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D

UNLV UCC DORMITORY COMPLEX
HUGHES AND FAIMAN HALLS
HVAC AND ROOFING REPLACEMENT

Phase 1

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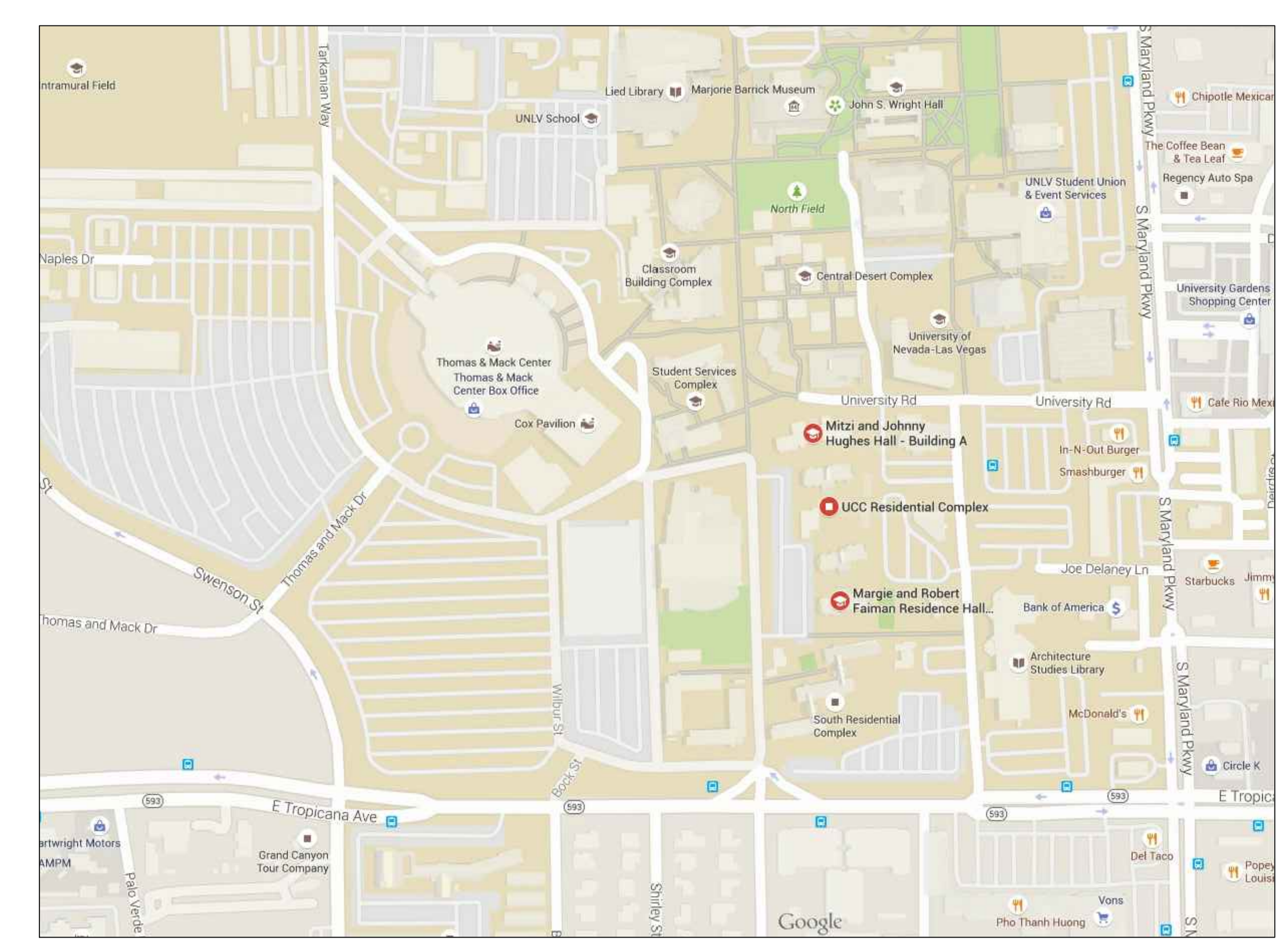
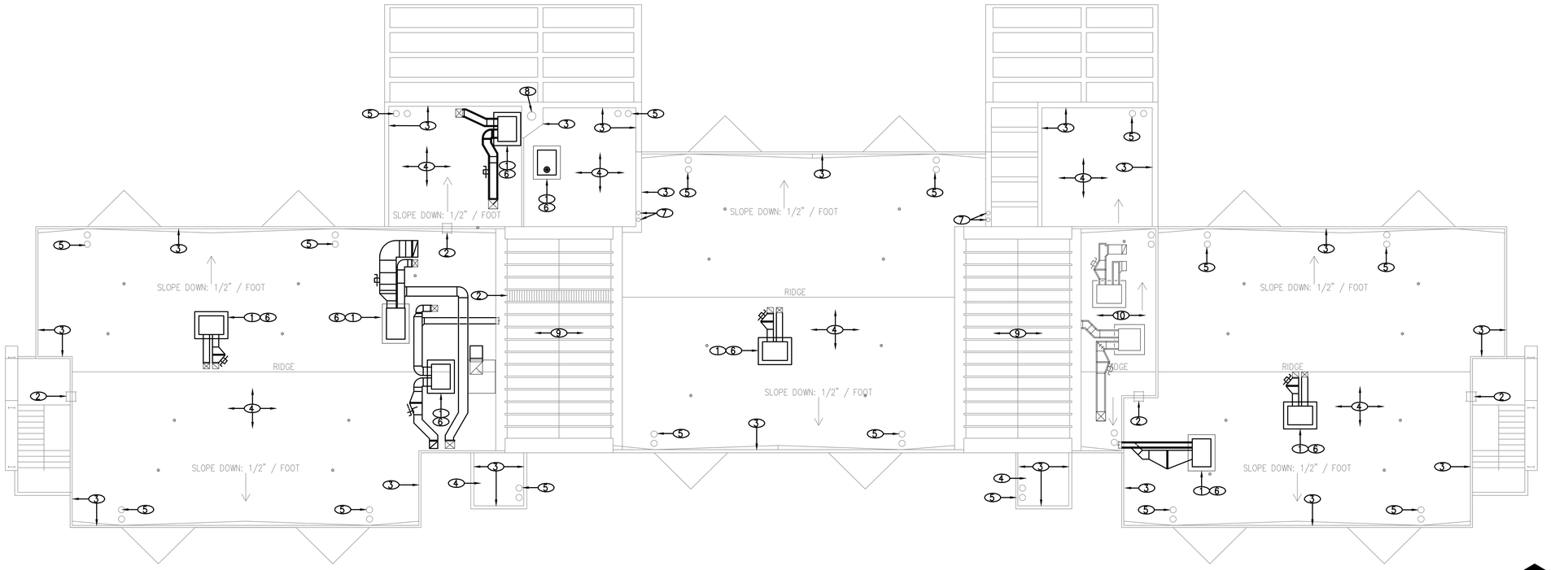
DRAWING INDEX

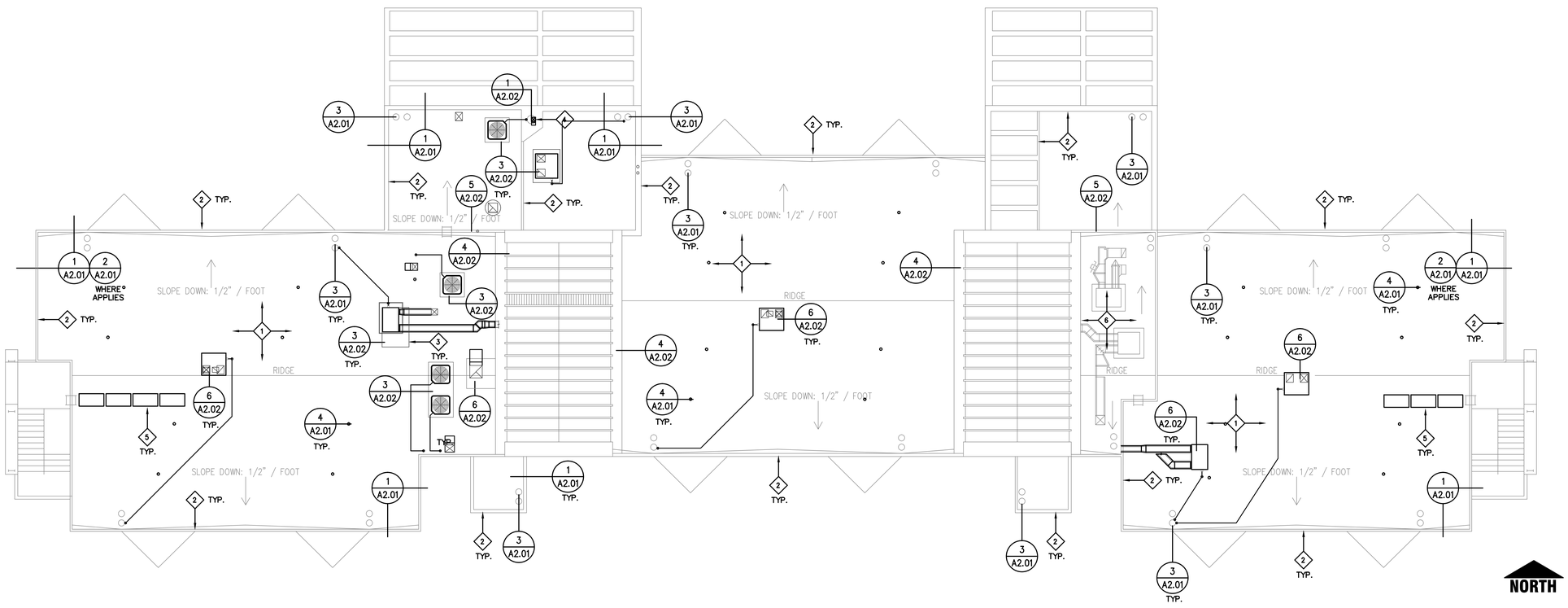
LOCATION MAP





A DEMOLITION ROOF PLAN - BUILDING A

1/8" = 1'-0"



B NEW ROOF PLAN - BUILDING A

1/8" = 1'-0"

NOTICE

THE CONTRACTOR MUST FIELD VERIFY THE EXACT SIZE AND LOCATION IN THE FIELD OF ALL PARAPET FLASHINGS, VENTS, ELECTRICAL OUTLETS, MECHANICAL UNITS AND EXISTING ROOF CONDITIONS AND ROOF SIZE PRIOR TO START OF WORK. NOTIFY THE ENGINEER / ARCHITECT OF ANY DISCREPANCIES.

EXISTING WORK TO REMAIN SHOWN LIGHT. EXISTING WORK TO BE REMOVED SHOWN DARK AND DASHED. NEW WORK SHOWN DARK.

DEMOLITION NOTES

1. REMOVE ALL EXISTING A/C UNITS, AND DUCTWORK SEE MECHANICAL PLANS. PROVIDE ADDITIONAL OPENING IN EXISTING ROOF IF REQUIRED FOR NEW DUCTWORK.
2. EXISTING ACCESS LADDER TYPICAL.
3. EXISTING PARAPET CAP FLASHING TO BE REMOVED TYPICAL ALL PARAPETS. UNLESS SHOWN OTHERWISE. REMOVE AND REPLACE ANY PARAPET WOOD NAILERS THAT ARE DAMAGED OR ROTTED AND REPLACE WITH NEW TREATED WOOD NAILERS AS REQUIRED.
4. REMOVE EXISTING ROOFING, CRICKETS AND PARAPET FLASHINGS DOWN TO EXISTING ROOF SHEATHING. INSPECT ROOF SHEATHING AND REPLACE ANY SHEATHING NOT SUITABLE FOR NEW ROOFING BY MANUFACTURER STANDARDS.
5. REMOVE ALL EXISTING ROOF DRAINS, OVERFLOW DRAINS, STRAINERS AND PREPARE ROOF FOR INSTALLATION OF NEW DRAINS AND STRAINERS AS SHOWN ON MECHANICAL PLANS.
6. REMOVE ALL EXISTING ROOF CURBS FOR MECHANICAL EQUIPMENT.
7. REMOVE EXISTING EXHAUST VENT.
8. REMOVE EXISTING HEATED VENT STACK.
9. EXISTING PITCHED METAL ROOF TO REMAIN.
10. EXISTING ROOF NO WORK THIS AREA.

NEW ROOF NOTES

1. NEW SINGLE PLY PVC ROOFING INSTALLED OVER 1/2" DENS BOARD OVER R-10 RIGID INSULATION OVER EXISTING WOOD DECK WITH TAPERED RIGID INSULATION CRICKETS AT 1/2" PER FOOT COUNTER SLOPE TO ROOF DRAINS. PROVIDE FULL HEIGHT PVC PARAPET FLASHING IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
2. NEW 22 GA. MINIMUM GALVANIZED METAL CAP FLASHING (FIELD VERIFY SIZES 6",8",11"). SEAL ALL EXPOSED JOINTS WITH SEALANT AND MAKE WATERTIGHT. PAINT CAP FLASHING TO MATCH EXISTING BUILDING TRIM COLOR. NEW BIRDSTOP TO BE INSTALLED BY OWNERS VENDOR.
3. NEW HVAC UNIT ON GALVANIZED METAL CURB. PROVIDE IF NECESSARY NEW WOOD FRAMING SUPPORT FOR ENTIRE UNIT PERIMETER.
4. INSTALL NEW GALVANIZED METAL HEATED STACK VENT AND FLASHING TO MATCH EXISTING.
5. NEW WALKWAY PADS FROM LADDER TO PERIMETER OF ALL HVAC UNITS TYPICAL.
6.. EXISTING ROOF NO WORK THIS AREA.

STAMP:

REVISIONS:

UNLV DORMITORY HVAC AND ROOFING REPLACEMENT

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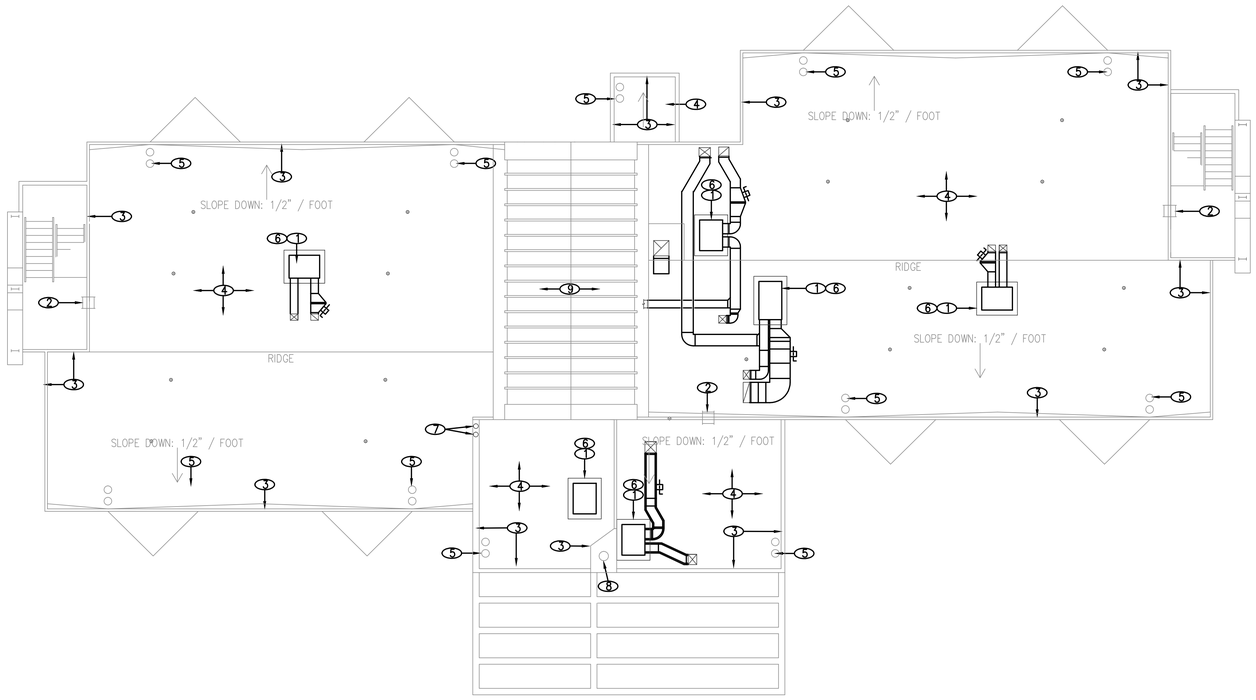
SHEET TITLE:

