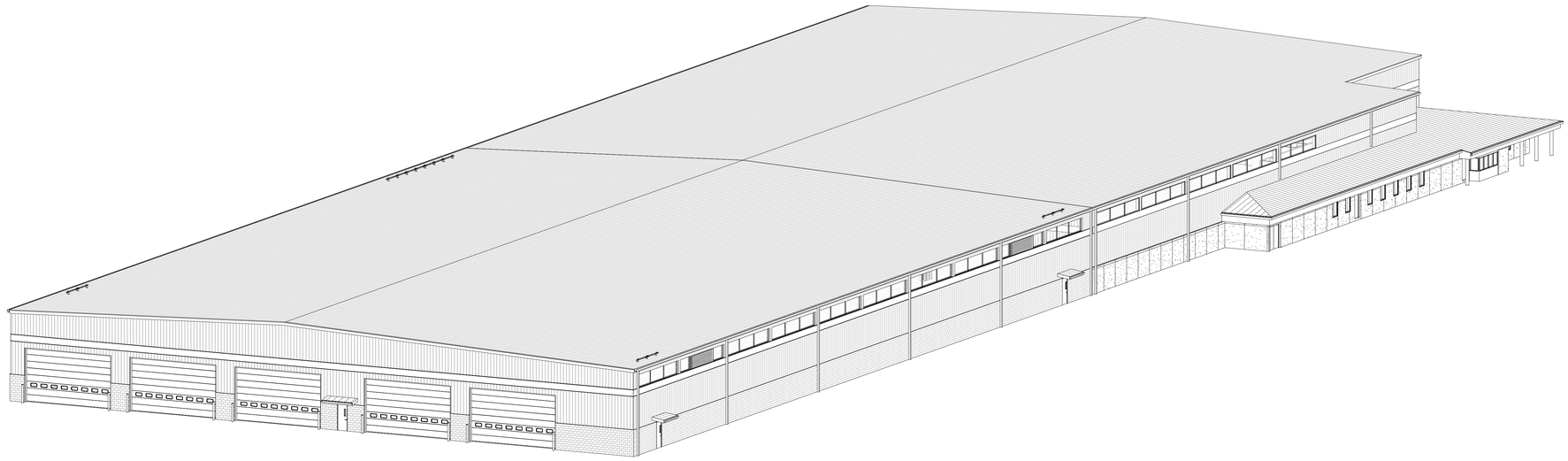
GERALD R. FORD INTERNATIONAL AIRPORT

SRE BUILDING EXPANSION

BID SET

SEPTEMBER 18, 2023



PROJECT ADDRESS

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION
GRAND RAPIDS, MI

GRR PROJECT NO. C-378
DLZ PROJECT NO. 2241.7462.00
C&S PROJECT NO. K19.012.001

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Troy, MI 48098
Office: 248.879.5666

EACH SEAL APPLIES TO ITS DESIGNATED DISCIPLINE.

ARCHITECTURAL	SITE / CIVIL	STRUCTURAL	MECHANICAL	ELECTRICAL
STATE OF MICHIGAN MICHAEL WAYNE HAGAN 1301071821 LICENSED ARCHITECT	STATE OF MICHIGAN MICHAEL D. HOLDWICK ENGINEER NO. 6201057577 LICENSED PROFESSIONAL ENGINEER	STATE OF MICHIGAN JOHN W. COLEMAN ENGINEER No. 6201069388 LICENSED PROFESSIONAL ENGINEER	STATE OF MICHIGAN JOHN T. HATSIOS ENGINEER No. 6201311201 LICENSED PROFESSIONAL ENGINEER	STATE OF MICHIGAN ERIC MICHAEL GRAETTINGER ENGINEER No. 6201052161 LICENSED PROFESSIONAL ENGINEER

Location Map

General Notes

A. CONTRACTOR IS RESPONSIBLE TO CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES AND REGULATIONS INCLUDING APPLICABLE ORDINANCES AND REFERENCED STANDARDS.

B. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO SUBMITTING A BID OR BEGINNING ANY WORK. CONDITIONS FOUND TO BE IN VARIANCE FROM THE INFORMATION IN THE DRAWINGS OR PROJECT MANUAL SHALL BE SUBMITTED TO THE ARCHITECT IN WRITING FOR CLARIFICATION.

C. KEYNOTES ARE MEANT AS A GENERAL GUIDE FOR TYPICAL LOCATIONS. CONTRACTOR TO PERFORM FULL EXTENT OF WORK REQUIRED TO ACCOMPLISH DESIGN INTENT. THE ABSENCE OF A KEYNOTE DOES NOT ABSOLVE THE CONTRACTOR FROM PROVIDING THE FEATURE GRAPHICALLY INDICATED ON THE DRAWINGS.

D. SPECIFIC WORK ITEMS SHALL BE COORDINATED AND INTERFACED WITH ALL OTHER TRADES TO ALLOW FOR A COMPLETE INSTALLATION AS REQUIRED TO ACCOMPLISH DESIGN INTENT.

E. REFER TO DRAWINGS OF EACH TRADE OR DISCIPLINE FOR ADDITIONAL GENERAL NOTES AND INFORMATION, INCLUDING CIVIL/SITE DEVELOPMENT, ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, ELECTRICAL AND TECHNOLOGY.

F. CONTRACTOR IS RESPONSIBLE FOR ALL WORK IDENTIFIED ON ALL DRAWINGS AND INFORMATION IN THE PROJECT MANUAL, AS A COMPLETE PROJECT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE SPECIFIC SCOPE OF WORK FOR ANY SUBCONTRACTORS FOR THIS PROJECT.

G. FIELD VERIFY ACTUAL LOCATIONS OF EXISTING PUBLIC AND PRIVATE UTILITIES, STRUCTURES, WATER LINES, STORM AND SANITARY LINES, GAS LINES, ELECTRICAL CONDUIT, AND OTHER UNDERGROUND UTILITIES PRIOR TO PERFORMING EARTHWORK, EXCAVATION, OR UTILITY WORK. ENGAGE THE SERVICES OF A PRIVATE UTILITY LOCATE COMPANY IF NECESSARY TO COMPLETELY LOCATE EXISTING UNDERGROUND UTILITIES AND STRUCTURES.

H. LOCATION OF ALL TEMPORARY FACILITIES SHALL BE COORDINATED WITH OWNER AND ARCHITECT PRIOR TO MOBILIZATION ON-SITE, INCLUDING BUT NOT LIMITED TO TEMPORARY STAGING AREA, MATERIAL STORAGE AREA, ACCESS DRIVE(S), PARKING AREA, TOPSOIL STOCKPILE AREA, WASTE DISPOSAL AREA, FIELD OFFICES AND TEMPORARY FACILITIES, JOB SIGN, AND TEMPORARY FENCING.

I. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL MISCELLANEOUS BLOCKING REQUIRED FOR INSTALLATION OF ALL BUILDING COMPONENTS, INCLUDING BUT NOT LIMITED TO FURNISHINGS, FIXTURES, EQUIPMENT, HARDWARE, BRACKETS, AND OWNER-PROVIDED EQUIPMENT. CONTRACTOR SHALL COORDINATE SPECIFIC REQUIREMENTS ASSOCIATED WITH EACH TRADE AND WITH OWNER'S REPRESENTATIVE.

J. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL MISCELLANEOUS WOOD AND METAL TRIM, FLASHING, CLIP ANGLES, ANCHORS, SUPPORTS, AND CLOSURE TRIM REQUIRED TO PROVIDE A COMPLETE, UNIFORM, AND WEATHERTIGHT ASSEMBLY AS REQUIRED TO ACCOMPLISH THE DESIGN INTENT.

K. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS. CONTRACTOR SHALL PROVIDE AND INSTALL ALL ACCESSORY COMPONENTS AS REQUIRED TO FULLY COMPLY WITH MANUFACTURER'S RECOMMENDATIONS.

L. CONTRACTOR SHALL PROVIDE ACCESS DOORS, 12"X24" MIN., IN ALL WALLS AND CEILINGS WHERE SERVICE OR ADJUSTMENT TO MECHANICAL, PLUMBING, FIRE PROTECTION OR ELECTRICAL ITEMS MAY BE REQUIRED. ACCESS DOORS SHALL BE OF AN APPROPRIATE SIZE REQUIRED FOR EACH APPLICATION. WHERE APPLICABLE, ACCESS DOORS SHALL MATCH THE FIRE RATING OF THE WALL ASSEMBLY.

M. WHERE DISCREPANCIES EXIST IN THE CONTRACT DOCUMENTS INCLUDING DISCREPANCIES BETWEEN DRAWINGS AND PROJECT MANUAL, CONTRACTOR SHALL REQUEST CLARIFICATION IN WRITING FROM ARCHITECT. THE CONTRACTOR SHALL NOT ASSUME ANY ITEM TAKES PRECEDENCE OVER THE OTHER. ANY ACTION THE CONTRACTOR MAKES PRIOR TO NOTIFICATION IN WRITING SHALL BE SOLELY AT THE CONTRACTOR'S RISK.

N. CONTRACTOR SHALL SEAL ALL PENETRATIONS AND JOINTS IN EXTERIOR WALL AND ROOF ASSEMBLIES WITH APPROPRIATE SEALANT(S) AND FLASHING(S) TO MAINTAIN A WEATHERTIGHT AND AIRTIGHT BUILDING ENVELOPE. INCLUDING THE FOLLOWING:
   1. JOINTS AROUND FENESTRATION AND DOOR FRAMES.
   2. JUNCTIONS BETWEEN WALLS AND FOUNDATIONS, BETWEEN WALLS AT BUILDING CORNERS, BETWEEN WALLS AND FLOORS OR ROOFS, AND BETWEEN WALLS AND ROOF OR WALL PANELS.
   3. OPENINGS AT PENETRATIONS OF UTILITY SERVICES THROUGH ROOFS, WALLS, AND FLOORS.
   4. JOINTS, SEAMS, AND PENETRATIONS OF VAPOR RETARDERS.
   5. ALL OTHER OPENINGS IN THE BUILDING ENVELOPE.

O. COORDINATE WITH OTHER CONSTRUCTION ACTIVITIES AND CONSTRUCTION SEQUENCING WITH OTHER PROJECT(S) AND WORK BEING PERFORMED CONCURRENTLY ON-SITE.

P. BUILDING ELEVATION 100'-0" EQUALS SITE ELEVATION 782.00.

Q. CONTRACTOR TO PROTECT ALL ITEMS WITHIN THE CONSTRUCTION LIMITS (INCLUDING SITE ELEMENTS) THAT ARE DESIGNATED TO REMAIN; ITEMS DAMAGED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT SHALL BE REPAIRED OR REPLACED TO ORIGINAL CONDITION.

R. ALL PENETRATIONS AND JOINTS IN FIRE-RATED WALL ASSEMBLIES AND FLOOR/CEILING ASSEMBLIES SHALL BE SEALED WITH A FIRESTOPPING SYSTEM OR FIRE-RESISTIVE JOINT SYSTEM WITH RATING EQUAL TO THE ASSEMBLY. SYSTEMS SHALL BE U.L.-LISTED FOR EACH APPLICATION. U.L. REVIEW FOR NON-STANDARD CONDITIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

S. ALL VERTICAL FENESTRATION (OPERABLE AND FIXED GLAZED ASSEMBLIES) SHALL BE LABELED BY THE MANUFACTURER WITH U-FACTOR, SHGC RATING, SAFETY RATING, AND FIRE-RESISTANCE RATING, WHERE APPLICABLE. WINDOWS AND DOORS SHALL BE CERTIFIED AS MEETING AIR LEAKAGE REQUIREMENTS PER NFRC 400.

T. THESE DRAWINGS SHALL NOT BE SCALED TO OBTAIN DIMENSIONS. IF THE DIMENSIONS CANNOT BE DETERMINED BY THE INFORMATION GIVEN, CONTRACTOR SHALL REQUEST CLARIFICATION FROM THE ARCHITECT. ALL DIMENSIONS ARE TO FACE OF STUD, FACE OF CMU, OR FACE OF CONCRETE, UNLESS NOTED OTHERWISE. CEILING HEIGHT DIMENSIONS ARE FROM FINISHED FLOOR TO FACE OF FINISHED CEILING MATERIALS, UNLESS NOTED OTHERWISE.

U. CONTRACTOR IS RESPONSIBLE TO PROVIDE DEWATERING ACTIVITIES AS PART OF THE BASE BID FOR EARTHWORK, IF REQUIRED.

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STATE OF MICHIGAN
MICHAEL WAYNE MONTGOMERY
ARCHITECT
No. 1301071821
LICENSED ARCHITECT

NO.	REVISION	DATE

DRAWN: AMB | CHK'D: DJM
DESIGNED: AMB
APPR'VD: -
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

GENERAL NOTES AND INFORMATION

DRAWING NUMBER G1.1

GENERAL

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I. 2015 Michigan Rehabilitation Code for Existing Buildings

A. Chapter 5 Classification of Work

1. Section 507 Addition 61,615 gross sf
   A. Shall comply with Chapter 11 and the applicable provisions of the 2015 Michigan Building Code.

B. Chapter 11 Additions

1. Section 1102 Heights and Areas
   Addition shall not increase the height or area beyond that permitted by Chapter 5 of the International Building Code for new buildings.

2. Section 1102.3 Fire Protection Systems
   Existing fire areas increased by the addition shall comply with Chapter 9 of the International Building Code.

3. Section 1106 Energy Conservation
   Additions shall conform to the International Energy Conservation Code for new construction.

II. 2015 Michigan Building Code

A. Chapter 3 Use and Occupancy Classification

1. Section 311.2 - Moderate-hazard storage, Group S-1

B. Chapter 5 – General Building Heights and Areas

1. Section 504.3 - Allowable Building Height
   Allowable: 75'
   Actual: 37'

2. Section 504.4 - Allowable Number of Stories
   Allowable: 3
   Actual: 1

3. Section 506 - Allowable Area
   Allowable: Unlimited (per Section 507.4)

C. Chapter 6 Types of Construction

1. Section 602.2 Type IIB Construction, unprotected
   Type II construction is that type of construction in which the building elements listed on Table 601 are of noncumbustible material.
2. Table 601- Fire Resistance Rating

Requirements for Building Elements	Hours Protection
- Structural Frame	0
- Bearing Walls Exterior	0
- Bearing Walls Interior	0
- Nonbearing Walls	0
- Floor Construction	0
- Roof Construction	0

D. Chapter 9 Fire Protection Systems

1. Section 903.2.9.1 Repair Garages
   An Automatic Sprinkler System shall be provided throughout buildings not more than one story above grade plane, with a fire area exceeding 12,000 square feet.

E. Chapter 10 Means of Egress

1. Section 1004 Occupant Load
   Parking Garage = 61,615 sf / 200 (gross) = 308 Additional Occupants

2. Section 1006 Number of Exits and Exit Access Doorways
   (based on work area including Assembly, Shipping, & Dock)
   Required: 2 Provided: 5

4. Section 1017 Exit Access Travel Distance Table 1017.2
   Group S-1: Maximum 250'
   Provided: See Life Safety Plan

III. 2015 Michigan Energy Code

A. Chapter 3 General Requirements

- Table 301.1 Climate Zones
  Kent County, Zone 5A

B. Chapter 4 Commercial Energy Efficiency

1. Section 401 Application

   Commercial buildings shall comply with ANSI/ASHRAE/IESNA 90.1-2013

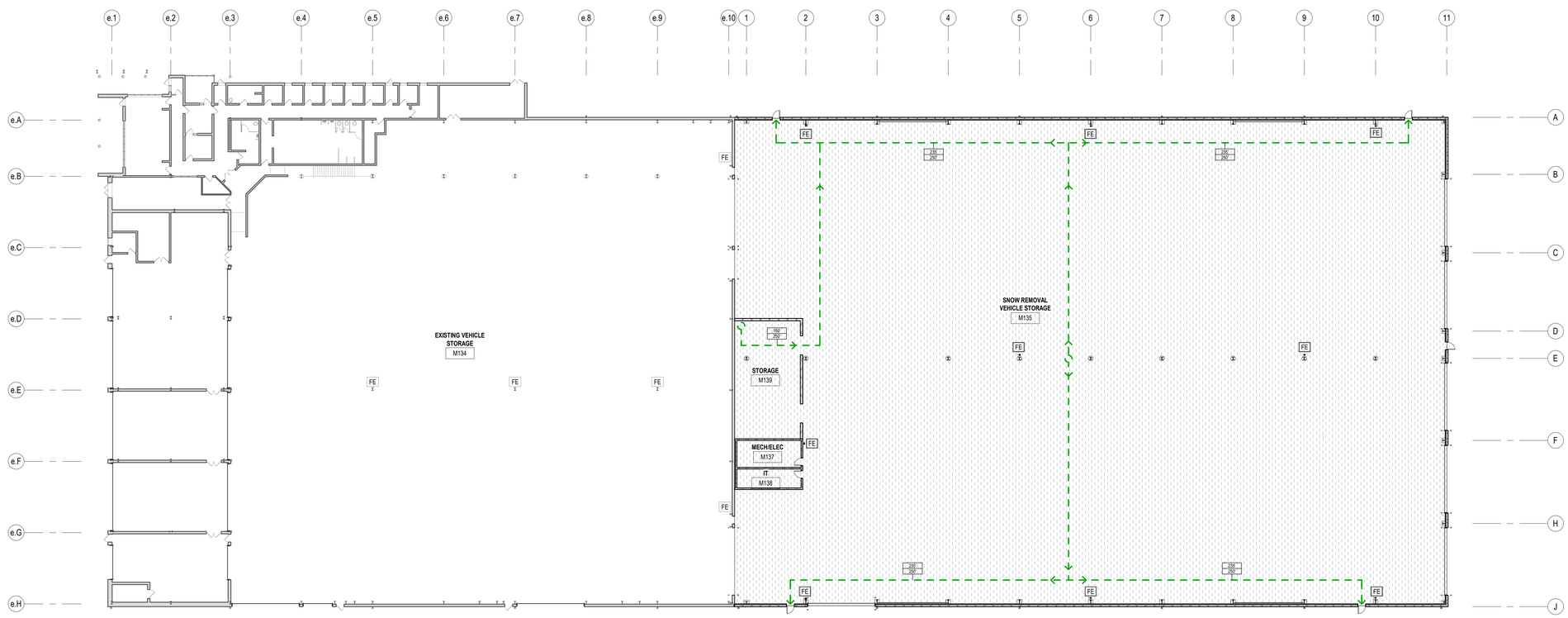
IV. ASHRAE 90.1-2013 - Energy Standard for Buildings

A. Chapter 5 - Building Envelope

1. Table 5.5-5 Building Envelope Requirements for Climate Zone 5

- Roof - Metal Building	U-0.210; R-4.4 + R-1.4 Ls or R-3.3 + R-1.9 Ls
- Walls - Metal Building	U-0.286
- Walls - Mass	U-0.513; R-2.0 c.i.
- Slab, Unheated	R-2.6 for 600mm (24") below
- Doors	U-2.839 max.
- Fenestration - Metal Framing, Fixed	U-2.38; SHGC-0.40

2 2015 MICHIGAN BUILDING CODE COMPLIANCE
SCALE: 1/8" = 1'-0"



1 LIFE SAFETY PLAN
SCALE: 3/64" = 1'-0"
NORTH

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MICHAEL WAYNE MONTAGUE
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GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

LIFE SAFETY PLAN AND BUILDING CODE ANALYSIS

DRAWING NUMBER G1.2

GENERAL

THIS PLAN IS TO BE PRINTED IN COLOR

KEYED NOTE REFERENCE
EXISTING AIRPORT PROPERTY LINE
EXISTING AVIGATION EASEMENT BOUNDARY
EXISTING ROADWAY BOUNDARY
EXISTING RUNWAY OBJECT FREE AREA
EXISTING RUNWAY SAFETY AREA
EXISTING TAXIWAY OBJECT FREE AREA
EXISTING TAXIWAY SAFETY AREA
EXISTING EDGE OF WATER
EXISTING WETLAND LOCATION
EXISTING EDGE OF WOODS
EXISTING CONIFEROUS TREE
EXISTING DECIDUOUS TREE
EXISTING CONTOUR LINE
EXISTING SWALE CENTERLINE
EXISTING TOP/BOTTOM OF DITCH
EXISTING FENCE LINE
EXISTING SINGLE SWING GATE
EXISTING DOUBLE SWING GATE
EXISTING CANTILEVER GATE
EXISTING GUIDE RAIL
EXISTING DRAINAGE LINE
EXISTING UNDERDRAIN
EXISTING UNDERDRAIN CLEANOUT
EXISTING CATCH BASIN
EXISTING DRAINAGE MANHOLE
EXISTING HEADWALL
EXISTING PIPE END SECTION
EXISTING WATER LINE
EXISTING HYDRANT
EXISTING WATER VALVE
EXISTING WATER MANHOLE
EXISTING SANITARY LINE
EXISTING SANITARY FORCE MAIN
EXISTING SANITARY MANHOLE
EXISTING GAS LINE
EXISTING GAS VALVE
EXISTING GAS LINE MARKER
EXISTING GLYCOL SYSTEM DRAINAGE LINE
EXISTING GLYCOL SYSTEM FORCE MAIN
EXISTING GLYCOL SYSTEM DRAINAGE MANHOLE
EXISTING GLYCOL SYSTEM VENT
EXISTING GLYCOL SYSTEM AIR RELEASE VAULT
EXISTING UNDERGROUND TELEPHONE LINE
EXISTING FIBER OPTIC LINE
EXISTING OVERHEAD TELEPHONE LINE
EXISTING TELEPHONE JUNCTION BOX
EXISTING TELEPHONE MANHOLE
EXISTING UNDERGROUND ELECTRIC LINE
EXISTING OVERHEAD ELECTRIC LINE
EXISTING LIGHT POLE
EXISTING UTILITY POLE
EXISTING GUY WIRE AND ANCHOR
EXISTING POLE SUPPORT
EXISTING CONCRETE MARKER
EXISTING CONCRETE DUCT MARKER
EXISTING CONCRETE CABLE MARKER
EXISTING CONCRETE SPLICE MARKER
EXISTING BOLLARD OR POST
EXISTING TIE-DOWN
EXISTING SINGLE POST TRAFFIC SIGN
EXISTING DOUBLE POST TRAFFIC SIGN
EXISTING MONITORING WELL
EXISTING OBSERVATION WELL
EXISTING HOLDING POSITION LIGHT

EXISTING SURFACE SENSOR
EXISTING RETROREFLECTIVE MARKER
EXISTING RUNWAY OR TAXIWAY EDGE LIGHT
EXISTING IN-PAVEMENT EDGE LIGHT
EXISTING AIRFIELD GUIDANCE SIGN
EXISTING REIL UNIT
EXISTING ELECTRICAL DISCONNECT
EXISTING TRANSFORMER
EXISTING WIND CONE
EXISTING LIGHTED WIND CONE
EXISTING ELECTRICAL MANHOLE
EXISTING PULLBOX
EXISTING JUNCTION CAN
EXISTING JUNCTION CAN PLAZA
EXISTING CIRCUIT LABEL
EXISTING AIRFIELD LIGHTING CABLE IN TRENCH
EXISTING AIRFIELD LIGHTING CABLE IN CONDUIT
EXISTING DUCT BANK
EXISTING SURVEY BASELINE
EXISTING SURVEY BASELINE POINT
EXISTING SURVEY CONTROL POINT
EXISTING BENCHMARK LOCATION
IRON ROD FOUND
EXISTING CONIFEROUS TREE TO BE REMOVED
EXISTING DECIDUOUS TREE TO BE REMOVED
EXISTING FENCE LINE TO BE REMOVED
EXISTING DRAINAGE LINE TO BE REMOVED
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EXISTING ELECTRICAL MANHOLE TO BE REMOVED

EXISTING PULLBOX TO BE REMOVED
EXISTING JUNCTION CAN TO BE REMOVED
EXISTING JUNCTION CAN PLAZA TO BE REMOVED
EXISTING AIRFIELD LIGHTING CABLE IN TRENCH TO BE REMOVED
EXISTING AIRFIELD LIGHTING CABLE IN CONDUIT TO BE REMOVED
EXISTING DUCT BANK TO BE REMOVED
EXISTING AIRFIELD GUIDANCE SIGN TO BE MODIFIED
EXISTING AIRFIELD GUIDANCE SIGN TO BE REFURBISHED
EXISTING RUNWAY OR TAXIWAY EDGE LIGHT TO BE MODIFIED
EXISTING CRACK TO BE MILLED AND FILLED
EXISTING MARKING TO BE REMOVED
PROPOSED AIRPORT PROPERTY LINE
PROPOSED AVIGATION EASEMENT BOUNDARY
PROPOSED ROADWAY BOUNDARY
PROPOSED WETLAND LOCATION
PROPOSED EDGE OF WOODS
PROPOSED CONIFEROUS TREE
PROPOSED DECIDUOUS TREE
PROPOSED CONTOUR LINE
PROPOSED INTERMEDIATE CONTOUR LINE
PROPOSED SPOT ELEVATION
PROPOSED GRADE LINE
PROPOSED SWALE CENTERLINE
PROPOSED FENCE LINE
PROPOSED SINGLE SWING GATE
PROPOSED DOUBLE SWING GATE
PROPOSED CANTILEVER GATE
PROPOSED GUIDE RAIL
PROPOSED DRAINAGE LINE
PROPOSED UNDERDRAIN
PROPOSED UNDERDRAIN CLEANOUT
PROPOSED CATCH BASIN
PROPOSED DRAINAGE MANHOLE
PROPOSED HEADWALL
PROPOSED PIPE END SECTION
PROPOSED WATER LINE
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PROPOSED SANITARY MANHOLE
PROPOSED GAS LINE
PROPOSED GAS VALVE
PROPOSED GLYCOL SYSTEM DRAINAGE LINE
PROPOSED GLYCOL SYSTEM FORCE MAIN
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PROPOSED HOLDING POSITION LIGHT
PROPOSED SURFACE SENSOR
PROPOSED BASE MOUNTED EDGE LIGHT
PROPOSED IN-PAVEMENT EDGE LIGHT
PROPOSED RETROREFLECTIVE MARKER
PROPOSED AIRFIELD GUIDANCE SIGN

PROPOSED SIGN UNIT ID TAG NUMBER
PROPOSED REIL UNIT
PROPOSED ELECTRICAL DISCONNECT
PROPOSED TRANSFORMER
PROPOSED WIND CONE
PROPOSED LIGHTED WIND CONE
PROPOSED ELECTRICAL MANHOLE
PROPOSED PULLBOX
PROPOSED JUNCTION CAN
PROPOSED JUNCTION CAN PLAZA
PROPOSED AIRFIELD LIGHTING CABLE IN CONDUIT WITH CIRCUIT NUMBER AND NUMBER OF CABLES
PROPOSED AIRFIELD LIGHTING CABLE IN TRENCH WITH CIRCUIT NUMBER AND NUMBER OF CABLES
PROPOSED DUCT BANK
PROPOSED DIRECTIONAL DRILL DUCT BANK
TEMPORARY SOLAR POWERED OBSTRUCTION LIGHT
TEST BORING LOCATION
TEST PIT LOCATION
PAVEMENT CORE LOCATION
PROPOSED SILT FENCE LOCATION
PROPOSED CHECK DAM LOCATION
PROPOSED STORM DRAIN INLET PROTECTION
PROPOSED STABILIZED CONSTRUCTION ENTRANCE LOCATION
PROPOSED ROCK OUTLET PROTECTION LOCATION
PROPOSED SEDIMENT TRAP LOCATION
PROPOSED HMA PAVEMENT
PROPOSED PCC PAVEMENT
EXISTING ASPHALT PAVEMENT TO BE REMOVED
EXISTING CONCRETE PAVEMENT TO BE REMOVED
EXISTING BUILDING TO BE REMOVED
BARRICADE LOCATION WITH WORK AREA DESIGNATION
WORK AREA LIMITS
FLAGPERSON LOCATION
HAUL ROAD/ACCESS ROUTE

ABBREVIATIONS

ABAN. - ABANDONED
APPROX. - APPROXIMATE
ASPH. - ASPHALT
AST - ABOVEGROUND STORAGE TANK
B- BASELINE
BLDG. - BUILDING
BM - BENCH MARK
C - CENTERLINE
CIP - CAST IRON PIPE
CMP - CORRUGATED METAL PIPE
CONC. - CONCRETE
CSP - CORRUGATED STEEL PIPE
DIA. - DIAMETER
ELEV. - ELEVATION
FND. - FOUNDATION
HP - HIGH POINT
INV. - INVERT
LT - LEFT
LP - LOW POINT
MAX. - MAXIMUM
MIN. - MINIMUM
MISC. - MISCELLANEOUS
NA - NOT APPLICABLE
OFA - OBJECT FREE AREA
O.C. - ON CENTER
PAVT. - PAVEMENT
PC - POINT OF CURVATURE
PCC - PORTLAND CEMENT CONCRETE PAVEMENT
PI - POINT OF INTERSECTION
P - PROPERTY LINE
PT- POINT OF TANGENCY
PVI - POINT OF VERTICAL INTERSECTION
PVC - POINT OF CURVATURE (VERTICAL CURVE)
PVC - POLYVINYL CHLORIDE PIPE
PVT - POINT OF TANGENCY (VERTICAL CURVE)
R - RADIUS
RCP - REINFORCED CONCRETE PIPE
ROFA - RUNWAY OBJECT FREE AREA
RSA - RUNWAY SAFETY AREA
ROW - RIGHT OF WAY
RPZ - RUNWAY PROTECTION ZONE
RT - RIGHT
RW - RUNWAY
SHDR. - SHOULDER
SICPP - SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE
STA. - STATION
TOFA - TAXIWAY OBJECT FREE AREA
TSA - TAXIWAY SAFETY AREA
TW - TAXIWAY
TYP. - TYPICAL
UD - UNDERDRAIN

SURVEY CONTROL POINTS

Point #	Northing	Easting	Elevation	Description
600	502977.22	12807954.55	793.19	CP P&N TRAV CAP TOP HILL 120W OF FORK IN DR
601	502944.58	12808364.94	790.41	CP P&N TRAV CAP 15 W OF < PT FNC 3 S OF EB PARKING
602	503058.15	12808240.03	790.09	CP P&N TRAV CAP 1.2N OF EB NEAR < PT FNC
603	503118.71	12808088.55	784.31	CP P&N TRAV CAP 30N OF N EDGE PRIM RD
604	503241.84	12808667.11	788.71	CP P&N TRAV CAP /12 W OF COMM MH20N OF EB
605	503277.18	12808983.88	794.27	CP P&N TRAV CAP /40 N FO EB OPROX CL OF FUEL DEPOT
606	503203.47	12809361.60	790.57	CP P&N TRAV CAP /BEAT CAP 3E OF EB 16+N OF CHLINK FNC TO E
607	502899.14	12809349.80	791.68	CP P&N TRAV CAP /30+- N OF E-W FNC 25 W OF N-S FNC
608	502902.36	12808956.88	789.16	CP P&N TRAV CAP /60+-SW OF HYD
612	502857.72	12808475.00	789.97	CP MAG NAIL IN PAVEMENT / 1FT N OF EB OPP CBS TO N AT GATE 36
613	502859.97	12808425.80	789.15	CP P&N TRAV CAP / 12S OF EB OPP FNC TO N
615	503124.06	12808393.37	789.31	CP MAG NAIL IN PAVEMENT /PK 10 NE OF CLDR 90W OF GATE 35

1 **CIVIL LEGEND, ABBREVIATONS & SURVEY CONTROL POINTS**
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ISSUED FOR BID

NO.	REVISION	DATE

DRAWN: GCH | CHK'D: MDH
DESIGNED: TWL
APPRV'D: MDH
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER: 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

CIVIL LEGEND, ABBREVIATONS & SURVEY CONTROL POINTS

DRAWING NUMBER: GI003 | CIVIL

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GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR'S ATTENTION IS DIRECTED TO SECTION 70, ATTACHMENT A - CONSTRUCTION SAFETY AND PHASING PLAN (CSPP) OF THE GENERAL PROVISIONS.
2. THESE DRAWINGS HAVE BEEN PREPARED, IN PART, BASED UPON RECORD DRAWINGS AND/OR CAD FILES FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THOSE UTILIZING THE INFORMATION ON THESE DRAWINGS ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING IT FOR ANY PURPOSE.
3. EXISTING UTILITIES WERE TAKEN FROM PLANS OF RECORD. THEY HAVE BEEN SHOWN TO THE EXTENT KNOWN AND ARE OFFERED IN GOOD FAITH SOLELY FOR INFORMATIONAL PURPOSES. THEY MAY NOT REFLECT ACTUAL LOCATIONS AND MAY NOT BE INCLUSIVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
4. THE ACTUAL LOCATION AND ELEVATION OF ALL UTILITIES SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
5. IN THE EVENT OF DAMAGE TO EXISTING UTILITIES OR CABLES, THE RPR (RESIDENT PROJECT REPRESENTATIVE) AND OWNER SHALL BE NOTIFIED IMMEDIATELY.
6. THE CONTRACTOR SHALL REPAIR ALL DAMAGE TO UTILITIES OR CABLES, AS DIRECTED BY THE RPR, IMMEDIATELY AND AT THE CONTRACTOR'S EXPENSE.
7. ALL AREAS DISTURBED AS A RESULT OF THE CONTRACTOR'S STAGING AND CONSTRUCTION OPERATIONS SHALL BE RESTORED EQUAL TO OR BETTER THAN ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
8. ALL DIRT, DUST, STONES AND LOOSE DEBRIS SHALL BE CONTINUOUSLY REMOVED FROM ALL PAVED SURFACES DURING THIS CONTRACT.
9. THE CONTRACTOR SHALL MAINTAIN EXISTING ACCESS ROADS AS REQUIRED FOR ACCESS TO THE WORK AREAS.
10. ALL OF THE CONTRACTOR'S OPERATIONS SHALL REMAIN ON AIRPORT PROPERTY AT ALL TIMES. UNDER NO CIRCUMSTANCES WILL THE CONTRACTOR BE ALLOWED ON ADJACENT PROPERTY.
11. TO THE EXTENT THAT WETLAND AREAS ARE KNOWN, THEY HAVE BEEN DEPICTED ON THE CONTRACT DRAWINGS.
12. THIS CONTRACT DOES NOT ALLOW FOR PRICE INCREASES DUE TO ESCALATION IN COST. THE CONTRACTOR SHALL TAKE THIS INTO CONSIDERATION WHEN PREPARING THEIR BID.
13. THE COST OF ALL FAILING TESTS PERFORMED BY THE OWNER OR ON THE OWNER'S BEHALF SHALL BE BORNE BY THE CONTRACTOR.
14. THE OWNER RESERVES THE RIGHT TO ELIMINATE ANY ITEMS OF THE CONTRACT AND PERFORM THESE ITEMS WITH ITS FORCES AND MATERIALS.
15. THE OWNER RESERVES THE RIGHT TO SALVAGE FENCE MATERIALS. THE MATERIAL TO BE SALVAGED IS IDENTIFIED IN THE SPECIFICATION. SALVAGED MATERIAL SHALL BE STOCKPILED AT A LOCATION DESIGNATED BY THE OWNER IN GOOD CONDITION. ALL OTHER FENCE MATERIAL SHALL BE SPOILED OFF AIRPORT PROPERTY AT A PROPER DISPOSAL SITE SELECTED BY THE CONTRACTOR.

GRADING AND EXCAVATION NOTES

16. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL STRIP AND STOCKPILE ALL MATERIAL SUITABLE FOR TOPSOILING.
17. SELECTIVE GRADING SHALL BE REQUIRED AS DIRECTED BY THE RPR.
18. THE EXACT LOCATIONS AND DIMENSIONS OF PAVEMENT TO BE RECONSTRUCTED SHALL BE DETERMINED BY THE RPR DURING CONSTRUCTION.
19. THE PLACEMENT OF UNSUITABLE MATERIALS SHALL BE COORDINATED WITH THE RPR PRIOR TO PLACEMENT.
20. EMBANKMENTS SHALL BE CONSTRUCTED WITH SUITABLE ON-SITE MATERIAL UNLESS OTHERWISE DIRECTED BY THE RPR.
21. THE LIMIT FOR TOPSOILING, SEEDING, AND MULCHING ARE THE LIMITS OF GRADING SHOWN ON THE GRADING PLANS. ALL AREAS OUTSIDE OF THE GRADING LIMITS WHICH ARE DISTURBED SHALL BE RESTORED BY THE CONTRACTOR AT HIS EXPENSE.
22. THE COMBINATION OF SILT/CLAY SOILS AND HIGH NATURAL MOISTURE CONTENTS CREATE THE POTENTIAL FOR LOSS OF STRENGTH UNDER REPETITIVE LOADINGS OR VIBRATION. THE CONTRACTOR SHOULD TAKE THESE FACTORS INTO CONSIDERATION WHEN SELECTING EQUIPMENT, METHODS AND MEANS FOR CONSTRUCTION OF THIS PROJECT, AS WELL AS HAULING EQUIPMENT THAT WILL OPERATE IN THE AREA THROUGHOUT CONSTRUCTION. ANY DAMAGE TO THE SUBGRADE CONDITION AS A RESULT OF CONSTRUCTION OPERATIONS SHALL BE RESTORED TO EQUAL OR BETTER THAN ORIGINAL CONDITION, AS DIRECTED BY THE RPR AND ALL AT THE CONTRACTOR'S EXPENSE.
23. TEMPORARY AIR AND WATER POLLUTION, SOIL EROSION AND SILTATION CONTROL WORK PERFORMED FOR PROTECTION OF CONSTRUCTION AREAS OUTSIDE THE CONSTRUCTION LIMITS, SUCH AS BORROW AREAS AND WASTE AREAS, HAUL ROADS, EQUIPMENT AND MATERIAL STORAGE SITES, AND TEMPORARY PLANT SITES, WILL NOT BE MEASURED AND PAID FOR DIRECTLY BUT SHALL BE CONSIDERED AS A SUBSIDIARY OBLIGATION OF THE CONTRACTOR.
24. TOPSOILING WILL BE CONSIDERED A NECESSARY AND INCIDENTAL PART OF THE WORK AND ITS COST SHALL BE CONSIDERED BY THE CONTRACTOR AND INCLUDED IN THE CONTRACT PRICE FOR THE WORK INVOLVED.
25. ALL SOIL EROSION AND SEDIMENT CONTROL DEVICES AND MATERIALS SHALL BE IN PLACE PRIOR TO BEGINNING EARTHWORK OPERATIONS AND SHALL BE MAINTAINED UNTIL THE NEW SLOPES ARE STABILIZED WITH SEEDING AND/OR SLOPE PROTECTION.

SURVEY NOTES

26. FOR TYPICAL SECTIONS, THE CONTOUR INTERVAL EQUALS 1 FOOT. FOR TRANSITIONAL AREAS TO KEYWAYS, THE CONTOUR INTERVAL EQUALS 0.1 FOOT.
27. ALL ELEVATIONS REFER TO NAVD 88 VERTICAL DATUM. COORDINATES REFER NAD 83 HORIZONTAL DATUM.
28. THE TOPOGRAPHIC FEATURES SHOWN HEREON WERE COMPILED FROM FIELD SURVEY PERFORMED BY PREIN & NEWHOF DATED 03/09/2023.
29. THE CONTRACTOR SHALL SURVEY UTILITY LOCATES AND REESTABLISH UTILITY MARKINGS THROUGHOUT THE PROJECT.

PAVING NOTES

30. ALL AREAS TO BE OVERLAID SHALL BE PREPARED IN ACCORDANCE WITH ITEM P-101, "PREPARATION/REMOVAL OF EXISTING PAVEMENTS".
31. TACK COAT (BOND COAT), ITEM MDOT 501, SHALL BE APPLIED PRIOR TO PLACING EACH LIFT OF PAVEMENT, UNLESS OTHERWISE DIRECTED BY THE RPR.
32. TRANSVERSE PAVING JOINTS IN ONE LAYER SHALL LINE UP WITH TRANSVERSE JOINTS IN THE PREVIOUS LAYERS UNLESS OTHERWISE APPROVED BY THE RPR.
33. TRANSVERSE PAVING JOINTS IN ADJACENT LANES SHALL LINE UP WITH EACH OTHER EXTENDING ACROSS THE FULL WIDTH OF PAVEMENT.
34. IN CASES OTHER THAN CENTERLINE JOINTS, LONGITUDINAL PAVING JOINTS IN ONE LAYER SHALL BE OFFSET FROM THAT IN THE PREVIOUS LAYER BY AT LEAST ONE FOOT. THE JOINT AT THE CENTERLINE OF THE PAVEMENT SHALL LINE UP WITH PREVIOUS LAYER CENTERLINE JOINTS.
35. PROPOSED BITUMINOUS SURFACE COURSE TO BE INSTALLED IN PAVEMENT RECONSTRUCTION AREAS, SHALL BE SUBJECTED TO THE SAME MATERIAL ACCEPTANCE CRITERIA AS THE ASPHALT LEVELING COURSE.
36. COLD JOINTS SHALL BE SAWCUT BACK A MINIMUM OF 6 INCHES TO EXPOSE A CLEAN, SOUND, UNIFORM VERTICAL SURFACE FOR THE FULL DEPTH OF THE LIFT. THE SAWCUT SHALL NOT BE PERFORMED UNTIL THE PAVEMENT HAS REACHED AMBIENT TEMPERATURE.
37. DELAMINATED PAVEMENT SHALL BE REMOVED BY COLD MILLING. THE LIMITS OF DELAMINATED PAVEMENT SHALL BE SAW CUT. THE LOCATION OF THE LIMITS OF DELAMINATED PAVEMENT WILL BE DETERMINED BY THE RPR.

1 CIVIL GENERAL NOTES
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STATE OF MICHIGAN
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ISSUED FOR BID

NO.	REVISION	DATE

DRAWN: GCH | CHK'D: MDH
DESIGNED: TWL
APPR'D: MDH
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

CIVIL GENERAL NOTES

DRAWING NUMBER
GI004
CIVIL

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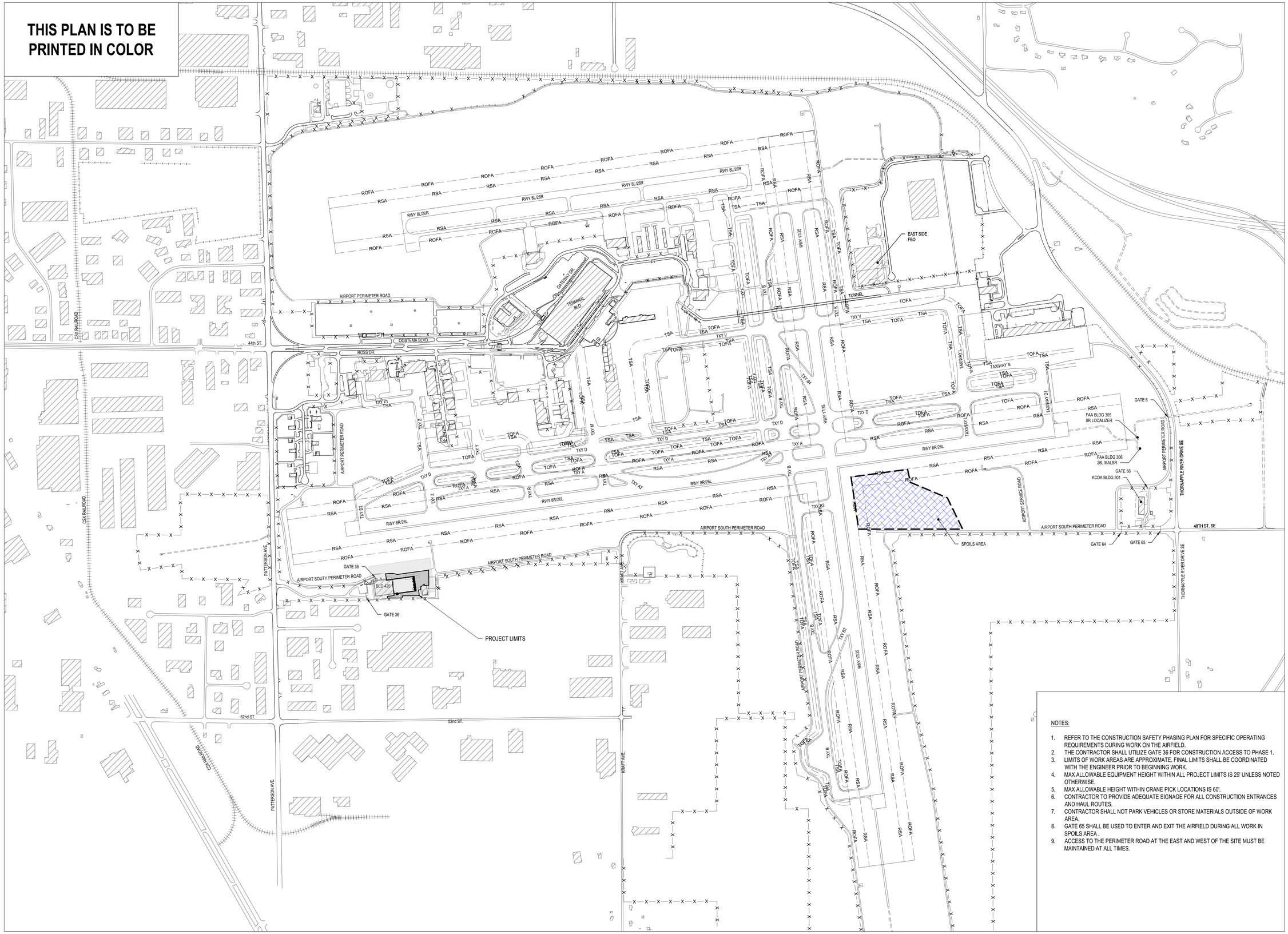

1 **GENERAL PLAN**
SCALE: 1" = 500'

NORTH

500' 0 500 1000FT.

NOTES:

1. REFER TO THE CONSTRUCTION SAFETY PHASING PLAN FOR SPECIFIC OPERATING REQUIREMENTS DURING WORK ON THE AIRFIELD.
2. THE CONTRACTOR SHALL UTILIZE GATE 36 FOR CONSTRUCTION ACCESS TO PHASE 1.
3. LIMITS OF WORK AREAS ARE APPROXIMATE. FINAL LIMITS SHALL BE COORDINATED WITH THE ENGINEER PRIOR TO BEGINNING WORK.
4. MAX ALLOWABLE EQUIPMENT HEIGHT WITHIN ALL PROJECT LIMITS IS 25' UNLESS NOTED OTHERWISE.
5. MAX ALLOWABLE HEIGHT WITHIN CRANE PICK LOCATIONS IS 60'.
6. CONTRACTOR TO PROVIDE ADEQUATE SIGNAGE FOR ALL CONSTRUCTION ENTRANCES AND HAUL ROUTES.
7. CONTRACTOR SHALL NOT PARK VEHICLES OR STORE MATERIALS OUTSIDE OF WORK AREA.
8. GATE 65 SHALL BE USED TO ENTER AND EXIT THE AIRFIELD DURING ALL WORK IN SPOILS AREA .
9. ACCESS TO THE PERIMETER ROAD AT THE EAST AND WEST OF THE SITE MUST BE MAINTAINED AT ALL TIMES.

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NO.	REVISION	DATE

DRAWN: GCH
DESIGNED: RDM
APPRVD: MDH
DATE: SEPTEMBER 18, 2023
CHK'D: MDH

PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

GENERAL PLAN

DRAWING NUMBER GI101

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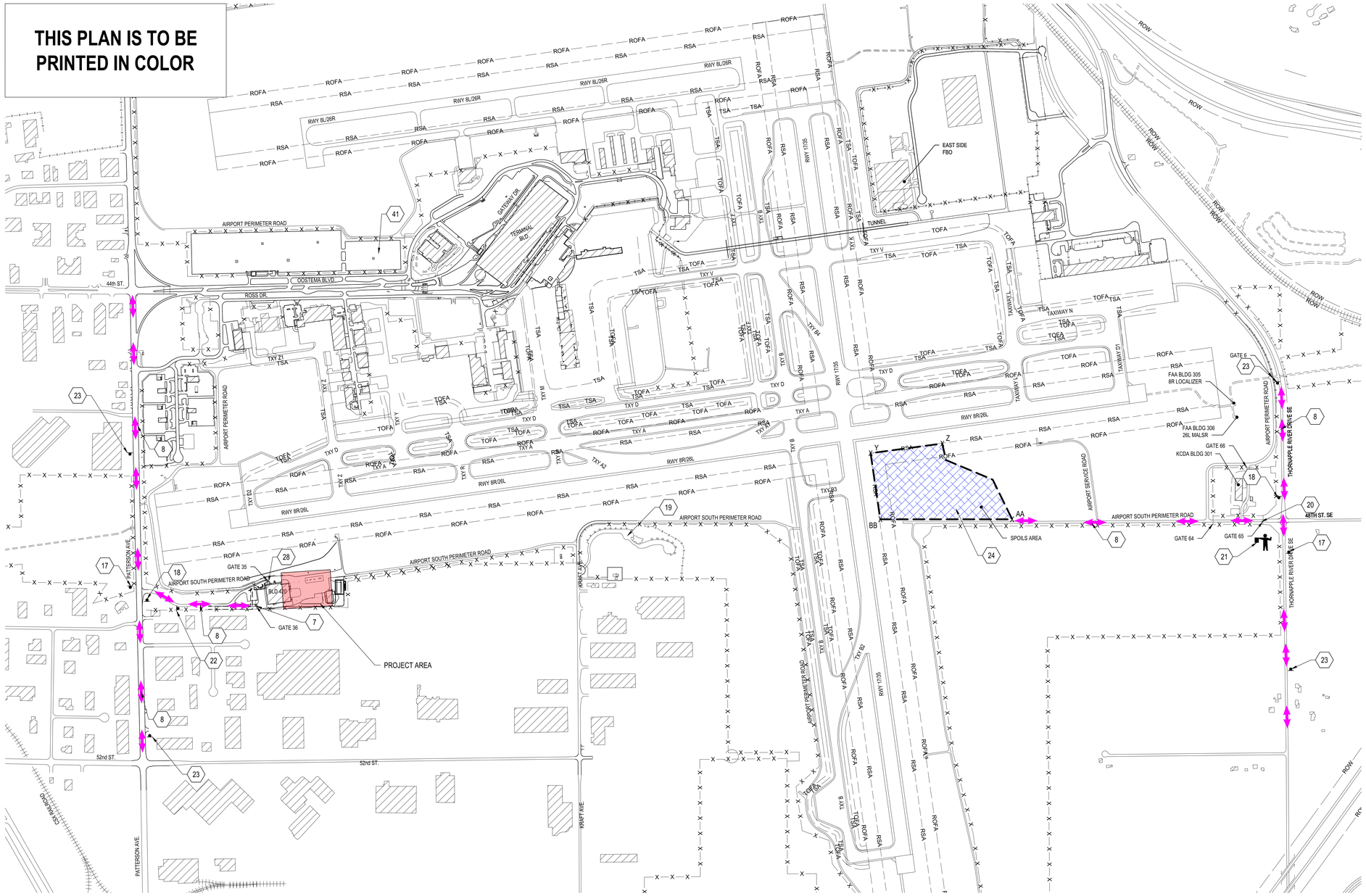

1 **CONSTRUCTION SAFETY PHASING PLAN - ACCESS PLAN**
SCALE: 1" = 500'
NORTH

KEYED NOTES

7. CONTRACTOR SHALL UTILIZE GATE 36 TO ACCESS SRE PROJECT
8. CONTRACTOR'S HAUL ROUTE
17. CONSTRUCTION PROJECT LOCATION SIGN, DETAIL 6/GC501
18. CONSTRUCTION PROJECT LOCATION SIGN, DETAIL 5/GC501
19. CONTRACTOR EMPLOYEES SHALL NOT BE ALLOWED TO PARK PERSONAL VEHICLES AT AIRPORT VIEWING AREAS AT ANY TIME
20. CONTRACTOR SHALL UTILIZE GATE 65 TO ACCESS SPOILS AREA
21. AOA ACCESS POINT TO SPOILS AREA THROUGH EXISTING SWING GATE. ONLY BADGED DRIVERS CAN ACCESS GATE. A CONTRACTOR PROVIDED GATE GUARD AND MANUAL GATE ARM EXTENDING THE FULL WIDTH OF THE GATE OPENING SHALL BE PROVIDED BY THE CONTRACTOR AT THIS LOCATION ANYTIME THE CONTRACTOR IS WORKING AND USING THE GATE. CONTRACTOR SHALL COORDINATE GATE GUARD SECURITY WITH ONGOING CONSTRUCTION EFFORTS FROM OTHER PROJECTS AT THE AIPRORT. COST SHALL BE INCLUDED IN THE ALLOWANCE FOR SECURITY SERVICES AT SPOILS AREA GATE. SEE SPECIFICATION 012100 ALLOWANCES.
22. CONSTRUCTION PROJECT LOCATION SIGN, DETAIL 4/GC501
23. CONSTRUCTION VEHICLES ENTERING SIGN, DETAIL 3/GC501
24. PROPOSED SPOILS AREA, FINAL LOCATION TO BE APPROVED BY THE RPR, (MAXIMUM ALLOWABLE HEIGHT IN SPOILS AREA SHALL BE 25'), COORDINATE OPERATIONS WITH OTHER PROJECT CONTRACTORS
28. CONTRACTOR SHALL ALLOW AIRPORT TRAFFIC ACCESS TO GATE 35 AT ALL TIMES
41. CONTRACTOR SHALL SHUTTLE EMPLOYEES FROM A SEPARATE AIRPORT OVERFLOW PARKING LOT (WELSH ROAD, 3.5 MILES AWAY) TO BE CONFIRMED BY THE OWNER IF ADDITIONAL PARKING REQUIRED.

