AECOM HUNT

Quality Bid & Scope Coordination Guidelines

09.13.2024

This guide is not all inclusive, it is a general guideline that captures the most frequently missed specification items.

A goal of exterior coordination guidelines is to reduce rework and provide a confident air and water-tight construction detailing. **NOTE:** These quality requirements are not to replace the specifications. These are additional expectations, typical manufacturer, or building code required items, in addition to any specifications established for the project. If there are contradictory items between this list or the specification, the stricter condition should be used. Please contact the Quality Department.

1. All Subcontractors are to submit a Job Specific Quality Program to the Quality Department for review *(Follow most recent Quality Guidelines)*

2. Provide for all BUILDING ENVELOPE coordination, including, but not limited to:

a. Recommend to NOT use recycled concrete as fill unless the material is tested for expansive properties.
b. Review vertical pipes in slabs with waterproofing and/or vapor barrier so that the pipes are a minimum 3” clear from each adjacent pipe.
c. Review horizontal pipes in basement walls with waterproofing and/or air barrier, so the pipes are a minimum 3” clear from each adjacent pipe.
d. Waterstopping at pipes need to coordinated with MEP, concrete, and waterproofing trade contractor. It is suggested that the concrete trade contractor install the waterstopping.
e. Per ACI 318 – Exterior concrete to be 5,000 psi min.
f. Concrete that is exposed, to be waterproofed or AVB, concrete finish to be 3.0, surface tolerance class A.
g. Do not punch through any exterior cold-formed metal framing (CFMF) without prior approval by the CFMF Engineer of Record. Electrical contractor shall coordinate pipe routing. Note that the CFMF jambs typically do not have pre-punches and cannot be punched.
h. All roof curbs, rails, and penetrations are to be coordinated correctly based on roof insulation shop drawing and a minimum 8” above the roof membrane. Coordinate tapered insulation with a roof as required.
i. Roof curb, parapet, and wood blocking should NOT be exterior treated when covered with roofing. If treating is required, all fasteners are to be 300 series stainless steel or ceramic coated.
j. Buy fastener calculations for all exterior window systems, including storefront, curtainwall, window wall, flanged windows, etc. Must be provided prior to the preinstallation meeting. Coordinate the attachment detailing to the framing (CFMF, CMU, Concrete, etc.)
k. Buy attachment calculations (code required) for support of façade elements (metal panel, terracotta, GFRC, etc.
l. A curtainwall should NOT have a full sill, unless specifically tested by the manufacturer.
m. Suggest to buy a stainless steel (with welded corners) or PVC sill pan for all punched or flanged window systems.
n. Recommend to water and vacuum test all flanged windows and consider failure, any water entering the interior.
o. Confirm that all exterior façade components have been tested as an assembly for NFPA 285. Coordinate the entire exterior materials as well as the interior insulation as designed.
p. Confirm all NFPA 285 detailing (opening head, jambs, and sill of opening) have been accounted for in the design/price.
q. Quality Department recommends that roof blocking be part of the roofers scope of work.
r. 3-lines of sealant is recommended for precast concrete.
s. 3-lines of sealant is recommended for curtainwall systems when possible.
t. Recommend installing a sill flashing under all precast openings.
u. Recommend installing a stainless steel pan under all doors at roof or plaza/terrace levels. (See detail for more information).
v. Must install a vapor retarder on a concrete roof deck – torch down is best.
w. Concrete roofs must include mechanically fastening the first layer of insulation at a minimum.
x. A roof assembly letter must be provided prior to the preinstallation meeting.
y. A substrate board is recommended for all metal deck installations with a vapor retarder.
z. Always slit the plastic cover and cover with a breathable cover on all roof insulation bundles.

