

ADDENDUM

Date Issued:	Feb 21, 2024
Project:	Intermountain Health Intermountain Kidney Services – West Valley Dialysis 2750 South 5600 West West Valley City, UT 84120
Addendum Number:	1

The Contractors submitting proposals on the above-captioned project shall be governed by the following addendum, changes and explanations to the drawings and specifications and shall submit their bids in accordance therewith.

Item Number	General Items Description
	<p>Questions from bidders and their responses</p> <p>Question #1: Roof Warranty: Is there a warranty in place for the roofing? Response from building owner: No warrant in place for roofing.</p> <p>Question #2: Fire Alarm: What is the current fire alarm system for the building? Response from building owner: Mountain Alarm: Contact Jerome Francisco 866-853-7338</p> <p>Question #3: Construction Schedule for Adjacent Suites: Can we obtain the construction schedule for the adjacent suites? Response from building owner: There will be four tenants in the building:</p> <ol style="list-style-type: none"> 1. LIV Studios—construction complete, already open. LIV Studios hours vary by salon user, but it would be appreciated if noisy construction including but not limited to concrete cutting and vibrations occur before 10:00 am and after 6:00 pm. 2. Intermountain Health 3. Red Arch Partners (Kid to Kid and Uptown Cheapskate retail stores) This space is under construction and should be completed within the next 90 days. 4. Vacant retail/Restaurant space. This space is being roughed out, but a tenant had not yet been procured. <p>All noisy work is required to be conducted outside of regular business hours, specifically between 6:00 PM and 10:00 AM.</p> <p>Question #4: Fire Sprinkler System: Have engineered calculations been performed for the fire sprinkler system? Are the lines adequately sized to extend the fire sprinklers to our area? Can we have the contact information for the fire protection subcontractor? Response from building owner: Yes, I believe engineered calculations have been performed and the lines are adequately sized. Contact Jesse Ricord Jesse@officialfiresystems.com. His bid for your space (which Intermountain declined) is attached.</p> <p>Question #5: Note 8 sheet EP602 is located in 2 locations on this sheet one location seems to be correct the other is off, please clarify that a this is correct. Is the UPS supplied by IHC or subcontractor</p>

Item Number	General Items Description
	<p>Response: The one by the maintenance bypass is incorrect – the maintenance bypass is also OFCI as noted on the plan. UPS is OFCI – owner furnished, contractor installed. The keynote has been removed in Addendum #1.</p> <p>Question #6: One-line diagram is showing main breakers in all new panels but the panel schedules are calling Main Lug Only please clarify which will be required.</p> <p>Response: The man breakers shown in panels 1L1, 1L2, 1LE1, and 1LE2 are not required; these have been removed in Addendum #1.</p> <p>Question #7: The lighting control panel schedule doesn't show any of the circuits as dimming. Is this correct?</p> <p>Response: This is correct – this is not a dimming panel; dimming is by local switches where indicated in plan.</p> <p>Question #8: The tiles called out come in both honed and unpolished and do not specify which one. Can you please clarify? I noticed there was no tile trim or schluter called out on the plans, am i missing something or is it to be determined? thanks Will we be putting a schluter trim in any locations?</p> <p>Response: All of the ceramic tile should be the honed finish. As for the tile trim, we call that out in our spec. Section 093000 Tiling 2.13 Miscellaneous Materials K. 1. We have added clarifying information to the comments on the finish schedule.</p>

Sheet Number	Drawings
	Architectural Drawings
A110	Clarified extent of slab demolition per questions from bidders. Demolish entire slab on grade. Additional demolition may be required to route electrical conduits from generator to new electrical room
A111	Existing ladder to be removed and stored during slab demolition.
A603A	Clarified tile questions from bidders.
	Mechanical Drawings
	See attached mechanical addendum
	Electrical Drawings
	See attached electrical addendum

Attachments:

Architectural Drawings: A110, A111, and A603A

Mechanical Drawings: See mechanical addendum.

Electrical Drawings: See electrical addendum.



Official Fire Systems

12001 Pineridge Rd
Sandy, UT 84094

801-206-4744

Estimate

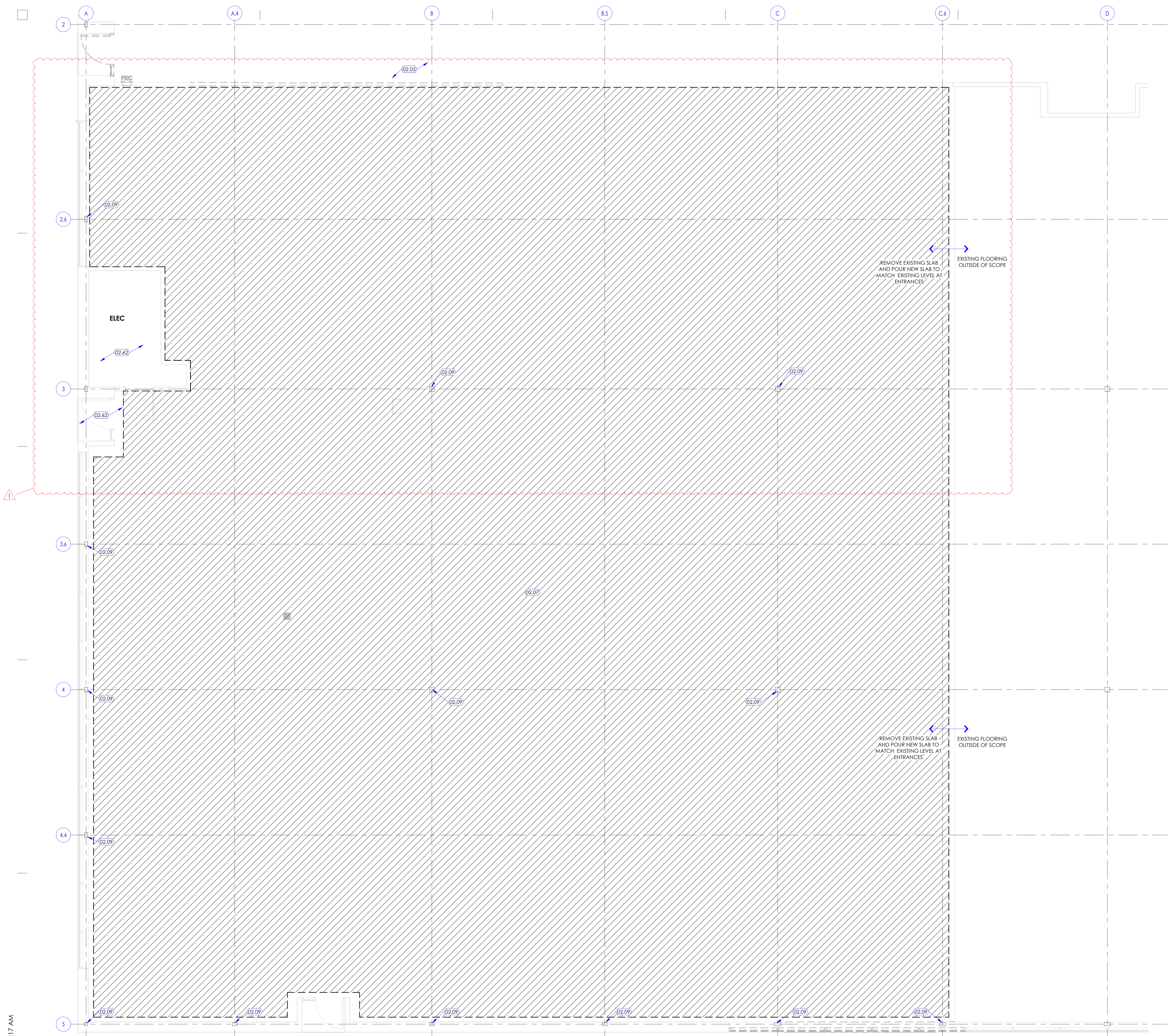
Date	Estimate #
11/15/2023	139

Name / Address
Brent Sloan IHC TI West Valley

Project
The Landing

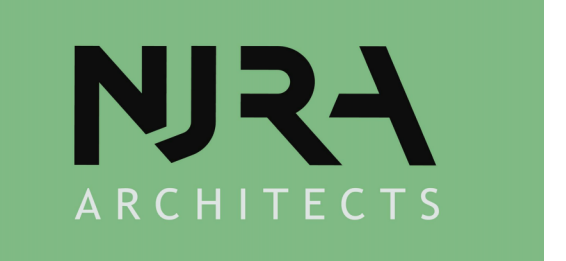
Description	Qty	Rate	Total
2.5" Dynaflow Steel Mains	94.5'	\$5.13/ft	\$485
1-1/4" Dynasteel Branch Lines	714'	\$3.24/ft	\$2,320
Fire Sprinkler Heads, Victaulic flex heads, Victaulic flex head brackets	65	\$100	\$6,500
Allthread, hangers, sammies, seismic and misc parts			\$2,500
Scissor Lift Rental	1	30 days	\$1,500
Labor		2 guys	\$4,000
Half of Designer			\$1,500
Half of 3rd party review and permit fee			\$425

Bid is good for 45 days. Half down required to start project. Available to start immediately.	Subtotal	\$19,230
Signature _____	Sales Tax (7.25%)	\$0.00
www.OfficialFireSystems.com - Jesse@officialfiresystems.com	Total	\$19,230

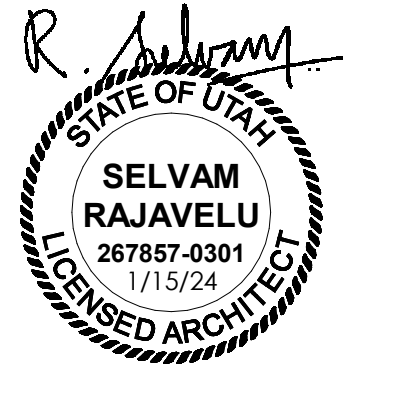


KEYED NOTES

- 02.05 REMOVE EXISTING FLOORING (INCLUDING ANY RAISED FLOORING) AND BASE INCLUDING ADHESIVE ALL THE WAY DOWN TO THE BARE CONCRETE FLOOR. CLEAN FLOOR AND PREP FOR NEW FLOOR FINISHES.
- 02.07 REMOVE EXISTING SLAB ON GRADE INCLUDING ALL EXISTING RECESSED CONCRETE FLOOR SLABS AND OTHER CONCRETE SLABS IN HATCHED AREA. COMPACT & PREPARE GRADE. INSTALL DRAINAGE GRAVEL AND 15 MIL VAPOR BARRIER BEFORE POURING NEW CONCRETE SLAB. TOP OF NEW SLAB SHALL FLUSH WITH SLAB LEVEL AT ENTRANCES THROUGHOUT BUILDING. TYPICAL UNLESS NOTED OTHERWISE. SEE DETAIL 7/A506A FOR TRENCHING AREAS BETWEEN EXISTING SLABS. IN AREAS WHERE IN FLOOR SCALE, TRENCH DRAIN OR TOILET ROOM TILE OCCURS, RECESS SLAB PER REQUIREMENTS IN DETAILS 4 AND 5 ON SHEET A506A, AND DETAIL 9/A506B. SEE NEW FLOOR PLAN FOR APPLICABLE LOCATIONS. ALSO SEE DETAILS ON STRUCTURAL DRAWINGS SHEET S-501.
- 02.09 IN AREAS WHERE COLUMNS OCCUR NEAR CONCRETE SLAB REMOVAL AND COLUMN FOOTINGS MAY BE BELOW SLAB, CAREFULLY SAW CUT AND REMOVE EXISTING SLAB ON GRADE AROUND EXISTING COLUMN FOOTING AND DO NOT SAWCUT EXISTING COLUMN FOOTING.
- 02.42 REMOVE EXISTING SLAB ON GRADE AS REQUIRED TO ROUTE ELECTRICAL CONDUITS FROM GENERATOR TO NEW ELECTRICAL ROOM. PATCH CONCRETE TO MATCH ADJACENT EXISTING AFTER ALL WORK IS COMPLETE. SEE DETAIL 7/A506A FOR TRENCHING AREAS BETWEEN EXISTING SLABS.



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Intermountain Health
 Intermountain Kidney Services
 West Valley Dialysis

2750 South 5600 West
 West Valley City, UT 84120

GENERAL NOTES

- A. SEE SHEET G003 AND G005 FOR SYMBOLS, GENERAL NOTES AND LEGEND.
- B. SEE SHEET A505A FOR CABINET LEGEND.
- C. SEE SHEET A601A FOR DOOR SCHEDULE.
- D. SEE SHEET A602A FOR WINDOW SCHEDULE.
- E. SEE SHEET A603A FOR FINISH SCHEDULE AND GENERAL NOTES.

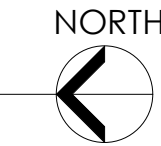
NJRA Project # 22211.05
Construction Documents Jan. 15, 2024
1 Addendum #01 Feb. 21, 2024

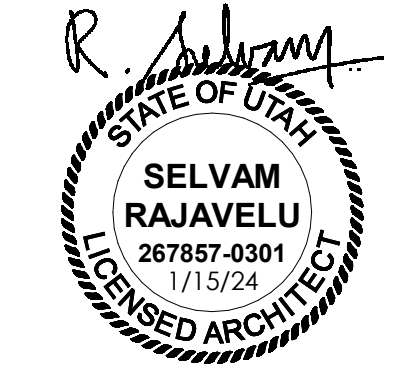
Demolition
Slab Plan

A110

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1 Demolition Floor Plan Level 1
SCALE: 1/4" = 1'-0"