SHEET NOTES:

1. PRIOR TO CONSTRUCTION, CONTRACTOR AND RPR SHALL VIDEOTAPE / PHOTOGRAPH ALL HAUL ROADS TO BE USED DURING THE PROJECT. THE INFORMATION SHALL BE PROVIDED TO THE OWNER PRIOR TO NOTICE TO PROCEED. ANY DAMAGE TO THE PAVEMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR, PER RPR. ALL COSTS SHALL BE RESPONSIBILITY OF THE CONTRACTOR.
2. THE CONTRACTOR SHALL GIVE WAY TO AIRPORT TRAFFIC AT ALL TIMES DURING THE PROJECT.
3. THE CONTRACTOR SHALL NOT LEAVE THE LIMITS OF WORK AND THE DESIGNATED HAUL ROUTES AS SHOWN ON THE CONTRACT DOCUMENTS UNLESS OTHERWISE AUTHORIZED BY AIRPORT PERSONNEL.
4. CONTRACTOR EMPLOYEES SHALL NOT BE ALLOWED TO PARK PERSONAL VEHICLES AT AIRPORT VIEWING AREAS AT ANY TIME.

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500'

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GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

CONSTRUCTION SAFETY PHASING PLAN - ACCESS PLAN

DRAWING NUMBER GC100

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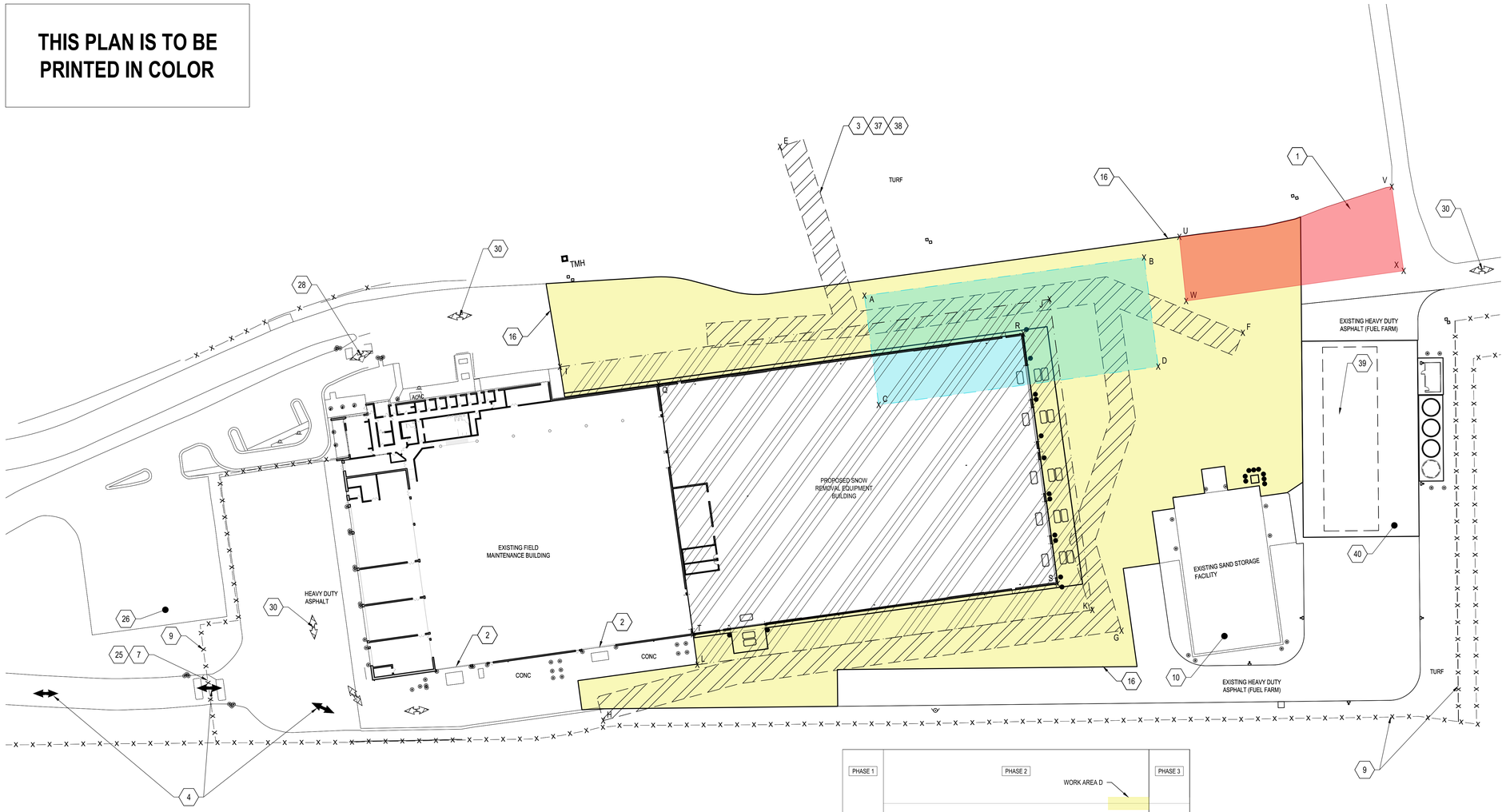
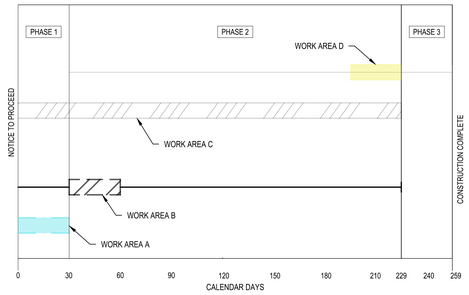


TOTAL CONTRACT TIME - 259 CALENDAR DAYS

- PHASE 1 (WORK AREA A, B, C) 30 DAYS
- PHASE 2 (WORK AREA B, C, D) 199 DAYS
- PHASE 3 (WORK AREA D) 30 DAYS
- ANTICIPATED NOTICE TO PROCEED MARCH 4, 2024
- SUBSTANTIAL COMPLETION FOR OPERATIONAL FACILITY USE OCTOBER 18, 2024



1 CONSTRUCTION SAFETY PHASING PLAN - OVERALL PLAN

SCALE: 1" = 40'

NORTH

WORK AREA A						
POINT NO.	NORTHING	EASTING	LATITUDE	LONGITUDE	GROUND ELEV.	MAX HEIGHT
A	503,212.93	12,808,923.83	N42° 52' 29.36"	W85° 32' 23.26"	789.26	25'
B	503,244.08	12,809,151.91	N42° 52' 29.70"	W85° 32' 20.21"	790.81	25'
C	503,123.72	12,808,935.44	N42° 52' 28.48"	W85° 32' 23.09"	789.11	25'
D	503,155.03	12,809,163.49	N42° 52' 28.82"	W85° 32' 20.04"	790.86	25'

WORK AREA C & TEMPORARY CRANE						
POINT NO.	NORTHING	EASTING	LATITUDE	LONGITUDE	GROUND ELEV.	MAX HEIGHT
I	503,154.83	12,808,675.35	N42° 52' 28.75"	W85° 32' 26.59"	790.17	60'
J	503,209.97	12,809,074.77	N42° 52' 29.35"	W85° 32' 21.24"	791.19	60'
K	502,956.42	12,809,109.77	N42° 52' 26.85"	W85° 32' 20.72"	791.19	60'
L	502,911.72	12,808,787.45	N42° 52' 26.36"	W85° 32' 25.04"	789.99	60'

FUEL FARM CANOPY & CHEMICAL TANKS						
POINT NO.	NORTHING	EASTING	LATITUDE	LONGITUDE	GROUND ELEV.	MAX HEIGHT
Q	503,140.71	12,808,755.75	N42° 52' 28.62"	W85° 32' 25.51"	790.16	25'
T	502,936.67	12,808,784.00	N42° 52' 26.61"	W85° 32' 25.09"	790.19	25'
R	503,181.90	12,809,053.41	N42° 52' 29.07"	W85° 32' 21.52"	790.93	25'
S	502,977.75	12,809,081.59	N42° 52' 27.06"	W85° 32' 21.10"	791.51	25'

WORK AREA B						
POINT NO.	NORTHING	EASTING	LATITUDE	LONGITUDE	GROUND ELEV.	MAX HEIGHT
E	503,334.42	12,808,854.89	N42° 52' 30.55"	W85° 32' 24.21"	779.17	25'
F	503,182.57	12,809,232.52	N42° 52' 29.10"	W85° 32' 19.11"	790.16	25'
G	502,939.51	12,809,133.53	N42° 52' 26.69"	W85° 32' 20.40"	791.19	25'
H	502,866.11	12,808,710.64	N42° 52' 25.90"	W85° 32' 26.06"	790.34	25'

WORK AREA D						
POINT NO.	NORTHING	EASTING	LATITUDE	LONGITUDE	GROUND ELEV.	MAX HEIGHT
M	503,222.71	12,808,664.04	N42° 52' 29.42"	W85° 32' 26.76"	788.69	25'
N	503,277.16	12,809,279.62	N42° 52' 30.04"	W85° 32' 18.50"	789.52	25'
O	502,910.21	12,809,146.23	N42° 52' 26.40"	W85° 32' 20.22"	0.00	25'
P	502,874.99	12,808,693.31	N42° 52' 25.99"	W85° 32' 26.30"	789.18	25'

SPOILS AREA POINTS						
POINT NO.	NORTHING	EASTING	LATITUDE	LONGITUDE	GROUND ELEV.	MAX HEIGHT
AA	503,858.49	12,816,890.46	N42° 52' 36.82"	W85° 30' 36.39"	782.00	25'
BB	503,858.49	12,815,407.48	N42° 52' 36.62"	W85° 30' 56.31"	782.00	25'
Y	504,601.72	12,815,298.89	N42° 52' 43.94"	W85° 30' 57.91"	782.00	25'
Z	504,710.36	12,816,104.83	N42° 52' 45.13"	W85° 30' 47.10"	782.00	25'

2 AIRSPACE ANALYSIS

SCALE: NOT TO SCALE

KEYED NOTES

1. CONTRACTOR STAGING AREA
2. SOUTH EXISTING MAINTENANCE FACILITY DOORS TO REMAIN OPERATIONAL AT ALL TIMES DURING CONSTRUCTION
3. CONTRACTOR TO COORDINATE UTILITY WORK WITH AIRPORT. CONTRACTOR TO PROVIDE A MINIMUM TWO WEEK NOTICE FOR ANY UTILITY WORK THAT WILL INTERUPT AIRPORT ACCESS TO AND FROM MAINTENANCE FACITLITY
4. CONTRACTOR VEHICLE ACCESS ROUTE TO PROJECT SITE. CONTRACTOR SHALL GIVE RIGHT OF WAY TO AIRPORT OPERATIONS VEHICLES AT ALL TIMES
7. CONTRACTOR SHALL UTILIZE GATE 36 TO ACCESS SRE PROJECT
9. EXISTING FENCE
10. EXISTING SAND STORAGE BUILDING
16. APPROXIMATE CONSTRUCTION LIMITS
25. PERSONAL VEHICLES CANNOT BE PARKED WITHIN LOCATION INSIDE THE SECURED AREA.
26. CONTRACTOR EMPLOYEE PARKING (UP-TO 10 SPACES ONLY), REFER TO CSPP. SEE NOTES 5 AND 6 THIS SHEET
28. CONTRACTOR SHALL ALLOW AIRPORT TRAFFIC ACCESS TO GATE 35 AT ALL TIMES
30. AIRPORT OPERATIONS VEHICLE ROUTES TO AIRFIELD
37. CONTRACTOR SHALL BACKFILL ALL TRENCHES TO EXISTING GRADE EACH DAY TO ALLOW AIRPORT TRAFFIC TO CROSS
38. CONTRACTOR SHALL PLACE BARRICADES AROUND ALL OPEN TRENCHES AND UNEVEN SURFACES AT ALL TIMES
39. FUEL FARM FACILITY (BY OTHERS). ANTICIPATED COMPLETION DATE DECEMBER 1, 2023.
40. EXISTING CONCRETE PAVEMENT (FUEL FARM)

SHEET NOTES:

1. PRIOR TO CONSTRUCTION, CONTRACTOR AND RPR SHALL VIDEOTAPE / PHOTOGRAPH ALL HAUL ROADS TO BE USED DURING THE PROJECT. THE INFORMATION SHALL BE PROVIDED TO THE OWNER PRIOR TO NOTICE TO PROCEED. ANY DAMAGE TO THE PAVEMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR, PER RPR. ALL COSTS SHALL BE RESPONSIBILITY OF THE CONTRACTOR.
2. CONTRACTOR TO COORDINATE UTILITY WORK WITH AIRPORT. CONTRACTOR TO PROVIDE A MINIMUM TWO WEEK NOTICE FOR ANY UTILITY WORK THAT WILL INTERRUPT AIRPORT ACCESS TO AND FROM MAINTENANCE FACILITY.
3. THE CONTRACTOR SHALL GIVE WAY TO AIRPORT TRAFFIC AT ALL TIMES DURING THE PROJECT.
4. THE CONTRACTOR SHALL NOT LEAVE THE LIMITS OF WORK AREAS AND THE DESIGNATED HAUL ROUTES AS SHOWN ON THE CONTRACT DOCUMENTS UNLESS OTHERWISE AUTHORIZED BY AIRPORT PERSONNEL.
5. CONTRACTOR SHALL SHUTTLE EMPLOYEES FROM A SEPARATE AIRPORT OVERFLOW PARKING LOT (WELSH ROAD, 3.5 MILES AWAY) TO BE CONFIRMED BY THE OWNER IF ADDITIONAL PARKING REQUIRED. SEE GC100.
6. CONTRACTOR EMPLOYEES SHALL NOT BE ALLOWED TO PARK PERSONAL VEHICLES AT AIRPORT VIEWING AREAS AT ANY TIME.

40 0 40 80FT.

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STATE OF MICHIGAN
MICHAEL D. HOLDWICK
ENGINEER
NO. 6201057577
PROFESSIONAL ENGINEER

ISSUED FOR BID

NO.	REVISION	DATE

DRAWN: GCH | CHK'D: MDH
DESIGNED: RDM
APPRV'D: MDH
DATE: SEPTEMBER 19, 2023

PROJECT NUMBER: 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

CONSTRUCTION SAFEFTY PHASING PLAN - OVERALL PLAN

DRAWING NUMBER: GC101

CIVIL

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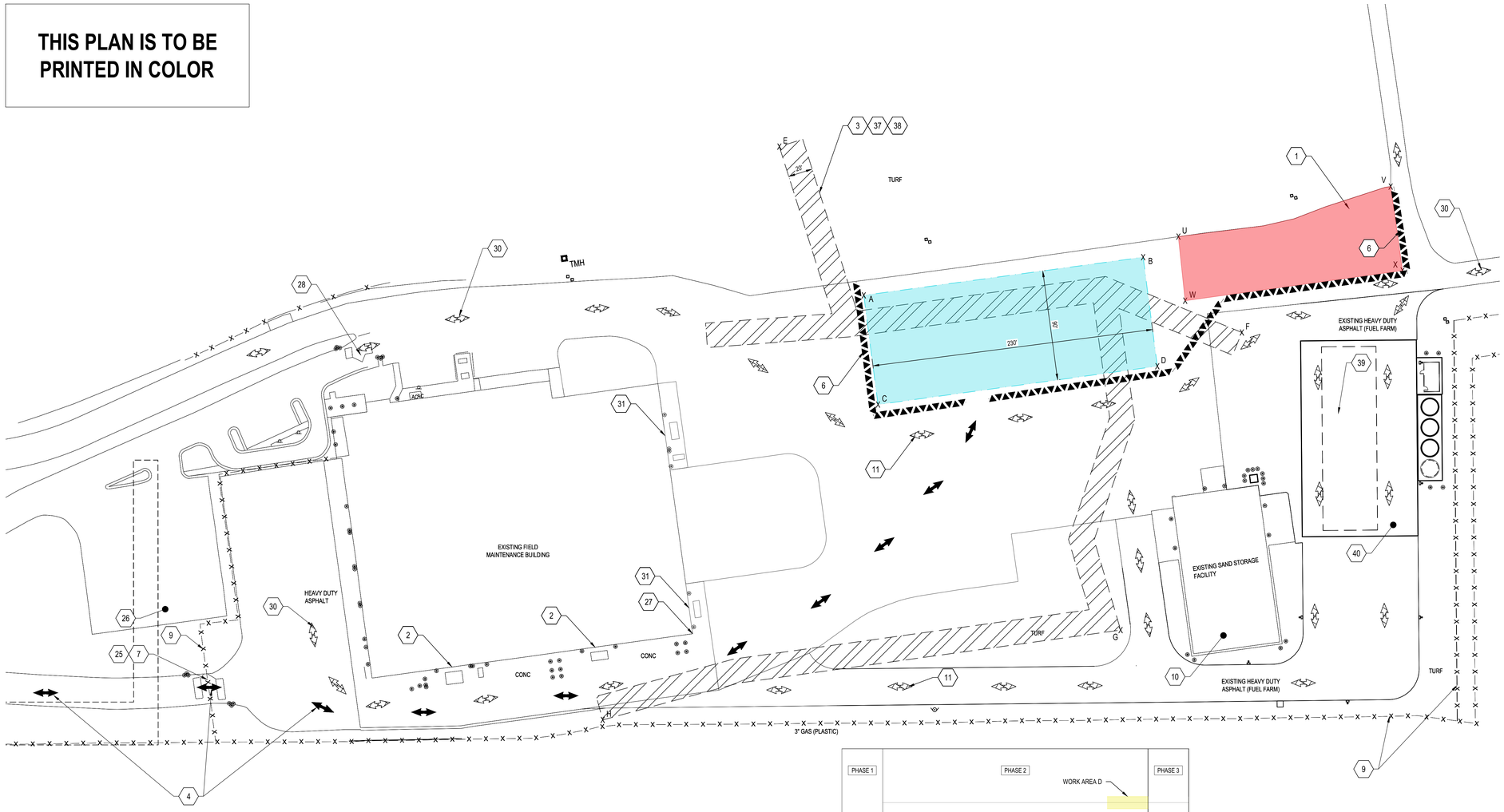
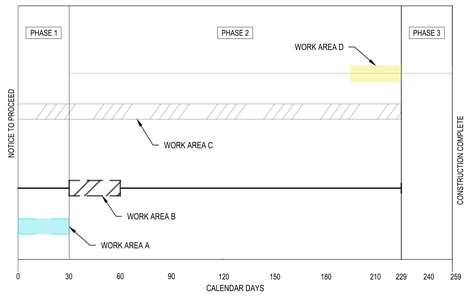


TOTAL CONTRACT TIME - 259 CALENDAR DAYS

- PHASE 1 (WORK AREA A, B, C) 30 DAYS
- PHASE 2 (WORK AREA B, C, D) 199 DAYS
- PHASE 3 (WORK AREA D) 30 DAYS
- ANTICIPATED NOTICE TO PROCEED MARCH 4, 2024
- SUBSTANTIAL COMPLETION FOR OPERATIONAL FACILITY USE OCTOBER 18, 2024



1 CONSTRUCTION SAFETY PHASING PLAN - PHASE 1

SCALE: 1" = 40'

NORTH

PHASE 1 (WORK AREA A) - 30 CALENDAR DAYS

PHASE 1 WILL INCLUDE DEMOLITION OF EXISTING FUEL FARM, INCLUDING CANOPY, FUEL EQUIPMENT, AND EXISTING FUEL TANKS

CONSTRUCTION:

- DISASSEMBLE CANOPY, EXISTING DISPENSERS, TANKS, LIGHT POLES, BOLLARDS, PIPE EQUIPMENT, PUMP SHED
- REMOVE EXISTING CONCRETE PAVEMENT
- EXCAVATE AND REMOVE EXISTING UNDERGROUND STORAGE TANKS
- BACKFILL EXCAVATED TANKS WITH SUITABLE BORROW MATERIAL
- REMOVE EXISTING PAVEMENT AND CURB
- CONTRACTOR SHALL BACKFILL AND COMPACT TRENCH AS INSTALLATION PROGRESSES TO RESTORE AIRPORT VEHICULAR TRAFFIC

TRAFFIC IMPACTS:

- FUELING TO TAKE PLACE AT NEW FUELING FACILITY EAST OF SAND STORAGE BUILDING
- CLOSED SECTION OF LOT TO BE BARRICADED OFF 10' FROM EDGE OF DEMOLISHED PAVEMENT
- CONTRACTOR SHALL BACKFILL AND COMPACT TRENCH AS INSTALLATION PROGRESSES TO RESTORE AIRPORT VEHICULAR TRAFFIC
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO EAST DOORS OF EXISTING MAINTENANCE BUILDING AT ALL TIMES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO EXISTING SAND STORAGE BUILDING AT ALL TIMES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO NEW FUEL FACILITY AT ALL TIMES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS TO GATE 35 AT ALL TIMES.

PHASE 1 (WORK AREA B)

THE SCOPE IN THIS AREA MUST BE COMPLETED CONCURRENT WITH PHASES 1 & 2 BASED ON THE LOCATION OF THE WORK. WORK AREA B WILL INCLUDE INSTALLATION OF NEW DRAINAGE SYSTEM FOR THE FINAL SITE.

CONSTRUCTION:

- INSTALL NEW DRAINAGE SYSTEM THROUGHOUT SITE.
- BACKFILL AND COMPACT DRAINAGE SYSTEM TO EXISTING GRADE TO RESTORE AIRPORT VEHICLE TRAFFIC

TRAFFIC IMPACTS:

- CONTRACTOR SHALL BACKFILL AND COMPACT TRENCH AS INSTALLATION PROGRESSES TO RESTORE AIRPORT VEHICULAR TRAFFIC
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO EXISTING MAINTENANCE BUILDING AT ALL TIMES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO EXISTING SAND STORAGE BUILDING AT ALL TIMES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO NEW FUEL FACILITY AT ALL TIMES
- CONTRACTOR SHALL BARRICADE ALL OPEN TRENCHES AT ALL TIMES

PHASE 1 (WORK AREA C)

PHASE 2 WILL INCLUDE CONSTRUCTION OF THE NEW SRE BUILDING. THIS WORK AREA MAY BEGIN CONCURRENT WITH PHASES 1 & 2 BASED ON THE LOCATION OF THE WORK.

CONSTRUCTION:

- FULL DEPTH REMOVAL OF EXISTING PAVEMENT
- REMOVAL OF EXISTING ELECTRICAL CABLE AND CONDUIT
- REMOVAL OF EXISTING DRAINAGE
- REMOVAL OF EXISTING CONCRETE APRONS
- REMOVAL OF EXISITNG BOLLARDS AND DOOR LOOPS
- CONSTRUCTION OF PROPOSED SRE BUILDING
- INSTALL AND CONNECT ROOF DRAINS

TRAFFIC IMPACTS:

- CONTRACTOR SHALL BARRICADE 25' OFFSET FROM EDGE OF BUILDING
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO SOUTH DOORS OF MAINTENANCE BUILDING AT ALL TIMES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO EXISTING SAND STORAGE BUILDING AT ALL TIMES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO NEW FUEL FACILITY AT ALL TIMES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS TO GATE 35 AT ALL TIMES.
- CONTRACTOR SHALL INSTALL NECESSARY STORM WATER PUMPS TO DRAIN LOW POINTS ON THE SITE

KEYED NOTES

1. CONTRACTOR STAGING AREA
2. SOUTH EXISTING MAINTENANCE FACILITY DOORS TO REMAIN OPERATIONAL AT ALL TIMES DURING CONSTRUCTION
3. CONTRACTOR TO COORDINATE UTILITY WORK WITH AIRPORT. CONTRACTOR TO PROVIDE A MINIMUM TWO WEEK NOTICE FOR ANY UTILITY WORK THAT WILL INTERUPT AIRPORT ACCESS TO AND FROM MAINTENANCE FACITLITY
4. CONTRACTOR VEHICLE ACCESS ROUTE TO PROJECT SITE. CONTRACTOR SHALL GIVE RIGHT OF WAY TO AIRPORT OPERATIONS VEHICLES AT ALL TIMES
6. TEMPORARY BARREL BARRICADES, SEE DETAIL 1/GC501
7. CONTRACTOR SHALL UTILIZE GATE 36 TO ACCESS SRE PROJECT
9. EXISTING FENCE
10. EXISTING SAND STORAGE BUILDING
11. AIRPORT OPERATIONS VEHICLE ROUTES DURING PHASE 1 CONSTRUCTION
25. PERSONAL VEHICLES CANNOT BE PARKED WITHIN LOCATION INSIDE THE SECURED AREA.
26. CONTRACTOR EMPLOYEE PARKING (UP-TO 10 SPACES ONLY). REFER TO CSPP. SEE NOTES 5 AND 6 THIS SHEET
27. CONTACTOR SHALL ALLOW AIRPORT ACCESS TO WASH DOWN AREA AT ALL TIMES.
28. CONTRACTOR SHALL ALLOW AIRPORT TRAFFIC ACCESS TO GATE 35 AT ALL TIMES
30. AIRPORT OPERATIONS VEHICLE ROUTES TO AIRFIELD
31. EAST EXISTING MAINTENANCE FACILITY DOORS TO REMAIN OPERATIONAL AT ALL TIMES DURING PHASE 1 CONSTRUCTION
37. CONTRACTOR SHALL BACKFILL ALL TRENCHES TO EXISTING GRADE EACH DAY TO ALLOW AIRPORT TRAFFIC TO CROSS
38. CONTRACTOR SHALL PLACE BARRICADES AROUND ALL OPEN TRENCHES AND UNEVEN SURFACES AT ALL TIMES
39. FUEL FARM FACILITY (BY OTHERS). ANTICIPATED COMPLETION DATE DECEMBER 1, 2023.
40. EXISTING CONCRETE PAVEMENT (FUEL FARM)

SHEET NOTES:

1. PRIOR TO CONSTRUCTION, CONTRACTOR AND RPR SHALL VIDEOTAPE / PHOTOGRAPH ALL HAUL ROADS TO BE USED DURING THE PROJECT. THE INFORMATION SHALL BE PROVIDED TO THE OWNER PRIOR TO NOTICE TO PROCEED. ANY DAMAGE TO THE PAVEMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR, PER RPR. ALL COSTS SHALL BE RESPONSIBILITY OF THE CONTRACTOR.
2. CONTRACTOR TO COORDINATE UTILITY WORK WITH AIRPORT. CONTRACTOR TO PROVIDE A MINIMUM TWO WEEK NOTICE FOR ANY UTILITY WORK THAT WILL INTERRUPT AIRPORT ACCESS TO AND FROM MAINTENANCE FACILITY.
3. THE CONTRACTOR SHALL GIVE WAY TO AIRPORT TRAFFIC AT ALL TIMES DURING THE PROJECT.
4. THE CONTRACTOR SHALL NOT LEAVE THE LIMITS OF WORK AREAS AND THE DESIGNATED HAUL ROUTES AS SHOWN ON THE CONTRACT DOCUMENTS UNLESS OTHERWISE AUTHORIZED BY AIRPORT PERSONNEL.
5. CONTRACTOR SHALL SHUTTLE EMPLOYEES FROM A SEPARATE AIRPORT OVERFLOW PARKING LOT (WELSH ROAD, 3.5 MILES AWAY) TO BE CONFIRMED BY THE OWNER IF ADDITIONAL PARKING REQUIRED. SEE GC100.
6. CONTRACTOR EMPLOYEES SHALL NOT BE ALLOWED TO PARK PERSONAL VEHICLES AT AIRPORT VIEWING AREAS AT ANY TIME.

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NO.	REVISION	DATE

DRAWN: GCH | CHK'D: MDH
DESIGNED: RDM
APPRV'D: MDH
DATE: SEPTEMBER 19, 2023

PROJECT NUMBER: 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

CONSTRUCTION SAFETY PHASING PLAN - PHASE 1

DRAWING NUMBER: GC102

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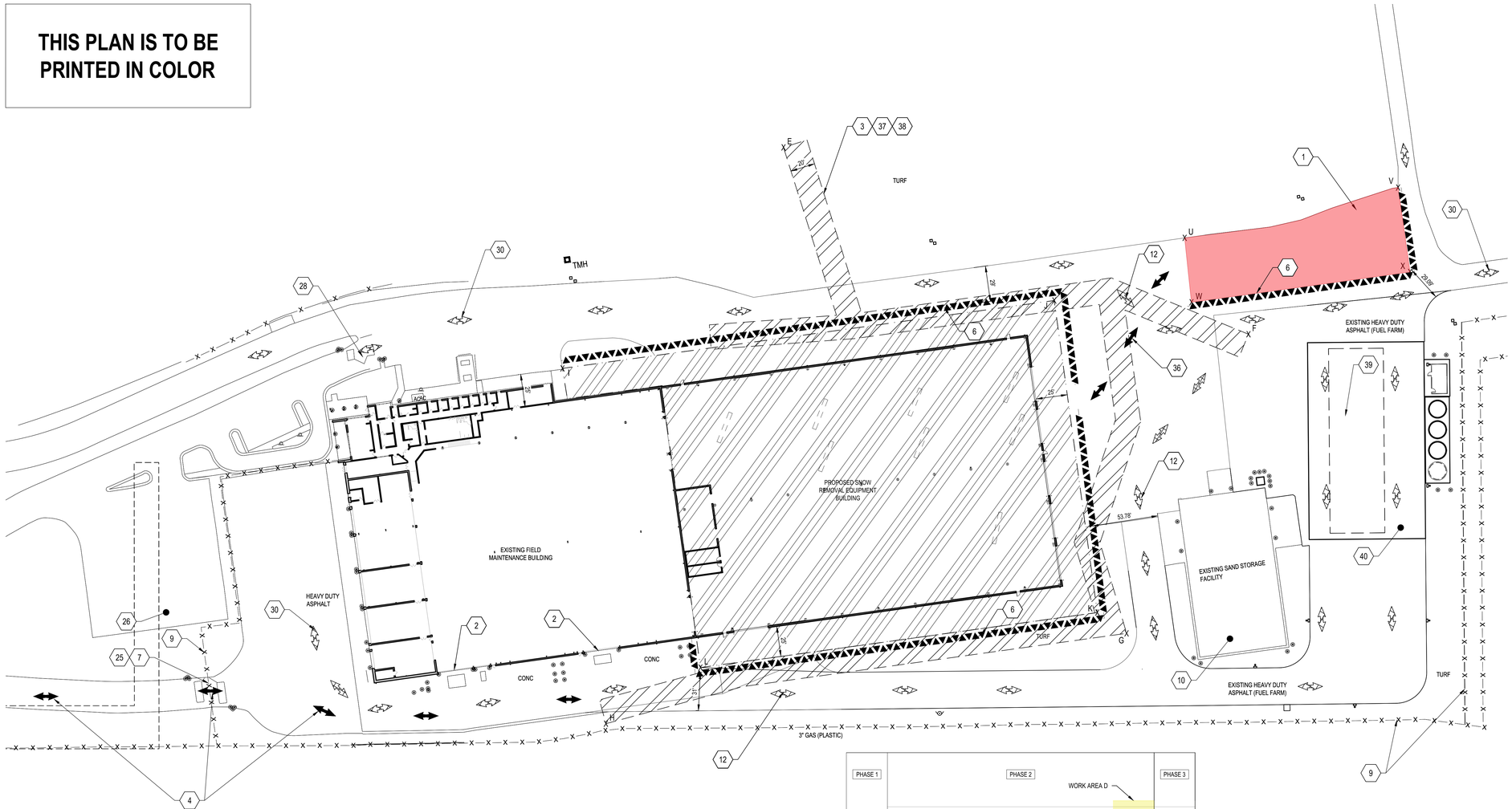
TMH
TURF
PROPOSED SNOW REMOVAL EQUIPMENT BUILDING
EXISTING FIELD MAINTENANCE BUILDING
HEAVY DUTY ASPHALT
CONC
CONC
EXISTING HEAVY DUTY ASPHALT (FUEL FARM)
EXISTING SAND STORAGE FACILITY
EXISTING HEAVY DUTY ASPHALT (FUEL FARM)
TURF
3" GAS (PLASTIC)
53.78'
20' REF
25'
25'
25'

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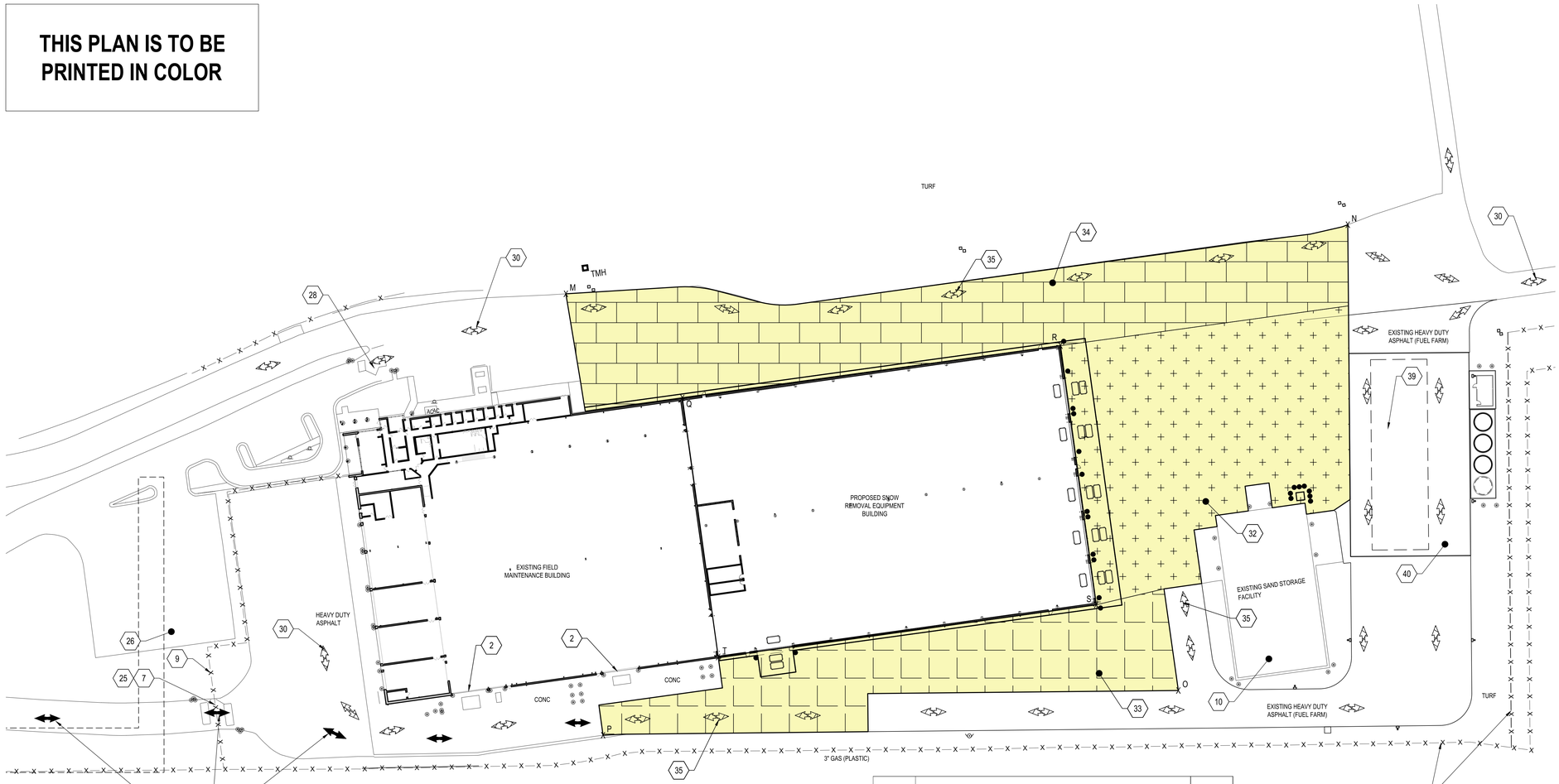
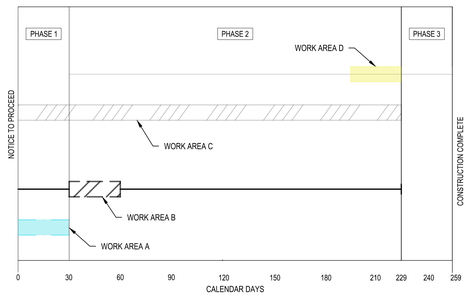


TOTAL CONTRACT TIME - 259 CALENDAR DAYS

- PHASE 1 (WORK AREA A, B, C) 30 DAYS
- PHASE 2 (WORK AREA B, C, D) 199 DAYS
- PHASE 3 (WORK AREA D) 30 DAYS
- ANTICIPATED NOTICE TO PROCEED MARCH 4, 2024
- SUBSTANTIAL COMPLETION FOR OPERATIONAL FACILITY USE OCTOBER 18, 2024



1 CONSTRUCTION SAFETY PHASING PLAN - PHASE 3

SCALE: 1" = 40'

NORTH

PHASE 3 (WORK AREA D) - 30 CALENDAR DAYS

PHASE 3 WILL INCLUDE DEMO AND FINAL PAVING OF THE SITE

CONSTRUCTION:

- DEMO OF ALL SITE PAVEMENT
- ADJUST PROPOSED STRUCTURES TO FINAL ELEVATION
- SALVAGE AND REGRADE EXISTING BASE COURSE
- SELECT FULL DEPTH PAVEMENT REMOVAL
- COMPACT ALL BASE COURSE
- PAVE NEW ASPHALT COURSE
- TIE PAVEMENTS INTO EXISTING BUILDINGS AND PAVEMENTS

TRAFFIC IMPACTS:

- CONTRACTOR SHALL BARRICADE 10' OFFSET OF EACH LOT PAVED AS CONSTRUCTION PROGRESSES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO SOUTH DOORS OF MAINTENANCE BUILDING AT ALL TIMES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO EXISTING SAND STORAGE BUILDING AT ALL TIMES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS LOOP TO NEW FUEL FACILITY AT ALL TIMES
- CONTRACTOR SHALL ENSURE AIRPORT VEHICLE FLEET ACCESS TO GATE 35 AT ALL TIMES.
- CONTRACTOR SHALL INSTALL NECESSARY STORM WATER PUMPS TO DRAIN LOW POINTS ON THE SITE

SUBPHASE 3.1: CONTRACTOR SHALL PAVE FIRST TO ALLOW AIRPORT VEHICLE ACCESS TO EAST DOORS OF FACILITY. CONTRACTOR SHALL NOT IMPACT AIRPORT TRAFFIC NORTH OR SOUTH OF THIS PHASE DURING THIS SUBPHASE. THIS WORK MUST BE COMPLETED PRIOR TO OCTOBER 18, 2023.

SUBPHASE 3.2: CONTRACTOR SHALL ALLOW ONE LANE OF AIRPORT VEHICLE TRAFFIC TO ACCESS SOUTH DOORS OF EXISTING FACILITY AT ALL TIMES.

SUBPHASE 3.3: CONTRACTOR SHALL ALLOW ONE LANE OF AIRPORT VEHICLE TRAFFIC TO ACCESS SOUTH DOORS OF EXISTING FACILITY AT ALL TIME.S.

KEYED NOTES

2. SOUTH EXISTING MAINTENANCE FACILITY DOORS TO REMAIN OPERATIONAL AT ALL TIMES DURING CONSTRUCTION
4. CONTRACTOR VEHICLE ACCESS ROUTE TO PROJECT SITE. CONTRACTOR SHALL GIVE RIGHT OF WAY TO AIRPORT OPERATIONS VEHICLES AT ALL TIMES
7. CONTRACTOR SHALL UTILIZE GATE 36 TO ACCESS SRE PROJECT
9. EXISTING FENCE
25. PERSONAL VEHICLES CANNOT BE PARKED WITHIN LOCATION INSIDE THE SECURED AREA.
26. CONTRACTOR EMPLOYEE PARKING (UP-TO 10 SPACES ONLY), REFER TO CSPP. SEE NOTES 5 AND 6 THIS SHEET
28. CONTRACTOR SHALL ALLOW AIRPORT TRAFFIC ACCESS TO GATE 35 AT ALL TIMES
30. AIRPORT OPERATIONS VEHICLE ROUTES TO AIRFIELD
32. CONTRACTOR SHALL MAINTAIN ONE-WAY TRAFFIC AT ALL TIMES DURING SUBPHASE 3.1
33. CONTRACTOR SHALL MAINTAIN ONE-WAY TRAFFIC AT ALL TIMES DURING SUBPHASE 3.2
34. CONTRACTOR SHALL MAINTAIN ONE-WAY TRAFFIC AT ALL TIMES DURING SUBPHASE 3.3
35. AIRPORT OPERATIONS VEHICLE ROUTES DURING PHASE 3 CONSTRUCTION
39. FUEL FARM FACILITY (BY OTHERS). ANTICIPATED COMPLETION DATE DECEMBER 1, 2023.
40. EXISTING CONCRETE PAVEMENT (FUEL FARM)

SHEET NOTES:

1. PRIOR TO CONSTRUCTION, CONTRACTOR AND RPR SHALL VIDEOTAPE / PHOTOGRAPH ALL HAUL ROADS TO BE USED DURING THE PROJECT. THE INFORMATION SHALL BE PROVIDED TO THE OWNER PRIOR TO NOTICE TO PROCEED. ANY DAMAGE TO THE PAVEMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR, PER RPR. ALL COSTS SHALL BE RESPONSIBILITY OF THE CONTRACTOR.
2. CONTRACTOR TO COORDINATE UTILITY WORK WITH AIRPORT. CONTRACTOR TO PROVIDE A MINIMUM TWO WEEK NOTICE FOR ANY UTILITY WORK THAT WILL INTERRUPT AIRPORT ACCESS TO AND FROM MAINTENANCE FACILITY.
3. THE CONTRACTOR SHALL GIVE WAY TO AIRPORT TRAFFIC AT ALL TIMES DURING THE PROJECT.
4. THE CONTRACTOR SHALL NOT LEAVE THE LIMITS OF WORK AND THE DESIGNATED HAUL ROUTES AS SHOWN ON THE CONTRACT DOCUMENTS UNLESS OTHERWISE AUTHORIZED BY AIRPORT PERSONNEL.
5. CONTRACTOR SHALL SHUTTLE EMPLOYEES FROM A SEPARATE AIRPORT OVERFLOW PARKING LOT (WELSH ROAD, 3.5 MILES AWAY) TO BE CONFIRMED BY THE OWNER IF ADDITIONAL PARKING REQUIRED. SEE GC100.
6. CONTRACTOR EMPLOYEES SHALL NOT BE ALLOWED TO PARK PERSONAL VEHICLES AT AIRPORT VIEWING AREAS AT ANY TIME.
7. THE CONTRACTOR MAY CONTINUE TO WORK ON WORK AREA C (INTERIOR WORK ONLY) DURING THIS PHASE.

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GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

CONSTRUCTION SAFETY PHASING PLAN - PHASE 3

DRAWING NUMBER GC104 CIVIL

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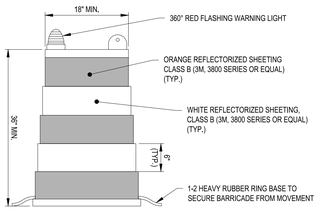
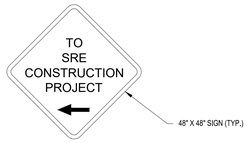


NOTE:

BARRICADES SHALL BE SPACED 8' MAX. O.C.

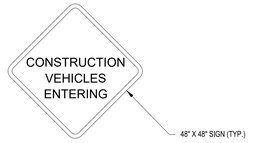
1 PLASTIC BARRICADE DETAIL
SCALE: NOT TO SCALE



SIGN NOTES:

1. SIGN BACKGROUND IS TO BE ORANGE. SIGN LETTERING IS TO BE BLACK, MINIMUM HEIGHT OF 3", AND BE A BOLD LETTERING STYLE SIMILAR TO DETAIL SHOWN ON THIS SHEET.
2. SIGN SHALL BE LOCATED HIGH ENOUGH TO ALLOW EASY VIEWING FROM ALL CONSTRUCTION VEHICLES ENTERING THE CONSTRUCTION SITE.
3. SEE PHASING DRAWINGS FOR GENERAL LOCATIONS. THE CONTRACTOR SHALL COORDINATE THE EXACT PLACEMENT AND LOCATION OF ALL CONSTRUCTION TRAFFIC SIGNS WITH THE AIRPORT AND ENGINEER.
4. SEE DETAIL 7 THIS SHEET FOR SIGN MOUNTING/ASSEMBLY.

6 CONSTRUCTION PROJECT LOCATION SIGN DETAIL
SCALE: NOT TO SCALE



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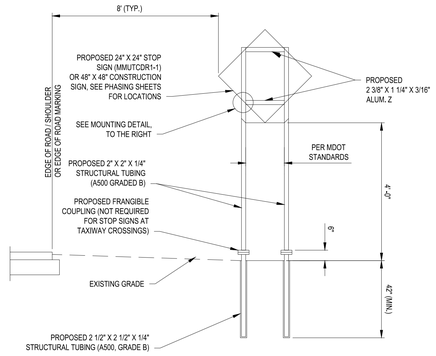
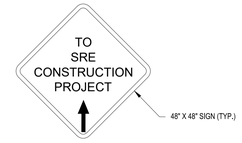
3. SEE PHASING DRAWINGS FOR GENERAL LOCATIONS. THE CONTRACTOR SHALL COORDINATE THE EXACT PLACEMENT AND LOCATION OF ALL CONSTRUCTION TRAFFIC SIGNS WITH THE AIRPORT AND ENGINEER.
4. SEE DETAIL 7 THIS SHEET FOR SIGN MOUNTING/ASSEMBLY.

3 CONSTRUCTION VEHICLES ENTERING SIGN
SCALE: NOT TO SCALE



7 CONSTRUCTION SIGN ASSEMBLY DETAIL
SCALE: NOT TO SCALE



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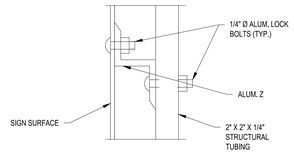
2. SIGN SHALL BE LOCATED HIGH ENOUGH TO ALLOW EASY VIEWING FROM ALL CONSTRUCTION VEHICLES ENTERING THE CONSTRUCTION SITE.
3. SEE PHASING DRAWINGS FOR GENERAL LOCATIONS. THE CONTRACTOR SHALL COORDINATE THE EXACT PLACEMENT AND LOCATION OF ALL CONSTRUCTION TRAFFIC SIGNS WITH THE AIRPORT AND ENGINEER.
4. SEE DETAIL 7 THIS SHEET FOR SIGN MOUNTING/ASSEMBLY.

4 CONSTRUCTION PROJECT LOCATION SIGN DETAIL
SCALE: NOT TO SCALE

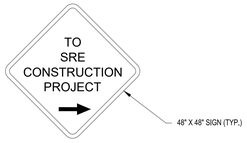


MOUNTING DETAIL

SIGN NOTES:

1. ALL SIGNS SHALL CONFORM IN SIZE, APPEARANCE AND REFLECTORIZATION TO THE REQUIREMENTS OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD).
2. AT PROJECT COMPLETION, ALL POSTS AND SIGNS SHALL BE REMOVED FROM AIRPORT PROPERTY AND SHALL REMAIN PROPERTY OF THE CONTRACTOR.
3. CONTRACTOR TO VERIFY PRESENCE OF EXISTING FOUNDATIONS AND TUBING PRIOR TO PURCHASE & INSTALLATION OF TEMPORARY CONSTRUCTION SIGNS. EXISTING FOUNDATIONS MAY BE UTILIZED PROVIDED THEY ARE IN THE CORRECT LOCATIONS.

5 CONSTRUCTION PROJECT LOCATION SIGN DETAIL
SCALE: NOT TO SCALE



SIGN NOTES:

1. SIGN BACKGROUND IS TO BE ORANGE. SIGN LETTERING IS TO BE BLACK, MINIMUM HEIGHT OF 3", AND BE A BOLD LETTERING STYLE SIMILAR TO DETAIL SHOWN ON THIS SHEET.
2. SIGN SHALL BE LOCATED HIGH ENOUGH TO ALLOW EASY VIEWING FROM ALL CONSTRUCTION VEHICLES ENTERING THE CONSTRUCTION SITE.
3. SEE PHASING DRAWINGS FOR GENERAL LOCATIONS. THE CONTRACTOR SHALL COORDINATE THE EXACT PLACEMENT AND LOCATION OF ALL CONSTRUCTION TRAFFIC SIGNS WITH THE AIRPORT AND ENGINEER.
4. SEE DETAIL 7 THIS SHEET FOR SIGN MOUNTING/ASSEMBLY.

