SCIENCE III CHILLER PLANT
BINGHAMTON UNIVERSITY

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State University of New York

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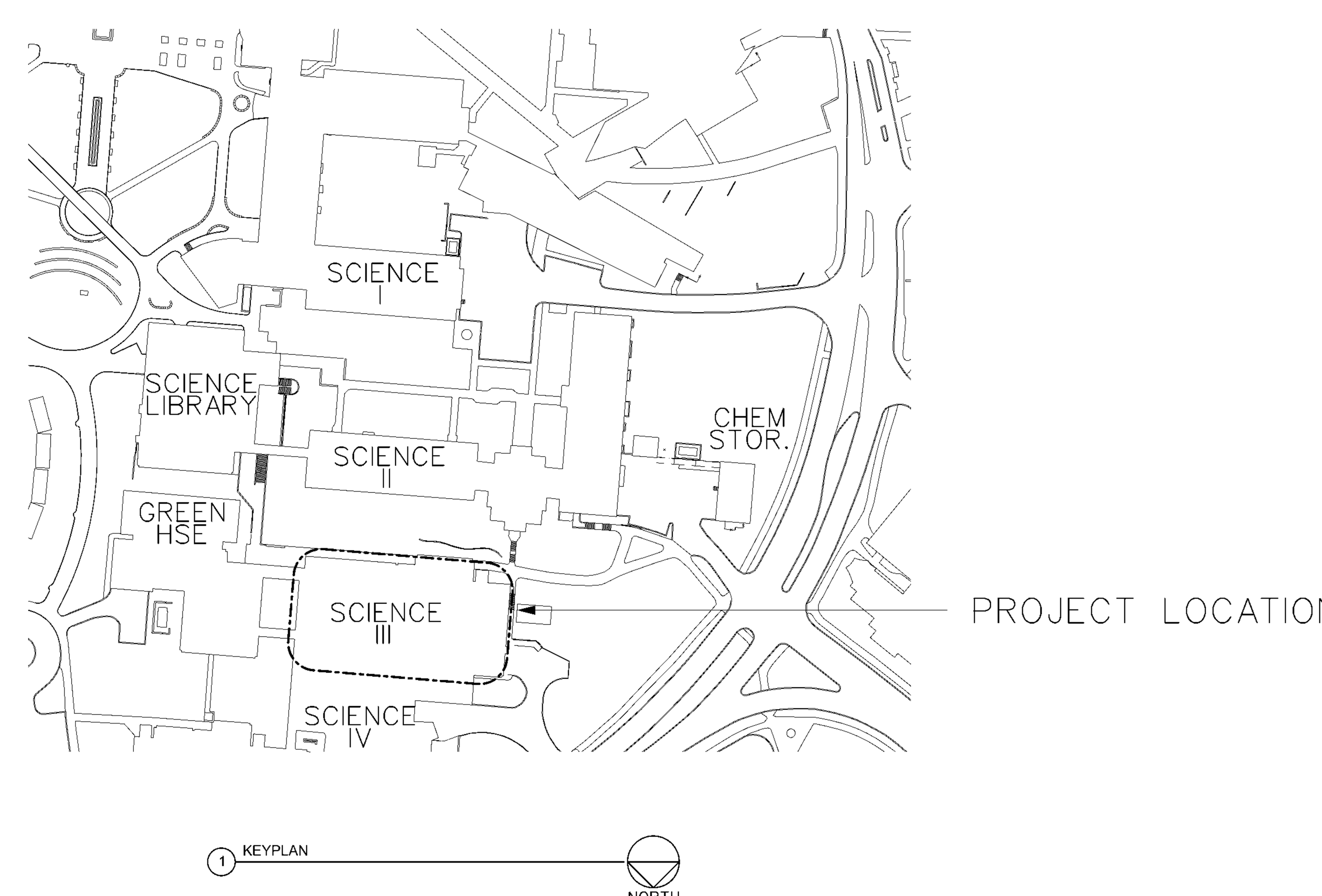
DRAWING INDEX:



1 KEYPLAN

NORTH

SCIENCE III - CHILLER PLANT
BINGHAMTON UNIVERSITY

REVISIONS

No.	Date	By	Description

DRAWING TITLE

COVER SHEET

DRAWING NO.		
T001	Drawn By:	DLT
	Checked By:	MDS
	Project Mgr:	MDS
	Project No:	071018
	M/E Project No:	170425

ISSUE DATE: **01/18/2019**

STATUS: **BID DOCUMENTS**

SCIENCE COMPLEX KEYPLAN:

CLASSIFICATION OF WORK

- REPAIRS
- ALTERATIONS- LEVEL 1
- ALTERATIONS- LEVEL 2

CODE REVIEW LEGEND

XX E.W.	ACTUAL EXIT WIDTH IN INCHES / ACCESSIBLE
EATD = X'-X"	EXIT ACCESS TRAVEL DISTANCE
CPOE = X'-X"	COMMON PATH OF EXIT TRAVEL DISTANCE

FIRE RATING LEGEND

1FP — 1FP	1 HOUR FIRE PARTITION (ASSUMED)
1FB — 1FB	1 HOUR FIRE BARRIER (ASSUMED)
2FP — 2FP	2 HOUR FIRE PARTITION (ASSUMED)
2FB — 2FB	2 HOUR FIRE BARRIER (ASSUMED)

CODE REVIEW

INTERNATIONAL BUILDING CODE

CHAPTER 3 USE AND OCCUPANCY CLASSIFICATION
GROUP: B - BUSINESS
USE: CLASSROOMS, LABORATORY, OFFICE
- BUILDING WILL NOT BE A MIXED USE FACILITY
- NO HAZARDOUS (H) OCCUPANCY WILL BE CREATED

CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREAS

OCCUPANCY: TYPE B
CONSTRUCTION TYPE: I-B

CHAPTER 6 TYPES OF CONSTRUCTION

CONSTRUCTION TYPE: I-B - NONCOMBUSTIBLE, PROTECTED

PRIMARY STRUCTURAL FRAME 2 HR
EXTERIOR BEARING WALLS 2 HR
INTERIOR BEARING WALLS 2 HR
NONBEARING EXTERIOR WALLS 0 HR (Per IBC 2015 § 602)
NONBEARING INTERIOR WALLS 0 HR
FLOOR CONSTRUCTION 2 HR FB
ROOF CONSTRUCTION 1 HR
FIRE WALLS 3 HR
CORRIDORS 1 HR FP UNO
EXIT STAIRWAY ENCLOSURES 1 HR OR 2 HR FB AS NOTED

CHAPTER 9 FIRE PROTECTION
BUILDING IS NOT SPRINKLERED

2015 INTERNATIONAL EXISTING BUILDING CODE:
CLASSIFICATION OF WORK: LEVEL 2 ALTERATIONS

OCCUPANCY CLASSIFICATION: B - Business

CONSTRUCTION CLASSIFICATION: I-B

FIRE PROTECTION SYSTEMS:

SPRINKLER SYSTEM	NO
STANDPIPE SYSTEM	YES (EXISTING)
FIRE ALARM SYSTEM	YES (EXISTING)

CHAPTER 5 CLASSIFICATION OF WORK

REPAIRS:

REPAIRS INCLUDE THE RECONSTRUCTION OR RENEWAL OF ANY PART OF AN EXISTING BUILDING FOR THE PURPOSE OF ITS MAINTENANCE OR TO CORRECT DAMAGE

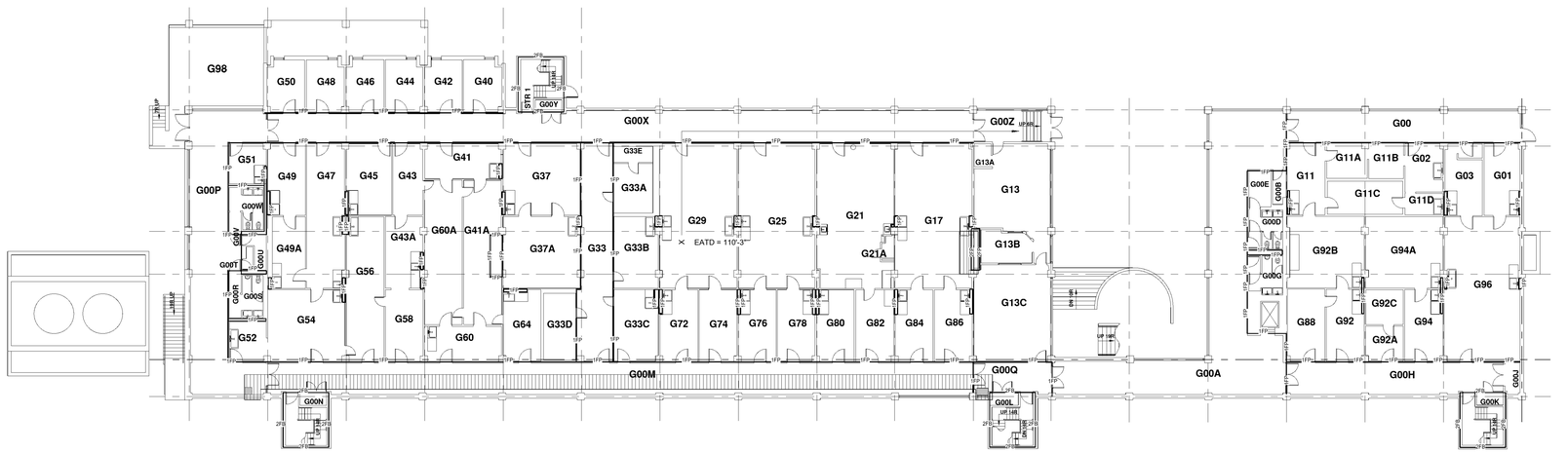
ALTERATIONS:

LEVEL 1: LEVEL 1 ALTERATIONS INCLUDE THE REMOVAL AND REPLACEMENT OR THE COVERING OF EXISTING MATERIALS, ELEMENTS, EQUIPMENT, OR FIXTURES USING NEW MATERIALS, ELEMENTS, EQUIPMENT, OR FIXTURES THAT SERVE THE SAME PURPOSE. LEVEL 1 ALTERATIONS SHALL COMPLY WITH THE PROVISIONS OF CHAPTER 7.

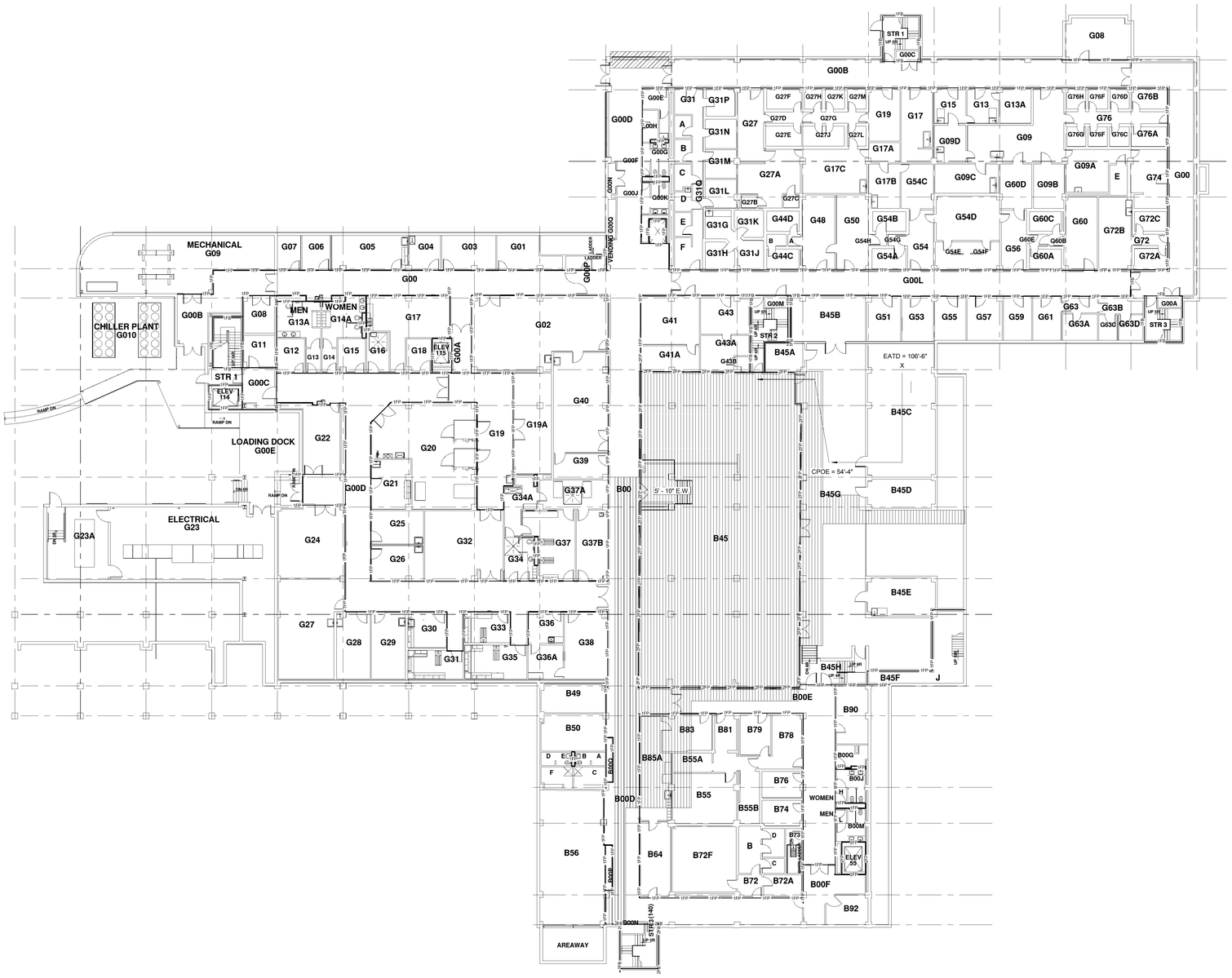
LEVEL 2: LEVEL 2 ALTERATIONS INCLUDE THE RECONFIGURATION OF SPACE, THE ADDITION OR ELIMINATION OF ANY DOOR OR WINDOW, THE RECONFIGURATION OR EXTENSION OF ANY SYSTEM, OR THE INSTALLATION OF ANY ADDITIONAL EQUIPMENT. LEVEL 2 ALTERATIONS SHALL COMPLY WITH THE PROVISIONS OF CHAPTER 7 FOR LEVEL 1 ALTERATIONS AS WELL AS THE PROVISIONS OF CHAPTER 8.

2015 EXISTING BUILDING CODE OF NYS:

CLASSIFICATION OF WORK (SEE CODE COMPLIANCE LEGEND AND PLANS)



2 GROUND FLOOR PLAN - CODE COMPLIANCE PLAN
1/16" = 1'-0"



1 BASEMENT FLOOR PLAN - CODE COMPLIANCE PLAN
1/16" = 1'-0"

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SCIENCE III - CHILLER PLANT
BINGHAMTON UNIVERSITY

REGISTERED ARCHITECT — RAY A. GAGARIN — 023302 — STATE OF NEW YORK

REVISIONS

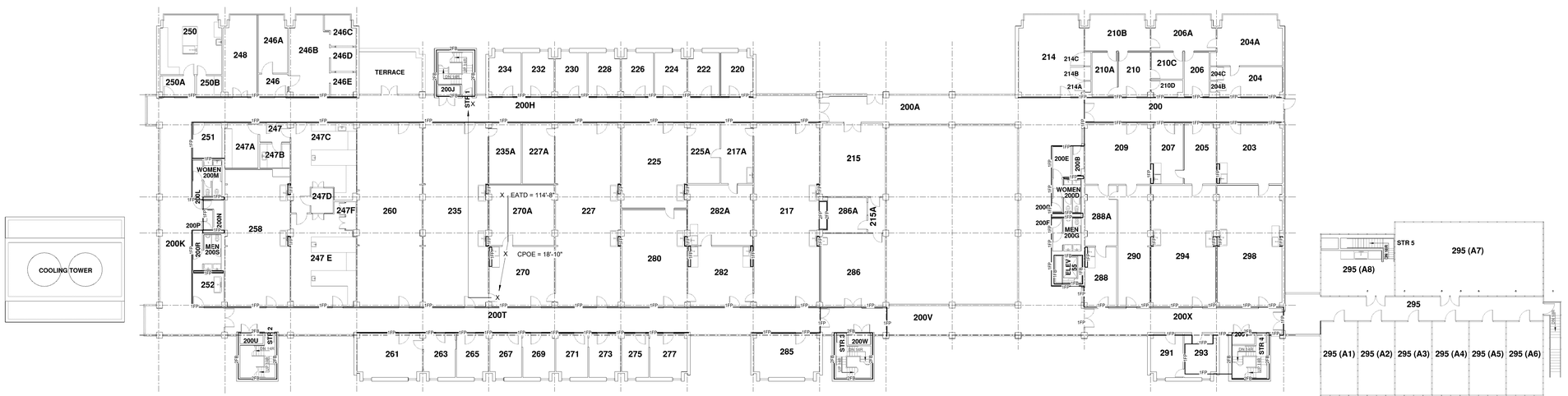
No.	Date	By	Description

DRAWING TITLE
CODE COMPLIANCE PLANS

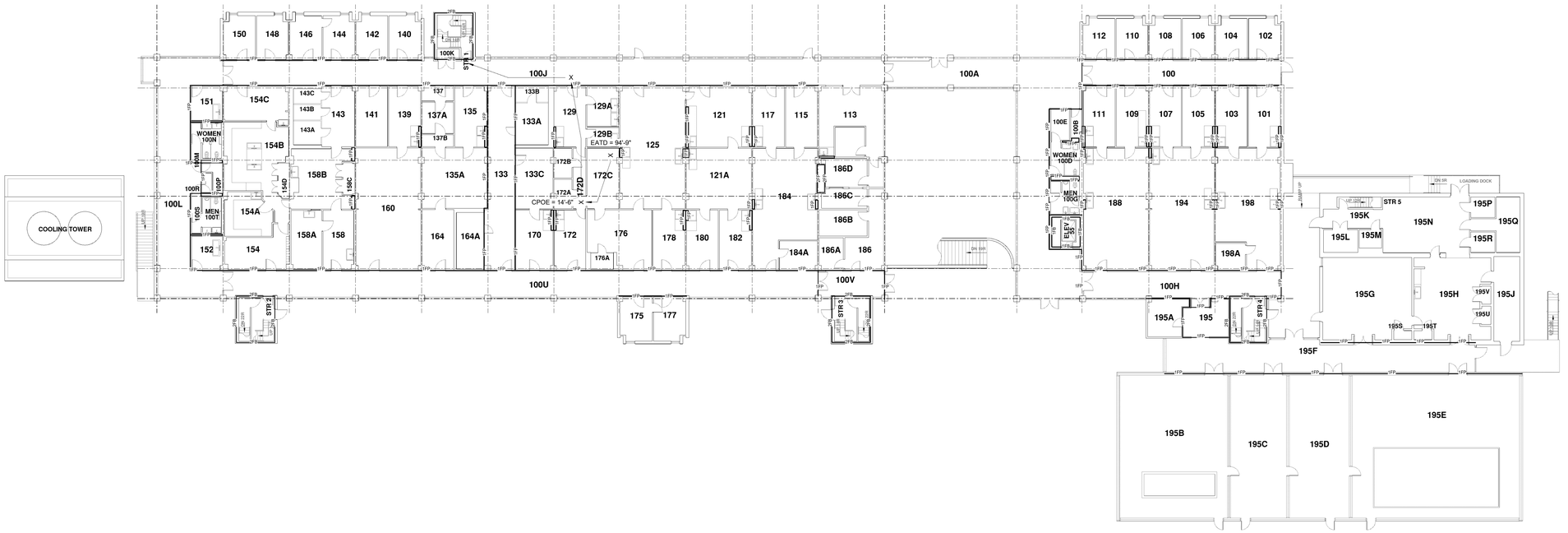
DRAWING NO.		
G001	Drawn By:	DM
	Checked By:	RA
	Project Mgr:	MDS
	SUCF Project No:	071018
	M/E Project No:	170425

ISSUE DATE:
1/18/2019
STATUS:
BID DOCUMENTS

3 THIRD FLOOR CODE COMPLIANCE PLAN
1/16" = 1'-0"



2 SECOND FLOOR CODE COMPLIANCE PLAN
1/16" = 1'-0"



1 FIRST FLOOR CODE COMPLIANCE PLAN
1/16" = 1'-0"

SCIENCE COMPLEX KEYPLAN:

CODE REVIEW LEGEND

EATD = X'-X"	EXIT ACCESS TRAVEL DISTANCE
CPOE = X'-X"	COMMON PATH OF EXIT TRAVEL DISTANCE

FIRE RATING LEGEND

1FP—1FP	1 HOUR FIRE PARTITION (ASSUMED)
1FB—1FB	1 HOUR FIRE BARRIER (ASSUMED)
2FP—2FP	2 HOUR FIRE PARTITION (ASSUMED)
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REGISTERED ARCHITECT
ROHIT AGGARWAL
029203
STATE OF NEW YORK

REVISIONS

No.	Date	By	Description

DRAWING TITLE
CODE COMPLIANCE PLANS - CONTINUED

DRAWING NO.
G002

Drawn By:	DM
Checked By:	RA
Project Mgr:	MDS
SUCF Project No:	071018
M/E Project No:	170425

ISSUE DATE:
1/18/2019
STATUS:
BID DOCUMENTS

1 PARTIAL CAMPUS SITE PLAN
1/32" = 1'-0"

NORTH
0 16' 32' 64'

STAGING GENERAL NOTES:

A. THE CONTRACTOR SHALL, AT ALL TIMES, KEEP ACCESS ROUTES AND STAGING AREAS CLEAN OF DEBRIS AND OTHER OBSTRUCTIONS RESULTING FROM THE WORK.

B. THE CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND PROVIDE STAGING LOCATION PLAN FOR USE OF STORAGE CONTAINERS, ETC. FOR REVIEW PRIOR TO MOBILIZATION AND AS PER SPECIFICATIONS. REFER TO SPECIFICATIONS FOR SAFETY AND OPERATING PROCEDURES, REPORTS, CERTIFICATES AND INSPECTION REQUIREMENTS FOR PROPOSED EQUIPMENT AND MACHINERY. REVIEW AND COORDINATE EQUIPMENT LOCATIONS WITH EXISTING UNDERGROUND UTILITIES. VERIFY EXACT UTILITY LOCATIONS PRIOR TO SUBMISSION OF MOBILIZATION PLANS.

C. PRIOR TO PER MORNING ANY REMOVALS OR CONSTRUCTION THAT IMPAIRS FREE EGRESS FROM EXISTING BUILDING EXITS FROM THE BUILDINGS, COMPLETE THE INSTALLATION OF TEMPORARY FENCING AND PARTITIONS. INSTALL TEMPORARY EGRESS PATHS AROUND WORK AREAS THAT COMPLY WITH THE EXISTING BUILDING CODE OF N.Y.S. CHAPTER 14, CONSTRUCTION SAFEGUARDS.

D. THE CONTRACTOR SHALL COORDINATE WITH THE CAMPUS FOR SHUT DOWN OF THE BUILDINGS HVAC FRESH AIR INTAKES DURING WORK AND WHEN INVOLVING SUSTAINED TRUCK AND EQUIPMENT IDLING.

E. THE CONTRACTOR SHALL RESTORE EXISTING GRASS AREAS WITH TOPSOIL PER THE SPECIFICATIONS AND RESTORE PAVEMENT WALKS AND DRIVES (WHETHER CONCRETE OR ASPHALT) TO ORIGINAL CONDITION PRIOR TO COMPLETION OF PROJECT. PHOTO DOCUMENT THE EXISTING CONDITIONS PER SPECIFICATIONS AND SUBMIT TO ENGINEER AND OWNER FOR REVIEW.

F. THE CONTRACTOR SHALL AT ALL TIMES, PROTECT EXISTING TREES (CANOPY & ROOTS) AND TREE BEDS INCLUDING MULCH FROM CONSTRUCTION ACTIVITIES THROUGHOUT THE PROJECT. THE METHOD OF PROTECTION FACILITIES SHALL BE SUBMITTED PRIOR TO MOBILIZATION. THE INSTALLATION AND MAINTENANCE OF PROTECTION FACILITIES AND THE REMOVAL BY THE CONTRACTOR AT THE COMPLETION OF PROJECT SHALL BE APPROVED BY AND COORDINATED WITH THE OWNER.

G. DUMPSTERS SHALL BE MAINTAINED ON PAVEMENT SURFACES ONLY. LOCATING DUMPSTERS ON GRASS AREAS IS NOT PERMITTED.

H. ALL DRIVE AND WALKWAYS SHALL HAVE PROTECTION WITH CRANE PADS PROVIDED AT ALL LOCATIONS THAT ARE SUBJECT TO VEHICLE AND EQUIPMENT TRAFFIC WITHIN THE PROJECT WORK AREAS.

I. ALL MECHANICAL SYSTEMS OPENINGS SHALL BE COVERED TIGHTLY WITH FIRE RETARDANT 6 MIL POLY IN CONSTRUCTION AREAS.

J. WHERE USING EXISTING DOORS AS A MEANS OF ACCESS/EXIT FROM THE CONSTRUCTION AREAS, PROVIDE A 6 MIL POLY ON THE ROOM SIDE OF THE DOOR.

K. RESTORE AND CLEAN PERMANENT FACILITIES UPON REMOVAL OF TEMPORARY CONSTRUCTION.

L. CONTRACTOR SHALL SUPPLY TEMPORARY BALLASTED CHAINLINK FENCING AT ALL RIGGING LOCATIONS AND DUMPSTER LOCATIONS. FINAL LAYOUTS AND LOCATIONS SHALL BE COORDINATED WITH THE CAMPUS PRIOR TO INSTALLATION. ONCE RIGGING OF EQUIPMENT INTO PLACE HAS BEEN COMPLETED, ALL TEMPORARY FENCING SHALL BE REMOVED.

DRAWING NOTES: ⊙

1 THE INDICATED AREA SHALL BE USED FOR ACCESS AND RIGGING OF THE PROPOSED CHILLER THROUGH THE WINDOW AS INDICATED ON THE ARCHITECTURAL MECHANICAL DRAWINGS. PROVIDE STONE FILL TO PROVIDE A TEMPORARY ACCESS ROAD TO ALLOW A TRUCK, LIFT AND ASSOCIATED EQUIPMENT ACCESS TO THE WINDOW AREA FOR RIGGING OF THE CHILLER. PROVIDE TEMPORARY PROTECTION OF THE EXISTING CONCRETE CAST PLANKS.

2 ONCE THE CHILLER RIGGING HAS BEEN COMPLETED, THE EXISTING AREA SHALL BE RESTORED TO EXISTING CONDITIONS. REMOVE ALL TEMPORARY ACCESS ROAD COMPONENTS AND PROVIDE TOP SOIL AND GRASS SEED TO RESTORE TO THE EXISTING CONDITIONS.

3 POTENTIAL LOCATION FOR RIGGING OF THE NEW COOLING TOWER SUPPORT STEEL AND EQUIPMENT PIPING TO THE ROOF. USE OF THE LOCATION SHALL BE COORDINATED WITH THE CAMPUS AND ALL WORK DONE DURING OFF HOURS. ALL LIFTING/RIGGING SHALL BE DONE WHILE THE BUILDING IS NOT OCCUPIED.

4 THE CONTRACTOR SHALL COORDINATE RIGGING OF THE NEW COOLING TOWERS AND ASSOCIATED COMPONENTS TO THE ROOF. RIGGING OF THE COOLING TOWERS SHALL BE DONE UTILIZING A HELICOPTER LIFT TO THE ROOF. THE LIFTING OF THE COOLING TOWERS SHALL BE PERFORMED DURING OFF HOURS WHEN THE BUILDING IS NOT IN USE. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED TEMPORARY PROTECTION, TRAFFIC CONTROLS, ETC. REQUIRED FOR THE RIGGING OF THE COOLING TOWERS TO THE ROOF. ALL WORK SHALL BE COORDINATED WITH THE CAMPUS.

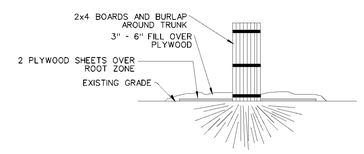
5 THE INDICATED PARKING LOT SHALL BE UTILIZED DURING THE COOLING TOWER HELICOPTER LIFT TO THE SCIENCE III ROOF. THE COOLING TOWERS SHALL BE TRUCKED TO THE SITE ON THE DAY OF THE HELICOPTER LIFT AND STAGED IN THE PARKING LOT FOR THE LIFT. ALL WORK AND ACCESS SHALL BE COORDINATED WITH THE CAMPUS.

STAGING LEGEND

—X—X—X— POST DRIVEN CHAIN LINK FENCE PROTECTION AT STAGING AREA

—o—o—o— BALLASTED CHAIN LINK FENCE AT WORK AREAS

EXISTING GRASS AREA FOR GRADE, TOPSOIL RESTORATION AND SOD.



2 TREE PROTECTION PLAN
NTS

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STATE OF NEW YORK — MARK D. STEPHENS — 075752 — LICENSED PROFESSIONAL ENGINEER

REVISIONS

No.	Date	By	Description

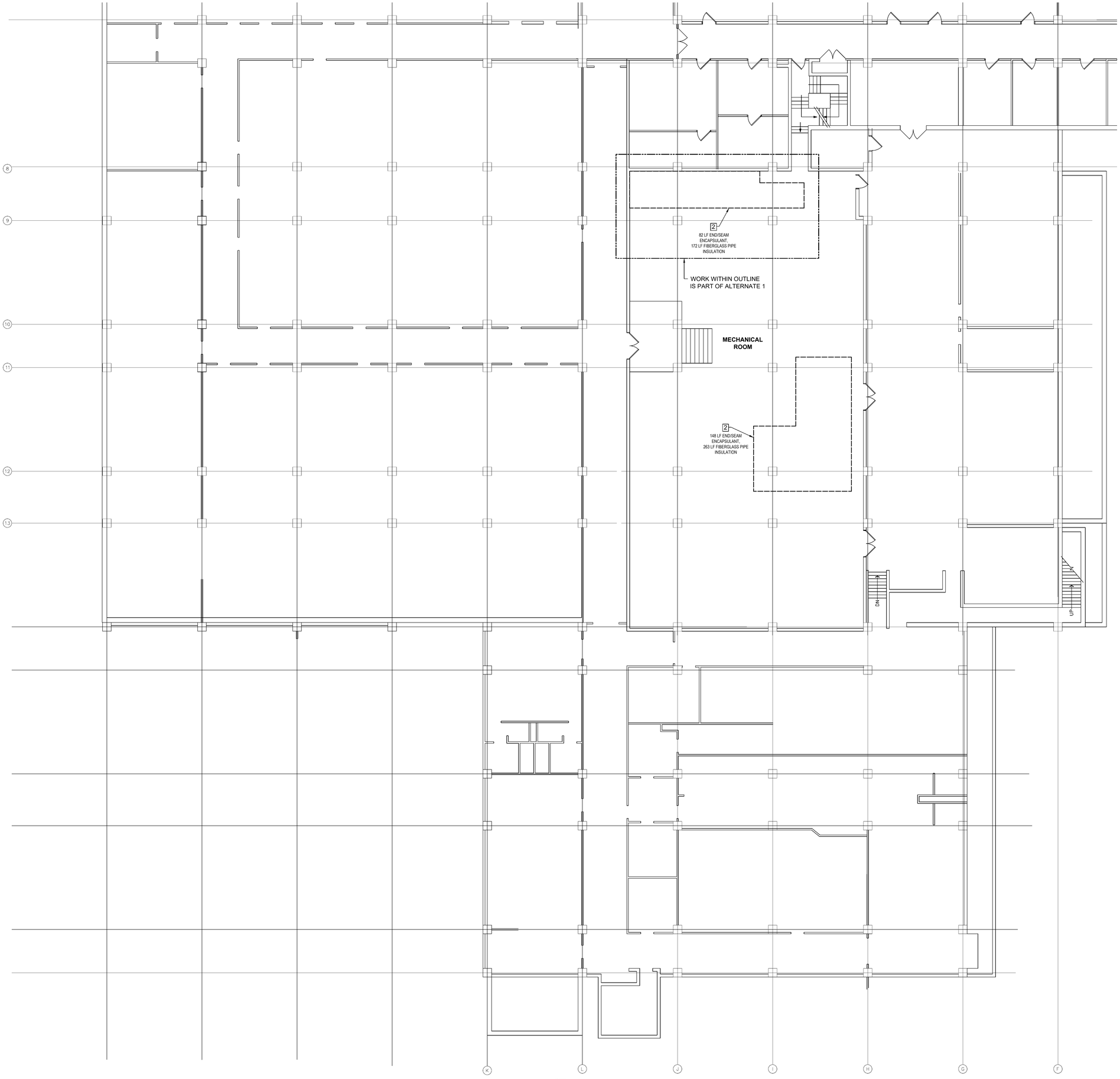
DRAWING TITLE
STAGING/RIGGING PLAN

DRAWING NO. G003

Drawn By:	DLT
Checked By:	MDS
Project Mgr:	MDS
Project No:	071018
M/E Project No:	170425

ISSUE DATE: **01/18/2019**

STATUS: **BID DOCUMENTS**



1 BASEMENT FLOOR PLAN - ABATEMENT
1/8" = 1'-0"

NORTH
0 4' 8' 16'

GENERAL DRAWING NOTES:

A. THE CONTRACTOR SHALL PERFORM ALL WORK, INCLUDING AREA CONTAINMENT MEASURES AND REMOVAL, IN STRICT ACCORDANCE WITH: THE PROJECT SPECIFICATION, ALL FEDERAL, STATE AND LOCAL REGULATIONS, AND ANY APPROPRIATE APPLICABLE VARIANCES AND SITE-SPECIFIC VARIANCES. APPLICABLE REGULATIONS INCLUDE, BUT ARE NOT LIMITED TO: OSHA 29 CFR 1926 SUBPART Z, 40 CFR PART 763 (AHERA), 40 CFR PART 61 SUBPART M (NESHAP STANDARD FOR DEMOLITION AND RENOVATION), AND NEW YORK STATE INDUSTRIAL CODE RULE 56.

B. AREAS UNDER ABATEMENT SHALL BE PROPERLY POSTED WITH WARNING SIGNS AND SECURED TO PREVENT UNAUTHORIZED ENTRIES.

C. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING THE WORK AREA IN A CLEAN AND SAFE CONDITION, PROVIDING TEMPORARY PROTECTION, PROTECTING BUILDING MATERIALS SCHEDULED TO REMAIN, AND TO PREVENT UNAUTHORIZED ACCESS DURING THE DURATION OF THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR THE CLEAN UP OF ALL CONTAINMENT WORK AREAS; SPECIFICALLY TAPE/ADHESIVES RESIDUE FROM ALL SURFACES. REPAIR OF DAMAGE CAUSED AS A RESULT OF INADEQUATE TEMPORARY PROTECTION OR CONTRACTOR ACTIVITIES, INCLUDING DAMAGE TO FINISHES RESULTING FROM CONTAINMENT MEASURES, WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

D. CONTRACTOR SHALL REFER TO THE ENTIRE SET OF CONTRACT DOCUMENTS FOR COORDINATION OF NOTES.

E. THE LOCATION OF ANY ON-SITE STORAGE OF MATERIALS, EQUIPMENT DUMPSTER/WASTE TRAILER AND DECONTAMINATION FACILITIES SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER OR THEIR CONSULTANT.

F. ALL ABATEMENT AND/OR REMOVAL OF ASBESTOS CONTAINING MATERIALS MUST PASS VISUAL INSPECTION AND CLEARANCE PROCEDURES PER 12NYCRR56 BEFORE GENERAL CONSTRUCTION WORK MAY COMMENCE.

G. A SITE SPECIFIC VARIANCE FOR THIS PROJECT HAS NOT BEEN APPLIED FOR. ANY VARIANCE APPLICATION PREPARED BY THE CONTRACTOR OR ITS AGENT MUST BE SUBMITTED TO THE OWNER FOR APPROVAL PRIOR TO SUBMISSION TO THE STATE OF NEW YORK DEPARTMENT OF LABOR ENGINEERING SERVICES FOR PROCESSING. THE OWNER SHALL BEAR NO ADDITIONAL COST AS A RESULT OF THE APPROVAL OF, THE DENIAL OF, AND/OR CONDITIONS SET FORTH WITHIN THE SITE SPECIFIC VARIANCE.

H. THE PROJECT MANUAL INCLUDES EXISTING HAZARDOUS MATERIAL INFORMATION FOR CONTRACTOR REFERENCE. THE CONTRACTOR SHALL MAINTAIN A COPY OF THE REPORT ON-SITE FOR THE DURATION OF THE PROJECT. QUANTITIES REPORTED WITHIN THE REPORT ARE APPROXIMATED.

I. IF DURING PROJECT WORK, A SUSPECT HAZARDOUS MATERIAL IS FOUND THAT WILL BE IMPACTED BY THE SCOPE OF WORK, AND WHICH HAS NOT BEEN TESTED AS DOCUMENTED IN THE PRE-RENOVATION INSPECTION REPORTS, THE CONTRACTOR SHALL CEASE OPERATIONS, AND NOTIFY THE CONSULTANT IMMEDIATELY.

J. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE OWNER'S REPRESENTATIVE REGARDING THE DE-ENERGIZING OF ALL DEVICES, EQUIPMENT, AND FIXTURES TO BE REMOVED PRIOR TO THE COMMENCEMENT OF ABATEMENT ACTIVITIES.

☐ KEYED ASBESTOS REMOVAL NOTES:

NOTE: NOT ALL REMOVAL NOTES ARE UTILIZED ON EVERY SHEET. REFERENCE SPECIFICATION 028213.

1 REMOVE AND PROPERLY DISPOSE OF THE ASBESTOS CONTAINING FLOOR TILE AND THE ASSOCIATED FLOOR TILE MASTIC COMPLETELY FROM A PORTION OF THE FLOOR TO FACILITATE FLOOR PENETRATIONS FOR PIPING. COORDINATE THE SIZE AND LOCATION WITH MECHANICAL PLANS.

2 REMOVE ALL END/SEAM ENCAPSULANT AND THE ASSOCIATED FIBERGLASS PIPE INSULATION TO FACILITATE ALL MECHANICAL WORK. THE END/SEAM ENCAPSULANT APPLIED TO THE ENDS AND SEAMS OF FIBERGLASS PIPE INSULATION ASSOCIATE WITH THE CHILLER UNIT AND THE PUMPS IS AN ASBESTOS CONTAINING MATERIAL. THE MATERIAL IS CONSIDERED AN EPA CATEGORY II NON-FRIABLE ASBESTOS CONTAINING MATERIAL, ITS REMOVAL IS CONSIDERED OSHA CLASS II ASBESTOS WORK. DURING PHASE IIA WORK AREA PREPARATION PROTECT ANY EXISTING FIBERGLASS PIPE INSULATIONS THAT ARE TO REMAIN PER ICR56-7.10.

◯ KEYED ASBESTOS AWARENESS NOTES:

NOTE: NOT ALL REMOVAL NOTES ARE UTILIZED ON EVERY SHEET.

1 THE BUILDING FOUNDATION WATERPROOFING TAR IS AN ASBESTOS CONTAINING MATERIAL. THE ABATEMENT OF THE WATERPROOFING TAR FOR PENETRATIONS OF NEW BURIED PIPING IS PLANNED AS PART OF THE SCIENCE II RENOVATION PROJECT.

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STATE OF NEW YORK
JOHN R. JOHNSON
065426
LICENSED PROFESSIONAL ENGINEER

REVISIONS

No.	Date	By	Description

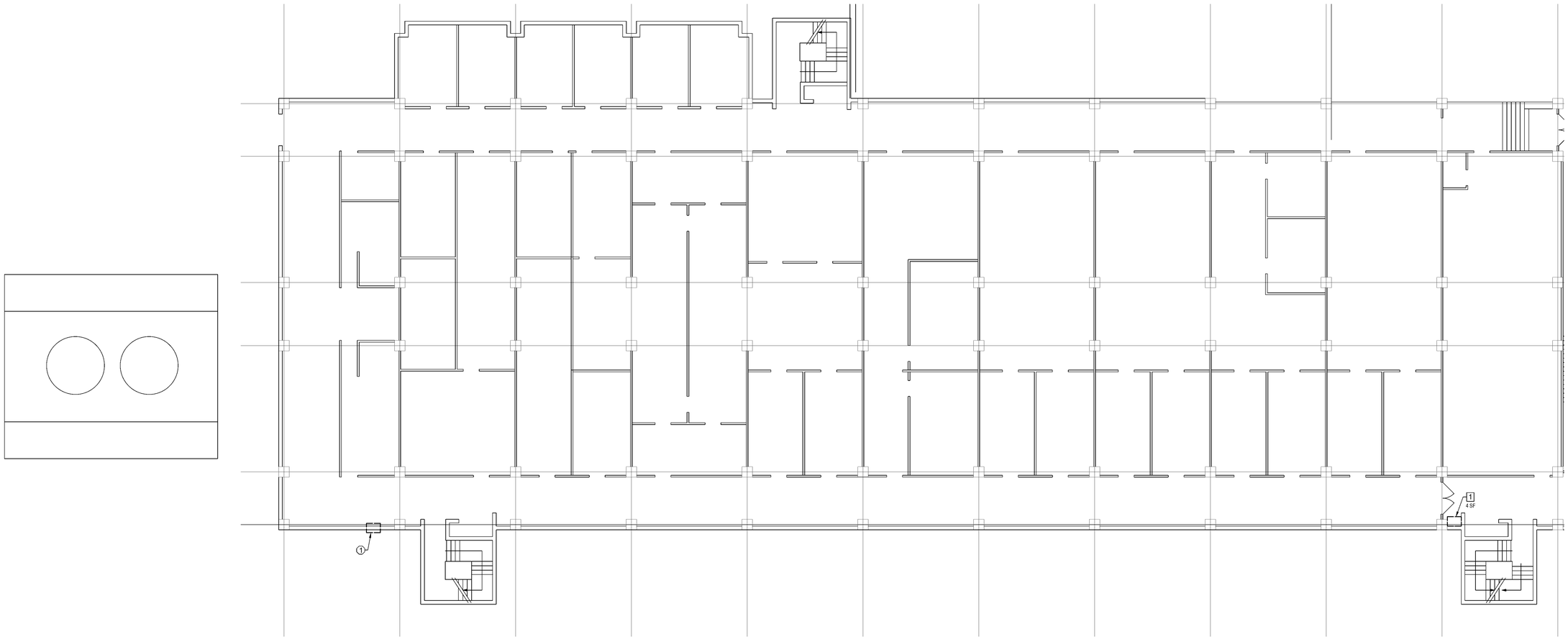
DRAWING TITLE
BASEMENT FLOOR PLAN - ABATEMENT

DRAWING NO.
H101

Drawn By:	EJR
Checked By:	JRP
Project Mgr:	MDS
SUCF Project No:	---
M/E Project No:	170425

ISSUE DATE:
01/18/2019

STATUS:
BID DOCUMENTS



1 GROUND FLOOR PLAN - ABATEMENT
1/8" = 1'-0"

NORTH
0 4' 8' 16'

GENERAL DRAWING NOTES:

A. THE CONTRACTOR SHALL PERFORM ALL WORK, INCLUDING AREA CONTAINMENT MEASURES AND REMOVAL, IN STRICT ACCORDANCE WITH: THE PROJECT SPECIFICATION, ALL FEDERAL, STATE AND LOCAL REGULATIONS, AND ANY APPROPRIATE APPLICABLE VARIANCES AND SITE-SPECIFIC VARIANCES. APPLICABLE REGULATIONS INCLUDE, BUT ARE NOT LIMITED TO: OSHA 29 CFR 1926 SUBPART Z, 40 CFR PART 763 (AHERA), 40 CFR PART 61 SUBPART M (NESHAP STANDARD FOR DEMOLITION AND RENOVATION), AND NEW YORK STATE INDUSTRIAL CODE RULE 56.

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D. CONTRACTOR SHALL REFER TO THE ENTIRE SET OF CONTRACT DOCUMENTS FOR COORDINATION OF NOTES.

E. THE LOCATION OF ANY ON-SITE STORAGE OF MATERIALS, EQUIPMENT DUMPSTER/WASTE TRAILER AND DECONTAMINATION FACILITIES SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER OR THEIR CONSULTANT.

F. ALL ABATEMENT AND/OR REMOVAL OF ASBESTOS CONTAINING MATERIALS MUST PASS VISUAL INSPECTION AND CLEARANCE PROCEDURES PER 12NYCRR56 BEFORE GENERAL CONSTRUCTION WORK MAY COMMENCE.

G. A SITE SPECIFIC VARIANCE FOR THIS PROJECT HAS NOT BEEN APPLIED FOR. ANY VARIANCE APPLICATION PREPARED BY THE CONTRACTOR OR ITS AGENT MUST BE SUBMITTED TO THE OWNER FOR APPROVAL PRIOR TO SUBMISSION TO THE STATE OF NEW YORK DEPARTMENT OF LABOR ENGINEERING SERVICES FOR PROCESSING. THE OWNER SHALL BEAR NO ADDITIONAL COST AS A RESULT OF THE APPROVAL OF, THE DENIAL OF, AND/OR CONDITIONS SET FORTH WITHIN THE SITE SPECIFIC VARIANCE.

H. THE PROJECT MANUAL INCLUDES EXISTING HAZARDOUS MATERIAL INFORMATION FOR CONTRACTOR REFERENCE. THE CONTRACTOR SHALL MAINTAIN A COPY OF THE REPORT ON-SITE FOR THE DURATION OF THE PROJECT. QUANTITIES REPORTED WITHIN THE REPORT ARE APPROXIMATED.

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☐ KEYED ASBESTOS REMOVAL NOTES:

NOTE: NOT ALL REMOVAL NOTES ARE UTILIZED ON EVERY SHEET.
REFERENCE SPECIFICATION 028213.

1 REMOVE AND PROPERLY DISPOSE OF THE ASBESTOS CONTAINING FLOOR TILE AND THE ASSOCIATED FLOOR TILE MASTIC COMPLETELY FROM A PORTION OF THE FLOOR TO FACILITATE FLOOR PENETRATIONS FOR PIPING. COORDINATE THE SIZE AND LOCATION WITH MECHANICAL PLANS.

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◯ KEYED ASBESTOS AWARENESS NOTES:

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SCIENCE III - CHILLER PLANT
BINGHAMTON UNIVERSITY

STATE OF NEW YORK
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REVISIONS

No.	Date	By	Description

DRAWING TITLE
GROUND FLOOR PLAN - ABATEMENT

DRAWING NO.
H102

Drawn By:	EJR
Checked By:	JRP
Project Mgr:	MDS
SUCF Project No:	---
M/E Project No:	170425

ISSUE DATE:
01/18/2019

STATUS:
BID DOCUMENTS

DESIGN DATA NOTES

1. GENERAL:

DESIGN PROVISIONS ..... 2017 NEW YORK STATE UNIFORM CODE (NYSUC)
INCORPORATING THE 2015 INTERNATIONAL BUILDING CODE (IBC)
RISK CATEGORY II
TERRAIN/EXPOSURE CATEGORY ..... B

2. CODE COMPLIANCE FOR EXISTING STRUCTURES:

DESIGN PROVISIONS ..... 2017 NEW YORK STATE UNIFORM CODE (NYSUC)
INCORPORATING THE 2015 INTERNATIONAL EXISTING BUILDING CODE (IEBC)

COMPLIANCE METHOD (IEBC) ..... WORK AREA

CLASSIFICATION OF WORK (IEBC) ..... LEVEL 2 ALTERATIONS

THE FOLLOWING GRAVITY LOAD CARRYING ELEMENTS HAVE BEEN EVALUATED BASED ON THE LIVE LOAD AND DEAD LOAD REQUIREMENTS DESCRIBED BELOW:
ROOF BEAMS, COLUMNS, FOOTINGS

EXISTING STRUCTURAL ELEMENTS RESISTING LATERAL LOADS ARE NO LESS CONFORMING TO THE PROVISIONS OF THE 2017 NYSUC WITH RESPECT TO EARTHQUAKE DESIGN THAN THEY WERE PRIOR TO THIS WORK. THEREFORE LATERAL LOADS HAVE NOT BEEN EVALUATED FOR THIS STRUCTURE.

