PROJECT DRAWINGS

INDUSTRIAL ARTS ALTERATION

GLOUCESTER CITY HIGH SCHOOL
1300 MARKET STREET
GLOUCESTER CITY, NEW JERSEY 08030
CAMDEN COUNTY
LOT 6 / BLOCK 22

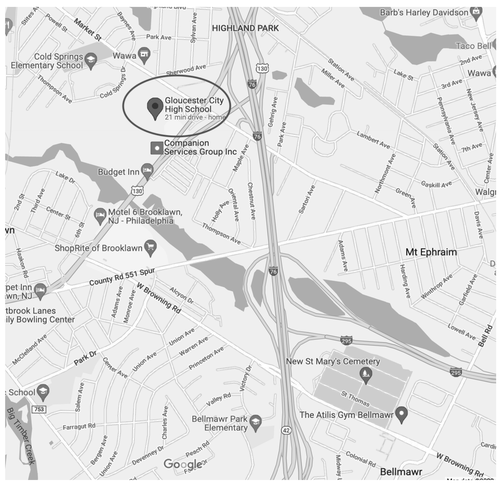
APPLICABLE LIST OF CODES

UCC SUBCODES

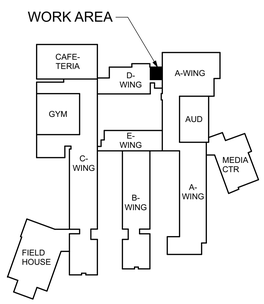
The following subcodes as adopted by the New Jersey Uniform Construction Code (NJAC 5:23 et seq.), shall apply to this Project.

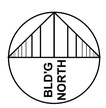
SUBCODE	NATIONAL MODEL CODE	UCC REFERENCE
Building	International Building Code NJ Ed/2021	NJAC 5:23-3.14
Plumbing	National Standard Plumbing Code/2021	NJAC 5:23-3.15
Electrical	National Electrical Code (NFPA 70)/2020	NJAC 5:23-3.16
Energy	ASHRAE 90.1-2019 (Comm & all other Res)	NJAC 5:23-3.18
Mechanical	International Mechanical Code/2021	NJAC 5:23-3.20
Fuel Gas	International Fuel Gas Code/2021	NJAC 5:23-3.22
Rehabilitation Subcode	NJUCC, Subchapter 6	NJAC 5:23-6
Barrier-Free	Barrier-Free Subcode & ICC/ANSI A117.1-2017	Chapter 11 of IBC/2021 & NJAC 5:23-7

LOCATION PLAN



BUILDING KEY PLAN





CONSTRUCTION NOTES:

SCOPE OF WORK:
Contractor(s) shall comply with the current NEW JERSEY UNIFORM CONSTRUCTION CODE (UCC) REHABILITATION SUBCODE & all applicable subcodes, ordinances & regulations of federal, state, municipal, & other governing bodies.
Contractor(s) shall be solely responsible for & have control over construction means, methods, techniques, sequences & procedures, shoring & bracing, jobsite safety, & for coordinating all portions of work.
Prior to submitting a bid, the Contractor(s) shall visit the site of the Work & shall thoroughly familiarize themselves w/ the exist'g conditions affecting the work & shall report any errors to the Arch't. By the act of submitting a bid, the Contractor(s) shall be deemed to have made such an examination, to have accepted such conditions, and to have made allowance therefore in preparing their bid. No additional compensation will be granted on the account of extra work made necessary by the Contractors' failure to investigate such exist'g conditions. Contractor(s) shall perform the Work in accordance with the documents or assume responsibility for corrections.
Contractor shall keep the premises & surrounding area free from accumulation of waste mat'ls & rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from & about the Project waste mat'ls, rubbish, the Contractor's tools, construction equipment, machinery, & surplus mat'ls.

PERMITS:
General Contractor shall be responsible for providing all necessary permits.
Complete building permit application and file with authorities having jurisdiction within five days of the Notice to Proceed or the date of execution of the Contract, whichever is later.
Fees shall be paid for by the Owner or reimbursed after submission of receipt to Architect for Owner's payment.

DIMENSIONS:
Are to outside surface of finish mat'ls unless shown otherwise.
All dimensions are nominal and shall be field verified.

DEMOLITION:
Prior to commencement of the Work, the Contractor shall survey the exist'g conditions & record them by use of preconstruction photographs &/or videotapes (or as per Section 013233 - Photographic Documentation of the Project Manual). Provide Architect with an electronic copy of the survey.
Prior to the commencement of any underground excavation, the Contractor shall call & obtain local identification of underground utilities & identification. Phone 1-800-272-1000. A copy of the approval notification shall be available for inspection at the excavation site.
Do not proceed w/ any interruption of services w/o Owner's written permission.
The Owner's Automatic Temperature Control (ATC) vendor is Matthew Rawlik, TRANE, at 610-962-1164.
Prior to the commencement of the Work, the Contractor shall review with the Owner all mat'ls & equipment to be removed. Should the Owner opt to keep any items, the Contractor shall salvage & deliver the items to the Owner on the site where so directed & properly dispose of all other demolition & construction mat'ls.
Remove all exterior structures, interior walls, flooring & clg finishes, fixtures & other items as noted on dwgs.
Support exist'g structural system before removing & replacing exist'g structure. Temporarily brace & shore all areas where supporting structures are removed until new construction is securely in place.
Protect existing Corridor flooring during the construction period with covering of hardboard panels or other suitable material. Do not use paper or plastic sheeting. Do not move heavy and sharp objects directly over exist'g or proposed flooring. Protect flooring as indicated above to prevent damage from storing or moving objects over flooring.
Maintain building envelope in a weathertight & secure condition for the duration of the Project.
Refer to MPE documents for additional requirements.

REPAIR, PATCH & PAINT:
All areas disturbed during demolition & construction shall match adjacent mat'ls & finishes at project completion.
Exist'g openings in clgs & walls shall be patched to match adjacent mat'ls & finishes.
Scrape, clean & patch exist'g concrete floor to provide an acceptable level floor. Prepare surface to receive specified floor finish.

EXISTING CONCRETE FLOOR:
Contractor is responsible for preparing, finishing and all required testing of the concrete slabs in accordance with the most stringent requirements of the finish floor systems specified and selected by the Owner.
Clean & patch to remove all exist'g mastic, paint and coatings to expose bare concrete & patch where req'd to provide an acceptable level floor. Prepare surface to receive specified floor finish.
Contractor shall ensure that the existing concrete work complies with the requirements of the finish floor manufacturer(s) selected for use on this project. This includes, but is not limited to, tolerances and conditions, rapid relative humidity testing as per ASTM F2170, *Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes*, bond testing, and alkalinity testing. General Contractor shall supply the Architect with copies of all test results, the finish floor manufacturer's concrete subfloor requirements, and letters of acceptance from the finish floor manufacturer(s) prior to proceeding with the concrete subfloor work.
The use of curing compounds on subfloors where finish floor manufacturers prohibit their use shall not be permitted.
Where cement based interior self-level'g underlayment is req'd, it shall be the responsibility of the Contractor to provide an underlayment compatible with the specified finish floor.
Where new concrete is req'd, it shall be the responsibility of the Contractor to review the intended concrete design mix with the limitations imposed by the finish floor manufacturers, and if necessary, make recommendations to the Architect of an amended design mix that would better facilitate the standards of the finish floor manufacturer's requirements. No additional compensation shall be awarded for the use of an alternative design mix.
The use of curing compounds on subfloors where finish floor manufacturers prohibit their use shall not be permitted.
Contractor shall be required to employ whatever means necessary to meet the requirements of the finish floor manufacturers for concrete slabs without additional compensation or time extension.

DOOR HARDWARE
Chain link swing gate hardware w/ exit device plate:
1 Gate Plate GTPLKIT 630 DETEX or Arch'ts approved equal.
16 gauge electrogalvanized powder coated steel.
Adjustable receiver bracket.
Provisions for specified hardware.
Stainless steel fasteners.
Size: Extension plate to accommodate gate width by 24" high.
Color: As selected by Arch't from manuf'rs full range of standard colors.
Hardware:
1 Exit Device 10xW 03Z 630 (Handing) 630 LD 99 IC7R 48" EC DETEX or Arch'ts approved equal.
1 630 SSK1 DX1 DETEX or Arch'ts approved equal.
1 Core: Match exist'g bldg.
1 Cylinder Trim Kit 03GS (As Required) DETEX or Arch'ts approved equal.

VINYL WALL BASE:
4" high coved vinyl wall base to match exist'g.
Color as selected by Arch't.

PAINT:
Paint shall be SHERWI-WILLIAMS or Arch'ts approved equal.
Colors as selected by Arch't to match exist'g school colors.
INTERIOR:
Concrete Floor:
Primer: 1 Coat Resuprime 3579
Intermediate: 1 Coat Resuflor 3746
Finish: 1 Coat Elladur 4850
Walls: Painted CMU:
Primer: 1 Coat PrepRite Block Filler
Finish : 2 Coats ProMar 200 Zero VOC Interior Latex Egshel
Steel Door Frames:
Primer if needed Pro Industrial ProCryl Universal Primer
(2) coats of S-W Pro Industrial Water Base Alkyd Urethane, Low Sheen.
Bar Joist & Metal Decking:
Primer: Prime as needed Pro Industrial ProCryl Universal Primer
Finish: 2 coats Pro Industrial Waterbased Dryfall
Galvanized Ductwork:
Primer: Prime as needed Pro Industrial ProCryl Universal Primer
Finish: 2 coats Pro Industrial Waterbased Dryfall
EXTERIOR:
Galvanized Handrails & Bollards:
Primer: 1 Coat Pro Industrial ProCryl Universal Primer
Finish: 2 Coats Pro Industrial Waterbased Alkyd
Urethane Semigloss

LOADING DOCK BUMPERS:
DAYTON 5W826 6" H x 33" W x 4 1/2" D min laminated rubber bumper sandwiched between painted steel angle mounting brackets on each end for bolting to proposed substraight or Arch'ts approved equal.

LIST OF DRAWINGS

DRAWING KEY

DRAWING TITLE	SCALE: 1/8" = 1'-0"	01	A-000

DRAWING/DETAIL TITLE
DRAWING/DETAIL SCALE
DRAWING/DETAIL NUMBER
SHEET REFERENCE NUMBER (WHERE DETAIL ORIGINATED)

REGAN YOUNG, AIA
21AI00912100

REGAN YOUNG ENGLAND BUTERA
REFERENDUMS • ENGINEERING • ARCHITECTURE • DESIGN
456 HIGH STREET • MT. HOLLY, NEW JERSEY 08060 USA
+1(609)265-2652/0333FAX • 21AI00912100 • RYEBREAD.COM

These Drawings have been reviewed and approved by the Gloucester City Board of Education.

Michelle Wright
Board President
Signature Board President
Date

Sean Gorman
Superintendent
Signature Superintendent
Date

NJDOE SP #1770-050-XX-XXXX

PROJECT TITLE:
INDUSTRIAL ARTS ALTERATION

ADDRESS:
GLOUCESTER CITY HIGH SCHOOL
BLOCK 222 / LOT 6
1300 MARKET STREET
GLOUCESTER CITY, NJ 08030

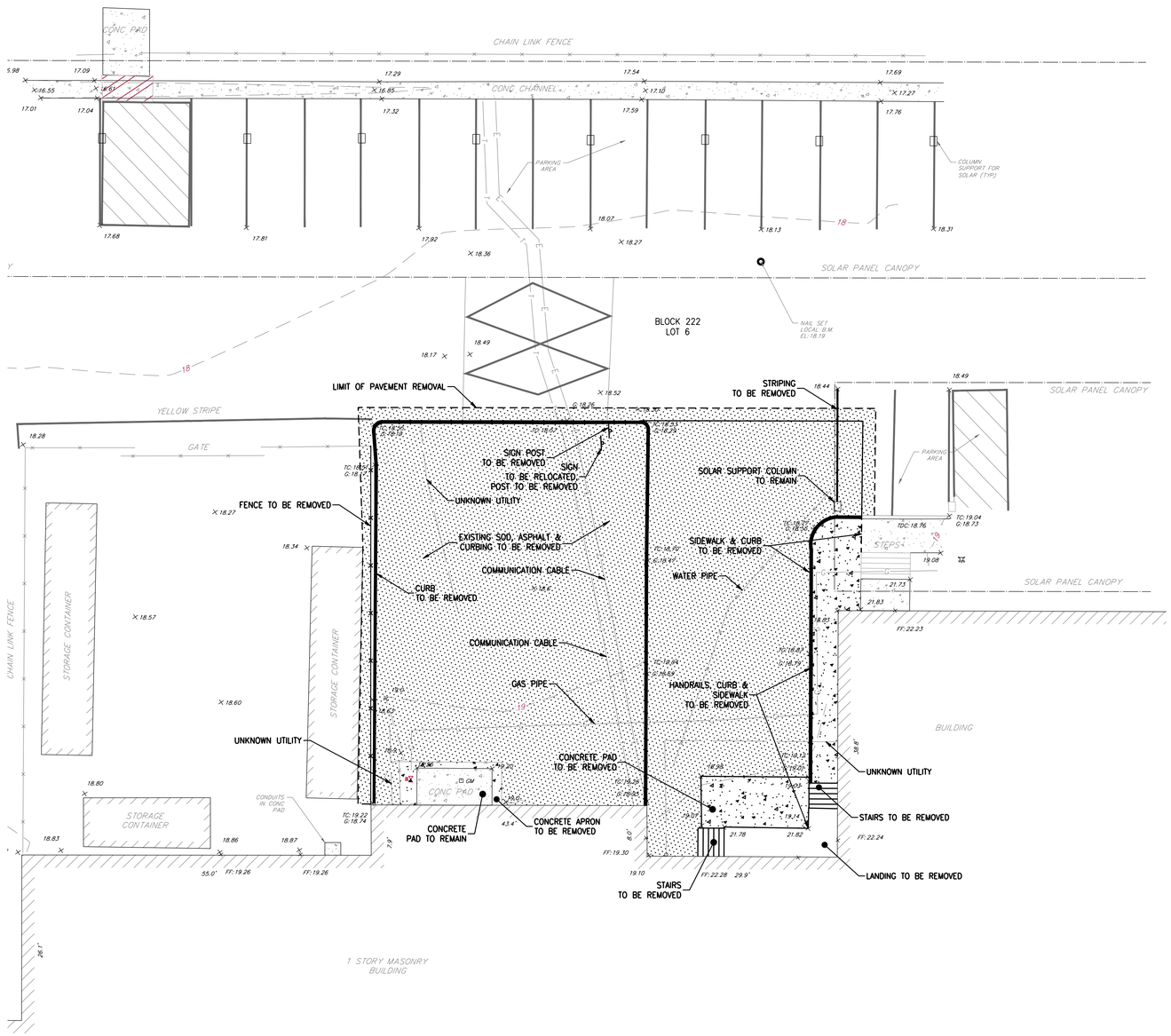
PROJECT NO.:	5672G

SUBMISSION DATE:	
REVISION DATE:	

DRAWING DATE:	24 FEB 23
PRINT DATE:	2/27/23
DRAWN BY:	APB
SHEET TITLE:	COVER SHEET

CS

1 OF 1



LEGEND

EXISTING FIRE HYDRANT	SANITARY MARKOUT
EXISTING SIGN	GAS MARKOUT
EXISTING UTILITY POLE	ELECTRIC MARKOUT
EXISTING SPOT ELEVATION	EXISTING CONCRETE
EXISTING LIGHT POLE	EXISTING CONTOUR
EXISTING WATER METER	
EXISTING WATER VALVE	
EXISTING CLEANOUT	
EXISTING STREET SIGN	
EXISTING INLET	
EXISTING MANHOLE	
EXISTING CURBING	
EXISTING STORM SEWER	
WATER MARKOUT	

UTILITY MARKOUT REQUIRED: CONTRACTOR IS RESPONSIBLE TO CALL NEW JERSEY ONE CALL (800-272-1000) FOR UTILITY MARK-OUT 3 FULL BUSINESS DAYS PRIOR TO COMMENCEMENT OF EXCAVATION.

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED

GLOUCESTER CITY, CAMDEN COUNTY, NEW JERSEY

GLOUCESTER CITY HIGH SCHOOL
INDUSTRIAL ARTS CLASSROOM ALTERATION

BLOCK 222 LOT 6
EXISTING CONDITIONS/DEMOLITION PLAN

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
203 SOUTH MAIN STREET, CAPE MAY COURT HOUSE, NEW JERSEY 08210 — 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1914
418 STOKES ROAD, MEDFORD, NEW JERSEY 08055 — 849 WEST BAY AVENUE, BARNEGAT, NEW JERSEY 08005-2164

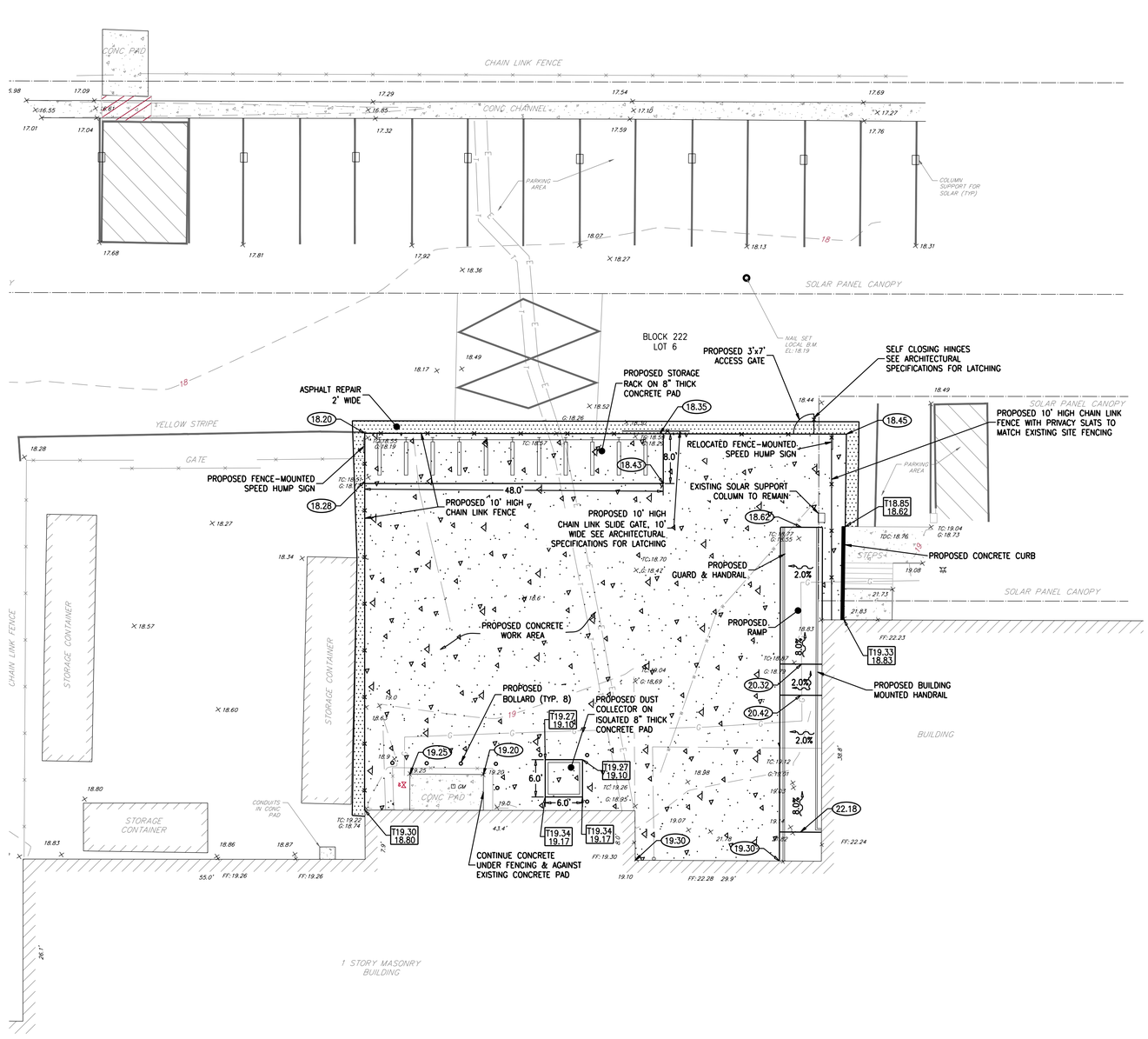
JOHN H. ALLGAIR P.E., P.P. (1983 - 2001)
DAVID J. SAMUEL P.E., P.P. NJ PE LIC NO. 25830 NJ PP LIC NO. 2455
JOHN J. STEFANI P.E., L.S. & P.P. NJ PE LS LIC NO. 24271 NJ PP LIC NO. 2089
JAY B. CORNELL P.E., P.P. NJ PE LIC NO. 32962 NJ PP LIC NO. 3874
MICHAEL J. McCLELLAND P.E., P.P. NJ PE LIC NO. 32468 NJ PP LIC NO. 3770
GREGORY R. VALESI P.E., P.P. NJ PE LIC NO. 34450 NJ PP LIC NO. 4361

JOSEPH GRAY, P.E.
PROFESSIONAL ENGINEER N.J. LIC. GE54013

SCALE	1"=10'
DRAWN BY	CC
DESIGNED BY	CC
CHECKED BY	JG
DATE	02/27/2023
SHEET	1 OF 3

C1

DWG NAME: DEMO
JOB NO: GCHSIA-DEMO
FILE NO: MGZ00502.01



LEGEND

EXISTING FIRE HYDRANT	SANITARY MARKOUT
EXISTING SIGN	GAS MARKOUT
EXISTING UTILITY POLE	ELECTRIC MARKOUT
EXISTING LIGHT POLE	PROPOSED WATER LINE
EXISTING WATER METER	PROPOSED SANITARY LINE
EXISTING WATER VALVE	PROPOSED GAS LINE
EXISTING CLEANOUT	EXISTING CONCRETE
EXISTING STREET SIGN	PROPOSED CONCRETE
EXISTING INLET	
EXISTING MANHOLE	
EXISTING CURBING	
PROPOSED CURBING	
EXISTING STORM SEWER	
WATER MARKOUT	

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10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED

GLOUCESTER CITY, CAMDEN COUNTY, NEW JERSEY

GLOUCESTER CITY HIGH SCHOOL
INDUSTRIAL ARTS CLASSROOM ALTERATION

BLOCK 222 LOT 6
SITE PLAN

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
203 SOUTH MAIN STREET, CAPE MAY COURT HOUSE, NEW JERSEY 08210 — 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1914
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JOSEPH GRAY, P.E.
PROFESSIONAL ENGINEER N.J. LIC. GE54013

SCALE	1"=10'
DESIGNED BY	CC
CHECKED BY	JG
DATE	02/27/2023
SHEET	2 OF 3

C2

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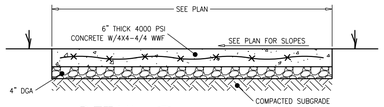
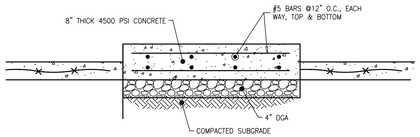
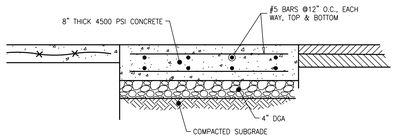
JOB/WORK: GCHSIAA-SITE
FILE No.: MGZ00502.01



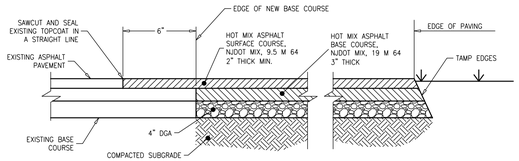
DETAIL 1 6" REINFORCED SLAB
N.T.S.



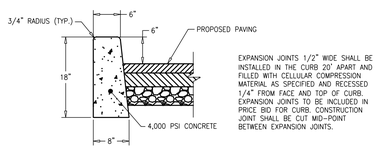
DETAIL 2 DUST COLLECTOR PAD
N.T.S.



DETAIL 3 STORAGE BAY PAD
N.T.S.

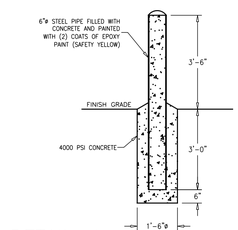


DETAIL 4 TYPICAL ASPHALT PAVEMENT CROSS SECTION AND SEAM
N.T.S.

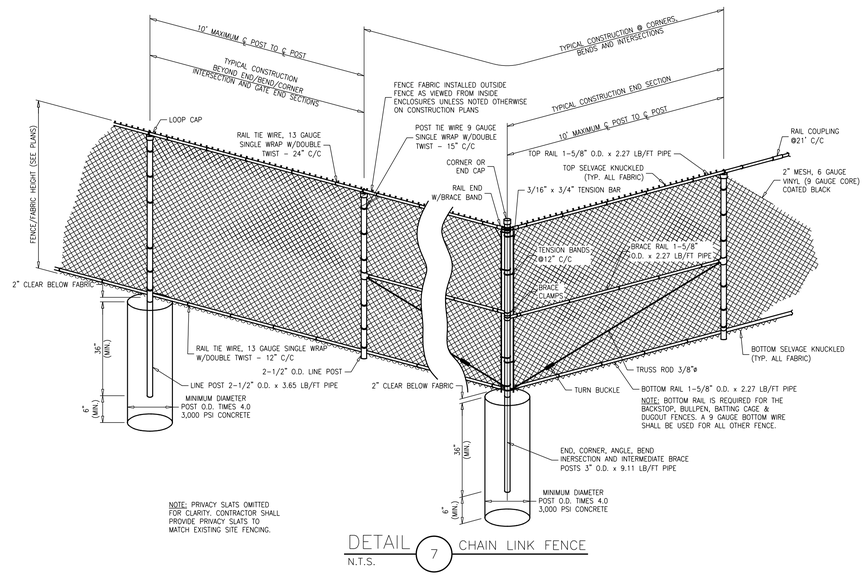


EXPANSION JOINTS 1/2" WIDE SHALL BE INSTALLED IN THE CURB 20' APART AND FILLED WITH CELLULAR COMPRESSION MATERIAL AS SPECIFIED AND RECESSED 1/4" FROM FACE AND TOP OF CURB. EXPANSION JOINTS TO BE INCLUDED IN PRICE BID FOR CURB. CONSTRUCTION JOINT SHALL BE CUT MID-POINT BETWEEN EXPANSION JOINTS.

DETAIL 5 6" x 8" x 18" VERTICAL CONCRETE CURB
N.T.S.

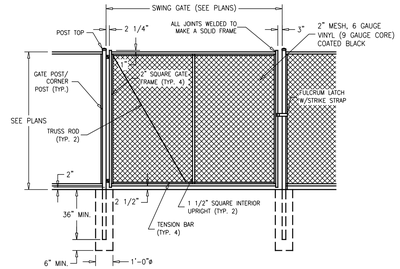


DETAIL 6 STEEL BOLLARD DETAIL
N.T.S.

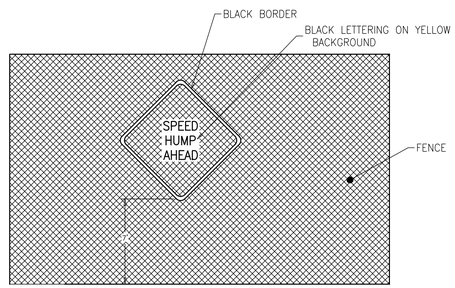


NOTE: PRIVACY SLATS OMITTED FOR CLARITY. CONTRACTOR SHALL PROVIDE PRIVACY SLATS TO MATCH EXISTING SITE FENCING.

DETAIL 7 CHAIN LINK FENCE
N.T.S.



DETAIL 8 SINGLE SWING GATE ELEVATION
N.T.S.



DETAIL 9 SPEED HUMP AHEAD SIGN (W17-1A) MIN. (24"x24")
N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED

GLOUCESTER CITY, CAMDEN COUNTY, NEW JERSEY

GLOUCESTER CITY HIGH SCHOOL
INDUSTRIAL ARTS ALTERATION

BLOCK 222, LOT 6
SECTIONS & DETAILS

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
203 SOUTH MAIN STREET, CAPE MAY COURT HOUSE, NEW JERSEY 08210 — 1660 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1914
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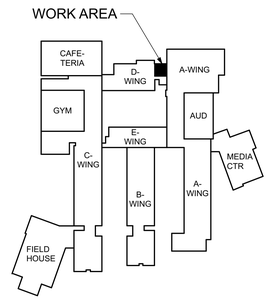
JOSEPH GRAY, P.E.
PROFESSIONAL ENGINEER N.J. LIC. GE54013

SCALE	DRAWN BY
	CC
DESIGNED BY	CHECKED BY
CC	JG
DATE	SHEET
02/27/2023	3 OF 3

C3

FILE NAME: DETAILS
JOB NUMBER: GCHSIAA-DET
FILE NO.: MGZ00201.01

BUILDING KEY PLAN



EXIST'G SOLAR ARRAY ABOVE

CHAIN LINK FENCE TO REMAIN

REMOVE EXIST'G FENCING

REMOVE SIDEWALK & CURB

SAW CUT SIDEWALK AT EXIST'G SEAM

EXIST'G CURB & SIDEWALK TO REMAIN

DN

REMOVE EXIST'G SOD ASPHALT & CURBING. REFER TO CIVIL DWGS FOR WORK IN THIS AREA.

EXIST'G PAVED AREA

CERAMICS D-XX

REMOVE HANDRAILS, STAIRS, LANDINGS CURB & SIDEWALK

FENCING, GAS TRAIN & CONC PAD TO REMAIN

REMOVE CONC PAD

EXIST'G GAS METER

LOADING DOCK

DN

PATCH BRICK TO MATCH EXIST'G TO A MIN OF 4" BELOW PROP ASPHALT. COORD W/ SHT A-001.

DN

REMOVE WALL MOUNTED SHELVING

REMOVE WALL, & PREP FOR PROP OH DOOR

REMOVE DOOR & FRAME

REMOVE ALL WALL PADS & SUPPORTS PATCH WALLS

REMOVE PULL-UP BARS & RETURN TO OWNER

BOILER ROOM

STORAGE D-13A

WRESTLING ROOM D-11

CORRIDOR

REMOVE EXIST'G CMU PTN & PATCH FLOOR & WALLS TO MATCH EXIST'G

REMOVE SOFFIT & APC SYSTEM

REMOVE EXIST'G SKYLT & PATCH METAL DECK & ROOF TO MATCH EXIST'G

APPROX LOCATION OF ROOF STRUCTURE (TYP)

SEE MECH DWGS FOR REMOVAL OF EXIST'G MECH UNIT & OTHER ROOF TOP EQUIP'T

EXIST'G PHONE TO REMAIN

REMOVE WALL MOUNTED DATA RACK & RETURN TO OWNER

REMOVE DOOR & FRAME

ROOMS D-11 & D-13.A;
CLEAN EXIST'G METAL DECK ROOF STRUCTURE, FIRE SUPPRESSION LINES & ANY REMAIN'G PIPING & CONDUIT IN THE CEILING THAT WILL BE EXPOSED TO VIEW IN PROPOSED SPACE PRIOR TO THE INSTALLATION OF PROPOSED CONDUIT & DUCTWORK, & THE PAINT'G OF THE WALLS OR INSTALLATION OF THE PROPOSED FLRG.
REMOVE ALL EXIST'G ANCHORS & HANGERS FROM FLOORS, WALLS BAR JOIST & DECKING.
PATCH ALL HOLES TO MATCH EXIST'G.
PREP FOR PROP FINISHES.

CORRIDOR

BLD'G NORTH

REGAN YOUNG, AIA
21AI00912100

REGAN YOUNG ENGLAND BUTERA
REFERENDUMS • ENGINEERING • ARCHITECTURE • DESIGN
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NJDOE SP #1770-050-XX-XXXX

PROJECT TITLE:

INDUSTRIAL ARTS ALTERATION

ADDRESS:

GLOUCESTER CITY HIGH SCHOOL
BLOCK 222 / LOT 6
1300 MARKET STREET
GLOUCESTER CITY, NJ 08030

PROJECT NO.:	**5672G**

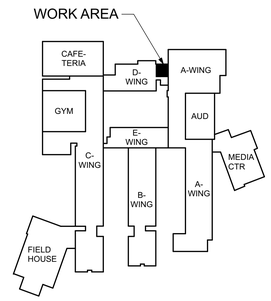
SUBMISSION DATE:	
REVISION DATE:	

DRAWING DATE:	**24 FEB 23**
PRINT DATE:	**2/27/23**
DRAWN BY:	**APB**
SHEET TITLE:	**DEMOLITION PLAN**

AD-100

1 OF 5

BUILDING KEY PLAN



EXIST'G SOLAR ARRAY ABOVE

10' X 10' CHAIN LINK MANUAL SINGLE HORIZ SLIDE VEHICLE GATE. FRAME SHALL BE WELDED.

3' X 7' ACCESS GATE. SEE DTL 05/A-002.

10' H CHIAN LINK FENCE

LATCH SHALL PERMIT OPERATION FROM BOTH SIDES OF GATE W/ PROVISION FOR PADLOCKING ACCESSIBLE FROM BOTH SIDES OF GATE

10' H CHIAN LINK FENCE

CHAIN LINK FENCE TO REMAIN

01 A-201

EXIST'G SOLAR SUPPORT COLUMN. STAY CLEAR OF EXIST'G FOOTINGS.

4'-0" MIN BETWEEN HANDRAILS

1'

PROP CONC CURB MATCH TOP ELEV OF EXIST'G SIDEWALK

02 A-201

EXIST'G CURB & SIDEWALK TO REMAIN

DN

REFER TO CIVIL DWGS FOR WORK IN THIS AREA

22'

SLOPE DN 1:12

EXIST'G PAVED AREA

OUTDOOR WORK AREA

GUARD & HANDRAIL

GUARD & HANDRAIL

5'

03 A-201

RESET EXIST'G EXHAUST TO BE TIGHT TO BRICK. SEE MECH DWGS.

CERAMICS D-XX

(5) BALLARDS

EXIST'G CONC PAD

EXIST'G GAS METER

5'-0" MIN

10'-0" MO

1'

EXTERIOR MOUNTED OVERHEAD DOOR ABOVE

LOADING DOCK

TOOTH-IN BRICK & CMU JAMBS (TYP)

OVERHEAD DOOR MOTOR LOCATION

BUMPER PAD (TYP)

EXIST'G DOWNSPOUT

04 A-201

5'-0" MIN

1'-8" MIN

(2) W8 X 18 + 3/4 DIA THRU BOLT @ 16" O/C. 8" MIN BR'G EA END. FILL 1ST (2) COURSES BELOW BR'G SOLID W/ MORTAR.

OVERHEAD DOOR CONTROL LOCATION

01 A-200

INFILL OPN'G W/ BRICK & CMU TO MATCH EXIST'G

MODIFY ROOF & STRUCTURE FOR PROP RTU. SEE DTL 02/A-200 & MECH DWGS FOR RTU STRUCT. & UNIT LOCATION & SIZE

BOILER ROOM

INDUSTRIAL ARTS D-11

REFER TO SHT ES-100 FOR ALL FURNITURE & EQUIP'T TO BE PROVIDE UNDER THIS CONTRACT. CONTR SHALL MAKE ALL FINAL DUST COLLECTOR & ELECTRICAL CONNECTIONS TO FURNITURE & EQUIP'T.

