



Project: Ben Steele Middle School
Addendum #: 4
Date Issued: January 22, 2016

Description of Addendum & Attachments:

1. Architectural Addendum #4 by A&E Architects – Attached – 19 pages
2. Langlas Bid Package Clarifications – Attached – 3 pages
3. Langlas Project Bid Schedule (Site Work Expanded) – Attached - 7 pages
4. Langlas Revised Bid Form – Attached – 2 pages
 - a. Please replace the previous bid form with the attached.

Bid Date: January 28th, 2016 at 2:00 pm.

This addendum will be part of the construction documents. All bidders must acknowledge the receipt of this addendum on the bid form.

END OF ADDENDUM #4

Addendum Number:	04	Date Issued:	January 22, 2016
Project:	Ben Steele Middle School	Project Number:	13048.20
Pages in Addendum:	19 w/attachments	Prepared By:	Kris Koessl
Issued To:	All Planholders All Consultants Hulteng, Inc.		

This Addendum's attachments consist of 1. Sanderson Stewart Addendum (4 pages), 2. Projector Spec Section 11 52 16 (3 pages), and 3. Revised sheets M0.2, M0.3, M0.4, M9.2, M9.3, and E7.1 (6 sheets)

Addendum to Contract Documents:

The additions, clarifications, and corrections contained herein shall be made to the Project Specification Manual, Drawings, and Schedules for the above referenced project, and shall be included in the scope of work and proposals to be submitted. References made below to the Project Specification Manual and Drawings shall be used as a general guide only. Bidder shall determine the extent of work affected by Addendum items.

General Bid Items:

The plan holder's list is being recorded and maintained by Langlas & Associates. Contact their office for questions or for a list of current plan holders.

This project is not subject to the terms and conditions of the Made in America Act.

Project Manual (Specifications):

07 42 13: Metal Siding

- 2.3.B.1, MP-3, change to 'Metal Sales: PBU' in lieu of 'T3'
 - 36" panel coverage
 - ¾" rib height
 - Trapezoidal ribs on 6" centers
 - Exposed fasteners

07 54 19: PVC Roofing

- 1.1, Summary, add the following verbiage for clarification: Each of the following roof installations are acceptable for (1) the entire roof or (2) in combination with one another, provided that any particular level of roof area uses a single installation method:
 - PVC – Fully Adhered
 - PVC – Mechanically Fastened
 - TPO – Fully Adhered, see Section 07 54 23
- 1.1.A.1, change to "Fully-adhered and mechanically-fastened polyvinyl-chloride (PVC) roofing system".
- 2.5, change title to "VAPOR BARRIER – PVC ROOFING"
- 2.5.1, remove "peel and stick application" from this sentence.
- 2.5.3, add Vapor Barrier Tape: Heavy duty cloth tape with aggressive natural rubber pressure-sensitive adhesive designed to adhere to a variety of surfaces under a wide variety of temperatures. Tested according to UL 723.
 - "Gorilla Tape" as manufactured by The Gorilla Glue Company (Phone 800-966-3458).

- Armor Tough" (product Code AC617) as manufactured by Intertape Polymer Group (Phone 800-474-8273).
- 2.8, remove section in its entirety.
- 3.2, change to "VAPOR BARRIER INSTALLATION"
- 3.2.1, delete line in its entirety, replace with "Apply vapor barrier to metal deck. Tape seams with manufacturer recommended over-laps. Extend up wall a minimum of 12"."
- 3.4.1, add the following section in its entirety:

3.4.1 MECHANICALLY FASTENED ROOFING INSTALLATION

- A. Mechanically fasten roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before retaining.
 - 1. Install sheet according to ASTM D 5082.
- B. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Mechanically fasten or adhere roofing securely at terminations, penetrations, and perimeter of roofing.
- D. Apply roofing with side laps shingled with slope of roof deck where possible.
- E. In-Seam Attachment: Secure one edge of PVC sheet using fastening plates or metal battens centered within seam, and mechanically fasten PVC sheet to roof deck.
- F. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet.
 - 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.
- G. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

07 54 23: Thermoplastic Polyolefin (TPO) Roofing

- 1.1, Summary, add the following verbiage for clarification: Each of the following roof installations are acceptable for (1) the entire roof or (2) in combination with one another, provided that any particular level of roof area uses a single installation method:
 - PVC – Fully Adhered, see Section 07 54 19
 - PVC – Mechanically Fastened, see Section 07 54 19
 - TPO – Fully Adhered
- 2.6, change title to "VAPOR BARRIER"
- 2.6.A, add "4. This product to be installed in cold-weather application."
- 2.6, add section C: Low-density polyethylene roof vapor barrier
 - a. Tensile Strength = 3,300 PSI
 - b. Minimum Thickness = 10 mil
 - c. Permeance = 0.019 perms
 - d. This product to be installed in warm-weather (40 degrees and rising) application.
 - e. See Section 07 54 19 – 2.5.3 for Vapor Barrier Tape
- 2.9, delete section in its entirety.

- 3.2.A, add sentence "2. Substrate board only required at sections of TPO that cannot be completed in manufacturer's recommended temperature ranges, typically 40 degrees and rising. Full section of roof must be consistent system."
- 3.3, change title to "VAPOR BARRIER INSTALLATION"
- 3.3.1, change sentence to "Apply vapor barrier to metal deck or substrate board."

08 71 00: Door Hardware, eliminate Door Hardware Group No. 39

10 14 00: Signage

- 2.3.A, add sentence: "D. Back letters in gym with ½" PVC board."

10 28 00: Toilet, Bath, and Custodial Accessories

- 2.3.H.2, clarification, to be 18", 36" or 42" per details and ADA requirements. No 2-wall grab bars.

11 40 00: Foodservice Equipment

- 2.1, add JJJJJJ, Item 113 – CORNER GUARD (1 LOT REQ'D)
Eagle Group
 1. 9 ea. Model CORNER GUARD Stainless Steel Corner Guard 2 1/8" x 2 1/8" x 48" – 16/304 s/s.
 2. 2 ea. Model END CAP, outside channel type, 2" edges, 43" high, verify wall width required, s/s, adhesive tape included.
 3. 1 lot Bumper Rails as shown on FS5.5 and detailed on FS5.0.

11 52 16: Video Projectors

- delete section in its entirety and replace with section attached with this addendum.

11 66 23: Athletic Equipment

- 2.8, Badminton Equipment, provide the following quantities:
 - Eight (8) portable badminton standards
 - Eight (8) badminton net
- 2.9, Climbing Rope
 - Draper manila rope is equivalent to specified hemp rope
 - Provide one (1) climbing rope
- 2.11, Wrestling Mat Storage System, delete item in its entirety

14 24 00: Hydraulic Elevators

- 1.1.A.1, change sentence to "Holeless hydraulic elevator with machine-roomless or machine-room application".
- 1.8.A, change first sentence to "Contractor shall furnish quarterly maintenance service concurrent with the warranty period".
- 1.8.D, change "house" to "hours"

23 09 23: Direct Digital Control (DDC) Systems for HVAC

- 3.4.A, add sentence "This section shall apply only to AHU-4. All other air handlers shall have all control accessories field installed, unless noted otherwise".

28 31 11: Digital Addressable Voice Evacuation Fire Alarm System (VEFAS)

- 2.1.A, add HTS, High Tech Solutions as an acceptable manufacturer.

Civil & Landscaping Specifications: Reference attached addendum sheets from Sanderson Stewart.

Drawings:

Cover: Schedule of Alternates, add (DEDUCT) ALTERNATE #11: LOW EFFICIENCY SCREW CHILLER

C4.0 & C4.3: add 122 LF of 15" RCP Arch Equivalent Storm Drain Pipe and 4 F.E.T.S for culverts at the entrance and exit to Grand Avenue.

L3.3: detail 8: delete add alternate paving detail. Change title of detail to "Basketball Court, High Jump, and Long Jump Surface Paving Detail".

Civil & Landscaping Sheets: Reference attached addendum sheets from Sanderson Stewart for additional information.

A2.1D: wall above roof line at Grid 28 from Grids LL to NN and at Grid NN from Grids 28 to 29 to be MP-1.

A5.3 thru A5.8: clarification, at all MP-1 and MP-2, panels to be installed vertically on horizontal z-furring. Eliminate any notation referencing vertical z-furring at these wall types.

A6.20 thru A6.44: MDF core at casework is acceptable to be particle board per Spec Section 06 41 16.

A9.3: make the following changes to the Door Schedule:

- change Door 1309.2 to be 7'-0" H.
- change Doors 1309A and 1309B to be Type F doors.

A9.4: clarification, Door Frame Type 22, tag 'W22' is for AL, tag '22' is for HM.

A9.6:

- PLAM-4 to be Formica 20563-90, Sail White Marker Board Gloss Finish.
- PLAM-7 to be Formica 927-90, Folkstone – Dry Erase Marker Board

A9.7: Room Finish Schedule

- delete 'PT-1' portion of tag from Room 2506C floor column. To be VCT-1 only.

S2.4D:

- All joists running east-west, from KK-LL and 28-31, at the music rooms to be tagged '24LH06 @ 6'-0"
- Change elevation of W16x26 beams along Grid KK from 20'-8" to 20'-3"

M0.1: Air Cooled Compressor Chiller Schedule, add the following:

- i. A bid alternate (**Bid Alternate #11**) will be established for a lower efficiency screw chiller. This bid alternate will include a mechanical deduct for the lower efficiency chiller.
 1. The minimum efficiency will be per the 2012 IECC table C403.2.3 (greater than or equal to 9.562 full load EER and 12.75 IPLV, when tested and rated in accordance with the applicable test procedure).
 2. The alternate chiller must meet the capacity listed on the drawings and must not have a MFS requirement over 700 amps.
 3. Review the site plan to see how any size changes would impact the design. Any significant enlargement should be carefully reviewed prior to bidding.
 4. All other requirements of the drawings and specifications do not change including, but not limited to: capacity, size, noise levels, required accessories, etc.
 5. This bid alternate will also include an electrical add for increased electrical requirements to feed the lower efficiency chiller. This is addressed in the electrical portion of this addendum.
 6. This alternate is an owner option and will be evaluated by the owner after the bid.

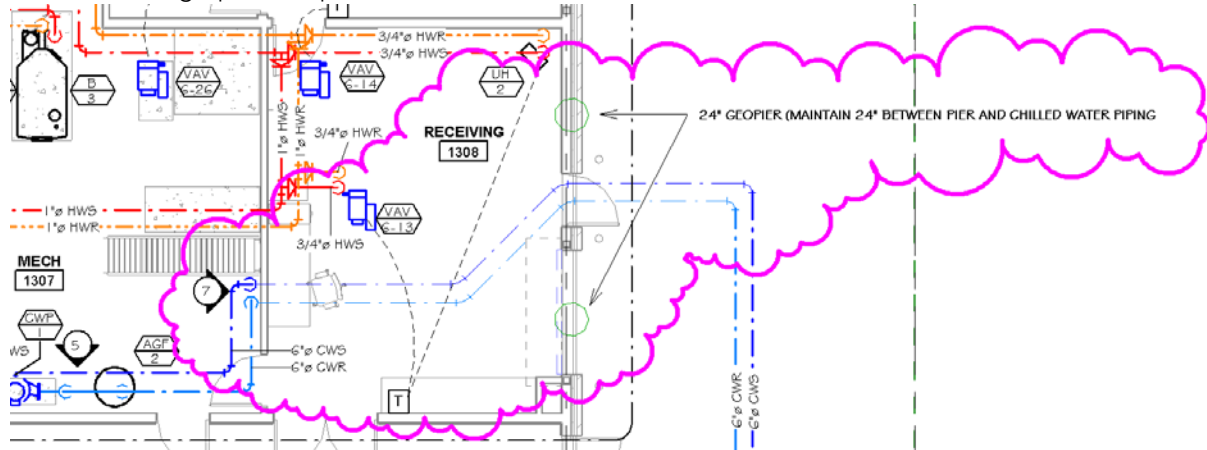
7. The base bid shall remain as the specified chiller or approved equal.
8. See the modified bid form for further instructions.

M0.2, M0.3, M0.4, M9.2, M9.3: replace sheets in their entirety with sheets attached to this addendum.

M3.1A: near Grid F and 20, change diffuser off of VAV1-25 from CD-8/325 cfm to CD-10/325 cfm.

M3.1B: near Grid GG and 17, change EF-20 tag to EF-18.

M4.1C: offset chilled water piping to avoid geopiers at the exterior wall, reference Grid QQ south of Grid 18. See below for graphical representation.



M4.2B: change z-bend on chilled water piping to horizontal u-loop over Science 2124, reference Grids 7 and Y.

P0.1: Plumbing Fixture Schedule, at sinks S-3 and S-8 trim (faucet), delete American Standard Heritage 6275.000 with wrist blade handles (faucet has been discontinued). Replace with American Standard Monterrey #6409.170.

E0.1: Luminaire Schedule, change the maximum fixture section length for Types P1 thru P2E and P9 thru P17 to be 8'-0"

E0.2: Electrical Riser Diagram, bid the following work as Alternate #11 in the project bid form:

- Change the breaker in Panel EDSB serving the chiller to a 700A 3-pole.
- Change the feeder serving chiller to consist of: (2) 3" C, 3#400kcmil, #400kcmil N, #3/0G. This feeder shall be done with **copper conductors**.

E0.3: Panel Schedules, bid the following work at Alternate #11 in the project bid form:

- Change the breaker in panel EDSB serving the chiller to a 800A frame with 700A trip rating.

E2.1A thru E4.2B and E6.1, Electrical General Notes, add: EC shall hold all underground conduit stub up's below finished floor height to allow for the use of a laser screed in project, approx. ½". Conduit shall be extended above floor height to final location once floor is finished.

E7.1:

- **replace sheet in its entirety with sheet attached to this addendum.**
- change the verbiage of Key Electrical Note #18 to "As part of base bid the EC shall route (4) empty 1" c. w/ pull line's from panel "1L3A", located in room 1503B stubbing conduit out of the building to the dashed outline shown on plan for add alternate #6 and #7. Insure that all conduits are stopped past any hard surface (Sidewalk) and reside in landscaped area. Provide (2) conduits per alternate area. Cap and mark location for continuation if add alternates are accepted."

Prior Approvals:

Reviewing is for conformance with the design concept of the project and compliance with the information given in the contract documents. Contractor is responsible for dimensions to be confirmed and correlated to the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of work of all trades.

MECHANICAL & PLUMBING EQUIPMENT SUBSTITUTION APPROVALS: Prior approvals for equipment substitutions are based upon manufacturer's name only. No material submissions have been reviewed. Any substitutions shall meet the specification for the product specified. Any costs associated with electrical modifications necessary due to a product substitution shall be the responsibility of the mechanical contractor.

ELECTRICAL SUBSTITUTION APPROVALS: Subject to compliance with the contract documents, the following manufacturers of the respective listed products and/or equipment shall be allowed for the project. No comment for submitted device as reviewed in prior approval package shall be viewed as an acceptable product.

<u>Section</u>	<u>Description</u>	<u>Approved</u>
04 22 00	Concrete Masonry Unit	Kanta Block
04 26 13	Masonry Veneer	Kanta Block
23 05 16	Expansion Fittings and Loops	Engineered Flexible Products
23 05 48	Vibration Controls	Vibro-Acoustics
23 09 23	DDC System for HVAC (VFDs)	Danfoss
23 09 23.14	Flow Measurement (Airflow)	Ruskin
23 73 13	Modular Outdoor Central AHUs	Energy Labs, Inc.
23 82 33	Convectors	Rittling
22 15 48	Vibration Controls	Vibro Acoustics
22 42 16.13	Commercial Lavatories: Manually Operated Faucets	Zurn Z7440-XL-Vp1.5 (Lavs 1, 2 & 3) Symmons S-20-2-G-1.5 (Lavs 1, 2 & 3)
22 42 16.13	Commercial Sinks: Mop Sinks Manually Operated Faucets	Acorn TRH-242410 Symmons S-245-LWG-G-5 (Sinks S1 & S2) Symmons 2-2490-CHKS (MS1 & MS2)
22 47 16	Pressure Water Coolers	Acorn A171.8VR-BF1S-WF1-220V
22 34 00	Fuel Fired Domestic Water Heaters	Bradford White BTNV-399-N-X-N (DWH-1) Laars Neotherm (DWH-1) Bradford White NV505JD5A-5-1 (ST-1)
22 42 23	Commercial Showers	Bradley 1C-EF-B24 (SH-1 & SH-2)
27 51 23	Public Address System and Clocks	Bogen Multicom 2000

January 21, 2016

PROJECT: **Ben Steele Middle School, Billings, Montana**

PROJECT NO.: **14063.02**

ADDENDUM NO. FOUR

The following changes shall be noted by all interested bidders and shall be made part of the Contract Plans and Specifications. A signed and printed **original, printed e-mail or facsimile photocopy** of this Addendum will be acceptable to include with the bid documents.

CLARIFICATIONS

1. Temporary backfill and grading at building perimeter to allow for access to exterior building shell. Where planting beds are located, all temporary backfill shall be removed beginning 4'-0" from outside building wall to a depth of 1'-6" below finish grade. Subgrade shall be scarified 1'-6" depth, then backfilled with blended planting soil to finish grade to allow for irrigation and planting.
2. Irrigation Trench & Backfill, Section 32 76 10. The domestic (secondary) irrigation supply source will be backflow protected per City of Billings' requirements. See mechanical plans for specific information on specified backflow prevention.
3. Construction Period Irrigation. The domestic (secondary) irrigation water supply will be metered by the City of Billings Public Utilities Department as a deductive irrigation water meter. The metered cost of water during the contract period to final acceptance will be a cost to the owner and the irrigation meter will be placed in the owner's name for billing purposes.
4. Trees, Shrubs & Groundcovers, Section 32 84 00 - Part 2.2 B., Mulch. Delete all reference to limestone for all planting beds and maintenance edges. Crushed gravel mulch to be locally available. Sample to be approved by owner's representative. Provide 1/4" minus crushed limestone at grade in tree planters surrounded by pavements shown on sheet L2.0, 1 1/2" section, ± 890 square feet of area. A sample of mulch to be approved by owner's representative.

5. Trees, Shrubs & Groundcovers, Section 32 84 00 - Part 2.3, Planting Mixture. Planting mixture (blended soil) shall be made from two parts by volume of native topsoil, one part natural fines and/or wash pond sediments, one part thoroughly composted manures or other approved organic components, 20 lbs. of elemental Sulphur and 20 lbs. of gypsum per 1,000 s.f. of bed area. Source, analysis, and sample to be approved by owner's representative prior to use. All materials to be thoroughly blended by milling or otherwise approved methods prior to placement.
6. Irrigation System Plan, Sheets L4.0 – L4.3. Irrigation lateral lines to be 1 1/2" or greater class 200 PVC. Delete all references to blu-lock pipe. Pipe sizes for drip irrigation zones may be different.
7. Irrigation System Plan, Sheets L4.0 – L4.3. Irrigation mainlines, delete reference to PVC class 315 for 1/2" pipe, PVC class 200 for 3/4" pipe.
8. Irrigation System Plan Sheet L4.4, Irrigation Pump Station (11). Contractor to provide water-tight housing for V.F.D. component.
9. Irrigation System Plan Sheet, L4.4, Irrigation Pump Station (11). Contractor to provide 6'-0" height chain link fence and 10'-0" wide vehicle access lockable gate, enclosing irrigation pump station. Material specifications and installation requirements are similar to sports field fencing requirements and specifications.
10. Irrigation System Plan Sheet L4.4, Irrigation Pump Station (11). Note stabilized turf access drive from pump station to multipurpose path, 10'-0" width, x +/- 30' length.
11. Lawns Comprehensive, Section 32 82 00 – Part 3.5A, General (Page 6). All lawns will be maintained by the contractor per the specifications through final acceptance of all lawns or through the end of the growing season 2017.
12. Add Alternates. Add Alternate Ball Fields and Parking Lot, if not awarded will require finish grading top soil, irrigation and seeding per the L4.0 – L4.3 plan sheets.
13. Add Alternates. Add Alternate Ball Fields, if not awarded will be finish graded per ball field grade plan.
14. Add Alternates. Add Alternate Park Lot, if not awarded will be finish graded to a lawn area, draining to the proposed parking lot gutter flow lines and adjacent drainages and detention basins.
16. Grand Avenue Improvements. School District #2 shall pay their share for the off-site (ROW) improvements on both Grand and 56th Street West and the City of Billings' project will build Grand Avenue and part of the 56th Street West improvements. The remainder of the 56th Street West ROW improvements will be constructed in the future under a separate project.

17. Add Alternate No. 3 – Base Gravel. Considering that the overflow parking area will have minimal traffic, the recommended section would be 12” of 1 ½” crushed base course overlying Mirafi 600x (or equivalent) separation fabric. Prior to placing the fabric, the subgrade should be scarified, moisture conditioned and proof rolled to identify any soft or yielding areas. If these areas are encountered, refer to geotechnical report for appropriate subgrade mitigation.
18. Geotech Section 5.1.1 Engineered Fill. The gradation for the 12” of compacted engineered fill to be placed below the interior floor slab can be found in Section 5.1.1 (Imported Pit-Run Gravel Table) of the geotechnical report.
19. Site Fill Requirements. The gradation for imported gravel to be used as engineered fill at the site can be found in Section 5.1.1 (Imported Pit-Run Gravel Table) of the geotechnical report.
20. Clarification. The non-developed areas of the southerly portions of the site that will not be graded are to be left undisturbed. Those undisturbed areas shall be over seeded using “dry land seed mix”. Where existing vegetation cover, no hydro-mulching is required. Prior to seeding, a single harrow pass is required to make a seed bed. Where the ungraded areas have been disturbed and vegetation cover does not exist or compaction has occurred, the ground shall be subsoiled or scarified to a minimum depth of 1’-0” and an even friable seed bed made by discing and/or harrowing, seeding with “dry land seed mix” and hydro-mulching the entire seed bed.
21. Clarification. All grading, excavation and filling require the salvage and replacement of the native topsoil to a depth of 10”. Areas where the cuts and fills are less than 10” and ‘A’ horizon (native topsoil) remain at the finish grade, no native topsoil salvage stockpiling and replacement is required if a minimum of 8” depth of ‘A’ Horizon (native topsoil) remains below finish grade.
22. Clarification. The native topsoil is anticipated to meet the topsoil fertility specification, once amended. The material has not been tested for suitability requirements per Earthwork Section 31 20 00 2.1, A.2. It is anticipated that native topsoil amendments specified on the plan sheet L2.0-2.3 and specification Lawns Comprehensive Section 32 82 00-3, 2.2, A.1 should provide a satisfactory growing medium.
23. Clarification. All seed beds shall be drill seeded where accessible and hydro-mulched per Lawns Comprehensive Section 32 82 00.
24. Clarification. The contractor shall be responsible for installing and marking all sleeves and conduits and their locations.
25. Clarification. Concrete walks with “jointing and treatment” does not imply the use of any coloring or stamping.
26. Clarification. The chain link “fence” along the front of the dugouts and the fence/gates at the dumpster enclosures are a part of the architectural bid package.
27. Clarification. All temporary power costs incurred and metered electrical costs to furnish power to the irrigation pump station during the entire construction contract period or through final acceptance of the lawns and landscape shall be paid for by the owner with the meter placed in the owner’s name for billing purpose.

28. Clarification. The high jump asphalt approach has no striping requirements per the National Federation of State High School Association' Standard Guidelines and diagram. The asphalt approach must have a minimum 50'-0" radius to the center point of the cross bar. When the track surface area is considered the approach meets minimum radius.

The basketball court, striping per plan sheet L3.2, Detail 1.

Discus layout, striping per plan sheet L3.3, Detail 1.

Shot put plan, striping per plan sheet L3.3, Detail 2.

Triple jump/long jump and pole vault plan striping per plan sheet L3.3, Detail 3.

29. Clarification. Site work bid alternates have no material affects to the base bid storm drainage piping.

30. Clarification. Bid Add Alternate No. #10 plan sheet C3.4, 6" cross field connecting pipe is a part of this add alternate.

Note: Bidder shall acknowledge receipt and acceptance of Addendum No. One by signing below and including Addendum in Bid Package.

END OF ADDENDUM NO. FOUR

This Addendum No. One is hereby acknowledged this _____ day of _____, 20__.

Set No. _____

(Company)

By: _____

SECTION 11 52 16 – VIDEO PROJECTORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Video projector at Gymnasium 1321, lens and accessories.
 - 2. All short throw projectors OFCI.
- B. Related Sections:
 - 1. Section 11 52 13 - Projection Screens.
 - 2. Electrical services and connections are specified in Division 26.

1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's specifications and installation instructions for each type of equipment, including data indicating compliance with requirements. Submit operating and maintenance instructions for each item of equipment.
- C. Section 01 77 00 – Closeout Procedures: Operations and Maintenance Manual.

1.3 DELIVERY AND STORAGE

- A. Deliver and handle equipment under provisions of Section 01 60 00 - Product Requirements.
- B. Deliver products to project site in manufacturer's undamaged protective containers, after spaces to receive them have been fully enclosed.

1.4 WARRANTY

- A. Submit manufacturer's standard written warranty for each item of equipment under provisions of Section 01 77 00 - Closeout Procedures.

PART 2 PRODUCTS

2.1 VIDEO PROJECTOR

- A. Acceptable Manufacturer:
 - 1. Basis of Design: Hitachi, CP-X9110 DLP Projector.
 - 2. Substitutions: Under provisions of Section 01 25 00.

- B. Optical
 - 1. Resolution: XGA (1024x768).
 - 2. Brightness: 10000 ANSI Lumens.
 - 3. Contrast Ratio: 2000:1.
 - 4. Number of Colors: 16.7 million.
- C. Power
 - 1. Voltage: 110V~120V, 220V-240V.
 - 2. Power Consumption: 540W.
- D. Compatibility
 - 1. Computer: VGA, SVGA, XGA, XGA/WXGA+/SXGA/SXGA+/WSXGA+/UXGA/WUXGA (compressed), MAC 16 inch.
- E. Physical
 - 1. Dimensions (W x D x H): 21.1 x 17.2 x6.7 inch.
 - 2. Weight: Approximately 36.9 pounds.
- F. Lens: Hitachi, USL-901.

2.2 ACCESSORIES

- A. Remote control with batteries.
- B. Computer cable.
- C. Power cord.
- D. User's Manual.
- E. Application CD.
- F. Security Label.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Determine conditions are acceptable for installation.

3.2 INSTALLATION

- A. General: Comply with manufacturer's instructions and recommendations.
- B. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate for proper operation of equipment.
- C. Utilities: Refer to Division 26 for electrical requirements.

3.3 ADJUST AND CLEAN

- A. Testing: Test each item or equipment to verify proper operation. Make necessary adjustments.
- B. Accessories: Verify that accessory items required have been furnished.
- C. Cleaning: Remove packing material from equipment items and leave units in clean condition, ready for operation.

3.4 DEMONSTRATION AND TRAINING

- A. Schedule and conduct maintenance training with Owner's maintenance personnel. Training session should include lecture and demonstration of all maintenance and repair procedures that end user personnel would normally perform.