aa. Recommend installing the air/vapor barrier with ABAA specifications & testing.
bb. Buyout back of roof parapet protection as required prior to the AVB installation.
cc. Install a minimum 15 mil vapor retarder, regardless of the specifications.
dd. Use below grade vapor retarder mastic for all penetrations and Manufacturer's double sided tape for concrete connections.
ee. Do not use liquid flashing for openings when possible.
ff. Use York 304 SS SA for opening flashings, transitions between AVB, waterproofing, roofing, and at expansion joints.
gg. Building expansion joints at the roof should be utilizing the roof manufacturer detailing, not a separate metal expansion joint.
hh. Sheathing without an applied air barrier coating is not recommended to be used for sheathing & air barrier.
ii. Coordinate location and size of all pipe sleeves with waterproofing and/or air barrier and overhang into the wall cavity with the space allowed. A flush-flanged sleeve might be required based on the wall cavity.
jj. Asphalt based detail membrane is not recommended to be used at joints.

A goal of the non-structural interior framing/drywall & MEP/FP coordination efforts, including as applicable 3D coordination process, is to reduce re-work in the field and field generated issues. In addition to pre-installation meetings, quality coordination guidelines are beneficial to the flow and installation of work, with the goal of avoiding any re-work.

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3. Considerations for BIM & general coordination, including, but not limited to:

a. Review all specified products, details, and constructability before the start of construction, including applicable codes and local jurisdiction guidelines.
b. Subcontractor to issue written RFI (request for information) should there be any concerns/conflicts.
c. Subcontractor to ensure that there is access to all system components (for example, access panel locations.).
d. Reference **Exhibit XXX** - Coordination Protocol Document for modeling requirements.
e. Review CMU walls and determine the location of bond beams. Bond beams are to be avoided; (i.e., 8 "-16" above a door and 1-3 CMU courses below the top of wall). Review the structural drawings for locations when penetrating a CMU wall.
f. All beam penetrations must include the following:
    i. The specified thickness of the fire spray insulation.
    ii. The specified thickness of the MEP/FP insulation, as applicable.
    iii. The flange is to be designed for half or full tip thickness before determining overall encroachment. (Verify with spray fireproofing subcontractor).
g. Include +1/2" minimum clearance all the way around the beam penetration, add fireproofing thickness as required.
h. All MEP/FP should run a minimum of 2" (or top track thickness) below the bottom of the deck (low flute) at all sound walls (this ensures space for sound caulking). See smoke/firewall section for more requirements, including the minimum clearance required below the top track.
i. Review for any project seismic bracing requirements and coordinate with engineered shop drawings.
j. All sleeves (floor and wall) to be sized to include insulation thickness and ¼" minimum and ½" maximum clearance around the sleeve.
k. Review if decks are post-tension and coordinate sleeve and slab opening with post-tension (PT) contractor/engineer. The shell size for any hangers shot or drilled after the post-tension floor has been poured must be approved by the engineer of record (EOR). Before installing any hangers, the Subcontractor is to follow written specifications such as x-ray or use of Ground Penetrating Radar (GPR) to identify and avoid the location of post-tension tendons. Formally review the outcome before proceeding with any installations.
l. Provide access and clearance around all equipment per the Manufacturer's recommendations, code requirements, and any local jurisdiction guidelines.

m. All MEP/FP trades to submit drawings depicting necessary access panels for review and approval.
n. Coordinate and ensure that dissimilar metals are not in contact with any non-accepting metals or materials (such as pressure-treated wood). If there is any confusion on which metals are non-accepting to your system, please discuss with Pepper, who can provide various compatibility charts.

4. Considerations for all non-structural interior framing/drywall & MEP-FP (including controls) Trades, including, but not limited to:

a. Only use indirect temporary heat for all interior finishes. Discuss if humidifier will be required.
b. Request the live load deflection from the SEOR or the Architect. If nothing is given, use L/360 for floors and L/240 for roofs.
c. Verify that the head track is at least 1" into the track at all times…(2x Deflection +1") (*Typical Sizes: ½" deflection gap = 2" leg; ¾" deflection gap = 2 ½" leg; 1" deflection gap = 3" leg; +1"-1.5" deflection gap = 4" leg; +2" deflection gap = 5" leg).*
d. Verify that the non-composite Mfr limiting height tables are being utilized (unless specified by the Mfr. based on the live load deflection given by the SEOR or Architect).
e. If studs are to be 25ga…discuss option for 20ga. (25ga has more of a tendency to strip while fastening) for openings and walls that are carrying cabinets, use a minimum 20ga. studs.
f. Verify if specifications call for G40 or G60 throughout. G90 should be installed at natatoriums and other caustic locations.
g. Review control Joint layout for walls (min 32' o.c.) and soffits (min. 50' o.c.).
h. Do you need a horizontal control joint in the stair (2 or more stories) where there is a deflection joint in the framing? If the framing is floor to floor – we will have a horizontal CJ…most likely in different planes as it goes around the stair based on the bottom of the beam(s).
i. Curved walls CAN NOT be Fire RATED… So, if we have a curved fire-rated wall...we need to consider a Conventional Plaster Wall, CMU wall, or segmented traditional wall.
j. Verify stud Gauge requirements @ Tile Walls *(Per TCNA 108-11-4.2-Studs shall be a min. 20ga-33 mil, G60 material) @ 16" o.c. This includes prefabricated walls – makes sure the walls are 16" o.c.*
k. Verify stud Gauge requirements @ Lead Lined Walls *Studs shall be a min. 20ga-30 mil @ 16" o.c. Install a tape or similar to separate the lead from the galvanized studs.*
l. Verify stud Gauge requirements @ abuse-resistant Walls *Studs shall be a min. 20ga-33 mil as per Manufacturer.*
m. Confirm that either non-composite limiting height charts or deflection limiting height charts (when available and applicable to project-specific requirements) are being used to determine the limiting heights of the interior metal studs. (Composite limiting height charts are no longer useable).
n. Corner & door, window jamb studs(both) are required to be fastened to the bottom track.
o. Review non-composite wall conditions and the requirement for control and correct limiting heights.
p. Shaftwall cannot be stacked without the Manufacturer's approval and calculations. Review drawings to verify if stacking or supplemental steel is required to install tall walls.
q. If we have electric in the door frames and we need to cut the king stud for the electrical installation, install a 3rd king stud, so at least two (2) king studs are properly installed – extend the box header as required for installation.
r. Make sure that the drywall is held ¼" to ½" from the concrete deck –filled with sound sealant.
s. Confirm that the fire-rated joint at the Head-of-Wall is a spray type system for anything over 1/8" live load deflection.
t. Confirm that the acoustical non-rated Head-of-Wall is a spray type system for anything over 1/8" live load deflection.
u. Request a UL assembly for each wall condition (typically 6 different types)
    i. Parallel to deck flute
    ii. Perpendicular to deck flute
    iii. Parallel offset to deck flute
    iv. Parallel to beams/joists

v. Perpendicular to beams/joists
vi. Parallel offset to beams/joists
vii. Concrete deck (flat) typically just one