CORRIDOR

PAINT ALL SIDES OF EXIST'G DOOR FRAME

EXIST'G PHONE TO REMAIN

05 1 sq ft

04

13

INFILL OPN'G W/ CMU TO MATCH EXIST'G

CORRIDOR

BLD'G NORTH

PROPOSED PLAN

SCALE: 1/4" = 1'-0"

01

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NJDOE SP #1770-050-XX-XXXX

PROJECT TITLE:
INDUSTRIAL ARTS ALTERATION

ADDRESS:
GLOUCESTER CITY HIGH SCHOOL
BLOCK 222 / LOT 6
1300 MARKET STREET
GLOUCESTER CITY, NJ 08030

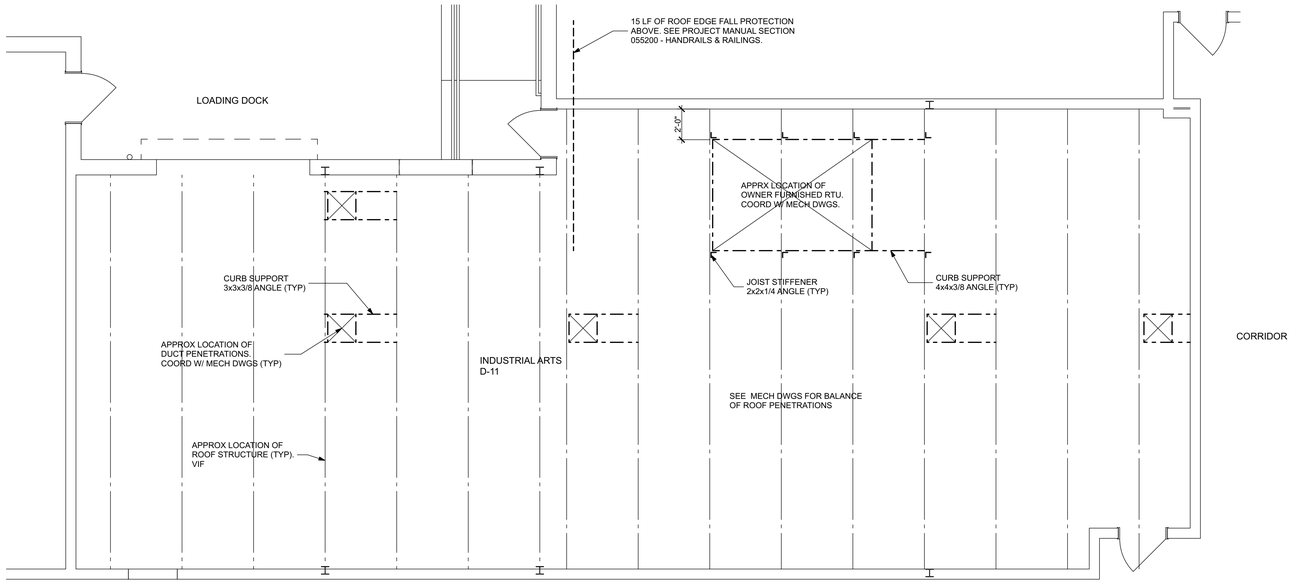
PROJECT NO.:	**5672G**

SUBMISSION DATE:	
REVISION DATE:	

DRAWING DATE:	**24 FEB 23**
PRINT DATE:	**2/27/23**
DRAWN BY:	**APB**
SHEET TITLE:	**PROPOSED PLAN**

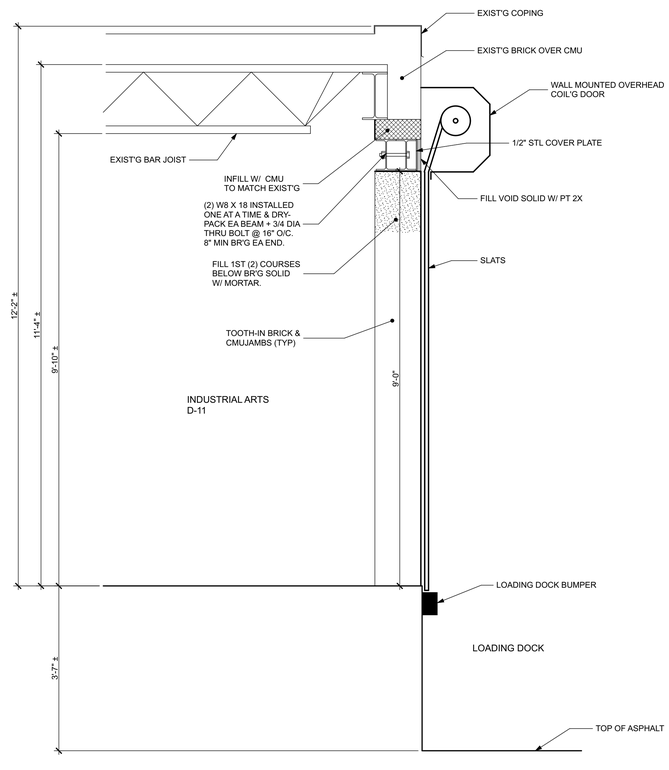
A-100

2 OF 5



ROOF CURB STRUCTURE

SCALE: 1/4" = 1'-0" | 02 | A-100



OVERHEAD DOOR SECTION

SCALE: 3/4" = 1'-0" | 01 | A-100

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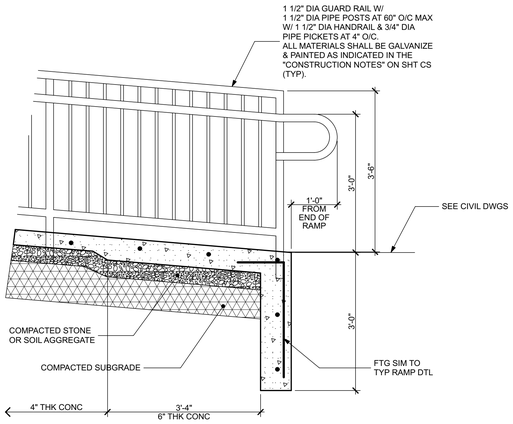
SHEET TITLE:	DETAILS

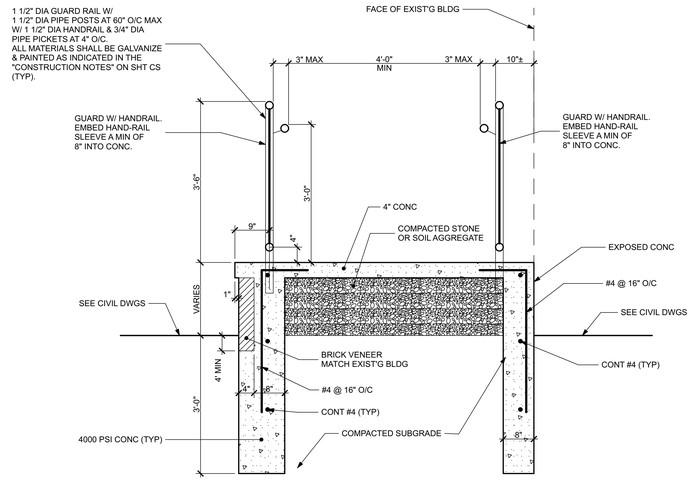
A-200

3 OF 5



BOTTOM LANDING SECTION

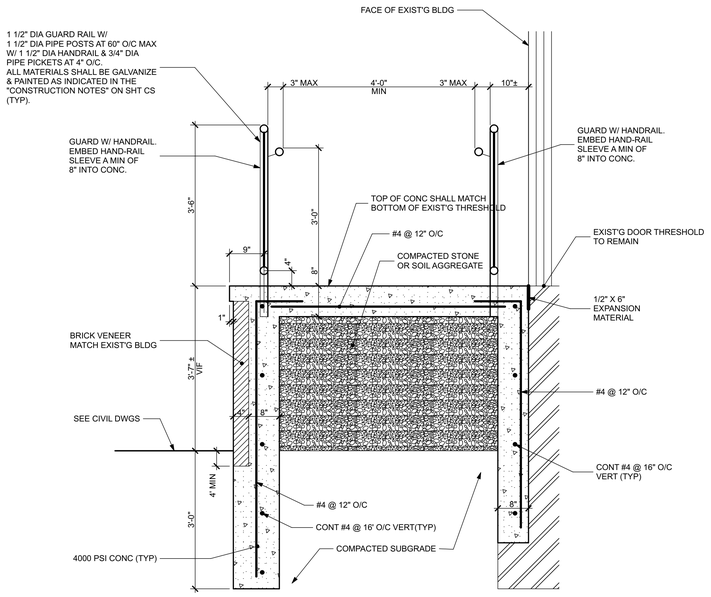
SCALE: 3/4" = 1'-0" | 01 | A-100



LOWER RAMP SECTION

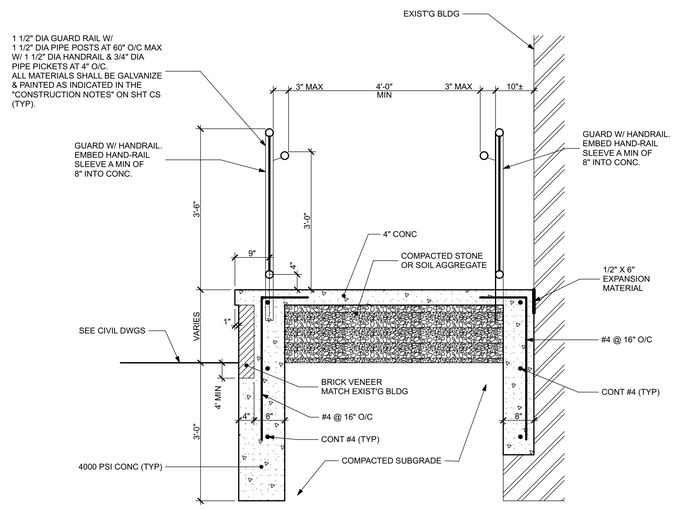
SCALE: 3/4" = 1'-0" | 02 | A-100

GENERAL NOTES
1. RAMP SHALL NOT EXCEED A 1:12 SLOPE.
2. CROSS SLOPES OF RAMPS & LANDINGS SHALL NOT EXCEED A 1:14 SLOPE.
3. CONC SHALL HAVE A MIN COMPRESSIVE STRENGTH OF 4,000 PSI IN 28 DAYS MIN.
4. CONC WALKING SURFACES SHALL HAVE A HAND BROOMED FINAL FINISH PERPENDICULAR TO THE PATH OF TRAVEL.



TOP LANDING SECTION

SCALE: 3/4" = 1'-0" | 04 | A-100



MID RAMP/LANDING SECTION

SCALE: 3/4" = 1'-0" | 03 | A-100

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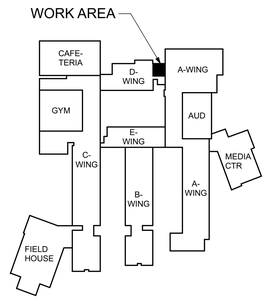
A-201

BUILDING KEY PLAN



1'-11 3/4"
40'-6" ±
6'-0" ±
CHAIN LINK FENCE TO REMAIN
27
EXIST'G SOLAR ARRAY ABOVE
4'-0" MIN BETWEEN HANDRAILS
1'
EXIST'G CURB & SIDEWALK TO REMAIN
DN
22"
SLOPE DN 1:12
EXIST'G PAVED AREA
OUTDOOR WORK AREA
CERAMICS
D-XX
EXIST'G GAS METER
26
DUCT ON ROOF. REFER TO MECH DWGS FOR ADD'L INFO
5'-0" MIN
10'-0" MO
1'
LOADING DOCK
6'-0" MIN
21
02
11 sq ft
10B
09
10A
09
10B
33 sq ft
12
6 sq ft
06
5 sq ft
07/14
5 sq ft
28
01
5 sq ft
21
38 sq ft
18
20 sq ft
20
3 sq ft
24
17 sq ft
23
17 sq ft
17
18 sq ft
BOILER ROOM
INDUSTRIAL ARTS
D-11
CORRIDOR
25
NJIBC EGRESS REQM'TS
ROOM AREA: 2,027 SF
LOAD FACTOR: 50 SF
OCCUPANTS: 41
22
13 sq ft
10B
8 sq ft
03
100 sq ft
05
1 sq ft
4 sq ft
04
13
9 sq ft
15
8 sq ft
16/14
6 sq ft
08
5 sq ft
19
4 sq ft
11
4 sq ft
EXIST'G PHONE TO REMAIN
CORRIDOR

FURNITURE & EQUIPMENT LIST

THE CONTR SHALL PROVIDE ITEMS INDICATED BELOW UNLESS NOTED OTHERWISE.

01- AIR COMPRESSOR
02 - BAND SAW
03 - CNC ROUTER
04 - ACCESSIBLE HAND SINK
05 - EYEWASH STATION
06 - FLAMMABLES SAFETY CABINET
07 - BENCH GRINDER W/28" HEAVY DUTY WORKBENCH
08 - PLANER/JOINTER
09 - MITER SAW STATION
10A - 96" HEAVY DUTY WORKBENCH
10B - 48" HEAVY DUTY WORKBENCH
11 - OSCILLATING SPINDLE SANDER
12 - ROLLING TOOL CABINET
13 - SINK
14 - 28" HEAVEY DUTY WORKBENCH
15 - STORAGE CABINET
16 - POTABLE PLANER W/28" HEAVY DUTY WORKBENCH
17 - TABLE SAW
18 - TEACHER'S DESK & CHAIR - (OWNER PROVIDED)
19 - BELT/DISK SANDER
20 - LOCKERS
21 - HORIZONTAL STEEL STORAGE RACK
22 - CABINETMAKER'S WORKBENCH
23 - LASER CUTTER
24 - 60" HEAVY DUTY WORKBENCH W/ROUND STOOLS
25 - MARKER BOARD
26 - DUST COLLECTOR
27 - CANTILEVERED STORAGE RACKS
28 - 2-A:20-B:C WALL MOUNTED FIRE EXTINGUISHER (OWNER PROVIDED)
29 - ROOFTOP UNIT (OWNER FURNISHED, CONTR INSTALLED. SEE RTU ROOF FRAMING DTL 02/A-200 & MECH DWGS).

1 INSTRUCTOR: 20 SF
20 STUDENTS AT 20 SF EA: 400 SF
FURNITURE & EQUIPMENT: + 547 SF
TOTAL REQ'D SF: = **967** SF

PROP ROOM AREA: 2,027 SF

BLD'G NORTH

ED SPEC & EGRESS PLAN SCALE: 1/4" = 1'-0" **01**

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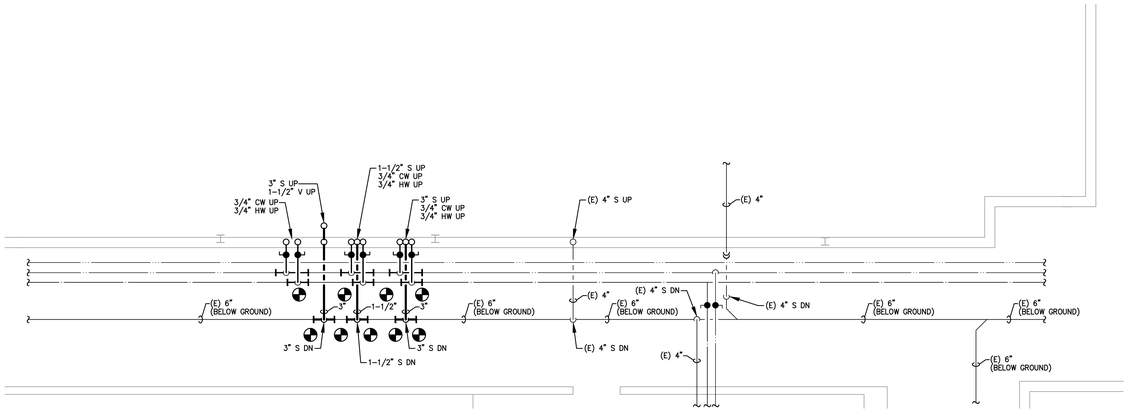
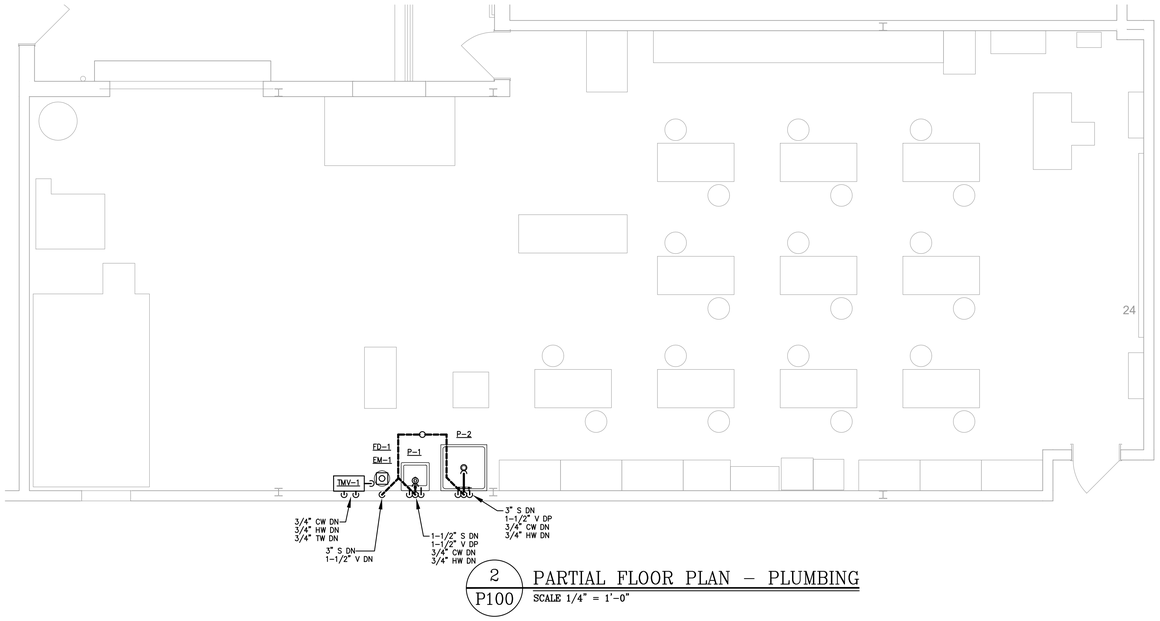
ES-100

5 OF 5



1 / P100 PARTIAL CRAWL SPACE PLAN – PLUMBING

SCALE 1/4" = 1'-0"



2 / P100 PARTIAL FLOOR PLAN – PLUMBING

SCALE 1/4" = 1'-0"

PLUMBING SYMBOL LIST

ABBREVIATION	SYMBOL	DESCRIPTION	ABBREVIATION	SYMBOL	DESCRIPTION
CW		COLD WATER PIPING	BV		BALL VALVE
HW		HOT WATER PIPING	CV		CHECK VALVE
TW	T	TEMPERED WATER PIPING			STRAINER
(E) CW		(E) COLD WATER PIPING			BRANCH – TOP CONNECTION
(E) HW		(E) HOT WATER PIPING			BRANCH – BOTTOM CONNECTION
(E) HWR		(E) HOT WATER RETURN PIPING	PG		PRESSURE GAUGE WITH GAUGE COCK
SAN		SOIL, WASTE, OR SANITARY SEWER			THERMOMETER
SAN		UNDERGROUND/BELOW SLAB SOIL, WASTE, OR SANITARY SEWER			NEW CONNECTION TO EXISTING
(E) SAN		(E) SOIL, WASTE OR SANITARY SEWER	CO		CLEANOUT
V		VENT	T&P		TEMPERATURE & PRESSURE RELIEF VALVE
(E) V		(E) VENT			TRAP
(E) G	(E) G	(E) NATURAL GAS	CODP	CODP	CLEAN OUT DECK PLATE
G	G	NATURAL GAS	PV		GAS PLUG VALVE
		REDUCER			GAS PRESSURE REGULATOR
		CAPPED OUTLET	FD		FLOOR DRAIN
		VALVED & CAPPED OUTLET			
		BREAK OR CONTINUATION			
		PIPING DROP			
		PIPING RISE			

PLUMBING FLOOR DRAIN SCHEDULE

MARK	DESCRIPTION	MANUFACTURER MODEL	LOCATION	REMARKS
FD-1	GENERAL DRAIN	ZURN INDUSTRIES, INC. ZN-415-Y	TOILET ROOMS	C.I. BODY, SEDIMENT BUCKET, –" OUTLET SIZE, 6" SQUARE TYPE S POLISHED NICKEL BRONZE STRAINER, PROVIDE TG ELASTOMETRIC WATERLESS TRAP GUARD SYSTEM (SEE PLUMBING SPECIALTIES SCHEDULE)

PLUMBING SPECIALTIES SCHEDULE

MARK	DESCRIPTION	MANUFACTURER MODEL	REMARKS
TG	WATERLESS TRAP GUARD	PROVENT TRAP GUARD	ELASTOMERIC, NORMALLY CLOSED TRAP GUARD DEVICE WHICH OPENS WHEN IN CONTACT WITH LIQUID, COMPLIES WITH WITH ANSI/ASME A112.6.3
TV	POINT-OF-USE TEMPERING VALVE	LEONARD VALVE MODEL 270-LF	CERTIFIED LEAD-FREE POU TEMPERING VALVE; INSTALL UNDER SINK P-1, SET OUTLET TEMPERATURE TO 105(F)

PLUMBING ABBREVIATIONS

CW	COLD WATER	GPM	GALLONS PER MINUTE
DN	DOWN	HW	HOT WATER SUPPLY
DP.	DROP	HWR	HOT WATER RETURN
DWG	DRAWING	S	SANITARY
(E)	EXISTING	SAN.	SANITARY
(F)	FAHRENHEIT	TW	TEMPERED WATER
FD	FLOOR DRAIN	V	VENT
G	NATURAL GAS	°	DEGREES

PLUMBING EQUIPMENT SCHEDULE

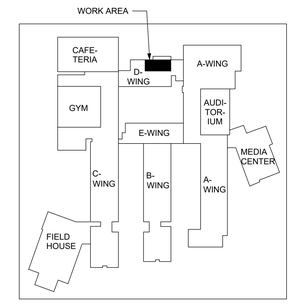
MARK	GENERAL				DESIGN DATA		ELECTRICAL						GAS CFH	REMARKS
	DESCRIPTION	MANUFACTURER	MODEL NUMBER	LOCATION	CAPACITY	PUMP HEAD	HP	RPM	VOLTS	PH	HZ			
TMV-1	THERMOSTATIC MIXING VALVE	BRADLEY	S19-2000	SEE PLANS	1.5 GPM MINIMUM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	THERMOSTATIC MIXING VALVE IN SURFACE MOUNTED CABINET ABOVE CEILING, SET DISCHARGE TEMPERATURE TO 85°(F)

PLUMBING FIXTURE & CONNECTION SCHEDULE

MARK	FIXTURE	MOUNTING	MANUFACTURER	MODEL NO.	TRIM NO.	SUPPORT NO.	TRAP	WASTE	VENT MIN.	CW	HW	TW	POWER	REMARKS
P-1	LAVATORY (HANDICAPPED)	WALL HUNG	SANI-LAV	ES2-605L	PROVIDED WITH UNIT	N/A	1-1/2" X 1-1/2"	1-1/2"	1-1/2"	3/4"	3/4"	N/A	A/C	18 GAUGE STAINLESS STEEL SINK WITH INTEGRAL SENSOR OPERATED FAUCET; PROVIDE DRAIN, BASKET STRAINER, CHROME PLATED TAILPIECE & P-TRAP, ANGLE STOPS AND SUPPLIES
P-2	STAINLESS STEEL UTILITY SINK	FLOOR MOUNTED	ADVANCE TABCO	4-1-36	KOHLER BOWE K-8377160-4A	N/A	3" X 3"	3"	1-1/2"	3/4"	3/4"	N/A	N/A	16 GAUGE STAINLESS STEEL SINK WITH INTEGRAL BACK SPLASH, DRIAN BODY AND BASKET STRAINER; PROVIDE CHROME PLATED TAILPIECE & P-TRAP
EM-1	EMERGENCY EYE WASH	PEDESTAL MOUNTED	BRADLEY	HALO S19214DC	SEE TMV-1 ON PLUMBING EQUIPMENT SCHEDULE	N/A	INDIRECT TO FD-1	N/A	N/A	3/4"	3/4"	3/4"	N/A	ADA-COMPLIANT EYEWASH WITH IMPACT RESISTANT PLASTIC BOWL, 1/2" STAY-OPEN EYE WASH VALVE, INTEGRAL 3.1 GPM FLOW CONTROL, AND DUST COVER

NOTE:

1. PLUMBING FIXTURES AND TRIM ARE BASIS OF DESIGN; PRODUCTS OF EQUAL QUALITY & PERFORMANCE AND APPROVED BY THE ARCHITECT SHALL BE PERMITTED.
2. PLUMBING CONTRACTOR SHALL COORDINATE SPECIFIED COUNTER SINKS WITH MILLWORK CONSTRUCTION DRAWINGS PRIOR TO PURCHASE OF ANY PLUMBING FIXTURES, AND SUBMIT MILLWORK DRAWINGS WITH FIXTURE SHOP DRAWINGS FOR REVIEW AND APPROVAL.
3. MOUNTING HEIGHTS FOR ALL FIXTURES SHALL BE AS INDICATED AND DIRECTED BY ARCHITECT.
4. ALL EXPOSED SANITARY PIPING, TRAP ASSEMBLIES AND WATER SUPPLIES SHALL BE INSULATED.



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Frank Tindall, P.E.
Professional Engineer
NJ 38656

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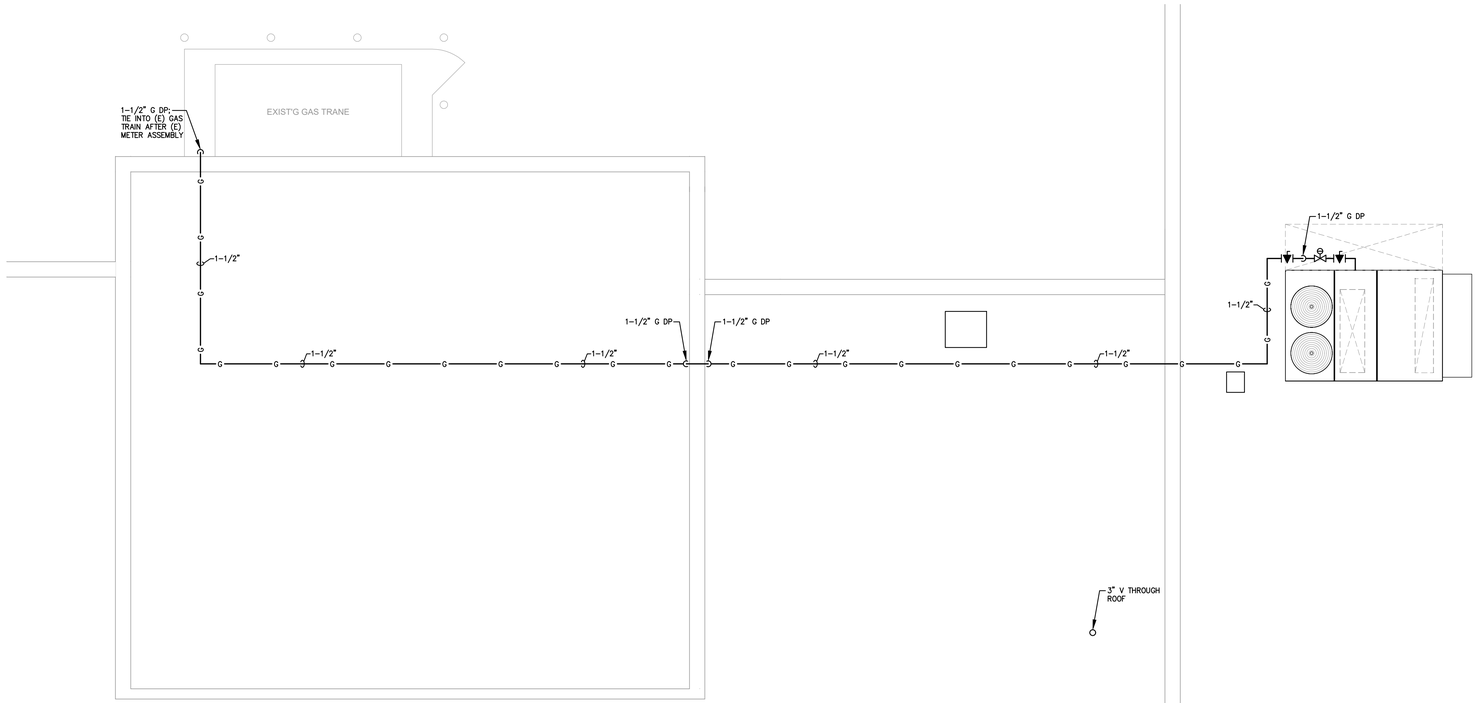
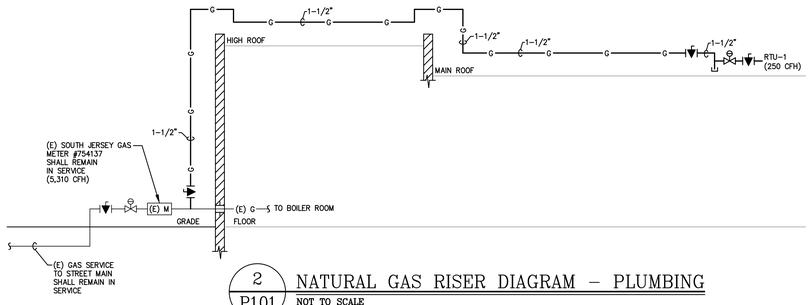
PRINT DATE:	20 DECEMBER 2023
DRAWN BY:	ACL
SHEET TITLE:	PARTIAL FLOOR PLANS, SYMBOLS LIST & SCHEDULES - PLUMBING

P-100

1 OF 4



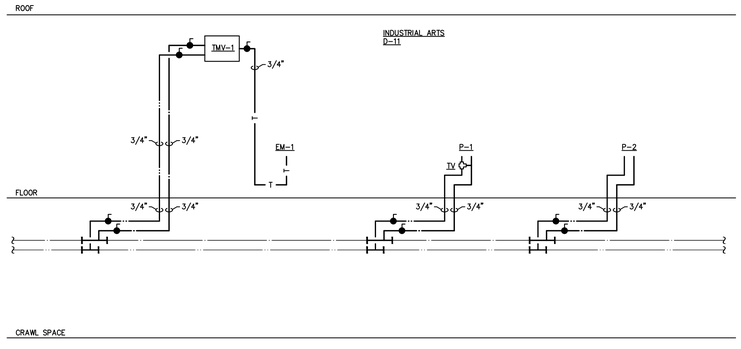
1 P101 PARTIAL ROOF PLAN – PLUMBING
SCALE 1/4" = 1'-0"



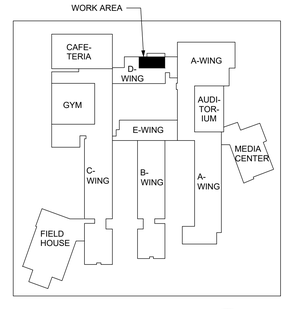
2 P101 NATURAL GAS RISER DIAGRAM – PLUMBING
NOT TO SCALE

NOTES:

1. TOTAL DEVELOPED LENGTH OF GAS PIPE = 150'-0"
2. TOTAL GAS LOAD = 250 MBH
3. ALL GAS PIPE AND FITTINGS SHALL BE PAINTED WITH TWO (2) COATS OF MARINE GRADE, SELF-PRIMING SILOXANE EPOXY PAINT. PAINT COLOURS SHALL BE OSHA SAFETY YELLOW (FS 13591) WITH OSHA SAFETY BLACK (FS 17038) LETTERING. PIPE SHALL BE MARKED "NAT. GAS" AT 10'-0" INTERVALS.
4. ALL GAS PRVS SHALL BE EQUIMETER LOCK-UP TYPE APPROVED BY GAS UTILITY. PRVS SHALL BE INSTALLED SUCH THAT THE VENT OPENINGS ARE ORIENTED DOWNWARD, AND PROVIDED WITH INSECT SCREENS.
5. ALL GAS PIPE SIZING SHALL BE PER NATIONAL FUEL GAS CODE (2021) TABLE 402.4 (1), AS AMENDED BY NJUCC.



3 P101 DOMESTIC WATER RISER DIAGRAM – PLUMBING
NOT TO SCALE



BLD'G NORTH

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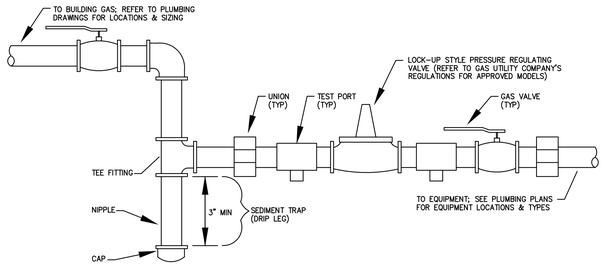
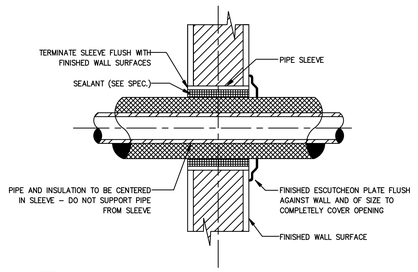
SHEET TITLE:	PARTIAL ROOF PLAN AND RISER DIAGRAMS - PLUMBING

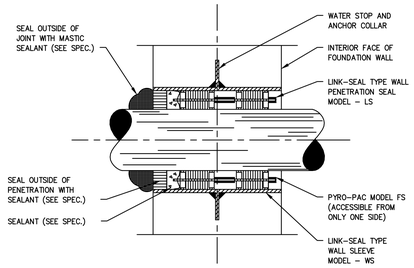
P-101



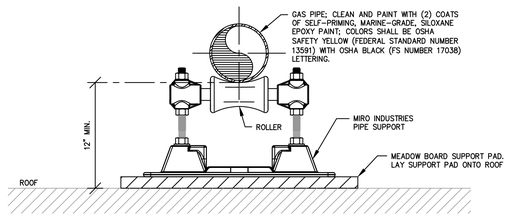
1 P200 TYPICAL GAS EQUIPMENT CONNECTION
NOT TO SCALE



2 P200 PIPE SLEEVE THRU INTERIOR WALL
NOT TO SCALE



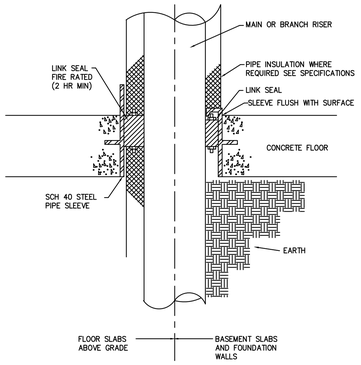
3 P200 PIPE SLEEVE THROUGH EXTERIOR FOUNDATION WALL
NOT TO SCALE



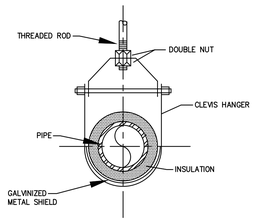
4 P200 ROOF-TOP GAS PIPE SUPPORT DETAIL
NOT TO SCALE

NOTES:

1. EVEN LOADING REQUIRED – LOAD SHALL NOT EXCEED 186 LBS.
2. MAXIMUM SPACING SHALL NOT EXCEED:
   10'-0" FOR PIPES 1" AND LARGER
   5'-0" FOR PIPES SMALLER THAN 1"



5 P200 PIPE SLEEVE THRU FLOOR SLAB
NOT TO SCALE

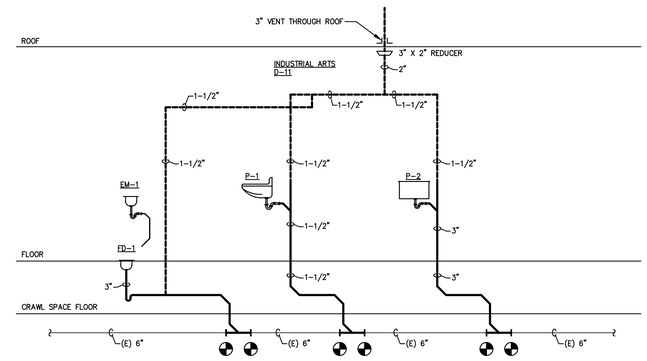


6 P200 CLEVIS HANGER DETAIL
NOT TO SCALE

PIPE HANGER SCHEDULE

PIPE DIA.	SHIELD LENGTH	SHIELD THICKNESS	ROD DIA.	MAX. PIPE SUPPORT SPAN STEEL	COPPER	CAST IRON
1/2"	12"	.048"	3/8"	8'-0"	6'-0"	–
3/4"	12"	.048"	3/8"	8'-0"	6'-0"	–
1"	12"	.048"	3/8"	8'-0"	6'-0"	–
1-1/4"	12"	.048"	3/8"	8'-0"	6'-0"	–
1-1/2"	12"	.048"	1/2"	10'-0"	8'-0"	5'-0"
2"	12"	.048"	1/2"	10'-0"	8'-0"	5'-0"
2-1/2"	12"	.048"	1/2"	10'-0"	8'-0"	–
3"	12"	.048"	1/2"	12'-0"	10'-0"	5'-0"
4"	12"	.060"	5/8"	12'-0"	10'-0"	5'-0"

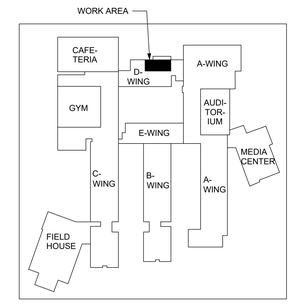
* SHIELD NOT REQUIRED ON INSULATED PIPE



7 P200 SANITARY AND VENT RISER DIAGRAM – PLUMBING
NOT TO SCALE

NOTES:

1. SYSTEM SIZED PER NSPC 2021 TABLE 11.4.1.
2. ALL PIPE SIZES 2" OR SMALLER SHALL BE PITCHED AT 1/4" PER 1'-0".
3. ALL PIPE SIZES 2-1/2" AND LARGER SHALL BE PITCHED AT 1/8" PER 1'-0".