END OF SECTION 11 52 16

VARIABLE AIR VOLUME UNIT SCHEDULE (W/ HOT WATER COIL)														
PLAN CODE	MANUFACTURER	MODEL NUMBER	100% CFM	MIN. CFM (HTG.)	HOT WATER COIL (35% GLYCOL)							MAX TOTAL S.P. @ 100% CFM IN. H ₂ O	INLET SIZE (IN, Ø)	
					HEATING CAP (MBH)	AIR SIDE				WATER SIDE				
						CFM	EAT °F	LAT °F	# ROWS	GPM	EWT °F/LWT			P.D. FT
VAV I-1	TRANE	VCWF	350	175	9.49	175	55	105	2	1.93	1 ⁵⁰ / ₁₆₀	<10'	0.75	8
VAV I-2	TRANE	VCWF	300	150	8.13	150	55	105	2	1.11	1 ⁵⁰ / ₁₆₀	<10'	0.75	6
VAV I-3	TRANE	VCWF	650	325	17.62	325	55	105	2	2.38	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV I-4	TRANE	VCWF	920	460	24.94	460	55	105	2	3.97	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV I-5	TRANE	VCWF	620	310	16.81	310	55	105	2	2.4	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV I-6	TRANE	VCWF	720	360	19.52	360	55	105	2	2.81	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV I-7	TRANE	VCWF	400	200	10.85	200	55	105	2	1.26	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV I-8	TRANE	VCWF	800	400	21.96	400	55	105	2	3.27	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV I-9	TRANE	VCWF	960	480	26.03	480	55	105	2	4.24	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV I-10	TRANE	VCWF	620	310	16.81	310	55	105	2	2.4	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV I-11	TRANE	VCWF	900	450	24.4	450	55	105	2	3.85	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV I-12	TRANE	VCWF	200	100	5.42	100	55	105	1	0.63	1 ⁵⁰ / ₁₆₀	<10'	0.75	6
VAV I-13	TRANE	VCWF	350	175	9.49	175	55	105	2	1.93	1 ⁵⁰ / ₁₆₀	<10'	0.75	8
VAV I-14	TRANE	VCWF	300	150	8.13	150	55	105	2	1.11	1 ⁵⁰ / ₁₆₀	<10'	0.75	6
VAV I-15	TRANE	VCWF	585	293	15.89	293	55	105	2	2.04	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV I-16	TRANE	VCWF	900	450	24.4	450	55	105	2	3.85	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV I-17	TRANE	VCWF	580	290	15.73	290	55	105	2	2.01	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV I-18	TRANE	VCWF	680	340	18.44	340	55	105	2	2.68	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV I-19	TRANE	VCWF	400	200	10.85	200	55	105	2	2.34	1 ⁵⁰ / ₁₆₀	<10'	0.75	8
VAV I-20	TRANE	VCWF	900	450	24.4	450	55	105	2	3.85	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV I-21	TRANE	VCWF	820	410	22.23	410	55	105	2	3.38	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV I-22	TRANE	VCWF	860	430	23.32	430	55	105	2	3.60	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV I-23	TRANE	VCWF	600	300	16.27	300	55	105	2	2.11	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV I-24	TRANE	VCWF	80	40	2.67	40	55	105	2	0.5	1 ⁵⁰ / ₁₆₀	<10'	0.75	5
VAV I-25	TRANE	VCWF	400	200	10.85	200	55	105	2	2.34	1 ⁵⁰ / ₁₆₀	<10'	0.75	8
VAV I-26	TRANE	VCWF	400	200	10.85	200	55	105	2	2.34	1 ⁵⁰ / ₁₆₀	<10'	0.75	8
VAV I-27	TRANE	VCWF	235	118	6.40	118	55	105	2	0.8	1 ⁵⁰ / ₁₆₀	<10'	0.75	6
VAV I-28	TRANE	VCWF	130	65	3.52	65	55	105	2	0.65	1 ⁵⁰ / ₁₆₀	<10'	0.75	5
VAV I-29	TRANE	VCWF	380	75	N/A	75	N/A	N/A	N/A	N/A	N/A	N/A	0.75	8

- VAV NOTES:**
- WATER TEMPERATURE DROP SHALL BE 30° F. BOXES TO BE SELECTED AS SUCH, ACCOUNT FOR 35% PROPYLENE GLYCOL.
 - ENTERING STATIC PRESSURE = 1" W.C.
 - BOX SUPPLIER TO PROVIDE FACTORY INSTALLED MULTI-POINT AVERAGING SENSORS, MECHANICAL CONTRACTOR TO PROVIDE BOXES WITH HANGING BRACKETS, AND PROVIDE DUCT TRANSITIONS TO AND FROM BOXES AS REQUIRED. TEMPERATURE CONTROL SUBCONTRACTOR TO FURNISH ALL DIGITAL VAV BOX CONTROLLERS, ACTUATORS ETC. TO THE BOX MANUFACTURER FOR INSTALLATION. COST OF CONTROLLERS AND SHIPPING SHALL BE BURDEN OF T.C. CONTRACTOR. COST OF THE INSTALLATION SHALL BE BY THE BOX MANUFACTURER.
 - SOUND DISCHARGE LEVELS TO BE <20 N.C. AT 1" INLET STATIC PRESSURE, UNLESS OTHERWISE NOTED.
 - PROVIDE FACTORY ACCESS PANEL FOR DAMPER AND COIL ACCESS.

VARIABLE AIR VOLUME UNIT SCHEDULE (W/ HOT WATER COIL)														
PLAN CODE	MANUFACTURER	MODEL NUMBER	100% CFM	MIN. CFM (HTG.)	HOT WATER COIL (35% GLYCOL)							MAX TOTAL S.P. @ 100% CFM IN. H ₂ O	INLET SIZE (IN, Ø)	
					HEATING CAP (MBH)	AIR SIDE				WATER SIDE				
						CFM	EAT °F	LAT °F	# ROWS	GPM	EWT °F/LWT			P.D. FT
VAV 2-1	TRANE	VCWF	620	310	16.81	310	55	105	2	2.22	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV 2-2	TRANE	VCWF	720	360	19.52	360	55	105	2	2.81	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV 2-3	TRANE	VCWF	400	200	10.85	200	55	105	2	2.34	1 ⁵⁰ / ₁₆₀	<10'	0.75	8
VAV 2-4	TRANE	VCWF	620	310	16.81	310	55	105	2	2.22	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV 2-5	TRANE	VCWF	400	200	10.85	200	55	105	2	2.34	1 ⁵⁰ / ₁₆₀	<10'	0.75	8
VAV 2-6	TRANE	VCWF	960	480	26.03	480	55	105	2	4.24	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV 2-7	TRANE	VCWF	860	430	23.32	430	55	105	2	3.60	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV 2-8	TRANE	VCWF	840	420	22.77	420	55	105	2	3.49	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV 2-9	TRANE	VCWF	600	300	16.27	300	55	105	2	2.11	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV 2-10	TRANE	VCWF	350	175	9.49	175	55	105	2	1.93	1 ⁵⁰ / ₁₆₀	<10'	0.75	8
VAV 2-11	TRANE	VCWF	900	450	24.4	450	55	105	2	3.85	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV 2-12	TRANE	VCWF	580	290	15.73	290	55	105	2	2.01	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV 2-13	TRANE	VCWF	680	340	18.44	340	55	105	2	2.55	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV 2-14	TRANE	VCWF	400	200	10.85	200	55	105	2	2.34	1 ⁵⁰ / ₁₆₀	<10'	0.75	8
VAV 2-15	TRANE	VCWF	625	300	16.27	300	55	105	2	2.11	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV 2-16	TRANE	VCWF	900	450	24.4	450	55	105	2	3.85	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV 2-17	TRANE	VCWF	820	410	22.23	410	55	105	2	3.38	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV 2-18	TRANE	VCWF	600	300	16.27	300	55	105	2	2.11	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV 2-19	TRANE	VCWF	760	380	20.61	380	55	105	2	3.10	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV 2-20	TRANE	VCWF	250	125	6.78	125	55	105	2	0.84	1 ⁵⁰ / ₁₆₀	<10'	0.75	6
VAV 2-21	TRANE	VCWF	600	300	16.27	300	55	105	2	2.11	1 ⁵⁰ / ₁₆₀	<10'	0.75	10
VAV 2-22	TRANE	VCWF	920	460	24.94	460	55	105	2	3.97	1 ⁵⁰ / ₁₆₀	<10'	0.75	12
VAV 2-23	TRANE	VCWF	300	60	N/A	60	N/A	N/A	N/A	N/A	N/A	N/A	0.75	6
VAV 2-24	TRANE	VCWF	300	60	N/A	60	N/A	N/A	N/A	N/A	N/A	N/A	0.75	6

- VAV NOTES:**
- WATER TEMPERATURE DROP SHALL BE 30° F. BOXES TO BE SELECTED AS SUCH, ACCOUNT FOR 35% PROPYLENE GLYCOL.
 - ENTERING STATIC PRESSURE = 1" W.C.
 - BOX SUPPLIER TO PROVIDE FACTORY INSTALLED MULTI-POINT AVERAGING SENSORS, MECHANICAL CONTRACTOR TO PROVIDE BOXES WITH HANGING BRACKETS, AND PROVIDE DUCT TRANSITIONS TO AND FROM BOXES AS REQUIRED. TEMPERATURE CONTROL SUBCONTRACTOR TO FURNISH ALL DIGITAL VAV BOX CONTROLLERS, ACTUATORS ETC. TO THE BOX MANUFACTURER FOR INSTALLATION. COST OF CONTROLLERS AND SHIPPING SHALL BE BURDEN OF T.C. CONTRACTOR. COST OF THE INSTALLATION SHALL BE BY THE BOX MANUFACTURER.
 - SOUND DISCHARGE LEVELS TO BE <20 N.C. AT 1" INLET STATIC PRESSURE, UNLESS OTHERWISE NOTED.
 - PROVIDE FACTORY ACCESS PANEL FOR DAMPER AND COIL ACCESS.

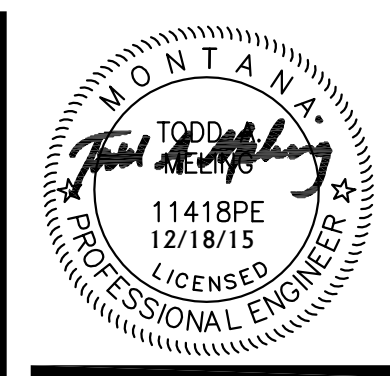
GRILLE - REGISTER - DIFFUSER SCHEDULE									
PLAN CODE	MANUFACTURER	MODEL NUMBER	FUNCTION	FACE SIZE	MATERIAL	FINISH	CFM	VOLUME DAMPER	REMARKS
CD-#	KRUEGER	1240	CEILING SUPPLY	SEE SUPPLY SCHEDULE	STEEL	BAKED ENAMEL, OFF WHITE	SEE PLANS	IN DUCT	MODULAR CORE, SEE CEILING SUPPLY DIFFUSER SCHEDULE.
RD-#	KRUEGER	6490	RETURN GRILLE	SEE RETURN SCHEDULE	STEEL	BAKED ENAMEL, OFF WHITE	SEE PLANS	IN DUCT	PERFORATED GRILLE SQUARE NECK. SEE CEILING RETURN DIFFUSER SCHEDULE.
EG-#	KRUEGER	6690	EXHAUST GRILLE	SEE EXHAUST SCHEDULE	STEEL	BAKED ENAMEL, OFF WHITE	SEE PLANS	IN DUCT	PERFORATED GRILLE ROUND NECK. SEE CEILING RETURN DIFFUSER SCHEDULE.
LCD-#	KRUEGER	1240	CEILING SUPPLY	SEE SUPPLY SCHEDULE	STEEL	BAKED ENAMEL, WHITE	SEE PLANS	IN DUCT	LIBRARY DIFFUSERS. MODULAR CORE. SEE CEILING SUPPLY DIFFUSER SCHEDULE. VERIFY COLOR WITH ARCHITECT PRIOR TO ORDERING.
KCD-#	KRUEGER	1240P	CEILING SUPPLY	SEE SUPPLY SCHEDULE	STEEL	BAKED ENAMEL, WHITE	SEE PLANS	IN DUCT	KITCHEN SUPPLY DIFFUSER. 3-WAY CORE. PERFORATED FACE. SEE CEILING SUPPLY DIFFUSER SCHEDULE.
SSG-1	KRUEGER	1800	WALL MOUNTED LINEAR BAR GRILLE SUPPLY	34" X 31"	ALUMINUM	BAKED ENAMEL	SEE PLANS	IN DUCT	FIXED DEFLECTION 1/2" BAR SPACING, CUSTOM COLOR BY ARCH. GRILLE IS TO FIT IN A 31"W X 210"H WALL SECTION.
SSG-2	KRUEGER	880	SIDEWALL SUPPLY GRILLE	6" X 6"	ALUMINUM	BAKED ENAMEL	SEE PLANS	IN DUCT	DOUBLE DEFLECTION, 3/4" SPACING
SSG-3	KRUEGER	DPL	DRUM LOUVER SUPPLY	18" X 6"	ALUMINUM	BAKED ENAMEL	SEE PLANS	IN DUCT	
SSG-4	KRUEGER	4880	HEAVY DUTY SIDEWALL SUPPLY GRILLE	48" X 56"	STEEL	BAKED ENAMEL	3590 CFM	IN DUCT	SAWTOOTH COLLECTION SYSTEM SUPPLY GRILLE. HEAVY DUTY DOUBLE DEFLECTION SIDEWALL GRILLE.
SSG-5	KRUEGER	DPL	DRUM LOUVER SUPPLY	40" X 10"	ALUMINUM	BAKED ENAMEL	1250 CFM	IN DUCT	GYM SUPPLY GRILLE
SSG-6	KRUEGER	DRL2	DRUM LOUVER SUPPLY	12" X 6"	ALUMINUM	BAKED ENAMEL	SEE PLANS	IN DUCT	SPLIT VANES, PROVIDE BALANCE DAMPER
SRG-1	KRUEGER	580	SIDEWALL RETURN GRILLE	6" X 6"	STEEL	BAKED ENAMEL	SEE PLANS	IN DUCT	3/4" FIXED BLADES WITH 35° DEFLECTION
SRG-2	KRUEGER	580	DUCT MOUNTED RETURN	24" X 10"	STEEL	BAKED ENAMEL	SEE PLANS	IN DUCT	3/4" FIXED BLADES WITH 35° DEFLECTION
SRG-3	KRUEGER	580	DUCT MOUNTED RETURN	22" X 6"	STEEL	BAKED ENAMEL	SEE PLANS	IN DUCT	3/4" FIXED BLADES WITH 35° DEFLECTION
SRG-4	KRUEGER	5480	HEAVY DUTY DUCT MOUNTED RETURN	56" X 16"	STEEL	BAKED ENAMEL	SEE PLANS	IN DUCT	GYM DUCT RETURN GRILLES. 1/2" FIXED BLADES WITH 0° DEFLECTION
SEG-2	KRUEGER	580	DUCT MOUNTED EXHAUST	22" X 6"	STEEL	BAKED ENAMEL	SEE PLANS	IN DUCT	
SL-1	KRUEGER	1950	SLOT DIFFUSER	3 SLOT WITH 1/2" SLOTS, 48" LENGTH	STEEL	CUSTOM COLOR	SEE PLANS	IN DUCT	FRAME STYLE 5. HANG FROM STRUCTURE. COMMONS DIFFUSERS. PROVIDE WITH MANUF. PLENUM. REVIEW APPLICATION IN SREGALTY COMMONS CEILING SYSTEM PRIOR TO ORDERING.
SL-1M	KRUEGER	1950	SLOT DIFFUSER	3 SLOT WITH 1/2" SLOTS, 48" LENGTH	STEEL	CUSTOM COLOR	SEE PLANS	IN DUCT	MOUNT IN LAY-IN CEILING. PROVIDE WITH MANUFACTURER LINED PLENUM. VERTICAL THROW. MUSIC ROOMS.
SL-2	KRUEGER	1910	SLOT DIFFUSER	3 SLOT WITH 1" SLOTS, 48" LENGTH	STEEL	BAKED ENAMEL, OFF WHITE	SEE PLANS	IN DUCT	MOUNT IN LAY-IN CEILING. PROVIDE WITH MANUFACTURER LINED PLENUM. VERTICAL THROW.
SL-3	KRUEGER	1950	SLOT DIFFUSER	3 SLOT WITH 1/2" SLOTS, 48" LENGTH	STEEL	BAKED ENAMEL, OFF WHITE	SEE PLANS	IN DUCT	FRAME STYLE 5. HANG FROM STRUCTURE. COMMONS DIFFUSER.

HOT WATER UNIT HEATER SCHEDULE														
PLAN CODE	MANUFACTURER	MODEL NUMBER	CFM (70°)	MBH	ΔT AIR	GPM	ΔP H ₂ O	ΔT H ₂ O	ELECTRICAL DATA					REMARKS
									RPM	FLA	HP	VOLT	PH	
UH-1,2	STERLING	HS-125A	580	20	60°	2.5	2.2 ft	20	1550	1.2	25W	120V	1	PROVIDE WITH RUBBER IN SHEAR ISOLATORS, OSHA GUARD, VERTICAL LOUVER

OUTDOOR MAKE UP AIR UNIT SCHEDULE														
PLAN CODE	MANF.	MODEL NO.	SUPPLY FAN			HEATING DATA			ELEC. DATA			UNIT WEIGHT	REMARKS	
			MAX CFM	ESP	RPM	MOTOR HP	FUEL TYPE	INPUT MBH	OUTPUT MBH	VOLTS	PH			FLA
MAU-1	CAPTIVE AIRE	A3-D-750-G18	6800	0.5	815	5	N.G.	799	735	208	3	15	1132 LBS	SEE NOTES BELOW AND 16/M9.2 FOR DETAIL.

- NOTES:**
- PROVIDE UNIT WITH 1 POINTS OF ELECTRICAL CONNECTION WITH FACTORY DISCONNECT.
 - ESP INCLUDES 0.2" FOR COILED FILTER AND EVERYTHING DOWNSTREAM OF MAU-1. TSP TO INCLUDE ALL INTERNAL COMPONENTS (MOTORIZED FRESH AIR DAMPER, BURNER, ETC.) IN ADDITION TO ESP LISTED.
 - UNIT TO BE 100% FRESH AIR.
 - PROVIDE WITH ROOF CURB FOR ROOF MOUNTING.
 - PROVIDE WITH INTAKE FILTER SECTION, OPTIONAL VIBRATION CONTROL FEET, ELECTRONIC GAS VALVE, DUCT STAY, ROOM OVERRIDE THERMOSTAT, AIRFLOW PROVING SWITCH, CONTROL TRANSFORMER, ALSO PROVIDE CONTROL PANEL WITH REMOTE DISCHARGE TEMPERATURE SETPOINT CONTROL DIAL, CLOGGED FILTER LIGHT.
 - PROVIDE WITH 2" PRE-FILTERS.

KITCHEN RANGE HOOD SCHEDULE											
PLAN CODE	MANUF.	MODEL NUMBER	LENGTH	WIDTH	HEIGHT	EXHAUST CFM	SUPPLY CFM	MATERIAL	FINISH	ACCESSORIES	REMARKS
K-1	CAPTIVE AIRE	6024 ND-2-PSF-F	10' HOOD + 11" ANSIUL CABINET	60" + 16" SUPPLY PLENUM	24"	2250	1800	304 SS	#4	VAPOR PROOF LED LIGHTS, LIGHT SWITCH, ANSUL R102 FIRE PROTECTION SYSTEM, SS FIELD WRAPPER, SS END PANELS, WALL FLASHING, CLOSURE PANEL BETWEEN TOP OF HOOD AND CEILING	GREASE HOOD



A C E
 ASSOCIATED ENGINEERS, INC.
 2040 Harbush Blvd.
 Billings, MT 59102
 406-245-0136
 PROJECT #: 13BL4131.002

100% CONSTRUCTION DOCUMENTS

sheet MECHANICAL SCHEDULES

project BEN STEELE MIDDLE SCHOOL

owner BILLINGS PUBLIC SCHOOLS

a&e proj #	13048.20
ia proj #	21438.00
revision	date
1	1/22/16

phase 100% CONSTRUCTION DOCUMENTS



issue date
12/18/2015

M0.3

VARIABLE AIR VOLUME UNIT SCHEDULE (W/ HOT WATER COIL)														
PLAN CODE	MANUFACTURER	MODEL NUMBER	100% CFM	MIN. CFM (HTG.)	HOT WATER COIL (35% GLYCOL)						MAX TOTAL S.P. @ 100% CFM IN. H2O	INLET SIZE (IN, Ø)		
					HEATING CAP (MBH)	AIR SIDE			WATER SIDE					
						CFM	EAT °F	LAT °F	# ROWS	GPM			EWT °F/LWT	P.D. FT
VAV 3-1	TRANE	VCWF	780	390	21.15	390	55	105	2	3.16	1 1/2 @ 20	<10'	0.75	12
VAV 3-2	TRANE	VCWF	740	370	20.06	370	55	105	2	2.96	1 1/2 @ 20	<10'	0.75	12
VAV 3-3	TRANE	VCWF	600	300	16.27	300	55	105	2	2.11	1 1/2 @ 20	<10'	0.75	10
VAV 3-4	TRANE	VCWF	600	300	16.27	300	55	105	2	2.11	1 1/2 @ 20	<10'	0.75	10
VAV 3-5	TRANE	VCWF	1840	920	49.89	920	55	105	2	5.67	1 1/2 @ 20	<10'	0.75	24"x16"
VAV 3-6	TRANE	VCWF	680	340	18.44	340	55	105	2	2.55	1 1/2 @ 20	<10'	0.75	10
VAV 3-7	TRANE	VCWF	880	440	23.86	440	55	105	2	3.72	1 1/2 @ 20	<10'	0.75	12
VAV 3-8	TRANE	VCWF	600	300	16.27	300	55	105	2	2.11	1 1/2 @ 20	<10'	0.75	10
VAV 3-9	TRANE	VCWF	800	400	21.96	400	55	105	2	3.27	1 1/2 @ 20	<10'	0.75	12
VAV 3-10	TRANE	VCWF	550	275	14.91	275	55	105	2	1.86	1 1/2 @ 20	<10'	0.75	10
VAV 3-11	TRANE	VCWF	1440	720	39.04	720	55	105	2	4.80	1 1/2 @ 20	<10'	0.75	16
VAV 3-12	TRANE	VCWF	1410	705	38.23	705	55	105	2	4.67	1 1/2 @ 20	<10'	0.75	16
VAV 3-13A	TRANE	VCWF	1410	705	38.23	705	55	105	2	4.67	1 1/2 @ 20	<10'	0.75	16
VAV 3-13B	TRANE	VCWF	1540	770	40.5	770	55	105	2	4.85	1 1/2 @ 20	<10'	0.75	16
VAV 3-14	TRANE	VCWF	680	340	18.44	340	55	105	2	2.55	1 1/2 @ 20	<10'	0.75	10
VAV 3-15	TRANE	VCWF	600	300	16.27	300	55	105	2	2.11	1 1/2 @ 20	<10'	0.75	10
VAV 3-16	TRANE	VCWF	1860	930	50.43	930	55	105	2	5.76	1 1/2 @ 20	<10'	0.75	24"x16"
VAV 3-17	TRANE	VCWF	680	340	18.44	340	55	105	2	2.55	1 1/2 @ 20	<10'	0.75	10
VAV 3-18	TRANE	VCWF	400	200	10.85	200	55	105	2	2.34	1 1/2 @ 20	<10'	0.75	8
VAV 3-19	TRANE	VCWF	700	350	18.98	350	55	105	2	2.68	1 1/2 @ 20	<10'	0.75	10
VAV 3-20	TRANE	VCWF	320	160	8.68	160	55	105	2	1.23	1 1/2 @ 20	<10'	0.75	8
VAV 3-21	TRANE	VCWF	1340	670	36.33	670	55	105	2	4.38	1 1/2 @ 20	<10'	0.75	16
VAV 3-22	TRANE	VCWF	460	230	N/A	250	N/A	N/A	N/A	NO COIL	N/A	N/A	0.75	10
VAV 3-23	TRANE	VCWF	450	225	N/A	250	N/A	N/A	N/A	NO COIL	N/A	N/A	0.75	10
VAV 4-1	TRANE	VCWF	175	120	6.51	120	55	105	2	0.79	1 1/2 @ 20	<10'	0.75	6
VAV 4-2	TRANE	VCWF	150	75	4.07	75	55	105	2	1.0	1 1/2 @ 20	<10'	0.75	6
VAV 4-3	TRANE	VCWF	80	40	2.67	40	55	105	1	0.5	1 1/2 @ 20	<10'	0.75	5
VAV 4-4	TRANE	VCWF	80	40	2.67	40	55	105	1	0.5	1 1/2 @ 20	<10'	0.75	5
VAV 4-5	TRANE	VCWF	80	40	2.67	40	55	105	1	0.5	1 1/2 @ 20	<10'	0.75	5
VAV 4-6	TRANE	VCWF	275	140	14.91	140	55	105	3	1.75	1 1/2 @ 20	<10'	0.75	6
VAV 4-7	TRANE	VCWF	245	125	6.78	125	55	105	2	0.84	1 1/2 @ 20	<10'	0.75	6
VAV 4-8	TRANE	VCWF	370	185	10.03	185	55	105	2	2.08	1 1/2 @ 20	<10'	0.75	8
VAV 4-9	TRANE	VCWF	230	115	6.24	115	55	105	2	0.75	1 1/2 @ 20	<10'	0.75	6
VAV 4-10	TRANE	VCWF	180	90	4.88	90	55	105	1	2.38	1 1/2 @ 20	<10'	0.75	6
VAV 4-11	TRANE	VCWF	180	90	4.88	90	55	105	1	2.38	1 1/2 @ 20	<10'	0.75	6
VAV 4-12	TRANE	VCWF	260	130	7.05	130	55	105	2	0.89	1 1/2 @ 20	<10'	0.75	6
VAV 4-13	TRANE	VCWF	290	205	11.12	205	55	105	2	2.01	1 1/2 @ 20	<10'	0.75	6
VAV 4-14	TRANE	VCWF	240	170	9.22	170	55	105	2	1.37	1 1/2 @ 20	<10'	0.75	6
VAV 4-15	TRANE	VCWF	100	50	2.95	50	55	105	1	0.5	1 1/2 @ 20	<10'	0.75	5
VAV 4-16	TRANE	VCWF	200	100	5.42	100	55	105	2	0.63	1 1/2 @ 20	<10'	0.75	5
VAV 4-17	TRANE	VCWF	200	100	5.42	100	55	105	2	0.63	1 1/2 @ 20	<10'	0.75	5
VAV 4-18	TRANE	VCWF	100	50	2.95	50	55	105	1	0.5	1 1/2 @ 20	<10'	0.75	5
VAV 4-19	TRANE	VCWF	325	165	8.95	165	55	105	2	1.78	1 1/2 @ 20	<10'	0.75	8

VAV NOTES:
 1. WATER TEMPERATURE DROP SHALL BE 30° F. BOXES TO BE SELECTED AS SUCH. ACCOUNT FOR 35% PROPYLENE GLYCOL.
 2. ENTERING STATIC PRESSURE = 1" W.C.
 3. BOX SUPPLIER TO PROVIDE FACTORY INSTALLED MULTI-POINT AVERAGING SENSORS. MECHANICAL CONTRACTOR TO PROVIDE BOXES WITH HANGING BRACKETS, AND PROVIDE DUCT TRANSITIONS TO AND FROM BOXES AS REQUIRED. TEMPERATURE CONTROL SUBCONTRACTOR TO FURNISH ALL DIGITAL VAV BOX CONTROLLERS, ACTUATORS ETC. TO THE BOX MANUFACTURER FOR INSTALLATION. COST OF CONTROLLERS AND SHIPPING SHALL BE BURDEN OF T.C. CONTRACTOR. COST OF THE INSTALLATION SHALL BE BY THE BOX MANUFACTURER.
 4. SOUND DISCHARGE LEVELS TO BE <20 N.C. AT 1" INLET STATIC PRESSURE, UNLESS OTHERWISE NOTED.
 5. PROVIDE FACTORY ACCESS PANEL FOR DAMPER AND COIL ACCESS.

VARIABLE AIR VOLUME UNIT SCHEDULE (W/ HOT WATER COIL)														
PLAN CODE	MANUFACTURER	MODEL NUMBER	100% CFM	MIN. CFM (HTG.)	HOT WATER COIL (35% GLYCOL)						MAX TOTAL S.P. @ 100% CFM IN. H2O	INLET SIZE (IN, Ø)		
					HEATING CAP (MBH)	AIR SIDE			WATER SIDE					
						CFM	EAT °F	LAT °F	# ROWS	GPM			EWT °F/LWT	P.D. FT
VAV 5-1	TRANE	VCWF	1180	600	32.53	600	55	105	2	4.6	1 1/2 @ 20	<10'	0.75	14
VAV 5-2	TRANE	VCWF	1710	855	46.38	855	55	105	2	8.23	1 1/2 @ 20	<10'	0.75	14
VAV 6-1	TRANE	VCWF	1850	925	50.16	925	55	105	2	9.81	1 1/2 @ 20	<10'	0.75	14
VAV 6-2	TRANE	VCWF	2300	1150	62.36	1150	55	105	2	8.13	1 1/2 @ 20	<10'	0.75	24"x16"
VAV 6-3	TRANE	VCWF	1880	940	50.97	940	55	105	2	10.20	1 1/2 @ 20	<10'	0.75	14
VAV 6-4	TRANE	VCWF	1680	840	45.55	840	55	105	2	7.93	1 1/2 @ 20	<10'	0.75	14
VAV 6-5	TRANE	VCWF	350	175	9.49	175	55	105	2	1.45	1 1/2 @ 20	<10'	0.75	5
VAV 6-6	TRANE	VCWF	1700	850	46.09	850	55	105	2	8.13	1 1/2 @ 20	<10'	0.75	14
VAV 6-7	TRANE	VCWF	1780	890	48.26	890	55	105	2	8.97	1 1/2 @ 20	<10'	0.75	14
VAV 6-8	TRANE	VCWF	250	125	6.78	125	55	105	2	0.53	1 1/2 @ 20	<10'	0.75	5
VAV 6-9	TRANE	VCWF	420	210	11.39	210	55	105	2	2.12	1 1/2 @ 20	<10'	0.75	6
VAV 6-10	TRANE	VCWF	510	255	13.83	255	55	105	2	3.54	1 1/2 @ 20	<10'	0.75	8
VAV 6-11A,B	TRANE	VCWF	2400	1200	65.07	1200	55	105	2	8.83	1 1/2 @ 20	<10'	0.75	24"x16"
VAV 6-12	TRANE	VCWF	410	205	11.12	205	55	105	2	2.01	1 1/2 @ 20	6	0.75	6
VAV 6-13	TRANE	VCWF	220	110	5.96	110	55	105	2	0.71	1 1/2 @ 20	<10'	0.75	4
VAV 6-14	TRANE	VCWF	535	270	NO COIL						0.75	8		
VAV 6-15	TRANE	VCWF	190	95	5.15	95	55	105	2	0.59	1 1/2 @ 20	<10'	0.75	4
VAV 6-16	TRANE	VCWF	550	275	14.91	275	55	105	2	4.14	1 1/2 @ 20	<10'	0.75	8
VAV 6-17	TRANE	VCWF	175	90	4.88	90	55	105	1	0.55	1 1/2 @ 20	<10'	0.75	4
VAV 6-18	TRANE	VCWF	2500	1250	67.78	1250	55	105	2	9.62	1 1/2 @ 20	<10'	0.75	24"x16"
VAV 6-19	TRANE	VCWF	1480	740	40.13	740	55	105	2	6.29	1 1/2 @ 20	<10'	0.75	14
VAV 6-20	TRANE	VCWF	280	140	7.59	140	55	105	2	1.00	1 1/2 @ 20	<10'	0.75	5
VAV 6-21	TRANE	VCWF	835	420	22.77	420	55	105	2	3.79	1 1/2 @ 20	<10'	0.75	10
VAV 6-22	TRANE	VCWF	835	420	22.77	420	55	105	2	3.79	1 1/2 @ 20	<10'	0.75	10
VAV 6-23	TRANE	VCWF	225	115	6.24	115	55	105	2	0.75	1 1/2 @ 20	<10'	0.75	4
VAV 6-24	TRANE	VCWF	225	115	6.24	115	55	105	2	0.75	1 1/2 @ 20	<10'	0.75	4
VAV 6-25	TRANE	VCWF	355	180	9.21	180	55	105	2	1.85	1 1/2 @ 20	<10'	0.75	8
VAV 6-26	TRANE	VCWF	335	170	NO COIL						0.75	8		
VAV 6-27	TRANE	VCWF	700	350	18.98	350	55	105	2	2.68	1 1/2 @ 20	<10'	0.75	10

VAV NOTES:
 1. WATER TEMPERATURE DROP SHALL BE 30° F. BOXES TO BE SELECTED AS SUCH. ACCOUNT FOR 35% PROPYLENE GLYCOL.
 2. ENTERING STATIC PRESSURE = 1" W.C.
 3. BOX SUPPLIER TO PROVIDE FACTORY INSTALLED MULTI-POINT AVERAGING SENSORS. MECHANICAL CONTRACTOR TO PROVIDE BOXES WITH HANGING BRACKETS, AND PROVIDE DUCT TRANSITIONS TO AND FROM BOXES AS REQUIRED. TEMPERATURE CONTROL SUBCONTRACTOR TO FURNISH ALL DIGITAL VAV BOX CONTROLLERS, ACTUATORS ETC. TO THE BOX MANUFACTURER FOR INSTALLATION. COST OF CONTROLLERS AND SHIPPING SHALL BE BURDEN OF T.C. CONTRACTOR. COST OF THE INSTALLATION SHALL BE BY THE BOX MANUFACTURER.
 4. SOUND DISCHARGE LEVELS TO BE <20 N.C. AT 1" INLET STATIC PRESSURE, UNLESS OTHERWISE NOTED.
 5. PROVIDE FACTORY ACCESS PANEL FOR DAMPER AND COIL ACCESS.