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STATE OF MICHIGAN
MICHAEL D. HOLDWICK
ENGINEER
NO. 6201057577
PROFESSIONAL ENGINEER

ISSUED FOR BID

DRAWN: GCH	CHK'D: MDH
DESIGNED: RDM	
APPRV'D: MDH	
DATE: SEPTEMBER 18, 2023	
PROJECT NUMBER	2241.7462.00

NO.	REVISION	DATE

DRAWING NUMBER: GC501

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

CONSTRUCTION SAFETY PHASING DETAILS

CIVIL

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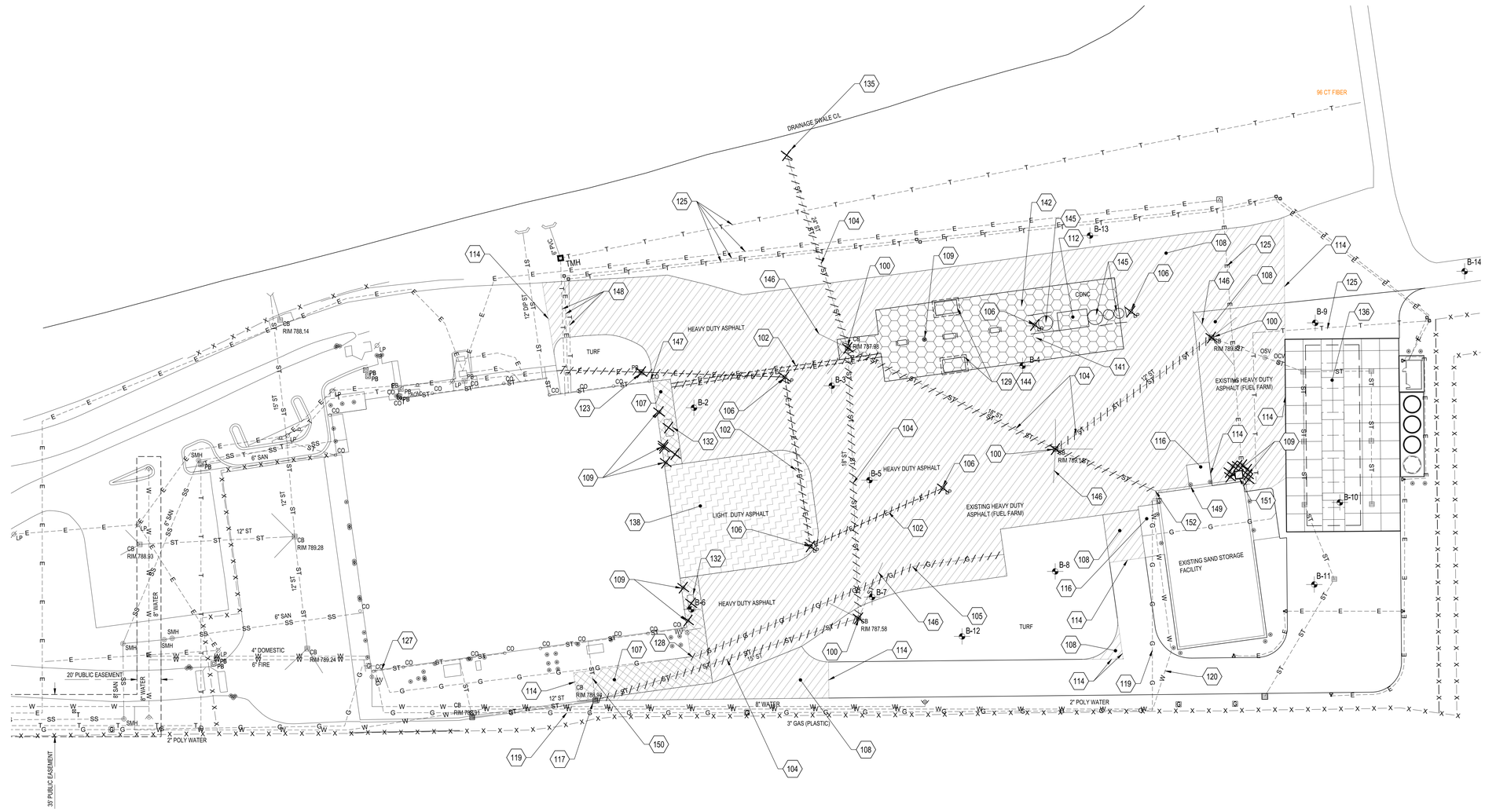

1 **EXISTING CONDITIONS AND DEMOLITION PLANS**
SCALE: 1" = 40'
NORTH

KEYED NOTES

100. REMOVE EXISTING DRAINAGE STRUCTURE
102. REMOVE EXSITING UNDERGROUND ELECTRIC CONDUIT AND CABLES.
104. REMOVE EXISTING STORM SEWER PIPE
105. REMOVE EXISTING GAS PIPE.
106. REMOVE LIGHT POLE AND FOUNDATION (HIGH PROFILE BASE, FULL DEPTH REMOVAL), DETAIL 2/CD501
107. REMOVE CONCRETE PAVEMENT (FULL DEPTH), DETAIL 6/CD501.
108. REMOVE HEAVY DUTY ASPHALT PAVEMENT (FULL DEPTH), DETAIL 5/CD501.
109. REMOVE EXISTING BOLLARD AND FOUNDATION.
112. REMOVE EXISTING CONCRETE SHED STRUCTURE
114. SAWCUT EXISTING PAVEMENT PRIOR TO REMOVAL (TYP.)
116. EXISTING CONCRETE APRON TO BE PROTECTED IN PLACE.
117. EXISTING DRAINAGE STRUCTURE TO BE PROTECTED IN PLACE
119. EXISTING ACTIVE GAS LINE TO BE PROTECTED IN PLACE
120. EXISTING ACTIVE WATER MAIN TO BE PROTECTED IN PLACE
123. REMOVE EXISTING PB ELECTRICAL EQUIPMENT
125. EXISTING ELECTRICAL CABLE AND CONDUIT TO BE PROTECTED IN PLACE.
127. EXISTING GAS LINE TO BE SHUT OFF AT FIELD MAINTENANCE BUILDING AND ABANDONED IN PLACE
128. LIMIT OF EXISTING GAS LINE REMOVAL. CAP AND ABANDON IN PLACE.
129. EXISTING UNDERGROUND FUEL TANKS. THE EXISTING UST SYSTEM IS TO BE REMOVED PER SPECIFICATION SECTION 026500
132. REMOVE EXISTING INDUCTIVE LOOP DETECTOR/CONCRETE SLABS
135. REMOVE FLARED END SECTION
136. FUEL FARM FACILITY (BY OTHERS), ANTICIPATED COMPLETION DATE NOVEMBER 15, 2023.
138. REMOVE LIGHT DUTY ASPHALT SECTION 3/CD501
141. REMOVE EXISTING CONCRETE FUEL ISLAND AND ALL FUELING EQUIPMENT
142. REMOVE EXISTING CANAOPY AND FOUNDATIONS, COMPLETE (FULL DEPTH)
143. REMOVE LIGHT POLE AND FOUNDATION (LOW PROFILE BASE, FULL DEPTH REMOVAL), DETAIL 1/CD501
144. REFERENCE STORAGE TANK REMOVAL SPECIFCATION 026500 FOR UNDERGROUND TANK REMOVAL
145. REFERENCE CHEMICAL TANK REMOVAL SPECIFICATION 026501 FOR STORAGE TANK REMOVAL
146. REMOVE UNDERDRAIN IN ITS ENTIRETY (TYP.)
147. EXISTING CLEANOUT PROTECT IN PLACE (TYP.)
148. EXISTING UTILITIES PROTECT IN PLACE
149. EXISTING BOLLARDS AND FOUNDATION PROTECT IN PLACE (TYP.)
150. EXISTING DRAINAGE PIPE, PROTECT IN PLACE
151. PROTECT EXISTING TRANSFORMER IN PLACE
152. LIMIT OF UNDERDRAIN REMOVAL. RECONNECT ROOF DRAIN TO PROPOSED STRUCTURE. SEE CU SERIES

SHEET NOTES:

1. ELECTRICAL AND COMMUNICATION WORK IS SHOWN FOR INFORMATIONAL PURPOSES ONLY. SEE ELECTRICAL AND COMMUNICATION PLANS FOR ALL WORK ASSOCIATED WITH THE LIGHTING, POWER DISTRIBUTION AND CABLING.
2. REFER TO THE PROPOSED UTILITY SERIES FOR THE LIMITS OF DEMO AND NEW PIPE.
3. THE CONTRACTOR SHALL DOUBLE SAWCUT FULL DEPTH PAVEMENT PRIOR TO THE REMOVAL OF EXISTING CONCRETE AND ASPHALT PAVEMENTS. SAWCUTS SHALL BE A MINIMUM OF 12 INCHES APART.
4. ALL STORED MISC. EQUIPMENT SUCH AS SPARE LIGHT POLES, CONCRETE BARRIERS, PLOWS, METAL, FRAC TANK AND DRUMS NOT SHOWN ON THIS PLAN SHALL BE REMOVED BY THE OWNER PRIOR TO CONSTRUCTION ACTIVITY.
5. THE CONTRACTOR MAY SALVAGE BASE MATERIALS UNDER PAVEMENT TO BE DEMOLISHED. SEE CD501 FOR PAVEMENT THICKNESS INFORMATION.
6. THERE ARE TWO (2) UNDERGROUND FUEL TANKS BENEATH THE EXISTING FUEL CANOPY. THE TANK ON THE N SIDE CONTAINS DIESEL, WHILE THE SOUTHERN TANK CONTAINS UNLEADED GAS. BOTH TANKS ARE 12,000 GALLONS.
7. EACH UNDERGROUND FUEL TANK MEASURES APPROXIMATELY 10.5' X 18.5' AT APPROXIMATELY 9,500 LBS EMPTY. TANKS ARE SET ON 3' X 14' X 22' REINFORCED CONCRETE SLABS, 11' BELOW EXISTING GRADE.
8. SOIL TESTING AT EACH UNDERGROUND FUEL TANK HAVE BEEN COMPLETED AND DO NOT INDICATE SOIL CONTAMINATION.
6. A HAZARDOUS BUILDING MATERIALS SURVEY WAS CONDUCTED ON THE EXISTING FUEL FACILITY AND NO ASBESTOS-CONTAIN MATERIALS OR LEAD-BASED PAINT WAS DETECTED IN ANY OF THE STRUCTURES. THE SURVEY IS AVAILABLE UPON WRITTEN REQUEST. THE CONTRACTOR SHALL REMOVE FROM THE STRUCTURES AND PROPERLY DISPOSE OF THE FOLLOWING UNIVERSAL WASTES: MERCURY VAPOR BULBS, FLORESCENT FIXTURES AND BALLASTS.
7. THE CONTRACTOR SHALL SURVEY UTILITY LOCATES TO REESTABLISH MARKINGS IF LOST DURING CONSTRUCTION.

40 0 40 80FT.
40

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GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

EXISTING CONDITIONS AND DEMOLITION PLANS

DRAWING NUMBER CD101 CIVIL

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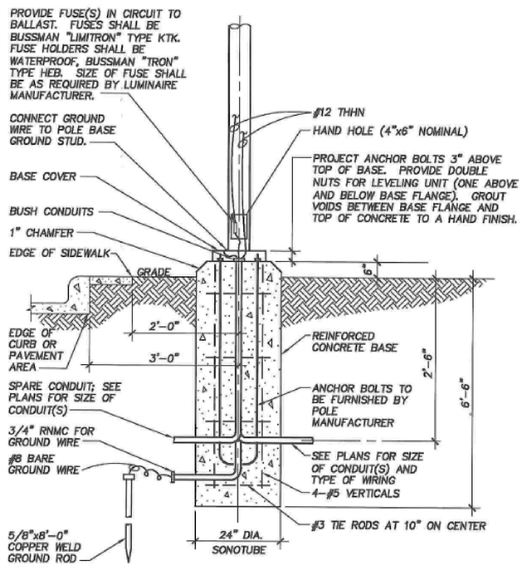
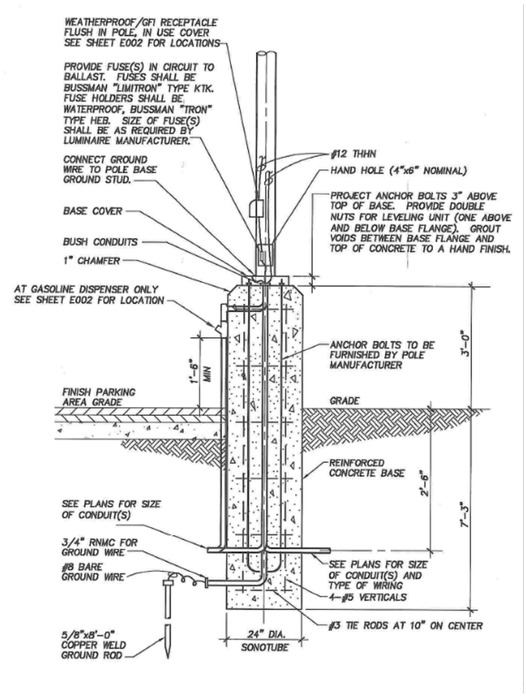


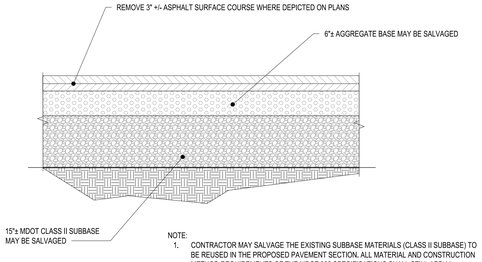
NOTE:
1. CONTRACTOR SHALL REMOVE ALL MATERIAL AND EQUIPMENT SHOWN AND DISPOSE OF OFF-SITE.

1 REMOVE EXISTING LIGHT POLE (LOW PROFILE BASE)
SCALE: NOT TO SCALE



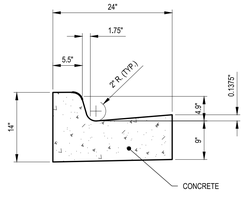
NOTE:
1. CONTRACTOR SHALL REMOVE ALL MATERIAL AND EQUIPMENT SHOWN AND DISPOSE OF OFF-SITE.

2 REMOVE EXISTING LIGHT POLE (HIGH PROFILE BASE)
SCALE: NOT TO SCALE



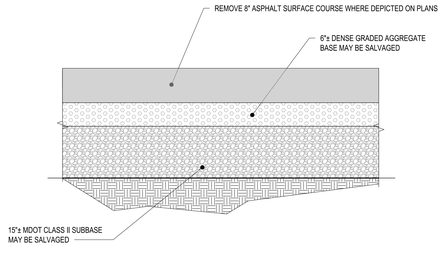
NOTE:
1. CONTRACTOR MAY SALVAGE THE EXISTING SUBBASE MATERIALS (CLASS II SUBBASE) TO BE REUSED IN THE PROPOSED PAVEMENT SECTION. ALL MATERIAL AND CONSTRUCTION METHOD REQUIREMENTS OF THE MDOT 302 SPECIFICATIONS SHALL STILL APPLY.
2. THE CONTRACTOR SHALL REMOVE ALL SALVAGEABLE CLASS II SUBBASE AND STOCKPILE ON SITE UNTIL SUBGRADE IS PREPARED. CONTRACTOR SHALL ENSURE THAT CLASS II SUBBASE IS NOT MIXED WITH AGGREGATE STONE WHILE STOCKPILING.
3. THE CONTRACTOR SHALL DETERMINE THE AMOUNT OF MATERIAL THAT CAN BE SALVAGED (INCLUDING LOSS FACTORS) BASED ON THE EXISTING SECTION INFORMATION.
4. ANY DEFICIT OF MATERIAL NEEDED FOR THE PROPOSED CONSTRUCTION SHALL BE IMPORTED FROM OFF SITE.

3 REMOVE LIGHT DUTY BITUMINOUS PAVING SECTION
SCALE: NOT TO SCALE



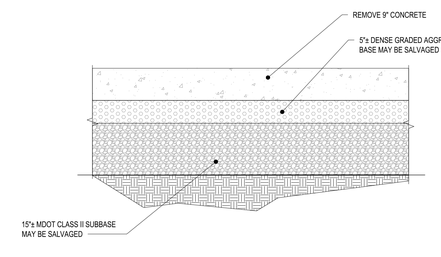
NOTE:
1. THE INFORMATION SHOWN IN THIS DETAIL IS PROVIDED BASED ON RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY ACTUAL FIELD CONDITIONS PRIOR TO BIDDING.
2. ALL DIMENSIONS SHOWN ARE APPROXIMATE.
3. DETAIL SHOWN FOR INFORMATIONAL PURPOSES ONLY.
4. CONTRACTOR SHALL REMOVE ALL MATERIAL AND EQUIPMENT SHOWN AND DISPOSE OF OFF-SITE.

4 REMOVE EXISTING CURB AND GUTTER (TIP-IN)
SCALE: NOT TO SCALE



NOTE:
1. CONTRACTOR MAY SALVAGE THE EXISTING SUBBASE MATERIALS (CLASS II SUBBASE) TO BE REUSED IN THE PROPOSED PAVEMENT SECTION. ALL MATERIAL AND CONSTRUCTION METHOD REQUIREMENTS OF THE MDOT 302 SPECIFICATIONS SHALL STILL APPLY.
2. THE CONTRACTOR SHALL REMOVE ALL SALVAGEABLE CLASS II SUBBASE AND STOCKPILE ON SITE UNTIL SUBGRADE IS PREPARED. CONTRACTOR SHALL ENSURE THAT CLASS II SUBBASE IS NOT MIXED WITH AGGREGATE STONE WHILE STOCKPILING.
3. THE CONTRACTOR SHALL DETERMINE THE AMOUNT OF MATERIAL THAT CAN BE SALVAGED (INCLUDING LOSS FACTORS) BASED ON THE EXISTING SECTION INFORMATION.
4. ANY DEFICIT OF MATERIAL NEEDED FOR THE PROPOSED CONSTRUCTION SHALL BE IMPORTED FROM OFF SITE.

5 REMOVE HEAVY DUTY BITUMINOUS PAVING SECTION
SCALE: NOT TO SCALE



NOTE:
1. CONTRACTOR MAY SALVAGE THE EXISTING SUBBASE MATERIALS (CLASS II SUBBASE) TO BE REUSED IN THE PROPOSED PAVEMENT SECTION. ALL MATERIAL AND CONSTRUCTION METHOD REQUIREMENTS OF THE MDOT 302 SPECIFICATIONS SHALL STILL APPLY.
2. THE CONTRACTOR SHALL REMOVE ALL SALVAGEABLE CLASS II SUBBASE AND STOCKPILE ON SITE UNTIL SUBGRADE IS PREPARED. CONTRACTOR SHALL ENSURE THAT CLASS II SUBBASE IS NOT MIXED WITH AGGREGATE STONE WHILE STOCKPILING.
3. THE CONTRACTOR SHALL DETERMINE THE AMOUNT OF MATERIAL THAT CAN BE SALVAGED (INCLUDING LOSS FACTORS) BASED ON THE EXISTING SECTION INFORMATION.
4. ANY DEFICIT OF MATERIAL NEEDED FOR THE PROPOSED CONSTRUCTION SHALL BE IMPORTED FROM OFF SITE.

6 REMOVE CONCRETE PAVING SECTION
SCALE: NOT TO SCALE

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GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

EXISTING CONDITIONS AND DEMOLITION DETAILS

DRAWING NUMBER CD501

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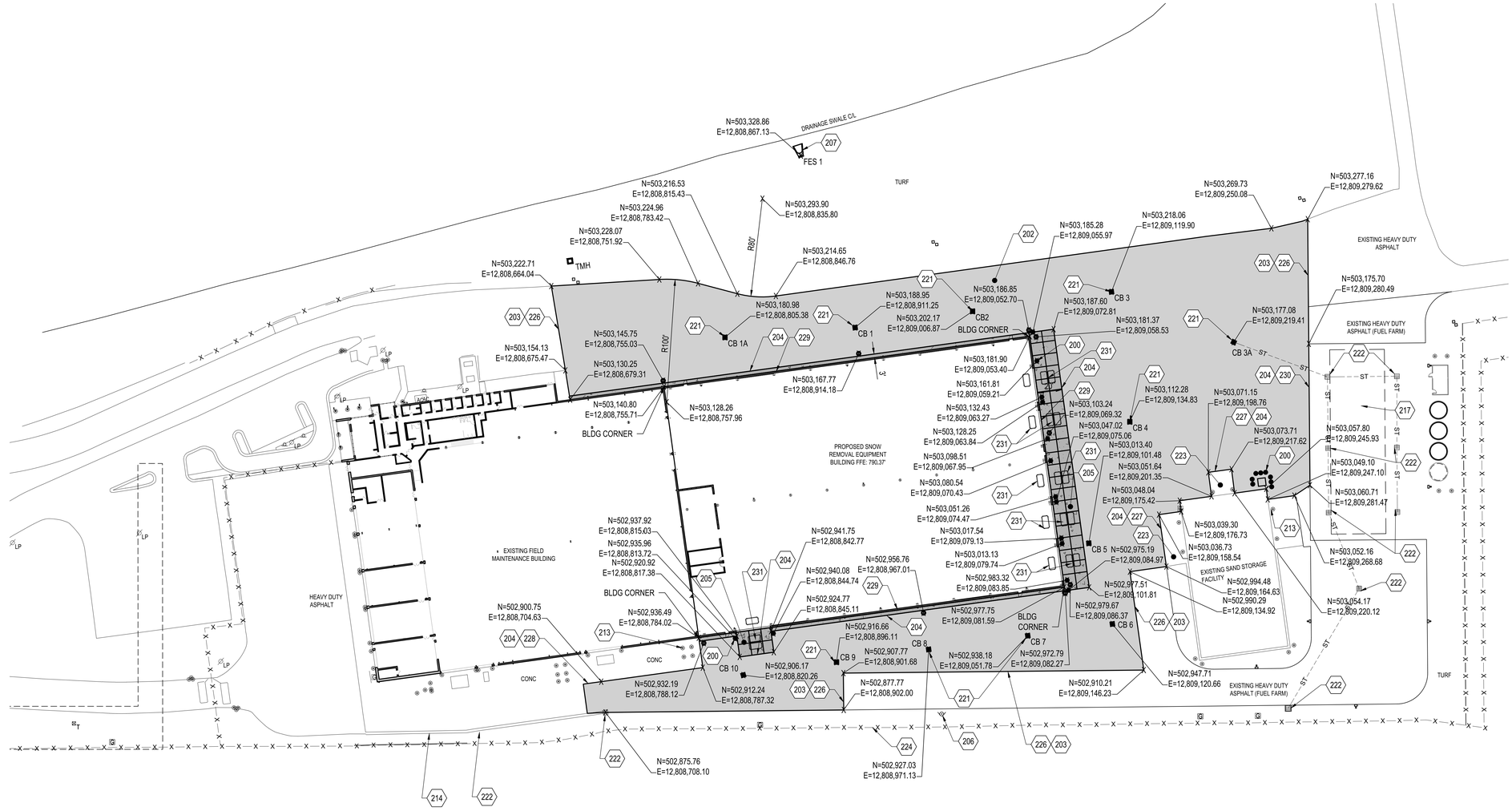

1 **GEOMETRY AND PAVING LAYOUT**
SCALE: 1" = 40'

NORTH

KEYED NOTES

200. PROPOSED BOLLARD (TYP.), SEE DETAIL 3/CP501
202. PROPOSED HEAVY DUTY ASPHALT PAVEMENT, SEE DETAIL 7/CP501
203. SAWCUT FREE EDGE OF EXISTING APSHALT PAVEMENT TO PROVIDE A CLEAN VERTICAL FACE TO KEY INTO PROPOSED ASPHALT PAVEMENT AND SEAL JOINT, SEE DETAIL 9/CP501
204. SAWCUT AND SEAL JOINT, SEE DETAIL 8/CP501
205. PROPOSED CONCRETE APRON, SEE DETAIL 1/CP501
206. EXISTING HYDRANT, PROTECT IN PLACE
207. PROPOSED FLARED END SECTION, SEE CG SERIES.
213. EXISTING BOLLARD (TYP.), PROTECT IN PLACE (TYP.)
214. EXISTING CURB AND GUTTER TO REMAIN
217. EXISTING FUEL FARM FACILITY (BY OTHERS)
221. PROPOSED DRAINAGE STRUCTURE (TYP.), SEE CG SERIES
222. EXISTING DRAINAGE STRUCTURE, SEE CG SERIES
223. EXISTING CONCRETE APRON, PROTECT IN PLACE
224. EXISTING AOA FENCE, PROTECT IN PLACE
226. PROPOSED HEAVY DUTY ASPHALT AND EXISTING ASPHALT PAVEMENT INTERFACE, SEE DETAIL 13/CP501
227. PROPOSED HEAVY DUTY ASPHALT AND EXISTING CONCRETE APRON INTERFACE, SEE DETAIL 12/CP501
228. PROPOSED HEAVY DUTY ASPHALT AND EXISTING CONCRETE INTERFACE, SEE DETAIL 11/CP501
229. THICKENED EDGE SEAL JOINT, SEE DETAIL 4/CP502
230. PROPOSED HEAVY DUTY ASPHALT AND EXISITNG FUEL FACILITY CONCRETE DRIVE PAD INTERFACE, SEE DETAIL 2/CP501
231. PROPOSED LOOP DETECTOR, SEE DETAIL 14/CP501

SHEET NOTES:

1. THE CONTRACTOR SHALL LAY OUT THE BUILDING CORNERS USING A LICENSED SURVEYOR TO CONFIRM BUILDING LOCATION AND SUBMIT TO ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF WORK.
2. SEE CG SERIES FOR DETAILED DRAINAGE LAYOUT AND ELEVATIONS.
3. SEE CU SERIES FOR DETAILED UTILITY LAYOUT AND ELEVATIONS.
4. SEE ELECTRICAL AND COMMUNICATIONS PLAN FOR ALL WORK ASSOCIATED WITH SITE LIGHTING, POWER DISTRIBUTION AND CABLING, COMMUNICATIONS AND FIBER OPTIC WORK.
5. THE CONTRACTOR MAY SALVAGE BASE MATERIALS UNDER PAVEMENT TO BE DEMOLISHED. SEE CD501 FOR PAVEMENT THICKNESS INFORMATION.

40 0 40 80FT.
40'

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GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

GEOMETRY AND PAVING LAYOUT

DRAWING NUMBER CP101 CIVIL

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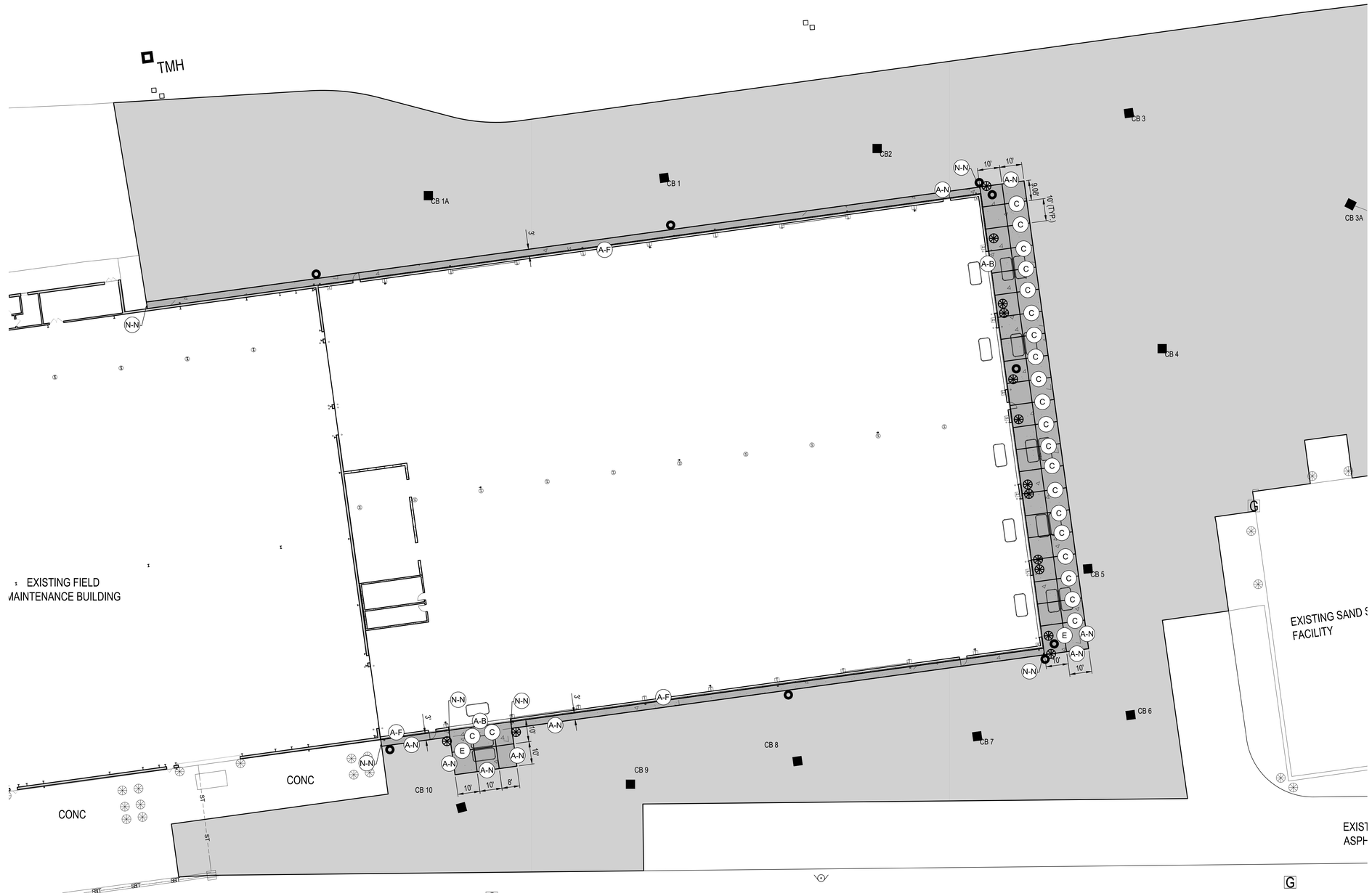

1 **PCC JOINTING LAYOUT**
SCALE: 1" = 20'

NORTH

- (C) CONTRACTION JOINT WITH DOWEL BAR, 5/CP502
- (E) CONSTRUCTION JOINT WITH DOWEL BAR, 6/CP502
- (A-N) CONCRETE TO ASPHALT JOINT, 8/CP501
- (A-B) THICKENED EDGE ISOLATION JOINT AT BUILDING FACE, 4/CP502
- (N-N) BUFFER CONCRETE ISOLATION JOINT, 7/CP502
- (A-F) BUFFER STRIP ISOLATION JOINT AT BUILDING FACE, 8/CP502

SHEET NOTES:

1. THE CONTRACTOR SHALL LAY OUT THE BUILDING CORNERS USING A LICENSED SURVEYOR TO CONFIRM BUILDING LOCATION AND SUBMIT TO ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF WORK.
2. SEE CG SERIES FOR DETAILED DRAINAGE LAYOUT AND ELEVATIONS.
3. SEE CU SERIES FOR DETAILED UTILITY LAYOUT AND ELEVATIONS.
4. SEE ELECTRICAL AND COMMUNICATIONS PLAN FOR ALL WORK ASSOCIATED WITH SITE LIGHTING, POWER DISTRIBUTION AND CABLING, COMMUNICATIONS AND FIBER OPTIC WORK.
5. THE CONTRACTOR MAY SALVAGE BASE MATERIALS UNDER PAVEMENT TO BE DEMOLISHED. SEE CD501 FOR PAVEMENT THICKNESS INFORMATION.
6. THE CONTRACTOR SHALL INSTALL NEW AOA SECURITY FENCE PRIOR TO REMOVAL OF EXISTING AOA FENCE.
7. THE CONTRACTOR SHALL INSTALL 1.5" TOOLED JOINTS EVERY 5 ' ALONG THE 3' CONCRETE BUFFER STRIP.

40' 0 40 80FT.

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GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

PCC JOINTING LAYOUT

DRAWING NUMBER: CP102 CIVIL

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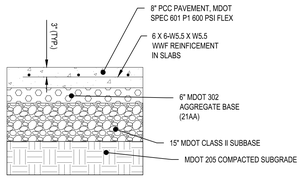
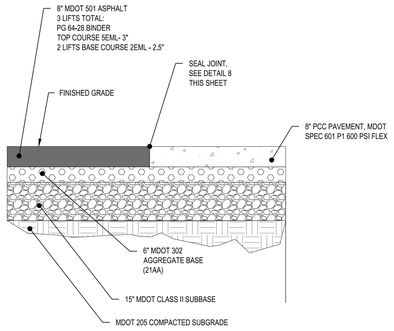
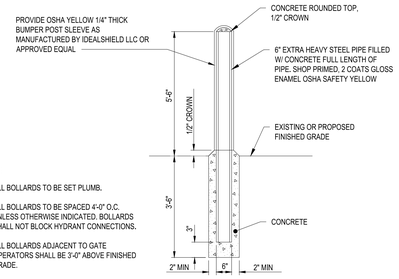


1 PROPOSED HEAVY DUTY PCC PAVEMENT SECTION
SCALE: NOT TO SCALE



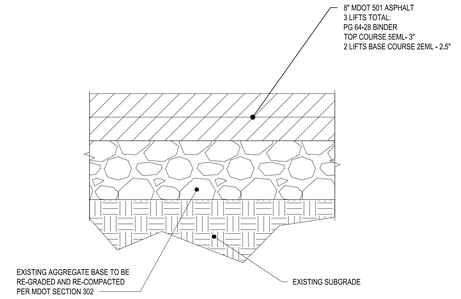
2 PROPOSED ASPHALT TO EXISTING CONCRETE DRIVE PAD KEY
SCALE: NOT TO SCALE



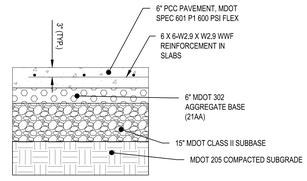
NOTES:

1. ALL BOLLARDS TO BE SET PLUMB.
2. ALL BOLLARDS TO BE SPACED 4'-0" O.C. UNLESS OTHERWISE INDICATED. BOLLARDS SHALL NOT BLOCK HYDRANT CONNECTIONS.
3. ALL BOLLARDS ADJACENT TO GATE OPERATORS SHALL BE 3'-0" ABOVE FINISHED GRADE.
4. RESTORE PAVEMENT OR EARTH TO A CONDITION EQUAL TO OR BETTER THAN ORIGINAL.
5. CONTRACTOR SHALL CORE DRILL EXISTING OR PROPOSED PAVEMENT FOR BOLLARDS TO BE PLACED WITHIN EXISTING PAVEMENT LIMITS.

3 TYPICAL BOLLARD DETAIL
SCALE: NOT TO SCALE



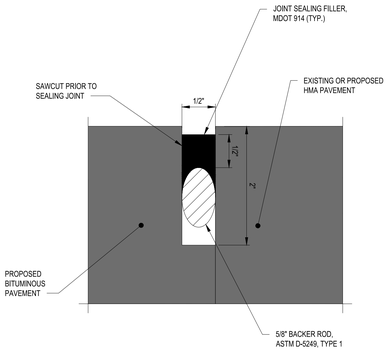
4 PROPOSED PARTIAL DEPTH ASPHALT RECONSTRUCTION
SCALE: NOT TO SCALE



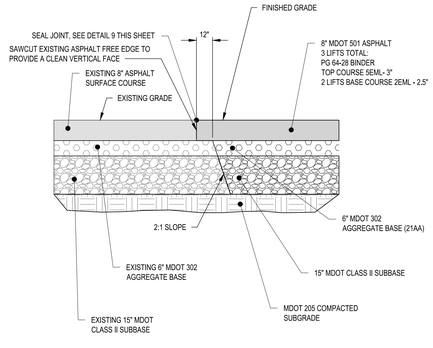
NOTE:

1. CONTRACTOR SHALL TOOL JOINT EVERY 5' ALONG BUFFER STRIP (1.5" DEEP)
2. CONTRACTOR SHALL INSTALL CONSTRUCTION JOINT EVERY 20' ALONG BUFFER STRIP

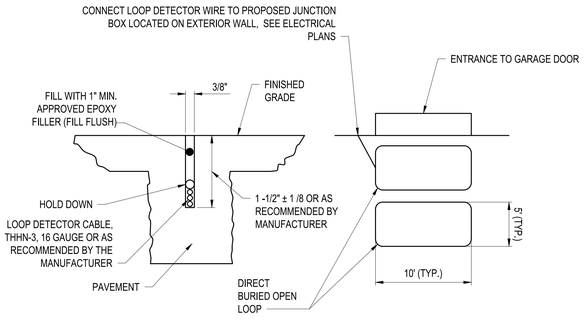
5 PROPOSED 3' PCC BUFFER STRIP SECTION
SCALE: NOT TO SCALE



6 ASPHALT TO ASPHALT JOINT SEALANT DETAIL
SCALE: NOT TO SCALE



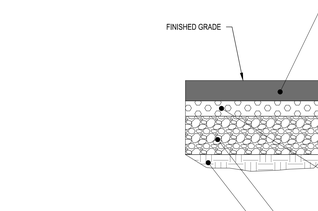
9 ASPHALT TO EXISTING ASPHALT APRON KEY
SCALE: NOT TO SCALE



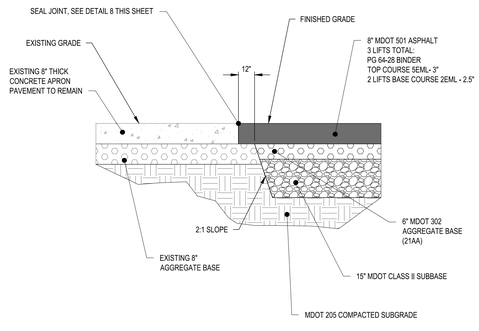
NOTE:

1. USE SHORT (1" TYP.) PIECE OF FLEXIBLE NEOPRENE RUBBER OR PLASTIC TUBING OR ROUND FOAM SEALER STRIPS AT 2' -0" CENTERS TO HOLD LOOP WIRES IN PLACE UNTIL SEALER SETS. DO NOT USE SHARP OBJECTS TO HOLD WIRES DOWN.
2. LOCATION SHALL BE COORDINATED WITH THE AIRPORT.
3. CONNECT NEW WIRE TO PROPOSED JUNCTION BOX.
4. DIRECT BURIED OPEN LOOP SHOULD HAVE A MINIMUM 6" OFFSET FROM PARALLEL PAVEMENT JOINT.

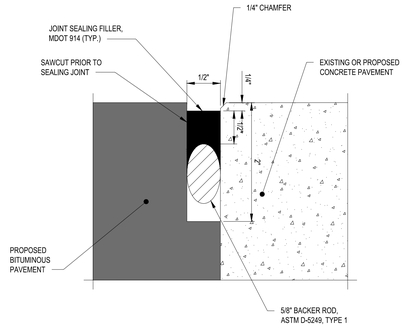
14 LOOP DETECTOR DETAIL
SCALE: NOT TO SCALE



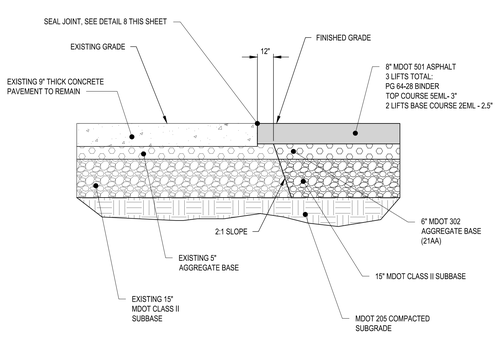
7 PROPOSED HEAVY DUTY ASPHALT PAVEMENT SECTION
SCALE: NOT TO SCALE



11 ASPHALT TO EXISTING APRON CONCRETE KEY
SCALE: NOT TO SCALE



8 ASPHALT TO CONCRETE JOINT SEALANT
SCALE: NOT TO SCALE



12 ASPHALT TO EXISTING CONCRETE KEY
SCALE: NOT TO SCALE

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MICHAEL D. HOLDWICK
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NO.	REVISION	DATE

DRAWN: GCH
CHK'D: MDH
DESIGNED: RDM
APPR'VD: MDH
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER: 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

GEOMETRY AND PCC JOINT DETAILS

DRAWING NUMBER: CP501

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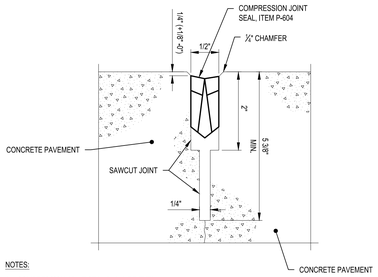
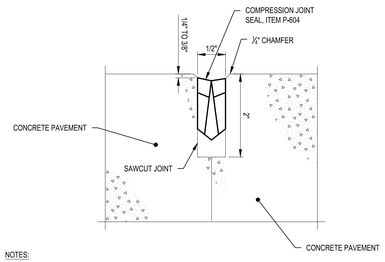


NOTES:

1. COMPRESSION JOINT SEAL SHALL BE FUEL RESISTANT.
2. COMPRESSION JOINT SEAL SHALL NOT BE HIGHER THAN BOTTOM OF CHAMFER.

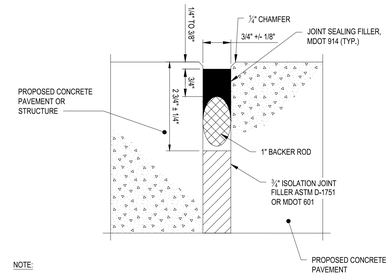
1 CONTRACTION JOINT SEALING DETAIL
SCALE: NOT TO SCALE



NOTES:

1. COMPRESSION JOINT SEAL SHALL BE FUEL RESISTANT.
2. COMPRESSION JOINT SEAL SHALL NOT BE HIGHER THAN BOTTOM OF CHAMFER,

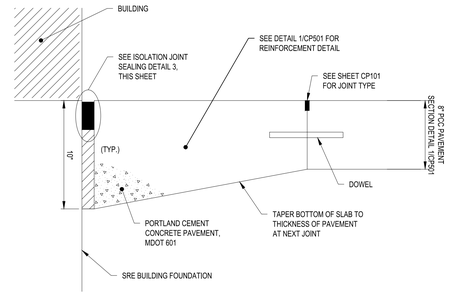
2 CONSTRUCTION JOINT SEALING DETAIL
SCALE: NOT TO SCALE



NOTE:

1. SEALANT SHALL NOT BE HIGHER THAN BOTTOM OF CHAMFER.

3 ISOLATION JOINT SEALING DETAIL
SCALE: NOT TO SCALE



NOTE:

1. FOR ISOLATION JOINTS AT DOORWAYS, SEE DETAIL 3, THIS SHEET

4 THICKENED EDGE ISOLATION JOINT AT BUILDING FACE (TYPE A-B)
SCALE: NOT TO SCALE

5 CONTRACTION JOINT WITH DOWEL BAR (TYPE C)
SCALE: NOT TO SCALE

6 CONSTRUCTION JOINT WITH DOWEL BAR (TYPE E)
SCALE: NOT TO SCALE

NOTE:

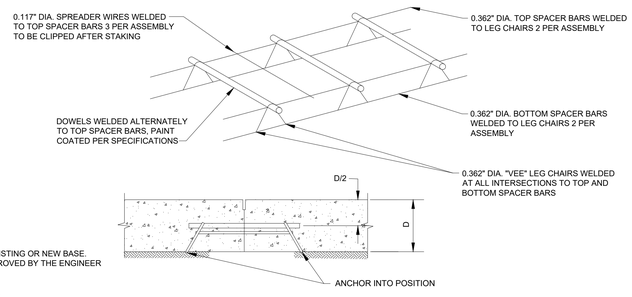
1. CONTRACTOR SHALL TOOL JOINT EVERY 5' ALONG BUFFER STRIP
2. CONTRACTOR SHALL INSTALL CONSTRUCTION JOINT EVERY 20' ALONG BUFFER STRIP

7 BUFFER CONCRETE ISOLATION JOINT (TYPE N-N)
SCALE: NOT TO SCALE

NOTE:

1. CONTRACTOR SHALL TOOL JOINT EVERY 5' ALONG BUFFER STRIP
2. CONTRACTOR SHALL INSTALL CONSTRUCTION JOINT EVERY 20' ALONG BUFFER STRIP

8 ISOLATION JOINT AT BUILDING FOUNDATION (TYPE A-F)
SCALE: NOT TO SCALE



NOTES:

1. BASKET MUST BE FIRMLY ANCHORED TO EXISTING OR NEW BASE. METHOD SHALL BE SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
2. ALL WIRE SIZES SHOWN ARE MINIMUM SIZE.
3. DOWELS SHALL BE HELD FIRMLY IN THE ABOVE WELDED ASSEMBLY.
4. NO STEEL WITHIN 0.5' OF EDGE OF PAVED LANE

9 TYPICAL DOWEL AND TIE BAR BASKET DETAIL
SCALE: NOT TO SCALE

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STATE OF MICHIGAN
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NO. 6201057577
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ISSUED FOR BID

NO.	REVISION	DATE

DRAWN: GCH | CHK'D: MDH
DESIGNED: RDM
APPR'D: MDH
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

GEOMETRY AND PCC JOINT DETAILS

DRAWING NUMBER CP502

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1 **GRADING AND DRAINAGE PLAN**
SCALE: 1" = 40'

NORTH

KEYED NOTES

302. PROPOSED CATCH BASIN (TYP.) SPEC MDOT 403, SEE DETAIL 3/CU501
303. ADJUST EXISTING STORM CATCH BASIN
304. EXISTING STORM CATCHBASIN, PROTECT IN PLACE
305. ADJUST EXISTING STRUCTURES TO GRADE
308. MATCH EXISTING GRADE (TYP.)
309. MATCH INTO PROPOSED BUILDING FFE
312. GRADE NEW END SECTION INTO EXISTING DRAINAGE SWALE FLOW LINE
313. PROPOSED GRADE BREAKS
314. PROPOSED STROM DRAIN INLET PROTECTION (TYP.), SEE DETAIL 4/CU501
316. INSTALL EROSION CONTROL BLANKET AT DIRECTION OF RPR UP-TO 10,000 SFT. SEE DETAIL 11/CU501
317. PROPOSED SILT FENCE. SEE DETAIL 9/CU501. FINAL LOCATION TO BE APPROVED BY THE RPR.
318. PROTECT FUEL FARM FACILITY (BY OTHERS)
320. PROPOSED UNDERDRAIN CLEANOUT, SEE DETAIL 6/CU501
321. PROTECT EXISTING ELECTRICAL TRANSFORMER (CONSUMERS ELECTRIC)
322. PROTECT EXISTING ELECTRICAL CONDUIT (CONSUMERS ELECTRIC)
323. PROTECT EXISTING TELECOM CONDUIT
324. CONNECT PROPOSED UNDERDRAIN TO EXISTING SAND STORAGE BUILDING DRAIN SYSTEM

SHEET NOTES:

1. SEE ELECTRICAL AND COMMUNICATIONS PLAN FOR ALL WORK ASSOCIATED WITH SITE LIGHTING, POWER DISTRIBUTION AND CABLING, COMMUNICATIONS AND FIBER OPTIC WORK.
2. THE CONTRACTOR SHALL RESTORE ALL DISTURBED TURF AREAS WITH 4" OF TOPSOIL AND SEED PER MDOT 816 THM (TYP).
3. THE CONTRACTOR SHALL OBTAIN AL PERMITS AND PAY FEES REQUIRED FOR SOIL EROSION AND SEDIMENTATION CONTROLFROM LOCAL, COUNTY, STATE ENTITIES.

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NO.	REVISION	DATE

DRAWN: GCH | CHK'D: MDH
DESIGNED: RDM
APPRV'D: MDH
DATE: SEPTEMBER 19, 2023
PROJECT NUMBER: 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

GRADING AND DRAINAGE PLAN

DRAWING NUMBER: CG101
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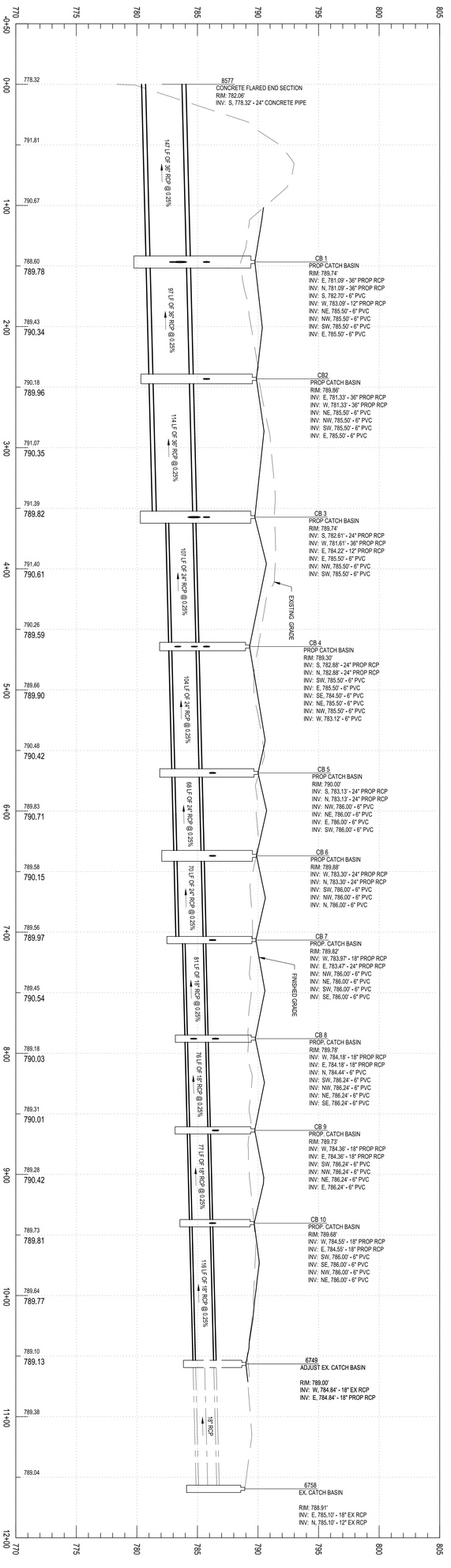
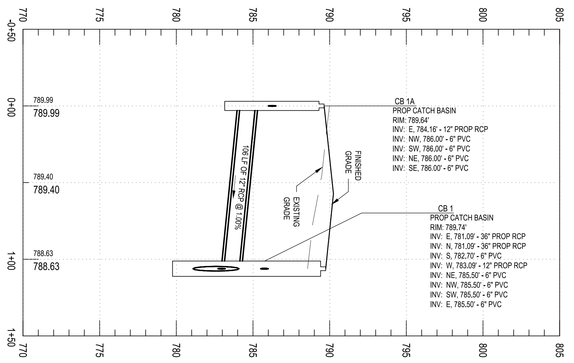
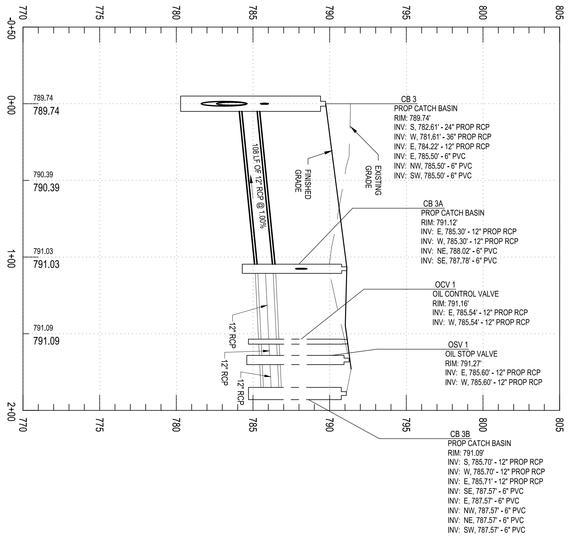
1 PROFILES
SCALE: HORZ. 1" = 40' VERT. 1" = 5'



2 PROFILES
SCALE: HORZ. 1" = 40' VERT. 1" = 5'





NOTE
1. CONTRACTOR MAY SALVAGE THE EXISTING SUBBASE MATERIALS (CLASS II SUBBASE) TO BE REUSED IN THE PROPOSED PAVEMENT SECTIONS. ALL APPLICABLE CONSTRUCTION METHOD REQUIREMENTS OF THE MDOT 2012 SPECIFICATIONS SHALL STILL APPLY.
2. THE CONTRACTOR SHALL REMOVE ALL SALVAGEABLE CLASS II SUBBASE AND STOCKPILE ON SITE IN A LOCATION AS DIRECTED BY THE ENGINEER. ANY MATERIAL THAT CLASS II SUBBASE IS NOT MIXED WITH AGGREGATE STONE WHILE STOCKPILING.
3. THE CONTRACTOR SHALL DETERMINE THE AMOUNT OF MATERIAL THAT CAN BE SALVAGED AND REUSED ON THE PROJECT. ANY ADDITIONAL MATERIAL NEEDED FOR THE PROPOSED CONSTRUCTION SHALL BE IMPORTED FROM OFF SITE.
4. ANY DEFICIT OF MATERIAL NEEDED FOR THE PROPOSED CONSTRUCTION SHALL BE IMPORTED FROM OFF SITE.