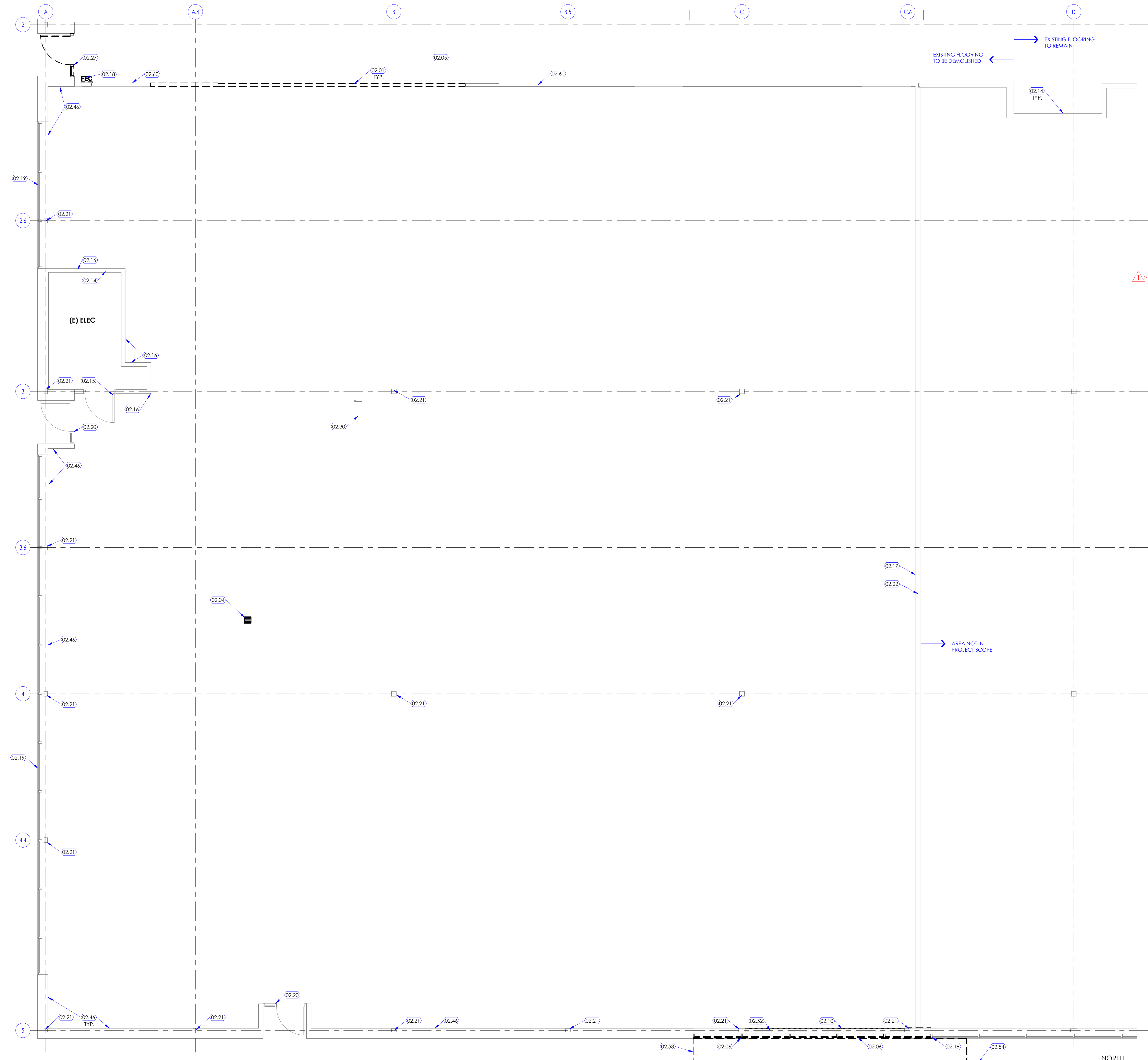




KEYED NOTES

- 02.01 REMOVE EXISTING STUD FRAMED WALL SHOWN DASHED INCLUDING STUDS, GYPSUM BOARD, STUD BRACING ABOVE CEILING, ELECTRICAL, MECHANICAL, AND PLUMBING ITEMS LOCATED IN THE WALL.
- 02.04 REMOVE EXISTING PLUMBING FIXTURES, PIPING AND ACCESSORIES. SEE PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
- 02.05 REMOVE EXISTING FLOORING (INCLUDING ANY RAISED FLOORING) AND BASE INCLUDING ADHESIVE ALL THE WAY DOWN TO THE BARE CONCRETE FLOOR. CLEAN FLOOR AND PREP FOR NEW FLOOR FINISHES.
- 02.06 REMOVE EXISTING ALUMINUM STOREFRONT SYSTEM, GLASS AND ASSOCIATED HARDWARE.
- 02.10 REMOVE PORTION OF WALL FOR NEW STOREFRONT AND DOOR OPENING. SEE KEYED NOTES 2.01 FOR WALL DEMOLITION. ALSO DEMO EXTERIOR FRAMING AND EPS. VERIFY ROUGH OPENING NEEDED FROM DIMENSION PLAN. FRAME WALL FOR NEW OPENING. SEE DETAILS ON SHEET A502A.
- 02.14 EXISTING WALL TO REMAIN. PROTECT DURING CONSTRUCTION.
- 02.15 EXISTING DOOR AND HARDWARE TO REMAIN. PROTECT DURING CONSTRUCTION.
- 02.16 FINISH THIS SIDE OF EXISTING GYPSUM BOARD AND METAL STUD WALL AS REQUIRED AND PAINT PER FINISH SCHEDULE.
- 02.17 PROVIDE 18 GAUGE ANGLE AT SLAB INFILL. SEE STRUCTURAL DRAWINGS DETAIL A4/S-501.
- 02.18 REMOVE EXISTING WALL MOUNTED FIRE EXTINGUISHER AND RETURN TO OWNER
- 02.19 EXISTING ALUMINUM WINDOW AND STOREFRONT SYSTEM TO REMAIN. PROTECT DURING CONSTRUCTION.
- 02.20 EXISTING ALUMINUM STOREFRONT GLAZED DOOR AND HARDWARE TO REMAIN. PROTECT DURING CONSTRUCTION.
- 02.21 EXISTING TUBE STEEL STRUCTURAL COLUMN TO REMAIN. PROTECT DURING CONSTRUCTION.
- 02.22 EXISTING STUD FRAMING TO REMAIN. MODIFY AS REQUIRED AROUND EXISTING MECHANICAL UNIT FOR FIRE RATING. SEE MECHANICAL DRAWINGS AND SIMILAR DETAILS ON A502B. PROVIDE 5/8" TYPE 'X' GYPSUM BOARD FROM FINISH FLOOR TO DECK ABOVE - BOTH SIDES. FINISHED WALL TO BE WALL TYPE 'C3'.
- 02.27 REMOVE EXISTING ALUMINUM STOREFRONT GLAZED DOOR, FRAME, AND HARDWARE.
- 02.30 CAREFULLY REMOVE AND SALVAGE EXISTING STEEL LADDER FOR REINSTALLATION AFTER NEW SLAB IS POURED. SEE DETAIL A/S048 FOR NEW PLYWOOD WALL BACKING. INSTALL NEW BENT STEEL ANCHORS FROM LADDER TO WALL AND ANCHOR LADDER TO FLOOR PER DETAIL. PAINT LADDER TO MATCH WALL COLOR.
- 02.46 REMOVE EXISTING VAPOR BARRIER AND IN-WALL INSULATION FROM INTERIOR SIDE OF THIS ROOM. INSTALL NEW R-13 BATT INSULATION AND FLOOR TO DECK VAPOR BARRIER (10 MIL MIN.), AND FLOOR TO DECK. GYPSUM BOARD AFTER ALL IN-WALL M/E/P ITEMS ARE COMPLETE. PAINT PER NEW FINISH SCHEDULE.
- 02.52 REMOVE TUBE STEEL KICKERS AND OTHER ASSOCIATED STRUCTURAL SUPPORTS BETWEEN COLUMNS FOR ALUMINUM SUNSHADE TO BE DEMOLISHED.
- 02.53 CAREFULLY REMOVE EXISTING ALUMINUM SUNSHADE. FIELD VERIFY EXACT LOCATION OF EXISTING JOINTS TO REMOVE UP TO EXISTING JOINT LOCATION. PATCH AND REPAIR EXTERIOR FINISHES TO MATCH ADJACENT EXISTING.
- 02.54 EXISTING SUNSHADE TO REMAIN, AS OCCURS.
- 02.60 UPGRADE EXISTING STUD FRAMING WITH TYPE 'X' GYPSUM BOARD TO DECK TO MATCH WALL TYPE 'C3' AFTER ALL IN WALL M/E/P WORK IS COMPLETED. ALL PENETRATIONS TO HAVE FIRE RATED CAULKING AND OTHER PROVISIONS PER WALL TYPE 'C' TO MAINTAIN FIRE RATING.

02.46 - REMOVE EXISTING VAPOR BARRIER AND IN-WALL INSULATION FROM INTERIOR SIDE OF THIS ROOM. INSTALL NEW R-13 BATT INSULATION AND FLOOR TO DECK VAPOR BARRIER (10 MIL MIN.), AND FLOOR TO DECK. GYPSUM BOARD AFTER ALL IN-WALL M/E/P ITEMS ARE COMPLETE. PAINT PER NEW FINISH SCHEDULE.



GENERAL NOTES

- A. SEE SHEET G003 AND G005 FOR SYMBOLS, GENERAL NOTES AND LEGEND.
- B. SEE SHEET A505A FOR CABINET LEGEND.
- C. SEE SHEET A601A FOR DOOR SCHEDULE.
- D. SEE SHEET A602A FOR WINDOW SCHEDULE.
- E. SEE SHEET A603A FOR FINISH SCHEDULE AND GENERAL NOTES.

1 Demolition Floor Plan Level 1
SCALE: 1/4" = 1'-0"

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Intermountain Health
Intermountain Kidney Services
West Valley Dialysis

2750 South 5600 West
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NJRA Project # 22211.05
Construction Documents Jan. 15, 2024
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Demolition
Floor Plan
Level 1

A111

FINISH SCHEDULE

TAG	FINISH TYPE	SIZE	MATERIAL DESCRIPTION	MANUFACTURER	STYLE	MODEL #	COLOR	COMMENTS
F1	FLOOR FINISH		SHEET VINYL FIELD COLOR	MANNINGTON COMMERCIAL	BIOSPEC MD	15361	FLAX	-
F2	FLOOR FINISH		SHEET VINYL ACCENT COLOR	MANNINGTON COMMERCIAL	BIOSPEC MD	15369	BEDROCK	-
F4	FLOOR FINISH	18" X 18"	LVT DARKER TONE	MANNINGTON COMMERCIAL	SELECT LVT	MSC224	FIERA PYRITE	5
F5	FLOOR FINISH	18" X 18"	LVT LIGHTER TONE	MANNINGTON COMMERCIAL	SELECT LVT	MSC220	FIERA QUARTZ	5
F6	FLOOR FINISH	12" X 12"	CERAMIC TILE	CROSSVILLE	NOTORIOUS	NTR05	LEADING MAN	8
F7	FLOOR FINISH	24" X 24"	WALK OFF CARPET TILES	SHAW CONTRACT GROUP	STEPPIN OUT, WELCOME II TILE ST031	31557	STERLING	7
F8	FLOOR FINISH		LIQUID APPLIED FLOOR COATING	SHERWIN WILLIAMS	ARMORSEAL TREAD-PLEX, WATER BASED ACRYLIC FLOOR COATING 6401-72656	B90A00101-20	HAZE GRAY	-
F9	FLOOR FINISH	18" X 36"	CARPET TILE	SHAW CONTRACT GROUP	STIPPLE TILE	5T116	SLATE 13585	6
F11	FLOOR FINISH	12" X 12"	CERAMIC TILE	CROSSVILLE	NOTORIOUS	NTR01	FEMME FATALE	11
F12	FLOOR FINISH		EPOXY FLOOR COATING	MASTER BUILDERS	MASTER PROTECT	170-CR	GRAY	14
B1	WALL BASE	4" HIGH	COVED SHEET VINYL	MANNINGTON COMMERCIAL	BIOSPEC MD	-	-	1
B2	WALL BASE	4" HIGH	RUBBER BASE	MANNINGTON COMMERCIAL	BURKE TP COVE	050	MOONBEAM	-
B3	WALL BASE	6" HIGH	CERAMIC TILE BASE	CROSSVILLE	NOTORIOUS	NTR05	LEADING MAN	8
B4	WALL BASE	6" HIGH	COVED SHEET VINYL	MANNINGTON COMMERCIAL	BIOSPEC MD	-	-	1
B5	WALL BASE		CARPET BASE (TOP EXPOSED EDGE BOUND WITH FABRIC)	SHAW CONTRACT GROUP	GRADIENT BROADLOOM	34512	ADRIFT	-
B6	WALL BASE	6" HIGH	CERAMIC TILE BASE	CROSSVILLE	NOTORIOUS	NTR01	FEMME FATALE	11
W1	WALL FINISH		PAINT	SHERWIN WILLIAMS	SATIN FINISH	SW 7005	PURE WHITE	-
W2	WALL FINISH	12" X 24"	CERAMIC TILE	CROSSVILLE	NOTORIOUS	NTR01	FEMME FATALE	9
W3	WALL FINISH	3" X 15"	CERAMIC TILE AT DRINKING FOUNTAIN	CROSSVILLE	NOTORIOUS	NTR05	LEADING MAN	10
W5	WALL FINISH		PAINT - ACCENT	SHERWIN WILLIAMS	SATIN FINISH	SW 0023	PEWTER TANKARD	-
W6	WALL FINISH		PAINT - ACCENT	SHERWIN WILLIAMS	SATIN FINISH	SW 6201	THUNDEROUS	-
W8	WALL FINISH		PAINT - EPOXY TYPE	SHERWIN WILLIAMS	-	SW 7005	PURE WHITE	-
C2	CEILING FINISH		PAINTED GYPSUM	SHERWIN WILLIAMS	FLAT FINISH	SW 7005	PURE WHITE	-
C5	CEILING FINISH		PAINTED GYPSUM - EPOXY	SHERWIN WILLIAMS	-	SW 7005	PURE WHITE	-
MS1	MISC. SURFACE FINISH		DOOR FRAME PAINT	SHERWIN WILLIAMS	SEMI-GLOSS FINISH	SW 7005	PURE WHITE	4
PL1	PLASTIC LAMINATE FINISH		PLASTIC LAMINATE SHEET OVER SUBSTRATE	WILSONART	LINEARITY FINISH	7970K-18	HIGH LINE	-
PL2	PLASTIC LAMINATE FINISH		PLASTIC LAMINATE SHEET OVER SUBSTRATE - HORIZONTAL	LAMINART	TEXTURED FINISH	2420	MINERAL GOLD	-
MM1	MONOLITHIC MATERIAL		SOLID SURFACE	CORIAN SOLID SURFACE	-	-	NEUTRAL CONCRETE	-
MM2	MONOLITHIC MATERIAL		SOLID SURFACE INTEGRAL SINK	CORIAN SOLID SURFACE	-	810	GLACIER WHITE	-
WP1	WALL PROTECTION	0.06" THICK	WAINSCOT PANEL	CONSTRUCTION SPECIALTIES	ACROVYN	-	949 WHITE	13
WP2	WALL PROTECTION	2" X 2" X 4'-0"	CORNER GUARD	CONSTRUCTION SPECIALTIES	-	SSM-20	949 WHITE	12
WC1	WINDOW COVERINGS		MANUAL ROLLER SHADE	MECHO	MECHO 7	1569	SILVER BIRCH	-
WC2	WINDOW COVERINGS		AUTOMATED ROLLER SHADE	MECHO	ELECTROSHADE	1569	SILVER BIRCH	-
TF1	TEXTILES (FABRICS)		CUBICLE CURTAINS AND TRACK	CONSTRUCTION SPECIALTIES	ON THE RIGHT TRACK	-	SPRING FROST AM COOKIE	3