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PROJECT TITLE:
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SUBMISSION DATE:	
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SHEET TITLE:	SANITARY RISER DIAGRAM AND DETAILS - PLUMBING

P-200

PLUMBING SPECIFICATIONS:

1. SCOPE OF WORK

A. DOMESTIC WATER PIPING.
B. SANITARY AND VENT PIPING.
C. NATURAL GAS PIPING.
D. INSULATION.
E. HANGERS AND SUPPORTS.
F. VALVES.
G. CUTTING AND ROUGH PATCHING.
H. REMOVALS.
I. EQUIPMENT
J. SUBMITTALS
K. PERMITS
L. WARRANTY
M. SUPERVISION
N. RIGGING
O. EXCAVATION AND BACKFILL

2. STANDARDS AND CODES

A. NEW JERSEY UNIFORM CONSTRUCTION CODE
B. INTERNATIONAL BUILDING CODE 2021, NEW JERSEY EDITION
C. NATIONAL STANDARD PLUMBING CODE 2021
D. INTERNATIONAL FUEL GAS CODE 2021
E. LOCAL MUNICIPAL UTILITY AUTHORITY
F. LOCAL WATER COMPANY RULES AND REGULATIONS
G. OTHER STATE AND LOCAL AUTHORITIES HAVING JURISDICTION

3. MATERIALS:

A. PIPE AND FITTINGS

1. PIPE

SERVICE	MATERIAL	SCHEDULE	DESIGNATION
SOIL, WASTE & VENT ABOVE GROUND	NO-HUB CAST IRON	STANDARD WEIGHT	CISPI-30-78
SOIL, WASTE & VENT BELOW GROUND	CAST IRON HUB & SPIGOT	STANDARD WEIGHT	ASTM A-74
COLD & HOT WATER ABOVE GROUND	COPPER	TYPE "L"	ASTM B-88
NATURAL GAS LOW & MEDIUM PRESSURE	BLACK STEEL	40	ASTM A-53

2. FITTINGS

SERVICE	SIZE	MATERIAL	WEIGHT	TYPE
SOIL, WASTE & VENT ABOVE GROUND	ALL	CAST IRON	STANDARD WEIGHT	NO-HUB ASTM A-48 MG COUPLING ASSEMBLY OR STAINLESS STEEL EQUAL TO CLAMP-ALL
SOIL, WASTE & VENT BELOW GROUND	ALL	CAST IRON	STANDARD WEIGHT	ASTM C-565 65T COMPRESSION GASKET
COLD AND HOT WATER ABOVE GROUND	ALL	WROUGHT COPPER	STANDARD	SOLDERED 95/5 TIN & ANTIMONY
NATURAL GAS ABOVE GROUND LOW PRESSURE	LESS THAN 2-1/2" 3" & LARGER 3" & LARGER	BLACK STEEL BLACK STEEL BLACK STEEL	SCHED. 40 SCHED. 40 SCHED. 40	THREADED WELDED WELDED

3. DISSIMILAR METALS: PIPE, FITTINGS, HANGERS, ETC. DISSIMILAR METALS SHALL BE INSULATED AGAINST DIRECT CONTACT WITH EACH OTHER, BY USING A HIGH QUALIT OR GRADE OF DIELECTRIC MATERIAL.

B. VALVES

1. BALL VALVES SHALL BE APOLLO, 77-200 SERIES OR APPROVED EQUAL, FULL PORT, SOLDER END WITH TFE TEFLON SEATS AND SEALS WITH STEEL LEVER HANDLES WITH STOPS.

2. LUBRICATED PLUG VALVES SHALL BE NORDSTROM FIGURE 142 OR APPROVED EQUAL; TWO BOLT COVER TYPE VALVE, WITH BUNA-N SEALS, OPERATING LEVER, AND STOPS.

C. INSULATION

1. INSULATE ALL DOMESTIC WATER PIPING, FITTINGS AND VALVES.

2. PIPE INSULATION

a. 0.4 LB DENSITY FIBROUS GLASS, ONE-PIECE MOLDED SECTIONAL PIPE COVERING, MAXIMUM K FACTOR 0.26 AT 75'F MEAN TEMPERATURE. OWENS-CORNING CORP. OR APPROVED EQUAL.

b. REPLACE NORMAL INSULATION INSIDE HANGER SHIELDS WITH INCOMPRESSIBLE INSULATING BLOCK INSIDE JACKET, OR USE LONGER SHIELDS AT HANGER.

c. JACKETS: FIRE RETARDANT ALL SERVICE OR PURPOSE TYPE. LAMINATE OF VINYL COATED WHITE KRAFT FACING, GLASS REINFORCING AND ALUMINUM FOIL.

d. ADHESIVES AND COATINGS: FOSTER OR APPROVED EQUAL AS FOLLOWS:

1. ADHESIVES: LAPS, 85-75; SELF SEALING LAPS MAY BE USED.

2. FITTING, VALVE AND EQUIPMENT COATINGS: COLD WATER, 30-35; HOT WATER, 30-36.

e. FASTENING DEVICES

1. WIRE: MINIMUM 16 GAUGE COPPER CLAD ANNEALED STEEL.

2. TAPE: PRESSURE SENSITIVE.

f. INSULATION AND JACKETS

1. HOT & COLD WATER: 1" THICK WITH VAPOR BARRIER JACKET.

g. FLAME & SMOKE SPREAD

1. FLAME SPREAD INDEX OF 20 OR LESS

2. SMOKE DEVELOPED INDEX OF 50 OR LESS

4. HANGERS AND SUPPORTS

A. HANGERS AND SUPPORTS

1. SHALL CONFORM TO NATIONAL STANDARD PLUMBING CODE 2021, WITH SEISMIC RESTRAINTS AS REQUIRED FOR NEW CONSTRUCTION UNDER 2021 IBC.

2. NATURAL GAS PIPING SYSTEM SHALL CONFORM TO THE INTERNATIONAL FUEL GAS CODE 2021. REFER TO TABLE 415.1

3. PIPE HANGERS SHALL BE SPACED NOT GREATER THAN 10'-0" O.C. WITH 1/2" MINIMUM ROD SIZE.

4. ALL PIPE HANGERS, SUPPORTS, & HARDWARE SHALL BE GALVANIZED.

5. PIPE SUPPORTS SHALL BE OF THE FOLLOWING TYPE AND FIGURE NUMBER, MANUFACTURED BY C&P, F&M, GRINNELL, MIRO INDUSTRIES OR APPROVED EQUAL:

a. BEAM CLAMP:

1. C&P - FIGURE 268

2. F&M - FIGURE 282

b. CLEVIS HANGER:

1. C&P - FIGURE 100

2. F&M - FIGURE 239

3. GRINNELL - FIGURE 260

c. RIGID TRAPEZE:

1. C&P - FIGURE 371

2. GRINNELL - STD. 45

d. U-BOLT:

1. C&P - FIGURE 283

2. F&M - FIGURE 176

3. GRINNELL - FIGURE 137

e. RISER CLAMP:

1. C&P - FIGURE 89 OR 126

2. F&M - FIGURE 241

3. GRINNELL - FIGURE 261

f. DOUBLE-BOLT PIPE CLAMP:

1. C&P - FIGURE 304

2. F&M - FIGURE 261

3. GRINNELL - FIGURE 295

g. WELDING BEAM ATTACHMENT:

1. C&P - FIGURE 113B

2. F&M - FIGURE 751

3. GRINNELL - FIGURE 66

h. ROOFTOP ROLLER SUPPORTS

1. MIRO - 3-RAH-7
3" AND LESS
W/ MEADOW BOARDS SUPPORT PAD

2. MIRO - 6-RAH-7
FROM 3" TO 6"
W/ MEADOW BOARDS SUPPORT PAD

3. MIRO - 8-RAH-18
LESS THAN 8"
W/ MEADOW BOARDS SUPPORT PAD

B. PIPE INSERTS

1. INSERTS SHALL BE PRESET CONCRETE INSERTS WITH STEEL REINFORCED RODS THROUGH THE INSERT AND BOTH ENDS HOOKED OVER THE REINFORCED MESH. INSERTS SHALL BE OF INDIVIDUAL TYPE OF MALLEABLE IRON CONSTRUCTION WITH ACCOMMODATION FOR REMOVABLE NUTS AND THREADED RODS UP TO 3/4" DIAMETER, PERMITTING LATERAL ADJUSTMENT, EXCEPT AS OTHERWISE NOTED. INDIVIDUAL INSERTS SHALL BE GRINNELL FIG. 282 UP TO 5" PIPE AND CONDUIT, FIG. 282, 6" AND UP TO 8" PIPE AND CONDUIT, FIG. 152 ABOVE 8" AND UP TO 12" PIPE AND CONDUIT. FOR FIGURES 282 AND 152, THEY SHALL COME WITH AN OPENING AT THE TIP TO ALLOW REINFORCING RODS UP TO 1/2" DIAMETER TO BE PASSED THROUGH THE INSERT BODY. RODS SHALL EXTEND A MINIMUM OF 4" ON EITHER SIDE OF THE INSERT. PIPES LARGER THAN 12" SHALL BE SUSPENDED FROM STEEL MEMBERS ONLY.

C. PIPE SHIELDS

1. FOR ALL INSULATED PIPE FURNISH CLEVIS HANGERS WITH WELDED SHIELDS AND EQUAL TO C&P, INC., FIG. 100 SH.

5. SUBMITTALS:

A. SHOP DRAWINGS SHALL BE REQUIRED FOR:

1. ALL EQUIPMENT, MATERIALS, MEANS & METHODS INTENDED FOR USE UNDER THIS CONTRACT.

B. PRIOR TO DELIVERY TO JOB SITE, BUT SUFFICIENTLY IN ADVANCE OF REQUIREMENTS NECESSARY TO ALLOW ARCHITECT AMPLE TIME FOR REVIEW, SUBMIT SHOP DRAWINGS OF ALL EQUIPMENT, FIXTURES, MATERIALS, PIPING, SLEEVES, WIRING DIAGRAMS, ETC. AND FURTHER OBTAIN WRITTEN COMMENTS OF "APPROVED" OR "APPROVED AS NOTED" FOR SAME FROM ARCHITECT BEFORE INSTALLING ANY OF THESE ITEMS.

C. SHOP DRAWINGS SHALL CONSIST OF MANUFACTURER'S CERTIFIED SCALE DRAWINGS, CUTS, OR CATALOGS, INCLUDING DESCRIPTIVE LITERATURE AND COMPLETE CERTIFIED CHARACTERISTICS OF EQUIPMENT, FIXTURES, ETC. SHOWING DIMENSIONS, CAPACITY, CODE REQUIREMENTS, MOTOR AND DRIVE TESTING, AS INDICATED IN THE CONTRACT DOCUMENTS.

D. CERTIFIED PERFORMANCE CURVES FOR ALL PUMPING EQUIPMENT SHALL BE SUBMITTED FOR REVIEW.

E. SAMPLES, DRAWINGS, SPECIFICATIONS, CATALOGS, ETC., SUBMITTED FOR REVIEW SHALL BE PROPERLY LABELED INDICATING PROJECT NAME, AND SPECIFIC SERVICE FOR WHICH MATERIAL OR EQUIPMENT IS TO BE USED.

F. FAILURE TO SUBMIT SHOP DRAWINGS IN AMPLE TIME FOR CHECKING SHALL NOT ENTITLE AN EXTENSION OF CONTRACT TIME, AND NO CLAIM FOR EXTENSION BY REASON OF SUCH DEFAULT SHALL BE ALLOWED.

G. PRIOR TO SUBMISSION OF SHOP DRAWINGS CONTRACTOR SHALL THOROUGHLY CHECK EACH SHOP DRAWING, REJECT THOSE NOT CONFORMING TO THE SPECIFICATIONS, AND INDICATE BY SIGNED, WRITTEN DECLARATION THAT THE SHOP DRAWINGS SUBMITTED MEET CONTRACT REQUIREMENTS.

H. THE COMMENT "APPROVED" OR "APPROVED AS NOTED" RENDERED ON SHOP DRAWINGS SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR BUILDING CONDITIONS. WHERE DRAWINGS ARE REVIEWED, SAID REVIEW DOES NOT IN ANY WAY RELIEVE THE RESPONSIBILITY, OR NECESSITY, OF FURNISHING MATERIAL OR PERFORMING WORK AS REQUIRED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS.

I. "APPROVED AS NOTED" MEANS, UNLESS OTHERWISE NOTED ON THE DRAWINGS, TO APPROVE FOR CONSTRUCTION, FABRICATION, AND/OR MANUFACTURE SUBJECT TO THE PROVISION THAT THE WORK SHALL BE CARRIED OUT IN COMPLIANCE WITH ALL ANNOTATIONS AND/OR CORRECTIONS INDICATED ON THE SHOP DRAWINGS AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

1. WHERE THE COMMENT "APPROVED AS NOTED" INCLUDES DIRECTION TO THE CONTRACTOR TO RESUBMIT CORRECTED SHOP DRAWING FOR RECORD, FAILURE TO COMPLY WITH THE INSTRUCTION TO RESUBMIT RECORD COPY SHALL RENDER THE APPROVAL NULL AND VOID.

6. PERMITS & FEES:

A. REFER TO "PERMITS" IN CONSTRUCTION NOTES ON DRAWING SHEET CS.

7. WARRANTY:

A. CONTRACTOR SHALL:

1. UNCONDITIONALLY WARRANTY HIS WORK TO BE FREE OF DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD TWO (2) YEARS FROM THE DATE OF SUBSTANTIAL COMPLETION.

a. ANY DEFECTS SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE OWNER AT NO ADDITIONAL COST.

2. ALL EQUIPMENT SHALL CARRY THE ORIGINAL MANUFACTURER'S WARRANTY AS SPECIFIED IN THE MANUFACTURER'S WARRANTY DOCUMENTATION PROVIDED WITH THE EQUIPMENT. WARRANTY PERIOD SHALL BE CALCULATED FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER.

a. ANY DEFECTS SHALL BE REPAIRED OR REPLACED AT THE DISCRETION OF THE OWNER.

8. EXECUTION:

A. CONCEALED PIPING

1. ALL PIPING INSTALLED IN FINISHED AREAS SHALL BE COMPLETELY CONCEALED WITHIN HUNG CEILINGS, FURRING, SOFFITS, PIPE SPACES, ETC.

2. WHERE COMPLETE CONCEALMENT IS IMPOSSIBLE BECAUSE OF OBSTRUCTIONS SUCH AS BEAMS, DUCTS, LIGHTS, PIPING, ETC., DO NOT INSTALL ANY WORK BEFORE FIRST CONSULTING WITH THE ARCHITECT, AND HIS INSTRUCTIONS (WRITTEN OR ON REVISED DRAWINGS) SHALL BE FOLLOWED.

3. ALL PIPING, ETC. SHALL BE COMPLETELY TESTED AND APPROVED BY ALL AUTHORITIES HAVING JURISDICTION BEFORE ANY CONCEALMENT BEGINS.

4. ALL VENT PIPING SHALL BE SLOPED BACK TO DRAINAGE SYSTEM.

5. ALL BACKFLOW PREVENTION DEVICES SHALL INCLUDE STRAINER AND AND ISOLATION VALVES UNLESS OTHERWISE INDICATED. ALL BACKFLOW PREVENTION DEVICES SHALL BE TESTED IN ACCORDANCE WITH CODE UPON INSTALLATION.

6. PROVIDE ACCESS PANELS IN NON ACCESSIBLE CEILINGS AND WALLS FOR ALL VALVES, SHOCK ABSORBERS, CLEAN OUTS, AND ALL OTHER ITEMS THAT REQUIRE ACCESS TO PROPERLY MAINTAIN OR SERVICE. ACCESS PANEL TYPE AND LOCATION SHALL BE APPROVED BY ARCHITECT PRIOR TO INSTALLATION.

9. EXCAVATION, BACKFILLING & COVER

A. ALL INTERIOR EXCAVATION AND BACKFILL, AND ALL HAND TRENCHING SHALL BE DONE BY THE CONTRACTOR.

B. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND APPLIANCES REQUIRED TO COMPLETE THE EXCAVATING, BACKFILL AND PUMPING REQUIRED FOR THE WORK, TO THE EXTENT SPECIFIED HEREINAFTER.

C. LOCATIONS OF PIPE LINES, CONDUITS, CABLES, ETC., SHOWN ARE NOT TO BE USED AS FINAL FOR INSTALLATION OF WORK; HOWEVER, THEY ARE TO BE FOLLOWED AS CLOSELY AS POSSIBLE, GROUND CONDITIONS PERMITTING. EXACT LOCATIONS OF ALL UNDERGROUND UTILITIES SHALL BE DETERMINED ON JOB.

D. UNDER NO CIRCUMSTANCES, LAY PIPE OR CONDUIT OR INSTALL APPURTENANCES IN WATER. KEEP TRENCHES FREE FROM WATER. PERFORM ALL NECESSARY PUMPING AS REQUIRED TO KEEP TRENCHES FREE FROM WATER AT NO ADDITIONAL COST TO THE OWNER.

E. BEFORE STARTING THE EXCAVATION WORK, STRIP ALL EXISTING SOD AND SOIL WITHIN ENTIRE LIMITS OF THIS CONTRACT, WHICH IS SUITABLE FOR TOP SOIL AND STOCKPILE IN LOCATION APPROVED BY THE OWNER.

F. A BED OF SAND OR OTHER SELECT FILL MATERIAL APPROVED BY THE DIVISION SHALL BE PLACED AROUND THE WATER SERVICE PIPE AND EXTENDED 1'-0" ABOVE THE TOP OF PIPE.

G. REMAINDER OF EXCAVATION SHALL BE FILLED WITH MATERIAL EXCAVATED FROM DITCH IF SUITABLE AND APPROVED BY THE ARCHITECT/ENGINEER.

H. BACKFILL SHALL BE PLACED AND TAMPED IN 1'-0" INCREMENTS AND COMPACTED TO 95% DENSITY.

I. ALL WATER SERVICES SHALL HAVE A MINIMUM COVER OF 4'-0" FOR PROTECTION AGAINST FREEZING.

10. ALTERATION WORK

A. ALL EQUIPMENT, PIPING, PLUMBING FIXTURES, ETC. TO BE REMOVED SHALL BE DISPOSED OF, TURNED OVER TO OWNER OR SALVAGED AS DIRECTED. THEY SHALL NOT BE REMOVED FROM THE PREMISES WITHOUT APPROVAL.

B. ALL PIPING TO BE REMOVED SHALL BE PROPERLY PLUGGED OR CAPPED SO THAT, UPON COMPLETION OF ALL NEW WORK, ALL ABANDONED PIPING SHALL BE CONCEALED IN FINISHED AREAS.

C. NO DEAD ENDS SHALL BE LEFT ON ANY PIPING UPON COMPLETION OF JOB.

D. EXISTING EXPOSED PIPING NOT REUSED AND NOT SPECIFICALLY NOTED OR SHOWN ON DRAWING TO BE ABANDONED SHALL BE COMPLETELY REMOVED.

E. THE EXISTING SYSTEM SHALL BE LEFT IN PERFECT WORKING ORDER UNTIL COMPLETION OF ALL NEW WORK.

F. LOCATIONS AND SIZES OF EXISTING PIPING ARE APPROXIMATE. EXACT SIZES AND LOCATIONS OF ALL EXISTING PIPING SHALL BE VERIFIED ON THE JOB.

G. NO REMOVED EXISTING PIPING, ETC. SHALL BE REUSED.

H. DO NOT INTERRUPT ANY OF THE SERVICES OF THE EXISTING BUILDING, NOR INTERFERE WITH THE SERVICES IN ANY WAY WITHOUT EXPRESS PERMISSION OF THE OWNER. SUCH INTERRUPTIONS AND INTERFERENCES SHALL BE MADE AS BRIEF AS POSSIBLE AND ONLY AT THE DESIGNATED TIMES.

I. UNDER NO CIRCUMSTANCES SHALL WORKMEN BE PERMITTED TO USE ANY PART OF THE BUILDING AS A SHOP, EXCEPT PARTS DESIGNATED FOR SUCH PURPOSES.

J. REROUTE OR REMOVE ALL EXISTING PIPING EXPOSED TO VIEW WHERE NECESSARY TO AVOID NEW EQUIPMENT, STRUCTURAL OR MASONRY WORK AS REQUIRED BY THE PROPOSED ALTERATIONS.

11. TESTING

A. FURNISH ALL TESTING INSTRUMENTS, GAUGES, PUMPS, AND ALL OTHER EQUIPMENT NECESSARY TO PERFORM TESTS.

B. ALL TESTS SHALL BE MADE IN THE PRESENCE OF THE REPRESENTATIVES OF THE ARCHITECT, THE OWNER AND THE PLUMBING INSPECTOR. GIVE NOT LESS THAN 5 DAYS NOTICE.

C. PRESSURE TEST

1. DRAINAGE AND VENT PIPING: TEST WITH WATER AT 10 FT. HD.
2. DOMESTIC WATER: TEST WITH WATER AT 125 PSI.
3. NATURAL GAS (UP TO AND INCLUDING 1/2 PSIG [14" W.C.])

a. COMPLETED PIPING IS TO BE TESTED WITH AIR OR INERT GAS AT 3 PSIG FOR A MINIMUM OF 1 HOUR.

b. FOR EXCEPTIONALLY LONG PIPING RUNS, LONGER TEST PERIODS MAY BE REQUIRED.

D. WATER QUALITY TEST

1. UPON COMPLETION OF WORK CONTRACTOR SHALL TEST WATER IN NEW PIPING SYSTEM FOR LEAD CONTENT.

a. TESTING SHALL CONFORM TO ASTM D3559-15 AND "TECHNICAL NOTES ON DRINKING WATER METHODS" (EPA/600/R-94/173).

b. COPIES OF TEST REPORT SHALL BE PROVIDED TO A/E FOR REVIEW PRIOR TO CLOSE-OUT.

c. IF LEAD LEVEL IS DETERMINED TO BE 15 PPB OR HIGHER, CONTRACTOR SHALL:

1. IMMEDIATELY INFORM A/E OF LEAD LEVEL AND PROVIDE COPY OF WRITTEN REPORT.
2. COLLECT SAMPLE IMMEDIATELY DOWNSTREAM OF WATER SERVICE ENTRY FOR COMPARATIVE TESTING.
3. INFORM A/E OF TEST RESULTS OF COMPARATIVE SAMPLE.

d. LEAD LEVEL MUST BE LESS THAN 15 PPB FOR FINAL ACCEPTANCE BY OWNER.

12. DISINFECTION OF DOMESTIC WATER PIPING

A. SHALL CONFORM WITH NATIONAL STANDARD PLUMBING CODE 2021, NJ EDITION

1. FLUSHING

a. THE DOMESTIC WATER SYSTEM FROM UPSTREAM OF POINTS OF NEW CONNECTION TO NEW, RELOCATED, AND/OR EXISTING FIXTURES SHALL BE FLOWED UNTIL WATER RUNS FREE AND CLEAR OF DEBRIS AND/OR PARTICLES.

b. FAUCET AERATORS OR SCREENS SHALL BE REMOVED DURING FLUSHING OPERATIONS.

2. DISINFECTING

a. DISINFECT THE ENTIRE DOMESTIC COLD AND HOT WATER SYSTEM IN ITS ENTIRETY AFTER FLUSHING AND PRIOR TO USE.

b. ALL WATER OUTLETS SHALL BE POSTED TO WARN AGAINST USE DURING DISINFECTION OPERATIONS.

c. DISINFECTION SHALL BE PERFORMED BY PERSONS EXPERIENCED IN SUCH WORK.

d. THE WATER SUPPLY TO THE DOMESTIC HOT AND COLD WATER SYSTEM SHALL BE VALVED OFF FROM THE NORMAL WATER SOURCE TO PREVENT INTRODUCTION OF DISINFECTING AGENTS INTO A PUBLIC WATER SUPPLY.

e. THE DOMESTIC COLD AND HOT WATER SYSTEM SHALL BE DISINFECTED WITH A WATER-CHLORINE SOLUTION.

f. DURING THE INJECTION OF THE DISINFECTING AGENT INTO THE PIPING, EACH OUTLET SHALL BE FULLY OPENED SEVERAL TIMES UNTIL A CONCENTRATION OF NOT LESS THAN 50 PARTS PER MILLION OF CHLORINE IS PRESENT AT EVERY OUTLET.

g. THE SOLUTION SHALL BE ALLOWED TO STAND IN THE PIPING FOR NOT LESS THAN 24 HOURS.

h. UPON EXPIRATION OF THE RETENTION TIME, CONCENTRATION OF CHLORINE AT EVERY OUTLET SHALL BE NO LESS THAN 5 PARTS PER MILLION.

i. IF THE CONCENTRATION OF CHLORINE IS LESS THAN 5 PARTS PER MILLION AT THE EXPIRATION OF RETENTION TIME THE PROCEDURE SHALL BE REPEATED UNTIL THE REQUIRED MINIMUM RESIDUAL CHLORINE LEVEL IS OBTAINED AT EVERY OUTLET.

13. PIPE INSTALLATION

A. MODIFY PIPING INSTALLATION TO SUIT BUILDING CONDITIONS AND TO AVOID INTERFERENCES WITH OTHER TRADES, MAINTAINING ACCESS TO ALL PARTS OF THE PIPING SYSTEMS AND DUCTWORK AND TO MAINTAIN PROPER PITCH.

B. RUN PIPING GENERALLY PARALLEL TO THE AXIS OF THE BUILDING, ARRANGED TO CONFORM TO THE BUILDING REQUIREMENTS AND TO SUIT THE NECESSITIES OF CLEARANCE OF DUCTS, FLUES, CONDUITS AND WORK OF OTHER TRADES AND CLOSE TO CEILING OR OTHER CONSTRUCTION AS PRACTICAL, FREE OF TRAPS OR BENDS.

C. PROVIDE ADDITIONAL OFFSETS, FITTINGS, VALVES, DRAINS, ETC. WHERE REQUIRED BY CONSTRUCTION AND WORK OF OTHER TRADES.

D. RUN IN CHASES, RECESSES, SHAFTS, HUNG CEILINGS AND BEAM CUTS WHERE APPLICABLE. DO NOT COVER BEFORE EXAMINATION AND TESTING. NO PIPING IN FLOOR FILL UNLESS NOTED OR APPROVED.

E. RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS AND OTHER PIPING, NEATLY SPACED AND WITH PLUMB RISERS. MAINTAIN MAXIMUM HEADROOM.

F. PROVIDE REDUCING FITTINGS FOR CHANGES IN PIPE SIZE. NO BUSHINGS ARE PERMITTED.

G. RUN WATER PIPING FREE OF TRAPS. GRADE AND VALVE FOR COMPLETE CONTROL AND DRAINAGE OF SYSTEM.

H. VALVES SHALL NOT BE INSTALLED WITH THE OPERATING HANDLE POINTING DOWNWARD.

I. MANUFACTURER'S NAMEPLATE, NAME OR TRADEMARK, SHALL BE PERMANENTLY AFFIXED TO ALL EQUIPMENT AND MATERIAL FURNISHED UNDER THIS SPECIFICATION. WHERE SUCH EQUIPMENT IS IN A FINISHED OCCUPIED SPACE, THE NAMEPLATE SHALL BE IN A CONCEALED BUT ACCESSIBLE LOCATION. THE NAMEPLATE OF A SUBCONTRACTOR OR DISTRIBUTOR WILL NOT BE ACCEPTABLE.

J. PROVIDE FOR EACH ITEM OF EQUIPMENT, INCLUDING PANELBOARDS, DISCONNECTS, BREAKERS, STARTERS, SWITCHES, AND ALL CONTROL DEVICES, PUMPS, FANS, COMPRESSORS, BOILERS, ETC., A PERMANENTLY ATTACHED NAMEPLATE MADE OF BLACK SURFACE, WHITE CORE FURNISHING EQUIPMENT SHALL PROVIDE NAMEPLATE. PNEUMATIC, ELECTRIC AND MECHANICALLY ACTUATED GAUGES SHALL HAVE A BRIEF, BUT COMPLETE DESCRIPTION OF THEIR FUNCTION. STATING THE AIR PRESSURE OR VOLTAGE RANGE ALONE IS NOT ACCEPTABLE. NAMEPLATES SHALL BE A MINIMUM OF 3" LONG BY 1-1/2" WIDE AND SHALL BEAR THE EQUIPMENT NAME AND ITEM NUMBER OF 1/2" HIGH WHITE LETTERS AS DESIGNATED IN THE EQUIPMENT SCHEDULE. MOUNTING SCREWS SHALL HAVE CHROME PLATED ACORN HEADED SCREWS.

K. FURNISH AND ATTACH TO EACH VALVE AS HEREINAFTER SPECIFIED, A 1-1/2" DIAMETER BRASS TAG WITH 1/2" INDENTED NUMERALS FILLED WITH DURABLE BLACK COMPOUND. TAGS SHALL BE SECURELY ATTACHED TO STEMS OF VALVES WITH COPPER WIRE AND "S" HOOKS.

1. VALVE TAG SCHEDULE

SERVICE	TAG DESIGNATION
COLD WATER	CW
HOT WATER	HW _ DEG. F
TEMPERED WATER	TW 85'(F) DEG. F
NATURAL GAS	G

L. CONTRACTOR SHALL MODIFY OWNER'S EXISTING VALVE CHARTS & BOOK TO REFLECT ALL CHANGES MADE UNDER THIS CONTRACT.

M. PROVIDE TAGS FOR THE FOLLOWING VALVES:

1. ZONE CONTROL, BYPASS, SHUT OFF, CHECK AND BALANCING VALVES.
2. BUILDING AND AREA SHUT OFF AND BALANCING VALVES.
3. CONTROL, BY PASS, SHUT OFF, BALANCING AND DRAIN VALVES FOR MAJOR PIECES OF EQUIPMENT SUCH AS BOILERS, DOMESTIC HOT WATER HEATERS, HEAT EXCHANGERS, REFRIGERATION MACHINES, PUMPS, HEATING, VENTILATING AND AIR CONDITIONING UNITS, COOLING TOWERS, ETC.
4. SYSTEM DRAIN VALVES, SAFETY AND RELIEF VALVES.

N. IDENTIFICATION SHALL BE IN ACCORDANCE WITH "SCHEME FOR IDENTIFICATION OF PIPING SYSTEM ANSI A13.1" AND OSHA SAFETY COLOR REGULATION.

O. MARKERS SHALL BE SNAP ON TYPE AS MANUFACTURED BY SETON NAMEPLATE CORP., NEW HAVEN, CONN. (SETMARK SYSTEM), BUNTING STAMP CO. INC., PITTSBURGH, P.A. OR APPROVED EQUAL. MARKERS SHALL COMPLETELY ENCIRCLE THE PIPE WITH A SUBSTANTIAL OVERLAP. NO ADHESIVE SHALL BE USED. THEY SHALL BE MANUFACTURED OF U.L. APPROVED, SELF EXTINGUISHING PLASTIC. WHEN THE PIPE INCLUDING INSULATION (IF ANY) IS LARGER THAN 6" DIAMETER AND LARGER, MARKERS SHALL BE STRAP ON TYPE.

P. WHERE PIPE IS TO BE LEFT BARE IT SHALL BE PAINTED WITH TWO (2) COATS OF SELF-PRIMING, MARINE-GRADE SILOXANE EPOXY PAINT IN GLOSS COLORS AS REQUIRED BY ITEM Q, BELOW, AND STENCIL AND VALVE TAG SCHEDULE.

1. COLOR SPECIFICATIONS:

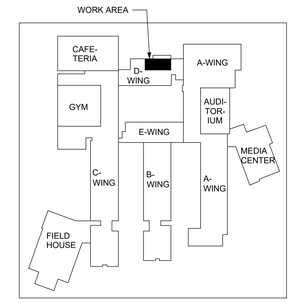
COLOR	NAME	FEDERAL STANDARD NUMBER
WHITE	INSIGNIA WHITE	17875
BLACK	OSHA SAFETY BLACK	17038
RED	OSHA SAFETY RED	11120
YELLOW	OSHA SAFETY YELLOW	13591
GREEN	OSHA SAFETY GREEN	14120
BLUE	OSHA SAFETY BLUE	15102
ORANGE	OSHA SAFETY ORANGE	12300
PURPLE	OSHA SAFETY PURPLE	17142
BROWN	NASA SAFETY BROWN	10080
GREY	MECHANIC GREY	16187

Q. PIPE SHALL BE LETTERED AND VALVES TAGGED IN ACCORDANCE WITH THE SCHEDULE BELOW. LETTERING SHALL BE LOCATED NEAR EACH VALVE AND BRANCH CONNECTION AND AT INTERVALS OF NOT OVER 40' (10' ON FIRE LINES) ON STRAIGHT RUNS OF PIPE. PROVIDE FLOW ARROWS FOR ALL PIPING AT EACH MARKER. ADJACENT TO THE LEGEND, STENCIL THE SIZE OF THE PIPE. LETTER COLORS ARE AS FOLLOWS:

1. WHITE WITH BLACK LETTERING
2. BLACK WITH WHITE LETTERING
3. RED WITH WHITE LETTERING
4. YELLOW WITH BLACK LETTERING
5. GREEN WITH WHITE LETTERING
6. BLUE WITH WHITE LETTERING
7. ORANGE WITH BLACK LETTERING
8. PURPLE WITH WHITE LETTERING
9. BROWN WITH WHITE LETTERING
10. GREY WITH WHITE LETTERING

R. STENCIL AND VALVE TAG SCHEDULE

SERVICE	STENCIL DESIGNATION	COLOR	TAG DESIGNATION
DOMESTIC COLD WATER	DOMESTIC COLD WATER	GREEN	CW
DOMESTIC HOT WATER	DOMESTIC HOT WATER _ DEG. F	GREEN	HWS _ DEG. F
DOMESTIC TEMPERED WATER	DOMESTIC TEMPERED WATER _ DEG. F	GREEN	HWS _ DEG. F
NATURAL GAS	NATURAL GAS	YELLOW	NG
SANITARY PIPING	SANITARY	GREEN	<NONE>



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GLOUCESTER CITY, NJ 08030

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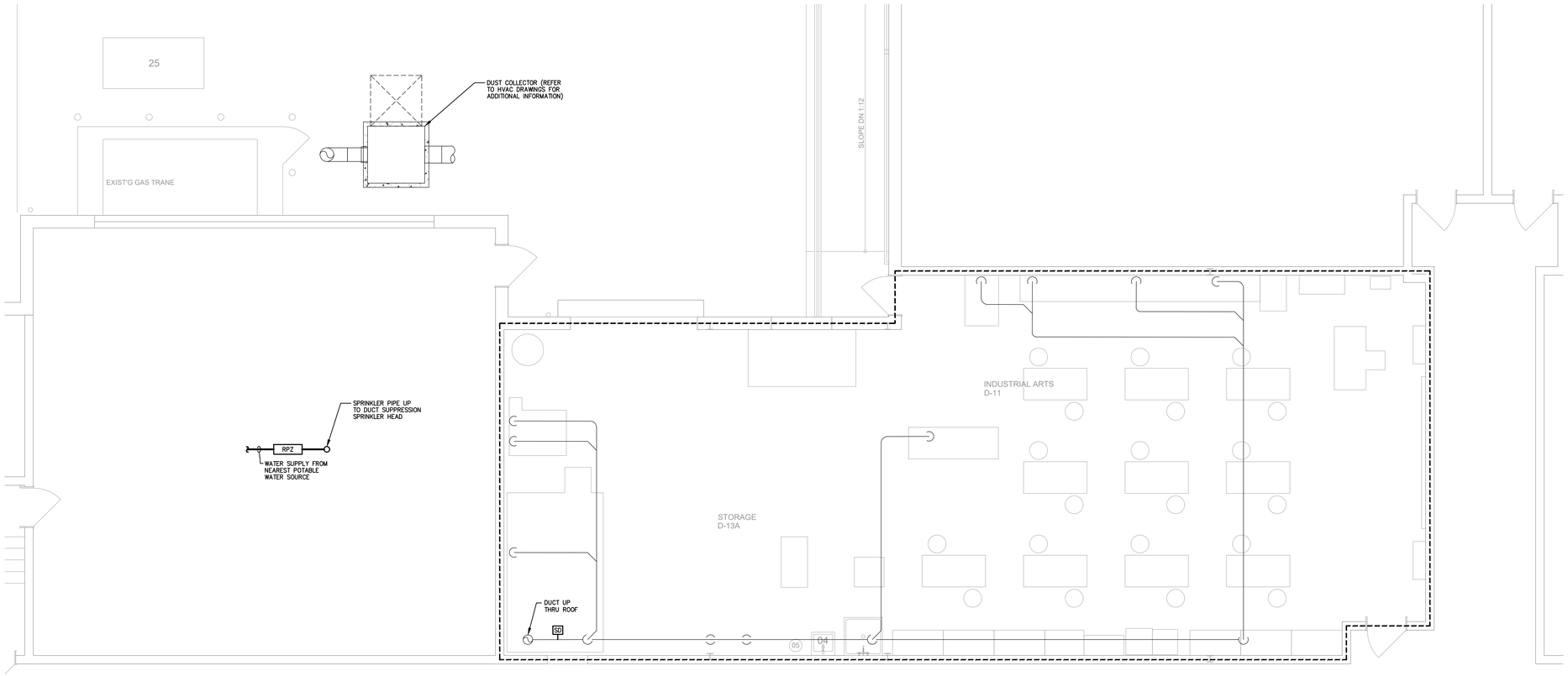
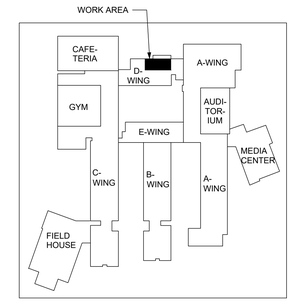


1 / FP100 PARTIAL FIRST FLOOR PLAN – FIRE PROTECTION

SCALE 1/4" = 1'-0"

NOTES:

1. SPARK DETECTOR SHALL TIE BACK TO SPARK DETECTOR CONTROL PANEL; REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
2. WET PIPING TO DUCT SUPPRESSION SYSTEM SHALL BE 30% GLYCOL BY VOLUME. GLYCOL LOOP SHALL BE ISOLATED FROM WATER SOURCE BY WATTS MODEL 4000B REDUCED PRESSURE ZONE ASSEMBLY OR APPROVED EQUAL.