DRAWING NUMBER	GERALD R. FORD INTERNATIONAL AIRPORT SRE BUILDING EXPANSION	DRAWN: GCH CHK'D: MDH DESIGNED: RDM APPRV'D: MDH DATE: SEPTEMBER 18, 2023 PROJECT NUMBER	NO.	REVISION	DATE
CG301		2241.7462.00			
CIVIL	PROFILES				

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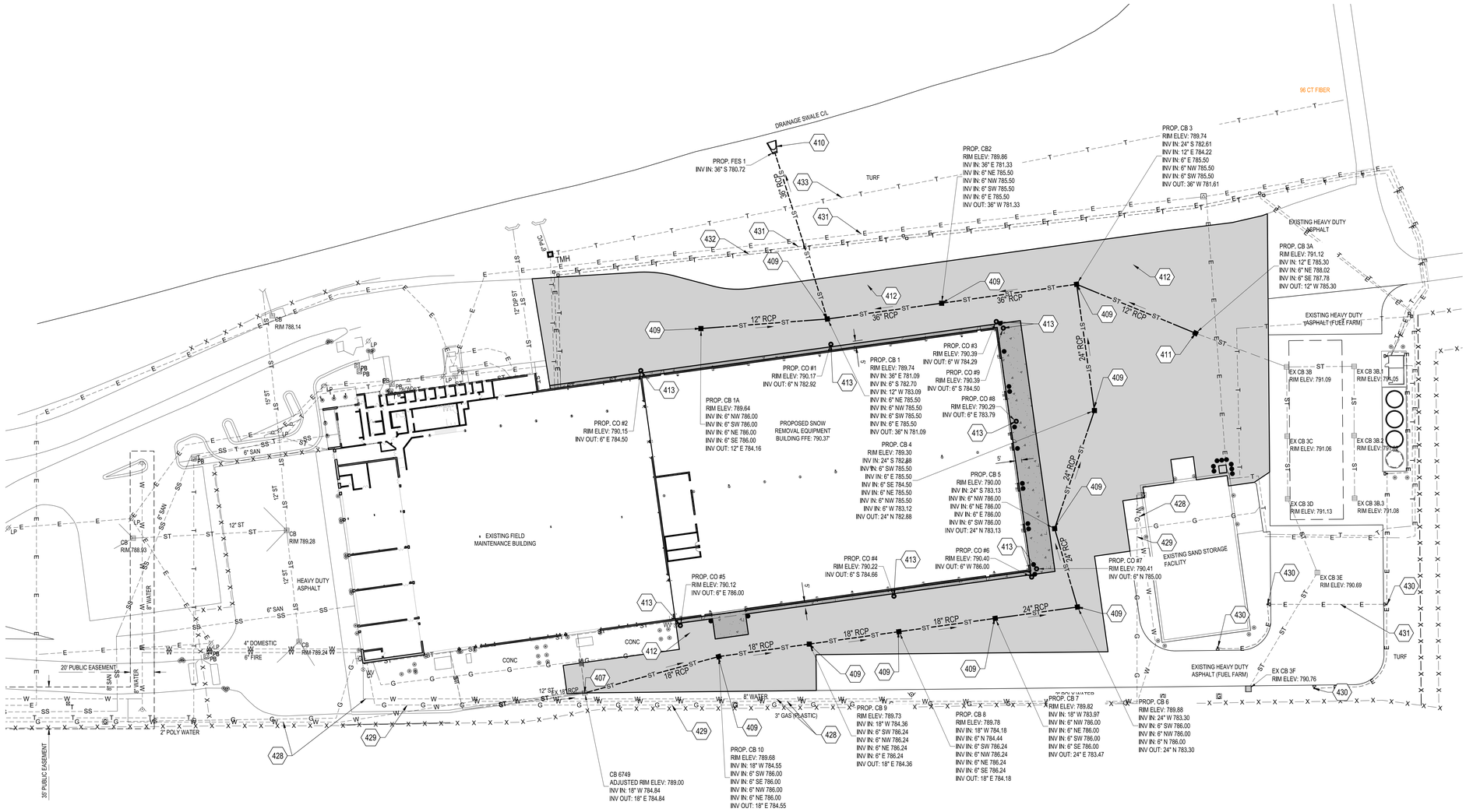

NORTH

1 UTILITY PLANS
SCALE: 1" = 40'

STRUCTURE TABLE			
STRUCTURE NAME & LOCATION:	DETAILS:	PIPES IN:	PIPES OUT
6749 N: 502875.76 E: 12808708.10	48" ADJUST EX. CATCH BASIN RIM = 789.00	18" EX RCP INV IN =784.84	18" PROP RCP INV OUT =784.84
CB 1 N: 503188.95 E: 12808911.25	96" PROP CATCH BASIN RIM = 789.74	36" PROP RCP INV IN =781.09 6" PVC INV IN =782.70 12" PROP RCP INV IN =783.09 6" PVC INV IN =785.50 6" PVC INV IN =785.50 6" PVC INV IN =785.50 6" PVC INV IN =785.50	36" PROP RCP INV OUT =781.09
CB 1A N: 503180.98 E: 12808805.38	48" PROP CATCH BASIN RIM = 789.64	6" PVC INV IN =786.00 6" PVC INV IN =786.00 6" PVC INV IN =786.00 6" PVC INV IN =786.00	12" PROP RCP INV OUT =784.16
CB 3 N: 503218.06 E: 12809119.90	96" PROP CATCH BASIN RIM = 789.74	24" PROP RCP INV IN =782.61 12" PROP RCP INV IN =784.22 6" PVC INV IN =785.50 6" PVC INV IN =785.50 6" PVC INV IN =785.50	36" PROP RCP INV OUT =781.61
CB 3A N: 503177.08 E: 12809219.41	48" PROP CATCH BASIN RIM = 791.12	12" PROP RCP INV IN =785.30 6" PVC INV IN =788.02 6" PVC INV IN =787.78	12" PROP RCP INV OUT =785.30
CB 4 N: 503112.28 E: 12809134.83	60" PROP CATCH BASIN RIM = 789.30	24" PROP RCP INV IN =782.88 6" PVC INV IN =785.50 6" PVC INV IN =785.50 6" PVC INV IN =784.50 6" PVC INV IN =785.50 6" PVC INV IN =785.50 6" PVC INV IN =783.12	24" PROP RCP INV OUT =782.88
CB 5 N: 503013.40 E: 12809101.48	60" PROP CATCH BASIN RIM = 790.00	24" PROP RCP INV IN =783.13 6" PVC INV IN =786.00 6" PVC INV IN =786.00 6" PVC INV IN =786.00 6" PVC INV IN =786.00	24" PROP RCP INV OUT =783.13
CB 6 N: 502947.71 E: 12809120.66	84" PROP CATCH BASIN RIM = 789.88	24" PROP RCP INV IN =783.30 6" PVC INV IN =786.00 6" PVC INV IN =786.00 6" PVC INV IN =786.00	24" PROP RCP INV OUT =783.30

STRUCTURE TABLE			
STRUCTURE NAME & LOCATION:	DETAILS:	PIPES IN:	PIPES OUT
CB 7 N: 502938.18 E: 12809051.78	48" PROP. CATCH BASIN RIM = 789.82	18" PROP RCP INV IN =783.97 6" PVC INV IN =786.00 6" PVC INV IN =786.00 6" PVC INV IN =786.00 6" PVC INV IN =786.00	24" PROP RCP INV OUT =783.47
CB 8 N: 502927.03 E: 12808971.13	48" PROP. CATCH BASIN RIM = 789.78	18" PROP RCP INV IN =784.18 6" PVC INV IN =784.44 6" PVC INV IN =786.24 6" PVC INV IN =786.24 6" PVC INV IN =786.24 6" PVC INV IN =786.24	18" PROP RCP INV OUT =784.18
CB 9 N: 502916.66 E: 12808896.11	48" PROP. CATCH BASIN RIM = 789.73	18" PROP RCP INV IN =784.36 6" PVC INV IN =786.24 6" PVC INV IN =786.24 6" PVC INV IN =786.24 6" PVC INV IN =786.24	18" PROP RCP INV OUT =784.36
CB 10 N: 502906.17 E: 12808820.26	48" PROP. CATCH BASIN RIM = 789.68	18" PROP RCP INV IN =784.55 6" PVC INV IN =786.00 6" PVC INV IN =786.00 6" PVC INV IN =786.00 6" PVC INV IN =786.00	18" PROP RCP INV OUT =784.55
CB2 N: 503202.17 E: 12809006.87	72" PROP CATCH BASIN RIM = 789.86	36" PROP RCP INV IN =781.33 6" PVC INV IN =785.50 6" PVC INV IN =785.50 6" PVC INV IN =785.50 6" PVC INV IN =785.50	36" PROP RCP INV OUT =781.33
CO #1 N: 503167.77 E: 12808914.18	15" UNDERDRAIN CLEANOUT RIM = 790.17		6" PVC INV OUT =782.92
CO #2 N: 503145.75 E: 12808755.03	15" UNDERDRAIN CLEANOUT RIM = 790.15		6" PVC INV OUT =784.50
CO #3 N: 503186.85 E: 12809052.70	15" UNDERDRAIN CLEANOUT RIM = 790.39		6" PVC INV OUT =784.29

STRUCTURE TABLE			
STRUCTURE NAME & LOCATION:	DETAILS:	PIPES IN:	PIPES OUT
CO #4 N: 502956.76 E: 12808967.01	15" UNDERDRAIN CLEANOUT RIM = 790.22		6" PVC INV OUT =784.66
CO #5 N: 502932.19 E: 12808788.12	15" UNDERDRAIN CLEANOUT RIM = 790.12		6" PVC INV OUT =786.00
CO #6 N: 502972.80 E: 12809082.27	15" UNDERDRAIN CLEANOUT RIM = 790.40		6" PVC INV OUT =786.00
CO #7 N: 502979.68 E: 12809086.37	15" UNDERDRAIN CLEANOUT RIM = 790.41		6" PVC INV OUT =785.00
CO #8 N: 503103.24 E: 12809069.32	15" UNDERDRAIN CLEANOUT RIM = 790.29		6" PVC INV OUT =783.79
CO #9 N: 503181.38 E: 12809058.54	15" UNDERDRAIN CLEANOUT RIM = 790.39		6" PVC INV OUT =784.50
OCV 1 N: 503160.58 E: 12809263.98	15" OIL CONTROL VALVE RIM = 791.16	12" PROP RCP INV IN =785.54	12" PROP RCP INV OUT =785.54

2 STRUCTURE TABLES
SCALE: NTS

KEYED NOTES

407. CONNECT PROPOSED STORM SEWER PIPE TO EXISTING CATCH BASIN
409. PROPOSED CATCH BASIN (TYP.) SPEC MDOT 403. SEE DETAIL 3/CU501
410. PROPOSED RCP FLARED END SECTION
411. PROPOSED DRAINAGE MANHOLE (TYP.), SEE DETAIL 3/CU501
412. PROPOSED PVC UNDERDRAIN @ 1% SLOPE (TYP.), SEE DETAIL 2/CU501
413. PROPOSED UNDERDRAIN CLEANOUT, SEE DETAIL 6/CU501
428. EXISTING WATER MAIN TO REMAIN, PROTECT IN PLACE
429. EXISTING GAS LINE TO REMAIN, PROTECT IN PLACE
430. EXISTING LIGHT POLE, PROTECT IN PLACE
431. EXISTING ELECTRICAL LINE, PROTECT IN PLACE
432. EXISTING TELECOMMUNICATION LINE, PROTECT IN PLACE
433. EXISTING FIBER OPTIC CABLE, PROTECT IN PLACE

SHEET NOTES:

1. SEE ELECTRICAL AND COMMUNICATIONS PLAN FOR ALL WORK ASSOCIATED WITH SITE LIGHTING, POWER DISTRIBUTION AND CABLING, COMMUNICATIONS AND FIBER OPTIC WORK.
2. ALL REINFORCED CONCRETE PIPE SHALL BE ASTM C76, CLASS III.
3. THE CONTRACTOR SHALL PROVIDE ALL FITTINGS NECESSARY TO CONNECT PROPOSED UTILITIES TO EXISTING AND PROPOSED FEATURES. ALL FITTINGS SHALL BE INCIDENTAL TO THE WORK BEING PERFORMED.
4. STORM/ROOF DRAIN LEADS SHALL HAVE 1% SLOPE MINIMUM. CONTRACTOR TO VERIFY ELEVATION OF DOWNSTREAM CONNECTION POINT PRIOR TO BEGINNING INSTALLATION AND NOTIFY ENGINEER WHEN MINIMUM SLOPE CANNOT BE MET.
5. SEE DETAIL SHEETS FOR MINIMUM CLEARANCES AT UTILITY CROSSINGS AND CONFLICTS.
6. CONTRACTOR SHALL COORDINATE LOCATION OF FOUNDATION DRAINS AND CONNECT TO STORM SEWER SYSTEM ACCORDINGLY.
7. CONTRACTOR SHALL INSTALL STORM DRAIN INLET PROTECTION IN ALL EXISTING AND PROPOSED STRUCTURES WITHIN WORK LIMITS.
8. ALL PVC UNDERDRAIN SHALL BE PERFORATED.

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GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

UTILITY PLANS

DRAWING NUMBER: CU101
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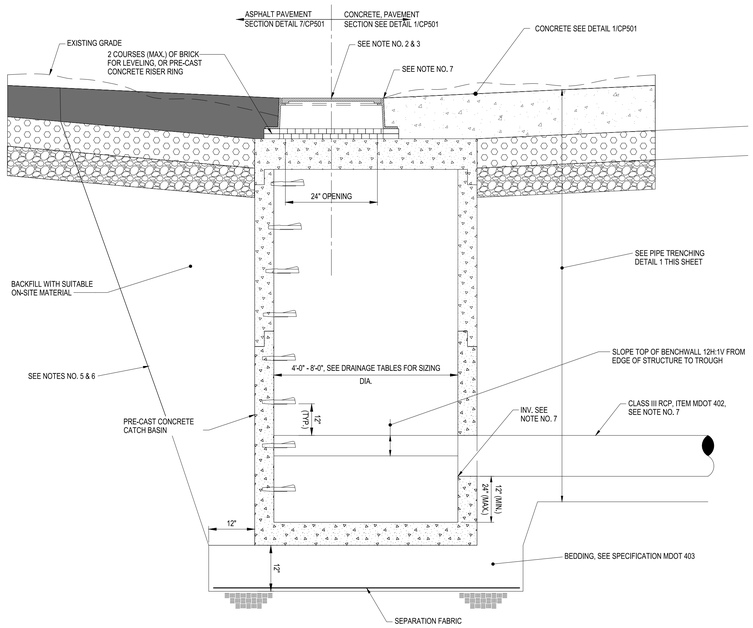


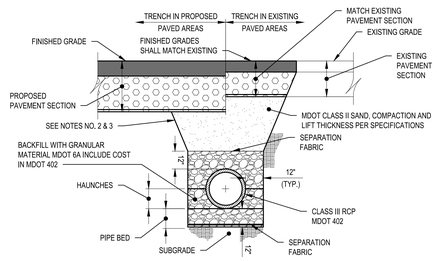
NOTES:

1. PRE-CAST MANHOLE/CATCH BASIN SHALL BE CONSTRUCTED TO SUPPORT AASHTO HS-25 LOADING, ITEM MDOT 403. CONTRACTOR SHALL FURNISH CALCULATIONS BY A LICENSED PROFESSIONAL ENGINEER TO BE APPROVED BY THE ENGINEER.
2. FOR CATCH BASINS, USE NEENAH FOUNDRY R-2556 FRAME WITH TYPE "G" GRATE, OR APPROVED EQUAL.
3. FOR MANHOLES, USE NEENAH FOUNDRY R-1556 LID, OR APPROVED EQUAL.
4. FRAME SHALL BE ANCHORED TO CONCRETE STRUCTURE IN 4 LOCATIONS, DRILL AND GROUT (4) ¾" DIA. ANCHOR BOLTS WITH 6" EMBEDMENT.
5. EXCAVATIONS, TRENCHING AND SHORING SHALL BE IN ACCORDANCE WITH OSHA REQUIREMENTS.
6. EXCAVATIONS SHALL NOT UNDERMINE EXISTING PAVEMENTS, STRUCTURES OR UTILITIES.
7. SEE SHEET CU101 FOR RIMS, INVERTS AND UTILITY INFORMATION.
8. THE CONTRACTOR SHALL INSTALL FOUR UNDERDRAIN INLETS IN EACH PROPOSED MANHOLE OR CATCH BASIN, UNLESS OTHERWISE SHOWN ON PLANS.

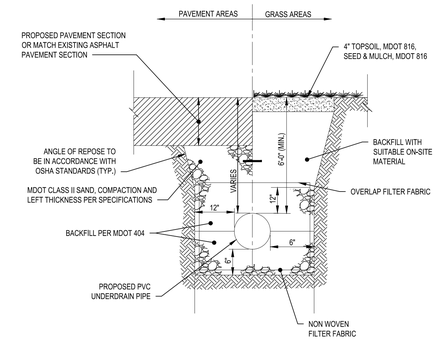
3 CATCH BASIN DETAIL
SCALE: NOT TO SCALE

NOTES:

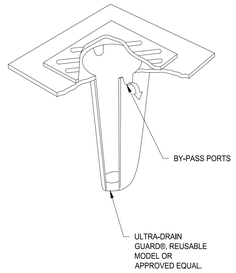
1. PIPE BEDDING SHALL BE INCLUDED IN THE COST OF THE PIPE.
2. EXCAVATIONS, TRENCHING AND SHORING SHALL BE IN ACCORDANCE WITH OSHA REQUIREMENTS.
3. EXCAVATIONS SHALL NOT UNDERMINE EXISTING PAVEMENTS, STRUCTURES OR UTILITIES.
4. SEPARATE PIPES IN A COMMON TRENCH BY A MINIMUM OF 24".
5. SEE PLANS FOR PIPE SIZES.



1 STORM DRAIN TRENCHING DETAIL
SCALE: NOT TO SCALE



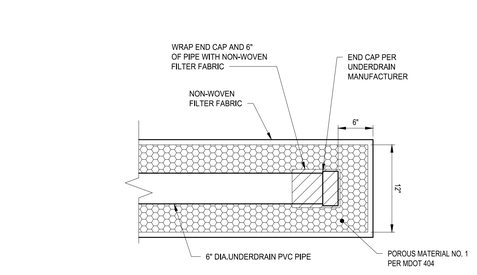
2 TYPICAL UNDERDRAIN DETAIL
SCALE: NOT TO SCALE



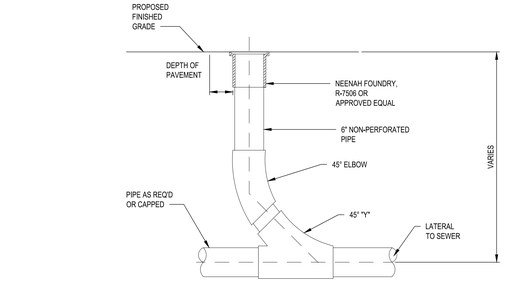
CATCH BASIN INSERT INLET PROTECTION NOTES:

1. INLETS IN TURF AREAS SHALL HAVE SILT FENCE INSTALLED AROUND THE STRUCTURES AS WELL.
2. CATCH BASIN INSERT SHALL BE ULTRA-DRAIN GUARD®, REUSABLE MODEL OR APPROVED EQUAL. CONTRACTOR SHALL VERIFY DIMENSIONS OF STRUCTURES WITH MANUFACTURER PRIOR TO ORDERING FOR CORRECT SIZING.
3. THE CATCH BASIN INSERT SHALL BE INSTALLED, MAINTAINED AND REMOVED IN ALL EXISTING AND PROPOSED STRUCTURES WITHIN THE CONSTRUCTION LIMITS PER MANUFACTURER RECOMMENDATIONS.
4. THE LOCATIONS SHOWN ON THE PLAN FOR PLACEMENT OF THIS DEVICE MAY VARY FROM WHERE THEY ARE ACTUALLY INSTALLED. THE DEVICES SHALL BE PLACED IN CATCH BASINS DURING CONCRETE SAW CUTTING AND DRILLING OPERATIONS, DURING REMOVAL OF CURING COMPOUND, AND AT ALL OTHER TIMES THAT THERE WILL BE WATER FLOWING INTO THE CATCH BASINS WHICH MAY CONTAIN DUST, DIRT OR OTHER FINE MATERIAL WHICH MAY CAUSE SILTATION DOWNSTREAM OF THE CONSTRUCTION SITE.
5. ALL STORM WATER THAT NEEDS TO BE PUMPED FROM THE SITE SHALL BE PUMPED INTO ONE OF THESE DEVICES. THE FLOW RATE PUMPED INTO THIS DEVICE SHALL NOT EXCEED THE MANUFACTURER'S RECOMMENDED TREATMENT FLOW RATE, DURING THE PUMPING PROCESS, THE DEVICE SHALL BE MONITORED IN ORDER TO DETERMINE THAT IT IS TREATING THE WATER. IF THE WATER IS UTILIZING THE BYPASS PORT AND IS NOT BEING CLEANED BY THE DEVICE, THE PUMPING SHALL BE STOPPED AND THE DEVICE SHALL BE CLEANED PER MANUFACTURER'S RECOMMENDATIONS AND THEN REINSTALLED.
6. ULTRA-DRAIN GUARD RETAINERS® OR APPROVED EQUAL MAY BE REQUIRED TO HOLD THE ULTRA-DRAIN GUARD®, REUSABLE MODEL OR APPROVED EQUAL IN-PLACE IF THE GRATING CANNOT BE INSTALLED, NEEDS TO BE REMOVED, OR THE INSERT IS INSTALLED ON A DRAINAGE MANHOLE.
7. MAINTENANCE SHALL BE PROVIDED BY THE CONTRACTOR WHEN THE CAPACITY IS REDUCED BY APPROXIMATELY 50 PERCENT OR DIRECTED BY THE ENGINEER.

4 STORM DRAIN INLET PROTECTION
SCALE: NOT TO SCALE



5 END OF UNDERDRAIN DETAIL
SCALE: NOT TO SCALE



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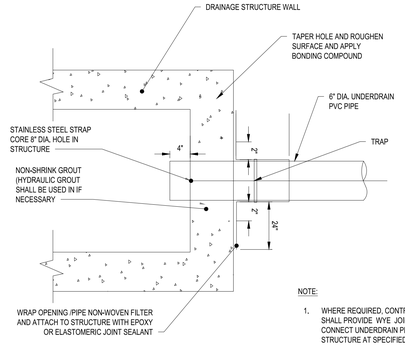
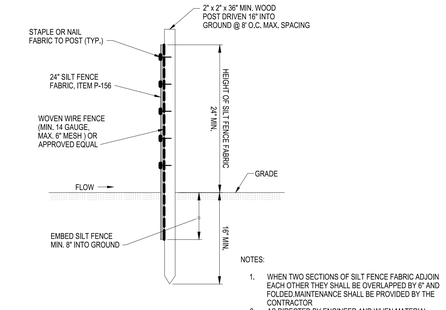


NOTE:

1. WHERE REQUIRED, CONTRACTOR SHALL PROVIDE WYE JOINTS TO CONNECT UNDERDRAIN PIPE TO INLET STRUCTURE AT SPECIFIED ELEVATION.

7 UNDERDRAIN CONNECTION TO DRAINAGE STRUCTURE
SCALE: NOT TO SCALE

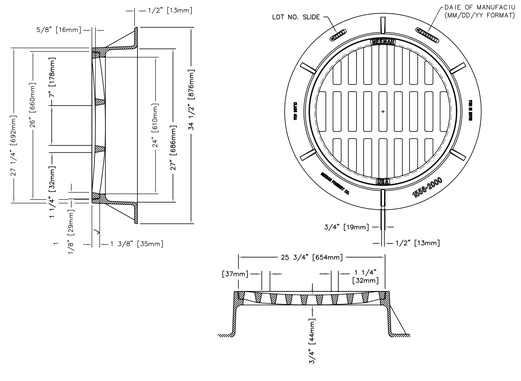


NOTES:

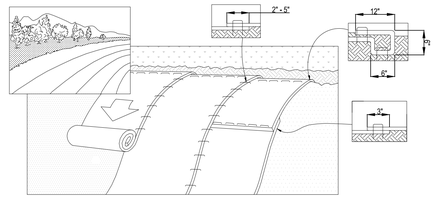
1. WHEN TWO SECTIONS OF SILT FENCE FABRIC ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.MAINTENANCE SHALL BE PROVIDED BY THE CONTRACTOR
2. AS DIRECTED BY ENGINEER AND WHEN MATERIAL "BULGES" DEVELOP IN THE SILT FENCE, CLEAR AND DISPOSE OF MATERIAL.
3. WOVEN WIRE FENCE SHALL BE SECURELY FASTENED TO FENCE POSTS WITH WIRE TIES OR STAPLES.
4. SILT FENCE FABRIC SHALL BE SECURELY FASTENED TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID-SECTION.

9 SILT FENCE DETAIL
SCALE: NOT TO SCALE

6 CLEANOUT DETAIL
SCALE: NOT TO SCALE



10 NEENAH FOUNDRY R-2556 FRAME WITH TYPE "G" GRATE
SCALE: NOT TO SCALE



NOTES:

1. ROLLED EROSION CONTROL PRODUCTS (RECP'S) SHALL BE "TEMPORARY". TEMPORARY PRODUCTS SHALL BE SPECIFIED AS "EROSION CONTROL BLANKETS" OR "ECB'S". ECB'S SHALL BE WESTERN EXCELSIOR "EXCEL SS-2 RAPID GO" OR APPROVED EQUAL. ALL RECP'S SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. ECB'S MUST TOTALLY BIODEGRADE WITHIN 1 YEAR (OR TURF ESTABLISHMENT) WITHOUT LEAVING RESIDUE/NETTING.
2. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP'S), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
3. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP'S IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP'S EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP'S WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP'S BACK OVER SEED AND COMPACTED SOIL. SECURE RECP'S OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECP'S.
4. ROLL THE RECP'S (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. RECP'S WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP'S MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
5. THE EDGES OF PARALLEL RECP'S MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP DEPENDING ON RECP'S TYPE.
6. CONSECUTIVE RECPS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP, STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE RECP'S WIDTH. (NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP'S.)

11 EROSION CONTROL BLANKET DETAIL
SCALE: NOT TO SCALE

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NO.	REVISION	DATE

DRAWN: GCH | CHK'D: MDH
DESIGNED: RDM
APPRV'D: MDH
DATE: SEPTEMBER 18, 2023

PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

UTILITY AND DRAINAGE DETAILS

DRAWING NUMBER CU501

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GENERAL WALL NOTES

1. THE TERM "WALL" AND "PARTITION" ARE USED INTERCHANGEABLY.
2. ALL DIMENSIONS ARE NOMINAL CENTERLINE OF METAL STUD PARTITION OR FACE OF MASONRY UNLESS OTHERWISE NOTED.
3. SEE PARTITION TYPES FOR LOCATIONS OF ACOUSTIC AND THERMAL INSULATION.

4 GENERAL WALL NOTES
SCALE: N.T.S.

	EARTH	
	GRANULAR FILL	
	CONCRETE	
	BRICK	
	CONCRETE MASONRY UNIT	
	STEEL SECTION	
	STRUCTURAL STEEL	
	PLYWOOD	

	WOOD (FINISHED)
	WOOD (CONTINUOUS)
	WOOD (BLOCKING)
	INSULATION (LOOSE OR BATT)
	INSULATION (RIGID BOARD)
	GLASS
	ACOUSTIC/CERAMIC TILE
	GYPSUM WALL BOARD, SAND, PLASTER, CEMENT, GROUT
	TERRAZZO
	CARPET

3 MATERIAL LEGEND
SCALE: N.T.S.

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
0000	STRUCTURAL GRID		LEVEL REFERENCE
SIM A1 A-101	EXTERIOR ELEVATION	A1 / A-101	VIEW REFERENCE
		ROOM NAME 101 150 SF	ROOM TAG
SIM A1 A-101	INTERIOR ELEVATION	XXXX	WALL TAG
SIM A1 A-101	BUILDING SECTION	101	DOOR TAG
		A	WINDOW TAG
SIM A1 A-101	WALL SECTION	1	REVISION TAG
			STRUCTURAL GRID LINE
			FINISHED SURFACE LINE
SIM A1 A-101	DETAIL CALLOUT		DEMOLITION LINE
			OVERHEAD/HIDDEN LINE

2 SYMBOLS LEGEND
SCALE: N.T.S.

A
AFF ABOVE FINISHED FLOOR
ACT ACOUSTICAL CEILING TILE
ACP ACOUSTICAL METAL PANEL
ALUM ALUMINUM
L ANGLE

B
BLK BLOCK
BD BOARD
BOT BOTTOM
BLDG BUILDING
BL BUILDING LINE

C
CPT CARPET TILE
CLKG CAULK(ING)
CBS CEMENT BOARD
CMU CEMENTITIOUS BACKER BOARD
CTR CENTER
CT CERAMIC TILE
CL CENTER LINE
CH BD CHALKBOARD
CLR CLEAR / CLEARANCE
CLOS CLOSET
COL COLUMN
CONC CONCRETE
CMU CONCRETE MASONRY UNIT
CONT CONTINUOUS
CJ CONTROL JOINT
CG CORNER GUARD
CR COURSE(S)
CRN CROWN

D
DEMO DEMOLISH / DEMOLITION
DET DETAIL
DIA DIAMETER
DIM DIMENSION
DISP DISPENSER
DN DOWN
DWG DRAWING
DF DRINKING FOUNTAIN

E
EA EACH
ELEC ELECTRIC
EWC ELECTRIC WATER COOLER
ELEV ELEVATION
ELEV ELEVATOR
ENCL ENCLOSURE
ENTR ENTRANCE
EQ EQUAL
EQUIP EQUIPMENT
EJ EXPANSION JOINT
EXIST EXISTING
ETR EXISTING TO REMAIN
EXP EXPANSION
EJ EXPANSION JOINT
EXP EXPOSED
EXT EXTERIOR

F
FOF FACE OF FINISH
FOM FACE OF MASONRY
FOS FACE OF STUDS
FOC FACE OF CURB
FF FACE TO FACE
FF FEET/FOOT
FRP FIBER REINFORCED POLYESTER
FGL FIBERGLASS
FIN FINISHED
FFE FINISHED FLOOR
FIN GR FINISH GRADE
FFL FINISHED FLOOR
FEC FIRE EXTINGUISHER CABINET
FHC FIRE HOSE CABINET
FPB FIRE PROTECTION
FRT FIRE RETARDANT
FP FIREPROOF
FP FIREPROOFING
FLASH FLASHING
FLR FLOOR
FD FLOOR DRAIN
FTG FOOTING
FDTN FOUNDATION
FURN FURNISHED
FBO FURNISHED BY OTHERS
FURG FURRED(ING)

G
GA GAUGE / GAUGE
GC GENERAL CONTRACTOR
GL GLASS
GB GLASS BLOCK
GB GRAB BAR
GRL GRILLE
GWB GYPSUM BOARD

H
HCP HANDICAPPED
HNDRL HANDRAIL
HDWD HARDWOOD
HDWE HARDWARE
HP HIGH POINT
HM HOLLOW METAL

I
IRWC IMPACT RESISTANT WALL COVERING
INSUL INSULATED / INSULATION
INT INTERIOR

J
JAN CL JANITOR'S CLOSET

K
KD KNOCKDOWN

L
LAM LAMINATE
LAV LAVATORY
L LENGTH LONG
LF LINEAL FEET
LG LONG LEG GLASS
LGH LONG LEG HORIZONTAL
LLV LONG LEG VERTICAL
LPT LOW POINT

M
MFR MANUFACTURER
MO MASONRY OPENING
MATL MATERIAL
MAU MAU MAKE
MECH MECHANICAL
MTL METAL
MEZZ MEZZANINE
MIN MINIMUM

N
NOM NOMINAL
NA NOT APPLICABLE
NIC NOT IN CONTRACT
NO NUMBER
NTS NOT TO SCALE

O
OC ON CENTER
OPNG OPENING
OFCI OFFICE
OD OUTSIDE DIAMETER
OHD OVERHEAD DOOR

P
PT PAINT
PTD PAPER TOWEL DISPENSER
PBD PARTICLE BOARD
PL PLATE
PLAS PLASTER
PLAM PLASTIC LAMINATE
PLYWD PLYWOOD
PVC POLYVINYL CHLORIDE
PT PRESSURE TREATED

Q
QT QUARRY TILE
QTZ QUARTZ

R
RAD RADIUS
REINF REINFORCE
REQD REQUIRED
RF RESILIENT FLOORING
REV REVISION / REVISED
RSF RISER
RH ROOF HATCH
RL ROOF LEADER
RTU ROOF TOP UNIT
RD ROOF DRAIN
RO ROUGH OPENING
RBR RUBBER
RB RUBBER BASE

S
SCH SCHEDULE (D)
SLNT SEALANT
SLR SEALER
SHTHG SHEATHING
SIM SIMILAR
SD SOAP DISPENSER
SAFB SOUND ATTENUATION FIBERGLASS BATT
SPEC SPECIFICATION
SF SQUARE FEET
STN STAIN
SS SOLID SURFACE
SST STAINLESS STEEL
STL STEEL
STOR STORAGE
STRUCT STRUCTURAL
SUSP SUSPENDED
SYS SYSTEM

T
TK BD TACK BOARD
TEMP GL TEMPERED GLASS
TERR TERRAZZO
THK THICKNESS
THRSHLD THRESHOLD
TL TILE
TPTN TOILET PARTITION
TOB TOILET PARTITION BOTTOM
TO TOP OF
TOS TOP OF STEEL
TOW TOP OF WALL
T&G TONGUE AND GROOVE
T TREAD(S)
TYP TYPICAL

U
UNFIN UNFINISHED
UON UNLESS OTHERWISE NOTED

V
VB VAPOR BARRIER
VR VAPOR RETARDER
VWP VAPOR RETARDER PROOF
VERIFY IN FIELD
VERT VERTICAL
VCT VINYL COMPOSITION TILE
VWB VINYL WALL BASE
VWC VINYL WALL COVERING
VP VISION PANEL

W
WSCT WAINSCOT
W CAB WALL CABINET
WC WATER CLOSET
W WIDE
WG WIRE GLASS
W/ WITH
WM WIRE MESH
WD WOOD
WBL WOOD BLOCKING

1 ABBREVIATION LIST
SCALE: N.T.S.

DRAWING NUMBER	ARCHITECTURE
A1.1	

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

ABBREVIATIONS, LEGENDS, & TYPICAL DETAILS

DRAWN:	AAB
DESIGNED:	AAB
APPR'D:	-
DATE:	SEPTEMBER 18, 2023
PROJECT NUMBER	2241.7462.00

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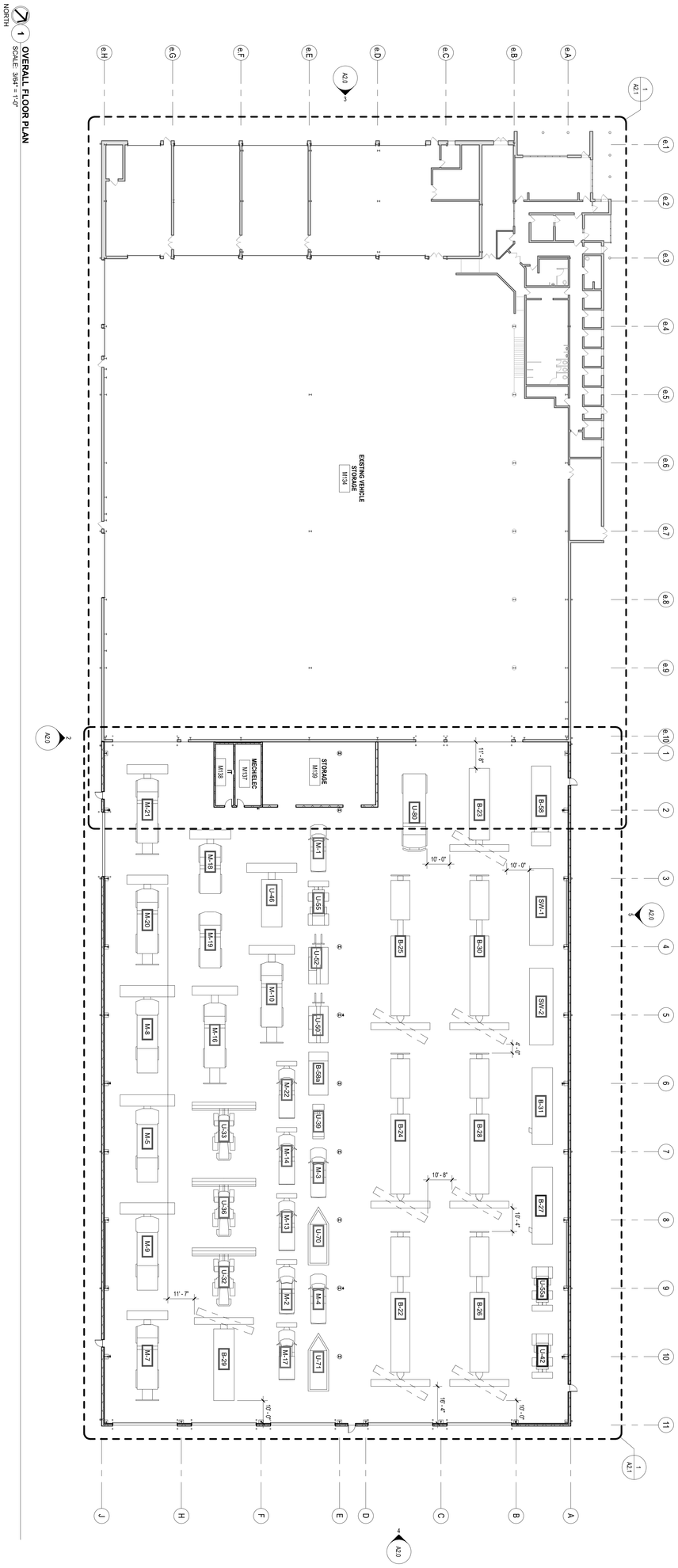

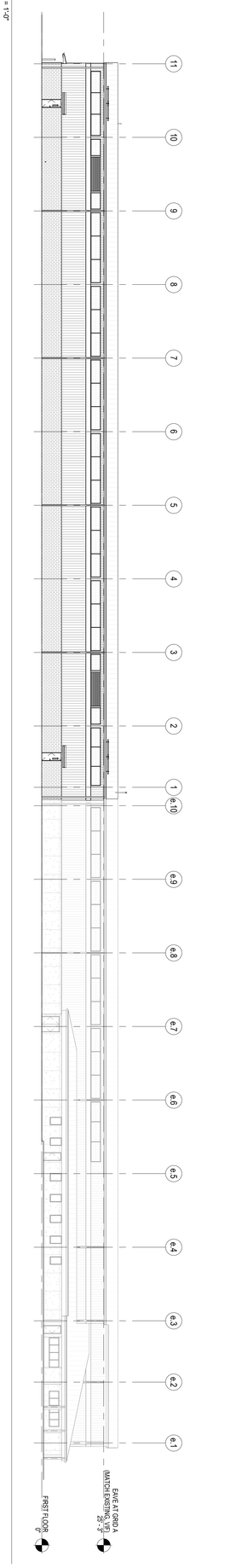

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		APPR'D: -				
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		PROJECT NUMBER				
ARCHITECTURE	REFERENCE FLOOR PLAN & EXTERIOR ELEVATIONS	2241.7462.00				

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ARCHITECTURE		

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DESIGNED: AAB
APPR'D: -
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER
2241.7462.00

NO.	REVISION	DATE

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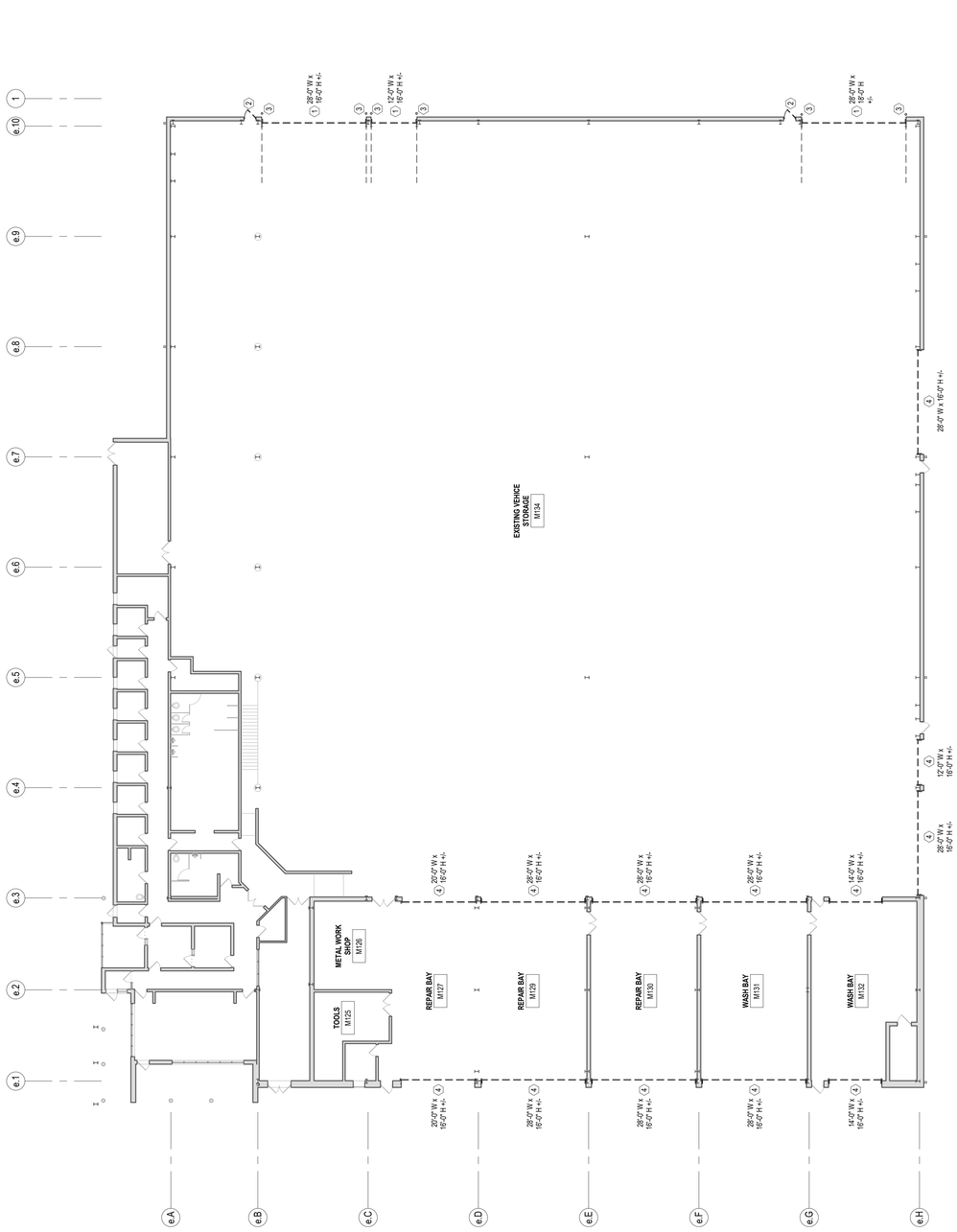
GENERAL DEMOLITION NOTES

1. PROTECT ALL EXISTING FINISH SURFACES TO REMAIN. PATCH EXISTING CONSTRUCTION TO MATCH ADJACENT SURFACES WHERE NEW WORK CONNECTS AS REQUIRED BY THE WORK (IE PIPE PENETRATIONS, REMOVAL OF WALL AND BASE CABINETS, RECEPTACLES ETC). CONTRACTOR IS RESPONSIBLE FOR ALL PATCHING AND REPAIR REQUIRED TO EXISTING WORK WITHIN AND OUTSIDE THE CONTRACT LIMIT LINE.
2. IT IS THE INTENT OF THE REMOVAL PLAN IS TO SHOW THE GENERAL NATURE AND EXTENT OF REMOVAL WORK. CONTRACTOR SHALL INSPECT AND BE RESPONSIBLE FOR VISITING THE JOB SITE AND VERIFYING THE EXISTING CONDITIONS. THE GENERAL CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE BIDDING.
3. GENERAL CONTRACTOR IS TO MAINTAIN SEPARATION BETWEEN AREAS OUTSIDE THE SCOPE OF WORK BY PROVIDING PLASTIC SHEATHING BETWEEN SPACES AND/OR TEMPORARILY TAPING OF JOINTS AND CAPS TO PREVENT DUST FROM MIGRATING.
4. CONDUCT DEMOLITION AND THE REMOVAL OF DEBRIS TO ENSURE MINIMUM INTERFERENCE WITH STREETS, WALKS AND OTHER ADJACENT OCCUPIED AND USED FACILITIES. OBSERVE ALL APPLICABLE REGULATIONS FOR RECYCLING AND TREATMENT OF ITEMS TO BE RECYCLED.
5. DISPOSE OF ALL REMOVED OR REMOVED MATERIALS LEGALLY OFF THE SITE, OR AS NOTED WITH ALL LOCAL AND AHJ CODES AND REQUIREMENTS.
6. UTILITIES TO REMAIN AS NOTED. DURING DEMOLITION, SHALL BE MAINTAINED AND PROTECTED AGAINST DAMAGE.
7. SCHEDULE ALL SERVICE SHUT-DOWNS WITH THE OWNER. NOTIFY THE OWNER A MINIMUM OF ONE (1) WEEK AND ADDITIONALLY ONE (1) HOUR PRIOR TO SHUT DOWNS.
8. UPON COMPLETION, CLEAN THE ENTIRE WORK AREA TO A TIDY, UNIFORM CONDITION. REMOVE ALL DEBRIS, RUBBISH AND UNUSED MATERIALS. ALL MATERIALS USED DURING DEMOLITION, CLEAN ALL AREAS IMPACTED BY DEMOLITION, INCLUDING BUT NOT LIMITED TO, ADJACENT OCCUPIED AREAS AS REQUIRED BY THE CONSTRUCTION MANAGER.
9. ABANDONMENT OF ITEMS OR PARTS OF UTILITIES IN PLACE IS STRICTLY PROHIBITED, UNLESS SPECIFICALLY PERMITTED BY OWNER.
10. DISPOSAL OF ALL DEBRIS AND DEMOLISHED MATERIALS SHALL BE CONTINUOUS DURING THE COURSE OF REMOVAL SHALL BE PROMPT AND GENERAL CLEAN-UP SHALL OCCUR DAILY.
11. FIRE AND SMOKE DETECTION DEVICES SHALL REMAIN OPERATIONAL DURING CONSTRUCTION. CONTRACTOR SHALL PROTECT FIRE AND SMOKE DETECTOR DEVICES FROM DUST DAMAGE AND DEBRIS.

DEMOLITION KEYNOTES

1	REMOVE OVERHEAD SECTIONAL DOOR, TRACK, OPERATOR AND ALL ASSOCIATED HARDWARE. APPROXIMATE SIZE AS NOTED IN PLAN. STEEL ROLLFORM OPENING CHANNELS AND BENT PLATE TRIMS TO REMAIN. PREP FOR PAINT.
2	REMOVE 3'-0" x 7'-10"+/- PERSONNEL DOOR, FRAME, AND ALL ASSOCIATED HARDWARE
3	REMOVE EXTERIOR BOLLARD. REFER TO CIVIL FOR RELATED EXTERIOR WORK.
4	ALTERNATE NO. 1 REMOVE OVERHEAD SECTIONAL DOOR, TRACK, OPERATOR AND ALL ASSOCIATED HARDWARE. APPROXIMATE SIZE AS NOTED IN PLAN. STEEL ROLLFORM OPENING CHANNELS AND BENT PLATE TRIMS TO REMAIN. PREP FOR PAINT. COORDINATE TIMING WITH OWNER TO MINIMIZE IMPACT TO OPERATIONS. ALTERNATE NO. 1 IS NOT INCLUDED IN SUBSTANTIAL COMPLETION MILESTONE FOR OPERATIONAL FACILITY USE.



1 DEMOLITION FLOOR PLAN
SCALE: 1/16" = 1'-0"

NORTH

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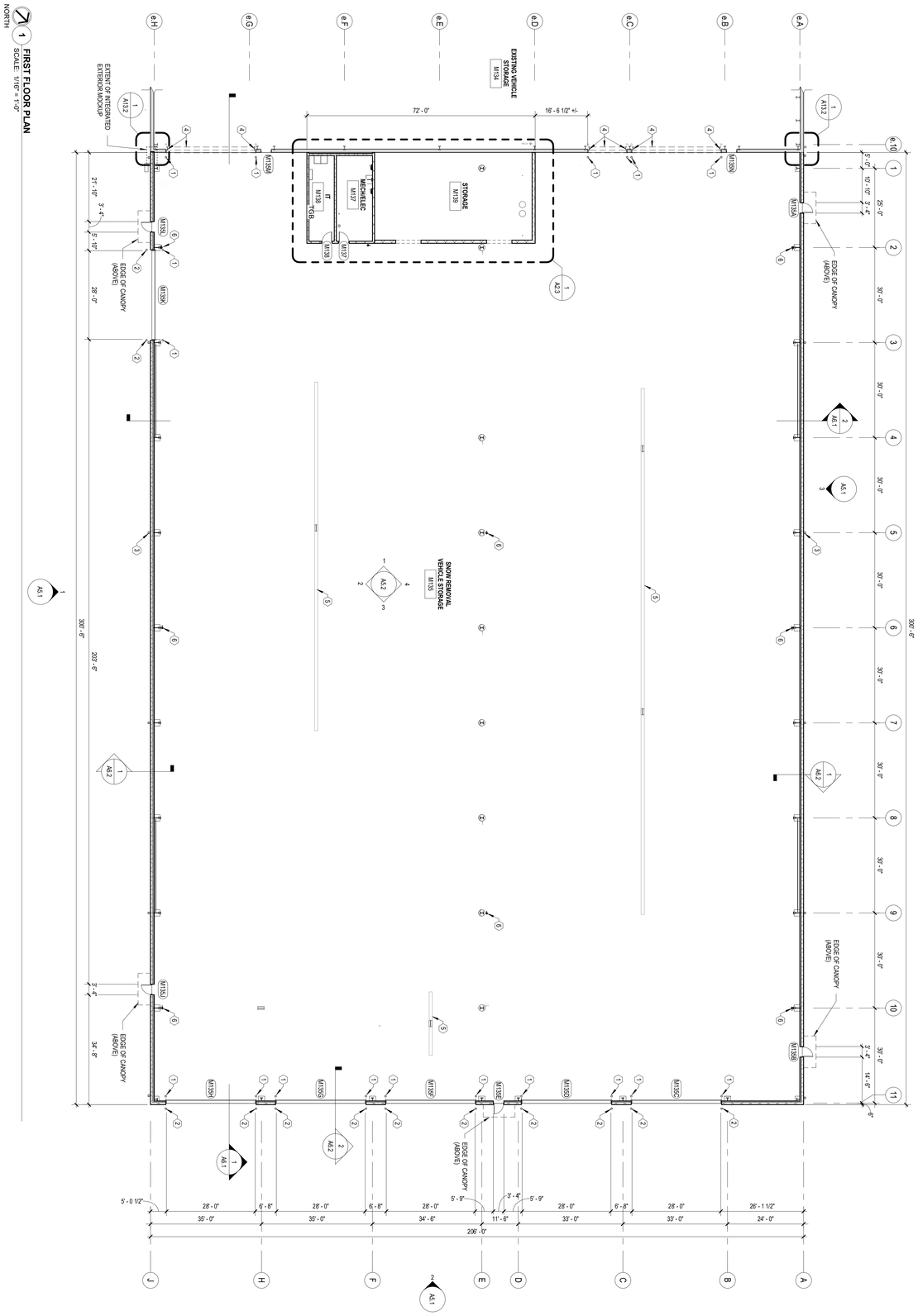

GENERAL NOTES

A. REFER TO G1.1 FOR ADDITIONAL GENERAL NOTES AND INFORMATION.

KEYNOTES

#	KEYNOTES
1	REMOVABLE BOLLARD
2	EXTERIOR BOLLARD. SEE CIVIL
3	LANDSCAPE TYPE. SEE ELEVATIONS
4	PATCH, PREP, AND PAINT EXISTING STEEL FRAME TO MATCH EXISTING.
5	TRENCH DRAIN. SEE PLUMBING AND STRUCTURAL
6	FIRE EXTINGUISHER, BRACKET MOUNTED AT 48" AFF. PROVIDE NFPA COMPLIANT TYPE EXTINGUISHER. ARROW SIGN AT 10' AFF.

