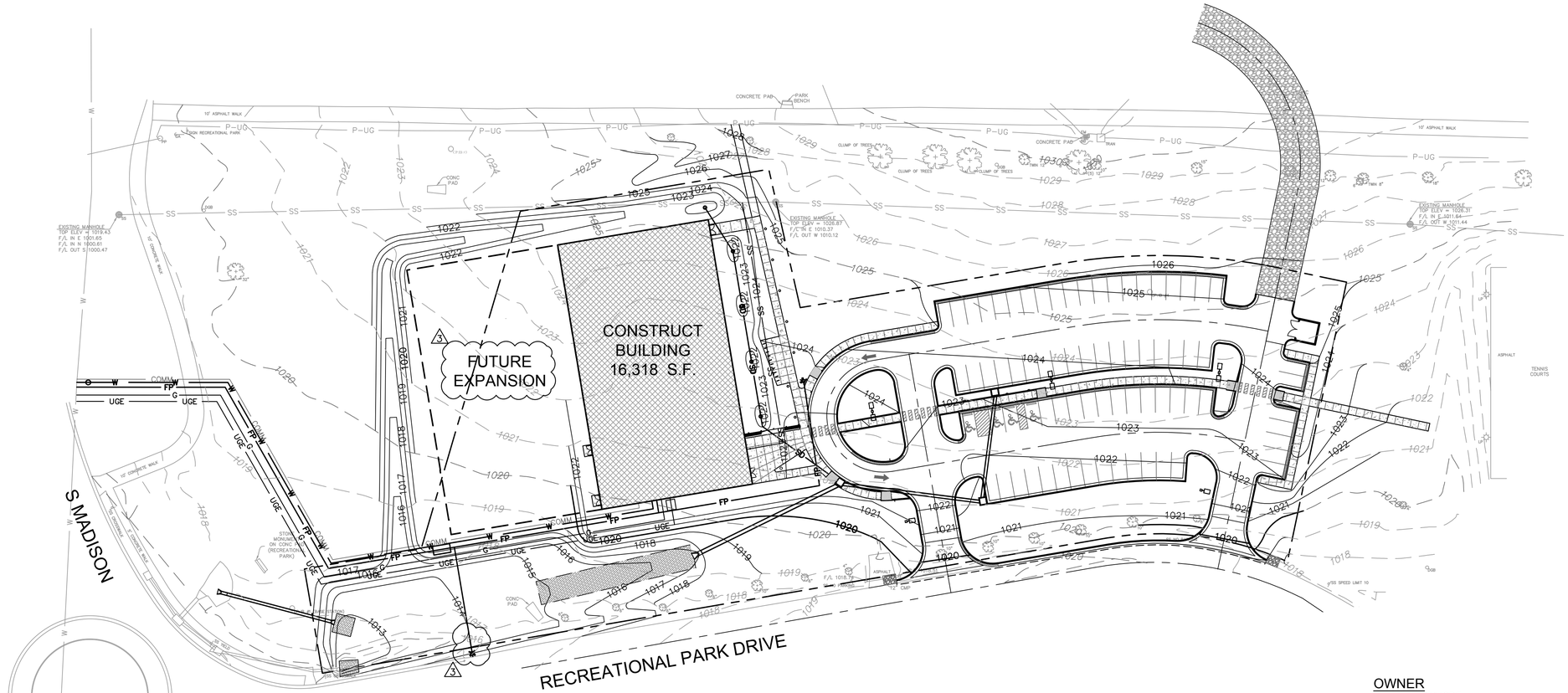
B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

C. Touchup Painting: Cleaning and touchup painting are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

D. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 133419



LEGEND

CP:IB	CONTROL POINT
F:IB	FOUND IRON BAR
F:CM	FOUND CURB MARK
S:IB	SET 1/2" IRON BAR W/CAP LS-2268
BB	BREAKER BOX
DGB	DISC GOLF BASKET
EM	ELECTRIC METER
TRAN	ELECTRIC TRANSFORMER
FH	FIRE HYDRANT
GA	GUY ANCHOR
LP	LAMP POST
SIGN	MISC SIGN
PP	POWER POLE
SS	SANITARY SEWER MANHOLE
SS	STREET SIGN
TR	TELEPHONE RISER
SIZE	TREE DECIDUOUS
WV	WATER VALVE
	BROKEN SCALE
OH	OVERHEAD UTILITIES
SS	SANITARY SEWER MAIN
UE	UNDERGROUND ELECTRIC
W	WATER MAIN
	SITE BOUNDARY
	CENTERLINE OF ROAD
	SAWCUT PAVEMENT FULL DEPTH
	NATIVE VEGETATION SWALE
SS	CONSTRUCT SANITARY SEWER
W	CONSTRUCT DOMESTIC WATER
FP	CONSTRUCT FIRE PROTECTION
UGE	CONSTRUCT ELECTRIC SERVICE
GAS	CONSTRUCT NATURAL GAS SERVICE
	CONSTRUCT TYPE B CONCRETE CURB & GUTTER
	CONSTRUCT TYPE B CONCRETE DRY CURB & GUTTER
	INSTALL CONCRETE PAVEMENT
	CONSTRUCT STORM SEWER

OWNER
CITY OF RAYMORE
100 N MUNICIPAL CIRCLE
RAYMORE, MO 64083
OFFICE: (816) 331-1852

ARCHITECT:
SFS ARCHITECTURE
2100 CENTRAL ST. SUITE 31
KANSAS CITY, MO 64108
PH: (816)474-1397

ENGINEER:
OLSSON ASSOCIATES, INC.
7301 W. 133RD STREET, SUITE 200
OVERLAND PARK, KS 66213
PH: 913-381-1170
FAX: 913-381-1174

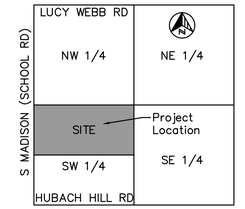
PROPERTY DESCRIPTION

(PER QUIT CLAIM DEED OF RELEASE RECORDED MAY 14, 1997 AS INSTRUMENT NO. 110120 IN BOOK 1578 AT PAGE 163)

THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 22, TOWNSHIP 46, RANGE 32, CASS COUNTY, MISSOURI, SUBJECT TO THAT PART THEREOF IN ROAD.

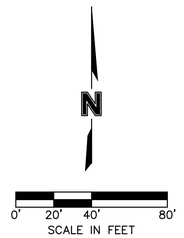
MISSOURI ONE CALL SYSTEM, INC 1-800-344-7483 STOP-CALL BEFORE YOU DIG!!

THE CONTRACTOR SHALL ADHERE TO THE PROVISIONS OF THE SENATE BILL NUMBER 583, 78TH GENERAL ASSEMBLY OF THE STATE OF MISSOURI. THE BILL REQUIRES THAT ANY PERSON OR FIRM DOING EXCAVATION ON PUBLIC RIGHT-OF-WAY DO SO ONLY AFTER GIVING NOTICE TO, & OBTAINING INFORMATION FROM, UTILITY COMPANIES. STATE LAW REQUIRES 48 HOURS ADVANCE NOTICE. CALL 1-800-DIG-RITE.



SEC 22, TWP 46 N, RNG 32 W

VICINITY MAP
SCALE 1"=2000'



SCALE IN FEET

sfs architecture
2100 Central St. Suite 31 Kansas City, MO 64110
(o) 816.474.1397 (f) 816.421.8024 www.sfsarch.com

STATE OF MISSOURI
MEGAN J. WALTER
NUMBER PE-2012020697
2-1-2017
PROFESSIONAL ENGINEER

RAYMORE ACTIVITY CENTER

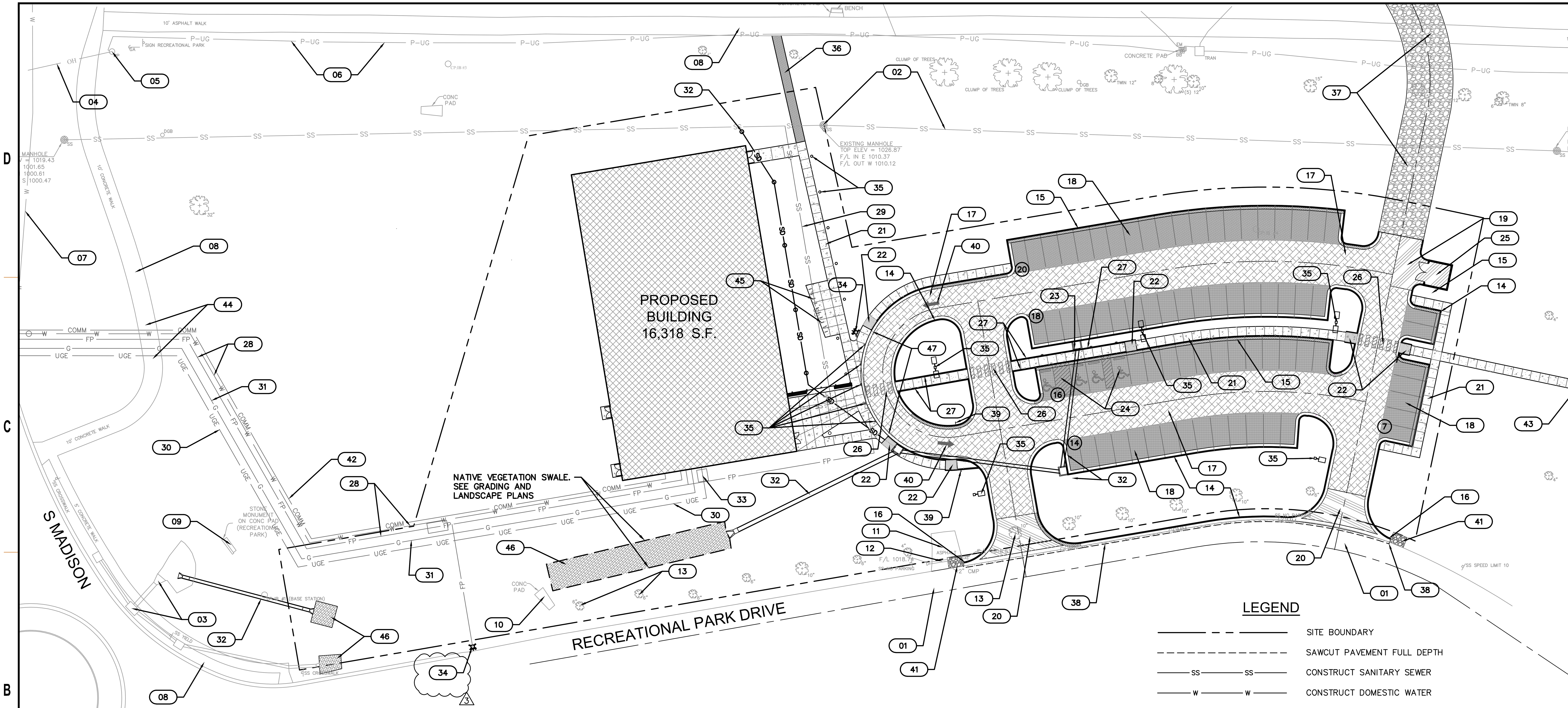
City of Raymore
1101 S. Madison Street
Raymore, MO 64083

MARK	DATE	DESCRIPTION
3	2/1/17	ADDENDUM 1

ISFS PROJECT NO: 15930
ISSUED FOR: CONSTRUCTION DOCUMENTS
ISSUE DATE: 01.09.17

GENERAL LAYOUT PLAN

C101



KEYNOTES:

1. EXISTING PAVEMENT.
2. EXISTING SANITARY SEWER.
3. EXISTING STORM SEWER.
4. EXISTING OVERHEAD POWER LINES.
5. EXISTING POWER POLE.
6. EXISTING UNDERGROUND ELECTRIC POWER.
7. EXISTING WATER MAIN.
8. EXISTING SIDEWALK.
9. EXISTING MONUMENT SIGN.
10. DEMO EXISTING CONCRETE DISC GOLF PAD. RECONSTRUCT CONCRETE PAD IN LOCATION APPROVED BY THE CITY OF RAYMORE.
11. DEMO EXISTING ASPHALT PAVEMENT.
12. DEMO EXISTING STORM SEWER.
13. DEMO EXISTING TREES.
14. CONSTRUCT TYPE CG-1 CONCRETE CURB AND GUTTER. SEE DETAIL SHEET C601.
15. CONSTRUCT TYPE CG-1 CONCRETE DRY CURB AND GUTTER.
16. CONSTRUCT 2'-0" CURB TRANSITION. SEE DETAIL SHEET C601.
17. CONSTRUCT HEAVY DUTY ASPHALT PAVEMENT. SEE SHEET C601 FOR PAVEMENT SECTIONS.
18. CONSTRUCT STANDARD DUTY ASPHALT PAVEMENT. SEE SHEET C601 FOR PAVEMENT SECTIONS.
19. CONSTRUCT HEAVY DUTY CONCRETE PAVEMENT WITH INTEGRAL CURB AND GUTTER. SEE SHEET C601 FOR PAVEMENT SECTIONS.
20. CONSTRUCT COMMERCIAL ENTRANCE. SEE SHEET C602 FOR DETAIL.
21. CONSTRUCT CONCRETE SIDEWALK.
22. CONSTRUCT ADA ACCESSIBLE RAMP.
23. INSTALL ADA ACCESSIBLE PARKING SIGN. SEE SHEET C601 FOR DETAILS
24. ADA PARKING STALL LAYOUT. SEE SHEET C601 FOR DETAIL.
25. PROPOSED TRASH ENCLOSURE AND EQUIPMENT AREA. SEE ARCHITECTURAL PLANS FOR DETAILS.
26. PROPOSED PAINTED CROSSWALK.
27. CONSTRUCT 6" LANDSCAPE CURB. SEE DETAIL SHEET C604.
28. PROPOSED DOMESTIC WATER AND FIRE PROTECTION SERVICE. SEE SHEET C400.
29. PROPOSED SANITARY SEWER SERVICE. SEE SHEET C400.
30. PROPOSED ELECTRIC SERVICE. SEE SHEET C400.
31. PROPOSED GAS SERVICE. SEE SHEET C400.
32. PROPOSED STORM SEWER. SEE SHEETS C401-C402.
33. PROPOSED TRANSFORMER LOCATION.
34. PROPOSED FIRE HYDRANT.
35. PROPOSED SITE LIGHTING. SEE LIGHTING PLANS FOR DETAILS.
36. CONSTRUCT ASPHALT SIDEWALK.
37. FUTURE ACCESS DRIVE BY OTHERS.
38. SAWCUT EXISTING ASPHALT FULL DEPTH & REMOVE EXISTING ASPHALT PAVEMENT. SEE DETAIL SHEET C604.
39. INSTALL "DO NOT ENTER SIGNAGE". SEE DETAIL SHEET C601.
40. INSTALL PAINTED ARROW.
41. INSTALL 6'X8' STONE RIP RAP. SEE DETAIL SHEET C601.
42. PROPOSED COMMUNICATION SERVICE.
43. FOR CONNECTION & CONTINUATION OF SIDEWALK SEE LANDSCAPE PLANS.
44. REPLACE EXISTING SIDEWALK REMOVED FOR UTILITY INSTALLATION.
45. PROPOSED BIKE RACKS SEE LANDSCAPE PLANS.
46. PROPOSED LANDLOCK TRM. SEE SHEET C300.
47. CONSTRUCT RIBBON CURB AT ENTRANCE. SEE DETAIL SHEET C601.

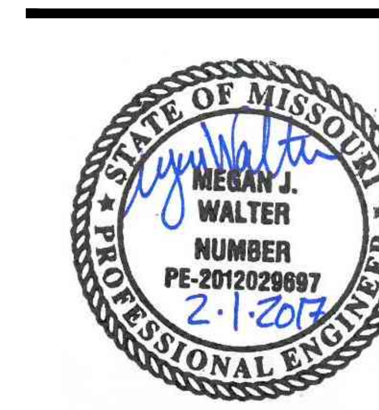
LEGEND

- SITE BOUNDARY
- SAWCUT PAVEMENT FULL DEPTH
- (SS) CONSTRUCT SANITARY SEWER
- (W) CONSTRUCT DOMESTIC WATER
- (FP) CONSTRUCT FIRE PROTECTION
- (UGE) CONSTRUCT ELECTRIC SERVICE
- (GAS) CONSTRUCT NATURAL GAS SERVICE
- CONSTRUCT TYPE CG-1 CONCRETE CURB & GUTTER
- CONSTRUCT TYPE CG-1 CONCRETE DRY CURB & GUTTER
- INSTALL CONCRETE PAVEMENT
- INSTALL HEAVY DUTY ASPHALT PAVEMENT
- INSTALL LIGHT DUTY ASPHALT PAVEMENT
- INSTALL HEAVY DUTY CONCRETE PAVEMENT
- CONSTRUCT STORM SEWER
- (XX) PARKING STALLS

N

0' 15' 30' 60'
SCALE IN FEET

sfs architecture
2100 Central St. Suite 31 Kansas City, MO 64108
(O) 816.474.1397 (F) 816.421.8024 www.sfsarch.com



RAYMORE ACTIVITY CENTER

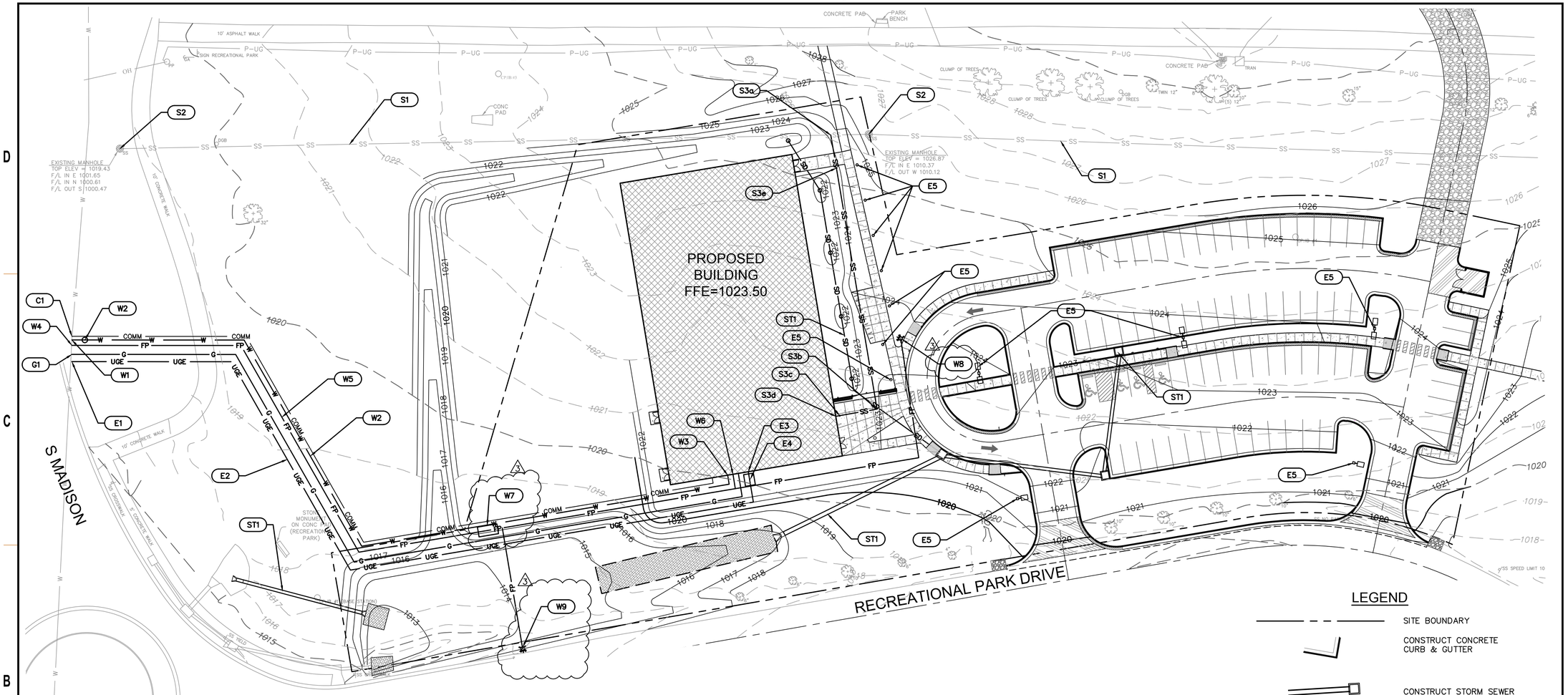
City of Raymore
1101 S. Madison Street
Raymore, MO 64083

MARK	DATE	DESCRIPTION
3	2/1/17	ADDENDUM 1

ISFS PROJECT NO: 15930
ISSUED FOR: PERMIT DOCUMENTS
ISSUE DATE: 01.09.17

SITE PLAN

C200



NOTES

1. PROVIDE 1 INCH DOMESTIC WATER METER FOR CONNECTION TO THE IRRIGATION SYSTEM.
2. CONTRACTOR TO CONTACT THE CITY OF RAYMORE PUBLIC WORKS DEPARTMENT TO ORDER WATER METERS. THE CONTACT NUMBER IS: 816-331-2377. BE ADVISED (TO PLUMBING CONTRACTOR) CONSIDERABLE LEAD TIME WILL BE REQUIRED WHEN ORDERING WATER METERS.