SAWDUST COLLECTION SYSTEM SCHEDULE													
PLAN CODE	MANUF	MODEL NUMBER	FAN MODEL NUMBER	CFM	ESP	FILTER SURFACE AREA	NUMBER OF FILTER BAGS	FILTER TYPE	QNTY OF 55GAL DRUMS	FAN ELECTRICAL DATA			REMARKS
										HP	VOLT	PH	
DC-1	CAMFIL	GS-10	F57-HS	7190	CLEAN FILTERS: 6" DIRTY FILTERS: 14"	3250 SQ FT	10	POCKET	4 (2 ACTIVE, 2 STORAGE)	30	460	3	WOOD SHOP COLLECTOR, NOTE MAX HEIGHT ON DRAWING 25/M9.3

NOTES:
 1. PROVIDE DC-1 WITH ABORT DAMPER AND SPARK DETECTION/EXTINGUISHING SYSTEM CONNECTED TO F.A., COORDINATE WITH E.C., INLET ISOLATION DAMPER. SEE 25/M9.3.
 2. DUST COLLECTOR TO BE FACTORY PAINTED. COLOR SELECTED BY ARCHITECT AT TIME OF SUBMITTAL.
 3. ISOLATION FLAP TO BE 18" DIAMETER MODEL ST.
 4. ABORT DAMPER TO BE 24" DIAMETER MODEL AG-24.

2

WOOD SHOP EQUIPMENT SCHEDULE

PLAN CODE	DESCRIPTION	CONNECTION TYPE	CFM	DROP SIZE
WE-1,2,13,14	DRILL PRESS	SEE NOTES.	350 EA	4"
WE-3,4	BAND SAW	SEE NOTES.	380 EA	4"
WE-5	JOINTER	SEE NOTES.	350	4"
WE-6	PLANER	PROVIDE VIBRATION ISOLATOR BETWEEN STEEL DUCT AND PLANER AS CLOSE TO PLANER AS POSSIBLE.	790	6"
WE-7	ROUTER TABLE	PROVIDE SPECIFIED FLEXIBLE HOSE TOO ALLOW FULL RANGE OF MOTION FOR SAW. CONNECT TO DUST COLLECTION POWER. MINIMUM OF 8 FEET OF RUN. SEE NOTES.	350	4"
WE-8	TABLE SAW	PROVIDE VIBRATION ISOLATOR BETWEEN DUCT AND DUST COLLECTION PORT.	350	4"
WE-9	LATHE	SEE NOTES.	550	6"
WE-10	SPINDLE SANDER	SEE NOTES.	400	3"
WE-11,12	BENCH SANDER	SEE NOTES.	500 EA	5"
WE-15,16	MINI LATHE	SEE NOTES.	400 EA	5"
WE-17	RADIAL ARM SAW	PROVIDE VIBRATION ISOLATOR BETWEEN DUCT AND DUST COLLECTION PORT	440	6"
SHEET NOTE	FLOOR SWEEP	SEE 19/M9.3	800	6"

NOTES:
1. SEE 24/M9.3 FOR TYPICAL DROP DETAILS.

METAL SHOP EQUIPMENT SCHEDULE

PLAN CODE	DESCRIPTION	CONNECTION TYPE	CFM	DROP SIZE
ME-1,2	DRILL PRESS	NONE	---	---
ME-4	BAND SAW	NONE	---	---
ME-4	CHOP SAW	NONE	---	---
ME-5	POWDER COAT OVEN	EXHAUST GRILLE	200	SEE PLANS
ME-6	INERT GAS WELDER	WELDING EXHAUST PER 29/M9.5	400	6"
ME-7	PLASMA CUTTER	18" DROP FROM EF-18 TO OWNER FABRICATED DOWN DRAFT SYSTEM	1600	18"

EXHAUST FAN SCHEDULE

PLAN CODE	MANUF	MODEL NUMBER	CFM	ESP	RPM	DRIVE TYPE	ELECTRICAL DATA				STATIC EFFICIENCY	SONES	WEIGHT	CONTROL NOTES	AREA SERVED	REMARKS
							HP	VOLT	FLA	PH						
EF-1	COOK	150C15D	1950	0.65"	1234	DIRECT	0.75	120	---	1	55%	12.7	200 LBS	SEE NOTE 5,10	BOYS TOILET 1114, 2114 GIRLS TOILET 1115,2115	ROOF FAN. SEE SCHEDULE NOTES 1, 2 BELOW. PROVIDE FACTORY WIRED SPEED CONTROLLER FOR DIRECT DRIVE FAN.
EF-2	COOK	135C15D	1800	0.65"	1486	DIRECT	0.5	120	---	1	49%	14	200 LBS	SEE NOTE 5	BOYS TOILET 1122, 2122 GIRLS TOILET 1123,2123	ROOF FAN. SEE SCHEDULE NOTES 1, 2 BELOW. PROVIDE FACTORY WIRED SPEED CONTROLLER FOR DIRECT DRIVE FAN.
EF-3	COOK	101C17DEC	435	0.7"	1486	DIRECT	0.25	120	---	1	92%	9	160 LBS	SEE NOTE 5	CUST 1122A, TOILET 1121A, CUST 2506B, TOILET 2506C, CUST 2122A	ROOF FAN. ECM MOTOR. SEE SCHEDULE 1, 2 NOTES BELOW
EF-4	COOK	100C15DH	300	0.7"	1486	DIRECT	0.125	120	---	1	84%	9.8	160 LBS	SEE NOTE 5	TOILET 1503A, CUST 1503A, CUST 2503A, TOILET 2503C	ROOF FAN. SEE SCHEDULE NOTES 1, 2 BELOW. PROVIDE FACTORY WIRED SPEED CONTROLLER FOR DIRECT DRIVE FAN.
EF-5	COOK	100 ACEB	820	0.65"	1923	BELT	0.25	120	---	1	46%	13	160 LBS	SEE NOTE 12	SCIENCE 2124	ROOF FAN. SEE SCHEDULE NOTES 1,2 BELOW
EF-6	COOK	100 ACEB	720	0.7"	1806	BELT	0.25	120	---	1	46%	13	160 LBS	SEE NOTE 12	SCIENCE 1124	ROOF FAN. SEE SCHEDULE NOTES 1, 2 BELOW
EF-7	COOK	100 ACEB	840	0.65"	1982	BELT	0.25	120	---	1	46%	13	160 LBS	SEE NOTE 12	SCIENCE 2126	ROOF FAN. SEE SCHEDULE NOTES 1, 2 BELOW
EF-8	COOK	100 ACEB	740	0.7"	1806	BELT	0.25	120	---	1	46%	13	160 LBS	SEE NOTE 12	SCIENCE 1126	ROOF FAN. SEE SCHEDULE NOTES 1, 2 BELOW
EF-9	COOK	101C17D	450	0.7"	1725	DIRECT	0.167	120	---	1	46%	10.2	160 LBS	SEE NOTE 5	PREP 1508A, CUST 1509D, PREP 2508A	ROOF FAN. SEE SCHEDULE NOTES 1, 2 BELOW. PROVIDE FACTORY WIRED SPEED CONTROLLER FOR DIRECT DRIVE FAN.
EF-10	COOK	101C17D	480	0.7"	1725	DIRECT	0.167	120	---	1	46%	10.2	160 LBS	SEE NOTE 6	1509C ELEVATOR MACHINE ROOM	ROOF FAN. SEE SCHEDULE NOTES 1, 2 BELOW. PROVIDE FACTORY WIRED SPEED CONTROLLER FOR DIRECT DRIVE FAN.
EF-11	COOK	90C17DEC	165	0.6"	1567	DIRECT	0.25	120	---	1	63%	5.7	28	NOTE 7	KILN 1106A	ROOF FAN. SEE SCHEDULE NOTES 1 AND 2 BELOW. INTERLOCK CONTROLS TO ACTIVATE WHEN KILN IS IN USE.
EF-12	COOK	120C17DEC	920	0.65"	1409	DIRECT	0.5	120	---	1	95%	9.4	200 LBS	NOTE 12	ART 2106	ROOF FAN. ECM MOTOR. SEE SCHEDULE NOTES 1, 2 BELOW
EF-13	COOK	120C17DEC	900	0.65"	1409	DIRECT	0.5	120	---	1	95%	9.4	200 LBS	NOTE 12	ART 1106	ROOF FAN. ECM MOTOR. SEE SCHEDULE NOTES 1, 2 BELOW
EF-14	COOK	135C15D	1500	0.7"	1357	DIRECT	0.5	120	---	1	58%	11.7	200 LBS	NOTE 8	ENTERPRISE 2104	ROOF FAN. SEE SCHEDULE NOTES 1, 2 BELOW. PROVIDE FACTORY WIRED SPEED CONTROLLER FOR DIRECT DRIVE FAN.
EF-15	COOK	101C17DEC	600	0.7"	1242	DIRECT	0.25	120	---	1	98%	10.2	160 LBS	NOTE 5	FAB LAB 1104	ROOF FAN. SEE SCHEDULE NOTES 1, 2 BELOW. PROVIDE ECM MOTOR FOR DIRECT DRIVE FAN.
EF-16	COOK	GC-622	350	0.5"	1368	DIRECT	99 WATTS	120	---	1	69%	3.0	35 LBS	NOTE 9	AV CLOSET	CEILING FAN. MOUNT WITH RUBBER IN SHEAR ISOLATOR KIT. SEE SCHEDULE NOTES 1, 2 BELOW
EF-17	COOK	100C15DH	225	0.75"	1503	DIRECT	0.125	120	---	1	72%	9.7	160 LBS	NOTE 5	ADMINISTRATION AREA	ROOF FAN. SEE SCHEDULE NOTES 1, 2 BELOW. PROVIDE FACTORY WIRED SPEED CONTROLLER FOR DIRECT DRIVE FAN.
EF-18	COOK	165WH15D	1600	0.6"	1182	DIRECT	.75	120	---	1	51%	9.7	250 LBS	NOTE 8	PLASMA TABLE	WALL FAN. SEE SCHEDULE NOTES 1, 10, AND 11 BELOW.
EF-19	FANTECH	DBF4XL1-705	134	0.4"	---	DIRECT	83 WATTS	120	---	1	111	---	10 LBS	INTEGRAL PRESSURE SWITCH	ENTERPRISE ROOM DRYER	IN LINE FAN MOUNTED IN CEILING SPACE FOR DRYER. M.C. TO INSTALL REMOTE MONITORING PANEL IN ENTERPRISE ROOM UTILIZING FACTORY CABLE. COORDINATE FINAL PANEL LOCATION WITH OWNER/ARCHITECT.
EF-20	COOK	101C15D	455	0.5"	1457	DIRECT	0.125	120	---	1	46%	8.0	30 LBS	NOTE 5	KITCHEN SUPPORT AREA	ROOF FAN. SEE SCHEDULE NOTES 1 AND 2 BELOW
EF-21	COOK	135R10D	995	0.5"	1063	DIRECT	0.167	120	---	1	59%	7.7	72 LBS	NOTE 5	1311 BOYS TOILET AND 1312 GIRLS TOILET	ROOF FAN. SEE SCHEDULE NOTES 1 AND 2 BELOW
EF-22	COOK	210 ACRUB	3000	0.5"	729	BELT	0.5	120	---	1	58%	7.7	228 LBS	NOTE 5	LOCKER ROOM AREAS	ROOF FAN. SEE SCHEDULE NOTES 1 AND 2 BELOW
EF-H1	CAPTIVEAIRE	NCA24HPFA	4000	1.25"	952	BELT	2	208	6.8	3	---	20	237 LBS	NOTE 3	KITCHEN HOOD KH-1, KH-2	PROVIDE VENTED/HINGED ROOF CURB, FACTORY DISCONNECT, GREASE BOX, UL 762 FAN. SEE 28/M9.2. VFD SYSTEM WITH HOOD EMS.
EF-H2	CAPTIVEAIRE	NCA24HPFA	4500	1.25"	999	BELT	2	208	6.8	3	---	21	237 LBS	NOTE 3	KITCHEN HOOD KH-3, KH-4	PROVIDE VENTED/HINGED ROOF CURB, FACTORY DISCONNECT, GREASE BOX, UL 762 FAN. SEE 28/M9.2. VFD SYSTEM WITH HOOD EMS.
EF-H3	CAPTIVEAIRE	DU33HFA	600	0.5"	1253	BELT	1/3	120	3.4	1	---	9.1	96 LBS	NOTE 4	DISHWASHER EXHAUST	PROVIDE STANDARD ROOF CURB, FACTORY DISCONNECT. SEE SCHEDULE NOTES 1 AND 2 BELOW.

EXHAUST FAN SCHEDULE NOTES:

- PROVIDE ALL FANS WITH BACKDRAFT DAMPERS, EXCEPT KITCHEN HOOD GREASE FANS EF-H1, EF-H2.
- PROVIDE ALL ROOF MOUNTED FANS WITH MANUF. INSULATED ACOUSTICAL ROOF CURB. VERIFY ROOF SLOPE ON SITE. PROVIDE ALL FANS WITH FACTORY MOUNTED AND WIRED DISCONNECT SWITCH. FAN MANUF. TO PROVIDE DIRECT DRIVE FANS WITH SPEED SELECTOR SWITCHES. ALL SPEED SELECTION SWITCHES TO BE FACTORY MOUNTED AND WIRED.
- GREASE HOOD FANS EF-H1, EF-H2 TO BE CONTROLLED VIA HOOD CONTROL PANEL. SEE HOOD ENERGY MANAGEMENT NOTES ON KITCHEN HOOD SCHEDULE. SEE SHEET M9.2 FOR DETAILS.
- DISHWASHER FAN TO BE CONTROLLED VIA INTERLOCK TO DISHWASHER CONTROLS BY E.C.
- FAN TO RUN DURING OCCUPIED HOURS. PROVIDE WITH DDC CONTROLS. PROVIDE SEPARATE SCHEDULE CAPABILITIES FOR EACH FAN. COORD SCHEDULE W/ OWNER.
- FAN TO RUN CONTINUOUS. MONITOR WITH DDC CONTROLS
- FAN TO BE WIRED TO KILN AND TO ACTIVATE WHEN KILN IS TURNED ON. CONTROLS BY T.C. CONTRACTOR.
- E.C. TO WIRE FAN TO WALL SWITCH.
- FAN TO OPERATE OFF OF A MAKE-ON-RISE THERMOSTAT. M.C. TO PROVIDE 120V THERMOSTAT. E.C. TO WIRE THERMOSTAT.
- E.C. PROVIDE ALL EXHAUST FANS 3/4 HP AND OVER WITH MOTOR STARTER.
- EF FOR SHOP EQUIPMENT CONNECTION TO BE BID AS SCHEDULED. DO NOT ORDER UNTIL OWNER HAS SELECTED ACTUAL SHOP EQUIPMENT. COORDINATE FINAL CFM/STATIC/CONNECTION WITH ENGINEER AND OWNER PRIOR TO ORDERING.
- T.C. CONTRACTOR TO PROVIDE A MOMENTARY SWITCH AS A DDC SYSTEM INPUT TO ACTIVATE FAN. DDC SYSTEM TO OPERATE FAN FOR 30 MINUTES. IF SWITCH IS ACTIVATED DURING FAN OPERATION, DEACTIVATE FAN.

GRAVITY VENTILATOR SCHEDULE

PLAN CODE	MANUF.	MODEL NUMBER	FUNCTION	HOOD SIZE	MATERIAL	CFM	APD	VELOCITY	FREE AREA	WEIGHT	DAMPER	REMARKS
GV-1	COOK	48 X 102 GR	GYM RELIEF	85" x 123" W x 26" H	ALUMINUM	10,000	0.021" W.C.	291 FPM	34.3 S.F.	750 LBS	24V MOTORIZED	SEE NOTES

NOTES:

- FINISH TO BE ALUMINUM.
- PROVIDE WITH 14" ROOF CURB AND BIRDSCREEN.



2040 Harbush Blvd.
Billings, MT 59102
406-245-0136
PROJECT #: 13BL4131.002

100% CONSTRUCTION DOCUMENTS

sheet MECHANICAL SCHEDULES

project BEN STEELE MIDDLE SCHOOL

owner BILLINGS PUBLIC SCHOOLS

a&e proj # 13048.20
ia proj # 21438.00
revision date
1/22/16

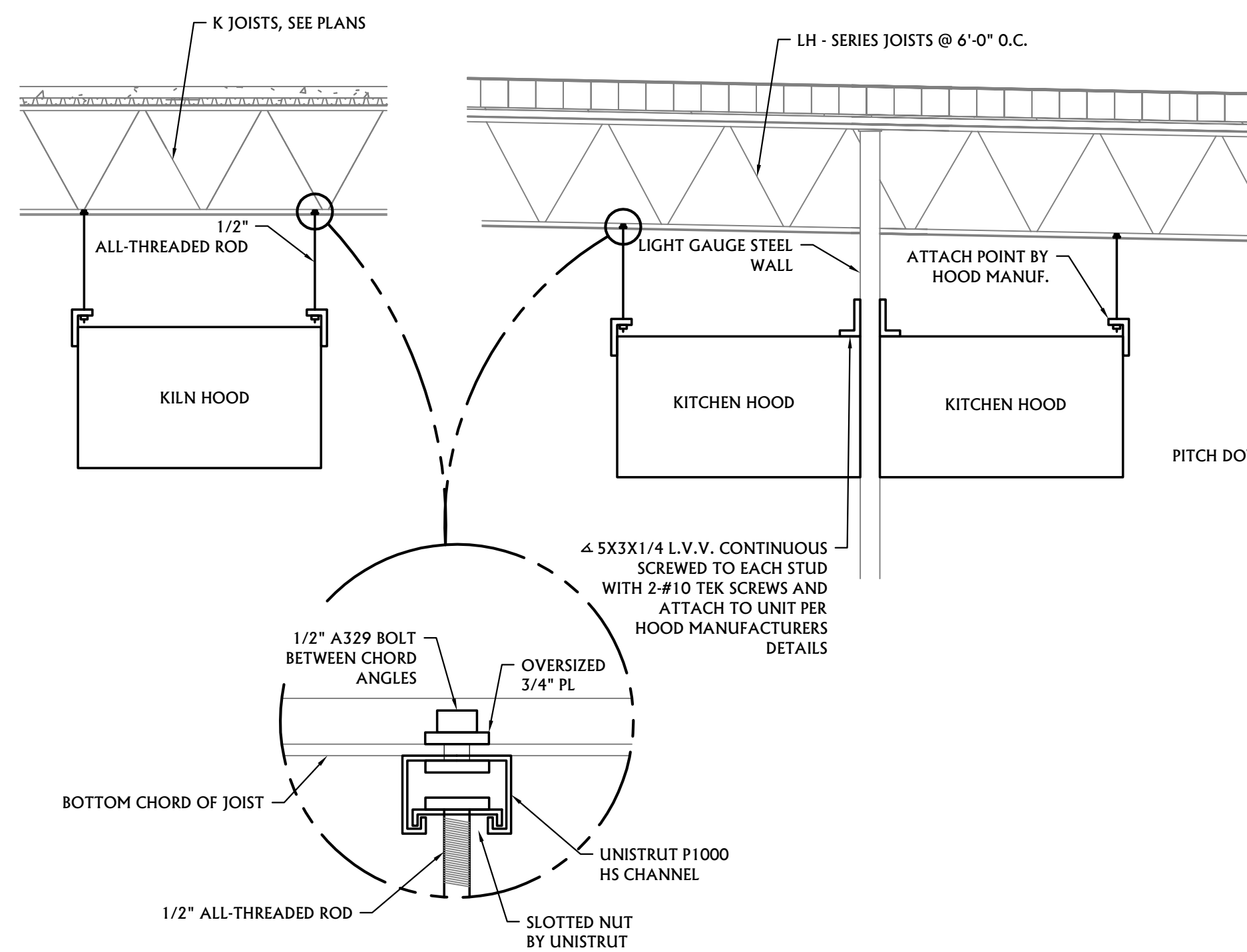
phase
100% CONSTRUCTION DOCUMENTS

a&e ARCHITECTS

integrus ARCHITECTURE

issue date
12/18/2015

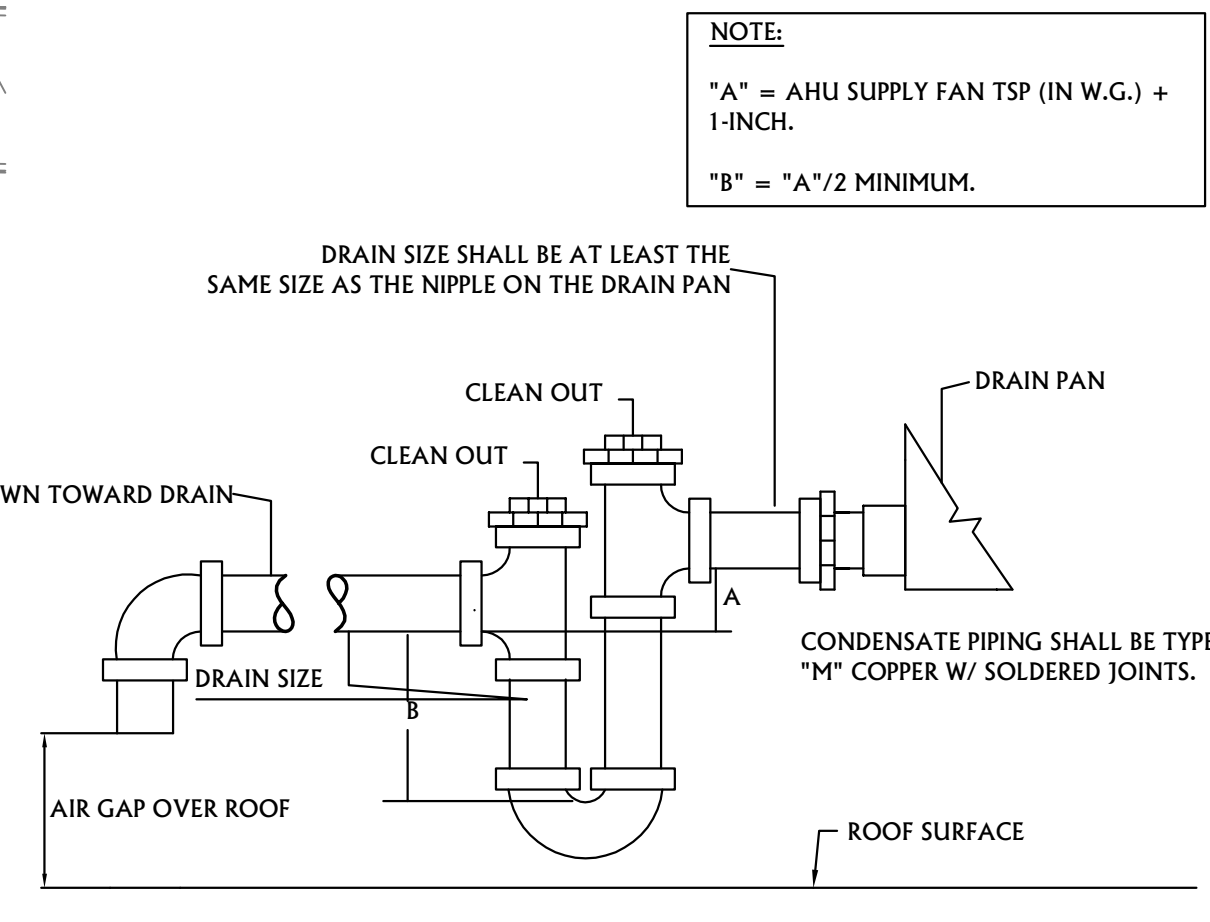
M0.4



1 HOOD SUPPORT DETAILS

M9.2 : M9.2

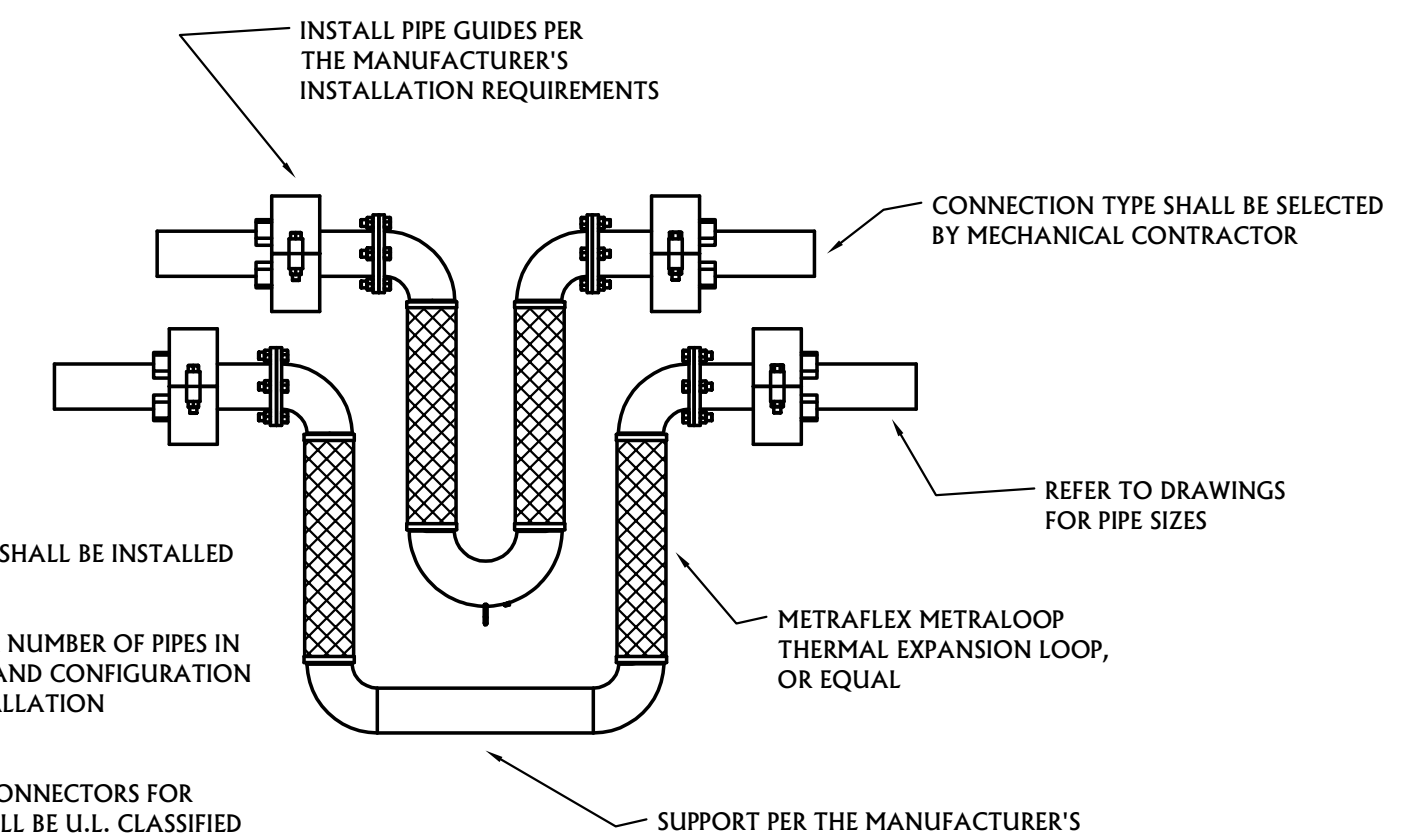
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2 AHU CONDENSATE DRAIN TRAP DETAIL