ROOF PLANS BUILDING A

DATE: 07-02-15

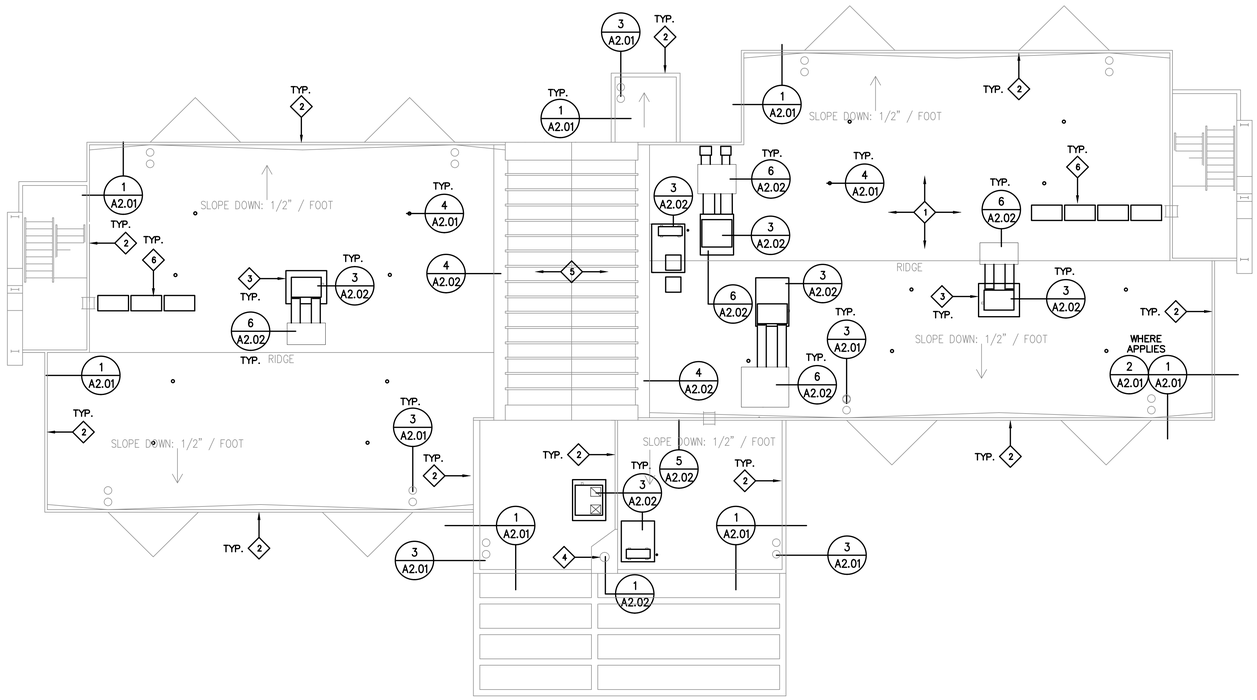
SHEET:

A1.01



A DEMOLITION ROOF PLAN - BUILDING D

1/8" = 1'-0"



B NEW ROOF PLAN - BUILDING D

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NOTICE

THE CONTRACTOR MUST FIELD VERIFY THE EXACT SIZE AND LOCATION IN THE FIELD OF ALL PARAPET FLASHINGS, VENTS, ELECTRICAL OUTLETS, MECHANICAL UNITS AND EXISTING ROOF CONDITIONS AND ROOF SIZE PRIOR TO START OF WORK. NOTIFY THE ENGINEER / ARCHITECT OF ANY DISCREPANCIES.

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7. REMOVE EXISTING EXHAUST VENT.
8. REMOVE EXISTING HEATED VENT STACK.
9. EXISTING PITCHED METAL ROOF TO REMAIN.

NEW ROOF NOTES

1. NEW SINGLE PLY PVC ROOFING INSTALLED OVER 1/2" DENS BOARD OVER R-10 RIGID INSULATION OVER EXISTING WOOD DECK WITH TAPERED RIGID INSULATION CRICKETS AT 1/2" PER FOOT COUNTER SLOPE TO ROOF DRAINS. PROVIDE FULL HEIGHT PVC PARAPET FLASHING IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
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3. NEW HVAC UNIT ON GALVANIZED METAL CURB. PROVIDE IF NECESSARY NEW WOOD FRAMING SUPPORT FOR ENTIRE UNIT PERIMETER.
4. INSTALL NEW GALVANIZED METAL HEATED STACK VENT AND FLASHING TO MATCH EXISTING.
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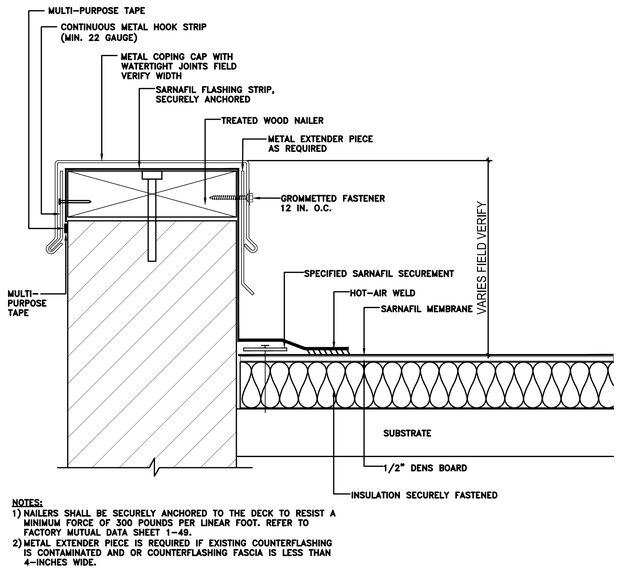
SHEET TITLE:

ROOF PLANS BUILDING D

DATE: 07-02-15

SHEET:

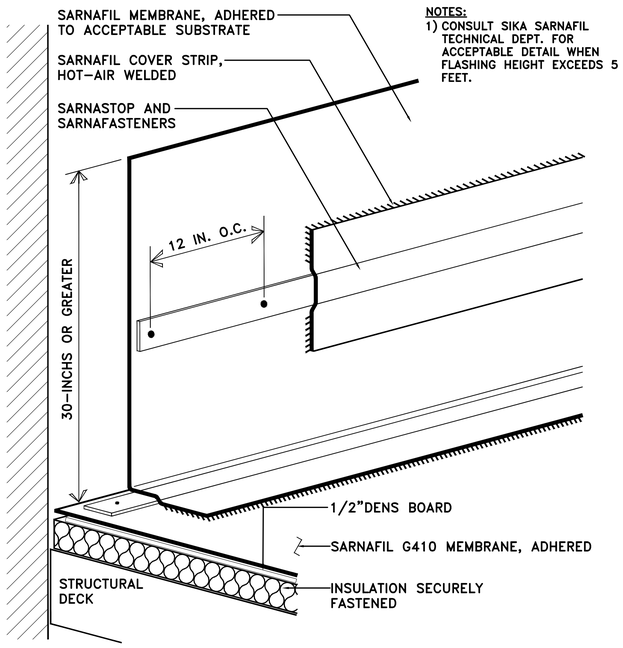
A1.02



NOTES:
1) NAILERS SHALL BE SECURELY ANCHORED TO THE DECK TO RESIST A MINIMUM FORCE OF 300 POUNDS PER LINEAR FOOT. REFER TO FACTORY MUTUAL DATA SHEET 1-49.
2) METAL EXTENDER PIECE IS REQUIRED IF EXISTING COUNTERFLASHING IS CONTAMINATED AND OR COUNTERFLASHING FASCIA IS LESS THAN 4-INCHES WIDE.

PARAPET WALL WITH METAL COPING CAP

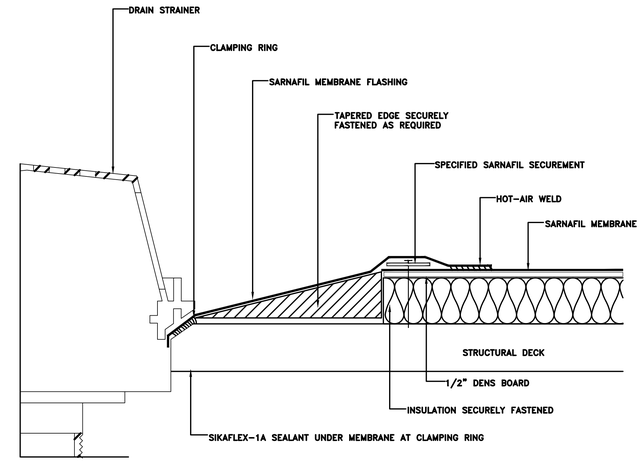
DETAIL NONE — 1 / A2.01



NOTES:
1) CONSULT SIKA SARNAFIL TECHNICAL DEPT. FOR ACCEPTABLE DETAIL WHEN FLASHING HEIGHT EXCEEDS 5 FEET.

ADHERED WALL FLASHING
(FOR WALL FLASHINGS GREATER THAN 30 INCHES IN HEIGHT)

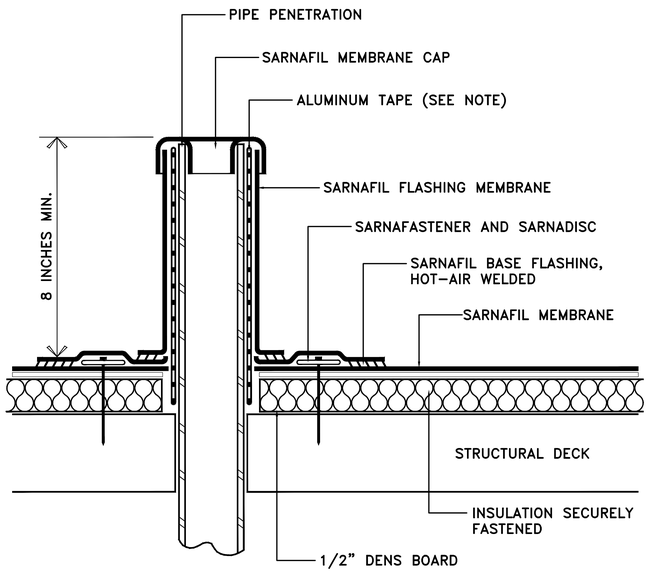
DETAIL NONE — 2 / A2.01



NOTES:
1) EXISTING DRAIN BOWL, CLAMPING RING AND DRAIN ACCESSORIES ARE TO BE CLEANED FREE OF ALL CONTAMINATES.
2) SARNAFIL G459 MEMBRANE MUST BE USED IN AREAS OF ASPHALT CONTAMINATION.

CLAMPING RING DRAIN

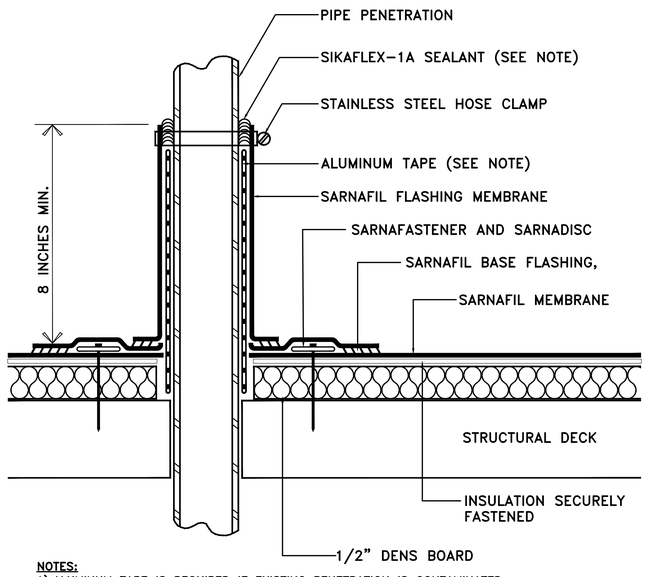
DETAIL NONE — 3 / A2.01



NOTES:
1) ALUMINUM TAPE IS REQUIRED IF EXISTING PENETRATION IS CONTAMINATED.

VENT STACK FLASHING

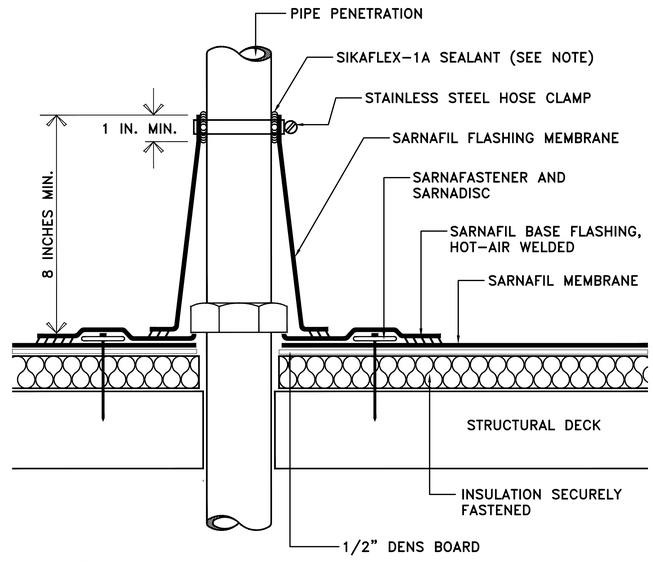
DETAIL NONE — 4 / A2.01



NOTES:
1) ALUMINUM TAPE IS REQUIRED IF EXISTING PENETRATION IS CONTAMINATED.
2) SEALANT IS A MAINTENANCE ITEM, MAINTENANCE IS NOT COVERED UNDER THE SARNAFIL WARRANTY.

PIPE PENETRATION FLASHING

DETAIL NONE — 5 / A2.01



NOTE:
1) SEALANT IS A MAINTENANCE ITEM. MAINTENANCE IS NOT COVERED UNDER SARNAFIL WARRANTY.

CONE FLASHING AT PENETRATION

DETAIL NONE — 6 / A2.01

STAMP:

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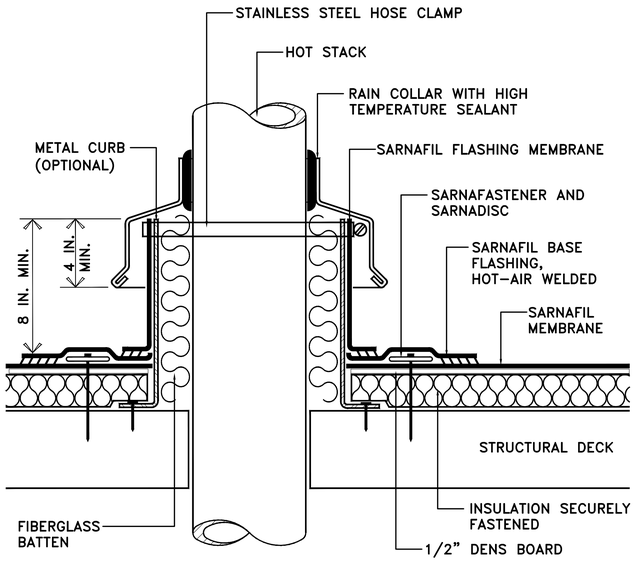
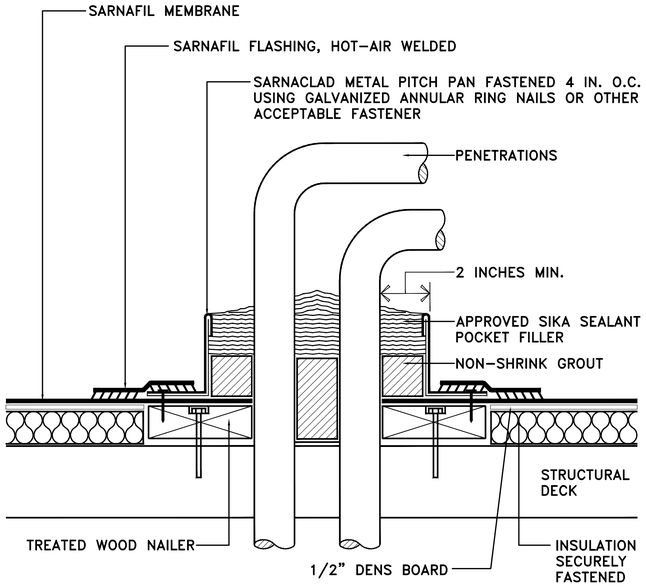


NOTES:
1) SARNAFIL MEMBRANE SHALL NOT BE IN CONTACT WITH SURFACES HAVING SUSTAINED TEMPERATURES ABOVE 160°F.