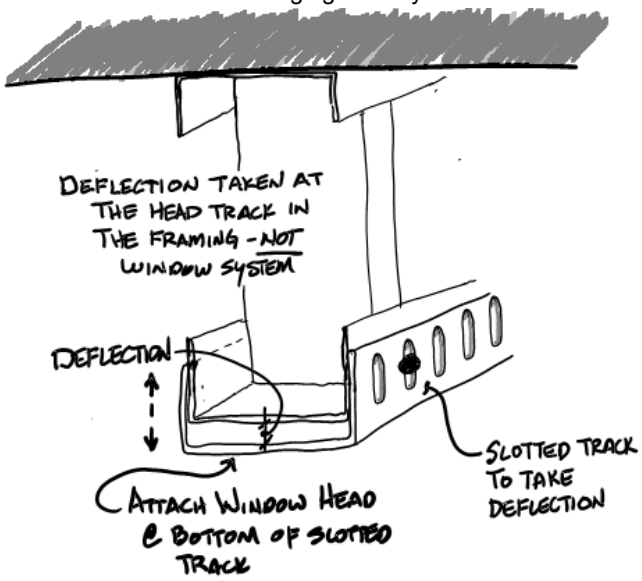
v. Review the UL Assembly for a perpendicular intersection of a beam and verify with the drywall should be cut around the beam or a certain distance away, straight cut… Add framing as required.
w. Confirm trade(s) are installing the sound or Fire Pads on the outlets.
x. In sound walls, Make sure that the stud attachment allows for proper movement and support .
y. Make sure that the top track support on the beams before the installation of the spray fireproofing is “Z-Furring” and cut to the width of the studs.
z. When a fire rated wall is parallel under a sprayed beam, the web of the beam will need about 1.5" extra fireproofing on each side.
aa. Determine top track substrate and if shooting is an option. (Concern is generally with metal deck – roof, non-concrete).
bb. On angled ceilings, decks, etc, Make sure that the stud attachment has clips for each stud, which allows for proper movement and support.
cc. Waffle formed concrete deck…The top track must go into the concrete depression and around. Drywall to span no more than 2”.
dd. Review acoustical sound attenuation will be installed full and solid in all cavities – including door frame and double/triple stud cavities before final stud installation.
ee. Hanging soffit framing must be fastened on both sides of the track.
ff. Hanging soffit framing must be laterally supported via kickers per Mfr calculations (coordinate kickers with MEP-FP).
gg. Framing that does not go up to the deck above must be laterally supported to adjacent walls or go up to the deck above.
hh. **Door Header Requirement: A Box Beam will be required(or engineered system)**, per the Mfr requirements based on framing, for openings 36” with more than 36” of drywall (both sides) (***Example*** – we have a 7’-0” x 36” door with a floor to ceiling height of 12’-0” with drywall running up to the deck) **(Based on a 20ga, 1¼” bottom track).**
ii. Engineer requirement for an opening greater than 6'-0".
jj. Discuss that backing plates are a minimum 3 studs long & 3 fasteners per stud or as indicated in the specifications.
kk. Grab bars and hand rails cannot be metal backing…only solid wood or plywood.
ll. Fire rated walls that turn the corner must connect the head of wall at the corner – do not run a non-rated wall into the rated wall without the head of wall connection. The wall coordination must allow for a complete fire rated wall corner, then a non-rated wall ties into that fire rated wall.
mm. ½ height walls – provide and confirm the structural support(s) needed. Confirm that if prefabricated structural support are used, the installation instructions are followed.
nn. Installing Cement Board/Tile Backer Board – Joint Compound MUST meet manufacture Requirements…Typically a Portland-based product – **VERIFY** **MUST USE TILE SETTING MATERIAL.** Confirm if this scope os in the Tile Contractor’s Scope of work.
oo. If installing Cement Board, review Mfr requirements for the installation of a vapor barrier behind the cement board (*a waterproof membrane is considered the vapor barrier if installed).*
pp. If installing a DensShield type tile backer...Install a silicone sealant in the corners before the installation of the glass mesh and tile setting material.
qq. Review if there is a tile baseboard…there should be a tile backer board at this location, also.
rr. Fire-rated walls…with a double layer installation, make sure that the overlap is at least 12”.
ss. *Level 5 finish is highly recommended* ***where gloss, semi-gloss, enamel, or flat paints are specified*** *or where severe lighting conditions occur. This highest quality finish is the most effective method to provide a uniform surface and minimize the possibility of joint photographing and of fasteners showing through the final decoration. Recommend that the painter provide the level 5 finish.*
tt. *When we have walls just past the ceiling (not to the deck) do not kick the framing to the floor above, install 45° studs from wall to wall.*

When we have non-full height partitions, Pepper recommends bracing the walls as shown to the right…with NO kickers to the deck above (*which will create cracks in the drywall*)

uu. Provide for a fire penetration & Head of wall Mock-up for larger fire rated partition projects.