SUGGESTED UTILITY DEPTHS:
COORDINATE WITH UTILITY PROVIDERS AND FOLLOW UTILITY PROVIDERS STANDARDS IF CONFLICT EXISTS.

GAS 24"
PRIMARY ELECTRIC 24"
SECONDARY ELECTRIC 18"
DOMESTIC WATER 48"
FIRE SERVICE 48"
COMMUNICATION LINES 18"

UTILITY KEYNOTES: (XX)

ELECTRICAL: (EX)

E1. CONNECT TO EXISTING POWER SOURCE. COORDINATE WITH KCP&L FOR CONNECTION.

E2. INSTALL 460± LF OF PVC CONDUIT FOR PRIMARY ELECTRICAL SERVICE PER KCP&L STANDARDS AND SPECIFICATIONS. COORDINATE ROUTING AND INSTALLATION WITH KCP&L.

E3. INSTALL 4± LF OF 1-4" PVC CONDUIT FOR SECONDARY ELECTRICAL SERVICE PER KCP&L STANDARDS AND SPECIFICATIONS. COORDINATE ROUTING WITH MEP PLANS FOR SPECIFICATIONS.

E4. PROPOSED TRANSFORMER LOCATION. COORDINATE INSTALLATION WITH KCP&L PLANS. CONTRACTOR TO INSTALL TRANSFORMER PAD PER KCP&L COMPANY STANDARDS AND SPECIFICATIONS.

E5. PROPOSED SITE LIGHTING. SEE LIGHTING PLANS FOR DETAILS.

SANITARY SEWER (SX)

S1. EX. SANITARY SERVICE LINE.

S2. EX. SANITARY SEWER MANHOLE.

S3. SANITARY SERVICE CONNECTION
- a. INSTALL 4" TEE ON EXISTING SANITARY SEWER MAIN, 10.5 L.F. 4" PVC SANITARY SEWER SERVICE LINE VERTICAL RISER (S), 146.32 L.F. 4" PVC SANITARY SEWER SERVICE LINE @ 2.00% (S), 45° BEND, 23.18 L.F. 4" PVC SANITARY SEWER SERVICE LINE @ 2.00% (W) & CONNECT TO BUILDING STUB.
  EX.INV. EL. @ SANITARY SEWER MAIN=1009.69
  INV. EL. @ END OF VERTICAL RISER=1017.11
  INV. EL. @ 4" BEND=1020.04
  INV. EL. @ CLEANOUT=1020.46
  INV. EL. @ BUILDING STUB=1020.50
- b. 4" SANITARY SEWER SERVICE LINE 45° BEND.
  INV. EL. @ 4" BEND=1020.04
- c. 4" ONE WAY CLEANOUT W/IRON LID
  INV. EL. @ 4" CLEANOUT=1020.46
- d. 4" BUILDING STUB
  INV. EL. @ 4" BUILDING STUB=1020.50
- e. 4" ONE WAY CLEANOUT W/IRON LID
  INV. EL. @ 4" CLEANOUT=1017.33

STORM SEWER (STX)

ST1. SEE SHEETS C401 & C402 FOR DETAILS

NATURAL GAS: (GX)

G1. UTILIZE EXISTING CONDUIT. INSTALL 455± LF OF NEW GAS SERVICE BY UTILITY COMPANY. COORDINATE WITH UTILITY COMPANY FOR EXACT LOCATION, ROUTING AND CONNECTION. ALLOW 4-6 WEEKS FOR COORDINATION.

WATER: (WX)

W1. CONNECT TO EXISTING WATER MAIN WITH 3" TAPPING SLEEVE AND VALVE PER CITY OF RAYMORE STANDARDS AND SPECIFICATIONS.

W2. INSTALL METER PIT AND 3" METER ADJACENT TO RIGHT OF WAY & ±435 LF OF 3" CTS HDPE DR-11 DOMESTIC WATER SERVICE (E) PER CITY OF RAYMORE STANDARDS AND SPECIFICATIONS.

W3. CONNECT TO BUILDING. SEE MEP PLANS FOR CONNECTION AND INTERNAL PLUMBING.

W4. CONNECT TO EXISTING WATER MAIN WITH 6" TAPPING SLEEVE AND VALVE PER CITY OF RAYMORE STANDARDS AND SPECIFICATIONS.

W5. INSTALL ±445 LF OF 6" PVC C900 (E) PER PER CITY OF RAYMORE STANDARDS AND SPECIFICATIONS INSTALL ALL NECESSARY PIPE, BENDS AND FITTING NECESSARY FOR OPERATION.

W6. CONNECT TO 6" BUILDING FIRE PROTECTION STUB. SEE MEP PLANS FOR CONNECTION AND INTERNAL PLUMBING.

3
- W7. INSTALL BACKFLOW PREVENTION VAULT WITH DOUBLE CHECK VALVE ASSEMBLY PER CITY OF RAYMORE STANDARDS AND SPECIFICATIONS
- W8. INSTALL NEW FIRE HYDRANT. COORDINATE INSTALLATION AND EXACT LOCATION WITH CITY AND FIRE DEPARTMENT. TEE ONTO 6" FIRE SERVICE AND INSTALL ±170 LF 6" PVC C900 (S&W) FIRE PROTECTION SERVICE AND ALL NECESSARY PIPE, BENDS AND FITTING NECESSARY FOR OPERATION PER CITY OF RAYMORE STANDARDS AND SPECIFICATIONS.
- W9. INSTALL NEW FIRE HYDRANT. COORDINATE INSTALLATION AND EXACT LOCATION WITH CITY AND FIRE DEPARTMENT. TEE ONTO 6" FIRE SERVICE AND INSTALL ±70 LF 6" PVC C900 (S) FIRE PROTECTION SERVICE AND ALL NECESSARY PIPE, BENDS AND FITTING NECESSARY FOR OPERATION PER CITY OF RAYMORE STANDARDS AND SPECIFICATIONS.

TELECOMMUNICATIONS: (CX)

C1. INSTALL (2) ±430 L.F. OF 3 SCH 40 PVC CONDUITS, MIN. 18" DEEP, WITH PULLSTRINGS FOR TELECOM SERVICE. COORDINATE ROUTING, CONDUIT SIZE AND INSTALLATION WITH UTILITY COMPANY. SEE MEP PLANS FOR BUILDING CONNECTION.

LEGEND

- SITE BOUNDARY
- CONSTRUCT CONCRETE CURB & GUTTER
- CONSTRUCT STORM SEWER
- SS — SS — INSTALL SANITARY SEWER SERVICE
- UGE — UGE — INSTALL ELECTRICAL LINE
- W — W — INSTALL DOMESTIC WATER SERVICE
- FP — INSTALL FIRE PROTECTION LINE
- GAS — GAS — INSTALL GAS SERVICE
- COMM — INSTALL GAS SERVICE

N

0' 15' 30' 60'
SCALE IN FEET

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2100 Central St. Suite 31 Kansas City, MO 64110
ph: 816.472.1397 ph: 816.421.8024 www.sfsarch.com

STATE OF MISSOURI
MEGAN J. WALTER
NUMBER PE-2012020697
PROFESSIONAL ENGINEER
2-1-2017

RAYMORE ACTIVITY CENTER

City of Raymore
1101 S. Madison Street
Raymore, MO 64083

MARK	DATE	DESCRIPTION
3	2/1/17	ADDENDUM 1

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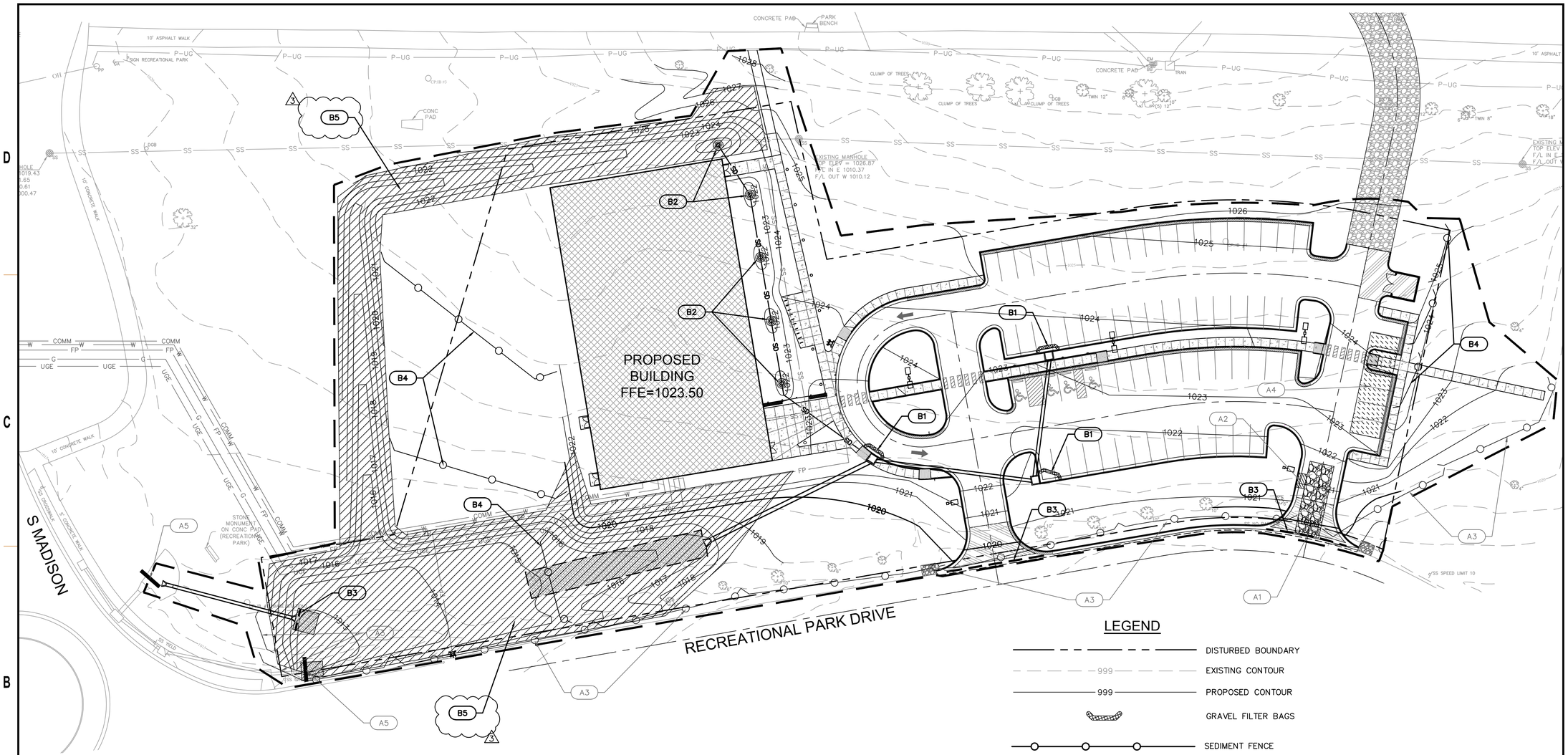
UTILITY PLAN

C400



EROSION AND SEDIMENT CONTROL STAGING CHART

PROJECT STAGE	EROSION CONTROL PLAN BMP REFERENCE NUMBER	BMP DESCRIPTION	REMOVE AFTER STAGE	NOTES:
A – PRIOR TO GRADING	A1	TEMPORARY CONSTRUCTION ENTRANCE	B	INSTALL AS INDICATED ON PLANS
	A2	CONCRETE WASHOUT	B	INSTALL AS INDICATED ON PLANS
	A3	TEMPORARY SLOPE BARRIER (SEDIMENT FENCE)	C	INSTALL AS INDICATED ON PLANS
	A4	STAGING/STOCKPILE AREA	B	INSTALL AS INDICATED ON PLANS
	A5	ROCK CHECK DAM	C	INSTALL AS INDICATED ON PLANS
B – STORM SEWER, UTILITY, BUILDING AND PAVEMENT CONSTRUCTION(STABILIZE ANY DISTURBED AREAS OUTSIDE BUILDING PARDS & PARKING LOTS)	B1	INLET PROTECTION(GRAVEL FILTER BAGS)	B	INSTALL AS INDICATED ON PLANS
	B2	LANDSCAPE DRAIN PROTECTION (STRAW WATTLE)	B	INSTALL AS INDICATED ON PLANS
	B3	TEMPORARY SLOPE BARRIER (STRAW WATTLE)	C	INSTALL AS INDICATED ON PLANS
	B4	TEMPORARY SLOPE BARRIER (SEDIMENT FENCE)	C	INSTALL AS INDICATED ON PLANS
	B5	LANDLOK S2 BLANKET OR APPROVED EQUAL	N/A	INSTALL AS INDICATED ON PLANS
C – FINAL STABILIZATION	C1	REPLACE TOP SOIL, SEED, MULCH, SOD, LANDSCAPE	N/A	ESTABLISH PERENNIAL VEGETATION WITH A 70% DENSITY OVER 100% OF DISTURBED AREA SEE LANDSCAPE PLANS

LEGEND

- DISTURBED BOUNDARY
- 999 EXISTING CONTOUR
- 999 PROPOSED CONTOUR
- GRAVEL FILTER BAGS
- SEDIMENT FENCE
- INSTALL TEMPORARY SLOPE BARRIER (STRAW WATTLE) PER MANUFACTURER SPECIFICATIONS
- STRAW WATTLE INLET PROTECTION
- LIMITS OF DISTURBANCE (3.43 ACRES)
- INSTALL ROCK CHECK DAM
- TEMPORARY CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT
- STAGING/STOCKPILE AREA
- TEMPORARY EROSION CONTROL BLANKET – LANDLOK S2 OR APPROVED EQUAL – INSTALLED PER MANUFACTURER RECOMMENDATIONS
- X1 EROSION CONTROL REFERENCE NUMBER

N

0' 15' 30' 60'
SCALE IN FEET

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2100 Central St. Suite 31 Kansas City, MO 64108
tel 816.472.1397 fax 816.421.8024 www.sfsarch.com

STATE OF MISSOURI
MEGAN J. WALTER
NUMBER PE-2012029897
2-1-17
PROFESSIONAL ENGINEER

RAYMORE ACTIVITY CENTER

City of Raymore
1101 S. Madison Street
Raymore, MO 64083

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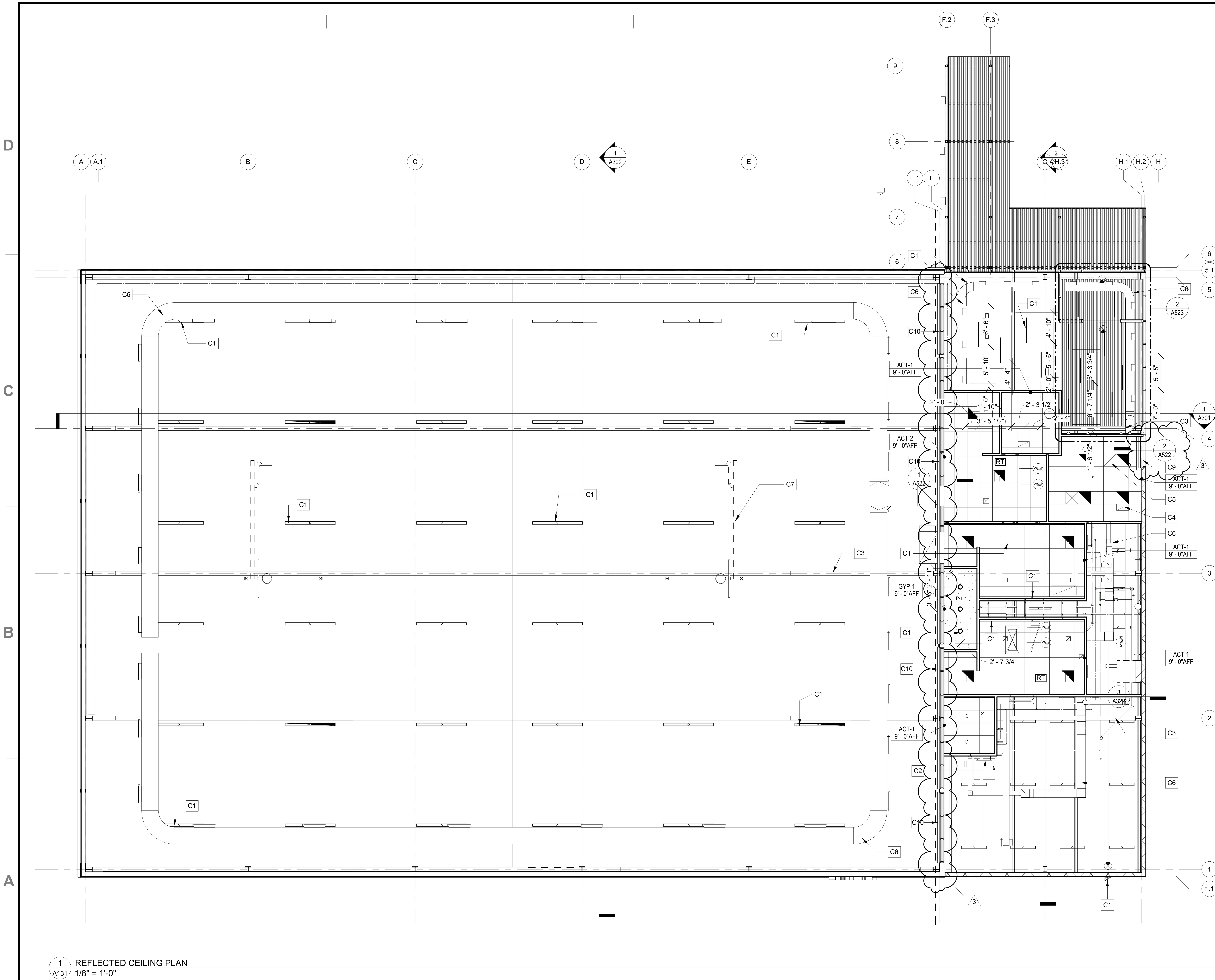
EROSION CONTROL PLAN-CONST.