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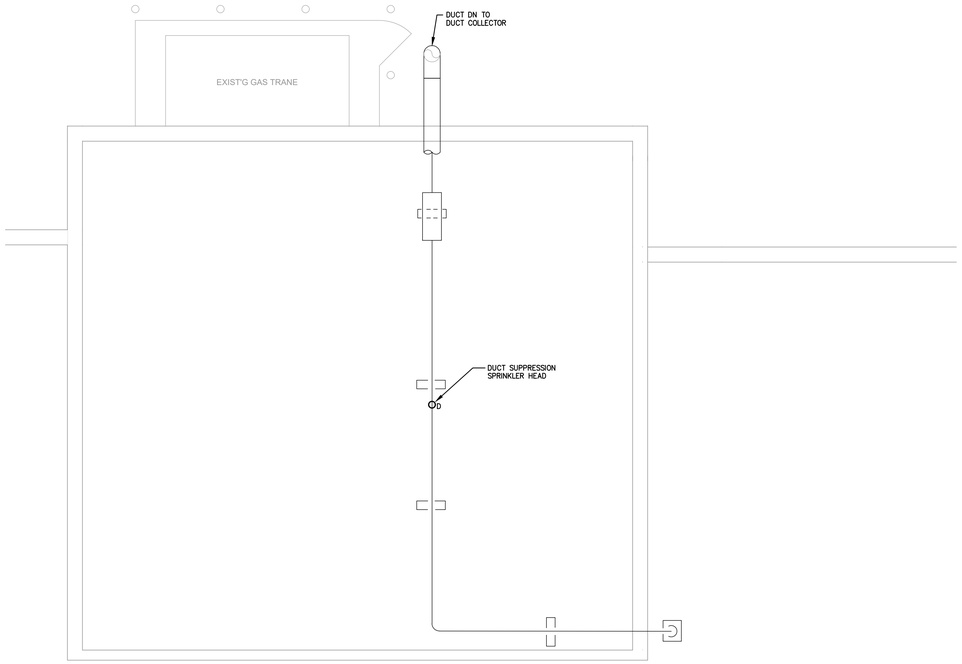


1 / FP101 PARTIAL FIRST FLOOR PLAN – FIRE PROTECTION

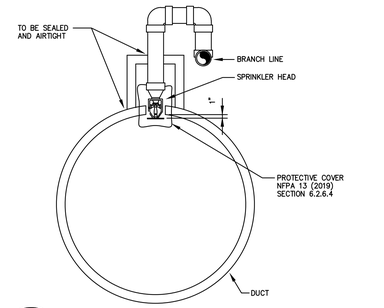
SCALE 1/4" = 1'-0"

NOTES:

1. DUCT SUPPRESSION SPRINKLER HEAD SHALL BE ELECTRONICALLY ACTUATED UPON RECEIPT OF SIGNAL FROM SPARK DETECTOR CONTROL PANEL; REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.

FIRE PROTECTION NOTES:

1. THE CONTRACTOR SHALL PERFORM THE SPRINKLER WORK IN ACCORDANCE WITH GENERAL AND SPECIFIC CONDITIONS OF THE SPECIFICATIONS AND BUILDING CODE STANDARDS.
2. ALL WORK AND MATERIALS SHALL COMPLY WITH APPLICABLE PROVISIONS OF THE NEW JERSEY STATE UNIFORM BUILDING CODE, NFPA-13 AND LOCAL FIRE CODE AUTHORITIES.
3. WORK SHALL INCLUDE THE PROVIDING OF ALL LABOR, MATERIALS, EQUIPMENT, ACCESSORIES AND TESTS NECESSARY TO COMPLETE AND MAKE READY FOR OPERATION THE INSTALLATION OF THE AUTOMATIC WET PIPE SPRINKLER SYSTEM WITH LIGHT AND ORDINARY HAZARD OCCUPANCY AS NOTED ON THE DRAWINGS.
4. THE INSTALLATION SHALL BE ACCOMPLISHED BY AN AUTHORIZED SPRINKLER CONTRACTOR RECOGNIZED AS A FULLY EXPERIENCED SPECIALIST IN AUTOMATIC SPRINKLER SYSTEMS BY THE STATE OF NEW JERSEY.
5. SEE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR CONSTRUCTION AND INTERFERENCE DETAILS. ANY CHANGES THAT MAY BE NECESSARY BECAUSE OF THE PHYSICAL CONDITIONS OR COMPLIANCE WITH THE CODES AND STANDARDS SHALL BE MADE BY THE SPRINKLER CONTRACTOR WITHOUT ADDITIONAL COST.
6. BEFORE COMMENCEMENT OF ANY WORK, COMPLETE AND SUBMIT 3 SIGNED AND SEALED COPIES OF THE DESIGN DRAWINGS TO THE CONSTRUCTION MANAGER FOR REVIEW BY LOCAL AUTHORITIES AND OTHER AGENCIES HAVING JURISDICTION THEREOF.
7. DESIGN CRITERIA FOR THE HYDRAULIC CALCULATIONS SHALL INCLUDE:
   a. AVAILABLE STATIC PRESSURE.
   b. THE MINIMUM WATER SUPPLY REQUIREMENT AND GPM PER SQUARE FOOT.
   c. AREA OF HYDRAULIC DEMAND.
   d. OCCUPANCY HAZARD CLASSIFICATION.
   e. SPRINKLER PIPING AND FITTING MATERIALS.
   f. ALL EXISTING WATER SOURCES, SIZES AND AVAILABLE PRESSURE INCLUDING OBTAINING A HYDRANT FLOW TEST AND SUBMISSION OF TEST RESULTS TO ENGINEER ALONG WITH HYDRAULIC CALCULATIONS FOR REVIEW OF PROPOSED INSTALLATION OF SPRINKLER AND RELATED FIRE PROTECTION SYSTEMS
8. THE CONTRACTOR SHALL MAKE MODIFICATIONS IN RESPECT TO LOCATION AND NUMBERS OF SPRINKLER HEADS, AS MAY BE REQUIRED BY FIELD CONDITIONS, CODE REQUIREMENTS OR AS MAY BE FOUND NECESSARY BY THE ARCHITECT AT THE TIME OF INSTALLATION. NO EXTRA COMPENSATION WILL BE ALLOWED. FITTINGS, HANGERS, MEANS OF DRAINING SYSTEM AND ALL NECESSARY APPURTENENCES SHALL BE INSTALLED AS REQUIRED.
9. THE SYSTEM SHALL BE INSTALLED SO THAT NO PART THEREOF WILL INTERFERE WITH DOORS, WINDOWS, HEATING, PLUMBING OR ELECTRICAL EQUIPMENT. SPRINKLER HEADS SHALL NOT BE LOCATED CLOSER THAN ONE FOOT FROM LIGHTING FIXTURES OR OTHER OBSTRUCTIONS. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE OTHER TRADES SO AS TO AVOID ANY INTERFERENCE WITH THE AUTOMATIC SPRINKLER SYSTEM.
10. EXTRA CHARGES OR COMPENSATION WILL NOT BE ALLOWED ON ACCOUNT OF THE DIFFERENCES BETWEEN ACTUAL MEASUREMENTS AND THE DIMENSIONS SHOWN ON THE DRAWINGS, BUT ANY SUCH DIFFERENCES WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE ARCHITECT FOR ADJUSTMENT, BEFORE PROCEEDING WITH WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF CEILING HEIGHTS, MEASUREMENTS AND CONDITIONS AS REQUIRED FOR PROPER INSTALLATION.
11. CONTRACTOR SHALL COORDINATE SPRINKLER PIPING LAYOUT AND DIMENSIONS WITH LIGHT FIXTURES, HVAC DUCTWORK AND ARCHITECTURAL ELEMENTS.

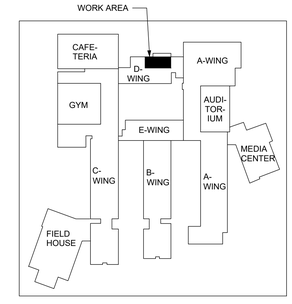


2 / FP101 DUCT-MOUNTED SPRINKLER HEAD

NOT TO SCALE

FIRE PROTECTION SYMBOL LIST

ABBREVIATION	SYMBOL	DESCRIPTION	ABBREVIATION	SYMBOL	DESCRIPTION
	OD	ELECTRONIC RELEASE DUCT SUPPRESION SYSTEM SPRINKLER HEAD	PG		PRESSURE GAUGE
BV		BALL VALVE	FC		FLEXIBLE CONNECTION
RCV		RISER CONTROL VALVE			PIPING DROP
ABD		FIRE DEPARTMENT SIAMESE CONNECTION AUTOMATIC BALL DRIP & CHECK VALVE			PIPING RISE
O.S.&Y.		OUTSIDE STEM & YOKE VALVE WITH TAMPER SWITCH			BRANCH – TOP CONNECTION
PRV		PRESSURE REDUCING VALVE			BRANCH – BOTTOM CONNECTION
CV		CHECK VALVE	CO		CAPPED OUTLET
AV		ANGLE VALVE	PS	PS	PRESSURE SWITCH
		VALVE ON VERTICAL	TS	TS	TAMPER SWTCH
PAV		PRE-ACTION VALVE (WITH ALL RELATED APPURTENANCES)	SD	SD	SPARK DETECTOR
FDC		WALL MOUNTED FIRE DEPARTMENT SIAMESE CONNECTION	RPZ	RPZ	REDUCED PRESSURE ZONE VALVE ASSEMBLY



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FIRE PROTECTION SPECIFICATIONS

1. SCOPE OF WORK

A. WET SPRINKLER PIPING.
B. HANGERS AND SUPPORTS.
C. VALVES AND SWITCHES.
D. CUTTING AND ROUGH PATCHING.
E. DETAILED SURVEY OF EXISTING CONDITIONS AS REQUIRED TO PREPARE HYDRAULIC DESIGN.
F. DETAILED LAYOUT DRAWINGS AND HYDRAULIC DESIGN SIGNED AND SEALED BY A NJ PROFESSIONAL ENGINEER.
G. HYDRANT FLOW TESTS.
H. SUBMITTALS.
I. ALL NECESSARY PERMITS AND APPROVALS INCLUDING CODE AND OWNER'S UNDERWRITER.
J. WARRANTY.
K. SUPERVISION.
L. RIGGING.

2. STANDARDS AND CODES

A. NEW JERSEY UNIFORM CONSTRUCTION CODE
B. NEW JERSEY UNIFORM FIRE CODE
C. INTERNATIONAL BUILDING CODE 2021, NEW JERSEY EDITION
D. NFPA-13, 2019
E. NFPA-664, 2020
F. LOCAL MUNICIPAL UTILITY AUTHORITY
G. LOCAL WATER COMPANY RULES AND REGULATIONS
H. LOCAL FIRE DEPARTMENT REQUIREMENTS
I. OTHER STATE AND LOCAL AUTHORITIES HAVING JURISDICTION
J. OWNER'S INSURANCE UNDERWRITER'S REQUIREMENTS

3. MATERIALS:

A. GENERAL REQUIREMENTS

1. FIRE PROTECTION SYSTEM COMPONENTS SHALL BE UL LISTED OR FM APPROVED (AS APPLIES) FOR FIRE PROTECTION SERVICE.
2. UNLESS OTHERWISE SPECIFIED, SPRINKLER SYSTEM EQUIPMENT SHALL BE BY CENTRAL, GRINNELL, RELIABLE, VIKING OR APPROVED EQUAL.

B. PIPE AND FITTINGS

1. PIPE

SERVICE	MATERIAL	SCHEDULE	DESIGNATION
WET SPRINKLER	BLACK STEEL	SCHEDULE 40	ASTM A 795 ANSI/ASTM A 53

2. FITTINGS

SERVICE	SIZE	MATERIAL	WEIGHT	TYPE
WET SPRINKLER	LESS THAN 2-1/2"	BLACK STEEL	SCHED. 40	FORGED ASME B16.11
	3" & LARGER	BLACK STEEL	SCHED. 40	CUT GROOVE ASTM A536
	3" & LARGER	BLACK STEEL	SCHED. 40	WELDED ASME B16.11

3. JOINTS

a. SCREWED JOINTS SHALL BE MADE UP WITH ACCEPTABLE PIPE JOINT COMPOUND.
b. GROOVED JOINT FLEXIBLE COUPLINGS SHALL BE VICTAULIC 75 WITH GRADE E GASKETS. MAY BE USED WHERE APPROVED BY CODE AND CONTROLLING AUTHORITIES FOR FIRE PROTECTION SYSTEMS.

4. DISSIMILAR METALS:

a. DISSIMILAR METALS SHALL BE INSULATED AGAINST DIRECT CONTACT WITH EACH OTHER BY USING A HIGH QUALITY OR GRADE OF DIELECTRIC MATERIAL.

5. PROHIBITED MATERIALS:

a. SCHEDULE 10 "LIGHTWALL" PIPING IS NOT PERMITTED.
b. CPVC PIPING IS NOT PERMITTED.

C. SPRINKLER HEADS:

1. ONLY NEW SPRINKLER HEADS SHALL BE EMPLOYED IN THE INSTALLATION OF SPRINKLER SYSTEMS AS PER NFPA 13, 2019, SECTION 6.2.1.
2. FURNISH SIX SPARES OF EACH STYLE AND TYPE OF HEAD; FURNISH SPRINKLER WRENCH AND STORAGE CABINET.

D. VALVES

1. OS&Y VALVES SHALL BE WATTS, SERIES 408-OSYRW OR APPROVED EQUAL, RESILIENT WEDGE, FLANGED GATE VALVE WITH POWDER COATED ASTM A 126 CLASS B CAST IRON BODY.
2. BALL VALVES SHALL BE WATTS, SERIES G4000 OR APPROVED EQUAL, 2-PIECE, FULL PORT, CAST IRON, FLANGED.

4. HANGERS AND SUPPORTS

A. HANGERS AND SUPPORTS

1. SHALL CONFORM TO NFPA-13 (2019), CHAPTER 9 "HANGING, BRACING, AND RESTRAINT OF SYSTEM PIPING".

B. PIPE INSERTS

1. INSERTS SHALL BE PRESET CONCRETE INSERTS WITH STEEL REINFORCED RODS THROUGH THROUGH THE INSERT AND BOTH ENDS HOOKED OVER THE REINFORCED MESH. INSERTS SHALL BE OF INDIVIDUAL TYPE OF MALLEABLE IRON CONSTRUCTION WITH ACCOMMODATION FOR REMOVABLE NUTS AND THREADED RODS UP TO 3/4" DIAMETER, PERMITTING LATERAL ADJUSTMENT, EXCEPT AS OTHERWISE NOTED.
2. INDIVIDUAL INSERTS SHALL BE GRINNELL FIG. 282 UP TO 5" PIPE AND CONDUIT, FIG. 282, 6" AND UP TO 8" PIPE AND CONDUIT, FIG. 152 ABOVE 8" AND UP TO 12" PIPE AND CONDUIT. FOR FIGURES 282 AND 152, THEY SHALL COME WITH AN OPENING AT THE TIP TO ALLOW REINFORCING RODS UP TO 1/2" DIAMETER TO BE PASSED THROUGH THE INSERT BODY. RODS SHALL EXTEND A MINIMUM OF 4" ON EITHER SIDE OF THE INSERT. PIPES LARGER THAN 12" SHALL BE SUSPENDED FROM STEEL MEMBERS ONLY.

5. SUBMITTALS:

A. SHOP DRAWINGS SHALL BE REQUIRED FOR:

1. ALL EQUIPMENT, MATERIALS, MEANS & METHODS INTENDED FOR USE UNDER THIS CONTRACT.

B. PRIOR TO DELIVERY TO JOB SITE, BUT SUFFICIENTLY IN ADVANCE OF REQUIREMENTS NECESSARY TO ALLOW ARCHITECT AMPLE TIME FOR REVIEW, SUBMIT SHOP DRAWINGS OF ALL EQUIPMENT, DEVICES, MATERIALS, PIPING, SLEEVES, WIRING DIAGRAMS, ETC. AND FURTHER OBTAIN WRITTEN COMMENTS OF "APPROVED" OR "APPROVED AS NOTED" FOR SAME FROM ARCHITECT BEFORE INSTALLING ANY OF THESE ITEMS.

C. SHOP DRAWINGS SHALL CONSIST OF MANUFACTURER'S CERTIFIED SCALE DRAWINGS, CUTS, OR CATALOGS, INCLUDING DISCRIPTIVE LITERATURE AND COMPLETE CERTIFIED CHARACTERISTICS OF EQUIPMENT, FIXTURES, ETC. SHOWING DIMENSIONS, CAPACITY, CODE REQUIREMENTS, MOTOR AND DRIVE TESTING, AS INDICATED IN THE CONTRACT DOCUMENTS.

1. GENERAL SALES BROCHURES/CATALOG PAGES ARE NOT ACCEPTABLE.

D. CERTIFIED PERFORMANCE DATA FOR ALL FIRE PROTECTION EQUIPMENT SHALL BE SUBMITTED FOR REVIEW.

E. SAMPLES, DRAWINGS, SPECIFICATIONS, CATALOGS, ETC., SUBMITTED FOR REVIEW SHALL BE PROPERLY LABELED INDICATING PROJECT NAME, AND SPECIFIC SERVICE FOR WHICH MATERIAL OR EQUIPMENT IS TO BE USED.

F. FAILURE TO SUBMIT SHOP DRAWINGS IN AMPLE TIME FOR CHECKING SHALL NOT ENTITLE AN EXTENSION OF CONTRACT TIME, AND NO CLAIM FOR EXTENSION BY REASON OF SUCH DEFAULT SHALL BE ALLOWED.

G. CONTRACTOR SHALL SUBMIT COMPLETE LAYOUT DRAWINGS AS REQUIRED BY NFPA-13 (2019) WITH ACCOMPANYING HYDRAULIC CALCULATIONS, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW JERSEY. CONTRACTOR IS RESPONSIBLE FOR OBTAINING CURRENT HYDRANT FLOW TEST DATA REQUIRED FOR HYDRAULIC CALCULATIONS.

H. PRIOR TO SUBMISSION OF SHOP DRAWINGS CONTRACTOR SHALL THOROUGHLY CHECK EACH SHOP DRAWING, REJECT THOSE NOT CONFORMING TO THE SPECIFICATIONS, AND INDICATE BY SIGNED, WRITTEN DECLARATION THAT THE SHOP DRAWINGS SUBMITTED MEET CONTRACT REQUIREMENTS.

I. THE COMMENT "APPROVED" OR "APPROVED AS NOTED" RENDERED ON SHOP DRAWINGS SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR BUILDING CONDITIONS. WHERE DRAWINGS ARE REVIEWED, SAID REVIEW DOES NOT IN ANY WAY RELIEVE THE RESPONSIBILITY, OR NECESSITY, OF FURNISHING MATERIAL OR PERFORMING WORK AS REQUIRED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS.

J. "APPROVED AS NOTED" MEANS, UNLESS OTHERWISE NOTED ON THE DRAWINGS, TO APPROVE FOR CONSTRUCTION, FABRICATION, AND/OR MANUFACTURE SUBJECT TO THE PROVISION THAT THE WORK SHALL BE CARRIED OUT IN COMPLIANCE WITH ALL ANNOTATIONS AND/OR CORRECTIONS INDICATED ON THE SHOP DRAWINGS AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

1. WHERE THE ACTION "APPROVED AS NOTED" INCLUDES DIRECTION FOR THE CONTRACTOR TO RESUBMIT CORRECTED SHOP DRAWING FOR RECORD, FAILURE TO COMPLY WITH THE INSTRUCTION TO RESUBMIT RECORD COPY SHALL RENDER THE APPROVAL NULL AND VOID.

6. PERMITS & FEES:

A. REFER TO "PERMITS" IN CONSTRUCTION NOTES ON DRAWING SHEET CS.

7. WARRANTY:

A. CONTRACTOR SHALL:

1. UNCONDITIONALLY WARRANTY HIS WORK TO BE FREE OF DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF TWO (2) YEARS FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER.
   a. ANY DEFECTS SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE OWNER AT NO ADDITIONAL COST.
2. ALL EQUIPMENT SHALL CARRY THE ORIGINAL MANUFACTURER'S WARRANTY AS SPECIFIED IN THE MANUFACTURER'S WARRANTY DOCUMENTATION PROVIDED WITH THE EQUIPMENT. WARRANTY PERIOD SHALL BE CALCULATED FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER.

8. EXECUTION:

A. SYSTEM

1. CONTRACTOR SHALL PROVIDE SYSTEM THAT IS FULLY COMPLIANT WITH ALL APPLICABLE CODES AND STANDARDS PERTAINING TO THIS PROJECT WETHER OR NOT SPECIFICALLY CITED IN THE CONTRACT DOCUMENTS.
   a. THIS SHALL INCLUDE DRAIN CONNECTIONS AND TEST TEES REQUIRED FOR PROPER OPERATION OF THE SYSTEM.

B. EXPOSED PIPING AND COMPONENTS

1. ALL PIPING INSTALLED IN FINISHED AREAS EXPOSED TO VIEW SHALL BE PAINTED AS REQUIRED IN THIS SPECIFICATION.
2. SPRINKLER HEADS SHALL NOT BE PAINTED.
3. IN FINISHED AREAS WITH HUNG CEILINGS SPRINKLER HEADS SHALL BE INSTALLED CENTERED IN CEILING TILES AND TO FORM COORDINATED UNIFORM PATTERN WITH LIGHT FIXTURES, AIR SUPPLY OR RETURN DIFFUSERS, REGISTERS, ETC. PROVIDE NECESSARY OFFSETS IN BRANCH PIPES TO ACCOMPLISH DESIRED RESULTS. COORDINATE WORK CLOSELY WITH CEILING INSTALLER.
4. IN FINISHED AREAS WITH SOLID CEILINGS SPRINKLER HEADS SHALL BE INSTALLED TO FORM COORDINATED UNIFORM PATTERN WITH LIGHT FIXTURES, AIR SUPPLY OR RETURN DIFFUSERS, REGISTERS, ETC. PROVIDE NECESSARY OFFSETS IN BRANCH PIPES TO ACCOMPLISH DESIRED RESULTS. COORDINATE WORK CLOSELY WITH CEILING INSTALLER.

C. CONCEALED PIPING

1. ALL PIPING INSTALLED IN FINISHED AREAS CONCEALED FROM VIEW SHALL BE CONCEALED WITHIN HUNG CEILINGS, FURRING, SOFFITS, PIPE SPACES, ETC.
2. WHERE SUCH CONCEALMENT IS REQUIRED, PIPING SHALL REMAIN ACCESSIBLE ABOVE HUNG CEILINGS, VIA ACCESS DOORS, ETC. DO NOT INSTALL ANY WORK BEFORE FIRST CONSULTING WITH THE ARCHITECT, AND HIS INSTRUCTIONS (WRITTEN OR ON REVISED DRAWINGS) SHALL BE FOLLOWED.
3. ALL PIPING, ETC. SHALL BE COMPLETELY TESTED AND APPROVED BY ALL AUTHORITIES HAVING JURISDICTION BEFORE ANY CONCEALMENT BEGINS.

9. ALTERATION WORK

A. DO NOT INTERRUPT ANY OF THE SERVICES OF THE EXISTING BUILDING, NOR INTERFERE WITH THE SERVICES IN ANY WAY WITHOUT EXPRESS PERMISSION OF THE OWNER. SUCH INTERRUPTIONS AND INTERFERENCES SHALL BE MADE AS BRIEF AS POSSIBLE AND ONLY AT THE DESIGNATED TIMES.

B. UNDER NO CIRCUMSTANCES SHALL WORKMEN BE PERMITTED TO USE ANY PART OF THE BUILDING AS A SHOP, EXCEPT PARTS DESIGNATED FOR SUCH PURPOSES.

C. FIRE PROTECTION SYSTEMS SHALL PROVIDE COMPLETE COVERAGE AS REQUIRED BY NFPA 13 AND OWNER'S INSURANCE AGENCY.

D. PROVIDE COMPLETE LAYOUT DRAWING PER NFPA 13.

10. TESTING

A. EACH SYSTEM SHALL BE FUNCTIONALLY TESTED AS REQUIRED BY LOCAL FIRE DEPARTMENT AND OWNER'S INSURANCE COMPANY. TESTS SHALL INCLUDE:

1. TESTING OF VALVES, EQUIPMENT AND ACCESSORIES FOR PROPER OPERATION.
2. SETTING AND ADJUSTING OF PRESSURE SWITCHES AND CONTROLS.
3. PERFORM NEW FIRE HYDRANT FLOW TEST
4. SUBMIT WRITTEN CERTIFICATION OF ACCEPTANCE OF ALL TESTS IN ACCORDANCE WITH NFPA-13.

B. FURNISH ALL TESTING INSTRUMENTS, GAUGES, PUMPS, AND ALL OTHER EQUIPMENT NECESSARY TO PERFORM TESTS.

C. ALL TESTS SHALL BE MADE IN THE PRESENCE OF THE REPRESENTATIVES OF THE ARCHITECT, THE OWNER AND THE PLUMBING INSPECTOR. GIVE NOT LESS THAN 5 DAYS NOTICE.

11. PIPE INSTALLATION

A. MODIFY PIPING INSTALLATION TO SUIT BUILDING CONDITIONS AND TO AVOID INTERFERENCES WITH OTHER TRADES, MAINTAINING ACCESS TO ALL PARTS OF THE PIPING SYSTEMS AND DUCTWORK AND TO MAINTAIN PROPER PITCH.

B. RUN PIPING GENERALLY PARALLEL TO THE AXIS OF THE BUILDING, ARRANGED TO CONFORM TO THE BUILDING REQUIREMENTS AND TO SUIT THE NECESSITIES OF CLEARANCE OF DUCTS, FLUES, CONDUITS AND WORK OF OTHER TRADES AND CLOSE TO CEILING OR OTHER CONSTRUCTION AS PRACTICAL, FREE OF TRAPS OR BENDS.

C. PROVIDE ADDITIONAL OFFSETS, FITTINGS, VALVES, DRAINS, ETC. WHERE REQUIRED BY CONSTRUCTION AND WORK OF OTHER TRADES.

D. RUN IN CHASES, RECESSES, SHAFTS, HUNG CEILINGS AND BEAM CUTS WHERE APPLICABLE. DO NOT COVER BEFORE EXAMINATION AND TESTING. NO PIPING IN FLOOR FILL UNLESS NOTED OR APPROVED.

E. RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS AND OTHER PIPING, NEATLY SPACED AND WITH PLUMB RISERS. MAINTAIN MAXIMUM HEADROOM.

F. PROVIDE REDUCING FITTINGS FOR CHANGES IN PIPE SIZE. NO BUSHINGS ARE PERMITTED.

G. HORIZONTAL OR DOWNFEED BRANCH CONNECTIONS TO SPRINKLER HEADS SHALL BE MADE ABOVE CENTERLINE OF HORIZONTAL MAINS.

H. SPRINKLER HEADS SHALL NOT BE INSTALLED UNTIL BRANCH LINES TO HEADS HAVE BEEN CLOSED.

I. SPRINKLER PIPING 3" AND LARGER MAY HAVE WELDED, THREADED OR GROOVED FITTINGS. WELDING MUST BE DONE IN SHOP ONLY AND MAY ONLY BE DONE IF APPROVED BY LOCAL AUTHORITY.

J. LAYOUT SHOWN ON CONTRACT DRAWINGS IS INTENDED TO SHOW GENERAL LAYOUT, AREAS TO BE COVERED AND BASIC REQUIREMENTS. PREPARE DETAILED WORKING DRAWINGS OF PIPING FOR REVIEW AND APPROVAL BY PROPER AUTHORITIES BEFORE ANY WORK IS PERFORMED.

K. RUN WATER PIPING FREE OF TRAPS. GRADE AND VALVE FOR COMPLETE CONTROL AND DRAINAGE OF SYSTEM.

L. VALVES SHALL NOT BE INSTALLED WITH THE OPERATING HANDLE POINTING DOWNWARD.

M. MANUFACTURER'S NAMEPLATE, NAME OR TRADEMARK, SHALL BE PERMANENTLY AFFIXED TO ALL EQUIPMENT AND MATERIAL FURNISHED UNDER THIS SPECIFICATION. WHERE SUCH EQUIPMENT IS IN A FINISHED OCCUPIED SPACE, THE NAMEPLATE SHALL BE IN A CONCEALED BUT ACCESSIBLE LOCATION. THE NAMEPLATE OF A SUBCONTRACTOR OR DISTRIBUTOR WILL NOT BE ACCEPTABLE.

N. FURNISH AND ATTACH TO EACH VALVE AS HEREINAFTER SPECIFIED, A 1-1/2" DIAMETER BRASS TAG WITH 1/2" INDENTED NUMERALS FILLED WITH DURABLE BLACK COMPOUND. TAGS SHALL BE SECURELY ATTACHED TO STEMS OF VALVES WITH COPPER WIRE AND "S" HOOKS.

O. VALVE CHARTS SHALL CONSIST OF SCHEMATIC DRAWINGS OF PIPING LAYOUTS, SHOWING AND IDENTIFYING EACH VALVE AND DESCRIBING THE FUNCTION. UPON COMPLETION OF THE WORK, ONE (1) COPY OF EACH CHART, SEALED TO RIGID BACKBOARD WITH CLEAR LACQUER PLACED UNDER GLASS AND FRAMED, SHALL BE HUNG IN A CONSPICUOUS LOCATION IN THE MAIN EQUIPMENT ROOM, UNLESS OTHERWISE DIRECTED BY THE ARCHITECT. TWO (2) ADDITIONAL UNMOUNTED COPIES IN 8-1/2" X 11" 3-RING BINDERS SHALL BE DELIVERED TO THE ARCHITECT. ALSO FURNISH THREE (3) COPIES OF SCHEMATIC FLOW CHART WITH CORRESPONDING VALVE NUMBERS NOTED ON CHART.

P. PROVIDE TAGS FOR THE FOLLOWING VALVES:

1. ZONE CONTROL AND BYPASS VALVES
2. SYSTEM DRAIN VALVES, SAFETY AND RELIEF VALVES.

Q. IDENTIFICATION SHALL BE IN ACCORDANCE WITH "SCHEME FOR IDENTIFICATION OF PIPING SYSTEM ANSI A13.1" AND OSHA SAFETY COLOR REGULATION.

R. WHERE PIPE IS TO BE LEFT BARE IT SHALL BE PAINTED WITH TWO (2) COATS OF SELF-PRIMING, MARINE-GRADE SILOXANE EPOXY PAINT IN GLOSS COLORS AS REQUIRED BY ITEM S, BELOW, AND STENCIL AND VALVE TAG SCHEDULE.

1. COLOR SPECIFICATIONS:

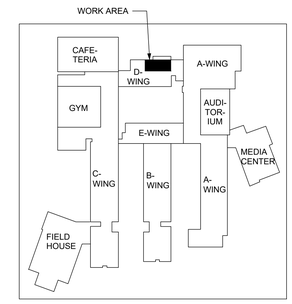
COLOR	NAME	FEDERAL STANDARD NUMBER
BLACK	OSHA BLACK	17038
WHITE	INSIGNIA WHITE	17875
RED	OSHA SAFETY RED	11120
YELLOW	OSHA SAFETY YELLOW	13591

S. PIPE SHALL BE LETTERED AND VALVES TAGGED IN ACCORDANCE WITH THE SCHEDULE BELOW. LETTERING SHALL BE LOCATED NEAR EACH VALVE AND BRANCH CONNECTION AND AT INTERVALS OF NOT OVER 40' (10' ON FIRE LINES) ON STRAIGHT RUNS OF PIPE. PROVIDE FLOW ARROWS FOR ALL PIPING AT EACH MARKER. ADJACENT TO THE LEGEND, STENCIL THE SIZE OF THE PIPE. LETTER COLORS ARE AS FOLLOWS: RED WITH WHITE LETTERS, AND YELLOW WITH BLACK LETTERS.

1. STENCIL AND VALVE TAG SCHEDULE

SERVICE	STENCIL DESIGNATION	COLOR	TAG DESIGNATION
WET SPRINKLER	SPRINKLER	RED	SPK
DRY SPRINKLER	DRY SPRINKLER	RED	D SPK
WET STANDPIPE	STANDPIPE	RED	SPIPE
DRY STANDPIPE	DRY STANDPIPE	RED	DRY SPIPE
COMPRESSED AIR	AIR	YELLOW	AIR
NITROGEN	NITROGEN	YELLOW	N

T. CONTRACTOR TO PROVIDE (3) COPIES OF OWNER & OPERATIONS MANUALS FOR ALL MATERIALS & EQUIPMENT PROVIDED UNDER THIS CONTRACT TO OWNER. OWNER & OPERATIONS MANUALS ARE TO BE FURNISHED IN 8-1/2" X 11" 3-RING BINDER. PROVIDE ALPHABETIC TABLE OF CONTENTS WITH EACH ENTRY TABULATED, INCLUDE LABELED BINDER TABS AT EACH ENTRY. INCLUDING BUT NOT LIMITED TO: FIRE PUMP, JOCKEY PUMP, STORAGE TANKS, VALVES, ETC.