COMMENTS

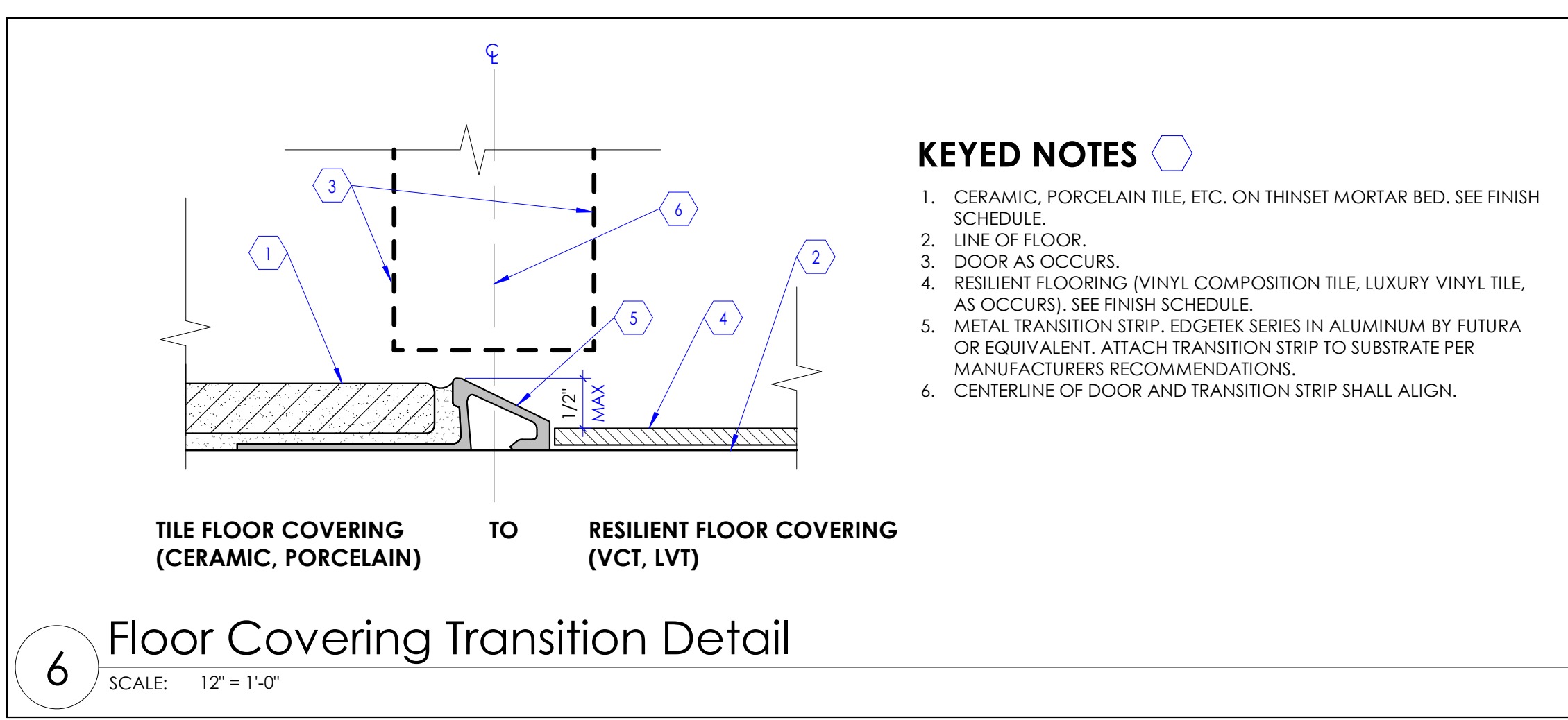
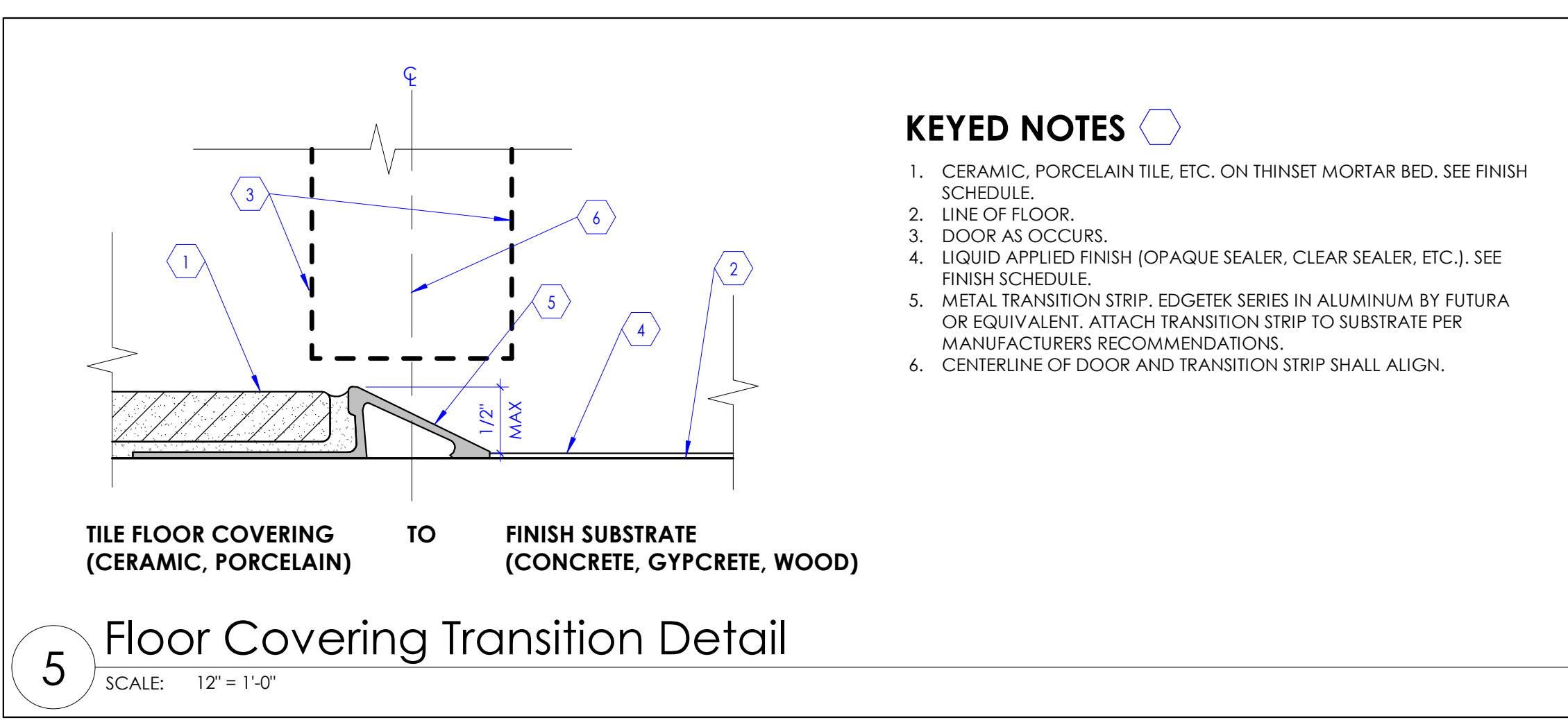
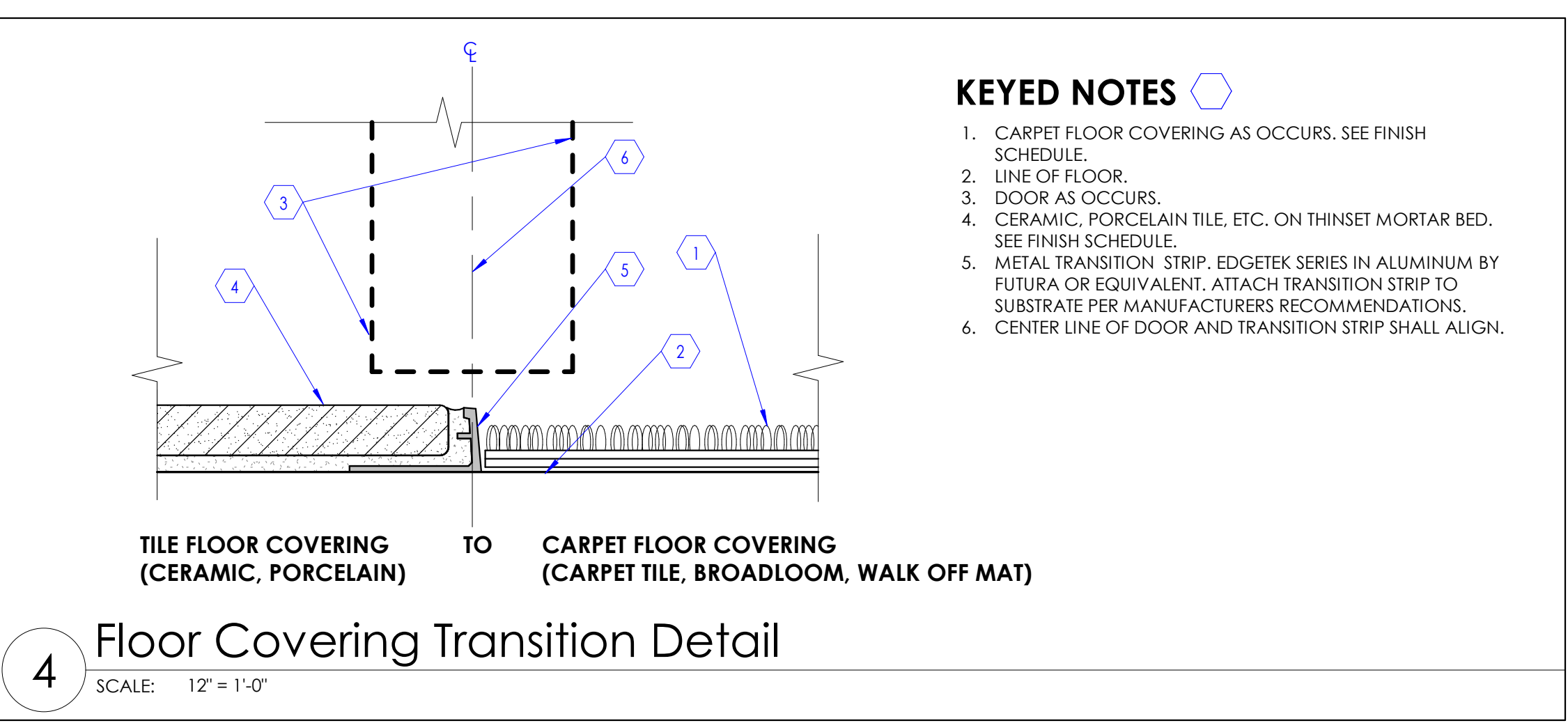
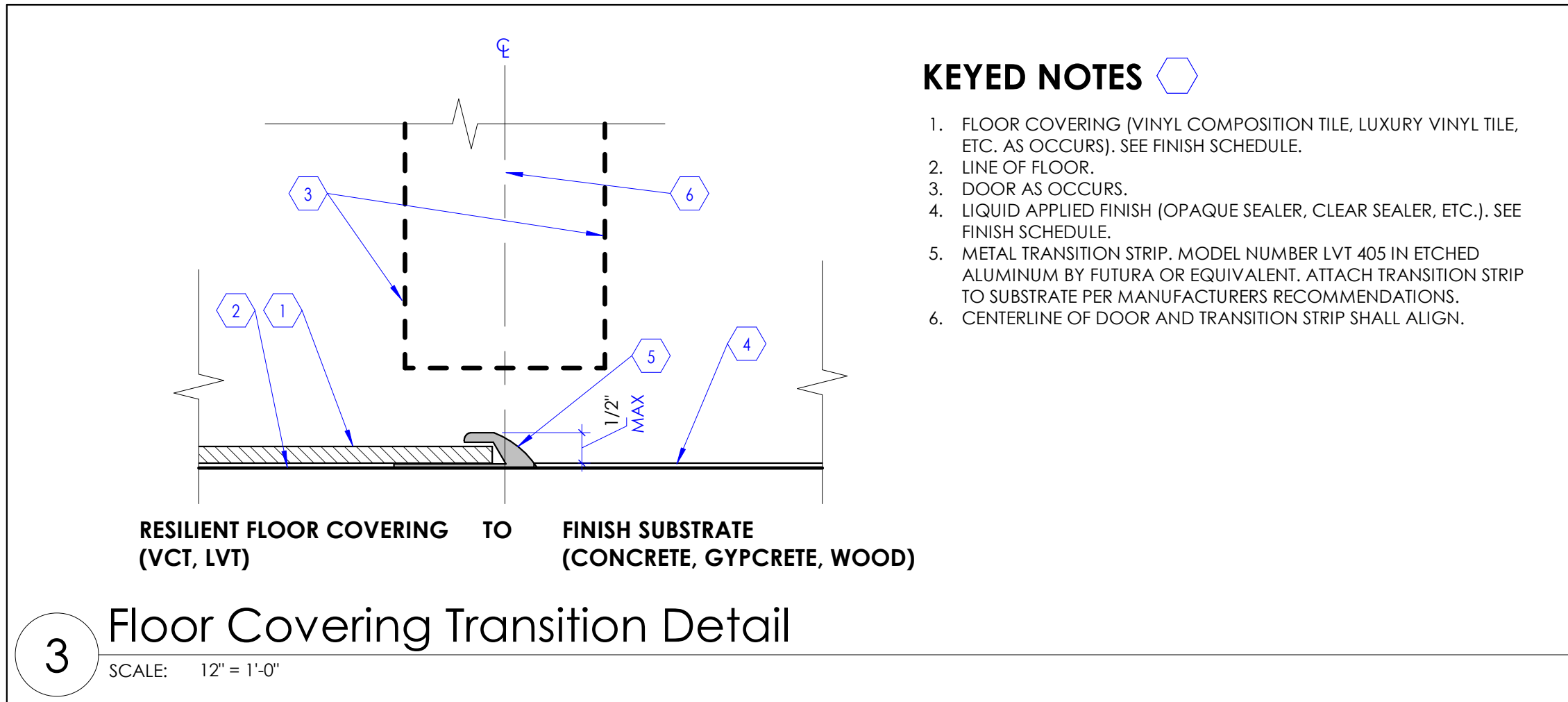
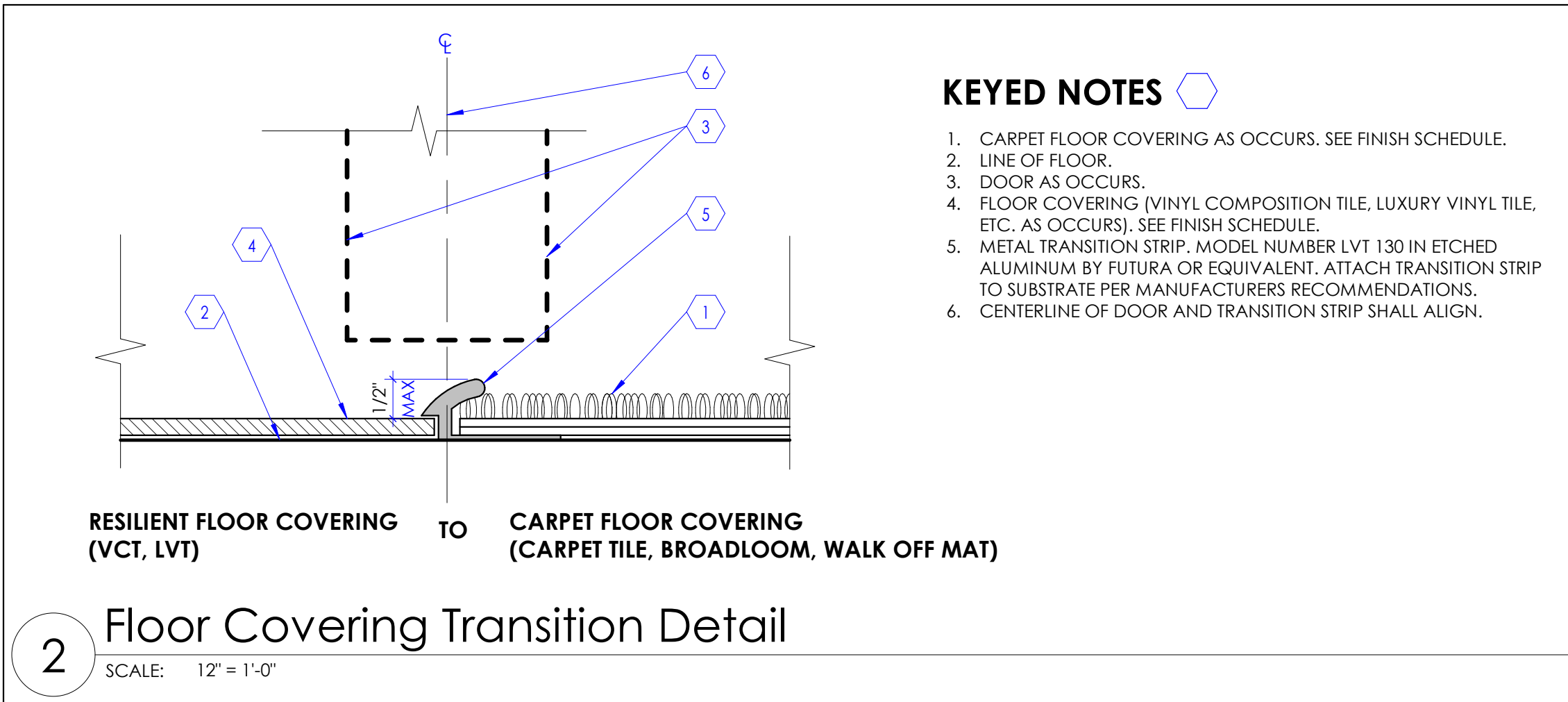
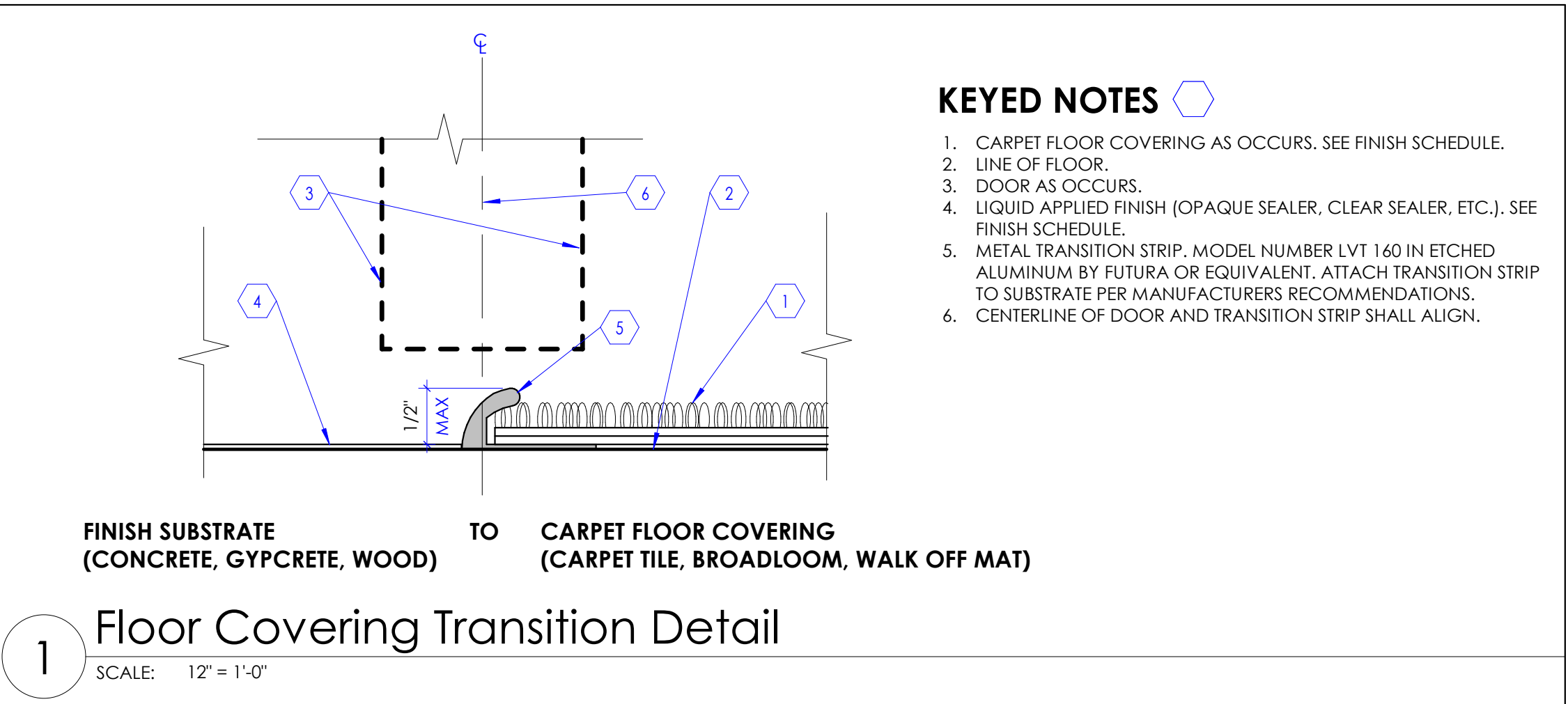
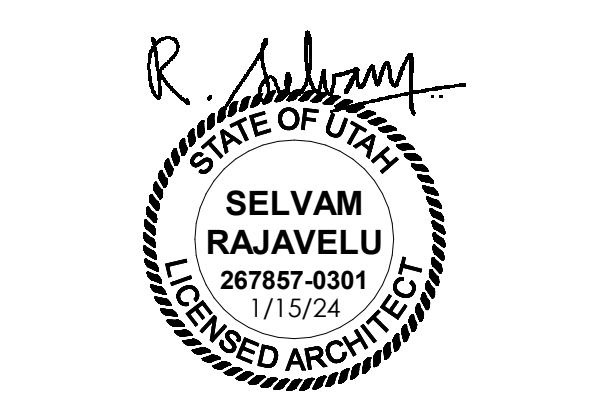
- COVED SHEET VINYL BASE COLOR SHOULD CONTINUE THE SAME COLOR AS THE FLOOR SHEET VINYL. INSTALL ALUMINUM TRIM ON TOP OF COVED SHEET VINYL BASE.
- SEE REFLECTED CEILING PLANS FOR GRID ORIENTATION AND LAYOUT.
- CUBICLE CURTAIN FABRIC AND TRACK TO BE OWNER FURNISHED AND CONTRACTOR INSTALLED (O.F.C.I.). SEE DETAIL 13/A503A.
- ALL HOLLOW METAL DOORS AND DOOR FRAMES IN THIS PROJECT SHOULD BE PAINTED WITH "MS" FINISH UNLESS NOTED OTHERWISE.
- LVT TO HAVE SQUARE EDGES. CONTACT MANUFACTURER REPRESENTATIVE TO ORDER CORRECTLY. NO BEVELED EDGES ON LVT WILL BE EXPECTED. LVT TO BE INSTALLED IN A BRICK ASHLAR PATTERN.
- CARPET TILES TO BE INSTALLED IN AN ASHLAR PATTERN. TILES TO RUN PARALLEL TO DOOR WHERE APPLICABLE.
- WALK-OFF CARPET TILES TO BE INSTALLED QUARTER TURNED.
- CERAMIC FLOOR TILES TO BE INSTALLED IN A SQUARE JOINT PATTERN. USE TILES WITH HONED FINISH. USE GROUT COLOR MAPEI #11 SAHARA BEIGE OR SIMILAR. USE EPOXY GROUT WITH FLOOR TILES. USE SCHLUTER METAL EDGE STRIPS AT TOP EDGE OF TILE WALL BASE WHERE APPLICABLE.
- CERAMIC WALL TILES TO BE INSTALLED IN A BRICK JOINT PATTERN. USE TILES WITH HONED FINISH. USE GROUT COLOR MAPEI #93 WARM GRAY OR SIMILAR. USE SCHLUTER METAL EDGE STRIPS AT OUTSIDE EDGE OF TILE WHERE APPLICABLE.
- CERAMIC WALL TILES AT DRINKING FOUNTAIN TO BE INSTALLED IN A BRICK JOINT PATTERN. USE TILES WITH HONED FINISH. USE GROUT COLOR MAPEI #11 SAHARA BEIGE OR SIMILAR. USE SCHLUTER METAL EDGE STRIPS AT OUTSIDE EDGE OF TILE WHERE APPLICABLE.
- CERAMIC FLOOR TILES TO BE INSTALLED IN A SQUARE JOINT PATTERN. USE TILES WITH HONED FINISH. USE GROUT COLOR MAPEI #93 WARM GRAY OR SIMILAR. USE EPOXY GROUT WITH FLOOR TILES. USE SCHLUTER METAL EDGE STRIPS AT TOP EDGE OF TILE WALL BASE WHERE APPLICABLE.
- CORNER GUARDS TO SPAN FROM TOP OF WALL BASE TO 4'-4" ABOVE FINISHED FLOOR. SEE DETAIL 2/A506A. AT PARTIAL HEIGHT WALLS, STOP CORNER GUARD AT THE BOTTOM OF SOLID SURFACE COUNTERTOP/CAP.
- WALL PROTECTION WAINSCOT TO SPAN FROM TOP OF WALL BASE TO 4'-4" ABOVE FINISH FLOOR. TOP OF WAINSCOT SHALL ALIGN WITH TOP OF CORNER GUARDS WHERE APPLICABLE.
- EPOXY COATING FOR ACID CONTAINMENT SYSTEM INCLUDING HORIZONTAL AND VERTICAL SURFACES OF CONCRETE CURBS, CONCRETE FLOOR AND CONCRETE PEDESTAL FOR TANKS.