C501



GENERAL NOTES - REFLECTED CEILING PLAN

1. CEILING HEIGHTS INDICATED ARE MEASURED FROM MAIN FLOOR BENCHMARK ELEVATION OF 100'-0""."
2. WHERE RECESSED LIGHT FIXTURES ARE INDICATED TO BE INSTALLED IN ACOUSTICAL TILE CEILINGS, FIXTURES ARE TO BE INSTALLED AT CENTER OF TILE UNLESS NOTED OTHERWISE."
3. SPRINKLER HEADS SHALL BE INSTALLED AT CENTER OF ACOUSTICAL TILE WHEN REQUIRED IN AREAS WITH ACOUSTICAL TILE CEILINGS. EXACT LOCATIONS AT ALL OTHER VISUALLY PROMINENT LOCATIONS SHALL BE COORDINATED WITH ARCHITECT."
4. REFER TO ELECTRICAL DRAWINGS FOR LIGHT FIXTURE TYPES AND SPECIFICATIONS."
5. COORDINATE FINAL MOUNTING LOCATION OF EXIT SIGNS, HORN STROBES, AND OTHER CEILING MOUNTED FIRE EXIT DEVICES WITH ARCHITECT PRIOR TO INSTALL."
6. REFER TO MECHANICAL DRAWINGS FOR DIFFUSERS, THERMO-STATS, AND OTHER MECHANICAL RELATED EQUIPMENT AND DEVICES."

REFLECTED CEILING PLAN SYMBOLS

NEW CONSTRUCTION

EXISTING CONSTRUCTION

ROOM NAME #### — ROOM NAME / ROOM NUMBER

TYPE #'-#"AFF — CEILING MATERIAL AND FINISH TYPE / CEILING HEIGHT

? — REFLECTED CEILING PLAN KEYNOTE

LEGEND - KEYNOTES

Key Value	Keynote Text
C1	LIGHT FIXTURE (RE: ELEC)
C2	METAL LADDER, (055000)
C3	PRIMARY STRUCTURAL-STEEL FRAMING (133419)
C4	EXHAUST GRILLE (RE: MECH)
C5	SUPPLY DIFFUSER (RE: MECH)
C6	DUCTWORK (RE: MECH)
C7	BASKETBALL GOAL (116623)
C8	GYMNASIUM DIVIDER CURTAIN, GD-1 (116653)
C9	MANUALLY OPERATED ROLLER SHADES (122413)
C10	MOTOR-OPERATED ROLLER SHADES (122413)

3

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ARCHITECT — STATE OF MISSOURI — NUMBER A-005831

RAYMORE ACTIVITY CENTER

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1011 S. Madison Street
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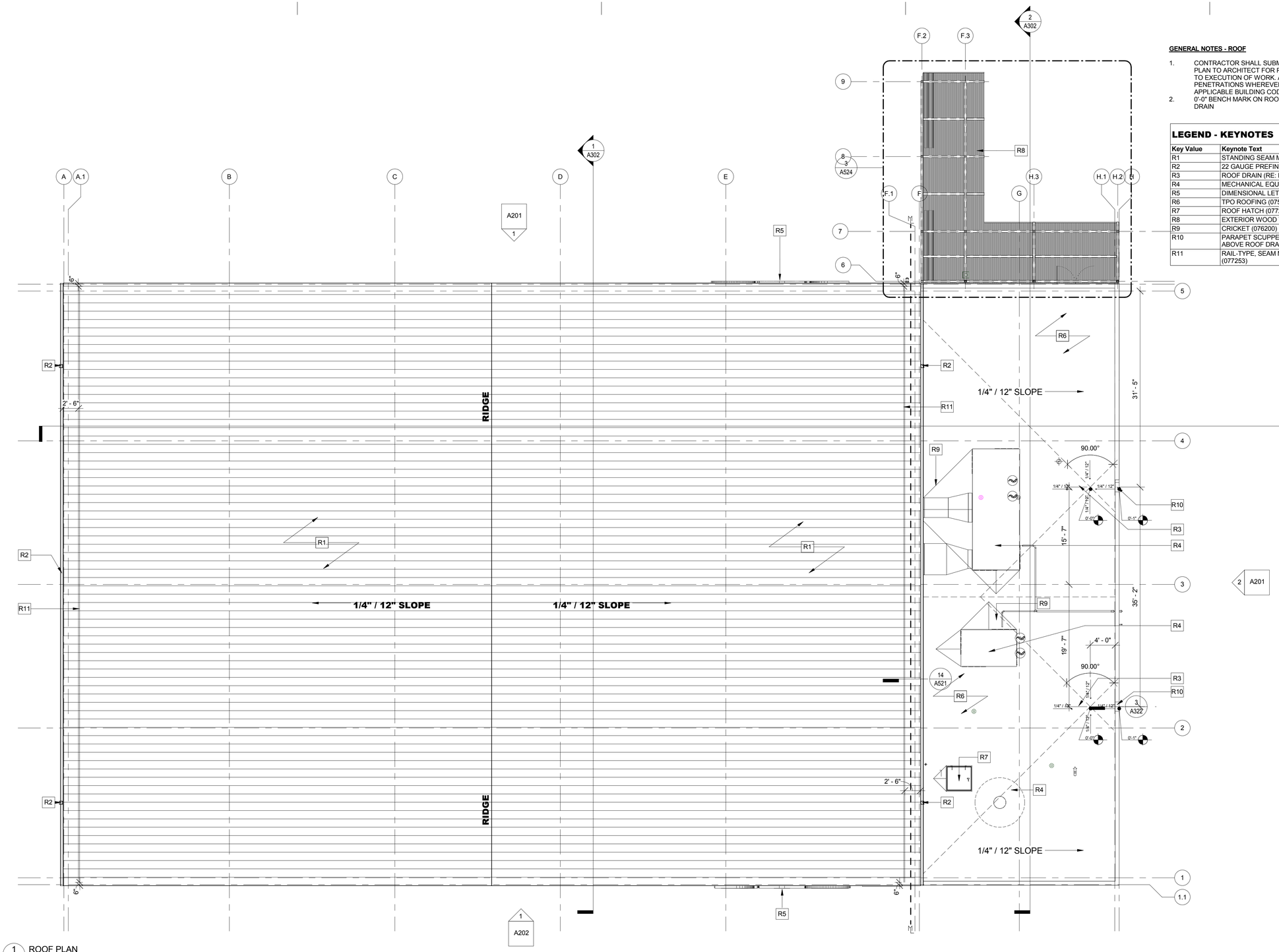
CEILING PLAN

A131



1 ROOF PLAN (A141)
1/8" = 1'-0"

GENERAL NOTES - ROOF

1. CONTRACTOR SHALL SUBMIT ROOF PENETRATION LAYOUT PLAN TO ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO EXECUTION OF WORK. ALIGN AND CONSOLIDATE ROOF PENETRATIONS WHEREVER POSSIBLE AND ALLOWABLE BY APPLICABLE BUILDING CODES.
2. 0'-0" BENCH MARK ON ROOF PLAN ONLY INDICATED TOP OF DRAIN

LEGEND - KEYNOTES

Key Value	Keynote Text
R1	STANDING SEAM METAL ROOF PANEL (133419)
R2	22 GAUGE PREFINISHED METAL GUTTER (076200)
R3	ROOF DRAIN (RE: PLUMBING)
R4	MECHANICAL EQUIPMENT (RE: MECH)
R5	DIMENSIONAL LETTER SIGNAGE (101419)
R6	TPO ROOFING (075423)
R7	ROOF HATCH (077200)
R8	EXTERIOR WOOD TRELLIS, ALT 1
R9	CRICKET (076200)
R10	PARAPET SCUPPER, LOCATE NO MORE THAN 1" ABOVE ROOF DRAIN ELEVATION (076200)
R11	RAIL-TYPE, SEAM MOUNTED SNOW GUARDS, (077253)

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ARCHITECT
2/1/17

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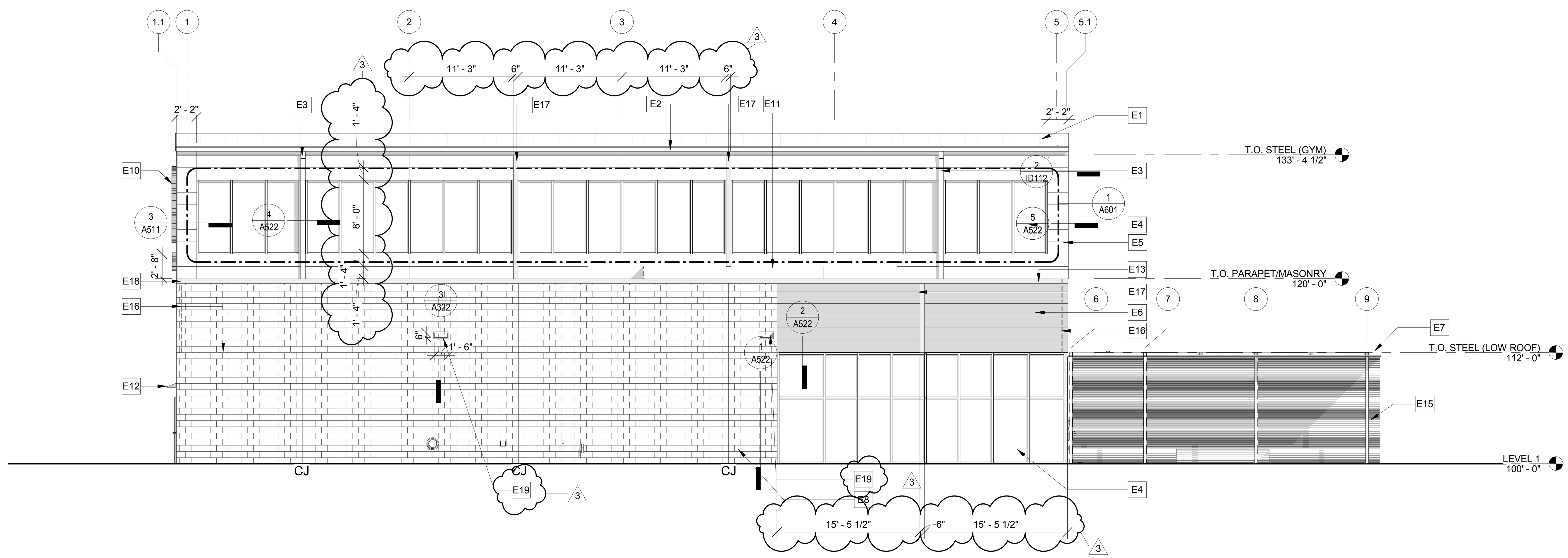
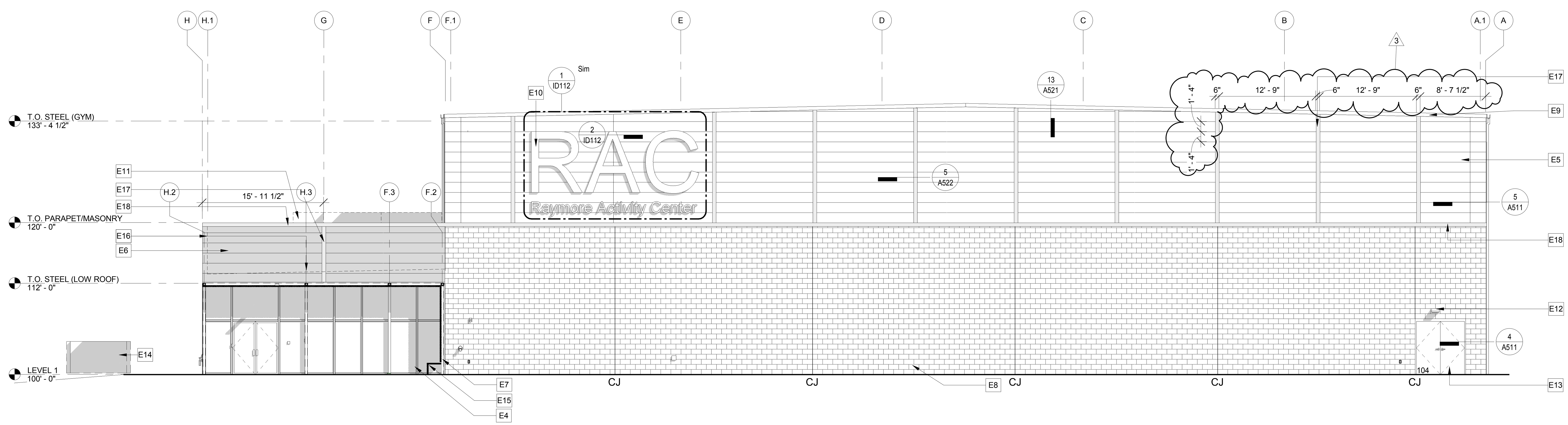
ROOF PLAN

A141



2 EXTERIOR ELEVATION - SOUTH
A201 1/8" = 1'-0"



1 EXTERIOR ELEVATION - EAST
A201 1/8" = 1'-0"

EXTERIOR ELEVATION LEGEND

- X — WINDOW TYPE
- ? — ELEVATION KEYNOTE
- SPOT ELEVATION

LEGEND - EXTERIOR ELEVATIONS
1/8" = 1'-0"

LEGEND - KEYNOTES

Key Value	Keynote Text
E1	STANDING SEAM METAL ROOF PANEL (133419)
E2	22 GAUGE PREFINISHED METAL GUTTER (133419)
E3	DOWNSPOUT (133419)
E4	ALUMINUM-FRAMED STOREFRONT (084113)
E5	METAL WALL PANEL, TYPE-1 (133419)
E6	METAL WALL PANEL, TYPE-2 (133419)
E7	PRIMARY STRUCTURAL-STEEL FRAMING (133419)
E8	CMU, CMU-1. (042200)
E9	PREFINISHED METAL FASCIA (133419)
E10	DIMENSIONAL LETTER SIGNAGE (101419)
E11	MECHANICAL EQUIPMENT (RE: MECH)
E12	LIGHT FIXTURE (RE: ELEC)
E13	HOLLOW METAL DOOR AND FRAME (RE: DOOR SCHEDULE)
E14	TRANSFORMER. RE: MEP
E15	EXTERIOR WOOD TRELLIS, ALT 1
E16	OUTLINE OF ROOF AND PARAPET BEYOND
E17	METAL WALL PANEL- 6" REVEAL (133419)
E18	PREFINISHED SHEET METAL COPING (133419)
E19	PARAPET SCUPPER, LOCATE NO MORE THAN 1" ABOVE ROOF DRAIN ELEVATION (076200)

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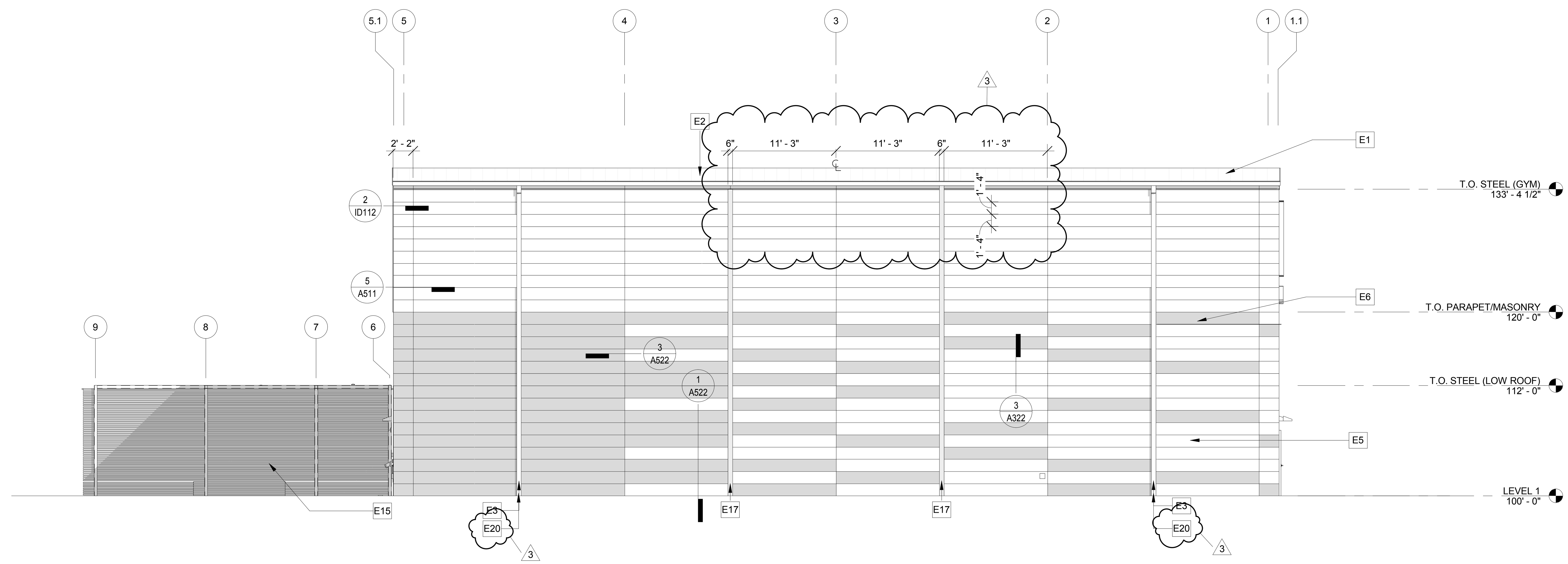
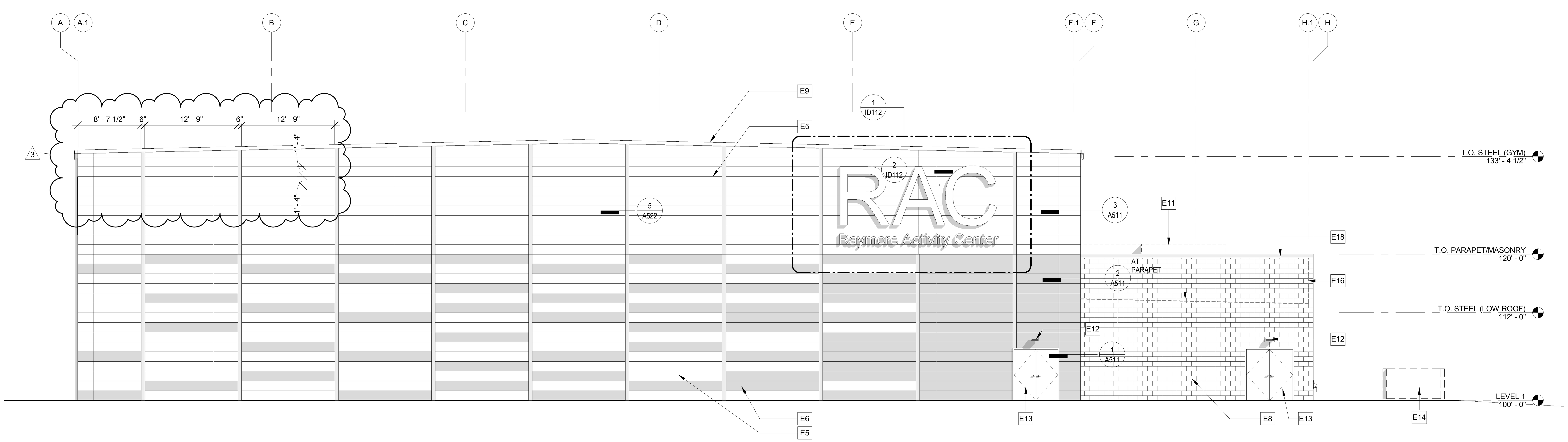
EXTERIOR ELEVATIONS