HEATED STACK FLASHING

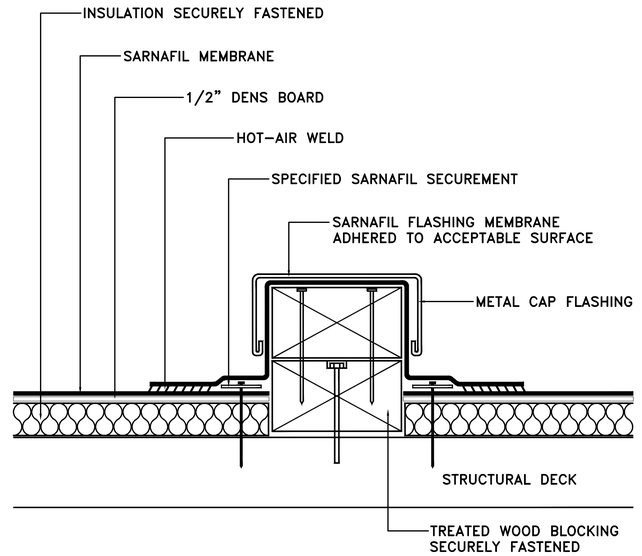
DETAIL 1 / A2.02
NONE



NOTES:
1) PITCH POCKETS ARE TO BE ELIMINATED WHERE POSSIBLE.
2) SEALANT IS A MAINTENANCE ITEM. MAINTENANCE IS NOT COVERED UNDER THE SIKA SARNAFIL WARRANTY.

SEALANT POCKET

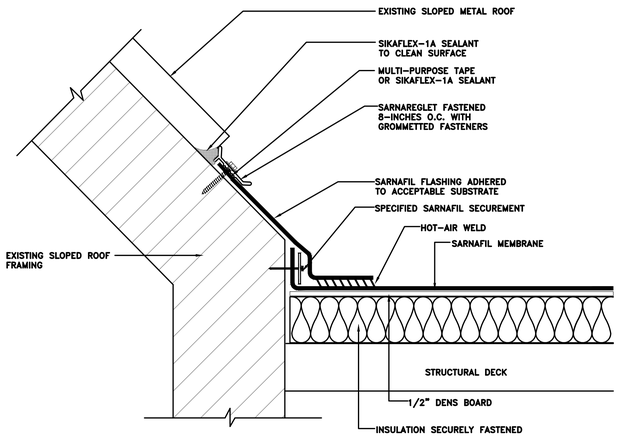
DETAIL 2 / A2.02
NONE



NOTES:
1) NAILERS SHALL BE SECURELY ANCHORED TO THE DECK TO RESIST A FORCE OF 300 POUNDS PER LINEAL FOOT IN ANY DIRECTION.

EQUIPMENT SUPPORT

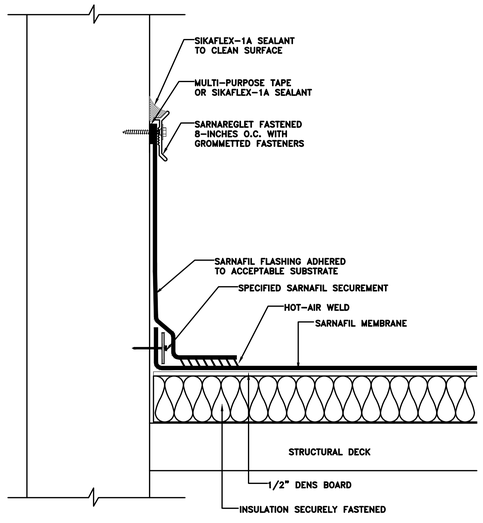
DETAIL 3 / A2.02
NONE



NOTES:
1) SEALANT IS A TWO STEP APPLICATION:
   A) BEHIND TOP OF SARNAFIL FLASHING.
   B) TOP OF SARNAREGLET.
2) SEALANT SHALL BE APPLIED TO CLEAN ACCEPTABLE SURFACES.
3) SEALANT IS A MAINTENANCE ITEM. MAINTENANCE IS NOT COVERED UNDER THE SARNAFIL WARRANTY.
4) SARNAREGLET SHALL BE SECURELY ANCHORED WITH GROMMETTED FASTENERS AND PROVIDE ADEQUATE COMPRESSION OF MEMBRANE FLASHING AND SEALANT.

SARNAREGLET TERMINATION

DETAIL 4 / A2.02
NONE



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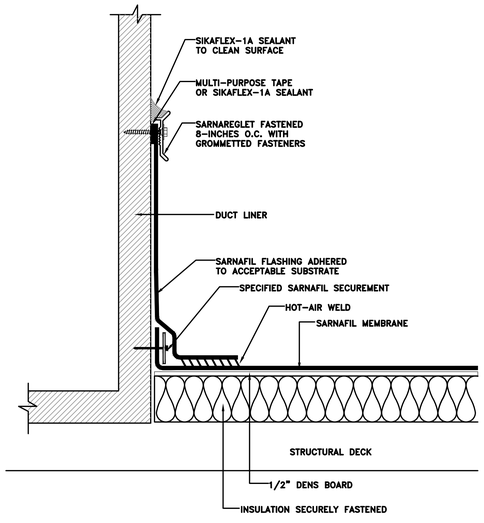
4) SARNAREGLET SHALL BE SECURELY ANCHORED WITH GROMMETTED FASTENERS AND PROVIDE ADEQUATE COMPRESSION OF MEMBRANE FLASHING AND SEALANT.

SARNAREGLET TERMINATION 2

DETAIL 5 / A2.02
NONE



NOTES:
1) SEALANT IS A TWO STEP APPLICATION:
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2) SEALANT SHALL BE APPLIED TO CLEAN ACCEPTABLE SURFACES.
3) SEALANT IS A MAINTENANCE ITEM. MAINTENANCE IS NOT COVERED UNDER THE SARNAFIL WARRANTY.
4) SARNAREGLET SHALL BE SECURELY ANCHORED WITH GROMMETTED FASTENERS AND PROVIDE ADEQUATE COMPRESSION OF MEMBRANE FLASHING AND SEALANT.

SARNAREGLET TERMINATION 3

DETAIL 6 / A2.02
NONE

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SHEET TITLE:
ROOF DETAILS BUILDING A & D

DATE: 07-02-15

SHEET:
A2.02

SECTION 075419.14
PVC RHINOBOND

PART 1 - GENERAL CONDITIONS

1.01 DESCRIPTION

A. Scope

To install: An attached 72 mil single-ply PVC roofing membrane utilizing Rhinobond attachment including flashings and other components, to comprise a roofing system for the structure of interest.

1. The existing Single Ply Roofing system is to be removed down to the existing insulation. Remove the existing single ply roof membrane including all curb/wall and penetration flashings, membrane screws and plates are to be removed.
2. Existing equipment curbs and walls are to be flashed with 72 mil PVC membrane. New equipment curbs are to receive 72 mil PVC fiberglass-reinforced flashing membrane.
3. 1/2" Dens-Deck roof board and insulation are to be mechanically fastened directly to the substrate using #15 Fasteners and Rhinobond plates in accordance with Section 3.05 of this specification.
4. A new 72 mil PVC, polyester-reinforced, PVC membrane is to be welded to the Rhinobond plate in accordance with Section 3.06 of this specification.
5. The color of the membrane is to be EnergySmart White, as selected by the Owner.
6. A 20 year UNLV Warranty shall be provided to the Owner upon completion as described in Section 1.0 of this specification.

B. Related Work

The work includes but is not limited to the installation of:
1. Substrate Preparation
2. Roof Drains
3. Wood Blocking
4. Insulation & Dens-Deck
5. Roof Membrane
6. Fasteners
7. Adhesive for Flashings
8. Roof Membrane Flashings
9. Walkways
10. Metal Flashings
11. Sealants

C. Upon successful completion of work the following warranties may be obtained:
1. 20 Year Systems Warranty - UNLV
2. 5 Year Roofing Applicator Warranty

1.02 QUALITY ASSURANCE

A. This roofing system shall be applied only by a Roofing Applicator authorized by approved PVC membrane manufacturer prior to bid.

B. Upon completion of the installation an inspection may be made by a Technical Service Representative of PVC Membrane Manufacturer to determine that the visible elements of the roofing system have been installed in accordance with the project specification, details and approved changes wherever a System warranty has been specified.

C. There shall be no deviation made from the Project Specification or the approved shop drawings without prior written approval by the Owner, the Owner's Representative and PVC Manufacturer.

D. Applicable code/insurance requirements shall be identified by the Owner or Owner's representative.

E. Manufacturers warranty shall be "No Dollar Limit" for the replacement of defective materials and/or labor and shall not contain any exclusion's for ponding water. Membrane manufacturer to submit the consistency of formulation for the last fifteen (15) years as certified by the manufacturer.

F. Manufacturer to be Responsible Care 140001 and ISO 140001 certified.

G. Membrane manufacturer must have an established program for recycling membrane at the end of its useful life. Must provide 3 (three) instances in which they have done so.

H. Membrane manufacturer to confirm in writing that they directly manufacture the roofing membrane (private labeled membranes are not acceptable and will not be reviewed).

I. Membrane manufacturer shall not require the use of cut edge sealant at any location. This is a maintenance items that the owner does not accept.

J. Membrane manufacturer must have an established program for recycling membrane at the end of its useful life. Must provide 3 (three) instances in which they have done so.

1.03 SUBMITTALS

A. Copies of Specification.

B. The Applicator shall submit written verification from PVC Membrane Manufacturer that they are an authorized Applicator.

C. The Applicator shall verify that the specifications for the roofing project are in accordance with PVC Membrane Manufacturer.

D. Sample copy of the Systems Warranty.

E. Sample copy of Applicator's Warranty.

F. Certification from the Applicator that the system specified meets code and insurance requirements.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. All products delivered to the job site shall be in the original unopened containers or wrappings bearing all seals and approvals.

B. Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture.

C. Membrane rolls shall be stored lying down on pallets and fully protected from the weather with clean canvas tarpaulins. Unvented polyethylene tarpaulins are not accepted due to the accumulation of moisture beneath the tarpaulin in certain weather conditions that may affect the ease of membrane weldability.

D. As a general rule all adhesives shall be stored at temperatures between 40 degree F and 80 degree F. Read instructions contained on adhesive canister for specific storage instructions.

E. All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer/supplier.

F. Any materials which the Owner's representative or PVC Membrane Manufacturer determine to be damaged are to be removed from the job site and replaced at no cost to the Owner.

G. Material Safety Data Sheets (MSDS) shall be available at the job site at all times.

1.05 JOB CONDITIONS

A. Materials may be installed under certain adverse weather conditions but only after consultation with PVC Membrane Manufacturer, as installation time and system integrity may be affected.

B. Only as much of the new roofing as can be made weathertight each day, including all flashing and detail work, shall be installed. All seams shall be heat welded before leaving the job site that day.

C. All work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.

D. All surfaces to receive new insulation, Dens-Deck, membrane or flashings shall be dry. Should surface moisture occur, the Applicator shall provide the necessary equipment to dry the surface prior to application.

E. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.

F. Uninterrupted waterstops shall be installed at the end of each day's work and shall be completely removed before proceeding with the next day's work. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the Owner.

G. The Applicator is cautioned that certain PVC membranes are incompatible with asphalt, coal tar, heavy oils, roofing cements, creosote and some preservative materials. Such materials shall not remain in contact with PVC membranes. The Applicator shall consult PVC Membrane Manufacturer regarding compatibility, precautions and recommendations.

H. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Applicator shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. A substantial protection layer consisting of plywood over felt or plywood over insulation board shall be provided for all new and existing roof areas that receive rooftop traffic during construction.

I. Prior to and during application, all dirt, debris and dust shall be removed from surfaces by vacuuming, sweeping, blowing with compressed air or similar methods.

J. The Applicator shall follow all safety regulations as required by OSHA and any other applicable authority having jurisdiction.

K. All new roofing waste material (i.e., scrap roof membrane, release paper, empty cans of adhesive) shall be immediately removed from the site by the Applicator and properly transported to a legal dumping area authorized to receive such material.

L. The Applicator shall take precautions that storage and application of materials and equipment does not overload the roof deck or building structure.

M. Flammable adhesives and deck primers shall not be stored and not be used in the vicinity of open flames, sparks and excessive heat.

N. All rooftop contamination that is anticipated or that is occurring shall be reported to PVC Membrane Manufacturer to determine the corrective steps to be taken.

O. The Applicator shall verify that all roof drain lines are functioning correctly (not clogged or blocked) before

starting work. Applicator shall report any such blockages in writing (letter copy to PVC Membrane Manufacturer) to the Owner's Representative for corrective action prior to the installation of the PVC roof system.

P. Applicator shall immediately stop work if any unusual or concealed condition is discovered and shall immediately notify Owner of such condition in writing.

Q. Site cleanup, including both interior and exterior building areas that have been affected by construction, shall be completed to the Owner's satisfaction.

R. All landscaped areas damaged by construction activities shall be repaired at no cost to the Owner.

S. The Applicator shall conduct fastener pullout tests in accordance with the latest version of the SPRI/ANSI Fastener Pullout Standard to help verify condition of the deck/substrate and to confirm expected pullout values.

T. Precautions shall be taken when using flashing adhesives at or near rooftop vents or air intakes. Adhesive odors could enter the building. Coordinate the operation of vents and air intakes in such a manner as to avoid the intake of adhesive odor while ventilating the building. Keep lids on unused cans at all times.

U. Protective wear shall be worn when using solvents or adhesives or as required by job conditions.

V. PVC membranes are slippery when wet or covered with snow, frost, or ice. Working on surfaces under these conditions is hazardous. Appropriate safety measures must be implemented prior to working on such surfaces. Always follow OSHA and other relevant fall protection standards when working on roofs.

W. Aesthetics and Performance are equally important. The owner's representative will require that all flashings, details, and hand welding work shall be uniform and consistent throughout the entire project. Giving the appearance that one individual performed all of the work. Any sub-standard work will be immediately corrected to the satisfaction of the Owner's Representative.

1.06 WARRANTIES

A. 20-year System Warranty (only products purchased from approved PVC Membrane Manufacturer are covered under the UNLV System Warranty)

Upon successful completion of the work to the owners satisfaction and receipt of final payment, the 20-Year System Warranty (70-mph wind speed) shall be issued.

B. Applicator/Roofing Contractor 5-Year Warranty

Applicator shall supply Owner with a separate 5-Year workmanship warranty. In the event any work related to roofing, flashing, or metal is found to be within the Applicator warranty term, defective or otherwise not in accordance with Contract Documents, the Applicator shall repair that defect at no cost to Owner. Applicator's warranty obligation shall run directly to Owner and a copy shall be sent to the manufacturer.

C. Owner Responsibility

Owner shall notify both the manufacturer and the Applicator of any leaks as they occur during the time period when both warranties are in effect.

PART 2 - PRODUCTS

2.01 GENERAL

A. All components of mechanically attached 72 mil single-ply PVC roofing membrane utilizing Rhinobond-attached roof system shall be manufactured, supplied or accepted by the membrane manufacturer.

B. Manufacturer to have a minimum of four years experience recycling their membranes at the end of their service life back into new membrane products. Provide a minimum of five reference projects.

C. Condensation or moisture migration into the roof system must be controlled so that it does not compromise the performance of components of the assembly. Moisture vapor tends to migrate from warmer to cooler areas. Air/vapor retarders are used to inhibit or block the flow of warm moist air into the roof system. To determine if an air/vapor barrier is necessary, a design professional with experience with air handling and moisture control should be consulted.