0 8 16 32

DRAWING NUMBER	GERALD R. FORD INTERNATIONAL AIRPORT SRE BUILDING EXPANSION	DRAWN: AMB	CHK'D: -	NO.	REVISION	DATE
A2.1		DESIGNED: AMB				
		APPR'D: -				
		DATE: SEPTEMBER 18, 2023				
		PROJECT NUMBER				
ARCHITECTURE	FIRST FLOOR PLAN	2241.7462.00				

STATE OF MICHIGAN
MICHAEL
A. BRUNETTE
30711
REGISTERED ARCHITECT

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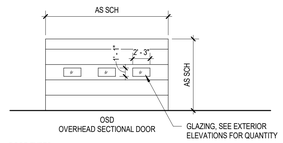
DOOR SCHEDULE - ALTERNATE NO. 1											
		DOOR					FRAME			HARDWARE	
DOOR NO.	ROOM NO.	TYPE	WIDTH	HEIGHT	MATERIAL	FINISH	TYPE	MATERIAL	FINISH	SET	NOTES
M127A	M126	OSD	20' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M127B	M126	OSD	20' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M129A	M126	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M129B	M126	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M130A	M130	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M130B	M130	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M131A	M131	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M131B	M131	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M132A	M132	OSD	14' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M132B	M132	OSD	14' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M134A	M134	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M134D	M134	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1
M134E	M134	OSD	12' - 0"	16' - 0"	STL	PT	-	STL	PT	-	ALTERNATE NO. 1

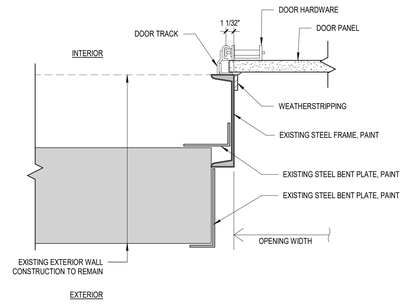


DOOR TYPES

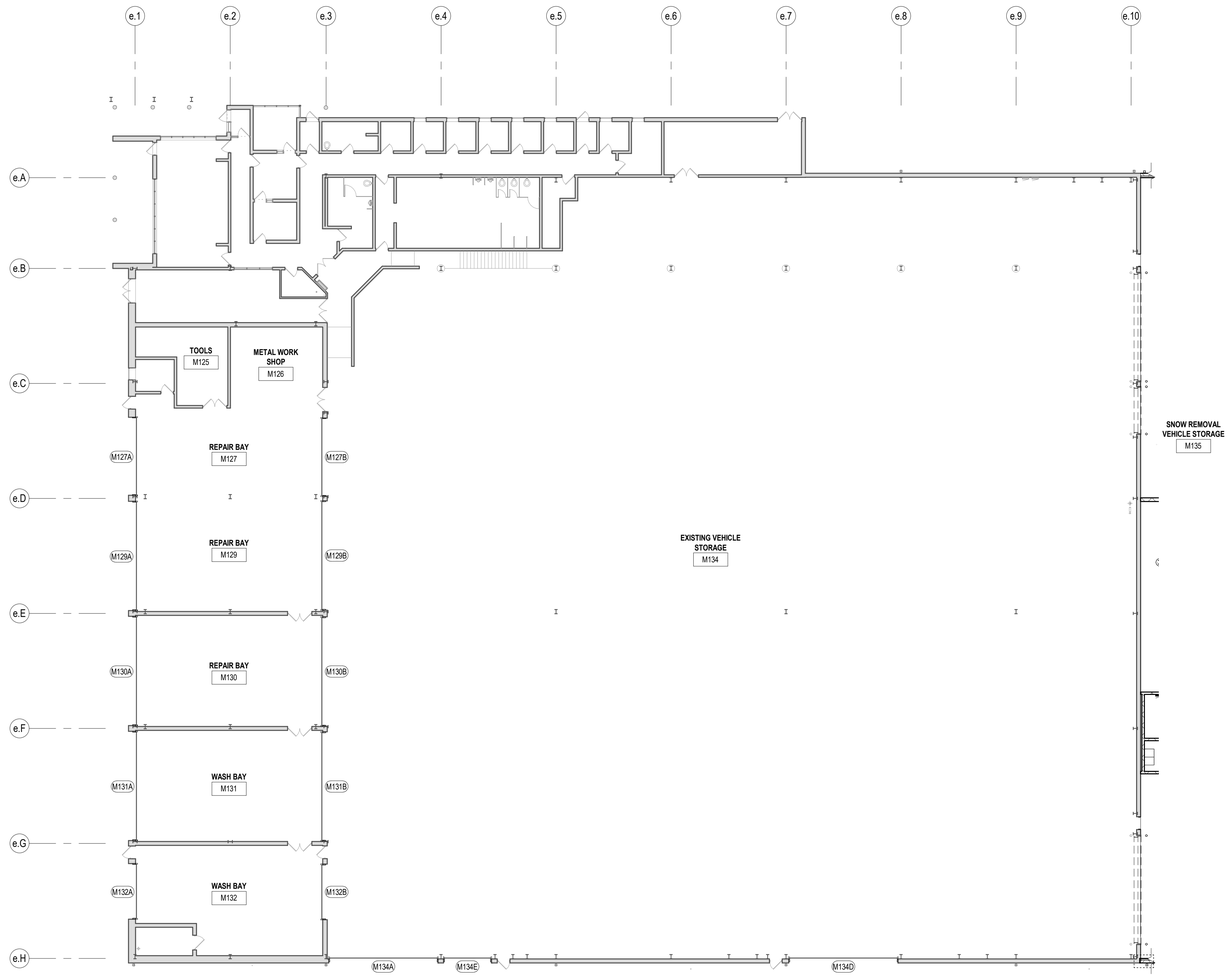
GENERAL DOOR NOTES:

1. DOOR SIZE, MOUNTING, HIGH-LIFT TRACK CLEARANCE, OPERATOR LOCATION, AND MOTOR STYLE TO MATCH EXISTING. VERIFY IN FIELD

2 DOOR SCHEDULE
SCALE: N.T.S.



3 ALTERNATE NO. 1 - OVERHEAD DOOR JAMB DETAIL
SCALE: 1 1/2" = 1'-0"



1 ALTERNATE NO. 1 - FIRST FLOOR PLAN
SCALE: 1/16" = 1'-0"

NORTH

GENERAL NOTES

A. REFER TO G1.1 FOR ADDITIONAL GENERAL NOTES AND INFORMATION.

B. COORDINATE TIMING WITH OWNER TO MINIMIZE IMPACT TO OPERATIONS. ALTERNATE NO. 1 IS NOT INCLUDED IN SUBSTANTIAL COMPLETION MILESTONE FOR OPERATIONAL FACILITY USE .

0 8' 16' 32'

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MICHAEL WAYNE MAINTAINCE
PROJECT
130 071821
LICENSED ARCHITECT

NO.	REVISION	DATE

DRAWN: AMB CHK'D: -
DESIGNED: AMB
APPR'VD: -
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

ALTERNATE NO. 1 - FIRST FLOOR PLAN AND DETAILS

DRAWING NUMBER A2.2

ARCHITECTURE

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WILLIAMSON
13070781
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NO.	REVISION	DATE

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APPR'D: -
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER
2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

ENLARGED FLOOR PLAN & DETAILS

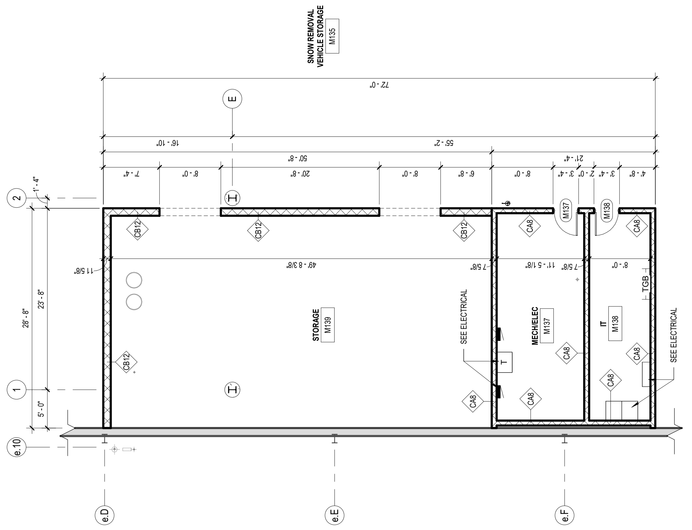
DRAWING NUMBER
A2.3

ARCHITECTURE

GENERAL NOTES

A. REFER TO G1.1 FOR ADDITIONAL GENERAL NOTES AND INFORMATION.

0 4' 8' 16'



1 ENLARGED PLAN AT STORAGE, MECH/ELEC & IT
SCALE: 1/8" = 1'-0"

NORTH

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FACILITY/21912001_ARCHITECTURAL.rvt
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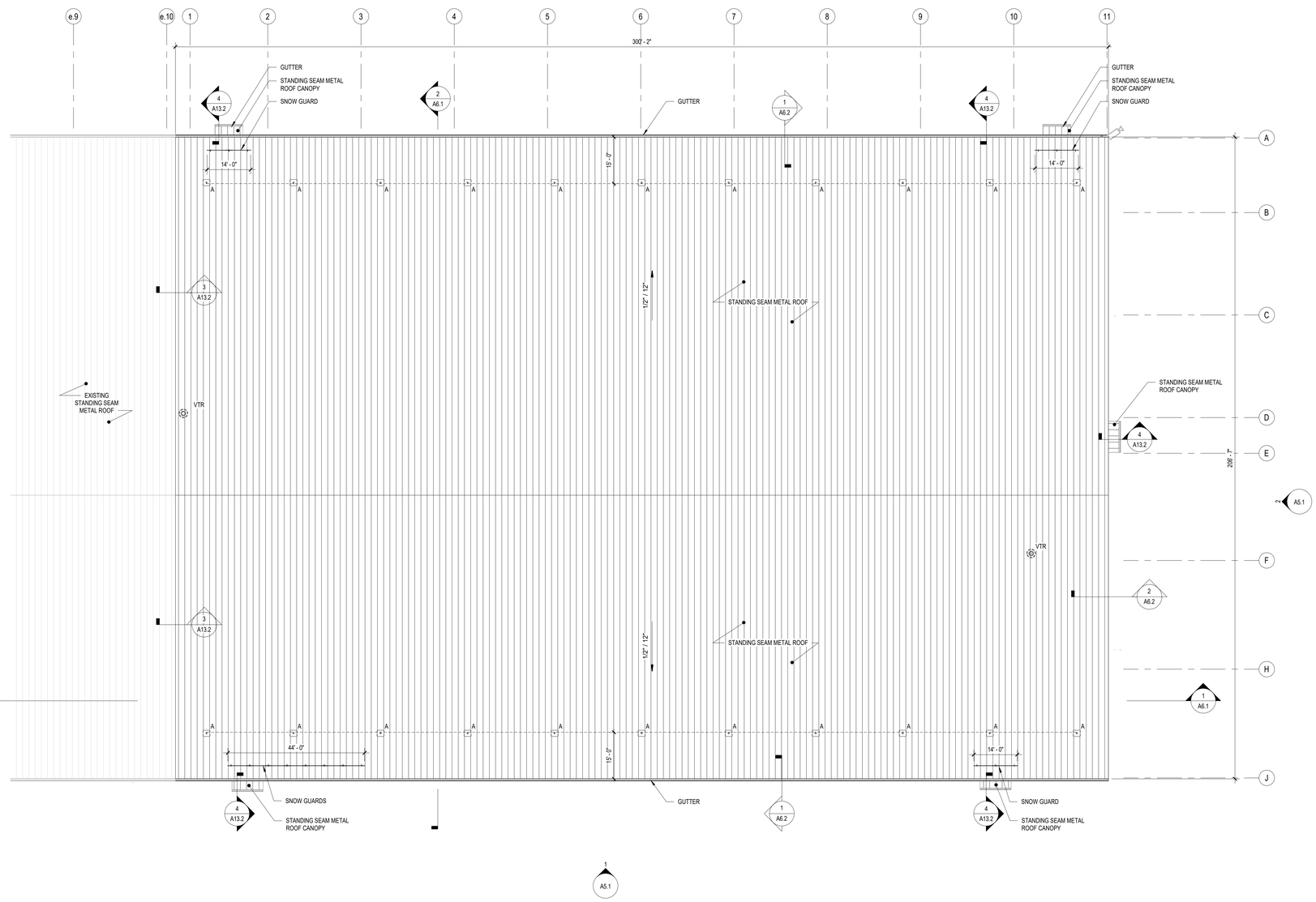
GENERAL NOTES

A. REFER TO G1.1 FOR ADDITIONAL GENERAL NOTES AND INFORMATION.

ROOF LEGEND

- STANDING SEAM METAL ROOF
- ROOF PITCH, AS NOTED
- VTR — VENT THRU ROOF, SEE PLUMBING AND 5 / A13.2
- A — FALL ARREST ROOF ANCHOR, CLAMPED TO METAL ROOF SEAMS, WITH HORIZONTAL LIFE LINE CABLE (3M DBI-SALA ROOFSAFE ANCHOR AND CABLE SYSTEM, OR ARCHITECT APPROVED EQUAL)



1 ROOF PLAN
SCALE: 1/16" = 1'-0"
NORTH

0 8' 16' 32'

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PROJECT
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DESIGNED: AMB | APPR'VD: -
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

ROOF PLAN

DRAWING NUMBER A4.1

ARCHITECTURE

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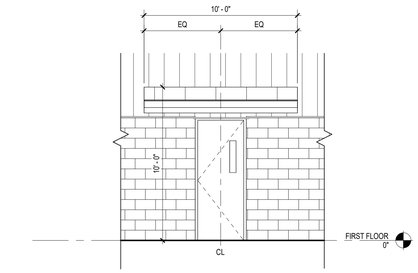
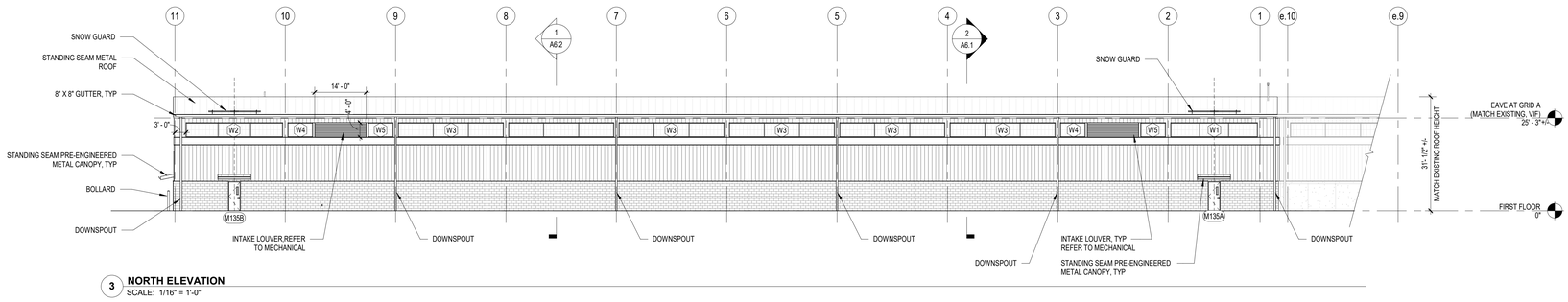
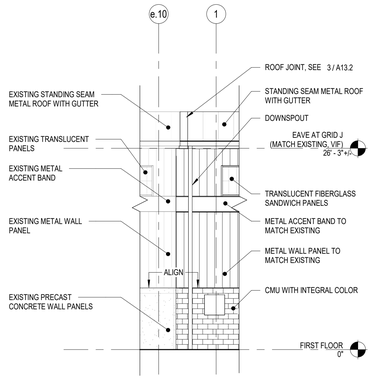


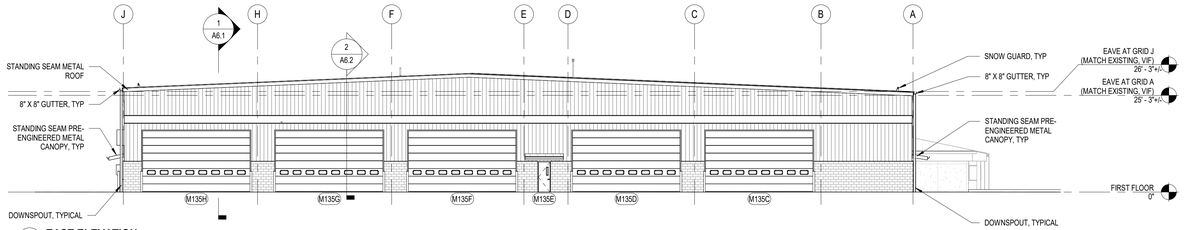
6 TYPICAL ELEVATION AT CANOPY
SCALE: 1/4" = 1'-0"



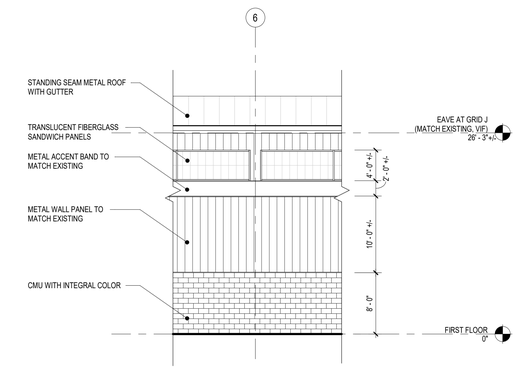
3 NORTH ELEVATION
SCALE: 1/16" = 1'-0"



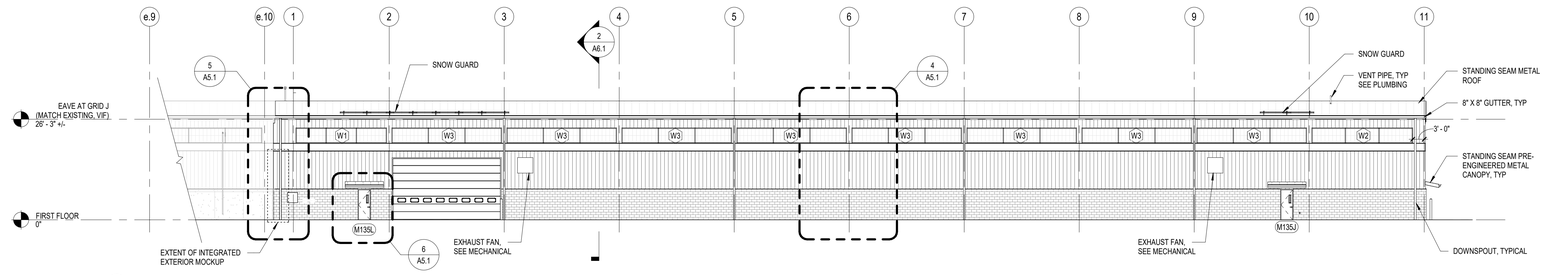
5 ENLARGED ELEVATION AT BUILDING TRANSITION
SCALE: 1/8" = 1'-0"



2 EAST ELEVATION
SCALE: 1/16" = 1'-0"



4 TYPICAL ENLARGED ELEVATION
SCALE: 1/8" = 1'-0"



1 SOUTH ELEVATION
SCALE: 1/16" = 1'-0"

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130 071821
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NO.	REVISION	DATE

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DESIGNED: AMB
APPR'VD: -
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

EXTERIOR ELEVATIONS & DETAILS

DRAWING NUMBER A5.1

ARCHITECTURE

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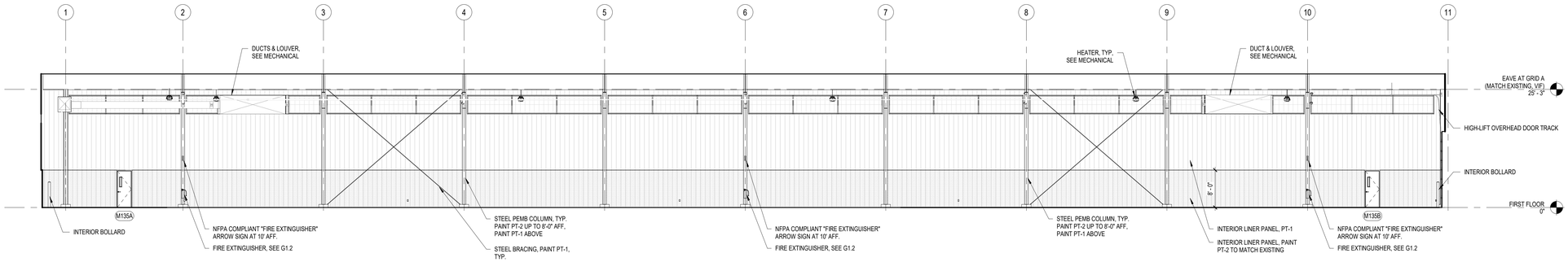
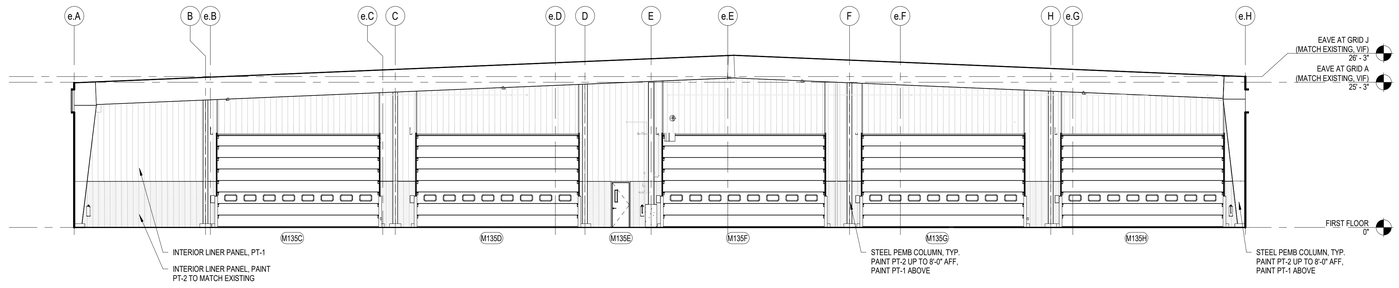
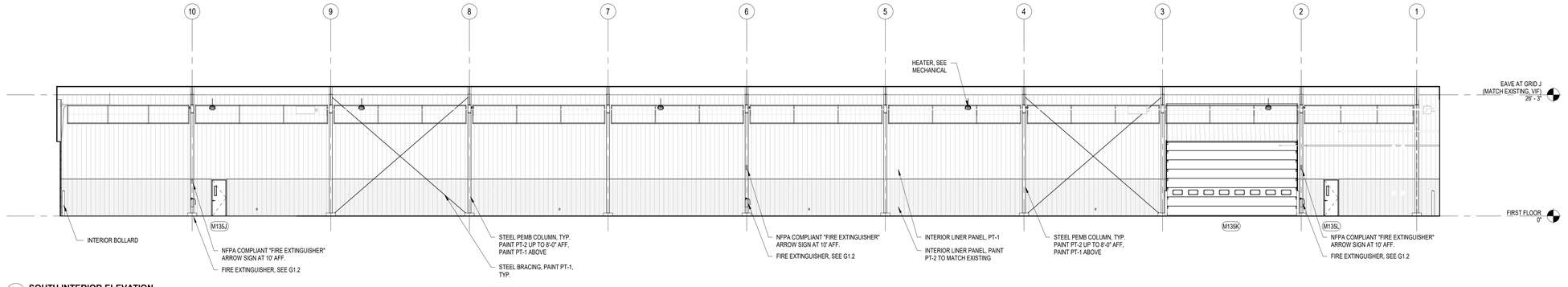


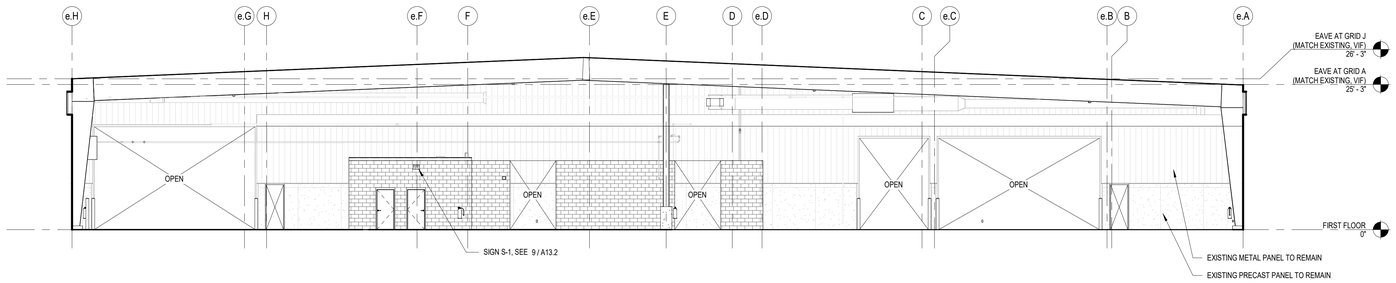
4 NORTH INTERIOR ELEVATION
SCALE: 3/32" = 1'-0"



3 EAST INTERIOR ELEVATION
SCALE: 3/32" = 1'-0"



2 SOUTH INTERIOR ELEVATION
SCALE: 3/32" = 1'-0"



1 WEST INTERIOR ELEVATION
SCALE: 3/32" = 1'-0"

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ENGINEER
130 071821
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NO.	REVISION	DATE
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DRAWN: AMB
CHK'D: -
DESIGNED: AMB
APPRV'D: -
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

INTERIOR ELEVATIONS

DRAWING NUMBER A5.2

ARCHITECTURE

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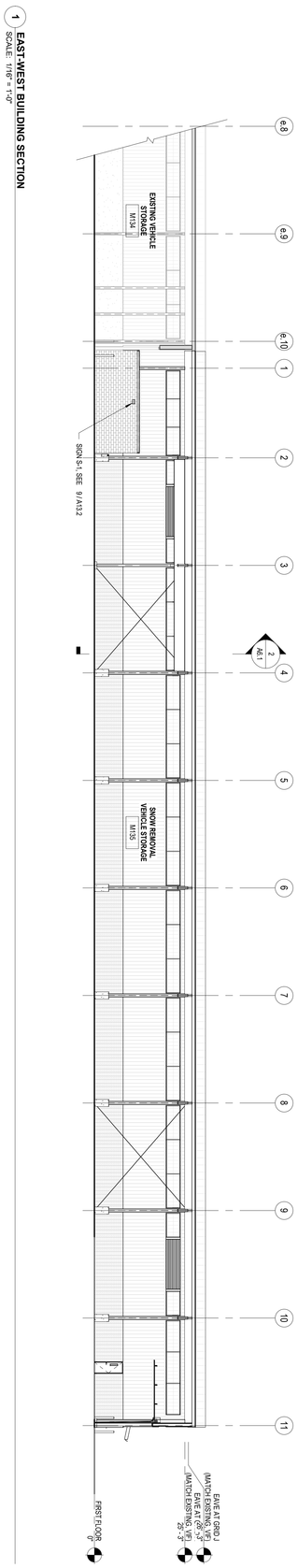
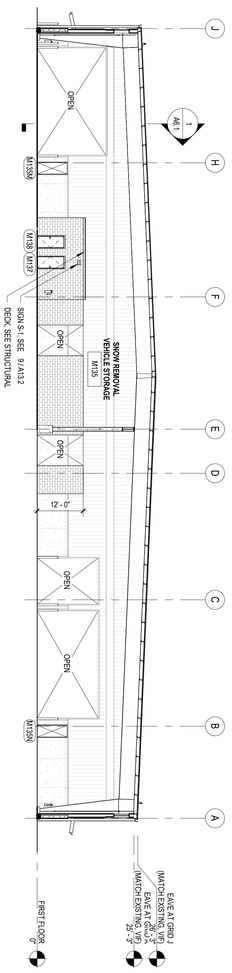


1 **EAST-WEST BUILDING SECTION**
SCALE: 1/16" = 1'-0"



2 **NORTH-SOUTH BUILDING SECTION**
SCALE: 1/16" = 1'-0"

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A6.1		DESIGNED: AMB			
		APPR'D: -			
		DATE: SEPTEMBER 18, 2023			
		PROJECT NUMBER			
		2241.7462.00			
ARCHITECTURE	BUILDING SECTIONS				

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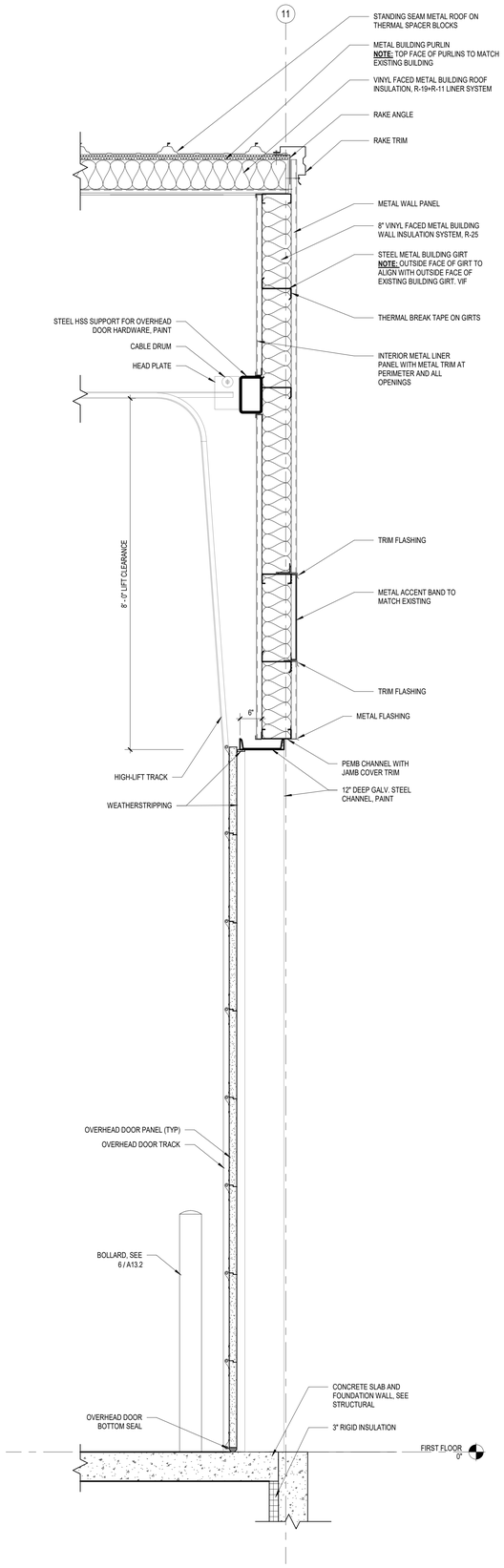
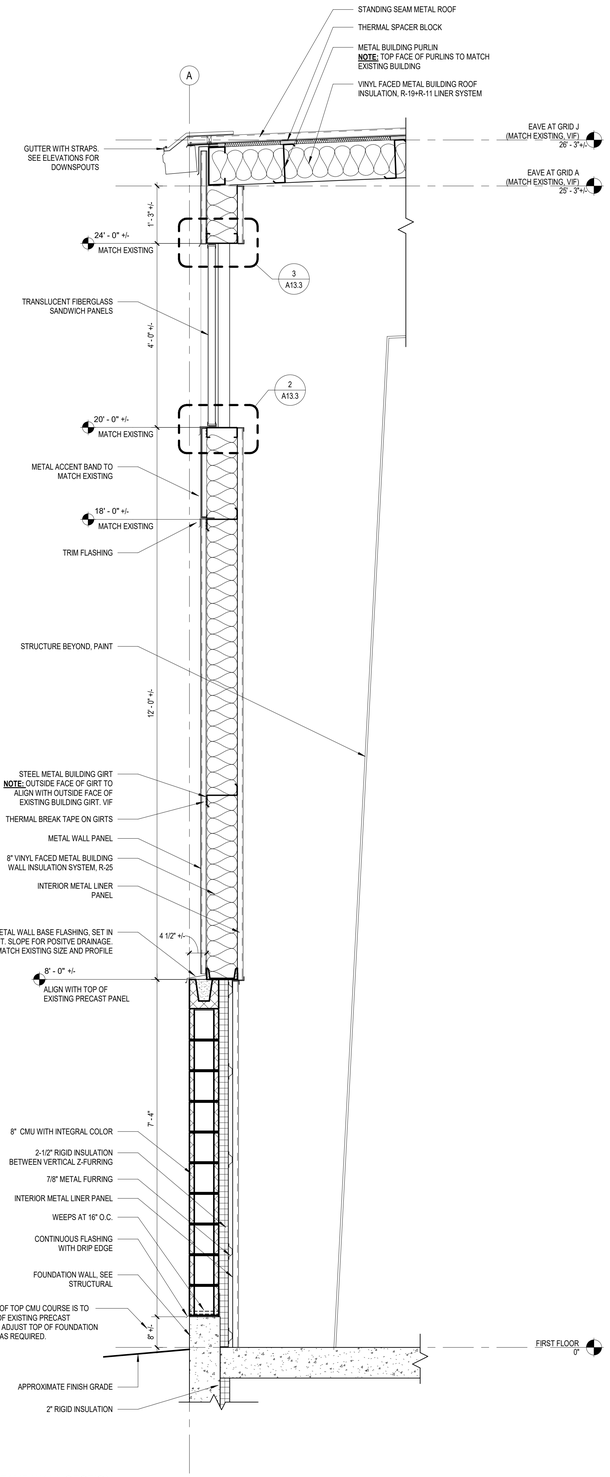


2 TYPICAL RAKE WALL SECTION
SCALE: 3/4" = 1'-0"



1 TYPICAL EAVE WALL SECTION
SCALE: 3/4" = 1'-0"

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DESIGNED: AMB
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DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

WALL SECTIONS

DRAWING NUMBER A6.2

ARCHITECTURE

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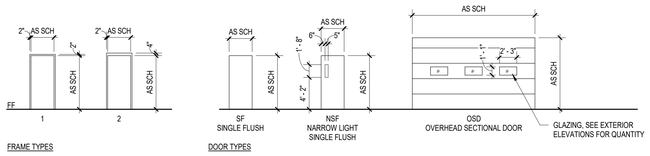
ROOM FINISH SCHEDULE											
				WALLS (SUBSTRATE/FINISH)				CEILING			
ROOM NO.	ROOM NAME	FLOOR	BASE	NORTH	SOUTH	EAST	WEST	SUBSTRATE/FINISH	HEIGHT	NOTES	
M134	EXISTING VEHICLE STORAGE	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST		
M135	SNOW REMOVAL VEHICLE STORAGE	CONC/SLR	-	MTL PNL	MTL PNL	MTL PNL	MTL PNL	EXPOSED/PT	VARIES		
M136	MAINTENANCE	CONC/SLR	-	CMU/PT	CMU/PT	CMU/PT	CMU/PT	EXPOSED/PT	VARIES		
M137	MECH/ELEC	CONC/SLR	-	CMU/PT	CMU/PT	CMU/PT	CMU/PT	EXPOSED/PT	12'-0"		
M138	IT	CONC/SLR	-	CMU/PT	CMU/PT	CMU/PT	CMU/PT	EXPOSED/PT	12'-0"		
M139	STORAGE	CONC/SLR	-	CMU/PT	CMU/PT	CMU/PT	EXIST/PT	EXPOSED/PT	VARIES		

ROOM FINISH SCHEDULE ABBREVIATIONS:
CONC - CONCRETE
CMU - CONCRETE MASONRY UNIT
PT - PAINT
SLR - SEALER

5 ROOM FINISH SCHEDULE
SCALE: N.T.S.

DOOR SCHEDULE											
		DOOR					FRAME			HARDWARE	
DOOR NO.	ROOM NO.	TYPE	WIDTH	HEIGHT	MATERIAL	FINISH	TYPE	MATERIAL	FINISH	SET	NOTES
M135A	M135	NSF	3' - 0"	7' - 10"	FRP	FRP	1	FRP	FRP	1	
M135B	M135	NSF	3' - 0"	7' - 10"	FRP	FRP	1	FRP	FRP	1	
M135C	M135	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	
M135D	M135	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	
M135E	M135	NSF	3' - 0"	7' - 10"	FRP	FRP	1	FRP	FRP	1	
M135F	M135	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	
M135G	M135	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	
M135H	M135	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	
M135J	M135	NSF	3' - 0"	7' - 10"	FRP	FRP	1	FRP	FRP	1	
M135K	M135	OSD	28' - 0"	16' - 0"	STL	PT	-	STL	PT	-	
M135L	M135	NSF	3' - 0"	7' - 10"	FRP	FRP	1	FRP	FRP	1	
M135M	M135	-	3' - 0"	7' - 10"	-	-	1	FRP	FRP	-	NEW CASED OPENING FRAME IN EXISTING OPENING. VERIFY SIZE IN FIELD. PT-1
M135N	M135	-	3' - 0"	7' - 10"	-	-	-	FRP	FRP	-	NEW CASED OPENING FRAME IN EXISTING OPENING. VERIFY SIZE IN FIELD. PT-1
M137	M137	SF	3' - 0"	7' - 0"	FRP	FRP	2	FRP	FRP	2	
M138	M135	SF	3' - 0"	7' - 0"	FRP	FRP	2	FRP	FRP	2	

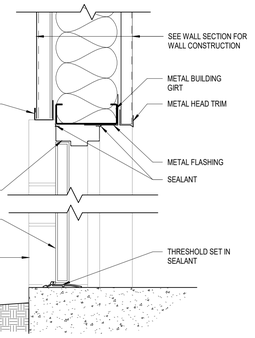
DOOR SCHEDULE ABBREVIATIONS:
FF - FINISH FLOOR
FRP - FIBERGLASS
PT - PAINT
STL - STEEL



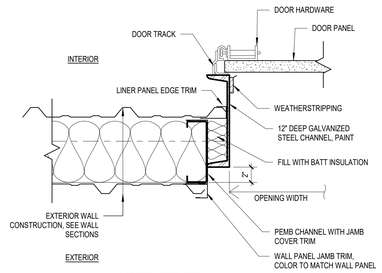
FRAME TYPES

DOOR TYPES

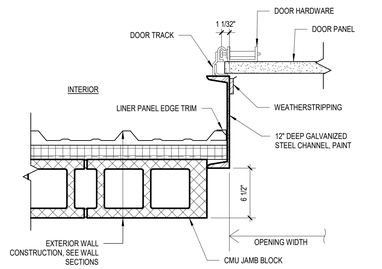
4 DOOR SCHEDULE
SCALE: N.T.S.



2 DOOR HEAD AND SILL DETAIL
SCALE: 1 1/2" = 1'-0"

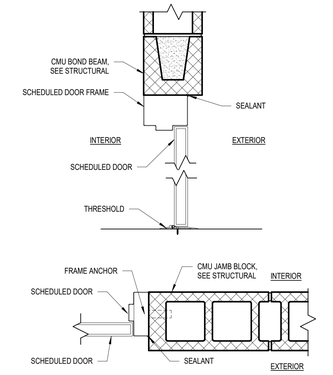


JAMB AT METAL PANEL (HIGH)



JAMB AT CMU (LOW)

3 OVERHEAD DOOR JAMB DETAILS
SCALE: 1 1/2" = 1'-0"



1 DOOR HEAD, JAMB, AND THRESHOLD
SCALE: 1 1/2" = 1'-0"

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STATE OF MICHIGAN
MICHAEL WAYNE MAINTAINCE
LICENSED ARCHITECT
1301071821

NO.	REVISION	DATE

DRAWN: TSM | CHK'D: -
DESIGNED: AMB | APPRVD: -
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

SCHEDULES & DETAILS

DRAWING NUMBER A13.1

ARCHITECTURE

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EXPANSION/A13.1 ARCHITECTURAL.rvt
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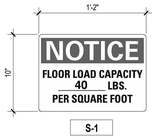
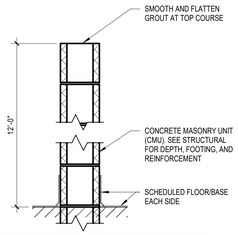


NOTES:
1. SIGN TO BE OSHA COMPLIANT
2. MATERIAL: LAMINATED PLASTIC
3. ATTACHMENT: MECHANICALLY FASTENED
4. MOUNTING HEIGHT: 10'-6" AFF

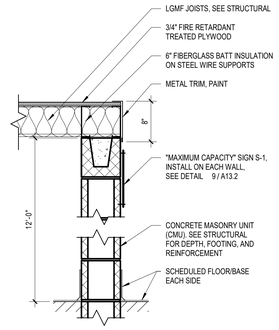
9 SIGNAGE DETAILS
SCALE: 1 1/2" = 1'-0"



CB

TYPE	MATERIAL	DEPTH	FIRE RATING	UNBRACED HEIGHT	DESCRIPTION
CB12	CMU	11-5/8"	-	-	-

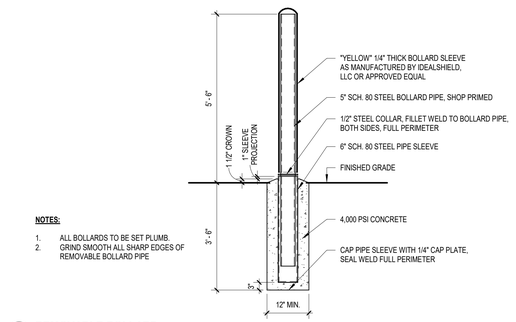
8 PARTITION TYPE CB
SCALE: 1" = 1'-0"



CA

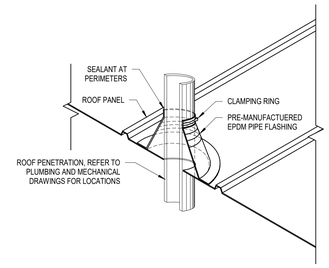
TYPE	MATERIAL	DEPTH	FIRE RATING	UNBRACED HEIGHT	DESCRIPTION
CA8	CMU	7-5/8"	-	-	-

7 PARTITION TYPE CA
SCALE: 1" = 1'-0"

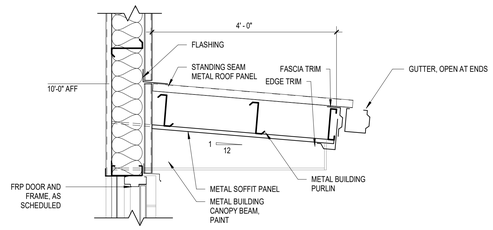


NOTES:
1. ALL BOLLARDS TO BE SET PLUMB.
2. GRIND SMOOTH ALL SHARP EDGES OF REMOVABLE BOLLARD PIPE.

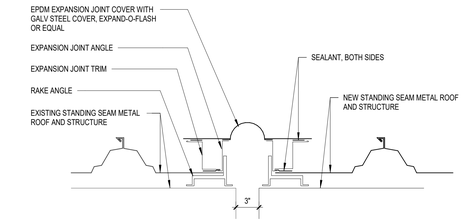
6 REMOVABLE BOLLARD
SCALE: 1/2" = 1'-0"



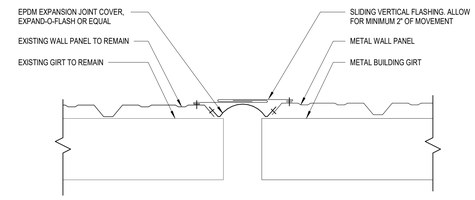
5 METAL ROOF PIPE PENETRATION DETAIL
SCALE: 1" = 1'-0"



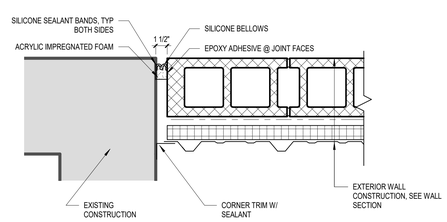
4 SECTION DETAIL AT CANOPY
SCALE: 3/4" = 1'-0"



3 ROOF TIE-IN EXPANSION JOINT
SCALE: 1 1/2" = 1'-0"



2 WALL PANEL EXPANSION JOINT
SCALE: 1 1/2" = 1'-0"



1 PLAN DETAIL - EXPANSION JOINT AT EXISTING CONCRETE AND CMU
SCALE: 1 1/2" = 1'-0"

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MICHAEL WAYNE MONTAGUE
ARCHITECT
130 071821
LICENSED ARCHITECT

DRAWN: TSM | CHK'D: -
DESIGNED: AMB | APPR'D: -
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

NO.	REVISION	DATE

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

DETAILS

DRAWING NUMBER A13.2

ARCHITECTURE

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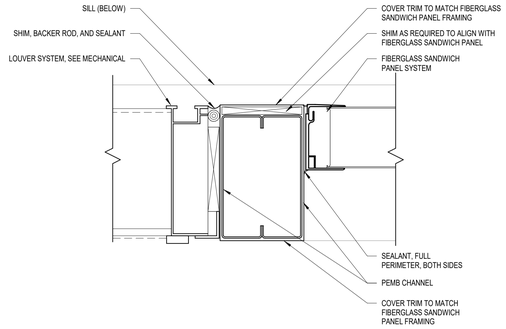
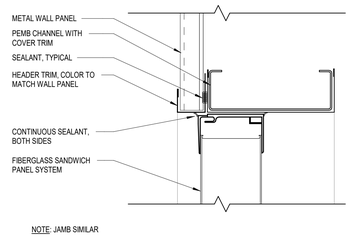
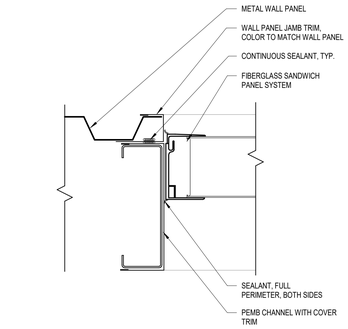


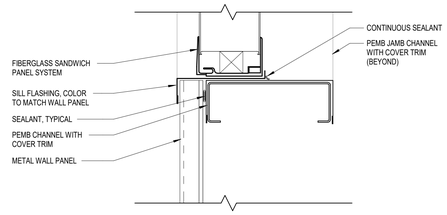
5 **FIBERGLASS SANDWICH PANEL - JAMB AT LOUVER**
SCALE: 3" = 1'-0"



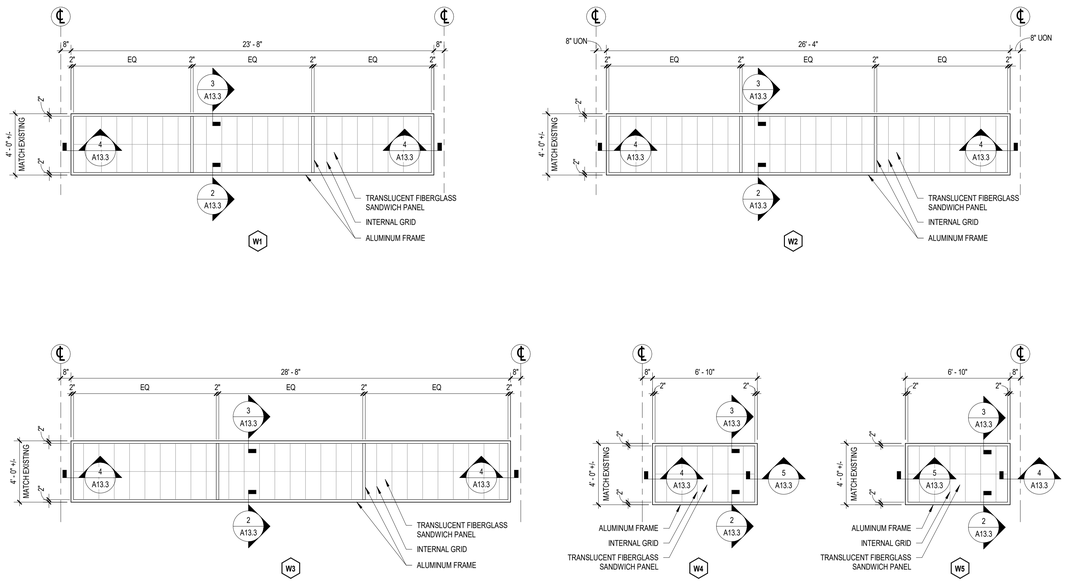
3 **FIBERGLASS SANDWICH PANEL - HEAD**
SCALE: 3" = 1'-0"



4 **FIBERGLASS SANDWICH PANEL - JAMB**
SCALE: 3" = 1'-0"



2 **FIBERGLASS SANDWICH PANEL - SILL**
SCALE: 3" = 1'-0"



1 **WINDOW TYPES**
SCALE: 1/4" = 1'-0"

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MICHAEL WAYNE MONTAGUE
LICENSE NO.
1301071821
LICENSED ARCHITECT

NO.	REVISION	DATE

DRAWN: TSM | CHK'D: -
DESIGNED: AMB
APPR'VD: -
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

WINDOW TYPES & DETAILS

DRAWING NUMBER A13.3

ARCHITECTURE

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PART I - DESIGN CRITERIA

1. CODES AND REFERENCE STANDARDS: 2015 MICHIGAN BUILDING CODE

2. STRUCTURAL LOADING DESIGN DATA:

A.	ROOF LIVE LOAD:	20 PSF
	COLLATERAL ROOF LOAD:	10 PSF (AT PRIMARY AND SECONDARY FRAMING)
B.	WIND LOAD (3-SEC. GUST):	
	ULTIMATE WIND SPEED:	115 MPH
	RISK CATEGORY:	II
	EXPOSURE CATEGORY:	C
	INTERNAL PRESSURE COEFFICIENT:	±0.18
	WIND-BORNE DEBRIS REGION	NA
C.	SNOW LOAD	
	GROUND SNOW LOAD	35 PSF
	FLAT-ROOF SNOW LOAD	24.5 PSF
	SNOW EXPOSURE FACTOR (Ce)	1.0
	SNOW IMPORTANCE FACTOR (Is)	1.0
	THERMAL FACTOR (Ct)	1.0
	DRIFT LOADS CALCULATED PER ASCE 7-10	
D.	SEISMIC LOAD:	
	RISK CATEGORY	II
	SEISMIC IMPORTANCE FACTOR	1.0
	SS	.073
	S1	.044
	SITE CLASS	D
	Sds	.078
	Sd1	.071
	SEISMIC DESIGN CATEGORY	B
	ANALYSIS PROCEDURE USED	BY PEMB MANUFACTURER
	BASIC SEISMIC FORCE-RESISTING SYSTEM	BY PEMB MANUFACTURER
	RESPONSE MODIFICATION COEFFICIENT, R	BY PEMB MANUFACTURER
	SEISMIC RESPONSE COEFFICIENT, Cs	BY PEMB MANUFACTURER
	SEISMIC BASE SHEAR, V	BY PEMB MANUFACTURER

3. HANDRAIL ASSEMBLIES AND GUARDS SHALL BE DESIGNED FOR 50 PLF OR A CONCENTRATED LOAD OF 200 LBS LOCATED AT ANY POINT APPLIED IN ANY DIRECTION AT THE TOP AND TRANSFER THE LOAD TO THE SUPPORT STRUCTURE. THE LOADS NEED NOT TO ACT CONCURRENTLY.

GENERAL: (THE FOLLOWING REQUIREMENTS TOGETHER WITH THE PROJECT PLANS AND SPECIFICATIONS SHALL APPLY TO THE STRUCTURES IN THIS CONTRACT.)