A201



2 EXTERIOR ELEVATION - NORTH
A202 1/8" = 1'-0"



1 EXTERIOR ELEVATION - WEST
A202 1/8" = 1'-0"

EXTERIOR ELEVATION LEGEND

X	WINDOW TYPE
?	ELEVATION KEYNOTE
(symbol)	SPOT ELEVATION

LEGEND - EXTERIOR ELEVATIONS
1/8" = 1'-0"

LEGEND - KEYNOTES

Key Value	Keynote Text
E1	STANDING SEAM METAL ROOF PANEL (133419)
E2	22 GAUGE PREFINISHED METAL GUTTER (133419)
E3	DOWNSPOUT (133419)
E5	METAL WALL PANEL, TYPE-1 (133419)
E6	METAL WALL PANEL, TYPE-2 (133419)
E8	CMU, CMU-1. (042200)
E9	PREFINISHED METAL FASCIA (133419)
E11	MECHANICAL EQUIPMENT (RE: MECH)
E12	LIGHT FIXTURE (RE: ELEC)
E13	HOLLOW METAL DOOR AND FRAME (RE: DOOR SCHEDULE)
E14	TRANSFORMER. RE: MEP
E15	EXTERIOR WOOD TRELLIS, ALT 1
E16	OUTLINE OF ROOF AND PARAPET BEYOND
E17	METAL WALL PANEL, 6" REVEAL (133419)
E18	PREFINISHED SHEET METAL COPING (133419)
E20	CONCRETE SPLASH BLOCK

3

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EXTERIOR ELEVATIONS

A202

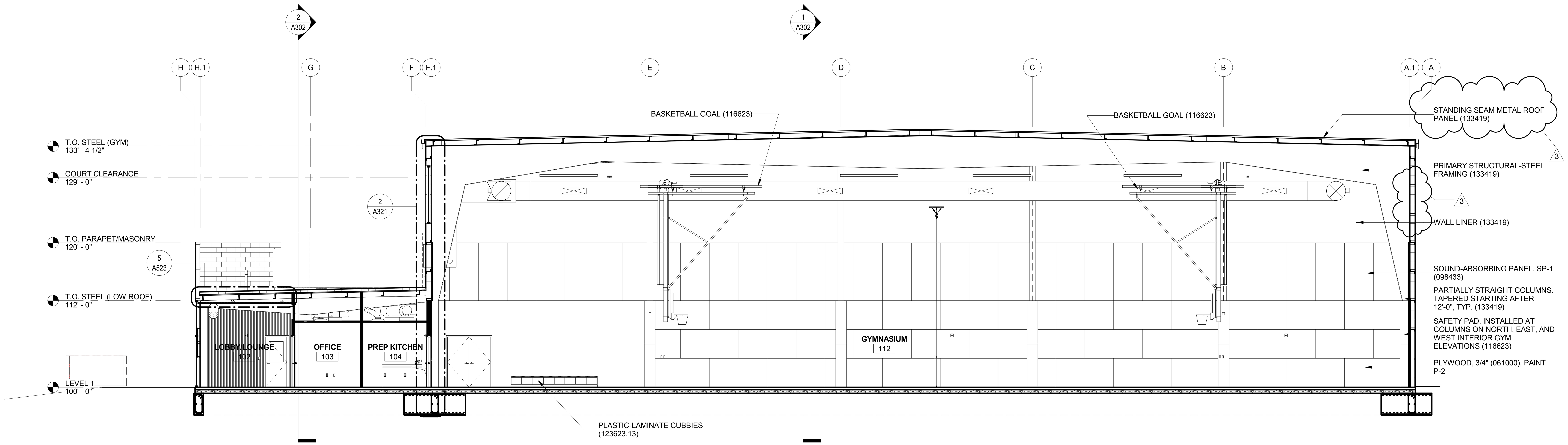
1 2 3 4 5

D

C

B

A



1
A301
BUILDING SECTION
1/8" = 1'-0"

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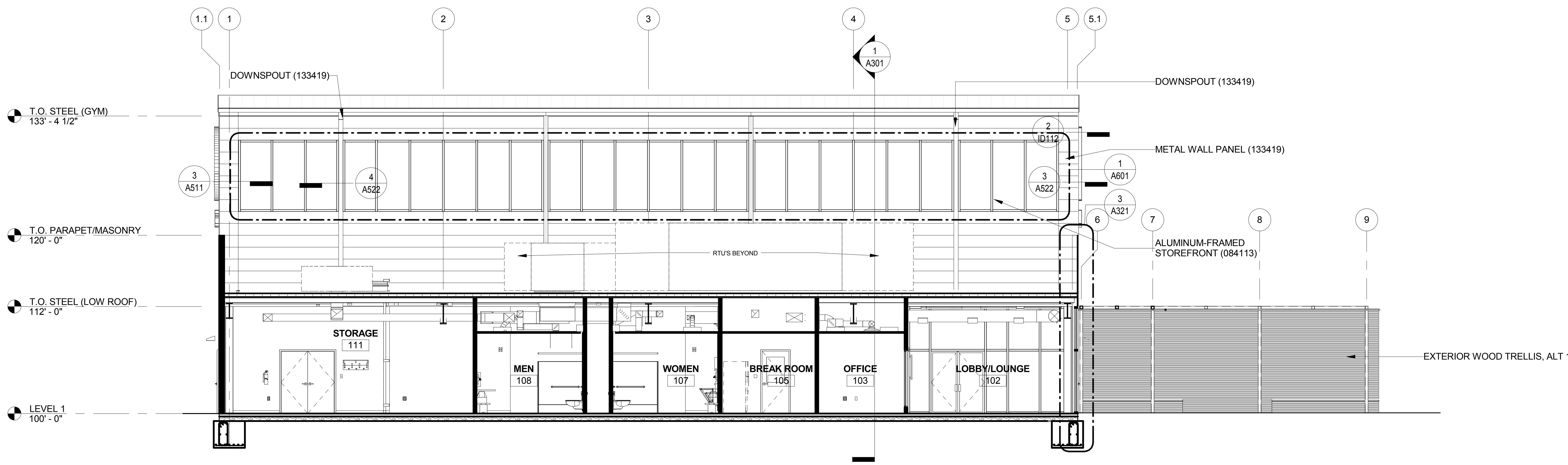
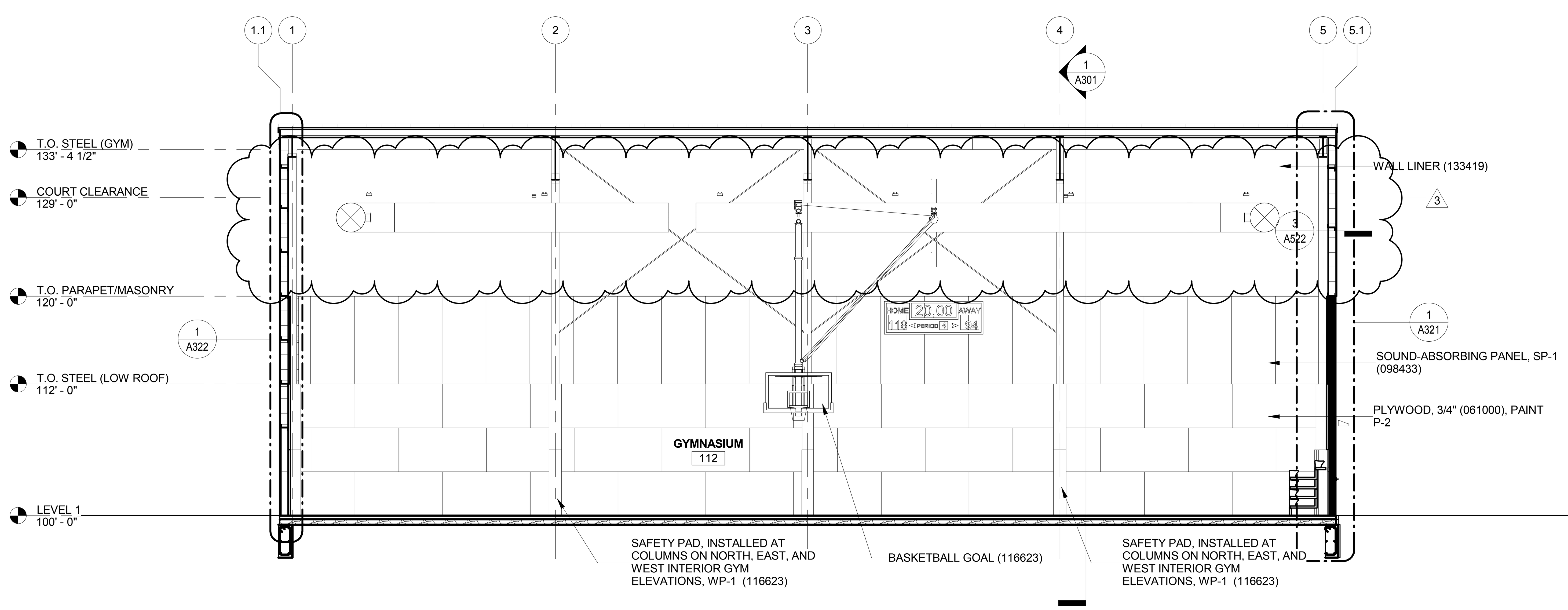
BUILDING SECTIONS

A301



2 BUILDING SECTION
A302 1/8" = 1'-0"



1 BUILDING SECTION
A302 1/8" = 1'-0"

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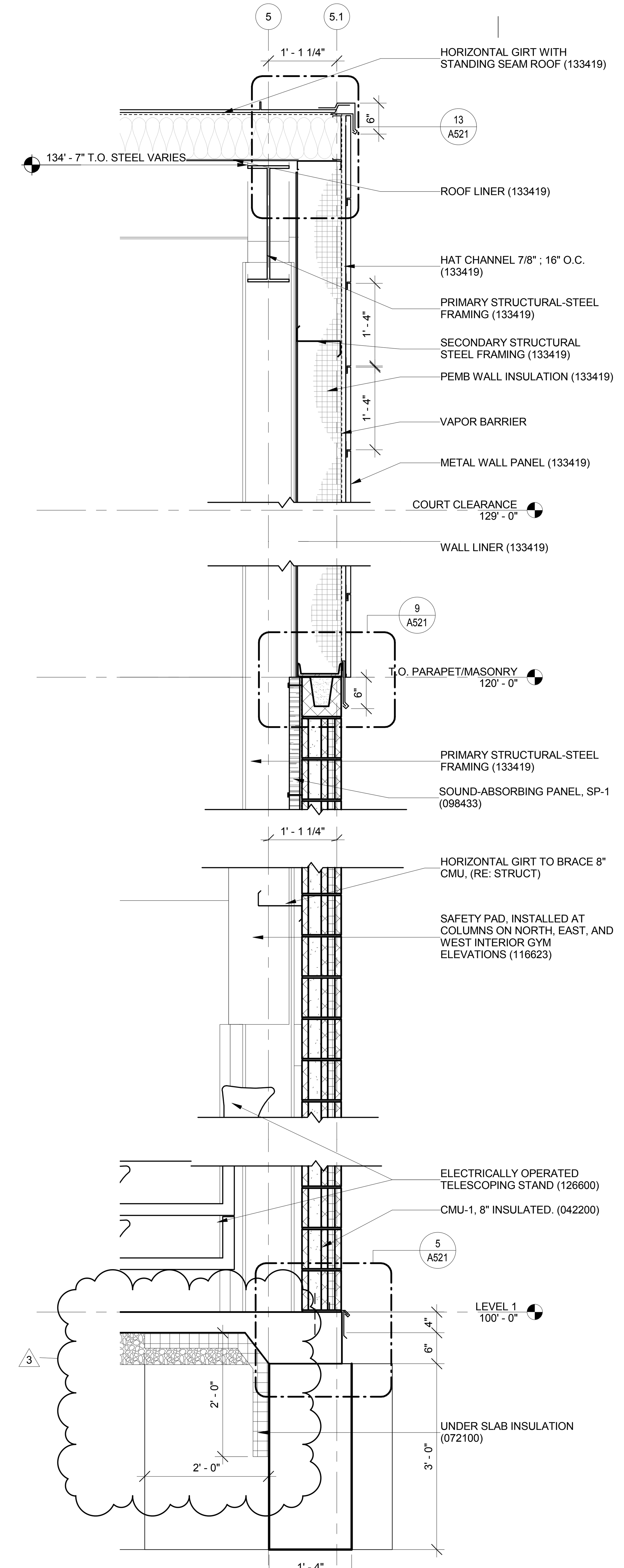
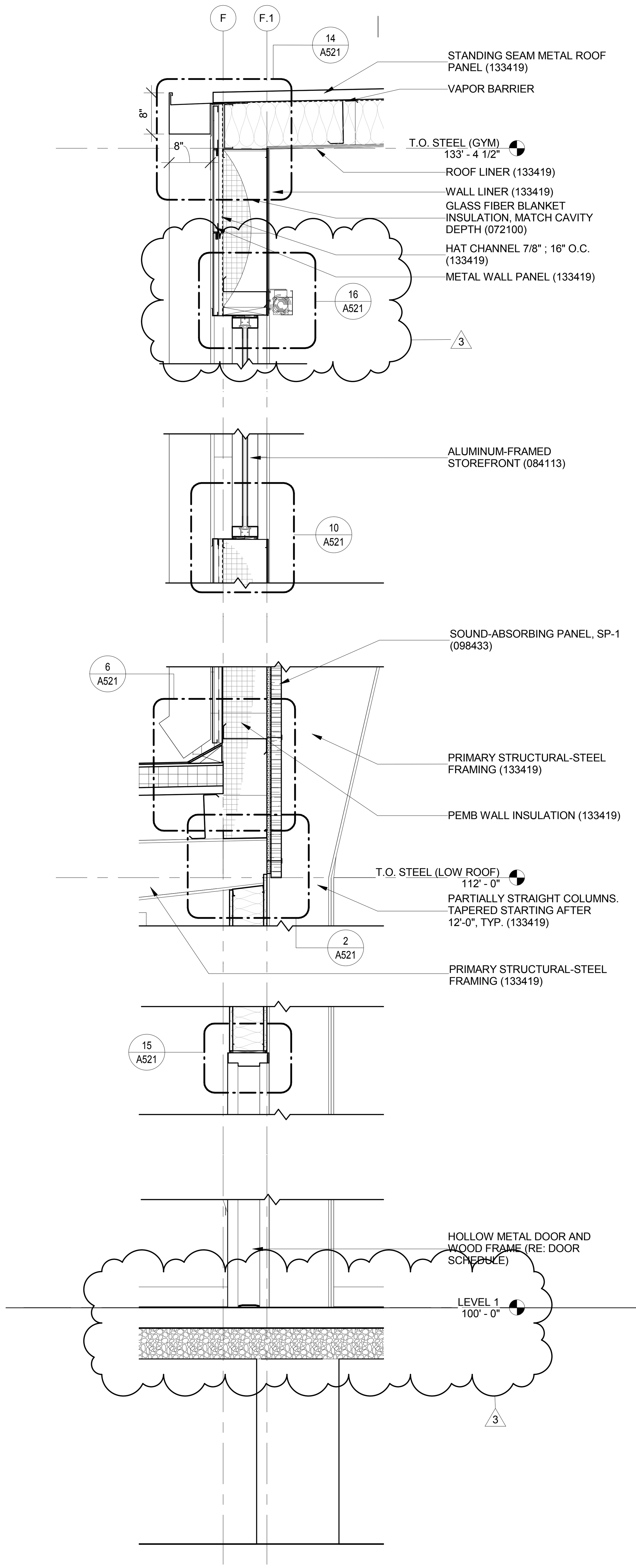
BUILDING SECTIONS