3. LIVE LOADS:

EXISTING ROOF STRUCTURAL COMPONENTS IN THE AREA OF THE PROPOSED ROOF TOP EQUIPMENT HAVE BEEN CHECKED FOR THE UNIFORMLY DISTRIBUTED LIVE LOADS NOTED BELOW.

UNIFORMLY DISTRIBUTED LIVE LOADS:

ROOF:
- UNIFORM GROUND SNOW LOAD (P_g) ..... 40 psf
- UNIFORM FLAT-ROOF SNOW LOAD (P_f) ..... 28 psf
- SNOW EXPOSURE FACTOR (C_e) 1.0
- THERMAL FACTOR (C_t) 1.0
- IMPORTANCE FACTOR (I_s) 1.0
- RAIN LOAD (5.2 INCHES OF ACCUMULATION) ..... 28 psf
  - A CODE COMPLIANT SECONDARY DRAINAGE SYSTEM SHALL BE PROVIDED TO LIMIT THE ACCUMULATED DEPTH OF WATER TO THIS AMOUNT OR LESS.
- RAIN-ON-SNOW SURCHARGE LOAD ..... NA psf
- LIVE LOAD ON CATWALK ..... 40 psf

4. DEAD LOADS:

SEE PLAN FOR LOCATIONS AND WEIGHTS OF COOLING TOWERS.
- DUNNAGE FRAMING WITH CATWALK ..... 20 psf

5. SEISMIC LOADS:

- SITE CLASS: ..... D (DEFAULT)
- SHORT-PERIOD DESIGN ACCELERATION (S_{DS}): 0.136
- ONE-SECOND DESIGN ACCELERATION (S_{D1}): 0.091
- SHORT PERIOD MAPPED SPECTRAL RESPONSE (S_S): 0.128
- ONE-SECOND MAPPED SPECTRAL RESPONSE (S1): 0.057
- SEISMIC DESIGN CATEGORY: ..... B
- IMPORTANCE FACTOR (I_E): 1.0
- SYSTEM COEFFICIENT R (NORTH-SOUTH): 3.0
- SYSTEM COEFFICIENT R (EAST-WEST): 3.0
- ANALYSIS PROCEDURE: ..... ELFP
- SEISMIC RESPONSE COEFFICIENT (C_S): 0.045
- SEISMIC DESIGN BASE SHEAR (V): DUNNAGE WITH COOLING TOWERS ..... 2 KIPS

6. MAIN WIND FORCE RESISTING SYSTEM HAS BEEN DESIGNED ACCORDING TO ASCE 7-10, AS REFERENCED IN THE 2015 INTERNATIONAL BUILDING CODE (IBC) SECTION 1609.1 USING THE FOLLOWING PROCEDURE:

THE DIRECTIONAL PROCEDURE PART 2 (ASCE 7-10, SECTION 27.5)

- ULTIMATE WIND SPEED (3 SECOND GUST) (Vult): ..... 115 mph
- NOMINAL WIND SPEED (3 SECOND GUST) (Vasd): ..... 89 mph
- HEIGHT OF MAIN ROOF: ..... 5 feet
- TOPOGRAPHIC FACTOR (Kzt): 1.0
- ENCLOSURE CLASSIFICATION: ..... OPEN
- INTERNAL PRESSURE COEFFICIENT (GCpi): ..... NA

SEE 1/S101 AND 2/S101 FOR ADDITIONAL WIND LOAD DATA FOR ROOFS, OVERHANGS, COMPONENTS, AND CLADDING. NET UPLIFT LOAD ON ROOF FRAMING COMPONENTS SHALL BE DETERMINED BY DEDUCTING 10 psf DEAD LOAD FROM THE TABULATED ROOF WIND LOADS FOR COMPONENTS AND CLADDING. NET UPLIFT VALUE SHALL BE A MINIMUM OF 10 psf.

7. STRUCTURAL MATERIAL STRENGTHS:

STRUCTURAL AND MISCELLANEOUS STEEL:

- ROLLED STEEL W SHAPES ..... - ASTM A 992
- ROLLED STEEL PLATES, BARS, AND ANGLES ..... - ASTM A 36 OR ASTM A 572, GRADE 50

FOR CONNECTIONS, PROVIDE HIGHER GRADE AS REQUIRED FOR CAPACITY.

GENERAL NOTES

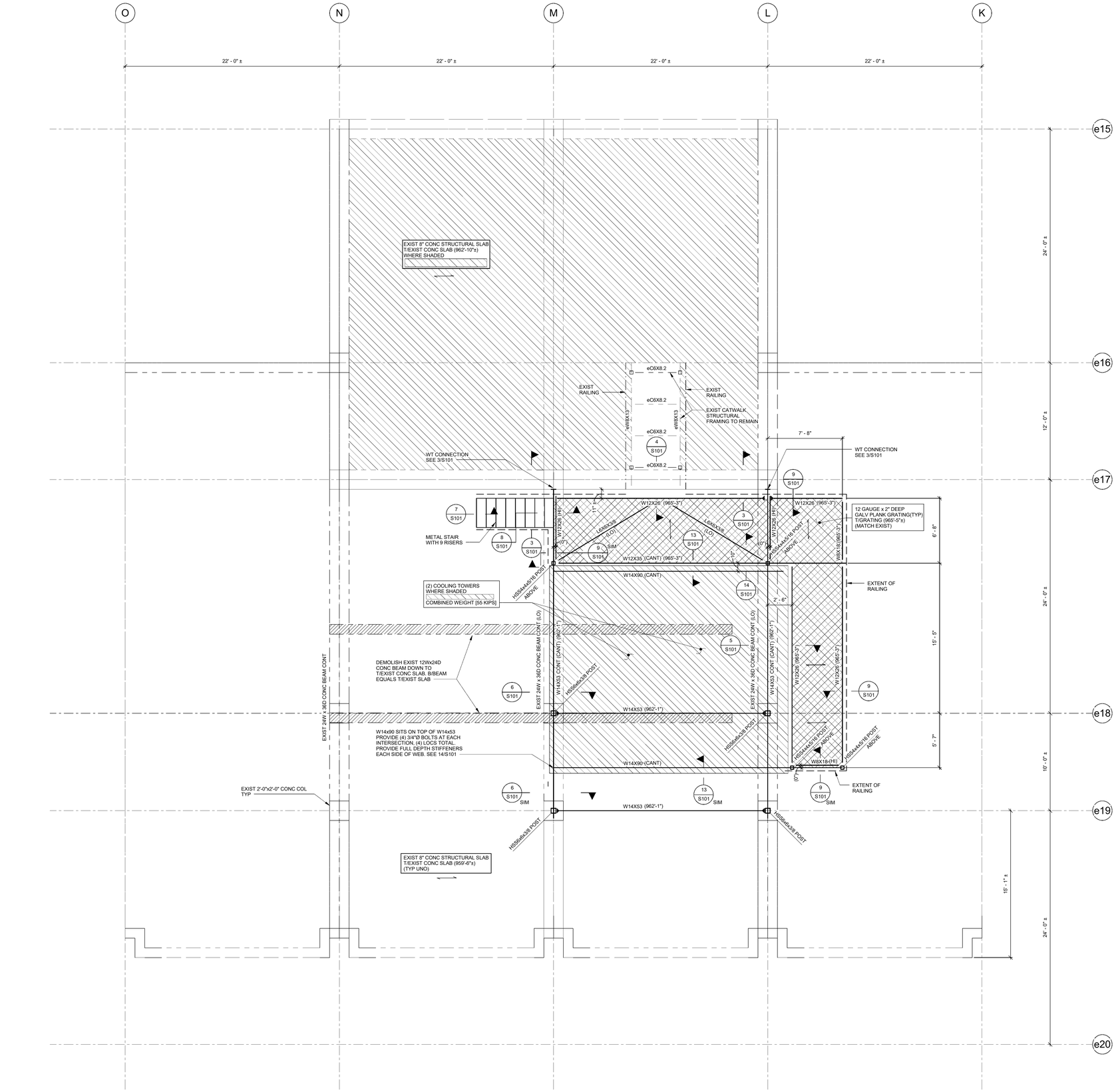
1. DIMENSIONS TO, OF, AND IN EXISTING STRUCTURE SHALL BE VERIFIED IN FIELD BY CONTRACTOR.
2. DO NOT SCALE DRAWINGS. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES IN DIMENSIONS BETWEEN EXISTING CONDITIONS AND/OR ARCHITECTURAL DRAWINGS AND THE STRUCTURAL DRAWINGS.
3. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
4. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE INDICATED.
5. THE NOTES ON THIS DRAWING ARE TYPICAL UNLESS OTHERWISE INDICATED.
6. CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING OF PROPOSED DEVIATIONS OR SUBSTITUTIONS FROM DIMENSIONS, MATERIALS, OR EQUIPMENT SHOWN ON THE DRAWINGS AND MAKE ONLY THOSE DEVIATIONS OR SUBSTITUTIONS ACCEPTED BY ENGINEER.
7. CONTRACTOR SHALL DETERMINE EXACT LOCATIONS OF EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR DAMAGES WHICH MIGHT OCCUR AS A RESULT OF FAILURE TO EXACTLY LOCATE AND PRESERVE EXISTING UTILITIES.
8. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY.

STRUCTURAL STEEL NOTES

1. DO NOT PLACE HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
2. WHERE FILLET WELD SIZES ARE NOT SPECIFICALLY NOTED, THE FABRICATOR SHALL DETAIL A MINIMUM SIZE FILLET WELD IN ACCORDANCE WITH AWS STANDARDS. THE ACTUAL SIZES SHALL BE SHOWN ON THE SHOP DRAWINGS.
3. PROVIDE HOT DIP GALVANIZED FASTENERS FOR GALVANIZED FRAMING CONNECTIONS.
4. GALVANIZING WHERE NOTED IN THE DRAWINGS SHALL BE HOT-DIP GALVANIZING IN ACCORDANCE WITH ASTM A123, UNLESS NOTED OTHERWISE.

ABBREVIATIONS LEGEND

ADJ	ADJACENT	EXT	EXTERIOR	PE	PROFESSIONAL ENGINEER
L	ANGLE	EOD	EDGE OF DECK	PERP	PERPENDICULAR
APPROX	APPROXIMATE	EOS	EDGE OF SLAB	PLF	POUNDS PER LINEAL FOOT
ARCH	ARCHITECT ARCHITECTURAL	FD	FLOOR DRAIN FOUNDATION	PSF	POUNDS PER SQUARE FOOT
B/	BOTTOM OF	FDN FTG	FOOTING		
BLDG	BUILDING	GA	GAUGE	PSI	POUNDS PER SQUARE INCH
BRG	BEARING	GALV	GALVANIZED		
BP	BASE PLATE	HSS	HOLLOW STEEL SECTION	PCF	POUNDS PER CUBIC FOOT
CANT	CANTILEVER	HORIZ	HORIZONTAL		
CJ	CONTROL, CONTRACTION, CONSTRUCTION JOINT	HI HP HVAC	HIGH HIGH POINT HEATING/VENTILATING/	PC PSL	PRECAST PARALLEL STRAND LUMBER
CMU	CONCRETE MASONRY UNIT(S)	INFO INT	INFORMATION INTERIOR	R RD	RADIUS ROOF DRAIN
CONC	CONCRETE	INV	INVERT	RDP	REGISTERED DESIGN PROFESSIONAL
CONT	CONTINUOUS	K	KIPS		
COL	COLUMN	LG	LONG	REQD	REQUIRED
CFMF	COLD-FORMED METAL FRAMING	LLH LLV	LONG LEG HORIZONTAL LONG LEG VERTICAL	REINF	REINFORCING OR REINFORCED
COORD	COORDINATE	LOC	LOCATION	REV	REVISION OR REVISED
DIA	DIAMETER	LW	LIGHT WEIGHT	RO	ROUGH OPENING
DIM	DIMENSION	LVL	LAMINATED VENEER LUMBER	SIM	SIMILAR
DN	DOWN			SPA	SPACE
do	DITTO	LO	LOW	STD	STANDARD
DWG	DRAWING	MANUF	MANUFACTURER	SF	SQUARE FEET
EA	EACH	MAX	MAXIMUM	SS	STAINLESS STEEL
EF	EACH FACE	MECH	MECHANICAL	STL	STEEL
EJ	EXPANSION JOINT	MIN	MINIMUM	SQ	SQUARE
ELEC	ELECTRICAL	MISC	MISCELLANEOUS	T/	TOP OF
EL	ELEVATION	MO	MASONRY OPENING	TYP	TYPICAL
ELEV	ELEVATOR	NA	NOT APPLICABLE	UNO	UNLESS NOTED OTHERWISE
ENGR	ENGINEER	NIC	NOT IN CONTRACT		
EMBD	EMBEDDED	NOM	NOMINAL	VERT	VERTICAL
EQ	EQUAL	NW	NORMAL WEIGHT	VIF	VERIFY IN FIELD
EQUIP	EQUIPMENT	OC	ON CENTER	W/	WITH
ES	EACH SIDE	OD	OUTSIDE DIAMETER	WP	WORK POINT
EW	EACH WAY	OPNG	OPENING	WWR	WELDED WIRE REINFORCEMENT
EXIST	EXISTING	OPP	OPPOSITE		
		PAF	POWDER ACTUATED FASTENER	WCJ	WALL CONTROL OR CONSTRUCTION JOINT



BEAM SIZE ("do" INDICATES SAME AS ADJACENT, PARALLEL BEAM)
W14x22 (±)
T/STEEL ELEVATION (IF DIFFERENT THAN NOTED ON FRAMING PLAN)
MOMENT CONNECTION

STEEL BEAM LEGEND

NOT TO SCALE

NOTES:
1. DO NOT CAMBER BEAMS UNLESS A VALUE FOR CAMBER IS SPECIFIED.
2. REFER TO THE DETAILS AND SPECIFICATION FOR CONNECTION DESIGN CRITERIA WHERE LOADS AND MOMENTS ARE NOT SHOWN.

1/S100 DUNNAGE FRAMING PLAN

1/4" = 1'-0"

NOTES:
1. TOP OF DUNNAGE STEEL (963'-3"), TYPICAL UNLESS NOTED OTHERWISE.
2. TOP OF CATWALK STEEL (965'-3" +/-).
3. TOP OF EXISTING CATWALK STEEL (965'-4" +/-).
4. COORDINATE SIZE AND LOCATION OF MECHANICAL UNITS WITH MECHANICAL AND ARCHITECTURAL DRAWINGS.
5. NOTIFY ENGINEER IF ACTUAL WEIGHTS OF MECHANICAL UNITS EXCEED WEIGHTS ON PLAN. COORDINATE EXACT DIMENSIONS AND LOCATIONS WITH THE MECHANICAL DRAWINGS AND UNITS SUPPLIED.
6. HOT DIP GALVANIZE ALL FRAMING AND CONNECTION COMPONENTS, INCLUDING RAILINGS, STAIRS, AND CATWALK PLANKS.
7. COOLING TOWER BASE FRAMING NOT SHOWN IN PLAN. SEE 12/S101.
8. WELD HSS4x4x5/16 POSTS ALL AROUND AT BOTTOM TO SUPPORTING BEAMS. 'ABOVE' INDICATES POSTS BEAR ON W-BEAMS BELOW.

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REVISIONS

No.	Date	By	Description

DRAWING TITLE
GENERAL NOTES AND FRAMING PLAN

DRAWING NO. S100

Drawn By: KMR
Checked By: CNL
Project Mgr:
SUCF Project No:
M/E Project No: 170425

ISSUE DATE:
JANUARY 18, 2019

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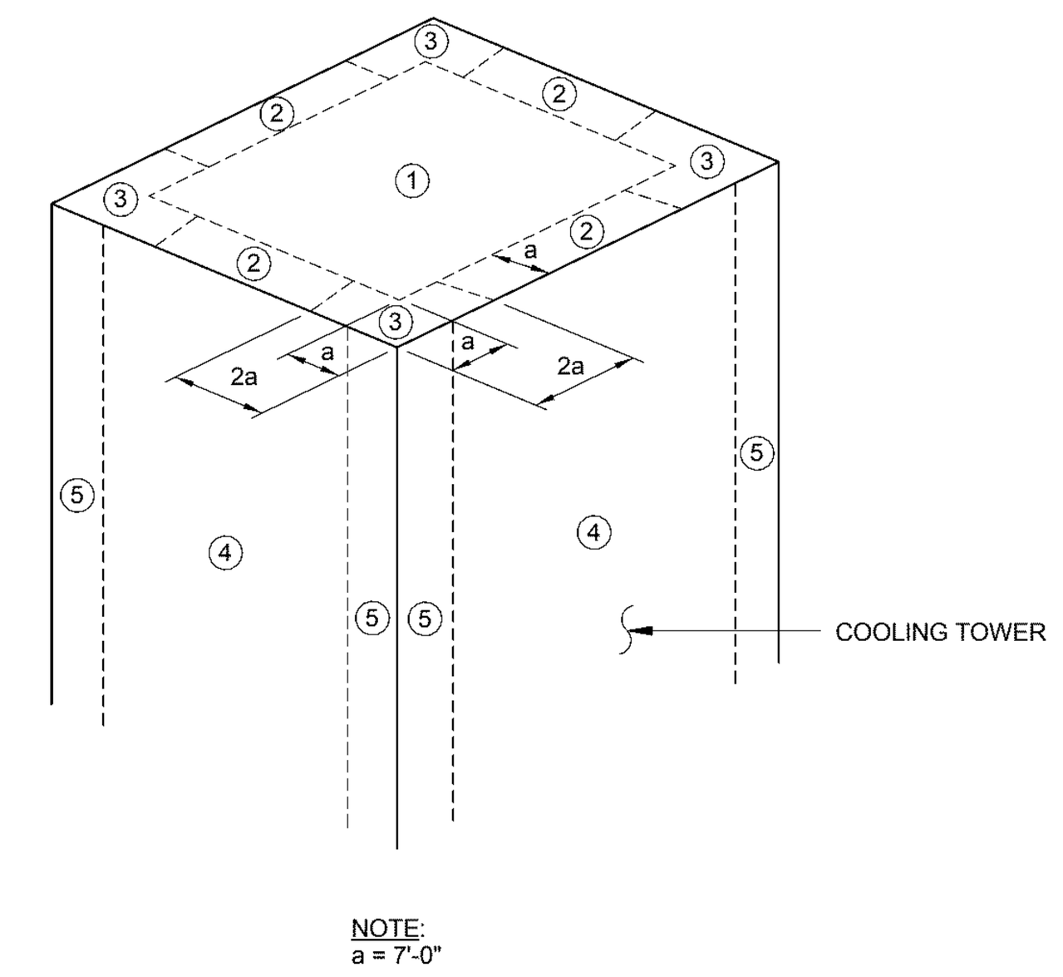
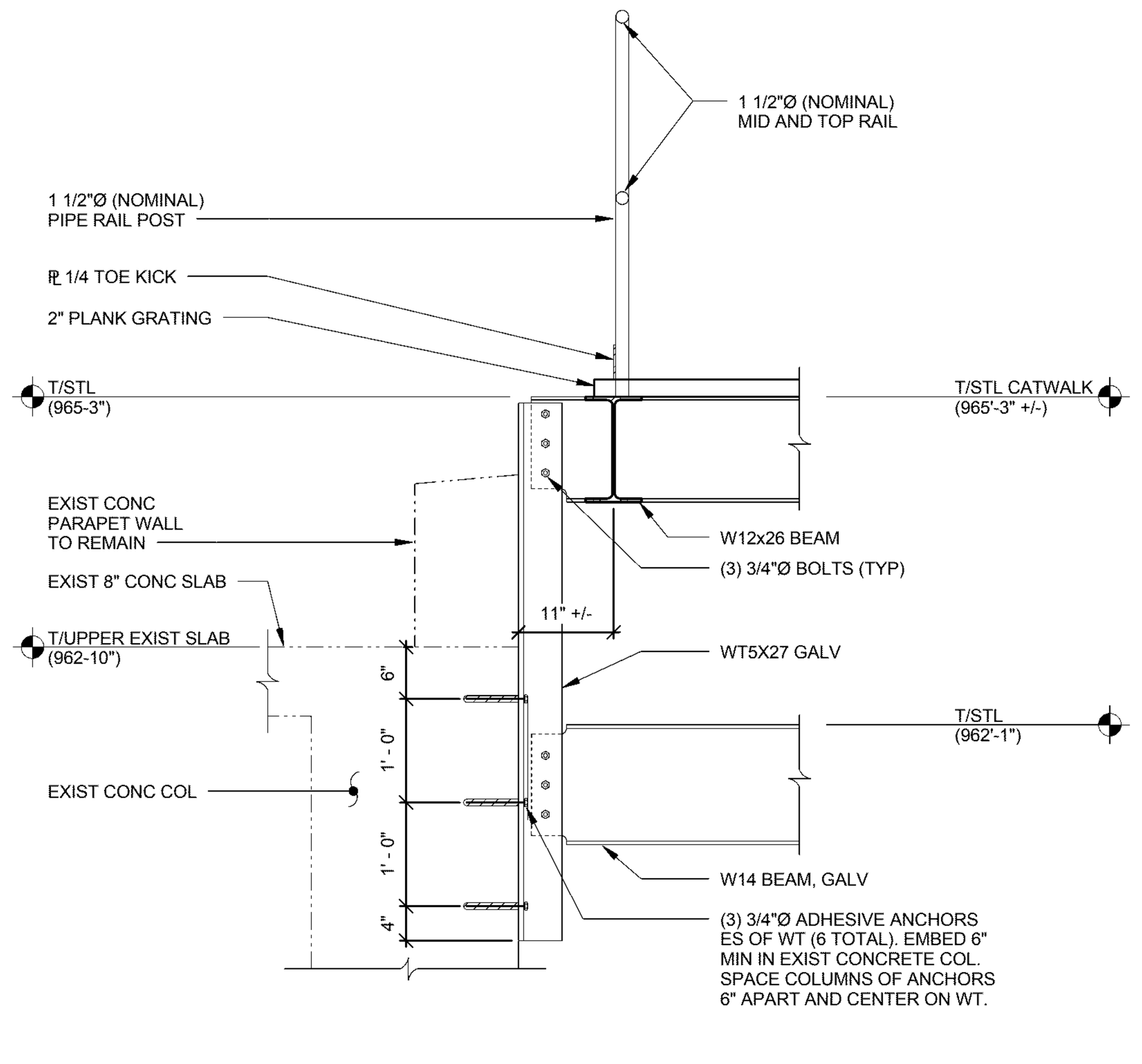


1 S101
COMPONENTS AND CLADDING WIND PRESSURE ZONE DESIGNATION
NOT TO SCALE

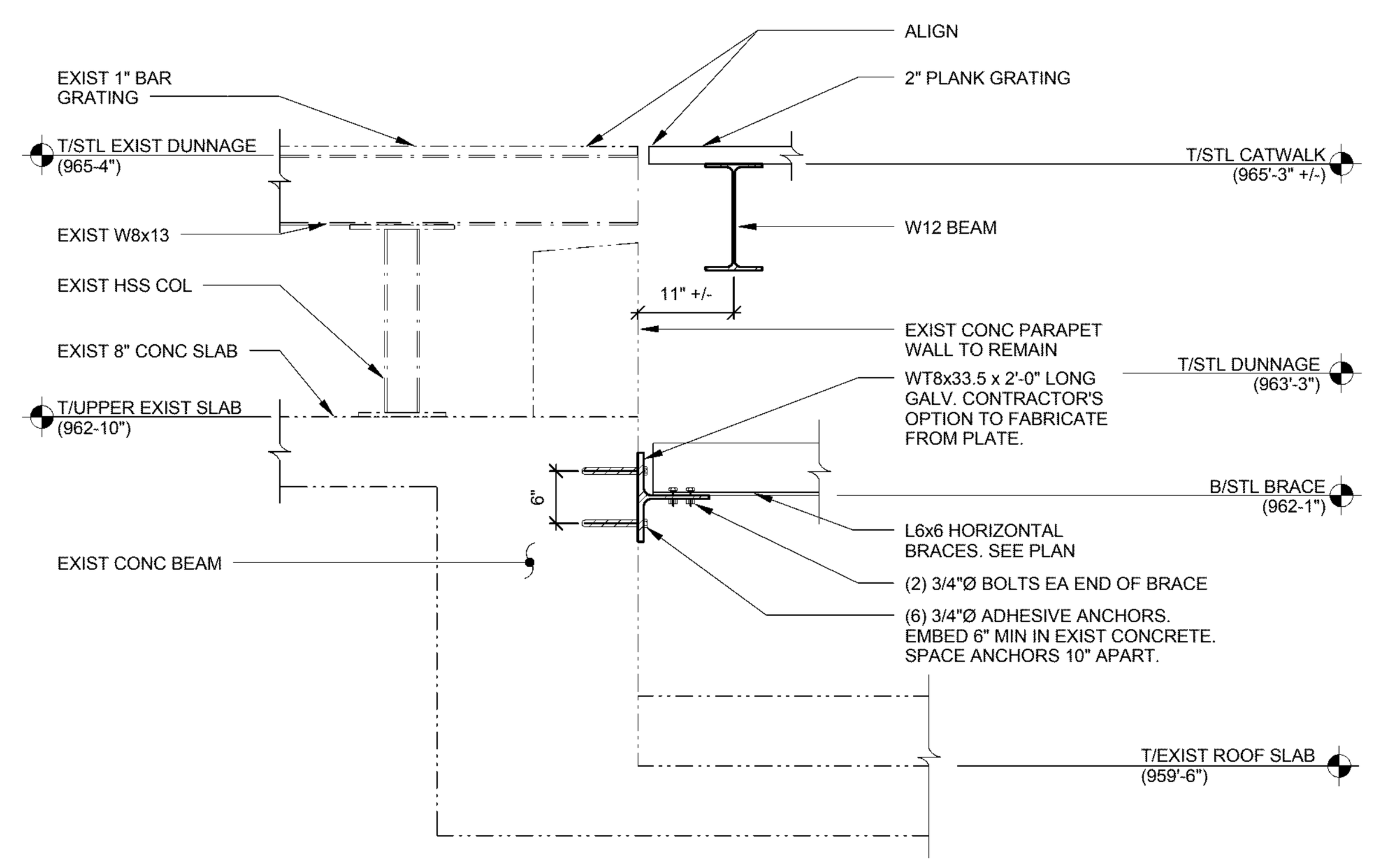
DESIGN WIND PRESSURE FOR EXTERIOR COMPONENTS AND CLADDING MATERIALS
BASIC WIND: Vult→115 mph H (ft)= 50
EXPOSURE: B Kzt= 1

ROOF TYPE	SURFACE	EFFECTIVE WIND AREA (sf)	WIND PRESSURE TOWARD SURFACE (psf)	WIND PRESSURE AWAY FROM SURFACE (psf)
0° TO 7°	ZONE 1 ROOF	10	16.0	-27.7
		20	16.0	-27.0
		50	16.0	-26.1
		100	16.0	-25.4
	ZONE 2 ROOF EDGES	10	16.0	-46.4
		20	16.0	-41.5
		50	16.0	-35.0
		100	16.0	-30.0
	ZONE 2 ROOF OVERHANG AT ROOF EDGES	10	NA	-39.9
		20	NA	-39.2
		50	NA	-38.3
		100	NA	-37.6
	ZONE 3 ROOF CORNERS	10	16.0	-69.9
		20	16.0	-57.9
		50	16.0	-42.0
		100	16.0	-30.0
	ZONE 3 ROOF OVERHANGS AT ROOF CORNERS	10	NA	-65.7
		20	NA	-51.5
		50	NA	-32.9
		100	NA	-18.7
	ZONE 4 WALL	10	27.7	-30.0
		20	26.4	-28.7
		50	24.8	-27.1
		100	23.5	-25.8
		500	20.6	-23.0
	ZONE 5 WALL CORNERS	10	27.7	-37.1
		20	26.4	-34.6
		50	24.8	-31.3
		100	23.5	-28.7
		500	20.6	-23.0

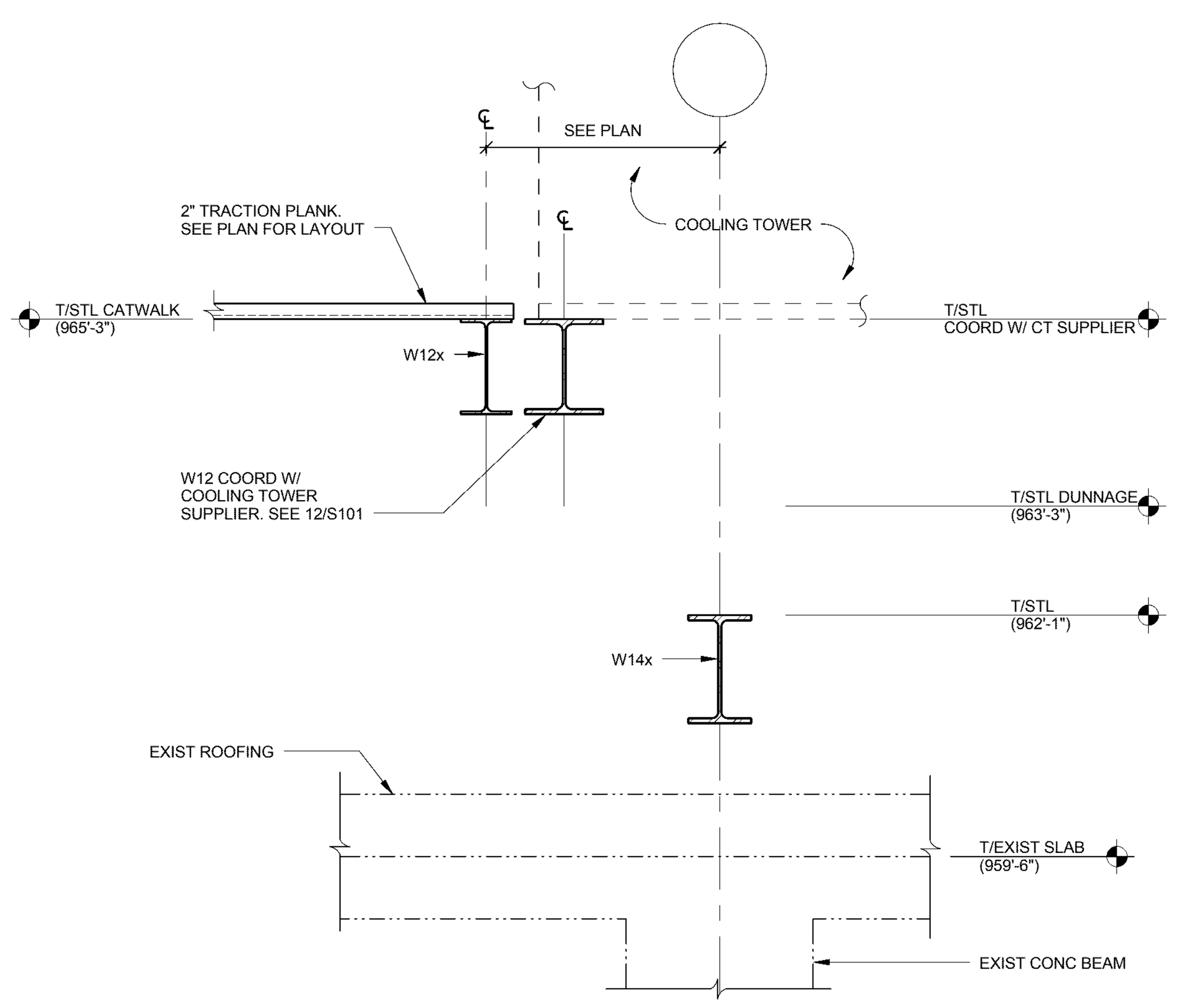
2 S101
DESIGN WIND PRESSURE FOR EXTERIOR COMPONENTS AND CLADDING MATERIALS
12" = 1'-0"



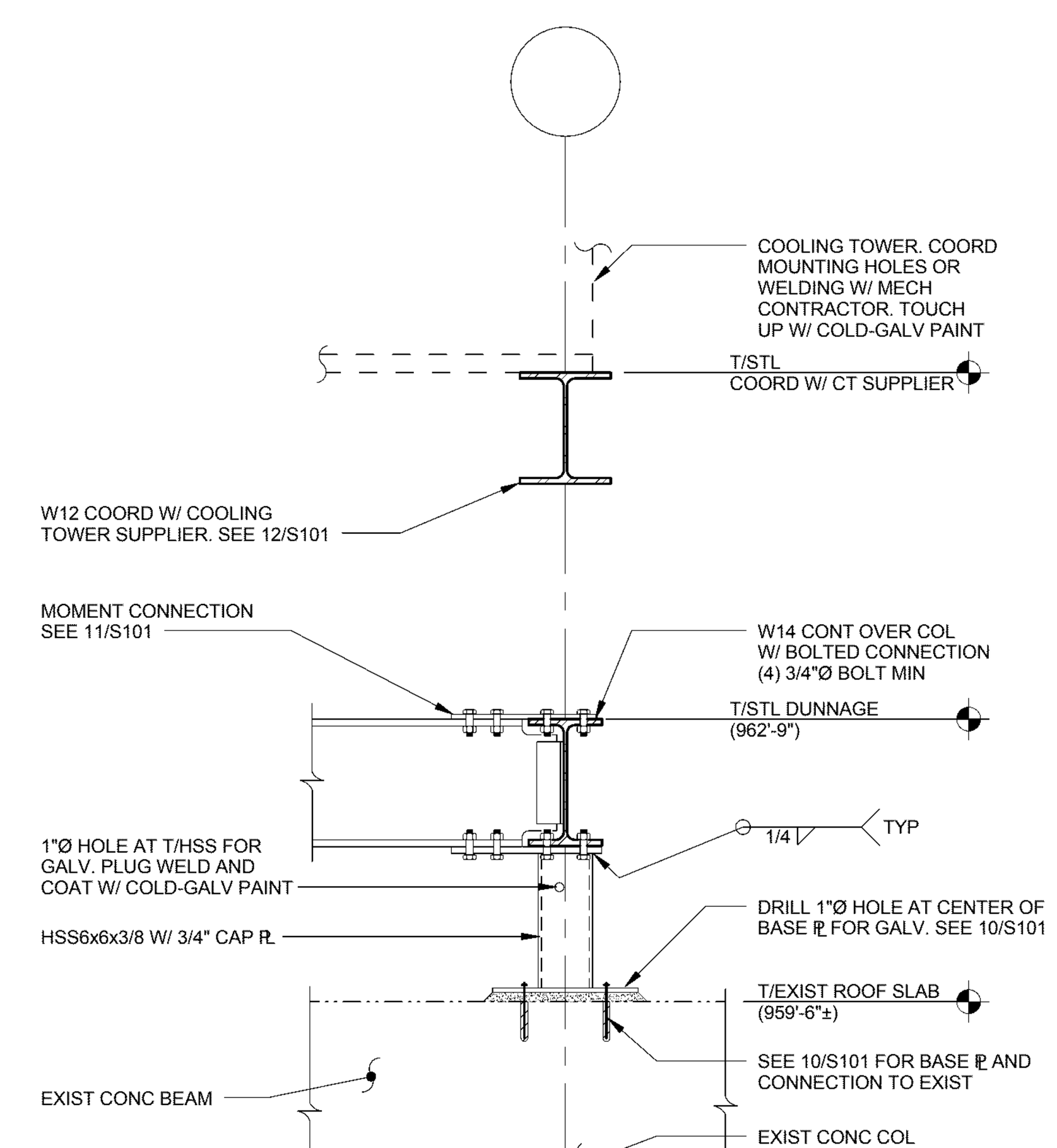
3 S101
SECTION
3/4" = 1'-0"



4 S101
SECTION
3/4" = 1'-0"

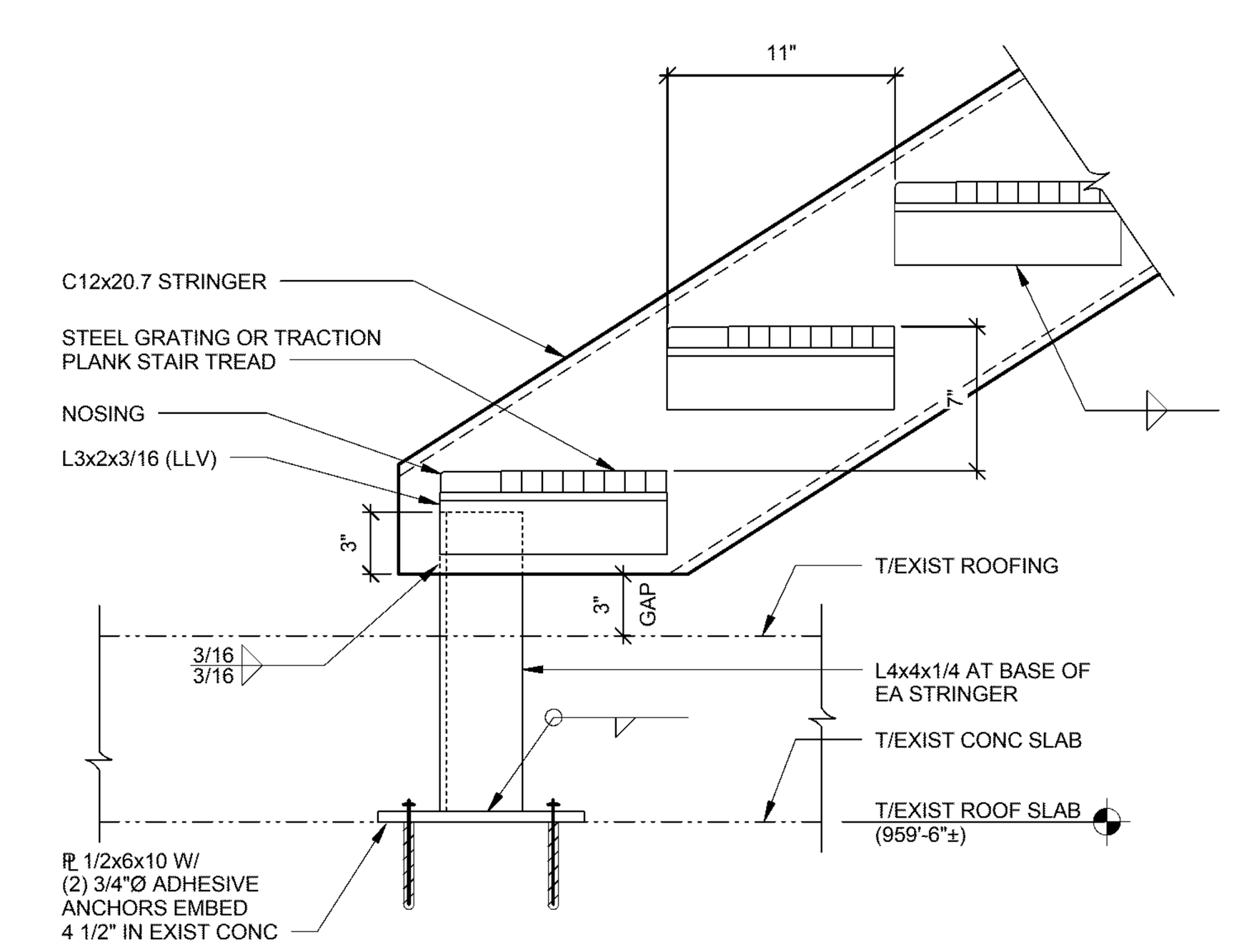


5 S101
SECTION
3/4" = 1'-0"



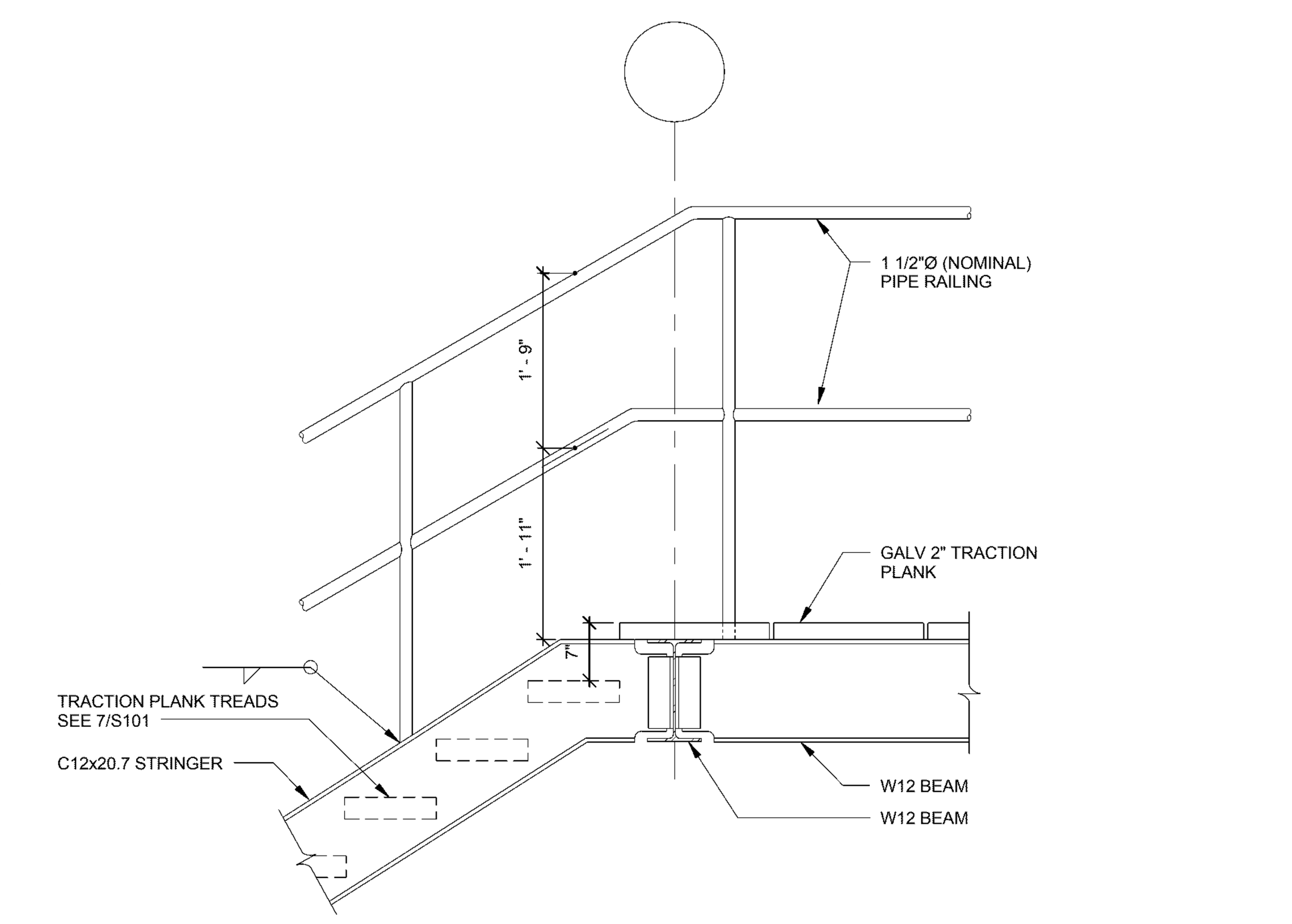
6 S101
SECTION
3/4" = 1'-0"

NOTES:
1. HOT-DIP GALVANIZE FRAME.
2. HOT-DIP GALVANIZE EXPOSED BOLTS.

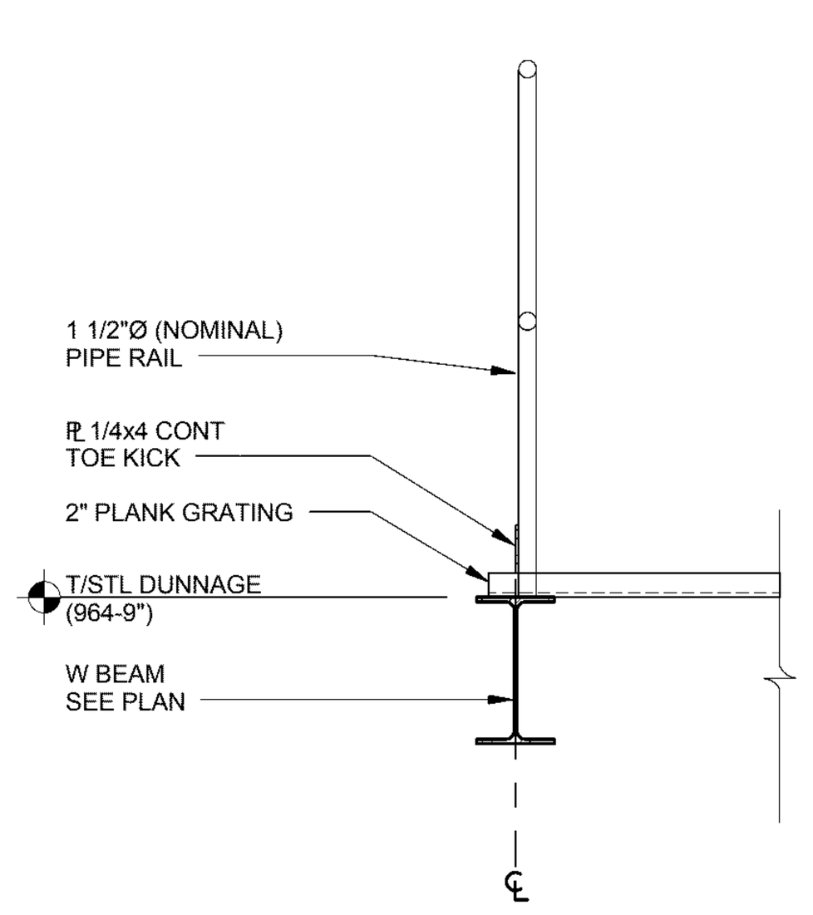


7 S101
STAIR DETAIL
1 1/2" = 1'-0"

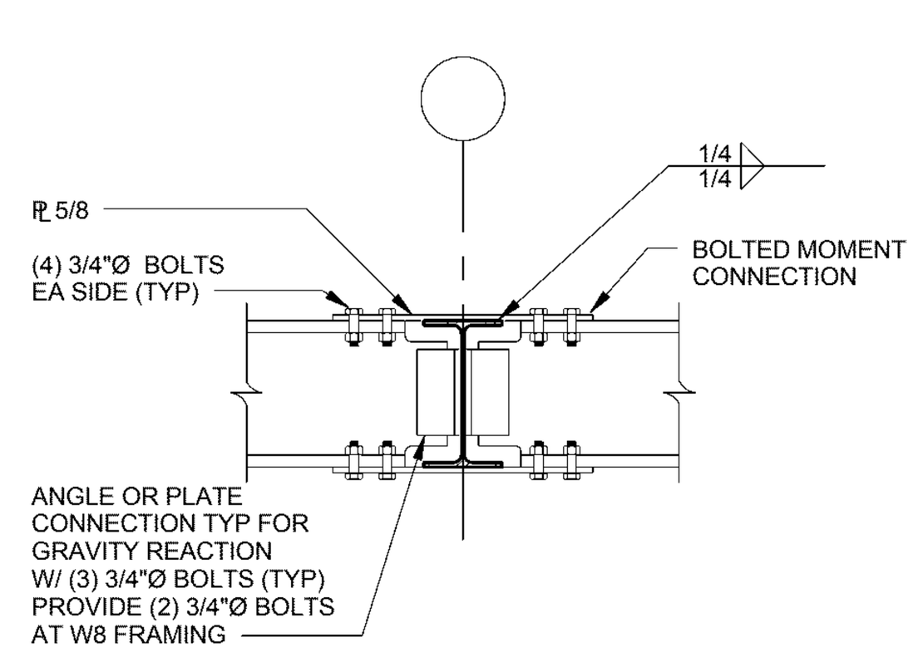
NOTE:
HOT-DIP GALVANIZE STAIR COMPONENTS.