GENERAL NOTES

- BASIS-OF-DESIGN FOR FINISHES. FINISHES INDICATED ON THE FINISH SCHEDULE ARE BASED ON THE NAMED MANUFACTURER AND THEIR PRODUCTS. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE THE NAMED PRODUCT OR A COMPARABLE PRODUCT BY ONE OF THE APPROVED MANUFACTURERS LISTED IN THE PROJECT MANUAL. SEE RELEVANT SPECIFICATION SECTION.
- SEE "SAMPLE LAYOUTS" INDICATED ON FINISH PLANS FOR CLARIFICATION ON HOW DIFFERENT TYPES OF REQUIRED FINISHES ARE INDICATED WITH FINISH TAGS FOR FLOORS, WALLS, MISCELLANEOUS SURFACE ETC. SEE FINISH FLOOR PLANS FOR REQUIRED FINISHES (INDICATED WITH FINISH TAGS SUCH AS F1, B1, W1, ETC.).
- LINE OF TRANSITION BETWEEN DIFFERENT TYPES OF FLOOR COVERING IS INDICATED ON THE FINISH FLOOR PLANS. IN PLACES WHERE TWO DIFFERENT FLOOR COVERINGS ABUT EACH OTHER, CONTRACTOR SHALL FOLLOW THE RELEVANT APPLICABLE "FLOOR COVERING TRANSITION DETAILS" INDICATED IN THIS CONSTRUCTION DOCUMENTS. WHERE TWO ROOMS ARE REQUIRED TO HAVE DIFFERENT FLOOR COVERINGS, LINE OF TRANSITION SHALL TYPICALLY OCCUR BELOW THE CENTER OF THE DOOR (LOCATED BETWEEN THE TWO ROOMS). AS THESE TRANSITION LINES ARE NOT INDICATED BELOW THE DOOR ON THE FINISH FLOOR PLANS, CONTRACTOR SHALL PROVIDE METAL TRANSITION STRIP (MANUFACTURED BY SCHLUTER OR EQUIVALENT) AS REQUIRED. AT EXTERIOR DOORS, PROVIDE ALUMINUM THRESHOLD MATCHING THE DOORWAY. FOR REMODEL PROJECTS, COORDINATE WITH DEMOLITION FLOOR PLAN AND NEW FLOOR PLAN TO DETERMINE WHERE NEW ABUTS EXISTING FLOOR COVERING THAT IS SCHEDULED TO REMAIN.
- LINE OF TRANSITION BETWEEN DIFFERENT TYPES OF WALL FINISH IS INDICATED ON THE INTERIOR ELEVATIONS AND FINISH FLOOR PLANS. FOR REQUIRED WALL PROTECTION TYPE (INDICATED WITH TAG WP1, WP2, ETC.), ON WALLS, COORDINATE WITH FINISH FLOOR PLANS AND INTERIOR ELEVATIONS.
- THERE ARE MISCELLANEOUS SURFACES THAT ARE EXPOSED AND WILL REQUIRE A FINISH. SUCH MISCELLANEOUS SURFACES ARE INDICATED IN THE DRAWINGS WITH FINISH TAGS SUCH AS MS1, MS2, ETC.
- PAINT ALL EXPOSED VISIBLE ITEMS SUCH AS METAL DECK, STEEL ANGLES, STEEL BEAMS, STEEL TRUSSES, MISC. STEEL ITEMS, PIPES, CONDUITS, ETC. UNLESS SPECIFICALLY NOTED AS A SURFACE NOT TO BE PAINTED. IF NATURAL FINISH IS REQUIRED, PAINT SURFACES USING FIELD COLORS AND ACCENT COLORS SPECIFIED BY THE ARCHITECT. DO NOT PAINT CONCEALED SURFACES, FINISHED METAL SURFACES, OPERATING PARTS, AND PRE-FINISHED ITEMS. VERIFY PAINTING SURFACE (SUCH AS STEEL, CONCRETE, MASONRY, GYPSUM BOARD, WOOD, ETC.) AND USE THE APPROPRIATE PAINT AND METHOD INDICATED IN THE PROJECT MANUAL UNDER RELEVANT SPECIFICATION SECTION. ALL HOLLOW METAL DOOR AND WINDOW FRAMES SHALL BE PAINTED. USE SEMI-GLOSS FINISH ON DOOR FRAMES.
- IN ROOMS AND AREAS WHERE GYPSUM BOARD CEILING IS INDICATED, PAINT CEILING WITH THE SAME COLOR AND TYPE AS ADJACENT WALLS. IN WET ROOMS (LIKE RESTROOM, KITCHEN, ETC.) WHERE EPOXY PAINT IS INDICATED AS A REQUIREMENT ON WALLS, PAINT CEILINGS AND SOFFITS WITH EPOXY TYPE PAINT. ALL GYPSUM BOARD SOFFITS SHALL BE PAINTED. COORDINATE ACCENT COLOR LOCATIONS WITH ARCHITECT WHEREVER INDICATED.
- SEE INTERIOR ELEVATIONS FOR PLASTIC LAMINATE FINISHES OVER CABINETS, COUNTERTOPS, WALLS, ETC. PLASTIC LAMINATE FINISHES ARE INDICATED AS PL1, PL2, ETC. COUNTERTOPS THAT ARE MONOLITHIC MATERIAL (SUCH AS SOLID SURFACE, QUARTZ, ETC. AND NOT PLASTIC LAMINATE WRAPPED), ARE INDICATED AS MM1, MM2, ETC.
- WHERE PORCELAIN AND/OR CERAMIC TILE FINISHES ARE INDICATED, PROVIDE METAL EDGE STRIPS (MANUFACTURED BY SCHLUTER OR EQUIVALENT) AT ALL OUTSIDE VERTICAL CORNERS AND TOP OF WAINSCOT.
- IN ROOMS AND AREAS (SUCH AS TOILET ROOMS, SHOWERS, ETC.) WHERE CERAMIC OR PORCELAIN TILES ARE INDICATED FOR WALL AND FLOOR FINISH, INSTALL BOTTOM ROW OF WALL TILE FIRST PER DETAIL 1/A603B. PROVIDE QUARTZ THRESHOLD AT DOORS TO TOILET ROOMS THAT ARE USED BY MULTIPLE USERS. SEE DETAILS 3 & 4 SHEET A603B.
- WHERE GYPSUM BOARD WALL ABUTS MASONRY WALL, PROVIDE REVEAL AS PER DETAIL 2/A603B.



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2/21/2024 9:05:22 AM

Intermountain Health
Intermountain Kidney Services
West Valley Dialysis

2750 South 5600 West
West Valley City, UT 84120

NJRA Project # 22211.05
Construction Documents Jan. 15, 2024
1 Addendum #01 Feb. 21, 2024

Finish
Schedule &
Details

A603A



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181 East 5600 South
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Date: 2/20/24
Project No: 22249
Project: IKS West Valley Dialysis
Revision: Addendum #1

Addendum - The following revision, additions, deletions, and/or items of clarification shall hereby be included as an integral part of the Contract Documents for the above-listed project and shall be fully binding. All other requirements shall remain in effect of the original plans and specification.

DIVISION - 21, 22, 23

GENERAL

- We received a comment about the DOAS unit having an evap cooling section from one of the bidders, to clarify for all, the DOAS has a DX cooling with nat gas heating.
- Mechanical Bid form is being provided for VRF.

DRAWINGS

Sheet: MH602 - MECHANICAL SCHEDULES

- VRF Indoor Schedule updated to include filter boxes on ducted units.

Sheet: PP101 - PLUMBING PLAN LEVEL 1

- KN 18 added.
- General Notes updated.

Sheet: FP101 - FIRE PROTECTION PLAN LEVEL 1

- Keyed Notes updated.