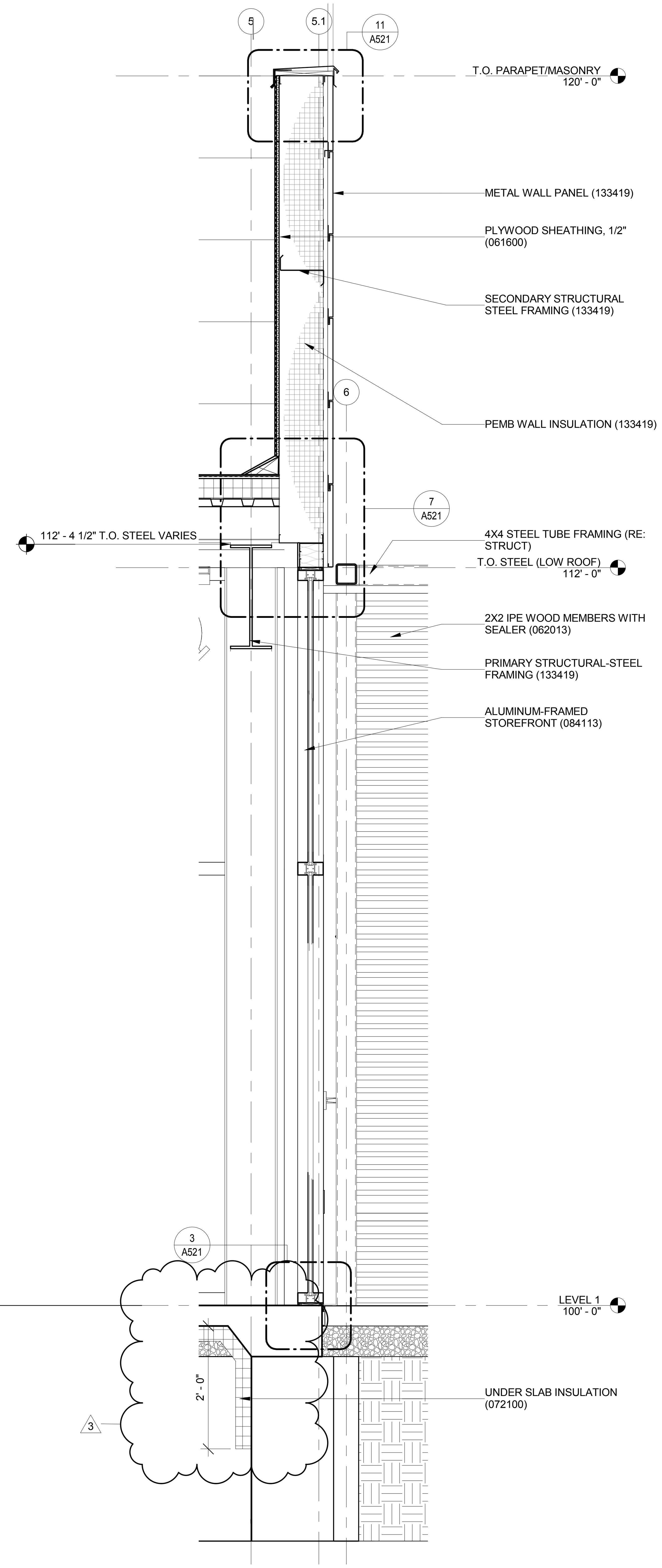
A302



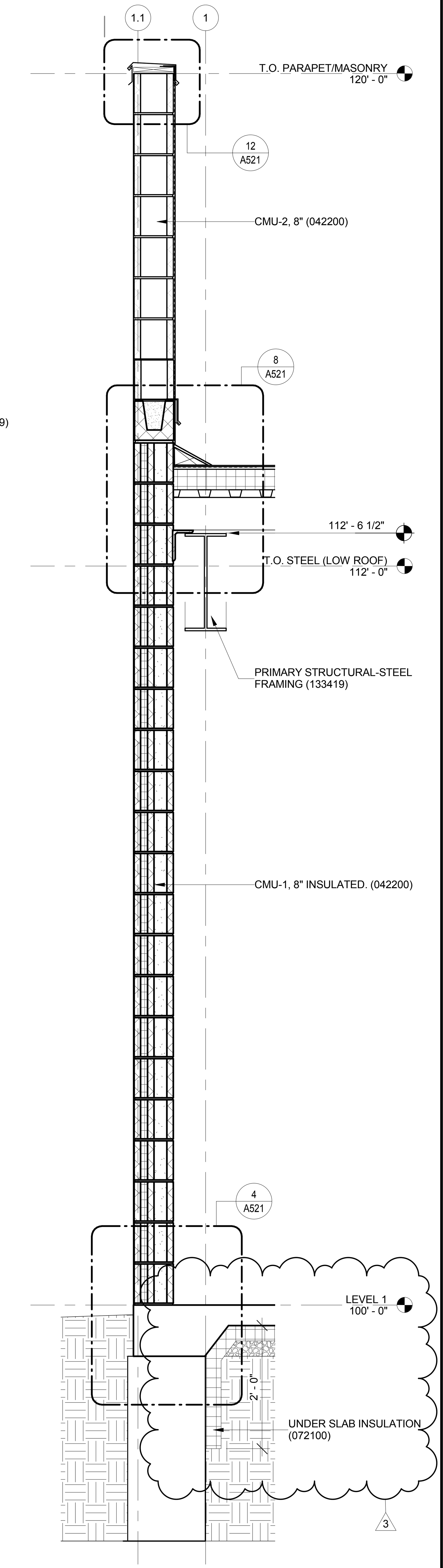
1 WALL SECTION - CMU GYMNASIUM WALL
A321 3/4" = 1'-0"



2 WALL SECTION - SOUTH GYMNASIUM WALL
A321 3/4" = 1'-0"



3 WALL SECTION - ENTRANCE
A321 3/4" = 1'-0"



4 WALL SECTION - STORAGE ROOM
A321 3/4" = 1'-0"

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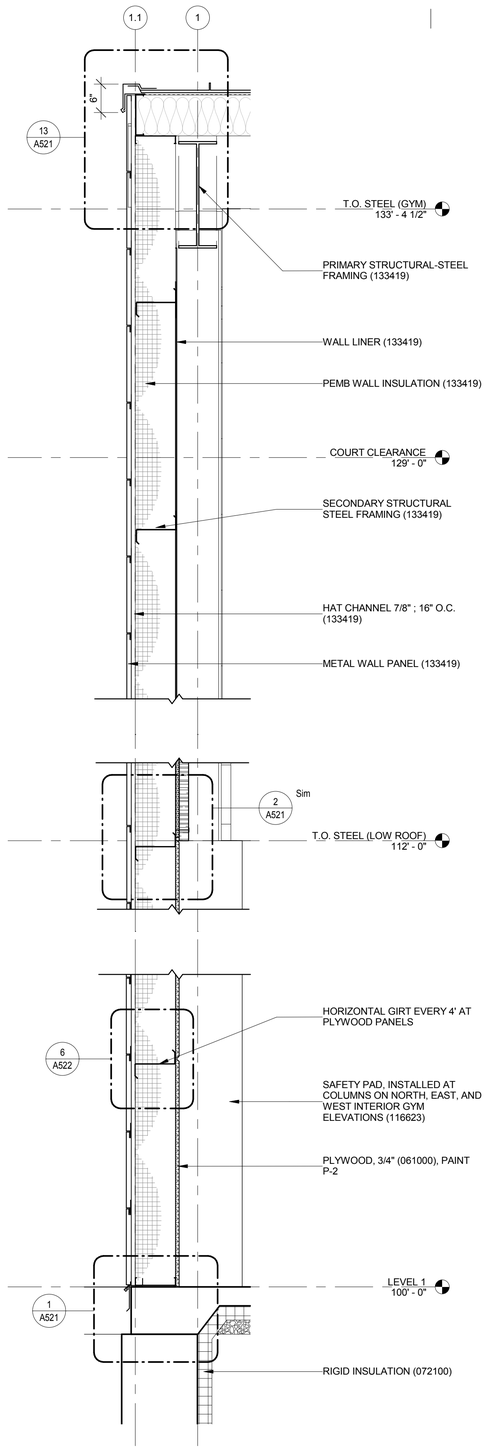
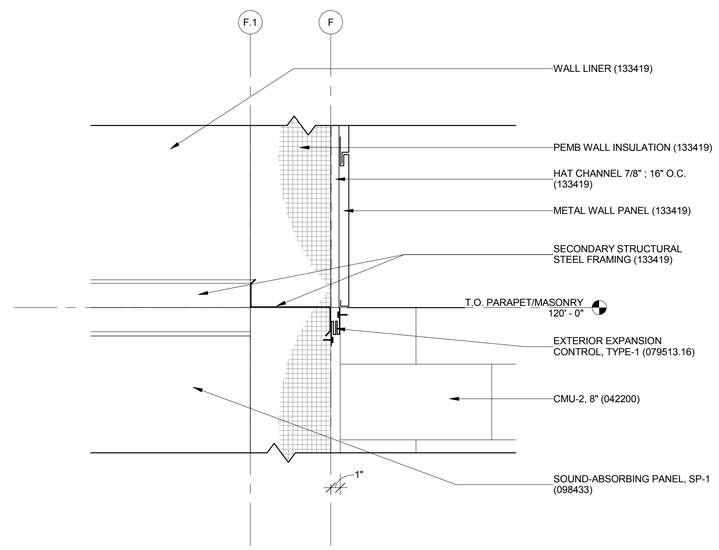
WALL SECTIONS

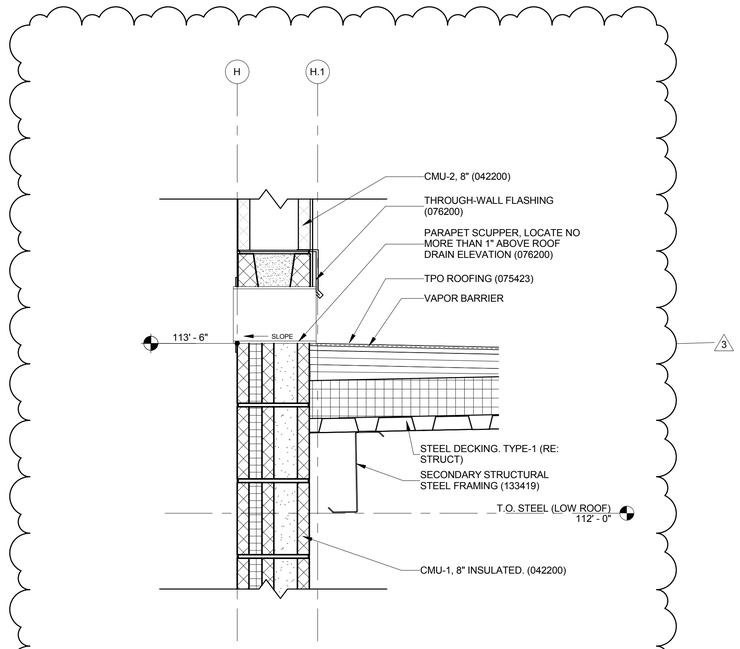
A321



1 A322 WALL SECTION - GYMNASIUM WALL (TYP)
3/4" = 1'-0"



2 A322 SECTION DETAIL - EXPANSION JOINT
1 1/2" = 1'-0"



3 A322 SECTION DETAIL - PARAPET SCUPPER
1 1/2" = 1'-0"

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STATE OF MISSOURI
KENT C. WILLIAMS
NUMBER A-005831
ARCHITECT
2/1/2017

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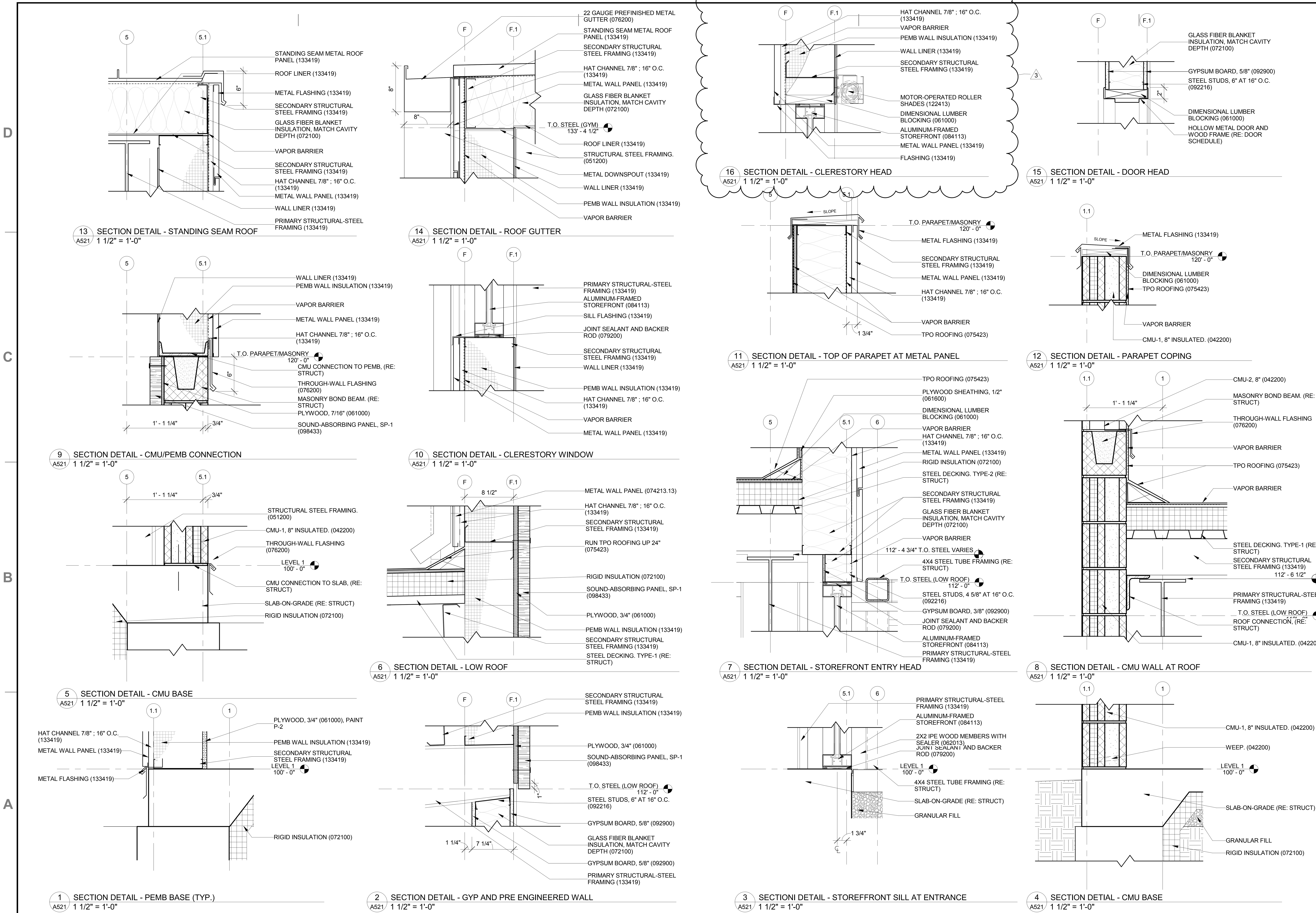
WALL SECTIONS

A322



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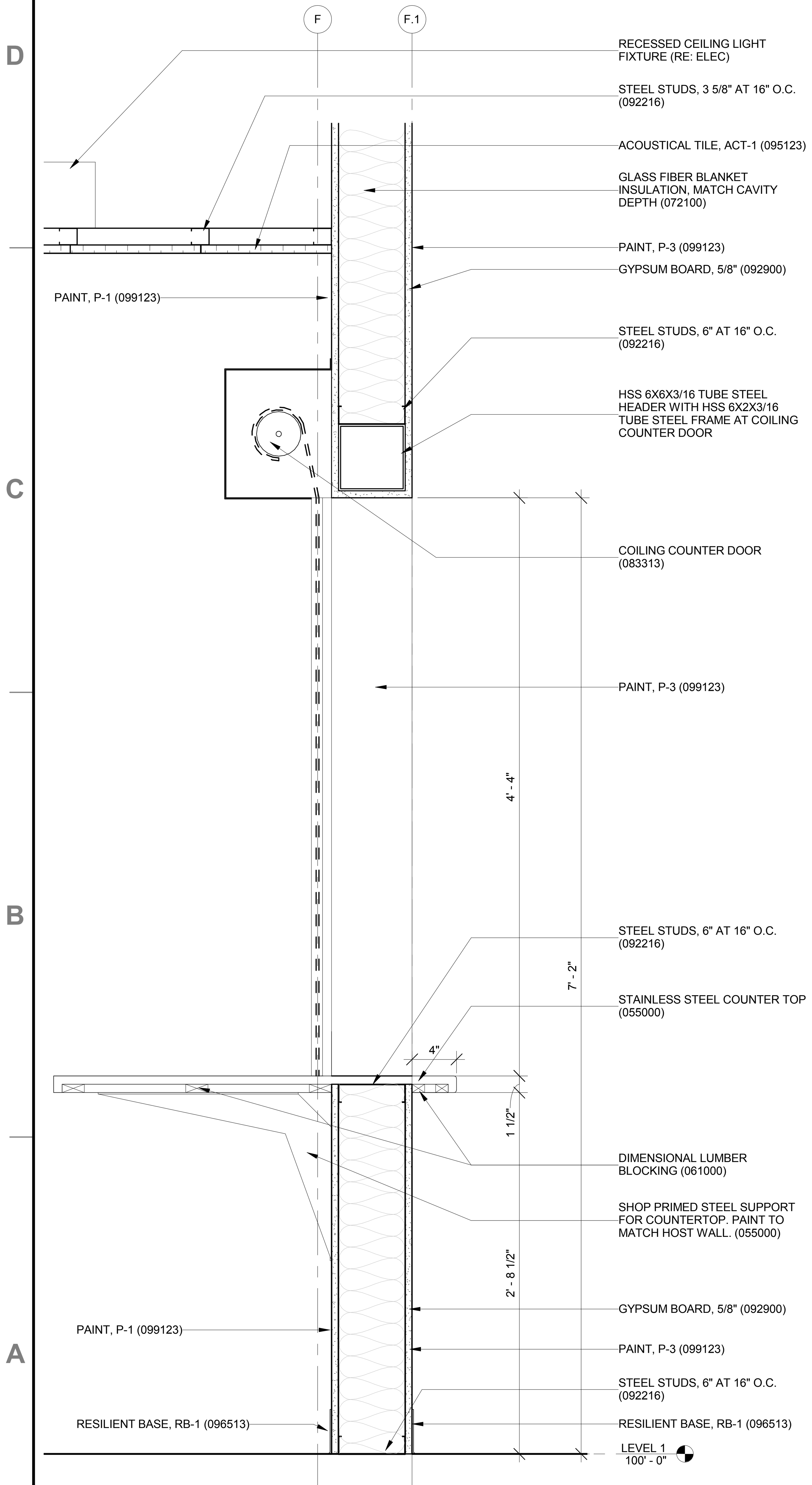
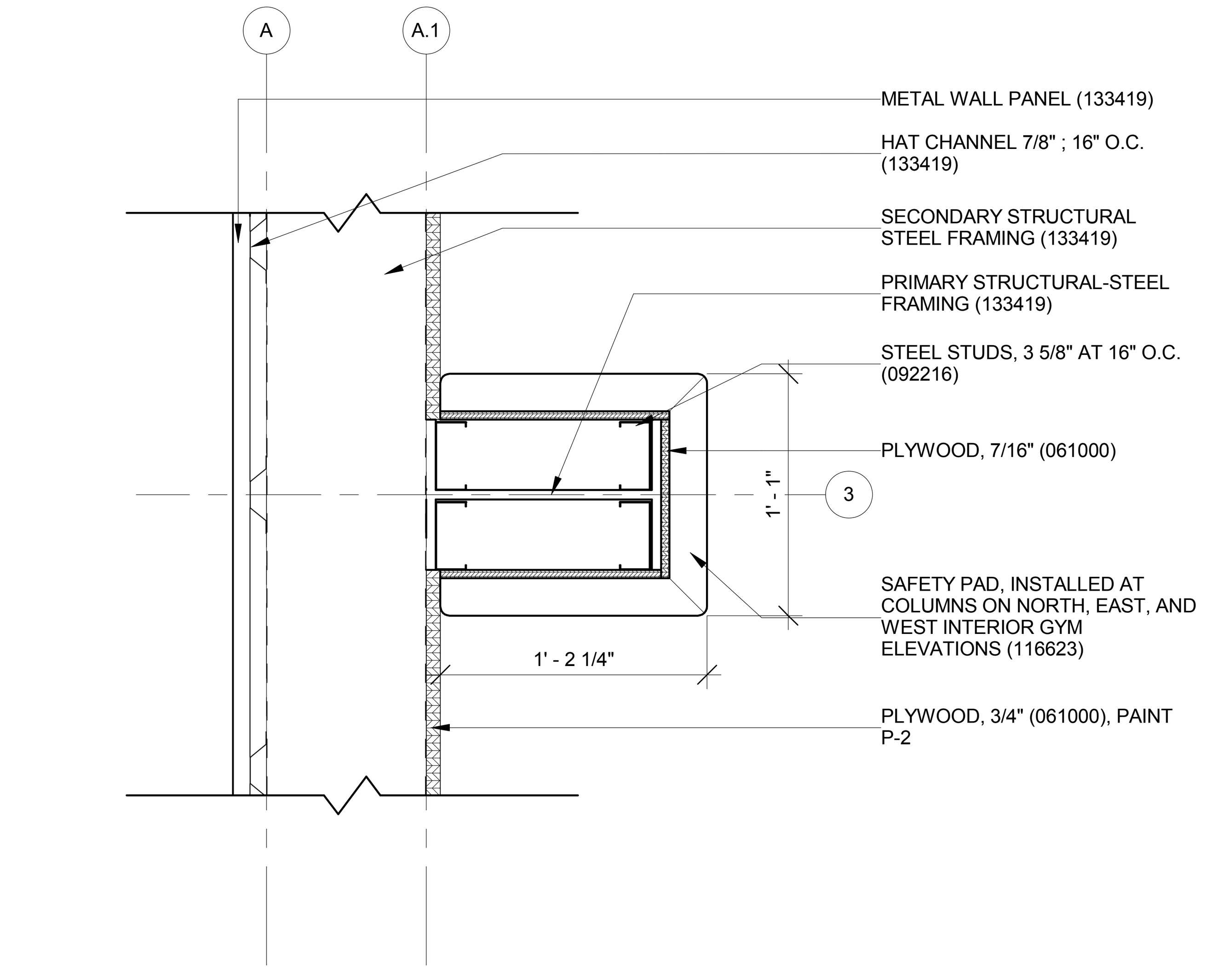
SECTION DETAILS