M9.2 : M9.2

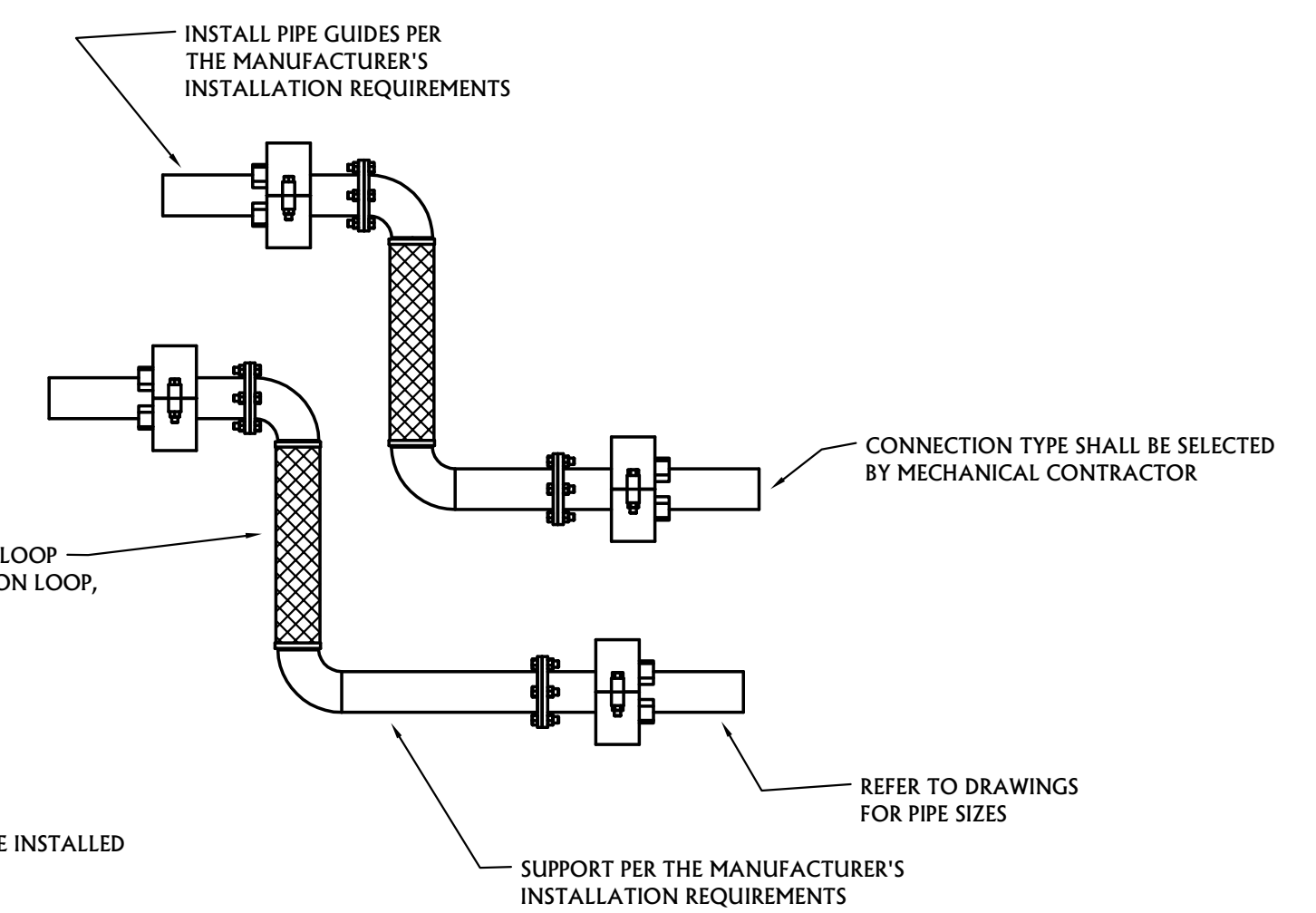
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4 THERMAL EXPANSION LOOP CONNECTORS

M9.2 : M9.2

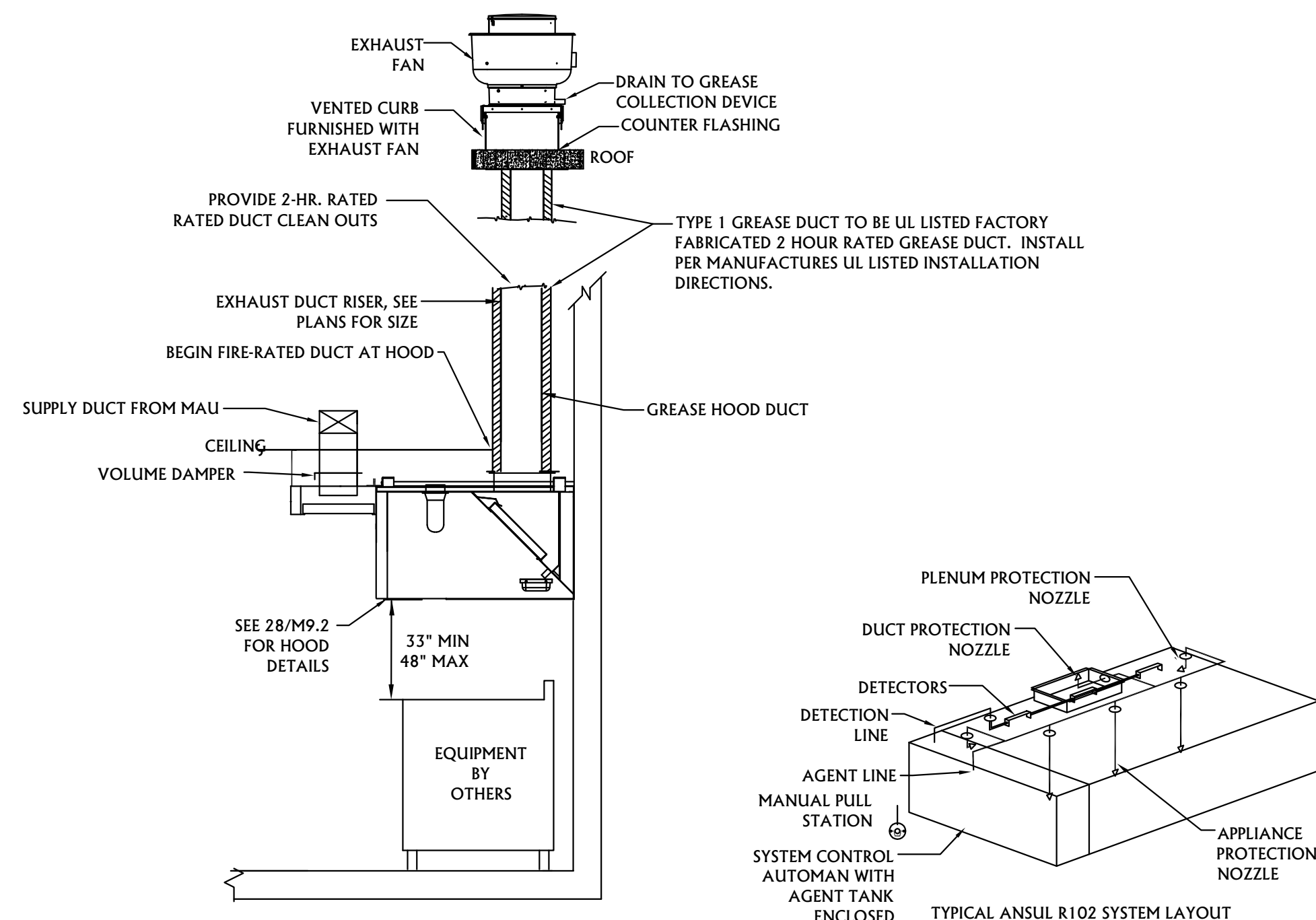
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6 MODIFIED THERMAL EXPANSION LOOP CONNECTORS

M9.2 : M9.2

SCALE: N.T.S.



13 KITCHEN HOOD EXHAUST INSTALLATION DETAIL

M9.2 : M9.2

SCALE: N.T.S.

THE MAKEUP AIR UNIT MANUFACTURER/SUPPLIER SHALL FURNISH A COMPLETE ELECTRIC AUTOMATIC TEMPERATURE CONTROL SYSTEM FOR THE MAKEUP AIR AND EVAPORATIVE COOLING UNIT FOR A COMPLETE AND FUNCTIONAL SYSTEM. THE MECHANICAL CONTRACTOR SHALL INSTALL THE CONTROL PACKAGE AND WIRING. ON THE COMPLETION OF THE PROJECT THE UNIT SUPPLIER SHALL COMPLETELY ADJUST, READY FOR USE, THE THERMOSTATS, DAMPERS, RELAYS, ETC. PROVIDED IN THIS WORK. THE UNIT SUPPLIER SHALL PROVIDE A COMPLETE INSTRUCTION MANUAL COVERING THE FUNCTION AND OPERATION OF CONTROL COMPONENTS ON THE PROJECT. THIS MANUAL SHALL BE FURNISHED TO THE OPERATING PERSONNEL, AND A COMPETENT TECHNICIAN SHALL TRAIN THE OPERATING PERSONNEL.

THE PACKAGED CONTROLS SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING DEVICES, OPTIONS, AND SAFETIES:

- A REMOTE CONTROL PANEL WITH A VENTILATION SUMMER/OFF/WINTER SWITCH, BURNER ON/OFF SWITCH, AND INDICATOR LIGHTS.
- A SPACE OVERRIDE THERMOSTAT.
- AN OUTDOOR AIR TEMPERATURE SENSOR.
- DISCHARGE DUCT THERMOSTAT AND SETPOINT DIAL ON CONTROL PANEL.

CONTROL SEQUENCE:

HOOD MOUNTED VENTILATION SWITCH ON:

GREASE HOOD EXHAUST SYSTEM ON: THE MAKEUP AIR UNIT WILL ENERGIZE AND RUN CONTINUOUSLY. THE UNIT MOUNTED OUTSIDE AIR DAMPER WILL OPEN TO 100%. THE EXHAUST FANS AND MAU WILL ACTIVATE AND VARY SPEED BASED UPON THE HOOD EMS CONTROL SYSTEM.

- WINTER MODE: THE MAKEUP AIR UNIT WILL MODULATE THE GAS BURNER TO MAINTAIN A 55°F (ADJUSTABLE) DISCHARGE AIR TEMPERATURE. ON A CALL FOR HEATING FROM THE ROOM THERMOSTAT, THE BURNER WILL GO TO FULL FIRE (MAXIMUM 120% DISCHARGE) TO MAINTAIN THE HEATING SETPOINT.
- SUMMER MODE: HEAT WILL BE LOCKED OUT, FAN WILL RUN.

HOOD MOUNTED VENTILATION SWITCH OFF:

- THE MAKE UP AIR UNIT AND EXHAUST FANS WILL BE OFF. THE MAU OUTSIDE AIR DAMPER WILL BE CLOSED.
- IF ANY OF THE HOODS SENSE HEAT IN THE HOOD, THE HOOD WILL ACTIVATE THE EMS SYSTEM.

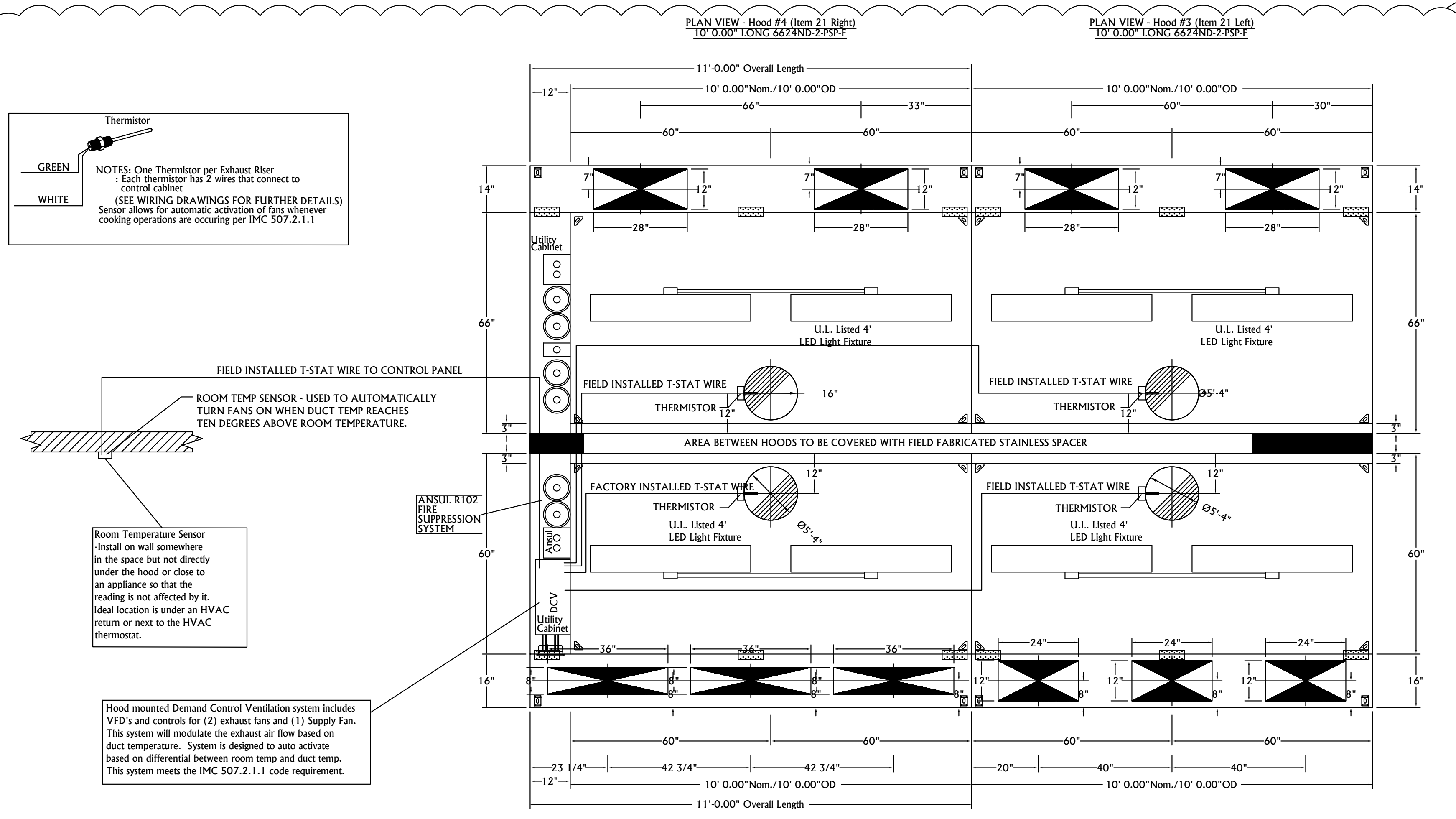
SAFETIES:

- AN INLET DUCT THERMOSTAT WILL SENSE THE OUTDOOR AIR TEMPERATURE AND LOCKOUT THE MAKEUP AIR BURNER WHEN THE OUTDOOR AIR IS ABOVE 60°F (ADJUSTABLE).
- THE OUTSIDE AIR DAMPER SHALL SPRING CLOSE ON A LOSS OF POWER.

16 MAKE UP AIR UNIT CONTROLS DETAIL

M9.2 : M9.2

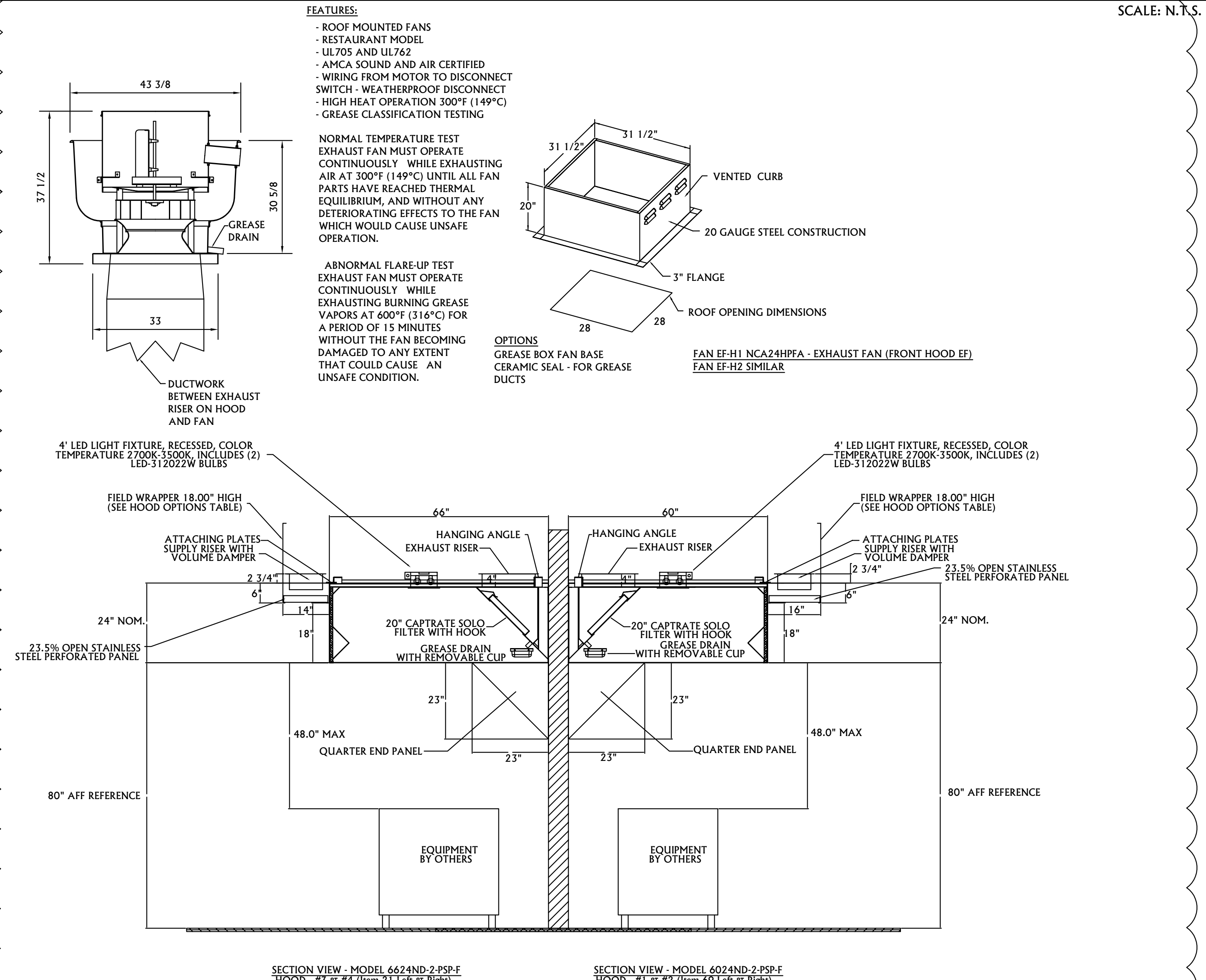
SCALE: N.T.S.



25 KITCHEN HOODS DETAIL - PLAN VIEW

M9.2 : M9.2

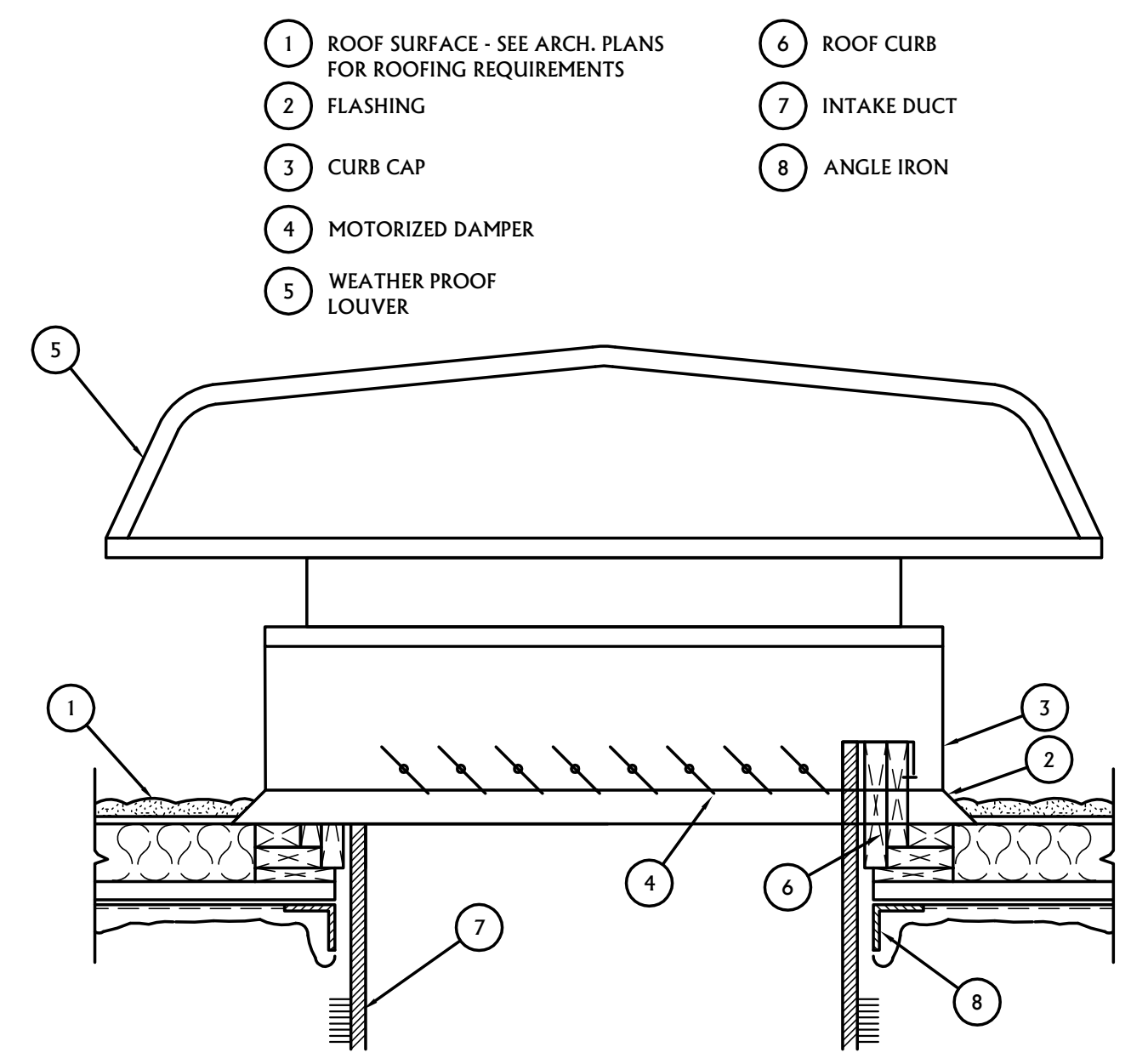
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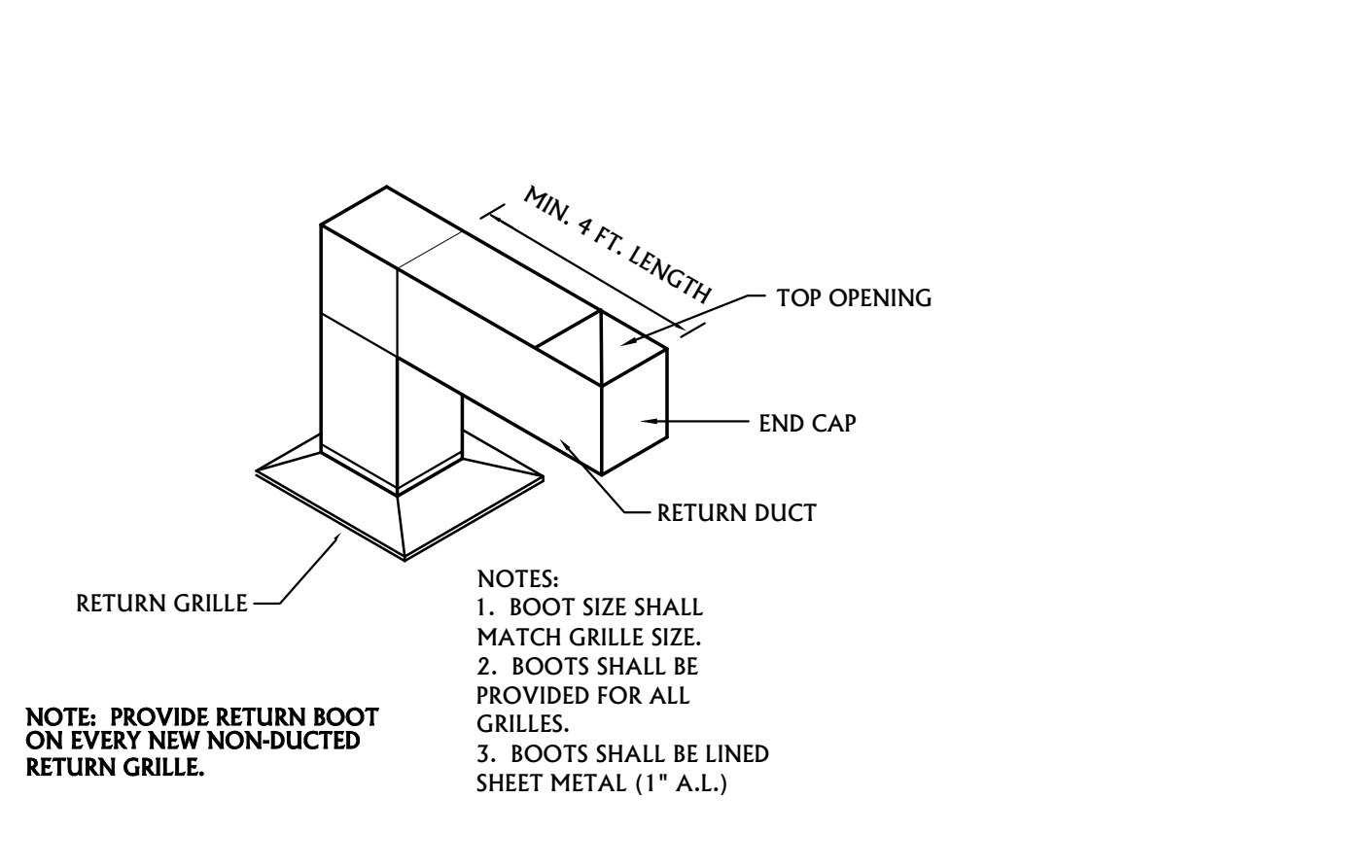
28 KITCHEN HOODS DETAIL - SECTION VIEW