SPECIFICATIONS

1. 230900 – attached in its entirety with changes in bold in the following sections
 - a. 1.1-A

- b. 2.1-A
- c. 3.7

PRIOR APPROVALS

Item	Manufacturer	Comments
VRF	LG VRF	Approved
HVCA Power Ventilators	Greenheck	Approved
Diffusers, Registers and Grilles	Greenheck	Approved
Dedicated Outdoor-Air Units	Greenheck	Approved
Finned-Tube Radiation Heaters	Beacon Morris, Sigma	Approved
VRF	Hitachi VRF	Not allowed
Water Heater	State	Not allowed
Water Heater	American	Not allowed
Water Closets	Sloan	Not allowed
Urinals	Sloan	Not allowed
Lavatories	Sloan	Not allowed
Trench Drains	Watts	Approved
Expansion Tanks	Watts	Approved

End of Addendum.

DIVISION 22 and 23 - BID FORM

**IKS West Valley City
MECHANICAL BID BREAKDOWN FORM:
February 21, 2024**

This bid form shall be completed and submitted to the CMGC at the time of bid opening. The "BASE BID" proposal price is based on equipment and systems selected by the contractor and indicated by the contractor as "Basis of Bid". If the contractor fails to indicate which equipment manufacturer has been selected for the basis of his bid, the Owner will have the right to select the desired equipment manufacturer as "Basis of Bid" without an increase to the proposed overall bid amount. If the contractor fails to indicate the alternative amount for a listed equipment manufacturer or fails to indicate that "NO BID" was received for the listed equipment, the Owner will have the right to select the alternative manufacturer as "Basis of Bid" without an increase to the proposed overall bid amount. The Owner reserves the right to select from the equipment listed. Mechanical items not specifically listed on the form may be selected by the Contractor from the specifications and equipment schedules.

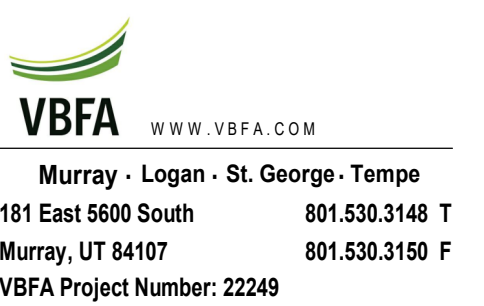
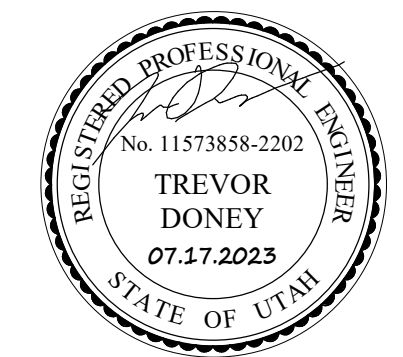
***Provide the cost of each piece of equipment listed including the base bid.**

EXAMPLE	<u>BASIS OF BID</u>	<u>ALTERNATIVE AMOUNT</u>
1. Widget		
Brand A	_____	\$ <u>18,000.00</u>
Brand B	<u>\$25,000</u>	\$ <u>0</u>
Brand C	_____	\$ <u>27,000.00</u>
Brand D	<u>No Bid</u>	\$ _____

PROJECT 3.02 BID ITEMS:

***Provide the cost of each piece of equipment listed including the base bid.**

MECHANICAL EQUIPMENT	<u>BASIS OF BID</u>	<u>ALTERNATIVE AMOUNT INCREASE OR DECREASE</u>
1. VRF		
Mitsubishi		\$ _____
LG		\$ _____
Other		\$ _____



MITSUBISHI ELECTRIC TRANE HVAC US: CITY MULTI VRF OUTDOOR UNIT SCHEDULE

System Tag	Tag Reference	M-NET Address	Model Number	Modules	Nominal Cooling Capacity (BTU/h)	Nominal Heating Capacity (BTU/h)	Nom System Connected Capacity (% of NOM)	Design Cooling Outdoor Temp DB (°F)	Design Heating Outdoor Temp WB (°F)	Corrected Cooling Total Capacity (BTU/h)	Corrected Heating Capacity (BTU/h)	Electrical-Per Module 208/230 or 460V				Notes / Options
												Voltage / Phase	MCA 208/230 or 460V	RFS	MCCP	
System 1	OU-1	51, 52	TURYE2403BN404N	P120, P120	240,000	270,000	122.5 %	97.0	2.3	235,125.3	210,261.0	208/230V / 3-phase 3-wire	41/38, 41/38	60/60, 60/60	60/60, 60/60	1, 2, 3, 4, 5, 6
System 3	OU-2	N/A	TRUZAO121KA70NA		12,000	14,000	100.0 %	97.0	2.3	10,275.6	7,447.3	208/230V / 1-phase	11	15	28	1, 2, 3, 4, 5, 6
System 4	OU-3	N/A	TRUZAO121KA70NA		12,000	14,000	100.0 %	97.0	2.3	10,275.6	7,447.3	208/230V / 1-phase	11	15	28	1, 2, 3, 4, 5, 6
System 5	OU-4	24	TRUYAO241HA70NA		24,000		100.0 %	97.0	2.3	20,551.3	0.0	208/230V / 1-phase	19	25	26	1, 2, 3, 4, 5, 6
System 6	OU-5	25	TRUYAO301HA70NA		30,000		100.0 %	97.0	2.3	25,689.1	0.0	208/230V / 1-phase	19	25	26	1, 2, 3, 4, 5, 6

- Notes & Options:
- Nominal cooling capacities are based on indoor coil EAT of 80/67°F (DB/WB), outdoor of 95°F (DB)
 - Nominal heating capacities are based on indoor coil EAT of 70°F (DB), outdoor of 43°F (WB)
 - Efficiency values for EER, IEER, COP are based on AHRI 1230 test method for mixture of ducted & non-ducted indoor units.
 - For systems with multiple modules, refrigerant pipe dimensions indicate total system combined piping downstream of module twinning.
 - Added field charge listed is in addition to factory charge, this must be updated based upon final as-built piping layout.
 - Corrected capacities shown are based on lowest guaranteed outdoor temperature, temperatures below this are not guaranteed.

VRF HEAT RECOVERY BRANCH CIRCUIT CONTROLLER

System Tag	Tag Reference	M-NET Address	Model Number	Type (double / Main / Sub)	Number of Parts	Connected Capacity to BC	Voltage / Phase	MCA 208/230	Notes / Options
System 1	BCController 1	53	TCMBM1016JA11N4	Main	16	294,000.0	208/230V/1-phase		1
System 1	BCController 2	66	TCBMS0104KB11N4	Sub	4	56,000.0	208/230V/1-phase		1

- Notes & Options:
- Include Diamondback Ball Valves BV-Series, 700PSIG working pressure, full port, 410A rated.
 - For sub BC controller CMB-P1016NU-HB1 or -GB, the total connectable indoor unit capacity can be 126,000 BTUs or less. If two sub BC controllers are used, the total indoor unit capacity connected to BOTH sub BC controllers also cannot exceed 126,000 BTUs. For sub BC controller CMB-P1016NU-HB1 the total connectable indoor unit capacity can be 126,000 BTUs or less. However, if two sub controllers are used, and one of them is CMB-1016NU-HB1, the total indoor unit capacity connected to BOTH sub controllers must NOT exceed 168,000 BTUs.

MITSUBISHI ELECTRIC TRANE HVAC US: CITY MULTI VRF INDOOR UNIT SCHEDULE

Tag Reference	System Tag	Served by Outdoor Unit	Model	Type	Nominal Cooling Capacity (BTU/h)	Nominal Heating Capacity (BTU/h)	Cooling Design Entering Temp DB/WB (°F) / (Water in temp)	Heating Design Entering Temp DB/WB (°F) / (Water in temp)	Cooling Diversity Full/Partial (See Note 5, 6)	Cooling Total Capacity (BTU/h)	Cooling Sensible Capacity (BTU/h)	Heating Diversity Full/Partial (See Note 5, 6)	Heating Capacity (BTU/h)	Refrig Pipe Dim Liquid/Suction (inch)	Fan Speed Setting	Peak Fan Airflow (cfm) / Design gpm (GUS)/mm	Max Fan ESP Setting 208V/230V (IN WG)	Voltage / Phase	Electrical MCA/MFS	Notes / Options
FC-1	System 1	OU-1	TPEFY012MA144A	Ceiling-Concealed (Ducted)	12,000	13,500	80.0/67.0	70	DIVERSITY OPERATION	10,264.2	7,654.5	DIVERSITY OPERATION	11,344.7	1/4 / 1/2	HIGH	371 0.6/0.6	208/230V/1-phase	2.13/15	1, 2, 3, 4, 7	
FC-2	System 1	OU-1	TPEFY012MA144A	Ceiling-Concealed (Ducted)	12,000	13,500	80.0/67.0	70	DIVERSITY OPERATION	10,264.2	7,654.5	DIVERSITY OPERATION	11,344.7	1/4 / 1/2	HIGH	371 0.6/0.6	208/230V/1-phase	2.13/15	1, 2, 3, 4, 7	
FC-3	System 1	OU-1	TPEFY012MA144A	Ceiling-Concealed (Ducted)	12,000	13,500	80.0/67.0	70	DIVERSITY OPERATION	10,264.2	7,654.5	DIVERSITY OPERATION	11,344.7	1/4 / 1/2	HIGH	371 0.6/0.6	208/230V/1-phase	2.13/15	1, 2, 3, 4, 7	
FC-4	System 1	OU-1	TPEFY012MA144A	Ceiling-Concealed (Ducted)	12,000	13,500	80.0/67.0	70	DIVERSITY OPERATION	10,264.2	7,654.5	DIVERSITY OPERATION	11,344.7	1/4 / 1/2	HIGH	371 0.6/0.6	208/230V/1-phase	2.13/15	1, 2, 3, 4, 7	
FC-5	System 1	OU-1	TPEFY008MA144A	Ceiling-Concealed (Ducted)	8,000	9,000	80.0/67.0	70	DIVERSITY OPERATION	6,842.8	5,988.9	DIVERSITY OPERATION	7,563.2	1/4 / 1/2	HIGH	300 0.6/0.6	208/230V/1-phase	1.75/15	1, 2, 3, 4, 7	
FC-6	System 1	OU-1	TPEFY030MA144A	Ceiling-Concealed (Ducted)	30,000	34,000	80.0/67.0	70	DIVERSITY OPERATION	25,660.5	19,858.9	DIVERSITY OPERATION	28,571.9	3/8 / 5/8	HIGH	883 0.6/0.6	208/230V/1-phase	2.88/15	1, 2, 3, 4, 7	
FC-7	System 1	OU-1	TPEFY024MA144A	Ceiling-Concealed (Ducted)	24,000	27,000	80.0/67.0	70	DIVERSITY OPERATION	20,528.4	17,893.9	DIVERSITY OPERATION	22,689.5	3/8 / 5/8	HIGH	883 0.6/0.6	208/230V/1-phase	2.88/15	1, 2, 3, 4, 7	
FC-8	System 1	OU-1	TPEFY024MA144A	Ceiling-Concealed (Ducted)	24,000	27,000	80.0/67.0	70	DIVERSITY OPERATION	20,528.4	17,893.9	DIVERSITY OPERATION	22,689.5	3/8 / 5/8	HIGH	883 0.6/0.6	208/230V/1-phase	2.88/15	1, 2, 3, 4, 7	
FC-9	System 1	OU-1	TPEFY012MA144A	Ceiling-Concealed (Ducted)	12,000	13,500	80.0/67.0	70	DIVERSITY OPERATION	10,264.2	7,654.5	DIVERSITY OPERATION	11,344.7	1/4 / 1/2	HIGH	371 0.6/0.6	208/230V/1-phase	2.13/15	1, 2, 3, 4, 7	
FC-10	System 1	OU-1	TPEFY024MA144A	Ceiling-Concealed (Ducted)	24,000	27,000	80.0/67.0	70	DIVERSITY OPERATION	20,528.4	17,893.9	DIVERSITY OPERATION	22,689.5	3/8 / 5/8	HIGH	883 0.6/0.6	208/230V/1-phase	2.88/15	1, 2, 3, 4, 7	
FC-11	System 1	OU-1	TPEFY030MA144A	Ceiling-Concealed (Ducted)	30,000	34,000	80.0/67.0	70	DIVERSITY OPERATION	25,660.5	19,858.9	DIVERSITY OPERATION	28,571.9	3/8 / 5/8	HIGH	883 0.6/0.6	208/230V/1-phase	2.88/15	1, 2, 3, 4, 7	
FC-12	System 4	OU-3	TPKA0A0121HA70A	Wall -Mounted	12,000	14,000	80.0/67.0	70	DIVERSITY OPERATION	10,275.6	9,053.1	DIVERSITY OPERATION	7,447.3	1/2 / 1/4	HIGH	425	208/230V/1-phase	Powered by Outdoor	1, 2, 3, 4	
FC-13	System 3	OU-2	TPKA0A0121HA70A	Wall -Mounted	12,000	14,000	80.0/67.0	70	DIVERSITY OPERATION	8,799.1	8,507.9	DIVERSITY OPERATION	4,621.9	1/2 / 1/4	HIGH	425	208/230V/1-phase	Powered by Outdoor	1, 2, 3, 4	
FC-14	System 1	OU-1	TPEFY024MA144A	Ceiling-Concealed (Ducted)	24,000	27,000	80.0/67.0	70	DIVERSITY OPERATION	20,528.4	17,893.9	DIVERSITY OPERATION	22,689.5	3/8 / 5/8	HIGH	883 0.6/0.6	208/230V/1-phase	2.88/15	1, 2, 3, 4, 7	
FC-15	System 1	OU-1	TPEFY008MA144A	Ceiling-Concealed (Ducted)	8,000	9,000	80.0/67.0	70	DIVERSITY OPERATION	6,842.8	5,988.9	DIVERSITY OPERATION	7,563.2	1/4 / 1/2	HIGH	300 0.6/0.6	208/230V/1-phase	1.75/15	1, 2, 3, 4, 7	
FC-16	System 1	OU-1	TPEFY018MA144A	Ceiling-Concealed (Ducted)	18,000	20,000	80.0/67.0	70	DIVERSITY OPERATION	15,396.3	12,706.0	DIVERSITY OPERATION	16,807.0	1/4 / 1/2	HIGH	600 0.6/0.6	208/230V/1-phase	2.94/15	1, 2, 3, 4, 7	
FC-17	System 1	OU-1	TPEFY024MA144A	Ceiling-Concealed (Ducted)	24,000	27,000	80.0/67.0	70	DIVERSITY OPERATION	20,528.4	17,893.9	DIVERSITY OPERATION	22,689.5	3/8 / 5/8	HIGH	883 0.6/0.6	208/230V/1-phase	2.88/15	1, 2, 3, 4, 7	
FC-18	System 1	OU-1	TPLFY005FM140A	Ceiling-Cassette (Four-Way)	5,000	5,800	80.0/67.0	70	DIVERSITY OPERATION	4,276.8	4,116.9	DIVERSITY OPERATION	4,706.0	1/4 / 1/2	HIGH	280	208/230V/1-phase	0.240/24/15	1, 2, 3, 4	
FC-19	System 1	OU-1	TPLFY015FM140A	Ceiling-Cassette (Four-Way)	15,000	17,000	80.0/67.0	70	DIVERSITY OPERATION	12,830.3	8,972.7	DIVERSITY OPERATION	14,286.0	1/4 / 1/2	HIGH	390	208/230V/1-phase	0.350/35/15	1, 2, 3, 4	
FC-20	System 5	OU-4	TPKA0A0241KA70A	Wall -Mounted	24,000	26,000	80.0/67.0	70	FULL DEMAND	20,551.3	17,191.9	FULL DEMAND	0.0	5/8 / 3/8	HIGH	775	208/230V/1-phase	Powered by Outdoor	1, 2, 3, 4	
FC-21	System 6	OU-5	TPKA0A0301KA70A	Wall -Mounted	30,000	32,000	80.0/67.0	70	FULL DEMAND	25,689.1	19,291.3	FULL DEMAND	0.0	5/8 / 3/8	HIGH	775	208/230V/1-phase	Powered by Outdoor	1, 2, 3, 4	

- Notes & Options:
- Nominal cooling capacities are based on indoor coil EAT of 80/67°F (DB/WB), outdoor of 95°F (DB)
 - Nominal heating capacities are based on indoor coil EAT of 70°F (DB), outdoor of 43°F (WB)
 - See outdoor unit schedule for outdoor ambient conditions, connected capacity, and other factors associated with corrected capacities
 - See schematic piping/control diagram for indication of required indoor unit remote controllers, system controllers, and integration devices.
 - Full demand corrected capacity includes de-rate associated with indoor vs. outdoor connected capacity indicated on outdoor unit schedule for associated system. Partial corrected capacity assumes sufficient diversity exists such that the corrected capacity de-rate does not apply. It is the designer's responsibility to ensure "Diamond System Builder" is set in the appropriate output capacity setting (full demand/partial demand) prior to generating this schedule.
 - It is recommended to always base heating corrected capacity on full demand.
 - Provide FMB series filter boxes on return duct side of ducted units. Filters to be 2" thick pleated MERV 13 filters. Contractor to coordinate filters are located in an accessible location.