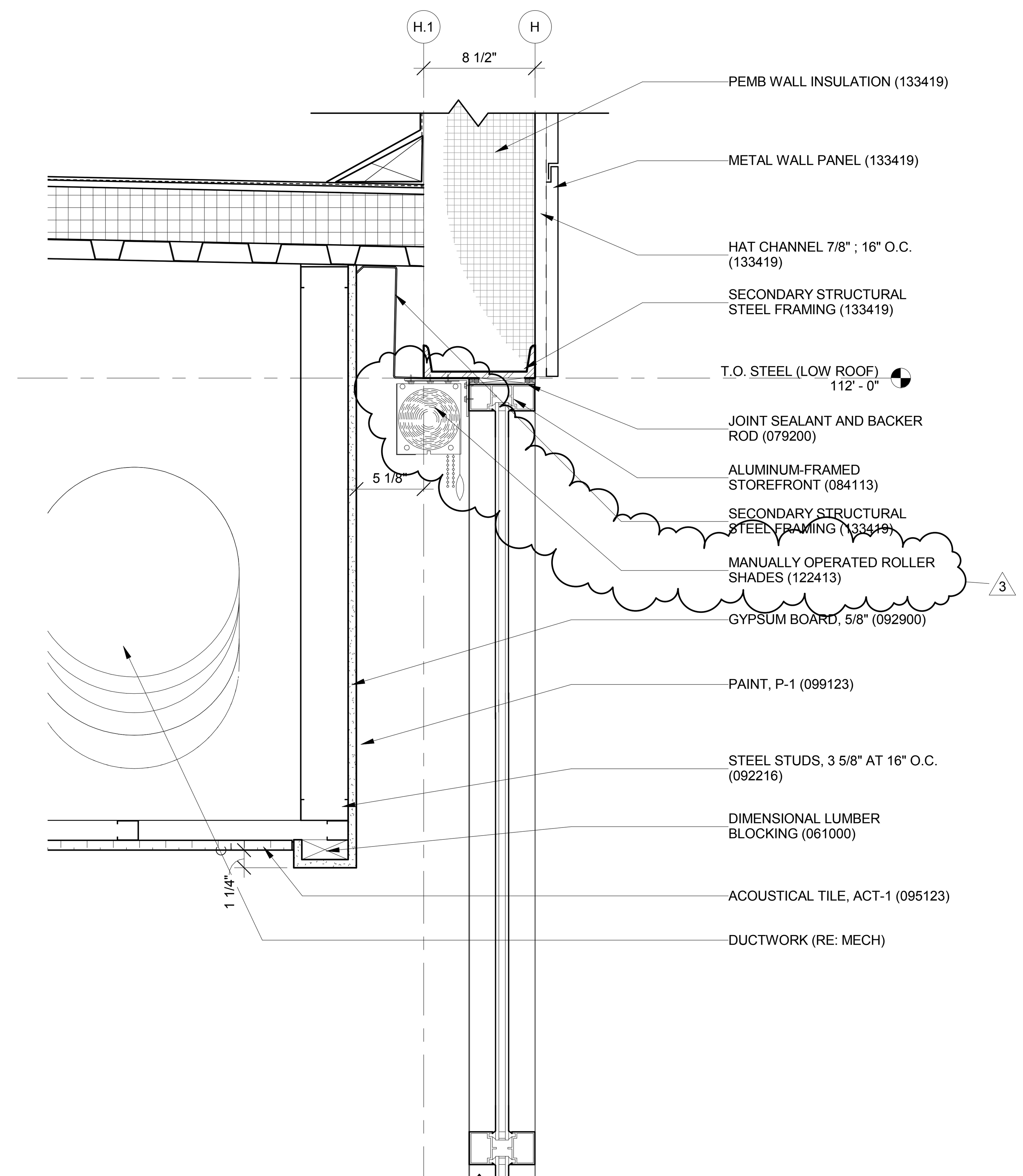
A521



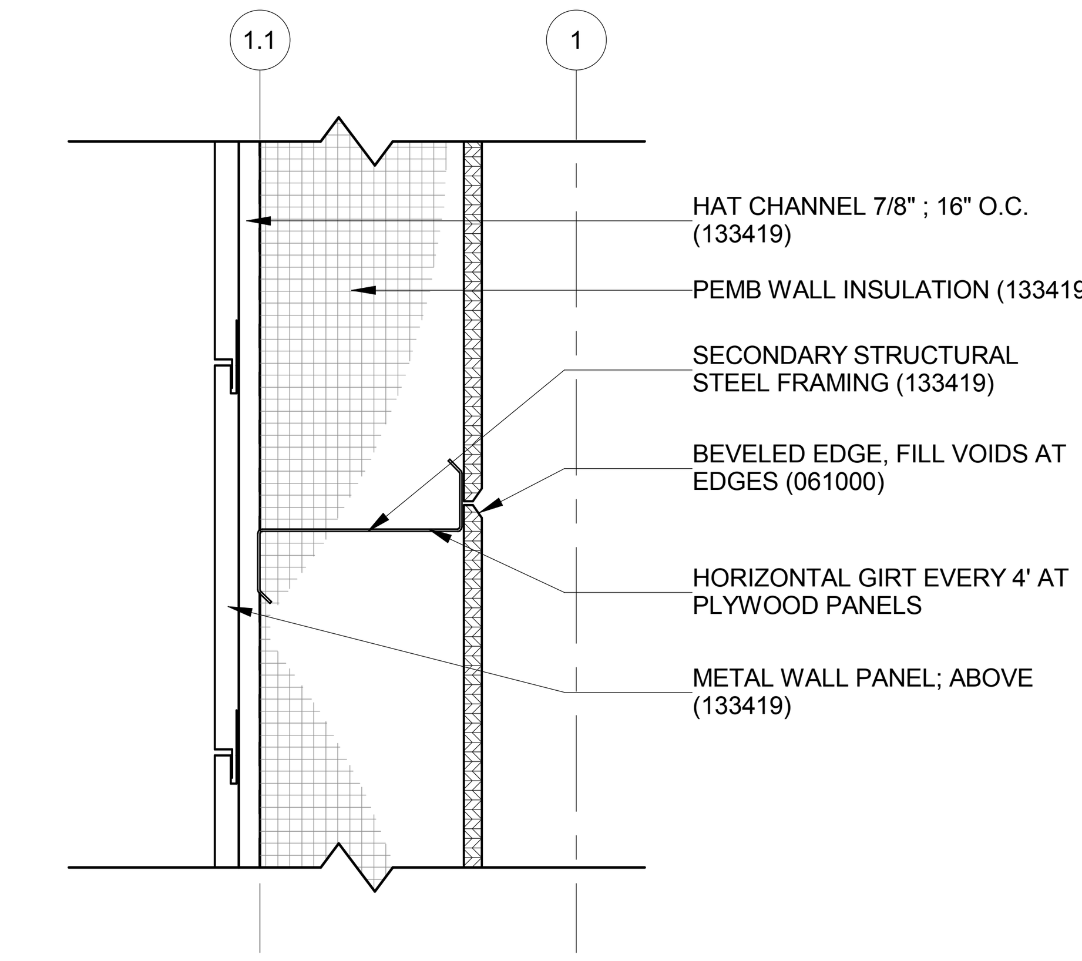
1 SECTION - COILING COUNTER DOOR
A522 1 1/2" = 1'-0"



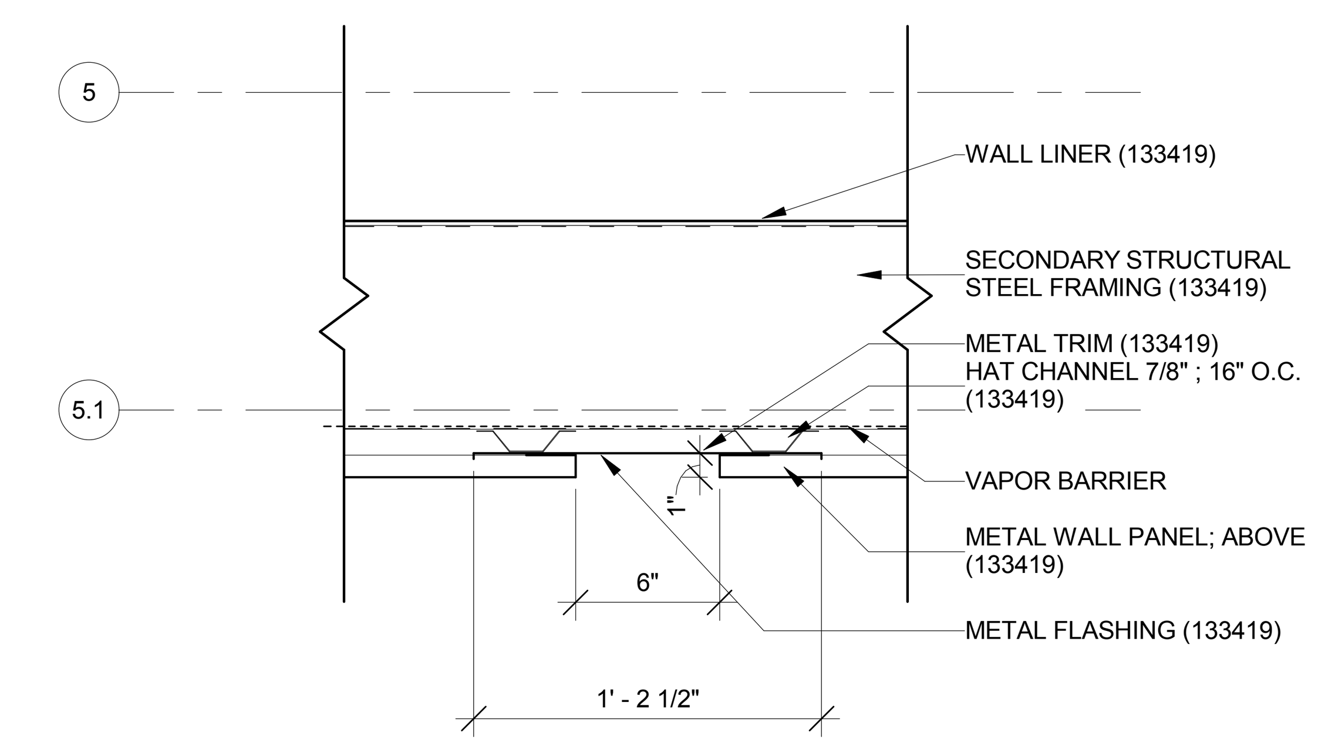
7 PLAN DETAIL - SAFETY PAD AT COLUMN, TYP.
A522 1 1/2" = 1'-0"



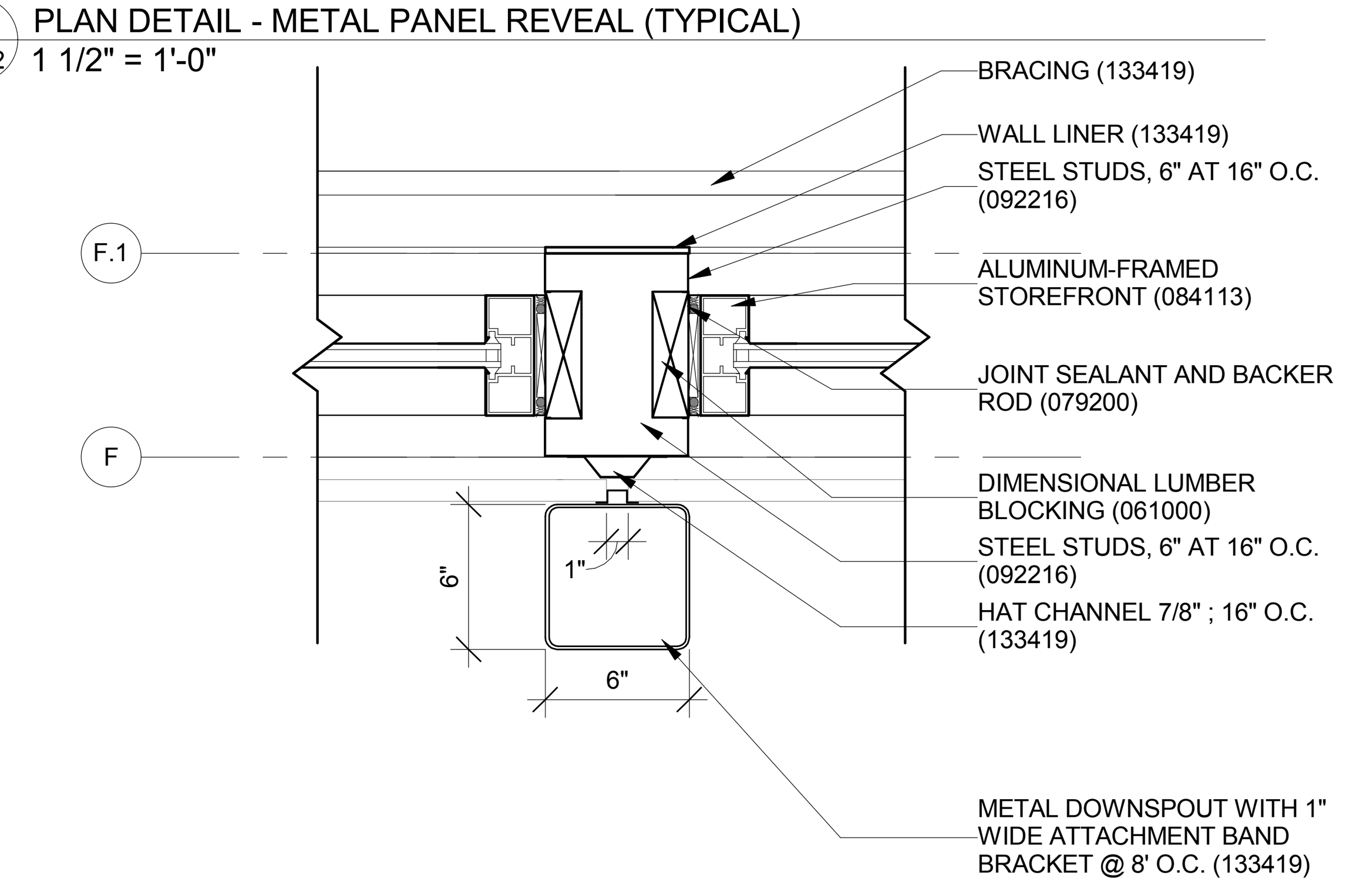
2 SECTION DETAIL - BREAK ROOM SOFFIT
A522 1 1/2" = 1'-0"



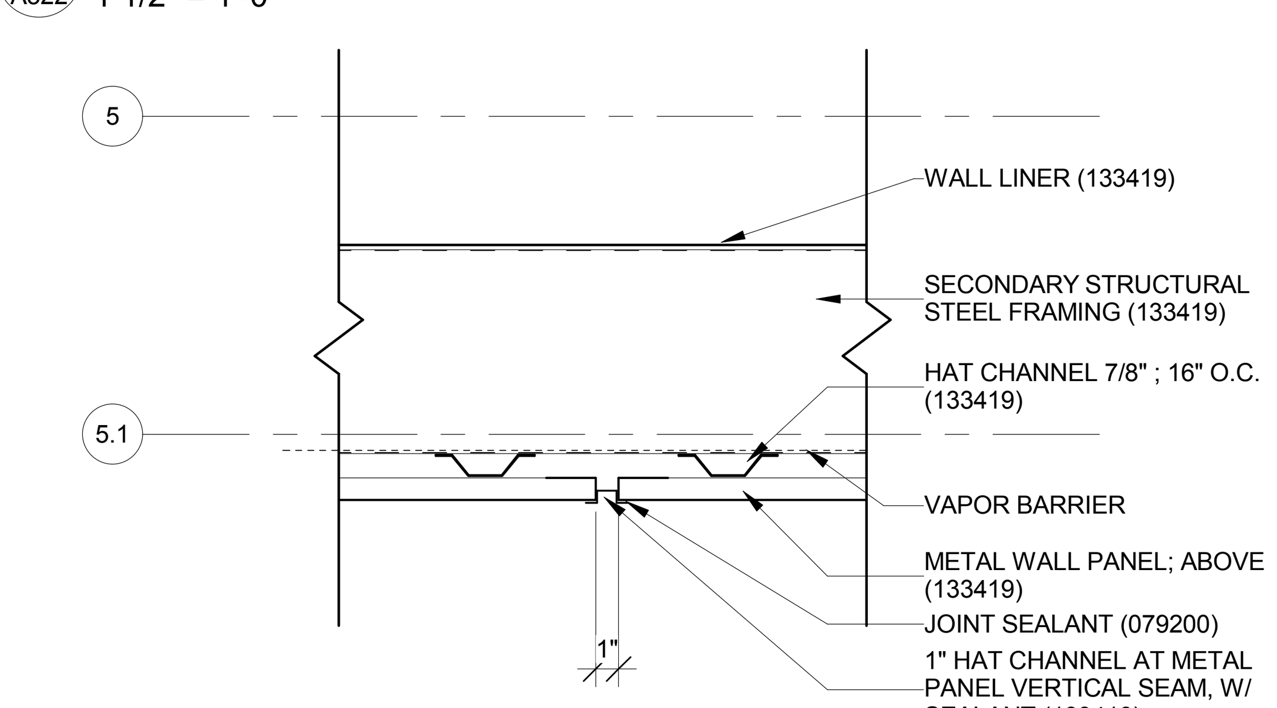
6 SECTION DETAIL - INTERIOR PLYWOOD PANELS
A522 1 1/2" = 1'-0"