1. THE CONTRACTOR IS RESPONSIBLE FOR THE SURVEY AND FIELD VERIFYING ALL EXISTING CONDITIONS.

2. WORK ON STRUCTURAL DRAWINGS REPRESENTS FINAL CONDITIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR THE STRUCTURAL STABILITY OF ALL INTERMEDIATE CONDITIONS DURING CONSTRUCTION.

3. THE CONTRACTOR SHALL COORDINATE THE ARCHITECTURAL, PLUMBING, HVAC, AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION NOT INDICATED ON THE STRUCTURAL DRAWINGS. SUCH INFORMATION INCLUDES, AS A MINIMUM, EMBEDDED SLEEVES AND INSERTS, MISCELLANEOUS DETAILS, SPECIAL FLOOR FINISHES, DOOR THRESHOLDS, SLOPES TO DRAINS, NAILERS, OPENINGS IN STRUCTURAL ELEMENTS, ETC.

4. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS, TIE-DOWNS, AND/OR SHORING MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.

5. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PROCEDURES. THE STRUCTURAL ENGINEER OF RECORD IS NOT RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION OR FOR RELATED SAFETY PROCEDURES.

6. TYPICAL NOTES AND DETAILS SHOWN ON STRUCTURAL TYPICAL DETAILS SHALL BE APPLICABLE TO ALL PARTS OF THE STRUCTURAL WORK EXCEPT WHERE SPECIFICALLY REQUIRED OTHERWISE ON THE CONTRACT DOCUMENTS. DETAILS NOT SPECIFICALLY SHOWN SHALL BE SIMILAR TO THOSE SHOWN FOR THE MOST NEARLY SIMILAR CONDITION ON THE DRAWINGS AS DETERMINED BY THE ENGINEER.

7. DO NOT SCALE DRAWING DIMENSIONS. IN THE EVENT OF A GRID LINE DIMENSION CONFLICT, THE ARCHITECTURAL DRAWINGS SHALL GOVERN.

8. THE CONTRACTOR SHALL SUBMIT COMPLETE SHOP DRAWINGS FOR ALL PARTS OF THE WORK INCLUDING DESCRIPTION OF DEMOLITION, TEMPORARY BRACING, CONSTRUCTION METHODS AND SEQUENCING, WHERE APPLICABLE NO PERFORMANCE OF WORK SHALL COMMENCE WITHOUT REVIEW OF THE SHOP DRAWINGS BY THE ENGINEER.

9. FABRICATION PRIOR TO THE RECEPT OF AN APPROVED SHOP DRAWINGS SHALL BE AT THE CONTRACTOR'S OWN RISK AND THAT INSTALLATION OF ANY WORK PRIOR TO RECEIPT OF AN APPROVED SHOP DRAWING SHALL BE STRICTLY PROHIBITED.

10. FOR ELEVATIONS REFER TO THE PLAN SHEETS.

11. DRILLING, CORING, SAW CUTTING AND ETC. INTO CONCRETE SHALL MEET THE LATEST OSHA REGULATIONS FOR SILICA DUST EXPOSURE.

PART II - EXCAVATION AND FILL

1. DEWATER, EXCAVATE, FILL AND COMPACT SOIL IN PREPARATION FOR SLAB ON GRADE, WALLS, AND FOUNDATION IN ACCORDANCE WITH THE RECOMMENDATIONS PRESENTED IN THE GEOTECHNICAL REPORT PREPARED BY TBD.

2. ALL EXCAVATIONS SHALL BE DEWATERED TO MAINTAIN GROUNDWATER AT LEAST 24" BELOW FOOTING BEFORE PLACING OF CONCRETE.

3. SLOPE THE EXTERIOR GRADE AWAY FROM THE STRUCTURE. REFER TO CIVIL PLANS FOR DETAILS.

4. PROVIDE TEMPORARY OR PERMANENT SUPPORTS, SHORING, SHEETING OR BRACING SO THAT NO HORIZONTAL MOVEMENT OR VERTICAL SETTLEMENT OCCURS TO ADJACENT STRUCTURES, STREETS, SOILS OR UTILITIES ADJACENT TO OR WITHIN THE PROJECT SITE.

5. BACKFILL SHALL BE PLACED IN COMPACTED LIFTS PER THE EARTHWORK SPECIFICATIONS.

6. NO FOUNDATION CONCRETE SHALL BE PLACED IN WATER.

7. DO NOT BACKFILL BEHIND FOUNDATION WALLS UNTIL THE PERMANENT LATERAL SUPPORT SYSTEM IS IN PLACE AND OF FULL STRENGTH.

8. COMPONENTS OF ANY SUPPORT OF EXCAVATION SYSTEM SHALL REMAIN IN PLACE UNTIL ALL PERMANENT STRUCTURAL SYSTEMS AT AND BELOW GROUND ARE IN PLACE.

PART III - FOUNDATION

1. THE FOUNDATION HAS BEEN DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT PREPARED BY SOMAT ENGINEERING, INC. (PROJECT # 2022081A).

2. THE GEOTECHNICAL REPORT NAMED ABOVE IS AVAILABLE TO THE CONTRACTOR UPON REQUEST TO THE OWNER. THE ARCHITECT AND ENGINEER WILL NOT BE RESPONSIBLE FOR THE ACCURACY OR APPLICABILITY OF SUCH DATA THEREIN.

3. NO RESPONSIBILITY IS ASSUMED BY THE ENGINEER FOR THE VALIDITY OF THE SUBSURFACE CONDITIONS DESCRIBED ON THE DRAWINGS, SPECIFICATIONS, TEST BORINGS, OR TEST PITS. THESE DATA ARE INCLUDED ONLY TO ASSIST THE CONTRACTOR DURING BIDDING AND SUBSEQUENT CONSTRUCTION. THEY REPRESENT CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AT THE TIME DATA WAS COLLECTED.

4. MAXIMUM ALLOWABLE SOIL BEARING PRESSURE = 1500 PSF (BASED ON SETTLEMENT)

5. FOOTINGS TO BEAR ON 12" OF COMPACTED SELECT STRUCTURAL FILL PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS TO EXHIBIT A DENSITY OF AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 1557 (MODIFIED PROCTOR).

6. GEOTECHNICAL ENGINEER MUST REVIEW THE FINAL SITE AND GRADING PLANS TO VALIDATE ALL RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT AND CONFIRM THEIR FINDINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF INSPECTIONS OR EXAMINATIONS PRIOR TO CONSTRUCTION COMMENCEMENT.

7. PERFORM SOIL COMPACTION TESTING, AT LEAST ONE TEST EVERY 100 FEET OF WALL FOOTING.

PART IV - CONCRETE

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF ACI 301 - SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.

2. STANDARDS:

DESIGN:	ACI 318 - 2014
DETAILS:	ACI 315 - 1999
MATERIALS:	ACI 301 - 2010

3. DESIGN STRENGTH:

SLAB ON GRADE:	4000 PSI COMPRESSIVE STRENGTH @ 28 DAYS, NORMAL WEIGHT CONCRETE
FOUNDATIONS, PIERS, AND WALLS:	4000 PSI COMPRESSIVE STRENGTH @ 28 DAYS, NORMAL WEIGHT CONCRETE - AIR ENTRAINED PER SPECIFICATIONS

4. SUBMIT PROPOSED CONCRETE MIX DESIGN TO THE OWNER'S REPRESENTATIVE AND TESTING LABORATORY CONCURRENTLY FOR REVIEW AND APPROVAL.

5. CONCRETE COVER OVER BARS:
   CONCRETE DEPOSITED ON GROUND 3".
   FORMED CONCRETE EXPOSED TO GROUND, WEATHER OR WATER 2".
   WALLS & SLABS NOT DIRECTLY EXPOSED TO GROUND, WATER, OR WEATHER 1-1/2".

6. CLEAN AND APPLY BONDING AGENT TO ALL EXISTING CONCRETE SURFACES TO RECEIVE NEW CONCRETE. ALL CONCRETE TO CONFORM WITH THE LATEST ACI BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE. (ACI - 301)

7. SECTIONS AND DETAILS MAY NOT SHOW ALL REQUIRED CONCRETE REINFORCEMENT. ADDITIONAL REINFORCEMENT MAY BE DESCRIBED IN SCHEDULES (IF APPLICABLE) AND NOTES.

8. PROVIDE BAR SUPPORTS AND SPACERS IN ACCORDANCE WITH REQUIREMENTS OF ACI 315 UNLESS NOTED OTHERWISE.

9. PROVIDE A MUD SLAB UNDER ALL SLABS TO RECEIVE A WATERPROOF MEMBRANE BELOW, AND FOR ALL SLABS WHERE THE GROUND SURFACE IS NOT SUITABLE TO SUPPORT REBAR SUPPORTS AND THE WEIGHT OF CONSTRUCTION WORKERS AND PLACEMENT EQUIPMENT.

10. NOT ALL ITEMS EMBEDDED IN THE CONCRETE ARE SHOWN ON THE STRUCTURAL DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE INSTALLATION OF ALL OPENINGS AND EMBEDDED ITEMS IN THE CONCRETE PERTAINING TO THE DIFFERENT TRADES AS SHOWN ON THEIR PERSPECTIVE DRAWINGS. SLEEVES, MECHANICAL OPENINGS, CONDUITS, PIPES, RECESSES, DEPRESSIONS, CURBS, AND ALL EMBEDDED ITEMS SHALL BE PROVIDED AS SHOWN ON THE ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS AND AS REQUIRED BY THE EQUIPMENT MANUFACTURERS.

11. EMBEDDED CONDUITS, PIPES, OR OTHER UTILITIES NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE ENGINEER. WHERE EMBEDDED ITEMS ARE ALLOWED, THEY SHALL BE SPACED NOT LESS THAN THREE DIAMETERS ON CENTER EACH WAY BUT WITH NOT LESS THAN TWO INCHES CLEAR SPACE BETWEEN EMBEDDED ITEMS. THE TOTAL DEPTH OF ALL EMBEDDED ITEMS AND THE CLEAR SPACE BETWEEN THEM SHALL NOT EXCEED 1/3 OF THE TOTAL CONCRETE DEPTH AND SHALL BE CONFINED TO THE MIDDLE THIRD OF THE CONCRETE DEPTH.

12. HORIZONTAL CONSTRUCTION JOINTS IN CONCRETE POURS (EXCEPT SHEAR WALLS) ARE PROHIBITED UNLESS AUTHORIZED BY ENGINEER.

13. UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE SIZE OF CONCRETE PLACEMENTS SHALL BE LIMITED AS FOLLOWS:
   A. STRIP FOOTINGS AND WALLS: 60 FT (UNLESS INTERMEDIATE CONTROL JOINTS ARE PROVIDED)
   B. SLABS ON GRADE: 30 FT MAX DIMENSION AND 900 SQ FT. (UNLESS INTERMEDIATE CONTROL JOINTS ARE PROVIDED)

14. PROVIDE 3/4" CHAMFER ON ALL EXPOSED CONCRETE EDGES U.N.O

15. THROUGH PENETRATIONS FOR CONCRETE WALLS OR SLABS SHALL CONFORM TO STANDARD DETAIL DRAWINGS.

16. MULTIPLE PENETRATIONS SHALL NOT BE SPACED CLOSER THAN THREE TIMES THE DIAMETER OR THREE TIMES THE WIDTH OF THE LARGER OPENING WITHOUT APPROVAL OF THE ENGINEER.

PART V - CONCRETE REINFORCING

1. REINFORCING:
   MESH: ASTM A-185 (FLAT SHEETS)
   BARS: ASTM A-615 GRADE 60 - DEFORMED.
   BARS: WELDABLE REINFORCING BARS TO CONFORM TO ASTM A-706 GRADE 60.

2. SPLICES IN REINFORCEMENT: UNLESS OTHERWISE NOTED, ALL SPLICES AND ANCHORAGES SHALL BE PER ACI. STAGGER SPLICES WHEREVER POSSIBLE AND LOCATE SO AS NOT TO IMPAIR STRENGTH OF MEMBERS.

3. REINFORCEMENT WORK OF DETAILING, FABRICATION ,AND ERECTION SHALL CONFORM TO THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318 (, ACI DETAILING MANUAL-2004 (SP-66) CRSI MANUAL OF STANDARD PRACTICE (MSP 2009), AND THE STRUCTURAL WELDING CODE- REINFORCING STEEL (AWS D1.1).

4. PROVIDE AND SCHEDULE ON SHOP DRAWINGS THE NECESSARY ACCESSORIES TO HOLD ALL REINFORCEMENT SECURELY IN POSITION.

5. WHERE CONTINUOUS REINFORCEMENT IS CALLED FOR , IT SHALL BE EXTENDED CONTINUOUSLY AROUND CORNERS AND LAPPED AT SPLICES OR AT DISCONTINUOUS ENDS. LAPS SHALL BE CLASS B TENSION LAP SPLICES UNLESS OTHERWISE NOTED.

6. WHERE REINFORCEMENT IS NOT SHOWN ON DRAWINGS, PROVIDE REINFORCEMENT IN ACCORDANCE WITH APPLICABLE DETAILS AS DETERMINED BY THE ENGINEER. IN NO CASE SHALL THE REINFORCEMENT BE LESS THAN THE MINIMUM PERMITTED BY THE APPLICABLE CODES.

7. WHERE REINFORCEMENT IS REQUIRED IN SECTION, REINFORCEMENT IS CONSIDERED TYPICAL WHEREVER THE SECTION APPLIES.

8. WHERE THERE IS A CONFLICT BETWEEN COLUMN VERTICAL BARS AND SLAB OR BEAM HORIZONTAL BARS THE COLUMN BARS SHALL REMAIN IN THEIR DESIGNATED POSITIONS AND THE HORIZONTAL BARS SHALL BE ADJUSTED.

9. REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS.

10. COLUMN DOWELS SHALL BE SET WITH A TEMPLATE SO AS TO BE ENCLOSED BY THE COLUMN TIES.

11. DOWELS SHALL MATCH BAR SIZES UNLESS OTHERWISE NOTED.

12. WELDED WIRE FABRIC SHALL BE LAPPED 8 INCHES OR 1 1/2 SQUARES WHICHEVER IS LARGER AND SHALL BE WIRED TOGETHER.

13. REINFORCEMENT INSTALLATION SHALL BE COMPLETED AT LEAST 24 HOURS BEFORE A CONCRETE PLACEMENT OR SHALL BE COORDINATED WITH THE SPECIAL INSPECTOR TO ENSURE PROPER TIME IS ALLOWED FOR THE INSPECTION OF THE REINFORCING. NOTIFY THE ENGINEER OF COMPLETION.

14. ALL REINFORCEMENT AND CONCRETE EMBEDMENTS SHALL BE SECURELY TIED IN PLACE AT THE POSITIONS SHOWN ON THE DRAWINGS BEFORE PLACING CONCRETE.

15. UNLESS NOTED OTHERWISE, ALL BARS SHALL BE EMBEDDED TO A MINIMUM DEPTH (Ld OR Ldh)

PART VI - POST-INSTALLED ANCHORS AND DOWELS

1. ALL POST INSTALLED ANCHORS INTO MASONRY USE HILTI HIT-HY 70 SYSTEM OR APPROVED EQUAL.

2. ALL POST INSTALLED ANCHORS INTO EXISTING CONCRETE USE HILTI HIT-HY 200 INJECTION ADHESIVE ANCHOR OR APPROVED EQUAL.

3. ALL POST-INSTALLED ANCHOR PRODUCTS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION PROCEDURES.

4. DRILLING, CORING, SAW CUTTING AND ETC. INTO CONCRETE SHALL MEET THE LATEST OSHA REGULATIONS FOR SILICA DUST EXPOSURE.

PART VII - SLAB-ON-GRADE PLACEMENT

1. ALL SLABS SHALL BE PLACED ON 6" OF COMPACTED SELECT STRUCTURAL FILL. SEE EARTHWORK SPECIFICATIONS

2. THE DESIGN OF CONCRETE MIXES, LOCATING OF CONSTRUCTION JOINTS IN SLABS, STAGGERING OF POUR PLACEMENTS, LOCATION OF POUR STRIPS, AND PLACEMENT AND CURING PROCEDURES ARE TO BE PERFORMED BY THE CONTRACTOR IN A MANNER THAT WILL MINIMIZE SHRINKAGE CRACKING OF THE SLABS.

3. PLACE INTERIOR SLABS ON VAPOR RETARDER (10 MIL. MIN UNO) WITH SOILS PREPARED PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.

4. SUBSEQUENT PLACEMENT OF ALTERNATE SLAB STRIPS SHOULD NOT BE MADE SOONER THAN 24 HOURS AFTER THE COMPLETION OF SLAB FINISHING OPERATIONS AND THE INITIATION OF CURING PROCEDURES.

5. THE CONTRACTOR SHALL REPAIR ALL SHRINKAGE CRACKS DESIGNATED AS UNACCEPTABLE BY THE ENGINEER BY EPOXY INJECTION AT NO ADDITIONAL COST TO THE CONTRACT.

6. REPAIR MATERIAL SHALL BE APPROPRIATE FOR THE APPLICATION AS RECOMMENDED BY THE MANUFACTURER. PRODUCTS SHALL BE BY SIKA CORPORATION, OR APPROVED EQUAL.

7. THE CONTRACTOR SHALL SUBMIT TO THE EOR FOR REVIEW PRIOR TO THE DEVELOPMENT OF SLAB REINFORCING SHOP DRAWINGS, A PROPOSED SLAB CONSTRUCTION JOINT LAYOUT PLAN, ALONG WITH PROPOSED METHODS FOR CONTROLLING SHRINKAGE CRACKING IN THE SLABS. CONTROL JOINT SLAB RECTANGULAR SHAPE CONFIGURATION NOT TO EXCEED A LENGTH TO WIDTH RATIO OF 1.5 IN ANY DIRECTION.

PART VIII - MASONRY

1. FURNISH AND CONSTRUCT CONCRETE MASONRY UNIT WORK ACCORDING TO REQUIREMENTS OF ACI 530.1-11 FOR MATERIALS, AND ACI 530.1-11 FOR DESIGN (MSJC). CONTACT OWNER'S REPRESENTATIVE BEFORE MASONRY WORK TO SCHEDULE PRE-CONSTRUCTION CONFERENCE WITH ENGINEER, GENERAL CONTRACTOR, MASONRY CONTRACTOR AND TESTING LABORATORY.

2. TEST (VERIFY) THE COMPRESSIVE STRENGTH OF THE MASONRY BY THE UNIT STRENGTH METHOD. VERIFY THE COMPRESSIVE STRENGTH OF THE MASONRY BEFORE CONSTRUCTION. ALL CONCRETE MASONRY ASSEMBLAGES SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (FM) OF 2,150 PSI. MASONRY UNITS SHALL BE ACCORDING TO REQUIREMENTS OF ASTM C90 HOLLOW CORE, GRADE N, WITH A NET AREA COMPRESSIVE STRENGTH 2,800 PSI MINIMUM. MORTAR SHALL BE TYPE S WITH WASHED SAND AGGREGATE ACCORDING TO REQUIREMENTS OF ASTM C144. MORTAR SHALL BE ACCORDING TO REQUIREMENTS OF ASTM C270 (PROPORTION SPECIFICATION TYPE S). SUBMIT FOR REVIEW PRODUCT DATA CONFIRMING THAT MASONRY PRODUCTS MEET OR EXCEED THESE STANDARDS.

3. FOR FILLING SPACES 4" OR LARGER IN BOTH DIRECTIONS, USE "COARSE GROUT" WITH A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI. THE GROUT SHALL BE TESTED IN ACCORDANCE WITH ASTM C1019. FOR FILLING SPACES LESS THAN 4" IN ONE OR BOTH DIRECTIONS USE FINE GROUT PROPORTIONED PER ASTM C476.

4. PLACE GROUT IN 4'-0" LIFTS AT 9" TO 11" SLUMP (HIGH-RANGE WATER REDUCING ADMIXTURE ASTM C494 TYPE F OR TYPE G). GROUT SHALL BE MIXED AT THE PLANT AND DELIVERED TO THE SITE BY A READY-MIX CONCRETE COMPANY. THE GROUT SHALL NOT BE MIXED ON SITE.

5. PROVIDE A CLASS B TENSION LAP AT ALL VERTICAL CMU REINFORCING UNO. ALL BARS SHALL BE TIED.

6. AT MASONRY OPENINGS WITH MASONRY LINTEL ABOVE OPENINGS, PROVIDE DOWELS WITH 2'-0" PROJECTION INTO LINTEL, MATCH VERT STEEL SIZE & REINF.

7. ALL MASONRY SHALL HAVE STANDARD HORIZONTAL JOINT REINFORCING AT 16" O.C. HOT DIPPED GALV.

8. PROVIDE DOWELS @ BOTTOM OF CMU WALL, MATCH VERTICAL BAR SPACING, TYP.

9. PROVIDE STANDARD HOOKED HORIZONTAL BARS AT ENDS OF BOND BEAMS. ALL VERTICAL BARS SHALL HAVE STANDARD HOOK INTO BOND BEAM.

10. REFER TO THE ARCHITECTURAL DRAWINGS FOR THE ROUGH MASONRY OPENING DIMENSIONS & ELEVATIONS.

11. MAXIMUM SPACING OF CMU CONTROL JOINTS NOT TO EXCEED 25'-0". SEE ARCH FOR JOINT LOCATIONS.

12. CONTRACTOR IS RESPONSIBLE FOR CMU WALL BRACING DURING CONSTRUCTION.

13. REINFORCED MASONRY IS CONTROLLED MATERIAL THAT REQUIRES CONTINUOUS INSPECTION DURING CONSTRUCTION. COORDINATE CONSTRUCTION WITH THE SPECIAL INSPECTOR.

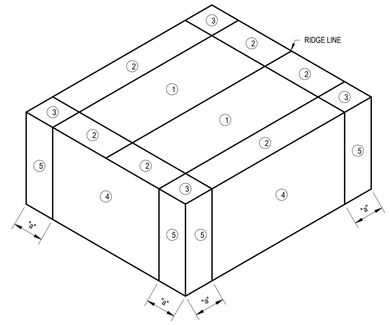
14. THROUGH PENETRATIONS FOR CMU WALLS THAT ARE CONFINED TO A SINGLE 8"X16" MASONRY UNIT SHALL NOT REQUIRE LINTELS OR OTHER REINFORCEMENT.

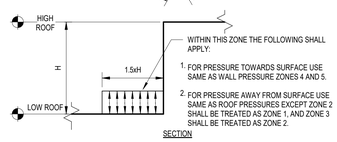
15. MULTIPLE PENETRATIONS THROUGH CMU WALLS SHALL NOT REQUIRE REINFORCEMENT PROVIDED THERE IS ONE FULL 8"X16" BETWEEN PENETRATIONS.

16. WHERE MULTIPLE PENETRATIONS ARE THROUGH ADJACENT 8"X16" MASONRY UNITS PROVIDE LINTELS PER STANDARD DETAIL DRAWINGS.

LEGEND / ABBREVIATIONS:

AESS	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL	FD	FLOOR DRAIN	SCH	SCHEDULE
ADD'L	ADDITIONAL	FF	FINISHED FLOOR	SIM	SIMILAR
AFF	ABOVE FINISHED FLOOR	FS	FOUNDATION STEP	SLBB	SHORT LEG BACK TO BACK
ALT	ALTERNATE	GALV	GALVANIZED	SOG	SLAB ON GRADE
		GB-_	GRADE BEAM	TB-_	TIE BEAM
BPE	BOTTOM OF PILE ELEVATION	HORIZ	HORIZONTAL	T&B	TOP AND BOTTOM
B/F	BOTTOM OF FOOTING	HP	HIGH POINT	TPC	TOP OF PILE CAP
BRG	BEARING	K	KIP	TPIER	TOP OF PIER ELEVATION
				TS	TOP OF STEEL ELEVATION
CANT	CANTILEVER	L	ANGLE	TSLAB	TOP OF SLAB ELEVATION
CFMF	COLD-FORMED METAL FRAMING	LLBB	LONG LEG BACK TO BACK	TWALL	TOP OF WALL ELEVATION
CJ	CONTROL JOINT	LLH	LONG LEG HORIZONTAL	TYP	TYPICAL
CJP	COMPLETE JOINT PENETRATION WELD	LLV	LONG LEG VERTICAL	UNO	UNLESS NOTED OTHERWISE
CL	CENTERLINE	LONG	LONGITUDINAL		
CLR	CLEAR	LP	LOW POINT	VERT	VERTICAL
CMU	CONCRETE MASONRY UNIT	LW	LIGHT WEIGHT		
COL	COLUMN			WP	WORK POINT
COMP	COMPRESSIBLE	MAX	MAXIMUM	WWF	WELDED WIRE FABRIC
CONC	CONCRETE	MIN	MINIMUM		
CONT	CONTINUOUS	MO	MASONRY OPENING	(__)	NUMBER OF STUDS
				ZL	DOUBLE ANGLE
DIA	DIAMETER	NIC	NOT IN CONTRACT		
do	DO OVER				
DW	DOWEL	OC	ON CENTER		
DZL	DEFORMED BAR ANCHOR	OCEF	ON CENTER, EACH FACE		
		OCEW	ON CENTER, EACH WAY		
EF	EACH FACE				
EFEW	EACH FACE, EACH WAY	P__	PIER		
EL	ELEVATION	PC__	PILE CAP		
EJ	EXPANSION JOINT	PJP	PARTIAL JOINT PENETRATION WELD		
EMB	EMBEDMENT	PL	PLATE		
EMP	EMBED PLATE				
EW	EACH WAY	RD	ROOF DRAIN		
EXIST	EXISTING	REINF	REINFORCEMENT		
EXP	EXPANSION	REQD	REQUIRED		
		RO	ROOF OPENING		





SECTION

ROOF STEP - COMPONENTS AND CLADDING
ROOF WIND PRESSURE ZONE DESIGNATIONS

DESIGN WIND PRESSURE FOR EXTERIOR COMPONENTS AND CLADDING MATERIALS

ROOF SLOPE	SURFACE	EFFECTIVE WIND AREA (SF)	WIND PRESSURE TOWARD SURFACE (+ PSF)	WIND PRESSURE AWAY FROM SURFACE (- PSF)
>0° TO 7°	ZONE 1 ROOF	10	14	33
		20	13	32
		50	12	31
		100	11	30
	ZONE 2 ROOF EDGES	10	14	55
		20	13	49
		50	12	41
		100	11	36
	ZONE 3 ROOF CORNERS	10	14	82
		20	13	68
		50	12	50
		100	11	36
NA	ZONE 4 WALL	10	30	33
		20	29	31
		50	27	30
		100	26	28
		500	23	25
	ZONE 5 WALL CORNERS	10	30	40
		20	29	37
		50	27	34
		100	26	31
		500	23	25

COMPONENTS AND CLADDING WIND PRESSURE NOTES:

1. THE COMPONENTS AND CLADDING WIND LOAD PRESSURES IN THE TABLES ABOVE ARE BASED ON ASCE 7-2010. THE WIND PRESSURES ARE ULTIMATE LOAD PRESSURES. REFER TO THE GENERAL NOTES AND DESIGN DATA NOTES FOR WIND LOAD INFORMATION AND PARAMETERS.
2. THE PRESSURES IN THE TABLES ABOVE ARE TO BE USED FOR WIND LOAD CONTRIBUTION TO THE TOTAL LOAD APPLIED TO ANY COMPONENTS AND CLADDING MEMBER OR MATERIAL WHICH IS PART OF A ROOF OR EXTERIOR WALL ASSEMBLY.
3. REFER TO CHAPTER 16 OF THE MICHIGAN BUILDING CODE AND ASCE 7-2010 FOR DEFINITION OF TERMS.
4. CONFIGURATION OF END ZONES, EDGE STRIPS AND CORNERS SHALL BE PER ASCE 7-2010.
5. INTERPOLATION FOR EFFECTIVE WIND AREA BETWEEN 10 SF AND 100 SF FOR ROOFS, AND 10 SF AND 500 SF FOR WALLS IS PERMITTED.
6. PRESSURES ARE APPLIED NORMAL TO THE SURFACE OF THE COMPONENT OR CLADDING ELEMENT.
7. POSITIVE AND NEGATIVE PRESSURES ACT SIMULTANEOUSLY AT PARAPETS.
8. THE WIDTH OF EDGE STRIP (a) SHALL BE 10 PERCENT OF THE LEAST HORIZONTAL OR 40 PERCENT OF THE EAVE HEIGHT, WHICHEVER IS LESS, BUT NOT LESS THAN EITHER 4 PERCENT OF THE LEAST HORIZONTAL DIMENSION OR 3 FEET.

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ENGINEER
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LICENSED PROFESSIONAL ENGINEER

ISSUED FOR BID

NO.	REVISION	DATE

DRAWN: K.S. CHK'D: J.O.
DESIGNED: K. SPYTKO, P.E.
APPRVD: J. OBLEMAN, P.E.
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

GENERAL NOTES

DRAWING NUMBER S-001

STRUCTURAL

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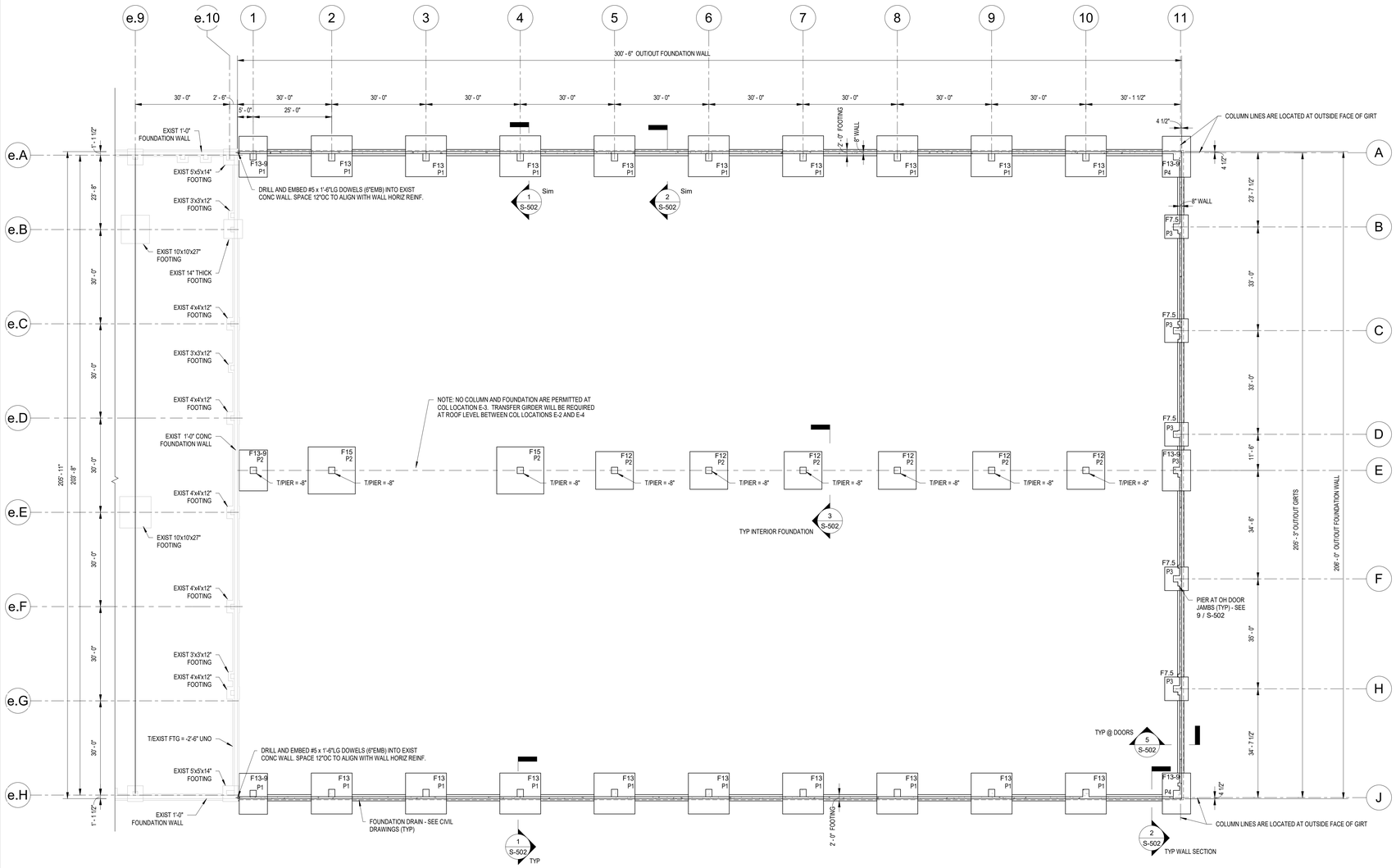

1 **FOUNDATION PLAN**
SCALE: 1/16" = 1'-0"

NORTH

FOUNDATION PLAN GENERAL NOTES:
1. SEE CIVIL PLANS FOR FF ELEVATION CORRESPONDING TO EL = 0'-0"
2. T/FTG = -4'-0" UNO
3. T/WALL = +8" UNO
4. T/PIER = +8" UNO
5. EXISTING FOUNDATIONS SHOWN FOR REFERENCE - CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS
6. F_ DENOTES A SPREAD FOUNDATION. SEE S-502 FOR FOUNDATION DETAILS
7. P_ DENOTES A PIER TYPE. SEE S-502 FOR PIER DETAILS
8. SEE CIVIL AND PLUMBING DRAWINGS FOR FOUNDATION PERIMETER DRAIN DETAILS
9. COORDINATE WITH CIVIL AND PLUMBING FOR UTILITY PENETRATIONS IN FOUNDATION WALL. SEE DETAIL 5 ON SHEET S-501 FOR REINFORCEMENT REQUIRED AT FOUNDATION WALL PENETRATIONS

PRE-ENGINEERED METAL BUILDING FOUNDATIONS ARE PRELIMINARY AND ARE PROVIDED FOR BIDDING PURPOSES ONLY. FINAL FOUNDATION DESIGN WILL BE PROVIDED TO THE SUCCESSFUL BIDDER AFTER REVIEW OF THE FINAL METAL BUILDING SHOP DRAWINGS AND FOUNDATION REACTIONS AND APPROVAL BY THE ENGINEER.

****FINAL FOUNDATION DRAWINGS WILL NOT BE PROVIDED UNTIL FINAL SHOP DRAWINGS AND FOUNDATION REACTIONS ARE PROVIDED****

(F) FOOTING SCHEDULE

MARK	DIMENSIONS "W"	"L"	"H"	REINFORCING
F7.5	7' - 6"	7' - 6"	1' - 6"	(8) #6 EACH WAY TOP & BOTTOM
F12	12' - 0"	12' - 0"	1' - 6"	(13) #6 EACH WAY TOP & BOTTOM
F13	13' - 0"	13' - 0"	1' - 6"	(14) #6 EACH WAY TOP & BOTTOM
F13-9	9' - 0"	13' - 0"	1' - 6"	(14) #6 LONG x (10) #6 SHORT TOP AND BOT
F15	15' - 0"	15' - 0"	2' - 0"	(16) #7 EACH WAY TOP & BOTTOM

0 8" 16" 32"

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GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

FOUNDATION PLAN

DRAWING NUMBER: S-101
STRUCTURAL

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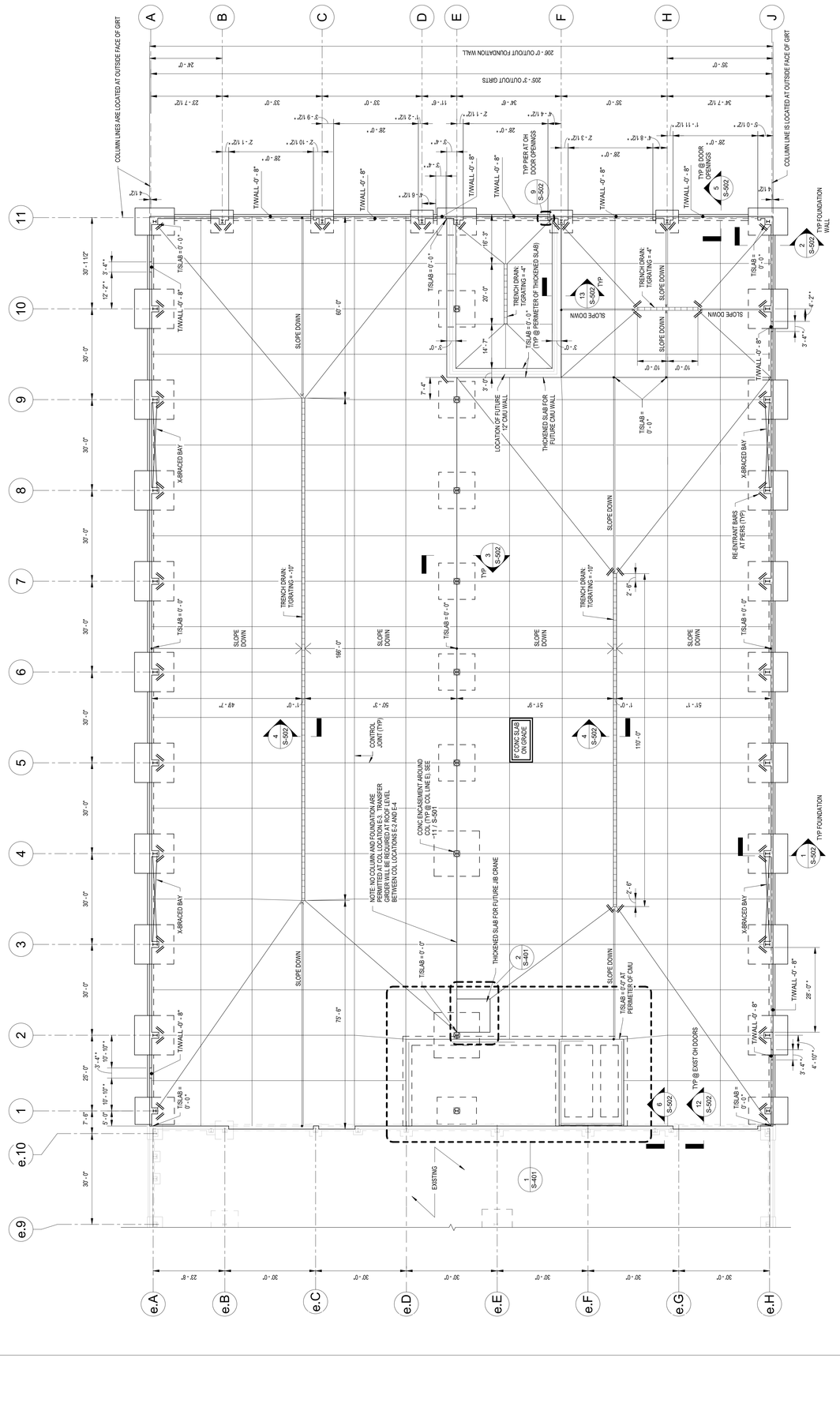


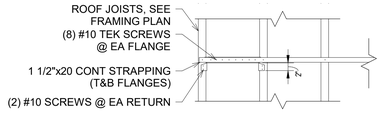
1 **SLAB PLAN**
SCALE: 1/16" = 1'-0"

NORTH

SLAB PLAN GENERAL NOTES
1. SEE CIVIL PLANS FOR FF ELEVATION CORRESPONDING TO EL = 0'-0"
2. EXISTING CONSTRUCTION SHOWN FOR REFERENCE ONLY - CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS
3. ALL SLAB ELEVATIONS ARE BASED ON TOP OF SLAB. REBAR SHALL BE PLACED IN CENTER OF SLAB.
4. SEE GENERAL NOTES FOR ADDITIONAL EXCAVATION AND SLAB ON GRADE REQUIREMENTS
5. COORDINATE FLOOR PENETRATIONS AND HOUSEKEEPING PAD LOCATIONS WITH MECHANICAL, PLUMBING, ELECTRICAL, ARCHITECTURAL, AND FIRE PROTECTION DRAWINGS
6. WALL LAYOUT BY ARCH.
7. DIMENSIONS NOTED WITH "•" REQUIRE COORDINATION WITH OTHER TRADES.

0 8 16 32

PLAN:



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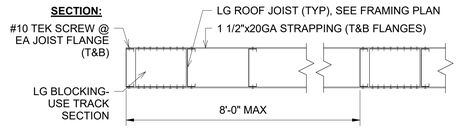
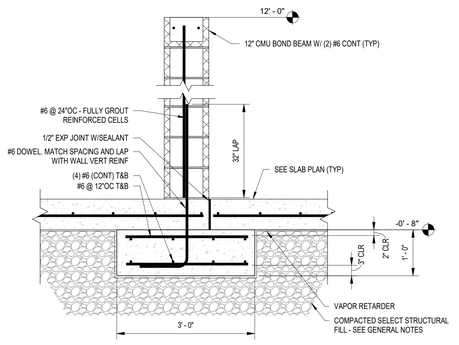
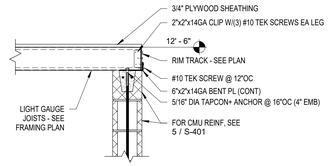


NOTES:
1. SEE PLANS FOR BLOCKING LOCATIONS
2. SOLID BLOCKING TO BE PROVIDED AT EDGES AND AT 8'-0" OC (MAX)

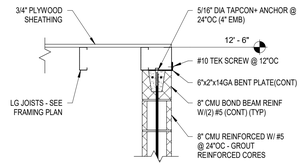
10 LIGHT GAUGE JOIST SOLID BLOCKING DETAIL
3/4" = 1'-0"



9 TYPICAL CMU WALL SECTION AT 12" CMU
3/4" = 1'-0"

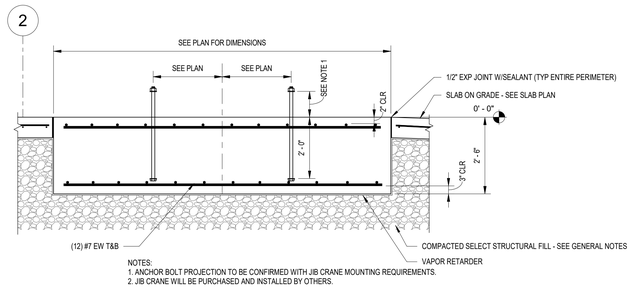


6 TYPICAL WALL SECTION
3/4" = 1'-0"



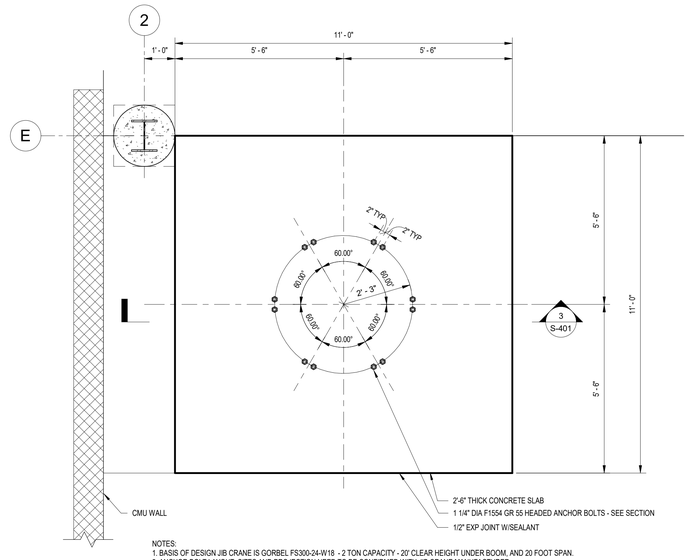
NOTE: SEE ARCH DRAWINGS FOR ADDITIONAL DETAILS

5 TYPICAL WALL SECTION
3/4" = 1'-0"



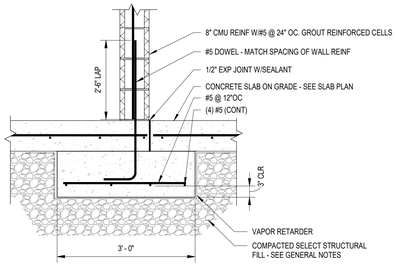
NOTES:
1. ANCHOR BOLT PROJECTION TO BE CONFIRMED WITH JIB CRANE MOUNTING REQUIREMENTS.
2. JIB CRANE WILL BE PURCHASED AND INSTALLED BY OTHERS.

3 JIB CRANE FOUNDATION SECTION
1/2" = 1'-0"



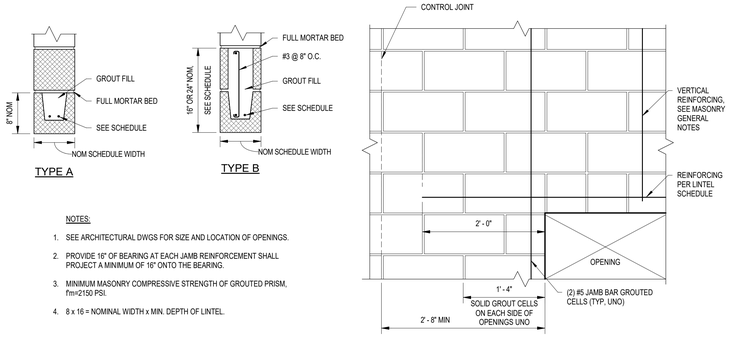
NOTES:
1. BASIS OF DESIGN JIB CRANE IS GORBEL FS300-24-W18 - 2 TON CAPACITY - 20' CLEAR HEIGHT UNDER BOOM, AND 20 FOOT SPAN.
2. ANCHOR BOLT LAYOUT, SIZES AND PROJECTION NEED TO BE CONFIRMED WITH JIB CRANE MANUFACTURER.
3. JIB CRANE WILL BE PURCHASED AND INSTALLED BY OTHERS.

NORTH 2 **JIB CRANE FOUNDATION PLAN**
SCALE: 1/2" = 1'-0"



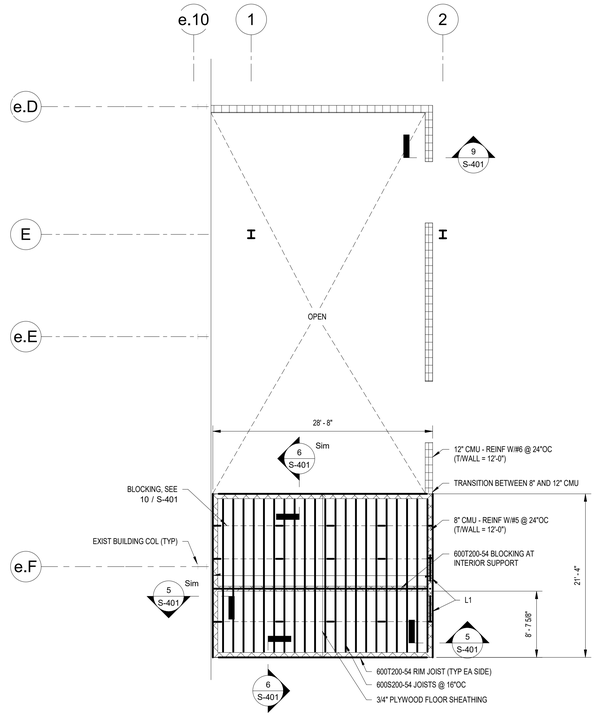
8 TYPICAL LOAD BEARING INTERIOR CMU WALL FOUNDATION DETAIL AT 8" CMU
3/4" = 1'-0"

CMU LINTEL SCHEDULE			
LINTEL MARK	REINFORCING REQUIREMENTS IN NOMINAL LINTEL SECTION (UNO)		
	8x8	8x16	8x24
L1	N/A	2 - #5	N/A

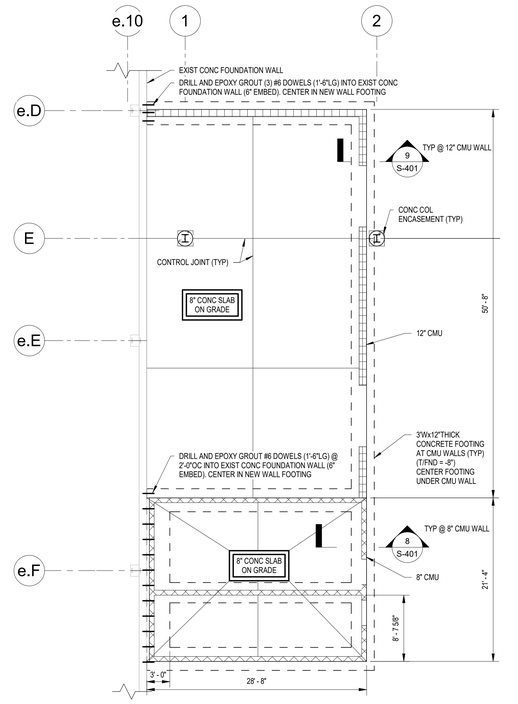


NOTES:
1. SEE ARCHITECTURAL DWGS FOR SIZE AND LOCATION OF OPENINGS.
2. PROVIDE 16" OF BEARING AT EACH JAMB REINFORCEMENT SHALL PROJECT A MINIMUM OF 16" ONTO THE BEARING.
3. MINIMUM MASONRY COMPRESSIVE STRENGTH OF GROUTED PRISM, f'm=2150 PSI.
4. 8 x 16 = NOMINAL WIDTH x MIN. DEPTH OF LINTEL.

7 CMU LINTEL SCHEDULE AND DETAILS
1" = 1'-0"



NORTH 4 **ENLARGED FRAMING PLAN**
SCALE: 1/8" = 1'-0"



NORTH 1 **ENLARGED FOUNDATION PLAN**
SCALE: 1/8" = 1'-0"

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STATE OF MICHIGAN
JOHN W. OBLEMAN
ENGINEER
NO. 6201069388
LICENSED PROFESSIONAL ENGINEER

ISSUED FOR BID

NO.	REVISION	DATE

DRAWN: K.S. | CHK'D: J.O.
DESIGNED: K. SPYTKO, P.E.
APPR'VD: J. OBLEMAN, P.E.
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

ENLARGED PLANS AND DETAILS

DRAWING NUMBER S-401 STRUCTURAL

Autodesk Docs://GFIAA SNOW REMOVAL EQUIPMENT (SRE) BUILDING EXPANSION/SRE_STRUCTURAL.rvt
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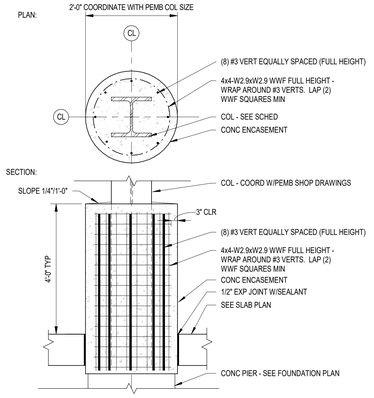
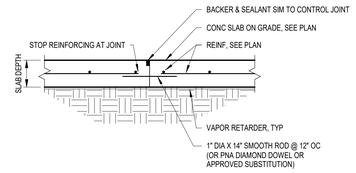


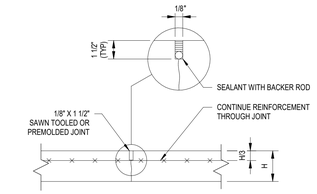
11 TYP CONC COL ENCASEMENT DETAIL
1/2" = 1'-0"



NOTES:

1. CONTRACTOR TO PROVIDE A PROPOSED CONSTRUCTION JOINT LAYOUT PLAN FOR APPROVAL. SEE THE STRUCTURAL GENERAL NOTES FOR LAYOUT GUIDELINES.

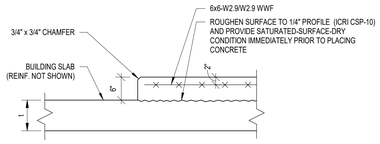
6 TYPICAL SLAB ON GRADE CONSTRUCTION JOINT
3/4" = 1'-0"



NOTES:

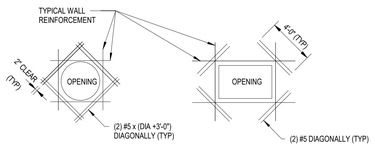
1. JOINT TO BE SAWN WITHIN 24 HOURS AFTER PLACING CONCRETE.
2. PROVIDE CONTROL JOINTS AS SHOWN ON PLAN. FILL JOINT WITH JOINT SEALANT.