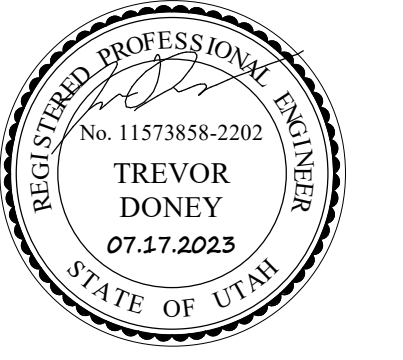
Intermountain Health
Intermountain Kidney Services
West Valley Dialysis

2750 South 5600 West
West Valley City, UT 84120

NJRA Project # 22211.05
Construction Documents Jan 15, 2024
1 Addendum #1 2/20/24

MECHANICAL SCHEDULES

MH602

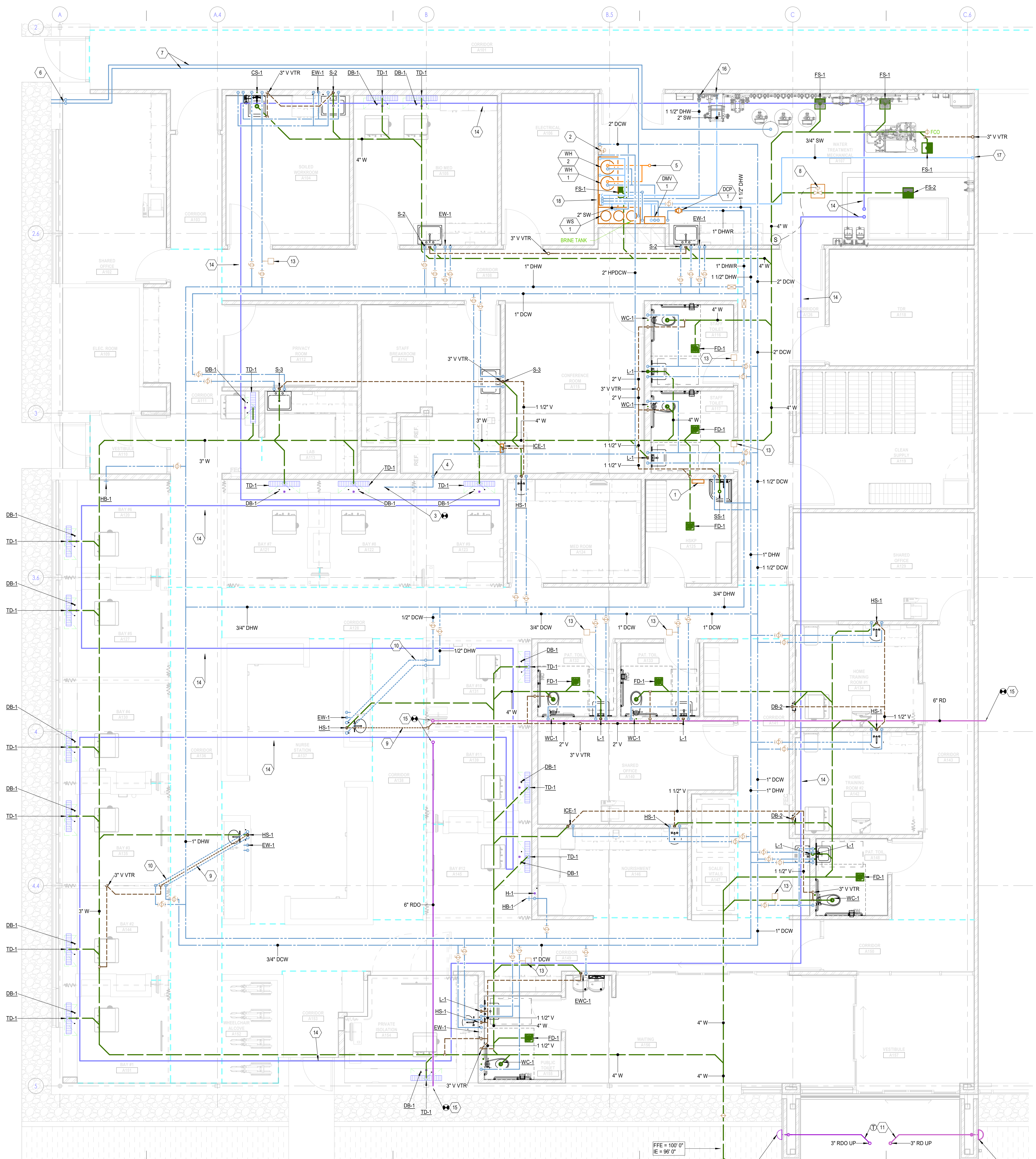


KEYED NOTES

- PRESSURE VACUUM BREAKER FOR CHEMICAL DISPENSER.
- DOMESTIC WATER PRESSURE REDUCING STATION.
- CONNECT NEW 2" DCW TO EXIST 1-1/2" DCW BELOW THE FLOOR FIELD VERIFY SIZE AND LOCATION OF EXISTING LINE.
- RISE UP WALL. PROVIDE SHUT OFF VALVE WITH ACCESS PANEL.
- 2" NG UP.
- TERMINATE SALT SUPPLY LINES AT WALL PER "STEP SAVER" REQUIREMENTS.
- NORMALLY STEEL SALT SUPPLY PIPING PER "STEP SAVER" REQUIREMENTS.
- NORMALLY CLOSED 2-POSITION LINE VOLTAGE SOLENOID VALVE IN CONCRETE PIT WITH ALUMINUM DIAMOND PLATE HINGED COVER. PROVIDE 0-30 MINUTE TIMER SWITCH ON WALL.
- ISLAND VENT PER PLUMBING CODE REQUIREMENTS.
- DROP PIPING BELOW FLOOR.
- THERMOSTAT FOR HEAT CABLE. HEAT TRACE ALL EXTERIOR RD PIPING WITH WATTS/FT. HEATING CABLE.
- SEE CIVIL FOR CONTINUATION.
- WATER HAMMER ARRESTOR.
- 4" PVC CONDUIT BELOW FLOOR FOR ACID TUBING. ROUTING SHOWN IS APPROXIMATE. COORDINATE WITH THE OWNER'S WATER TREATMENT SUPPLIER FOR FINAL ROUTING, INCLUDING PENETRATIONS UP THROUGH THE FLOOR FOR CONNECTION TO THE DIALYSIS BOXES.
- CONNECT NEW 6" CAST IRON ROOF DRAIN PIPING TO EXISTING DRAINS, DOWNSPOUTS AND PVC PIPING OUTSIDE OF THE PLENUM SPACE OF THIS PROJECT.
- CONNECT TO WATER TREATMENT EQUIPMENT. COORDINATE WITH OWNER'S WATER TREATMENT SUPPLIER.
- 3/4" WATER LINE TO BIO-AMP UNIT. TERMINATE WITH 3/4" HOSE THREAD.
- THERMOSTATIC MIXING VALVE.

GENERAL NOTES

- PROJECT SHALL COMPLY WITH ALL GRANGER-HUNTER IMPROVEMENT DISTRICT SPECIFICATIONS AND REQUIREMENTS
- PROJECT SHALL COMPLY WITH ALL UTAH DIVISION OF DRINKING WATER RULES AND REGULATIONS INCLUDING, BUT NOT LIMITED TO THOSE PERTAINING TO BACKFLOW PROTECTION AND CROSS CONNECTION PREVENTION.
- OWNER IS RESPONSIBLE TO SUBMIT BACKFLOW REPORTS TO GRANGER HUNTER IMPROVEMENT DISTRICT WATER QUALITY DEPARTMENT WITHIN 10 DAYS OF INITIAL USE AND ANNUALLY THEREAFTER
- AT THE TIME OF THE GHID FINAL REVIEW OF THESE PLANS, THIS PROJECT WAS NOT CATEGORIZED AS AN INDUSTRIAL USER. IF IN THE FUTURE THIS PROJECT IS MODIFIED, OR ITS USE CHANGED GHID MAY REQUIRE INFRASTRUCTURE TO BE INSTALLED AT THE SOLE COST OF THE OWNER. DISCHARGERS OF FATS, OILS, GREASES, SANDS, ETC. SHALL BE CONNECTED TO AN OUTDOOR 1000 GALLON (MINIMUM), GREASE INTERCEPTOR AND SAMPLING MANHOLE. ONLY ONE SAMPLING MANHOLE IS ALLOWED PER PARCEL OWNER, OR CULINARY WATER METER AND BILL.



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

Intermountain Health
Intermountain Kidney Services
West Valley Dialysis

2750 South 5600 West
West Valley City, UT 84120

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PLUMBING
PLAN LEVEL 1

PP101

2/20/2024 3:48:04 PM



- KEYED NOTES**
1. PROVIDE NEW WET-PIPE FIRE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13, 2019 EDITION. REFER TO DIVISION 21 SPECIFICATIONS FOR DESIGN PARAMETERS.
 2. 2-INCH ROLL-GROOVED FEED MAIN FROM RISER. THIS IS THE POINT OF CONNECTION FOR THE FIRE SPRINKLER SYSTEM. CONTRACTOR SHALL OBTAIN PLANS OF FIELD SURVEY THE EXACT PLACEMENT OF THE EXISTING SYSTEM COMPONENTS BETWEEN THE RISER AND THIS STUB, FOR USE IN HYDRAULIC CALCULATIONS.
 3. ROOM SHALL BE DESIGNED TO ORDINARY-HAZARD GROUP 1.

GENERAL NOTES

1. ALL FIRE LINES WITHIN GRANGER-HUNTER BOUNDARIES MUST COMPLY WITH THE INTERNATIONAL PLUMBING CODE, SECTION 606 PROTECTION OF POTABLE WATER SUPPLY. GRANGER-HUNTER IMPROVEMENT DISTRICT REQUIRES TESTABLE BACKFLOW ASSEMBLIES ON ALL CONNECTIONS CONSIDERED A CROSS-CONNECTION. THE FIRE SYSTEM MAY NEED TO BE MODIFIED BY ENGINEER'S RECOMMENDATIONS.



1 FIRE PROTECTION PLAN LEVEL 1
SCALE: 1/4"=1'-0"

Intermountain Health
Intermountain Kidney Services
West Valley Dialysis

2750 South 5600 West
West Valley City, UT 84120

NJRA Project # 22211.05
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FIRE PROTECTION PLAN LEVEL 1

FP101

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SECTION 23 0900 - INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. The Facility Management and Control System (FMCS) Contractor shall furnish and install a fully integrated building automation system, incorporating direct digital control (DDC) for energy management, equipment monitoring and control as herein specified. The system shall include all required computer software and hardware, controllers, sensors, transmission equipment, system workstations, local panels, conduit, wire, installation, engineering, database and setup, supervision, commissioning, acceptance test, training, warranty service and, at the owner's option, extended warranty service. **Through a BACnet Interface the VRF control system will be required to report back to Utah Valley Hospital's Control Shop.**
- B. The system shall use BACnet as its floor level protocol. System components shall be certified and display the BTL logo where applicable.
- C. The FMCS shall demonstrate, with (3) proof sources, integration with HVAC industry open standard protocols, including LonMark, BACnet, Modbus, and Internet standard SQL database and HTTP / HTML / XML text formats.
- D. The FMCS shall communicate to third party systems such as boilers, air handling systems, energy metering systems, other energy management systems, fire-life safety systems and other building management related devices using any of the open, interoperable communication protocols referenced in Paragraph D.
- E. All materials and equipment used shall be standard components, regularly manufactured for this and/or other systems and not custom designed especially for this project
- F. Plenum rated cable is allowed for low voltage control wiring.
- G. Control voltage on each floor for fan coil units and other mechanical equipment is located in the electrical rooms. See electrical drawings for location.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including General and supplementary Conditions and Division-1 specification sections, apply to work of this section.
- B. Products furnished but not installed under this section:
 - 1. Valves, flow switches, flow sensors, thermowells and pressure taps to be installed under Section 23000.
 - 2. Automatic dampers to be installed under Section 23000.
- C. Coordination with electrical:

1. Installation of all line voltage power wiring by Division 26000 with the exception where line voltage power wiring is required by the FMCS and is not show to be provided by Division 26000, it shall be furnished as part of the work of the FMCS.
2. Each motor starter provided under Division 26000, shall be furnished with individual control power transformer to supply 120-volt AC control power and auxiliary contacts (one N.O. and one N.C.) for use by this section.
3. Coordinate Electrical Sub-metering as required in this specification.

1.3 QUALITY ASSURANCE

- A. The system shall be furnished, engineered, and installed by the manufacturers' locally authorized representative. The controls contractor shall have factory-trained technicians to provide instruction, routine maintenance, and emergency service within 24 hours upon receipt of request.
- B. At the time of bid, all FMCS Application Specific Controllers and Programmable Equipment Controllers shall be listed as follows:
 1. Underwriters Laboratory UL 916
 2. FCC Regulation, Part 15, Class B

1.4 SUBMITTALS

- A. Submit 10 complete sets of documentation in the following phased delivery schedule:
 1. Valve and damper schedules
 2. Equipment data cut sheets
 3. System schematics, including:
 - a. sequence of operations
 - b. point names
 - c. point addresses
 - d. point to point wiring
 - e. interface wiring diagrams
 - f. panel layouts
 - g. system riser diagrams
 4. AutoCAD® compatible as-built drawings
- B. Upon project completion, submit operation and maintenance manuals, consisting of the following:
 1. Index sheet, listing contents in alphabetical order
 2. Manufacturer's equipment parts list of all functional components of the system, disk of system schematics, including wiring diagrams
 3. Description of sequence of operations
 4. As-Built interconnection wiring diagrams
 5. User's documentation containing product, system architectural and programming information.

6. Trunk cable schematic showing remote electronic panel locations, and all trunk data
7. List of connected data points, including panels to which they are connected and input device (ionization detector, sensors, etc.)
8. Conduit routing diagrams
9. Copy of the warranty/guarantee
10. Operating and maintenance cautions and instructions
11. Recommended spare parts list

1.5 COMMISSIONING COORDINATION

- A. The Temperature Controls Contractor shall coordinate all work with the Commissioning Agent. Work will include but not be limited to control sequence review meetings, establish remote FMCS access, functional testing and retesting.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. **Approved systems to communicate with the Mitsubishi/Trane VRF system are.**
 1. **Siemens.**
 2. **Atkinson Electronics**

2.2 The Facility Management Control System (FMCS) shall be comprised of a network of interoperable, stand-alone digital controllers. The FMCS shall incorporate BACnet technology. The system shall include:

- A. Graphical User Interface (GUI), which includes the hardware and software necessary for a user to interface with the control system and devices. (SUPERVISOR)
- B. All components and controllers supplied under this contract shall be true "peer-to-peer" communicating devices. Components or controllers requiring "polling" by a host to pass data shall not be acceptable.
- C. Communication and integration of 3rd party BACnet products shall be accomplished without gateways or interface devices. The 3rd party product supplier shall provide BACnet pic statements for each device.