M9.2 : M9.2

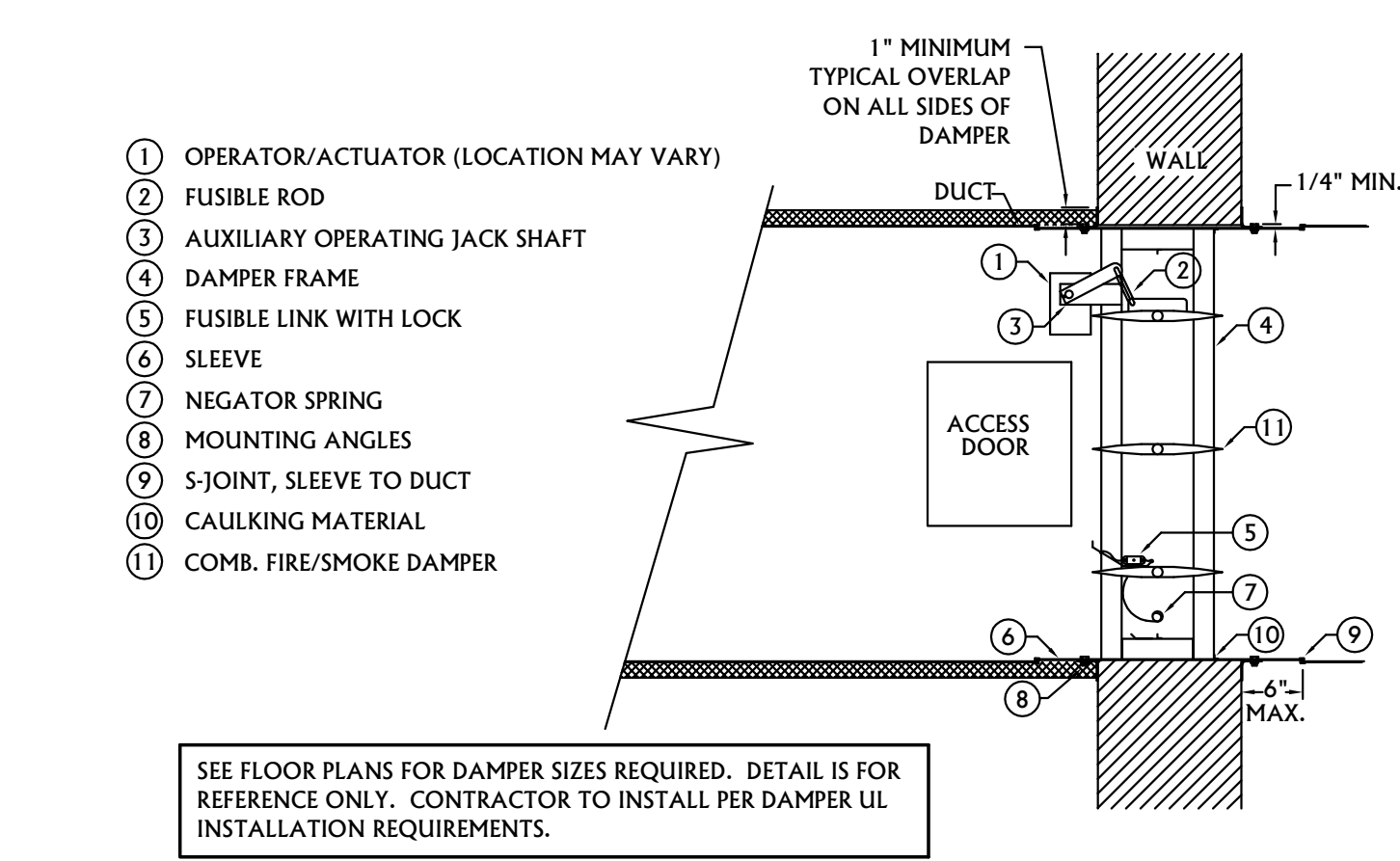
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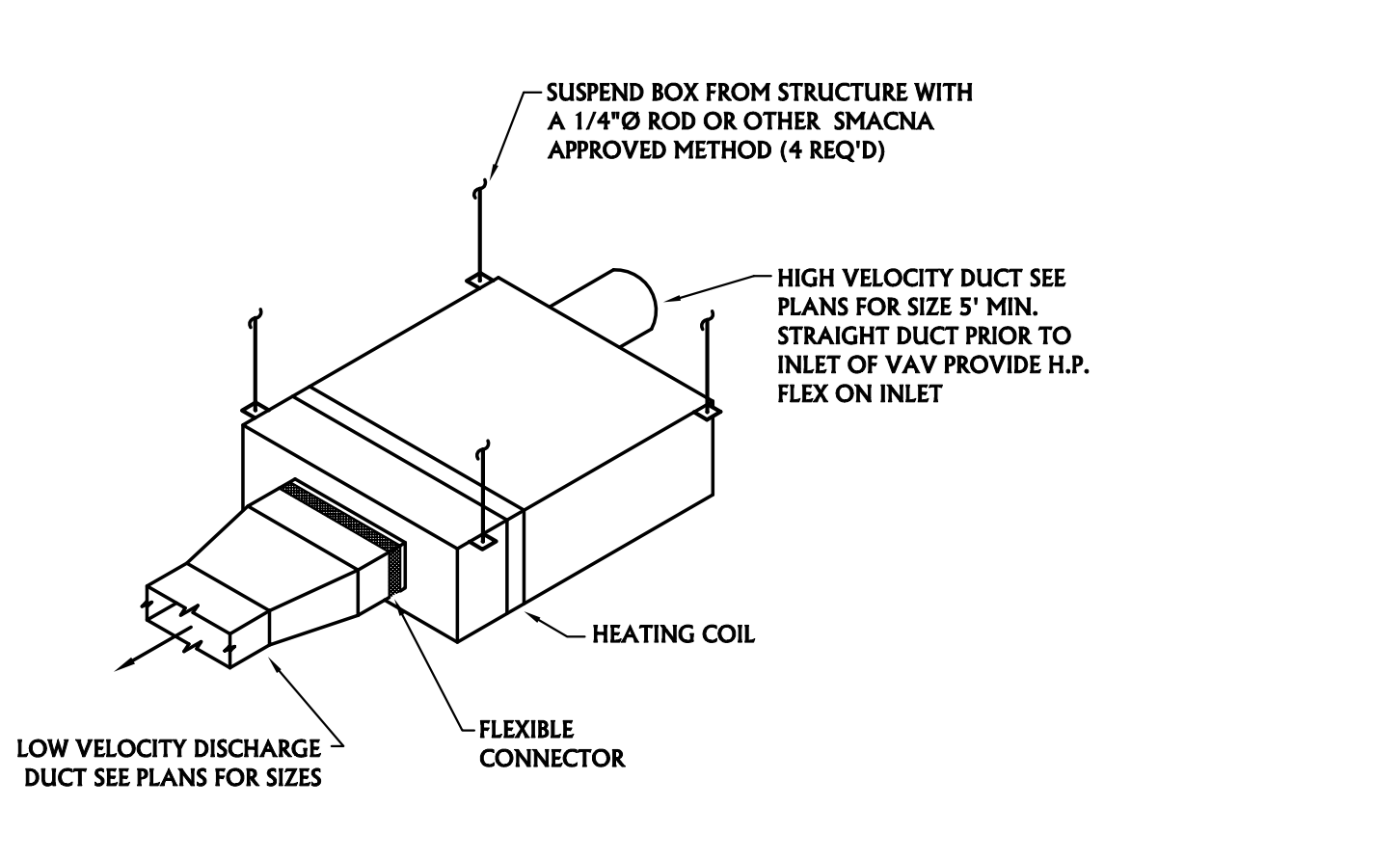
1 GRAVITY VENTILATOR DETAIL
M9.3 : M9.3 SCALE: N.T.S.



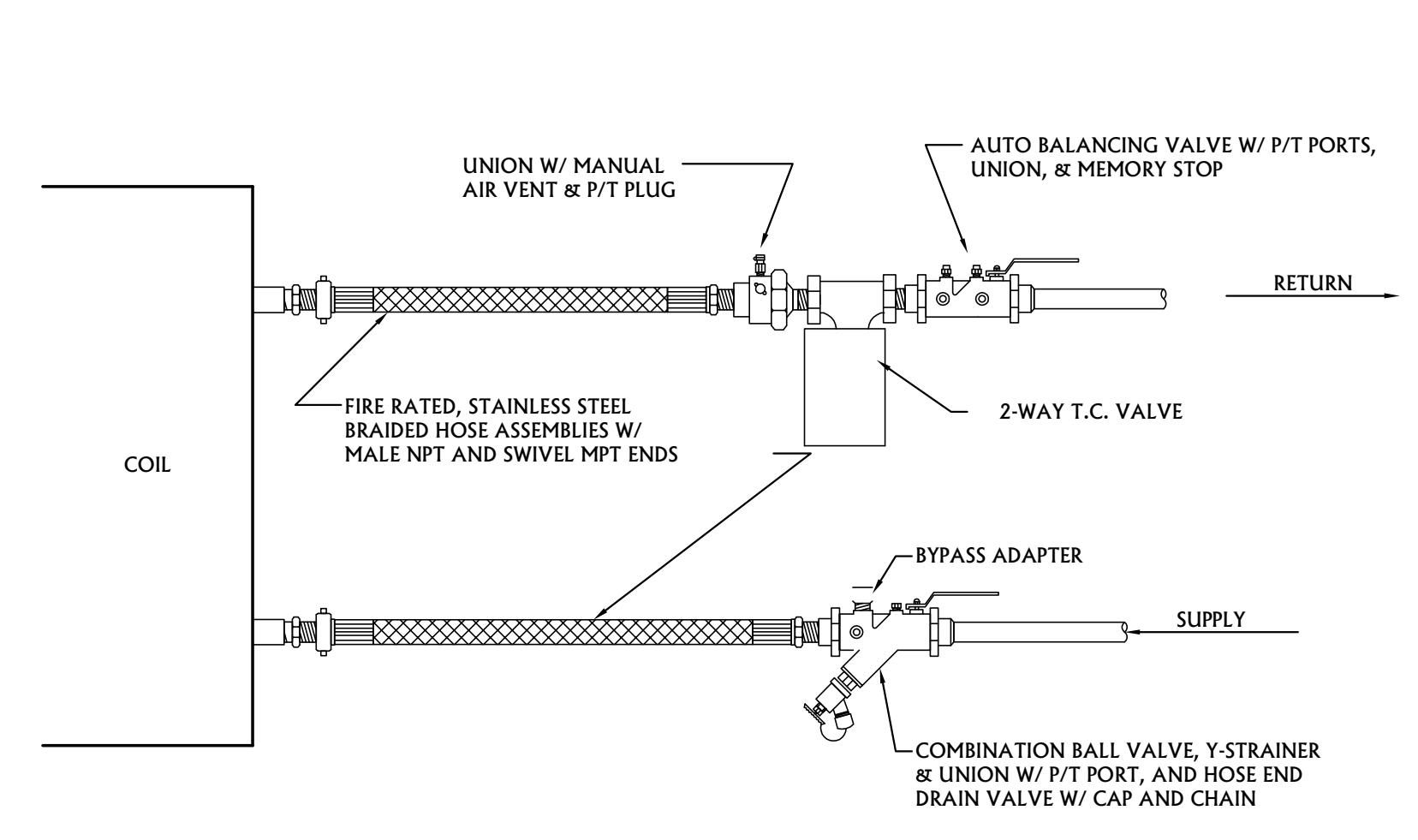
2 PLENUM RETURN GRILLE AND DUCT DETAIL
M9.3 : M9.3 SCALE: N.T.S.



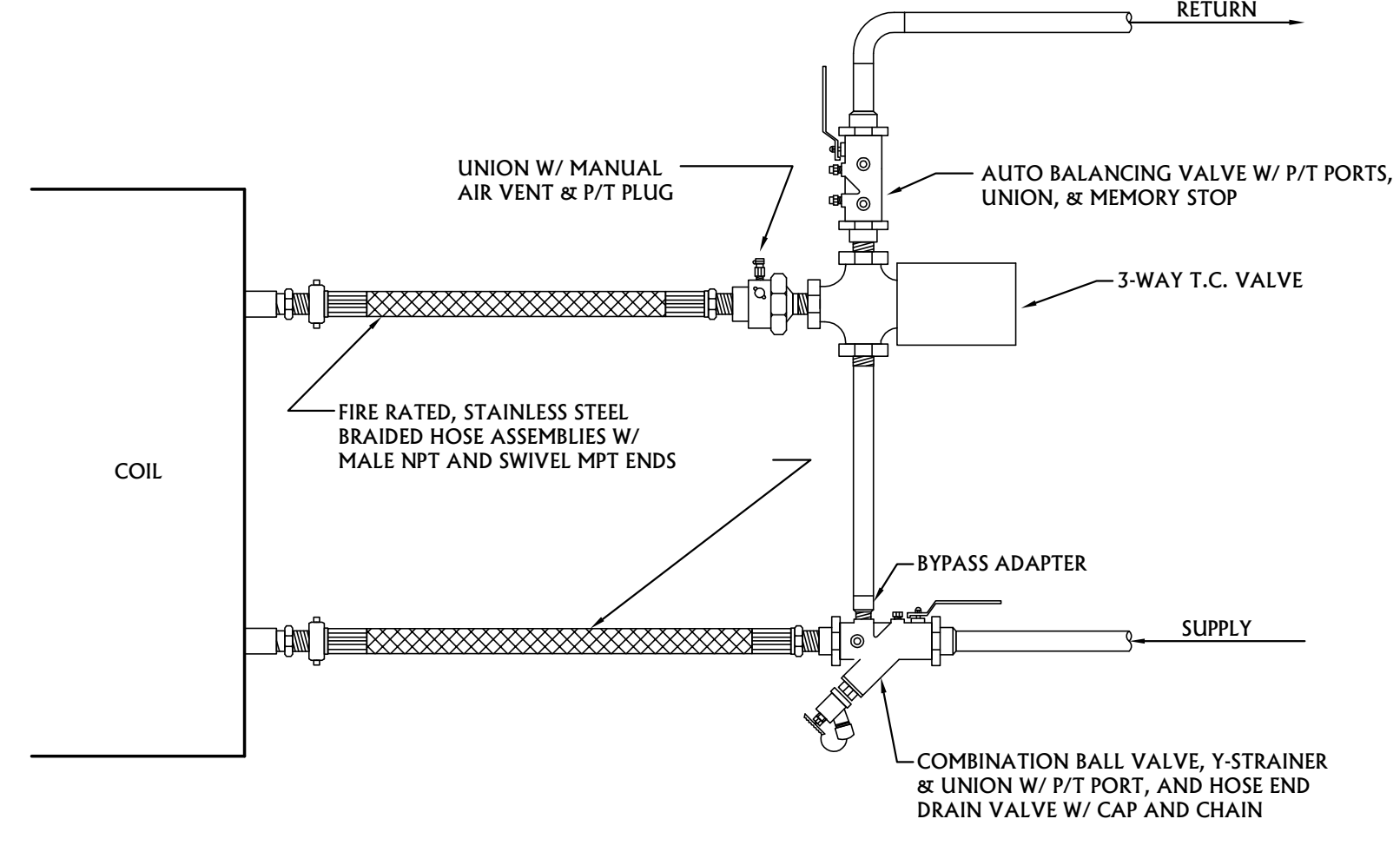
4 COMBINATION FIRE/SMOKE DAMPER DETAIL
M9.3 : M9.3 SCALE: N.T.S.



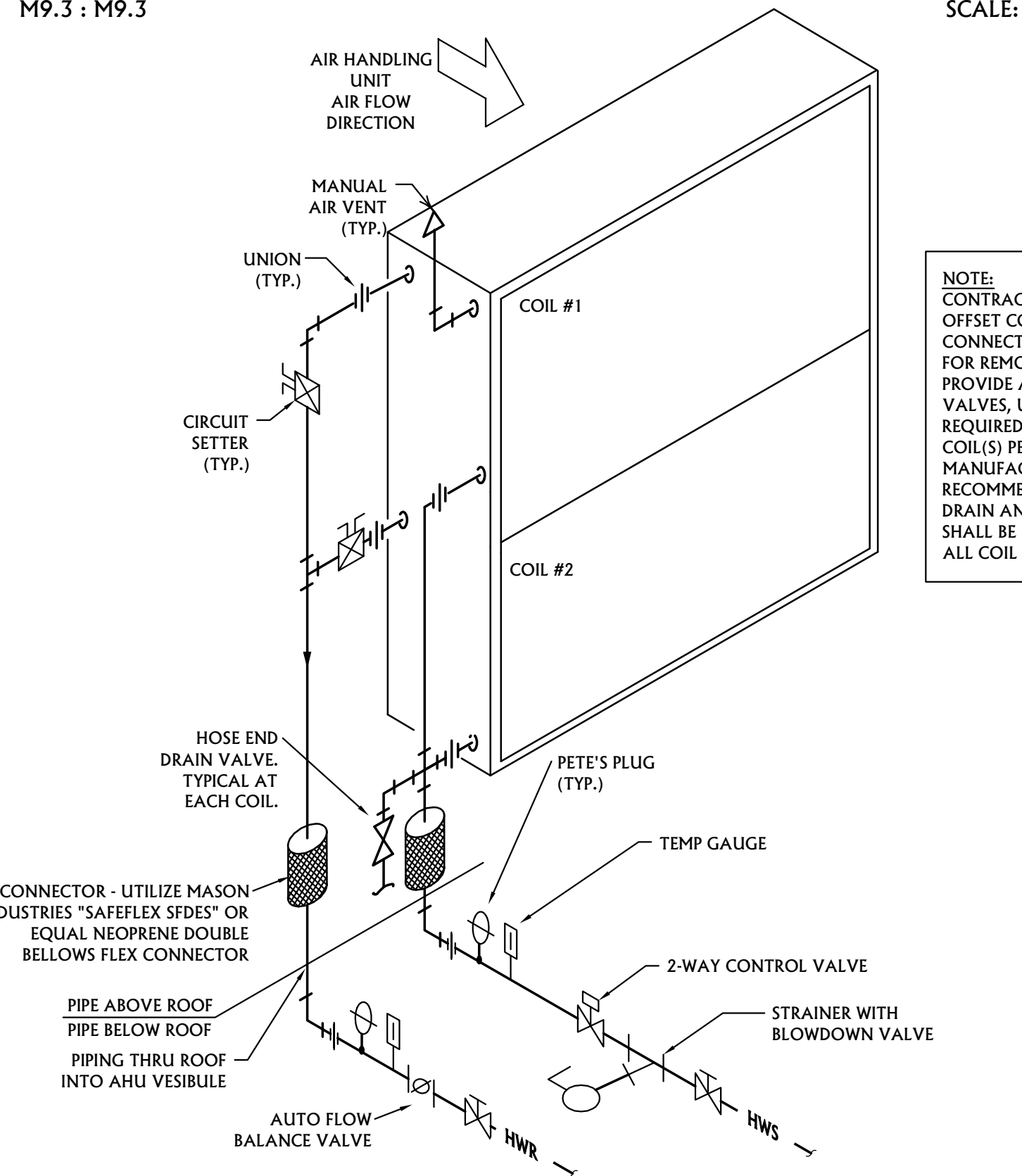
6 VAV BOX DETAIL
M9.3 : M9.3 SCALE: N.T.S.



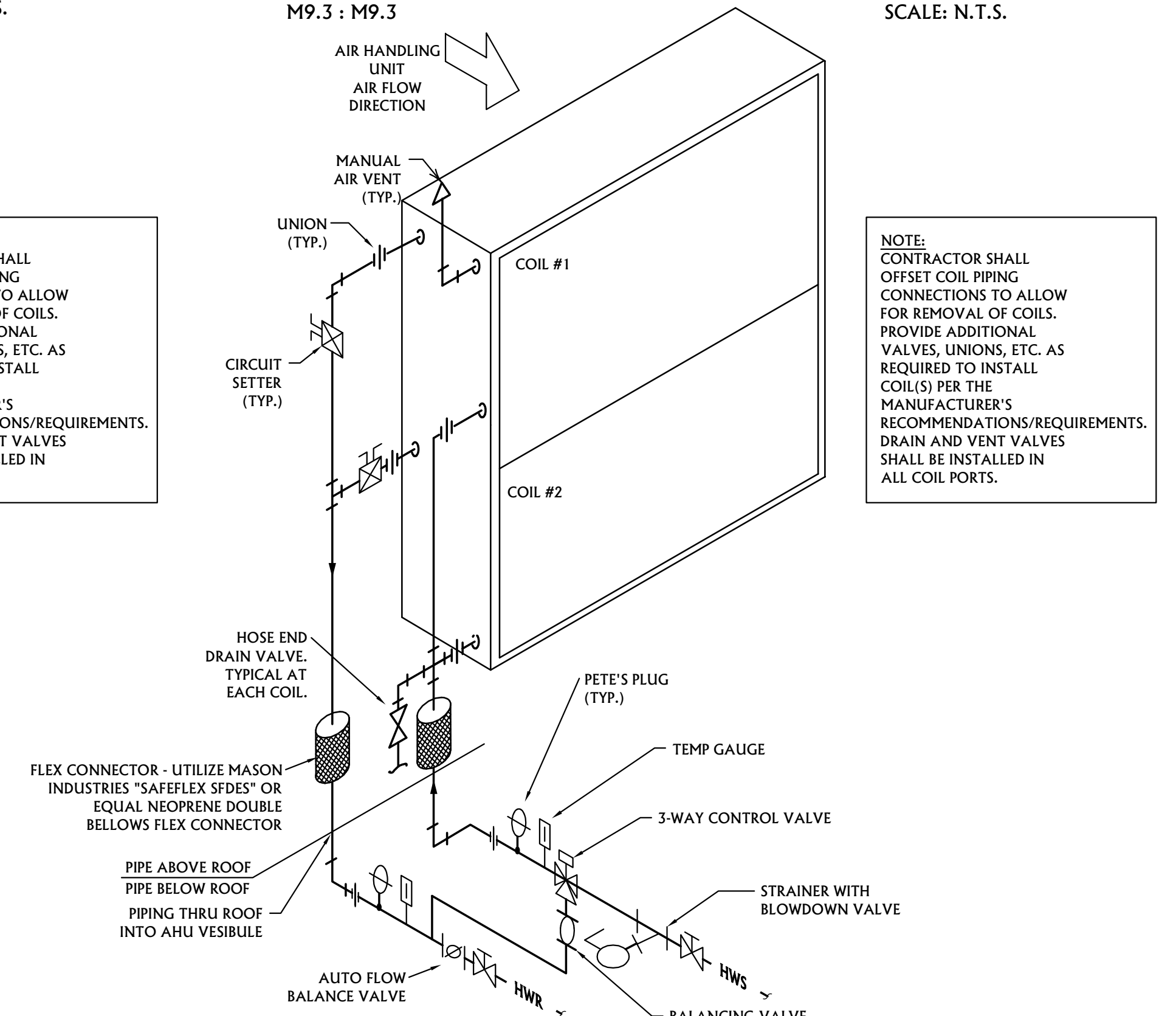
13 2-WAY COIL DETAIL
M9.3 : M9.3 SCALE: N.T.S.



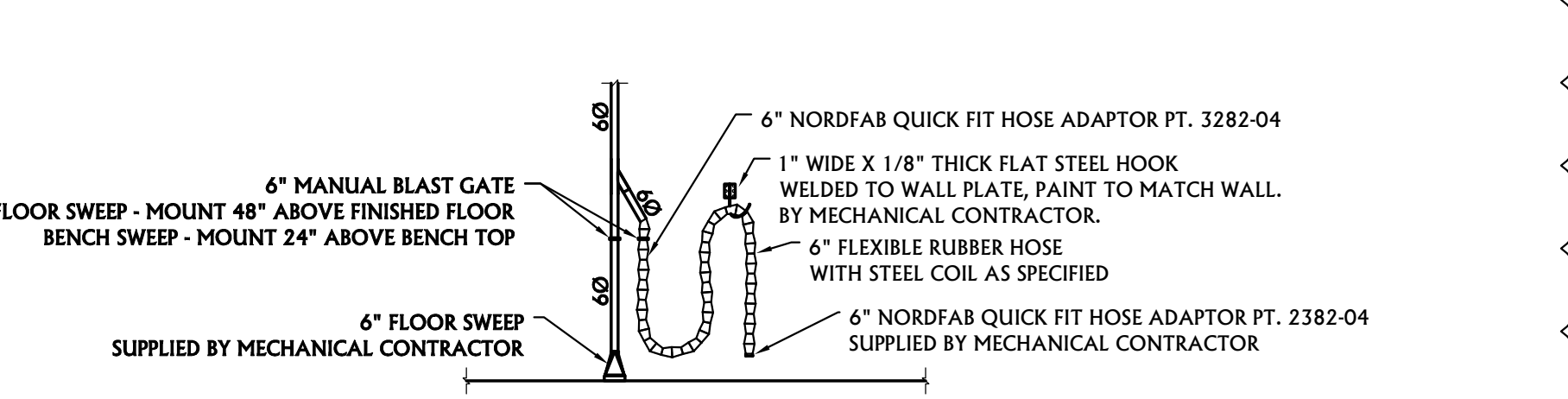
15 3-WAY COIL DETAIL
M9.3 : M9.3 SCALE: N.T.S.



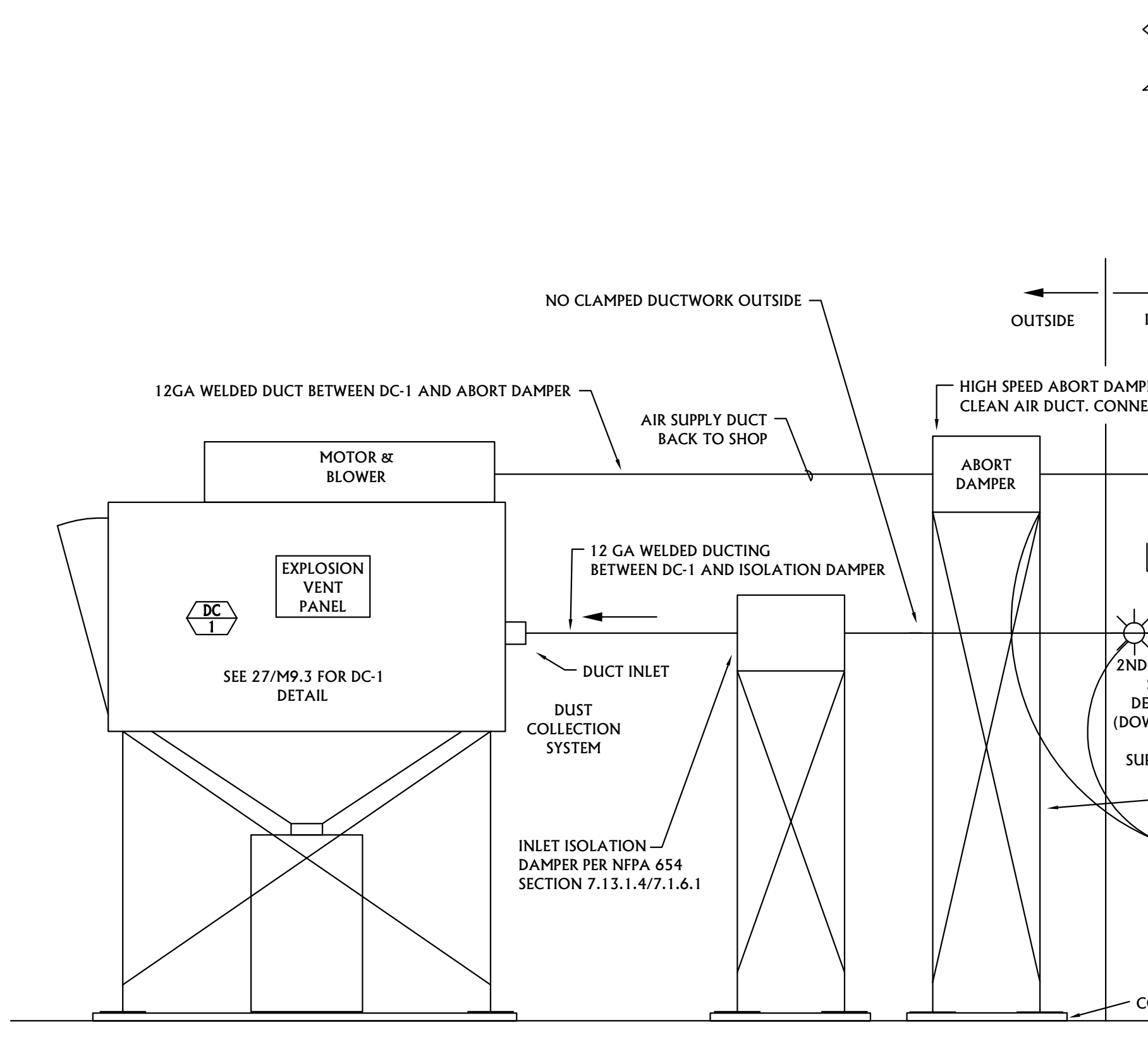
16 AHU 2-WAY COIL DETAIL
M9.3 : M9.3 SCALE: N.T.S.