4 TYPICAL SLAB ON GRADE CONTROL JOINT DETAIL
3/4" = 1'-0"



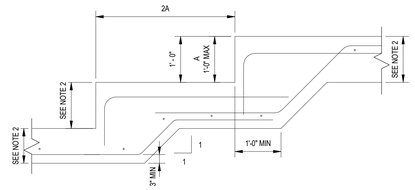
NOTES: 1) HOUSEKEEPING PADS NOT SHOWN ON STRUCTURAL DRAWINGS.
2) SEE ARCHITECTURAL DRAWINGS FOR PAD SIZES AND LOCATIONS.
3) DETAIL NOT APPLICABLE FOR MECHANICAL EQUIPMENT BASES.
4) SEE PLAN AND TYPICAL SLAB DETAILS FOR BUILDING SLAB INFORMATION.

10 TYPICAL HOUSEKEEPING PAD
3/4" = 1'-0"



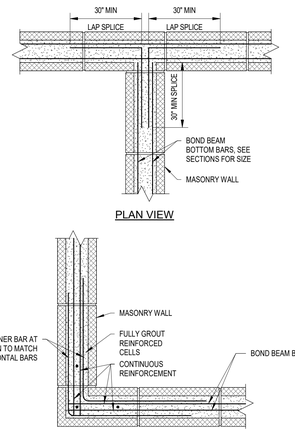
NOTES:
1.) FOR WALLS WITH OPENINGS GREATER THAN 6" IN ANY DIRECTION.
2.) PLACE BARS AT EACH FACE FOR WALLS WITH (2) LAYERS OF REINFORCING.
3.) FOR WALLS WITH REINFORCEMENT LARGER THAN #5 BARS, MATCH WALL REINFORCEMENT BAR SIZE.

5 WALL OPENING REINFORCING DETAIL
3/4" = 1'-0"

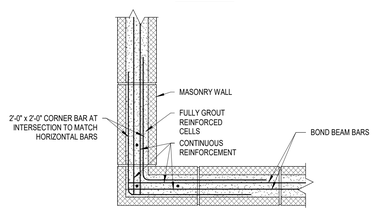


NOTE:
1.) REINFORCING SIZE AND SPACING TO MATCH FOOTING REINFORCEMENT.
2.) THICKNESS TO MATCH CONTINUOUS FOUNDATION. SEE PLAN.

3 FOUNDATION STEP DETAIL
3/4" = 1'-0"

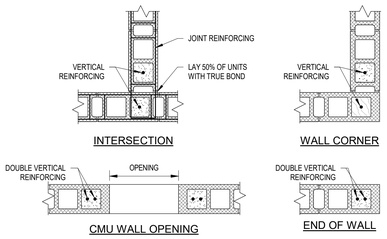


PLAN VIEW



PLAN VIEW

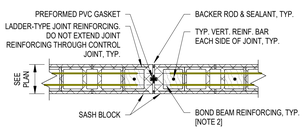
14 TYPICAL CMU BOND BEAM DETAILS
1" = 1'-0"



NOTES:

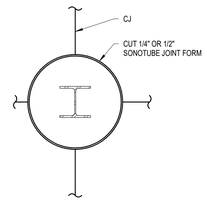
1. TYPICAL CMU WALL REINFORCEMENT TO BE AS SHOWN ON PLAN OR WITHIN REINFORCED MASONRY NOTES IN ADDITION TO THE CONDITIONS SHOWN ABOVE.

13 TYPICAL CMU WALL DETAILS
3/4" = 1'-0"



NOTES: 1) SEE PLAN FOR CONTROL JOINT LOCATIONS. IF NOT SHOWN, JOINT SPACING SHALL BE LESSER OF 25'-0" AND 2x WALL HEIGHT.
2) UNLESS OTHERWISE NOTED, BOND BEAM REINFORCING FOR BOND BEAMS AT FLOOR OR ROOF LEVELS IS CONTINUOUS AND REINFORCING FOR INTERMEDIATE BOND BEAMS BETWEEN LEVELS IS NOT CONTINUOUS THROUGH CONTROL JOINTS.

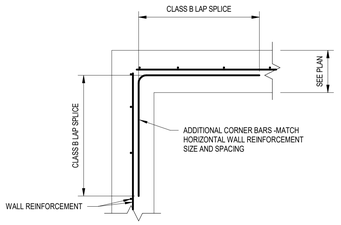
12 TYPICAL CMU CONTROL JOINT
3/4" = 1'-0"



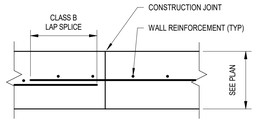
NOTE:

INSTALL JOINT FILLER AND SEALANT IN EXPOSED JOINTS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

9 TYPICAL ISOLATION JOINT AT COLUMNS
3/4" = 1'-0"

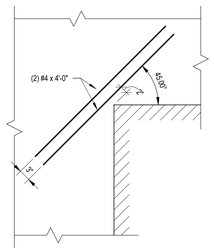


8 TYPICAL CONCRETE WALL CORNER DETAIL
3/4" = 1'-0"

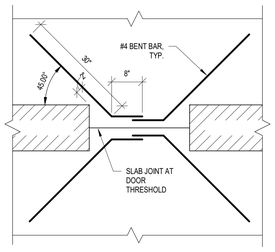


NOTES: 1) SUBMIT PROPOSED JOINT LOCATIONS TO ENGINEER FOR REVIEW AND APPROVAL.
2) IF FEASIBLE, LOCATE AT VENEER EXPANSION JOINTS.
3) DO NOT LOCATE WITHIN 3'-0" OF COLUMN PIER / PILASTER.

7 CONCRETE WALL CONSTRUCTION JOINT
3/4" = 1'-0"



TYPICAL RE-ENTRANT CORNER



RE-ENTRANT CORNERS AT DOORS

2 SLAB ON GRADE RE-ENTRANT CORNER REINFORCEMENT
3/4" = 1'-0"

BAR SIZE	F'c = 4000 psi	
	Lhb	0.7Lhb
#3	7	6
#4	9	7
#5	12	8
#6	14	10
#7	17	12
#8	19	13
#9	21	15
#10	24	17
#11	27	19

NOTES:
1. Ldh = DEVELOPMENT LENGTH OF STANDARD HOOKS IN TENSION (INCHES).
2. Ldh = Lhb UNLESS CONDITIONS OF ITEM 3 ARE SATISFIED.
3. Ldh = 0.7Lhb WHEN SIDE COVER NORMAL TO PLANE OF HOOK IS NOT LESS THAN 2 1/2 INCHES AND FOR 90 DEGREE HOOKS, COVER ON BAR EXTENSION BEYOND HOOK IS NOT LESS THAN 2 INCHES.
4. HOOKS SHALL NOT BE CONSIDERED EFFECTIVE FOR DEVELOPING BARS IN COMPRESSION.
5. VALUES SHOWN ARE FOR GRADE 60 BARS. MULITPLY BY 1.25 FOR GRADE 75 BARS.
6. Ldh SHALL BE MULTIPLIED BY 1.2 FOR EPOXY-COATED HOOKED BARS.

TENSION DEVELOPMENT LENGTHS OF STANDARD HOOKS- NORMAL WEIGHT CONCRETE (GRADE 60 REINFORCING BARS)

BAR SIZE	F'c = 4000 psi	
	CLASS A (1.0 Ld)	CLASS B (1.3 Ld)
#3	12	12
#4	12	15
#5	15	19
#6	17	22
#7	28	37
#8	36	47
#9	44	57
#10	54	70
#11	64	84

NOTES:
1. Ld = TENSION DEVELOPMENT LENGTH.
2. ALL SPLICE LENGTHS ARE IN INCHES.
3. FOR TOP BARS, MULTIPLY SPLICE LENGTHS BY 1.30. TOP BARS REQUIRE A MINIMUM OF 12" FRESH CONCRETE BELOW BAR. FOR TOP REINFORCEMENT IN SLABS 12" THICK OR LESS, USE VALUES IN TABLE.
4. FOR EPOXY-COATED BARS, MULTIPLY SPLICE LENGTHS BY 1.5. THE PRODUCT OF THE TOP BAR MULTIPLIER AND THE EPOXY-COATED BAR MULTIPLIER NEED NOT BE MORE THAN 1.7.
5. WHEN LAP SPLICING BARS OF DIFFERENT SIZES, THE LAP LENGTH IS DETERMINED BY THE SMALLER BAR, BUT MAY NOT BE LESS THAN THE CLASS A SPLICE LENGTH OF THE LARGER BAR.
6. SPLICE LENGTHS ARE BASED OFF A MINIMUM OF 1 1/2" OF COVER.

TENSION DEVELOPMENT AND SPLICE LENGTHS- NORMAL WEIGHT CONCRETE (GRADE 60 REINFORCING BARS)

1 CONCRETE REINFORCEMENT TENSION DEVELOPMENT AND SPLICE LENGTHS
12" = 1'-0"

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ISSUED FOR BID

NO.	REVISION	DATE

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CHK'D: J.O.
DESIGNED: K. SPYTKO, P.E.
APPRV'D: J. OBLEMAN, P.E.
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

TYPICAL DETAILS

DRAWING NUMBER S-501
STRUCTURAL

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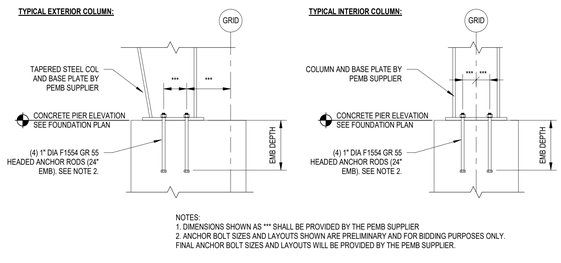
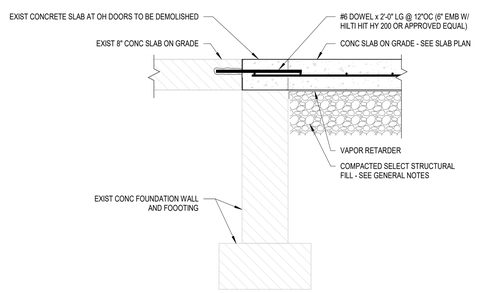
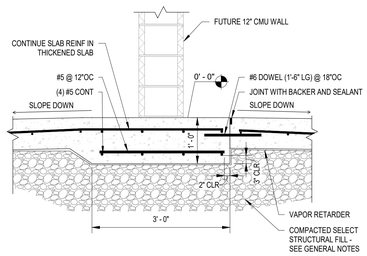


NOTES:
1. DIMENSIONS SHOWN AS *** SHALL BE PROVIDED BY THE PEMB SUPPLIER
2. ANCHOR BOLT SIZES AND LAYOUTS SHOWN ARE PRELIMINARY AND FOR BIDDING PURPOSES ONLY. FINAL ANCHOR BOLT SIZES AND LAYOUTS WILL BE PROVIDED BY THE PEMB SUPPLIER.

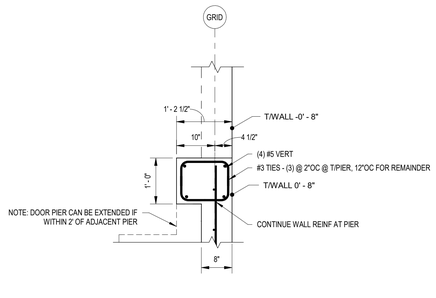
14 TYPICAL COLUMN BASE PLATE AND ANCHOR BOLT DETAILS
3/4" = 1'-0"



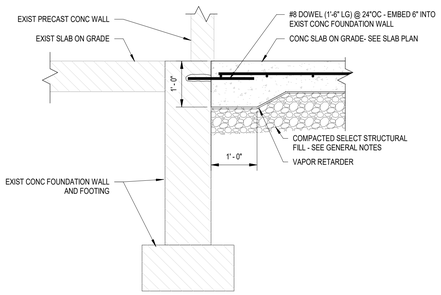
12 SLAB SECTION AT EXISTING OVERHEAD DOOR
3/4" = 1'-0"



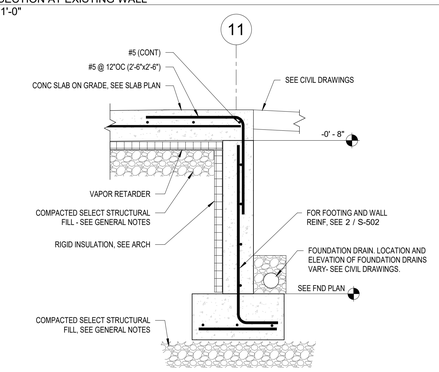
13 SLAB SECTION AT FUTURE CMU WALL
3/4" = 1'-0"



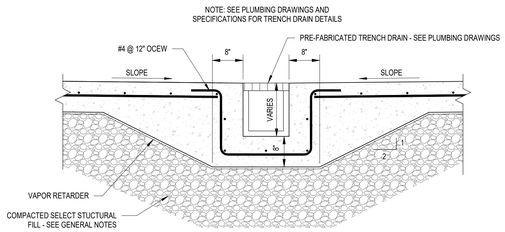
9 TYPICAL PIER AT DOOR OPENING
3/4" = 1'-0"



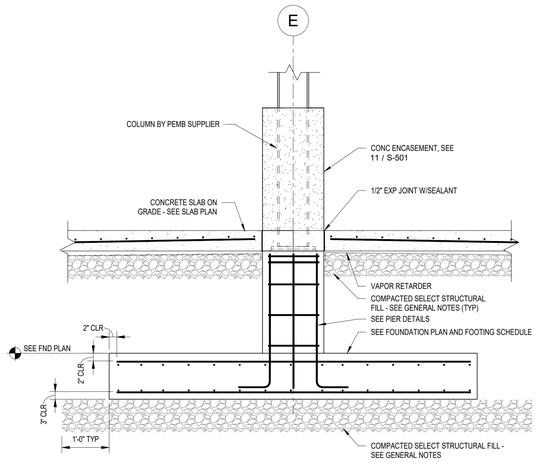
6 SLAB SECTION AT EXISTING WALL
3/4" = 1'-0"



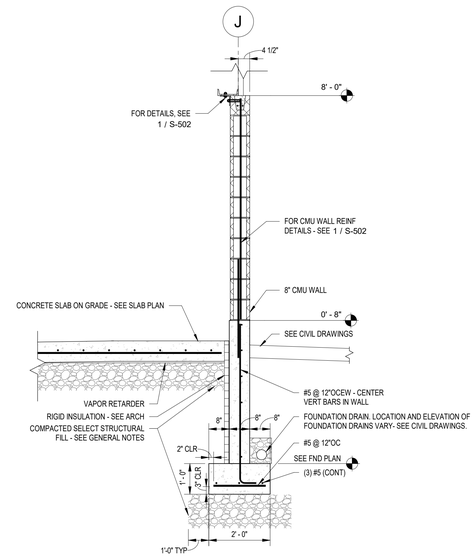
5 TYPICAL FOUNDATION WALL SECTION AT DOOR
3/4" = 1'-0"



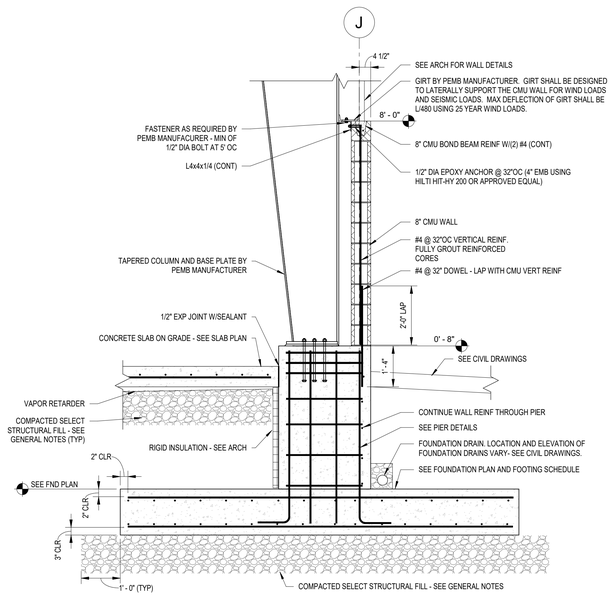
4 TYPICAL TRENCH DRAIN DETAIL
3/4" = 1'-0"



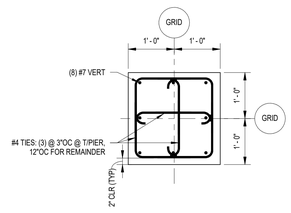
3 TYPICAL INTERIOR FOUNDATION SECTION
1/2" = 1'-0"



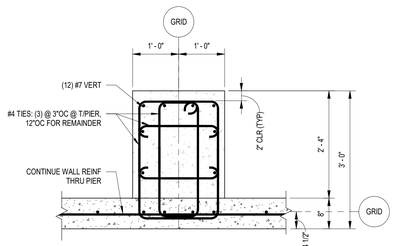
2 TYPICAL FOUNDATION WALL SECTION
1/2" = 1'-0"



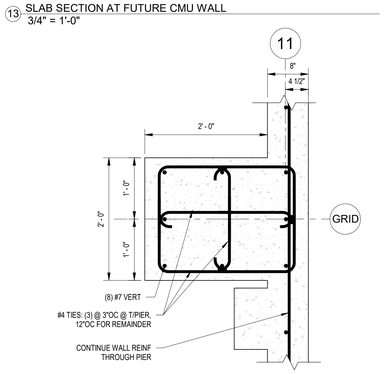
1 TYPICAL FOUNDATION SECTION
1/2" = 1'-0"



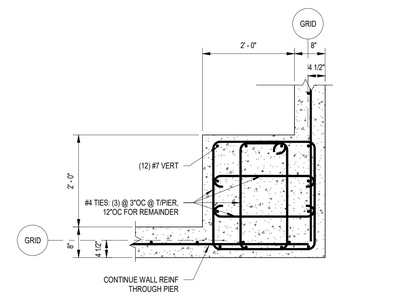
10 PIER P2 DETAIL
3/4" = 1'-0"



7 PIER P1 DETAIL
3/4" = 1'-0"



11 PIER P3 DETAIL
1" = 1'-0"



8 PIER P4 DETAIL
3/4" = 1'-0"

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NO.	REVISION	DATE

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DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

DETAILS

DRAWING NUMBER S-502 STRUCTURAL

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MECHANICAL ABBREVIATION LIST

ABBREVIATION	DESCRIPTION
A	COMPRESSED AIR
A(___#)	COMPRESSED AIR (SPECIFIC PSIG)
AAV	AUTOMATIC AIR VENT
ACC	AIR COOLED CONDENSER
ACCU	AIR COOLED CONDENSER UNIT
AD	ACCESS DOOR
AD	AREA DRAIN
AE	AIR EXTRACTOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
AMP	AMPERE
APD	AIR PRESSURE DROP
AR	ARGON
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS
ASR	AUTOMATIC SPRINKLER RISER
ATD	AIR TRANSFER DUCT
AUX	AUXILIARY
AV	ACID VENT
AVTR	ACID VENT THROUGH ROOF
AW	ACID WASTE
BAS	BUILDING AUTOMATION SYSTEM
BCU	BLOWER COIL UNIT
BDD	BACK DRAFT DAMPER
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BVC	BEVERAGE CONDUIT
BWV	BACKWATER VALVE
C	COMMON
CAP	CAPACITY
CAV	CONSTANT AIR VOLUME
CB	CATCH BASIN
CC	COOLING COIL
CD	COLD DECK
CD	CONDENSATE DRAIN
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHW	CHILLED WATER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CLG	COOLING
CNDS	CONDENSATE
CNDS (__#)	CONDENSATE (SPECIFIC PSIG)
CO	CLEAN OUT
CO2	CARBON DIOXIDE
CONT	CONTINUATION OR CONTINUED
CONTR	CONTRACTOR
CONV	CONVECTOR
COP	COEFFICIENT OF PERFORMANCE
CP	CIRCULATING PUMP
CRU	CONDENSATE RETURN UNIT
CSS	CLINICAL SERVICE SINK
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
CW	DOMESTIC COLD WATER
CWF	DOMESTIC COLD WATER - FILTERED
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
D&T	DRIP AND TRAP
DA	DISCHARGE AIR
DAT	DISCHARGE AIR TEMPERATURE
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREE
DFU	DRAINAGE FIXTURE UNITS
DIA	DIAMETER
DMPR	DAMPER
D/N	DAY/NIGHT
DN	DOWN
DNZ	DOWNSPOUT NOZZLE
DS	DUCT SILENCER
DT	DRAIN TILE
DTC	DRAIN TILE CONNECTION
DWH	DOMESTIC WATER HEATER
DWG	DRAWING
(E)	EXISTING
E	EXHAUST GRILLE OR REGISTER
EA	EACH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	EXPANSION COMPENSATOR
ECUH	ELECTRIC CABINET UNIT HEATER
EDB	ENTERING DRY BULB
EER	ENERGY EFFICIENCY RATIO
EES	EMERGENCY EYE WASH / SHOWER
EEW	EMERGENCY EYE WASH
EF	EXHAUST FAN
EFF	EFFICIENCY
EHC	ELECTRIC HEATING COIL
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
EMS	ENERGY MANAGEMENT SYSTEM
ERL	ENERGY RECOVERY LOOP
ERLR	ENERGY RECOVERY LOOP RETURN
ERLS	ENERGY RECOVERY LOOP SUPPLY
ERU	ENERGY RECOVERY UNIT
ESH	EMERGENCY SHOWER
ESP	EXTERNAL STATIC PRESSURE
EUH	ELECTRIC UNIT HEATER
EWB	ENTERING WET BULB
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
F	FIRE PROTECTION
°F	DEGREES FAHRENHEIT
F&B	FACE AND BYPASS
F&T	FLOAT AND THERMOSTATIC
FA	FACE AREA
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FFD	FUNNEL FLOOR DRAIN
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK
FHV	FIRE HOSE VALVE
FLA	FULL LOAD AMPS
FLR	FLOOR
FM	FLOW METER
FMS	FLOW MEASURING STATION
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FP	FIRE PUMP
FPTU	FAN POWERED (AIR) TERMINAL UNIT
FS	FLOOR SINK
FSEC	FOOD SERVICE EQUIPMENT CONTRACTOR
FT	FEET
FTR	FINNED TUBE RADIATION
FV	FACE VELOCITY
G	NATURAL GAS
GA	GAUGE
GAL	GALLON
GRH	GRAVITY RELIEF HOOD
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GSAN	GREASE SANITARY WASTE
H	HYDROGEN
HB	HOSE BIBB
HC	HEATING COIL
HD	HOT DECK
HEPA	HIGH EFFICIENCY PARTICULATE ARRESTANCE
HL	HIGH LIMIT
HOA	HAND/OFF/AUTO
HP	HEAT PUMP
HP	HORSEPOWER
HPCW	HIGH PRESSURE DOMESTIC COLD WATER
HPHW	HIGH PRESSURE DOMESTIC HOT WATER
HPHWR	HIGH PRESSURE DOMESTIC HOT WATER RETURN
HPL	HEAT PUMP LOOP
HPLR	HEAT PUMP LOOP RETURN
HPLS	HEAT PUMP LOOP SUPPLY
HR	HOUR
HTG	HEATING
HV	HEATING VENTILATING
HVAC	HEATING, VENTILATING, AIR CONDITIONING
HWH	HOT WATER HEATING
HWHR	HOT WATER HEATING RETURN
HWHS	HOT WATER HEATING SUPPLY
HW	DOMESTIC HOT WATER
HW(__)	DOMESTIC HOT WATER (SPECIFIC TEMP °F)
HWR	DOMESTIC HOT WATER RETURN
HX	HEAT EXCHANGER
HZ	HERTZ
IAQ	INDOOR AIR QUALITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IH	INTAKE HOOD
IN	INCHES
IR	INFRARED HEATER
IW	INDIRECT WASTE
JC	JANITOR'S CLOSET
JP	JOCKEY PUMP
KA	THOUSAND AMP
KW	KILOWATT
KWH	KILOWATT-HOUR
LAT	LEAVING AIR TEMPERATURE
LAB	LABORATORY
LAV	LAVATORY
LBS	POUNDS
LDB	LEAVING DRY BULB
LL	LOW LIMIT
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
LRA	LOCKED ROTOR AMPS
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MCA	MEDICAL COMPRESSED AIR
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH	MANHOLE
MIL	1/1000th INCH
MIN	MINIMUM
MISC	MISCELLANEOUS
MMBH	MILLION BRITISH THERMAL UNITS PER HOUR
MOP	MAXIMUM OVERCURRENT PROTECTION
M/S	MOTOR STARTER
MTD	MOUNTED
MTR	MOTOR
MV	MANUAL AIR VENT
MVAC	MEDICAL VACUUM
N	NITROGEN
N2O	NITROUS OXIDE
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NCTC	NORMALLY CLOSED TIMED CLOSED
NCTO	NORMALLY CLOSED TIMED OPEN
NFPA	NATIONAL FIRE PROTECTION AGENCY
NOTC	NORMALLY OPEN TIMED CLOSED
NOTO	NORMALLY OPEN TIMED OPEN
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPCW	NON POTABLE COLD WATER
O	OXYGEN
OA	OUTSIDE AIR
OAT	OUTSIDE AIR TEMPERATURE
OB	OUTLET BOX
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER/CENTER TO CENTER
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OL	OVERLOAD
ORC	OVERFLOW RAIN CONDUCTOR
ORD	OVERFLOW ROOF DRAIN
OS&Y	OUTSIDE SCREW AND YOKE
OV	OUTLET VELOCITY
OWS	OPERATOR WORKSTATION
PACU	PACKAGED AIR CONDITIONING UNIT
PBD	PARALLEL BLADE DAMPER
PC	PUMPED CONDENSATE
PCW	PROCESS COOLING WATER
PCWR	PROCESS COOLING WATER RETURN
PCWS	PROCESS COOLING WATER SUPPLY
PD	PRESSURE DROP (FEET OF WATER)
PH	PERIMETER HEAT
PHR	PERIMETER HEAT RETURN
PHS	PERIMETER HEAT SUPPLY
PNL	PANEL
PPM	PARTS PER MILLION
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSAN	PUMPED SANITARY
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAUGE
PST	PUMPED STORM
PW	PURIFIED WATER
PWR	PURIFIED WATER RETURN
PWS	PURIFIED WATER SUPPLY
(R)	RELOCATED
R	RETURN GRILLE OR REGISTER
RA	RETURN AIR
RAT	RETURN AIR TEMPERATURE
RC	RAIN CONDUCTOR
RCP	RADIANT CEILING PANEL
RD	ROOF DRAIN
REQD	REQUIRED
REF	ROOF EXHAUST FAN
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RLFA	RELIEF AIR
RPM	REVOLUTIONS PER MINUTE
RPDA	REDUCED PRESSURE BACKFLOW DETECTION ASSY
RPZA	REDUCED PRESSURE BACKFLOW ZONE ASSY
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
S	SUPPLY AIR DIFFUSER OR GRILLE
SA	SOUND ATTENUATOR
SA	SUPPLY AIR
SAN	SANITARY WASTE
SAT	SUPPLY AIR TEMPERATURE
SCCA	SHORT CIRCUIT CURRENT RATING
SECT	SECTION
SF	SUPPLY FAN
SH	SHOWER
SK	SINK
SMR	SNOW MELT RETURN
SMS	SNOW MELT SUPPLY
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SPKLR	SPRINKLER
SQFT	SQUARE FOOT/SQUARE FEET
S/S	START/STOP
SS	SERVICE SINK
ST	STORM
STD	STANDARD
STK	STACK
STM	STEAM
STM(__#)	STEAM (SPECIFIC PSIG)
S/W	SUMMER/WINTER
SW	SWITCH
T	TRANSFER GRILLE
TC	TEMPERATURE CONTROL
TC	TEMPERING COIL
TCP	TEMPERATURE CONTROL PANEL
TD	TRENCH DRAIN
TEMP	TEMPERATURE
TEMP	TEMPORARY
TH	TERMINAL HEATING
THA	TOTAL HEAT ABSORBED
THR	TERMINAL HEATING RETURN
THR	TOTAL HEAT REJECTED
THS	TERMINAL HEATING SUPPLY
TPD	TEPID WATER
TSP	TOTAL STATIC PRESSURE
TU	(AIR) TERMINAL UNIT
TV	TURNING VANES
TW	TEMPERED WATER
TYP	TYPICAL
UH	UNIT HEATER
UL	UNDERWRITER'S LABORATORY
UON	UNLESS OTHERWISE NOTED
UR	URINAL
UV	UNIT VENTILATOR
V	VALVE
V	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VD	VOLUME DAMPER (MANUALLY ADJUSTABLE)
VOL	VOLUME
VFC	VARIABLE FREQUENCY CONTROLLER
VTR	VENT THROUGH ROOF
VTU	VENTURI TERMINAL UNIT
VUV	VERTICAL UNIT VENTILATOR
W	WASTE
W&V	WASTE AND VENT
WAGD	WASTE ANESTHETIC GAS DISPOSAL
WB	WET BULB
WC	WATER CLOSET
WC	WATER COLUMN
WG	WATER GAUGE
WH	WALL HYDRANT
WMSD	WASHING MACHINE SUPPLY AND DRAIN BOX
WPD	WATER PRESSURE DROP
WT	WEIGHT
XFMR	TRANSFORMER
ZVB	ZONE VALVE BOX

TEMPERATURE CONTROL - PARTIAL SYMBOLS LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
CO2	CARBON DIOXIDE SENSOR	OS	OCCUPANCY SENSOR
CO	CARBON MONOXIDE SENSOR	PT	PRESSURE TRANSMITTER
DPT	DIFFERENTIAL PRESSURE TRANSMITTER	SP	STATIC PRESSURE SENSOR OR PROBE
FM	FLOW METER		VALVE - 2 WAY CONTROL VALVE
	GUARD FOR STAT OR SENSOR		VALVE - 3 WAY CONTROL VALVE
H	HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS)	T	THERMOSTAT OR TEMPERATURE SENSOR (AS DEFINED ON TC DRAWINGS)

NOTE: LIST OF ADDITIONAL SYMBOLS & ABBREVIATIONS ASSOCIATED WITH TEMPERATURE CONTROLS ARE IDENTIFIED ON TC DRAWINGS.

MECHANICAL SYMBOL LIST

PIPING SYMBOLS

SYMBOL	DESCRIPTION
AV	AIR VENT - AUTOMATIC
MV	AIR VENT - MANUAL
BFP	BACKFLOW PREVENTER
	CATCH BASIN
	CIRCULATING PUMP
CO	CLEAN OUT - IN FLOOR
CO	CLEAN OUT - FLANGE
	DIRECTION OF FLOW
	DIRECTION OF PITCH - DOWN
	FINNED TUBE RADIATION
	FIRE PROTECTION - SIAMESE CONNECTION - FREE STANDING
	FIRE PROTECTION - SIAMESE CONNECTION - WALL MOUNTED
	FIRE PROTECTION - SPRINKLER HEAD, CONCEALED
	FIRE PROTECTION - SPRINKLER HEAD, PENDANT
	FIRE PROTECTION - SPRINKLER HEAD, UPRIGHT
	FIRE PROTECTION - SPRINKLER HEAD, SIDEWALL
	FLOOR DRAIN
	FLOOR DRAIN - ELEVATION
	FLOOR DRAIN - FUNNEL
	FLOOR DRAIN - FUNNEL, ELEVATION
FS	FLOW MEASURING DEVICE (FOR TEST AND BALANCING)
FM	FLOW SWITCH
HB	FLOW METER
MH	HOSE BIBB
	MANHOLE
	OPEN SITE DRAIN
	PIPE - ANCHOR
	PIPE - CAP OR PLUG
	PIPE - ELBOW DOWN
	PIPE - ELBOW UP
	PIPE - EXPANSION JOINT OR COMPENSATOR
	PIPE - FLANGE
	PIPE - HOSE AND BRAID FLEXIBLE CONNECTION
	PIPE - RUBBER FLEXIBLE CONNECTION
	PIPE - GUIDE
	PIPE - TEE DOWN
	PIPE - TEE UP
	PIPE - UNION
P/T	PRESSURE AND TEMPERATURE TEST PLUG
	PRESSURE GAUGE AND COCK
	REDUCER - CONCENTRIC
	REDUCER - ECCENTRIC
	ROOF/OVERFLOW DRAIN
	STEAM TRAP - FLOAT AND THERMOSTATIC
	STRAINER
	STRAINER WITH VALVE AND BLOW-OFF
	THERMOMETER
	TRAP
	VALVE - ANGLE
	VALVE - BALL
0.5	VALVE - BALANCE (i.e. BALANCE VALVE TO 0.5 GPM)
0.5	VALVE - COMBINATION BALANCE & FLOW MEASURING (i.e. BALANCE VALVE TO 0.5 GPM)
	VALVE - BUTTERFLY
	VALVE - CHECK
	VALVE - SPRING CHECK
	VALVE - GAS (MANUAL)
	VALVE - GLOBE
	VALVE - ISOLATION
	VALVE - NEEDLE
	VALVE - OS&Y
	VALVE - PLUG
	VALVE - PRESSURE REGULATING
	VALVE - PRESSURE REDUCING
	VALVE - PRESSURE RELIEF
	VALVE - PRESSURE & TEMPERATURE RELIEF
VTR	VENT THROUGH ROOF
WH	WALL HYDRANT
WM	WATER METER
GM	GAS METER

DOUBLE LINE PIPING SYMBOLS

SYMBOL	DESCRIPTION
	FLANGE
	FLEX CONNECTION
	STRAINER - BASKET
	STRAINER - Y TYPE
	VALVE - 2 WAY CONTROL
	VALVE - 3 WAY CONTROL
	VALVE - BUTTERFLY
	VALVE - CHECK
	VALVE - DETECTOR CHECK
	VALVE - OS&Y HORIZONTAL STEM
	VALVE - OS&Y VERTICAL STEM

DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
TU-101	AIR TERMINAL UNIT
TU-101	AIR TERMINAL UNIT WITH HEATING COIL
VTU-101	VENTURI AIR TERMINAL UNIT
VTU-101	VENTURI AIR TERMINAL UNIT WITH HEATING COIL
	DAMPER - HORIZONTAL FIRE (EXISTING, NEW)
	DAMPER - HORIZONTAL FIRE / SMOKE (EXISTING, NEW)
	DAMPER - SMOKE (EXISTING, NEW)
	DAMPER - VERTICAL FIRE (EXISTING, NEW)
	DAMPER - VERTICAL FIRE / SMOKE (EXISTING, NEW)
BDD	DAMPER - BACK DRAFT
M	DAMPER - MOTORIZED
	DAMPER - VOLUME (MANUALLY ADJUSTABLE)
	DIFFUSER - BLANK OFF
	DIFFUSER - LINEAR SLOT
	DIFFUSER - SQUARE OR RECTANGULAR
	DUCT CROSS SECTION - SUPPLY
	DUCT CROSS SECTION - RETURN
	DUCT CROSS SECTION - EXHAUST
	DUCT - FLEXIBLE CONNECTION
	DUCT - FLEXIBLE DUCT
	DUCT TAKE-OFF - ROUND CONICAL
	DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP
	ELBOW - RECTANGULAR WITH TURNING VANES
	ELBOW - RECTANGULAR/ ROUND SMOOTH RADIUS
	ELBOW DOWN - RECTANGULAR
	ELBOW DOWN - ROUND
	ELBOW UP - RECTANGULAR
	ELBOW UP - ROUND
	FAN - AXIAL
	FAN - CENTRIFUGAL (ELEVATION)
	HEATING COIL
D	INCLINED DROP IN DIRECTION OF AIRFLOW
R	INCLINED RISE IN DIRECTION OF AIRFLOW
	INTAKE OR RELIEF HOOD
	REGISTER - RETURN OR EXHAUST
	REGISTER - RETURN WITH BOOT
	REGISTER - TRANSFER GRILLE
	ROOF EXHAUST FAN
	TRANSITION - CONCENTRIC
	TRANSITION - ECCENTRIC
	UNIT HEATER - HORIZONTAL THROW
	UNIT HEATER - VERTICAL THROW

DOUBLE LINE DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
	DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP
	DUCT TAKE-OFF - ROUND CONICAL
	ELBOW - RECTANGULAR WITH TURNING VANES
	ELBOW - RECTANGULAR SHORT RADIUS WITH SPLITTER VANES
	ELBOW - ROUND
	ELBOW - RECTANGULAR SMOOTH RADIUS
	ELBOW DOWN - RECTANGULAR
	ELBOW DOWN - ROUND
	ELBOW UP - RECTANGULAR
	ELBOW UP - ROUND
	HEATING COIL
D	INCLINED DROP IN DIRECTION OF AIRFLOW
R	INCLINED RISE IN DIRECTION OF AIRFLOW
	TRANSITION - CONCENTRIC
	TRANSITION -ECCENTRIC

MECHANICAL DRAWING INDEX

SHEET NO.	SHEET TITLE
M0.1	MECHANICAL STANDARDS AND DRAWING INDEX
M2.0	UNDERGROUND PLUMBING PLAN
M2.1	FIRST FLOOR PLUMBING AND FIRE PROTECTION PLAN
M4.1	FIRST FLOOR SHEET METAL PLAN
M5.2	MECHANICAL ROOF PLAN
M6.1	MECHANICAL DETAILS
M6.2	MECHANICAL DETAILS
M7.1	MECHANICAL SCHEDULES
M7.2	MECHANICAL SCHEDULES
M8.1	TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES
M8.2	TEMPERATURE CONTROLS
M8.3	TEMPERATURE CONTROLS
M8.4	TEMPERATURE CONTROLS

STANDARD METHODS OF NOTATION

S-1
10ø
350-4
SUPPLY DIFFUSER WITH SCHEDULE TAG "1", 10" DIAMETER NECK SIZE 350 CFM TYPICAL FOR 4

R-1
22x22
640
RETURN REGISTER WITH SCHEDULE TAG "1", 22"x 22" NECK SIZE 640 CFM TYPICAL FOR 2 EXHAUST REGISTER E DESIGNATION SIMILAR.

TU-101
AIR TERMINAL UNIT WITH HEATING COIL NO. 101 WITH SERVICE CLEARANCE SHOWN

VTU-101
VENTURI AIR TERMINAL WITH HEATING COIL NO. 101 WITH SERVICE CLEARANCE SHOWN

(2)WC-1
FD-1
PLUMBING FIXTURE UNIT IDENTIFICATION TAG WATER CLOSET TYPE "1" TYPICAL FOR 2

8
PIPE DIAMETER NOTATION ALL SIZES IN INCHES

8ø
22x10
18x14ø
DUCT SIZE NOTATION ALL SIZES IN INCHES
OVAL DUCT
RECTANGULAR DUCT

1
CONSTRUCTION KEY NOTE (NUMBER) OR DEMOLITION KEY NOTE (LETTER)

EF
1
EQUIPMENT DESIGNATION, (i.e. EXHAUST FAN NUMBER 1)

HW-1
PIPING RISER DESIGNATION, (i.e. HOT WATER RISER NUMBER 1)

NEW SYSTEM COMPONENT
EXISTING SYSTEM COMPONENT TO REMAIN
POINT OF NEW CONNECTION SYMBOL

1
M5.1
SECTION OR PLAN NUMBER
SHEET WHERE SECTION IS DRAWN

AREA OF ENLARGEMENT
1
M5.1
PLAN NUMBER
SHEET WHERE ENLARGED PLAN IS DRAWN

1
M5.1
SECTION OR ENLARGED PLAN
SCALE: 1/8" = 1' - 0"
SECTION OR PLAN NUMBER
SHEET WHERE SECTION IS CUT OR ENLARGED PLAN IS REFERENCED

SHEET M1.0
SHEET M1.1
MATCHLINE

HEAVY LINE WEIGHT INDICATES NEW WORK

LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT OR REFERENCED INFORMATION

GRAY LINE INDICATES BACKGROUND INFORMATION

DASHED LINES INDICATE PIPING ROUTED BELOW SLAB OR GRADE

HATCH MARKS INDICATE EQUIPMENT OR MATERIALS TO BE DISCONNECTED AND REMOVED.

NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.

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NO.	REVISION	DATE
1		

DRAWN: JTH
DESIGNED: JTH
APPR'VD: DC
DATE: SEPTEMBER 19, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

MECHANICAL STANDARDS AND DRAWING INDEX

DRAWING NUMBER M0.1 MECHANICAL

9/15/2023 11:24:04 AM Autodesk Docs://GFIAA SNOW REMOVAL EQUIPMENT (SRE) FACILITY/2022-0215-MEP-GFIA SRE V22.rvt

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

PLUMBING GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

4 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

6 REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.

7 HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.

8 PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.

9 PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.

10 MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

CONSTRUCTION KEY NOTES:

1 4" SAN TO TD.

2 2" GAS TO MAU.

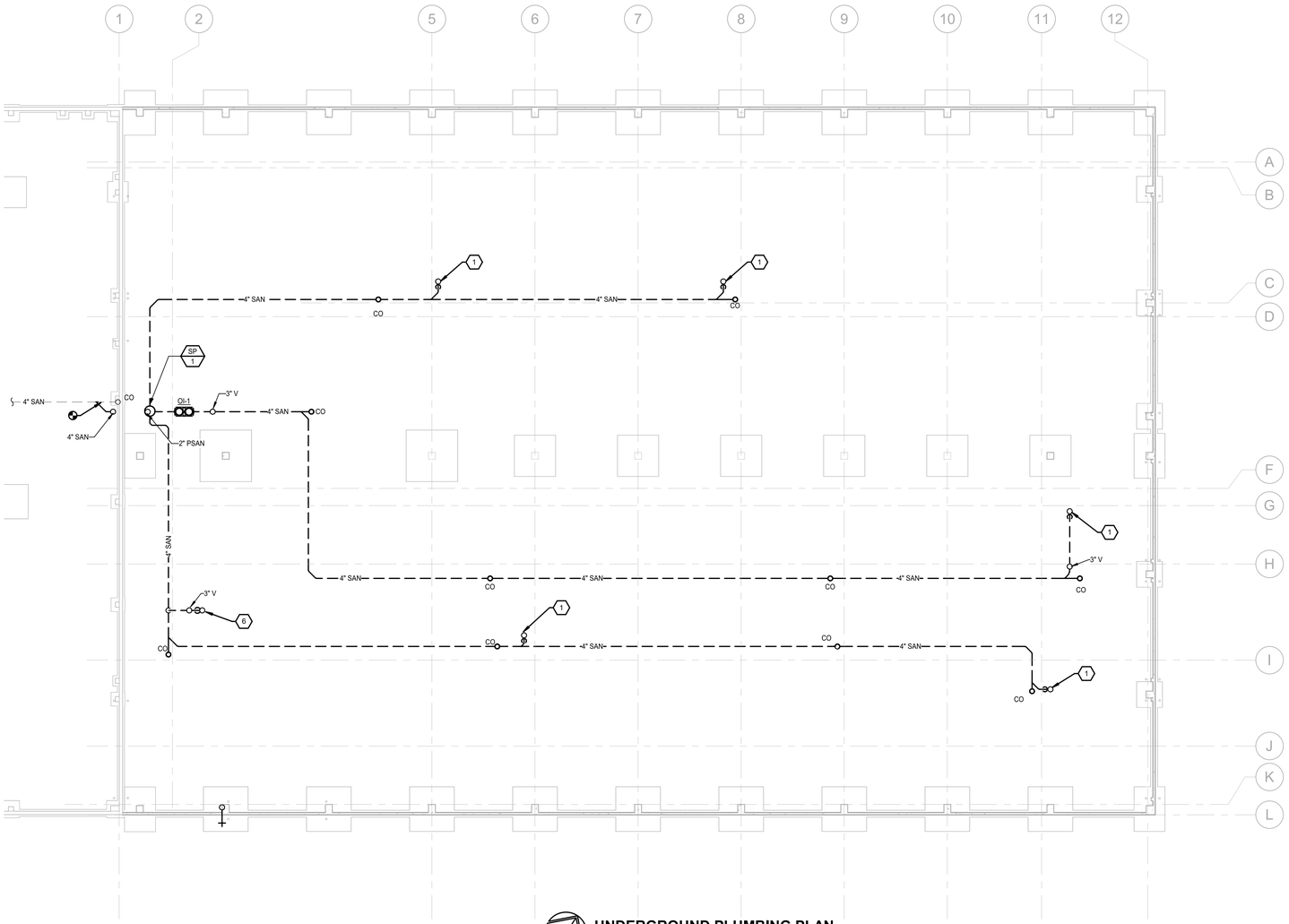
3 PROVIDE WET PIPE FIRE PROTECTION SYSTEM PER NFPA 13 IN AREA INDICATED.

4 1" G TO GUH

5 1/2 A TO PNEUMATIC QUICK-CONNECT FITTING.

6 3 SAN TO FLOOR DRAIN/SINK.

7 SPRINKLER FEED FOR ADDED ZONE 3 AND 4.



UNDERGROUND PLUMBING PLAN
SCALE: 1/16" = 1'-0"

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PBA Project No.: 2022.0215

STATE OF MICHIGAN
JOHN T. HATSIOS
ENGINEER
No. 6201311201
LICENSED PROFESSIONAL ENGINEER

ISSUED FOR BID

NO.	REVISION	DATE
1		

DRAWN: JTH | CHK'D: JTH
DESIGNED: JTH
APPRVD: DC
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

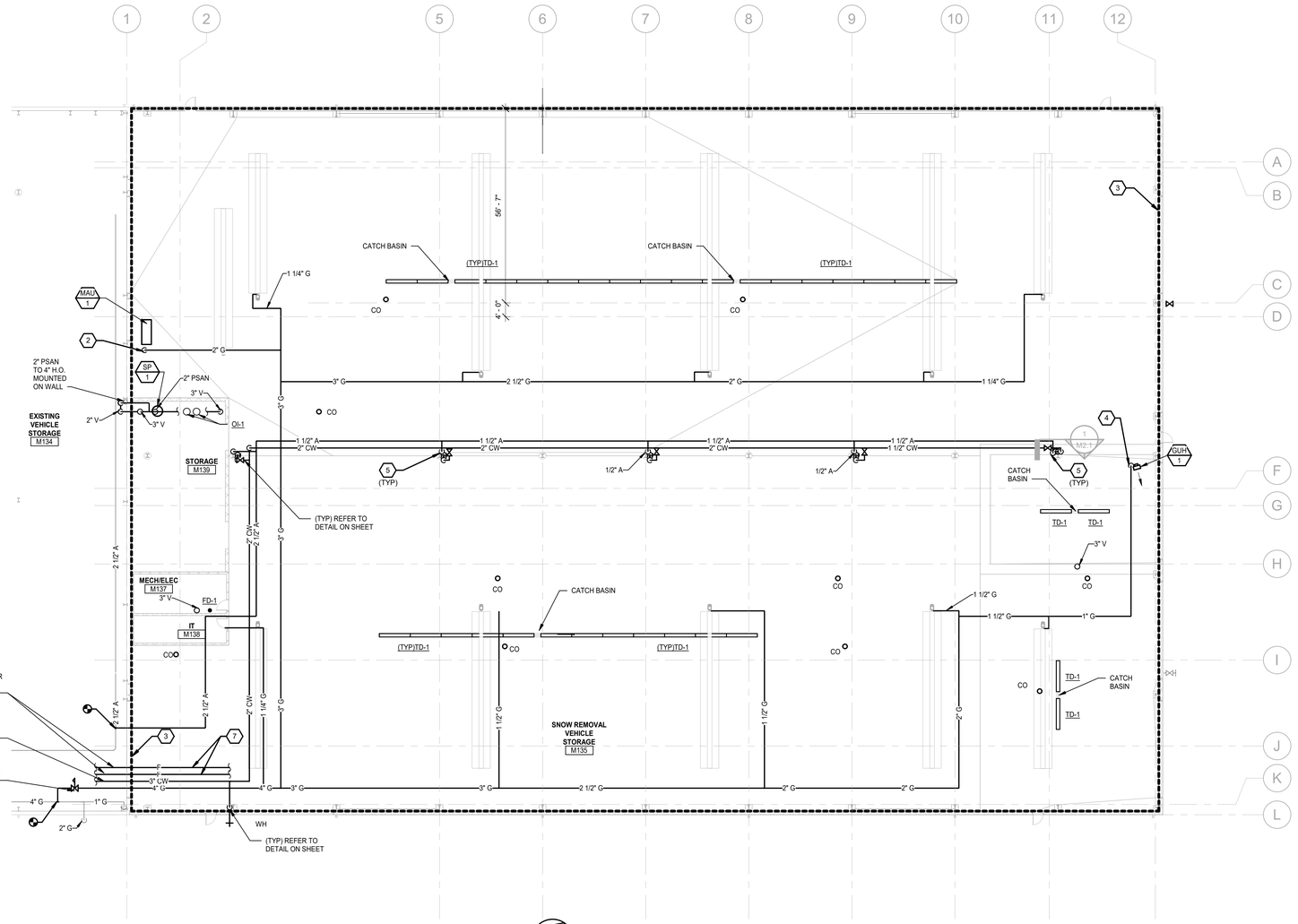
UNDERGROUND PLUMBING PLAN

DRAWING NUMBER M2.0

MECHANICAL

9/18/2023 1:31:43 PM Autodesk Docs://GFIAA SNOW REMOVAL EQUIPMENT (SRE) FACILITY/2022-0215-MEP-GFIA SRE V22.rvt

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



FIRST FLOOR PLUMBING PLAN
SCALE: 1/16" = 1'-0"

FIRE PROTECTION GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 NO SPRINKLER PIPING SHALL BE ROUTED THROUGH ELECTRICAL EQUIPMENT ROOMS, TELECOMMUNICATION EQUIPMENT ROOMS, ELEVATOR EQUIPMENT ROOMS OR SIMILAR ROOMS. ONLY SPRINKLER PIPING SERVING SPRINKLERS HEADS IN THOSE ROOMS SHALL BE ALLOWED.

4 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

5 MINIMUM RUN-OUT PIPE SIZE TO SPRINKLER HEADS SHALL BE 1".

6 PROVIDE AN AUTOMATIC WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13 LIGHT HAZARD CLASSIFICATION. HYDRAULIC CALCULATIONS SHALL BE BASED ON DENSITY OF 0.10 GPM/SQ FT. OVER THE MOST REMOTE 1500 SQ. FT.

7 CONTRACTOR SHALL MAKE HIS OWN PRESSURE AND FLOW TEST PRIOR TO SYSTEM DESIGN.

PLUMBING GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

4 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

6 REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.

7 HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.

8 PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.

9 PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.

10 MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

CONSTRUCTION KEY NOTES:

1 4" SAN TO TD.

2 2" GAS TO MAU.

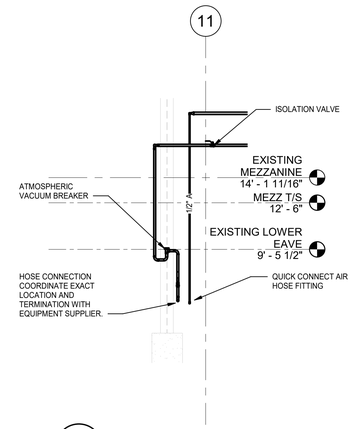
3 PROVIDE WET PIPE FIRE PROTECTION SYSTEM PER NFPA 13 IN AREA INDICATED.

4 1" G TO GUH

5 1/2 A TO PNEUMATIC QUICK-CONNECT FITTING.

6 3 SAN TO FLOOR DRAIN/SINK.