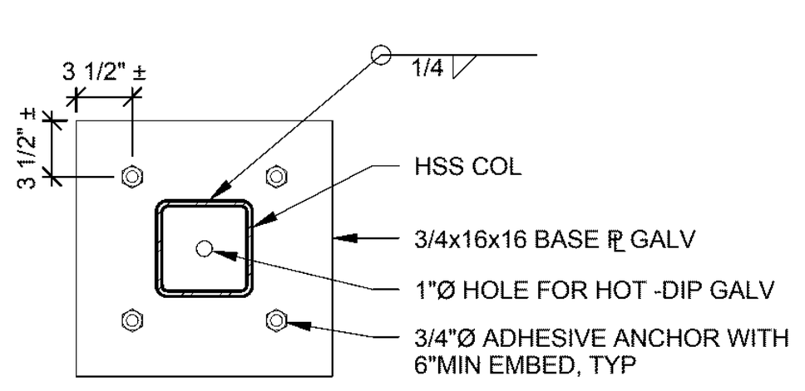
8 S101
STAIR DETAIL
3/4" = 1'-0"



9 S101
SECTION
3/4" = 1'-0"

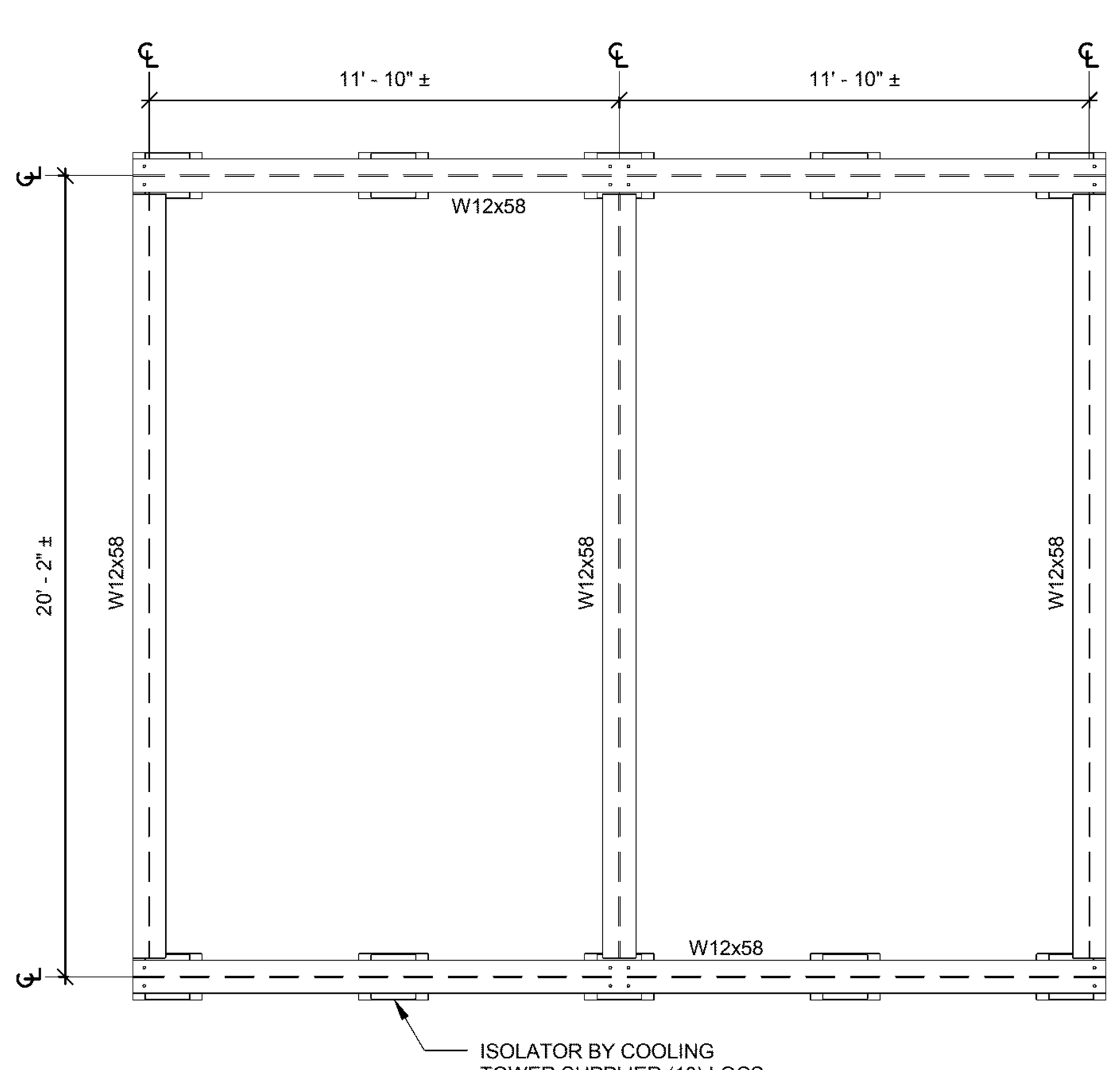


11 S101
MOMENT CONNECTION DETAIL
3/4" = 1'-0"



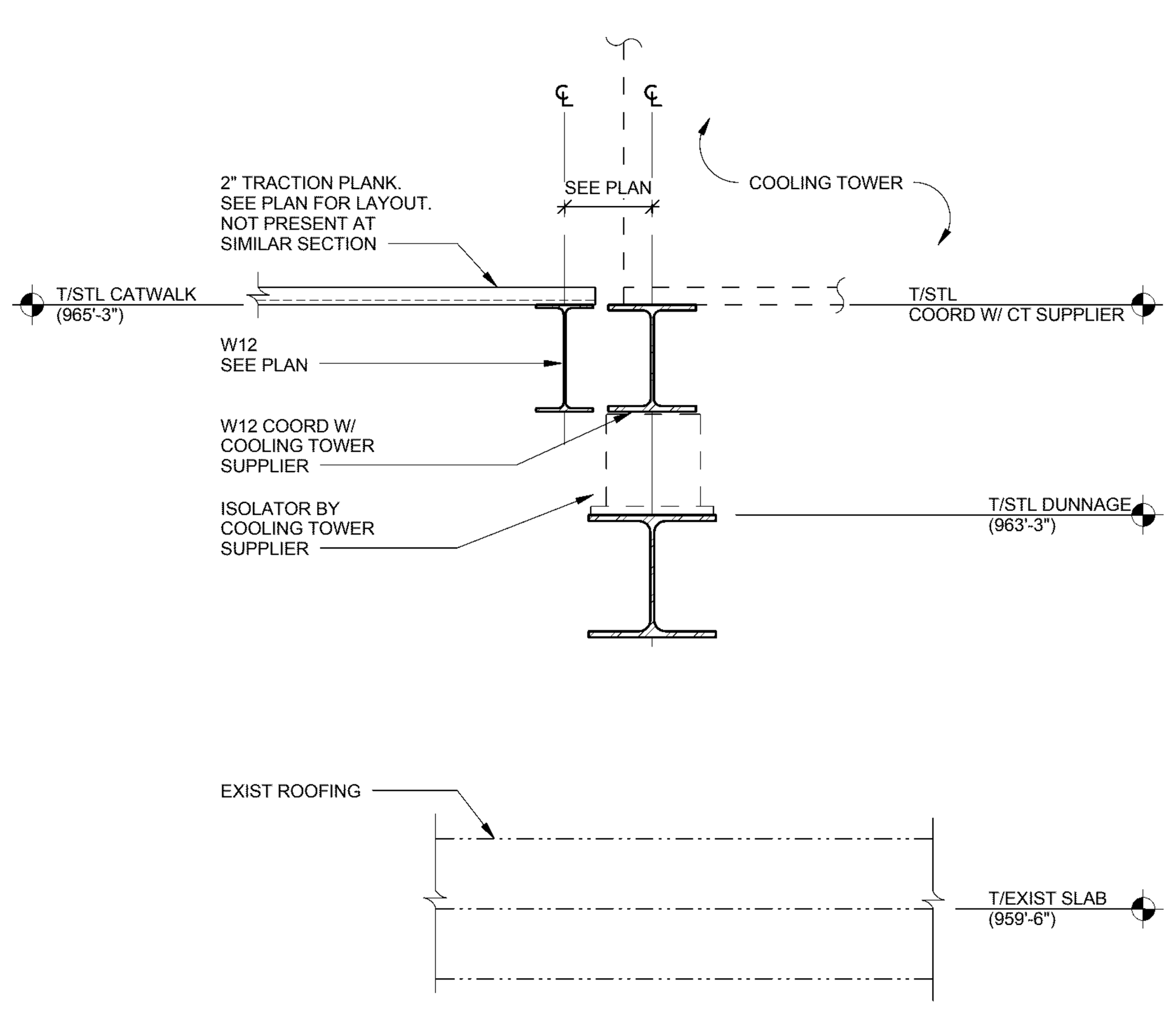
NOTES:
1. ANCHOR LOCATIONS SHOWN ARE APPROXIMATE. FIELD DRILL HOLES IN BASE PLATE AFTER ANCHORS HAVE BEEN LOCATED.
2. DO NOT DAMAGE EXISTING REINFORCING DURING ANCHOR INSTALLATION.
3. TOUCH UP FIELD DRILLED HOLES WITH COLD-GALV PAINT PRIOR TO INSTALLING BASE PLATE.

10 S101
BASE PLATE DETAIL
1" = 1'-0"

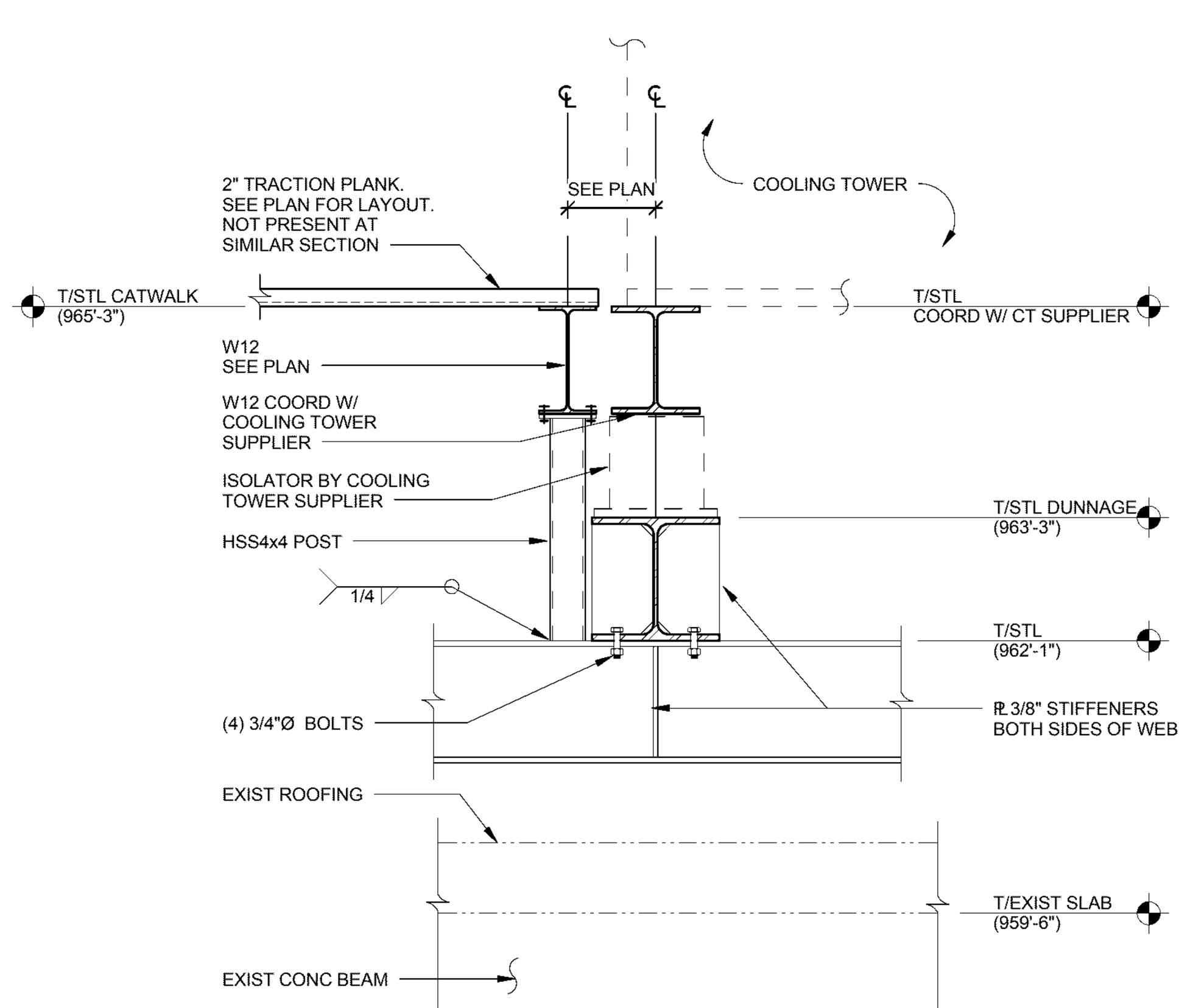


12 S101
COOLING TOWER BASE
1/4" = 1'-0"

NOTES:
1. COORDINATE COOLING TOWER BASE FRAMING ISOLATOR DIMENSIONS AND CONNECTIONS WITH SUPPLIER.
2. ISOLATORS BEAR ON W14x90 BEAM FRAMING. SEE S100.



13 S101
SECTION
3/4" = 1'-0"



14 S101
SECTION
3/4" = 1'-0"

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DRAWING TITLE
SECTIONS AND DETAILS

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S101	Drawn By: KMR
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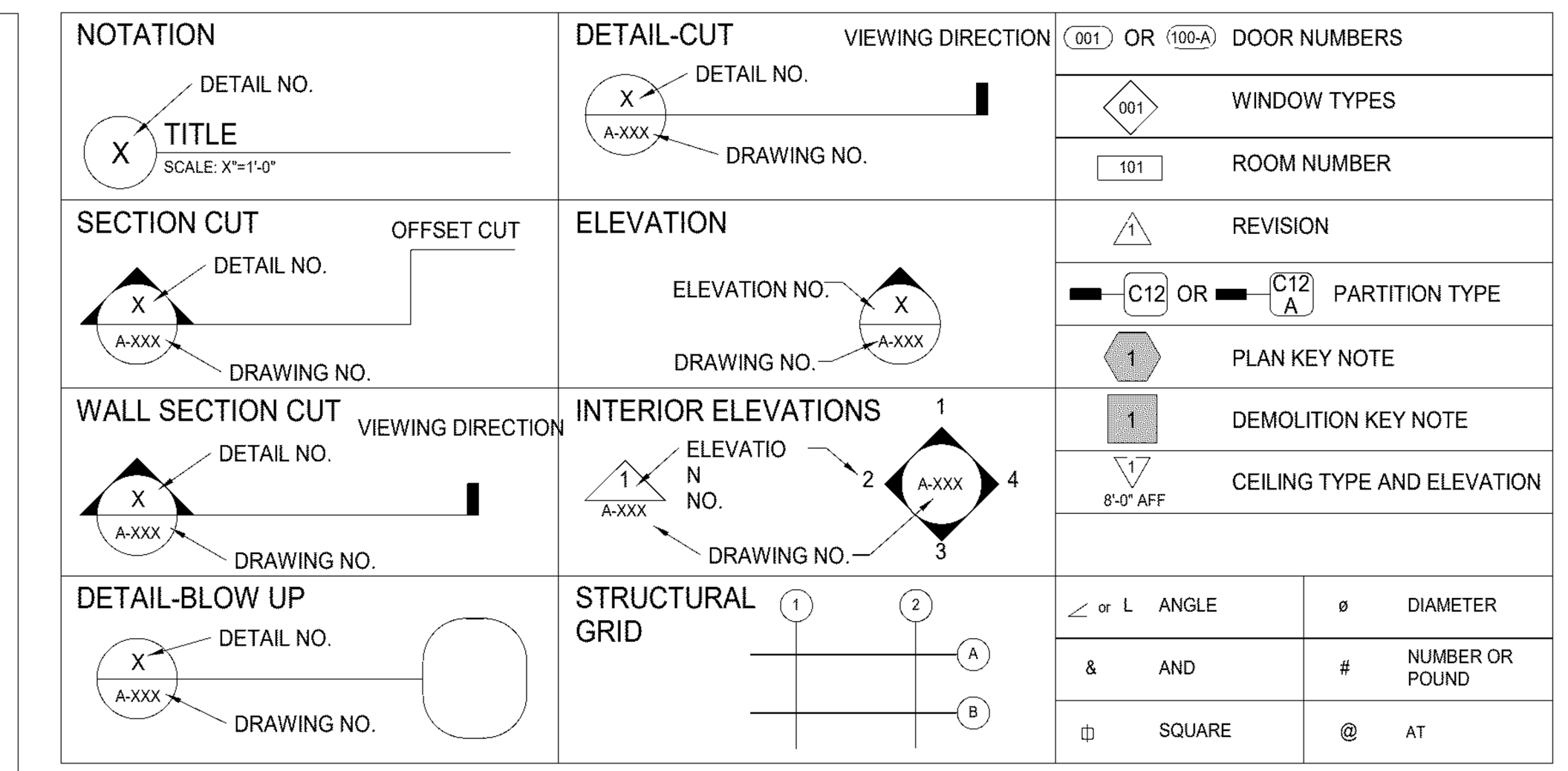
LIST OF ARCHITECTURAL ABBREVIATIONS:

Abbreviation	Meaning
AB	ANCHOR BOLT
A/C	AIR CONDITION(ING) (ED)
ACC	ACCESSIBLE
ACCU	AIR COOLED CONDENSING UNIT
ACI	AMERICAN CONCRETE INSTITUTE
ACT	ACOUSTICAL CEILING TILE
ACM	ASBESTOS CONTAINING MATERIAL
ACOUS PNL	ACOUSTICAL PANEL
ACS PNL	ACCESS PANEL
ADDL	ADDITIONAL
ADJ	ADJUSTABLE, ADJACENT
ADH	ADHESIVE
AFF	ABOVE FINISHED FLOOR
AGGR	AGGREGATE
AHU	AIR HANDLING UNIT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
ALT	ALTERNATE
ALUM	ALUMINUM
ANOD	ANODIZED
APPROX	APPROXIMATE
ARCH	ARCHITECT(URAL)
ARD	AUXILLARY ROOF DRAIN
ASD	ALLOWABLE STRESS DESIGN
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWP	ACOUSTICAL WALL PANEL
AWS	AMERICAN WELDING SOCIETY
BAT	BATTEN
B/B	BACK TO BACK
B BD	BASE BOARD
BITUM	BITUMINOUS
BD	BOARD
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM, BENCHMARK
BOT	BOTTOM
BR	BEDROOM
BRG	BEARING
BRZ	BRONZE
BSMT	BASEMENT
BTWN	BETWEEN
BUR	BUILT UP ROOFING
BW	BOTH WAYS
CCTV	CLOSED CIRCUIT TELEVISION
CAB	CABINET
CB	CATCH BASIN, CORNER BEAD
CH BD	CHALKBOARD
CEM	CEMENT
CF	CONTRACTOR FURNISHED
CF/CI	CONTRACTOR FURNISHED/ CONTRACTOR INSTALLED
CF/OI	CONTRACTOR FURNISHED/ OWNER INSTALLED
CG	CORNER GUARD
CH	COAT HOOK
CI	CAST IRON
CIP	CAST IN PLACE, CAST IRON PIPE
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLO	CLOSET
CLR	CLEAR, COLOR
CMT	CERAMIC MOSAIC TILE
CMU	CONCRETE MASONRY UNIT
CNTR	COUNTER
CO	CLEANOUT, CASED OPENING, COMPANY
COL	COLUMN
CONC	CONCRETE
CONF	CONFERENCE
CONN	CONNECT(ION)
CONSTR	CONSTRUCTION
CONT	CONTINUE(OUS)
CONTR	CONTRACT(OR)
COORD	COORDINATE
CPT	CARPET
CSJ	CONSTRUCTION JOINT
CSK	COUNTER SUNK
CT	CERAMIC TILE, COUNT, CURRENT TRANSFORMER
CTR	CENTER
CW	COLD WATER PIPING, CASEMENT WINDOW
CU	CUBIC
CUH	CABINET UNIT HEATER
CU YD	CUBIC YARD
D	DEEP, DEPTH
D	PENNY (NAIL)
db	BAR DIAMETER
DBL	DOUBLE
DEG	DEGREE
DEMO	DEMOLITION
DEPT	DEPARTMENT
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA OR ø	DIAMETER
DIAG	DIAGONAL, DIAGRAM
DIM	DIMENSION
DIFF	DIFFUSER
DIR	DIRECTION
DISP	DISPENSER
DIV	DIVISION
DMPF	DAMP PROOFING
DL	DEAD LOAD
DN	DOWN
DO	DITTO
DR	DOOR, DRIVE
DS	DOWNSPOUT
DW	DISHWASHER
DWV	DRAINAGE WASTE & VENT
DWG	DRAWING
DWL	DOWEL
E	EAST
EA	EACH
EC	ELECTRICAL CONTRACTOR
EF	EACH FACE
EIFS	EXTERIOR INSULATION AND FINISH SYSTEM
EJ	EXPANSION JOINT
ELAS	ELASTOMERIC
EL	ELEVATION
ELEC	ELECTRIC(AL)
ELEV	ELEVATOR
EM	ENTRY MAT, EXPANDED METAL
EMER	EMERGENCY
ENCL	ENCLOSURE
ENGR	ENGINEER
EOS	EDGE OF SLAB
EP	ELECTRIC PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EMERGENCY SHOWER
ETC	ET CETERA
ETR	EXISTING TO REMAIN
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXC	EXCAVATION, EXCAVATE
EXP	EXPAND, EXPANSION
EXT	EXTERIOR, EXTERNAL, EXTINGUISHER
F/F	FACE TO FACE
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FD	FLOOR DRAIN
FDTN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
FIN	FINISH(ED)
FIXT	FIXTURE
FLASH	FLASHING
FLEX	FLEXIBLE
FLOUR	FLUORESCENT
FLG	FLOORING, FLANGE
FO	FINISHED OPENING
FP	FIRE PROTECTION, FIREPROOF
FRTW	FIRE RETARDANT TREATED WOOD
FT	FOOT, FEET
FTG	FOOTING
FTR	FINNED TUBE RADIATION
FURN	FURNACE, FURNITURE, FURNISH
FUT	FUTURE
FWC	FABRIC WALL COVERING
GA	GAGE
GAL	GALLON
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACT(OR)
GFRC	GLASS FIBER REINFORCED CONCRETE
GFRG	GLASS FIBER REINFORCED GYPSUM
GL	GLASS, GROUND LEVEL
GL BLK	GLASS BLOCK
GLU LAM	GLUED LAMINATED BEAM
GR	GRADE, GROSS
GWT	GLAZED WALL TILE
GYP	GYPSUM
GYP BD	GYPSUM BOARD
GYP PLAS	GYPSUM PLASTER
HB	HOSE BIBB
HC	HOLLOW CORE, HOSE CABINET
HCP	HANDICAPPED
HDW	HARDWARE
HDWD	HARDWOOD
HM	HOLLOW METAL
HO	HOLD OPEN
HORIZ	HORIZONTAL
HP	HIGH POINT, HORSEPOWER
HR	HOUR
HSS	HOLLOW STRUCTURAL SECTION
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HW	HOT WATER
HYD	HYDRANT
ID	INSIDE DIAMETER
IN	INCHES
INCL	INCLUDED
INCAND	INCANDESCENT
INFO	INFORMATION
INSUL	INSULATION
INTERM	INTERMEDIATE
INT	INTERIOR
JAN	JANITOR
JST	JOIST
JT	JOINT
KIP	1000 POUNDS
KIT	KITCHEN
KO	KNOCKOUT
KPL	KICK PLATE
L	LITER, ANGLE
LAM	LAMINATE(D)
LAU	LAUNDRY
LAV	LAVATORY
LB	POUND
LBL	LABEL
LD	LOAD
LF	LINEAR FEET (FOOT)
LH	LEFT HAND, LATENT HEAT
LIN	LINEAR
LKR	LOCKER
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LOC	LOCATION
LRFD	LOAD & RESISTANCE FACTOR DESIGN
LT	LIGHT
LTG	LIGHTING
LWC	LIGHT-WEIGHT CONCRETE
MACH	MACHINE
MAINT	MAINTENANCE
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCB	METAL CORNER BEAD
MDO	MEDIUM DENSITY OVERLAY
MDF	MEDIUM DENSITY FIBERBOARD
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH	MANHOLE
MM	MILLIMETER
MIN	MINIMUM
MISC	MISCELLANEOUS
MLWK	MILLWORK
MO	MASONRY OPENING
MRK BD	MARKER BOARD
MTD	MOUNTED
MTL	METAL
MULL	MULLION
N	NORTH
NAT	NATURAL
NCOMBL	NONCOMBUSTIBLE
NIC	NOT IN CONTRACT
NO OR #	NUMBER
NOM	NOMINAL
NORM	NORMAL
NRC	NOISE REDUCTION COEFFICIENT
NTS	NOT TO SCALE
NWC	NORMAL WEIGHT CONCRETE
O/O	OUT TO OUT
OA	OVERALL, OUTSIDE AIR
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF/CI	OWNER FURNISHED, CONTACTOR INSTALLED
OF/OI	OWNER FURNISHED, OWNER INSTALLED
OFD	OVERFLOW DRAIN
OFF	OFFICE
OH	OVERHANG
OH DR	OVERHEAD (COILING) DOOR
OPNG	OPENING
OPP	OPPOSITE
OPH	OPPOSITE HAND
OPT	OPTIONAL, OPTIMUM
OZ	OUNCE
PA	PUBLIC ADDRESS
PBD	PARTICLEBOARD
PC	PLUMBING CONTRACTOR, PORTLAND CEMENT
PCC	PRECAST CONCRETE
PCT	PORCELAIN CERAMIC TILE
PED	PEDESTAL
PEND	PENDANT
PER	PERIOD
PERF	PERFORATED
PGBD	PEG BOARD
PL	PLATE, PROPERTY LINE
PLF	PONDS PER LINEAR FOOT
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLB	PLUMBING
PLYWD	PLYWOOD
PNL	PANEL
POL	POLISHED
PORC	PORCELAIN
POS	POSITIVE, POSITION
PPT	PRESSURE-PRESERVATIVE TREATED
PR	PAIR
PREFAB	PREFABRICATE
PREFIN	PREFINISH
PREP	PREPARATION
PROJ	PROJECT
PROJ SCRN	PROJECTION SCREEN
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PAINT, POST TENSION
PTN	PARTITION
PVC	POLYVINYL CHLORIDE (PLASTIC)
PVG	PAVING
QT	QUARRY TILE
QTR	QUARTER
QTY	QUANTITY
R	RISER, RADIUS, THERMAL RESISTANCE
RB	RUBBER BASE, RESILIENT BASE
RCP	REINFORCED CONCRETE PIPE, REFLECTED CEILING PLAN
RD	ROOF DRAIN, ROAD
REC	RECESSED
REF	REFRIGERATOR
REFL	REFLECT
REG	REGISTER, REGULATION
REINF	REINFORCED
REQD	REQUIRED
RESIL	RESILIENT
REV	REVISION
RF	RESILIENT FLOORING
RFG	ROOFING
RH	RIGHT HAND, ROOF HATCH
RM	ROOM
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RTU	ROOF TOP UNIT
RV	ROOF VENT
RWB	RUBBER WALL BASE
S	SOUTH
SAB	SOUND ATTENUATION BATTS
SAN	SANITARY
SC	SOLID CORE, SHADING COEFFICIENT
SCHED	SCHEDULE
SEAL	SEALER ON FLOOR (FINISH)
SECT	SECTION
SF	SQUARE FOOT, SAFETY FACTOR
SGT	STRUCTURAL GLAZED TILE
SHT	SHEET
SHR	SHOWER
SIM	SIMILAR
SOG	SLAB ON GRADE
SP	STANDPIPE, SUMP PIT
SPA	SPACES
SPKR	SPEAKER
SPEC	SPECIFICATION
SQ	SQUARE
SRD	SECONDARY ROOF DRAIN
SS	SERVICE SINK
SSM	SOLID SURFACE MATERIAL
SSP	STAINLESS STEEL PIPE
SST	STAINLESS STEEL
STA	STATION
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STOR	STORAGE
STR	STRAIGHT, STRINGERS
STRUCT	STRUCTURAL
SUSP	SUSPENDED
SV	SHEET VINYL
SY	SQUARE YARD
T	TREAD
T/	TOP OF
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TEL	TELEPHONE
THRES	THRESHOLD
TEMP	TEMPORARY
TER	TERRAZZO
THK	THICK(NESS)
TK BD	TACK BOARD
TMPD	TEMPERED
TOC	TOP OF CONCRETE
TOM	TOP OF MASONRY
TOPO	TOPOGRAPHY, TOPOGRAPHIC
TOS	TOP OF STEEL
TOW	TOP OF WALL
TPD	TOILET PAPER DISPENSER
TSTAT	THERMOSTAT
TV	TELEVISION
TYP	TYPICAL
U	HEAT TRANSFER COEFFICIENT
UC	UNDERCUT
UCL	UNDER CABINET LIGHTING
UGND	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITER'S LABORATORIES
UNEX	UNEXCAVATED
UNFIN	UNFINISHED
UON	UNLESS OTHERWISE NOTED
UTIL	UTILITY
UV	UNIT VENTILATOR
VARN	VARNISH(ED)
VB	VINYL BASE
VCT	VINYL COMPOSITION TILE
VENT	VENTILATION
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VIN	VINYL
VOL	VOLUME
VR	VAPOR RETARDER
VT	VINYL TILE
V SHT	VINYL SHEET
VWC	VINYL WALL COVERING
W	WEST
W/	WITH
WC	WATER CLOSET, WALL COVERING
W/O	WITHOUT
WD	WOOD
WDW	WINDOW
WF	WIDE FLANGE
WD GD	WOOD GUARD
WH	WATER HEATER
WI	WROUGHT IRON
WM	WIRE MESH
WP	WATERPROOFING, WORKING POINT
WR	WATER REPELLENT, WEATHER RESISTANT
W RECPT	WASTE RECEPTACLE
WSCT	WAINSCOT
WT	WEIGHT, WATERTIGHT, WATER TABLE
WWF	WELDED WIRE FABRIC
X	BY
YD	YARD

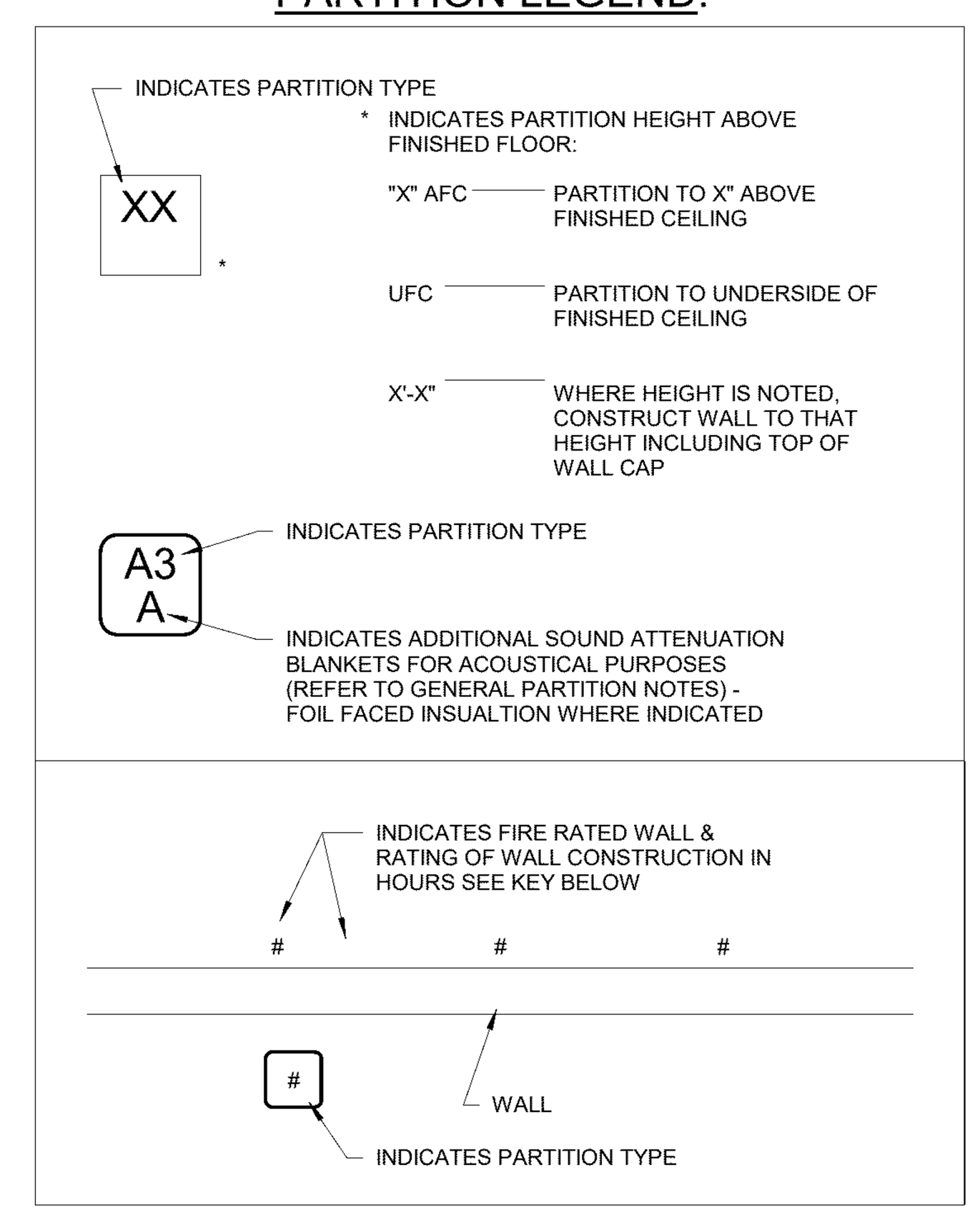
DRAWING SYMBOLS:



MATERIAL SYMBOLS:

UNDISTURBED EARTH	STEEL-LARGE-SCALE (Other metals as noted)	SEMI-RIGID BATT INSULATION
GRAVEL OR CRUSHED STONE	STEEL-SMALL-SCALE (Other metals as noted)	RIGID INSULATION
STONE	WOOD FRAMING (CONTINUOUS)	WOOD BLOCKING OR SHIM
CONCRETE	FINISH WOOD	
CONCRETE MASONRY UNIT	PLYWOOD	
BRICK	GYPSUM, SAND, MORTAR	

PARTITION LEGEND:



GENERAL NOTES:

1. ALL GENERAL NOTES PERTAIN TO ALL ARCHITECTURAL (A-SERIES) DRAWINGS IN THIS SET
2. CONTRACTOR TO PROVIDE ALL INTERIOR LINTELS AT ALL MASONRY OPENINGS EXCEEDING 16" WIDE INCLUDING, BUT NOT LIMITED TO: DOORS, WINDOWS, DUCTS, ETC. PER LINTEL SCHEDULE, AND PER S DWGS. LINTEL LOCATIONS FOR PLUMBING, ELECTRICAL AND MECHANICAL WORK ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS. CONTRACTOR SHALL COORDINATE WITH RESPECTIVE DRAWINGS. CONTRACTOR TO PROVIDE TEMPORARY SHORING WHERE MASONRY OPENINGS ARE TO BE TEMPORARY
3. EXTERIOR PERIMETER OF ALL WINDOWS, DOORS, STOREFRONT, LOUVERS, OR OTHER ITEMS INSERTED IN OR PENETRATING AN EXTERIOR WALL, SHALL BE SEALED WITH BACKER ROD AND SEALANT WHETHER INDICATED ON DRAWINGS OR NOT
4. ALL EXISTING DIMENSIONS ARE APPROXIMATE AND FOR CONTRACTORS VERIFICATIONS. IF DISCREPANCIES ARISE, NOTIFY THE ARCHITECT (AND/OR CONSTRUCTION MANAGER) PRIOR TO PROCEEDING WITH THE WORK THAT MAY BE AFFECTED BY THE DIMENSION CHANGE
5. EVERY ATTEMPT HAS BEEN MADE TO INDICATE PERTINENT EXISTING UTILITIES AND CONDITIONS AS ACCURATELY AS POSSIBLE FROM EXISTING SURVEYS, DRAWINGS AND OTHER DATA. PRIOR TO THE BID OPENING, CONTRACTORS SHALL WALK THE JOB SITE AND SATISFY THEMSELVES TO EXISTING CONDITIONS. THE ARCHITECT SHALL BE CONSULTED WHEN ANY QUESTION ARISES RELATIVE TO MATERIALS NOT SPECIFICALLY SHOWN OR SPECIFIED
6. ALL EXISTING WORK (CEILINGS, FLOORS, WALLS, PARTITIONS, FINISHES, ETC.) DISTURBED BY NEW CONSTRUCTION, INCLUDING MECHANICAL, PLUMBING, AND ELECTRICAL, SHALL BE PATCHED AND REPAIRED TO RESTORE SURFACES TO THE ORIGINAL CONDITION AFTER INSTALLATION OF OTHER WORK
7. PENETRATIONS THROUGH FIRE-RESISTANT CONSTRUCTION SHALL BE BUILT IN ACCORDANCE WITH U.L. LISTED THROUGH-PENETRATION FIRESTOP SYSTEMS. PENETRATIONS THROUGH NON FIRE-RESISTANT RATED HORIZONTAL ASSEMBLIES, NOT PROTECTED BY A SHAFT ENCLOSURE, SHALL HAVE ITS ANNULAR SPACE FILLED WITH NON-COMBUSTIBLE MATERIAL TO PREVENT THE PASSAGE OF FLAME, SMOKE FUMES, AND HOT GASES. NON-COMBUSTIBLE PENETRATING ITEMS SHALL NOT PENETRATE MORE THAN 3 FLOOR ASSEMBLIES. COMBUSTIBLE PENETRATING ITEMS SHALL NOT PENETRATE MORE THAN 1 FLOOR ASSEMBLY

GENERAL PARTITION NOTES:

A. ALL GYPSUM PARTITIONS NOT INDICATED WITH A PARTITION TYPE SHALL BE TYPE (U2)

B. ALL MASONRY PARTITIONS NOT INDICATED WITH A PARTITION TYPE SHALL BE TYPE (C6).

D. GYPSUM BOARD TO BE "TYPE X" UNLESS OTHERWISE NOTED

E. ALL PARTITIONS ARE TO BE TO THE UNDERSIDE OF DECK UNLESS OTHERWISE NOTED

F. DIMENSIONS SHOWN FOR EACH PARTITION DESCRIPTION INDICATE FACE-TO-FACE THICKNESS OF MATERIALS LISTED FOR THAT PARTITION

G. PROVIDE LISTED U.L. FIRE-RESISTANT JOINT ASSEMBLIES AT TOP OF ALL WALLS INDICATED TO BE FIRE-RESISTANT RATED

H. THE TOP OF ALL PARTITIONS FRAMED AGAINST THE UNDERSIDE OF STRUCTURES SHALL HAVE PROVISIONS FOR DEFLECTION & RESTRAINT

I. PROVIDE BULLNOSE BLOCK AT ALL EXPOSED OUTSIDE CORNERS OF CMU PARTITIONS NOT COVERED WITH OTHER FINISH MATERIALS.

J. PROVIDE CONTROL JOINTS IN GYPSUM BOARD WALLS & CEILINGS. CONTROL JOINTS SHALL BE INSTALLED IN CEILINGS EXCEEDING 30 LF. PROVIDE JOINT WHERE CEILING FRAMING OR FURRING CHANGES DIRECTION AND WHERE CONTROL JOINTS OCCUR IN EXTERIOR WALL

K. MOISTURE RESISTANT GYPSUM BOARD TO BE USED WHERE REPAIRS ARE REQUIRED AT PLUMBING CHASES.

L. PROVIDE CONTROL JOINTS IN INTERIOR MASONRY PARTITIONS AT A SPACING NOT TO EXCEED 25 FT AND WHERE PARTITION THICKNESS OR HEIGHTS CHANGE. PROVIDE CONTROL JOINTS FOR FINISHES (TILE OR GYPSUM BOARD) THAT BRIDGE THESE JOINTS. CONTRACTOR TO SUBMIT DRAWING FOR APPROVAL

M. FOR CMU WALLS INDICATED TO BE FIRE-RESISTANT RATED, PROVIDE UNITS MEETING THE FIRE RATING DURATION INDICATED BASED ON THE EQUIVALENT THICKNESS OF THE MASONRY AND TYPE OF AGGREGATE USED

UNBALANCED SERIES PARTITIONS:

U2	2 1/4"	1 5/8" METAL STUD AT 16" OC, (1) LAYER 5/8" GYPSUM BOARD AT ROOM SIDE ONLY. STUDS TO BE SECURED TO ADJACENT CMU PARTITION AT 4'-0" VERTICALLY

CMU SERIES PARTITIONS:

C6	5 5/8"	2 HOUR RATED 6" CMU PER UL #U906 WITH HORIZONTAL REINFORCING AT 16" OC, AND VERTICAL REINFORCING AT 16" OC

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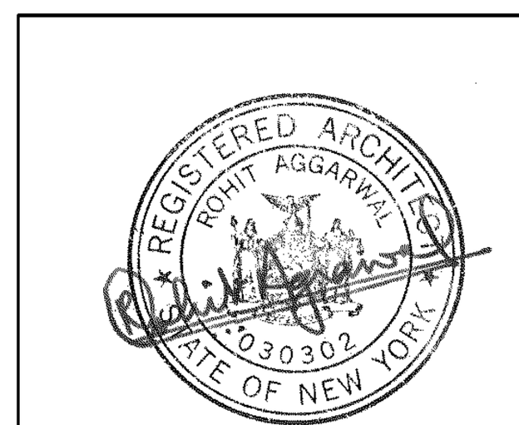


REVISIONS

No.	Date	By	Description

DRAWING TITLE
GENERAL NOTES AND PARTITION TYPES

DRAWING NO.
A100

Drawn By: DM
Checked By: RA
Project Mgr: MDS
SUCF Project No: 071018
M/E Project No: 170425

ISSUE DATE:
1/18/2019
STATUS:
BID DOCUMENTS

SCIENCE COMPLEX KEYPLAN:

DEMOLITION FLOOR PLAN GENERAL NOTES:

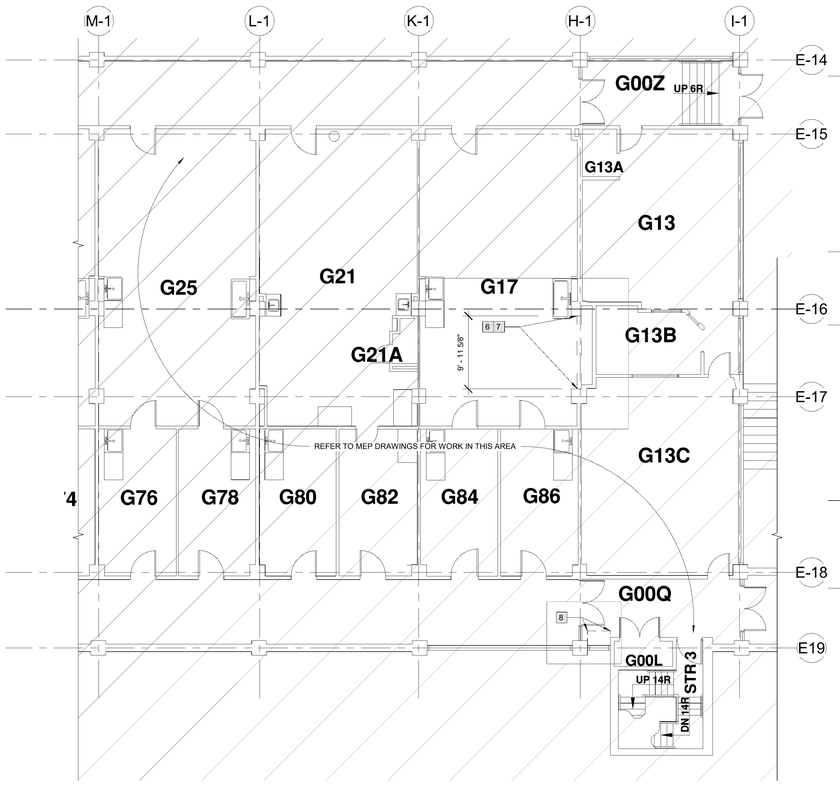
1. THIS DEMOLITION DRAWING INDICATES MAJOR ARCHITECTURAL ITEMS FOR REMOVAL, PATCH AND REPAIR. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS IN THE FIELD AND NOTIFY ARCHITECT IN CASE OF ANY DISCREPANCIES.
2. COORDINATE REMOVALS OF BUILDING ELEMENTS WITH UNDERGROUND UTILITY INFORMATION ON SITE SURVEYS.
3. COORDINATE THE SHUT-DOWN OF ALL BUILDING UTILITIES BETWEEN ALL CONTRACTORS AND WITH OWNER AND OWNER'S REPRESENTATIVE.
4. REFER TO H-, P- AND E- DRAWINGS FOR CONSTRUCTION REQUIRING SELECTIVE REMOVALS OF EXISTING CONSTRUCTION. CONTRACTOR SHALL CUT AND PATCH EXISTING CONSTRUCTION AS REQUIRED TO ACHIEVE THEIR WORK.
5. ALL REMOVALS, CUTTING AND PATCHING SHALL BE DONE SO AS TO PRESERVE THE STRUCTURAL INTEGRITY OF THE EXISTING CONSTRUCTION AND MAINTAIN WEATHER-TIGHTNESS WHERE REQUIRED.
6. ALL EXISTING CONSTRUCTION SHALL BE PATCHED WITH COMPONENTS AND ASSEMBLIES SIMILAR TO EXISTING CONSTRUCTION IN MATERIAL, FORM, COLOR AND TEXTURE.
7. SALVAGE ALL EXISTING FIRE EXTINGUISHERS AND SIGNAGE. ALL SALVAGE ITEMS TO BE REMOVED CAREFULLY, PROTECTED AND DELIVERED TO OWNER. ALL ITEMS NOT SALVAGED ARE TO BE DISPOSED OF BY CONTRACTOR PERFORMING THE REMOVALS IN A SAFE MANNER.
8. PROTECT EXISTING ROOF MEMBRANE WITH MINIMUM 1/2" PLYWOOD OR COVERBOARD AT AREAS OF ROOF WORK OR EQUIPMENT PATHS

DEMOLITION PLAN KEYNOTES:

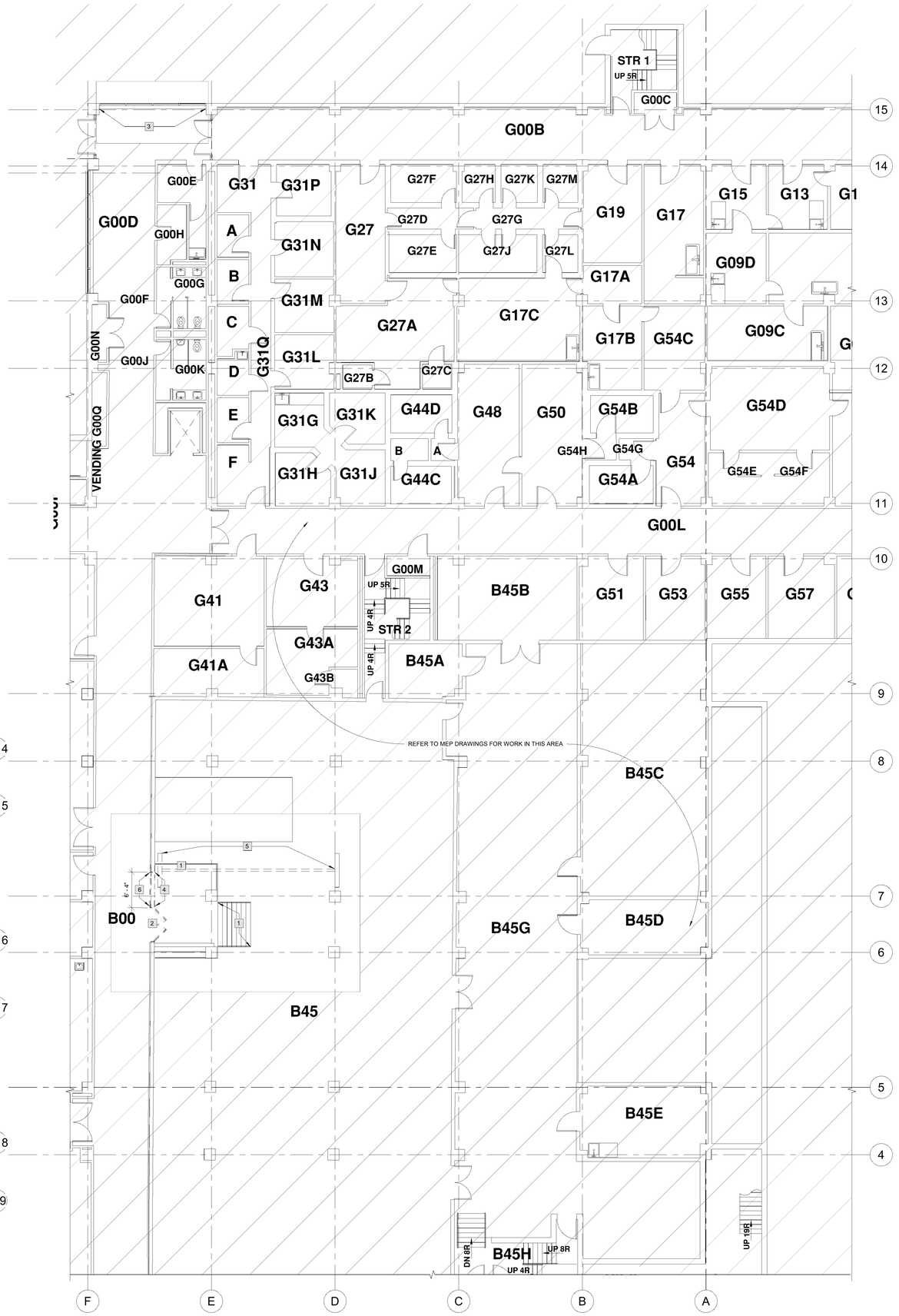
1. REMOVE AND SALVAGE EXISTING METAL PIPE RAILINGS, INCLUDING MISCELLANEOUS ACCESSORIES AND SUPPORT POSTS FOR REINSTALLATION.
2. REMOVE EXISTING HM DOOR, FRAME, AND ASSOCIATED ACCESSORIES. REMOVE EXISTING LINTEL AND PROVIDE TEMPORARY SUPPORT AS REQUIRED
3. REMOVE AND SALVAGE EXISTING STOREFRONT WINDOW SYSTEM FOR REINSTALLATION, REMOVE OR PROTECT EXISTING WINDOW STOOL AND ADJACENT FINISHED SURFACES AS REQUIRED FOR THE REMOVAL AND INSTALLATION OF MECHANICAL EQUIPMENT.
4. REMOVE PORTION OF EXISTING CMU WALL AS INDICATED, SAWCUT AND PREPARE FOR MASONRY TOOTH IN TO NEXT WHOLE UNIT
5. REMOVE AND SALVAGE EXISTING GANTRY AND ASSOCIATED SUPPORTS, COMPONENTS AND ACCESSORIES AT SPECIFIED POINTS FOR REINSTALLATION AS REQUIRED FOR CHILLER MOVEMENT.
6. REMOVE PORTION OF EXISTING DRYWALL AND ASSOCIATED FRAMING AND FURRING.
7. REMOVE EXISTING CLAY SPEED TILE PARTITION AS INDICATED PER DETAIL 10/A600
8. AREA OF EXISTING FLOOR TILE TO BE REMOVED PER H DWGS

DEMOLITION PLAN LEGEND:

REFER TO MEP DRAWINGS FOR WORK IN THIS AREA



2 PARTIAL GROUND FLOOR DEMOLITION PLAN
1/8" = 1'-0"



1 PARTIAL BASEMENT FLOOR DEMOLITION PLAN
1/8" = 1'-0"

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SCIENCE III - CHILLER PLANT
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REGISTERED ARCHITECT
RENAT AGGARKOV
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STATE OF NEW YORK

REVISIONS

No.	Date	By	Description

DRAWING TITLE
PARTIAL DEMOLITION FLOOR PLANS

DRAWING NO.		
A101	Drawn By:	DM
	Checked By:	RA
	Project Mgr:	MDS
	SUCF Project No:	071018
	M/E Project No:	170425

ISSUE DATE:
1/18/2019
STATUS:
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SCIENCE COMPLEX KEYPLAN:

FLOOR PLAN GENERAL NOTES:

1. REFER TO S, M, AND E DRAWINGS FOR LOCATIONS OF FLOOR, CEILING AND WALL MOUNTED MECHANICAL AND ELECTRICAL ITEMS.
2. TEMPORARILY SUPPORT OR SECURE ANY EXISTING CONDUIT REVEALED OR REQUIRED TO COMPLETE DEMOLITION AND RESTORATION OF EXISTING PARTITIONS.
3. COORDINATE WITH M, AND E DWGS FOR LOCATION OF WALL PENETRATIONS, AT ALL PENETRATIONS, PROVIDE TYPICAL FIRE/SMOKE PROTECTION PER TRADE DRAWINGS AND SPECIFICATIONS.
4. UNLESS OTHERWISE NOTED IT IS ASSUMED THAT ALL PARTITIONS ARE RATED AND ARE CONTAMINATED WITH ASBESTOS CONTAINING MATERIALS

FLOOR PLAN KEYNOTES:

① REINSTALL SALVAGED PIPE RAILINGS AND ASSOCIATED MOUNTS, COMPONENTS, AND ACCESSORIES. ENSURE MOUNTING SURFACE HAS BEEN PATCHED CLEANED AND REPAIRED AS REQUIRED FOR SECURE ATTACHMENT AND TO MATCH EXISTING ADJACENT MATERIAL, COLOR, AND FINISH TEXTURE.