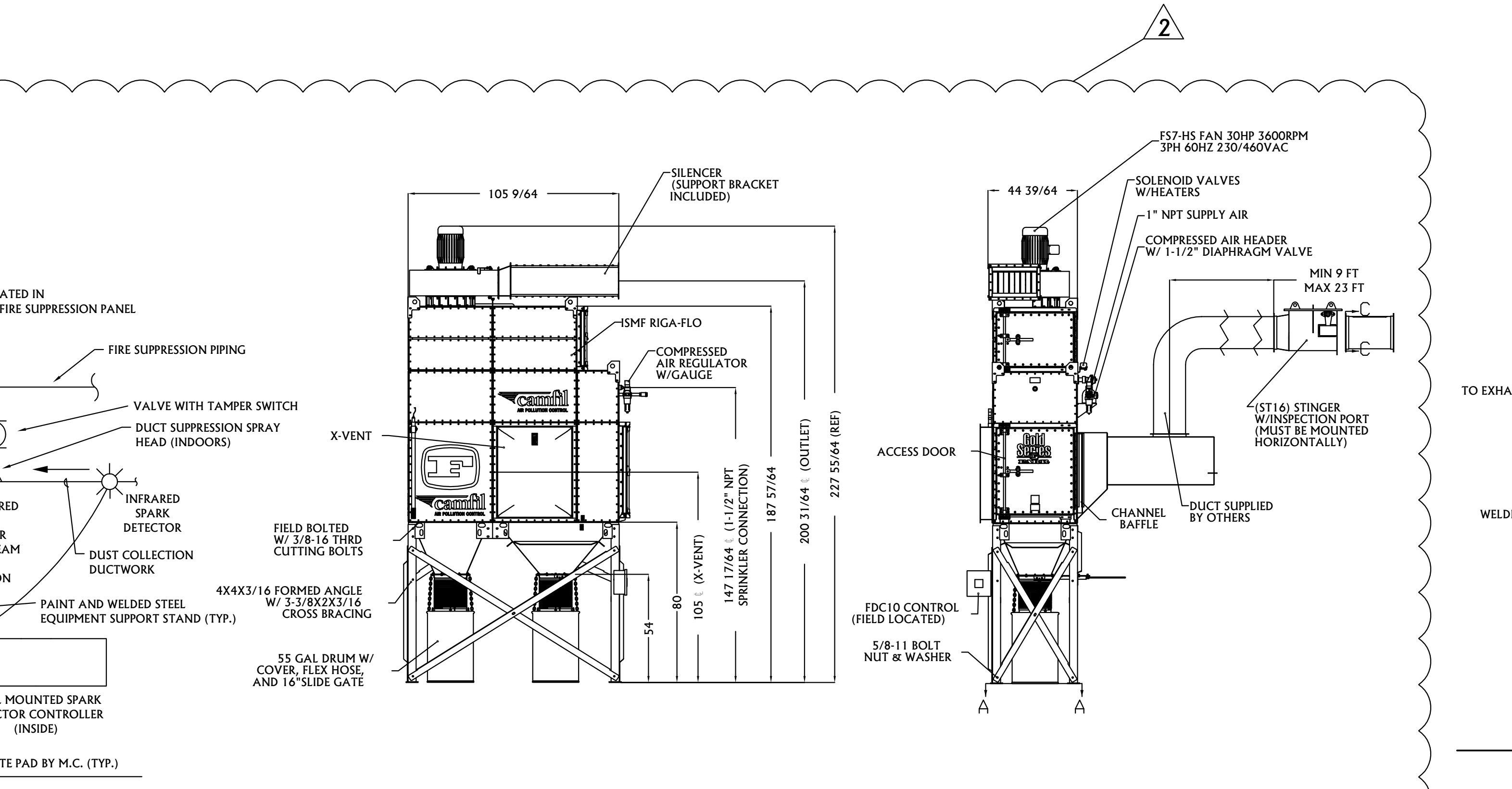
18 AHU 3-WAY COIL DETAIL
M9.3 : M9.3 SCALE: N.T.S.



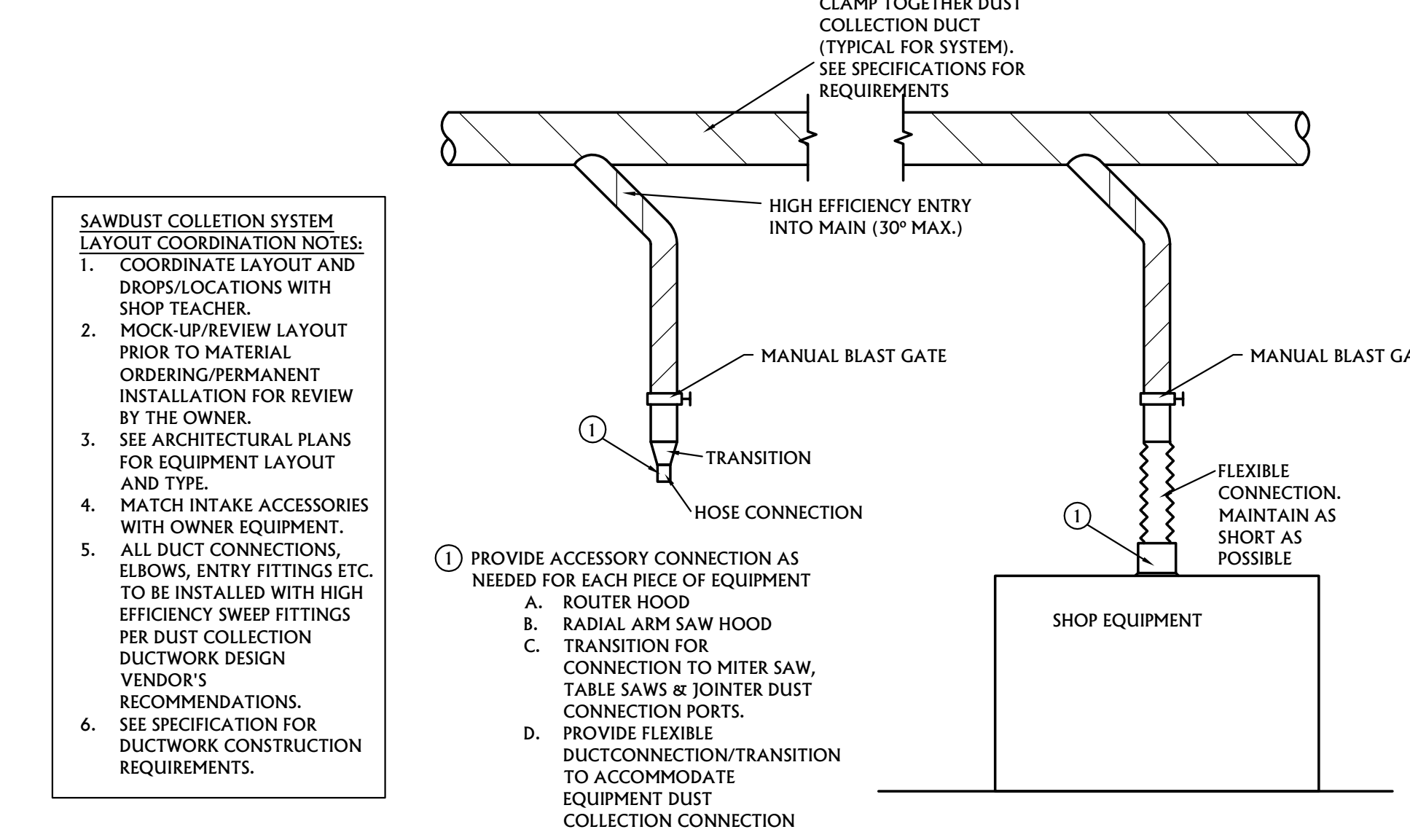
19 DUST COLLECTION FLOOR SWEEP DETAIL
M9.3 : M9.3 SCALE: N.T.S.



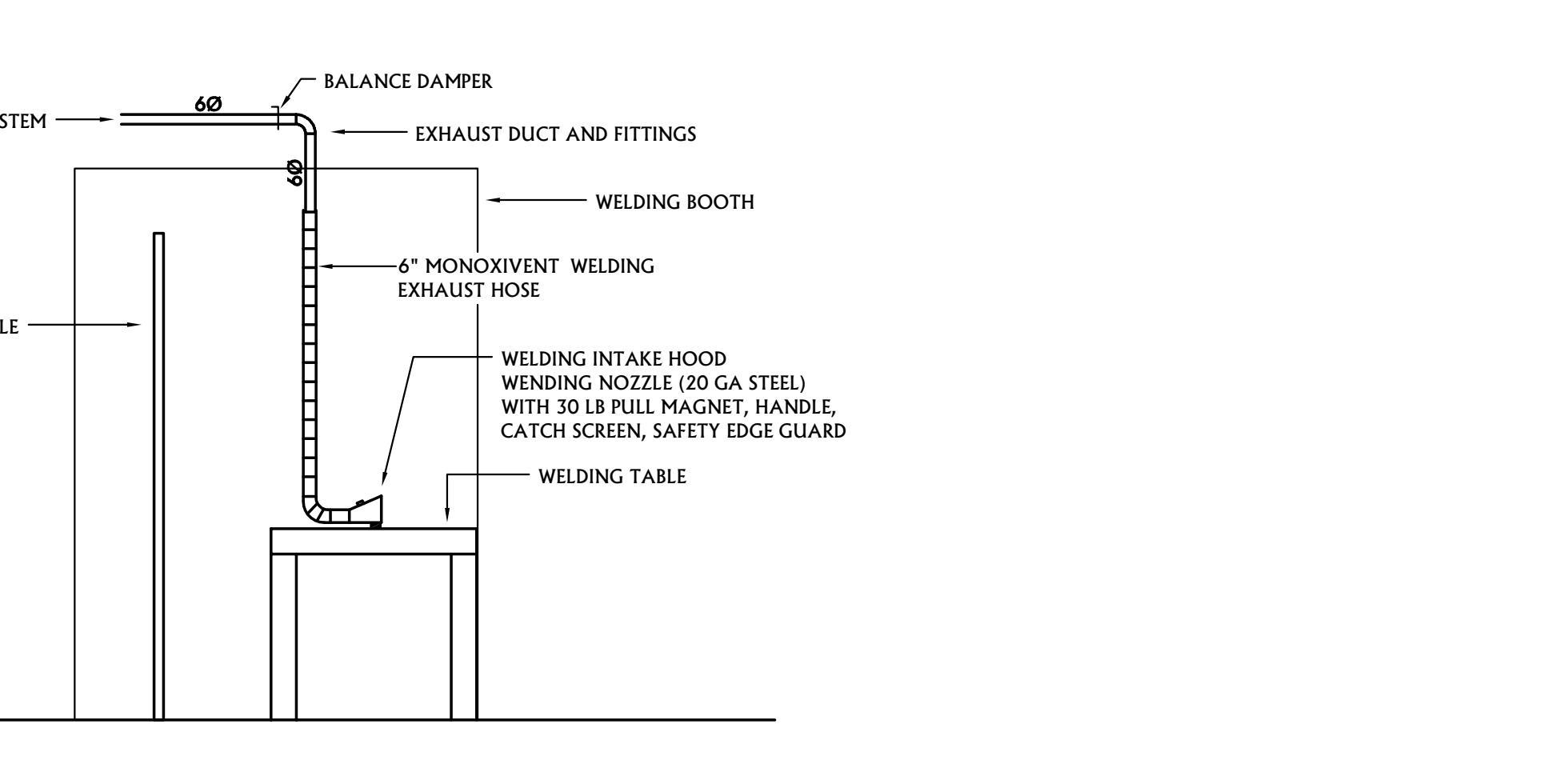
25 EXPLOSIVE DUST COLLECTOR SCHEMATIC
M9.3 : M9.3 SCALE: N.T.S.



27 DC-1 DUST COLLECTOR DETAIL - DETAIL OF SPECIFIED UNIT
M9.3 : M9.3 SCALE: N.T.S.



24 WOOD SHOP DUST COLLECTION SYSTEM DROPS
M9.3 : M9.3 SCALE: N.T.S.



29 WELDING EXHAUST DROP DETAIL
M9.3 : M9.3 SCALE: N.T.S.

100% CONSTRUCTION DOCUMENTS

MECHANICAL DETAILS

BEN STEELE MIDDLE SCHOOL

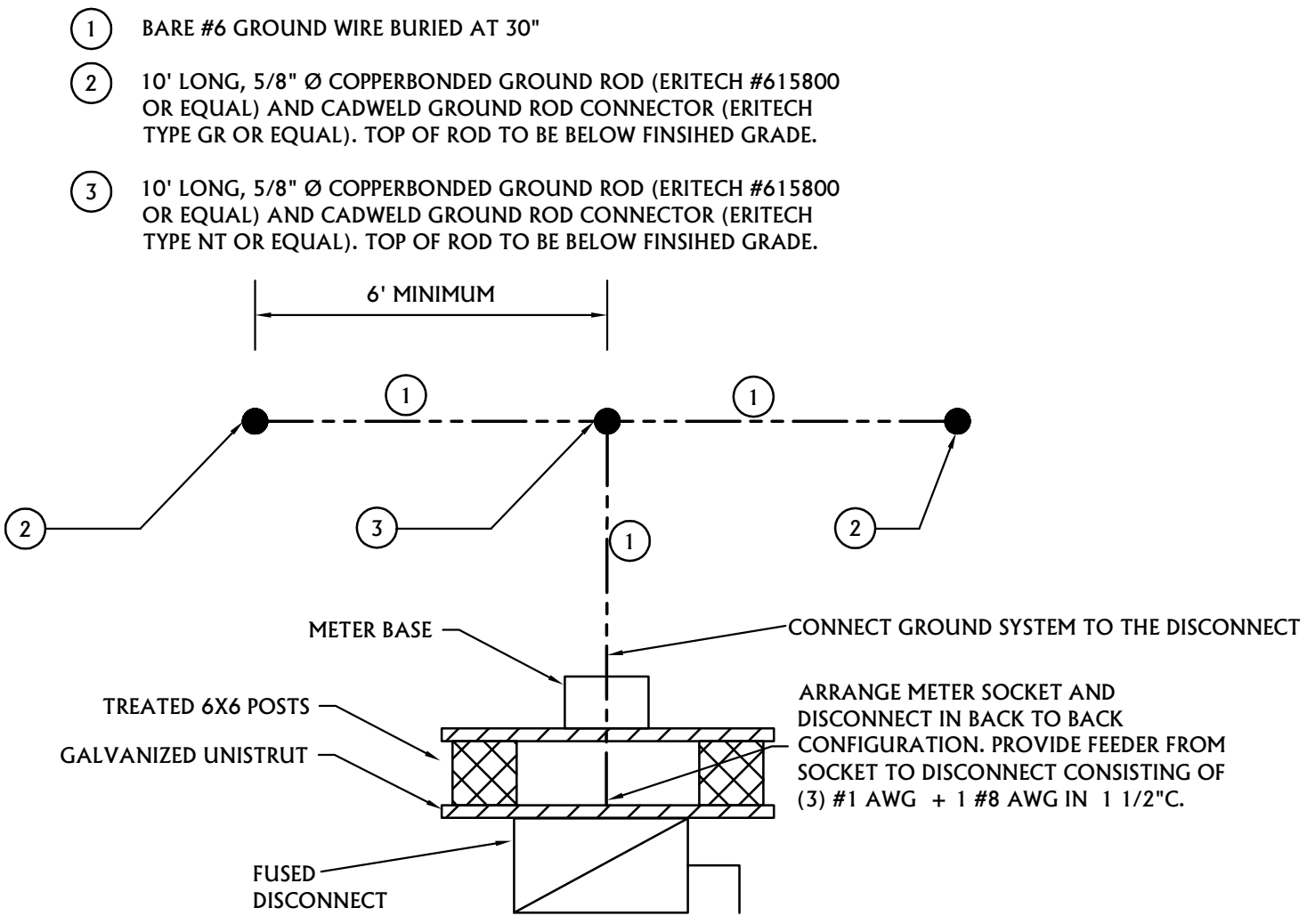
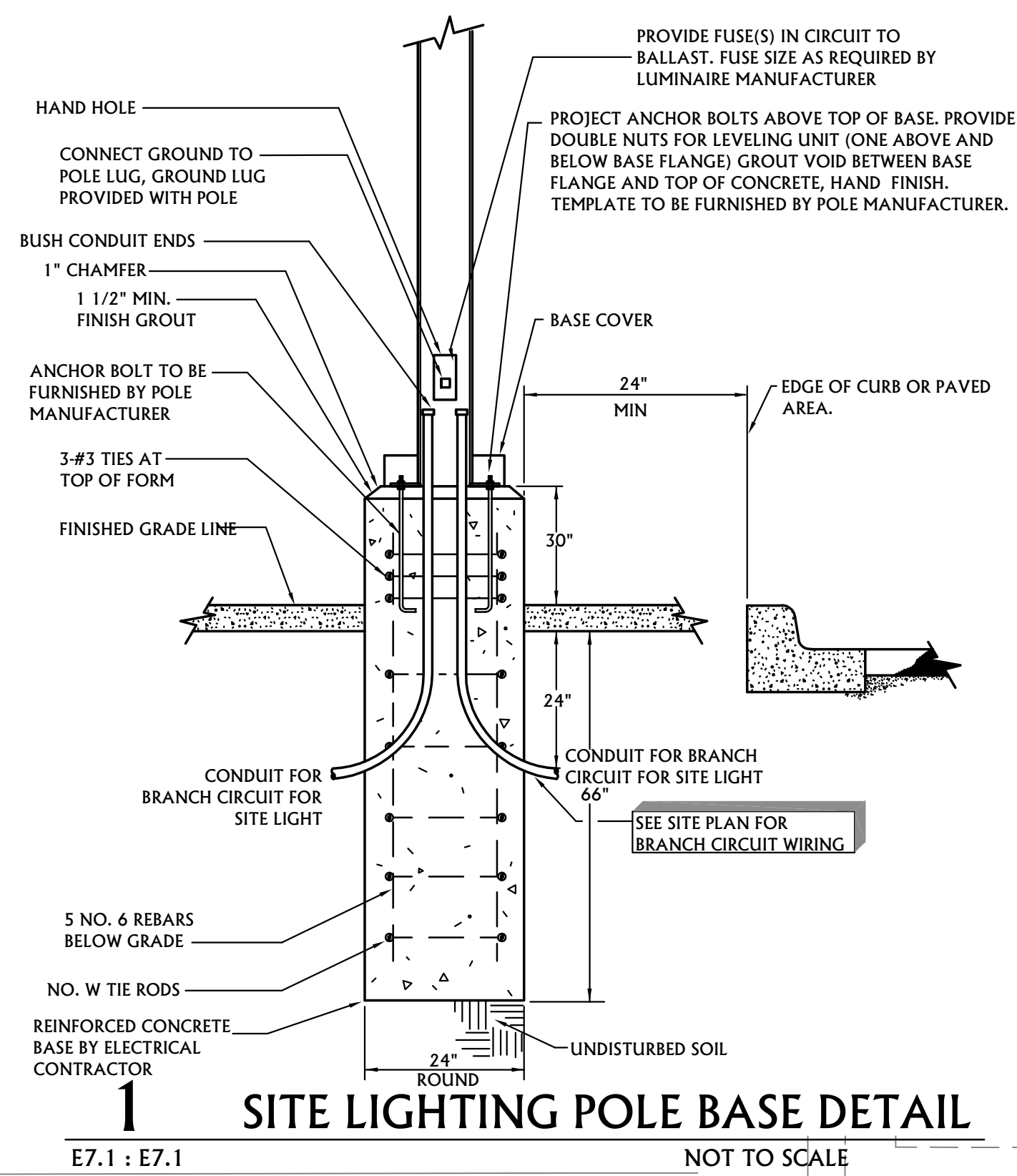
BILLINGS PUBLIC SCHOOLS

sheet	13048.20
project	21438.00
owner	
revision	date
1	1/22/16

phase
100% CONSTRUCTION DOCUMENTS

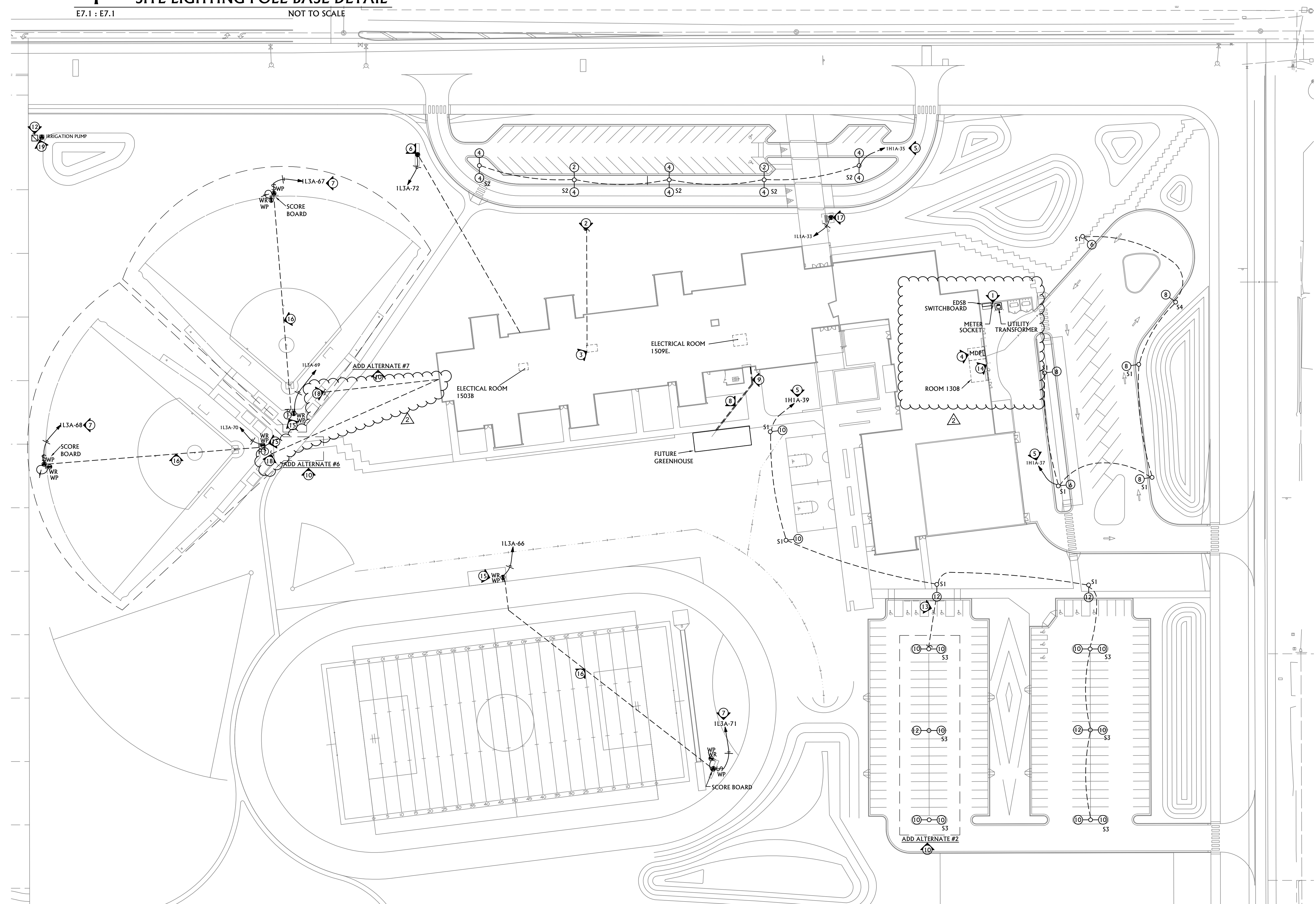
ase ARCHITECTS
integrus ARCHITECTURE

issue date
12/18/2015
M9.3



3 IRRIGATION PUMP SERVICE
 E7.1 : E7.1 NOT TO SCALE

- GENERAL ELECTRICAL NOTES:**
- ELECTRICAL CONTRACTOR SHALL COORDINATE ALL UTILITY WORK WITH SERVING UTILITY.
- KEY ELECTRICAL NOTES:**
- LOCATION OF PAD MOUNTED TRANSFORMER, FREE STANDING SWITCH BOARD/ EXTERIOR DISCONNECTING MEANS & METER SOCKET. EC TO PROVIDE CONCRETE PAD/ TRANSFORMER VAULT AND METER SOCKET PER UTILITY STANDARDS. UTILITY WILL METER THE SERVICE VIA CT DONUTS IN THE TRANSFORMER. LOCATE METER SOCKET ON EXTERIOR WALL PER UTILITY REQUIREMENTS.
 - EC TO PROVIDE (1) 4" EMPTY PVC C. W/ (1) 4" 3-CELL "MAXCELL" FABRIC INNERDUCT WITH PULL LINES FACTORY INSTALLED, FOR TELEPHONE. (1) 2" EMPTY PVC C. W/ PULL LINE ROUTED TO BUILDING FOR SCHOOLS FIBER OPTIC NETWORK SYSTEM AND (1) 2" EMPTY PVC C. W/ PULL LINE, FOR CABLE TELEVISION. PROVIDE PULL LINES IN CONDUITS FROM TELEPHONE BACK BOARD. LOCATED IN NORTH WEST CORNER OF DATA ROOM 1506A TO NEAREST SERVING UTILITY PEDESTAL FOR TELEPHONE, FIBER OPTIC AND CABLE TELEVISION. COORDINATE EXACT ROUTING PATH WITH CIVIL PLANS AND SERVING UTILITY SUCH THAT CORRECT UTILITY PEDESTAL IS ROUTED TO.
 - LOCATION OF MAIN DATA ROOM 1506A - MDF. SEE FLOOR PLAN SHEETS FOR ADDITIONAL DETAILS.
 - LOCATION OF MAIN ELECTRICAL ROOM 1308B. SEE FLOOR PLAN E2.1C FOR ADDITIONAL DETAILS.
 - ROUTE CIRCUIT THROUGH LIGHTING CONTROL PANEL WITH #8 CONDUCTORS FOR CONTROL. NUMBER INSIDE FIXTURES INDICATES RELAY IN LIGHTING CONTROL PANEL THE DEVICE IS CONNECTED TO FOR CONTROL. SEE DETAILS AND SCHEDULES ON SHEET EP.1 FOR INITIAL LIGHTING CONTROL PROGRAM SCHEDULE AND ADDITIONAL INFORMATION. COORDINATE W/ OWNER FOR FINAL SCHEDULE AND ADJUSTMENTS TO SUIT OWNERS REQUEST.
 - PROVIDE POWER CONNECTION TO ELECTRONIC READER BOARD WITH #10 CONDUCTORS IN 1" PVC C. STUB CONDUIT UP INSIDE ELECTRICAL ROOM 1503B AT PANEL 1L3A. EC TO ALSO PROVIDE (1) EMPTY 1" PVC C. W/ PULL LINE FROM THE CENTER OF THE READER BOARD STUBBED UP IN DATA ROOM 1506A FOR CONTROL CABLING BY OTHERS. COORDINATE ANY ADDITIONAL REQUIREMENTS W/ READER BOARD PROVIDER.
 - PROVIDE 120V POWER CONNECTION TO SCORE BOARD. CIRCUIT SHALL CONSIST OF #8'S IN 1" CONDUIT. LOCATE LOCAL DISCONNECT SWITCH ON THE BACK SIDE OF THE SCOREBOARD SUPPORT POST. MOUNT RECEPTACLE ON SCOREBOARD POST AT 24" AFF. PROVIDE AN ADDITIONAL (1) 1" PVC CONDUIT W/ PULL LINE FROM SCOREBOARD TO THE BACK OF THE CORRESPONDING BACK STOP / CROWS NEST FOR CONTROL CABLING BY OTHERS. COORDINATE ALL REQUIREMENTS WITH SCOREBOARD INSTALLER PRIOR TO ROUGH-IN.
 - ROUTE (2) 1 1/2" E2" C FROM PANEL LDP2 LOCATED IN ELECTRICAL ROOM 1509E TO LOCATION OF FUTURE PROPOSED GREEN HOUSE. CAP AND MARK CONDUIT ENDS AT THE GREENHOUSE FOR EASE OF LOCATING IN FUTURE.
 - ROUTE (1) 1" EMPTY C FROM DATA ROOM 1506A TO LOCATION OF FUTURE PROPOSED GREEN HOUSE. CAP AND MARK CONDUIT END AT THE GREENHOUSE FOR EASE OF LOCATING IN FUTURE.
 - ELECTRICAL WORK LOCATED IN THE DASHED AREA SHALL BE BID AS A "ADD ALTERNATE". ALTERNATE NUMBER IS CALLED OUT ON THE PLAN. EC SHALL PROVIDE A SEPARATE PRICE FOR ALL ELECTRICAL WORK IN OUTLINE AREA.
 - NEW IRRIGATION PUMP BY OTHERS, WIRED COMPLETE BY ELECTRICAL CONTRACTOR. PROVIDE 3/4" CONDUIT FROM PUMP TO IRRIGATION CONTROLLER BY EC. CONTROL WIRE BY OTHERS. CONTROLLER IS LOCATED IN ROOM 1308 IN SCHOOL BUILDING. COORDINATE ALL REQUIREMENTS WITH LANDSCAPE CONTRACTOR.
 - EC TO PROVIDE A FREE STANDING UNISTRUT RACK FOR MOUNTING OF THE ELECTRICAL SERVICE FOR THE IRRIGATION PUMP UPON. SERVICE SHALL CONSIST OF A 100A, 3-POLE FUSED DISCONNECT; SQ D 3110 CLASS IN A NEMA 3R ENCLOSURE AND 100A DIRECT METERING SOCKET, RATED FOR 480V WITH ALL CHARACTERISTICS PER UTILITY REQUIREMENTS. ROUTE AN EMPTY 2" C FROM METER SOCKET TO EXISTING UTILITY TRANSFORMER LOCATED NORTH WEST OF THIS LOCATION. PROVIDE FUSES PER PUMP MANUFACTURERS RECOMMENDATIONS. SEE DETAIL 3 THIS SHEET FOR PROPOSED CONSTRUCTION.
 - AS PART OF BASE BID THE EC SHALL ROUTE AN EMPTY 1" C. W/ PULL LINE FROM LIGHT POLE AS NOTED, UNDERGROUND AND SOUTH INTO "ADD ALTERNATE #1" AREA. CAP AND MARK LOCATION FOR CONTINUATION TO "ADD ALTERNATE #1" FIXTURES IF ALTERNATE IS ACCEPTED.
 - MAIN IRRIGATION CONTROLLER IS LOCATED IN BUILDING INTERIOR IN ROOM RECEIVING 1308. SEE SHEET E2.1C FOR LOCATION.
 - ELECTRICAL CONTRACTOR SHALL PROVIDE A WEATHER RESISTANT GFI RECEPTACLE IN A WEATHERPROOF IN-USE STEEL COVER MOUNTED ON A POST OF THE BACKSTOP FENCE/ SCORERS TABLE, MOUNT SECURE AT 18". CIRCUIT SHALL CONSIST OF #8'S IN 1" CONDUIT
 - PROPOSED ROUTING PATH OF 1" PVC W/ PULL LINE TO BE USED BY OTHERS IN PULLING OF CONTROL CABLING FROM SCORE BOARD TO BACK STOP AND BASEBALL FIELDS AND CROWS NEST/ TABLE AT FOOTBALL FIELD. VERIFY WITH SCORE BOARD INSTALLER FOR ADDITIONAL DETAILS PRIOR TO ROUGH-IN.
 - PROVIDE POWER TO INTERNALLY LIGHTED MONUMENT SIGN WITH #10 CONDUCTORS IN 1" PVC C. STUB CONDUIT UP INSIDE ELECTRICAL ROOM 1303B AT THE LIGHTING CONTROL PANEL AND ROUTE THROUGH LCP FOR CONTROL. VERIFY EXACT SIGN LOCATION AND COORDINATE ANY ADDITIONAL REQUIREMENTS W/ SIGN PROVIDER PRIOR TO ROUGH-IN.
 - AS PART OF BASE BID THE EC SHALL ROUTE (4) EMPTY 1" C. W/ PULL LINES FROM PANEL "1L3A", LOCATED IN ROOM 1503B STUBBED CONDUIT OUT OF THE BUILDING TO THE DASHED OUTLINE SHOWN ON PLAN FOR ADD ALTERNATE #6 AND #7. INSURE THAT ALL CONDUITS ARE STOPPED PAST ANY HARD SURFACE (SIDEWALK) AND RESIDE IN LANDSCAPED AREA. PROVIDE (2) CONDUITS PER ALTERNATE AREA. CAP AND MARK LOCATION FOR CONTINUATION IF ADD ALTERNATE'S ARE ACCEPTED.
 - EC TO PROVIDE A CIRCUIT CONSISTING OF 4) #1 AWG CU + 1) #6 AWG CU IN 1 1/2" C. FROM THE FREE STANDING UTILITY PEDESTAL SERVICE DISCONNECT TO THE PUMP STARTER/ SINGLE POINT LOCATED ON THE PUMP. PUMP STATION IS PROVIDED COMPLETE BY OTHERS, WIRING TO STARTER/ CONTROL POINT ON UNIT BY THE EC.