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NJDOE SP #1770-050-XX-XXXX

PROJECT TITLE:
INDUSTRIAL ARTS ALTERATION

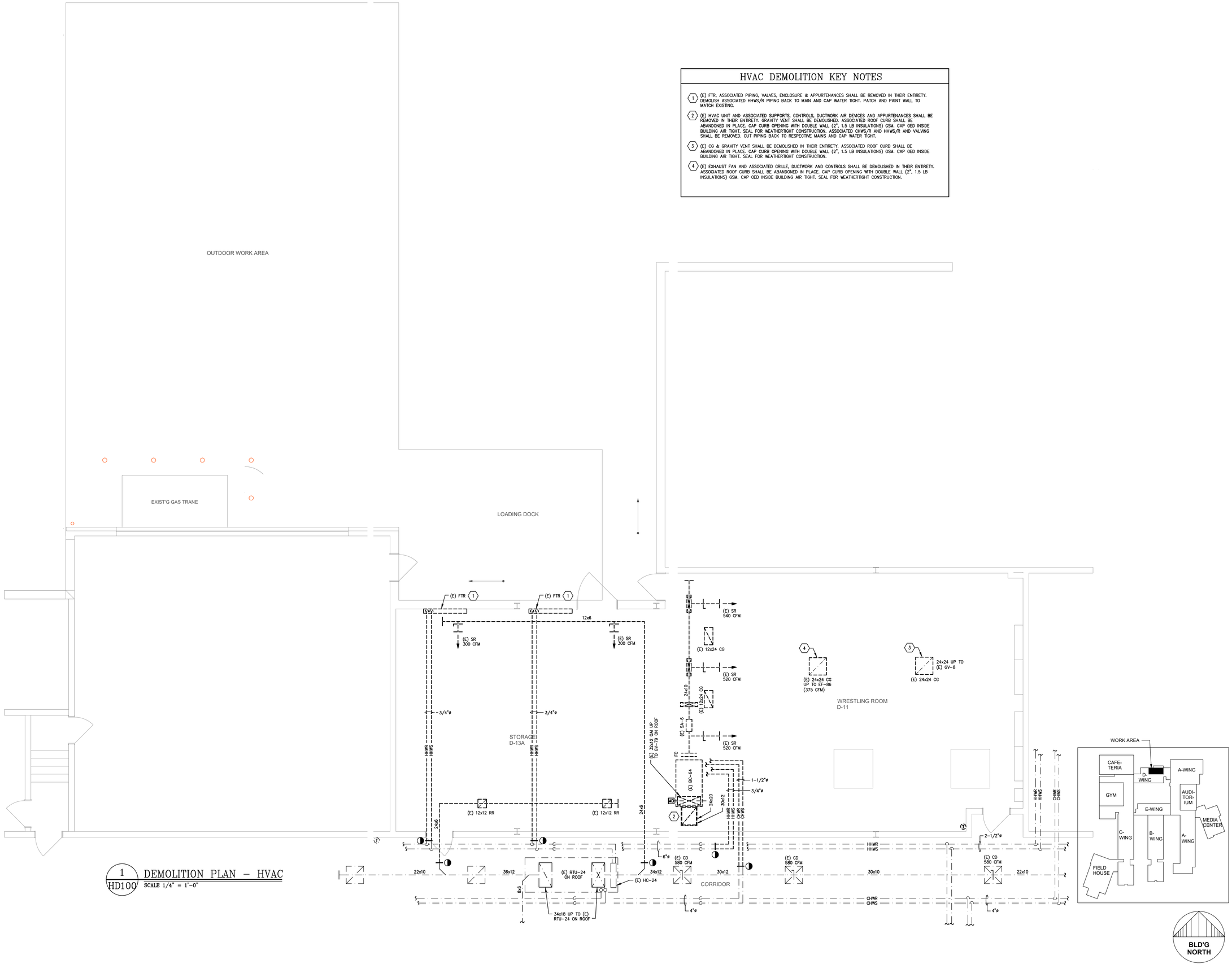
ADDRESS:
GLOUCESTER CITY HIGH SCHOOL
BLOCK 222 / LOT 6
1300 MARKET STREET
GLOUCESTER CITY, NJ 08030

PROJECT NO.:	5672G
SUBMISSION DATE:	
REVISION DATE:	
DRAWING DATE:	24 FEB 2023
PRINT DATE:	24 FEB 2023
DRAWN BY:	ACL
SHEET TITLE:	SPECIFICATIONS - FIRE PROTECTION

FP-200

HVAC DEMOLITION KEY NOTES

1. (E) FTR, ASSOCIATED PIPING, VALVES, ENCLOSURE & APPURTENANCES SHALL BE REMOVED IN THEIR ENTIRETY. DEMOLISH ASSOCIATED HHWS/R PIPING BACK TO MAIN AND CAP WATER TIGHT. PATCH AND PAINT WALL TO MATCH EXISTING.
2. (E) HVAC UNIT AND ASSOCIATED SUPPORTS, CONTROLS, DUCTWORK AIR DEVICES AND APPURTENANCES SHALL BE REMOVED IN THEIR ENTIRETY. GRAVITY VENT SHALL BE DEMOLISHED. ASSOCIATED ROOF CURB SHALL BE ABANDONED IN PLACE. CAP CURB OPENING WITH DOUBLE WALL (2", 1.5 LB INSULATIONS) GSM. CAP OED INSIDE BUILDING AIR TIGHT. SEAL FOR WEATHERTIGHT CONSTRUCTION. ASSOCIATED CHWS/R AND HHWS/R AND VALVING SHALL BE REMOVED. CUT PIPING BACK TO RESPECTIVE MAINS AND CAP WATER TIGHT.
3. (E) CG & GRAVITY VENT SHALL BE DEMOLISHED IN THEIR ENTIRETY. ASSOCIATED ROOF CURB SHALL BE ABANDONED IN PLACE. CAP CURB OPENING WITH DOUBLE WALL (2", 1.5 LB INSULATIONS) GSM. CAP OED INSIDE BUILDING AIR TIGHT. SEAL FOR WEATHERTIGHT CONSTRUCTION.
4. (E) EXHAUST FAN AND ASSOCIATED GRILLE, DUCTWORK AND CONTROLS SHALL BE DEMOUSHED IN THEIR ENTIRETY. ASSOCIATED ROOF CURB SHALL BE ABANDONED IN PLACE. CAP CURB OPENING WITH DOUBLE WALL (2", 1.5 LB INSULATIONS) GSM. CAP OED INSIDE BUILDING AIR TIGHT. SEAL FOR WEATHERTIGHT CONSTRUCTION.



1 HD100 DEMOLITION PLAN – HVAC
SCALE 1/4" = 1'-0"

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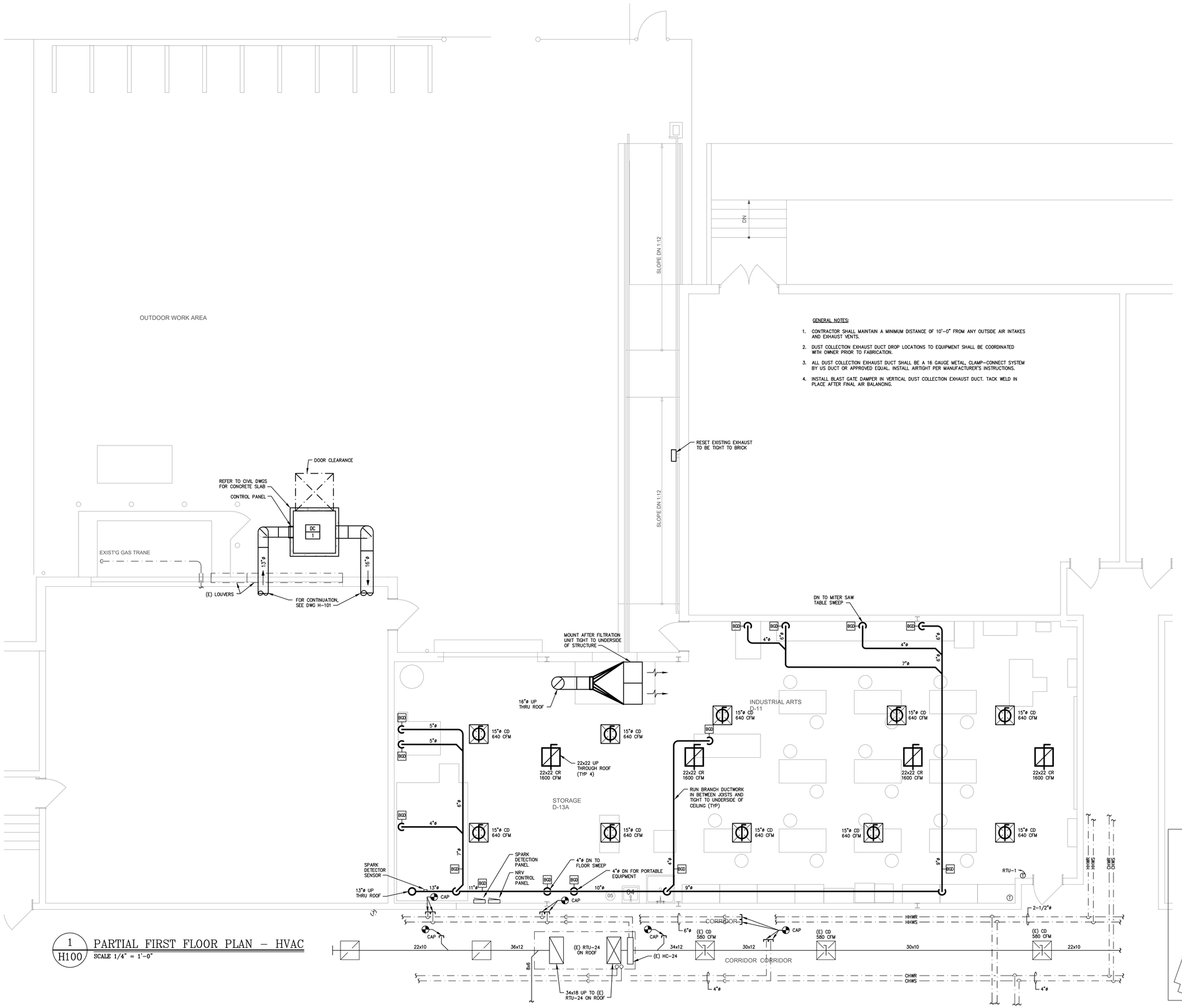
SHEET TITLE:	**DEMOLITION PLAN - HVAC**

HD-100

1 OF 6



1 / H100 PARTIAL FIRST FLOOR PLAN – HVAC
SCALE 1/4" = 1'-0"

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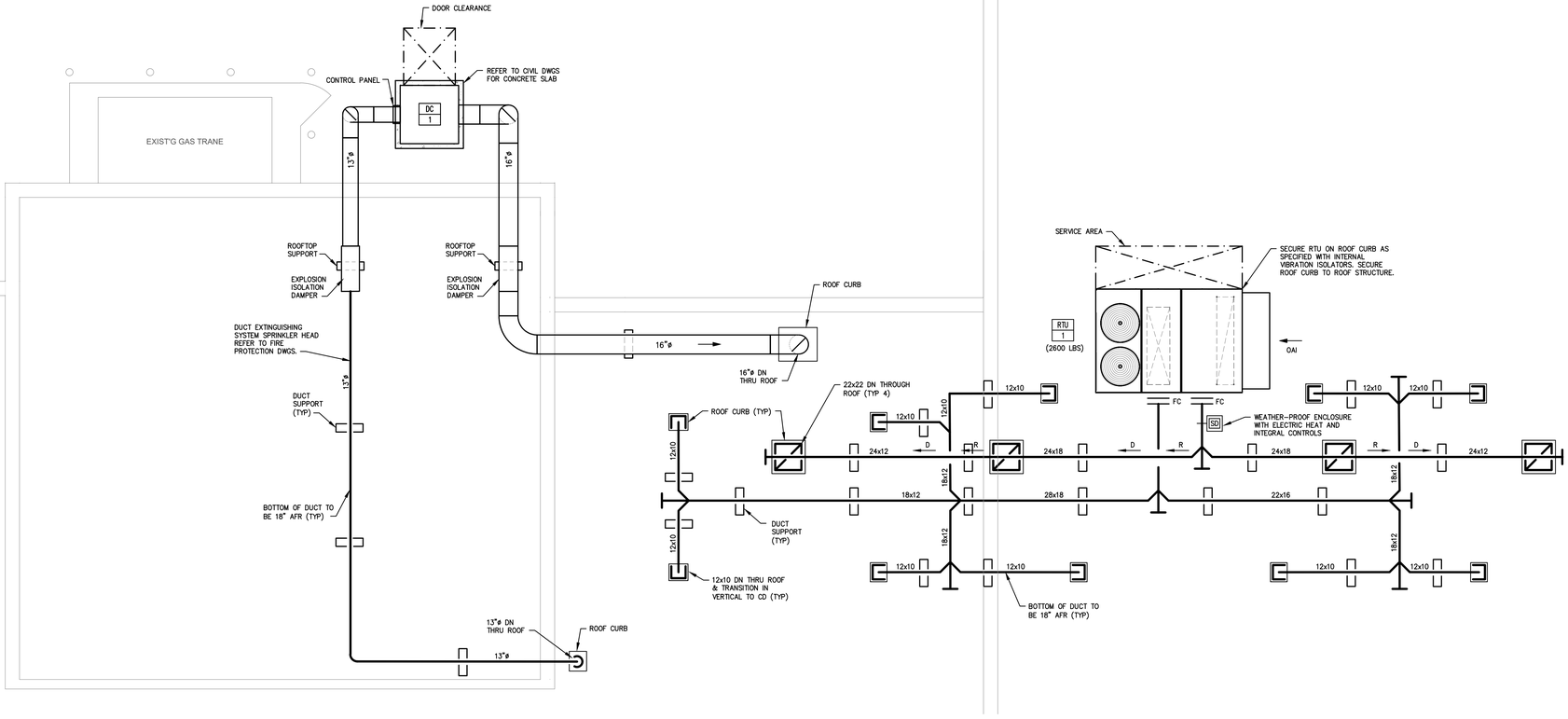

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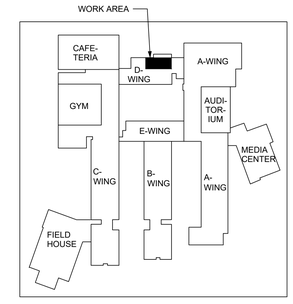
H101

PARTIAL ROOF PLAN – HVAC

SCALE 1/4" = 1'-0"

NOTES:

1. ALL SUPPLY AND RETURN AIR DUCTWORK ABOVE ROOF SHALL BE PRE-FABRICATED DOUBLE-LAYER R-16 DUCTING SYSTEM WITH 0.032" ALUMINUM JACKET WITH KINGSPAN KOOL DUCT PANELS THAT ARE UL LISTED AS A CLASS 1 AIR DUCT SYSTEM BY PTM MANUFACTURING, LLC DUAL-TECH OR APPROVED EQUAL. SECURE AND SUPPORT TO ROOF ACCORDING TO CONTRACT DOCUMENTS AND PER MANUFACTURER'S INSTRUCTIONS.
2. ROOFTOP UNIT AND EQUIPMENT CURB SHALL BE PRE-PURCHASED BY THE OWNER AND RIGGED AND INSTALLED BY CONTRACTOR.



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ABBREVIATIONS

AD	ACCESS DOOR	LBS/HR	POUNDS PER HOUR
AFF	ABOVE FINISHED FLOOR	L	LENGTH
AMPS	AMPERES	LBS	POUNDS
APPROX	APPROXIMATE	LxWxH	LENGTH BY WIDTH BY HEIGHT
ARCH	ARCHITECTURAL	LWT	LEAVING WATER TEMPERATURE
APD	AIR PRESSURE DROP	MAX	MAXIMUM
ATC	AUTOMATIC TEMPERATURE CONTROL	MBH	MAXIMUM MAX THOUSAND BTU PER HOUR
&	AND		
@	AT	MCA	MINIMUM CIRCUIT AMPACITY
BHP	BRAKE HORSEPOWER	MFR	MANUFACTURER
BMS	BUILDING MANAGEMENT SYSTEM	MIN	MINIMUM
CC	COOLING COIL	MOCP	MAX OVER CURRENT PROTECTION
CD	CEILING DIFFUSER	N/A	NOT APPLICABLE
CG	CEILING GRILLE	NK	NECK
CFM	CUBIC FEET PER MINUTE	NOM	NOMINAL
CO	CLEANOUT	# NO	NUMBER
CR	CEILING REGISTER	OA	OUTSIDE AIR
CHWR	CHILLED WATER RETURN	OAI	OUTSIDE AIR INTAKE
CHWS	CHILLED WATER SUPPLY	OCP	OVER CURRENT PROTECTION
D	DRAIN	OD	OUTSIDE DIAMETER
DB	DRY BULB	OED	OPEN ENDED DUCTWORK
DC	DUST COLLECTOR	PC	PUMPED CONDENSATE
DIA, ø	ø DIAMETER	PD	PRESSURE DROP
DN	DOWN	%	PERCENT
DWG	DRAWING	PH	PHASE
EA	EACH, EXHAUST AIR	QTY	QUANTITY
EAT	ENTERING AIR TEMPERATURE	RA	RETURN AIR
EDB	ENTERING DRY BULB	RH	RELATIVE HUMIDITY
ELEC	ELECTRICAL	RL	REFRIGERANT LINES
EQUIP	EQUIPMENT	RM	ROOM
ER	EXHAUST REGISTER	RPM	REVOLUTIONS PER MINUTE
EWB	ENTERING WET BULB	RR	RETURN REGISTER
ESP	EXTERNAL STATIC PRESSURE	SA	SUPPLY AIR
EXIST./(E)	EXISTING	S/S	STAINLESS STEEL
°F	FAHRENHEIT	SD	SMOKE DETECTOR
FA	FACE AREA	SENS	SENSIBLE
FC	FLEXIBLE CONNECTOR	SF	SUPPLY FAN
FLA	FULL LOAD AMPS	SQ FT	SQUARE FOOT
FPM	FEET PER MINUTE	SPEC	SPECIFICATIONS
FT	FEET	SP	STATIC PRESSURE
FTR	FINNED TUBE RADIATION	SR	SUPPLY REGISTER
G	GAS	SS	STAINLESS STEEL
GC	GENERAL CONTRACTOR	T	THERMOSTAT
GV	GRAVITY VENTILATOR	TA	THROW AWAY
H	HEIGHT	TEFC	TOTALLY ENCLOSED, FAN COOLED
HGRH	HOT GAS REHEAT	TEMP	TEMPERATURE
HHWR	HEATING HOT WATER RETURN	TG	TRANSFER GRILLE
HHWS	HEATING HOT WATER SUPPLY	TYP	TYPICAL
HP	HORSE POWER	V/PH/Hz	VOLTS/PHASE/HERTZ
HR	HOUR	VD	VOLUME DAMPER
HTG	HEATING	VRV	VARIABLE REFRIGERANT VOLUME
Hz	HERTZ (FREQUENCY)	WB	WET BULB
ID	INSIDE DIAMETER	(W)	WATT
IN	INCH	W	WIDTH
IWG	INCHES IN WATER GAUGE	W/	WITH
IWC	INCHES OF WATER COLUMN	WMS	WIRE MESH SCREEN
KW	KILOWATTS	WPD	WATER PRESSURE DROP
LAT	LEAVING AIR TEMPERATURE	WT	WEIGHT

SYMBOLS LIST

- X / X — EQUIPMENT DESIGNATION / ITEM NUMBER
- (T) — THERMOSTAT
- BGV — BLAST GATE DAMPER
- MD — MOTORIZED DAMPER
- BAROMETRIC DAMPER
- (SD) — SMOKE DETECTOR
- AIRFLOW THRU UNDERCUT DOOR
- SUPPLY AIR FLOW
- RETURN OR EXHAUST AIRFLOW
- VOLUME DAMPER (MANUAL)
- 8x6 — DUCT SIZE, SECOND FIGURE IS HEIGHT SHOWN
- PIPE TURNED UP
- PIPE TURNED DOWN
- PIPE TEE BRANCH TURNED DOWN
- CD — CONDENSATE DRAIN PIPING
- PITCH PIPE IN DIRECTION OF ARROW
- POINT OF NEW CONNECTION
- POINT OF REMOVAL
- PIPE CAP
- CLEAN-OUT
- DEMOLITION WORK
- NEW WORK (DOUBLE-LINE & EQPT.)
- NEW WORK (SINGLE-LINE)

CD-X / X CFM — SUPPLY CEILING DIFFUSER

CR-X / X CFM — SUPPLY CEILING REGISTER

CR-X / X CFM — RETURN, EXHAUST CEILING REGISTER

CG-X / X CFM — RETURN, EXHAUST CEILING GRILLE

4-WAY 3-WAY 2-WAY 2-WAY 1-WAY

DIFFUSER & REGISTER SCHEDULE

NO.	MARK	REMARKS
1.	CD SHALL BE TITUS MODEL TMS-AA OR APPROVED "EQUAL".	1 2 3 4
2.	SR SHALL BE TITUS MODEL 300-FL OR APPROVED "EQUAL".	2 4
3.	CG/TG, CR/ER/RR SHALL BE TITUS MODEL 350-FL OR APPROVED "EQUAL".	4 5

REMARKS:

1. LOUVERED FACE, HIGH CAPACITY, ALUMINUM DIFFUSER WITH ROUND NECK AND ADJUSTABLE DISCHARGE PATTERN.
2. PROVIDE OPPOSED BLADE VOLUME DAMPER.
3. PROVIDE EQUALIZING GRID.
4. PROVIDE STANDARD WHITE FINISH.
5. ALUMINUM RETURN/EXHAUST REGISTER WITH BLADES AT 3/4" SPACING AND 35° FIXED DEFLECTION. REFER TO DRAWINGS FOR CORRECT MOUNTING STYLE.

VENTILATION SCHEDULE

ROOM NAME	ROOM NUMBER	AREA SQ. FT.	No. OF PEOPLE	REQUIRED OUTSIDE (EXHAUST) AIR CFM PER CODE					PROVIDED VENTILATION AIR (CFM) PER DESIGN				EQUIPMENT TAG No.
				OA PER PERSON	OA PER SQ. FT.	OA TOTAL (MINIMUM)	EA PER SQ. FT.	OA TOTAL (MINIMUM)	SUPPLY	RETURN	OUTSIDE AIR	EXHAUST	
INDUSTRIAL ARTS	D-11	2014	25	10	0.18	613	0.05	101	6400	6400	610	610	RTU-1
–	–	–	–	–	–	–	–	–	–	–	–	–	–

VENTILATION SCHEDULE NOTES:

1. NEW JERSEY STATE ADMINISTRATIVE CODE, EDUCATION – ALL SCHOOL BUILDINGS SHALL BE EQUIPPED WITH A MECHANICAL AIR SUPPLY AND EXHAUST VENTILATION SYSTEM WHICH WILL PROVIDE DURING PERIODS OF OCCUPANCY, STANDARD TEMPERED OUTDOOR AIR SUPPLY AND MECHANICAL EXHAUST AT THE MINIMUM RATE SET FORTH IN THE INTERNATIONAL MECHANICAL CODE VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY.
2. VENTILATION RATES ARE BASED ON 2021 IMC, NJ EDITION.

ROOF TOP UNIT SCHEDULE

RTU 1

MARK No.		RTU-1
LOCATION		ROOF
SERVICE		INDUSTRIAL ARTS D-11
MANUFACTURER		TRANE
MODEL		YSJ180A4SAL
SUPPLY FAN DATA:		
TOTAL AIRFLOW	CFM	6400
MIN OUTSIDE AIR	CFM	610
ESP	IWG	1.25
TSP	IWG	1.57
FAN SPEED	RPM	1379
BRAKE HORSEPOWER	BHP	3.100
MOTOR HORSEPOWER	HP	3.406
QUANTITY / TYPE		2 / PLENUM, DIRECT DRIVE
EXHAUST FAN DATA:		
TOTAL AIRFLOW	CFM	6400
ESP	IWG	1.25
FAN SPEED	RPM	1075
BRAKE HORSEPOWER	BHP	–
MOTOR HORSEPOWER	HP	0.87
TYPE		PLENUM, DIRECT DRIVE
DX COOLING COIL DATA:		
NET SENSIBLE CAPACITY	MBH	152.90
NET TOTAL CAPACITY	MBH	165.99
EAT DB/WB	°F	77.40/62.30
LAT DB/WB	°F	54.06/52.61
FACE VELOCITY	FPM	267
ROWS/FINS		2/18
GAS HEAT DATA:		
INPUT	MBH	250.00
OUTPUT	MBH	175.00
CONNECTION QUANTITY		1
EAT/LAT	°F	54.2/83.49
APD	IWC	0.12
GAS PRESSURE MIN/MAX	IWC	4.5/14
TURNDOWN		10:1
HX MATERIAL		STAINLESS STEEL
HOT GAS REHEAT COIL DATA:		
TOTAL CAPACITY	MBH	125.22
LAT DB/WB	°F	73.83/53.64
APD	IWC	0.05
CONDENSING DATA:		
REFRIGERANT TYPE		R-410A
EER		10.8
COMPRESSOR:		
QUANTITY		2
FLA	AMPS	16.7 + 8.2
CAPACITY CONTROL		INVERTER + FIXED SCROLL
CONDENSER/EVAPORATOR FANS:		
NUMBER OF FANS/MOTORS		2
FULL LOAD CURRENT	AMPS	1.10/4.6
ELECTRICAL DATA:		
POWER	V/PH/HZ	460/3/60
MCA	AMPS	45.0
MOCP	AMPS	50.0
FILTER DATA:		
TYPE		PLEATED
EFFICIENCY		MERV 8 & MERV 13
FILTERS CLEAN SP	IWC	0.38
DIRT ALLOWANCE	IWG	0.57
DIMENSIONS RTU (L x W x H)	IN	124.0 x 87 x 59
APPROX. UNIT WEIGHT	LBS	2600

UNIT SOUND DATA:

FREQUENCY BAND	63	125	250	500	1000	2000	4000	8000
DUCTED DISCHARGE (DB)	80	92	79	72	66	62	62	61
DUCTED INLET (DB)	79	85	72	66	62	59	59	56
RADIATED (DB)	84	88	92	91	87	83	80	74

RTU AND EQUIPMENT CURB SHALL BE PRE-PURCHASED BY THE OWNER AND RIGGED AND INSTALLED BY CONTRACTOR.

PROVIDE THE FOLLOWING:

1. ROOF CURB AS SPECIFIED WITH INTERNAL VIBRATION ISOLATORS. SECURE ROOF CURB TO ROOF STRUCTURE & SECURE RTU TO ROOF CURB.
2. FLEXIBLE CONNECTIONS AT ALL DUCT CONNECTIONS.
3. INVERTER DUTY MOTOR & VFD W/ INTEGRAL NON-FUSED DISCONNECT FOR ALL FAN MOTORS.
4. FACTORY MOUNTED GFI CONVENIENCE OUTLET.
5. COMPLETE DDC CONTROLS, WIRING, RELAYS, TRANSFORMERS, PROGRAMMING, ETC. FOR SATISFACTORY OPERATION.
6. FACTORY START UP & PERSONNEL TRAINING.

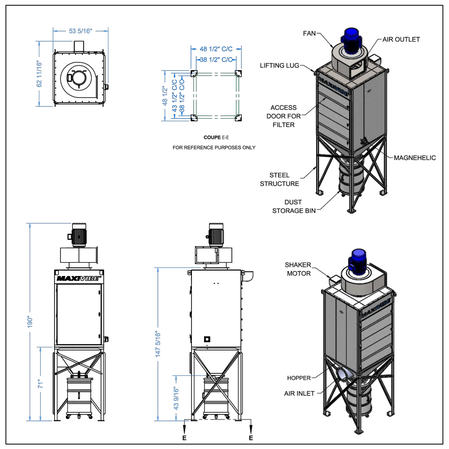
DUST COLLECTOR SCHEDULE

DC 1

DUST COLLECTOR DATA:		
MARK No.		DC-1
MANUFACTURER		MAXVIBE (OR APPROVED EQUAL)
MODEL		AMV-570
MAX. AIR VOLUME	CFM	3,500
TYPE OF FILTER		MULTI POCKET FILTER ENVELOPE
QUANTITY		1
FILTER AREA	SQ. FT.	570
FILTER EFFICIENCY @ 3 MICRONS	%	99
AIR TO CLOTH RATIO @ DESIGN VOLUME	%	6.14/1
DIMENSIONS (W x L x H)	IN	48.5 x 48.5 x 190.0
UNIT WEIGHT (APPROX.)	LBS	2000
BLOWER DATA:		
MANUFACTURER		TWIN CITY FAN
MODEL		BC-SW 150
TYPE OF WHEEL		BI, NON SPARKING
ARRANGEMENT		DIRECT DRIVE, ARR. #4
FLOW RATE	ACFM	4350
TSP	IWG	14.0
FAN SPEED	RPM	3471
BRAKE HORSEPOWER	BHP	13.76
MOTOR HORSEPOWER	HP	15.0
ELECTRICAL DATA:		
FAN MOTOR POWER	V/PH/HZ	208/3/60
SHAKER MOTOR HORSEPOWER	HP	1.0
UNIT AND FAN WEIGHT (APPROX.)	LBS	2600

PROVIDE THE FOLLOWING:

1. INVERTER DUTY MOTOR & VFD W/ INTEGRAL NON-FUSED DISCONNECT FOR FAN MOTOR.
2. FACTORY MOUNTED GFI CONVENIENCE OUTLET.
3. COMPLETE DDC CONTROLS, WIRING, RELAYS, TRANSFORMERS, PROGRAMMING, ETC. FOR SATISFACTORY OPERATION.
4. SOUND INSULATED FAN PLENUM, TWO (2) NFPA RATED DRUM LID KIT AND DRUM AND 14" AND 16" EXPLOSION ISOLATION DAMPERS WITH LOCKING MECHANISM.
5. FACTORY START UP & PERSONNEL TRAINING.
6. AFTER FILTRATION UNIT MODEL AFS-F2 .



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PROJECT TITLE:
INDUSTRIAL ARTS ALTERATION

ADDRESS:
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PROJECT NO.: 5672G

SUBMISSION DATE:	
REVISION DATE:	

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DRAWN BY:	SLB
SHEET TITLE:	SCHEDULES- HVAC

H-200

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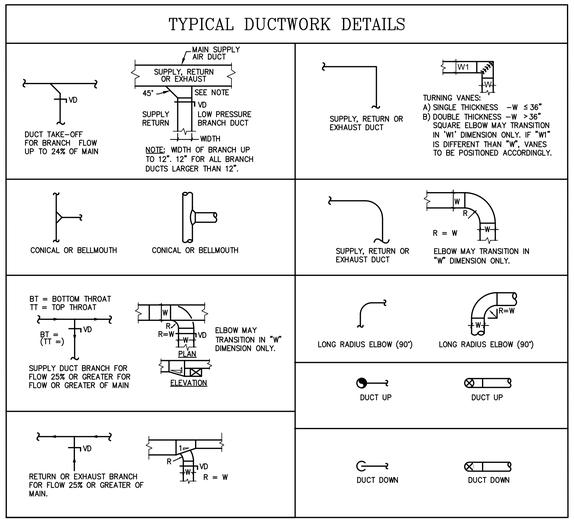
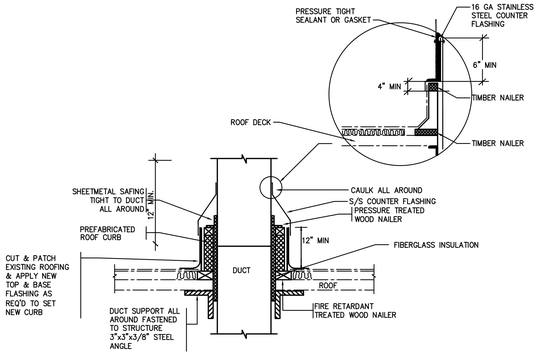
TYPICAL DUCTWORK DETAILS



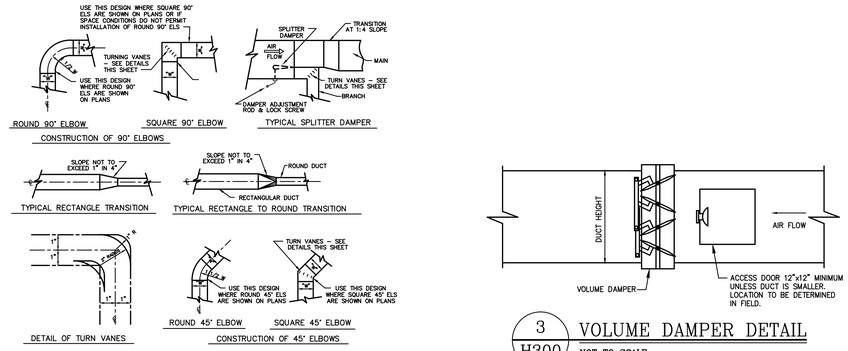


1 H300 — DUCT PENETRATION THROUGH ROOF DETAIL

NOT TO SCALE

NOTES:

1. ALL WOOD SHALL BE PRESSURE TREATED FIRE RETARDANT.

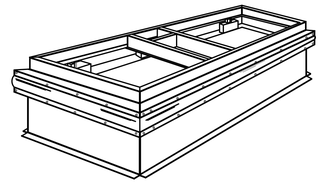


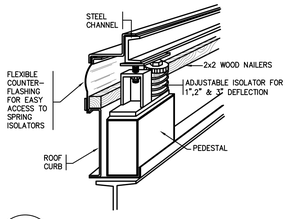
2 H300 — DUCTWORK DETAILS

NOT TO SCALE

3 H300 — VOLUME DAMPER DETAIL

NOT TO SCALE





4 H300 — ROOF CURB DETAIL

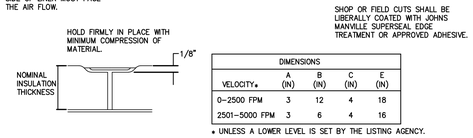
NOT TO SCALE

NOTES:

1. EQUIPMENT CURB SHALL BE PRE-PURCHASED BY THE OWNER AND RIGGED AND INSTALLED BY CONTRACTOR.

DUCT LINER INSTALLATION

PROVIDE METAL NOSING ON EVERY LEADING EDGE. NOSING MAY BE FORMED ON DUCT OR BE CHANNEL OR ZEE ATTACHED BY SCREWS, RIVETS OR WELDS. A METAL NOSING SHALL ALSO BE INSTALLED AT THE FAN DISCHARGE AND AT ANY POINT WHERE LINED DUCT IS PRECEDED BY UNLINED DUCT.

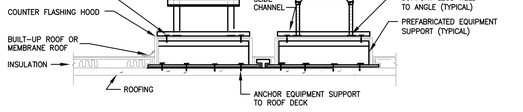


DIMENSIONS				
VELOCITY*	A (IN)	B (IN)	C (IN)	E (IN)
0–2500 FPM	3	12	4	18
2501–5000 FPM	3	6	4	16

* UNLESS A LOWER LEVEL IS SET BY THE LISTING AGENCY.

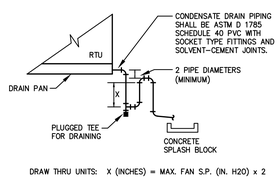
5 H300 — DUCT LINER INSTALLATION DETAIL

NOT TO SCALE



6 H300 — DUCT SUPPORT ON ROOF DETAIL

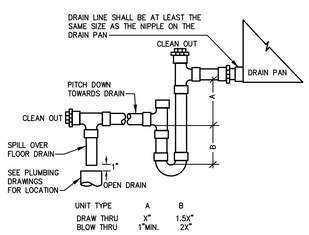
NOT TO SCALE



DRAW THRU UNITS: X (INCHES) = MAX. FAN S.P. (IN. H20) x 2

7 H300 — RTU COOLING COIL CONDENSATE DRAIN PIPING DETAIL

NOT TO SCALE

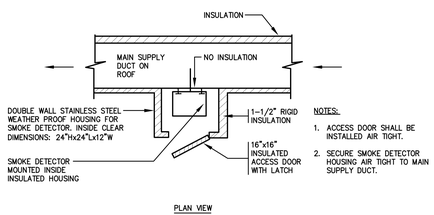


UNIT TYPE	A	B
DRAW THRU	X"	1.5X"
BLOW THRU	1"MIN.	2X"

WHERE X= STATIC PRESSURE IN PAN

8 H300 — AIR HANDLING UNIT DRAIN TRAP DETAIL

NOT TO SCALE



NOTES:

1. ACCESS DOOR SHALL BE INSTALLED AIR TIGHT.
2. SECURE SMOKE DETECTOR HOUSING AIR TIGHT TO MAIN SUPPLY DUCT.

PLAN VIEW

9 H300 — SMOKE DETECTOR HOUSING DETAIL

NOT TO SCALE

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H-300

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HVAC SPECIFICATIONS:

1.0 GENERAL

A. GOVERNING CODES AND STANDARDS
   a. NJ UNIFORM CONSTRUCTION CODE
   b. 2021 INTERNATIONAL BUILDING CODE, NJ EDITION
   c. 2021 INTERNATIONAL MECHANICAL CODE
   d. NFPA STANDARDS 90A
   e. ALL APPLICABLE ASHRAE STANDARDS
   f. ALL APPLICABLE SMACNA STANDARDS
   g. 2020 NATIONAL ELECTRICAL CODE
   h. UL (ALL EQUIPMENT MUST BE LABELED)
   i. NEBB.

B. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH RECOGNIZED INDUSTRY STANDARDS, GOVERNING CODES, APPROVED SHOP DRAWINGS AND MANUFACTURER'S INSTRUCTIONS.

C. PERMITS: SEE "PERMITS" IN CONSTRUCTION NOTES ON SHEET CS

D. WARRANTY: THE EQUIPMENT SHALL HAVE A MANUFACTURER'S WARRANTY FOR A PERIOD OF TWO (2) YEARS FROM DATE OF SUBSTANTIAL COMPLETION BY OWNER. IF DURING THIS PERIOD, ANY PART SHOULD FAIL TO FUNCTION PROPERLY DUE TO DEFECTS IN WORKMANSHIP OR MATERIAL, IT SHALL BE REPLACED OR REPAIRED AT THE DISCRETION OF THE MANUFACTURER. MANUFACTURER SHALL HAVE FIFTEEN YEARS EXPERIENCE IN THE U.S. MARKET.

E. BEFORE SUBMITTING BIDS, CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND BECOME THOROUGHLY FAMILIAR WITH THE OBSERVABLE EXISTING CONDITIONS AFFECTING HIS WORK. NO ADDITIONAL COMPENSATION WILL BE GRANTED ON ACCOUNT OF EXTRA WORK MADE NECESSARY BY THE CONTRACTOR'S FAILURE TO INVESTIGATE EXISTING CONDITIONS.

F. SUBMIT COMPOSITE COORDINATION SHOP DRAWINGS THAT SHOW ALL EXISTING AND NEW DUCTWORK, HVAC PIPING, PLUMBING PIPING, CONDUITS, LIGHTING FIXTURES, BUILDING STRUCTURE, CEILING/ROOF MOUNTED EQUIPMENT, ETC. EXACT ELEVATION OF ALL COMPONENTS SHALL BE INDICATED

G. CONTRACTOR SHALL SUBMIT MARKED UP HVAC DRAWINGS TO ENGINEER TO SHOW "AS-BUILT" CONDITIONS AFTER SATISFACTORY COMPLETION OF PROJECT.

H. CONTRACTOR SHALL PROVIDE OWNER WITH THREE (3) COPIES OF OPERATION AND MAINTENANCE MANUALS PRIOR TO ACCEPTANCE OF FINAL PAYMENT.

2.0 SUBMITTALS

A. SHOP DRAWINGS SHALL BE REQUIRED FOR: ALL EQUIPMENT, MATERIALS, MEANS & METHODS INTENDED FOR USE UNDER THIS CONTRACT.

B. PRIOR TO DELIVERY TO THE JOB SITE, BUT SUFFICIENTLY IN ADVANCE OF REQUIREMENTS NECESSARY TO ALLOW ARCHITECT AMPLE TIME FOR REVIEW, SUBMIT SHOP DRAWINGS OF ALL EQUIPMENT, FIXTURES, MATERIAL, PIPING, DUCTWORK, SLEEVES, WIRING DIAGRAMS, ETC. AND FURTHER OBTAIN WRITTEN COMMENTS OF "APPROVED" OR "APPROVED AS NOTED" FOR THE SAME FROM ARCHITECT BEFORE INSTALLING ANY OF THESE ITEMS.

C. SHOP DRAWINGS SHALL CONSIST OF MANUFACTURER'S CERTIFIED SCALE DRAWINGS, CUTS, OR CATALOGUES, INCLUDING DESCRIPTIVE LITERATURE AND COMPLETE CERTIFIED CHARACTERISTICS OF EQUIPMENT, FIXTURES, ETC. SHOWING DIMENSIONS, CAPACITY, CODE REQUIREMENTS, MOTOR AND DRIVE TESTING, AS INDICATED IN THE CONTRACT DOCUMENTS.

D. CERTIFIED PERFORMANCE CURVES FOR ALL MECHANICAL EQUIPMENT SHALL BE SUBMITTED FOR REVIEW.

E. SAMPLES, DRAWINGS, SPECIFICATIONS, CATALOGUES, ETC., SUBMITTED FOR REVIEW SHALL BE PROPERLY LABELED INDICATED PROJECT NAME, AND SPECIFIC SERVICE FOR WHICH MATERIAL OR EQUIPMENT IS TO BE USED.

F. FAILURE TO SUBMIT SHOP DRAWINGS IN AMPLE TIME FOR CHECKING SHALL NOT ENTITLE AN EXTENSION OF CONTRACT TIME, AND NO CLAIM FOR EXTENSION BY REASON OF SUCH DEFAULT SHALL BE ALLOWED.

G. PRIOR TO SUBMISSION OF SHOP DRAWINGS, CONTRACTOR SHALL THOROUGHLY CHECK EACH SHOP DRAWING, REJECT THOSE NOT CONFORMING TO THE SPECIFICATIONS, AND INDICATE BY SIGNED, STAMPED, & WRITTEN DECLARATION THAT THE SHOP DRAWINGS SUBMITTED MEET CONTRACT REQUIREMENTS.

H. THE COMMENT "APPROVED" OR "APPROVED AS NOTED" RENDERED ON SHOP DRAWINGS SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR BUILDING CONDITIONS. WHERE DRAWINGS ARE REVIEWED, SAID REVIEW DOES NOT IN ANY WAY RELIEVE THE RESPONSIBILITY, OR NECESSITY, OF FURNISHING MATERIAL OR PERFORMING WORK AS REQUIRED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS

I. "APPROVED AS NOTED" MEANS, UNLESS OTHERWISE NOTED ON THE DRAWINGS, TO APPROVE FOR CONSTRUCTION, FABRICATION, AND/OR MANUFACTURE SUBJECT TO THE PROVISION THAT THE WORK SHALL BE CARRIED OUT IN COMPLIANCE WITH ALL ANNOTATIONS AND/OR CORRECTIONS INDICATED ON THE SHOP DRAWINGS AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
   1. WHERE THE COMMENT "APPROVED AS NOTED" INCLUDES DIRECTION TO THE CONTRACTOR TO RESUBMIT CORRECTED SHOP DRAWINGS FOR RECORD; FAILURE TO COMPLY WITH THE INSTRUCTION TO RESUBMIT RECORD COPY SHALL RENDER ALL APPROVAL NULL AND VOID.

3.0 IDENTIFICATION

A. PROVIDE IDENTIFICATION FOR DUCTWORK AND EQUIPMENT.

B. IDENTIFICATION SHALL BE IN ACCORDANCE WITH "SCHEME FOR IDENTIFICATION OF PIPING SYSTEM ANSI A13.1" AND OSHA SAFETY COLOR REGULATION.

C. PROVIDE FOR EACH ITEM OF EQUIPMENT, A PERMANENTLY ATTACHED NAMEPLATE MADE OF BLACK SURFACE, WHITE CORE LAMINATED BAKELITE WITH INCISED LETTERS. SUBCONTRACTOR FURNISHING EQUIPMENT SHALL PROVIDE NAMEPLATE. NAMEPLATES SHALL BE A MINIMUM OF 3" LONG BY 1 1/2" WIDE AND SHALL BEAR THE EQUIPMENT NAME AND ITEM NUMBER OF 1/2" HIGH WHITE LETTERS AS DESIGNATED IN THE EQUIPMENT SCHEDULE. MOUNTING SCREWS SHALL HAVE CHROME PLATED ACORN HEADED SCREWS.

4.0 BALANCING

A. NEBB CERTIFIED BALANCING COMPANY MUST BE A COMPANY WHICH IS INDEPENDENT OF THE CONTRACTOR AND BE APPROVED FOR USE BY THE OWNER PRIOR TO BALANCING THE SYSTEM.

B. BALANCE THE HEATING AND COOLING SYSTEMS TO PROVIDE UNIFORM TEMPERATURES IN ALL HEATED OR COOLED AREAS AND ROOMS.

C. BALANCE AIR SYSTEMS TO QUANTITIES INDICATED AND FURNISH A REPORT INDICATING DIFFUSER, REGISTER SIZES, LOCATIONS AND CFM VALUES INCLUDING ACTUAL FAN PERFORMANCE DATA.

D. THE CONTRACTOR SHALL SUBMIT AN AIR BALANCE REPORT PRIOR TO FINAL ACCEPTANCE.

E. THE FOLLOWING DATA SHALL BE OBTAINED AND RECORDED:
   1. FAN AND MOTOR RPM.
   2. MOTOR AND CURRENT VOLTAGE.
   3. FAN, COIL AND FILTER STATICS.
   4. NAMEPLATE DATA ON FAN AND MOTOR.
   5. MOTOR SHEAVE, FAN PULLEY AND BELT SIZES.

F. TRAVERSE MAIN SUPPLY AND RETURN DUCTS TO DETERMINE CFM DELIVERIES OF VENTILATION SYSTEM.

G. MEASURE THE SYSTEM DUCT STATIC PRESSURE AT SELECTED POINTS THROUGHOUT THE SYSTEM. MONITORING POINTS SHALL BE IN THOSE DUCT RUNS THAT ARE OF THE LONGEST EQUIVALENT LENGTH (GREATEST FRICTION LOSS). MONITOR THESE POINTS DURING THE ADJUSTING AND BALANCING PROCEDURE TO ASSURE PROPER INLET STATIC PRESSURE IS BEING MAINTAINED TO TERMINAL BOXES.

H. MAKE PRELIMINARY OUTLET READINGS AND BALANCE THE OUTLETS TO DESIGN CFM AND RECORD ALL READINGS.

5.0 SHEET METAL WORK

A. FURNISH AND INSTALL ALL SHEET METAL DUCTWORK, PLENUMS, AND ITEMS OF METAL WORK AS NECESSARY TO COMPLETE THE VARIOUS AIR CONDITIONING, VENTILATING AND HEATING SYSTEMS OF THE BUILDING SO THEY ARE READY FOR SATISFACTORY OPERATION. WHILE THE INSTALLATION SHOULD ADHERE TO THE PLANS AND SPECIFICATIONS AS MUCH AS POSSIBLE, THE CONTRACTOR SHALL BE ENTITLED TO MODIFY THE RUNS AND SIZES OF THE DUCTWORK AND TO MAKE OFFSETS, WHERE NECESSARY TO ACCOMMODATE BUILDING CONDITIONS, ONLY AFTER RECEIPT OF WRITTEN APPROVAL FROM THE ENGINEER. ALL SUCH CHANGES OR OFFSETS SHALL BE INDICATED IN THE "AS-BUILT" DRAWINGS SUBMITTED AT THE END OF THE JOB.

B. DUCTWORK SHALL BE CONSTRUCTED ACCORDING TO THE "EQUIPMENT HANDBOOK" PUBLISHED BY ASHRAE AND "HVAC DUCT CONSTRUCTION STANDARDS" PUBLISHED BY SMACNA.

C. SHEET METAL GAUGES, TRANSVERSE JOINTS, LONGITUDINAL SEAMS AND INTERMEDIATE REINFORCING MUST BE IN CONFORMANCE WITH SMACNA STANDARDS FOR 6" W.G. AND SEAL CLASS A.

D. ALL SUPPLY DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED STEEL OF U.S. D. STANDARD SHEET METAL GAUGE UNLESS NOTED OTHERWISE ON THE DRAWINGS. ALL JOINTS SHALL BE SEALED AIRTIGHT WITH 3MEC-800. CONNECTIONS TO FAN SHALL BE THRU ACID RESISTANT RUBBER NOT LESS THAN 4" LONG, FUME TIGHT AND SECURELY FASTENED WITH COPPER METAL BANDS.

E. ALL CHANGES IN DIRECTION, HORIZONTAL OR VERTICAL, SHALL BE SHAPED TO PERMIT THE EASIEST POSSIBLE AIR FLOW, USING CENTERLINE RADIUS OF 1-1/2 X WIDTH. FOR ALL CASES WHERE 90 DEGREE SQUARE ELBOWS ARE USED, APPROVED DOUBLE THICKNESS TURNING VANES SHALL BE USED. HVAC CONTRACTOR SHALL SUBMIT DETAILS FOR APPROVAL.

F. ALL DUCTWORK SHALL BE BUILT WITH APPROVED JOINTS AND SEAMS SMOOTH ON THE INSIDE WITH LAPS MADE IN THE DIRECTION OF THE AIR FLOW AND NO FLANGES PROJECTING INTO THE AIR STREAM. OUTSIDE SEAMS AND JOINTS SHALL BE AS NEAR TO AIR TIGHT AS POSSIBLE WITH A NEAT FINISH. THE CONTRACTOR SHALL CAULK ALL JOINTS WHICH ARE NOT MECHANICALLY TIGHT.

G. LONGITUDINAL JOINTS SHALL BE PITTSBURGH LOCK AT CORNERS OR ACME LOCK ON FLAT SURFACES DOUBLE SEAMS HAMMERED TIGHT AND SHALL BE LOCATED ABOVE THE HORIZONTAL AXIS OF THE DUCT. A SNAP LOCK SEAM SHALL NOT BE PERMITTED AS A SUBSTITUTE FOR THE PITTSBURGH LOCK AT CORNERS OF DUCTS.

H. TRAVERSE JOINTS SHALL BE MADE AIRTIGHT WITH ALL LAPS IN THE DIRECTIONS OF AIR FLOW.

I. VOLUME DAMPERS AS SHOWN ON DRAWINGS AND AS REQUIRED FOR PROPER OPERATION SHALL BE INSTALLED IN THE VARIOUS BRANCHES FOR USE IN BALANCING THE SYSTEM. VOLUME DAMPERS SHALL BE OF MULTI-OPPOSED BLADE CONSTRUCTION WITH LOCKING QUADRANTS FOR ALL DUCTS OVER 12" IN DEPTH. MOUNTED OUTSIDE OF THE DUCT IN AN ACCESSIBLE PLACE. VOLUME DAMPERS SHALL BE RUSKIN MODEL MD35 OR APPROVED EQUAL WITH END BEARINGS, STAND OFF FOR INSULATED DUCTWORK AND CONTINUOUS AXLE & LOCKING QUADRANT.

J. ALL DUCTWORK SHALL BE INSTALLED AS HIGH AS POSSIBLE TO MAXIMIZE HEADROOM.

K. ALL DUCTWORK SHALL BE HUNG FROM THE BUILDING STRUCTURE.

L. ALL SUPPLY AND RETURN DUCTWORK SHALL BE INSULATED WITH FIBERGLASS INSULATION WRAP AND VAPOR BARRIER. INSULATION WRAP SHALL MEET THE REQUIREMENTS OF NFPA 90A, WITH FLAME SPREAD, SMOKE DEVELOPMENT, AND FUEL CONTRIBUTED NOT EXCEEDING 25, 50, AND 50 RESPECTIVELY AS TESTED BY PROCEDURE ASTM-84, NFPA 255, AND UL 723 UNLESS OTHERWISE NOTED. INSULATION WRAP SHALL PROVIDE MINIMUM R VALUE OF 6.0 WHEN INSTALLED.

6.0 SUPPORTS

A. ALL SUPPORTS AND HANGERS FOR EQUIPMENT, DUCTWORK AND PIPING UNDER THIS CONTRACT SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.

B. ALL HANGERS, SUPPORTS, & HARDWARE SHALL BE GALVANIZED UNLESS OTHERWISE INDICATED.

C. WHERE EXCESSIVE LOADING REQUIRES PROPER DISTRIBUTION OF THE WEIGHT, PROPER SUPPORTS MUST BE PROVIDED, SUBJECT TO THE ARCHITECT'S APPROVAL. ALL SUPPORTS SHALL BE OF STRUCTURAL STEEL.

7.0 PIPING

7.1 CONDENSATE DRAIN PIPING

A. ALL PIPES SHALL BE NEW, FREE FROM SCALE OR RUST, OF THE MATERIAL AND WEIGHT SPECIFIED UNDER THE VARIOUS SERVICES. EACH LENGTH OF PIPE SHALL BE PROPERLY MARKED AT THE MILL FOR PROPER IDENTIFICATION WITH NAME OR SYMBOL OF MANUFACTURER.

B. ALL COPPER TUBING SHALL BE OF WEIGHT AS REQUIRED FOR SERVICE SPECIFIED, WITH CONFORMANCE WITH ASTM B-88 FOR TYPES "L" AND "K" TUBING, AS MANUFACTURED BY CHASE, ANACONDA, REVERE, OR APPROVED EQUAL. TUBING AND FITTINGS SHALL BE THOROUGHLY CLEANED WITH SAND CLOTH AND TREATED WITH AN APPROVED NON-CORROSIVE FLUX BEFORE SOLDER IS APPLIED.

C. COPPER TUBING JOINTS SHALL BE MADE WITH 95-5 SOLDER FOR WATER APPLICATIONS.

SERVICE	MATERIAL	SCHEDULE
OVERFLOW AND DRAIN	COPPER	TYPE L (HARD)

7.2 FITTINGS

A. FITTINGS SHALL BE OF MATERIAL CONFORMING TO THE FOLLOWING SCHEDULE: SOLDER FITTINGS ASTM B-88, 150 LBS. FOR WATER SERVICE & 300 LBS. FOR REFRIGERANT.

B. ALL FITTINGS USED AT EXPANSION LOOPS OR BENDS SHALL BE EXTRA HEAVY.

C. FLANGES SHALL BE RAISED FACE, OF THE SAME WEIGHT AS THE FITTINGS IN EACH SERVICE CATEGORY. ALL FLANGES SHALL BE DRILLED TO "US STANDARD" HEX NUTS AND WASHERS. BOLTING SHALL CONFORM TO ASTM 193 GRADE B-7, THREADS CLASS 7 FIT. NUTS SHALL BE SEMI-FINISHED HEXAGONAL, ANSI B18.2 ASTM A194 GRADE 2H.

7.3 PIPE HANGERS AND SUPPORTS

A. PROVIDE NECESSARY STRUCTURAL MEMBERS, HANGERS AND SUPPORTS OF APPROVED DESIGN TO KEEP PIPING IN PROPER ALIGNMENT AND PREVENT TRANSMISSION OF INJURIOUS THRUSTS AND VIBRATIONS. IN ALL CASES WHERE HANGERS, BRACKETS, ETC., ARE SUPPORTED FROM CONCRETE CONSTRUCTION, CARE SHALL BE TAKEN NOT TO WEAKEN CONCRETE OR PENETRATE WATERPROOFING. ALL HANGERS AND SUPPORTS SHALL BE CAPABLE OF SCREW ADJUSTMENT AFTER PIPING IS ERECTED. HANGERS SUPPORTING PIPING EXPANDING INTO LOOPS, BENDS AND OFFSETS SHALL BE SECURED TO THE BUILDING STRUCTURE IN SUCH A MANNER THAT HORIZONTAL ADJUSTMENT PERPENDICULAR TO THE RUN OF PIPING SUPPORTED MAY BE MADE TO ACCOMMODATE DISPLACEMENT DUE TO EXPANSION. ALL SUCH HANGERS SHALL BE FINALLY ADJUSTED, BOTH IN THE VERTICAL AND HORIZONTAL DIRECTION, WHEN THE SUPPORTED PIPING IS HOT, OR CHILLED, AS REQUIRED. ALL PIPE HANGERS, SUPPORTS, & HARDWARE SHALL BE GALVANIZED UNLESS OTHERWISE INDICATED. METAL TO METAL CONTACT IS TO BE AVOIDED. HANGERS IN CONTACT WITH COPPER SHALL BE COPPER PLATED STEEL.

B. PIPE HANGERS SHALL BE THE CLEVIS TYPE, EXCEPT WHERE OTHERWISE NOTED.

PIPE HANGER SCHEDULE:

PIPE	MAKE AND MODEL TYPE OF HANGER	GRINNELL FIG. NO.	F & M FIG. NO.	CARPENTER& PATERSON FIG. NO.
2" & SMALLER (COPPER)	ADJUSTABLE WROUGHT IRON	CT-65	364	100CT

C. HANGER RODS SHALL BE OF THE FOLLOWING DIAMETERS:

PIPE SIZE:	ROD DIAMETER:	MAXIMUM SPACING:
1 1/4" & BELOW	3/8"	6' - 0"
1 1/2" AND 2"	3/8"	10' - 0" (COPPER 8' - 0")

D. BEAM CLAMPS – HANGERS SUPPORTED FROM FLOOR STEEL SHALL BE APPROVED I BEAM CLAMPS. I BEAM CLAMPS FOR HANGERS SUPPORTING PIPING 2" AND SMALLER SHALL BE C & P FIG. NO. 148 ADJUSTABLE BEAM CLAMPS.

E. ALL VERTICAL PIPING SHALL BE ANCHORED BY MEANS OF HEAVY STEEL CLAMPS SECURELY BOLTED OR WELDED TO THE PIPING, AND WITH END EXTENSION BEARING ON THE BUILDING.

F. PIPING SHALL NOT BE HUNG FROM OTHER PIPING DUCTS, CONDUITS OR FROM EQUIPMENT OF OTHER TRADES AND NO VERTICAL EXPANSION SHIELDS WILL BE PERMITTED. HANGER RODS SHALL NOT PIERCE DUCTS.

G. ALL WATER PIPING CONNECTED TO ROTATING EQUIPMENT WITHIN ALL MECHANICAL SPACES SHALL BE ISOLATED FROM THE BUILDING STRUCTURE BY MEANS OF VIBRATION HANGERS INSERTED IN THE HANGER RODS. THE VIBRATION HANGERS SHALL CONSIST OF A STEEL SPRING IN COMBINATION WITH A DOUBLE DEFLECTION NEOPRENE ELEMENT WITHIN A RECTANGULAR STEEL HOUSING. COMBINED STATIC DEFLECTION SHALL BE 1.375" MINIMUM. HANGERS SHALL HAVE CAPABILITY OF SUPPORTING THE PIPING AT A FIXED ELEVATION DURING INSTALLATION AND SHALL INCORPORATE AN ADJUSTING DEVICE TO TRANSFER THE LOAD TO THE SPRING. DEFLECTION SHALL BE INDICATED BY MEANS OF SCALE. VIBRATION HANGERS SHALL BE TYPE PCDNHS MADE BY MASON INDUSTRIES.

H. WHERE ADDITIONAL STEEL IS REQUIRED FOR THE SUPPORT OF HANGERS, FURNISH AND INSTALL SAME SUBJECT TO THE APPROVAL OF THE ARCHITECT.

I. PIPING RUNNING ON WALLS SHALL BE SUPPORTED BY MEANS OF HANGER SUSPENDED FROM HEAVY ANGLE IRON WALL BRACKETS. NO WALL HOOKS WILL BE PERMITTED.

J. LATERAL BRACING OF HORIZONTAL PIPE SHALL BE PROVIDED WHERE REQUIRED TO PREVENT SIDE SWAY OR VIBRATION. THE LATERAL BRACING SHALL BE OF A TYPE APPROVED BY THE ARCHITECT AND SHALL BE INSTALLED WHERE DIRECTED BY THE ARCHITECT.

7.4 REFRIGERATION PIPING

A. UNLESS OTHERWISE NOTED, ALL REFRIGERATION PIPING SHALL BE REFRIGERATION ACR GRADE ANNEALED OR DRAWN TEMPER COPPER TUBING, DEGREASED, & SEALED.

B. FITTINGS SHALL BE WROUGHT COPPER OR FORGED BRASS AND ONLY LONG RADIUS ELBOWS OR FORMED LONG SWEEP ELBOWS SHALL BE USED. ALL CHANGES IN LINE SIZE SHALL BE ACCOMPLISHED WITH FITTINGS. ABSOLUTELY NO STAB-INS ARE PERMITTED.

C. ALL PIPING JOINTS SHALL BE BRAZED WITH SILVER SOLDER, WITH CONTINUOUS N2 PURGE.

D. PROTECTION OF THE PIPING SYSTEMS SHALL BE THIS CONTRACTOR'S RESPONSIBILITY. TEMPORARY PROTECTION SHALL BE PROVIDED UNTIL THE JOB IS IN SATISFACTORY CONDITION, AND PERMANENT PROTECTION SHALL BE PROVIDED AS REQUIRED TO PROTECT THE PIPING, FITTING, ETC FROM DAMAGE.

E. INSTALL SCHRADER TYPE VALVES AT THE EVAPORATOR OUTLET OF EACH FIXTURE TO FACILITATE THE ADJUSTMENT OF SUPER HEAT SETTINGS AND TO ESTABLISH PRESSURE DROP. LIQUID LINES CAN BE AFFIXED TO THE SUCTION INSULATION VIA APPROVED DUCT TAPES.

F. SIZE, CHARGE, AND INSULATION OF ALL REFRIGERANT PIPING SHALL BE IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S INSTRUCTIONS.

7.5 REFRIGERATION VALVES

A. ALL VALVES FOR REFRIGERATION SERVICES SHALL BE DIAPHRAGM PACKLESS VALVES. FORGED BRASS OR CAST BRONZE, GLOBE DESIGN WITH STRAIGHT THROUGH OR ANGLE PATTERN. WORKING PRESSURE RATING: 500 PSIG. MAXIMUM OPERATING TEMPERATURE: 275°F.

8.0 PIPING INSULATION

8.1 CONDENSATE PIPING INSULATION

A. THE FOLLOWING PIPING SHALL BE COVERED WITH FIBERGLASS INSULATION WITH VAPOR BARRIER OF THE FOLLOWING THICKNESS:

SERVICE	THICKNESS
CONDENSATE DRAIN	1/2"

B. INSULATION SHALL BE GLASS FIBER WITH A MAXIMUM K FACTOR OF 0.23 AT 75 DEGREES F. MEAN TEMPERATURE WITH FACTORY-APPLIED ALL SERVICE VAPOR BARRIER JACKET. DENSITY SHALL BE NOT LESS THAN 3 LBS. PER CUBIC FOOT.

C. INSULATION SHALL BE HEAVY DENSITY FIBERGLASS SECTIONAL PIPE INSULATION AS MADE BY OWENS-CORNING FIBERGLAS CORP. OR CSG'S "SNAP-ON" OR MANVILLE "FLAME SAFE" FIBERGLASS INSULATION.

D. ALL FITTINGS, VALVES AND FLANGES FOR PIPE SIZES SMALLER THAN 4" SHALL BE INSULATED WITH MOLDED FIBER GLASS FITTINGS OF SAME THICKNESS AS THE ADJOINING PIPE INSULATION, SECURED WITH NO. 20 GAUGE GALVANIZED ANNEALED STEEL WIRE ZESTON 25/50 PVC AS MADE BY MANVILLE, OR APPROVED EQUAL.

E. DIRECT CONTACT BETWEEN PIPE AND HANGER SHALL BE AVOIDED.

F. AT PIPE SUPPORTS INSULATION SHIELD PROTECTION SADDLES, HIGH DENSITY INSULATION SUPPORT BLOCKS, AND MATCHING HANGER SHALL BE USED.

8.2 PVC INSULATED FITTING COVERS

A. THE CONTRACTOR SHALL HAVE OPTION TO USE ZESTON 25/50 RATED PVC COVERS AS MADE BY MANVILLE OR APPROVED EQUAL.

8.3 REFRIGERATION PIPING INSULATION

A. THE FOLLOWING PIPING SHALL BE COVERED WITH CLOSED CELL ELASTOMERIC INSULATION WITH VAPOR BARRIER OF THE FOLLOWING THICKNESS:

SERVICE	THICKNESS
REFRIGERANT PIPING	3/4"

B. INSULATION SHALL BE FLEXIBLE CLOSED CELL ELASTOMERIC WITH A MAXIMUM K FACTOR OF 0.27 AT 75 DEGREES F MEAN TEMPERATURE.

C. INSULATION SHALL BE MANUFACTURED BY ARMACELL LLC OR APPROVED EQUAL.

9.0 – EXECUTION

9.1 INSTALLATION

A. COORDINATE WITH OTHER WORK AS NECESSARY TO INTERFACE INSTALLATION OF PIPING WITH OTHER COMPONENTS OF SYSTEMS.

B. PROVIDE AND ERECT IN A WORKMANLIKE MANNER, ACCORDING TO THE BEST PRACTICES OF THE TRADE, ALL PIPING SHOWN ON THE DRAWINGS OR REQUIRED TO COMPLETE THE INSTALLATION INTENDED BY THESE SPECIFICATIONS.

C. THE DRAWINGS INDICATE SCHEMATICALLY THE SIZE AND LOCATION OF PIPING. PIPING SHALL BE SET UP AND DOWN AND OFFSET TO MEET FIELD CONDITIONS AND TO PROVIDE ADEQUATE MAINTENANCE ROOM AND HEADROOM IN THE SERVICE CORRIDOR.

D. TUBING SHALL BE ERECTED NEATLY IN A WORKMANLIKE MANNER. BENDS IN SOFT COPPER TUBING SHALL BE CREATED WITH BENDERS TO PREVENT DEFORMATION OF THE TUBING IN THE BENDS.

E. THE ENDS OF ALL PIPE AND NIPPLES SHALL BE THOROUGHLY REAMED TO THE FULL INSIDE DIAMETER OF THE PIPE AND ALL BURRS FORMED IN THE CUTTING OF THE PIPES SHALL BE REMOVED.

F. PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE ASME CODE FOR PRESSURE PIPING.

G. DISSIMILAR PIPING SHALL BE CONNECTED WITH DIELECTRIC FITTINGS BY THE PERFECTION CORPORATION (NO DIELECTRIC UNION).

9.2 TESTING OF PIPING

A. ALL NEW R-410A REFRIGERANT PIPING SHALL BE TESTED AS HEREINAFTER SPECIFIED:
   1. SUCTION LINES FOR AIR-CONDITIONING APPLICATIONS: 300 PSIG
   2. SUCTION LINES FOR HEAT-PUMP APPLICATIONS: 535 PSIG
   3. HOT-GAS & LIQUID LINES: 535 PSIG

10.0 DUST COLLECTOR

10.1 UNIT

A. 11 AND 14 GAUGE MILD STEEL EPOXY PRIMER COAT (4000 HOURS SALT SPRAY TEST) WITH TWO (2) COATS OF AIR DRIED POLYURETHANE FINAL PAINT; CABINET AND SUPPORT STRUCTURE WITH RE-DRILLED HOLES FOR FLOOR ANCHORING; HIGH EFFICIENCY MULTI-POCKET FILTER ENVELOPE; SEALED FRAME ACCESS DOOR TO FILTER ENVELOPE; ELECTRONIC CONTROL PANEL WITH TIMER FOR SHAKER CLEANING IN NEMA 4 ENCLO SURE; DIRECT DRIVE TEFC MOTOR WITH NON-SPARKING BACKWARD INCLINED IMPELLER FOR WOOD DUSTS OR REACTIVE METALS; SOUND INSULATED FAN PLENUM; DIRTY AIR INLET WITH DUST DEFLECTOR IN HOPPER SECTION, CLEAN AIR OUTLET ON TOP OF COLLECTOR; LIFT LUGS FOR FILTER CABINET POSITIONING; 1 HP SHAKER MOTOR WITH OSCILLATING PATTERN FOR BETTER CLEANING EFFICIENCY, JOINTS AND FOLDS SEALED WITH GASKETS TO PREVENT AIR LEAKAGE.

B. DUST STORAGE CAPACITY SHOULD BE WITH DRUM DOLLY WITH SWIVEL CASTERS.

C. UNIT TO BE EQUIPPED WITH THE FOLLOWING:
   1. DEFLECTED EXPLOSION VENT PANEL.
      a. EV-VS EXPLOSION VENT DEFLECTORS WITH EV-VL, EV-VD AND EV-VDSIL VENT PANELS.
      b. CERTIFIED: ATEX II GD, EN 14491, EN 14994, EN 14797, EN 1127.1.
      c. MATERIAL: STEEL WITH SAFETY RED FINISH, PSTAT: 0.1 BAR (1.45 PSI) ± 15%.
   2. NFPA RATED DRUM LID KIT AND DRUM – QUANTITY (2).
   3. TRANSITIONS AND STACK.
   4. RAPTOR SPARK SINGLE ZONE DETECTION KIT IS FM APPROVED, CE LISTED AND IN AN IP65 ENCLOSURE AND TO INCLUDE THE FOLLOWING:
      a. MODEL RS-PCUSP1L CONTROL PANEL PER KIT.
      b. MODEL RS-SD02 SPARK DETECTOR FOR DUCTS < 40 H.
      c. MODEL RS-SD02 SPARK DETECTOR FOR DUCTS 0.40 h AND 0.68 h
      d. EXTINGUISHING KIT, FLEXIBLE HOSES, AUDIBLE ALARM AND WARNING LIGHT.
   5. 14" EXPLOSION ISOLATION VALVE (VigiFLAP) WITH LOCKING MECHANISM, DOMED FLAP (304 STAINLESS STEEL), ANSI FLANGES INSPECTION/ACCESS DOOR, GROUNDING STRAPS AND ABILITY TO OPERATE NORMALLY OPEN OR AS A CHECK VALVE. ATEX EN 16447 CERTIFICATION. INDUCTIVE PROXIMATELY SHUTDOWN SWITCH PROVIDED STANDARD.
   6. 16" EXPLOSION ISOLATION VALVE (VigiFLAP) WITH LOCKING MECHANISM, DOMED FLAP (304 STAINLESS STEEL), ANSI FLANGES INSPECTION/ACCESS DOOR, GROUNDING STRAPS AND ABILITY TO OPERATE NORMALLY OPEN OR AS A CHECK VALVE. ATEX EN 16447 CERTIFICATION. INDUCTIVE PROXIMATELY SHUTDOWN SWITCH PROVIDED STANDARD.
   7. CONTROL PANEL (CP04) – UL698A CONTROL PANEL FOR USE WITH NFPA 69 COMPLIANT EXPLOSION ISOLATION VALVES. STANDARD PANEL INCLUDES STATUS LIGHTS, INTRINSIC CIRCUIT WITH BARRIER AND PHYSICAL SEPARATION (1 PER ZONE), MONITORED INPUTS (3 TOTAL / 2 PROGRAMMABLE), ABILITY TO ADD A SECONDARY CLEAN AIR ISOLATION VALVE, OUTPUT FOR SYSTEM SHUT DOWN AND MONITORING, DRAWINGS, INSTALLATION INSTRUCTIONS, NEMA 4 OUTDOOR RATED ENCLOSURE, UL AND CANADA UL LISTINGS. ALLOWS FOR 120VAC OR 24VDC INPUT POWER.
   8. DUST LEVEL SENSOR – ADJUSTABLE SETPOINT MODEL FOR ORGANIC DUSTS.

11.0 AUTOMATIC TEMPERATURE CONTROLS

A. PROVIDE ALL NECESSARY CONTROLLERS, RELAYS, SPACE TEMPERATURE, RELATIVE HUMIDITY (RH) & CO2 SENSORS, OUTSIDE AIR TEMPERATURE SENSORS, CONTROL WIRING, TRANSFORMERS PROGRAMMING START-UP, ETC. FOR THE SATISFACTORY OPERATION OF THE NEW ROOFTOP UNITS.

B. DURING OCCUPIED HOURS, THE SUPPLY FAN SHALL RUN CONTINUOUSLY. THE DX COOLING OR GAS HEAT SHALL BE STAGED TO MAINTAIN THE SPACE COOLING SET POINT OF 75°F DB, 50% RH (ADJUSTABLE) AND SPACE HEATING SET POINT OF 72°F DB (ADJUSTABLE).

C. THE CO2 CONTROLLER SHALL MODULATE THE OUTSIDE AIR INTAKE (OAI) DAMPER TO MAINTAIN THE CO2 LEVEL SET POINT. THE EXHAUST FAN SHALL BE ENERGIZED TO RELIEVE EXCESSIVE AIR PRESSURE IN THE SPACE.

D. WHEN THE RH IN THE SPACE RISES TO 60% (ADJUSTABLE), THE DX COOLING SHALL BE STAGED AND THE HOT GAS REHEAT SHALL BE ACTIVATED TO MAINTAIN THE SET POINT OF 75°F DB AND 50% RH.