5. Considerations for glass wall or demountable partitions, but not limited to:

vv. Request the live load deflection from the SEOR or the Architect. If nothing is given, use L/360 for floors and L/240 for roofs.
ww. Make sure that the window systems take deflection into account.
xx. Corner glass issues – need to design a proper header to catch the corner.
yy. Glass doors – the door pivot does not have movement…need to design a header in this location.
zz. Typically demountable do not have movement built in – therefore we need a header system or provide a reverse slotted track on a hanging soffit system:



6. Considerations for Flooring, including, but not limited to:

aaa. Sodium Silicates or similar should not be used for curing of the concrete (products such as Barrier 1, Dry Bones, ISE Logik MVRA 900, or similar).
bbb. Always have the floor prep manufacturer provide a letter how to prep the floor and review with the Quality Team.
ccc. Moist cure (plastic) concrete that will receive flooring.
ddd. Use a polished concrete curing blanket for polished concrete or exposed concrete flooring. When a curing blanket is used, the concrete must be rinsed with water after the 7-day cure).
eee. A fuzzy finish (orange peel) concrete finish – do not hard trowel concrete.
fff. Do not hard trowel light weight concrete. FF to be 25 or less.
ggg. Do not hard trowel exterior air entrained concrete.
hhh. Floor prep material should be cement based when possible (no plaster of paris or excessive gypsum.
iii. Shot blasting is a must after mitigation of asbestos.
jjj. Gypsum type floor leveling products require a double primer on concrete and/or on top of the gypsum.

kkk. Always verify Gypsum based products under the floor materials.
lll. Always sound concrete and floor prep prior to the floor installation/prep.
mmm. If the glue is tacky or water- If the floor use to be a roof – always sound the floor and shot blast. If the roof or vapor retarder was asphalt based, the concrete must be chemically analyzed at least ½" down, ASAP based – it must be removed 100% and concrete shot blasted.

7. Considerations for MEP-FP (including controls) Trades – In-wall & Above Ceiling, including, but not limited to:

a. Review and verify that all valve locations are accessible by the owner (such as soffits and other hard surface locations.).
b. Saddles are to be installed with proper rigid insulation.
c. Pipe insulation should not be interrupted by supports (vertical or horizontal) and valves – install valve extension as required.
d. All pipes routing through the wall do not affect the integrity of that wall (for example, additional punches in the stud, etc.). Holes can be made in the studs as follows:
    i. No less than 12" from the bottom of the stud.
    ii. Aligned with existing pre-punched holes.
    iii. At the mid-point of the two punched holes and no wider than the size of the existing pre-punched holes.
    iv. Discuss with the Director of Quality and the Stud Manufacturer before cutting studs if differs from above items.
e. All piping must be at least 12" from the bottom of the stud.
f. Subcontractor to review the need for a header where large horizontal piping is installed in the wall (such as a vent or when pipes transverse more than one stud cavity). Coordinate to confirm this will not cause issues with any other systems.
g. Coordinate that pipe sizing and specified wall thickness are compatible to ensure all pipes are fully enclosed in drywall (not half in/half out of drywall) and particularly in fire-rated walls.
h. Coordinate that all in-wall routings and specified wall thickness are compatible to ensure all pipes/duct runs take into account the full thickness of insulation.
i. All pipes, ducts, cleanouts, etc., must be coordinated to provide proper access to all equipment. Ensure coordination with architectural drawings (details, sections, features, owner items, etc.)
j. Avoid king studs when possible. King studs are not allowed to be cut in the field to allow routing. If there is a location of king stud that may come in conflict with routings, the conflict must be resolved before installing the king stud and/or routings.
k. Do not punch through any cold-formed metal framing (CFMF) without prior approval by the CFMF Engineer of Record. This is typically at the exterior of the building but will also include any studs 18 gauge or greater.
l. In locations where NFPA 101 is a code requirement, NFPA 101 does not allow any systems in the walls of any stairway or designated fire exit hallways if it is not serving the stair or exit.
m. Review and coordinate any valve/control locations with the reflected ceiling plan, considering items such as soffits, millwork, other MEP/FP, etc. that may conflict with control access. Ensure accessibility and clearance of valve/controls.
n. Review the architectural or acoustical drawings to verify any acoustical details needed for pipe or duct penetrations.