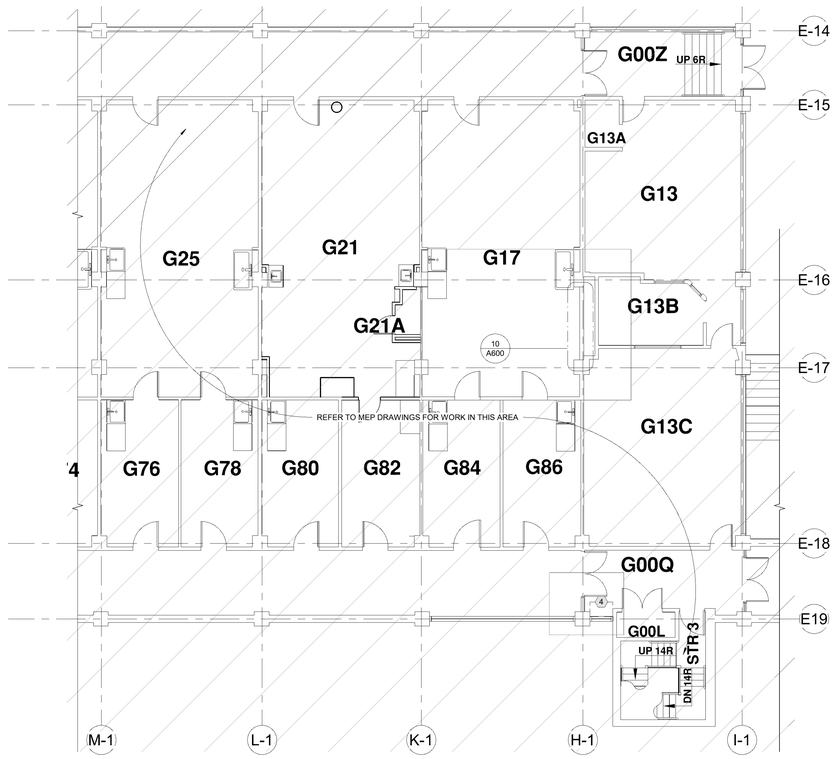
② REINSTALL SALVAGED FENESTRATION UNIT AND WINDOW STOOL PER ASSOCIATED DETAIL. PATCH, CLEAN AND RESTORE ANY DAMAGED FINISHES TO ORIGINAL CONDITION AND TO MATCH ADJACENT FINISHES

③ REINSTALL SALVAGED GANTRY AND ASSOCIATED FRAMING, MOUNTS, COMPONENTS, AND ACCESSORIES.

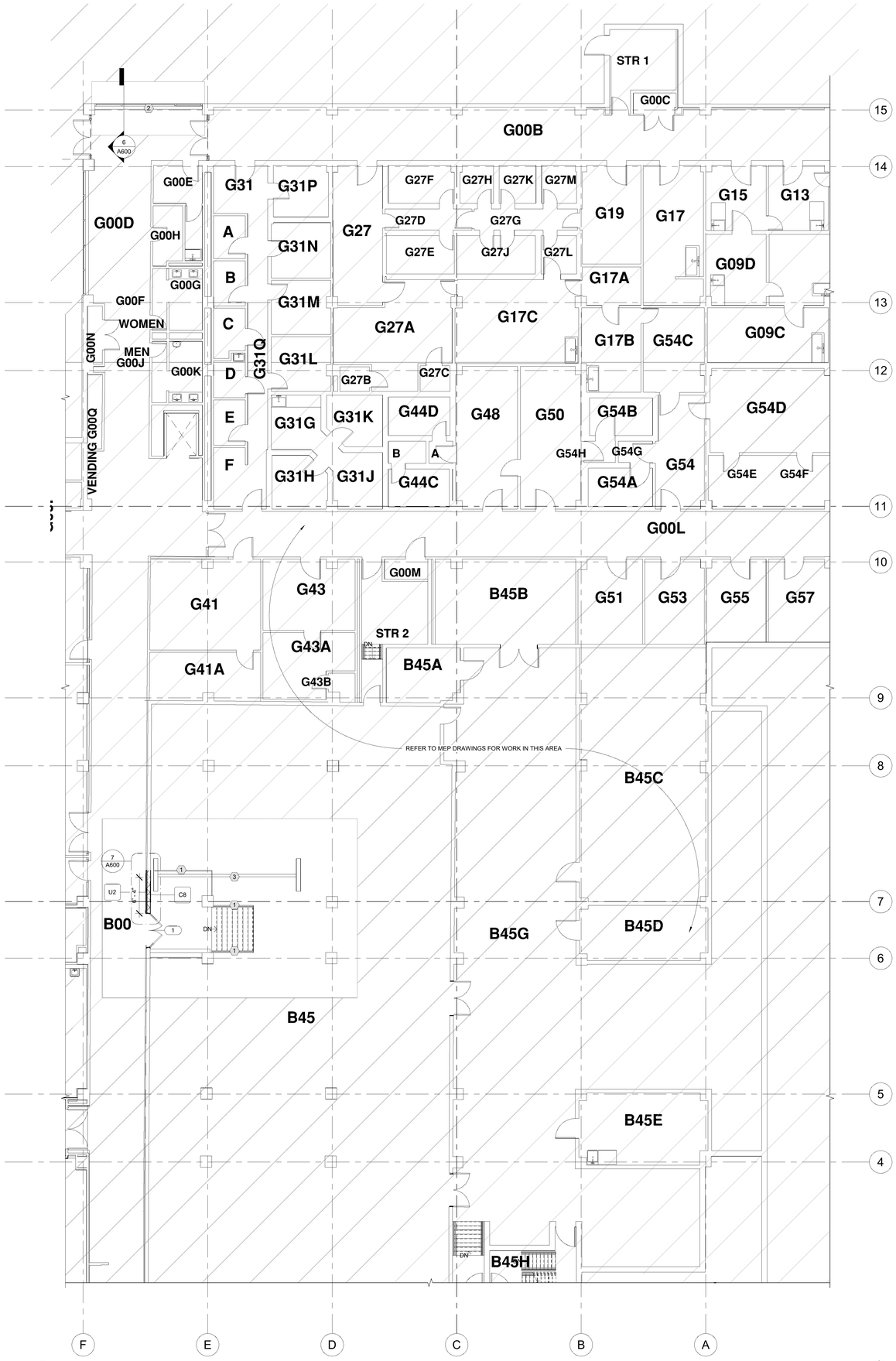
④ 2' X 2' AREA OF REPLACEMENT VINYL COMPOSITION TILE. PATCH IN TILE TO MATCH EXISTING ADJACENT COLOR AND FINISH AT AREA OF REMOVAL PER H DWGS, WORK TO BE PERFORMED BY LICENSED NYS ASBESTOS CONTRACTOR

FLOOR PLAN LEGEND:

REFER TO MEP DRAWINGS FOR WORK IN THIS AREA



2 PARTIAL GROUND FLOOR PLAN
1/8" = 1'-0"



1 PARTIAL BASEMENT FLOOR PLAN
1/8" = 1'-0"

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REVISIONS

No.	Date	By	Description

DRAWING TITLE
PARTIAL FLOOR PLANS

DRAWING NO.
A110

Drawn By:	DM
Checked By:	RA
Project Mgr:	MDS
SUCF Project No:	071018
M/E Project No:	170425

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1/18/2019
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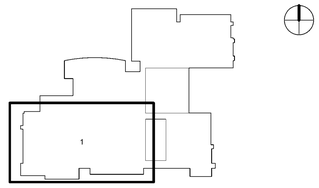
BID DOCUMENTS

SCIENCE COMPLEX KEYPLAN:



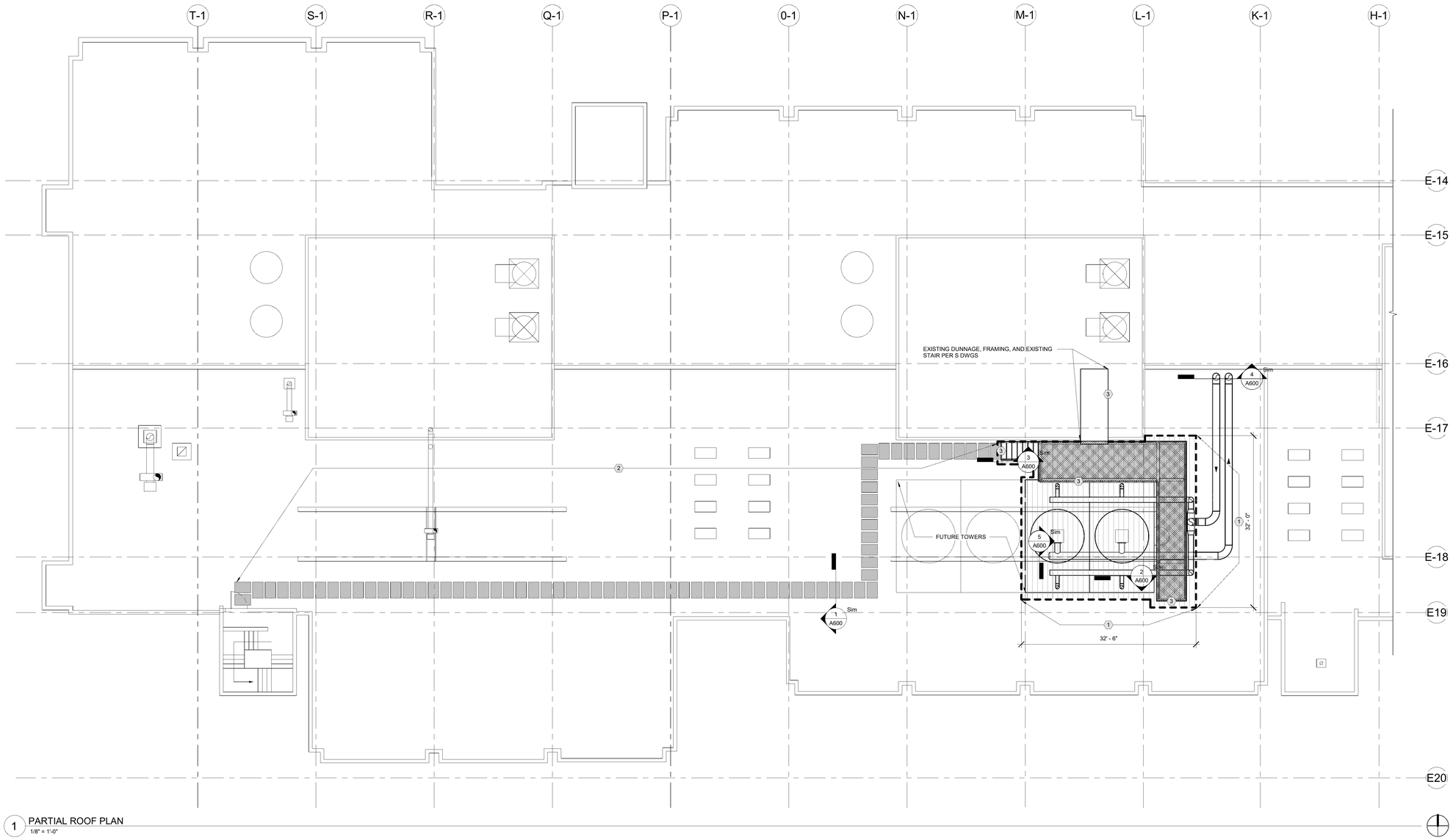
RE-ROOFING GENERAL NOTES:

1. PROVIDE ADDITIONAL FLASHING, COUNTER FLASHING, PRESSURE TREATED PT WD BLOCKING AND ALL OTHER NECESSARY MATERIALS FOR COMPLETE ROOF RECONSTRUCTION.
2. EXTEND EXISTING PLUMBING VENT PIPES, IF NEEDED, SO THAT SUCH PIPES PROJECT A MINIMUM OF 1' - 4" ABOVE THE ROOF MEMBRANE.
3. PROTECT ALL ROOF SURFACES ADJACENT TO WORK AREAS WITH 2 LAYERS OF 1/2" PLYWOOD UNLESS OTHERWISE NOTED.
4. PROVIDE CRICKETS AT ALL OBSTRUCTIONS TO WATER FLOW WHICH ARE WIDER THAN 2 FEET. CRICKET BACK SLOPES SHALL BE TWICE THAT OF ROOF SLOPES.
5. ROOFING DETAILS ON THIS DRAWING ARE INTENDED TO SHOW ROOF MEMBRANE AND FLASHING DETAILING AT VARIOUS TYPES OF ROOF PENETRATIONS. ACTUAL CONDITIONS BELOW THE MEMBRANE ARE SHOWN DIAGRAMMATICALLY.
6. THE EXISTING ROOF SYSTEM IS NOT UNDER WARRANTY.
7. THE CONTRACTOR SHALL AVOID EXCESSIVE LOADING ON THE ROOF IN PLACING & HANDLING MATERIALS & EQUIPMENT. ROOF LOADING DURING CONSTRUCTION SHALL NOT EXCEED A LOAD OF 40 PSF.
8. REMOVE AND SALVAGE FOR REINSTALLATION MISC DEVICES SUCH AS CONDUIT, VIDEO SURVEILLANCE & LIGHT FIXTURES AS NECESSARY TO PERFORM ROOFING REPLACEMENT WORK. REINSTALL WHEN COMPLETE. ALL ELECTRICAL WORK TO BE PERFORMED BY A NYS LICENSED ELECTRICIAN.
9. CLEAN DEBRIS OFF EXISTING ROOF MEMBRANE PER ROOFING MANUFACTURER'S RECOMMENDATIONS TO ACHIEVE SPECIFIED PERFORMANCE OF ROOF SYSTEM AND ASSOCIATED MODIFICATIONS
10. ALL DEMOLITION DEBRIS CHUTES ARE TO BE OF FIRE RESISTIVE MATERIAL. COMBUSTIBLE CHUTES ARE NOT PERMITTED. THE STORAGE OF REMOVED OR EQUIPMENT/MATERIAL TO BE INSTALLED ON THE ROOF DECK FOR EXTENDED PERIODS IS NOT PERMITTED. REFER TO DIVISION 1 SPECIFICATIONS FOR REQUIREMENTS
11. CONTRACTOR IS NOT PERMITTED TO REMOVE MORE OF EXISTING ROOF THAN CAN BE REPLACED WATERTIGHT IN THE SAME DAY.
12. REFER TO S, M, AND E DWGS FOR NOTES AND DETAILS REGARDING INSTALLATION OF STRUCTURAL MOUNTINGS AND ROOF/MEMBRANE PENETRATIONS AND MOUNTINGS FOR EQUIPMENT.
13. ARCHITECTURAL ROOF DETAILS ARE MEANT TO SUPPLEMENT S, M, AND E ROOF DETAILS, REFER TO TRADE DRAWINGS FOR LOCATIONS OF ROOFTOP DEVICES, MOUNTINGS, AND PENETRATIONS.

ROOF PLAN KEYNOTES:

1. AREA OF ROOF MODIFICATION AND REPAIR; REMOVE EXISTING ROOF MEMBRANE AND FLASHING AS REQUIRED FOR INSTALLATION OF STEEL WALKWAY AND DUNNAGE PER S DWGS, AND FOR INSTALLATION AND REMOVAL OF ROOF PENETRATIONS PER MEP DRAWINGS. ROOF DECK PENETRATIONS TO BE MODIFIED OR CREATED AS REQUIRED FOR INSTALLATION AND REMOVAL OF MEP EQUIPMENT.

   APPLY FLASHING MEMBRANE AT AREA OF NEW AND EXISTING MODIFIED FOOTINGS AND WHERE EXISTING RAIL OR STRUCTURAL STEEL PER S DWGS CONNECTS TO DECK. APPLY LIQUID FLASHING UP AND OVER CURB FLASHINGS PER MANUFACTURERS RECOMMENDATION ONCE M AND E EQUIPMENT IS INSTALLED PER ASSOCIATED DETAILS
2. 3' X 2' EPDM WALKWAY PADS SPACED AT MAXIMUM 4" INTERVALS, SEALED TO EXISTING ROOF MEMBRANE PER DETAIL
3. STEEL DUNNAGE, FRAMING, AND WALKWAY PER S DWGS, ASSOCIATED ARCHITECTURAL ROOF DETAILS ARE TYPICAL AND TO BE APPLIED AS REQUIRED PER S, AND MEP DWGS



1 PARTIAL ROOF PLAN
1/8" = 1'-0"

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SCIENCE III - CHILLER PLANT
BINGHAMTON UNIVERSITY

REGISTERED ARCHITECT
ROBERT AGGARWAL
No. 020302
STATE OF NEW YORK

REVISIONS

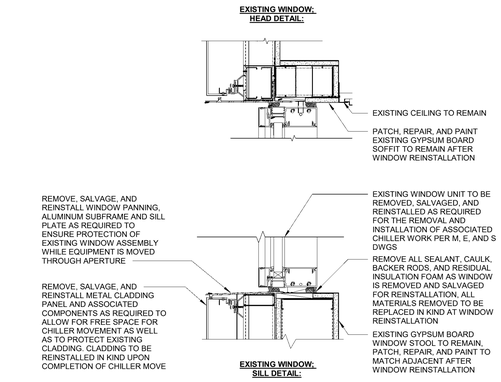
No.	Date	By	Description

DRAWING TITLE
PARTIAL ROOF PLAN

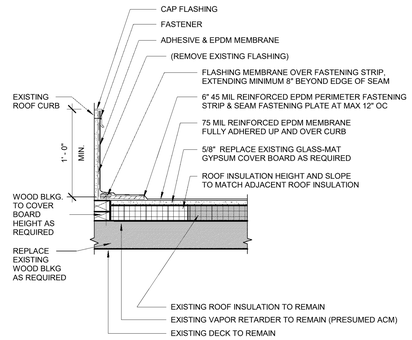
DRAWING NO.
A111

Drawn By:	DM
Checked By:	RA
Project Mgr:	MDS
SUCF Project No:	071018
M/E Project No:	170425

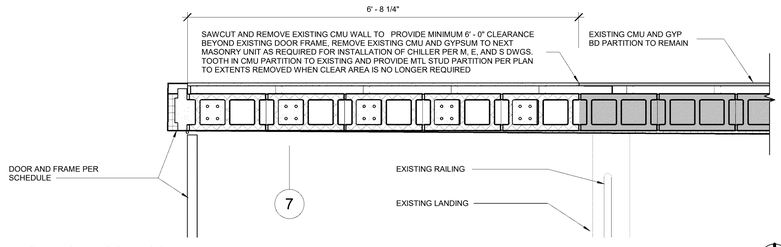
ISSUE DATE:
1/18/2019
STATUS:
BID DOCUMENTS



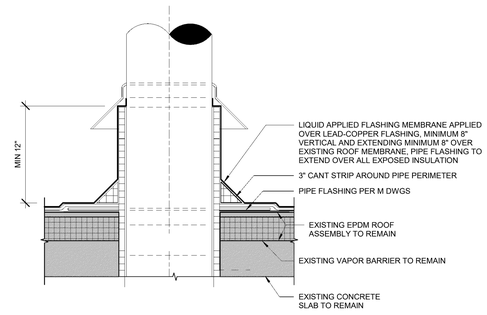
6 WINDOW SECTION DETAIL
3" = 1'-0"



5 EXISTING RAIL CURB FLASHING DETAIL
1 1/2" = 1'-0"



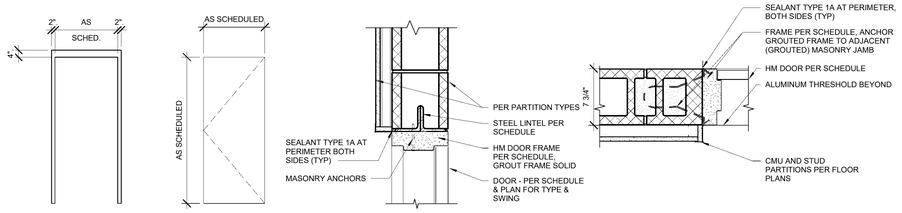
7 MECHANICAL ROOM DOOR DETAIL
1" = 1'-0"



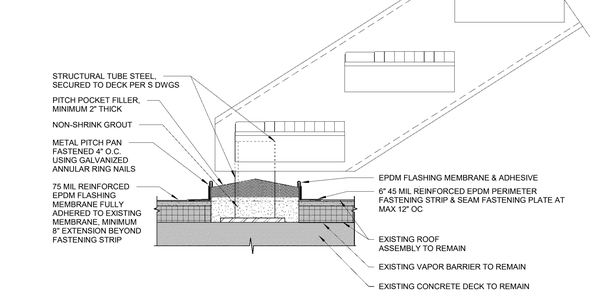
4 PIPE PENETRATION DETAILS
1 1/2" = 1'-0"

Door Schedule

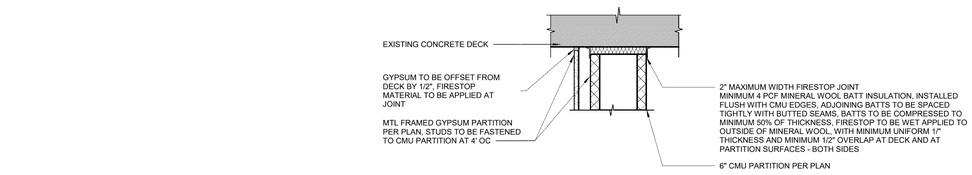
Door Finish	Door Material	Door Type	Frame Finish	Frame Material	Frame Type	Glass type	Hardware Set	Width	Height	Appears in Schedule	Mark	Leaf Qty.	Thickness	Fire Rating
PT-1	HM	1	PT-1	HM	1	-	1	6' - 0"	7' - 0"	Y	1	2	2"	90 MIN



8 DOOR DETAILS
1 1/2" = 1'-0"



3 STAIR LANDING FLASHING DETAIL
1 1/2" = 1'-0"



9 2 HOUR RATED CMU - AND GYPSUM PARTITION CONNECTION TO DECK (TYP)
1 1/2" = 1'-0"

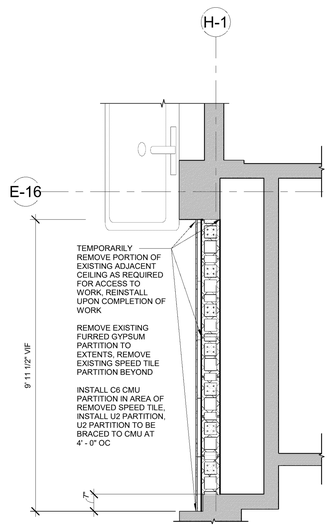
MISCELLANEOUS LINTEL SCHEDULE
(NON-LOAD BEARING WALLS ONLY)

WALL THICKNESS	MASONRY OPENING			DETAIL
	UP TO 4'-0	4'-1 TO 6'-0	6'-1 TO 8'-0	
4"	L 3 1/2 x 3 1/2 x 1/4 OR ST3 x 6.25			⌟ OR ⊥
6"	2 L'S 3 1/2 x 2 1/2 x5/16	WT 7 x 11	WT 7 x 11	⌟|⌞ OR ⊥
8"	2 L'S 3 1/2 x 3 1/2 x 1/4	2 L'S 4 x 3 1/2 x 5/16	2 L'S 5 x 3 1/2 x 5/16	⌟|⌞
10"	L 5 x 3 1/2 x 1/4 L 4 x 4 x 1/4	L 5 x 3 1/2 x 5/16 L 4 x 4 x 5/16	L 5 x 5 x 5/16 L 4 x 4 x 5/16	⌟⌞
12"	3 L'S 3 1/2 x 3 1/2 x 5/16	3 L'S 4 x 3 1/2 x 5/16	3 L'S 6 x 3 1/2 x 5/16	⌟⌟|⌞
BEARING LENGTH	4"	6"	8"	ALL ANGLES L.L.V.

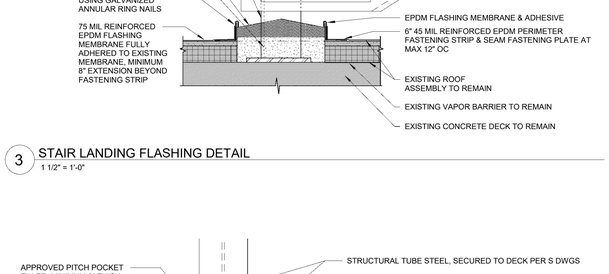
NOTE:
1. HOT-DIP GALVANIZE ALL PIECES OF ALL LINTELS IN EXTERIOR WALLS.
2. LINTELS FOR OPENINGS LARGER THAN 8' X 8' FOR HVAC, ELECTRICAL AND PLUMBING SHAL BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. COORDINATE QUANTITY, LOCATION AND SIZES WITH ALL TRADES.
3. PROVIDE MASONRY BOND BEAM LINTELS WHERE INDICATED ON DRAWINGS. TYPICAL AT WINDOW AND DOOR MASONRY OPENINGS WHERE MAXIMUM MASONRY OPENING IS 6'-0".
4. LINTELS ON EXTERIOR WALLS SHALL HAVE A MINIMUM THICKNESS OF 5/16"
5. FOR OPENINGS ON MASONRY WALLS NOT MARKED ON PLAN, USE APPROPRIATE SIZE FROM THIS TABLE OR CONTACT ARCHITECT / ENGINEER.

See also: Load bearing lintel "Special-1" & "Special-2; Edit notes as reqd.

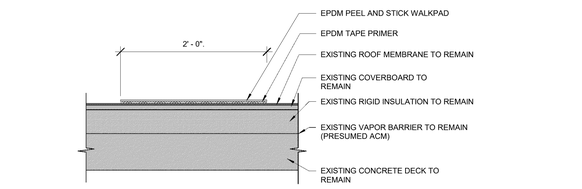
11 LINTEL SCHEDULE
12" = 1'-0"



10 GROUND FLOOR CHASE ACCESS DETAIL - ROOM G17
1/2" = 1'-0"



2 PITCH POCKET DETAIL
1 1/2" = 1'-0"



1 WALKWAY PAD DETAIL
1 1/2" = 1'-0"

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SCIENCE III - CHILLER PLANT
BINGHAMTON UNIVERSITY

REGISTERED ARCHITECT
BRENT A. GAGARIN
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STATE OF NEW YORK

REVISIONS

No.	Date	By	Description

DRAWING TITLE
DETAILS

DRAWING NO.
A600

Drawn By:	DM
Checked By:	RA
Project Mgr:	MDS
SUCF Project No:	071018
M/E Project No:	170425

ISSUE DATE:
1/18/2019

STATUS:
BID DOCUMENTS

HVAC SYMBOL LIST

SYMBOL	DESCRIPTION
	EXISTING WORK TO BE REMOVED
	POINT OF CONNECTION
	POINT OF DISCONNECTION
(X)	DRAWING KEYNOTE
[X]	DEMOLITION KEYNOTE
MBH	THOUSAND BTU/HOUR
NTS	NOT TO SCALE
(E)	EXISTING
(L)	ACOUSTIC THERMAL LINING - 1½" THICK
(2L)	ACOUSTIC THERMAL LINING - 2" THICK
(DBL)	DOUBLE WALL LINED DUCT
FPM	FEET PER MINUTE
CFM	CUBIC FEET PER MINUTE
AFF	ABOVE FINISHED FLOOR
AD	ACCESS DOOR
W/W	WALL TO WALL
N.O.	NORMALLY OPEN
N.C.	NORMALLY CLOSED
	FLEXIBLE DUCTWORK
AxB FO	DUCT SECTION - FLAT OVAL (FO)
12"	ROUND DUCT - IN INCHES
	DUCT SECTION - SUPPLY
	DUCT SECTION - RETURN
A B	WIDTH A x DEPTH B

SINGLE LINE	DOUBLE LINE	DUCT TAKEOFFS
		TRANSITION SQUARE TO ROUND
R	R	RISE IN DUCT - IN DIRECTION OF AIRFLOW
D	D	DROP IN DUCT - IN DIRECTION OF AIRFLOW
DN 24x12 UP	DN 24x12 UP	SUPPLY DUCT TURNING UP OR DOWN
DN 24x12 UP	DN 24x12 UP	RETURN DUCT TURNING UP OR DOWN
24x12 14x8	24x12 6" BOOT TAP 14x8	SUPPLY/RETURN RECTANGULAR MAIN RECTANGULAR BRANCH
24x12 14"	24x12 6" BOOT TAP 14"	SUPPLY/RETURN RECTANGULAR MAIN ROUND BRANCH
18" 14"	18" CONICAL TEE 14"	SUPPLY/RETURN ROUND MAIN ROUND BRANCH
18" 14"	18" LATERAL 14"	SUPPLY/RETURN ROUND MAIN ROUND BRANCH
		MITERED ELBOW WITH TURNING VANES

SYMBOL	DESCRIPTION
	SUPPLY DIFFUSER, REGISTER OR GRILLE
	RETURN OR EXHAUST REGISTER OR GRILLE
	VALANCE
A B C	REGISTER, GRILLE OR DIFFUSER TAG A = TYPE B = NECK SIZE C = CFM
FT-A B C D	FIN TUBE RADIATION TAG FT-A = TYPE B = FIN TUBE LENGTH C = ENCLOSURE LENGTH D = GPM
A B C D	VALANCE TAG A = TYPE B = COIL SIZE C = COOLING GPM D = HEATING GPM
5	AIR TERMINAL UNIT AND TAG (OPTION 1)
A B C	AIR TERMINAL UNIT TAG (OPTION 2) A = UNIT NO. B = MAXIMUM CFM C = MINIMUM CFM
DSD	DUCT SMOKE DETECTOR
H	HUMIDISTAT
S	TEMPERATURE SENSOR
T T E	PNEUMATIC/ELECTRIC THERMOSTAT
T G S G	THERMOSTAT/SENSOR WITH GUARD

SYMBOL	DESCRIPTION
A	COMPRESSED AIR
V	VENT
BBD	BOILER BLOW DOWN
CS	CONDENSER WATER SUPPLY
CR	CONDENSER WATER RETURN
CW	DOMESTIC COLD WATER
CWS	CHILLED WATER SUPPLY
CWR	CHILLED WATER RETURN
D	DRAIN
G	GAS
GS	GLYCOL SUPPLY
GR	GLYCOL RETURN
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
LPS	LOW PRESSURE STEAM
LPC	LOW PRESSURE CONDENSATE
MPS	MEDIUM PRESSURE STEAM
MPC	MEDIUM PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HPC	HIGH PRESSURE CONDENSATE
PC	PUMPED CONDENSATE
RD	REFRIGERANT DISCHARGE
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
SWS	SECONDARY WATER SUPPLY (2 PIPE) (DUAL TEMPERATURE - HW/CW)
SWR	SECONDARY WATER RETURN (2 PIPE) (DUAL TEMPERATURE - HW/CW)
TD	TRIPLE DUTY VALVE
	GLOBE VALVE
	BALL VALVE
	GATE VALVE
	CONTROL VALVE
	THREE WAY CONTROL VALVE
	CHECK VALVE
	BALANCING VALVE
	BUTTERFLY VALVE
	RELIEF VALVE
PRV	PRESSURE REDUCING VALVE
	PRESSURE/TEMPERATURE TEST PLUG
	SINGLE LINE PIPE OR DUCT CONTINUED
	DOUBLE LINE PIPE OR ROUND DUCT CONTINUED
	DOUBLE LINE RECTANGULAR DUCT CONTINUED
	AIR FLOW
	PIPE ANCHOR
	PIPE GUIDE
	EXPANSION COMPENSATOR WITH GUIDES
	PRE-FAB EXPANSION LOOP
	STRAINER
	PRESSURE GAUGE
	THERMOMETER
	UNION
V	AIR VENT
TT	THERMOSTATIC TRAP
FT	FLOAT & THERMOSTATIC TRAP
TD	THERMODYNAMIC TRAP
BT	BUCKET TRAP
	DIRECTION OF FLOW
	REDUCER
	CAP OR PLUG
	ELBOW DOWN
	ELBOW UP
	BOTTOM TAP
AAD	AUTOMATIC AIR DAMPER
FD	FIRE DAMPER
SD	SMOKE DAMPER
BDD	BACK DRAFT DAMPER
FC	FLEX CONNECTOR - DUCTWORK
M	MOTORIZED DAMPER
BG	BLAST GATE
	VOLUME DAMPER
SD	SUCTION DIFFUSER
	FLEXIBLE CONNECTOR - PIPING
	DRAIN VALVE WITH HOSE CONNECTION, CAP AND CHAIN
FS	WATER FLOW SENSOR
TS	WATER TEMPERATURE SENSOR
SP	STATIC PRESSURE SENSOR

CONTROLS SCHEMATIC SYMBOL LIST

SYMBOL	DESCRIPTION
DI	DIGITAL INPUT (GENERAL)
DO	DIGITAL OUTPUT (GENERAL)
AI	ANALOG INPUT (GENERAL)
AO	ANALOG OUTPUT (GENERAL)
	THERMOWELL
A	ALARM
E	ELECTRIC ACTUATOR
FZ	FREEZE-STAT
H	HUMIDIFIER
R	RELAY
S	STATUS
M	FLOW METER
BTU	BTU ENERGY METER
	AIR FLOW MEASURING STATION
	AVERAGING SENSOR
H	HUMIDITY SENSOR (DUCT MOUNTED)
S	TEMPERATURE SENSOR (DUCT OR PIPE MOUNTED)
CO 2	CARBON DIOXIDE SENSOR (DUCT MOUNTED)
S	SPACE TEMPERATURE SENSOR (WALL MOUNTED)
H	SPACE HUMIDITY SENSOR (WALL MOUNTED)
CO2	CARBON DIOXIDE ROOM SENSOR (WALL MOUNTED)
CO	CARBON MONOXIDE ROOM SENSOR (WALL MOUNTED)
T	PNEUMATIC THERMOSTAT
T E	LINE VOLTAGE THERMOSTAT
OS	OCCUPANCY SENSOR
M	MOISTURE SENSOR
	PROBE SENSOR
FS	FLOW SENSOR/SWITCH
ES	END SWITCH
S M	MANUAL SWITCH
ΔP	DIFFERENTIAL STATIC PRESSURE SWITCH
E/P	ELECTRIC/PNEUMATIC SWITCH OR RELAY
P/E	PNEUMATIC/ELECTRIC SWITCH OR RELAY
ΔP	DIFFERENTIAL STATIC PRESSURE SENSOR
F	FLOW TRANSMITTER TRANSDUCER
P	PRESSURE SENSOR

SYMBOL	DESCRIPTION
DSD	DUCT SMOKE DETECTOR
CT	CURRENT TRANSDUCER
I/P	ELECTRIC/PNEUMATIC TRANSDUCER
I/E	ELECTRONIC/ELECTRIC TRANSDUCER
	ELECTRICAL INTERFACE
S/S	START/STOP
O/C	OPEN/CLOSE
E/D	ENABLE/DISABLE
	HARD WIRE INTERFACE
I	ELECTRONIC INTERFACE
	PNEUMATIC CONTROL VALVE (3-WAY)
	PNEUMATIC CONTROL VALVE (2-WAY)
E	ELECTRIC/ELECTRONIC CONTROL VALVE (3-WAY)
E	ELECTRIC/ELECTRONIC CONTROL VALVE (2-WAY)
S	SOLENOID VALVE
	THERMOSTATIC EXPANSION VALVE
	AUTOMATIC AIR DAMPER (PARALLEL BLADE)
	AUTOMATIC AIR DAMPER (OPPOSED BLADE)
	PNEUMATIC ACTUATOR
M	MAIN TEMPERATURE CONTROL AIR SOURCE
EA	EXHAUST AIR
OA	OUTSIDE AIR
RA	RETURN AIR
SA	SUPPLY AIR
SF	SUPPLY FAN
RF	RETURN AIR FAN
EF	EXHAUST AIR FAN
	FILTER
	BASE MOUNTED PUMP
	IN LINE PUMP
ASD	ADJUSTABLE SPEED DRIVE
C/C	COOLING COIL
H/C	HEATING COIL
HR/C	HEAT RECOVERY COIL

PUMP SCHEDULE

PUMP NO.	LOCATION	SERVICE	UNIT TYPE & DESCRIPTION	PUMP CAPACITY		MAX WWP	MOTOR CHARACTERISTICS					IMPELLER SIZE (DIA. In.)	FLUID TEMP. (DEG.F)	MIN. PUMP EFF. (%)	MAX. BHP	SUCTION & DISCHARGE SIZES	TRIPLE DUTY VALVE SIZE	SUCTION DIFFUSER SIZE	MANUFACTURER & MODEL No.	REMARKS
				FLOW (GPM)	TOTAL HEAD IN FEET		RPM	HP	VOLTS	PHASE	STARTER									
CWP-1	MECH RM	CHILLED WATER DISTRIBUTION	END SUCTION	1600	120		1800	75	460	3	ASD	11.875	60	84.8	56.9	8/6		10x8	B&G E1510-6G	
CWP-2	MECH RM	CHILLED WATER DISTRIBUTION	END SUCTION	1600	120		1800	75	460	3	ASD	11.875	60	84.8	56.9	8/6		10x8	B&G E1510-6G	
CWP-3	MECH RM	CHILLED WATER DISTRIBUTION	END SUCTION	1600	120		1800	75	460	3	ASD	11.875	60	84.8	56.9	8/6		10x8	B&G E1510-6G	
CTP-1	MECH RM	COND. WATER PUMP	VERTICAL SPLIT	3700	50		1200	75	460	3	ASD	13.25	85	86.5	55.9	12/10			B&G VSX-VSC 10x12x13.5A	
CTP-2	MECH RM	COND. WATER PUMP	VERTICAL SPLIT	3700	50		1200	75	460	3	ASD	13.25	85	86.5	55.9	12/10			B&G VSX-VSC 10x12x13.5A	

REMARKS:
1. GLYCOL - PROPYLENE, [XX%]
2. STAND-BY
3. INVERTER DUTY MOTOR
4. ADJUSTABLE SPEED DRIVE
5. PUMPS OPERATE IN PARALLEL (NON-OVERLOADING)
6. MAX. WWP (WORKING WATER PRESSURE)
7. EC MOTOR (ELECTRONICALLY COMMUTATED)
8. INTEGRATED ADJUSTABLE SPEED DRIVE

OPEN COOLING TOWER SCHEDULE

UNIT NO.	LOCATION	SERVICE	UNIT TYPE & DESCRIPTION	NOMINAL CAPACITY (TONS)	AMB. AIR TEMP. WET BULB (DEG. F)	WATER FLOW RATE (GPM)	ENT. WATER TEMP. (DEG. F)	LVG. WATER TEMP. (DEG. F)	MIN FLOW RATE (GPM)	DRIFT LOSS (GPM)	EVAP. (GPM)	BLOW DOWN (GPM)	PERFORMANCE (GPM/HP)	FAN MOTOR(S)						MAKE-UP WATER INLET PRESSURE (PSI)	MANUFACTURER & MODEL No.	REMARKS
														NO.	HP EACH	RPM	ELECTRICAL VOLTS	ELECTRICAL PHASE	STARTER			
CT-1	SCIENCE 3 ROOF	SCIENCE 3 CH-1	INDUCED DRAFT CROSS FLOW	750	73	1750	97	85	560	0.09	20.4	20.3	74	1	25	1200	460	3	ASD		MARLEY NC8407RLN	4,5,6,7,8,9,10,11,12,13,14,15,16
CT-2	SCIENCE 3 ROOF	SCIENCE 3 CH-1	INDUCED DRAFT CROSS FLOW	750	73	1750	97	85	560	0.09	20.4	20.3	74	1	25	1200	460	3	ASD		MARLEY NC8407RLN	4,5,6,8,9,10,11,12,13,14,15,16

REMARKS:
1. DISCHARGE HOOD.
2. SOUND ATTENUATORS.
3. CAPACITY CONTROL DAMPERS.
4. PAN WATER HEATERS (15 KW).
5. WATER LEVEL CONTROL SENSOR.
6. VIBRATION ISOLATORS AND ASSOCIATED SUPPORT RAIL.
7. REMOTE MOUNTED 2" MAKEUP SLOW CLOSING SOLENOID VALVE
8. HIGH LOW WATER LEVEL ALARM SENSORS
9. "I"-BEAM SUPPORTS COORDINATED WITH STRUCTURAL
10. BLOW DOWN BASED ON 2 CONCENTRATIONS
11. BOTTOM SUMP-SIDE DISCHARGE WITH ANTIVORTEX PLATE
12. ADJUSTABLE SPEED DRIVE - TEFC-INVERTER DUTY MOTOR.
13. EXTERNAL SERVICE PLATFORM WITH LADDER & SAFETY CAGE.
14. PERFORMANCE TEST PROCEDURE CTI ATC-105 AND CTI STD-201.
15. VIBRATION SWITCH.
16. NOZZLE SELECTION FOR MIN. FLOW RATE (FREE COOLING)

CENTRIFUGAL DUPLEX WATER CHILLER SCHEDULE

UNIT NO.	LOCATION	CAPACITY (TONS)	NO. OF COMPRESSORS	REFRIGERANT TYPE	CHILLED WATER FLOW RATE (GPM) DESIGN	CHILLED WATER FLOW RATE (GPM) MINIMUM	P.D. (Ft. HD)	ENT. WATER TEMP. (DEG. F)	LVG. WATER TEMP. (DEG. F)	NO. OF PASSES	FOULING FACTOR	CONDENSER WATER FLOW RATE (GPM)	P.D. (Ft. HD)	ENT. WATER TEMP. (DEG. F)	LVG. WATER TEMP. (DEG. F)	NO. OF PASSES	FOULING FACTOR	EFFICIENCY FULL LOAD	EFFICIENCY NPLV	KW/TON CAPACITY STEPS 1	0.75	0.5	0.25	ELECTRICAL VOLTS	PHASE	MCA	MOP	STARTERS	NOISE RATING (dBA)	MANUFACTURER & MODEL No.	REMARKS
CH-1	MECH RM	1500	2	R-514A	2389	1403	5.92	57	42	1	0.0001	3479	6.36	85	97	1	0.00025	0.516	0.434	.516	.448	.424	.421	460	3	657/682	1000/1200	SOLID STATE		TRANE CDHF1500	1,2,4

REMARKS:
1. BREAK DOWN AND REASSEMBLE FOR RIGGING
2. MARINE WATER BOXES.
3. FREE COOLING OPTION.
4. MINIMUM EFFICIENCY PATH B

PLATE HEAT EXCHANGER SCHEDULE - WATER TO WATER

UNIT NO.	LOCATION	SERVICE	TYPE	HIGH TEMP. SIDE - CHILLED WATER FLOW RATE (GPM)	WATER TEMP. ENT. (DEG. F)	WATER TEMP. LVG. (DWG. F)	CAPACITY (MBH)	PRESS. DROP (Ft. HD)	FOULING FACTOR	LOW TEMP. SIDE - TOWER WATER FLOW RATE (GPM)	WATER TEMP. ENT. (DEG. F)	WATER TEMP. LVG. (DEG. F)	CAPACITY (MBH)	PRESS. DROP (Ft. HD)	LMTD (DEG. F)	FOULING FACTOR	MIN. EFF. REQ. EXCESS SURFACE (PCT)	MIN. EFF. REQ. TEST PROC.	HEAT TRANSFER SURFACE AREA (Sq. Ft.)	MANUFACTURER & MODEL No.	REMARKS
HX-2	MECH RM	WINTER FREE COOLING	PLATE & FRAME	800	52.5	48	1809	6.64	0.0005	1200	42	45	1809	14.35	6.72	0.0005	1.48	AHRI 400	613.97	B&G AP43 - 126 PLATE	2

REMARKS:
1. PROVIDE INSULATION SHROUD
2. XX

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BINGHAMTON UNIVERSITY

STATE OF NEW YORK
JOHN J. DREDGE
075752-1
LICENSED PROFESSIONAL ENGINEER

REVISIONS

No.	Date	By	Description

DRAWING TITLE
SYMBOLS LIST AND SCHEDULES - HVAC

DRAWING NO.
M001

Drawn By:	DLT
Checked By:	DAR
Project Mgr:	MDS
Project No:	071018
M/E Project No:	170425

ISSUE DATE: **01/18/2019**
STATUS: **BID DOCUMENTS**

1 ENLARGED MECH ROOM PLAN - HVAC DEMOLITION
1/4" = 1'-0"

NORTH
0' 2' 4' 8'

M101 GENERAL NOTES

A. REFER TO PIPING SCHEMATICS FOR ADDITIONAL DETAIL.
B. CHILLER CH-2A TO REMAIN AS OPERATIONAL BACK-UP AND SHALL BE FULLY FUNCTIONAL AT BEGINNING OF COOLING SEASON.