E. DURING UNOCCUPIED HOURS, THE DX COOLING OR GAS HEAT SHALL BE STAGED TO MAINTAIN THE UNOCCUPIED COOLING SET POINT OF 85°F (ADJUSTABLE) AND UNOCCUPIED HEATING SET POINT OF 60°F (ADJUSTABLE). THE OAI DAMPER SHALL BE FULLY CLOSED DURING UNOCCUPIED OPERATION OF THE ROOFTOP UNIT.

F. WHEN THE OUTSIDE AIR ENTHALPY IS LOWER THAN THE RETURN AIR ENTHALPY, THE MECHANICAL COOLING SHALL BE OFF AND THE OAI DAMPER SHALL FULLY OPEN FOR FREE COOLING. DURING THE ECONOMIZER CYCLE, THE EXHAUST FAN SHALL RUN TO RELIEVE SPACE AIR PRESSURE.

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PROJECT NO.: 5672G

SUBMISSION DATE:
REVISION DATE:

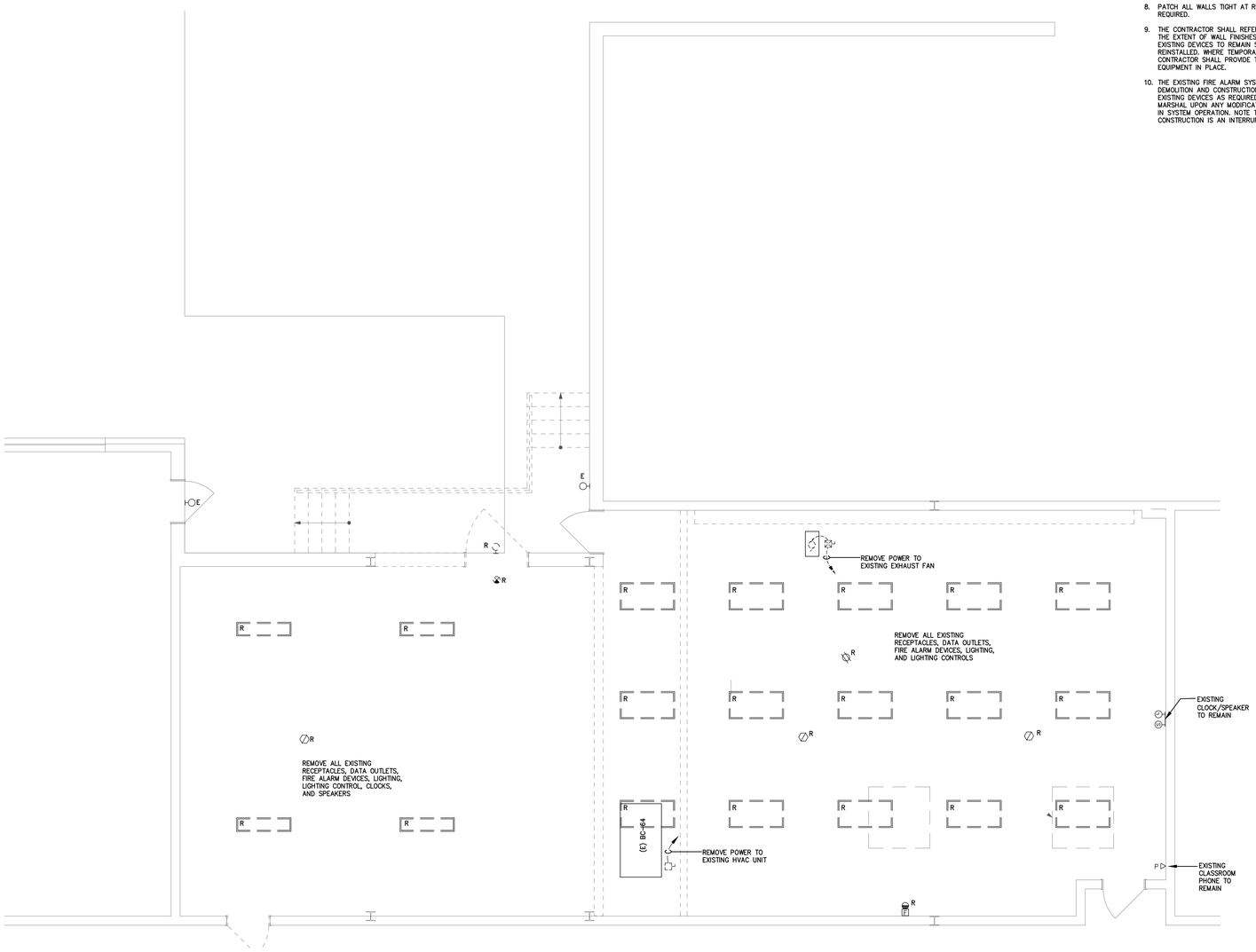
DRAWING DATE: 24 FEB 2023
PRINT DATE: 24 FEB 2023
DRAWN BY: SLB
SHEET TITLE: SPECIFICATIONS - HVAC

DEMOLITION NOTES:

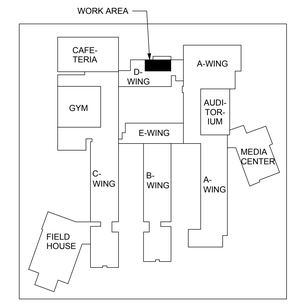
1. THESE DEMOLITION PLANS ARE INTENDED TO BE USED AS A GUIDE TO THE CONTRACTOR. ALL DEMOLITION WORK REQUIRED, OR NECESSARY FOR THE INSTALLATION OF NEW WORK OR THE REMOVAL OF EXISTING EQUIPMENT, IS HEREBY INCLUDED, WHETHER SHOWN ON THESE PLANS OR NOT. REFER TO DRAWINGS OF ALL TRADES FOR ADDITIONAL WORK, AND COORDINATE IN THE FIELD.
2. THE CONTRACTOR SHALL VERIFY ACTUAL SITE CONDITIONS PRIOR TO SUBMITTING HIS BID. THE CONTRACTOR SHALL INCLUDE ALL DEMOLITION WORK NECESSARY FOR THE EFFECTIVE INSTALLATION AND PERFORMANCE OF NEW SYSTEMS. THE CONTRACTOR SHALL ALSO INCLUDE TEMPORARY REMOVAL AND REINSTALLATION OF EXISTING WORK WHEREVER NECESSARY. THE OWNER SHALL NOT ACCEPT EXTRA COSTS ASSOCIATED WITH THE DEMOLITION AND/OR TEMPORARY REMOVAL/REINSTALLATION WORK FROM THE CONTRACTOR.
3. THIS CONTRACTOR SHALL REMOVE ALL LIGHTING FIXTURES AND ELECTRICAL DEVICES AS INDICATED ON THE DEMOLITION PLANS, OR THAT ARE NO LONGER NEEDED BY THE OWNER. ALL EXISTING WIRING AND CONDUIT WHERE NO LONGER REQUIRED SHALL BE REMOVED BACK TO EXISTING PANEL. ALL EXISTING DISCONNECTED CIRCUITS NOT BEING REUSED SHALL BE TURNED OFF AND LABELED "SPARE". WHERE CONDUITS ARE INACCESSIBLE, REMOVE WIRE AND ABANDON CONDUITS.
4. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY POWER IS BEING PROVIDED TO ALL EXISTING EQUIPMENT REQUIRED TO REMAIN IN SERVICE. RECONNECT ALL DISTURBED FACILITIES WHICH ARE EXISTING TO REMAIN AND PLACE THEM IN OPERATIONAL CONDITION.
5. REMOVE ALL WIRING DEVICES FROM WALLS TO BE DEMOLISHED. REMOVE EXISTING LIGHT SWITCHES WHERE NO LONGER REQUIRED. REUSE ALL EXISTING CONCEALED CONDUIT AND RECESSED DEVICE BOXES WHERE POSSIBLE. ABANDON BOXES IF THEY ARE IN EXISTING WALLS TO REMAIN. PATCH WALLS OVER ABANDONED BOXES TO MATCH ADJACENT SURFACES.
6. REMOVE ABANDONED OUTLET BOXES, SURFACE METAL RACEWAY AND CONDUIT THAT WOULD BE EXPOSED, AND REPAIR DISTURBED SURFACES TO MATCH ADJACENT AREAS.
7. MAJOR PIECES OF EQUIPMENT ARE TO BE TURNED OVER TO THE OWNER FOR HIS USE, OR AT THE OWNER'S DISCRETION, REMOVED FROM THE SITE AND DISPOSED OF, IF NO LONGER REQUIRED.
8. PATCH ALL WALLS TIGHT AT REMOVALS. MAINTAIN FIRE RATINGS AS REQUIRED.
9. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL DRAWINGS FOR THE EXTENT OF WALL FINISHES AND CEILINGS TO BE REPLACED. ALL EXISTING DEVICES TO REMAIN SHALL BE TEMPORARILY DISCONNECTED AND REINSTALLED. WHERE TEMPORARY REMOVAL IS NOT POSSIBLE THE CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT OF EXISTING EQUIPMENT IN PLACE.
10. THE EXISTING FIRE ALARM SYSTEM SHALL BE MAINTAINED THROUGHOUT DEMOLITION AND CONSTRUCTION. PROVIDE TEMPORARY SUPPORT OF EXISTING DEVICES AS REQUIRED. THE CONTRACTOR SHALL NOTIFY THE FIRE MARSHAL UPON ANY MODIFICATIONS TO OR ANY NECESSARY INTERRUPTION IN SYSTEM OPERATION. NOTE THAT COVERING DEVICES DURING CONSTRUCTION IS AN INTERRUPTION TO COVERAGE.

SYMBOL LIST & ABBREVIATIONS

	LIGHT FIXTURE – REFER TO LIGHTING FIXTURE SCHEDULE
	LIGHT FIXTURE WITH INTEGRAL BATTERY BACKUP – REFER TO LIGHTING FIXTURE SCHEDULE
	EXIT SIGN – REFER TO LIGHTING FIXTURE SCHEDULE
OS	OCCUPANCY SENSOR – LETTER DENOTES TYPE OF SENSOR TO BE INSTALLED. WATTSTOPPER OR APPROVED EQUAL.
	CIW = CX-100 PASSIVE INFRARED SENSOR – WALL MOUNTED
PP	POWER PACK TRANSFORMER AND RELAY, OUTPUT RELAYS RATED 20A BALLAST OR INCANDESCENT, PROVIDE QUANTITY OF RELAYS AS REQUIRED, REFER TO AUTOMATIC LIGHTING CONTROL NOTES
GFI	DUPLEX RECEPTACLE, 20A, 125V, 2 POLE, 3 WIRE, GROUNDED GFI INDICATES GROUND FAULT INTERRUPTION, TR INDICATES TAMPER-RESISTANT WITH UL LISTED TAMPER-RESISTANT SHUTTER,
	DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER HEIGHT OR AS NOTED
	DUPLEX RECEPTACLE CEILING MOUNTED
Q	DOUBLE DUPLEX RECEPTACLE (QUAD)
	VOICE/DATA/VIDEO OUTLET – 4" X 4" OUTLET BOX WITH 1-1/4"C WITH PULLWIRE STUBBED UP ABOVE NEAREST ACCESSIBLE CEILING VERIFY LOCATION IN FIELD
WIFI	WIFI ACCESS POINT
S_{LV}	LOW VOLTAGE MOMENTARY SWITCH
S	SINGLE POLE SWITCH
S_M	MANUAL MOTOR STARTER
EM	EMERGENCY SHUTOFF (SURFACE MOUNTED) SEE 3/E300
EM KEY	EMERGENCY SHUTOFF WITH KEY SWITCH (SURFACE MOUNTED) SEE 3/E300
	UNFUSED DISCONNECT SWITCH
	MOTOR
	JUNCTION BOX
	480/277V PANELBOARD
	208/120V PANELBOARD
FACP	FIRE ALARM CONTROL PANEL
	FIRE ALARM AUDIO/VISUAL DEVICE
	FIRE ALARM VISUAL DEVICE
	FIRE ALARM MANUAL PULL STATION
H	FIRE ALARM HEAT DETECTOR
	FIRE ALARM SMOKE DETECTOR
CO	CARBON MONOXIDE DETECTOR
	WIRE & CONDUIT, CONCEALED IN CEILING OR WALL
	WIRE & CONDUIT, HOMERUN TO PANEL
	CONNECTION TO EQUIPMENT
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
CU	CONDENSING UNIT
CR	CORD REEL
E	EXISTING TO REMAIN
EF	EXHAUST FAN
R	EXISTING TO BE REMOVED
RL	RELOCATE EXISTING TO THIS LOCATION, COORDINATE EXACT LOCATION IN FIELD, PROVIDE NEW WIRING TO EXTEND EXISTING WIRING AS REQUIRED, MATCH EXISTING WIRING TYPE AND SIZE
RTU	ROOF TOP UNIT
WP	WEATHERPROOF



1 ED100 DEMOLITION PLAN – ELECTRICAL
SCALE 1/4" = 1'-0"



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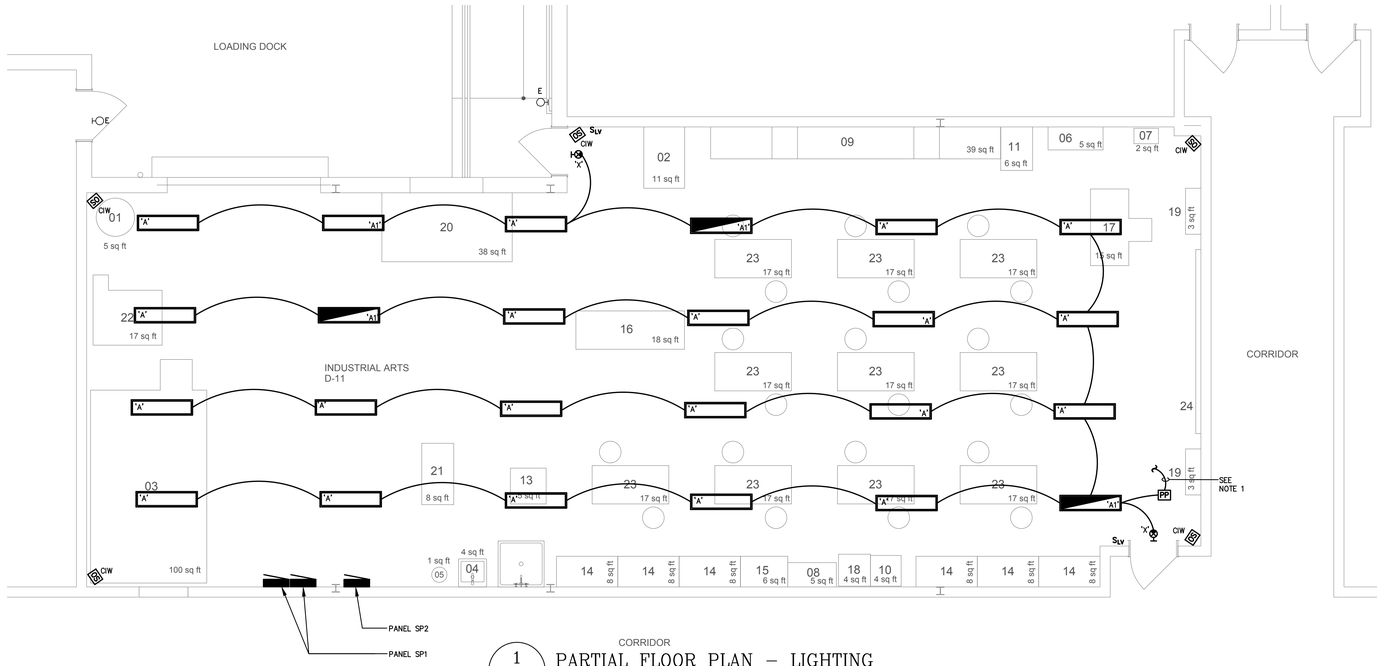
DRAWN BY:	LA
SHEET TITLE:	PARTIAL DEMOLITION PLAN & SYMBOLS LIST - ELECTRICAL

ED-100

1 OF 7



1 / E100 PARTIAL FLOOR PLAN – LIGHTING

SCALE 1/4" = 1'-0"

NOTE:

1. CONNECT BACK TO LIGHTING CIRCUIT THAT PREVIOUSLY SERVED DEMOLISHED LIGHT FIXTURE, CIRCUIT VIA 2 #12 & 1 #12 GRD – 3/4"C.

LIGHTING FIXTURE SCHEDULE

ID	LAMPS	MANUF.	CAT. NO.	MOUNTING	DESCRIPTION
A	68.7W LED 7000 LUMENS SPX 40	METALUX *	4WSL-LD2-70-SPS-UNV-L840-CD1	PENDANT	1'x4' FIXTURE, ACRYLIC PRISMATIC LENS, DIE FORMED HOUSING, WHITE ENAMEL FINISH, UNIVERSAL 120V-277V INPUT
A1	68.7W LED 7000 LUMENS SPX 40	METALUX *	4WSL-LD2-70-SPS-UNV-EL7W-L840-CD1	PENDANT	1'x4' FIXTURE, ACRYLIC PRISMATIC LENS, DIE FORMED HOUSING, WHITE ENAMEL FINISH, INTEGRAL 90 MINUTE BATTERY BACKUP, UNIVERSAL 120-277V INPUT
B	LED SPX 40	CROUSE HINDS *	RP7830	SURFACE	VAPOR PROOF FIXTURE, UL LISTED FOR WET LOCATIONS, RIGHT ANLE/BOX, CLEAR GLOBE, CAST GUARD, 120V INPUT (PROVIDE WITH LED BULB MAXIMUM 200W EQUIVALENT)
X	LED	SURE-LITE *	CAX-6-00-R-W	WALL/ CEILING	DIE-CAST ALUMINUM EXIT SIGN, WHITE BODY AND FACE WITH 6" x 3/4" RED LETTERS, SINGLE OR DOUBLE FACE AS REQ'D, ARROWS AS SHOWN, 90 MINUTE BATTERY BACKUP, 120V INPUT

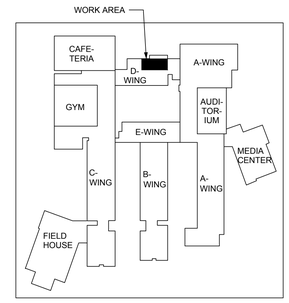
LIGHTING FIXTURE NOTES:

1. ALL FIXTURES SPECIFIED WITH EMERGENCY BACKUP SHALL BE PROVIDED WITH AN ADDITIONAL 120V/1P SIGNAL TO MONITOR NORMAL POWER FAILURE.
2. CONNECT ALL EXIT SIGNS AHEAD OF ALL SWITCHING AND LIGHTING CONTROL.

* OR APPROVED EQUAL

AUTOMATIC LIGHTING CONTROL NOTES:

1. FURNISH AND INSTALL ALL OCCUPANCY SENSORS AND ACCESSORIES AS RECOMMENDED BY THE MANUFACTURER'S WRITTEN WIRING INSTRUCTIONS.
2. PROVIDE ALL RELAYS, POWER PACKS AND LOW VOLTAGE WIRING AS REQUIRED. COORDINATE QUANTITY OF RELAYS & POWER PACKS IN THE FIELD AND PROVIDE AS REQUIRED.
3. VERIFY ALL OCCUPANCY SENSORS TO BE FURNISHED AND INSTALLED WITH LOW VOLTAGE OR LINE VOLTAGE INPUTS. LINE VOLTAGE OCCUPANCY SENSORS SHALL BE INSTALLED IN PARALLEL FOR THE COMMON CONTROL OF A SINGLE SPACE.



BLD'G NORTH

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PRINCETON JUNCTION NEW JERSEY 08550

Frank Tindall, P.E.
Professional Engineer
NJ 38656

NJDOE SP #1770-050-XX-XXXX

PROJECT TITLE:
INDUSTRIAL ARTS ALTERATION

ADDRESS:
GLOUCESTER CITY HIGH SCHOOL
BLOCK 222 / LOT 6
1300 MARKET STREET
GLOUCESTER CITY, NJ 08030

PROJECT NO.:	5672G
SUBMISSION DATE:	
REVISION DATE:	
DRAWING DATE:	24 FEB 2023
PRINT DATE:	24 FEB 2023
DRAWN BY:	LA
SHEET TITLE:	PARTIAL FLOOR PLAN - LIGHTING

E-100

2 OF 7

HAIN LINK
REMAIN

G PAVED

OUTDOOR WORK AREA

EXIST'G SOLAR SUPPORT COLUMN

EXIST'G SOLAR ARRAY ABOVE

SLOPE DN 1:12

DN

EXIST'G CURB & SIDEWALK TO REMAIN

CERAMICS
D-XX

EXIST'G GAS TRANE

CONTROL PANEL

FACP

SEE DRAWING 4/E300

LOADING DOCK

BOILER ROOM

AIR COMPRESSOR

LASER ENGRAVER

CNC ROUTER

INDUSTRIAL ARTS
D-11

NEMA 14-50R BAND SAW

NEMA 6-20R GRINDER

20BV RECEPTACLE FLOOR MOUNTED FOR TABLE SAW, SEE NOTE 1, TYPICAL

NEMA 10-20R SPINDLE SANDER

HARD WIRED AUTOMATIC FAUCET

PANEL SP1
2 SECTION PANEL

PANEL SP2

CORRIDOR

CORRIDOR

WORK AREA

CAFE-TERIA
D-WING
A-WING
GYM
AUDI-TOR-IUM
E-WING
MEDIA CENTER
C-WING
B-WING
A-WING
FIELD HOUSE

BLD'G NORTH

1 E101 PARTIAL FLOOR PLAN – POWER

SCALE 1/4" = 1'-0"

NOTES:

1. VERIFY NEMA CONFIGURATIONS OF ALL CORDS FURNISHED WITH EQUIPMENT AND PROVIDE CORRESPONDING DEVICE TYPE.
2. ALL CONDUIT ENDS AT JUNCTION BOXES SHALL BE SEALED INTERNALLY AFTER INSTALLATION OF WIRES.

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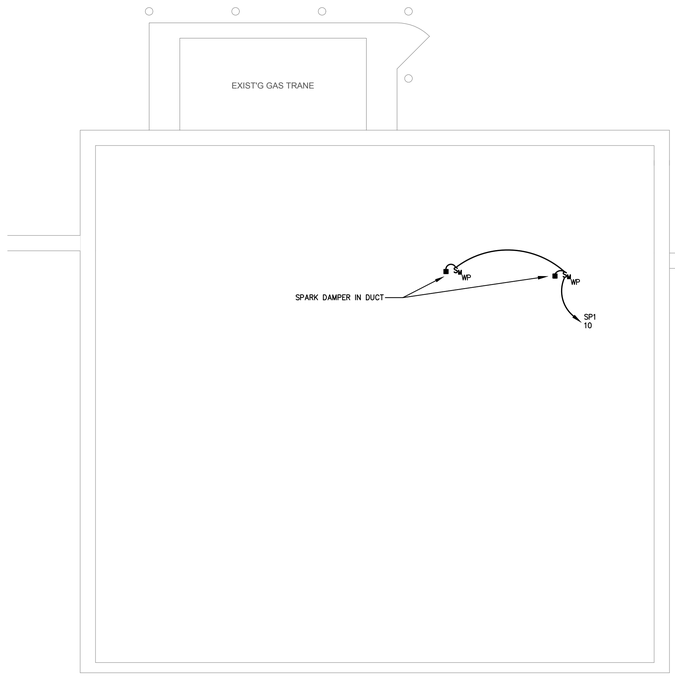
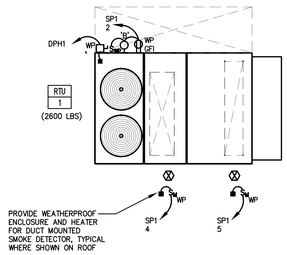
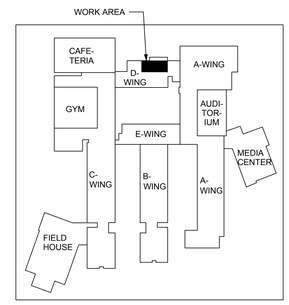
E-101

3 OF 7





1 / E102 PARTIAL ROOF PLAN – ELECTRICAL
SCALE 1/4" = 1'-0"



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PROJECT NO.:	5672G

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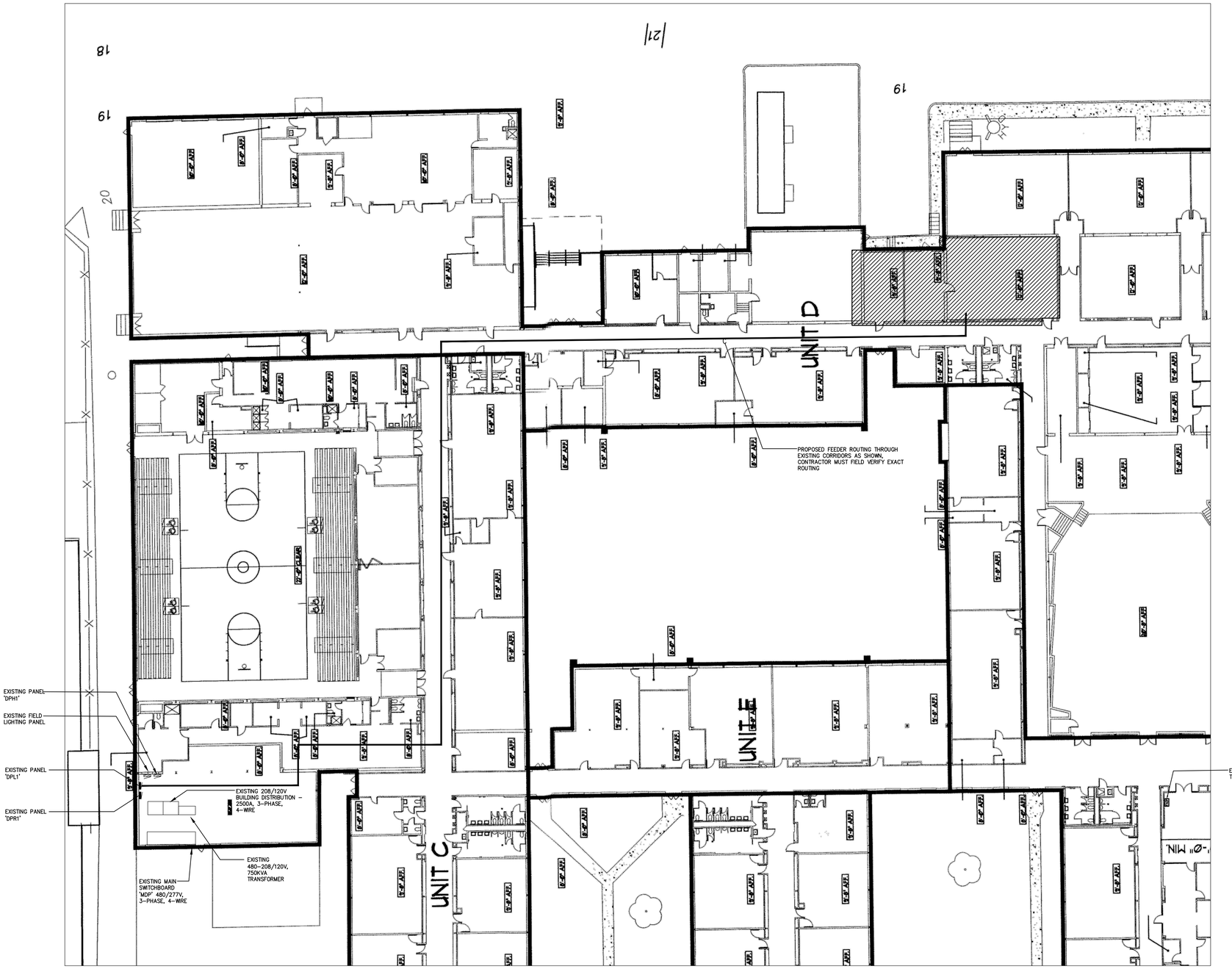
REVISION DATE:	

DRAWING DATE:	**24 FEB 2023**
PRINT DATE:	**24 FEB 2023**
DRAWN BY:	**SLB**
SHEET TITLE:	**PARTIAL ROOF PLAN - ELECTRICAL**

E-102

4 OF **7**



1 / E200 OVERALL FLOOR PLAN
SCALE 1/16" = 1'-0"

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NJDOE SP #1770-050-XX-XXXX

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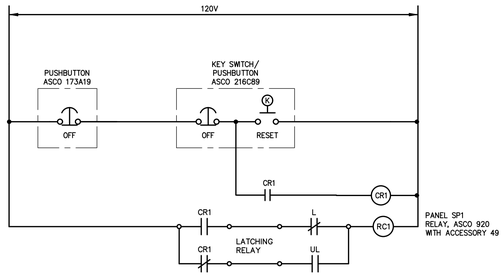
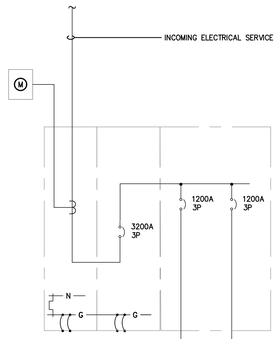
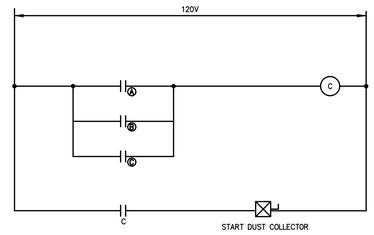
DRAWN BY:	SLB
SHEET TITLE:	POWER DISTRIBUTION PLAN - ELECTRICAL

E-200

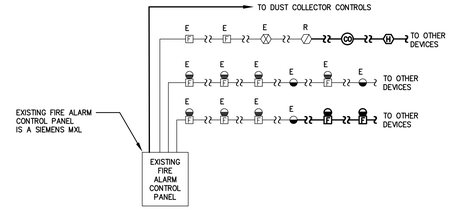


3 E300 EMERGENCY SHUTOFF WIRING DIAGRAM
SCHEMATIC





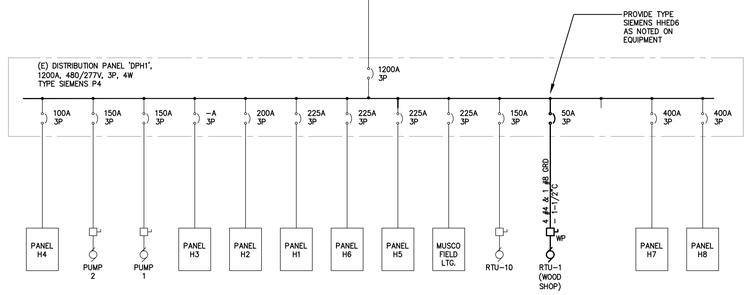
4 E300 WIRING DIAGRAM FOR DUST COLLECTOR
SCHEMATIC

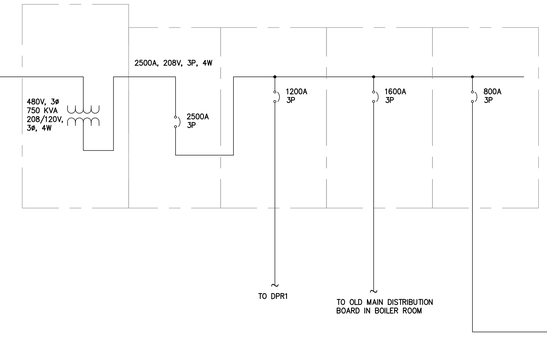


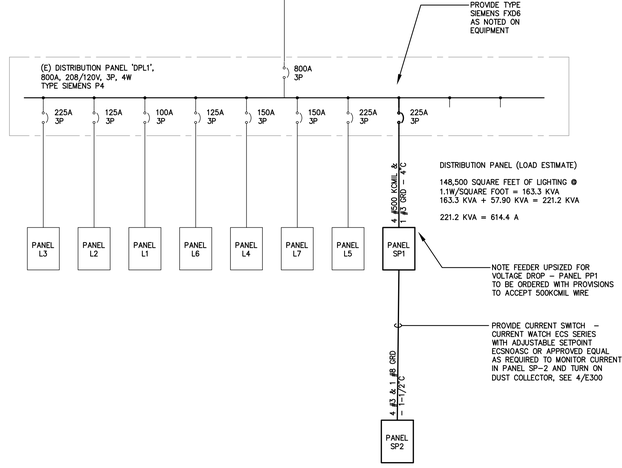
2 E300 FIRE ALARM SYSTEM RISER DIAGRAM
SCHEMATIC

FIRE ALARM SYSTEM NOTES:

1. PROVIDE ALL WIRING AS RECOMMENDED BY MANUFACTURER. ALL WIRING SHALL BE IN CONDUIT. FIRE ALARM LABELED MC CABLE MAY BE USED IN CONCEALED LOCATIONS WHERE PERMITTED BY CODE.
2. ALL EQUIPMENT AND WIRING SHALL MATCH EXISTING.
3. CONTRACTOR IS RESPONSIBLE FOR INSURING THAT COMPLETE SYSTEM MEETS ALL APPLICABLE CODES AND FOR OBTAINING FINAL APPROVAL FROM LOCAL FIRE INSPECTOR(S).
4. FURNISH AND INSTALL DUCT MOUNTED SMOKE DETECTORS WITH REMOTE INDICATING LIGHT AND TEST SWITCH. CONTRACTOR SHALL VERIFY AND CLEARLY LABEL REMOTE TEST SWITCH AS TO THE HVAC EQUIPMENT ASSOCIATED WITH EACH DETECTOR.
5. PROVIDE INTERCONNECTION WIRING BETWEEN HVAC EQUIPMENT AND FIRE ALARM CONTROL PANEL AS REQUIRED FOR FAN SHUTDOWN.
6. PROVIDE AT EACH LOCATION SHOWN, AUDIO/VISUAL DEVICES WITH OUTPUT LEVELS AS RECOMMENDED BY MANUFACTURER FOR THE SPACE TO COMPLY WITH ADA & CODE REQUIREMENTS. PROVIDE ADDITIONAL DEVICES TO THOSE SHOWN IF/AS REQUIRED TO MEET LEVELS.
7. PROVIDE CARBON MONOXIDE DETECTORS AT ALL HVAC EQUIPMENT UTILIZING NATURAL GAS. PROVIDE CARBON MONOXIDE DETECTORS WITHIN THE SPACES SERVED BY GAS FIRED AIR HANDLING UNITS.
8. FIRE ALARM SHOP DRAWINGS MUST BE SIGNED AND SEALED BY A NEW JERSEY LICENSED PROFESSIONAL ENGINEER AND AFTER THEY HAVE BEEN REVIEWED AND APPROVED BY A/E, THEY MUST BE SUBMITTED TO AHJ FOR THEIR APPROVAL PRIOR TO RELEASE OR INSTALLATION OF ANY WORK. FIRE ALARM SHOP DRAWING MUST CONTAIN SCALED DRAWINGS THAT INCLUDE LOCATIONS OF ALL INITIATING, NOTIFICATION DEVICES, CONTROL UNIT, ANNUNICATORS AND POWER SUPPLIES. INDICATE CANDELA RATING FOR ALL VISUAL DEVICES AND DB RATINGS FOR AUDIBLE DEVICES. PROVIDE MOUNTING DETAILS FOR ALL DEVICES. INCLUDE MANUFACTURER'S CUT SHEET FOR EACH TYPE OF DEVICE, A COMPLETE FIRE ALARM RISER, VOLTAGE DROP AND BATTERY CALCULATIONS, A COMPLETE SEQUENCE OF OPERATION AND ALL INFO REQUIRED BY IBC 907.1.1.
9. UPON COMPLETION OF FIRE ALARM WORK, PROVIDE A RE-ACCEPTANCE TEST OF THE ENTIRE SYSTEM PER NFPA 72.