8. Considerations for MEP-FP (including controls) Trades – Fire/Smoke Walls, including, but not limited to:

a. Review and coordinate any items penetrating a firewall.
b. Ensure penetrations at firewalls allow for fire stopping and any flange installations. At penetrations that are close to an adjacent wall, allow for the ability to install fire stopping (for example, allow a minimum of 4" for logistics of proper firestopping install).

c. MEP-FP items should not go through the fire/smoke wall at an angle other than 90°. Review the submitted testing assembly (UL) for any 90-degree variance.
d. MEP-FP items such as plumbing should not have a flange, hub, "Y," or any fitting connection partway in the wall plane. (For example, box out if needed).
e. MEP-FP items are not allowed to go through the head of wall. Obtain a review from the Director of Quality for any proposed variance regarding fire/smoke wall assemblies, including pipes going through the head of wall. (see f below).
f. Review head of wall assemblies, including, but not limited to the following:
    i. Review fire plan, beam locations and determine types of head of walls that will be used. Note that the head of wall assembly will likely be horizontal if the beam is less than 12" from the wall. The systems cannot go through the horizontal fire membrane adjacent to firewall.
    ii. If a spray system is being used for the head of wall, locate the top of any MEP-FP item 5 "-6" from the bottom of deck (low flute), steel beam flange, joist, etc. in order for others to properly install the fire stopping overlap (this includes the insulation thickness).
    iii. If a mechanical type of head of wall system is used (such as drywall overlapping the joint, "fire trak," etc.), the distance will dramatically be different (for example, 8 "-15"). This needs to be verified on a job by job basics. It will also require a 6 "-8" no-fly zone on the sides of beams, joists, etc., for this type of system.
g. All hanger rods should be a minimum of 3" from any fire/smoke wall. All hanger rods should be a minimum of 1" from all non-rated walls.
h. Coordinate the requirement to rigidly support MEP items on both sides of the wall as per Tested Assembly.
i. Ensure that any toggle bolts going into a rated wall / Unistrut have a minimum 16ga washer at the wall surface.

9. Trade specific considerations for Fire Protection, including, but not limited to:

a. Sprinkler heads must be installed a minimum distance of 4" off any wall.
b. Design fire protection system taking into account any ceiling-hung signage, large hung decorative items, or any other design elements that could cause obstructions when designing the model, particularly in their effects on spray coverage (if applicable). Coordinate any concerns with the project team.
c. All sprinkler heads should be placed in the center of the acoustic tile unless noted otherwise.
d. Install auxiliary drain valves at all low points where water is trapped. Pipe to nearest drain, as required per code or local authority having jurisdiction.
e. All soffits that extend beyond the code required width (for example, greater than 48" wide soffit) will have heads located at the top or side and at the bottom of the soffit.
f. Sprinkler heads to be provided at stairwell landings and intermediate floors per code or local authority having jurisdiction.
g. Furnish and Install Sprinkler heads in elevator Shaft / Pit per code or local authority having jurisdiction.
h. Fire protection should be hung independently and separate from any other trade.
i. Review millwork wardrobe cabinet requirements for sprinkler installation (if applicable; especially hospital projects).