D. Membrane shall be certified by the PVC manufacturer to be with three (3) mils of the specified membrane thickness as stated in this section. ASTM minimum standards of +/_ 10% will not be accepted.

E. **Membrane shall have a minimum of thirty-four (34) mils of waterproofing polymers above the reinforcements as documented by a third party source.**

2.02 MEMBRANE

A. A new 72 mil PVC S327, thermoplastic membrane with polyester reinforcement.

1. Approved Manufacturers; Sika Sarnafil, Durolast or pre-approved Equal.

B. Typical Physical Properties

Parameters	ASTM Test Method	Minimum Physical Properties
Reinforcing Material	-	Polyester
Overall Thickness, min., inches	D751	0.072
Thickness Over Scrim, inches	D751	0.030
Breaking Strength, min., lbf/in.	D751	315
Elongation at Break, min.	D751	
Machine Direction		28.5
Cross Machine Direction		29.5
Seam strength*, min. (% of breaking strength)	D751	85
Retention of Properties After Heat Aging	D3045	-
Tensile Strength, min., (% of original)	D751	Pass
Elongation, min., (% of original)	D751	Pass
Tearing Strength, min., lbf	D1004	48.5
Low Temperature Bend, -40°F	D2136	Pass
Accelerated Weathering Test (Florescent Light, UV exposure)	G154	10,000 Hours
Cracking (7x magnification)	-	None
Discoloration (by observation)	-	Negligible
Crazing (7 x magnification)	-	None
Linear Dimensional Change	D1204	-0.12
Weight Change After Immersion in Water	D570	2
Static Puncture Resistance, 33 lbf	D5602	Pass
Dynamic Puncture Resistance, 14.7 ft-lbf	D5635	Pass
Initial Solar Reflectance	E903	0.83
Emissivity	0.90	
Solar Reflective Index (SRI)	E1980	104

2.03 FLASHING MATERIALS

Consult respective product data sheets for additional information.

A. Wall/Curb Flashings
1. PVC Membrane flashing
2. PVC Clad laminated metal flashing
3. PVC Flashing Membrane – asphalt resistant

B. Perimeter Edge Flashings
1. PVC clad
2. Non-Typical Edge

C. Miscellaneous Flashings
1. Corners - Universal
   Prefabricated outside/inside flashing corners made of 0.060 inch (60 mil/1.5 mm) thick membrane that are heat-welded to membrane or Sarnaclad base flashings.
2. Stack
   Prefabricated cones available in 5 sizes
3. Multi-Purpose Sealant
   A proprietary sealant used at flashing terminations.
4. Flashing Adhesive
   A solvent based reactivating-type adhesive used to attach membrane to flashing substrate.

2.04 INSULATION/BARRIER BOARD

Consult respective product data sheets for additional information.

A. Polyisocyanurate Insulation – If required by owner
   A closed-cell, tapered, polyisocyanurate (ISO) foam core insulation board. ISO insulation must have a minimum nominal density of 2.0 pcf per ASTM D 1622. Insulation shall have less than 1% water absorption per ASTM C209 and less than 2% linear change per ASTM S2126 testing for dimensional stability. Insulation is available in 3.1 inch x 4' x 8' boards.

B. DensDeck – ½" minimum thickness
   A siliconized gypsum, fire-tested hardboard with glass-mat facers. Available in 1/2 inch x 4' x 8' boards.

2.05 ATTACHMENT COMPONENTS

Consult respective product data sheets for additional information.

A. RhinoBond Disc
A polymer coated 3 inch round plate used with various Sarnafasteners to attach the Insulation/Dens-Deck board and as a substrate for induction welding the membrane.

B. Fastener-XP
A #15, heavy-duty, corrosion-resistant fastener used with Sarnadisc RhinoBond to attach Insulation/Dens-Deck to steel or wood roof decks.

2.06 MISCELLANEOUS ACCESSORIES

A. Multi-Purpose Tape
A high performance sealant tape used with metal flashings as a preventive measure against air and wind blown moisture entry.

B. Walk-Tred (color: Light Gray)

A polyester reinforced, 0.096 inch (96 mil/2.4 mm), weldable membrane with surface embossment. Used as a protection layer from rooftop traffic. Tread is supplied in rolls of 39.3 inches (1.0 m) wide and 32.8

C. RhinoBond Induction Welder
A 110 volt induction welding device that creates a radio frequency that allows the membrane to be welded to a specially coated plate.

D. Solvent Cleaner
A high quality solvent cleaner used for the general cleaning of residual asphalt, scuff marks, etc., from the membrane surface. Sarnasolv is also used daily to clean seam areas prior to hot-air welding in tear off or dirty conditions or if the membrane is not welded the same day it is unrolled.

E. Perimeter Warning Tape

Designed for use on PVC membranes as a reflective, highly visible pressure sensitive tape used to draw attention to roof perimeters and potential hazardous areas. The tape is available in 2 inch wide rolls by 30 feet long and comes on a release liner for easy application. Perimeter Warning Tape exceeds reflectivity 3 requirements and Federal spec. L-S-300, Class 1.

2.07 SEALANTS

A. Multi-Purpose Sealant (for termination details).

B. Depending on substrates, the following sealants are options for temporary overnight tie-ins:
1. Multiple layers of roofing cement and felt.
2. Spray-applied, water-resistant urethane foam.
3. Mechanical attachment with rigid bars and compressed sealant.

2.08 MISCELLANEOUS FASTENERS AND ANCHORS

A. All fasteners, anchors, nails, straps, bars, etc. shall be post-galvanized steel, aluminum or stainless steel. Mixing metal types and methods of contact shall be assembled in such a manner as to avoid galvanic corrosion. Fasteners for attachment of metal to masonry shall be expansion type fasteners with stainless steel pins. All concrete fasteners and anchors shall have a minimum embedment of 1-1/4 inch and shall be approved for such use by the fastener manufacturer. All miscellaneous wood fasteners and anchors used for flashings shall have a minimum embedment of 1 inch and shall be approved for such use by the fastener manufacturer.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION CONFERENCE

A. The primary contractor shall conduct a pre-roofing conference before any work begins, so all parties involved in the roofing system construction, or who may work on or through the roofing system, understand their obligations with respect to the roofing membrane.

3.02 SUBSTRATE CONDITION

A. Applicator shall be responsible for acceptance or provision of proper substrate to receive new roofing materials.

B. Applicator shall verify that the work done under related sections meets the following conditions:
1. Roof drains and scuppers have been reconditioned or replaced and installed properly.
2. Roof curbs, nailers, equipment supports, vents and other roof penetrations are properly secured and prepared to receive new roofing materials.
3. All surfaces are smooth and free of dirt, debris and incompatible materials.
4. All roof surfaces shall be free of water.

3.03 SUBSTRATE INSPECTION

A. A dry, clean and smooth substrate shall be prepared to receive PVC mechanically-attached roof system.

B. The substrate shall be clean, smooth, dry, free of flaws, sharp edges, loose and foreign material, oil and grease. Roofing shall not start until all defects have been corrected.

C. All roof surfaces shall be free of water.

D. PVC shall be applied over compatible and accepted substrates only.

3.04 SUBSTRATE PREPARATION

A. If necessary, accumulations of bitumen or other irregularities shall be scratched and removed so as to produce a flat, smooth surface. Insulation and Dens-Deck boards shall lay flat from one board to another.

B. All wet areas shall be removed and replaced.

C. Surfaces on which the PVC membrane is to be applied shall be compatible, clean, smooth, free of sharp edges, loose and foreign material, oil, grease and bitumen.

D. When possible, work shall begin at the high point of the roofing area and proceed to the lowest point.

3.05 INSULATION/DENS-DECK INSTALLATION

General Criteria:

A. Insulation/Dens-Deck shall be installed according to manufacturer's instructions.

B. Insulation/Dens-Deck shall be neatly cut to fit around penetrations and projections.

C. Install tapered insulation in accordance with insulation manufacturer's shop drawings.

D. Do not install more Insulation/Dens-Deck board than can be covered with 72 mil single-ply PVC roofing membrane by the end of the day or the onset of inclement weather.

E. Mechanical - Rhinobond Attachment
1. Insulation/Dens-Deck shall be mechanically fastened to the structural deck with approved membrane fasteners and RhinoBond Disc according to the manufacturer's and PVC membrane manufacturer's recommendations for fastening rates and patterns. The quantity and locations of the fasteners and plates shall also cause the boards to rest evenly on the roof deck/substrate. Each board shall be installed tightly against the adjacent boards on all sides.

2. Fasten the Insulation/Dens-Deck so the RhinoBond disc and fastener XP in a 2 by 2 foot grid pattern according to PVC Membrane Manufacturer's and the wind design requirements. Fasteners must be tight enough that the membrane disc does not turn, but not so tight as to deform the disc.

3. Perimeter and Corner Areas

   The perimeter and corner area will be determined by building height and width and other conditions according to ASCE 7 guidelines, PVC Membrane Manufacturer's Technical or FM LPDS 1-29 if insured by Factory Mutual. To meet the perimeter and corner uplift requirements, increase fastener density by decreasing the spacing between fastener points in one or both directions. The total tributary area to each fastener is no more than 60 percent for the perimeter and 40 percent for corners, based on the field of roof fastening density. See Detail Drawings.

   Notes:
   a) Perimeter area is defined as the outer boundary of the roof. If the roof is broken into different levels, each roof area shall be treated as an individual roof with its outer boundary being

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SHEET TITLE:
SPECIFICATION SHEET

DATE: 07-02-15

SHEET:
SP.1

treated as a perimeter. Typically, internal expansion joints and firewalls are not considered to be full perimeters. Refer to Factory Mutual's Data Sheet 1-28 for more information.

b) The ridge area is defined as the high point in the roof area formed by two intersecting planes. When the sum of the slopes is a minimum of 4 inches in 12 inches (30 degrees), each side of the ridge shall be treated as a perimeter area.

4. Fasteners are to be installed consistently in accordance with fastener manufacturer's recommendations. Fasteners are to have minimum penetration of 1 inch through the structural deck.

5. Use fastener tools with a depth locator and torque-limiting attachment as recommended or supplied by fastener manufacturer to ensure proper installation.

3.06 INSTALLATION OF PVC MEMBRANE

The surface of the Dens-Deck shall be inspected prior to installation of the PVC roof membrane. The substrate shall be clean, dry, free from debris and smooth with no surface roughness or contamination. Broken, delaminated, wet or damaged boards shall be removed and replaced. PVC membrane shall be attached with fasteners and RhinoBond disc according to PVC membrane manufacturer's and wind uplift requirements per ASCE 7 or Factory Mutual.

A. RhinoBond - Membrane Attachment to Structural Deck

1. General

a) PVC full width rolls shall be placed over the installed boards. Membrane overlaps shall be shingled with the flow of water where possible. Seam overlaps may be placed over disc RhinoBond plate. Welding of the plate will not be affected.
b) Tack welding of the membrane for purposes of temporary restraint during installation is not permitted and may result in voiding of warranty. Consult Technical Department for further information.

2. Field, Perimeter and Corner Areas

Over the properly prepared, installed and attached substrate surface following the 2 by 2 foot grid pattern, PVC full-width rolls are to be installed so as to properly shed water. See Detail Drawings for fastener layouts. Refer to FM LPDS 1-29 for their requirements for perimeter and corner enhancements.

3. Securement Around Rooftop Penetrations

a) Around all perimeters, at the base of walls, drains, curbs, vent pipes, or any other roof penetrations, fasteners and RhinoBond discs, discs or perimeter bars shall be installed according to perimeter rate of attachment. Fasteners shall be installed according to the manufacturer's instructions. Fasteners shall be installed using the fastener manufacturer's recommended torque-sensitive fastening tools with depth locators. If RhinoBond disc is not used, the fasteners shall clamp the PVC membrane tightly to the substrate.
b) PVC membrane flashings shall extend 2-1/2 inches past disc and be hot-air welded to the PVC deck membrane.

3.07 RHINOBOND INDUCTION WELDING

B. General

1. Welding equipment shall be provided by or approved by PVC membrane manufacturer. All mechanics intending to use the equipment shall have successfully completed a training course provided by a Technical Service Representative prior to welding.

2. All membrane to be welded shall be clean and dry.

C. Induction Welding

1. Activate the weld between membrane and plate using approved portable induction device. The induction coil must be positioned over the center of the RhinoBond disc, +/- 1 inch Portable induction device must elevate the temperature of the RhinoBond disc from ambient to 400 – 500 degree F. Cycle time will be affected by available power, use a heavy gauge power cord, at a minimum 12 gauge by 100 feet.

2. When the induction welding cycle is complete, immediately place a Cool & Clamp magnetic weight on the welded assembly. This device must be left in place for at least 60 seconds.

3.08 HOT-AIR WELDING OF SEAM OVERLAPS

A. General

1. All seams shall be hot-air welded. Seam overlaps should be 3 inches wide when automatic machine-welding and 4 inches wide when hand-welding, except for certain details.
2. Welding equipment shall be provided by or approved by PVC membrane manufacturer. All mechanics intending to use the equipment shall have successfully completed a training course provided by a PVC Manufacturer Technical Service Representative prior to welding.
3. All membrane to be welded shall be clean and dry.

B. Hand-Welding

Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.
1. The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss of hot air during the final welding.
2. The nozzle shall be inserted into the seam at a 45 degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow", the hand roller is positioned perpendicular to the nozzle and rolled lightly. For straight seams, the 1-1/2 inch wide nozzle is recommended for use. For corners and compound connections, the 3/4 inch wide nozzle shall be used.

C. Machine Welding

1. Machine welded seams are achieved by the use of PVC membrane automatic welding equipment. When using this equipment, PVC manufacturer instructions shall be followed and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated simultaneously off the generator.
2. Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.

D. Quality Control of Welded Seams

1. The Applicator shall check all welded seams for continuity using a rounded screwdriver. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark grey material from the underside of the top membrane. On-site evaluation of welded seams shall be made daily by the Applicator at locations as directed by the Owner's Representative or PVC membrane representative. One inch wide cross-section samples of welded seams shall be taken at least three times a day. Correct welds display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Applicator at no extra cost to the Owner.

3.09 MEMBRANE FLASHINGS

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and PVC manufacturer. Approval shall only be for specific locations on specific dates. If any water is allowed to

enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.

A. Adhesive for Membrane Flashings

1. Over the properly installed and prepared flashing substrate, flashing adhesive shall be applied according to instructions found on the Product Data Sheet. The adhesive shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies. Only an area which can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.
2. No adhesive shall be applied in seam areas that are to be welded. All panels of membrane shall be applied in the same manner, overlapping the edges of the panels as required by welding techniques.

B. PVC manufacturer's requirements and recommendations and the specifications shall be followed. All material submittals shall have been accepted by PVC Manufacturer prior to installation.

C. All flashings shall extend a minimum of 8 inches above roofing level unless otherwise accepted in writing by the Owner's Representative and PVC Membrane Manufacturer Technical Department. All curb flashings will picture frame the penetration; the corners of adjacent sheets will form one corner where the base flashings meet on the plane of the roof membrane. All flashing will be uniformly installed at all locations. Failure to picture frame the penetrations will result in the contractor removing the flashing and redoing the penetration to the satisfaction of the owners representative at no additional cost to the owner.

D. All flashing membranes shall be consistently adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place. No bitumen shall be in contact with the PVC membrane.

E. All flashing membranes shall be mechanically fastened along the counter-flashed top edge with peel stop at 6-8 inches on center.

F. PVC flashings shall be terminated according to PVC membrane recommended details.

G. All adhered flashings that exceed 30 inches in height or that of the perimeter Sarnabar spacings shall receive additional securement. Consult Technical Department for securement methods.

H. All mechanically-attached flashings that exceed 18 inches in height shall receive additional securement. Consult approved PVC Manufacturer Technical Department for securement methods.

3.10 PVC CLAD METAL BASE FLASHINGS/EDGE METAL

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and PVC Manufacturer. If any water is allowed to enter under the newly completed roofing due to incomplete flashings, the affected area shall be removed and replaced at the Applicator's expense.

A. PVC clad metal flashings shall be formed and installed per the Detail Drawings.

1. All metal flashings shall be fastened into solid wood nailers with two rows of post galvanized flat head annular ring nails, 4 inches on center staggered. Fasteners shall penetrate the nailer a minimum of 1 inch.
2. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.