16 ELECTRICAL SITE PLAN
 E7.1 : E7.1 1" = 50'-0"

100% CONSTRUCTION DOCUMENTS

sheet **ELECTRICAL SITE PLAN**
 project **BEN STEELE MIDDLE SCHOOL**
 owner **BILLINGS PUBLIC SCHOOLS**

a&e proj #	13048.20
ia proj #	21438.00
revision	date
1	1-22-16

phase
 100% CONSTRUCTION DOCUMENTS



issue date
 12/18/2015
E7.1



Bid Package Clarifications:

General Requirements For All Bid Packages:

1. All trades that have to excavate or trench to install their work and encounter water will be responsible for dewatering.
2. All testing and special inspections are by owner unless otherwise noted in the bid package descriptions.
3. Floor protection for flooring scopes is NOT to be included in the Bid Packages.

Bid Package 2A – Site Work

1. List of material that was left by Geopier Northwest to be reused on-site:
 - a. 6" + boulders = 36.45 tons or 1 load (rip rap at storm outlets?)
 - b. 3" - 6" Lime stone rip raps/pawls = 80 tons or 2.5 loads (track-off pads)
 - c. ¾" Road base = 280.5 tons or 8.5 loads (road base)
2. Dugout concrete slabs will be included in this scope of work.
3. The intent of the 20' pad around the building is to have a workable surface for lifts and other equipment to safely work on. The area will need to be reclaimed, regraded or removed for finish grading and landscaping.
4. An excavation width for the footing needs to be wide enough for the concrete crew to walk and set forms in. There will be no dirt formed grade beams.
5. This bid pack will also be responsible for excavating and/or auguring for the athletic equipment as well as backfill. Installation of athletic equipment will be installed under Bid Package #11B.
6. Please disregard Item #26 on Sanderson Stewart's Addendum #4. The fencing that is associated with the dugouts will be a part of this bid pack.
7. The pin locations for striping the football fields and soccer fields will be the 4 outside corners.
8. The foul poles that are associated with the softball fields will be removed from this Bid Package and provided and installed under Bid Package #11B.
9. Provide and install LPSS service line sleeve per Addendum #3 shown on C5.0.
10. Paving sections on the plans take precedence over the soils report.
11. All required soil amendments for topsoil will be supplied, placed, and mixed by Bid Package #2B.
12. Provide and install the irrigation pump station concrete pad per 11/L4.4.
13. Supply and rigid insulation over utilities only as indicated on the plans and specifications.
14. Please see the attached Project Schedule with the "Site Work" expanded.
15. Regardless of Alternates acceptance all storm drainage work will remain part of the base bid.
16. If Alternates are NOT accepted for the Softball Fields and Paved Parking Lot then the base bid shall include grading per Sanderson Stewart's Addendum #4 and irrigation and seeded turf to match the surrounding areas.
17. If Alternates are NOT accepted for the Soccer Fields and Gravel Parking Lot then the base bid shall include grading per Sanderson Stewart's Addendum #4 and dryland seeded turf to match the surrounding areas.

Bid Package 2B – Landscaping & Irrigation

1. All required soil amendments for topsoil will be supplied, placed, and mixed by this Bid Package.
2. Per Addendum #3, provide and install 2” deep – 3/8” gravel with weed barrier fabric at pump station. Disregard the stabilized turf note on 11/L4.4.
3. If Alternates are NOT accepted for the Softball Fields and Paved Parking Lot then the base bid shall include grading per Sanderson Stewart’s Addendum #4 and irrigation and seeded turf to match the surrounding areas.
4. If Alternates are NOT accepted for the Soccer Fields and Gravel Parking Lot then the base bid shall include grading per Sanderson Stewart’s Addendum #4 and dryland seeded turf to match the surrounding areas.

Bid Package 3B – Building Concrete Place and Finish

1. There will control joints for interior concrete slabs. Construction joints will be coordinated with CM to minimize and to locate under framed walls.

Bid Package 3C – Polished Concrete

1. Provide an allowance for 50 LF of joint filler created by control joints or construction joints.
2. There will control joints for interior concrete slabs. Construction joints will be coordinated to minimize and locate under framed walls.

Bid Package 7B – Exterior Envelope Supply & Install, Exterior Vapor/Air Barrier, Horizontal furring, & Exterior Insulation

1. All primary exterior furring regardless if insulation is present or not is the responsibility of this Bid Package.

Bid Package 7C – Roofing

1. Provide and install all parapet caps at metal panels, masonry, and Swisspearl locations. On page A5.9 detail 2 the roofer will install the parapet cap and the Swisspearl closure trim will be provided and installed by bid pack 7E.

Bid Package 7D – Metal Roof & Wall Panels & Secondary Furring/Flashing

1. Please provide Metal Panel (MP1) on the walls above the roof line shown on A2.4D at Grid 28 between Grids LL & NN and at Grid NN between Grids 28 & 29.
2. Metal Roof Panel MP3 is specified under the 074213 of the Specifications and has been changed in Addendum #3 to Metal Sales, PBU – Panel.
3. ACT-3 at exterior canopies is to be provided and installed under Bid Package #9B.
4. All primary exterior furring regardless if insulation is present or not is the responsibility of Bid Package #7B.

Bid Package 7E – SwissPearl & Secondary Furring/Flashing

1. Bid Package #7C will provide and install all parapet caps at metal panels, masonry, and Swisspearl locations. On page A5.9 detail 2 the roofer will install the parapet cap and the Swisspearl closure trim will be provided and installed by this Bid Package.
2. All primary exterior furring regardless if insulation is present or not is the responsibility of Bid Package #7B.

Bid Package 8A – Doors, Hardware, & Access Control (Supply Only)

1. Supply of all hardware for the aluminum doors is by Bid Package #8B. Cores and keying will still be by this bid package.

Bid Package 8B – Aluminum Framed Entrances, Storefront Windows, Interior Glass, & Glazing.

1. This bid package is responsible for all partition closures as shown on 17/A6.32.
2. Supply and installation of hardware for the aluminum doors is by this bid package. Hardware must conform to the Door Hardware Specification 087100. Cores and keying will be by Bid Package #8A.
3. The intent of the storefront system is to provide a system without Curtain Wall. If an approved manufacture dictates that Curtain Wall is needed then it is the responsibility of this bid package to price accordingly. If a Curtain Wall system is needed then all adjacent windows shall match.
4. The storefront systems are to be “front” glazed. In the event that the 6 ½” deep storefront system cannot be “front” glazed then ALL storefronts systems shall be 6 ½” deep. If the 6 1/2” storefront system can be “front” glazed then the 4 ½” deep “front” glazed can be used in locations that does not require the 6 ½” deep system, due to size or height restrictions. All adjacent storefront systems shall match (i.e. you cannot change from one system to another at a window opening).

Bid Package 9B – Acoustic Ceilings & Acoustic Wall Panels

1. ACT-3 at exterior canopies is to be provided and installed under this Bid Package.

Bid Package 9D – Wood Athletic Flooring

1. Provide and install the vented rubber base “VRB-1”.

Bid Package 10B – Signage

1. Provide the monument sign per plans shown on A2.13 and provide the Exterior LED Message Board and Base per Specification 101463.

Bid Package 11B – Athletic Equipment

1. Provide and install the foul poles for the softball fields.
2. Excavating and/or auguring for the athletic equipment as well as backfill are by Bid Package #2A. Installation of athletic equipment will be installed under this Bid Package.

Bid Package 15B – Plumbing (Pipe Insulation, Controls, and Test & Balance)

1. All underground piping will need to be cut down for concrete pours for slab on grade. Piping shall be flush or ¼” under finish floor elevation before concrete pour begins.
2. Provide alternate pricing for Alternate #11 – Low Efficiency Chiller.

Bid Package 16A – Electrical, Fire Alarm, Low Voltage, Security, & Access Control

3. If the alternates do not go through it will be your responsibility to run the conduits to 5’0” outside the building for feature use.
4. Provide and install all sleeves under site hard surfaces as needed.
5. All underground piping will need to be cut down for concrete pours for slab on grade. Piping shall be flush or ¼” under finish floor elevation before concrete pour begins.
6. Provide alternate pricing for Alternate #11 – Low Efficiency Chiller.

END OF BID PACKAGE CLARIFICATIONS – ADDENDUM #4



BILLINGS PUBLIC SCHOOLS

Ben Steele Middle School Bid Schedule



Langlas & Associates
GENERAL CONTRACTORS

ID	Task Name	Duration	Start	Finish	3rd Quarter			2nd Quarter			1st Quarter			4th Quarter				
					May	Sep	Jan	May	Sep	Jan	May	Sep						
1	GC/CM INTERVIEWS	1 day	Wed 6/10/15	Wed 6/10/15	6/10 ◆ GC/CM INTERVIEWS													
2	PRECONSTRUCTION	74 days	Tue 11/17/15	Mon 2/29/16	11/17 PRECONSTRUCTION 2/29													
3	100% CD's ISSUED	0 days	Tue 11/17/15	Tue 11/17/15	11/17 ◆ 100% CD'S ISSUED													
4	PREPARE BID DOCUMENTS	31 days	Wed 11/18/15	Wed 12/30/15	11/18 PREPARE BID DOCUMENTS													
5	BID PROJECT	20 days	Thu 12/31/15	Wed 1/27/16	12/31 BID PROJECT													
6	SUBCONTRACT BIDS DUE	1 day	Thu 1/28/16	Thu 1/28/16	1/28 ◆ SUBCONTRACT BIDS DUE													
7	QUALIFY BIDS	10 days	Thu 1/28/16	Wed 2/10/16	1/28 QUALIFY BIDS													
8	ESTABLISH GMP & FINALIZE CONTRACT	5 days	Thu 2/11/16	Wed 2/17/16	2/11 ESTABLISH GMP & FINALIZE CONTRACT													
9	EARLY SUBMITTALS	8 days	Thu 2/18/16	Mon 2/29/16	2/18 EARLY SUBMITTALS													
10	CONSTRUCTION BEGINS	0 days	Mon 2/29/16	Mon 2/29/16	2/29 ◆ CONSTRUCTION BEGINS													
11	BUILDING	370 days	Mon 2/29/16	Fri 7/28/17	2/29 BUILDING 7/28													
12	BUILDING PAD/EXCAVATION	37 days	Mon 2/29/16	Tue 4/19/16	2/29 BUILDING PAD/EXCAVATION 4/19													
13	SURVEY BUILDING PAD	1 day	Mon 2/29/16	Mon 2/29/16	2/29 SURVEY BUILDING PAD													
14	CONSTRUCT AND CERTIFY BALANCE OF BUILDING PAD	10 days	Tue 3/1/16	Mon 3/14/16	3/1 CONSTRUCT AND CERTIFY BALANCE OF BUILDING PAD													
15	LAYOUT BUILDING	2 days	Fri 3/11/16	Mon 3/14/16	3/11 LAYOUT BUILDING													
16	EXCAVATE FOR PERIMETER FOOTINGS FOUNDATION	15 days	Mon 3/14/16	Fri 4/1/16	3/14 EXCAVATE FOR PERIMETER FOOTINGS FOUNDATION													
17	EXCAVATE FOR INTERIOR GRADE BEAMS	15 days	Wed 3/30/16	Tue 4/19/16	3/30 EXCAVATE FOR INTERIOR GRADE BEAMS													
18	FOOTINGS/FOUNDATIONS	40 days	Mon 3/21/16	Fri 5/13/16	3/21 FOOTINGS/FOUNDATIONS 5/13													
19	FOOTINGS STAKED	2 days	Mon 3/21/16	Tue 3/22/16	3/21 FOOTINGS STAKED													
20	PERIMETER FOOTINGS FORM, REINFORCE, POURED	17 days	Mon 3/21/16	Tue 4/12/16	3/21 PERIMETER FOOTINGS FORM, REINFORCE, POURED													
21	INTERIOR GRADE BEAMS FORM, REINFORCE, POURED	20 days	Wed 3/30/16	Tue 4/26/16	3/30 INTERIOR GRADE BEAMS FORM, REINFORCE, POURED													
22	FOUNDATION WALLS	28 days	Wed 4/6/16	Fri 5/13/16	4/6 FOUNDATION WALLS													
23	SLAB ON GRADE	36 days	Mon 4/25/16	Mon 6/13/16	4/25 SLAB ON GRADE 6/13													
24	AREA #D SLAB ON GRADE [EVERYTHING BUT GYM]	23 days	Mon 4/25/16	Wed 5/25/16	4/25 AREA #D SLAB ON GRADE [EVERYTHING BUT GYM] 5/25													
25	FOUNDATION INSULATION	2 days	Mon 4/25/16	Tue 4/26/16	4/25 FOUNDATION INSULATION													
26	FOUNDATION BACK FILLED	3 days	Mon 4/25/16	Wed 4/27/16	4/25 FOUNDATION BACK FILLED													
27	MEP UNDERGROUND	12 days	Wed 4/27/16	Thu 5/12/16	4/27 MEP UNDERGROUND													
28	FINE GRADE SLAB	3 days	Thu 5/12/16	Mon 5/16/16	5/12 FINE GRADE SLAB													
29	SLAB FORM, REINFORCE, POUR EXCEPT GYM	3 days	Mon 5/16/16	Wed 5/18/16	5/16 SLAB FORM, REINFORCE, POUR EXCEPT GYM													
30	SLAB CURE TIME AREA D OUTSIDE GYM	5 days	Thu 5/19/16	Wed 5/25/16	5/19 SLAB CURE TIME AREA D OUTSIDE GYM													
31	AREA #D SLAB ON GRADE [GYM]	30 days	Mon 4/25/16	Fri 6/3/16	4/25 AREA #D SLAB ON GRADE [GYM] 6/3													
32	FOUNDATION INSULATION	2 days	Mon 4/25/16	Tue 4/26/16	4/25 FOUNDATION INSULATION													
33	FOUNDATION BACK FILLED	3 days	Mon 4/25/16	Wed 4/27/16	4/25 FOUNDATION BACK FILLED													
34	MEP UNDERGROUND	4 days	Thu 5/19/16	Tue 5/24/16	5/19 MEP UNDERGROUND													
35	FINE GRADE SLAB	3 days	Tue 5/24/16	Thu 5/26/16	5/24 FINE GRADE SLAB													
36	SLAB FORM, REINFORCE, POUR GYM	2 days	Thu 5/26/16	Fri 5/27/16	5/26 SLAB FORM, REINFORCE, POUR GYM													
37	SLAB CURE TIME GYM	5 days	Mon 5/30/16	Fri 6/3/16	5/30 SLAB CURE TIME GYM													
38	AREA #C SLAB ON GRADE ON GRADE	23 days	Mon 5/2/16	Wed 6/1/16	5/2 AREA #C SLAB ON GRADE ON GRADE 6/1													



Ben Steele Middle School Bid Schedule



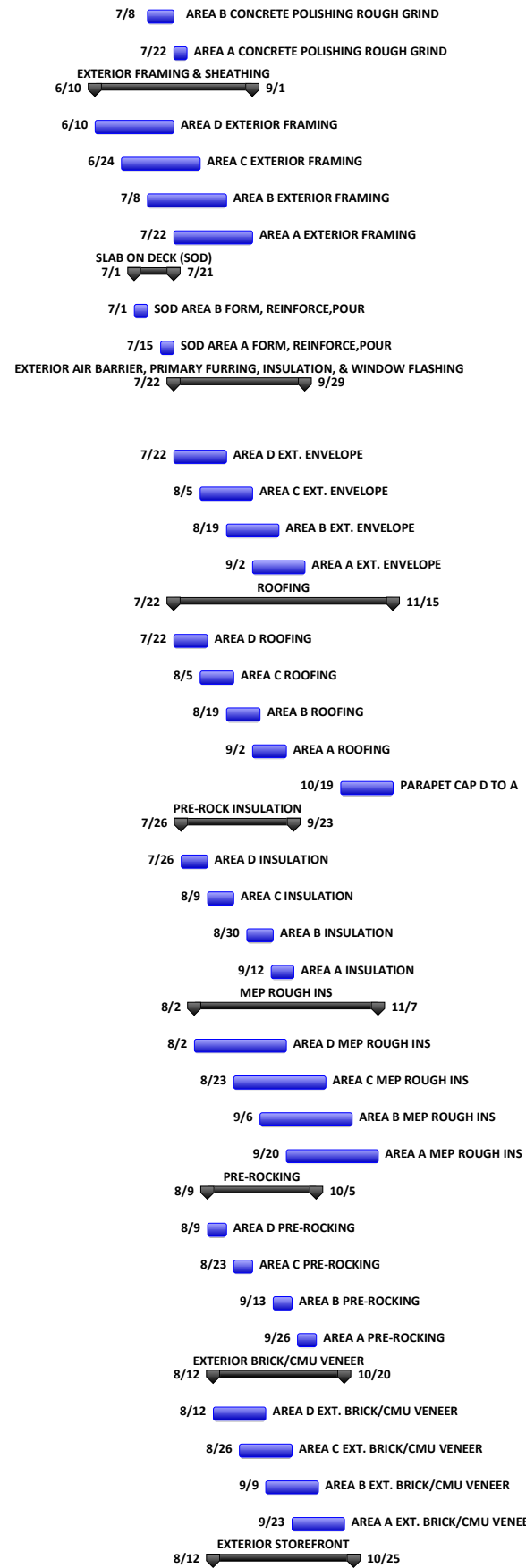
ID	Task Name	Duration	Start	Finish	3rd Quarter			2nd Quarter			1st Quarter			4th Quarter
					May	Sep	Jan	May	Sep	Jan	May	Sep		
39	FOUNDATION INSULATION	2 days	Mon 5/2/16	Tue 5/3/16				5/2						
40	FOUNDATION BACK FILLED	3 days	Mon 5/2/16	Wed 5/4/16				5/2						
41	MEP UNDERGROUND	12 days	Wed 5/4/16	Thu 5/19/16				5/4						
42	FINE GRADE SLAB	3 days	Thu 5/19/16	Mon 5/23/16				5/19						
43	SLAB FORM, REINFORCE, POUR	3 days	Mon 5/23/16	Wed 5/25/16				5/23						
44	SLAB CURE TIME AREA C	5 days	Thu 5/26/16	Wed 6/1/16				5/26						
45	AREA #B SLAB ON GRADE	21 days	Mon 5/9/16	Mon 6/6/16				5/9	6/6					
46	FOUNDATION INSULATION	2 days	Mon 5/9/16	Tue 5/10/16				5/9						
47	FOUNDATION BACK FILLED	3 days	Mon 5/9/16	Wed 5/11/16				5/9						
48	MEP UNDERGROUND	10 days	Wed 5/11/16	Tue 5/24/16				5/11						
49	FINE GRADE SLAB	3 days	Tue 5/24/16	Thu 5/26/16				5/24						
50	SLAB FORM, REINFORCE, POUR	3 days	Thu 5/26/16	Mon 5/30/16				5/26						
51	SLAB CURE TIME AREA B	5 days	Tue 5/31/16	Mon 6/6/16				5/31						
52	AREA #A SLAB ON GRADE	21 days	Mon 5/16/16	Mon 6/13/16				5/16	6/13					
53	FOUNDATION INSULATION	2 days	Mon 5/16/16	Tue 5/17/16				5/16						
54	FOUNDATION BACK FILLED	3 days	Mon 5/16/16	Wed 5/18/16				5/16						
55	MEP UNDERGROUND	10 days	Wed 5/18/16	Tue 5/31/16				5/18						
56	FINE GRADE SLAB	3 days	Tue 5/31/16	Thu 6/2/16				5/31						
57	SLAB FORM, REINFORCE, POUR	3 days	Thu 6/2/16	Mon 6/6/16				6/2						
58	SLAB CURE TIME AREA A	5 days	Tue 6/7/16	Mon 6/13/16				6/7						
59	STRUCTURAL STEEL & CMU WALLS	61 days	Thu 4/28/16	Thu 7/21/16				4/28	7/21					
60	EXTERIOR CMU GRIDS NN & 29 WALLS AREA D	15 days	Thu 4/28/16	Wed 5/18/16				4/28						
61	STRUCTURAL STEEL DELIVERED AREAS D & C	2 days	Tue 5/17/16	Wed 5/18/16				5/17						
62	EXTERIOR CMU GRIDS RR & 30 WALLS AREA D	12 days	Thu 5/19/16	Fri 6/3/16				5/19						
63	JOISTS & DECKING DELIVERED AREAS D & C	1 day	Thu 5/26/16	Thu 5/26/16				5/26						
64	STEEL/JOISTS/DECKING ERECT AREA D EVERYTHING OUTSIDE GYM	10 days	Fri 5/27/16	Thu 6/9/16				5/27						
65	JOISTS/DECKING AREA D GYM INSTALLED	5 days	Mon 6/6/16	Fri 6/10/16				6/6						
66	STEEL/JOISTS/DECKING ERECT AREA C	10 days	Fri 6/10/16	Thu 6/23/16				6/10						
67	STRUCTURAL STEEL DELIVERED AREAS B & A	3 days	Tue 6/21/16	Thu 6/23/16				6/21						
68	STEEL/JOISTS/DECKING ERECT AREA B	10 days	Fri 6/24/16	Thu 7/7/16				6/24						
69	JOISTS & DECKING DELIVERED AREAS B & A	1 day	Fri 7/1/16	Fri 7/1/16				7/1						
70	STEEL/JOISTS/DECKING ERECT AREA A	10 days	Fri 7/8/16	Thu 7/21/16				7/8						
71	INTERIOR WALL FRAMING/SOFFITS & DOOR FRAMES	84 days	Tue 5/17/16	Fri 9/9/16				5/17	9/9					
72	DOOR FRAMES DELIVERED	0 days	Tue 5/17/16	Tue 5/17/16				5/17						
73	AREA D INTERIOR WALL/SOFFIT FRAMING	30 days	Tue 6/14/16	Mon 7/25/16				6/14						
74	AREA C INTERIOR WALL/SOFFIT FRAMING	30 days	Tue 6/28/16	Mon 8/8/16				6/28						
75	AREA B INTERIOR WALL/SOFFIT FRAMING	35 days	Tue 7/12/16	Mon 8/29/16				7/12						
76	AREA A INTERIOR WALL/SOFFIT FRAMING	35 days	Mon 7/25/16	Fri 9/9/16				7/25						
77	CONCRETE FLOOR POLISHING ROUGH GRIND	35 days	Fri 6/10/16	Thu 7/28/16				6/10	7/28					
78	AREA D CONCRETE POLISHING ROUGH GRIND	10 days	Fri 6/10/16	Thu 6/23/16				6/10						
79	AREA C CONCRETE POLISHING ROUGH GRIND	10 days	Fri 6/24/16	Thu 7/7/16				6/24						



Ben Steele Middle School Bid Schedule



ID	Task Name	Duration	Start	Finish	3rd Quarter			2nd Quarter			1st Quarter			4th Quarter
					May	Sep	Jan	May	Sep	Jan	May	Sep		
80	AREA B CONCRETE POLISHING ROUGH GRIND	10 days	Fri 7/8/16	Thu 7/21/16										
81	AREA A CONCRETE POLISHING ROUGH GRIND	5 days	Fri 7/22/16	Thu 7/28/16										
82	EXTERIOR FRAMING & SHEATHING	60 days	Fri 6/10/16	Thu 9/1/16										
83	AREA D EXTERIOR FRAMING	30 days	Fri 6/10/16	Thu 7/21/16										
84	AREA C EXTERIOR FRAMING	30 days	Fri 6/24/16	Thu 8/4/16										
85	AREA B EXTERIOR FRAMING	30 days	Fri 7/8/16	Thu 8/18/16										
86	AREA A EXTERIOR FRAMING	30 days	Fri 7/22/16	Thu 9/1/16										
87	SLAB ON DECK (SOD)	15 days	Fri 7/1/16	Thu 7/21/16										
88	SOD AREA B FORM, REINFORCE,POUR	5 days	Fri 7/1/16	Thu 7/7/16										
89	SOD AREA A FORM, REINFORCE,POUR	5 days	Fri 7/15/16	Thu 7/21/16										
90	EXTERIOR AIR BARRIER, PRIMARY FURRING, INSULATION, & WINDOW FLASHING	50 days	Fri 7/22/16	Thu 9/29/16										
91	AREA D EXT. ENVELOPE	20 days	Fri 7/22/16	Thu 8/18/16										
92	AREA C EXT. ENVELOPE	20 days	Fri 8/5/16	Thu 9/1/16										
93	AREA B EXT. ENVELOPE	20 days	Fri 8/19/16	Thu 9/15/16										
94	AREA A EXT. ENVELOPE	20 days	Fri 9/2/16	Thu 9/29/16										
95	ROOFING	83 days	Fri 7/22/16	Tue 11/15/16										
96	AREA D ROOFING	12 days	Fri 7/22/16	Mon 8/8/16										
97	AREA C ROOFING	12 days	Fri 8/5/16	Mon 8/22/16										
98	AREA B ROOFING	12 days	Fri 8/19/16	Mon 9/5/16										
99	AREA A ROOFING	12 days	Fri 9/2/16	Mon 9/19/16										
100	PARAPET CAP D TO A	20 days	Wed 10/19/16	Tue 11/15/16										
101	PRE-ROCK INSULATION	44 days	Tue 7/26/16	Fri 9/23/16										
102	AREA D INSULATION	10 days	Tue 7/26/16	Mon 8/8/16										
103	AREA C INSULATION	10 days	Tue 8/9/16	Mon 8/22/16										
104	AREA B INSULATION	10 days	Tue 8/30/16	Mon 9/12/16										
105	AREA A INSULATION	10 days	Mon 9/12/16	Fri 9/23/16										
106	MEP ROUGH INS	70 days	Tue 8/2/16	Mon 11/7/16										
107	AREA D MEP ROUGH INS	35 days	Tue 8/2/16	Mon 9/19/16										
108	AREA C MEP ROUGH INS	35 days	Tue 8/23/16	Mon 10/10/16										
109	AREA B MEP ROUGH INS	35 days	Tue 9/6/16	Mon 10/24/16										
110	AREA A MEP ROUGH INS	35 days	Tue 9/20/16	Mon 11/7/16										
111	PRE-ROCKING	42 days	Tue 8/9/16	Wed 10/5/16										
112	AREA D PRE-ROCKING	8 days	Tue 8/9/16	Thu 8/18/16										
113	AREA C PRE-ROCKING	8 days	Tue 8/23/16	Thu 9/1/16										
114	AREA B PRE-ROCKING	8 days	Tue 9/13/16	Thu 9/22/16										
115	AREA A PRE-ROCKING	8 days	Mon 9/26/16	Wed 10/5/16										
116	EXTERIOR BRICK/CMU VENEER	50 days	Fri 8/12/16	Thu 10/20/16										
117	AREA D EXT. BRICK/CMU VENEER	20 days	Fri 8/12/16	Thu 9/8/16										
118	AREA C EXT. BRICK/CMU VENEER	20 days	Fri 8/26/16	Thu 9/22/16										
119	AREA B EXT. BRICK/CMU VENEER	20 days	Fri 9/9/16	Thu 10/6/16										
120	AREA A EXT. BRICK/CMU VENEER	20 days	Fri 9/23/16	Thu 10/20/16										
121	EXTERIOR STOREFRONT	53 days	Fri 8/12/16	Tue 10/25/16										