M101 DEMOLITION NOTES [X]

1 RELOCATE EXISTING CONDENSATE EQUIPMENT, ASSOCIATED PIPING AND ACCESSORIES TO ACCOMMODATE INSTALLATION OF NEW CHILLER. REMOVE CONCRETE BASE AND PATCH FLOOR.
2 RELOCATE EXISTING COMPRESSOR, ASSOCIATED COMPRESSED AIR PIPING AND ACCESSORIES TO ACCOMMODATE INSTALLATION OF NEW PUMPS. REMOVE CONCRETE BASE AND PATCH FLOOR.
3 REMOVE CHILLER AND PIPING TO NOTED POINTS. UNIVERSITY FACILITIES TO REMOVE SELECTED CONTROL COMPONENTS AND CONTROL PANEL PRIOR TO DEMOLITION. CONTRACTOR TO PROVIDE ASME REFRIGERANT RECOVERY STORAGE TANK. RECOVER REFRIGERANT AND DELIVER FILLED TANK TO LOADING DOCK FOR PICKUP BY UNIVERSITY. COORDINATE RECOVERY AND REFRIGERANT DELIVERY WITH UNIVERSITY. CONTRACTOR TO DISPOSE OF CHILLER.
4 REMOVE ABANDONED PNEUMATIC CONTROLLER SERVING PREVIOUSLY REMOVED CHILLED WATER BYPASS CONTROL VALVE. 2-PIPE SECONDARY WATER SYSTEM CONTROLLER TO REMAIN.
5 RELOCATE EXISTING DOMESTIC WATER STORAGE TANK, CHEMICAL FEED TANK, ASSOCIATED PIPING AND ACCESSORIES TO ACCOMMODATE INSTALLATION OF NEW CHILLER.
6 RELOCATE (E)CH-2A RUPTURE DISC PIPING TO ACCOMMODATE INSTALLATION OF NEW CHILLER.
7 RELOCATE 2-PIPE SECONDARY WATER RETURN PIPING TO ACCOMMODATE INSTALLATION OF NEW CHILLER.
8 REMOVE SECTION OF EXHAUST DUCTWORK BACK TO WALL. DUCT TO REMAIN OPEN ENDED AT WALL. PROVIDE BIRDSCREEN.
9 ISOLATE PUMPS WITH VALVES IN VERTICAL RISERS. REMOVE PUMPS, SUPPORTS AND CHEMICAL POT FEEDER TEMPORARILY TO ALLOW FOR RIGGING OF CHILLER SHELLS. REINSTALL TO ORIGINAL CONDITION AFTER CHILLER RIGGING IS COMPLETE.

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STATE OF NEW YORK — MATTHEW D. SCHNEIDER — LICENSED PROFESSIONAL ENGINEER — 075752-1

REVISIONS

No.	Date	By	Description

DRAWING TITLE
ENLARGED MECH ROOM PLAN - HVAC DEMOLITION

DRAWING NO. M101

Drawn By:	Author
Checked By:	Checker
Project Mgr:	MDS
SUCF Project No:	071018
M/E Project No:	170425

ISSUE DATE: **01/18/2019**

STATUS: **BID DOCUMENTS**

1 ENLARGED MECH ROOM PLAN - HVAC DEMOLITION - ALTERNATE
1/4" = 1'-0"

NORTH
0' 2' 4' 8'

M101 GENERAL NOTES

A. REFER TO PIPING SCHEMATICS FOR ADDITIONAL DETAIL.
B. CHILLER CH-2A TO REMAIN AS OPERATIONAL BACK-UP AND SHALL BE FULLY FUNCTIONAL AT BEGINNING OF COOLING SEASON.

M101A DEMOLITION NOTES X

1 RELOCATE EXISTING CONDENSATE EQUIPMENT, ASSOCIATED PIPING AND ACCESSORIES TO ACCOMMODATE INSTALLATION OF NEW CHILLER. REMOVE CONCRETE BASE AND PATCH FLOOR.
2 RELOCATE EXISTING COMPRESSOR, ASSOCIATED COMPRESSED AIR PIPING AND ACCESSORIES TO ACCOMMODATE INSTALLATION OF NEW PUMPS. REMOVE CONCRETE BASE AND PATCH FLOOR.
3 REMOVE CHILLER AND PIPING TO NOTED POINTS. UNIVERSITY FACILITIES TO REMOVE SELECTED CONTROL COMPONENTS AND CONTROL PANEL PRIOR TO DEMOLITION. CONTRACTOR TO PROVIDE ASME REFRIGERANT RECOVERY STORAGE TANK, RECOVER REFRIGERANT AND DELIVER FILLED TANK TO LOADING DOCK FOR PICKUP BY UNIVERSITY. COORDINATE RECOVERY AND REFRIGERANT DELIVERY WITH UNIVERSITY. CONTRACTOR TO DISPOSE OF CHILLER.
4 REMOVE ABANDONED PNEUMATIC CONTROLLER SERVING PREVIOUSLY REMOVED CHILLED WATER BYPASS CONTROL VALVE. 2-PIPE SECONDARY WATER SYSTEM CONTROLLER TO REMAIN.
5 RELOCATE EXISTING DOMESTIC WATER STORAGE TANK, CHEMICAL FEED TANK, ASSOCIATED PIPING AND ACCESSORIES TO ACCOMMODATE INSTALLATION OF NEW CHILLER.
6 RELOCATE (E)CH-2A RUPTURE DISC PIPING TO ACCOMMODATE INSTALLATION OF NEW CHILLER.
7 RELOCATE 2-PIPE SECONDARY WATER RETURN PIPING TO ACCOMMODATE INSTALLATION OF NEW CHILLER.
8 REMOVE SECTION OF EXHAUST DUCTWORK BACK TO WALL. DUCT TO REMAIN OPEN ENDED AT WALL. PROVIDE BIRDSCREEN.
9 ISOLATE PUMPS WITH VALVES IN VERTICAL RISERS. REMOVE PUMPS, SUPPORTS AND CHEMICAL POT FEEDER TEMPORARILY TO ALLOW FOR RIGGING OF CHILLER SHELLS. REINSTALL TO ORIGINAL CONDITION AFTER CHILLER RIGGING IS COMPLETE.
10 DISCONNECT EVENT CENTER CWS/R PIPING AT WALL PENETRATION.
11 DISCONNECT SCIENCE 4 CWR PIPING AT WALL PENETRATION. EXISTING SCIENCE 4 CWS PIPING TO REMAIN CONNECTED AS IS.
12 REMOVE PUMP AND CONCRETE BASE. PATCH FLOOR. REMOVE PUMP PIPING TRIM AND PIPING TO NOTED POINTS.

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REVISIONS

No.	Date	By	Description

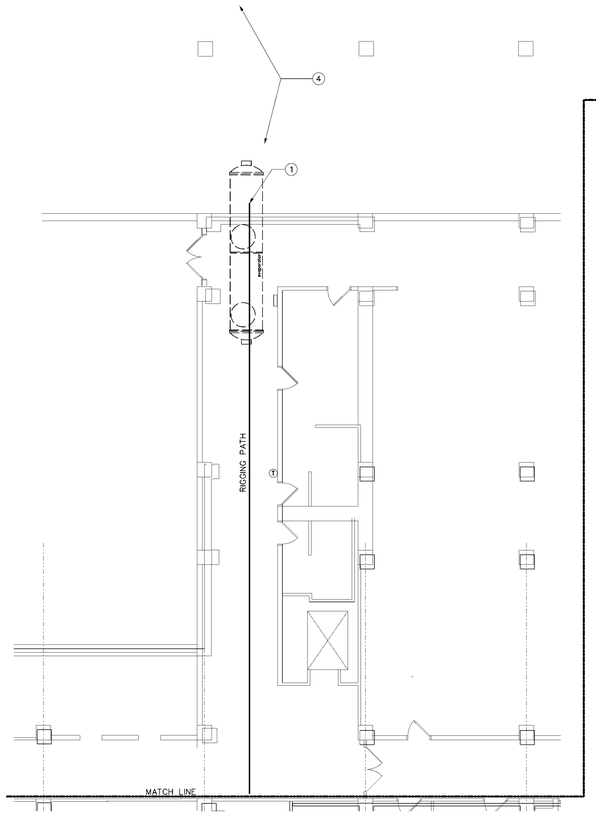
DRAWING TITLE
ENLARGED MECH ROOM PLAN - HVAC DEMOLITION - ALTERNATE

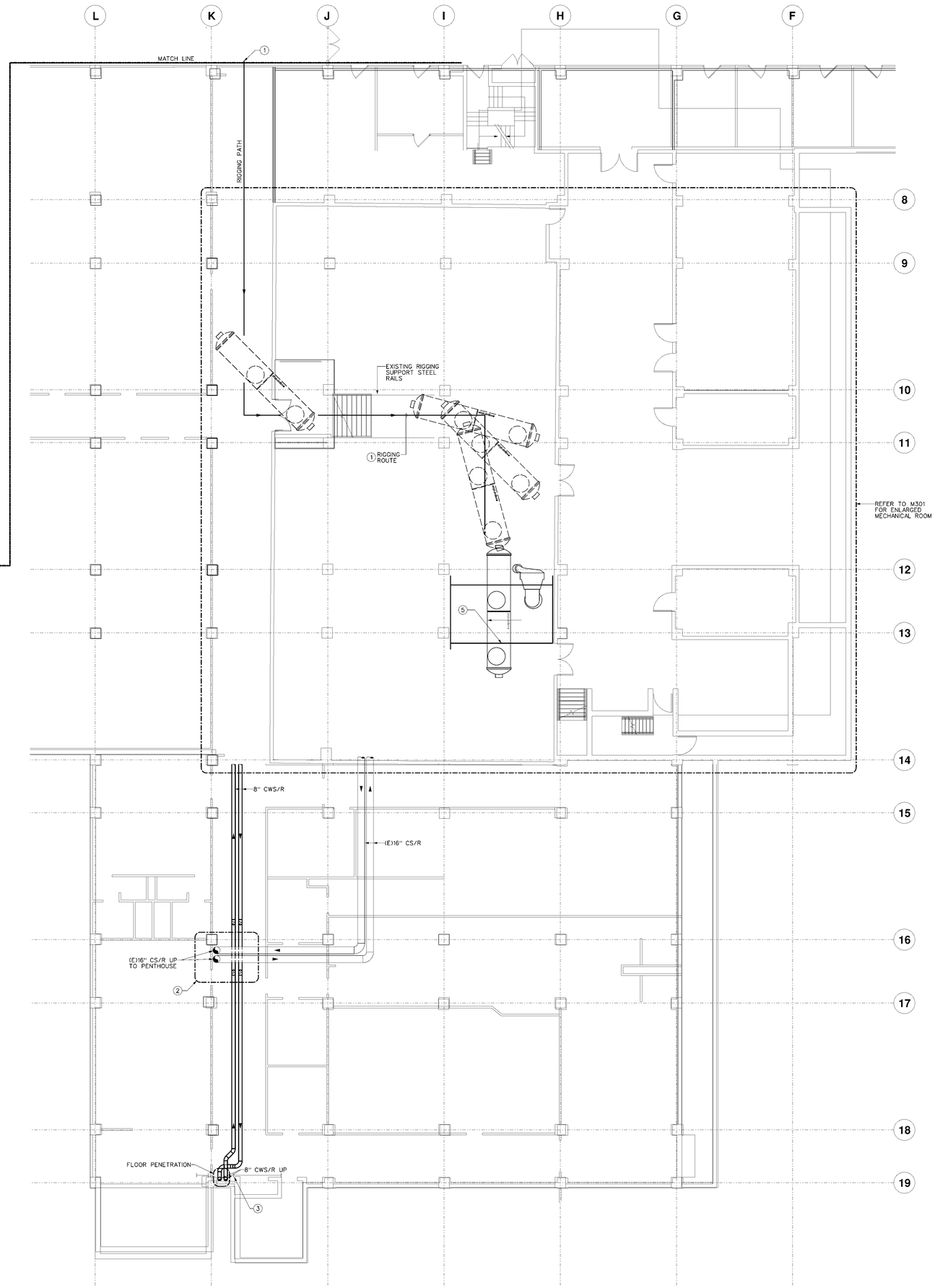
DRAWING NO. M101A

Drawn By:	DLT
Checked By:	DAR
Project Mgr:	MDS
SUCF Project No:	071018
M/E Project No:	170425

ISSUE DATE: **01/18/2019**

STATUS: **BID DOCUMENTS**





DRAWING NOTES:

1. CHILLER TO BE DISASSEMBLED AND RIGGED THROUGH REMOVED WINDOW, DOWN HALLWAY AND INTO MECHANICAL ROOM. REFER TO ARCHITECTURAL DRAWINGS FOR WINDOW REMOVAL AND PARTIAL WALL REMOVAL AT MECHANICAL ROOM ENTRY.
2. OFFSET AROUND EXISTING PIPE RACK AND CONDUIT. MAINTAIN DOOR SWING CLEARANCE TO ELECTRIC ROOM.
3. REROUTE 1" PVC DRAIN TO ACCOMMODATE PIPING. COORDINATE ¾" CONDUIT RELOCATION AS NOTED ON ELECTRICAL DRAWINGS.
3. FULLY COORDINATE SUPPLY AND RETURN PIPING CONNECTIONS WITH PIPING PENETRATIONS FROM SCIENCE 2 PROJECT PRIOR TO INSTALLING ANY PIPING. COORDINATE ELEVATIONS AND CONNECTIONS TO SCIENCE 2 PIPING IN ORDER TO PREVENT HAVING TO CROSS PIPING AT CONNECTION POINT AND MAINTAINING A SINGLE ELEVATION PLANE. REFER TO M202.
4. PREPARE SITE AT RIGGING ENTRY POINT TO ALLOW ACCESS FOR RIGGING OF EQUIPMENT. REPAIR ALL GRASS, CURBS, PAVEMENT OR PAVERS DAMAGED DURING RIGGING TO ORIGINAL CONDITIONS.
5. PROVIDE STEEL RIGGING STRUCTURE COORDINATED WITH EQUIPMENT, PIPING AND CLEARANCES TO MOUNT/DEMOUNT COMPRESSORS AND COMPRESSOR MOTORS.

GENERAL NOTES:

A. PROVIDE FLOOR AND WALL PROTECTION FOR ALL RIGGING.

B. PATCH AND REPAIR ANY DAMAGED SURFACES TO ORIGINAL CONDITION.

1 BASEMENT FLOOR PLAN - DUCTWORK
1/8" = 1'-0"

NORTH
0 4' 8' 16'

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REVISIONS

No.	Date	By	Description

DRAWING TITLE

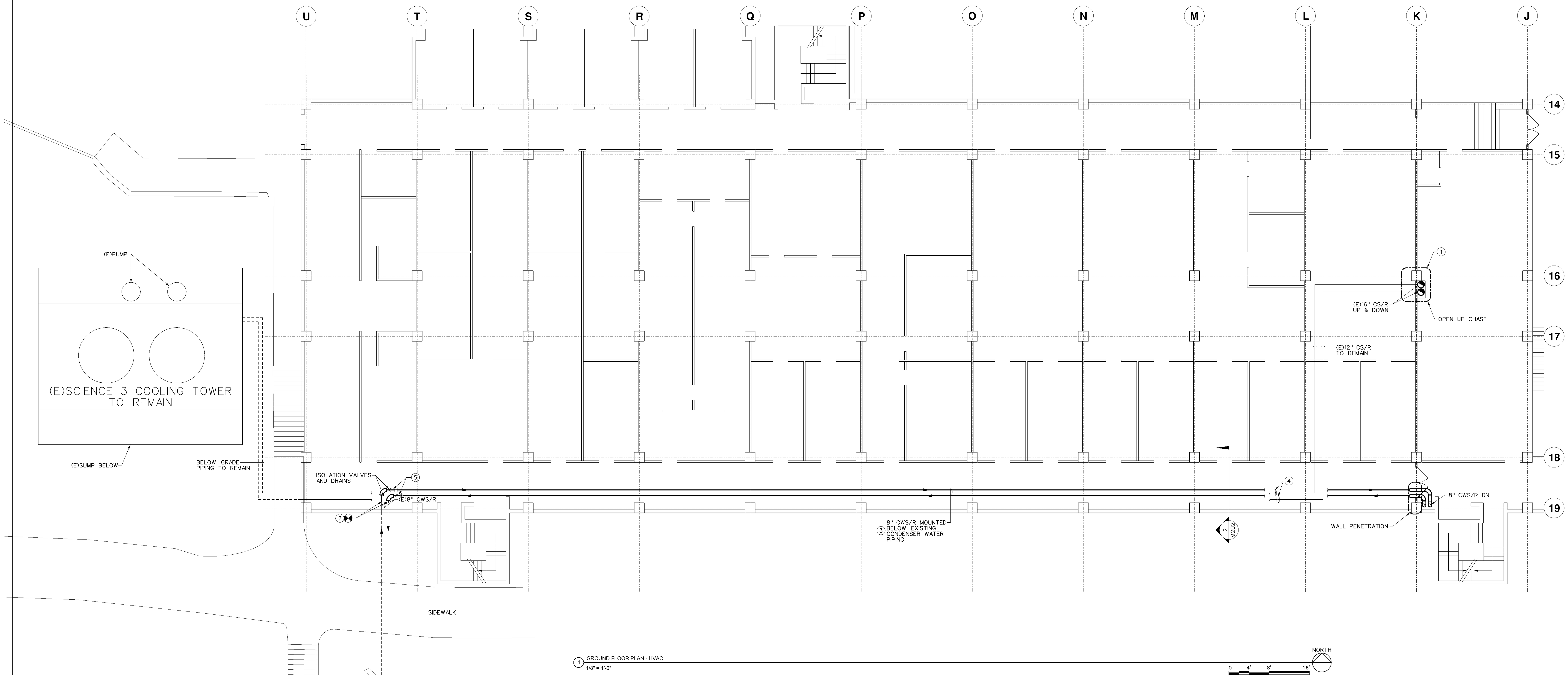
BASEMENT FLOOR PLAN AND RIGGING PATH - HVAC

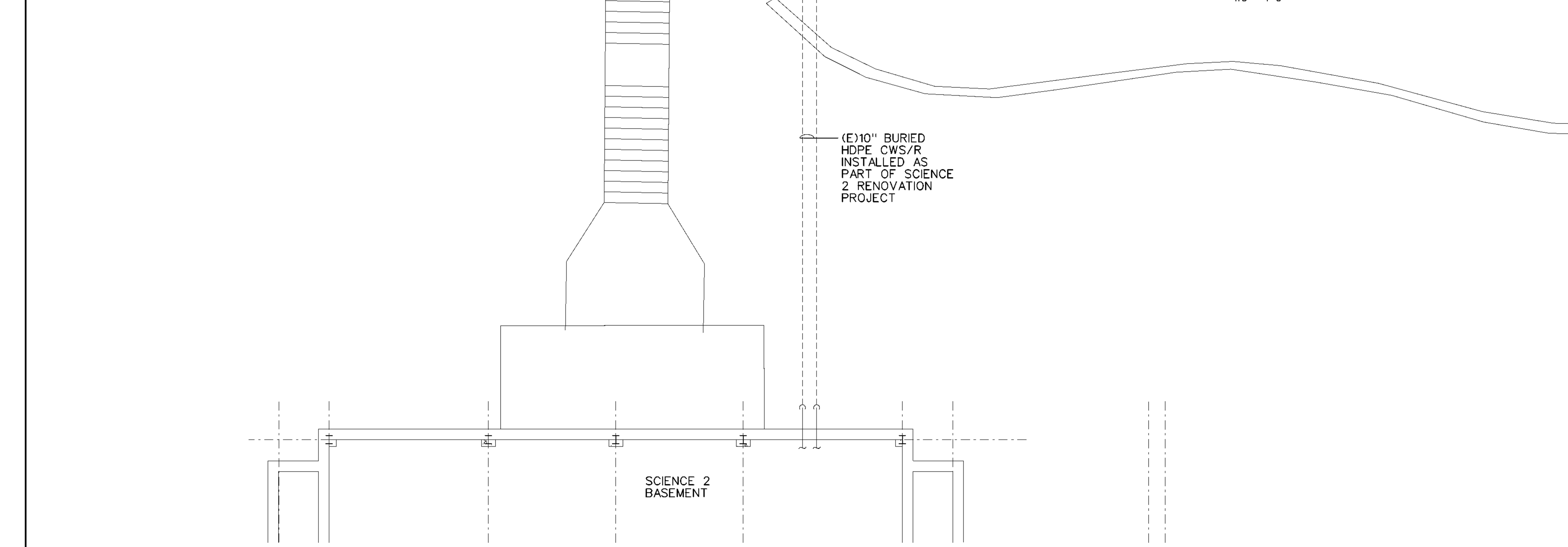
DRAWING NO. M201

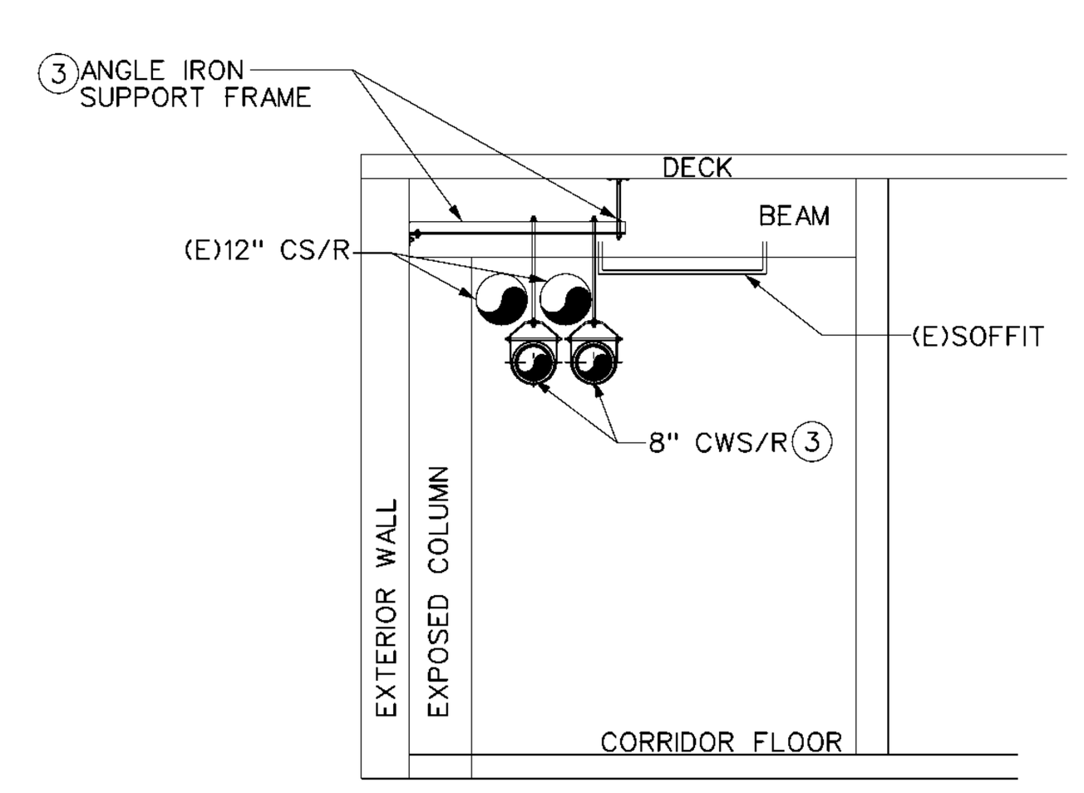
Drawn By:	DLT
Checked By:	DAR
Project Mgr:	MDS
Project No:	071018
M/E Project No:	170425

ISSUE DATE: **01/18/2019**

STATUS: **BID DOCUMENTS**







DRAWING NOTES:

1 PROVIDE CONNECTION BETWEEN ABANDONED 16" CS/R RISER AND CURRENT 16" CS/R PIPING IN SHAFT. APPROXIMATELY A 24" SPOOL PIECE. REFER TO SCHEMATIC ON M402.

2 CONNECT TO STEEL FLANGE ON HDPE TO STEEL ADAPTER PROVIDED BY SCIENCE 2 PROJECT. COORDINATE PENETRATIONS WITH UNIVERSITY AND SCIENCE 2 PROJECT COORDINATOR. COORDINATE SUPPLY AND RETURN WITH INSTALLED PIPING AT WALL PENETRATIONS PRIOR TO HANGING PIPING TO AVOID HAVING TO CROSS PIPING WITHIN THE ELEVATION PLANE. FULL PIPE ROUTING COORDINATION SHALL BE DONE PRIOR TO INTALLING ANY PIPING.

3 OFFSET PIPING TO ALLOW FOR PLACEMENT OF HANGER ROD BETWEEN AND NEXT TO EXISTING CONDENSER WATER PIPING ABOVE. HANGERS FOR NEW PIPING TO BE STAGGERED WITH EXISTING PIPE HANGER TO SPREAD OUT POINT LOADS. PROVIDE INTERMEDIATE STEEL SUPPORTS ABOVE EXISTING PIPE RACK AS NEEDED TO ALLOW CONNECTION OF NEW PIPE HANGERS. HANG PIPING AS HIGH AS POSSIBLE.

4 PROVIDE REPLACEMENT ISOLATION VALVES ON (E)12" CS/R PIPING.

5 PROVIDE ISOLATION VALVES AND DRAINS.

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REVISIONS

No.	Date	By	Description

DRAWING TITLE

GROUND (SCIENCE 3) AND BASEMENT (SCIENCE 2) FLOOR PLANS - HVAC

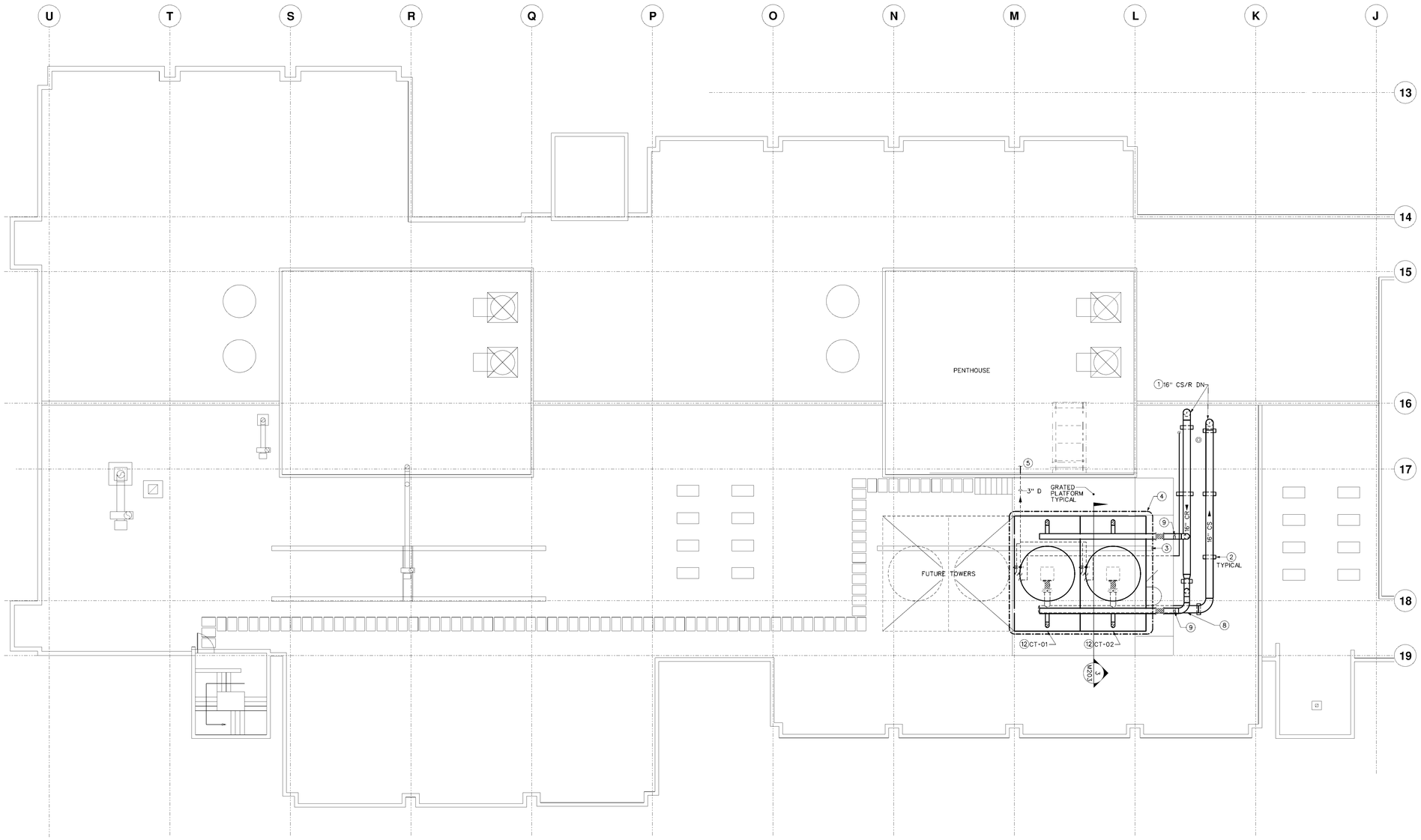
DRAWING NO.

M202

Drawn By:	DLT
Checked By:	DAR
Project Mgr:	MDS
Project No:	071018
M/E Project No:	170425

ISSUE DATE: **01/18/2019**

STATUS: **BID DOCUMENTS**



GENERAL NOTES:

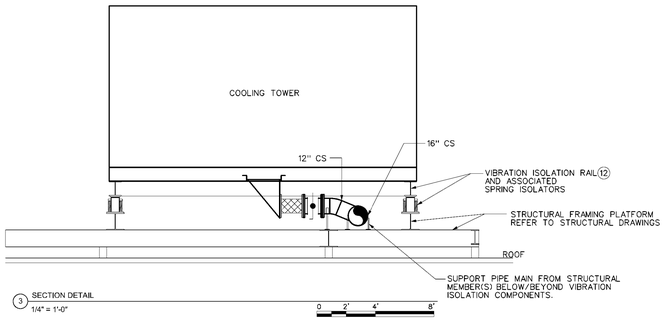
A. PROVIDE CONDENSER WATER PIPING INSULATION AS SPECIFIED FOR WINTER FREE COOLING APPLICATION.

DRAWING NOTES:

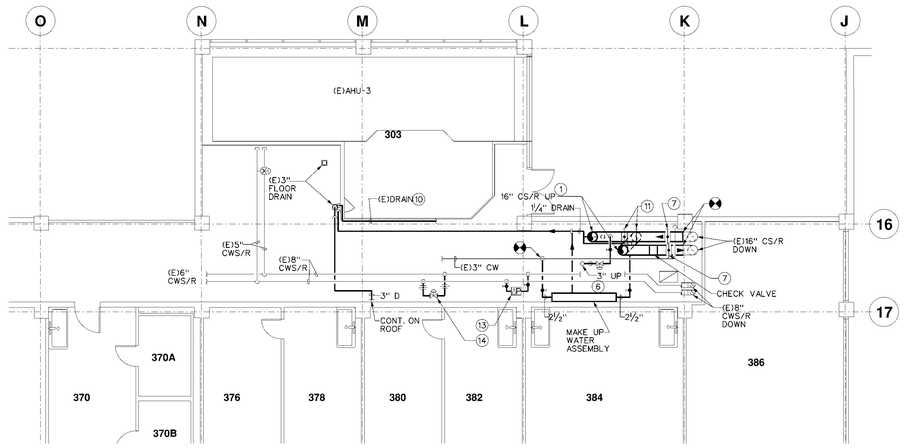
1. PROVIDE ROOF PENETRATION. SUPPORT PIPING FROM BELOW AND FLASH PER DETAIL 6/M501.
2. PROVIDE PIPE SUPPORT CURBS. PROVIDE ROOF FLASHING TO MAINTAIN CURRENT ROOF WARRANTIES.
3. REFER TO STRUCTURAL DRAWINGS FOR SUPPORT STEEL. COORDINATE FINAL SIZING WITH TOWER SHOP DRAWINGS AND PIPING COORDINATION. PROVIDE FLASHING TO MAINTAIN ROOF WARRANTIES.
4. REFER TO PIPING SCHEMATIC ON M402 FOR PIPE SIZING, VALVING AND ACCESSORY REQUIREMENTS.
5. ROUTE 3" DRAIN PIPING TO NEAREST FLOOR DRAIN. REFER TO SCHEMATIC ON M402.
6. DOMESTIC MAKE-UP WATER FOR CONDENSER WATER SYSTEM. REFER TO SCHEMATIC ON M402.
7. PROVIDE CHAIN WHEEL OPERATORS ON ISOLATION VALVES. PROVIDE TIE BACK HOOK FOR CHAINS ON WALL.
8. COORDINATE PIPING ELEVATION WITH STEEL SUPPORT FRAMING AND TOWER SUMP OUTLET TO ALLOW FOR PIPING TO PITCH BACK TO MECHANICAL ROOM.
9. PROVIDE PIPE SUPPORT STAND FROM STRUCTURAL SUPPORT UP TO OVERHEAD PIPE.
10. REPLACE EXISTING DRAIN AT HIGHER ELEVATION.
11. PROVIDE TWO BUTTERFLY VALVES ON A COMMON LINKAGE TO ACT AS BYPASS CONTROL VALVE.
12. PROVIDE COOLING TOWER VIBRATION ISOLATION RAIL BASE. BASIS OF DESIGN IS VMC GROUP UTILIZING EIGHT M4S-3E-8440 ISOLATORS, TWO M4S-3E-14000 ISOLATORS AND AN INTEGRAL W12x58 ISOLATION RAIL. ALL COMPONENTS TO BE HOT-DIP GALVANIZED.
13. PROVIDE DIFFERENTIAL PRESSURE SENSOR FOR CWS/R AND CONNECT TO SIEMENS CONTROL SYSTEM.
14. PROVIDE A 6" MINIMUM FLOW BYPASS CONTROL VALVE BETWEEN CWS AND CWR MAINS. CONNECT TO CONTROL SYSTEM FOR CHILLER MINIMUM FLOW REQUIREMENT CONTROL.

2 ROOF PLAN - HVAC
1/8" = 1'-0"

NORTH
0 4' 8' 16'



3 SECTION DETAIL
1/4" = 1'-0"
0 2' 4' 8'



1 THIRD FLOOR PLAN - HVAC
1/8" = 1'-0"

NORTH
0 4' 8' 16'

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REVISIONS

No.	Date	By	Description

DRAWING TITLE
THIRD FLOOR AND ROOF PLANS - HVAC

DRAWING NO. **M203**

Drawn By:	DLT
Checked By:	DAR
Project Mgr:	MDS
Project No:	071018
M/E Project No:	170425

ISSUE DATE: **01/18/2019**

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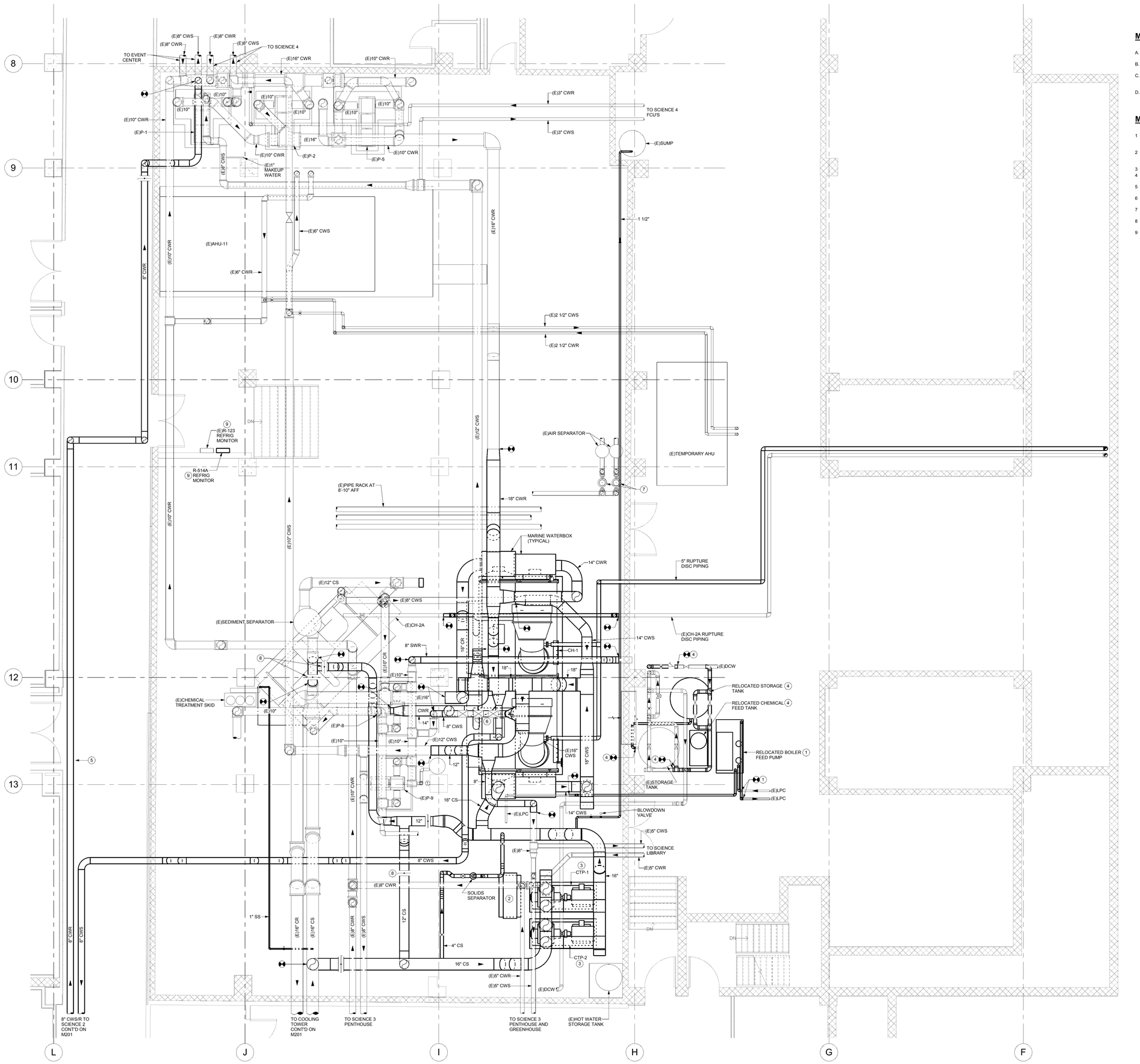

1 ENLARGED MECH ROOM PLAN - HVAC
1/4" = 1'-0"

M301 GENERAL NOTES

A. REFER TO PIPING SCHEMATIC ON M402 FOR COMPLETE VALVING AND ACCESSORIES REQUIREMENTS.
B. PIPING HEADERS DESIGNED FOR REPLACEMENT OF CH2A WITH 1500 TON TO MATCH CH-1.
C. PROVIDE PERMANENT OVERHEAD STEEL RAIL FOR RIGGING AND FUTURE REPLACEMENT OF MOTOR/COMPRESSOR ON CHILLER CH-1. SUPPORT LEGS TO BE OUT OF WALKWAYS AND SERVICE AREAS.
D. PROVIDE FLOW METERS AS INDICATED ON PIPING SCHEMATIC AND CONTROLS SCHEMATIC. COORDINATE LOCATIONS WITH PLAN PIPING AND FLOW METER INSTALLATION REQUIREMENTS.

M301 DRAWING NOTES (X)

1 RELOCATED CONDENSATE EQUIPMENT, PIPING AND ACCESSORIES. PROVIDE 4" HIGH CONCRETE EQUIPMENT PAD TO MATCH EQUIPMENT LAYOUT.
2 RELOCATED COMPRESSOR, ASSOCIATED COMPRESSED AIR PIPING AND ACCESSORIES. PROVIDE 4" HIGH CONCRETE EQUIPMENT PAD TO MATCH THE ONE REMOVED DURING DEMOLITION.
3 PROVIDE PUMPS ON CONCRETE HOUSEKEEPING PADS.
4 RELOCATED DOMESTIC WATER STORAGE TANK, CHEMICAL FEED TANK, ASSOCIATED PIPING AND ACCESSORIES.
5 RELOCATE DRAIN VALVE ON EXISTING PIPE TO ACCOMMODATE INSTALLATION OF NEW CHILLED WATER PIPE.
6 RELOCATED CHILLED WATER VALVES SERVING SECONDARY WATER SYSTEM.
7 REINSTALL SYSTEM TO ORIGINAL WORKING CONDITION AFTER COMPLETION OF RIGGING.
8 PROVIDE A CHAIN WHEEL OPERATOR AND CHAIN. PROVIDE TIE BACK FOR OUT OF THE WAY CHAIN STORAGE.
9 PROVIDE REFRIGERANT MONITOR SYSTEM PROGRAMMED FOR USE WITH R-514A. PROVIDE CONNECTION TO DDC SYSTEM TO ACTIVATE EXISTING PROGRAMMING AND FANS ASSOCIATED WITH EXISTING R-123 MONITOR SYSTEM. EXISTING R-123 SYSTEM TO REMAIN. AN ALARM FROM EITHER SYSTEM SHALL ACTIVATE REFRIGERANT PURGE. PROVIDE ALARM STROBE OUTSIDE OF ENTRY DOOR OR TIE INTO EXISTING FROM OTHER SYSTEM.

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REVISIONS

No.	Date	By	Description

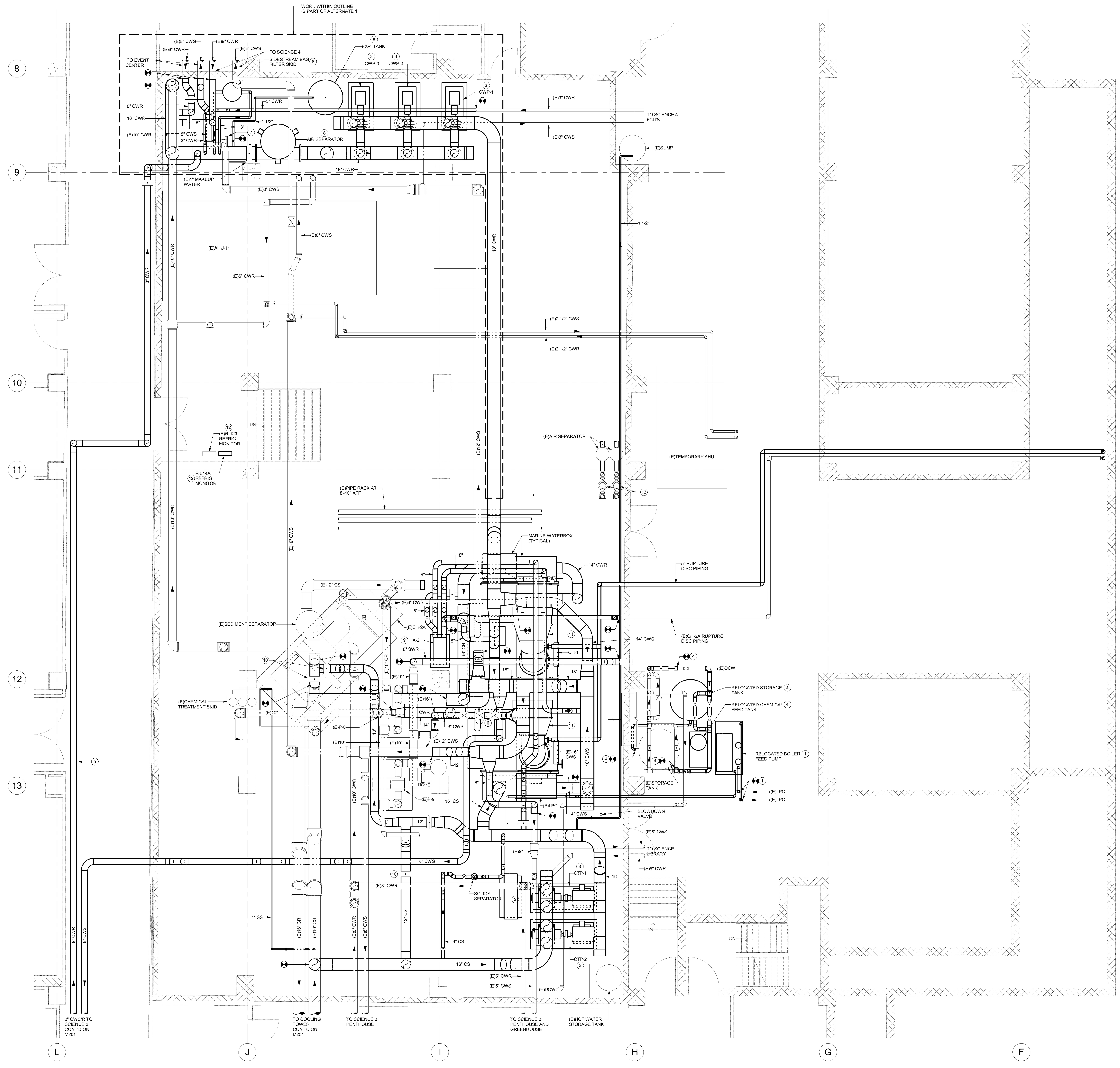
DRAWING TITLE
ENLARGED MECH ROOM PLAN - HVAC

DRAWING NO. **M301**

Drawn By: Author
Checked By: Checker
Project Mgr: MDS
SUCF Project No: 071018
M/E Project No: 170425

ISSUE DATE: **01/18/2019**

STATUS: **BID DOCUMENTS**



1 ENLARGED MECH ROOM PLAN - HVAC - ALTERNATE
1/4" = 1'-0"

M301A GENERAL NOTES

A. REFER TO PIPING SCHEMATIC ON M402 FOR COMPLETE VALVING AND ACCESSORIES REQUIREMENTS.

B. PIPING HEADERS DESIGNED FOR REPLACEMENT OF CH2A WITH 1500 TON TO MATCH CH-1.

C. PROVIDE PERMANENT OVERHEAD STEEL RAIL FOR RIGGING AND FUTURE REPLACEMENT OF MOTOR/COMPRESSOR ON CHILLER CH-1. SUPPORT LEGS TO BE OUT OF WALKWAYS AND SERVICE AREAS.

D. PROVIDE FLOW METERS AS INDICATED ON PIPING SCHEMATIC AND CONTROLS SCHEMATIC. COORDINATE LOCATIONS WITH PLAN PIPING AND FLOW METER INSTALLATION REQUIREMENTS.

M301A DRAWING NOTES (X)

1 RELOCATED CONDENSATE EQUIPMENT, PIPING AND ACCESSORIES. PROVIDE 4" HIGH CONCRETE EQUIPMENT PAD TO MATCH EQUIPMENT LAYOUT.

2 RELOCATED COMPRESSOR, ASSOCIATED COMPRESSED AIR PIPING AND ACCESSORIES. PROVIDE 4" HIGH CONCRETE EQUIPMENT PAD TO MATCH THE ONE REMOVED DURING DEMOLITION.