10. Trade specific considerations for Plumbing, including, but not limited to:

a. Make sure that all drains within a waterproofed floor has the ability for the waterproofing has weeps/flanges for the attachment of the waterproofing to the drain.
b. Review for any in-wall vertical alignment of cleanouts and electrical boxes. They cannot align vertically; therefore, coordinate and relocate final locations upon approval by the architect.
c. Ensure access to any pipe cleanout. Review and coordinate access panels at any drywall ceiling locations.
d. Ensure vent and soil pipes have a proper slope. Review and coordinate that all piping has proper pitch (in-wall & above the ceiling).
e. For any water / sanitary pipe going through an IT or electrical closet, confirm with the engineer of record this condition is acceptable. If acceptable, provide a stainless steel pan with soldered joints under the pipe or containment system. A drain line to the nearest floor drain is required.

f. Coordinate floor drain locations with all contract documents (for example, architectural, MEP, equipment, etc.), as well as with other trades. Include coordination in mechanical spaces and around mechanical pads.
g. Before setting pipes/fixtures, review and coordinate with the architectural contract documents the floor tile thickness (accounting for floor leveling) and the wall tile thickness to ensure specified ADA requirements are achieved.
h. Review items such as carriers/drinking fountains/foodservice equipment and their installation for ADA compliance. Issue RFI for any concerns/conflicts.
i. Any pipe penetrations, including vents, sleeves, etc., to be at least 12" above the final roof elevations. Include a review of the tapered insulation drawings to determine the height.
j. Review roof drain overflow locations. Ensure locations are near the base of the building or at the base of another roof. Do not place roof drain overflow over a door.

11. Trade specific considerations for HVAC, including, but not limited to:

a. For existing systems to be used, pretest the HVAC to confirm assumptions.
b. Any fire dampers in a 2-hour rated wall or greater to be in the wall plane (not outside of the wall).
c. Any access panel locations are to be fully accessible.
d. Any smoke dampers to be within 2'-0" of the face of the wall. Subcontractor to coordinate a clear access zone.
e. Any grilles penetrating a fire-rated wall must maintain the wall integrity. Discuss details with the Quality Department.
f. A 2" support angle (or per tested assembly) on the top and bottom of any fire damper in any rated wall to be furnished and installed by HVAC trade. Fire damper to be 5 – 6" below head of wall to allow for fire spray application.
g. All hangers are to be properly coordinated with the hanger shown on the outside of the insulation.
h. Based on the fire engulfment tests, hangers for grease ducts are to be installed at least 5'-0" apart. Verify if fire blankets are required.
i. Verify Generator exhaust insulation thickness and coordinate the proper sleeve size to account for the insulation thickness.
j. All dunnage for large equipment must be coordinated to have the steel splice plate welded and NOT bolted to allow the AHU or RTU to lay flat on the steel.,
k. All diffusers should be laid out based on the Architectural RCP. An RFI should be submitted if the architect's location and quantities differ from the mechanical layout.
l. For any ductwork (stainless steel, etc.) that requires drain piping, coordinate drain piping to the nearest floor drain.

12. Trade specific considerations for Electrical, including, but not limited to:

a. Electrical going through the exterior wall through the air barrier must be a solid conduit going through the wall…not a flex type conduit, unless watertight type product.
b. Coordinate for any power within the floor slab, including, but not limited to the following:
    i. Maintain a minimum clearance of 3" between conduits.
    ii. Do not cross conduits.
    iii. Minimum concrete coverage is 2".
    iv. Confirm with the structural engineer items noted above and any maximum size conduit within the slab.
c. Conduits to only penetrate fire-rated walls at a 90 to 45 (max) -degree angle (i.e., do NOT cut any drywall slots for bent conduit). Coordinate routings of your systems for proper installations.
d. Review UL assembly of drywall partition for allowable penetrations of conduit thru a wall within a given allowable horizontal span.
e. Review the fire tested assembly for bundled piping, including but not limited to the following:
    i. Maximum size.
    ii. Number of conduits.
    iii. Size of conduits.
    iv. Annual space.

f. Allow for fire stopping or sound attenuation installation between conduits (more than two rows are not constructible).
g. Space the electrical boxes off any steel receiving spray-on fireproofing at least the thickness of the spray fireproofing to allow for proper installation.
h. Ensure panel access zones are coordinated for access at the front of the panels and any access above the panels.
i. Do not direct pipe back to back electrical boxes within a sound wall.
j. Do not direct pipe electrical boxes on opposite sides of the wall within a sound wall.