1 E300 PARTIAL SINGLE LINE DIAGRAM
SCHEMATIC

PANELBOARD 'SP1' (SECTION 1)

208/120V, 3ø, 4W, S/N, SURFACE, 225A/3P MAIN CIRCUIT BREAKER, 22 KAIC

CKT. NO.	CIRCUIT BREAKER AMPS	CIRCUIT BREAKER POLES	LOAD KVA	LOAD HP	CIRCUIT DESCRIPTION	WIRE & CONDUIT
1	20	2	1.8	1	OVERHEAD DOOR	2 #12 & 1 #12 GRD - 3/4"C
2	20	1	0.40	–	RTU SERVICE LTG/RECEP	2 #12 & 1 #12 GRD - 3/4"C
3	100	3	16.7	15	DUST COLLECTOR	3 #3 & 1 #8 GRD - 1-1/2"C
4	20	1	1.00	–	DUCT DETECTOR HEATER	2 #12 & 1 #12 GRD - 3/4"C
5	20	1	–	–	SPARE	–
6	20	1	0.20	–	ASCO RELAY	2 #12 & 1 #12 GRD - 3/4"C
7	20	1	0.20	–	DUST COLLECTOR SERVICE RECEP.	2 #12 & 1 #12 GRD - 3/4"C
8	20	1	0.20	–	HARDWIRED AUTO FAUCET	2 #12 & 1 #12 GRD - 3/4"C
9	20	1	0.20	–	NRV CONTROL PANEL	2 #12 & 1 #12 GRD - 3/4"C
10	20	1	0.20	–	SPARK DAMPERS IN DUCT	2 #12 & 1 #12 GRD - 3/4"C
					INTEGRAL ASCO 920 REMOTE CONTROL SWITCH 225A, 3 POLE WITH 3 WIRE CONTROL RELAY DIRECT MOUNT TO SPLIT BUS PANELBOARD SEE WIRING DIAGRAM 3/E300	
11	100	3	20.0	–	PANEL SP2	SEE SINGLE LINE DIAGRAM
12	20	3	4.6	5	ITEM 1 AIR COMPRESSOR	3 #12 & 1 #12 GRD - 3/4"C
* 13	20	2	0.8	–	ITEM 7 GRINDER	2 #12 & 1 #12 GRD - 3/4"C
14	20	1	1.6	–	ITEM 8 JOINTER	2 #12 & 1 #12 GRD - 3/4"C
15	20	1	0.2	–	ITEM 13 WORK TABLE CORD REEL	2 #12 & 1 #12 GRD - 3/4"C
16	20	1	0.4	–	ITEM 17 RECEPS TEACHER DESK	2 #12 & 1 #12 GRD - 3/4"C
17	20	1	0.9	–	ITEM 18 VERTICAL BELT SANDER	2 #12 & 1 #12 GRD - 3/4"C
18	20	1	0.5	–	CORD REEL - WORK TABLE	2 #12 & 1 #12 GRD - 3/4"C
19	20	1	0.5	–	CORD REEL - STUDENT TABLE	2 #12 & 1 #12 GRD - 3/4"C
20	20	1	0.5	–	CORD REEL - STUDENT TABLE	2 #12 & 1 #12 GRD - 3/4"C
21	20	1	0.5	–	CORD REEL - STUDENT TABLE	2 #12 & 1 #12 GRD - 3/4"C
22	20	1	0.5	–	CORD REEL - STUDENT TABLE	2 #12 & 1 #12 GRD - 3/4"C
23	20	1	0.5	–	CORD REEL - STUDENT TABLE	2 #12 & 1 #12 GRD - 3/4"C
24	20	1	0.5	–	CORD REEL - STUDENT TABLE	2 #12 & 1 #12 GRD - 3/4"C
25	20	1	0.5	–	CORD REEL - STUDENT TABLE	2 #12 & 1 #12 GRD - 3/4"C
26	20	1	0.5	–	CORD REEL - STUDENT TABLE	2 #12 & 1 #12 GRD - 3/4"C
27	20	1	0.5	–	CORD REEL - STUDENT TABLE	2 #12 & 1 #12 GRD - 3/4"C
28	20	1	0.5	–	CORD REEL - STUDENT TABLE	2 #12 & 1 #12 GRD - 3/4"C
29	20	1	0.4	–	WALL RECEPS. FRONT	2 #12 & 1 #12 GRD - 3/4"C
30	20	1	0.4	–	WALL RECEPS. BACK	2 #12 & 1 #12 GRD - 3/4"C
31	20	1	0.4	–	WALL RECEPS.	2 #12 & 1 #12 GRD - 3/4"C
32	20	1	0.2	–	OUTSIDE WORK AREA RECEPT.	2 #12 & 1 #12 GRD - 3/4"C
33	20	1	0.2	–	OUTSIDE WORK AREA RECEPT.	2 #12 & 1 #12 GRD - 3/4"C
34	20	1	0.2	–	OUTSIDE WORK AREA RECEPT.	2 #12 & 1 #12 GRD - 3/4"C
			57.10		TOTAL CONNECTED LOAD	

* NOTE PER CUT SHEET EQUIPMENT CAN EITHER BE ORDERED AS 120 OR 208V, COORDINATE VOLTAGE WITH PURSCHASED EQUIPMENT

PANELBOARD 'SP-1' (SECTION 2)

208/120V, 3ø, 4W, S/N, SURFACE, 225A/3P MAIN LUGS ONLY, 22 KAIC

CKT. NO.	CIRCUIT BREAKER AMPS	CIRCUIT BREAKER POLES	LOAD KVA	LOAD HP	CIRCUIT DESCRIPTION	WIRE & CONDUIT
35	20	1	0.2	–	OUTSIDE WORK AREA RECEPT.	2 #12 & 1 #12 GRD - 3/4"C
36	20	1	0.2	–	OUTSIDE WORK AREA RECEPT.	2 #12 & 1 #12 GRD - 3/4"C
37	20	1	0.2	–	OUTSIDE WORK AREA RECEPT.	2 #12 & 1 #12 GRD - 3/4"C
38	20	1	0.2	–	OUTSIDE WORK AREA RECEPT.	2 #12 & 1 #12 GRD - 3/4"C
39	20	1	–	–	SPARE	–
40	20	1	–	–	SPARE	–
41	20	1	–	–	SPARE	–
42	20	1	–	–	SPARE	–
43	20	1	–	–	SPARE	–
44	20	1	–	–	SPARE	–
45	20	1	–	–	SPARE	–
46	20	1	–	–	SPARE	–
47	20	1	–	–	SPARE	–
48	20	1	–	–	SPARE	–
49	20	1	–	–	SPARE	–
50	20	1	–	–	SPARE	–
51	20	1	–	–	SPARE	–
52	20	1	–	–	SPARE	–
53	20	1	–	–	SPARE	–
54	20	1	–	–	SPARE	–
55	20	1	–	–	SPARE	–
56	20	1	–	–	SPARE	–
57	20	1	–	–	SPARE	–
58	20	1	–	–	SPARE	–
59	20	1	–	–	SPARE	–
60	20	1	–	–	SPARE	–
61	20	1	–	–	SPARE	–
62	20	1	–	–	SPARE	–
63	20	1	–	–	SPARE	–
64	20	1	–	–	SPARE	–
65	20	1	–	–	SPARE	–
66	20	1	–	–	SPARE	–
67	20	1	–	–	SPARE	–
68	20	1	–	–	SPARE	–
69	20	1	–	–	SPARE	–
70	–	1	–	–	SPACE	–
71	–	1	–	–	SPACE	–
72	–	1	–	–	SPACE	–
73	–	1	–	–	SPACE	–
74	–	1	–	–	SPACE	–
75	–	1	–	–	SPACE	–
76	–	1	–	–	SPACE	–
			0.8		TOTAL CONNECTED LOAD	

PANELBOARD 'SP2'

208/120V, 3ø, 4W, S/N, SURFACE, 100A MAIN LUGS ONLY, 22 KAIC

CKT. NO.	CIRCUIT BREAKER AMPS	CIRCUIT BREAKER POLES	LOAD KVA	LOAD HP	CIRCUIT DESCRIPTION	WIRE & CONDUIT
35	40	3	8.1	7.5	ITEM 2 BAND SAW	3 #8 & 1 #10 GRD - 1"C
2	30	2	3.9	3	ITEM 3 CNC ROUTER	2 #10 & 1 #10 GRD - 3/4"C
3	20	1	1.8	–	ITEM 9 MITER SAW	2 #12 & 1 #12 GRD - 3/4"C
4	20	1	1.8	–	ITEM 9 MITER SAW	2 #12 & 1 #12 GRD - 3/4"C
5	20	2	1.3	–	ITEM 10 OSC. SPINDLE SANDER	2 #12 & 1 #12 GRD - 3/4"C
6	20	2	1.3	–	ITEM 16 TABLE SAW	2 #12 & 1 #12 GRD - 3/4"C
7	20	1	1.8	–	ITEM 22 LASER ENGRAVER	2 #12 & 1 #12 GRD - 3/4"C
8	20	1	–	–	SPARE	–
9	20	1	–	–	SPARE	–
10	20	1	–	–	SPARE	–
11	20	1	–	–	SPARE	–
12	20	1	–	–	SPARE	–
13	20	1	–	–	SPARE	–
14	20	1	–	–	SPARE	–
15	20	1	–	–	SPARE	–
16	20	1	–	–	SPARE	–
17	20	1	–	–	SPARE	–
18	20	1	–	–	SPARE	–
19	20	1	–	–	SPARE	–
20	20	1	–	–	SPARE	–
21	20	1	–	–	SPARE	–
22	20	1	–	–	SPARE	–
23	20	1	–	–	SPARE	–
24	20	1	–	–	SPARE	–
25	20	1	–	–	SPARE	–
26	20	1	–	–	SPARE	–
			20.0		TOTAL CONNECTED LOAD	

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E-300

ELECTRICAL SPECIFICATIONS

GENERAL REQUIREMENTS

This Section is coordinate with and complementary to the General Conditions and Special Requirements.

Drawings are diagrammatic. Sizes and locations of equipment are shown to scale where possible, but may be distorted for clarity on the Drawings. Final locations shall be as required or directed.

Light and power and system riser diagrams and schematic diagrams generally indicate equipment and connections to be used for various systems. System conduit and wiring shall be as required. Provide all work shown on diagrams whether or not it is duplicated on the plans.

SCOPE OF WORK

In general the work includes, but is not limited to the following:

1. Raceways and Installation Components.
2. Wire and Cable.
3. Panelboards.
4. Fuses.
5. Safety and Disconnect Switches.
6. Motor Installations
7. Grounding.
8. Lighting Fixtures.
9. Telephone Data and Communication Conduit Systems.
10. Electrical Provisions for Fire and Life Safety.
11. Fire Alarm System (modifications)
12. Control Equipment
13. Testing.
14. Seismic Restraints.
15. Furnishing of Access Doors.
16. Furnishing and setting of all sleeves through the floors, roof, and walls where required, including waterproofing, and fireproof sealing, and cap flashing.
17. Cutting, drilling and boring associated with electrical work.
18. Prime painting, where required for electrical equipment and installation.
19. Provisions for temporary light and power.
20. Final connection of all equipment unless otherwise noted.

QUALITY ASSURANCE AND STANDARDS

The complete installation shall be in accordance with NJUCC (The State Building Code).

Permits : See 'Permits' in construction notes on SHT cs.

SUBMITTALS

The Contractor shall submit shop drawings in accordance w/section 013300 for all system and components with such promptness as to cause no delay in high own work or that of another contractor.

The contractor shall review and check each submittal meets the intent of the contract, prior to

submitting. Label and log each submittal with a standard format including spec section, title and date.

EXAMINATION OF EXISTING CONDITIONS ON PREMISES

Before submitting his bid, this Contractor shall visit the site of the work and shall thoroughly familiarize himself with the existing conditions affecting the work. By the act of submitting a bid, the Contractor shall be deemed to have made such an examination, to have accepted such conditions, and to have made allowance therefore in preparing his bid. No additional compensation will be granted on account of extra work made necessary by the Contractor's failure to investigate such existing conditions. Verify all grades, elevations, dimensions, and clearances at the site.

COORDINATION OF WORK WITH OTHER TRADES

The contractor shall coordinate the work of this Section with the work of all other Contracts and all the Utility Companies. It shall be so arranged that there will be no delay in the proper installation and completion of all work.

INSPECTION AND TESTS

At the time of the final inspection and tests, all connections at the panels and all splices, etc., must have been completed. All fuses must be in place and the circuits continuous from service switches to all receptacles, outlets, motors, etc. Each entire wiring system must test free from short circuits and grounds When wiring systems are "megger" tested, the insulation resistance between conductors and grounds, based on maximum load, shall not be less than that required by the National Electrical Code and local authorities having jurisdiction. A written record (5 copies) of all test data shall be supplied to the Architect. The tests shall cover but but not be limited to the following:

1. Secondary service and distribution system.
2. Fire alarm, sprinkler and smoke detection systems.
3. All communications, signaling and alarm systems.
4. 10% of all power installations and motor controls randomly selected by the Engineer.
5. 10% of all light installations and circuit switching randomly selected by the engineer.
6. Any part of the work called for in the Specifications and/or on the Drawings and as designated by the Architect or Engineer.

Provide all necessary testing equipment, instruments, and skilled personnel for the tests. If in the opinion of the Architect, the results of such tests show that the work has not complied with the requirements of the Specifications or Drawings, the Contractor shall make all additions or changes necessary to put the system in proper working condition and shall pay for all expenses and for all subsequent test which are necessary to determine whether the work is satisfactory. Any additional work or subsequent tests shall be carried our at the convenience of the Owner prior to final payment.

PROTECTION, MAINTENANCE AND PRODUCT HANDLING OF ELECTRICAL EQUIPMENT

Electrical equipment shall be delivered and stored at the site, properly packed and crated until finally installed.

Provide effective protection against damage for all material and equipment during shipment and storage at the Project Site.

This Contractor shall be responsible for the maintenance of all installed equipment and systems until final acceptance by the Owner.

GUARANTEE

This Contractor shall guarantee in writing to the Owner that all work installed by him shall be free of defects in workmanship and materials and that all apparatus will develop the capacities and characteristics as indicated, and that, if during a period of two years from date of substantial completion of work by the Architect, any defects in workmanship, materials or performance appear, he will remedy them without any cost to the Owner.

ACCESSIBILITY AND MEASUREMENTS

All work shall be installed so as to be readily accessible for operation, maintenance, and repair. Minor deviations from the plans may be made to accomplish this, subject to approval.

Before ordering any material or doing any work, the Contractor shall verify all measurements at the Building, and shall be responsible for the correctness of same as related to the work under this Contract.

TEMPORARY LIGHT AND POWER

Electric services for temporary light and power shall be obtained from the existing electrical service and extended as required.

The Electrical Contractor shall furnish, install, and maintain the temporary lighting and power system for all Contractors. Provide temporary power for all construction trailers or as directed. The use of electricity shall be kept to a minimum.

The Owner will pay for all energy required by the temporary lighting and power system.

Provide all wiring, supports, lamp sockets, receptacle sockets and any other materials, supplies or equipment necessary for temporary light and power system.

Provide Ground fault protection as required by OSHA.

Provide sufficient supplementary temporary lighting to permit proper execution of the work.

Keep the temporary lighting and power system operational commencing fifteen (15) minutes before the established starting time of that trade which starts work earliest in the morning and ending fifteen (15) minutes after the established quitting time of that trade which stops work latest in the evening.

IDENTIFICATION NAMEPLATES

Identify and mark all electrical equipment to meet OSHA standards and as specified herein.

Identify all circuits at junction boxes, devices and equipment served with permanent labeling this includes but is not limited to panels, starters, disconnects, surface mounted raceways, junction boxes, receptacles, switches, etc.

Fixed circuiting labels shall indicating supply panel and circuit serving the local device as well as any circuits running through the raceway system.

Unless otherwise noted, nameplates shall be black laminate with white letters of uniform size consisting of reasonably large capital letters, 3/16 inch minimum.

SEISMIC RESTRAINTS

Provide lateral restraints for all electrical equipment installed on project; i.e., Battery racks, ballast racks, cable trays, conduit, generators, lighting fixtures, panels and transformers. Typically, lateral restraints shall consist of angle iron and "uni-strut" bracing, cross bracing, hanger rods, anchor clips, expansion shield anchor bolts, etc. The purpose of the restraints is to provide resistance to lateral (horizontal) movement during earthquake.

All equipment shall be anchored to the floor, ceiling structure or walls.

All suspended equipment, wiring trough and conduit trade size 2-1/2" or larger shall have (lateral) horizontal bracing capable of resisting 50% of the equipment weight. Horizontal bracing shall be placed at each point where vertical supports are specified or required.

All life safety equipment, and conduit shall have lateral bracing capable of resisting 100% of the equipment weight.

Stem mounted fixtures shall have stems and swivel canopies designed for seismic loads. Ceiling outlet boxes and hangers for stem-mounted fixtures shall have lateral bracing capable of withstanding full vertical load. Lateral bracing shall be attached to the ceiling (at an angle) or wall structure.

Recessed and surface mounted light fixtures must be secured to the ceiling system so as to resist 50% of their weight laterally; i.e. a 40 pound fixture must be resistant to a 20 pound lateral force. Life safety lighting fixture must be secured to the ceiling system so as to resit 100% of their weight laterally. Suitable anchor clips must be provided for all lay-in fixtures. Surface mounted fixtures must be supported at two points in addition to the outlet box.

RACEWAYS AND INSTALLATION COMPONENTS

The requirements of this Section apply to raceway work specified elsewhere in these specifications.

The work includes the providing of completely coordinated grounded raceway systems complete with boxes, fittings, flexible connections to vibrating equipment and accessories, as specified and as required for a complete system.

The work permits the use of metal-clad cable in conjunction with conduit. See below.

Raceways and fittings shall be manufactured by Triangle or approved equal by Allied or Republic.

Rigid steel conduit shall be full weight steel pipe, hot dip galvanized inside and outside, threaded, minimum 3/4 inch.

Intermediate metal conduit (IMC) shall be intermediate steel pipe, hot dip galvanized, threaded, minimum 3/4 inch.

Electric metallic tubing (EMT) shall be steel thin wall pipe, galvanized, threadless, minimum 3/4 inch, maximum 2 inch.

Flexible steel conduit (Greenfield) shall be continuous single strip, galvanized, minimum 3/4 inch.

Liquid-tight flexible steel conduit (Seal-tite) shall be zinc coated, consist of flexible galvanized steel tubing over which is extruded a liquid-tight sheathing of polyvinyl chloride (PVC). Conduit shall be provided with a continuous copper bonding conductor would spirally between the convolutions.

Rigid steel and IMC conduit fittings shall be standard threaded couplings, locknuts, bushings, and elbows. Material shall be steel or malleable iron only.

Electrical metallic tubing fittings shall be compression waterproof connection type. Set screw or indent type connectors are not permitted.

Flexible steel conduit (Greenfield) fittings shall be multiple point type, threading into the internal wall of the conduit convolutions, and shall have insulated throat.

Liquid-tight flexible metal conduit fittings shall incorporate a threaded grounding cone, a steel or plastic compression ring, and a gland for tightening. Connectors shall have insulated throats.

Expansion and deflection couplings shall be manufactured by O-Z/Gedney, Crouse-Hinds, Appleton or approved equal.

Individual conduit hangers, shall be designed for the purpose, and have pre-assembled closure bolt and nut, and provisions for receiving hanger rod.

Multiple conduit (trapeze) hangers shall be not less than 1-1/2 by 1-1/2 inch, 12 gauge steel, cold formed, lipped channels. Hanger rods shall be not less than 3/8-inch diameter steel.

Solid masonry and concrete anchors shall be a type approved for the purpose.

Provide and assume responsibility for locating and maintaining in proper position all sleeves required for the work.

Openings through floors and walls in which cables, conduits, or pipe pass shall be sealed by U.L. classified smoke and fire stop fittings, and have an hourly rating equal to the fire rating of the floor or wall. Fittings shall be similar to O-Z/Gedney Type "CFS" or "CAFS".

Penetrations through fire-rated floors in which wiring for floor service outlets are routed shall be sealed by U.L. classified smoke and fire-stop fittings, and shall have an hourly rating equal to the floor rating. Fittings shall be similar to O-Z/Gedney Type "PTFS".

Outlet boxes shall be manufactured by Raco, RussellStoll, Steel City, Thomas & Betts or Crouse Hinds.

Outlet boxes for concealed work shall be galvanized steel, 4 in. square or octagon (except as otherwise required by construction, devices or wiring). Provide sufficient depth for application.

Outlet boxes located outdoors and in damp locations shall be weatherproof.

Offset back-to-back outlets shall have minimum 6 in. separation between them. In rated walls, they are to be separated by a stud

Junction, splice and pull boxes shall be made of code gauge sheet steel with removable covers fastened with brass or stainless steel screws, except as noted, and will include insulated supports for cables. Box dimensions shall conform to N.E.C. requirements.

Provide junction, splice and/or pull boxes as noted or as required to facilitate pulling of conductors or in raceway runs that have more than three (3) 90-degree bends.

For indoor applications, boxes shall have a gray enamel finish. For outdoor and damp locations, boxes shall be galvanized.

Wireways shall be as manufactured by Square D, General Electric, or approved equal.

Wireways shall be square, brake-formed of code gauge steel, furnished in standard 10-foot sections with knockouts as required. Wireways shall be of the screw cover type and all necessary offset and elbow fittings. They shall have a gray enamel finish. Size shall be as required for proper cable fill.

Install raceway and installation components as indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and in accordance with the recognized industry practices, to ensure that products serve intended function.

Raceway supports shall be provided by means of ceiling trapeze, strap hangers, or wall brackets. Use structural steel angles or channels, or manufactured steel support system. Spacing of supports shall be as per NEC and per manufacturer's recommendations but in no case shall exceed 8'-0" on centers. Provide U-bolts at each floor level for riser raceways and anchor to acceptable supports. Secure raceways to supports with pipe straps or U-bolts.

Mechanically join all metal raceways, enclosures and junction boxes to assure continuity.

Branch circuit conduits shall be supported by the building structure.

Conduits located underground beyond the building shall be installed with a minimum of 30 in. top cover as shown on the drawings.

Provide expansion-deflection fittings at expansion joints in accordance with manufacturer's recommendations. Expansion-deflection fittings shall be used for all trade sizes 1-1/4" or larger. For trade sizes up to 1" in size, a suitable length of flexible conduit (or liquid-tight flexible conduit) with sufficient slack for movement and grounding conductor fastened on each side of joint shall be permitted.

Rigid steel conduit shall be used for underground installation; in wet, damp or wash down locations; for exposed runs on the exterior of the building; embedded in concrete or masonry or below concrete that is in contact with earth.

Intermediate metal conduit (IMC) may be used in place of rigid steel in dry locations only.

EMT is to be used for feeders and branch circuits in dry locations such as hung ceilings, interior hollow block walls and furred spaces.

Flexible steel conduit shall be used in dry locations for short connections where rigid conduits or tubing is impracticable, and for final connections to lights and equipment other than motors and transformers.

Liquid-tight flexible steel conduit shall be used in damp locations for final connections to motor terminal boxes, transformers, and other vibrating equipment in damp and dry locations.

In general, cutting and core drilling is to be avoided. Where it becomes necessary, locations are to be coordinated with other trades, the Owner and the structural engineer. There is to be no cutting or core drilling without prior approval.

Provide an outlet box for each lighting fixture and device shown, or required, in the wiring system.

Provide galvanized steel extension rings (depth as required) and raised cover plates in plaster, dry wall, masonry and tile walls.

Mount outlet boxes for similar equipment at uniform height within same or similar areas.

Outlet boxes for fixtures recessed in non-accessible ceilings shall be accessible through the opening created by the removal of the fixture or through access doors provided by this contractor.

All outlet boxes in finished areas for convenience receptacles or local switches shall be 4" square and 1-5/8" deep minimum. Provide with regular deep switch extension cover.

All exposed work shall be in surface mounted raceway, type wiremold or approved equal.

Boxes for use with surface mounted raceways shall be of the same construction and manufacture as the raceway.

Provide junction, splice and pull boxes where required to facilitate installation of wiring, whether or not shown on Drawings. Size boxes according to code, and provide interior partitions, insulated supports, hot dip galvanized angle iron braces, screw-on one-piece or split covers, ground connectors, and other accessories as required.

All outdoor installations shall be weatherproof.

Support all material from the building structure in an approved manner.

Where electrical equipment is mounted in suspended ceiling panels, provide support members to span between runners of ceiling suspension system. Do not support electrical equipment from acoustical panels or other ceiling material; attach to this material for alignment only.

Where electrical outlet boxes, lighting fixtures, and other equipment is installed on tee bars of suspended ceilings, use independent support clips with threaded studs. Do not attach to tee bar except for alignment; use clip similar to Caddy "ICS" that snaps around tee bar and has provisions for independent support wire. Attach a suitable anchor in the structure above ceiling, and suspend a minimum No. 12 support wire to engage the clip.

Do not exceed manufacturer' load rating for mounting devices.

At drywall partitions, provide support members to carry weight of equipment; do not use drywall material to carry any weight.

WIRE AND CABLE

The work includes providing wire and cable complete with all accessories in accordance with Drawings and Specifications and as required for a complete system. Wiring size referenced in this Section shall be AWG, except as noted

This project has been designed for copper conductors. Aluminum conductors are not acceptable and shall not be used. Cable shall be manufactured by Triangle or approved equal by Carol or Guardian Products.

No. 10 and smaller conductors shall be ASTM Standard, solid, copper; and, No. 8 and larger conductors shall be ASTM standard, stranded copper.

Minimum conductor size shall be No. 12 for lighting and power and No. 14 for control and alarm. Increase wire sizes as required for long runs to overcome voltage drop.

Communications and signal wiring shall conform to the recommendations of the manufacturer's communication and signal systems and shall be specified in respective Sections of these Specifications. As noted on the drawings for this residential type building, nonmetallic type NM wiring is acceptable. Install and provide protection from physical damage in accordance with NEC, 334.

"THWN" or "XHHW" insulation shall be used for interior branch circuit and feeder wiring. Rating shall be 90°C in dry locations and 75°C in wet locations.

Green colored insulated wire shall be used for all grounding applications.

Phase wires shall be color-coded as follows:

1. 120/208 volt system: Black for A phase
   Red for B Phase
   Blue for C Phase
2. 480/277 volt system: Brown for A phase
   Yellow for B Phase
   Orange for C Phase

Neutral conductors shall be white for 120/208 volt and white with gray stripe for 480/277V.

Provide O-Z/Gedney Type "CSB" series or approved equal seal fittings between the wire and conduit for all cable and wire entering the building from underground, including service cables.

Not more than 3 current carrying conductors shall be in one (1) conduit unless otherwise indicated. Provide one neutral conductor for each 3 phase 4 wire homerun to a panelboard unless otherwise noted.

MC cable shall comply with the NEC article 330. MC cable shall be as manufactured by AFC or approved equal by Guardian Products.

MC cable shall include a green insulated ground wire of the same size as the other conductors.

Run MC cable in dry hollow metal partitions and above suspended ceilings. Install cable as slack span; do not pull tight. Maintain at least 6" clearance between parallel runs of light and power wiring to avoid inductive coupling. Maintain at least 24" clearance from hot water and steam piping. Provide conduit sleeves through walls and partitions that obstruct horizontal passage of wiring, and seal sleeves after installation of cables. Cable shall be secured by approved staples, hangers or similar fittings independent of ceiling grids or supports.

MC cable shall be used in conjunction with conduit. Cable shall only be permitted for single phase circuits in hollow metal walls and above accessible ceilings. Single phase cable runs shall be gathered into three phase conduit homeruns. In no case shall cable enter directly into panelboards.

Secure MC cable to ceiling structure at intervals not to exceed 6 feet and within 12 inches of every outlet box, junction box, or fitting.

Make wire splices electrically and mechanically secure. Install small wire connectors so that no bare conductor is exposed. Tighten bolts on large conductor connectors so that conductor is deformed, but do not break strands of wire. Use compression tool with proper die for compression connectors in accordance with manufacturer's recommendations, so that conductors are deformed but not broken. Apply insulation over splice so that insulation thickness is at least 1-1/2 times that on conductor. Lap applied insulation at least 1" over conductor insulation so that no bare conductor is exposed.

In general, all feeders No. 8 and larger shall be continuous from point of origin to equipment being served. Splices shall only be used where necessary and with prior written approval of the Engineer.

Terminate conductors on terminal strips in equipment where terminal strips are used. Provide appropriate connectors, or hook conductors around terminal screws as required.

Provide encapsulated splice kits (3-M type 85 series or approved equal) for all splices in areas subject to moisture, including wet locations inside buildings and underground handholes, manholes, and buried junction boxes. Install splice kit in accordance with manufacturer's recommendations, and make splice waterproof. Apply sealing putty to surround each cable. Install mold body so that resin covers each cable sheath by a minimum of one inch.

All copper conductors No. 8 & larger shall be terminated, spliced, and tapped with color-keyed compression connectors, as manufactured by Thomas & Betts Co., Series 54000, Ideal Industries Series 87000, or approved equal. The manufacturer's recommended tooling shall be used. Mechanical type connectors shall not be used.

All copper conductors No. 10 AWG & smaller shall be terminated and spliced with Ideal Industries wing-nut wire connectors or approved equal compression connectors. The flame-retardant thermoplastic insulated type shall be used to isolate the terminal from other metal parts and equipment.t

Use insulating boots supplied for compression connectors or fill joint with "Scotchfil" insulating putty and serve (3) 1/2 lap layers of "Scotch" #33 electrical tape.

WIRING DEVICES AND INSTALLATION COMPONENTS

All local switches near doors shall be located at strike side of door as finally hung, whether so indicated on the Drawings or not.

Height of outlets from finished floor to centerline of outlet shall be as follows:

Receptacle outlets: 1'-6", unless otherwise noted

Wall switch outlet: 3'-8"

Wall switch outlet at borrowed light: 3'-0"

Telephone outlet: 1'-6"

Receptacles at counters: Centered between backsplash and wall cabinets or 2" clear above backsplash. Coordinate prior to roughin.

Motor controllers: 5'-0"

Safety and disconnect switches: 5'-0"

Panelboards (Lighting and Power): 6'-6" above finished floor to top

Wiring devices and installation components shall be manufactured by Hubbell, Bryant Electric, Pass & Seymour, Leviton, Cooper Industries-Arrow Hart, or General Electric.

Switches shall be heavy-duty specification grade, toggle, quiet type, fully enclosed in composition cases, color as selected by Architect at shop drawing stage. They shall be rated 20 amp, 120 volt, AC.

Receptacles shall be the grounding type, composition base, meeting NEMA standards, publication WD-1-1971, color as selected by Owner.

Duplex Convenience Receptacles shall be 20 amps, 125 volts, 2 pole, 3 wire, U ground slot type, Hubbell No. BR20.

Special purpose Single Receptacles shall be 20 amps, 125 volts, 2 pole, 3 wire, twist-lock type, Hubbell No. 2310.

Ground Fault Interrupter Duplex Receptacles: 20 amps, 125 volts, 2 pole, 3 wire, Hubbell No. GF-5352, with weatherproof cover, Hubbell No. 5221.

Where more than one switch or receptacle is being installed, provide multiple gang plates for number of devices as required.

Plates shall be beveled steel, of minimum .035" thickness, color selected by architect.

Manual motor starters shall be Allen Bradley Bulletin 600 or approved equal by Square D or General Electric and shall be horsepower rated, and voltage rated for the motor load.

Wallboard and masonry shall fit snuggly to all sides of outlet boxes, grout and patch as required.

Convenience receptacles shall be mounted with ground pole up, except those mounted above counter levels.

Local switches and receptacles shall be mounted vertically unless otherwise indicated.

MOTOR INSTALLATION

Run all power feeds and connections from power panels to all motor starters or control panel locations. Where shown on Drawings connect the motor starting devices for motors, supplying and installing all necessary connections between starters and control devices and motors, in conduit, and leave motors ready to start. The power supply leads to the motors from the starters or control panels shall be of the same size and number of the other leads required for the proper operation of each motor. Provide (6) wires from starters to two speed motors.

Check motor nameplates for full-load current rating and allowable temperature rise to determine overload heater elements. Install correct heater element in the corresponding starter. Verify proper rotation.

Furnish motor safety disconnect switches for all motors except where such switches are specified to be furnished in other divisions or are included in the equipment control panel. Install all motor safety disconnect switches furnished under this Division or other Divisions of the Specification. Install manually-operated devices, such as push-buttons and manual starters, to permit convenient operation and be readily accessible.

Install "Seattite" flexible conduit for final connections to all motors and vibrating equipment including transformers.

Individual starters furnished by others shall be received and erected under this Section. Starters shall be individually or group mounted plumb and level, on freestanding angle iron frames, supplied under this Section.

Provide manual motor starters for all fractional horsepower motors as shown on the Drawings or otherwise required.

PANELBOARDS

The interior distribution system, in general, shall consist of 3-phase, 4-wire mains at 277/480 volts and 120/208 volts. The contractor shall balance the load on all feeders as nearly as possible on the three phases after the system is fully energized and all components are functioning.

Panelboards and distribution panels shall be General Electric "A" Series and CCB or approved equal by Square D, Cutler Hammer, or Siemens.

Panel circuit breaker overcurrent protective devices shall be as scheduled on the Drawings and as specified. All breakers shall be bolted-on thermal magnetic type

Panel circuit breakers shall be rated for 10,000 RMS symmetrical amperes minimum interrupting rating at 120/208 volts and for 14,000 RMS symmentrical amperes minimum interrupting rating at 277/480 volts. Provide higher ratings as required or as scheduled on the Drawings.

Provide handle-locking attachments for all circuit breaker serving emergency lights, exit lights, clocks, and other functions indicated.

Cabinets and trim shall be fabricated of code gauge steel, with hinged door, lock and catch, and directory pocket covered with clear plastic shield over directory.

Furnish and install a typewritten circuit directory. Hand written will not be accepted.

SAFETY AND DISCONNECT SWITCHES

Switches shall be heavy-duty and service rated. They shall be General Electric Type "TH" or equal by Square D, Cutler Hammer, or Siemens. Switches shall include solid neutral where required. Provide auxiliary contacts where required to break motor control circuit power.

Interior enclosures shall be NEMA 1. Enclosures shall have interlocked doors and be capable of being positively padlocked in ON and OFF positions. For exterior installations, the enclosures shall be NEMA 4.

FUSES

Fused safety and disconnect switches shall be provided with fuses of class, type, and rating as required or shown on Drawings.

Install disconnect switches used with motor-driven appliances, and motors and controllers within sight of the controller position unless otherwise indicated.

Fuses sizes 0 to 600 Amperes shall be Buss Fusetron Type FRS-R or equal by Chase Shawmut or Cefco. They shall be U.L. Class "RK-5" Time-Delay dual element.

GROUNDING

The complete electrical installation shall be permanently and effectively grounded in accordance with all code requirements, whether or not such connections are specifically shown or specified. Measured resistance to ground shall be 5 ohms, maximum. All parts of the electrical installation shall be grounded.

Ground conductors shall be sized in accordance with the National Electrical Code. Ground conductors shall be continuous without splices.

LIGHTING FIXTURES

Refer to Lighting Fixture Schedule on Drawings for manufacturer specified for each type of fixture. Manufacturers and catalog numbers indicated constitute the type and quality of equipment to be furnished. However, they shall be considered only as a guide. Similar equipment of equal quality are being installed. Fixtures shall have proper labels; i.e. 'hazardous', 'damp locations', 'dust tight', may be submitted for review. Fixtures shall be suitable for application and environment where they etc., whether or not specifically indicated in the specified catalog number or fixture description.

Note that specifications for recessed fixtures generally do not include mounting accessories, and that each fixture type may be used in several different ceilings. Provide recessed fixtures to suit particular type of ceiling construction, with appropriate trims and plaster frames provided if required. Lamps shall be manufactured by General Electric, Phillips, or Sylvania. A complete set of new lamps shall be installed in each fixture.

Only High Frequency Electronic Ballasts manufactured by Advance Mark V or equal by Motorola, Magnitec, or Universal shall be used. Ballasts shall comply with ASHARE/IESNA 90.1 Standards for efficiency.

All LED fixtures shall be provided with necessary drivers and hardware for complete operation.

Suspended fixtures shall be supported by chains, conduit, or 1/8 inch galvanized steel aircraft cable or manufactured stems. Outlet box canopy shall be the swivel, self-aligning type.

Where fixtures are surface mounted to or pendant mounted below suspended ceilings, support fixture from structure above suspended ceiling. Support of fixture from grid ceiling suspension systems shall not be permitted. Pierce ceiling material for hangers and outlet boxes as required. For fixtures mounted on suspended ceilings, provide supplementary alignment clips and attach to grid system.

Pendant mount fixtures where indicated, and provide all mounting hardware. Suspend fixtures with self-aligning components.

Hang all fixtures plumb, with continuous rows in alignment except as noted.

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PROJECT TITLE:
INDUSTRIAL ARTS ALTERATION

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