B. Adjacent sheets of clad shall be spaced 1/4 inch apart. The joint shall be covered with 2 inch wide aluminum tape. A 4 inch minimum wide strip of PVC flashing membrane shall be hot-air welded over the joint. Exercise caution at perimeter of roof. Workers shall follow OSHA safety procedures.

3.11 WALKWAY INSTALLATION

A. Tread Walkway

Roofing membrane to receive tread Walkway shall be clean and dry. Place chalk lines on deck sheet to indicate location of Walkway. Apply a continuous coat of approved adhesive to the deck sheet and the back of Walkway in accordance with technical requirements and press Walkway into place with a water-filled, foam-covered lawn roller. Clean the deck membrane in areas to be welded. Hot-air weld the entire perimeter of the Walkway to the PVC deck sheet. Check all welds with a rounded screwdriver. Re-weld any inconsistencies. **Important:** Check all existing deck membrane seams that are to be covered by Walkway with rounded screwdriver and reweld any inconsistencies before Walkway installation. Do not run Walkway over bars. Tread Walkway shall be installed two (2) courses wide around all roof top mechanical equipment and at all access and egress locations.

3.12 TEMPORARY CUT-OFF

All flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses. All temporary waterstops shall be constructed to provide a 100 percent watertight seal. The stagger of the board joints shall be made even by installing partial panels of Insulation/Dens-Deck. The new membrane shall be carried into the waterstop. Waterstop shall be sealed to the deck and substrate so that water will not be allowed to travel under the new or existing roofing. The edge of the membrane shall be sealed in a continuous heavy application of sealant as described in Section 2.07. When work resumes, the contaminated membrane shall be cut out. All sealant, contaminated membrane, insulation fillers, etc. shall be removed from the work area and properly disposed of off site. None of these materials shall be used in the new work.

If inclement weather occurs while a temporary waterstop is in place, the Applicator shall provide the labor necessary to monitor the situation to maintain a watertight condition.

If any water is allowed to enter under the newly-completed roofing, the affected area shall be removed and replaced at the Applicator's expense.

3.13 COMPLETION

Prior to demobilization from the site, the work shall be reviewed by the Owner's Representative and the Applicator. All defects noted and non-compliances with the Specifications or the recommendations of PVC roofing membrane manufacturer shall be itemized in a punch list. These items must be corrected immediately by the Applicator to the satisfaction of the Owner's Representative and PVC roofing membrane manufacturer prior to demobilization.

All Warranties referenced in this Specification shall have been submitted and have been accepted at time of contract award.

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SPECIFICATION SHEET

DATE: 07-02-15

SHEET:
SP.2

2012 IECC DOCUMENTATION

Generated by COM*check-Web* Software

Mechanical Compliance Certificate

2012 IECC

Section 1: Project Information

Project Type: **Alteration**
Project Title : UNLV UCC Dormitory Complex

Construction Site:	Owner/Agent:	Designer/Contractor:
University of Nevada Las Vegas Las Vegas, Nevada 89102	Bob Mobley UNLV Planning and Construction 4505 S, Maryland Parkway Box 451027 Las Vegas, Nevada 702-895-4960	Donald Koch DG Koch Associates LLC 2000 South Jones #110 Las Vegas, Nevada 89146 702-221-5160

Section 2: General Information

Building Location (for weather data): **Las Vegas, Nevada**
Climate Zone: **3b**

Section 3: Mechanical Systems List

Quantity **System Type & Description**

3 HVAC System (Single Zone) : Single Package Heat Pump
Heating Mode: Capacity = 22 kBtu/h,
Proposed Efficiency = 8.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 24 kBtu/h,
Proposed Efficiency = 14.00 SEER, Required Efficiency = 13.00 SEER
Fan System: FAN SYSTEM 1 -- Compliance (Motor nameplate HP method) : Passes

Fans:
FAN 1 Supply, Constant Volume, 800 CFM, 0.3 motor nameplate hp

1 HVAC System (Single Zone) : Single Package Heat Pump
Heating Mode: Capacity = 24 kBtu/h,
Proposed Efficiency = 8.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 27 kBtu/h,
Proposed Efficiency = 14.00 SEER, Required Efficiency = 13.00 SEER
Fan System: FAN SYSTEM 2 -- Compliance (Motor nameplate HP method) : Passes

Fans:
FAN 2 Supply, Constant Volume, 1000 CFM, 0.3 motor nameplate hp

1 HVAC System (Single Zone) : Single Package Heat Pump
Heating Mode: Capacity = 28 kBtu/h,
Proposed Efficiency = 8.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 34 kBtu/h,
Proposed Efficiency = 14.00 SEER, Required Efficiency = 13.00 SEER
Fan System: FAN SYSTEM 3 -- Compliance (Motor nameplate HP method) : Passes

Fans:
FAN 3 Supply, Constant Volume, 1200 CFM, 0.5 motor nameplate hp

1 HVAC System (Single Zone) : Single Package Heat Pump
Heating Mode: Capacity = 32 kBtu/h,
Proposed Efficiency = 8.00 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 37 kBtu/h,
Proposed Efficiency = 14.00 SEER, Required Efficiency = 13.00 SEER
Fan System: FAN SYSTEM 4 -- Compliance (Motor nameplate HP method) : Passes

Fans:
FAN 4 Supply, Constant Volume, 1600 CFM, 0.8 motor nameplate hp

4 HVAC System (Single Zone) : Split System Heat Pump
Heating Mode: Capacity = 27 kBtu/h,
Proposed Efficiency = 7.70 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 31 kBtu/h,
Proposed Efficiency = 14.00 SEER, Required Efficiency = 13.00 SEER
Fan System: FAN SYSTEM 5 -- Compliance (Motor nameplate HP method) : Passes

Fans:
FAN 5 Supply, Constant Volume, 1270 CFM, 0.3 motor nameplate hp

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical alteration project has been designed to meet the 2012 IECC, Chapter 8, requirements in COM*check-Web* and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title Signature Date

Section 6: Post Construction Compliance Statement

- ☐ HVAC record drawings of the actual installation and performance data for each equipment provided to the owner within 90 days after system acceptance.
- ☐ HVAC O&M documents for all mechanical equipment and system provided to the owner within 90 days after system acceptance.
- ☐ Written HVAC balancing report provided to the owner.

The above post construction requirements have been completed.

Principal Mechanical Designer-Name Signature Date

COM*check* Software Version 4.9.3

Inspection Checklist

Energy Code: 2012 IECC

Requirements: 98.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

2012 IECC	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

2012 IECC	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C403.2.4.5 [FO9][3]	Freeze protection and snow/ice melting system sensors for future connection to controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

Section # & Req.ID	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
C403.2.3 [ME55][2]	HVAC equipment efficiency verified.	Efficiency:____	Efficiency:____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
C403.2.5.1 [ME59][1]	Demand control ventilation provided for spaces >500 ft2 and >25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.7 [ME60][2]	HVAC ducts and plenums insulated. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation Inspection.	R-____	R-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.8 [ME61][2]	HVAC piping insulation thickness. Where piping is installed in or under a slab, verification may need to occur during Foundation Inspection.	____ in.	____ in.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. *See the Mechanical Systems list for values for HVAC System.*
C403.2.8 [ME41][3]	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.3.1.a [null][0]	Total cooling capacity without economizers must be less than %varMaxKBtuPerH%.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.7 [ME10][2]	Ducts and plenums sealed based on static pressure and location.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.7.1.3 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.7.1.3 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.7.1.3 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.7.1.3 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.7.1.3 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C408.2.2.1 [ME53][3]	Air outlets and zone terminal devices have means for air balancing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Fans with fan motors of 1 hp (0.74 kW) or less.
C403.4.2 [ME66][2]	VAV fan motors >=7.5 hp to be driven by variable speed drive, have a vane-axial fan with variable pitch blades, or have controls to limit fan motor demand.	☐ VSD ☐ Vane axial fan ☐ Other	☐ VSD ☐ Vane axial fan ☐ Other	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.4.2 [ME66][2]	VAV fan motors >=7.5 hp to be driven by variable speed drive, have a vane-axial fan with variable pitch blades, or have controls to limit fan motor demand.	☐ VSD ☐ Vane axial fan ☐ Other	☐ VSD ☐ Vane axial fan ☐ Other	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.4.2 [ME66][2]	VAV fan motors >=7.5 hp to be driven by variable speed drive, have a vane-axial fan with variable pitch blades, or have controls to limit fan motor demand.	☐ VSD ☐ Vane axial fan ☐ Other	☐ VSD ☐ Vane axial fan ☐ Other	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.4.2 [ME66][2]	VAV fan motors >=7.5 hp to be driven by variable speed drive, have a vane-axial fan with variable pitch blades, or have controls to limit fan motor demand.	☐ VSD ☐ Vane axial fan ☐ Other	☐ VSD ☐ Vane axial fan ☐ Other	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.4.2 [ME66][2]	VAV fan motors >=7.5 hp to be driven by variable speed drive, have a vane-axial fan with variable pitch blades, or have controls to limit fan motor demand.	☐ VSD ☐ Vane axial fan ☐ Other	☐ VSD ☐ Vane axial fan ☐ Other	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.6 [ME57][1]	Exhaust air energy recovery on systems meeting Table C403.2.6			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.11 [ME71][2]	Unenclosed spaces that are heated use only radiant heat.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

2012 IECC	Final Inspection	Complies?	Comments/Assumptions
C403.2.4.2 [FI47][3]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.2 [FI47][3]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.2 [FI47][3]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.2 [FI47][3]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.2 [FI47][3]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.2 [FI38][3]	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2 [FI20][3]	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.3 [FI39][3]	Each zone equipped with setback controls using automatic time clock or programmable control system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.3 [FI40][3]	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.4.3.3 [FI41][3]	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.3.3 [FI41][3]	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.3.3 [FI41][3]	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*

2012 IECC	Final Inspection	Complies?	Comments/Assumptions
C403.2.4.3.3 [FI41][3]	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.3.3 [FI41][3]	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.1.1 [FI42][3]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.1.1 [FI42][3]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.1.1 [FI42][3]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C403.2.4.1.1 [FI42][3]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values for HVAC System.*
C403.2.4.1.1 [FI42][3]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values for HVAC System.*
C408.2.5.1 [FI7][3]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C303.3,C408.2.5.2 [FI8][3]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.3 [FI43][1]	An air and/or hydronic system balancing report is provided for HVAC systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.2 [FI10][1]	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.2 [FI27][3]	HVAC systems and equipment capacity does not exceed calculated loads.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.1 [FI28][1]	Commissioning plan developed by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

2012 IECC	Final Inspection	Complies?	Comments/Assumptions
C408.2.4 [FI29][1]	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.4 [FI30][1]	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.1 [FI31][1]	HVAC equipment has been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Unitary or packaged HVAC eqiupment without supply air economizers.
C406 [FI34][1]	Efficient HVAC performance, efficient lighting system, or on-site supply of renewable energy consistent with what is shown the approved plans.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

MECHANICAL SPECIFICATIONS

COMPLY WITH THE INTERNATIONAL BUILDING CODE, THE UNIFORM MECHANICAL AND PLUMBING CODES, THE INTERNATIONAL ENERGY CONSERVATION CODE AND THE SOUTHERN NEVADA AMENDMENTS AS ADOPTED BY THE AUTHORITY HAVING JURISDICTION.

IN ADDITION TO THE STATUARY WARRANTY REQUIREMENTS, WORK SHALL BE GUARANTEED FOR ONE YEAR AFTER ACCEPTANCE BY THE OWNER. MATERIALS AND EQUIPMENT SHALL BE AS SPECIFIED AND/OR SCHEDULED OR AN APPROVED EQUAL. PROVIDE SUBMITTALS FOR MATERIALS AND EQUIPMENT TO THE ARCHITECT FOR APPROVAL PRIOR TO ORDER RELEASE. SUBMIT SHOP DRAWINGS FOR DUCTWORK, ATTACHMENTS, AND SEISMIC RESTRAINTS PRIOR TO BEGINNING WORK. OBTAIN APPROVAL FROM ARCHITECT PRIOR TO BEGINNING WORK.

DO NOT SCALE THE DRAWINGS. EQUIPMENT SHALL BE SECURED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. DUCT DIMENSIONS SHOWN ARE INSIDE CLEAR DIMENSIONS. VERIFY "FIT" OF DUCTWORK, HVAC PIPING, PLUMBING AND ELECTRICAL SYSTEMS PRIOR TO FABRICATION. COORDINATE EQUIPMENT, DIFFUSER AND REGISTER LOCATIONS WITH THE ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL LIGHTING PLANS, AND THE FIRE SPRINKLER AND FIRE ALARM SHOP DRAWINGS. CONFORM TO THE ELECTRICAL AND FIRE ALARM CODES CLEARANCE REQUIREMENTS AND ABIDE BY THE MANUFACTURER'S RECOMMENDATIONS. BRING ANY CONFLICTS IRRESOLVABLE IN THE FIELD TO THE ATTENTION OF THE ARCHITECT FOR RESOLUTION PRIOR TO INSTALLATION. NOTIFY OWNER'S REPRESENTATIVE AND ARCHITECT OF ANY UTILITY SHUTDOWN REQUIRED BY THE EXECUTION OF THIS CONTRACT IN WRITING AT LEAST 48 HOURS PRIOR TO THE DESIRED OUTAGE.

CONFIRM THAT THE MECHANICAL EQUIPMENT POWER REQUIREMENTS MATCHES THE VOLTAGE AND PHASE AVAILABLE AT JOBSITE PRIOR TO ORDERING EQUIPMENT. ADDITIONAL ELECTRICAL WORK RESULTING FROM EQUIPMENT SUBSTITUTION SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR.

UPON COMPLETION OF THE WORK, PRIOR TO SUBMISSION OF THE FINAL REQUEST FOR PAYMENT, SUBMIT RECORD DRAWINGS, OPERATION AND MAINTENANCE MANUALS FOR REVIEW. DELIVER SPECIAL TOOLS TO THE OWNER'S REPRESENTATIVE AND OBTAIN A DELIVERY RECEIPT. OWNER'S MANUALS SHALL INCLUDE A COMPLETE LIST OF THE CONTRACTORS, SUBCONTRACTORS AND VENDORS AND THEIR CONTACT INFORMATION, COPIES OF THE WARRANTIES, THE MANUFACTURER'S INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS. REFER TO THE ARCHITECTURAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED STEEL PER THE 2005 SMACNA THIRD EDITION HVAC DUCT CONSTRUCTION STANDARDS. SPIRAL LOCK-FORMED ROUND DUCT WITH RADIUSED ELBOWS OR RECTANGULAR DUCTWORK WITH MITERED ELBOWS WITH TURNING VANES SHALL BE USED WHERE THE DRAWINGS INDICATE ROUND DUCTWORK. TURNING VANE RUNNERS SHALL HAVE A VANE IN EVERY SLOT AND SHALL CONFORM TO THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS.

SUPPLY DUCTS FROM INDOOR FAN COILS SHALL BE 1" DUCT BOARD, CONSTRUCTED PER SMACNA STANDARDS WITH HEAT SEALED JOINTS.

SUPPLY AND RETURN AIR DUCTWORK INSTALLED OUTDOORS SHALL BE CONSTRUCTED FOR 4" WATER COLUMN STATIC PRESSURE WITH SEAL CLASS A. JOINTS SHALL BE MADE WITH DUCT MATE OR APPROVED EQUAL DUCT FITTINGS. PROVIDE 2" THICK DUCT LINER AS SPECIFIED BELOW.

DUCT HANGERS FOR ENVIRONMENTAL AIR AND FLEXIBLE DUCTS SHALL BE CONSTRUCTED OF GALVANIZED STEEL, CONFORMING TO 2005 SMACNA HVAC DUCT CONSTRUCTION STANDARDS. BOLTS, SCREWS, RIVETS OR OTHER MECHANICAL FASTENERS SHALL NOT PENETRATE WALLS OF VAPOR OR GREASE DUCT.