3 PROVIDE PUMPS ON CONCRETE HOUSEKEEPING PADS.

4 RELOCATED DOMESTIC WATER STORAGE TANK, CHEMICAL FEED TANK, ASSOCIATED PIPING AND ACCESSORIES.

5 RELOCATE DRAIN VALVE ON EXISTING PIPE TO ACCOMMODATE INSTALLATION OF NEW CHILLED WATER PIPE.

6 RELOCATED CHILLED WATER VALVES SERVING SECONDARY WATER SYSTEM.

7 CONNECT MAKE-UP WATER PIPING TO NEARBY 3" CW PIPING. REFER TO DETAILS ON M501.

8 REFER TO PIPING SCHEMATIC ON M402 FOR ADDITIONAL DETAIL.

9 WORK ASSOCIATED WITH WATER SIDE ECONOMIZER/FREE COOLING HEAT EXCHANGER IS PART OF ALTERNATE 2.

10 PROVIDE A CHAIN WHEEL OPERATOR AND CHAIN. PROVIDE TIE BACK FOR OUT OF THE WAY CHAIN STORAGE.

11 MAINTAIN CLEARANCE AREA TO REMOVE COMPRESSORS AND MOTORS.

12 PROVIDE REFRIGERANT MONITOR SYSTEM PROGRAMMED FOR USE WITH R-514A. PROVIDE CONNECTION TO DDC SYSTEM TO ACTIVATE EXISTING PROGRAMMING AND FANS ASSOCIATED WITH EXISTING R-123 MONITOR SYSTEM. EXISTING R-123 SYSTEM TO REMAIN. AN ALARM FROM EITHER SYSTEM SHALL ACTIVATE REFRIGERANT PURGE. PROVIDE ALARM STROBE OUTSIDE OF ENTRY DOOR OR TIE INTO EXISTING FROM OTHER SYSTEM.

13 REINSTALL SYSTEM TO ORIGINAL WORKING CONDITION AFTER COMPLETION OF RIGGING.

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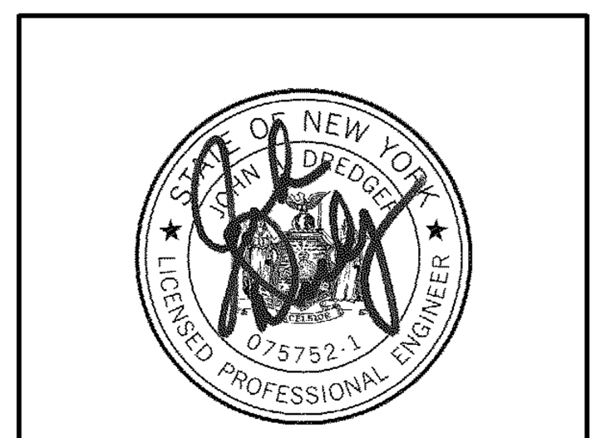

REVISIONS

No.	Date	By	Description

DRAWING TITLE
ENLARGED MECH ROOM PLAN - HVAC - ALTERNATE

DRAWING NO.
M301A

Drawn By:	DLT
Checked By:	DAR
Project Mgr:	MDS
SUCF Project No:	071018
M/E Project No:	170425

ISSUE DATE:
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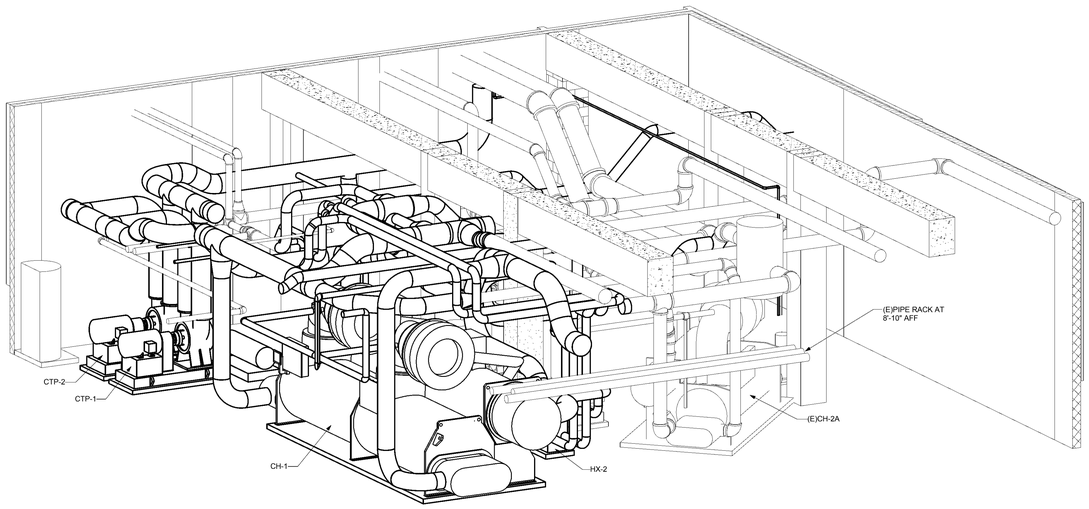
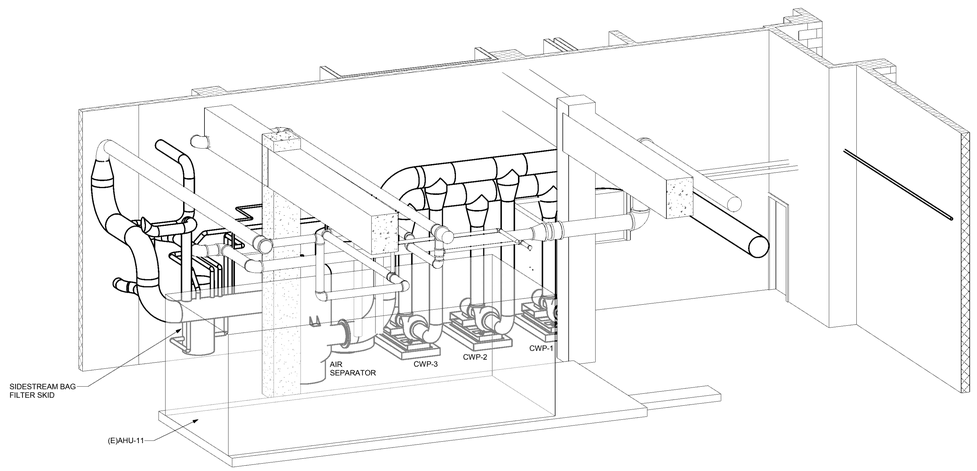


1 MECHANICAL ROOM VIEW 1
NTS



2 MECHANICAL ROOM VIEW 2 (ALTERNATE)
NTS

M302 GENERAL NOTES

A. REFER TO PIPING SCHEMATICS FOR MORE DETAILED EXTENT OF VALVING AND PIPING ACCESSORIES. REFER TO ASSOCIATED DETAILS FOR PUMP AND SYSTEM ACCESSORIES. ALL PIPING COMPONENTS ARE NOT SHOWN IN THESE VIEWS FOR CLARITY. VIEW IS FOR ROUTING REFERENCE AND COORDINATION.

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SCIENCE III - CHILLER PLANT
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REVISIONS

No.	Date	By	Description

DRAWING TITLE
MECHANICAL ROOM ISOMETRICS

DRAWING NO.
M302

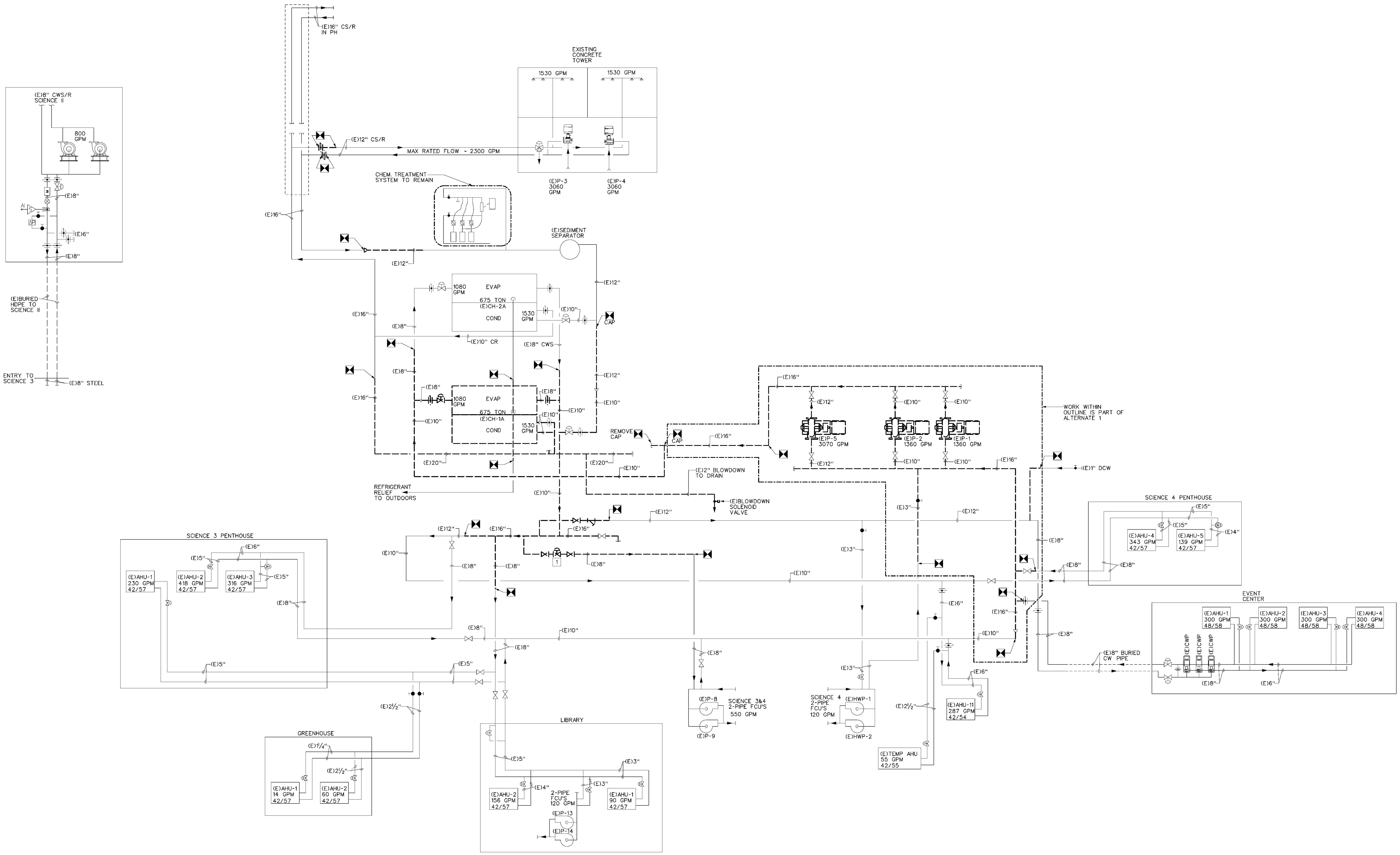
Drawn By:	DLT
Checked By:	DAR
Project Mgr:	MDS
SUCF Project No:	071018
M/E Project No:	170425

ISSUE DATE:
01/18/2019

STATUS:
BID DOCUMENTS

DEMOLITION NOTES: X

1 RELOCATE EXISTING VALVING TO ACCOMMODATE INSTALLATION AND CLEARANCES OF NEW CHILLER.



(1) CHILLED WATER PIPING DEMOLITION SCHEMATIC - HVAC
NTS

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No.	Date	By	Description

DRAWING TITLE
CHILLED WATER PIPING DEMOLITION SCHEMATIC - HVAC

DRAWING NO.
M401

Drawn By:	DLT
Checked By:	DAR
Project Mgr:	MDS
Project No:	071018
M/E Project No:	170425

ISSUE DATE: **01/18/2019**
STATUS: **BID DOCUMENTS**

GENERAL NOTES:

A. COORINATE WITH CAMPUS CHEMICAL CONTROL CONTRACTOR FOR ALL FLUSHING AND CHEMICAL TREATMENT EQUIPMENT AND CHEMICALS.

B. COORDINATE ALL SENSOR WELL AND FLOW METER LOCATIONS WITH TEMPERATURE CONTROLS.

DRAWING NOTES: (X)

1. REFER TO BASE MOUNTED END SUCTION PUMP DETAIL FOR ASSOCIATED PIPING ACCESSORY REQUIREMENTS.
2. REFER TO BASE MOUNTED HORIZONTAL SPLIT CASE PUMP DETAIL FOR ASSOCIATED PIPING ACCESSORY REQUIREMENTS.
3. OPEN FOR CT-01 & CT-02 OPERATION AND CLOSED FOR (E)CT-03 & CT-04 OPERATION.
4. CLOSED FOR CT-01 & CT-02 OPERATION AND OPEN FOR (E)CT-03 & CT-04 OPERATION.
5. REPLACEMENT ISOLATION VALVES ON (E)CS/R PIPING.
6. INSTALLED AS PART OF ALTERNATE 1.
7. PROVIDE 2-POSITION ISOLATION VALVE AS PART OF ALTERNATE 2. BASE BID TO INCLUDE A SPOOL PIECE FOR POSSIBLE FUTURE INSTALLATION OF VALVE.
8. RELOCATED CHILLED WATER SERVING SECONDARY WATER SYSTEM. REPLACE CONTROL VALVE.
9. AS PART OF BASE BID, CONNECT 8" CWR PIPING TO EXISTING 16" CWR PIPING HEADER. REFER TO M301 FOR CLARIFICATION.
10. PROVIDE CHAIN WHEEL OPERATOR AND CHAIN.
11. WORK IN DETAIL OUTLINE ASSOCIATED WITH WATER SIDE ECONOMIZER/FREE COOLING HEAT EXCHANGER TO BE INCLUDED AS PART OF ALTERNATE 2.
12. FLOW METER TO BE INCLUDED AS PART OF ALTERNATE 2.
13. MODIFIY CONTROL VALVE BYPASS PIPING WITH REDUCED SIZE PIPING AND BALANCING VALVE. INCLUDE MODIFICATION AS PART OF ALTERNATE 2.
14. PROVIDE DIFFERENTIAL PRESSURE SENSOR ACROSS SUPPLY AND RETURN MAINS. CONNECT TO SIEMENS CONTROL SYSTEM.
15. PROVIDE 6" TWO WAY BYPASS VALVE FOR CONTROL OF CHILLER MINIMUM FLOW.

(1) CHILLED WATER PIPING SCHEMATIC - HVAC
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No.	Date	By	Description

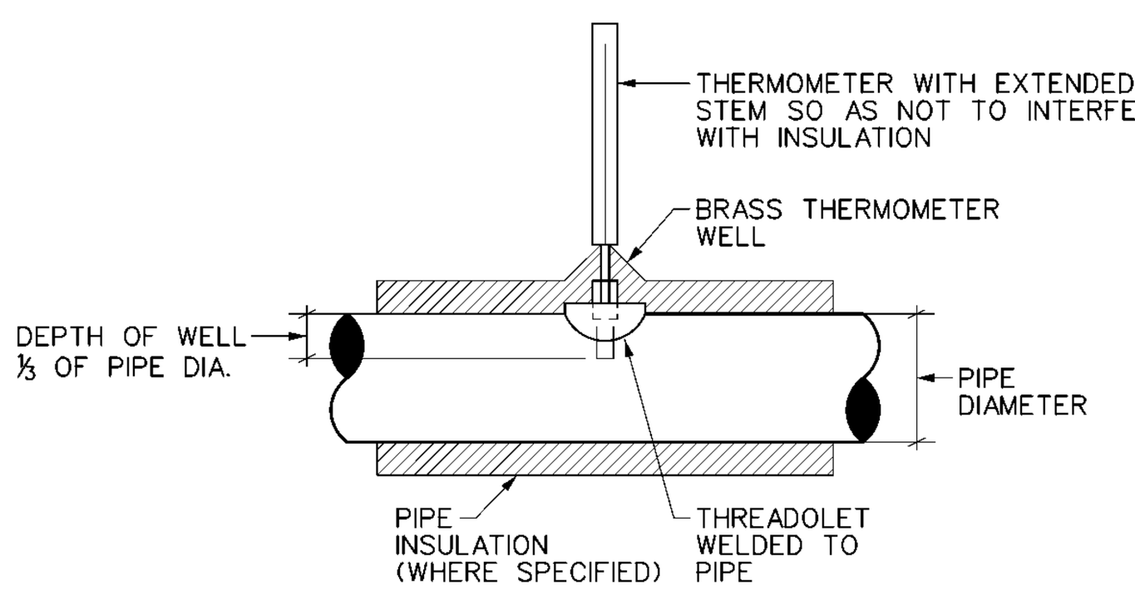
DRAWING TITLE

CHILLED WATER PIPING SCHEMATIC - HVAC

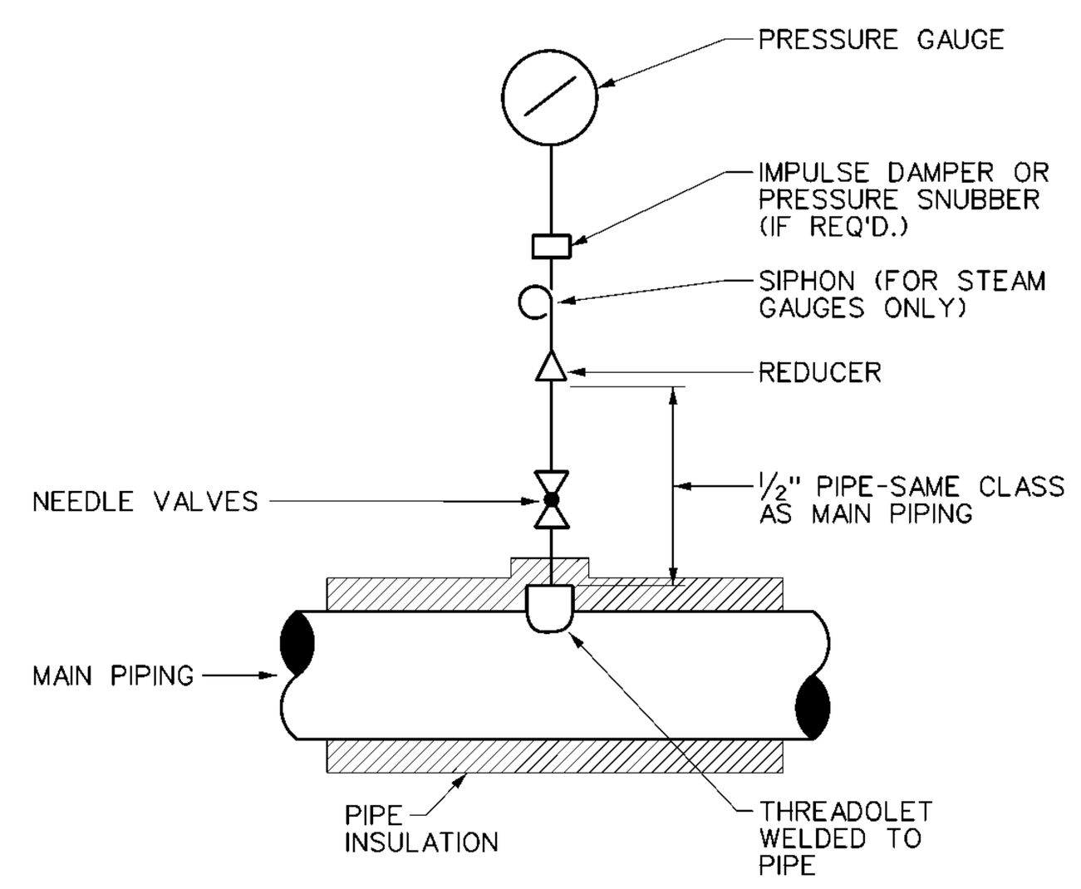
DRAWING NO.		
M402	Drawn By:	DLT
	Checked By:	DAR
	Project Mgr:	MDS
	Project No:	071018
	M/E Project No:	170425

ISSUE DATE: **01/18/2019**

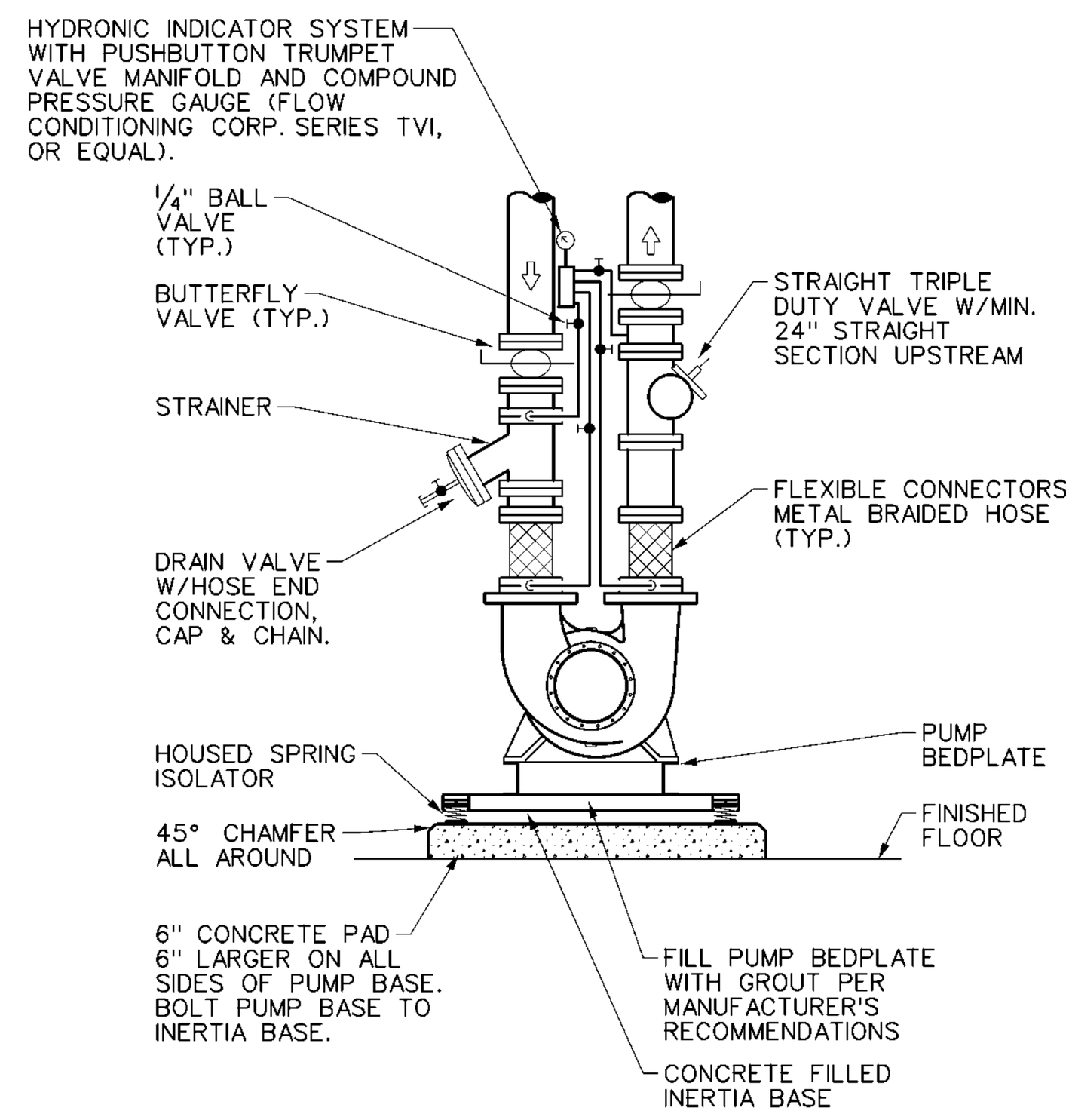
STATUS: **BID DOCUMENTS**



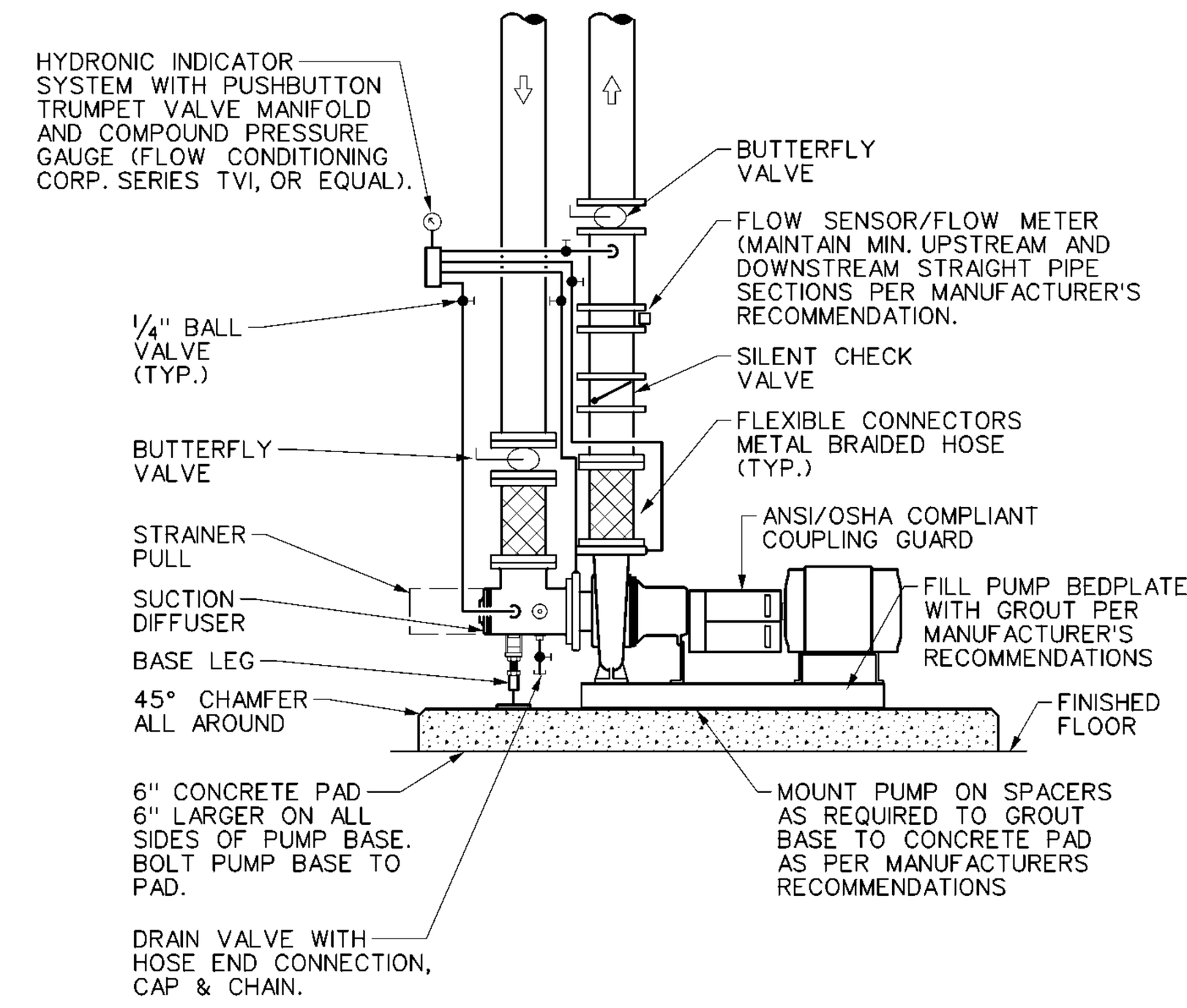
1 / M501	THERMOMETER INSTALLATION DETAIL
	SCALE: NONE



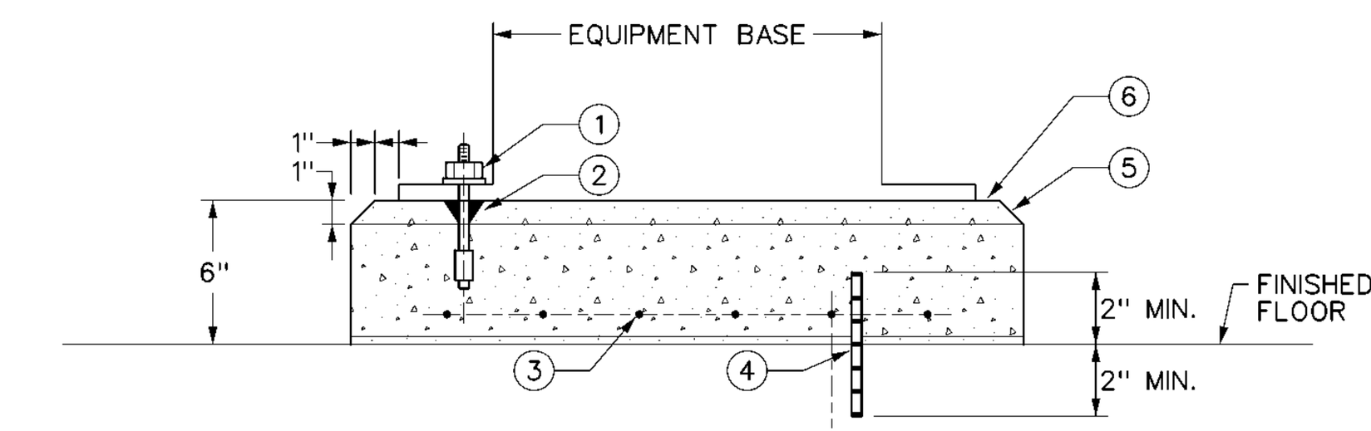
2 / M501	PRESSURE GAUGE INSTALLATION DETAIL
	SCALE: NONE



3 / M501	FLOOR MOUNTED PUMP PIPING DETAIL	
	SCALE: NONE	VERTICAL SPLIT CASE



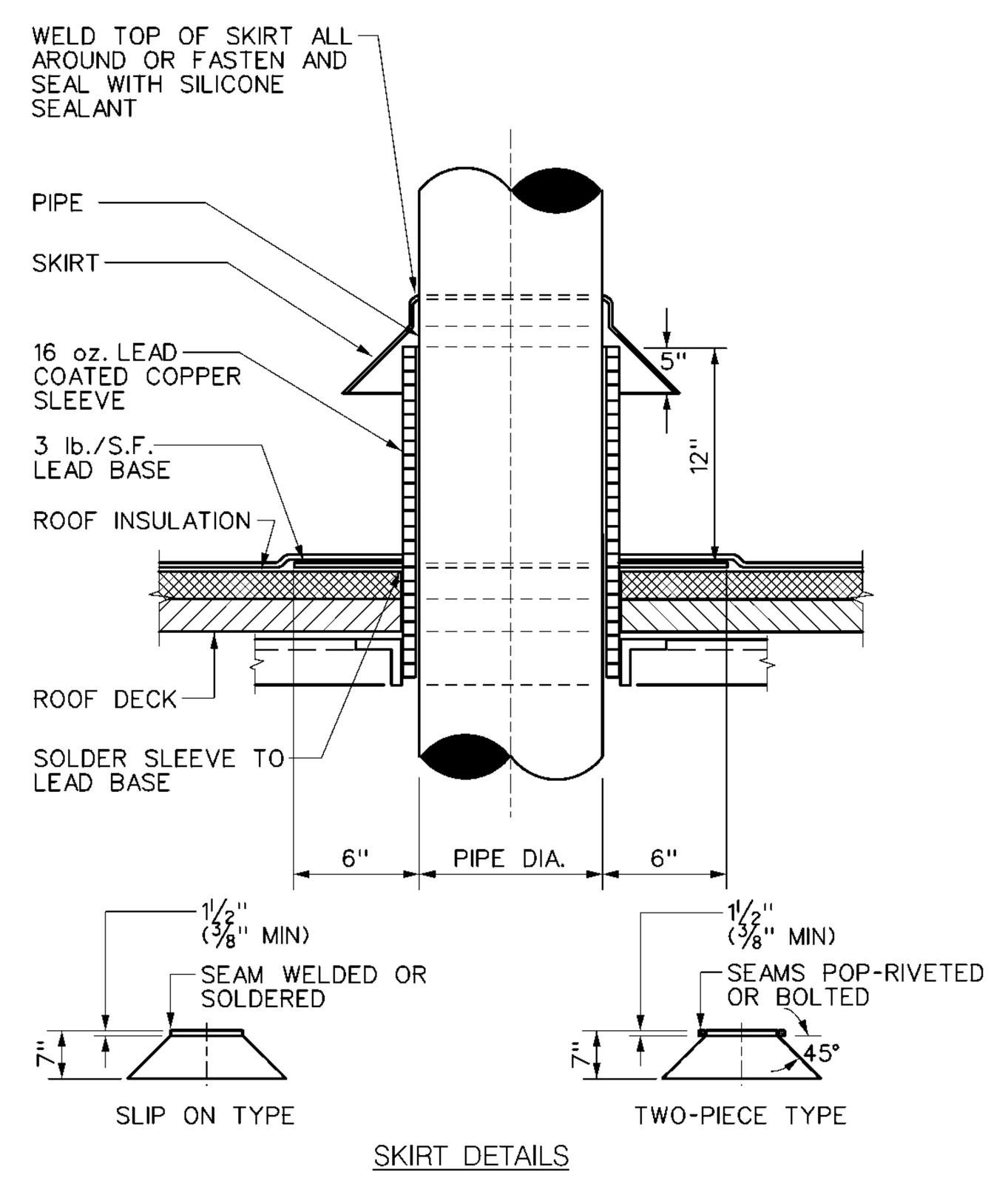
4 / M501	FLOOR MOUNTED PUMP PIPING DETAIL	
	SCALE: NONE	ADJUSTABLE SPEED APPLICATION-END SUCTION



DETAIL NOTES:

1. ANCHOR BOLT, SIZE & LOCATION AS REQUIRED TO MATCH EQUIPMENT BASE.
2. PLASTIC SLEEVE & ANCHOR.
3. *3 REINFORCING BARS, 12" O.C. EACH WAY.
4. *4 DOWEL, 12" O.C.
5. CHAMFER.
6. CONCRETE PAD 3,000 PSI CONCRETE, LENGTH & WIDTH, 6" GREATER THAN THE EQUIPMENT BASE PLATE.

5 / M501	CONCRETE EQUIPMENT BASE DETAIL
	SCALE: NONE



DETAIL NOTES:

A. PENETRATION SHOULD NOT BE CLOSER THAN 3-TIMES DIAMETER TO ANOTHER ROOF OPENING.

B. SLEEVE THICKNESS TO BE MINIMUM OF ½" FOR PIPE CARRYING FLUID UP TO 150 F. INSULATE WITH BLANKET TYPE.

C. PIPE SKIRT (SEE BELOW). SMALL APPLICATIONS: COPPER REDUCING FITTINGS MAY BE USED.

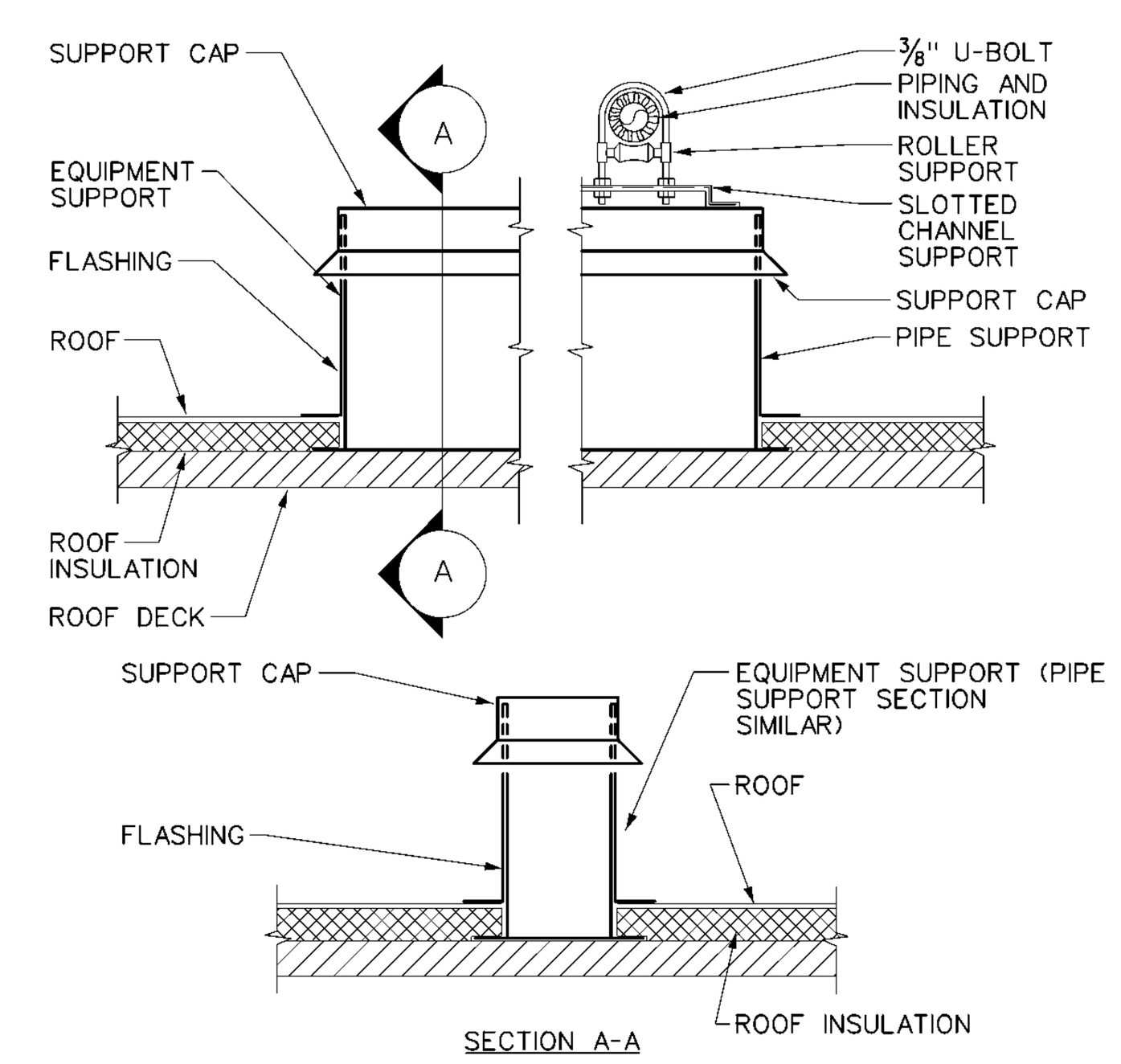
PIPE MATERIAL	SKIRT MATERIAL
STEEL	22 GA. GALVANIZED STEEL
STAINLESS STEEL	STAINLESS STEEL AS PIPE OR DUCT

D. FRAME OPENING WITH ANGLE IRON AS NOTED BELOW. ANGLES SHALL BE CLAMPED OR WELDED TO THE ROOF SUPPORT STEEL.

ROOF OPENING	DISTANCE BETWEEN ROOF FRAMING
	5'-0" UP TO 10'-0"
0" TO 12"	NO SUPPORT *
OVER 12" TO 18"	3" x 3" x ¼" ∠
OVER 18" TO 24"	4" x 4" x ¼" ∠

* - REQUIRES 2" x 2" x ¼" IF MORE THAN ONE RIB IS CUT

6 / M501	ROOF PENETRATION FOR PIPE DETAIL
	SCALE: NONE



DETAIL NOTES:

A. CUT BACK INSULATION AND PROVIDE FLASHING.

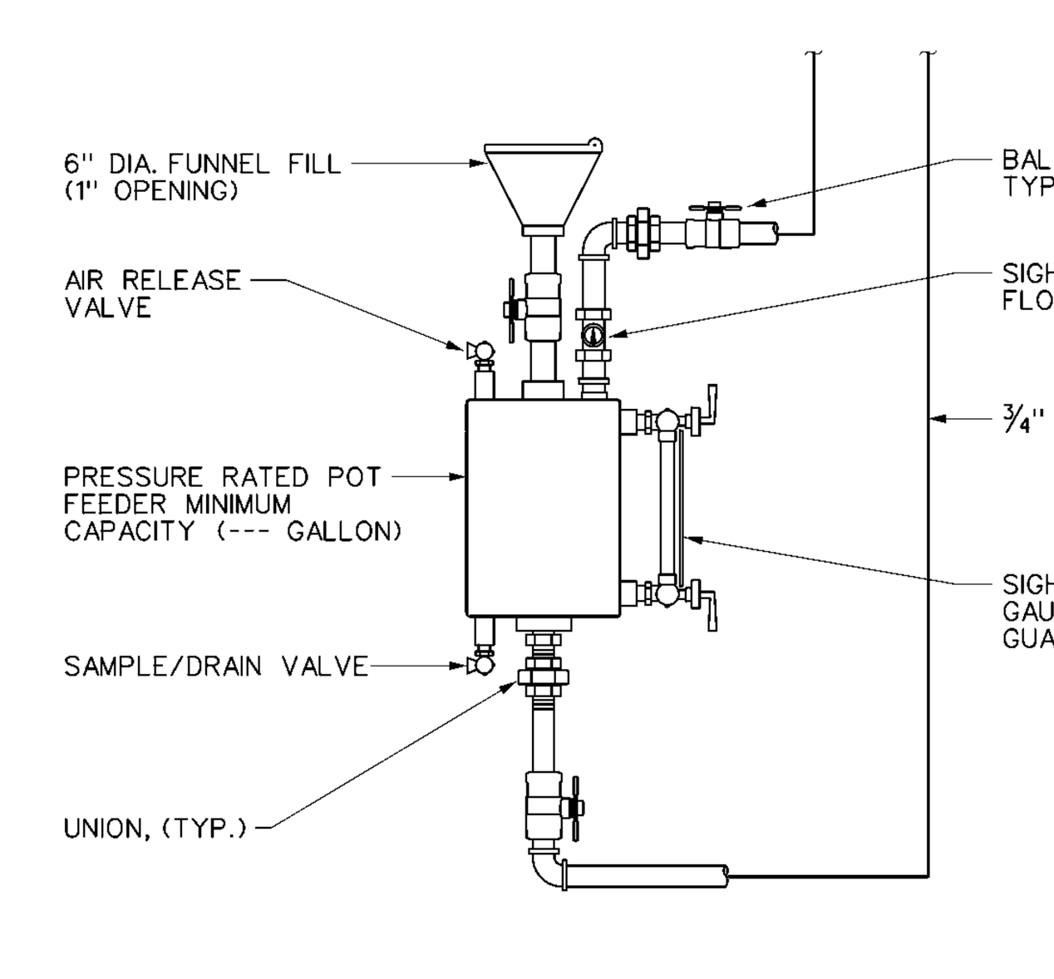
B. LOCATE, SET AND SECURE CURB.

C. PROVIDE SHIMS WHERE REQUIRED TO LEVEL SUPPORT

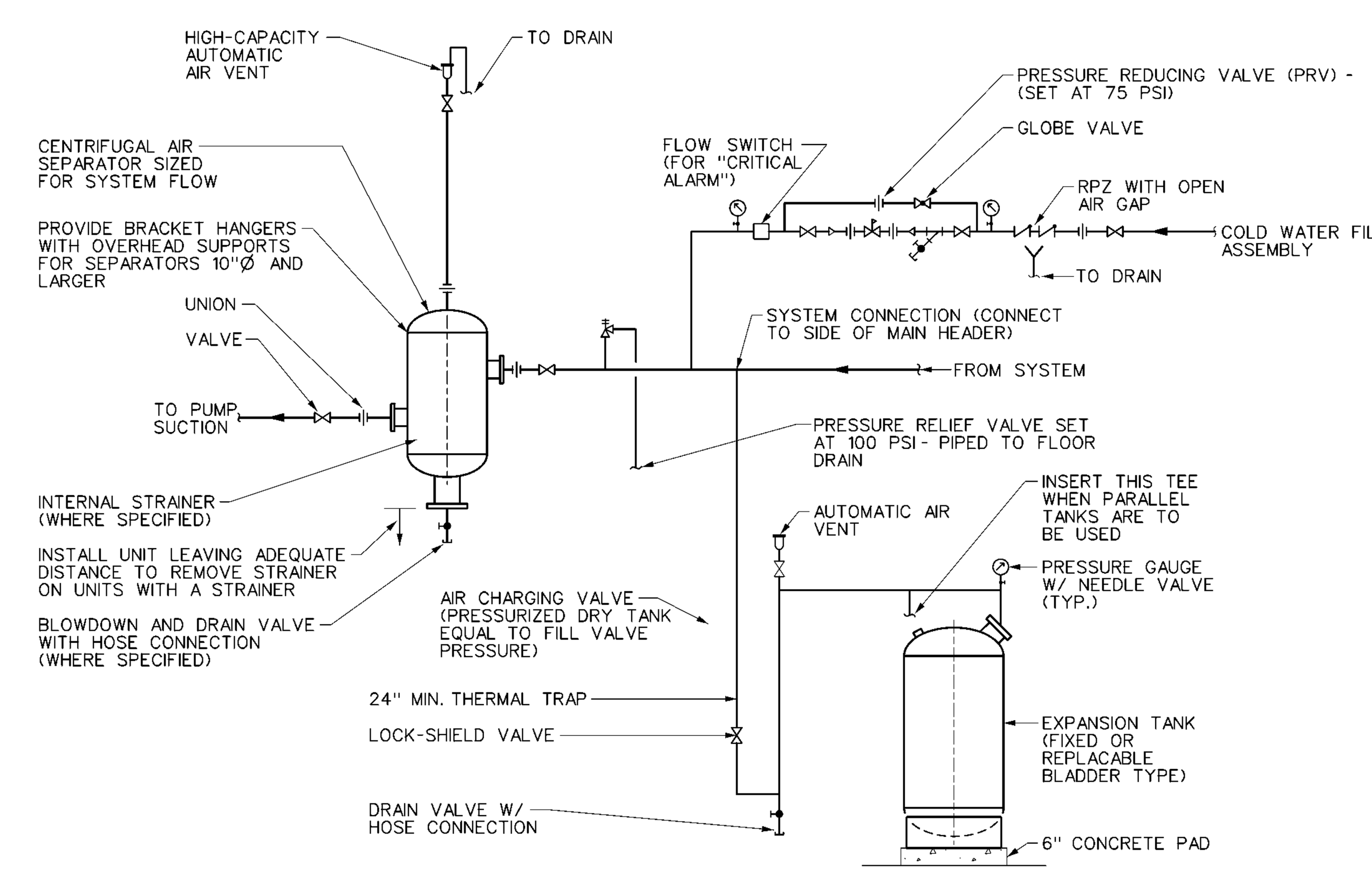
D. LENGTH OF SUPPORTS AS CALLED FOR. PROVIDE BLOCKING BENEATH SUPPORTS IN FLUTES OF METAL DECKS.

E. PROVIDE WIND RESTRAINT PER SPECIFICATION SECTION 230550-WIND RESTRAINT FOR HVAC SYSTEMS [230529-SEISMIC AND WIND RESTRAINT FOR MECHANICAL SYSTEMS].