2.3 GRAPHICAL USER INTERFACE SOFTWARE (GUI)

- A. Operator workstations must be capable of supporting any LonMark or BACnet compliant product. The operator shall not be able to distinguish the DDC points from different manufacturers when commanding, monitoring points or acknowledging alarms.
- B. The software shall provide a multi-tasking type environment that allows the user to run several applications simultaneously. The GUI software shall run on a Windows 10 operating system. The operator shall be able to work in Microsoft Word, Excel, and

other Windows10 based software packages, while concurrently annunciating on-line FMCS alarms and monitoring information.

- C. Real-Time Displays. The GUI, shall at a minimum, support the following graphical features and functions:
1. Graphic screens shall be developed using any drawing package capable of generating a GIF, BMP, or JPG file format. Use of proprietary graphic file formats shall not be acceptable. In addition to, or in lieu of a graphic background, the GUI shall support the use of scanned pictures.
 2. A gallery of HVAC and automation symbols shall be provided, including fans, valves, motors, chillers, AHU systems, standard ductwork diagrams and symbols. The user shall have the ability to add custom symbols to the gallery as required.
 3. Graphic screens shall have the capability to contain objects for text, real-time values, animation, color spectrum objects, logs, graphs, HTML or XML document links, schedule objects, hyperlinks to other URL's, and links to other graphic screens.
 4. Graphics shall support layering and each graphic object shall be configurable for assignment to a layer. A minimum of six layers shall be supported.
 5. Modifying common application objects, such as schedules, calendars, and setpoints shall be accomplished in a graphical manner.
 - a. Schedule times will be adjusted by mouse command using a graphical slider, without requiring any keyboard entry from the operator.
 - b. Holidays shall be set by mouse command using a graphical calendar, without requiring any keyboard entry from the operator.
 6. Commands to start and stop binary objects shall be done by mouse command from the pop-up menu. No entry of text shall be required.
 7. Adjustments to analog objects, such as set points, shall be done by mouse command using a graphical slider to adjust the value. No entry of text shall be required.
- D. On-Line Help. Provide a context sensitive, on-line help system to assist the operator in operation and editing of the system. On-line help shall be available for all applications and shall provide the relevant data for that particular screen. Additional help information shall be available through the use of hypertext. All system documentation and help files shall be in HTML format.
- E. Each operator shall be required to log on to that system with a user name and password in order to view, edit, add, or delete data. System security shall be selectable for each operator. The system administrator shall have the ability to set passwords and security levels for all other operators. Each operator password shall be able to restrict the operators' access for viewing and/or changing each system application, full screen editor, and object. Each operator shall automatically be logged off of the system if no keyboard or mouse activity is detected. This auto log-off time shall be set per operator password. All system security data shall be stored in an encrypted format.
- F. System Diagnostics. The system shall automatically monitor the operation of all workstations, printers, modems, network connections, building management panels, and controllers. The failure of any device shall be annunciating to the operator.

- G. The system will be provided with a dedicated alarm window or console. This window will notify the operator of an alarm condition, and allow the operator to view details of the alarm and acknowledge the alarm. The use of the Alarm Console can be enabled or disabled by the system administrator.
- H. When the Alarm Console is enabled, a separate alarm notification window will supersede all other windows on the desktop and shall not be capable of being minimized or closed by the operator. This window will notify the operator of new alarms and un-acknowledged alarms. Alarm notification windows or banners that can be minimized or closed by the operator shall not be acceptable.

2.4 WEB BROWSER CLIENTS

- A. The system shall be capable of supporting an unlimited number of clients using a standard Web browser such as Internet Explorer® or Mozilla Firefox®. Systems requiring additional software (to enable a standard Web browser) to be resident on the client machine, or manufacture-specific browsers shall not be acceptable.
- B. The Web browser software shall run on any operating system and system configuration that is supported by the Web browser. Web page access and control shall be from the SUPERVISOR.
- C. The Web browser shall provide the same system view, in terms of graphics, schedules, calendars, logs, etc., and provide the same interface methodology as is provided by the Graphical User Interface. Systems that require different views or that require different means of interacting with objects such as schedules, or logs, shall not be permitted.
- D. The Web browser client shall support at a minimum, the following functions:
 - 1. Graphical screens developed for the GUI shall be the same screens used for the Web browser client. Any animated graphical objects supported by the GUI shall be supported by the Web browser interface.
 - 2. HTML programming shall not be required to display system graphics or data on a Web page. HTML editing of the Web page shall be allowed if the user desires a specific look or format.
 - 3. Storage of the graphical screens shall be in the SUPERVISOR. Systems that require graphics storage on each client machine are not acceptable.
 - 4. Real-time values displayed on a Web page shall update automatically without requiring a manual "refresh" of the Web page.
 - 5. Users shall have administrator-defined access privileges. Depending on the access privileges assigned, the user shall be able to perform the following:
 - a. Modify in a graphical manner, common application objects, such as schedules, calendars, and set points. Schedule times will be adjusted by mouse command using a graphical slider, without requiring any keyboard entry from the operator. Holidays shall be set by mouse command using a graphical calendar, without requiring any keyboard entry from the operator.
 - b. Commands to start and stop binary objects shall be done by mouse command right-click of the selected object and selecting the appropriate

- command from the pop-up menu. No entry of text shall be required.
 - c. View logs and charts
 - d. View and acknowledge alarms
 - 6. The system shall provide the capability to specify a user's home page (as determined by the log-on user identification). The system shall provide the ability to limit a specific user to just their defined home page. From the home page, links to other views, or pages in the system shall be possible, if allowed by the system administrator.
 - 7. Graphic screens on the Web Browser client shall support hypertext links to other locations on the Internet or on Intranet sites, by specifying the Uniform Resource Locator (URL) for the desired link.
- E. Trend logging and system monitoring requirements.
- 1. Trend data shall be stored for three years and be accessible through web-browser-based reporting tools.
 - 2. See Section 230800 for additional trending implementation requirements.

2.5 BACNET NETWORK MANAGEMENT

- A. Network management shall include the following services: device identification, device installation, device configuration, device diagnostics and device maintenance.
- B. The network management tool shall also provide diagnostics to identify devices on the network, to reset devices, and to view health and status counters within devices.
- C. These tools shall provide the ability to "learn" an existing BACnet network, regardless of what network management tool(s) were used to install the existing network, so that existing devices and newly added devices are part of a single network management database.
- D. The network management database shall be resident in the Network Area Controller (NAC), ensuring that users with proper authorization have access to the network management database at all times. Systems employing network management databases that are not resident at all times within the control system shall not be accepted.

2.6 PROJECT SPECIFIC WEB PAGES

- A. Home page shall include a campus layout of the individual buildings at the site. Once an individual building is selected the following minimum web-based tree structure shall be provided:
 - 1. Documents Page: The document page shall include the O&M Manuals for the control system in PDF format along with AutoCAD drawings for each drawing provided in the control system O&M Manual.
 - 2. Station Functions:
 - a. Logging separate sheet of station functions for a particular selected building shall be the viewing of one or more logs or the creation of logs in

which any value at any point, or the mode of any point, shall be selected via the web to be trended against any other point with an adjustable frequency in seconds, minutes, hours or days.

- b. The alarm acknowledgement via the web shall allow the viewing and acknowledgement of the alarms.
 - c. Audit log shall be provided via the web to show the operator actions as well as other audit logs as specified in section 2.5 Network Area Controller (NAC) paragraph "M" Data Collection and Storage.
3. Floor Plans:
- a. AutoCAD drawings of floor plans shall be provided in the control system such that via the web the user shall be able to turn layers on and off on the mechanical floor plans. These floor plans shall also include an overlay of the temperature control as-built wiring for the project showing thermostat locations, communication runs, transformer locations, controller locations, etc.
 - b. Floor Display Summaries. The operator shall be able to select floor plans displaying the following formats:
 1. All zone temperatures
 2. All zone heating percentages
 3. All zone cooling percentages
 4. All zone room names and numbers
 5. All zones cfm delivered.
 - c. Upon selecting a graphical floor plan layout, the web page shall show all the zone temperature sensor locations on the floor. By clicking on the zone temperature location, an individual VAV box graphic shall be displayed with the following attributes:
 1. A manual menu that shall allow the operator to manually set the air flow set point, space temperature set point, damper position, cooling percentage, heating percentage, and zero the box.
 2. A 24-hour log chart that shows space temperature history, flow history, and allows the operator to build custom charts by comparing this log to other associated selectable logs.
 3. A display of the VAV box discharge temperature, air handler discharge temperature, space temperature, and space temperature set point.
 4. A bar graph that shows actual CFM, current air flow, and current air flow set point, percentage of heating and cooling in a thermometer-like fashion and changes color based on heating or cooling mode.
 5. The damper position, reheat valve position, occupancy status, room name and heating/cooling mode shall also be shown.
4. Systems:
- a. On selecting the systems menu, a tree structure shall allow the operator to select the air handlers, boilers, chillers, control valves, pumps, heat exchangers, lab air flow valves and hoods, etc. systems associated with that building. The graphics shall also show the piping and ductwork

associated with the air handler as well as the safeties, temperature sensors, humidity sensors, dampers, VFD's, associated with that fan system. See points lists for specifics.

- b. All devices that provide dynamic function in the primary equipment, i.e., fans, pumps, coils, dampers shall be dynamic in nature showing their operating status/percentage of capacity by movement on the web page.
- c. The set points for the various control loops shall be adjustable via the web page. Individual controlled devices, i.e. valves, dampers and fans shall be controlled via the web page and be stopped or started or placed in a command state or percentage of value output.

2.7 FIELD DEVICES

A. Provide automatic control valves, automatic control dampers, thermostats, ~~clocks~~, sensors, controllers, and other components as required for complete installation. Except as otherwise indicated, provide manufacturer's standard control system components as indicated by published product information, designed and constructed as recommended by manufacturer.

B. TEMPERATURE SENSORS

1. Temperature Sensors: Temperature sensors shall be linear precision elements with ranges appropriate for each specific application. Where sensors are located in public areas they shall not employ set point adjustments or override capability. Set point adjustment shall be programmed for $\pm 2.5^\circ$ maximum initially.
2. Space (room) sensors shall be available with set point adjustment and override switch.
3. Duct mounted averaging sensors shall utilize a sensing element incorporated in a copper capillary with a minimum length of 20 feet. The sensor shall be installed according to manufacture recommendation and looped and fastened at a minimum of every 36 inches.
4. Sunshields shall be provided for outside air sensors.
5. Thermo-wells for all immersion sensors shall be stainless steel or brass as required for the application.

C. Humidity Sensors: Humidity sensors shall be of the solid-state type using a capacitance-sensing element. The sensor shall vary the output voltage with a change in relative humidity. Room humidity sensors shall have a minimum range of 10% to 90% $\pm 5\%$. Supply air humidity sensors shall have a normal range of 10% to 90% $\pm 5\%$.

D. Air Velocity Sensors: The sensor shall use differential pressure to determine airflow rate and have repeatability within 1% of reading and an accuracy of $\pm 5\%$ of range. The velocity range shall be from 0 to 3250 FPM.

E. Pressure Sensors: The differential pressure sensor shall be temperature compensated and shall vary the output voltage with a change in differential pressure. Sensing range shall be suitable for the application with linearity of 1.5% of full scale and offset of less than 1% of full scale. Sensor shall be capable of withstanding up to 150% of rated pressure without damage. Sensor range shall not exceed 4 times the set point.

- F. Building Static Pressure Transmitters and Building Sensing Arrays: Building static pressure transmitter installations shall include four runs of equal length 3/8 pneumatic tubing to the four exposures of the building. The indoor transmitter reference point shall be the lobby if the air handler serves the lobby or a public outside entrance. For the upper floors of the building, the indoor reference point shall be the elevator lobby of the middle floor served by the air handler, with the outdoor references located on the same floor as the elevator lobby reference with equal length 3/8 tubing to each exposure of the building. Separate building static transmitters shall be used for each air handling system.

1. Outdoor pickups shall include a bug screen to prevent insects from plugging and shielded to prevent rain water or snow from entering the pickup sensor.

G. SWITCHES AND THERMOSTATS

1. The FMCS Contractor shall furnish all electric relays and coordinate with the supplier of magnetic starters for auxiliary contact requirements. All electric control devices shall be of a type to meet current, voltage, and switching requirement of their particular application. Relays shall be provided with 24 VAC coils and contacts shall be rated at 10 amps minimum.
2. Differential Pressure Switches: Pressure differential switches shall have SPDT changeover contact, switching at an adjustable differential pressure set point.
3. Low Temperature Detection Thermostats: Shall be the manual reset type. The thermostat shall operate in response to the coldest one-foot length of the 20-foot sensing element, regardless of the temperatures at other parts of the element. The element shall be properly supported to cover the entire downstream side of the coil with a minimum of three loops. Separate thermostats shall be provided for each 25 square feet of coil face area or fraction thereof.
4. Current Sensing Relays: Motor status indications, where shown on the plans point list shall be provided via current sensing relays. The switch output contact shall be rated for 30 VDC, .15 amps.
5. Flow Switches: Motor status indications, where shown on the plans point list, shall be provided via flow switches. Flow switches shall be of the paddle type equipped with SPDT contacts to establish proof of flow.

H. CONTROL VALVES

1. General: Control Valves up to 4 inches shall be sized for a 3 to 5 psi pressure drop. Valves shall be packless, modulating, electrically or magnetically actuated, with a control rangeability of 100 to 1. These valves shall have true linear flow characteristics in relationship to valve opening.
2. ½ inch to 4 inches: Valves shall be equipped with handwheel, or manual position mounted dial adjacent to valve, to allow manual positioning of valve in absence of control power.
3. 4 inches to 6 inches: Valves shall be modulating electrically actuated, 2-way or 3-way as required, with a rangeability of 50 to 1. Valve body shall be flanged and shall be equipped with a handwheel, or manual position dial mounted adjacent to the valve, to allow manual positioning of the valve in the absence of control power.
4. Butterfly Valves: 2-way and 3-way butterfly valves shall be cast iron valve body,

- with stainless steel stem, and available with disc seal for bubble-tight shut off.
5. Pressure Independent Chilled Water Control Valves for Primary Equipment
 - a. The control valves shall be NPS 2 and smaller with a forged brass body rated at no less than 400 PSI, chrome plated brass ball and stem, female NPT union ends, dual EPDM lubricated O-rings and a brass or TEFZEL characterizing disc.
 - b. The control valves shall be NPS 2-1/2 through 6 with GG25 cast iron body according to ANSI Class 125, standard class B, stainless steel ball and blowout proof stem, flange to match ANSI 125 with a dual EPDM O-ring packing design, PTFE seals and a stainless-steel flow characterizing disc.
 - c. The control valves shall accurately control the flow from 0 to 100% full rated flow with an operating pressure differential range of 5 to 50 PSI differential across the valve with a valve body accuracy of $\pm 5\%$ variance due to differential pressure fluctuation or $\pm 10\%$ total assembly error incorporating differential pressure fluctuation, manufacturing tolerances and valve hysteresis.
 - d. The control valves shall have equal percentage flow characteristics.
 - e. The control valves manufacturer shall provide a published commissioning procedure following the guidelines of the National Environmental Balancing Bureau (NEBB) and the Testing Adjusting Balancing Bureau (TABB).