FLEXIBLE CONNECTIONS SHALL BE FURNISHED AND INSTALLED AT DUCT CONNECTIONS TO FANS AND WHERE INDICATED. FLEXIBLE CONNECTIONS SHALL BE 6" MINIMUM AND 10" MAXIMUM IN LENGTH. MATERIAL SHALL BE MANUFACTURED BY VENTFAB OR APPROVED EQUAL.

SCHEDULED EQUIPMENT, TERM SHALL BE AS SCHEDULED OR AN APPROVED EQUAL. EXPOSED SCREWS SHALL BE THE FINISHING TYPE AND PAINTED TO MATCH THE AIR DEVICE. SQUARE TO ROUND ADAPTORS SHALL BE PROVIDED WHERE REQUIRED FOR AIR DEVICES IN CEILINGS. AIR DEVICES SHALL BE FINISHED WITH WHITE BAKED ENAMEL FINISH UNLESS NOTED OTHERWISE. CONFIRM COLORS OF ALL INTERIOR EQUIPMENT WITH THE ARCHITECT PRIOR TO ORDER RELEASE.

CONCEALED DUCTWORK REQUIRING INSULATION SHALL BE INSULATED WITH 0.75 POUNDS PER CUBIC FOOT DENSITY FLEXIBLE FIBERGLASS INSULATION WITH FOIL SCRIM FACING. JOINTS SHALL BE COVERED WITH 3" WIDE FOIL REINFORCED KRAFT TAPE. ADHESIVE OR MECHANICAL FASTENERS SHALL BE USED WHERE NECESSARY TO PREVENT SAGGING. OMIT INSULATION AT ACCESS DOORS AND DAMPER OPERATORS.

DUCTWORK INDICATED AS LINED FOR ACOUSTICAL PURPOSES SHALL BE INTERNALLY INSULATED WITH 2" THICK 1.5 POUNDS PER CUBIC FOOT DENSITY FIBERGLASS INSULATION WITH MOLD RESISTANT COATED SURFACE. DUCT DIMENSIONS SHALL BE INCREASED TO COMPENSATE FOR LINER, SO THAT DUCT SIZE INDICATED IS NET INTERIOR DIMENSIONS. LINER SHALL BE FASTENED TO THE DUCT WITH ADHESIVE AND MECHANICAL FASTENERS. LINER ADHESIVE SHALL BE WATERPROOF AND FIRE RETARDANT. MECHANICAL FASTENERS SHALL BE AS RECOMMENDED BY SMACNA. TRANSVERSE EDGES OF LINER SHALL BE COATED WITH ADHESIVE, EXCEPT WHERE SHEET METAL NOSING IS USED. SHEET METAL NOSING SHALL BE USED AT TRANSVERSE EDGES PRECEDED BY UNLINED DUCTWORK AND WHERE EDGE IS WITHIN FIVE FEET OF A FAN DISCHARGE.

INSULATION THICKNESS SHALL CONFORM TO THE 2012 IECC REQUIREMENTS AS AMENDED BY THE SOUTHERN NEVADA ENERGY CONSERVATION CODE ORDINANCE.

EQUIPMENT AND CONDENSATE DRAIN PIPING SHALL BE TYPE M COPPER WITH WROUGHT COPPER FITTINGS AND 95-5 TIN-ANTIMONY SOLDERED JOINTS. SCHEDULE 40 PVC PIPE WITH SOLVENT WELDED JOINTS MAY BE USED FOR COMBUSTIBLE CONSTRUCTION OUTSIDE OF RETURN AIR PLENUMS. PVC PIPE EXPOSED TO THE EXTERIOR SHALL BE PAINTED WITH UV RESISTANT PAINT, COLOR TO BE SELECTED BY THE ARCHITECT. DRAINS SHALL BE CONNECTED WITH A VENTED P TRAP AND SHALL BE ROUTED TO NOT CREATE A TRIPPING HAZARD. PROVIDE OVERFLOW CONDENSATE DRAIN SYSTEM WITH DRIP PANS AND SECONDARY PIPING SYSTEM.

CONDENSATE DRAINS INSTALLED OUTDOORS SHALL BE INSULATED WITH ARMSTRONG, ARMAFLEX 25/50 FLAME SPREAD SMOKE DEVELOPED RATED ELASTOMERIC INSULATION. LIQUID AND SUCTION LINES SHALL BE INSULATED CONTINUOUSLY FROM THE OUTDOOR UNIT. COPPER TUBING SHALL BE FREE OF EXTRANEOUS CHEMICALS OR MATERIALS PRIOR TO INSTALLATION OF THE INSULATION. A MANUFACTURER RECOMMENDED ADHESIVE SHALL BE APPLIED AT ALL SEAMS AND TERMINATIONS. INSULATION INSTALLED OUTDOORS SHALL BE UV LIGHT RESISTANT WITH AN ALUMINUM JACKET.

PIPING SHALL BE IDENTIFIED WITH PLASTIC PIPE MARKERS IN CLEAR VIEW AND ALIGNED WITH AXIS OF PIPING. MARKERS SHALL BE PREPRINTED WITH PRESSURE SENSITIVE PERMANENT ADHESIVE AND COLOR CODED IN COMPLIANCE WITH ANSI A13.1. SERVICE AND FLOW DIRECTION SHALL BE INDICATED. DISTANCE BETWEEN IDENTIFICATION LOCATIONS SHALL NOT EXCEED 20'. IDENTIFICATION SHALL BE LOCATED AT EACH VALVE, RUN OUT, EQUIPMENT CONNECTION AND ON BOTH SIDES OF AN OBSTRUCTION. VALVE TAGS SHALL BE BRASS AND 1.5" DIAMETER WITH SOLID BRASS CHAIN. TAGS FOR FLOW CONTROLS SHALL INCLUDE FLOW AND PRESSURE DROP SET POINTS. MECHANICAL EQUIPMENT SHALL BE IDENTIFIED WITH BAKELITE NAMEPLATES. COLOR CODING AND OWNER'S IDENTIFICATION NAME/NUMBER SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE.

AN INDEPENDENT AABC OR NEBB TEST AND BALANCE AGENCY SHALL BE RETAINED FOR TESTING AND BALANCING OF AIR AND WATER SYSTEMS. THE TEST REPORT SHALL BE IN A FORMAT APPROVED BY AABC FOR SYSTEMS OF THIS TYPE AND COMPLEXITY. QUALIFICATIONS OF INDEPENDENT TEST AND BALANCE FIRM SHALL BE SUBMITTED FOR REVIEW. TEST AND BALANCING WORK SHALL INCLUDE VERIFICATION (BUT NOT CALIBRATION) OF AUTOMATIC CONTROL OPERATION. FINAL BALANCE SHALL CONFORM TO THE REQUIREMENTS OF THE AABC.

LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
⊠	SUPPLY AIR GRILLE - REGISTER	NO	NUMBER
⍁	RETURN AIR GRILLE - REGISTER	TYP	TYPICAL
(T)	ROOM TEMPERATURE SENSOR	MAX	MAXIMUM
⌐‒‒	MANUAL VOLUME DAMPER	MIN	MINIMUM
——RS——	REFRIGERANT SUCTION	V-PH	VOLTAGE-PHASE
——RL——	REFRIGERANT LIQUID	MCA	MINIMUM CIRCUIT AMPS
——D——	DRAIN	MOCP	MAXIMUM OVERCURRENT PROTECTION
—▷—	REDUCER	ESP	EXTERNAL STATIC PRESSURE
○	ELBOW UP	RPM	REVOLUTIONS PER MINUTE
C	ELBOW DOWN	SA	SUPPLY AIR
͡	TEE	RA	RETURN AIR
ǁ	UNION	EA	EXHAUST AIR
⊙	VENT THRU ROOF	OSA	OUTSIDE AIR
		ENT	ENTERING
		DB	DRY BULB
		WB	WET BULB
		EER	ENERGY EFFICIENCY RATIO
		SEER	SEASONAL ENERGY EFFICIENCY RATIO
		COP	COEFFICIENT OF PERFORMANCE
		HSPF	HTG SEASONAL PERFORMANCE FACTOR
		LBS	POUNDS
		OPER	OPERATING
		MBH	1,000 BTU PER HOUR
		BTU	BRITISH THERMAL UNIT

SHEET INDEX

SYMBOL: 09-29-15 PERMIT SET	SHEET NO	SHEET DESCRIPTION
●	MG1.01	LEGEND, INDEX, NOTES, SCHEDULES, IECC COMPLIANCE
●	M1.01	ROOF PLANS - BUILDING A
●	M1.02	ROOF PLANS - BUILDING D
●	M2.01	PARTIAL DEMO FLOOR PLANS - BUILDINGS A & D
●	M2.02	PARTIAL FLOOR PLANS - BUILDINGS A & D

GENERAL NOTES

MECHANICAL

1. DO NOT SCALE DRAWINGS. VERIFY FIT OF DUCTWORK AND PIPING PRIOR TO FABRICATION.
2. PROVIDE EQUIPMENT SCHEDULED OR INDICATED ON THE DRAWINGS BUT NOT INCLUDED WITHIN THE SPECIFICATIONS. INSTALLATION SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS AND APPLICABLE CODES. PROVIDE SUBMITTALS.
3. ELECTRICAL POWER REQUIREMENTS FOR MECHANICAL EQUIPMENT SHALL BE VERIFIED WITH ELECTRICAL DRAWINGS PRIOR TO EQUIPMENT ORDER RELEASE. CONTRACTOR SHALL CONFIRM THAT VOLTAGE AND AMPERAGE REQUIRED BY MECHANICAL EQUIPMENT IS COMPATIBLE WITH ELECTRICAL SYSTEM WITH NO CHANGES TO ELECTRICAL SYSTEM. ADDITIONAL ELECTRICAL WORK RESULTING FROM EQUIPMENT SUBSTITUTION IS THE RESPONSIBILITY OF THE CONTRACTOR..
4. DUCT SIZES INDICATED ARE NET INSIDE CLEAR DIMENSIONS.
5. DRAIN PIPING FROM HVAC EQUIPMENT SHALL BE ROUTED SO AS NOT TO CREATE A TRIPPING HAZARD. REMOVE GYPSUM BOARD.
6. CONDENSATE DRAIN TRAPS SHALL BE 2" DEEP, MINIMUM.
7. DUCT ACCESS DOORS SHALL BE DUCTMATE SANDWICH OR EQUAL.
8. MANUAL VOLUME DAMPERS AND VALVES ON INSULATED DUCTWORK AND PIPING SHALL HAVE EXTENDED STEMS TO ALLOW FOR THE INSULATION THICKNESS. PROVIDE MINIMUM 12" LONG RED RIBBON QUADRANT LOCATOR ON VOLUME DAMPER HANDLES.

HEAT PUMP UNIT SCHEDULE

ITEM	TRANE / AMERICAN STANDARD MODEL NO	LOCATION	CFM	OSA CFM	ESP	COOLING ENT AIR °F	COOLING DB - WB °F	COOLING TOTAL MBH	COOLING SENS MBH	HEATING AMB °F	HEATING RA °F	HEATING TOTAL MBH	HSPF	COP	SEER		ELECTRICAL V-PH	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT LBS	FILTERS NO (SIZE)	REMARKS
RHP-1	4WCY4024A1000B	CORRIDORS	800	200	0.4"	110	80-62	23.60	23.60	26	70	21.71	8.0	3.5	14.0		208-1	16.1	25	357	1 (24 x 24 x 1)	A
RHP-3	4WCY4030A1000B	MULTI-USE	1000	200	0.4"	110	80-62	27.2	27.2	26	70	23.86	8.0	3.5	14.0		208-1	19.2	30	357	1 (24 x 24 x 1)	A
RHP-4	4WCY4036B3000A	LOBBY	1200	300	0.6"	110	80-62	34.20	34.20	26	70	27.82	8.0	3.4	14.0		208-3	18.4	25	372	1 (24 x 24 x 1)	B
RHP-5	4WCY4048A3000C	LOBBY	1600	200	0.4"	110	80-62	37.03	37.03	26	70	31.94	8.0	3.4	14.0		208-3	25.3	35	479	1 (24 x 24 x 1)	B

REMARKS

A. FURNISH WITH CUSTOM ROOF CURB, DOWN DISCHARGE ELECTRONIC PROGRAMMABLE THERMOSTAT, 25% OUTSIDE AIR ECONOMIZER WITH AUTOMATIC DAMPER.

B. FURNISH WITH SIDE DISCHARGE, ELECTRONIC PROGRAMMABLE THERMOSTAT, 25% OUTSIDE AIR ECONOMIZER WITH AUTOMATIC DAMPER.

SPLIT SYSTEM HEAT PUMP UNIT SCHEDULE

ITEM	TRANE / AMERICAN STANDARD (OUTDOOR) FIRST CO. (INDOOR)	LOCATION	CFM	OSA CFM	ESP	COOLING ENT EAT °F	COOLING DB °F	COOLING WB °F	COOLING TOTAL MBH	COOLING SENS MBH	HEATING AMB °F	HEATING RA °F	HEATING TOTAL MBH	HEATING ELEC HEAT	MIN SEER	MIN HSPF	ELECTRICAL HP	ELECTRICAL V-PH	ELECTRICAL RPM	ELECTRICAL MCA	ELECTRICAL MCB MOCP	OPER WEIGHT LBS	FILTERS NO	FILTERS SIZE	REMARKS
HP-1	4A6H7036A1000A 37HXX-C	C-(M2.02)	1270	0	0.3"	115	82	62	30.6	30.6	27	70	26.8	-	14.0	7.7	- 1/2	208/230-1 208-1	- -	22 6	35 15	274 -	1	20 x 20 x 1	A
HP-2	4A6H7036A1000A 37HXX-C	B-(M2.02)	1270	0	0.3"	115	82	62	30.6	30.6	27	70	26.8	-	14.0	7.7	- 1/2	208/230-1 208-1	- -	22 6	35 15	274 -	1	20 x 20 x 1	A
HP-3	4A6H7036A1000A 37HXX-C	B-(M2.02)	1270	0	0.3"	115	82	62	30.6	30.6	27	70	26.8	-	14.0	7.7	- 1/2	208/230-1 208-1	- -	22 6	35 15	274 -	1	20 x 20 x 1	A
HP-4	4A6H7036A1000A 37HXX-C	A-(M2.02)	1270	0	0.3"	115	82	62	30.6	30.6	27	70	26.8	-	14.0	7.7	- 1/2	208/230-1 208-1	- -	22 6	35 15	274 -	1	20 x 20 x 1	A

REMARKS

A. FURNISH WITH PROGRAMMABLE THERMOSTAT, REFRIGERANT LINE SETS FOR LONG LINE APPLICATION ACCESSORIES, LOW AMBIENT COOLING KIT, FAN COIL ENCLOSURE WITH CEILING PANEL (FILTER BY CONTRACTOR), FAN RELAY PACKAGE, ECM MOTOR AND TXV, AND ACCESSORIES NECESSARY FOR HIGH EFFICIENCY HEAT PUMP APPLICATION.