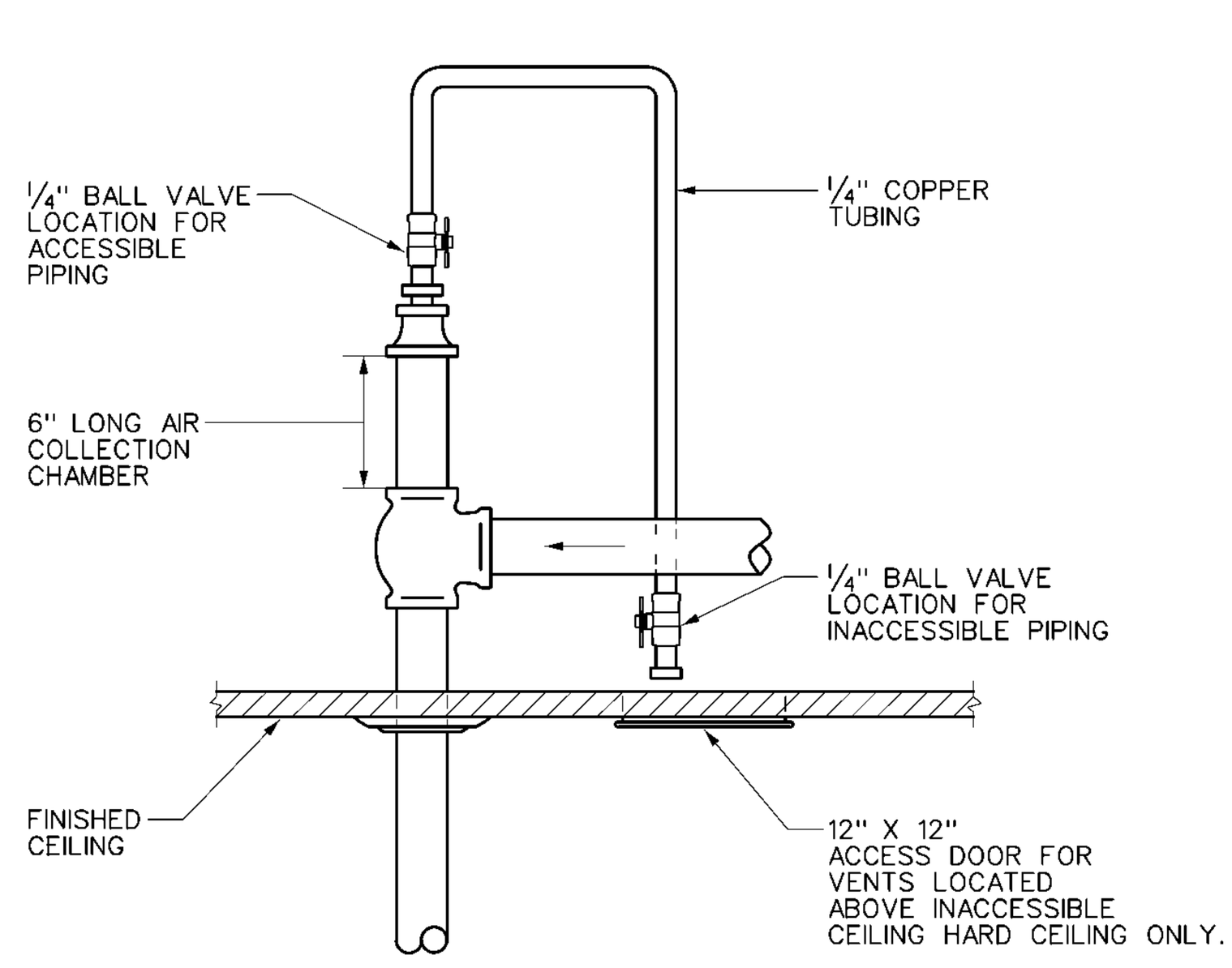
7 / M501	EQUIPMENT & PIPE SUPPORT DETAIL
	SCALE: NONE



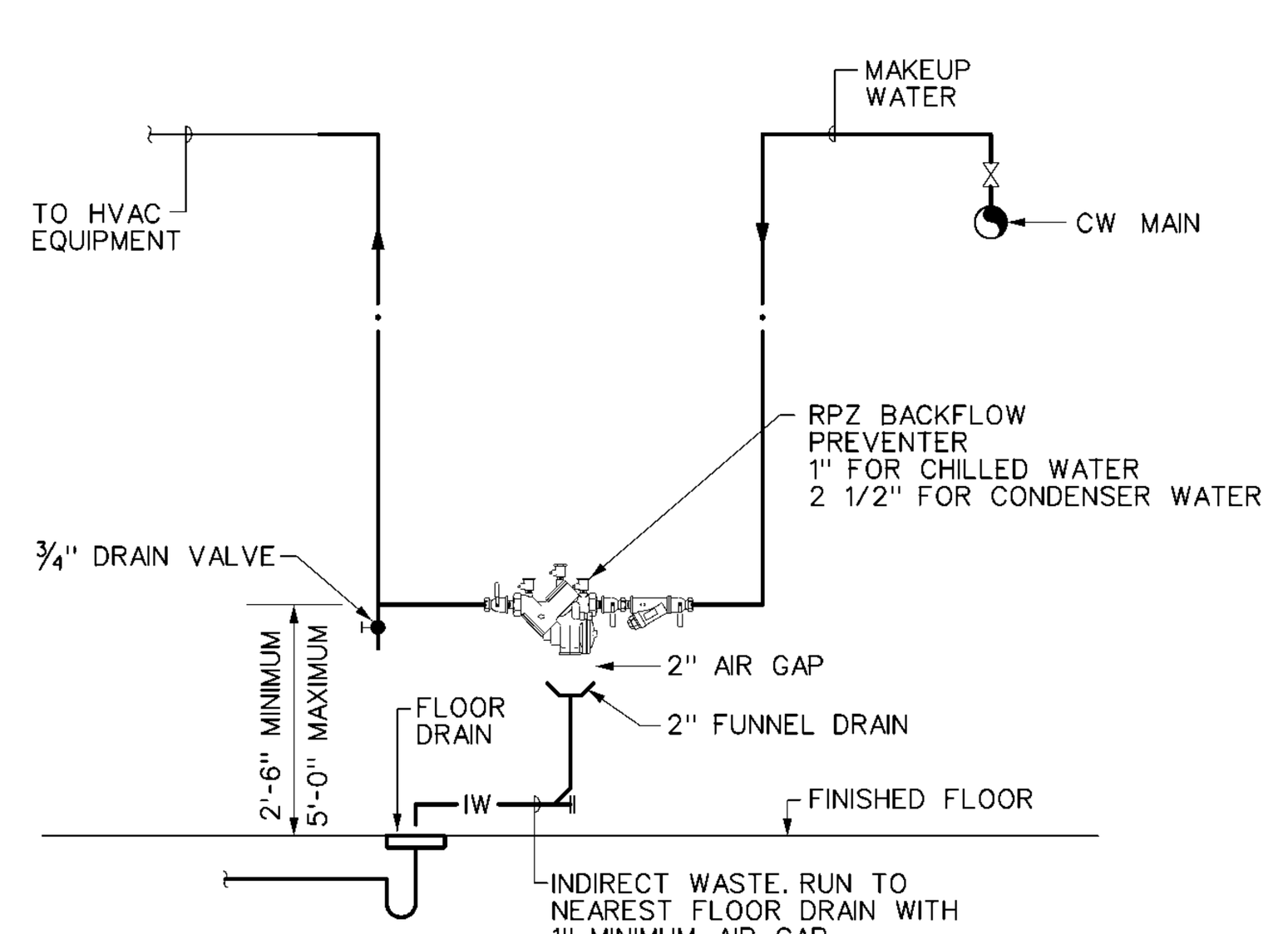
8 / M501	CHEMICAL POT FEEDER DETAIL	
	SCALE: NONE	¾ GALLON AND LARGER



9 / M501	AIR SEPARATOR AND EXPANSION TANK DETAIL	
	SCALE: NONE	VERTICAL FLOOR MOUNTED-REPLACEABLE BLADDER



10 / M501	MANUAL AIR VENT DETAIL
	SCALE: NONE



DETAIL NOTES:

A. BACKFLOW PREVENTER SHALL BE LOCATED UPSTREAM OF ALL CONNECTIONS TO HVAC EQUIPMENT.

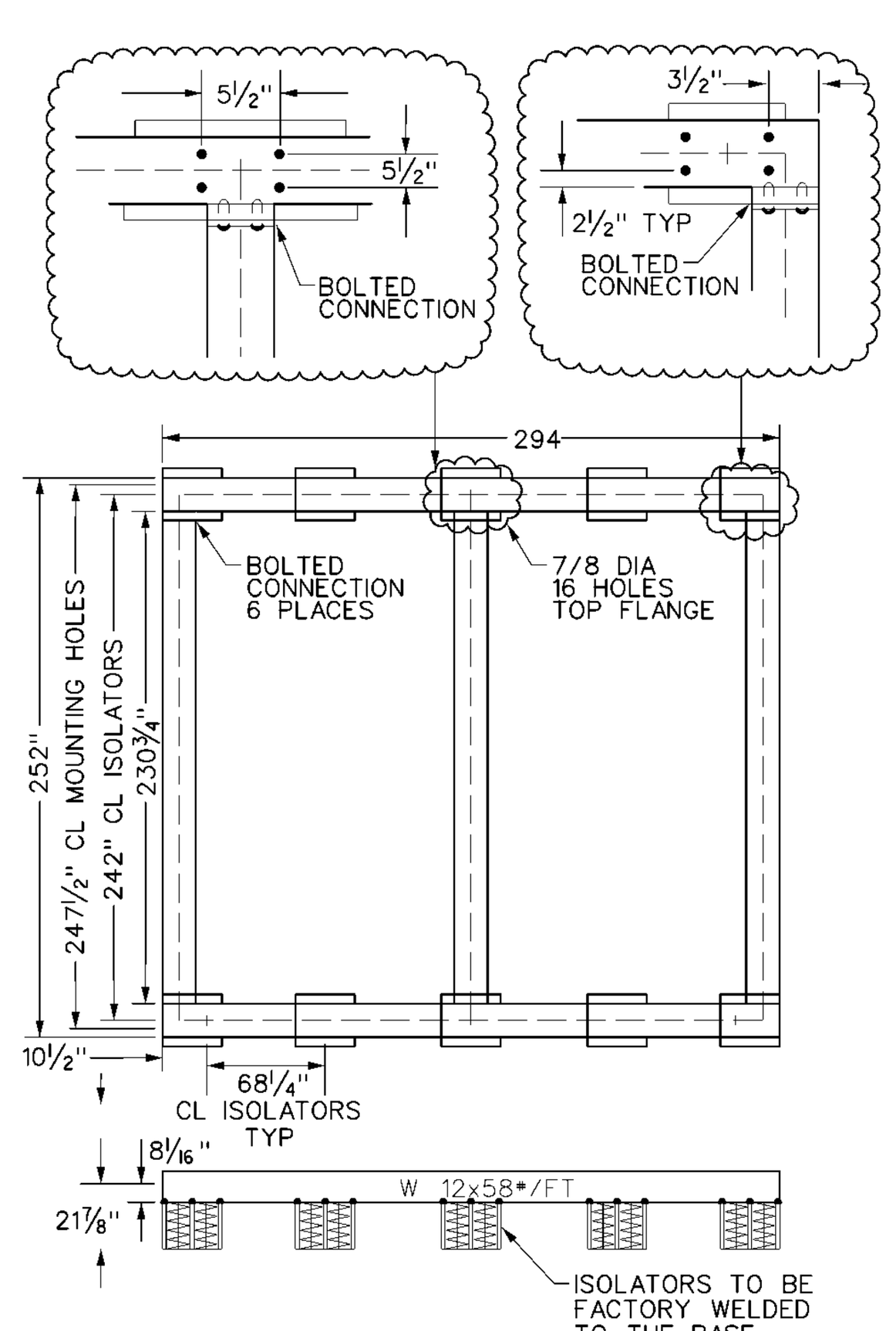
B. PROVIDE PROPER SUPPORTS FOR BACKFLOW PREVENTER AND PIPING.

C. PROVIDE 8" CLEARANCE BEHIND BACKFLOW PREVENTER, 1'-0" ABOVE AND 2'-6" CLEARANCE IN FRONT OF DEVICE.

D. THE INSTALLATION OF A FIXED AIR GAP FITTING IS NOT ACCEPTABLE FOR USE ON DRAIN LINE. PROVIDE FUNNEL DRAIN AS INDICATED.

E. PAINT SUPPORTS WITH ONE (1) PRIMER AND TWO (2) FINISH COATS OF COLOR AS SPECIFIED.

11 / M501	MAKE-UP WATER BACKFLOW PREVENTER DETAIL
	SCALE: NONE



DETAIL NOTES:

1. ALL VIBRATION ISOLATION AND ASSOCIATED SUPPORT ABOVE THE DUNNAGE INDICATED ON STRUCTURAL DRAWINGS IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR RESPONSIBLE FOR PROVIDING THE COOLING TOWERS.
2. ALL VIBRATION ISOLATION AND ASSOCIATED SUPPORT ARE TO BE COORDINATED AT TIME OF SHOP DRAWINGS FOR SUBMITTED TOWER INTENDED FOR INSTALLATION.
3. VIBRATION ISOLATION AND COOLING TOWER INSTALLATION SHALL COMPLY WITH ALL REQUIREMENTS OF SPECIFICATION 230550 FOR WIND RESTRAINT PERSUANT TO NYS CODE.
4. ALL BOLTED CONNECTIONS CONSIST OF ¾" ASTM A325 BOLTED CONNECTION EXCEPT AS OTHERWISE NOTED.
5. ALL BOLTED CONNECTIONS SHALL BE FIELD FASTENED. CONNECTIONS DESIGNED & PREPPED BY THE VMC GROUP. ERECTION SHALL NOT BE PROVIDED BY THE VMC GROUP.
6. FRAME & ISOLATORS TO BE HOT-DIPPED GALVANIZED.

12 / M501	COOLING TOWER VIBRATION SUPPORT DETAIL
	SCALE: NONE

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DRAWING TITLE

DETAILS - HVAC

DRAWING NO.		
M501	Drawn By:	DLT
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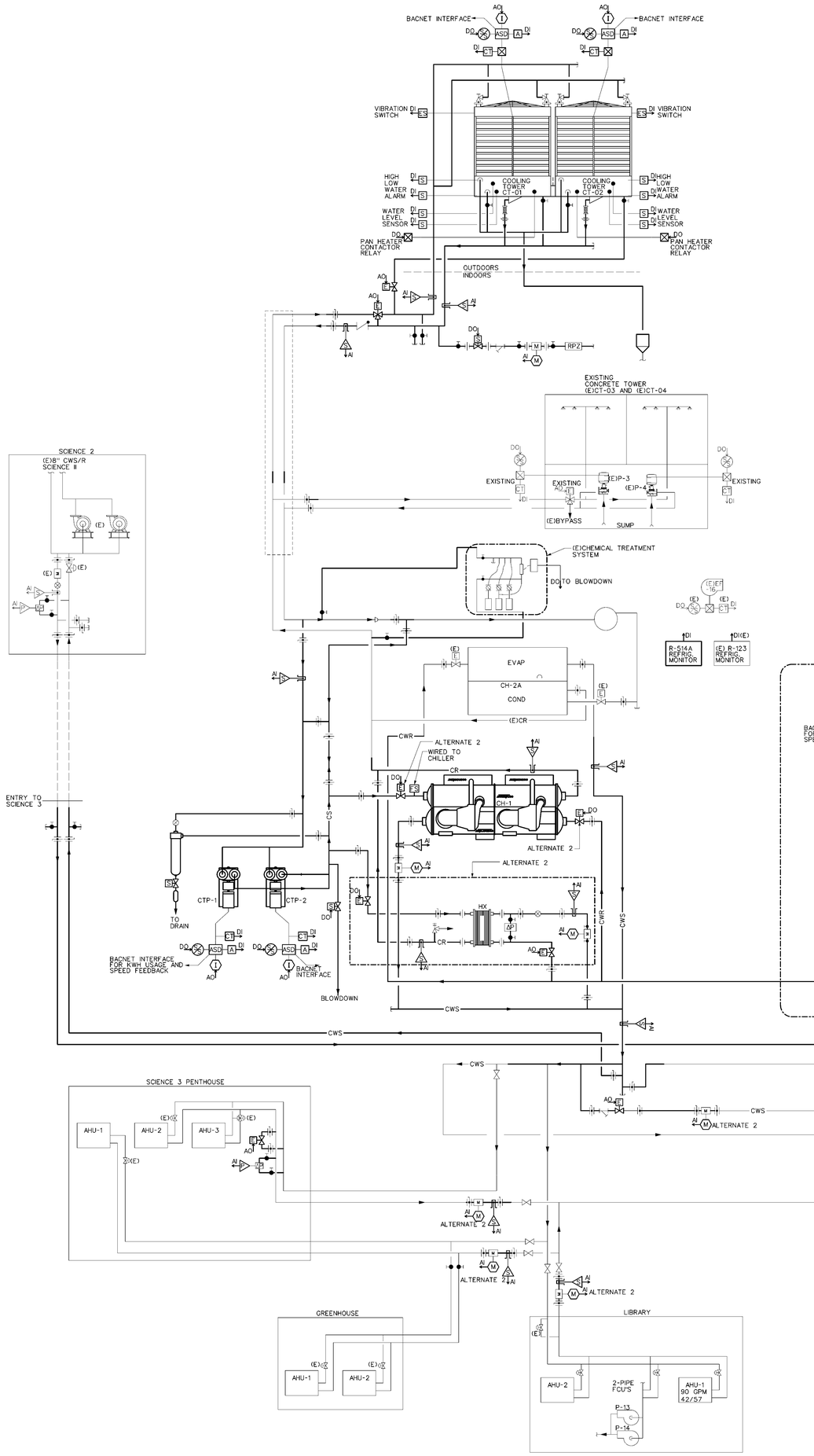

CHILLED WATER SYSTEM

A. OVERVIEW: THE CHILLED WATER SYSTEM IS UTILIZED FOR BUILDING COMFORT COOLING THROUGH CENTRAL AIR HANDLING UNIT SYSTEMS AND PROCESS COOLING AT POINT OF USE. THE SYSTEM IS INCLUDES DUAL COMPRESSOR CENTRIFUGAL CHILLER WITH A TWO OPEN COOLING TOWERS, THREE VARIABLE SPEED CHILLED WATER PUMPS AND TWO CONDENSER WATER PUMPS. AN EXISTING CHILLER AND TOWER ARE TO REMAIN IN SERVICE AS UNUSED BACKUP. THE SYSTEM INCORPORATES A WATER SIDE ECONOMIZER FOR YEAR ROUND OPERATION. THE SYSTEM OPERATES AS A VARIABLE PRIMARY FLOW SYSTEM. SYSTEM IS SIZED FOR ENTIRE SCIENCE COMPLEX USE.

B. CHILLERS: THE CHILLERS OPERATE UTILIZING INTERNAL PACKAGED CHILLER MANAGEMENT SYSTEM TO MAINTAIN DISCHARGE CHILLED WATER TEMPERATURE SETPOINT. THE ADJUSTABLE DISCHARGE SETPOINT IS TAKEN AS AN OUTPUT FROM THE BUILDING DDC SYSTEM. THE CHILLERS SHALL INTERFACE WITH DDC SYSTEM THROUGH BACNET INTERFACE TO MAKE ALL SETPOINTS, ALARMS AND OPERATION INFORMATION AVAILABLE FOR NOTIFICATION AND VIEWING THROUGH THE BUILDING DDC SYSTEM. CHILLERS SHALL BE ENABLED/DISABLED AS LEAD/LAG BY BUILDING CONTROL SYSTEM BASED ON BUILDING SCHEDULE FOR DAY, TIME OF DAY AND DATE.

C. COOLING TOWERS CT-1,2:

1. COOLING TOWERS SHALL BE ENABLED/DISABLED AS LEAD/LAG BY BUILDING CONTROL SYSTEM BASED ON BUILDING SCHEDULE FOR DAY, TIME OF DAY AND DATE. LEAD/LAG STATUS OF EACH UNIT SHALL BE ABLE TO BE VARIED BY OPERATOR ON SYSTEM GRAPHIC. TOWER(S) SHALL OPERATE IN NORMAL COOLING MODE WITH CONDENSER WATER SETPOINT TO MEET CHILLER NEEDS OR IN FREE COOLING MODE TO DELIVER COLDER CONDENSER WATER SETPOINT TEMPERATURE TO MEET CHILLED WATER FREE COOLING EXCHANGER NEEDS.

2. NORMAL MODE COOLING: THE DDC SYSTEM SHALL MONITOR CONDENSER SUPPLY WATER TEMPERATURE. THE DDC SHALL START AND RAMP FAN VARIABLE SPEED DRIVES AS FOLLOWS TO MAINTAIN CONDENSER SUPPLY WATER TEMPERATURE OF 65 DEGF (ADJUSTABLE BASED ON CHILLER REQUIRED SETPOINT):

   a. IF CONDENSER WATER SUPPLY IS HIGHER THAN SETPOINT TEMPERATURE FOR NORMAL OPERATION, THE LEAD TOWER FAN SHALL START AND RUN AT MINIMUM FAN SPEED. IF CONDENSER WATER TEMPERATURE IS NOT MET AFTER 5 MINUTES THEN THE SECOND TOWER (IF ENABLED) SHALL START FAN AT MINIMUM SPEED.

   b. IF CONDENSER WATER TEMPERATURE SETPOINT CANNOT BE MAINTAINED BY BOTH ENABLED FANS AT MINIMUM SPEED THEN RAMP FAN ADJUSTABLE SPEED DRIVES TO A HIGHER SPEED. ALL OPERATING FANS SHALL RAMP TOGETHER AS ONE. LIMIT CHANGING OF FAN SPEED TO 5 PERCENT SPEED CHANGE PER MINUTE.

   c. IF CONDENSER WATER TEMPERATURE FALLS BELOW SETPOINT FOR MORE THAN 5 MINUTES AND ALL OPERATING FANS ARE AT MINIMUM SPEED THEN ONE LAG TOWER FAN SHALL CYCLE OFF. IF AFTER 10 MINUTES THE WATER TEMPERATURE IS MORE THAN 1 DEGREE BELOW SETPOINT THE LEAD TOWER FAN SHALL CYCLE OFF.

3. TOWER BYPASS VALVE: CONDENSER WATER SUPPLY TEMPERATURE TO CHILLERS SHALL BE MONITORED AND USED AS A LOW LIMIT TO CONTROL TOWER BYPASS VALVE. ANYTIME CONDENSER WATER SUPPLY TEMPERATURE FALLS BELOW MINIMUM SETPOINT VALUE (65 DEG F INITIAL SETPOINT) DURING NORMAL OPERATION THE VALVE SHALL MODULATE TO MAINTAIN MINIMUM CHILLER INLET WATER TEMPERATURE.

4. MAKE UP WATER VALVE: TOWER SUMP OPERATIONAL WATER LEVEL TO BE MONITORED WITH TWO SENSING POINTS. OPERATIONAL WATER LEVEL IS BETWEEN THESE TWO HIGH AND LOW POINTS. (SEE BELOW FOR ADDITIONAL ALARM POINT SENSOR OPERATION). WHEN WATER LEVEL FALLS BELOW THE LOW LEVEL OPERATION POINT THE MAKE-UP WATER VALVE SHALL OPEN TO ADD WATER. WHEN THE SUMP LEVEL REACHES THE HIGH WATER LEVEL SENSOR THE MAKE-UP WATER VALVE SHALL CLOSE. TOWER MAKE-UP WATER FLOW PULSE METER SHALL BE MONITORED BY DDC SYSTEM AND TOTALIZED MONTHLY IN GALLONS.

5. BLOWDOWN VALVE: A SIGNAL FROM THE CHEMICAL TREATMENT SYSTEM SHALL BE SENT TO OPEN BLOWDOWN VALVE WHEN CONDUCTIVITY METER SENSES WATER CONCENTRATIONS ABOVE SETPOINT.

6. MONITOR CONTINUOUSLY AND REPORT GRAPHICALLY AT THE DDC OPERATOR'S CONSOLE THE FOLLOWING:

   1. CONDENSER WATER RETURN TEMPERATURE ENTERING THE COOLING TOWERS.
   2. COMMON CONDENSER WATER SUPPLY TEMPERATURE LEAVING THE COOLING TOWERS.
   3. ON-OFF STATUS OF EACH TOWER.
   4. FAN SPEED AS A PERCENTAGE OF EACH TOWER.
   5. TOTAL RUN TIME OF EACH TOWER.
   6. STATUS OF VIBRATION SWITCHES. WIRED TO FAN SPEED DRIVE FOR FAN SHUTDOWN. GENERATE ALARM IF VIBRATION DETECTED AND FAN SHUT DOWN.
   7. HIGH WATER AND LOW WATER ALARM SENSOR STATUS. ALARM SENSORS LOCATED ABOVE AND BELOW OPERATIONAL HIGH/LOW SENSORS.
      a. GENERATE AN ALARM IF HIGH OR LOW WATER LIMIT IS DETECTED.

7. WINTER FREE COOLING OPERATION (ALTERNATE 2): A WATER SIDE ECONOMIZER WILL BE UTILIZED TO PROVIDE FREE COOLING IN THE COLD MONTHS AND PROVIDE YEAR ROUND CHILLED WATER SERVICE. A PLATE AND FRAME HEAT EXCHANGER PIPED IN THE CHILLED WATER AND CONDENSER WATER SYSTEM TO ACT AS AN ADDITIONAL CHILLER FOR THIS PURPOSE. THIS SYSTEM IS EXPECTED TO OPERATE ANYTIME THE OUTSIDE AIR TEMPERATURE IS APPROXIMATELY 42 DEG.F OR BELOW.
   a. COOLING TOWER OPERATION WITH DEFROST CYCLE- TWO TOWERS WILL ALTERNATE IN A TIMED SEQUENCE DURING COLD WEATHER WITH ONE FAN OPERATING WHILE THE OTHER FAN IS OFF AND IN DEFROST. THE COMMON SUMPS WILL REMAIN FULL. WATER WILL CONTINUE TO FLOW THROUGH BOTH ACTIVE TOWERS. THE CYCLE TIMING WILL BE ALTERED BASED ON OUTDOOR AIR TEMPERATURE RAMP. WHEN OA TEMP IS 40 DEG F OR ABOVE THE TOWERS SHALL CYCLE EVERY 30 MINUTES. WHEN OA IS 15 DEG F OR BELOW THE TOWERS WILL CYCLE EVERY 10 MINUTES. WHEN A TOWER IS IN DEFROST THE WARM WATER WILL FLOW THROUGH THE FILL TO MELT OFF ANY ICE BUILDUP. IF THE PAN TEMPERATURE FALLS BELOW SETPOINT THEN A BYPASS VALVE LOCATED BETWEEN THE TOWER WATER INLET PIPE AND THE PAN SHALL OPEN TO FLOW A PORTION OF THE WARM WATER DIRECTLY INTO PAN AND RAISE TEMPERATURE AND MELT ANY FALLEN ICE CHUNKS. THE INTEGRATED SUMP HEATER SHALL HAVE AN ON/OFF CONTACTOR CONTROLLED BY THE SIEMENS CONTROL SYSTEM TO ACTIVATE/DEACTIVATE THE ELECTRIC SUMP HEATER BASED ON TOWER SUMP WATER RETURN TEMPERATURE. IF SUMP BYPASS VALVE IS FULL OPEN FOR 5 MINUTES AND SUMP TEMPERATURE WATER FALLS BELOW 33 DEGREES THEN THE SUMP HEATER SHALL BE ACTIVATED. IF TOWER PUMPS ARE OFF AND TOWER IS ACTIVE THEN SUMP HEATER SHALL BE ACTIVATED.

D. CHILLED WATER SYSTEM PUMPS

1. OVERVIEW: THE CHILLED WATER PUMPS ARE USED TO DISTRIBUTE CHILLED WATER TO THE SYSTEM COOLING LOOP AS A VARIABLE PRIMARY FLOW COOLING SYSTEM. THE PUMP SUB-SYSTEM CONTAINS THE FOLLOWING COMPONENTS: PUMPS, ELECTRICAL DISCONNECTS, ADJUSTABLE SPEED DRIVES (ASD) AND DIFFERENTIAL PRESSURE SENSORS LOCATED NEAR THE END OF THE LOOP. THE CHILLED WATER PUMPS ARE ENABLED TO OPERATE AS LEAD/LAG SYSTEM.

2. THE PRIMARY CHILLED WATER PUMPS OPERATE AS A LEAD/LAG SEQUENCE. THE PUMPS SHALL BE STAGED ON ONE AT A TIME TO SATISFY THE TOTAL SYSTEM LOAD BASED ON DIFFERENTIAL PRESSURE SETPOINTS. IF THE LEAD PUMP CANNOT MAINTAIN PRESSURE OR MINIMUM FLOW REQUIREMENT OF CHILLER THEN THE FIRST LAG PUMP SHALL START AND OPERATE IN PARALEL WITH THE LEAD PUMP. IF THE TWO OPERATING PUMPS CANNOT MAINTAIN SETPOINTS THEN THE SECOND LAG PUMP SHALL START AND OPERATE ALL THREE PUMPS IN PARALEL. IF PARALEL OPERATING PUMPS REDUCE TO MINIMUM SPEED AND STILL EXCEED SETPOINTS THEN ONE LAG PUMP SHALL BE TURNED OFF AT A TIME UNTIL ONLY THE LEAD PUMP IS OPERATING TO SATISFY SETPOINTS.

3. DIFFERENTIAL PRESSURE ASD CONTROL: THE CHILLED WATER DIFFERENTIAL PRESSURE SENSORS PROVIDE FEEDBACK TO THE DDC CONTROL SYSTEM IN ORDER TO ACHIEVE PROPER CHILLED WATER SYSTEM FLOW CONTROL. THE SYSTEM TO MAINTAIN A CONSTANT MINIMUM DIFFERENTIAL AT EACH LOCATION BASED ON INDIVIDUAL MINIMUM DP SETPOINTS AS THE DIFFERENTIAL PRESSURE FALLS AT ANY INDIVIDUAL LOCATION, THE DDC CONTROL SYSTEM RESPONDS BY INCREASING THE SPEED OF THE PUMP(S) ASD TO SATISFY ALL INDIVIDUAL SETPOINTS. CONVERSELY AS THE DIFFERENTIAL PRESSURE INCREASES ABOVE ALL SETPOINTS, INDICATIVE OF 2-WAY CONTROL VALVES MODULATING CLOSED, THE DDC CONTROL SYSTEM SHALL RESPOND BY DECREASING THE SPEED OF THE PUMP(S) ASD TO MINIMUM SETPOINT. MINIMUM SPEED SHALL BE BASED ON CHILLER MINIMUM FLOW REQUIREMENT FROM CALIBRATED FLOW METER LOCATED AT CHILLER EVAPORATOR BARREL. IN THE EVENT THAT PUMP IS OPERATING AT MINIMUM SPEED AND FLOW APPROACHES MINIMUM CHILLER FLOW SETPOINT THE CHILLED WATER BYPASS VALVE SHALL MODULATE OPEN TO MAINTAIN MINIMUM FLOW REQUIREMENT. PUMP SHALL NOT RAMP UP UNTIL BYPASS VALVE IS FULLY CLOSED. NO MINIMUM FLOW IS REQUIRED IF SYSTEM IS OPERATING IN WINTER FREE COOLING MODE WITH CHILLER OFF. PUMP SPEED MINIMUM MUST BE VERIFIED DURING BALANCING RELATIVE TO CHILLER MINIMUM FLOW WITH ALL SYSTEM CONTROL VALVES EITHER CLOSED OR IN BYPASS FOR 3-WAY INSTALLATIONS AND BYPASS VALVE FULL OPEN.

4. PUMP PROOF CONFIRMATION: EACH PUMP HAS, AS ITS POSITIVE PROOF OF OPERATION A FEEDBACK SIGNAL INDICATING THE FREQUENCY THAT THE DRIVE IS RUNNING AT, THIS IN CONJUNCTION WITH THE DIFFERENTIAL PRESSURE SENSOR SHALL SERVE AS A RUN PROOF. THE TWO TOGETHER SHALL INDICATE THAT THE DRIVE IS SPINNING THE PUMP IMPELLER AND THAT IT IS GENERATING A PRESSURE DIFFERENTIAL ACROSS THE HEADER.

5. PUMP FAILURE: DURING THE PUMP START PROCESS AS WELL AS THE RUN PROCESS, THE PUMPS ARE CONTINUOUSLY CHECKED BY THE DDC SYSTEM FOR A CONFIRMED RUNNING PROOF STATUS SIGNAL. THE ONLY EXCEPTION IS DURING THE PUMP STARTUP WHERE A TIME DELAY IS USED TO ENABLE THE PUMP CURRENT CONFIRMATION SIGNAL PROCESS. IF AFTER THE INITIAL TIME DELAY THE PUMP FAILS TO PROVE OPERATION, OR AFTER IS HAS PROVEN OPERATION IT NO LONGER SHOWS CURRENT CONFIRMATION, A FAILURE WILL BE GENERATED FOR THE PUMP BEING CALLED ON FOR STARTUP. EACH PUMP HAS AN INDIVIDUAL FAILURE VARIABLE IN THE DDC SYSTEM. SHOULD BOTH PUMPS FAIL FOR ANY REASON, THE LAST PUMP DESIGNATED AS LEAD SHALL REMAIN AS LEAD, DUE TO A POSSIBLE PROOF CONFIRMATION FAILURE.

6. THE DDC SYSTEM SHALL CONTINUOUSLY MONITOR THE STATUS OF THE VARIABLE SPEED DRIVES AND GIVE FEEDBACK ON THE GRAPHIC FOR RUN STATUS, SPEED AND KW USAGE IN ADDITION TO ANY ALARM CONDITIONS. THE CHILLED WATER INLET AND OUTLET TEMPERATURES ALONG WITH MEASURED FLOW UTILIZING FLOW METER AT EVAPORATOR SHALL BE USED TO CALCULATE ENERGY USAGE OF CHILLER ALONG WITH MONITORING AND RECORDING KW OR RLA DATA FROM CHILLER.

E. REFRIGERANT MONITOR: REFRIGERANT MONITOR SHALL OPERATE AS A STAND ALONE DEVICE AS SPECIFIED TO DETECT INSTALLED REFRIGERANT TYPE. THE EXISTING REFRIGERANT MONITOR ASSOCIATED WITH THE EXISTING TO REMAIN CHILLER SHALL ALSO REMAIN ACTIVE TO DETECT THE REFRIGERANT ASSOCIATED WITH IT. UPON ACTIVATION OF ALARM FROM EITHER MONITOR A DIGITAL SIGNAL SHALL BE SENT TO DDC SYSTEM TO INDICATE THAT ALARM HAS BEEN INITIATED. UPON ACTIVATION OF ALARM SIGNAL, THE EXISTING MECHANICAL ROOM EXHAUST FAN EF-16 AND MAKE UP AH-3 ASSOCIATED WITH THE EXISTING MONITOR SHALL BE ACTIVATED AT FULL FLOW UNTIL ALARM HAS BEEN RESET.

BUILDING AND SYSTEM FLOW METERS (ALTERNATE 2)

A. INDIVIDUAL BUILDING AND SYSTEMS TO INCLUDE CALIBRATED FLOW METERS AS SHOWN ON SCHEMATIC TO CONTINUOUSLY MONITOR CHILLED WATER FLOW. THE RETURN TEMPERATURE OF EACH SYSTEM IS ALSO TO BE MEASURED AND MONITORED CONTINUOSLY. THE SUPPLY TEMPERATURE FOR EACH SYSTEM IS TAKEN FROM THE MAIN SUPPLY AT CHILLER DISCHARGE. THE DIFFERENTIAL TEMPERATURE AND FLOW SHALL BE USED TO CALCULATE THE ENERGY USAGE IN BTU,S AND TONS AND INCLUDED ON SYSTEM GRAPHIC. TOTAL USAGE OF EACH SYSTEM SHALL BE TRENDED AND SAVED IN A LOG THAT GETS SAVED IN A DATABASE MONTHLY FOR FUTURE REVIEW. LOG DATA SHALL INCLUDE CORRESPONDING OUTDOOR AIR TEMPERATURE AND TIME OF DAY. LOG SHALL BE SAVED IN HOURLY INCREMENTS USING TOTAL FLOW, AVERAGE DIFFERENTIAL TEMPERATURE AND AVERAGE OUTDOOR AIR TEMPERATURE FOR THE HOUR.

GENERAL NOTES:

A. ALL EXISTING INDIVIDUAL BUILDING CONNECTIONS AND CONTROLS ARE EXISTING TO REMAIN UNLESS NOTED OTHERWISE.

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REVISIONS

No.	Date	By	Description

DRAWING TITLE

CHILLER CONTROL SCHEMATIC AND SEQUENCES - HVAC

DRAWING NO.		
M601	Drawn By:	DLT
	Checked By:	DAR
	Project Mgr:	MDS
	Project No:	071018
	M/E Project No:	170425

ISSUE DATE: **01/18/2019**

STATUS: **BID DOCUMENTS**

ELECTRICAL SYMBOLS LIST

BASIC MATERIALS AND METHODS

SYMBOL	DESCRIPTION
NLGP-1C	HOME RUN TO PANELBOARD. LETTERS/ NUMBERS INDICATE PANEL. NUMBERS INDICATE CIRCUITS. NUMBER OF ARROWS EQUALS NUMBER OF CIRCUITS. CIRCUIT SHALL BE 20 AMP, 120 VOLT, 2-#12, 1-#12 EG., IN ¾" C., UNLESS NOTED OTHERWISE. BRANCH CIRCUIT WIRING SIZE AND NUMBER TO MATCH HOMERUN. REFER TO SPEC'S FOR RACEWAY TYPE.
	SOLID HALF ARROW(S) INDICATES 120 VOLT CIRCUIT TO SINGLE POLE CIRCUIT BREAKER(S), UNLESS NOTED OTHERWISE.
	SOLID FULL ARROW INDICATES 208 VOLT CIRCUIT TO MULTI-POLE CIRCUIT BREAKER, UNLESS NOTED OTHERWISE.
	OPEN HALF ARROW(S) INDICATES 277 VOLT CIRCUIT TO SINGLE POLE CIRCUIT BREAKER(S), UNLESS NOTED OTHERWISE.
	OPEN FULL ARROW INDICATES 480 VOLT CIRCUIT TO MULTI-POLE CIRCUIT BREAKER, UNLESS NOTED OTHERWISE.
(J)	JUNCTION BOX
$S^{3}_{a,b,c}$	TOGGLE SWITCH, VOLTAGE AS INDICATED ON FIXTURE SCHEDULE, SUBSCRIPTS INDICATE TYPE: 2 - TWO POLE SWITCH 3 - THREE WAY SWITCH 4 - FOUR WAY SWITCH O - OCCUPANCY SENSOR (DUAL TECHNOLOGY) K - KEY OPERATED PL - PILOT LIGHT WP - WEATHER PROOF. PROVIDE CLEAR SILICONE RUBBER BUBBLE PLATE. HUBBELL CAT.#: HBL1795 a,b,c - SWITCHING DESIGNATIONS NUMBER OF LETTERS EQUALS NO. OF GANGED SWITCHES M - MONETARY SWITCH
	DUPLEX RECEPTACLE, 20 AMP, 125 VOLT SUBSCRIPTS INDICATE TYPE: OC - OVER COUNTER UC - UNDER THE COUNTER WP - WEATHER PROOF TP - TAMPER PROOF G - GROUND FAULT INTERRUPTING
	QUAD RECEPTACLE 20 AMP, 125 VOLT
	SPECIAL PURPOSE RECEPTACLE. PROVIDE PROPER VOLTAGE, CLASS, CURRENT RATING AND NEMA CONFIGURATION AS REQUIRED BY BRANCH CIRCUIT AND/OR MATCH CAP ON EQUIPMENT BEING FURNISHED BY OTHERS. PROVIDE CORD AND CAP. SUBSCRIPT DENOTES TYPE: A- 120V, 1Ø, 30AMP, NEMA L6-30R B- 208V, 3Ø, 20AMP, NEMA L21-20R C- 250V, 1Ø, 20AMP, NEMA L6-20R D- 208V, 1Ø, 15AMP, NEMA 6-15R
(E)	EXISTING TO REMAIN- INDICATES EXISTING ITEM SHALL REMAIN. MAINTAIN EXISTING ELECTRICAL CONNECTIONS UNLESS OTHERWISE NOTED.
(ER)	EXISTING TO BE RELOCATED - INDICATES EXISTING ITEM SHALL BE RELOCATED. DISCONNECT AND REMOVE, REINSTALL AT NEW LOCATION AND RECONNECT ITEM AS REQUIRED.
(3)	REFERENCE TO DRAWING NOTE
[3]	REFERENCE TO DEMOLITION NOTE
	EXISTING ELECTRICAL OR EQUIPMENT OR DEVICE, DASHED LIGHT IS EXISTING TO BE REMOVED.
	EXISTING WIRING OR EQUIPMENT, SOLID LIGHT IS EXISTING TO REMAIN
	HEAVY SOLID IS NEW

POWER DISTRIBUTION AND CONTROL

SYMBOL	DESCRIPTION
T	TRANSFORMER, REFER TO ONE LINE DIAGRAM FOR SIZE AND TYPE
	208Y/120 VOLT PANELBOARD
	480Y/277 VOLT PANELBOARD
	DISCONNECT SWITCH AMP RATING AS INDICATED ON ELECTRIC EQUIPMENT AND CONTROL SCHEDULE
	FUSED DISCONNECT SWITCH AMP RATING AS INDICATED ON ELECTRIC EQUIPMENT AND CONTROL SCHEDULE
	COMBINATION FUSED DISCONNECT SWITCH AND MAGNETIC STARTER AMP RATING AS INDICATED ON ELECTRIC EQUIPMENT AND CONTROL SCHEDULE
M	MOTOR CONNECTION. REFER TO ELECTRIC EQUIPMENT AND CONTROL SCHEDULE FOR SIZE.
ASD	ADJUSTABLE SPEED DRIVE
CB *	ENCLOSED CIRCUIT BREAKER, * INDICATES AMPERES RATING

COMMUNICATIONS SYMBOLS

SYMBOL	DESCRIPTION
WAP	WIRELESS ACCESS POINT

ONE LINE DIAGRAM SYMBOLS

SYMBOL	DESCRIPTION
	FUSED DISCONNECT SWITCH
	DRAW OUT CIRCUIT BREAKER
	GROUND CONNECTION
SST LSIG 1200AT 1600AF	CIRCUIT BREAKER SOLID STATE TRIP CHARACTERISTICS INDICATED BY SUBSCRIPTS: AT - TRIP COIL AMPERE RATING AF - FRAME SIZE AMPERE RATING CL - CURRENT LIMITING L - LONG TIME TRIP S - SHORT TIME TRIP I - INSTANTANEOUS TRIP G - GROUND FAULT TRIP SH - SHUNT TRIP
A	FEEDER DESIGNATION - REFER TO FEEDER SCHEDULE

LUMINAIRES

SYMBOL	DESCRIPTION
FA d	CEILING MOUNTED LUMINAIRE. UPPER CASE LETTERS INDICATE FIXTURE TYPE ON SCHEDULE, LOWER CASE LETTER INDICATES SWITCHING DESIGNATION.
FA d	WALL MOUNTED LUMINAIRE. UPPER CASE LETTERS INDICATE FIXTURE TYPE ON SCHEDULE, LOWER CASE LETTER INDICATES SWITCHING DESIGNATION.
	WALL MOUNTED EXIT LUMINAIRE
	CEILING MOUNTED EXIT LUMINAIRE

GENERAL NOTES:

A. EXISTING CONDITIONS ARE TAKEN FROM FIELD OBSERVATIONS AND PRIOR CONSTRUCTION DOCUMENTS WHEN AVAILABLE AND ARE NOT GUARANTEED. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO BID. NO ALLOWANCE SHALL BE MADE FOR ADDITIONAL COSTS DUE TO CONTRACTOR'S FAILURE TO VERIFY EXISTING CONDITIONS AND DIMENSIONS. NOT ALL DEVICES TERMINATIONS, JUNCTION BOXES AND WIRING HAVE BEEN SHOWN.

B. WHEN EXISTING CONSTRUCTION, WHICH IS TO REMAIN, IS DAMAGED DURING THE COURSE OF DEMOLITION OR NEW WORK AS A RESULT OF THE CONTRACTOR'S WORK, IT SHALL BE REPAIRED AND/OR REPLACED WITH SIMILAR OR LIKE MATERIALS, AS MUCH AS POSSIBLE, SUBJECT TO THE ENGINEERS APPROVAL.

C. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF EXISTING CONSTRUCTION IN THE WAY OF NEW WORK. PROTECT BUILDING AND FURNISHINGS FROM DAMAGE.

D. SLEEVE AND SEAL ALL WALL AND FLOOR PENETRATIONS. PROVIDE AND INSTALL FIRE STOPPING FOR ALL FIRE-RATED PENETRATIONS. PROVIDE AND INSTALL ACOUSTICAL SEALANT FOR ALL NON-RATED PENETRATIONS. ALL FIRE RATINGS SHALL BE MAINTAINED.

E. MAINTAIN SERVICE CLEARANCES OF ALL EQUIPMENT. ADVISE OTHER DIVISIONS OF SERVICE CLEARANCES TO INSURE NO OTHER SERVICES OR DIVISIONS RUN THROUGH SERVICE AREAS.

F. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST ADDITION OF THE NEC AND ALL LOCAL/STATE CODES.

G. ALL LOW VOLTAGE WIRING TERMINATIONS/SPLICES/CONNECTIONS TO (TRANSFORMERS, POWER PACKS, RELAYS, OCCUPANCY SENSORS, ETC.) SHALL BE DONE INSIDE A JUNCTION BOX. ANY LOW VOLTAGE CABLING EXITING THE JUNCTION BOX EXPOSED SHALL HAVE A RUBBER GROMETT TO PROTECT THE CABLING.

H. COORDINATE ALL SHUTDOWNS OF ELECTRICAL SYSTEMS WITH THE BINGHAMTON UNIVERSITY FACILITY PERSONNEL FOR TIE-IN CONNECTIONS. ALL SHUT DOWNS WILL OCCUR DURING NIGHTS OR WEEKENDS. THE CONTRACTOR SHALL ASSIST THE BUILDING OWNERS FACILITY PERSONNEL IN COORDINATING AND SHUTTING DOWN THE SYSTEM TO FACILITATE THE INTENDED WORK.

I. CONSTRUCTION WORK SHALL BE PHASED TO FACILITATE MINIMUM IMPACT TO THE NORMAL OPERATION OF THE FACILITY. THOROUGHLY REVIEW THE GENERAL CONDITIONS AND ALL OF THE CONSTRUCTION DOCUMENTS FOR THE PHASING REQUIREMENTS. PROVIDE FOR ALL TEMPORARY SERVICES (POWER, LIGHTING, AND SYSTEMS) TO THE FACILITY TO MEET PHASING REQUIREMENTS WITHOUT INTERUPTION OF THE ELECTRICAL SYSTEMS.

J. ALL EQUIPMENT SHALL BE LABELED. SPECIFIC LABELING SCHEME SHALL BE COORDINATED WITH THE OWNER PRIOR TO FINAL INSTALLATION, AT A MINIMUM THE LABEL SHALL INCLUDE THE EQUIPMENT ID, VOLTAGE AND THE ASSOCIATED PANELBOARD/CIRCUITS FEEDING IT.

K. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF EXISTING ACT CEILINGS TO FACILITATE ELECTRICAL SCOPE OF WORK IN AREAS WHERE THE CEILING ARE NOT BEING MODIFIED. THE CONTRACTOR SHALL BE RESPONSIBLE TO REPLACE ANY CEILING COMPONENTS DAMAGED DURING CONSTRUCTION.

L. DISCONNECT AND REMOVE ALL EXISTING ELECTRICAL EQUIPMENT AS INDICATED UNLESS NOTED TO REMAIN OR TO BE RELOCATED WITHIN THE PROJECT AREA. DISCONNECT AND REMOVE ALL ASSOCIATED BRANCH CIRCUIT AND SPECIAL SYSTEMS WIRING AND RACEWAYS, WHERE EXISTING DEVICES ARE NOT BEING REUSED, THEY AND THEIR ASSOCIATED WIRING AND RACEWAYS SHALL BE COMPLETELY REMOVED. DISCONNECT AND REMOVE ALL EMPTY AND ABANDONED RACEWAYS. CUT FLUSH WITH FLOOR WHERE APPLICABLE AND PLUG WITH GROUT.

M. PLUG ALL UNUSED HOLES IN JUNCTION BOXES AND PANELBOARDS RESULTING FROM EQUIPMENT REMOVAL.

N. PROVIDE ALL LABOR AND MATERIAL AS REQUIRED TO RE-SUPPORT EXISTING CONDUITS THAT ARE TO REMAIN THAT ARE LOCATED ABOVE ALL CEILINGS BEING REMOVED. ATTACH THESE EXISTING CONDUITS TO BUILDING STRUCTURE AS REQUIRED.