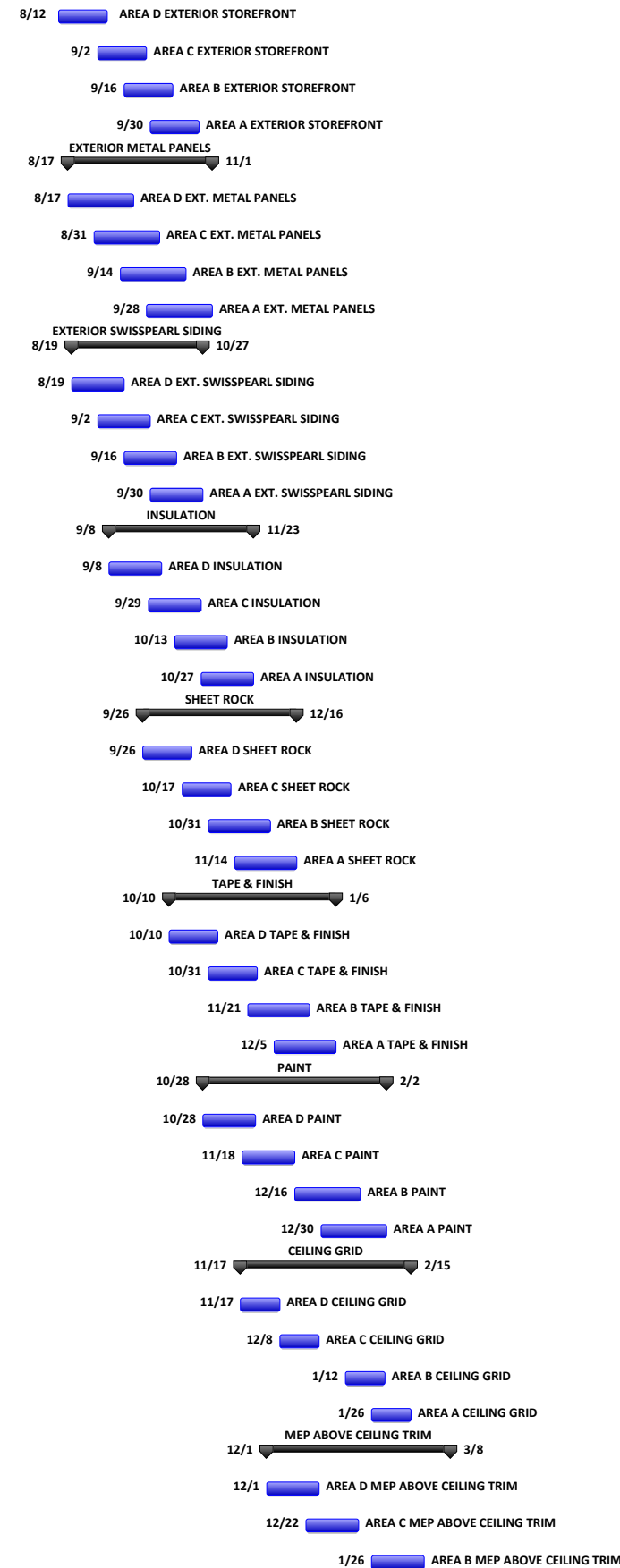




Ben Steele Middle School Bid Schedule



ID	Task Name	Duration	Start	Finish	3rd Quarter			2nd Quarter			1st Quarter			4th Quarter
					May	Sep	Jan	May	Sep	Jan	May	Sep		
122	AREA D EXTERIOR STOREFRONT	18 days	Fri 8/12/16	Tue 9/6/16										
123	AREA C EXTERIOR STOREFRONT	18 days	Fri 9/2/16	Tue 9/27/16										
124	AREA B EXTERIOR STOREFRONT	18 days	Fri 9/16/16	Tue 10/11/16										
125	AREA A EXTERIOR STOREFRONT	18 days	Fri 9/30/16	Tue 10/25/16										
126	EXTERIOR METAL PANELS	55 days	Wed 8/17/16	Tue 11/1/16										
127	AREA D EXT. METAL PANELS	25 days	Wed 8/17/16	Tue 9/20/16										
128	AREA C EXT. METAL PANELS	25 days	Wed 8/31/16	Tue 10/4/16										
129	AREA B EXT. METAL PANELS	25 days	Wed 9/14/16	Tue 10/18/16										
130	AREA A EXT. METAL PANELS	25 days	Wed 9/28/16	Tue 11/1/16										
131	EXTERIOR SWISSPEARL SIDING	50 days	Fri 8/19/16	Thu 10/27/16										
132	AREA D EXT. SWISSPEARL SIDING	20 days	Fri 8/19/16	Thu 9/15/16										
133	AREA C EXT. SWISSPEARL SIDING	20 days	Fri 9/2/16	Thu 9/29/16										
134	AREA B EXT. SWISSPEARL SIDING	20 days	Fri 9/16/16	Thu 10/13/16										
135	AREA A EXT. SWISSPEARL SIDING	20 days	Fri 9/30/16	Thu 10/27/16										
136	INSULATION	55 days	Thu 9/8/16	Wed 11/23/16										
137	AREA D INSULATION	20 days	Thu 9/8/16	Wed 10/5/16										
138	AREA C INSULATION	20 days	Thu 9/29/16	Wed 10/26/16										
139	AREA B INSULATION	20 days	Thu 10/13/16	Wed 11/9/16										
140	AREA A INSULATION	20 days	Thu 10/27/16	Wed 11/23/16										
141	SHEET ROCK	60 days	Mon 9/26/16	Fri 12/16/16										
142	AREA D SHEET ROCK	20 days	Mon 9/26/16	Fri 10/21/16										
143	AREA C SHEET ROCK	20 days	Mon 10/17/16	Fri 11/11/16										
144	AREA B SHEET ROCK	25 days	Mon 10/31/16	Fri 12/2/16										
145	AREA A SHEET ROCK	25 days	Mon 11/14/16	Fri 12/16/16										
146	TAPE & FINISH	65 days	Mon 10/10/16	Fri 1/6/17										
147	AREA D TAPE & FINISH	20 days	Mon 10/10/16	Fri 11/4/16										
148	AREA C TAPE & FINISH	20 days	Mon 10/31/16	Fri 11/25/16										
149	AREA B TAPE & FINISH	25 days	Mon 11/21/16	Fri 12/23/16										
150	AREA A TAPE & FINISH	25 days	Mon 12/5/16	Fri 1/6/17										
151	PAINT	70 days	Fri 10/28/16	Thu 2/2/17										
152	AREA D PAINT	20 days	Fri 10/28/16	Thu 11/24/16										
153	AREA C PAINT	20 days	Fri 11/18/16	Thu 12/15/16										
154	AREA B PAINT	25 days	Fri 12/16/16	Thu 1/19/17										
155	AREA A PAINT	25 days	Fri 12/30/16	Thu 2/2/17										
156	CEILING GRID	65 days	Thu 11/17/16	Wed 2/15/17										
157	AREA D CEILING GRID	15 days	Thu 11/17/16	Wed 12/7/16										
158	AREA C CEILING GRID	15 days	Thu 12/8/16	Wed 12/28/16										
159	AREA B CEILING GRID	15 days	Thu 1/12/17	Wed 2/1/17										
160	AREA A CEILING GRID	15 days	Thu 1/26/17	Wed 2/15/17										
161	MEP ABOVE CEILING TRIM	70 days	Thu 12/1/16	Wed 3/8/17										
162	AREA D MEP ABOVE CEILING TRIM	20 days	Thu 12/1/16	Wed 12/28/16										
163	AREA C MEP ABOVE CEILING TRIM	20 days	Thu 12/22/16	Wed 1/18/17										
164	AREA B MEP ABOVE CEILING TRIM	20 days	Thu 1/26/17	Wed 2/22/17										





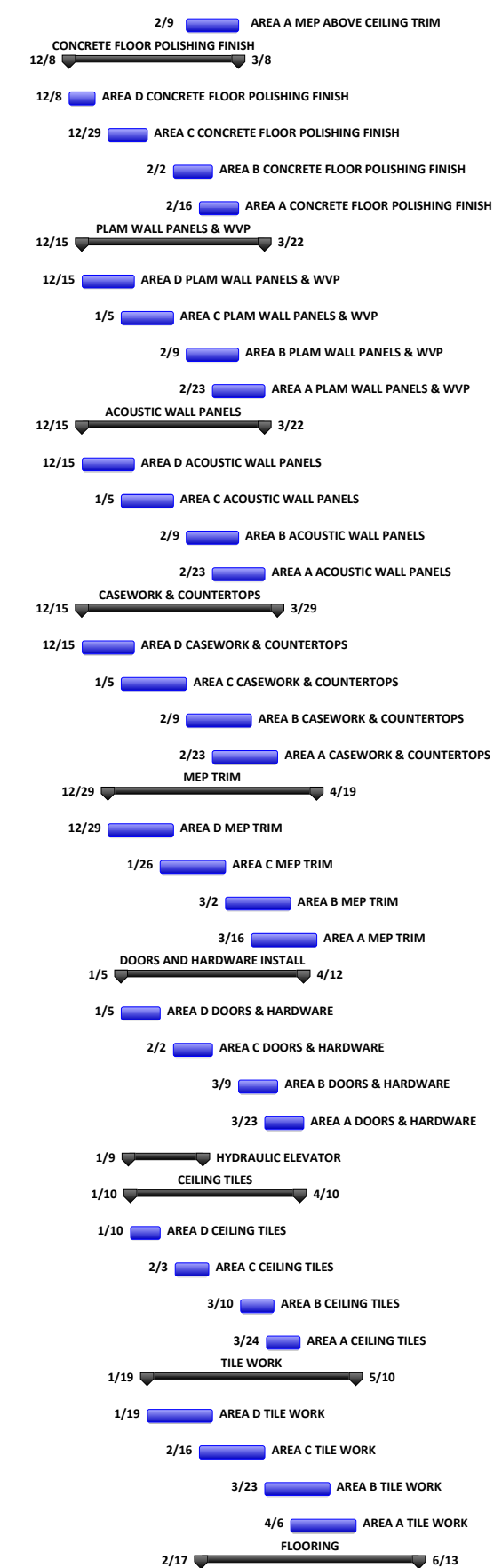
BILLINGS PUBLIC SCHOOLS

Ben Steele Middle School Bid Schedule



Langlas & Associates
GENERAL CONTRACTORS

ID	Task Name	Duration	Start	Finish	3rd Quarter			2nd Quarter			1st Quarter			4th Quarter
					May	Sep	Jan	May	Sep	Jan	May	Sep		
165	AREA A MEP ABOVE CEILING TRIM	20 days	Thu 2/9/17	Wed 3/8/17										
166	CONCRETE FLOOR POLISHING FINISH	65 days	Thu 12/8/16	Wed 3/8/17										
167	AREA D CONCRETE FLOOR POLISHING FINISH	10 days	Thu 12/8/16	Wed 12/21/16										
168	AREA C CONCRETE FLOOR POLISHING FINISH	15 days	Thu 12/29/16	Wed 1/18/17										
169	AREA B CONCRETE FLOOR POLISHING FINISH	15 days	Thu 2/2/17	Wed 2/22/17										
170	AREA A CONCRETE FLOOR POLISHING FINISH	15 days	Thu 2/16/17	Wed 3/8/17										
171	PLAM WALL PANELS & WVP	70 days	Thu 12/15/16	Wed 3/22/17										
172	AREA D PLAM WALL PANELS & WVP	20 days	Thu 12/15/16	Wed 1/11/17										
173	AREA C PLAM WALL PANELS & WVP	20 days	Thu 1/5/17	Wed 2/1/17										
174	AREA B PLAM WALL PANELS & WVP	20 days	Thu 2/9/17	Wed 3/8/17										
175	AREA A PLAM WALL PANELS & WVP	20 days	Thu 2/23/17	Wed 3/22/17										
176	ACOUSTIC WALL PANELS	70 days	Thu 12/15/16	Wed 3/22/17										
177	AREA D ACOUSTIC WALL PANELS	20 days	Thu 12/15/16	Wed 1/11/17										
178	AREA C ACOUSTIC WALL PANELS	20 days	Thu 1/5/17	Wed 2/1/17										
179	AREA B ACOUSTIC WALL PANELS	20 days	Thu 2/9/17	Wed 3/8/17										
180	AREA A ACOUSTIC WALL PANELS	20 days	Thu 2/23/17	Wed 3/22/17										
181	CASEWORK & COUNTERTOPS	75 days	Thu 12/15/16	Wed 3/29/17										
182	AREA D CASEWORK & COUNTERTOPS	20 days	Thu 12/15/16	Wed 1/11/17										
183	AREA C CASEWORK & COUNTERTOPS	25 days	Thu 1/5/17	Wed 2/8/17										
184	AREA B CASEWORK & COUNTERTOPS	25 days	Thu 2/9/17	Wed 3/15/17										
185	AREA A CASEWORK & COUNTERTOPS	25 days	Thu 2/23/17	Wed 3/29/17										
186	MEP TRIM	80 days	Thu 12/29/16	Wed 4/19/17										
187	AREA D MEP TRIM	25 days	Thu 12/29/16	Wed 2/1/17										
188	AREA C MEP TRIM	25 days	Thu 1/26/17	Wed 3/1/17										
189	AREA B MEP TRIM	25 days	Thu 3/2/17	Wed 4/5/17										
190	AREA A MEP TRIM	25 days	Thu 3/16/17	Wed 4/19/17										
191	DOORS AND HARDWARE INSTALL	70 days	Thu 1/5/17	Wed 4/12/17										
192	AREA D DOORS & HARDWARE	15 days	Thu 1/5/17	Wed 1/25/17										
193	AREA C DOORS & HARDWARE	15 days	Thu 2/2/17	Wed 2/22/17										
194	AREA B DOORS & HARDWARE	15 days	Thu 3/9/17	Wed 3/29/17										
195	AREA A DOORS & HARDWARE	15 days	Thu 3/23/17	Wed 4/12/17										
196	HYDRAULIC ELEVATOR	30 days	Mon 1/9/17	Fri 2/17/17										
197	CEILING TILES	65 days	Tue 1/10/17	Mon 4/10/17										
198	AREA D CEILING TILES	12 days	Tue 1/10/17	Wed 1/25/17										
199	AREA C CEILING TILES	12 days	Fri 2/3/17	Mon 2/20/17										
200	AREA B CEILING TILES	12 days	Fri 3/10/17	Mon 3/27/17										
201	AREA A CEILING TILES	12 days	Fri 3/24/17	Mon 4/10/17										
202	TILE WORK	80 days	Thu 1/19/17	Wed 5/10/17										
203	AREA D TILE WORK	25 days	Thu 1/19/17	Wed 2/22/17										
204	AREA C TILE WORK	25 days	Thu 2/16/17	Wed 3/22/17										
205	AREA B TILE WORK	25 days	Thu 3/23/17	Wed 4/26/17										
206	AREA A TILE WORK	25 days	Thu 4/6/17	Wed 5/10/17										
207	FLOORING	83 days	Fri 2/17/17	Tue 6/13/17										





BILLINGS PUBLIC SCHOOLS

Ben Steele Middle School Bid Schedule



Langlas & Associates
GENERAL CONTRACTORS

ID	Task Name	Duration	Start	Finish	3rd Quarter			2nd Quarter			1st Quarter			4th Quarter
					May	Sep	Jan	May	Sep	Jan	May	Sep	Sep	
208	AREA D FLOORING	25 days	Fri 2/17/17	Thu 3/23/17										2/17
209	AREA C FLOORING	25 days	Fri 3/17/17	Thu 4/20/17										3/17
210	AREA B FLOORING	25 days	Fri 4/21/17	Thu 5/25/17										4/21
211	AREA A FLOORING	25 days	Wed 5/10/17	Tue 6/13/17										5/10
212	DIVISION #10 & LOCKERS	62 days	Mon 2/20/17	Tue 5/16/17										2/20
213	AREA D DIVISION #10	7 days	Mon 2/20/17	Tue 2/28/17										2/20
214	AREA C DIVISION #10	7 days	Mon 3/20/17	Tue 3/28/17										3/20
215	AREA B DIVISION #10	7 days	Mon 4/24/17	Tue 5/2/17										4/24
216	AREA A DIVISION #10	7 days	Mon 5/8/17	Tue 5/16/17										5/8
217	KITCHEN EQUIPMENT	30 days	Fri 3/17/17	Thu 4/27/17										3/17
218	AREA C KITCHEN EQUIPMENT	30 days	Fri 3/17/17	Thu 4/27/17										3/17
219	CONSTRUCTION CLEANING	68 days	Fri 3/24/17	Tue 6/27/17										3/24
220	AREA D CONSTRUCTION CLEANING	10 days	Fri 3/24/17	Thu 4/6/17										3/24
221	AREA C CONSTRUCTION CLEANING	10 days	Fri 4/28/17	Thu 5/11/17										4/28
222	AREA B CONSTRUCTION CLEANING	10 days	Fri 5/26/17	Thu 6/8/17										5/26
223	AREA A CONSTRUCTION CLEANING	10 days	Wed 6/14/17	Tue 6/27/17										6/14
224	G.C. INCOMPLETE WORK LIST BUILDING	35 days	Wed 5/17/17	Tue 7/4/17										5/17
225	AREA D INCOMPLETE WORK LIST	10 days	Wed 5/17/17	Tue 5/30/17										5/17
226	AREA C INCOMPLETE WORK LIST	10 days	Wed 5/17/17	Tue 5/30/17										5/17
227	AREA B INCOMPLETE WORK LIST	10 days	Fri 6/2/17	Thu 6/15/17										6/2
228	AREA A INCOMPLETE WORK LIST	10 days	Wed 6/21/17	Tue 7/4/17										6/21
229	OWNERS PUNCH LIST WALK BUILDING	28 days	Wed 5/31/17	Fri 7/7/17										5/31
230	AREA D OWNER PUNCH LIST	3 days	Wed 5/31/17	Fri 6/2/17										5/31
231	AREA C OWNER PUNCH LIST	3 days	Wed 5/31/17	Fri 6/2/17										5/31
232	AREA B OWNER PUNCH LIST	3 days	Fri 6/16/17	Tue 6/20/17										6/16
233	AREA A OWNER PUNCH LIST	3 days	Wed 7/5/17	Fri 7/7/17										7/5
234	OWNER PUNCH LIST BUILDING WORK	30 days	Mon 6/5/17	Fri 7/14/17										6/5
235	AREA D OWNER PUNCH LIST WORK	5 days	Mon 6/5/17	Fri 6/9/17										6/5
236	AREA C OWNER PUNCH LIST WORK	5 days	Mon 6/5/17	Fri 6/9/17										6/5
237	AREA B OWNER PUNCH LIST WORK	5 days	Wed 6/21/17	Tue 6/27/17										6/21
238	AREA A OWNER PUNCH LIST WORK	5 days	Mon 7/10/17	Fri 7/14/17										7/10
239	OWNER FF&E	35 days	Mon 6/12/17	Fri 7/28/17										6/12
240	AREA D OWNER FFE	10 days	Mon 6/12/17	Fri 6/23/17										6/12
241	AREA C OWNER FFE	10 days	Mon 6/12/17	Fri 6/23/17										6/12
242	AREA B OWNER FFE	10 days	Wed 6/28/17	Tue 7/11/17										6/28
243	AREA A OWNER FFE	10 days	Mon 7/17/17	Fri 7/28/17										7/17
244	TEST AND BALANCE- COMMISSIONING	20 days	Wed 6/28/17	Tue 7/25/17										6/28
245	AREA'S A - D TEST & BALANCE	20 days	Wed 6/28/17	Tue 7/25/17										6/28
246	AREA'S A - D COMMISSIONING	20 days	Wed 6/28/17	Tue 7/25/17										6/28
247	SUBSTANTIAL COMPLETION	0 days	Fri 7/28/17	Fri 7/28/17										7/28
248	SITE WORK	370 days	Mon 2/29/16	Fri 7/28/17										2/29
249	ONSITE WORK FIELDS	126 days	Mon 2/29/16	Mon 8/22/16										2/29
250	MOBILIZATION/FENCING/ SWPPP	1 day	Mon 2/29/16	Mon 2/29/16										2/29



Ben Steele Middle School Bid Schedule



ID	Task Name	Duration	Start	Finish	3rd Quarter			2nd Quarter			1st Quarter			4th Quarter					
					May	Sep		Jan	May	Sep	Jan	May	Sep						
251	SITE CLEARING FOR FIELDS TO SUITABLE SUBGRADE	10 days	Tue 3/1/16	Mon 3/14/16				3/1											
252	ROUGH GRADING FIELDS	15 days	Tue 3/15/16	Mon 4/4/16				3/15											
253	UNDERGROUND UTILITIES FIELDS	10 days	Tue 4/5/16	Mon 4/18/16				4/5											
254	IRRIGATION FIELDS	15 days	Tue 4/19/16	Mon 5/9/16				4/19											
255	FINE GRADING FIELDS	15 days	Tue 5/10/16	Mon 5/30/16				5/10											
256	IMPORTED SOIL, FIELD MIXES, AND AMENDMENTS	15 days	Tue 5/31/16	Mon 6/20/16				5/31											
257	FIELD EQUIPMENT/DUGOUTS	15 days	Tue 6/21/16	Mon 7/11/16					6/21										
258	SEED/SOD/TURF/TRACK	20 days	Tue 7/12/16	Mon 8/8/16					7/12										
259	INSTALL TEMP FENCING AROUND FIELDS TO PROTECT SURFACES UNTIL 2017	10 days	Tue 8/9/16	Mon 8/22/16					8/9										
260	FIELDS ARE COMPLETE	0 days	Mon 8/22/16	Mon 8/22/16					8/22										
261	ONSITE WORK BUILDING	370 days	Mon 2/29/16	Fri 7/28/17															
262	MOBILIZATION/FENCING/ SWPPP	1 day	Mon 2/29/16	Mon 2/29/16				2/29											
263	SITE CLEARING TO SUITABLE SUBGRADE	10 days	Tue 3/1/16	Mon 3/14/16				3/1											
264	ROUGH GRADING SITE	40 days	Tue 3/15/16	Mon 5/9/16				3/15											
265	BRING UTILITIES TO BUILDING	45 days	Tue 4/19/16	Mon 6/20/16				4/19											
266	IRRIGATION SLEEVES	10 days	Tue 5/10/16	Mon 5/23/16				5/10											
267	CURB AND GUTTER	25 days	Tue 5/24/16	Mon 6/27/16				5/24											
268	SITE LIGHTPOLE BASES & FIXTURES	10 days	Tue 6/21/16	Mon 7/4/16					6/21										
269	CONCRETE SIDEWALKS AT PARKING LOTS & FILEDS	25 days	Tue 6/28/16	Mon 8/1/16					6/28										
270	FINE GRADING SITE PARKING LOTS	25 days	Tue 8/2/16	Mon 9/5/16					8/2										
271	1ST LIFT PAVING	10 days	Tue 9/6/16	Mon 9/19/16					9/6										
272	SITE WINTER SHUTDOWN	140 days	Tue 9/20/16	Mon 4/3/17					9/20										
273	PREP SIDEWALKS & HARDSCAPING AROUND BUILDING	20 days	Tue 4/4/17	Mon 5/1/17											4/4				
274	POUR SIDEWALKS & HARDSCAPING AROUND BUILDINGS	20 days	Tue 5/2/17	Mon 5/29/17											5/2				
275	TOPSOIL IMPORT FOR LANDSCAPE AREAS AROUND BUILDING	10 days	Tue 5/30/17	Mon 6/12/17											5/30				
276	2ND LIFT PAVING	10 days	Tue 6/13/17	Mon 6/26/17											6/13				
277	IRRIGATION AROUND BUILDING	10 days	Tue 6/20/17	Mon 7/3/17											6/20				
278	STRIPING	2 days	Tue 6/27/17	Wed 6/28/17											6/27				
279	LANDSCAPING	24 days	Tue 6/27/17	Fri 7/28/17											6/27				
280	SITE SIGNAGE(ADA SIGNS, TRAFFIC SIGNS, ETC...)	4 days	Thu 6/29/17	Tue 7/4/17											6/29				
281	OWNER PUNCHLIST SITE INCLUDING FIELDS	15 days	Wed 7/5/17	Tue 7/25/17											7/5				
282	SITE COMPLETE AROUND BUILDING & FIELDS	0 days	Fri 7/28/17	Fri 7/28/17											7/28				
283	PROJECT COMPLETION	0 days	Fri 7/28/17	Fri 7/28/17											7/28				
284	FIRST DAY OF SCHOOL 2017	0 days	Thu 8/24/17	Thu 8/24/17															8/24

BID FORM

Ben Steele Middle School
School District #2, Billings, MT

BID PACKAGE: _____ (Each bid package requires a separate bid form)

PACKAGE DESCRIPTION: _____

Submitted By: _____ Date: _____

To: Langlas & Associates, Inc.
C/O Billings School District #2
2270 Grant Road
Billings, MT 59102

We, the undersigned Bidder, having carefully read the Documents for the proposed contract, including the General Conditions, Supplemental Conditions, Specifications, Drawings, addendums, schedule, and bid scopes and having carefully ascertained the conditions under which the work is to be performed, hereby bid and offer to enter into a Contract to perform the Work as described in accordance with the Documents. We are bidding the entire Bid package as noted above and provide a bid for the entire bid scope as noted in the documents for the price of:

Base Bid:

_____ Dollars. \$ _____

Cost to Provide 100% Performance and Payment Bond (Add) \$ _____

- Alternate #1A – LVT Flooring in lieu of VCT on the 1st Floor (Add/Deduct) \$ _____
- Alternate #1B – LVT Flooring in lieu of VCT on the 2nd Floor (Add/Deduct) \$ _____
- Alternate #1C – Polished Concrete in lieu of VCT on 1st Floor (Add/Deduct) \$ _____
- Alternate #2 - Asphalt Paved Parking Lot (94 Spaces) (Add/Deduct) \$ _____
- Alternate #3 - Gravel Parking Lot (Add/Deduct) \$ _____
- Alternate #4 - East Soccer Field (Add/Deduct) \$ _____
- Alternate #5 - West Soccer Field (Add/Deduct) \$ _____
- Alternate #6 - West Softball Field, Dugouts, & Concrete Paving (Add/Deduct) \$ _____
- Alternate #7 - North Softball Field, Dugouts, & Concrete Paving (Add/Deduct) \$ _____
- Alternate #8 - CMU Veneer in lieu of Brick Veneer (Add/Deduct) \$ _____
- Alternate #9 - Eliminate Four South-Facing Gym Windows & Shades (Add/Deduct) \$ _____
- Alternate #10 – Field Underdrain Piping At Football Field (Add/Deduct) \$ _____
- Alternate #11 – Low Efficiency Chiller (Add/Deduct) \$ _____

Please provide pricing for each of the alternates listed above. Please circle whether the alternate pricing is to be added to or subtracted from the base bid.

1% Montana Gross Receipts Tax will be deducted from all subcontractor payments and the subcontractor can apply for a tax credit for the 1% with the State of Montana.

PERIOD OF ACCEPTANCE:

The Bidder agrees that this bid shall remain open for acceptance and the price shall remain and unchanged and notwithstanding any error in the Bid at the amount stated for a period of sixty (60) days from the date of closing of this bid.

CONTRACT:

The Bidder agrees that the Bid is subject to a formal AIA Contract being prepared and executed with the Construction Manager.

The bidder agrees to execute the Contract within 7 days of notification of the acceptance of his bid and to provide Certificates of Insurance including Worker’s Compensation Insurance.

The Bidder shall furnish 100% performance and Payment Bonds, if required by the Construction Manger. Cost of said bonds is listed as a bid item to the base bid above. Alternates will be adjusted based upon the percentage stated.

ADDENDA:

Addendum No. _____ Dated _____ Addendum No. _____ Dated _____

Addendum No. _____ Dated _____ Addendum No. _____ Dated _____

SUBMITTED BY:

Company: _____

Name of Bidder: _____

Signature of Bidder: _____

Dated: _____

MT License No: _____

Phone No: _____

Fax No: _____

Email: _____

Your signature above constitutes your understanding of the scope of work and existing conditions of the project. This bid is complete per the documents.

ATTACHMENTS TO BE INCLUDED WITH BID FORM:

Attachment A – Copy of Bid Package that subcontractor is submitting this price for consideration.

Attachment B – Clarifications and Qualifications – Include any clarifications or qualifications of bid proposal.

These clarifications and qualifications shall only be provided for information only and may or may not influence the award.

END OF BID FORM