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BID DOCUMENTS

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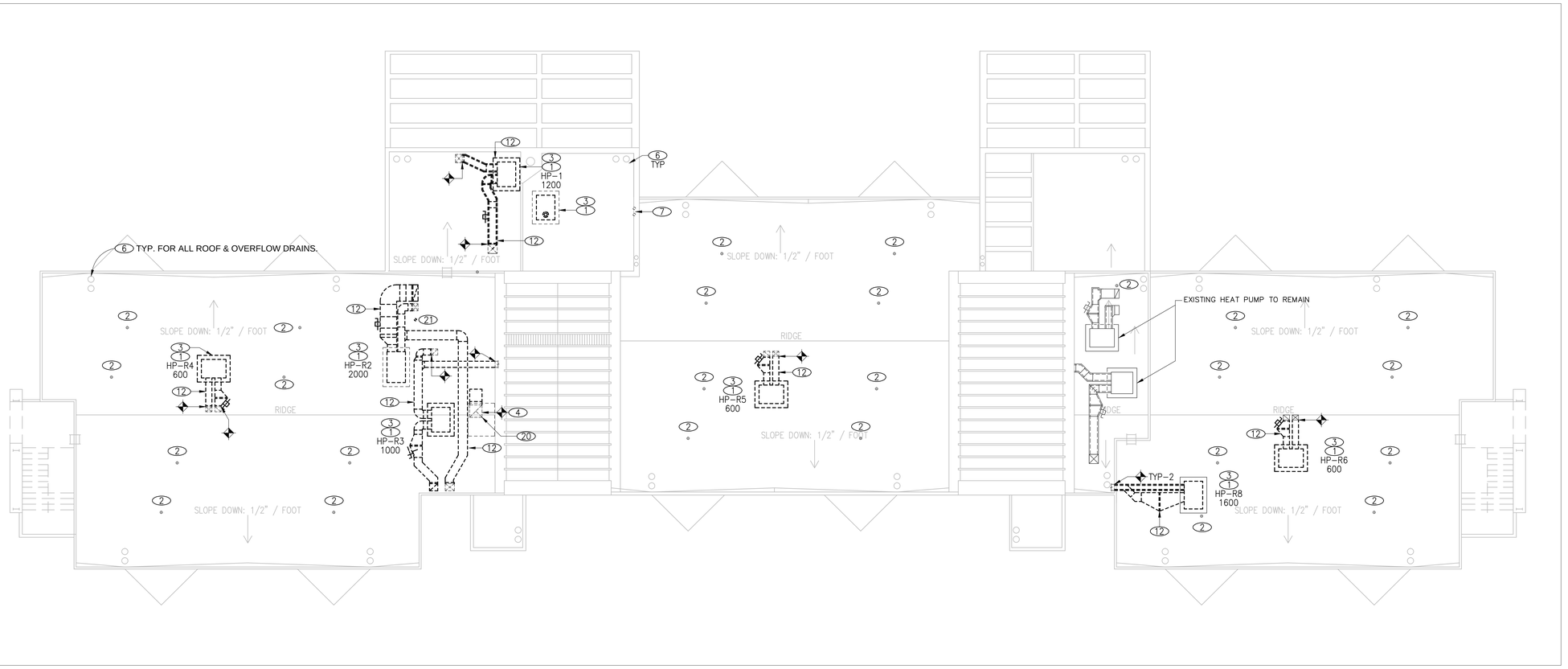
SHEET TITLE:

LEGEND, INDEX NOTES SCHEDULES IECC COMPLIANCE

DATE: 09–29–15

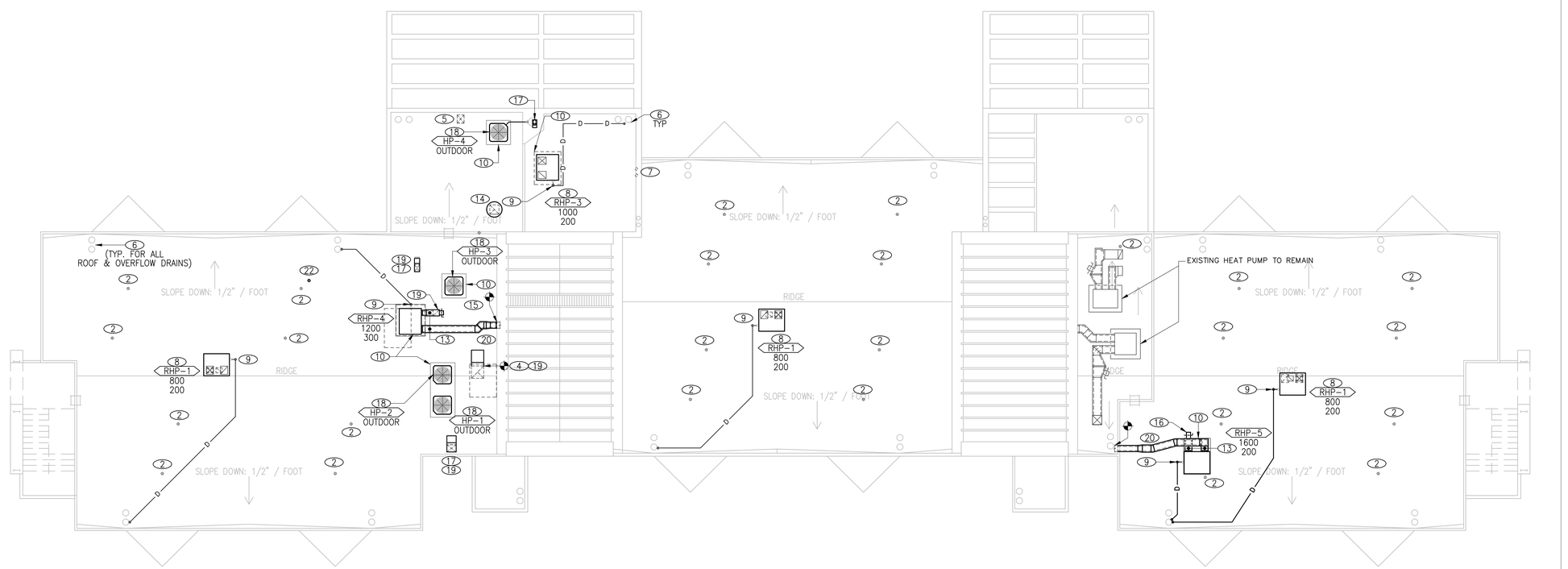
SHEET:

MG1.01



A DEMOLITION ROOF PLAN - BUILDING A

1/8" = 1'-0"



B ROOF PLAN - BUILDING A

1/8" = 1'-0"

8 6 4 2 0 4 8 12 16

GRAPHIC SCALE : 1/8"=1'-0"

NOTICE

MAINTAIN MINIMUM CLEARANCE OF 10'-0" BETWEEN OUTDOOR AIR INTAKES WITH PLUMBING VENTS, EXHAUST FANS AND FLUE VENTS.

FC-1 — UNIT
2000 — SUPPLY CFM
320 — OSA CFM

DOUBLE LINE DUCT WITH 2" THICK 1.5 LB DENSITY DUCT LINER, WITH DUCTMATE FITTINGS.

POINT OF DISCONNECT FROM EXISTING. VERIFY EXACT SIZE AND LOCATION IN FIELD PRIOR TO START OF WORK.

POINT OF CONNECTION TO EXISTING. VERIFY EXACT SIZE AND LOCATION IF FIELD PRIOR TO START OF WORK.

EXSITING WORK TO REMAIN SHOWN LIGHT. EXISTING WORK TO BE REMOVED SHOWN DARK AND DASHED. NEW WORK SHOWN DARK.

KEY NOTES

1. EXISTING A/C UNIT TO BE REMOVED.
2. EXISTING PLUMBING VENT TO REMAIN
3. REMOVE EXISTING EQUIPMENT BASE.
4. REMOVE & REPLACE EXISTING ELEVATOR VENT GOOSENECK MATCH EXISTING SIZE & CONSTRUCTION
5. CAP DUCT BELOW NEW ROOFING & INSULATION.
6. REPAIR/REHAB EXISTING ROOF DRAINS. KEEP EXISTING SUMP & ADJUST TO NEW ROOF. CLEAN OUT DEBRIS. PROVIDE NEW STRAINER. TEST SYSTEM.
7. CAP AND ABANDON EXISTING DRYER VENTS.
8. PROVIDE NEW UNIT WITH CUSTOM ROOF CURB TO PERMIT DUCT TRANSITION FROM OUTLET OF UNIT TO EXISTING DUCTS DOWN THRU ROOF WITHIN CURB.
9. PROVIDE VENTED P-TRAP AT UNIT & NEW DRAIN PIPING TO TERMINATE OVER ROOF DRAIN WITH 90° ELL DOWN. SUPPORT PIPING WITH MIRO OR EQUAL PIPE SUPPORTS AT 6'-0" O.C.
10. PROVIDE NEW EQUIPMENT BASE FOR NEW UNIT: REFER TO DETAIL 3-A2.02.
11. NOT USED.
12. REMOVE EXISTING DUCTWORK & SUPPORTS.
13. FULL SIZE SUPPLY & RETURN DUCTS WITH 2" DUCTLINER & DUCT MATE FITTINGS.
14. NEW GREEN HECK G-090 DIRECT DRIVE EXHAUST FAN WITH ROOF CURB & BACK DRAFT DAMPER, DISCONNECT SWITCH & REMOVE VARIABLE SPEED SWITCH CONTROL.
15. OSA INTAKE WITH GOOSENECK AND 12 x 8 MVD (300 CFM).
16. OSA INTAKE WITH GOOSENECK AND 8 x 8 MVD (200 CFM)
17. OSA INTAKE GOOSENECK WITH FILTER. REFER TO DETAIL 3-(M1.02). MAINTAIN 10' CLEARANCE TO PLUMBING VENTS.
18. PROVIDE PRECHARGED REFRIGERANT TUBING BETWEEN INDOOR AND OUTDOOR UNITS. SIZE PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE 1" ARMSTRONG AP2000 25/50 ELASTOMERIC INSULATION FOR VAPOR PIPING. PROVIDE UV PROTECTION FOR PIPING INSTALLED OUTDOORS.
19. DUCT THRU ROOF REFER TO DETAIL 2-(M1.02).
20. PROVIDE BIRD PROOF SCREENING BETWEEN BOTTOM OF DUCT AND ROOF TO DETER USE OF SPACE BELOW DUCTWORK FOR BIRD NESTING.
21. EXISTING VTR TO BE RELOCATED.
22. REROUTE PLUMBING VENT PIPING BELOW ROOF DECK TO NEW VTR LOCATION SHOWN.

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15031

SHEET TITLE:

ROOF PLANS BUILDING A

DATE: 09-29-15

SHEET:

M1.01

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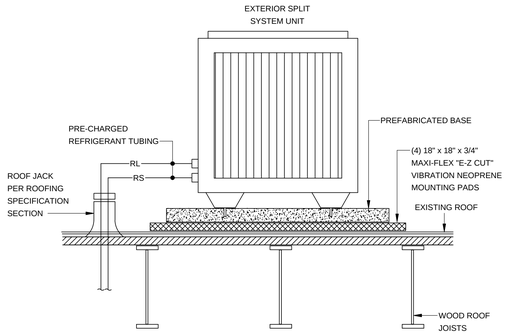
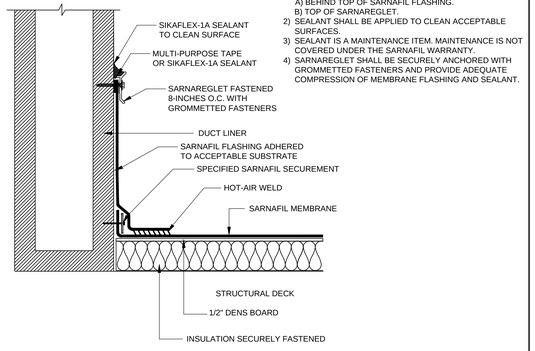


1 EXTERIOR SPLIT SYSTEM MOUNTING DETAIL

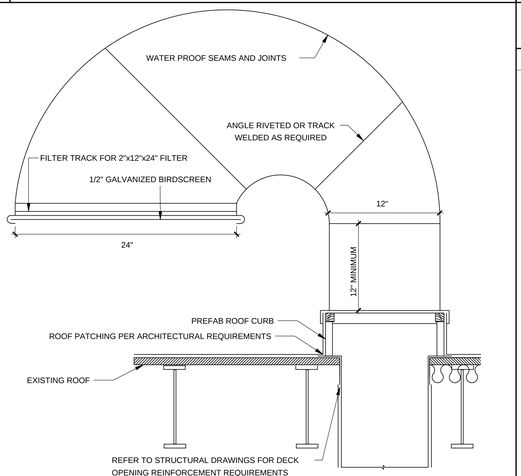
NO SCALE



NOTES:
1) SEALANT IS A TWO STEP APPLICATION:
   A) BEHIND TOP OF SARNAFIL FLASHING.
   B) TOP OF SARNAREGLET.
2) SEALANT SHALL BE APPLIED TO CLEAN ACCEPTABLE SURFACES.
3) SEALANT IS A MAINTENANCE ITEM. MAINTENANCE IS NOT COVERED UNDER THE SARNAFIL WARRANTY.
4) SARNAREGLET SHALL BE SECURELY ANCHORED WITH GROMMETTED FASTENERS AND PROVIDE ADEQUATE COMPRESSION OF MEMBRANE FLASHING AND SEALANT.

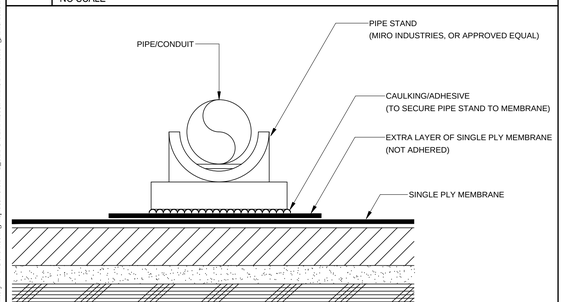
2 SARNAREGLET TERMINATION 3

NO SCALE



3 OUTDOOR AIR GOOSENECK AND FILTER

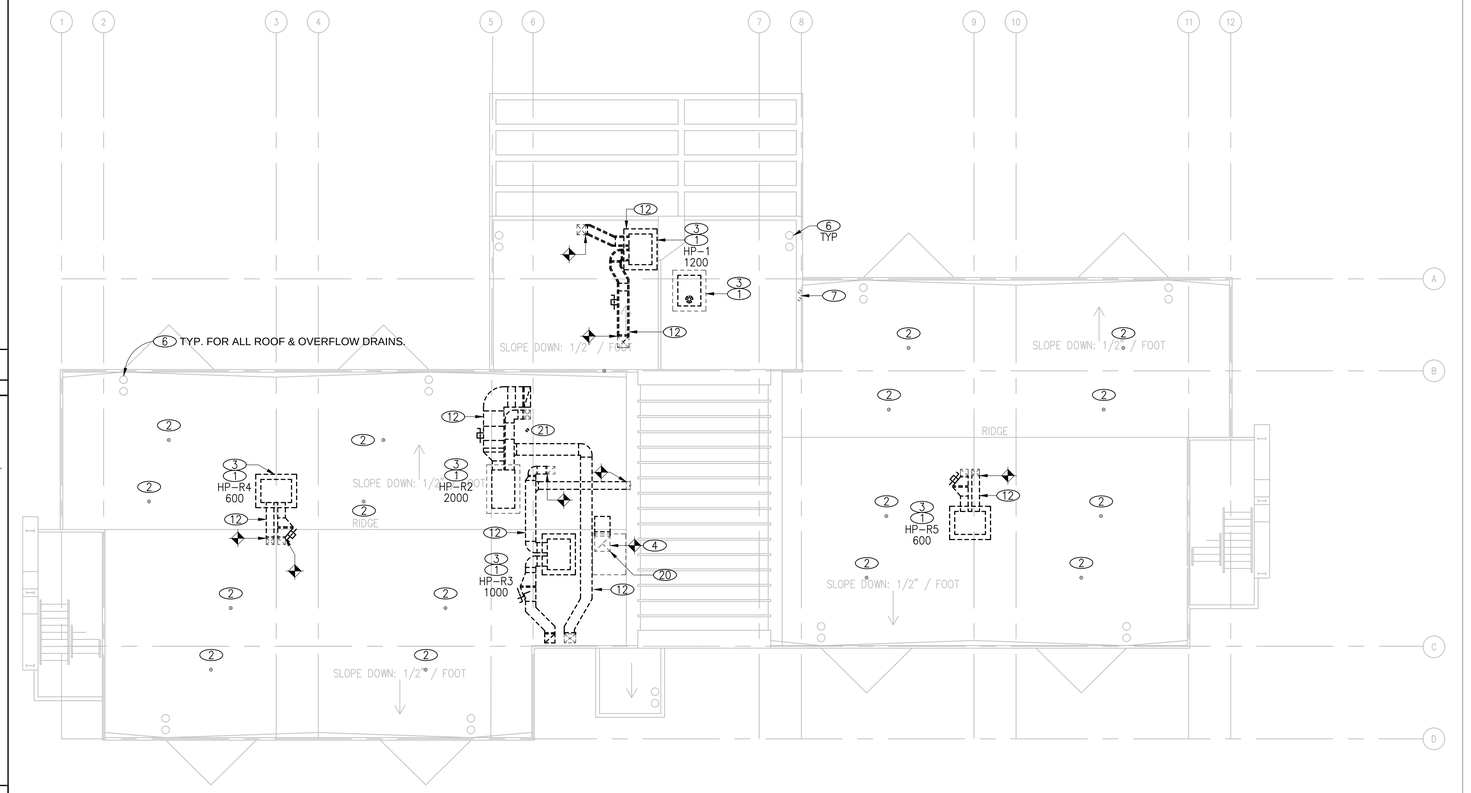
NO SCALE



NOTE: UTILIZE THIS DETAIL ONLY WITH PRIOR APPROVAL -
(ROUTE ALL PIPING BELOW ROOF AND UP INSIDE OF
ROOF-MOUNTED EQUIPMENT CURBS WHENEVER POSSIBLE).