5 PLAN DETAIL - METAL PANEL REVEAL (TYPICAL)
A522 1 1/2" = 1'-0"



4 PLAN DETAIL - DOWNSPOUT (TYP.)
A522 1 1/2" = 1'-0"



3 PLAN DETAIL - METAL PANEL VERTICAL SEAM (TYP.)
A522 1 1/2" = 1'-0"

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RAYMORE ACTIVITY CENTER

City of Raymore
1011 S. Madison Street
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3	2/1/17	Addendum No. 1

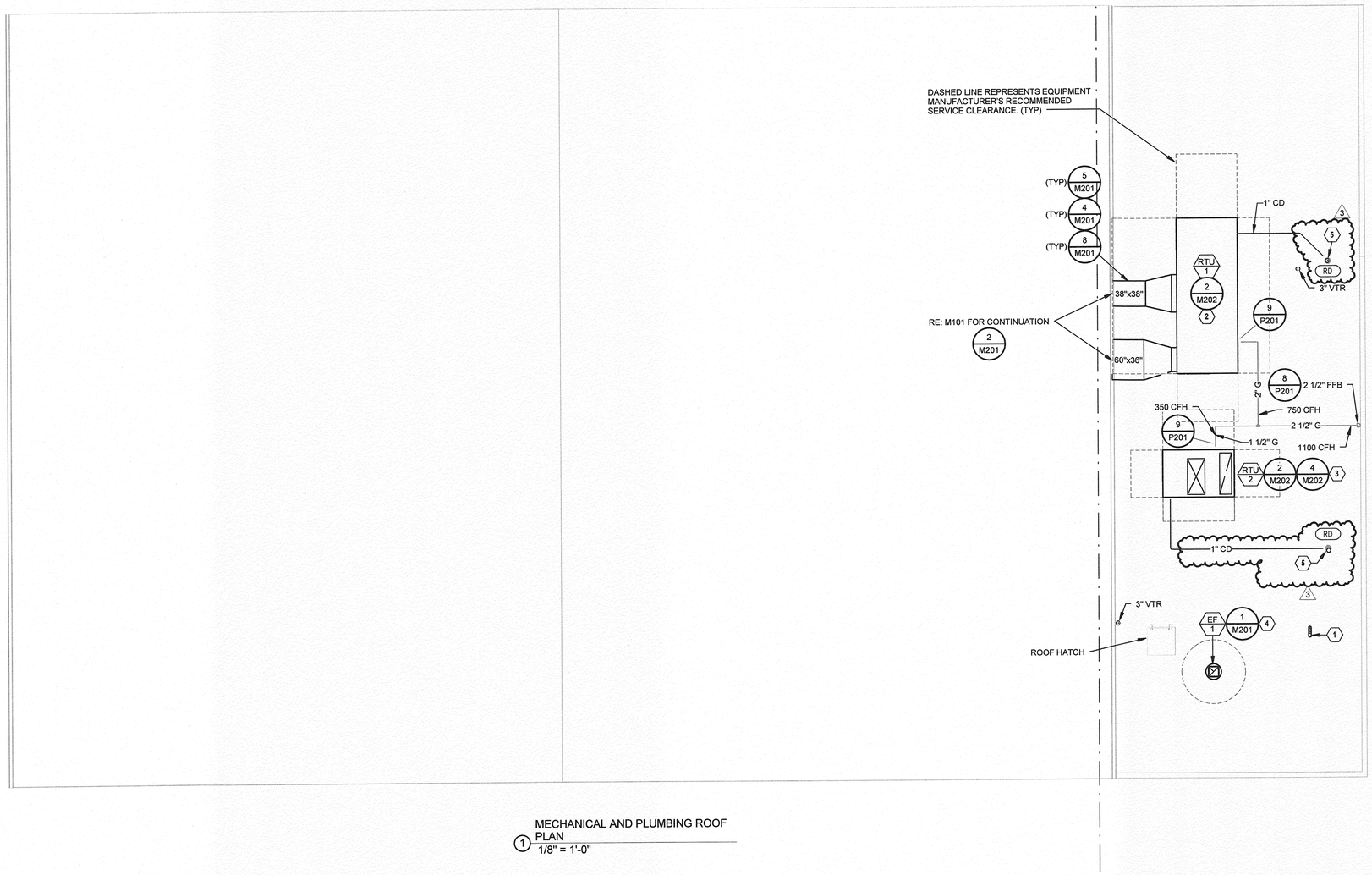
SFS PROJECT NO: 15930
ISSUED FOR: CONSTRUCTION DOCUMENTS
ISSUE DATE: 01.09.17

DETAILS

A522

MECHANICAL PLAN NOTES

1. 4" DIAMETER PVC WATER HEATER FLUE. TERMINATE PER WATER HEATER MANUFACTURER REQUIREMENTS. TERMINATION SHALL BE MINIMUM 28" ABOVE ROOF SURFACE. PAINT PVC ON ROOF WITH WHITE PAINT TO PROTECT FROM UV LIGHT.
2. BASIS OF DESIGN UNIT WEIGHS APPROXIMATELY 7500 LBS INCLUDING ROOF CURB. GENERAL CONTRACTOR SHALL COORDINATE STRUCTURAL DESIGN WITH ACTUAL ROOF EQUIPMENT BEING PURCHASED.
3. BASIS OF DESIGN UNIT WEIGHS APPROXIMATELY 2300 LBS INCLUDING ROOF CURB. GENERAL CONTRACTOR SHALL COORDINATE STRUCTURAL DESIGN WITH ACTUAL ROOF EQUIPMENT BEING PURCHASED.
4. BASIS OF DESIGN UNIT WEIGHS APPROXIMATELY 300 LBS INCLUDING ROOF CURB. GENERAL CONTRACTOR SHALL COORDINATE STRUCTURAL DESIGN WITH ACTUAL ROOF EQUIPMENT BEING PURCHASED.
5. DISCHARGE CONDENSATE AT ROOF DRAIN WITH INDIRECT CONNECTION.



1 MECHANICAL AND PLUMBING ROOF PLAN
1/8" = 1'-0"

sfs architecture
2100 Central St. Suite 31 Kansas City, MO 64108
ph 816.421.9024 www.sfsarch.com

HENDERSON ENGINEERS INC
1801 MAIN, SUITE 300
KANSAS CITY, MO 64108
TEL 816.663.8700 FAX 816.663.8701
www.hei-eng.com
1550002990
MO. CORPORATE NUMBER: E-5580
EXPIRES 12/31/2018

JAMES J. DIETZ
LICENSE # PE-2007020258

STATE OF MISSOURI
JAMES J. DIETZ
NUMBER PE-2007020258
PROFESSIONAL ENGINEER

RAYMORE ACTIVITY CENTER

City of Raymore
1101 S. Madison Street
Raymore, MO 64083

MARK	DATE	DESCRIPTION
1	01.06.17	PLAN REVIEW COMMENTS
3	02.01.17	ADDENDUM 1

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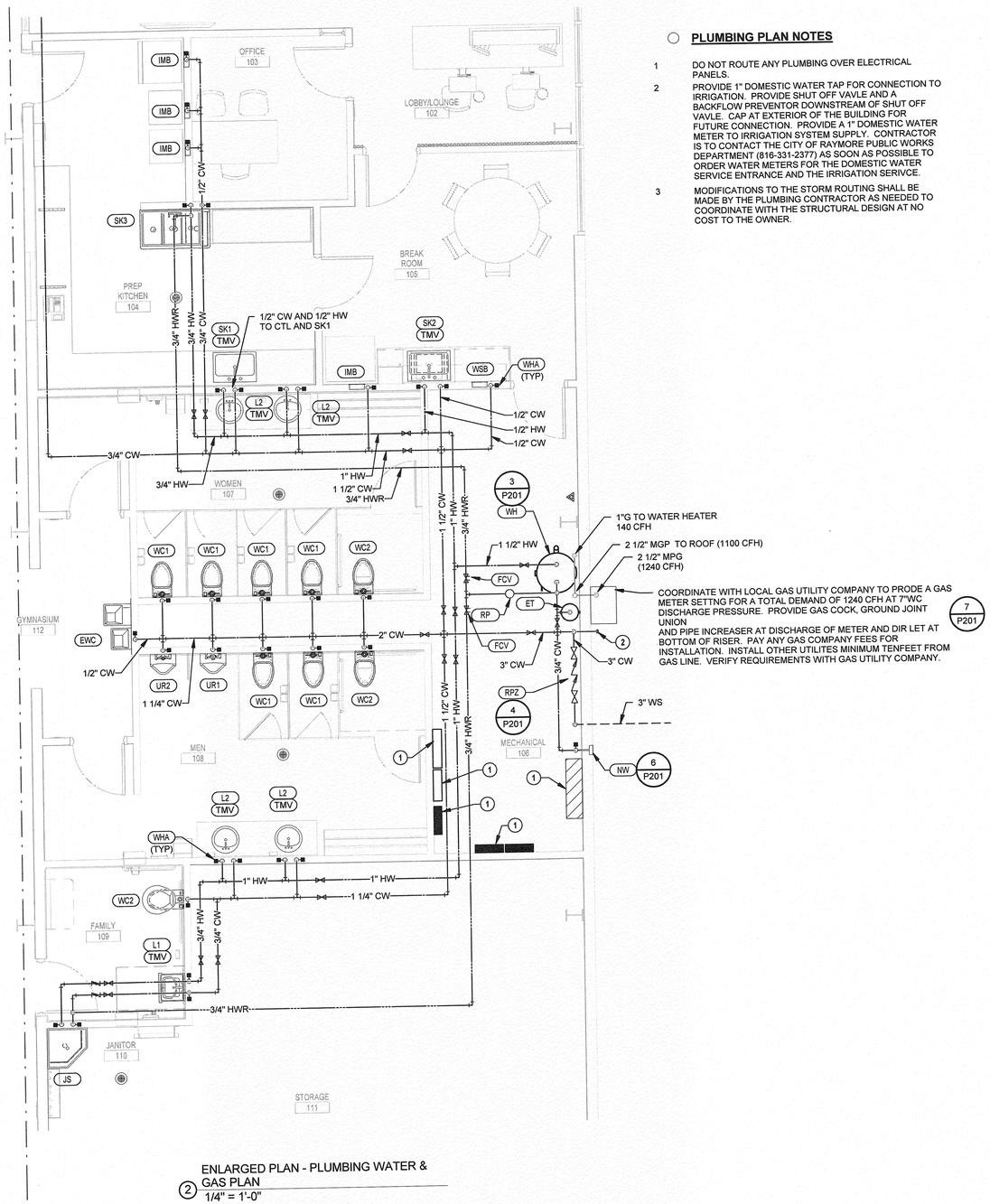
MECHANICAL AND PLUMBING ROOF PLAN

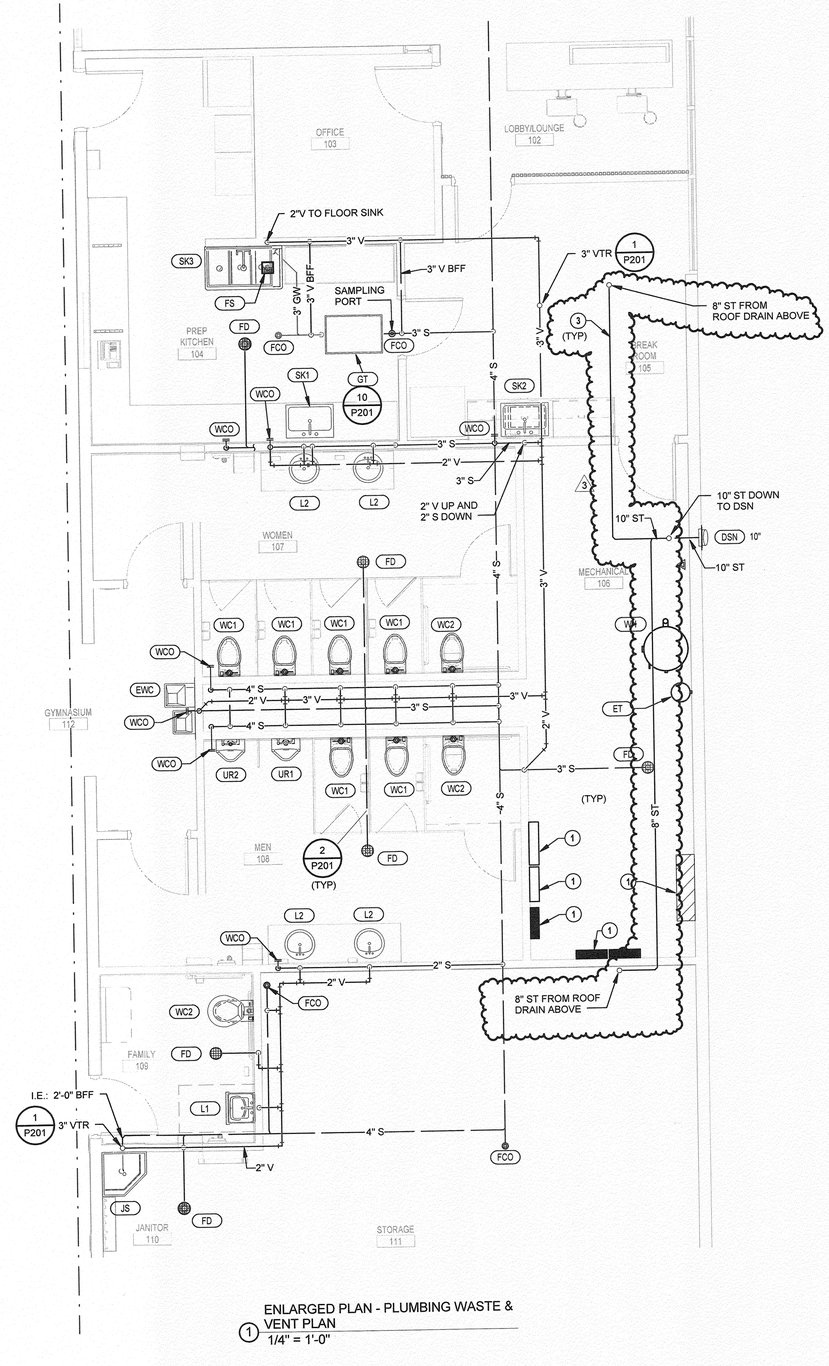
MP101

PLUMBING PLAN NOTES

1. DO NOT ROUTE ANY PLUMBING OVER ELECTRICAL PANELS.
2. PROVIDE 1" DOMESTIC WATER TAP FOR CONNECTION TO IRRIGATION. PROVIDE SHUT OFF VAVLE AND A BACKFLOW PREVENTOR DOWNSTREAM OF SHUT OFF VAVLE. CAP AT EXTERIOR OF THE BUILDING FOR FUTURE CONNECTION. PROVIDE A 1" DOMESTIC WATER METER TO IRRIGATION SYSTEM SUPPLY. CONTRACTOR IS TO CONTACT THE CITY OF RAYMORE PUBLIC WORKS DEPARTMENT (816-331-2377) AS SOON AS POSSIBLE TO ORDER WATER METERS FOR THE DOMESTIC WATER SERVICE ENTRANCE AND THE IRRIGATION SERIVCE.
3. MODIFICATIONS TO THE STORM ROUTING SHALL BE MADE BY THE PLUMBING CONTRACTOR AS NEEDED TO COORDINATE WITH THE STRUCTURAL DESIGN AT NO COST TO THE OWNER.