O. SLEEVE AND SEAL ALL WALL AND FLOOR PENETRATIONS. PROVIDE APPROPRIATE FIRE STOPPING FOR ALL PENETRATIONS.

P. COORDINATE EXACT LOCATION OF ALL CONDUIT ROUTES, EQUIPMENT AND DEVICES WITH OTHER TRADES.

Q. PLUG HOLES IN EXISTING CONSTRUCTION LEFT BY THE REMOVAL OF CONDUIT OR EQUIPMENT. MAINTAIN FIRE/SMOKE RATING.

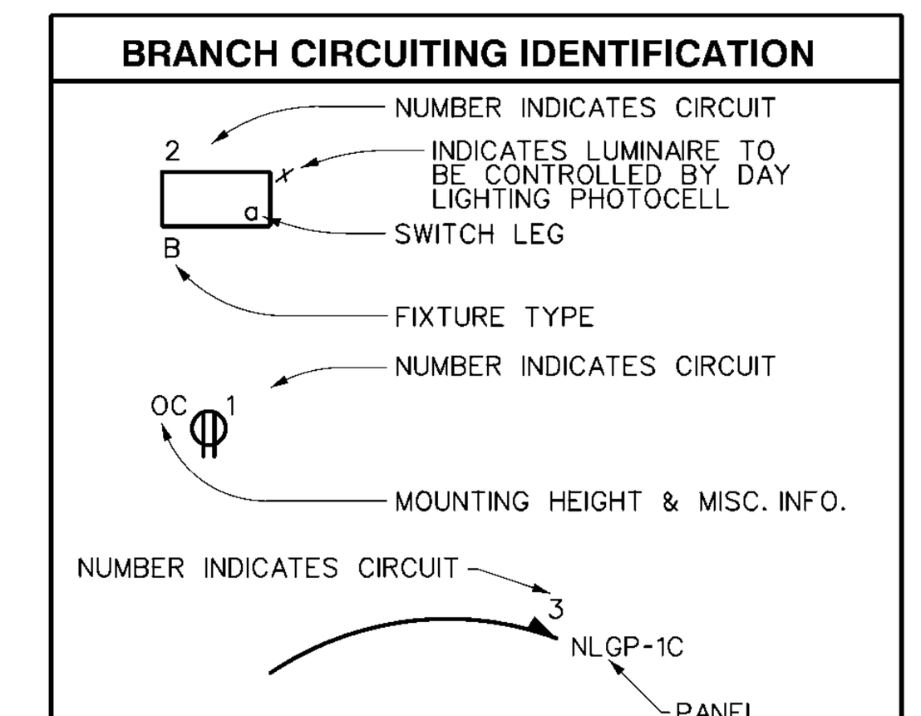
R. REVISE ALL EXISTING PANELBOARD SCHEDULES AND MCC CUBICLE LABELS AFFECTED BY THIS PROJECT.

S. WHERE EXISTING CIRCUITING IS DISTURBED BY DEMOLITION WORK, REWORK AND/OR EXTEND EXISTING CIRCUITING AS REQUIRED TO MAINTAIN CONTINUITY TO ALL REMAINING LOADS ON THE CIRCUITS. WHERE WIRING FEEDING LIGHTING, RECEPTACLES, ETC. IN SPACES NOT INCLUDED IN THE ALTERATIONS ARE REQUIRED FOR REUSE AND ARE CUT, THEY SHALL BE EXTENDED AND RECONNECTED AS REQUIRED.

T. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DISPOSE OF ALL DEMOLITION DEBRIS AND MATERIALS OFF SITE IN A PROPER LEGAL MANNER.

U. THE DEMOLITION DRAWINGS SHOWN IN GENERAL MAJOR EQUIPMENT REMOVALS. THE INTENT IS NOT TO IDENTIFY ALL MISCELLANEOUS ACCESSORIES, SUPPORTS, CONTROLS, WIRING, CONDUIT, AND ASSOCIATED HARDWARE TO BE DISCONNECTED AND REMOVED BUT IS THE REQUIREMENTS UNDER THIS CONTRACT. NO EQUIPMENT OR CONDUIT SHALL BE ABANDONED IN PLACE UNLESS OTHERWISE NOTED ON THE DRAWINGS.

BRANCH CIRCUITING IDENTIFICATION



NOTE:
TYPICAL FOR ALL DEVICES AND HOMERUNS

ABBREVIATIONS

ABBREV.	DESCRIPTION	ABBREV.	DESCRIPTION
A.	AMPERE	NIC	NOT IN CONTRACT
AFF	ABOVE FINISHED FLOOR	OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
AFG	ABOVE FINISHED GRADE	OFOI	OWNER FURNISHED, OWNER INSTALLED
AWG	AMERICAN WIRE GAGE	PNL.	PANEL
CB	CIRCUIT BREAKER	PH.	PHASE
CLG.	CEILING	P.	POLE
C.	CONDUIT	SP.	SPACE
CUH	CABINET UNIT HEATER	SW.	SWITCH
DCS	DIGITAL CONTROL SYSTEM	TSP	TWISTED SHIELDED PAIR
EG	EQUIPMENT GROUND	TYP.	TYPICAL
(E)	EXISTING	V.	VOLT
FCU	FAN COIL UNIT	WP	WEATHERPROOF
FBOCI	FURNISHED BY OTHERS, CONTRACTOR INSTALLED	XP	EXPLOSION PROOF
GND.	GROUND	4 W.	WIRE
GFI	GROUND FAULT INTERRUPTING	3P.15A.	P - POLE A - AMPERE
HP.	HORSEPOWER	OC	MOUNTED OVER COUNTER HEIGHT
KW.	KILOWATT	UC	MOUNTED UNDER COUNTER HEIGHT
LS	LIFE SAFETY BRANCH	UOI	UNLESS OTHERWISE INDICATED
MCB	MAIN CIRCUIT BREAKER		
MLO	MAIN LUG ONLY		
NAC	NOTIFICATION APPLIANCE CIRCUIT		

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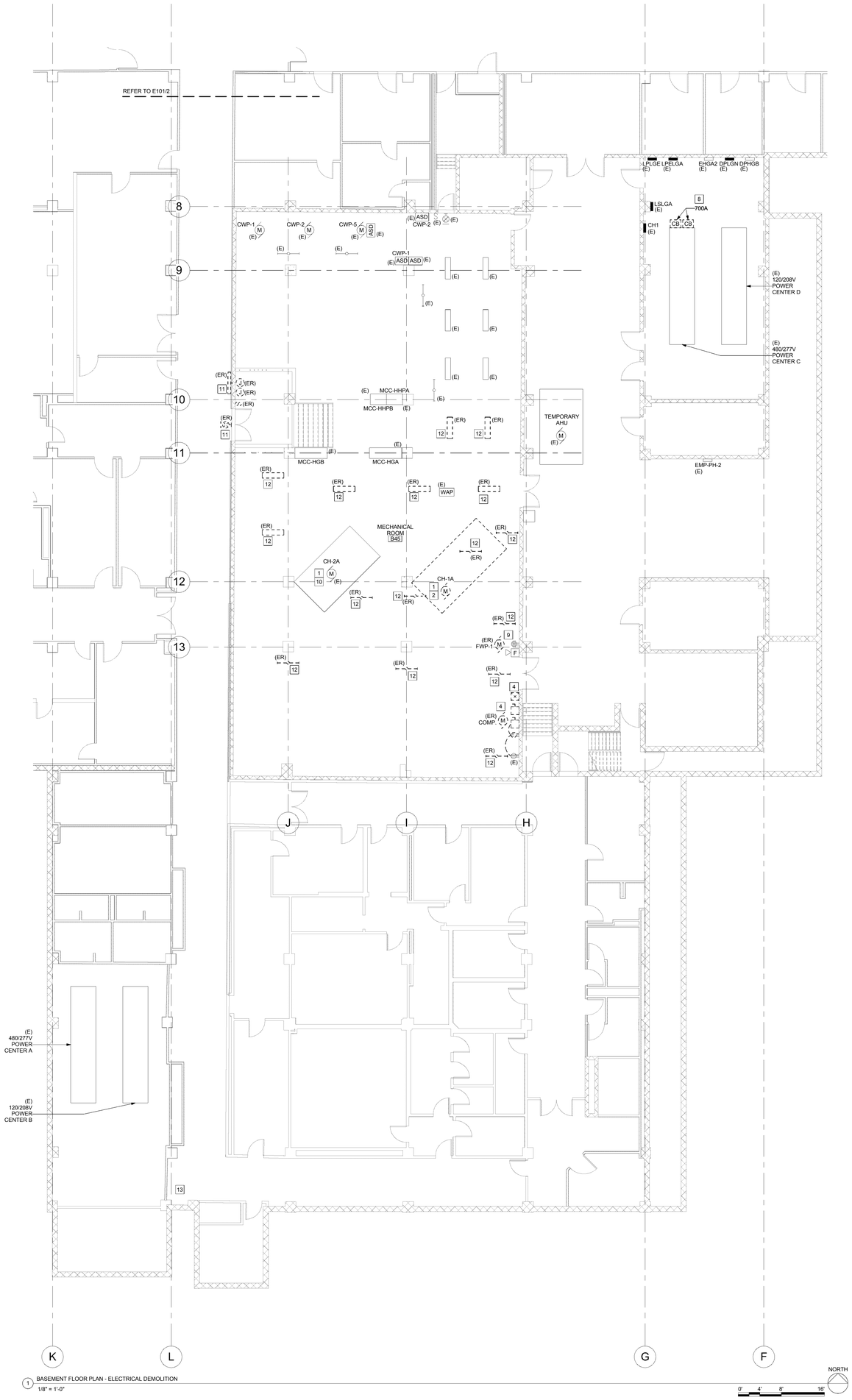
REVISIONS

No.	Date	By	Description

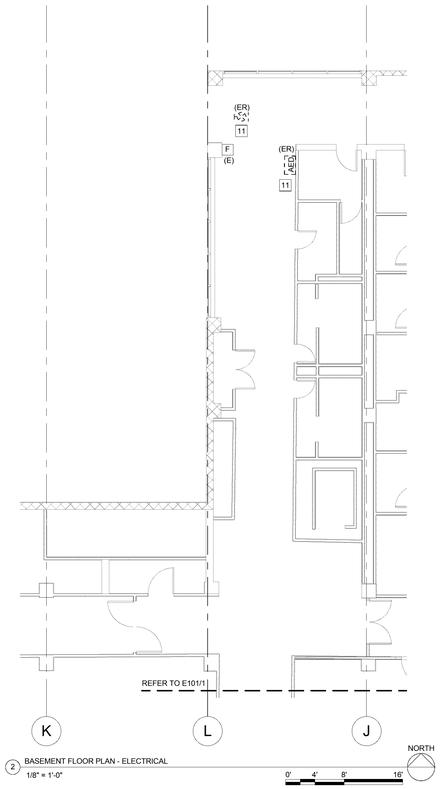
DRAWING TITLE
GENERAL NOTES AND SYMBOLS LIST - ELECTRICAL

DRAWING NO.		
E001	Drawn By:	LA
	Checked By:	MDS
	Project Mgr:	MDS
	Project No:	071018
	M/E Project No:	170425

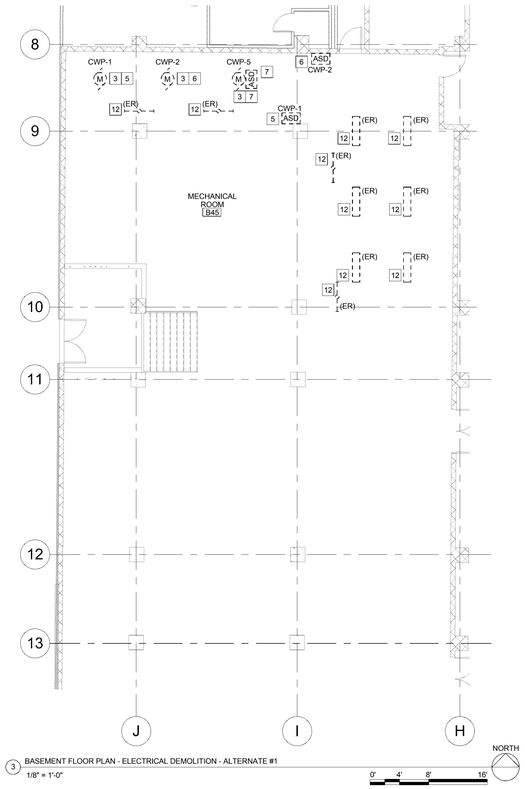
ISSUE DATE: **01/18/2019**
STATUS: **BID DOCUMENTS**



1 BASEMENT FLOOR PLAN - ELECTRICAL DEMOLITION
1/8" = 1'-0"



2 BASEMENT FLOOR PLAN - ELECTRICAL
1/8" = 1'-0"



3 BASEMENT FLOOR PLAN - ELECTRICAL DEMOLITION - ALTERNATE #1
1/8" = 1'-0"

E101 GENERAL NOTES

A. UNLESS OTHERWISE NOTED DISCONNECT AND REMOVE ALL ASSOCIATED CONDUIT, WIRE AND HARDWARE ASSOCIATED WITH ITEMS BEING REMOVED.
B. DISCONNECT AND REMOVE ASDS AS INDICATED AND TURN OVER TO CAMPUS.
C. REFER TO NEW PLANS FOR NEW LOCATION OF ITEMS BEING RELOCATED.

E101 DEMOLITION NOTES

1 DISCONNECT EXISTING CHILLER FROM POWER CENTER C. REMOVE ALL ASSOCIATED CONDUIT, WIRE AND HARDWARE FROM CHILLER TO 700A ENCLOSED CIRCUIT BREAKER.
2 EXISTING CHILLER TO BE REMOVED BY OTHER TRADE.
3 DISCONNECT EQUIPMENT FOR REMOVAL BY OTHER TRADE.
4 DISCONNECT UNIT FOR RELOCATION BY OTHER TRADE. DISCONNECT AND REMOVE 20A FED TO MCC-HGA. DISCONNECT AND REMOVE ASSOCIATED MANUAL STARTER AND DISCONNECT SWITCH.
5 DISCONNECT AND REMOVE 225A FEED TO ASD AND FROM ASD TO MCC-HGA.
6 DISCONNECT AND REMOVE 350A FEED TO ASD AND FROM ASD TO POWER CENTER C.
7 DISCONNECT AND REMOVE 350A FEED TO ASD AND FROM ASD TO POWER CENTER A.
8 DISCONNECT AND REMOVE EXISTING 700A CBS AND PROVIDE NEW 800A CBS IN THEIR PLACE, REFER TO ONE-LINE DIAGRAM.
9 DISCONNECT UNIT FOR RELOCATION BY OTHER TRADE. DISCONNECT AND REMOVE 30A FED TO MCC-HGA.
10 PRIOR TO DISCONNECTING CH-1A DISCONNECT EXISTING CHILLER FROM POWER CENTER C. REMOVE ALL ASSOCIATED CONDUIT, WIRE AND HARDWARE FROM CHILLER TO 700A ENCLOSED CIRCUIT BREAKER. CONNECT TO LOAD CENTER A. REFER TO ONE LINE DIAGRAM.
11 DISCONNECT AND REMOVE FOR RIGGING OF NEW CH-1A. REINSTALL IN EXISTING LOCATION AFTER CHILLER IS SET IN PLACE.
12 DISCONNECT AND REMOVE EXISTING LIGHT FIXTURES FOR DEMOLITION OF OLD CHILLED WATER PIPING AND INSTALLATION OF NEW CHILL WATER PIPING. EXISTING LIGHTING CIRCUITS TO REMAIN AND BE REUSED.
13 REROUTE 3/4" CONDUITS IN THIS LOCATION TO ACCOMMODATE FOR INSTALLATION OF NEW CHILLED WATER PIPING. REFER TO DIVISION 23 TRADE DRAWINGS FOR COORDINATION.

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No.	Date	By	Description

DRAWING TITLE
BASEMENT FLOOR PLAN - ELECTRICAL DEMOLITION

DRAWING NO.
E101

Drawn By:	LA
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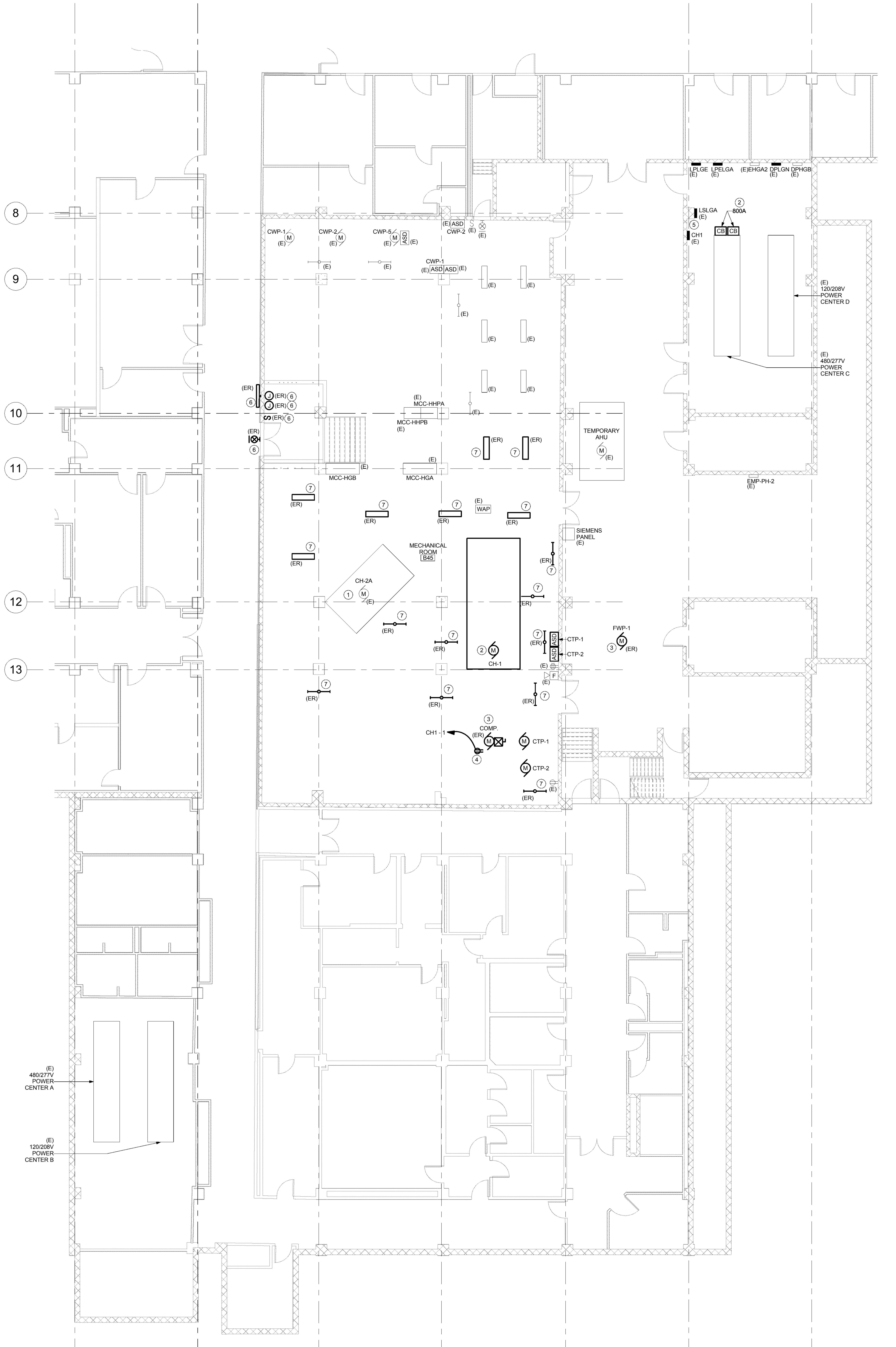
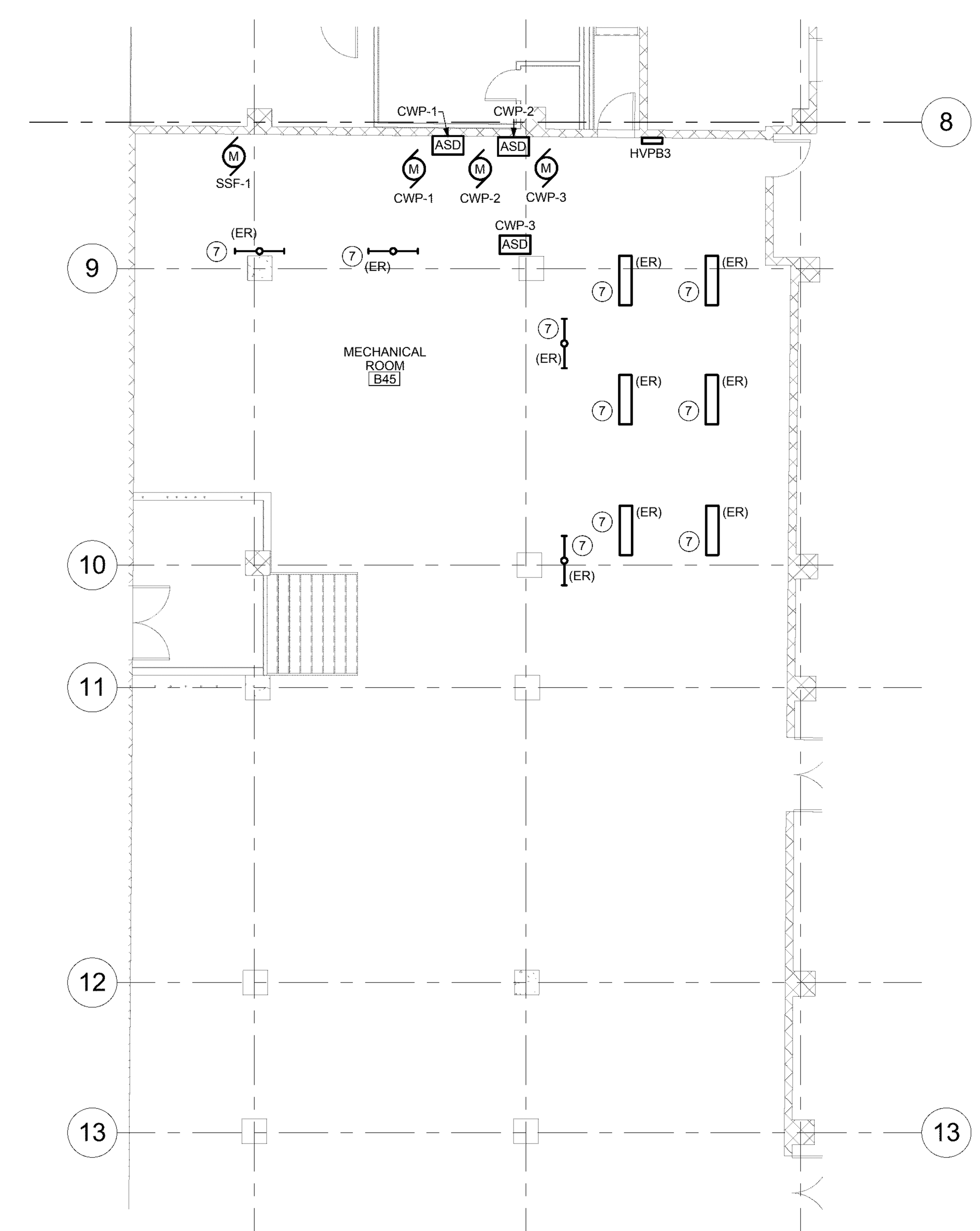


1 BASEMENT FLOOR PLAN - ELECTRICAL
1/8" = 1'-0"



2 BASEMENT FLOOR PLAN - ELECTRICAL - ALTERNATE #1
1/8" = 1'-0"

E201 DRAWING NOTES (#)

1 RECONNECT CHILLER TO POWER CENTER A. REFER TO ONE LINE DIAGRAM.
2 CONNECT NEW CHILLER TO POWER CENTER C. REFER TO ONE LINE DIAGRAM.
3 NEW LOCATION FOR RELOCATED DEVICE.
4 OUTLET FOR AIR DRYER AND COMPRESSOR AUTO DRAIN, COORDINATE EXACT LOCATION IN FIELD.
5 PROVIDE 20A. 1P. CB TO FIT EXISTING CUTLER HAMMER PANEL.
6 REINSTALL IN EXISTING LOCATION AFTER NEW CH-1A CHILLER IS SET IN PLACE.
7 REINSTALL EXISTING LIGHT FIXTURES TO ACCOMMODATE INSTALLATION OF NEW CHILLED WATER PIPING. REFER TO DIVISION 23 DRAWINGS FOR COORDINATION OF LOCATIONS FOR REINSTALLATION. RECONNECT TO EXISTING LIGHTING CIRCUITS.

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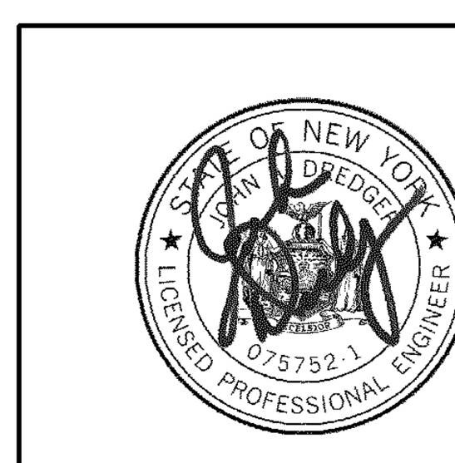

REVISIONS

No.	Date	By	Description

DRAWING TITLE
BASEMENT FLOOR PLAN - ELECTRICAL

DRAWING NO.
E201

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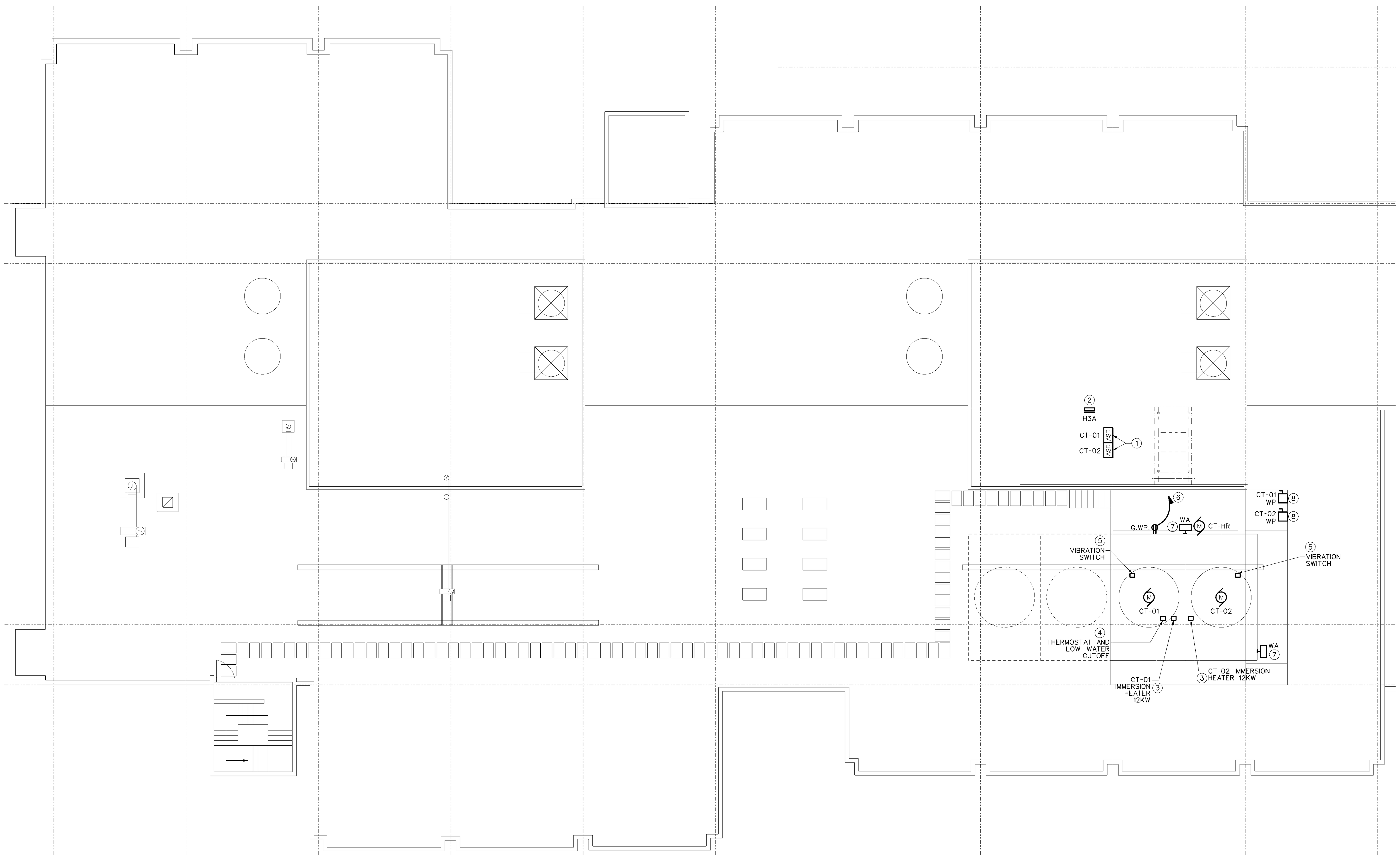

(1) ROOF PLAN - ELECTRICAL
1/8" = 1'-0"

0 4' 8' 16'

NORTH

DRAWING NOTES:

1. PROVIDE FLOOR TO CEILING CHANNEL SUPPORT SYSTEM TO MOUNT ASD.
2. REPLACE EXISTING PANEL WITH NEW, REFER TO ONE-LINE DIAGRAM.
3. PROVIDE 3*10, 1*10G, 3/4"C TO CT-HR, CONNECT PER MANUFACTURERS INSTRUCTIONS.
4. PROVIDE 2*14, 3/4"C TO CT-HR, CONNECT PER MANUFACTURERS INSTRUCTIONS.
5. PROVIDE 2*14, 3/4"C AND CONNECT VIBRATION SWITCH TO SAFETY SHUTDOWN CIRCUIT OF ASSOCIATED ASD.
6. CONNECT TO NEAREST 120V RECEPTACLE CIRCUIT. PROVIDE A STEEL CHANNEL SUPPORT FOR MOUNTING OF RECEPTACLE. COORDINATION LOCATION IN FIELD.
7. CONNECT EXTERIOR LIGHTING LUMINAIRE TO NEAREST 120V RECEPTACLE CIRCUIT. PROVIDE A STEEL CHANNEL SUPPORT FOR MOUNTING OF LIGHT FIXTURE. COORDINATION LOCATION IN FIELD.
8. PROVIDE A STEEL CHANNEL SUPPORT FOR MOUNTING OF DISCONNECT SWITCH. COORDINATE LOCATION IN FIELD.

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No.	Date	By	Description

DRAWING TITLE

ROOF PLAN - ELECTRICAL

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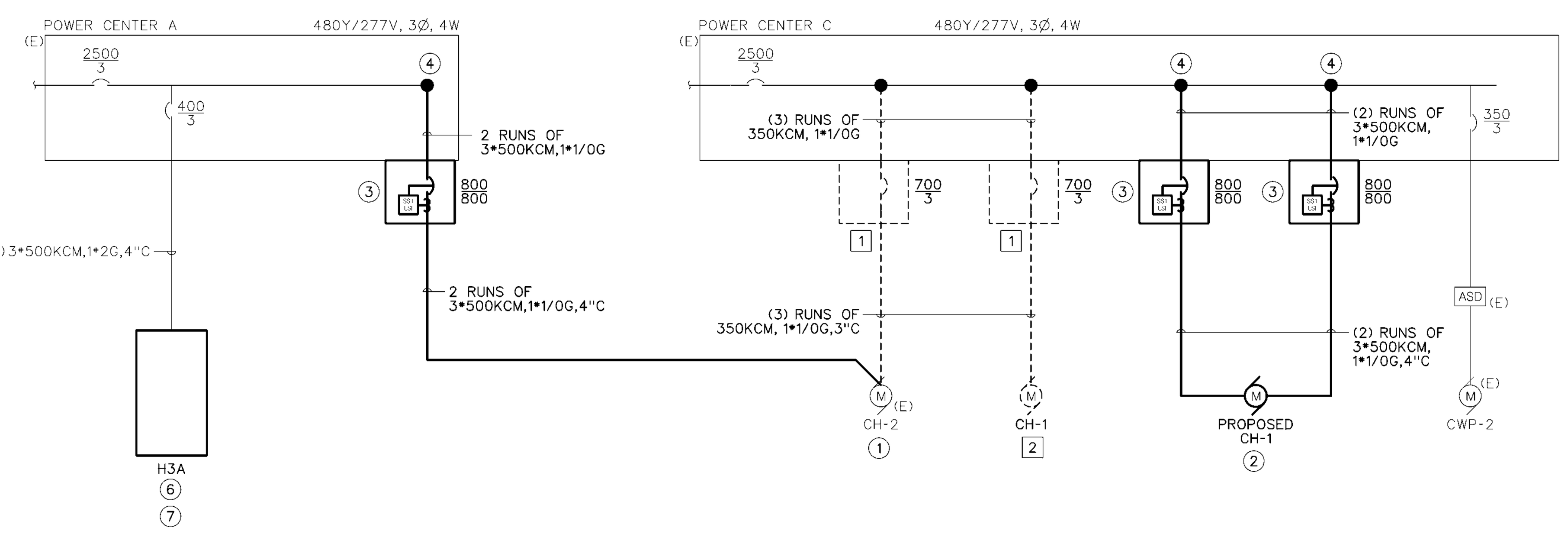
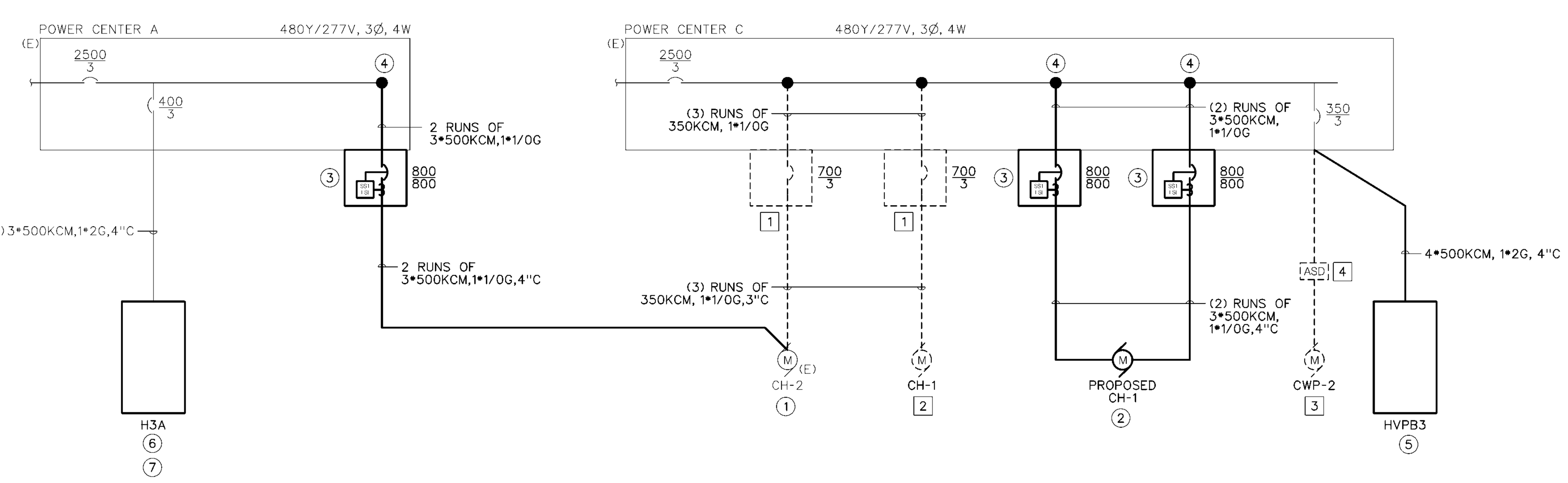


1 ELECTRICAL ONE-LINE DIAGRAM



1 ELECTRICAL ONE-LINE DIAGRAM - ALTERNATE #1

DRAWING NOTES: (*)

1 DISCONNECT EXISTING CHILLER FROM POWER CENTER C AND RECONNECT TO POWER CENTER A AS INDICATED.

2 CONNECT NEW CHILLER AS INDICATED.

3 PROVIDE ENCLOSED CIRCUIT BREAKER, SIZE AS INDICATED, MOUNT TO SIDE OF POWER CENTER, CONNECT TO POWER CENTER BUS AS INDICATED.

4 DRILL AND TAP BUS AS REQUIRED FOR CONNECTION OF CONDUCTORS INDICATED.

5 PROVIDE NEW PANEL.

6 DISCONNECT AND REMOVE EXISTING PANEL AND PROVIDE NEW PANEL IN ITS PLACE.

7 PROVIDE ALL CONDUIT, WIRE, SPLICES, TERMINATIONS AND HARDWARE AS REQUIRED TO RECONNECT EXISTING FEED AND THE FOLLOWING EXISTING CIRCUITS TO NEW PANEL:
   1. 125A/3P - 60HP AC5 - 3*1/0, 1*6G, 1 1/2"C
   2. 100A/3P - 50HP EF6A - 3*2, 1*6G, 1 1/2"C
   3. 100A/3P - 50HP EF6B - 3*2, 1*6G, 1 1/2"C
   4. 20A/3P - AHU3 HEATER - 3*12, 1*12G, 3/4"C

DEMOLITION NOTES: [*]

1 DISCONNECT AND REMOVE CIRCUIT BREAKERS MOUNTED TO SIDE OF POWER CENTER, WIRING TO CHILLERS AND CONDUCTORS CONNECTED TO POWER CENTER BUS.

2 DISCONNECT EXISTING CHILLER FOR REMOVAL BY OTHER TRADE.

3 DISCONNECT PUMP FOR REMOVAL BY OTHER TRADE.

4 DISCONNECT & REMOVE ASD AND TURN OVER TO CAMPUS.

M/E ENGINEERING
Mechanical/Electrical Engineering Consultants

SCIENCE III - CHILLER PLANT
BINGHAMTON UNIVERSITY

REVISIONS

No.	Date	By	Description

DRAWING TITLE
ELECTRICAL ONE-LINE DIAGRAM

DRAWING NO.
E401

Drawn By:	LA
Checked By:	MDS
Project Mgr:	MDS
Project No:	071018
M/E Project No:	170425

ISSUE DATE: **01/18/2019**
STATUS: **BID DOCUMENTS**

EQUIPMENT: "INSERT DESIGNATION"

POWER SOURCE: "INSERT SOURCE & ROOM #

TYPE SUPPLY: "INSERT-NORMAL, OR CRITICAL OPERATION POWER, OR OPTIONAL STANDBY, OR LEGALLY REQUIRED, OR LIFE SAFETY EMERGENCY AS APPLICABLE"

VOLTAGE: "INSERT APPLICABLE VOLTAGE-208Y/120V OR 480Y/277V, ETC."

CONDUCTOR COLOR CODING:
PHASE A - BLACK OR BROWN
PHASE B - RED OR ORANGE
PHASE C - BLUE OR YELLOW
NEUTRAL - WHITE OR GRAY
GROUND - GREEN

NOTES:

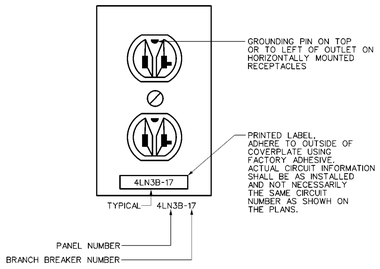
A. PROVIDE CUSTOM NAMEPLATE AS INDICATED FOR ALL PANELBOARDS, MCC'S, SWITCHBOARDS, SWITCHGEAR, TRANSFER SWITCHES, GENERATORS ETC.

B. NAMEPLATE SHALL BE ENGRAVED (WHITE LETTERING, BLACK BACKGROUND) AND ATTACHED TO THE EQUIPMENT WITH SCREWS. LETTERING SHALL BE 1/4" HIGH WITH SPACE BETWEEN LINES 1/4" MINIMUM. MINIMUM SHALL BE 8"H x 8"W.

C. PROVIDE SAMPLE NAMEPLATE FOR REVIEW.

D. NAMEPLATE SHALL BE ATTACHED WITH FOUR STAINLESS STEEL SCREWS.

1 E601 — EQUIPMENT NAMEPLATE DETAIL
SCALE: NONE



DETAIL NOTES:

A. PROVIDE GREEN GROUND WIRE IN ALL RECEPTACLE CIRCUITS. CONNECT TO GROUND BUS IN PANEL.

2 E601 — TYPICAL RECEPTACLE IDENTIFICATION
SCALE: NONE

LUMINAIRE SCHEDULE

TYPE	DESCRIPTION	MFR. & CATALOG No.	LAMP	VOLTAGE/BALLAST	MOUNTING	UNIT WATTS	ACCEPTABLE MANUFACTURERS	REFERENCE NOTES
WA	WALL MOUNTED EXTERIOR LED LUMINAIRE. PROVIDE WITH DIE CAST ALUMINUM HOUSING, WET LOCATION RATED, INTEGRAL MOTION SENSOR AND PHOTOCELL FOR DIMMING OPERATION.	MCGRAW CAT. #: IST-F02-LED-EQ-GZW-MS/DIM-LXX	5500 LUMEN LED 4000K	120/277V	SURFACE/ WALL	47W	GARDCO - "101 LED" SERIES LITHONIA - "WST" SERIES	

PANELBOARD SCHEDULE

PANEL INFORMATION		TYPE		VOLTAGE RATING			MAIN AMPERE RATING					KAIC IRMS SYM	MOUNT		BRANCH CIRCUIT DEVICES						TOTAL NO. OF CIRCUITS	NOTES
NAME	ROOM LOCATION	DIST.	BRANCH CIR.	VOLT	PHASE	WIRE	MLO	MCB	MFS	THRU FEED LUGS	SUB FEED LUGS		F	S	QUANTITY: ACTIVE	QUANTITY: SPARE	QUANTITY: SPACE	FRAME / SWITCH SIZE	TRIP / FUSE SIZE-FU	POLES		
HVPB3		X		480/277	3	4	400					65k		X	3		2		150A	3	18	A
															1				20A	3		
H3A		X		480	3	3	400					65k		X	1				20A	3	30	
															1				40A	3		
															2		3		100A	3		
															1				125A	3		
															2				90A	3		

REFERENCE NOTES:

A. ALL WORK ASSOCIATED WITH INDICATED ELECTRICAL PANEL SHALL BE BID AS PART OF ALTERNATE #1. PANEL SHALL NOTE EXCEED 30" WIDE.

ELECTRIC EQUIPMENT AND CONTROL SCHEDULE

GENERAL NOTES:
1. ALL DEVICES PROVIDED BY THE DIVISION [16]/[26] CONTRACTOR.
2. ITEM NUMBER INDICATES EQUIPMENT NUMBER
3. ALL DEVICES SHALL BE SURFACE MOUNTED UNLESS OTHERWISE NOTED.
4. PROVIDE OVERLOADS, SIZE AS REQUIRED, BY THE DIVISION [15]/[22/23] CONTRACTOR.
5. "AU" INDICATES CONTROL DEVICES IS LOCATED AT THE UNIT.
6. "NF" INDICATES NON-FUSED.
7. "IU" INDICATES INTEGRAL WITH UNIT.

EQUIPMENT: ITEM ID	NAME	ROOM LOCATION	HP	KW	PHASE	SYSTEM VOLTS	MCA or SYSTEM AMPS	POWER SOURCE, PROTECTION & WIRING: PANEL or CONTROL CENTER	CIRCUIT BREAKER or "FU" FOR FUSE	POWER WIRING FROM PANEL TO CONTROL UNIT: PHASE	GROUND	CONDUIT	POWER WIRING FROM CONTROL UNIT TO EQUIPMENT: PHASE	GROUND	CONDUIT	NEMA DEVICE,TYPE AND CONTROLS: NEMA SIZE STARTER	NEMA TYPE	MANUAL MOTOR STARTER	MANUAL MOTOR STARTER WITH RELAY	MAGNETIC STARTER	COMBINATION MAGNETIC STARTER	COMBINATION REDUCED VOLTAGE STARTER	COMBINATION STARTER MFR/FUSE I/T SIZE	ADJUSTABLE SPEED DRIVE	ADJUSTABLE SPEED DRIVE WITH BYPASS	ADJUSTABLE SPEED DRIVE WITH REDUNDANT ASD	PACKAGED CONTROL UNIT FURNISHED BY OTHERS	DIGITAL PUMP CONTROLLER BY OTHERS	FIRE ALARM FAN SHUTDOWN REQUIRED	SUPPLY DUCT SMOKE DETECTOR W/ REMOTE TEST STATION	RETURN DUCT SMOKE DETECTOR W/ REMOTE TEST STATION	ECM MOTOR CONNECTION CONNECT TO CONTROLS BY OTHERS	THERMOSTAT CONNECTION	ADJUSTAT CONNECTION	MOTORIZED DAMPER CONNECTION	START/STOP PUSHBUTTONS	OFF/AUTO SELECTOR SWITCH	CONTROL DEVICE LOCATION	SAFETY SWITCH: SWITCH AMPS	SAFETY SWITCH: FUSE SIZE	SAFETY SWITCH: LOC.	SAFETY SWITCH: WEATHER PROOF	REF. NOTES	ITEM ID
CWP-1	CHILLED WATER PUMP	MECHANICAL ROOM	75		3	480	96.0	HVPB3-1,3,5	150/3	3*1/0	1*4	1-1/2"C	3*1/0	1*4	1-1/2"C									X													AU					E	CWP-1
CWP-2	CHILLED WATER PUMP	MECHANICAL ROOM	75		3	480	96.0	HVPB3-2,4,6	150/3	3*1/0	1*4	1-1/2"C	3*1/0	1*4	1-1/2"C									X													AU					E	CWP-2
CWP-3	CHILLED WATER PUMP	MECHANICAL ROOM	75		3	480	96.0	HVPB3-7,9,11	150/3	3*1/0	1*4	1-1/2"C	3*1/0	1*4	1-1/2"C									X													AU					E	CWP-3
CTP-1	CONDENSER WATER PUMP	MECHANICAL ROOM	75		3	480	96.0	MCC-HHPA	175FU	3*1/0	1*4	1-1/2"C	3*1/0	1*4	1-1/2"C									X													AU					A	CTP-1
CTP-2	CONDENSER WATER PUMP	MECHANICAL ROOM	75		3	480	96.0	MCC-HHPB	175FU	3*1/0	1*4	1-1/2"C	3*1/0	1*4	1-1/2"C									X													AU					A	CTP-2
FWP-1	FEED WATER PUMP	MECHANICAL ROOM			3	480	10.0	MCC-HGA		3*10	1*10	3/4"C																X								AU					B	FWP-1
COMP	AIR COMPRESSOR	MECHANICAL ROOM	5		3	480	7.6	MCC-HGA		3*12	1*12	3/4"C	3*12	1*12	3/4"C								(F)15													X	AU					C,D	COMP
CT-01	COOLING TOWER FAN	ROOF	25		3	480	34.0	H3A-2,4,6	90/3	3*8	1*8	3/4"C	3*8	1*8	3/4"C									X														PH	60	NF	AU	X		CT-01
CT-02	COOLING TOWER FAN	ROOF	25		3	480	34.0	H3A-8,10,12	90/3	3*8	1*8	3/4"C	3*8	1*8	3/4"C									X														PH	60	NF	AU	X		CT-02
CT-HR	PAN HEATERS	ROOF		24	3	480	28.9	H3A-14,16,18	40/3	3*8	1*10	3/4"C																X								AU						CT-HR
SSF-1	SIDE STREAM FILTER	MECHANICAL ROOM	3		3	480	4.8	HVPB3-8,10,12	20/3	3*12	1*12	3/4"C																X								AU					E	SSF-1

REFERENCE NOTES:

A. UTILIZE EXISTING SPACE IN MCC AND PROVIDE 200A FUSED SWITCH TO FIT EXISTING GE EVOLUTION 9000 MCC.

B. RELOCATED UNIT, CONNECT TO EXISTING FWP-1-2 CUBICAL IN MCC.

C. RELOCATED UNIT, PROVIDE NEW STARTER AND CONNECT TO EXISTING CUBICAL IN MCC.

D. PROVIDE 2*12, 1/2"C AND CONNECT UNIT MOUNTED PRESSURE SWITCH TO CONTROL UNIT.

E. ALL WORK ASSOCIATED WITH INDICATED ELECTRICAL EQUIPMENT SHALL BE BID AS PART OF ALTERNATE #1.

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SCIENCE III - CHILLER PLANT
BINGHAMTON UNIVERSITY

REVISIONS

No.	Date	By	Description

DRAWING TITLE
DETAILS AND SCHEDULES - ELECTRICAL

DRAWING NO. E601

Drawn By:	LA
Checked By:	MDS
Project Mgr:	MDS
Project No:	071018
M/E Project No:	170425

ISSUE DATE: **01/18/2019**

STATUS: **BID DOCUMENTS**