I. GAS FLOW METERS – ONICON

1. Provide an ONICON Model F-3XXX Insertion Electromagnetic Flow Meter (or FB-3500 for Bi-directional flow applications), complete with all installation hardware necessary to enable insertion and removal of the meter without system shutdown.
2. The flow meter shall be hand-insertable up to 400 psi.
3. The flow meter shall average velocity readings from two sets of diametrically opposed electrodes.
4. Each flow meter shall be individually wet-calibrated against a primary volumetric standard that is accurate to within 0.1% and traceable to NIST*.
5. A certificate of calibration shall be provided with each flow meter. Accuracy shall be within $\pm 1\%$ of rate from 2-20 ft/s. Overall turndown shall exceed 100:1.
6. The FLOW Meters shall have a BACnet/IP output signal.

J. DAMPER ACTUATORS

1. Actuators shall be of the push-pull or rotary type of modulating, 3-point floating, or 2-position control as required by the application. The actuator shall use an overload-proof synchronous motor or an electric motor with end switches to de-energize the motor at the end of the stroke limits. Control voltage shall be 24 VAC, 0-10 VDC, or 4-20 ma as required. Actuators shall be available with spring return to the normal position when required. Actuators shall have a position indicator for external indication of damper position. Actuators shall have manual override capability without disconnecting damper linkage. Actuators for purge system shall meet failsafe and smoke control speed requirements.

K. CONTROL DAMPERS

1. Motorized dampers, unless otherwise specified elsewhere, shall have damper

frames using 13 gauge galvanized steel channel or 1/8" extruded aluminum with reinforced corner bracing. Damper blades shall not exceed ten (10) inches in width or 48" in length. Blades are to be suitable for high velocity performance. Damper bearings shall be as recommended by manufacturer for application. Bushings that turn in the bearing are to be oil impregnated sintered metal. All blade edges and top and bottom of the frame shall be provided with replaceable, butyl rubber or neoprene seals. Side seals may be spring-loaded stainless steel. The seals shall provide a maximum of 1% leakage at a wide open face velocity of 1500 FPM and 4: W.C. close-off pressure. The damper linkage shall provide a linear flow or equal percentage characteristic as required. Provide Ruskin RCD60 model.

2. Control dampers shall be parallel or opposed blade type as scheduled on drawings or outdoor and return air mixing box dampers shall be parallel blade, arranged to direct air streams towards each other. All other dampers may be parallel or opposed blade types.

2.8 AIRFLOW MEASURING STATION

A. General:

1. Provide Ebtron Gold or Air Monitor Electraflo, VOLU-probe and VOLU-flo/OAM total supply air, and outside, and return air flow measurement stations (AFMS) for each new air handling unit and return fans.
2. AFMS shall consist of single or multiple probes as required to achieve an airflow measurement accuracy of $\pm 3\%$ of reading.
3. AFMS probe assemblies must have multiple sensors that use instrument grade thermal dispersion, temperature compensated, thermistor sensing technology and digital electronics.
4. The AFMS manufacturer &/or their local representative shall recommend and approve the actual location for the AFMS and determine whether or not a honeycomb straightener is required.
5. Vortex shedding or pitot tube arrays and differential pressure sensing arrays with sensors that require auto-zeroing will not be accepted.
6. The basis of design for the AFMS is powered by the low voltage controls. If line voltage is required, it will be the responsibility of this section to coordinate and provide line voltage at no additional cost to the owner.
7. The flow monitor/controller shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.
8. The monitor/controller shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.
9. The monitor/controller shall measure inlet airflow with an accuracy of $\pm 5\%$ of reading over range of 150-600 FPM, 2501,000 FPM, 500-2,000 FPM, and 150-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.
10. The monitor/controller shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

11. The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1.
12. Provide where indicated, an array of airflow traverse probes capable of continuously monitoring the fan or duct capacities (air volumes) they serve.
13. Each airflow traverse probe shall contain multiple total and static pressure sensors located along the exterior surface of the cylindrical probe and internally connected to their respective averaging manifolds. The flow sensors shall not protrude beyond the surface of the probe(s), and shall be the offset (Fechheimer) type for static pressure and the chamfered impact type for total pressure measurement. The airflow sensing probe's measurement accuracy shall not be affected by directional flow having pitch and/or yaw angles up to 30°. Each airflow traverse probe shall be of extruded aluminum construction and furnished with mounting plate(s), gasket, and signal fittings suitable for HVAC duct installation.
14. Total and static pressure sensors shall be located at the centers of equal areas (for rectangular ducts) or at equal concentric area centers (for circular ducts) along the probe length.
15. Probes shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of $\pm 2\%$ without the use of correction factors. The maximum allowable unrecovered pressure drop caused by the probes shall not exceed .025" w.c. at 2000 FPM, or .085" w.c. at 4000 FPM.
16. The transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce an output linear and scaled for air volume, velocity, differential pressure, etc.
17. The transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one transmitter output during normal operating mode. All transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.
18. The transmitter will be available in multiple natural spans covering the range of 0.05 IN w.c. to 25.0 IN w.c. with an accuracy of 0.25% of natural span. The transmitter shall be furnished with a transducer automatic zeroing circuit and be capable of maintaining linear output signals on applications requiring 10 to 1 velocity turndown.

B. Sensors:

1. Each sensing point shall consist of one glass encapsulated self-heated thermistor for velocity sensing and one glass encapsulated thermistor for temperature sensing.
2. Sensors must be hermetically sealed to be water resistant and capable of being frequently exposed to moisture without causing sensor failure.
3. Factory calibration: @ 0 fpm & @ 16 different airflow rates to NIST standards.
4. Velocity accuracy: ~ 2% of reading.
5. Temperature accuracy: + 0.180F.
6. Velocity output scaling: 0-500; 0-1000; 0-2500; 0-5000 or 0-10000 fpm (as required by the application).
7. Operating temp. range: ~20o to 1600 F.
8. Operating RH range: 0 to 99% (non-condensing).

C. Probes:

1. Aluminum, 316 stainless steel or gold anodized bodies with 2 to 8 sensors per probe.
2. Air pressure drop: 0.0005 in wg. @ 2000 fpm (maximum).

D. Electronics:

1. Microprocessor based, totally solid state, industrial grade integrated circuits that do not require periodic calibration.
2. Each sensor shall be independent from any other sensor.
3. An intelligent "sensor detection system" (SDS) shall put the transmitter into an alarm mode if any sensor or the transmitter is not operating properly.
4. The SDS shall ignore any sensor that is inoperable and utilize only the remaining operable sensors to determine airflow and assure an accurate and uninterrupted output signal.
5. Transmitter outputs: 4-20 ma; 0-10 vdc; BACnet MSTP or IP.
6. Operating temp. range: -20~ to 160°F.
7. Operating RH range: 0 to 99% (non-condensing).
8. Multi-character based for transmitter visual interface (note: LCD available or Gold Series product line only).

E. Start-up:

1. Factory authorized start-up certification and owner-training services must be provided and conducted by the AFMS manufacturer's local representative.

F. Warranty:

1. 24 months from date of start-up certification.

2.9 PROJECT MANAGEMENT

A. Provide a manager who shall, as part of his duties, be responsible for the following activities:

1. Coordination between the Controls Contractor and all other trades, owner, local authorities and the design team.
2. Scheduling of manpower, material delivery, equipment installation and checkout.
3. Maintenance of construction records such as project scheduling and manpower planning and AutoCAD or Visio for project co-ordination and as-built drawings.
4. Coordination/single point of contact.

2.10 INSTALLATION METHODS

A. Install systems and materials in accordance with manufacturer's instructions, rough-in drawings and equipment details. Install electrical components and use electrical products complying with requirements of applicable Division 26000 sections of these specifications.

1. The contractor is required to deliver a functionally complete operating building.

Provide unconditional one-year parts and service warranty. Warranty period commences when architectural substantial completion has been achieved and all the FMCS controls commissioning issues have been resolved. At that time, a completion certificate will be issued by the Cx agent.

- B. The term "control wiring" is defined to include providing of wire, conduit, and miscellaneous materials as required for mounting and connecting electric or electronic control devices.
- C. All exposed wiring, low and line voltage subject to mechanical damage, shall be run in conduit. Line and low voltage wiring shall be run in separate conduits. Concealed but accessible wiring, except in mechanical rooms and areas where other conduit and piping are exposed shall run in UL plenum rated cable as approved by local codes unless expressly restricted by requirements in Division 26000 specification. Control wiring below 8 feet in Mechanical Rooms and areas exposed to severe physical damage (i.e. loading dock, corridors subject to carts, forklifts, etc.) may be run in EMT conduit in lieu of rigid conduit as required in Section 260533.
- D. All controllers, relays, transducers, etc., required for stand-alone control shall be housed in a NEMA 1 enclosure with a lockable door.

2.11 SYSTEM ACCEPTANCE

- A. General: The system installation shall be complete and tested for proper operation prior to acceptance testing for the Owner's authorized representative. A letter shall be submitted to the Architect requesting system acceptance. This letter shall certify all controls are installed and the software programs have been completely exercised for proper equipment operation. Acceptance testing will commence at a mutually agreeable time within ten (10) calendar days of request. When the field test procedures have been demonstrated to the Owner's representative, the system will be accepted. The warranty period will start at this time.
- B. Field Equipment Test Procedures: DDC control panels shall be demonstrated via a functional end-to-end test. Such that:
 - 1. All output points shall be commanded (on/off, stop/start, adjust, etc.) and their operation verified.
 - 2. All analog input points shall be verified for proper operation.
 - 3. All digital input points shall be verified by changing the state of the field device and observing the appropriate change of displayed value.
 - 4. If a point should fail testing, perform necessary repair action and retest failed point and all interlocked points.
 - 5. Automatic control operation shall be verified by introducing an error into the system and observing the proper corrective system response.
 - 6. Selected time and set point schedules shall be verified by changing the schedule and observing the correct response on the controlled outputs.
- C. As-Built Documentation: After a successful acceptance demonstration, the Contractor shall submit as-built drawings of the completed project for final approval. After receiving final approval, supply "6" complete 11x17 as-built drawing sets, together with AutoCAD or Visio diskettes to the owner.

- D. Operation and Maintenance Manuals: Submit four copies of operation and maintenance manuals. Include the following
1. Manufacturer's catalog data and specifications on sensors, transmitters, controllers, control valves, damper actuators, gauges, indicators, terminals, and any miscellaneous components used in the system.
 2. An operator's manual that will include detailed instructions for all operations of the system.
 3. An operator's reference table listing the addresses of all connected input points and output points. Settings shall be shown where applicable.
 4. A copy of the warranty/guarantee.
 5. Operating and maintenance cautions and instructions.

2.12 TRAINING

- A. Contractor shall provide to the engineer a training class outline prior to any scheduled training.
- B. Factory trained control engineers and technicians shall provide 5 training sessions (4 Hrs each) for the Owner's personnel.
- C. The course shall include instruction on specific systems and instructions for operating the installed system to include as a minimum:
1. HVAC system overview
 2. Operation of control system
 3. Function of each component
 4. System operating procedures
 5. Programming procedures
 6. Maintenance procedures

2.13 WARRANTY/GUARANTEE

- A. The control system shall be warranted/guaranteed to be free from defects in both material and workmanship for a period of twelve (12) months of normal use and service. This warranty/guarantee shall become effective the date the owner accepts or receives beneficial use of the system as defined by Utah state law.

PART 3 SEQUENCE OF OPERATION

3.1 General:

- A. All mechanical equipment shall be monitored thru the DDC Control system with proof of flow devices. The run time of a monitored motors shall be available at the Facility Management System Console. A maintenance alarm message shall be programmed at a specific run time as designated by the system operator. The alarm message shall be a designated by the operator.

- B. Equipment shall be provided with network interface provisions and controlled from a stand alone web based system until the main building is upgraded with a new BMS system. Once the new BMS is available, the equipment shall interface and integrate with the main building control system.

3.2 GENERAL EXHAUST FAN:

- A. Fan shall run continuously as commanded by the FMCS. A fan status shall monitor the fan for proof of flow and alarm the FMCS system upon fan failure. Exhaust fans shall be interlocked with the DOAS unit. When the DOAS is off the exhaust fans shall be off. These fans shall run continuously as commanded by the FMCS. Monitor fan status and alarm the FMCS system upon fan failure.

3.3 VESTIBULE RADIANT PANELS:

- A. These panels shall be enabled based on local thermostat. The mechanical room unit heater shall provide a fault alarm if equipment fails.

3.4 BUILDING GRAPHICAL USER INTERFACE

- A. All metered trend data and power usage should be displayed to the graphical user interface (GUI) of the building management system. The GUI shall be a separate page on the controls graphics that can be access from the home page of the building automation system. This page shall display at a minimum the following information.
 1. Building energy usage for both electrical consumption and natural gas. Electrical usage shall be displayed in (kWh) and natural gas displayed in (Dth). This display will provide access to past history as well as real time building performance.
 2. Cooling Plant usage (MBTU).
 3. Boiler Plant energy usage (MBTU).
 4. Fan efficiency per air handler. This shall be displayed in (kW/CFM).

3.5 GAS METERS

- A. Provide a BTU flow meter on the main natural gas line serving the building. A remote monitoring module shall be provided with the natural gas meter for the building. The contractor shall record the flow on the main gas meter. The difference between this meter and the other BTU meters shall be recorded by the FMCS to provide natural gas usage. Meters shall report pressure and temperature compensated volume in hundreds cubic fee (CCF) or thousands cubic fee (MCF).

3.6 VRF SYSTEM AND DEDICATED OUTSIDE AIR SYSTEM (DOAS):

- A. **The VRF system operates under factory furnished controls. This contractor wires the thermostat to the fan coils and then from the fan coils to the refrigerant control boxes and then to the respective VRF air cooled compressor assembly located on the roof. There is also wiring required between the VRF equipment and the BACnet interface card. Monitor the listed points through the BACnet card. Including but not limited to space temperature, dirty filter, unit failure etc.**

- B. The DOAS shall run continuously while in occupied mode. A control loop shall measure the Discharge Air temperature and modulate the heating to maintain a Discharge Air temperature of 70° F (adj) while in heating mode. A control loop shall measure the Discharge Air temperature and modulate the cooling to maintain a Discharge Air temperature of 75° F (adj) while in cooling mode. Provide an alarm to the BMS in the event that the discharge air temperatures have not maintained, dirty filters, unit failure, etc.

PART 4 POINTS LIST:

	Input / Output						Web Pages Graphics										Alarms				Trends Archive Size Verify w/Owner					
	Digital Input	Digital Output	Analog Input	Analog Output	Hardwire Interlock	BAS Communication	Status	Temperature of Other Value	Cooling Percentage	Heating Percentage	Dynamic Flow Diagrams	O&M Manuals	Start/Stop	Status	Display Value	Adjust Value	Run Time Totalize or Totalize	Operator Workstation	Remote Device/Email	Building Manager	User	Life Safety Alarm	Run Time / Totalize	30 Minute / Week	Change of Value / 800 Samples	
EXHAUST FAN																										
Fan Start/Stop		X				X				X		X						X	X	X						
Fan Status	X					X	X			X			X					X	X				X			
DOAS																										
Fan Start/Stop		X				X				X		X														
Fan Status	X					X	X			X			X					X	X	X			X			
Discharge Air temperature	X		X			X	X			X								X	X	X			X			
Discharge Air Set Point						X		X		X					X	X							X			
VRF UNITS																										

	Input / Output						Web Pages Graphics						Alarms			Trends Archive Size Verify w/Own er									
	Digital Input	Digital Output	Analog Input	Analog Output	Hardware Interlock	BAS Communication	Status	Temperature of Other Value	Cooling Percentage	Heating Percentage	Dynamic Flow Diagrams	O&M Manuals	Start/Stop	Status	Display Value	Adjust Value	Run Time Totalize or Totalize	Operator Workstation	Remote Device/Email	Building Manager	User	Life Safety Alarm	Run Time / Totalize	30 Minute / Week	Change of Value / 800 Samples
Points as available via BACnet IP Interface						X																			

END OF SECTION 23 0900