ENLARGED PLAN - PLUMBING WATER & GAS PLAN
2 1/4" = 1'-0"



ENLARGED PLAN - PLUMBING WASTE & VENT PLAN
1 1/4" = 1'-0"

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2100 Central St. Suite 31 Kansas City, MO 64108
p) 816.474.1997 f) 816.421.8024 www.sfsarch.com

HENDERSON ENGINEERS
1601 MAIN, SUITE 300
KANSAS CITY, MO 64108
TEL 816.663.8700 FAX 816.663.8701
www.hei-eng.com
1550002990
MO. CORPORATE NUMBER: E-5550
EXPIRES 12/31/2018

JAMES J. DIETZ
LICENSE # PE-2007020258

STATE OF MISSOURI
JAMES J. DIETZ
NUMBER PE-2007020258
PROFESSIONAL ENGINEER
1-30-17

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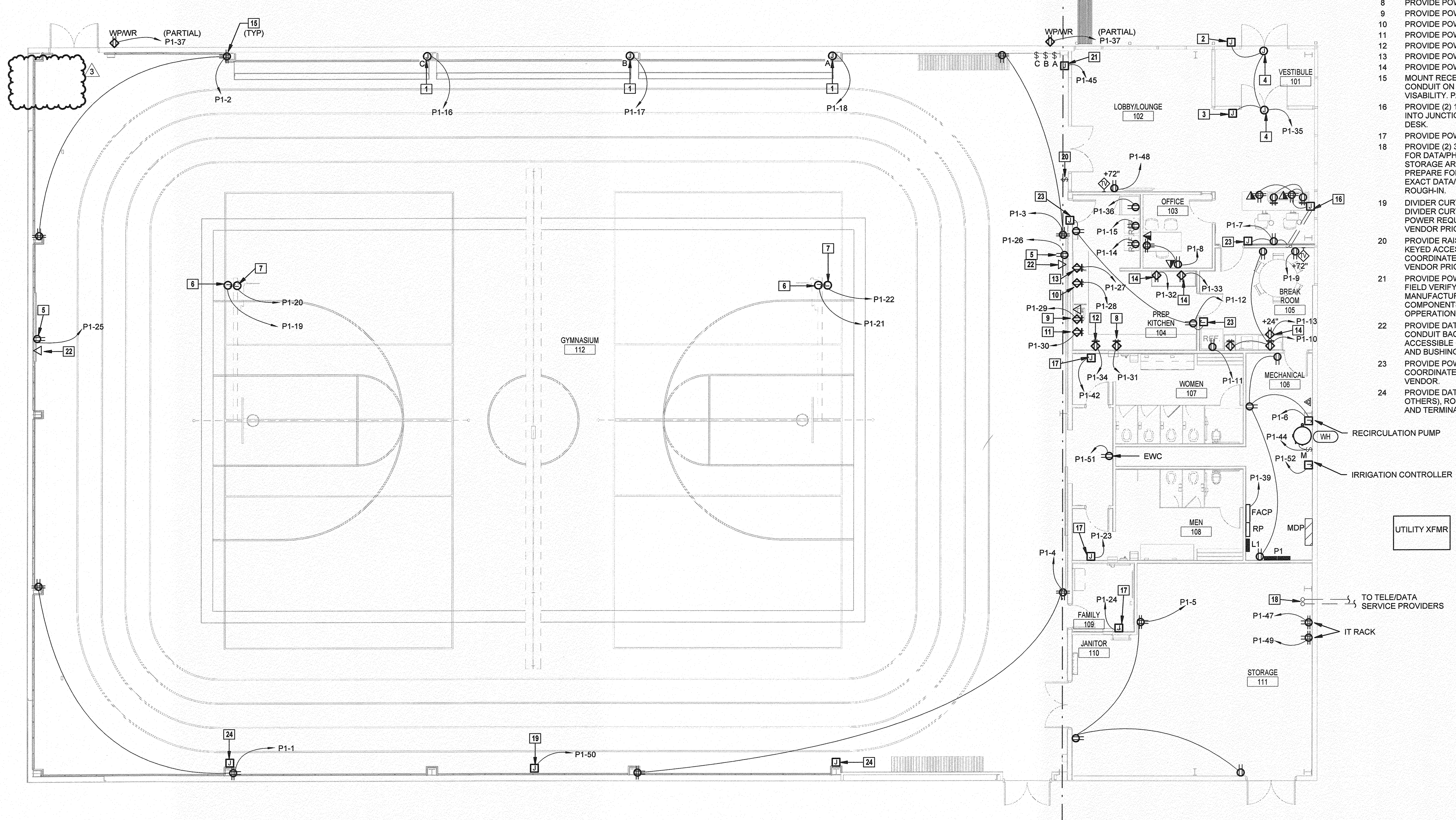
PLUMBING ENLARGED PLANS

P121



1 POWER PLAN
1/8" = 1'-0"

ELECTRICAL PLAN NOTES

1. RETRACTABLE BLEACHERS. PROVIDE POWER CONNECTION AND DISCONNECT PER EQUIPMENT MANUFACTURER RECOMMENDATIONS. GROUP UP/DOWN PUSH BUTTON SWITCH IN ACCESSIBLE LOCATION WITH OTHER BLEACHER CONTROLS.
2. PROVIDE ROUGH-IN FOR CARD READER AND ADA PUSH BUTTON ACCESS ON PEDESTAL (BY ARCHITECT). PROVIDE UNDERGROUND CONDUIT TO INTERIOR DEVICES AND TO ACCESSIBLE SPACE. COORDINATE WITH DOOR ACCESS HARDWARE PROVIDER.
3. PROVIDE ROUGH-IN FOR ADA PUSH BUTTON ACCESS AND CONDUIT PATH TO ABOVE ACCESSIBLE CIELING. COORDINATE WITH DOOR ACCESS HARDWARE PROVIDER.
4. DOOR ACCESS CONTROLS. MOUNT POWER SUPPLY IN ACCESSIBLE AREA AND COORDINATE WITH DOOR ACCESS HARDWARE INSTALLER.
5. SCOREBOARD. COORDINATE FINAL LOCATION AND HEIGHT WITH SCOREBOARD INSTALLER AND OWNER.
6. MOTORIZED BASKETBALL GOAL. COORDINATE FINAL MOTOR LOCATION, POWER CONNECTION, AND CONTROL REQUIREMENTS WITH EQUIPMENT MANUFACTURER.
7. GOAL HEIGHT ADJUSTER. COORDINATE FINAL MOTOR LOCATION, POWER CONNECTION, AND CONTROL REQUIREMENTS WITH EQUIPMENT MANUFACTURER.
8. PROVIDE POWER FOR POPCORN MACHINE.
9. PROVIDE POWER FOR POS EQUIPMENT.
10. PROVIDE POWER FOR NACHO CHEESE WARMER.
11. PROVIDE POWER FOR FOOD WARMING TRAY
12. PROVIDE POWER FOR TOASTER OVEN.
13. PROVIDE POWER FOR HOT DOG WARMER/ROLLER TRAY.
14. PROVIDE POWER FOR MICROWAVE.
15. MOUNT RECEPTACLE TO STRUCTURAL STEEL. RUN CONDUIT ON INSIDE FLANGE OF STEELE TO MINIMIZE VISABILITY. PAINT TO MATCH STEEL.
16. PROVIDE (2) 1" CONDUITS FOR POWER AND DATA. STUB UP INTO JUNCTION BOX FOR CONNECTION TO RECEPTION DESK.
17. PROVIDE POWER FOR HAND DRYER.
18. PROVIDE (2) 3" CONDUIT AND PULL STRING AS REQUIRED FOR DATA/PHONE WIRING TO D-MARK LOCATION IN STORAGE AREA. ROUTE CONDUIT INTO SPACE, CAP, AND PREPARE FOR FUTURE SERVICE PROVIDER. FIELD VERIFY EXACT DATA/PHONE SERVICE ENTRANCE PRIOR TO ROUGH-IN.
19. DIVIDER CURTAIN. PROVIDE POWER CONNECTION TO DIVIDER CURTAIN WENCH MOTOR. COORDINATE EXACT POWER REQUIREMENTS AND LOCATION WITH EQUIPMENT VENDOR PRIOR TO INSTALLATION.
20. PROVIDE RAISE/LOWER MOTOR RATED PUSH BUTTON WITH KEYED ACCESS FOR CONTROL OF DIVIDER CURTAIN. COORDINATE EXACT REQUIREMENTS WITH EQUIPMENT VENDOR PRIOR TO INSTALLATION.
21. PROVIDE POWER FOR MOTORIZED SHADES AT WINDOWS. FIELD VERIFY POWER REQUIREMENTS WITH EQUIPMENT MANUFACTURER AND PROVIDE ALL NECESSARY COMPONENTS AND ACCESSORIES FOR PROPER OPPERATION.
22. PROVIDE DATA BACK BOX FOR SCOREBOARD. ROUTE 1/2" CONDUIT BACK TO PREP KITCHEN, TERMINATE ABOVE ACCESSIBLE CEILING, AND PROVIDE WITH PULL STRING AND BUSHING.
23. PROVIDE POWER CONNECTION FOR CARD READER. COORDINATE EXACT REQUIREMENTS WITH EQUIPMENT VENDOR.
24. PROVIDE DATA BACK BOX FOR WIFI ROUTER (PROVIDED BY OTHERS), ROUTE 1/2" CONDUIT BACK TO STORAGE ROOM AND TERMINATE ABOVE IT RACK LOCATION.

sfs architecture
2100 Central St. Suite 31 Kansas City, MO 64108

HENDERSON ENGINEERS INC
1801 MAIN, SUITE 300
KANSAS CITY, MO 64108
TEL 816 663 8700 FAX 816 663 8701
www.hei-eng.com
1550002990
MO. CORPORATE NUMBER: E-556D
EXPIRES 12/31/2018

JULIETTE A. PIERCE
LICENSE # PE-2009003622

STATE OF MISSOURI
JULIETTE A. PIERCE
NUMBER PE-2009003622
PROFESSIONAL ENGINEER
1-30-2017

RAYMORE ACTIVITY CENTER

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POWER PLAN

E101

PANELBOARD: P1

BUS AMPS: 200A
MAIN SIZE/TYPE: MLO
VOLTS/PHASE: 208Y/120 V 3P/4W
SUPPLIED BY: MDP

AUDITORIUM
BUILDING SQUARE FOOTAGE: 16128

FAULT CURRENT: REFER TO ONE-LINE DIAGRAM
AIC RATED: FULLY RATED
AIC RATING: FCA +10% MINIMUM
SERVES: GYM
MOUNTING: SURFACE
LOCATION: MECHANICAL 106

EQUIPMENT GROUND BUS

CKT NO.	DESCRIPTION	LOAD TYPE	NOTES	WIRE SIZE	GND SIZE	BKR AMP	P	PHASE A	PHASE B	PHASE C	P	BKR AMP	GND SIZE	WIRE SIZE	NOTES	LOAD TYPE	DESCRIPTION	CKT NO.
1	RCPT- GYM 1	R		12	12	20	1	360	360		1	20	12	12		R	RCPT- GYM NW	2
3	RCPT- GYM 2	R		12	12	20	1	360	360		1	20	12	12		R	RCPT- GYM SE	4
5	RCPT- WEST LOBBY	R		12	12	20	1	720	1040		1	20	12	12		R Z	RCPT- ELECTRICAL ROOM	6
7	RCPT- EAST LOBBY DESK	R		12	12	20	1	1260	540		1	20	12	12		R	RCPT- OFFICE	8
9	PWR- BREAKROOM TV	R		12	12	20	1	180	540		1	20	12	12		R	RCPT- BREAKROOM	10
11	PWR- BREAKROOM REF	R	GF	12	12	20	1	180	600		1	20	12	12		R Z	RCPT- CONCESSION GENERAL	12
13	PWR- BREAKROOM MICROWAVE	R		12	12	20	1	180	180		1	20	12	12	GF	R	PWR- CONCESSION REF 2	14
15	PWR- CONCESSION REF 1	R	GF	12	12	20	1	180	500		1	30	10	10		Z	PWR- BLEACHERS 1	16
17	PWR- BLEACHERS 2	Z		10	10	30	1	500	500		1	30	10	10		Z	PWR- BLEACHERS 3	18
19	PWR- SOUTH GOAL RAISER	Z		10	10	30	1	500	168		1	30	10	10		Z	PWR- NORTH GOAL ADJUSTER	20
21	PWR- SOUTH GOAL	Z		10	10	30	1	500	168		1	30	10	10		Z	PWR- SOUTH GOAL ADJUSTER	22
23	PWR- HAND DRY MEN	Z		12	12	20	1	1500	1500		1	20	12	12		Z	PWR-HAND DRY FAMILY RR	24
25	PWR- SCOREBOARD NORTH	R		12	12	20	1	180	77		1	20	12	12		R	PWR- SCOREBOARD SOUTH	26
27	PWR- HOT DOG ROLLER	R		12	12	20	1	180	180		1	20	12	12		R	PWR- NACHO CHEESE WARMER	28
29	PWR- POS STATION	R		12	12	20	1	180	180		1	20	12	12		R	PWR- WARMING TRAY	30
31	PWR- POPCORN MACHINE	R		12	12	20	1	180	180		1	20	12	12		R	PWR- MICROWAVE 1	32
33	PWR- MICROWAVE 2	R		12	12	20	1	180	180		1	20	12	12		R	PWR- TOASTER OVEN	34
35	PWR- ADA DOOR CONTROLS	Z		12	12	20	1	2000	180		1	20	12	12	GF	R	PRW- FREEZER	36
37	RECEPTACLES	R		12	12	20	1	360	540		1	20	12	12		R	PWR- ROOF RCPTS	38
39	FACP	Z	LCK,FA	12	12	20	1		360	180	1	20	12	12		Z	RELAY PANEL	40
41	EF-1	M	RP	10	10	25	2			686	1500	1	20	12	12		Z	PWR- HAND DRY WOMEN	42
43								686	1500			1	20	12	12		PWR- WATER HEATER	44
45	PWR- MOTORIZED SHADES 1	M		10	10	30	1		500	0		1	20				SPARE	46
47	RCPT- IT RACK 1	R		12	12	20	1			360	180	1	20	12	12		PWR- LOBBY TV	48
49	RCPT- IT RACK 2	R		12	12	20	1	360	500			1	20	10	10	Z	PWR- DIVIDER CURTAIN	50
51	RCPT- EWC	R	GF	12	12	20	1		180	500		1	20	10	10	Z	PWR- IRRIGATION CONTROL	52
53	SPARE					20	1				0	0	20				SPARE	54
55	SPARE					20	1	0	0				20				SPARE	56
57	SPARE					20	1		0	0			20				SPARE	58
59	SPARE					20	1				0	0	20				SPARE	60
61	SPARE					20	1	0	0				20				SPARE	62
63	SPARE					20	1		0	0			20				SPARE	64
65	SPARE					20	1				0	0	20				SPARE	66
67	SPARE					20	1	0	0				20				SPARE	68
69	SPARE					20	1		0	0			20				SPARE	70
71	SPARE					20	1				0	0	20				SPARE	72
73	SPARE					20	1	0	0				20				SPARE	74
75	SPARE					20	1		0	0			20				SPARE	76
77	SPARE					20	1				0	0	20				SPARE	78
79	SPARE					20	1	0	0				20				SPARE	80
81	SPARE					20	1		0	0			20				SPARE	82
83	SPARE					20	1				0	0	20				SPARE	84
			TOTAL LOAD (VA):					8111 VA	5228 VA	11806 VA								
			TOTAL AMPS:					71 A	44 A	102 A								

LOAD TYPE	CONNECTED LOAD	DEMAND FACTOR	NEC DEMAND
EXISTING LOAD (E)	0 VA	100 %	0 VA
COOLING (C)	0 VA	0 %	0 VA
HEATING (H)	0 VA	100 %	0 VA
LIGHTING (L)	0 VA	125 %	0 VA
RECEPTACLES (R)	10157 VA	99 %	10079 VA
MOTORS (M)	500 VA	100 %	500 VA
SUPPLEMENTAL HEAT (U)	1500 VA	100 %	1500 VA
MISC EQUIP (Z)	11616 VA	100 %	11616 VA
REFRIGERATION (F)	0 VA	100 %	0 VA
SIGN/DISPLAY (D)	0 VA	125 %	0 VA
KITCHEN (K)	0 VA	100 %	0 VA
LARGEST MOTOR	1372 VA	125 %	1715 VA
SHOW WINDOW (W)	0 VA	125 %	0 VA
TRACK LIGHTING	0 VA	100 %	0 VA

PANELBOARD NOTES
LCK - HANDLE PADLOCKABLE-OFF DEVICE RP - VIA RELAY PANEL

PANELBOARD TOTALS

TOTAL CONNECTED LOAD	25145 VA
TOTAL NEC LOAD	25410 VA
TOTAL CONNECTED CURRENT	70 A
TOTAL NEC DEMAND CURRENT	71 A

PANELBOARD: L1

BUS AMPS: 200A
MAIN SIZE/TYPE: MLO
VOLTS/PHASE: 208Y/120 V 3P/4W
SUPPLIED BY: MDP

AUDITORIUM
BUILDING SQUARE FOOTAGE: 16128

FAULT CURRENT: REFER TO ONE-LINE DIAGRAM
AIC RATED: FULLY RATED
AIC RATING: FCA +10% MINIMUM
SERVES: REC CENTER
MOUNTING: SURFACE
LOCATION: MECHANICAL 106

EQUIPMENT GROUND BUS

CKT NO.	DESCRIPTION	LOAD TYPE	NOTES	WIRE SIZE	GND SIZE	BKR AMP	P	PHASE A	PHASE B	PHASE C	P	BKR AMP	GND SIZE	WIRE SIZE	NOTES	LOAD TYPE	DESCRIPTION	CKT NO.
1	LTG- GYM 1(DAYLIGHT) +EM	L	RP,EM	10	10	20	1	984	364		1	20	12	12	EM	L	LTG- STORAGE +EM	2
3	LTG-GYM 2 +EM	L	RP,EM	10	10	20	1		984	465	1	20	12	12	RP,EM	L	LTG- LOBBY +EM	4
5	LTG- GYM 3	L	RP	10	10	20	1			984 526	1	20	12	12	EM	L	LTG- RESTROOMS, UTILITY+EM	6
7	LTG- GYM 4	L	RP	10	10	20	1	984	0		1	20					SPARE	8
9	LTG- GYM 5	L	RP	10	10	20	1		984	270	1	20	10	10	RP	L	LTG- SIGN SPOT LIGHTS	10
11	LTG- GYM 6 +EM	L	RP,EM	10	10	20	1			984 174	1	20	10	10	RP, EM	L	LTG- EXT SNC & CANOPY+EM	12
13	LTG- KITCHEN, BREAK ROOM +EM	L	EM	12	12	20	1	616	728		1	20	8	8	RP	L	LTG- SITE POLES	14
15	LTG- EXTERIOR WALL PACKS+EM	L	RP,EM	12	12	20	1		180	0	1	20					SPARE	16
17	LTG- SITE BOLLARDS	L	RP	10	10	20	1			260 0	1	20					SPARE	18
19	SPARE					20	1	0	0		1	20					SPARE	20
21	SPARE					20	1		0	0	1	20					SPARE	22
23	SPARE					20	1			0 0	1	20					SPARE	24
25	SPARE					20	1	0	0		1	20					SPARE	26
27	SPARE					20	1		0	0	1	20					SPARE	28
29	SPARE					20	1			0 0	1	20					SPARE	30
31	SPARE					20	1	0	0		1	20					SPARE	32
33	SPARE					20	1		0	0	1	20					SPARE	34
35	SPARE					20	1			0 0	1	20					SPARE	36
37	SPARE					20	1	0	0		1	20					SPARE	38
39	SPARE					20	1		0	0	1	20					SPARE	40
41	SPARE					20	1			0 0	1	20					SPARE	42
			TOTAL LOAD (VA):					3676 VA	2883 VA	2928 VA								
			TOTAL AMPS:					31 A	24 A	24 A								

LOAD TYPE	CONNECTED LOAD	DEMAND FACTOR	NEC DEMAND
EXISTING LOAD (E)	0 VA	100 %	0 VA
COOLING (C)	0 VA	0 %	0 VA
HEATING (H)	0 VA	100 %	0 VA
LIGHTING (L)	9487 VA	125 %	11859 VA
RECEPTACLES (R)	0 VA	0 %	0 VA
MOTORS (M)	0 VA	100 %	0 VA
SUPPLEMENTAL HEAT (U)	0 VA	100 %	0 VA
MISC EQUIP (Z)	0 VA	100 %	0 VA
REFRIGERATION (F)	0 VA	100 %	0 VA
SIGN/DISPLAY (D)	0 VA	125 %	0 VA
KITCHEN (K)	0 VA	100 %	0 VA
LARGEST MOTOR	0 VA	125 %	0 VA
SHOW WINDOW (W)	0 VA	125 %	0 VA
TRACK LIGHTING	0 VA	100 %	0 VA

PANELBOARD NOTES
EM - EMERG LTG HANDLE-ON CLAMP RP - VIA RELAY PANEL

PANELBOARD TOTALS

TOTAL CONNECTED LOAD	9487 VA
TOTAL NEC LOAD	11859 VA
TOTAL CONNECTED CURRENT	26 A
TOTAL NEC DEMAND CURRENT	33 A

sfs architecture
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KANSAS CITY, MO 64108
TEL 816.683.8700 FAX 816.683.8701
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ELECTRICAL PANEL SCHEDULES

E202