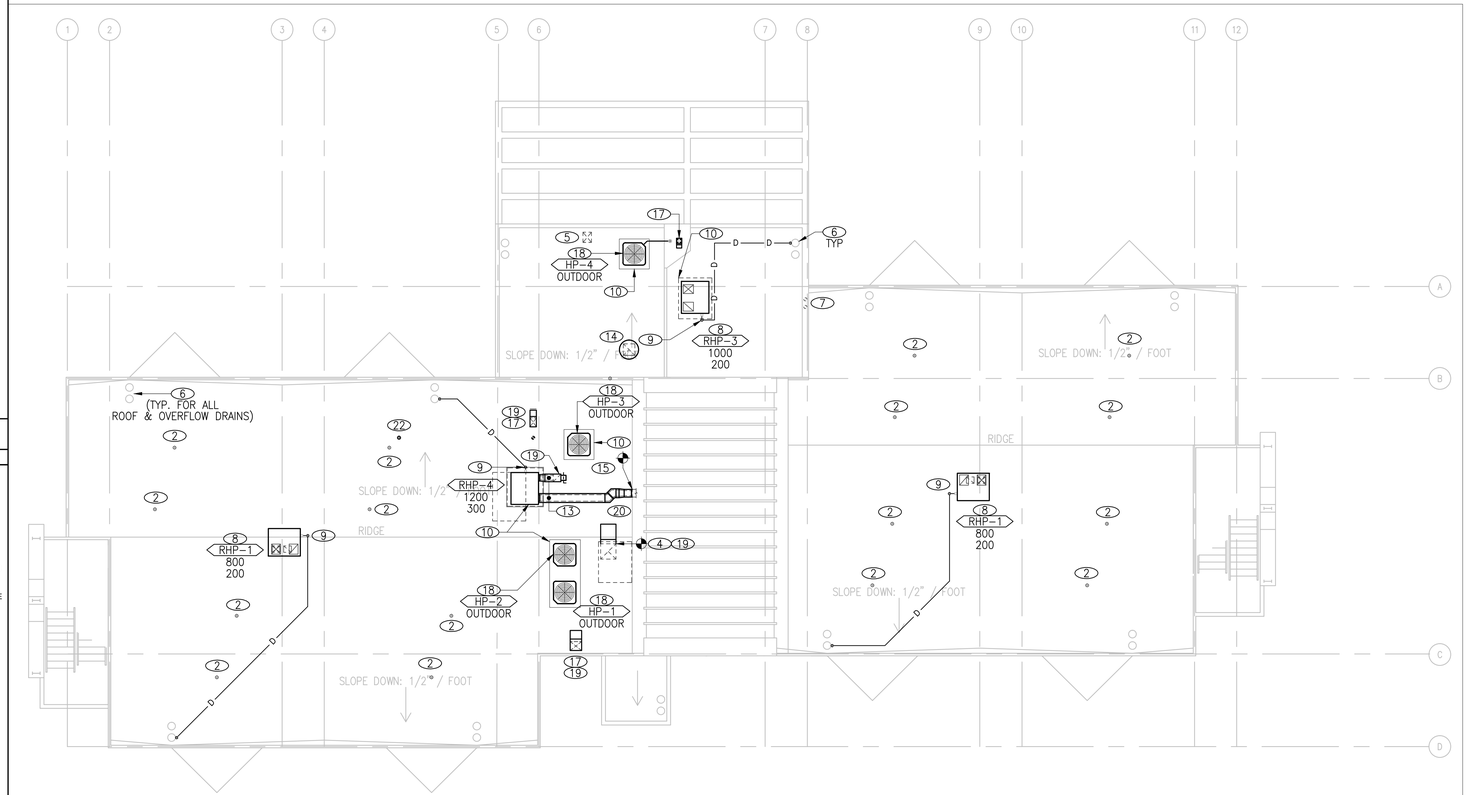
4 PIPE/CONDUIT SUPPORT DETAIL

NO SCALE



A DEMOLITION ROOF PLAN - BUILDING D

1/8" = 1'-0"



B ROOF PLAN - BUILDING D

1/8" = 1'-0"

NOTICE

MAINTAIN MINIMUM CLEARANCE OF 10'-0" BETWEEN OUTDOOR AIR INTAKES WITH PLUMBING VENTS, EXHAUST FANS AND FLUE VENTS.

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2000 — SUPPLY CFM
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DOUBLE LINE DUCT WITH 2" THICK 1.5 LB DENSITY DUCT LINER, WITH DUCTMATE FITTINGS.

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KEY NOTES

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2. EXISTING PLUMBING VENT TO REMAIN
3. REMOVE EXISTING EQUIPMENT BASE.
4. REMOVE & REPLACE EXISTING ELEVATOR VENT GOOSENECK MATCH EXISTING SIZE & CONSTRUCTION
5. CAP DUCT BELOW NEW ROOFING & INSULATION.
6. REPAIR/REHAB EXISTING ROOF DRAINS. KEEP EXISTING SUMP & ADJUST TO NEW ROOF. CLEAN OUT DEBRIS. PROVIDE NEW STRAINER. TEST SYSTEM.
7. CAP & ABANDON EXISTING DRYER VENTS.
8. PROVIDE NEW UNIT WITH CUSTOM ROOF CURB TO PERMIT TRANSITION FROM OUTLET OF UNIT TO EXISTING DUCTS DOWN THRU ROOF WITHIN CURB.
9. PROVIDE VENTED P-TRAP AT UNIT & NEW DRAIN PIPING TO TERMINATE OVER ROOF DRAIN WITH 90° ELL DOWN. SUPPORT PIPING WITH MIRO OR EQUAL PIPE SUPPORTS AT 6'-0" O.C.
10. PROVIDE NEW EQUIPMENT BASE FOR NEW UNIT: REFER TO DETAIL 3-A2.02.
11. NOT USED.
12. REMOVE EXISTING DUCTWORK & SUPPORTS.
13. FULL SIZE SUPPLY & RETURN DUCTS WITH 2" DUCTLINER & DUCT MATE FITTINGS.
14. NEW GREEN HECK G-090 DIRECT DRIVE EXHAUST FAN WITH ROOF CURB & BACK DRAFT DAMPER, DISCONNECT SWITCH & REMOVE VARIABLE SPEED SWITCH CONTROL.
15. OSA INTAKE WITH GOOSENECK AND 12 x 8 MVD (300 CFM).
16. NOT USED.
17. OSA INTAKE GOOSENECK WITH FILTER. REFER TO DETAIL 3-(M1.02). MAINTAIN 10' CLEARANCE TO PLUMBING VENTS.
18. PRECHARGED REFRIGERANT TUBING BETWEEN INDOOR & OUTDOOR UNIS. SIZE PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE 1" ARMSTRONG AP2000 25/50 ELASTOMERIC INSULATION FOR VAPOR PIPING. PROVIDE UV PROTECTION FOR PIPING INSTALLED OUTDOORS.
19. DUCT DOWN THRU ROOF REFER TO DETAIL 2-(M1.02).
20. PROVIDE BIRD PROOF SCREENING BETWEEN BOTTOM OF DUCT AND ROOF TO DETER USE OF SPACE BELOW DUCTWORK FOR BIRD NESTING.
21. EXISTING VTR TO BE RELOCATED.
22. REROUTE PLUMBING VENT PIPING BELOW ROOF DECK TO NEW VTR LOCATION SHOWN.

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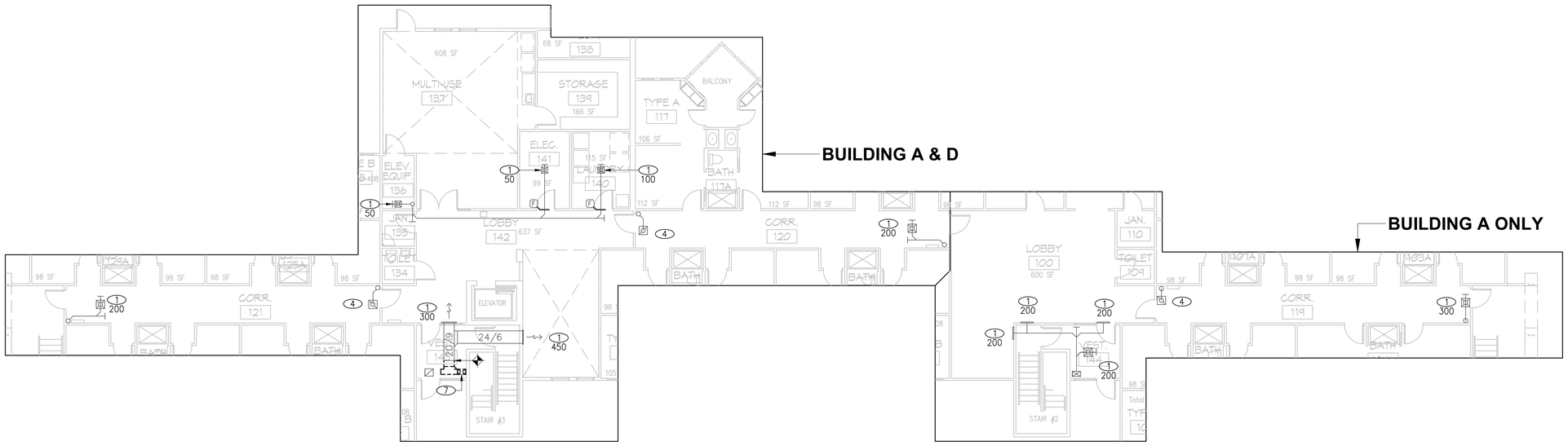
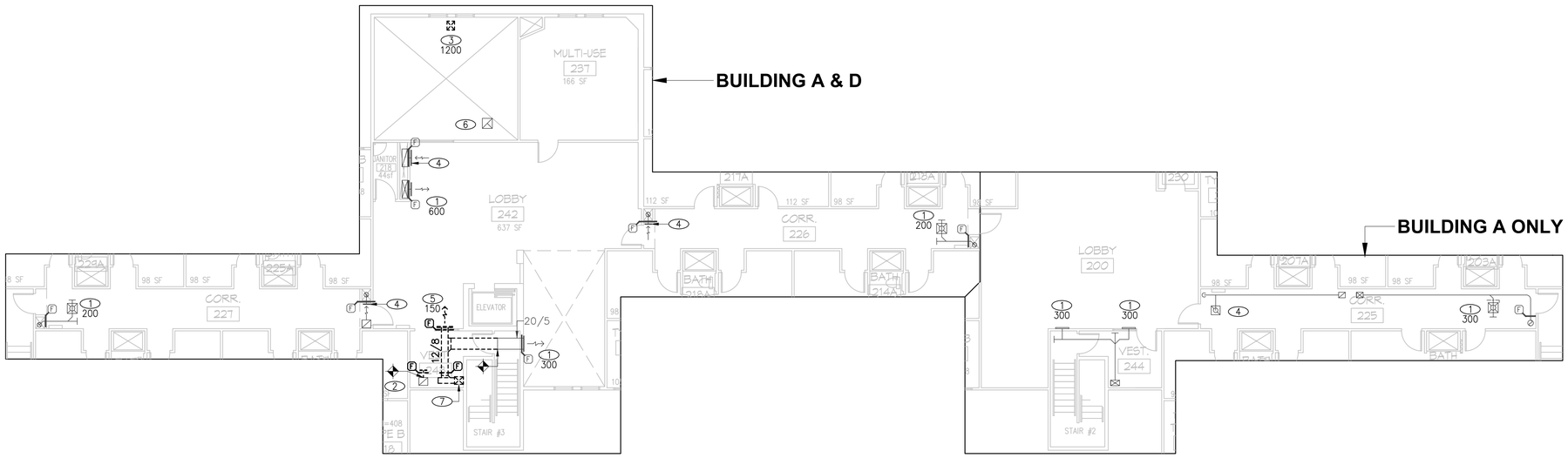


A PARTIAL DEMO FIRST FLOOR PLAN - BUILDINGS A & D

1/8" = 1'-0"



B PARTIAL DEMO SECOND FLOOR PLAN BUILDINGS A & D

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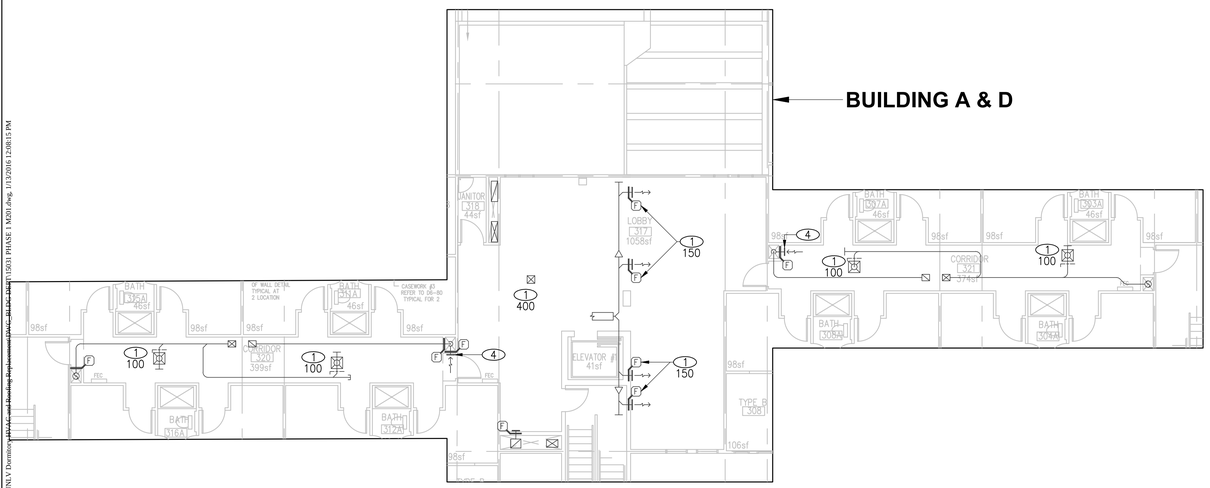

C PARTIAL THIRD FLOOR PLAN DEMO - HVAC BUILDINGS A & D

1/8" = 1'-0"

NOTICE

- POINT OF DISCONNECT FROM EXISTING. VERIFY EXACT SIZE AND LOCATION IN FIELD PRIOR TO START OF WORK.
- POINT OF CONNECTION TO EXISTING. VERIFY EXACT SIZE AND LOCATION IF FIELD PRIOR TO START OF WORK.
- EXSIITING WORK TO REMAIN SHOWN LIGHT. EXISTING WORK TO BE REMOVED SHOWN DARK AND DASHED. NEW WORK SHOWN DARK.

KEY NOTES

1. REMOVE EXISTING SUPPLY REGISTER. CLEAN INTERIOR OF DUCT. RE-INSTALL REGISTER & BALANCE TO AIR FLOW SHOWN ON SHEET M2.02.
2. REMOVE EXISTING RETURN AIR GRILLE & FIRE DAMPER. PREP DUCT FOR NEW CONNECTION.
3. REMOVE EXISTING SUPPLY REGISTER. CAP DUCT BEHIND CEILING. PATCH CEILING.
4. REMOVE EXISTING RETURN REGISTER. CLEAN DUCT INTERIOR & REGISTER. RE-INSTALL REGISTER FOR RE-USE.
5. REMOVE EXISTING SUPPLY GRILLE AND ASSOCIATED DUCTWORK.
6. REMOVE EXISTING RETURN GRILLE. PREP DUCT FOR NEW GRILLE CONNECTION.
7. REMOVE EXISTING SUPPLY DUCT. PREP DUCT FOR NEW CONNECTION.

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