7 SPRINKLER FEED FOR ADDED ZONE 3 AND 4.



1 / M2.1 **HOSE CONNECTION DETAIL**
SCALE: 1/4" = 1'-0"

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PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

FIRST FLOOR PLUMBING AND FIRE PROTECTION PLAN

DRAWING NUMBER M2.1

MECHANICAL

9/18/2023 1:32:05 PM Autodesk Docs://GFIAA SNOW REMOVAL EQUIPMENT (SRE) FACILITY/2022-0215-MEP-GFA SRE V22.rvt

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

SHEET METAL GENERAL NOTES:

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2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

4 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

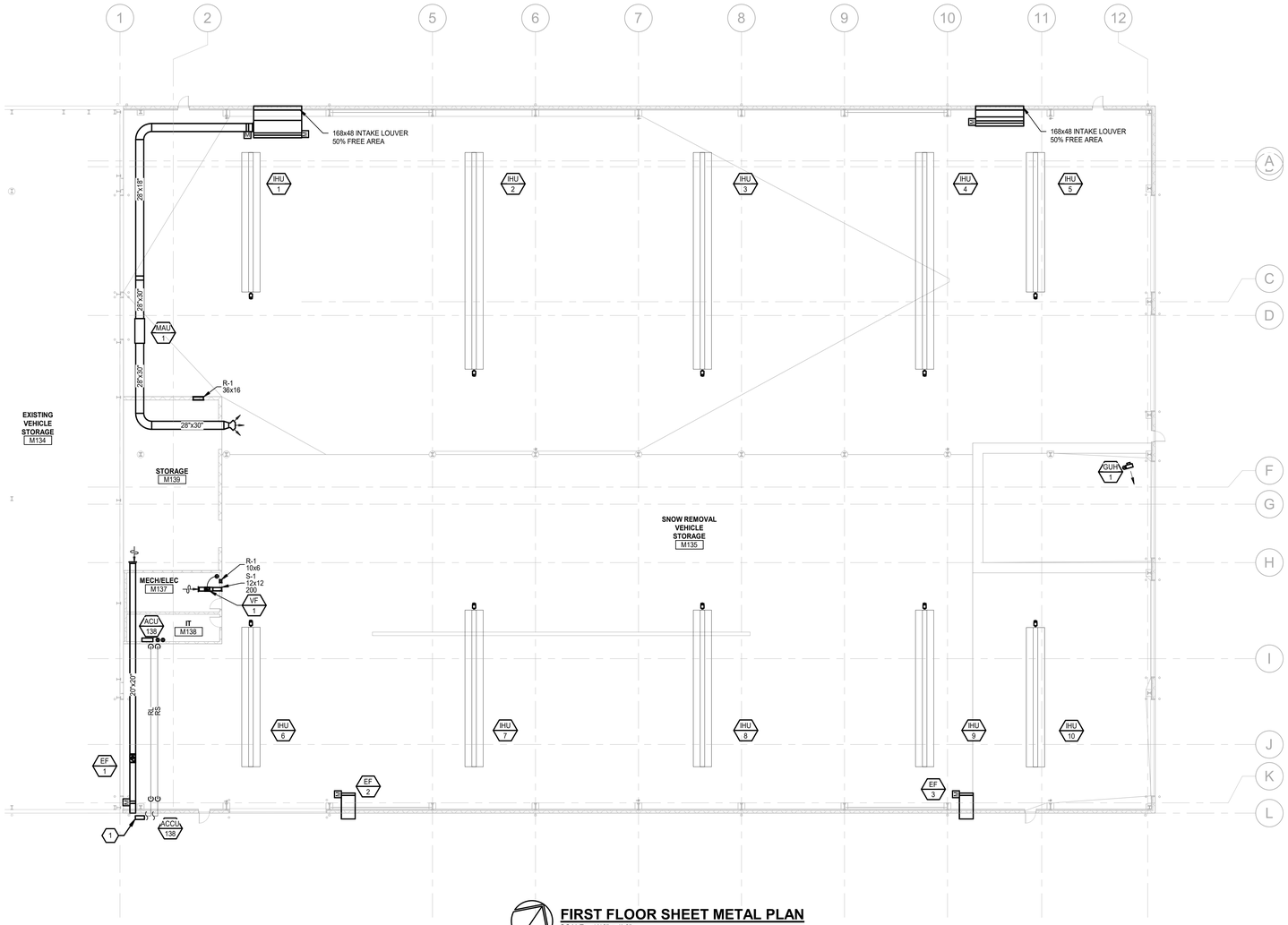
5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

6 REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONED LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.

7 REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

CONSTRUCTION KEY NOTES:

1 PROVIDE WALL MOUNT SYSTEM FOR ACCU. COORDINATE INSTALLATION REQUIREMENTS WTIH MANUFACTURER.



FIRST FLOOR SHEET METAL PLAN
SCALE: 1/16" = 1'-0"

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PBA Project No: 2022.0215

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ENGINEER
No. 6201055589
REGISTERED PROFESSIONAL ENGINEER

ISSUED FOR BID

NO.	REVISION	DATE
1		

DRAWN: JTH | CHK'D: JTH
DESIGNED: JTH
APPRV'D: DC
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER: 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

FIRST FLOOR SHEET METAL PLAN

DRAWING NUMBER: M4.1
MECHANICAL

9/15/2023 11:26:18 AM Autodesk Docs://GFIAA SNOW REMOVAL EQUIPMENT (SRE) FACILITY/2022-0215-MEP-GFIA SRE V22.rvt

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

SHEET METAL GENERAL NOTES:

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7 REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

CONSTRUCTION KEY NOTES:

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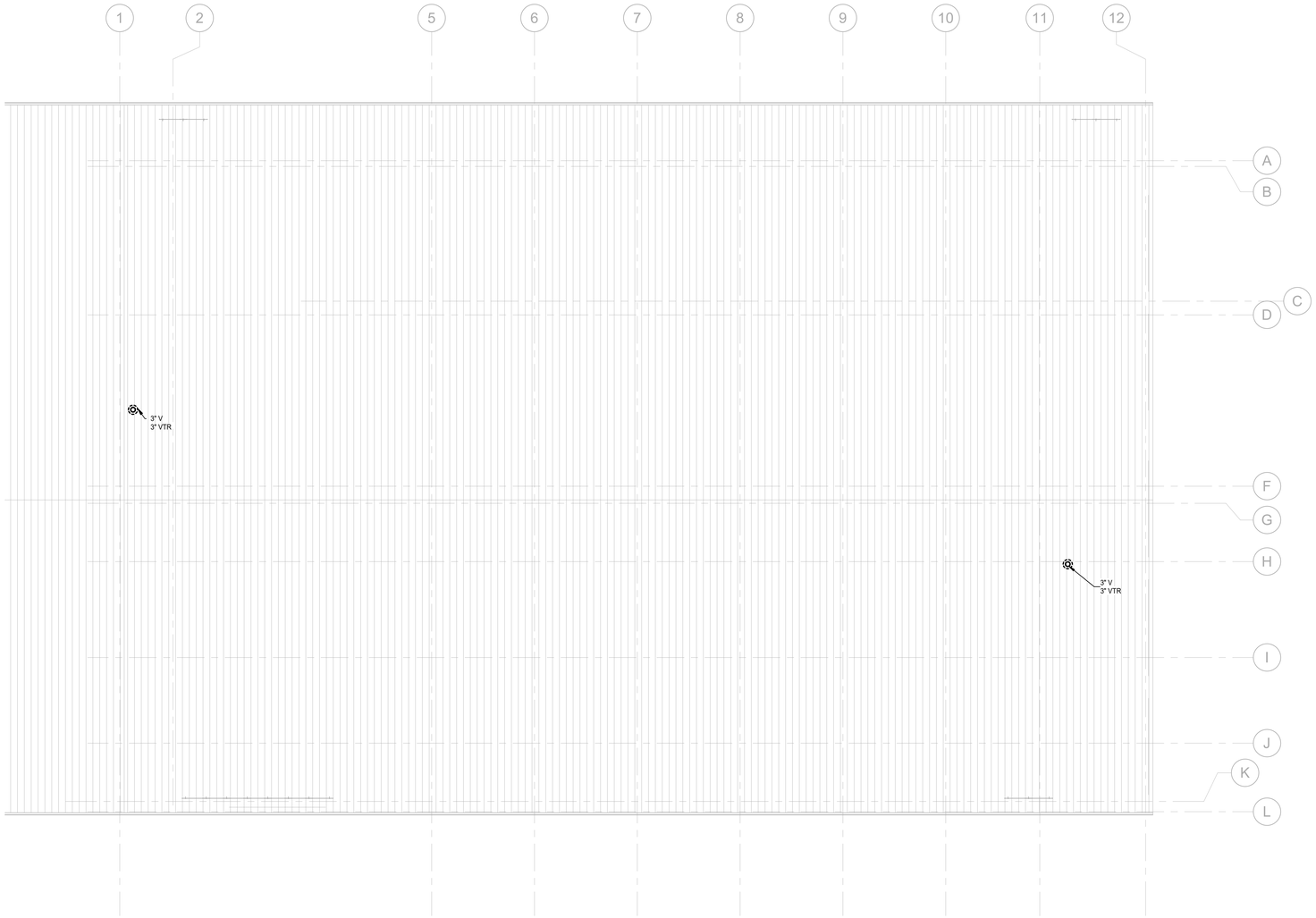

ROOF MECHANICAL PLAN
SCALE: 1/16" = 1'-0"

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ISSUED FOR BID

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DATE: SEPTEMBER 19, 2023
PROJECT NUMBER 2241.7462.00

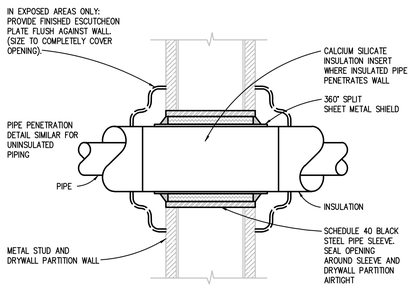
GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

MECHANICAL ROOF PLAN

DRAWING NUMBER M5.2

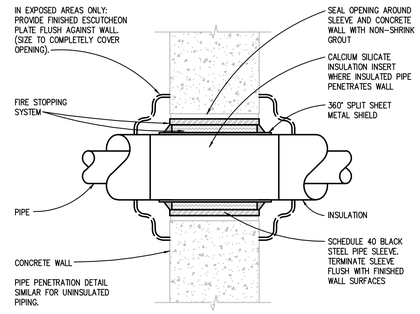
MECHANICAL

9/15/2023 11:26:19 AM Autodesk Docs://GFIAA SNOW REMOVAL EQUIPMENT (SRE) FACILITY/2022-0215-MEP-GFIA SRE \'22.rvt



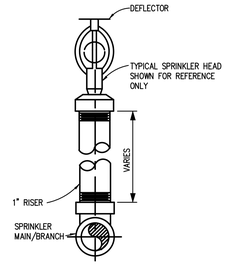
DETAIL INDICATES THE INSTALLATION REQUIREMENTS FOR A FIRE RATED ASSEMBLY. FOR A NON-FIRE RATED ASSEMBLY PACK SLEEVED OPENING WITH INSULATION MATERIAL AND CAULK WITH NON-HARDENING SEALANT.

FIRE RATED AND NON-FIRE RATED METAL STUD AND DRYWALL PARTITION WALL PIPE PENETRATION DETAIL
NO SCALE

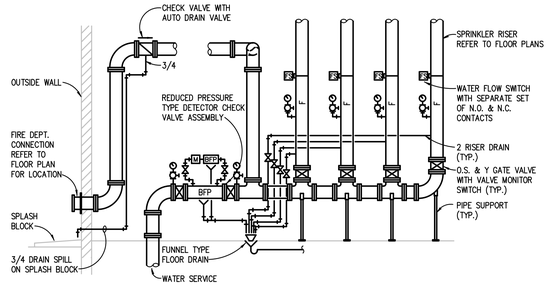


DETAIL INDICATES THE INSTALLATION REQUIREMENTS FOR A FIRE RATED ASSEMBLY. FOR A NON-FIRE RATED ASSEMBLY PACK SLEEVED OPENING WITH INSULATION MATERIAL AND CAULK WITH NON-HARDENING SEALANT.

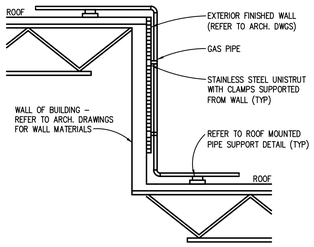
FIRE RATED AND NON-FIRE RATED POURED CONCRETE OR BLOCK WALL PIPE PENETRATION DETAIL
NO SCALE



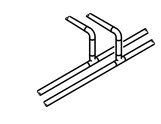
TYPICAL UPRIGHT SPRINKLER PIPING DETAIL
NO SCALE



AUTOMATIC SPRINKLER RISER PIPING DIAGRAM
NO SCALE

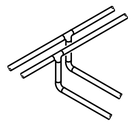


GAS PIPE MOUNTING DETAIL
NO SCALE



BRANCH CONNECTION OFF TOP

APPLIES TO THE FOLLOWING SYSTEMS:
DOMESTIC WATER
STEAM & CONDENSATE
LABORATORY GASES
LABORATORY VACUUM
COMPRESSED AIR
NATURAL GAS

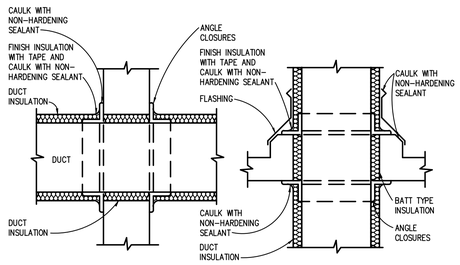


BRANCH CONNECTION OFF BOTTOM

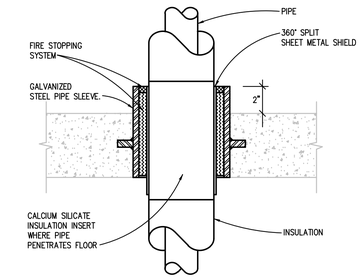
APPLIES TO THE FOLLOWING SYSTEMS:
HOT WATER HEATING
CHILLED WATER
CONDENSER WATER
ENERGY RECOVERY
PROCESS COOLING WATER

NOTE: BOTTOM AS INDICATED OR SIDE CONNECTION IS ACCEPTABLE. CONNECTION ABOVE CENTERLINE OF MAINS IS NOT ACCEPTABLE.

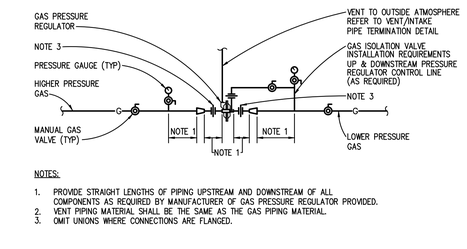
TYPICAL BRANCH TAKE-OFF CONNECTION PIPING DETAIL
NO SCALE



VERTICAL OR HORIZONTAL (NON FIRE RATED ASSEMBLY) DUCT PENETRATION DETAIL
NO SCALE



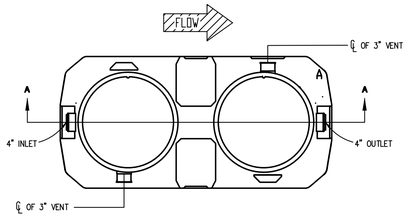
NEW FLOOR PIPE PENETRATION DETAIL
NO SCALE



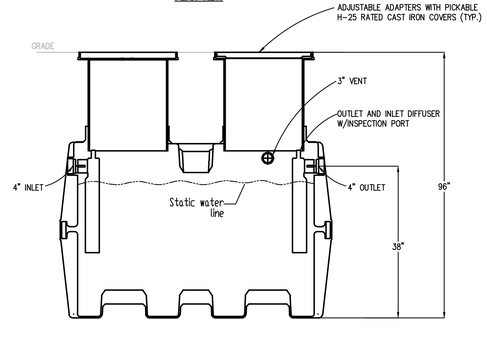
NOTES:

1. PROVIDE STRAIGHT LENGTHS OF PIPING UPSTREAM AND DOWNSTREAM OF ALL COMPONENTS AS REQUIRED BY MANUFACTURER OF GAS PRESSURE REGULATOR PROVIDED.
2. VENT PIPING MATERIAL SHALL BE THE SAME AS THE GAS PIPING MATERIAL.
3. OMIT UNIONS WHERE CONNECTIONS ARE FLANGED.

GAS PRESSURE REGULATOR PIPING DETAIL
NO SCALE

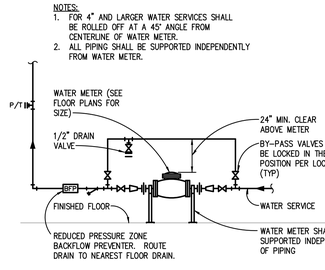


PLAN VIEW

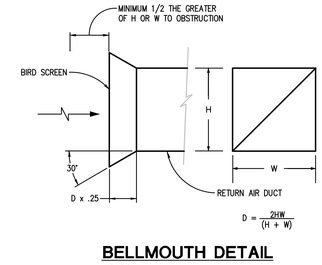


SECTION 'A-A'

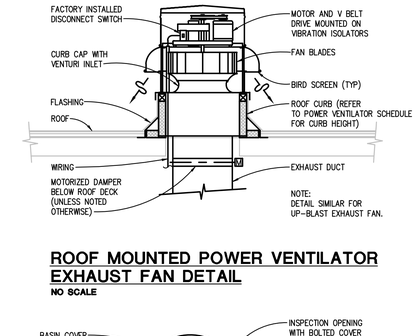
OIL INTERCEPTOR DETAIL
NO SCALE



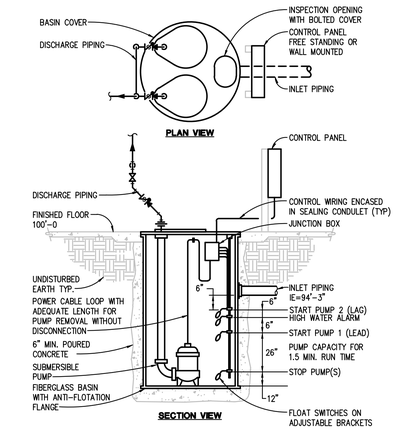
DOMESTIC WATER METER PIPING DIAGRAM
NO SCALE



BELLMOUTH DETAIL
NO SCALE



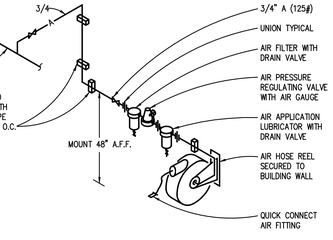
ROOF MOUNTED POWER VENTILATOR EXHAUST FAN DETAIL
NO SCALE



PLAN VIEW

SECTION VIEW

DUPLEX SUMP PUMP PIPING DIAGRAM (SP-1)
NO SCALE



AIR OUTLET DETAIL WITH HOSE REEL
NO SCALE

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DATE: SEPTEMBER 18, 2023
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GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

MECHANICAL DETAILS

DRAWING NUMBER: M6.1
MECHANICAL

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PBA Project No. 2222023

STATE OF MICHIGAN
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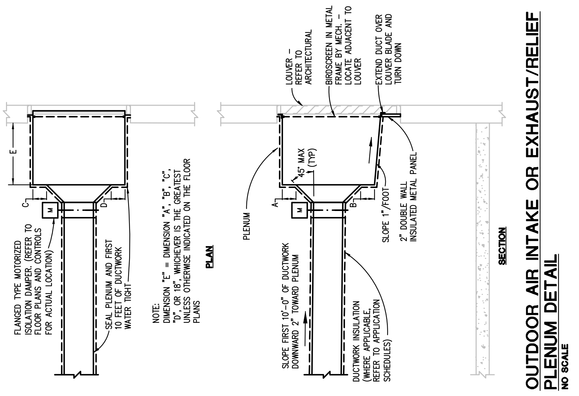
ISSUED FOR BID

NO.	REVISION	DATE

DRAWN: JTH CHK'D: DC
DESIGNED: -
APPR'D: DC
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER
2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION
MECHANICAL DETAILS

DRAWING NUMBER
M6.2
MECHANICAL



OUTDOOR AIR INTAKE OR EXHAUST/RELIEF PLENUM DETAIL

NO SCALE

ABOVEGROUND PLUMBING PIPE & ACCESSORY INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)							FIELD-APPLIED JACKET MATERIAL						
	FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	ALUMINUM	STAINLESS STEEL	PVC	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES
INDOOR PIPE SYSTEM AND SIZE (INCHES)														
DOMESTIC COLD WATER	1	1						X		X				A
DOMESTIC HOT WATER SUPPLY & RETURN 140 DEG F AND LESS:														
NPS 1-1/4 AND SMALLER	1	1						X		X				A
NPS 1-1/2 AND LARGER	1.5	1.5						X		X				A

UNLESS OTHERWISE INDICATED OR SCHEDULED, DO NOT INSULATE THE FOLLOWING:
- FIRE SUPPRESSION PIPING
- UNDERGROUND PIPING
- LABORATORY GAS AND VACUUM PIPING
- MEDICAL GAS AND VACUUM PIPING
- FUEL GAS PIPING
- FUEL OIL PIPING

GENERAL NOTES

1. 'X' OR THICKNESS IN INCHES INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. INSULATE PIPING WITHIN AIR HANDLING EQUIPMENT THE SAME AS INDOOR PIPING. PROVIDE ALUMINUM OR STAINLESS STEEL JACKET.

KEYED NOTES

A. PROVIDE FIELD APPLIED JACKET FOR PIPING EXPOSED IN EQUIPMENT ROOMS, STORAGE ROOMS, JANITORS CLOSETS, RECEIVING ROOMS, TEST AREAS, CIRCULATION AREAS AND SUCH AREAS SUBJECT TO DAMAGE, WITHIN 10 FEET (3 METERS) OF FINISHED FLOOR.

PLUMBING PIPING & VALVE APPLICATION SCHEDULE

| | MATERIAL | | | | | | | | | | | | | |

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

UNIT IDENTIFICATION	TYPE	FACE SIZE	NECK SIZE	FRAME TYPE	ACCESSORY	CONSTRUCTION	FINISH	MODEL NUMBER	KEYED NOTES
S-1	GRILLE	NK + 1-3/4	SEE PLANS	SURFACE MOUNT	---	STEEL	WHITE	520	
R-1	GRILLE	NK + 1-3/4	SEE PLANS	SURFACE MOUNT	---	STEEL	WHITE	90	

GENERAL NOTES:
1. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.

POWER VENTILATOR SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TYPE	AIRFLOW CFM	T.S.P. IN. W.G.	TIP SPEED FPM	FAN RPM	MOTOR				CURB HEIGHT INCHES	MODULATION/ CONTROL TYPE	ELECTRICAL				UNIT INLET Lw BY OCTAVE BAND								MODEL NUMBER	KEYED NOTES
							BHP	HP	RPM	DRIVE TYPE			VOLTS	PHASE	SCCR KA (NOTE 3)	OPTIONS/ ACCESSORIES	63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)		
EF-1	CHEMICAL STORAGE	INLINE	2,850	0.5	6,346	1,665	0.88	1.0	1,725	DIRECT	---	ECM	208	1		B	76	76	85	81	72	70	67	64	SQ-140-VG	
EF-2	GARAGE PURGE	SIDEWALL	21,380	0.25	10,863	860	2.34	3.0	860	DIRECT	---	AUTO	480	3		A	99	94	94	90	88	84	82	78	AER-48	
EF-3	GARAGE PURGE	SIDEWALL	21,380	0.25	10,863	860	2.34	3.0	860	DIRECT	---	AUTO	480	3		A	99	94	94	90	88	84	82	78	AER-48	
VF-1	ELECTRICAL ROOM	INLINE	250	0.5	---	1,350	126 W	126 W	1,350	DIRECT	---	AUTO	120	1		A	---	---	---	---	---	---	---	---	CSP-A390	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED.
3. CONTROLLER (E.G. VARIABLE FREQUENCY CONTROLLER, MOTOR STARTER) FOR SPECIFIED EQUIPMENT SHALL BE MANUFACTURED AND MARKED PER NEC WITH A MINIMUM SHORT CIRCUIT CURRENT RATING AS INDICATED.

DIRECT FIRED MAKE-UP AIR UNIT SCHEDULE

UNIT I.D.	AREA SERVED	SUPPLY FAN							HEATING SECTION - GAS FIRED (NATURAL GAS)				FILTER SECTION	MAXIMUM UNIT DIMENSIONS			UNIT ARRANGEMENT	MAXIMUM UNIT OPERATING WEIGHT LBS.	TOTAL UNIT ELECTRICAL						MODEL NO.	KEYED NOTES
		AIRFLOW CFM	MINIMUM OUTSIDE AIR FLOW CFM	E.S.P. IN. W.G.	T.S.P. IN. W.G.	FAN SPEED RPM	BHP	HP	AIR TEMP.		CAPACITY (MBH)			LENGTH (IN.)	HEIGHT (IN.)	WIDTH (IN.)			VOLTS	PHASE	FLA	MCA / MOP	SCCR KA	OPTIONS/ ACCESSORIES		
									E.A.T. °F	L.A.T. °F	INPUT	OUTPUT	MIN/MAX MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN													
MAU-1	NEW SRE	2,950	2,950	0.25	1.4	2,676	1.32	2.0	-10.0	60.0	237.6	218.6	8-14	MERV 8 DIPS.	86.2	39.0	33.7	HORIZONTAL	800	480	3		4.6		B	DGX-P112-H 12-MF	

GENERAL NOTES:
1. REFER TO SCHEDULE GENERAL NOTES.
2. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED
3. DESIGN MINIMUM OUTSIDE AIRFLOW CFM (VENTILATION) LISTED IS BASED ON THE ESTIMATED MAXIMUM OCCUPANT LOAD. REFER TO TEMPERATURE CONTROL DRAWINGS FOR OUTSIDE AIR CONTROL SEQUENCE.

GAS-FIRED PROPELLER FAN UNIT HEATER SCHEDULE

UNIT IDENTIFICATION	CAPACITY MBH	FAN		FUEL				FINAL AIR TEMPERATURE °F	MOTOR HP	MODULATION/ CONTROL TYPE	ELECTRICAL					MODEL NUMBER	KEYED NOTES
		RPM	CFM	TYPE	MIN/MAX MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN	INPUT MBH	OUTPUT MBH				VOLTS	PHASE	FLA	SCCR KA	OPTIONS/ ACCESSORIES		
GUH-1	60.0	1,625	990	NAT. GAS	6-7	60.0	49.2	105.0	1/12	AUTO	120	1	3.3		B	HDS-60	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE MODINE UNLESS OTHERWISE NOTED.

SEWAGE PUMP AND SUMP PUMP SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	SIMPLEX OR DUPLEX	PUMP					BASIN				MODULATION/ CONTROL TYPE	ELECTRICAL				MODEL NUMBER	KEYED NOTES
			QUANTITY	FLOW EACH GPM	W.P.D. FT. HEAD	HP EACH	RPM	CONSTRUCTION	DIAMETER INCHES	DEPTH INCHES	COVER TYPE		VOLTS	PHASE	SCCR KA	OPTIONS/ ACCESSORIES		
SP-1	SANITARY	DUPLEX	2	75	20	1.5	1750	BASIN	36	120	SEALED	AUTO	208	3	–	–	1625	#

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE WEIL UNLESS OTHERWISE NOTED.

GAS FIRED INFRA-RED HEATER SCHEDULE

UNIT IDENTIFICATION	HEATER LENGTH	NAT GAS INPUT MBH	INLET PRESSURE AT GAS TRAIN	MODULATION/ CONTROL TYPE	ELECTRICAL			MODEL NUMBER	REMARKS
					VOLTS	PHASE	OPTIONS/ ACCESSORIES		
IHU-1	41'	150	7"-14"	AUTO	120	1	---	MSTA	
IHU-2	65'	200	7"-14"	AUTO	120	1	---	MSTA	
IHU-3	65'	200	7"-14"	AUTO	120	1	---	MSTA	
IHU-4	65'	200	7"-14"	AUTO	120	1	---	MSTA	
IHU-5	41'	150	7"-14"	AUTO	120	1	---	MSTA	
IHU-6	41'	150	7"-14"	AUTO	120	1	---	MSTA	
IHU-7	51'	175	7"-14"	AUTO	120	1	---	MSTA	
IHU-8	51'	175	7"-14"	AUTO	120	1	---	MSTA	
IHU-9	51'	175	7"-14"	AUTO	120	1	---	MSTA	
IHU-10	41'	150	7"-14"	AUTO	120	1	---	MSTA	

NOTE:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE SOLARONICS UNLESS OTHERWISE NOTED.

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE

INDOOR UNIT														OUTDOOR UNIT											KEYED NOTES
UNIT IDENTIFICATION	TOTAL CAPACITY MBH	EVAPORATOR FAN			COOLING COIL			FILTER		ELECTRICAL					MODEL NUMBER	UNIT IDENTIFICATION	CONDENSING SECTION					MODULATION/ CONTROL TYPE	ELECTRICAL					MODEL NUMBER	
		AIRFLOW CFM	NUMBER FANS	WATTS EACH	E.D.B. °F	E.W.B. °F	MINIMUM FACE AREA SQ. FT.	EFF. %	AREA SQ. FT.	VOLTS	PHASE	FLA	MOP	SCCR KA			NUMBER OF COMPRESSORS	NUMBER OF CONTROL STAGES	AMBIENT TEMPERTURE °F	AIRFLOW CFM	FAN WATTS		VOLTS	PHASE	MCA	MOP	SCCR KA		
ACU-138	18.0	559	1	---	80.0	67.0	2.71	MERV 4	---	208	1	---	---	---	40MHHQ18	ACCU-138	1	MODULATING	95.0	1450	---	AUTO	208	1	16.0	20.0	5.0	38MURAQ18AA3	1,2

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE CARRIER UNLESS OTHERWISE NOTED.

KEYED NOTES:
1. INDOOR UNIT POWER FEED THROUGH OUTDOOR UNIT.
2. UNITS SHALL BE CAPABLE OF OPERATING DOWN TO 0 DEG. F.

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PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

MECHANICAL SCHEDULES

DRAWING NUMBER M7.2

MECHANICAL

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TEMPERATURE CONTROL - SYMBOLS LIST

SCHEMATIC SYMBOLS

SYMBOL	DESCRIPTION
AFC	AIR FLOW CONTROLLER
AQ	AQUASTAT, STRAP ON BULB
CO2	CARBON DIOXIDE SENSOR – WALL MOUNTED
CO2	CARBON DIOXIDE SENSOR – DUCT MOUNTED
CS	CURRENT SWITCH
	DAMPER – OPPOSED BLADE
	DAMPER – PARALLEL BLADE
M	DAMPER MOTOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
DPS	DIFFERENTIAL PRESSURE SWITCH
CM	FIRE ALARM SYSTEM, ADDRESSABLE CONTROL MODULE
FMS	FLOW MEASURING STATION
FM	FLOW METER
FS	FLOW SWITCH
FZ	FREEZESTAT
F	GAUGE – FLOW
P	GAUGE – PRESSURE
T	GAUGE – TEMPERATURE
	GUARD FOR STAT OR SENSOR
	HUMIDIFIER
H	HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS)
H	HUMIDITY SENSOR, DUCT MOUNTED
LVL	LEVEL SWITCH OR TRANSMITTER
LS	LIMIT SWITCH
	LINE – ELECTRIC
	LINE – INSTRUMENT AIR
M/S	MOTOR STARTER
OS	OCCUPANCY SENSOR
R	PILOT LIGHT OR BEACON R – RED LENS A – AMBER LENS B – BLUE LENS G – GREEN LENS
PS	PRESSURE SWITCH
PT	PRESSURE TRANSMITTER
R	RELAY, ELECTRIC
S/N	SELECTOR SWITCH, (N=NUMBER OF POSITIONS)
AI	SIGNAL – DDC/BAS, ANALOG INPUT
AO	SIGNAL – DDC/BAS, ANALOG OUTPUT
DI	SIGNAL – DDC/BAS, DIGITAL INPUT
DO	SIGNAL – DDC/BAS, DIGITAL OUTPUT
AI	SIGNAL – PACKAGED EQUIPMENT, ANALOG INPUT
AO	SIGNAL – PACKAGED EQUIPMENT, ANALOG OUTPUT
DI	SIGNAL – PACKAGED EQUIPMENT, DIGITAL INPUT
DO	SIGNAL – PACKAGED EQUIPMENT, DIGITAL OUTPUT

NOTES:

1. SOME SYMBOLS & ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.
2. REFER TO MECHANICAL STANDARDS ON DRAWING M0.1 FOR ADDITIONAL SYMBOLS & ABBREVIATIONS THAT MAY BE USED ON TEMPERATURE CONTROL DRAWINGS.

SCHEMATIC SYMBOLS (CONT.)

SYMBOL	DESCRIPTION
DD	SMOKE DETECTOR – DUCT MOUNTED
S/S	START/STOP RELAY
SPT	STATIC PRESSURE TRANSMITTER
SP	STATIC PRESSURE SENSOR OR PROBE
SW	SWITCH
T	TEMPERATURE SENSOR – RIGID ELEMENT IN WELL
T	TEMPERATURE SENSOR – STRAP ON BULB
T	TEMPERATURE SENSOR – DUCT MOUNTED AVG ELEMENT
T	TEMPERATURE SENSOR – DUCT MOUNTED RIGID ELEMENT
T	THERMOSTAT OR TEMPERATURE SENSOR (AS DEFINED ON TC DRAWINGS)
XF	TRANSFORMER
	VALVE – 2 WAY CONTROL VALVE
	VALVE – 3 WAY CONTROL VALVE
VFC	VARIABLE FREQUENCY CONTROLLER
VS	VELOCITY SENSOR
VIB	VIBRATION SWITCH
V	VOLTAGE SENSOR

WIRING SYMBOLS

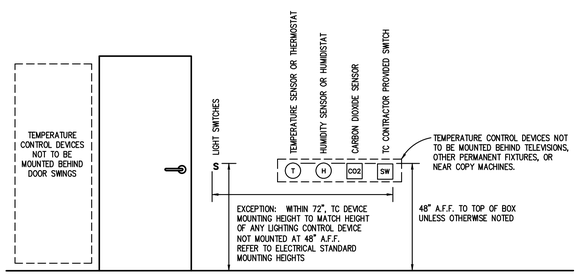
SYMBOL	DESCRIPTION
	AUDIBLE DEVICE (AS DEFINED ON TC DRAWINGS)
M/S	COIL – MOTOR STARTER CONTACTOR
R	COIL – RELAY
TDR	COIL – TIME DELAY RELAY
VFC	COIL – VARIABLE SPEED DRIVE CONTACTOR
	COIL – EP OR SOLENOID VALVE
	CONTACT – INSTANT OPERATING, NO
	CONTACT – INSTANT OPERATING, NC
	CONTACT – TIMED AFTER COIL IS ENERGIZED, NOTC
	CONTACT – TIMED AFTER COIL IS ENERGIZED, NCTO
	CONTACT – TIMED AFTER COIL IS DE–ENERGIZED, NOTO
	CONTACT – TIMED AFTER COIL IS DE–ENERGIZED, NCTC
	GROUND
	MOTOR, SINGLE PHASE
R	PILOT LIGHT OR BEACON R – RED LENSE A – AMBER LENS B – BLUE LENSE G – GREEN LENS
R	PILOT LIGHT, WITH PUSH–TO–TEST
	PUSH BUTTON – MOMENTARY CONTACT, NO
	PUSH BUTTON – MOMENTARY CONTACT, NC
	PUSH BUTTON – MOMENTARY CONTACT, NO & NC
	PUSH BUTTON – MOMENTARY, NO (MUSHROOM HEAD)
	PUSH BUTTON – MOMENTARY, NC (MUSHROOM HEAD)

WIRING SYMBOLS (CONT.)

SYMBOL	DESCRIPTION
1 2	SWITCH – 2 POSITION SELECTOR
H O A	SWITCH – 3 POSITION SELECTOR HAND/OFF/AUTO
	SWITCH – FLOW (AIR, WATER, ETC.), NO
	SWITCH – FLOW (AIR, WATER, ETC.), NC
	SWITCH – LIMIT, NO
	SWITCH – LIMIT, NO, HELD CLOSED
	SWITCH – LIMIT, NC
	SWITCH – LIMIT, NC, HELD OPEN
	SWITCH – LIQUID LEVEL, NO
	SWITCH – LIQUID LEVEL, NC
	SWITCH – MANUAL SPST, NO
	SWITCH – MANUAL DPST, NO
	SWITCH – MANUAL SPST, NC
	SWITCH – MANUAL DPST, NC
	SWITCH – MANUAL SPDT
	SWITCH – MANUAL DPDT
	SWITCH – PRESSURE & VACUUM, NO
	SWITCH – PRESSURE & VACUUM, NC
	SWITCH – TEMPERATURE ACTUATED, NO
	SWITCH – TEMPERATURE ACTUATED, NC
	THERMAL OVERLOAD, SINGLE PHASE
OLs	THERMAL OVERLOAD CONTACTS – 3 PHASE
	TRANSFORMER
	WIRE TERMINATION AT DEVICE
	WIRE TO WIRE TERMINATION
	WIRING NOT CONNECTED

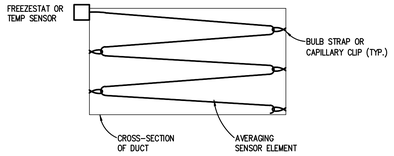
ABBREVIATIONS

ABBREVIATION	DESCRIPTION
BAS	BUILDING AUTOMATION SYSTEM
DDC	DIRECT DIGITAL CONTROL
TC	TEMPERATURE CONTROLS
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
NOTO	NORMALLY OPEN TIMED OPEN
NOTC	NORMALLY OPEN TIMED CLOSED
NCTO	NORMALLY CLOSED TIMED OPEN
NCTC	NORMALLY CLOSED TIMED CLOSED
SPST	SINGLE POLE SINGLE THROW
SPDT	SINGLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DPDT	DOUBLE POLE DOUBLE THROW



TC DEVICE STANDARD MOUNTING HEIGHTS DETAIL

NO SCALE

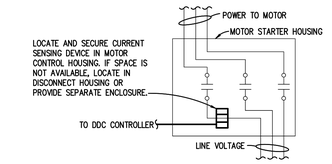


AVERAGING ELEMENT INSTALLATION DETAIL

TYPICAL

NOTES:

1. FREEZESTAT QUANTITY SHALL BE ONE PER 20 SQ. FT. OF CROSS–SECTIONAL AREA.
2. AVERAGING DDC SENSOR QUANTITY SHALL BE SUFFICIENT TO COVER AND SENSE THE CROSS–SECTIONAL AREA.
3. PROVIDE REQUIRED CAPILLARY STRAP OR CLIPS TO SUPPORT SENSOR TO PREVENT VIBRATION FROM AIR MOVEMENT.
4. PROVIDE PROTECTION AT EACH CAPILLARY STRAP OR CLIP TO PREVENT ABRASION TO CAPILLARY.



CURRENT SWITCH INSTALLATION DETAIL

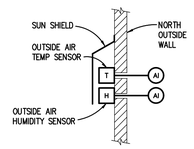
TYPICAL

NOTES:

1. WHERE INDICATED ON CONTROL DETAILS, CURRENT SWITCHES SHALL BE INSTALLED FOR DDC SYSTEM STATUS INDICATION OF FAN OR PUMP OPERATION. APPROPRIATE TIME DELAY FOR STATUS FEEDBACK UPON DDC START AND STOP COMMANDS SHALL BE INCLUDED WITH THE DDC LOGIC TO AVOID NUISANCE OPERATIONAL ALARMS.
2. AS APPLICABLE, CURRENT SWITCH SHALL BE ADJUSTED TO MEET THE CURRENT DRAW REQUIRED TO DETECT FAN BELT LOSS, PUMP COUPLING DETACHMENT, OR VFC LOSS.

SEQUENCE OF OPERATION:

1. WHEN FAN OR PUMP MOTOR IS ENERGIZED THROUGH ITS STARTER OR VFC, AND NOT IN ALARM, DDC SYSTEM SHALL TOTALIZE RUN TIME HOURS FOR BUILDING AUTOMATION SYSTEM GRAPHICS.



OA SENSOR INSTALLATION DETAIL

NO SCALE

NOTES:

1. TC CONTRACTOR SHALL REPLACE THE EXISTING OUTSIDE AIR TEMPERATURE AND HUMIDITY SENSORS FOR THE BUILDING. IF THEY ARE GLOBAL SENSORS (NETWORKED OUTSIDE AIR TEMPERATURE AND HUMIDITY SENSORS), VERIFY THAT THEY HAVE BEEN REPLACED IN THE LAST TWO YEARS. IF SO, DO NOT REPLACE.
2. CALCULATE OA ENTHALPY OR DEW POINT TEMPERATURE AS REQUIRED PER SEQUENCE OF OPERATION REQUIREMENTS.
3. BROADCAST OUTSIDE AIR TEMPERATURE, HUMIDITY, AND CALCULATED OA ENTHALPY OR DEW POINT TEMPERATURE, AS REQUIRED, THROUGH BAS COMMUNICATION NETWORK TO CONTROLLERS REQUIRING INFORMATION FOR DDC PROGRAMMING LOGIC.

TC GENERAL NOTES

1. THESE GENERAL NOTES SHALL BE APPLICABLE FOR ALL TEMPERATURE CONTROL (TC) DRAWINGS.
2. "PROVIDE" IS DEFINED AS "FURNISH AND INSTALL".
3. TEMPERATURE CONTROLS CONTRACTOR (TC CONTRACTOR) SHALL BE RESPONSIBLE TO COMPLY WITH ALL APPLICABLE CODES AND STANDARDS.
4. FOR TEMPERATURE CONTROL DRAWINGS ONLY, ALL DETAILED INFORMATION IDENTIFIED WITH HEAVY LINE WEIGHT SHALL BE PROVIDED BY TC CONTRACTOR. ALL OTHER INFORMATION IDENTIFIED WITH LIGHT LINE WEIGHT SHALL BE PROVIDED BY OTHER TRADES.
5. ALL CONTROL SCHEMATICS AND WIRING DIAGRAMS ARE FOR THE CLARIFICATION OF EQUIPMENT INTERLOCKING FUNCTIONS AND THE INTERFACE OF VARIOUS CONTRACTORS' WORK AND SHALL NOT BE MISTAKEN AS SHOP DRAWINGS FOR ACTUAL INSTALLATION.
6. TC CONTRACTOR SHALL PROVIDE DDC CONTROLLERS AS REQUIRED TO MEET INTENT OF DESIGN DOCUMENTS. REFER TO THE PLANS FOR THE DDC FUNCTIONS THAT APPLY TO EACH MECHANICAL SYSTEM.
7. ALL TC PROVIDED COMPONENTS AND ALL TC CONTRACTOR INSTALLED WIRING SHALL BE LABELED PER SPECIFICATIONS.
8. ALL WIRING AND SYSTEM CONTROL VOLTAGES SHALL BE IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATION AND THE ELECTRICAL SPECIFICATIONS.
9. FAN AND PUMP MOTOR STARTERS, STARTER WIRING, CONTROL VOLTAGE TRANSFORMERS AND ASSOCIATED POWER WIRING SHALL BE PROVIDED BY OTHER TRADES.
10. FAN AND PUMP MOTOR VARIABLE FREQUENCY CONTROLLERS SHALL BE PROVIDED BY THE TC CONTRACTOR INCLUDING CONTROL WIRING AND CONTROL VOLTAGE TRANSFORMERS.
11. DUCT SMOKE DETECTORS SHALL BE FURNISHED, INSTALLED AND WIRED TO THE FIRE ALARM SYSTEM BY THE ELECTRICAL CONTRACTOR. ELECTRICAL SHALL PROVIDE FIRE ALARM SYSTEM CONTROL MODULES FOR REQUIRED SAFETIES TO MOTOR STARTERS OR VFC'S AS INDICATED. CONTROL MODULES SHALL BE LOCATED NEAR RESPECTIVE MOTOR STARTERS OR VFCs. TC CONTRACTOR SHALL PROVIDE INTERLOCK WIRING FROM CONTROL MODULES TO MOTOR STARTERS OR VFCs.
12. ALL DDC AND CONTROL INTERLOCK WIRING SHALL BE BY TC CONTRACTOR UNLESS OTHERWISE NOTED. TC CONTRACTOR SHALL COORDINATE WITH VFC AND MOTOR STARTER SUPPLIERS TO DETERMINE EXACT WIRING REQUIREMENTS AND TERMINATION POINTS.
13. ALL DDC AND CONTROL INTERLOCK WIRING BETWEEN COMPONENTS SHALL BE INSTALLED WITHOUT INTERMEDIATE STOPS. WIRE SPLICING AT INTERMEDIATE TERMINAL STRIPS IS NOT ACCEPTABLE.
14. ALL ELECTRICAL WIRING AND RACEWAY SYSTEMS SHALL COMPLY WITH ELECTRICAL SPECIFICATION REQUIREMENTS. WHERE RACEWAY IS REQUIRED, TWO SEPARATE ELECTRICAL RACEWAY SYSTEMS SHALL BE PROVIDED: ONE FOR 120V WIRING AND THE OTHER FOR 24V WIRING.
15. TC CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POWER SUPPLIES REQUIRED FOR TC SYSTEM UNLESS OTHERWISE NOTED. REFER TO ELECTRICAL PANEL SCHEDULES FOR SPARE CIRCUITS OR CIRCUITS DEDICATED TO TEMPERATURE CONTROLS. COORDINATE CIRCUIT USE WITH ELECTRICAL CONTRACTOR.
16. TC CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL FIELD MOUNTED COMPONENTS.
17. THERMOSTATS AND SPACE TEMPERATURE SENSORS SHALL BE MOUNTED 4'–0" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE. PROVIDE GUARDS FOR SPACE TEMP SENSORS LOCATED IN PUBLIC AREA.
18. TC CONTRACTOR SHALL PROVIDE AUXILIARY PANELS FOR REQUIRED PANEL MOUNTED EQUIPMENT SUCH AS RELAYS, TRANSDUCERS, CONTROL TRANSFORMERS, ETC. AUXILIARY PANELS SHALL BE LOCATED NEXT TO ASSOCIATED DDC PANEL, DEPENDING ON WIRE QUANTITY OR COMPLEXITY, PROVIDE CONDUITS BETWEEN PANELS OR WIRING THROUGH WITH CONDUIT STUBS ABOVE ALL ASSOCIATED PANELS.
19. REMOTELY MOUNTED FIELD DEVICES SUCH AS RELAYS, CONTROL TRANSFORMERS, ETC., SHALL BE HOUSED IN AN ENCLOSURE PROVIDED BY THE TC CONTRACTOR.
20. CONTROL TRANSFORMERS WHEN REQUIRED SHALL BE SIZED FOR 150% OF ACTUAL LOAD.
21. FREEZESTATS SHALL BE MOUNTED ON UPSTREAM FACE OF COOLING COILS. FREEZESTAT QUANTITY SHALL BE ONE PER 20 SQ. FT OF CROSS SECTIONAL AREA.
22. CURRENT SWITCHES USED FOR OPERATIONAL STATUS SHALL HAVE CURRENT THRESHOLD SETPOINT ADJUSTED TO INDICATE BELT OR DRIVE FAILURE.
23. ALL CONTROL VALVES, CONTROL DAMPERS AND ASSOCIATED CONTROL ACTUATORS IDENTIFIED ON TC DRAWINGS SHALL BE FURNISHED BY TC CONTRACTOR UNLESS OTHERWISE NOTED. DAMPER SIZE AND LOCATIONS ARE INDICATED ON MECHANICAL FLOOR PLAN DRAWINGS.
24. ALL CONTROL VALVES AND DAMPERS FURNISHED BY THE TC CONTRACTOR SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR. ALL PIPE PENETRATIONS AND BASIC FITTINGS REQUIRED FOR SENSOR INSTALLATIONS SHALL BE PROVIDED BY MECHANICAL CONTRACTOR.
25. DAMPER ACTUATORS SHALL BE INSTALLED BY TC CONTRACTOR WHEN FURNISHED BY TC CONTRACTOR.
26. ALL INSTRUMENTATION TUBING REQUIRED FOR DPS AND DPT COMPONENT INSTALLATIONS SHALL BE PROVIDED BY TC CONTRACTOR.
27. TC CONTRACTOR SHALL FIELD MOUNT ALL REQUIRED "SHIPPED LOOSE" PACKAGED CONTROL COMPONENTS FURNISHED BY EQUIPMENT SUPPLIERS. ALL REQUIRED 24V AND 120V FIELD WIRING SHALL BE PROVIDED BY TC CONTRACTOR UNLESS NOTED OTHERWISE. TC CONTRACTOR SHALL COORDINATE SPECIFIC SYSTEM WIRING REQUIREMENTS WITH PACKAGED EQUIPMENT SUPPLIERS.

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PROFESSIONAL ENGINEER

ISSUED FOR BID

NO.	REVISION	DATE

DRAWN: JTH
CHK'D: DC
DESIGNED:
APPRV'D: DC
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER: 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES

DRAWING NUMBER: M8.1

MECHANICAL

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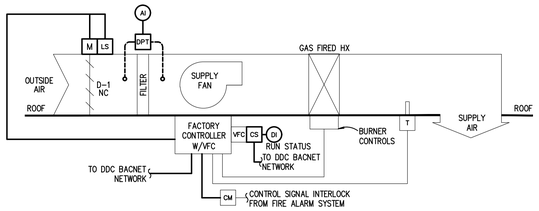
GENERAL NOTES

GENERAL NOTES ON TC DRAWING M8.1 APPLY TO THIS DRAWING.



MAKE-UP AIR UNIT CONTROL

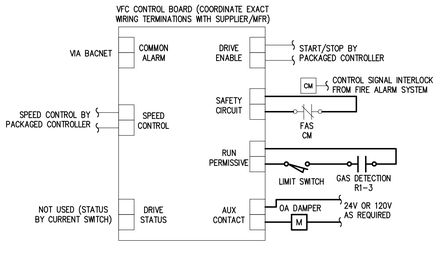
NOTES:

1. MAKE-UP AIR UNIT (MAU) SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS FROM MANUFACTURER INCLUDING FACTORY DDC CONTROLLER, BACnet COMMUNICATION INTERFACE FOR BAS SCHEDULING, ALL SENSORS & DEVICES FOR CONTROLS, CONTROL DAMPERS, DISCHARGE AIR TEMPERATURE SENSOR, AND UNIT MONITORING.
2. TC CONTRACTOR SHALL PROVIDE FIELD CONTROL WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS AND WIRING FROM FIRE ALARM PANEL TO CONTROL MODULE. TC CONTRACTOR SHALL PROVIDE WIRING FROM CONTROL MODULE TO MAU SAFETY CUTOUT CIRCUIT.
4. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM MAU CONTROL PANEL TO BACNET NETWORK SUPERVISORY CONTROLLER.
5. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
6. MAU SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR START-UP, PROGRAMMING, AND COORDINATION WITH TC CONTRACTOR FOR INTEGRATION TO THE BAS.

SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

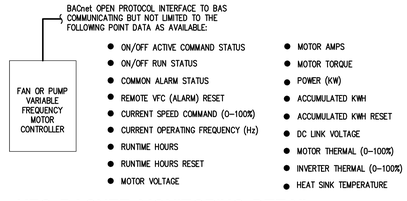
1. MAKE-UP AIR UNIT (MAU) WITH PACKAGED CONTROLS SHALL MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT OF 60°F (ADJ. THRU BACNET INTERFACE) WITH MANUFACTURER'S SEQUENCE OF OPERATION. PACKAGED CONTROLS SHALL PROVIDE POINTS AS AVAILABLE AND SHOWN IN INTEGRATION POINTS CHART.
2. MAU SHALL HAVE START/STOP CAPABILITY FROM THE DDC/BAS SYSTEM. UNIT SHALL OPERATE CONTINUOUSLY UNLESS COMMANDED OFF FROM DDC/BAS OR TRIPPED OFF DUE TO A SAFETY. PACKAGED CONTROLS SHALL PROVIDE CONSTANT VOLUME AIRFLOW CONTROL.
3. OUTSIDE AIR DAMPER AND LIMIT SWITCH SHALL BE HARDWIRE INTERLOCKED WITH PACKAGED CONTROLLER SO THAT DAMPER REMAINS OPEN WHILE SUPPLY FAN IS ACTIVATED. DAMPER LIMIT SWITCH SHALL ALLOW FAN TO OPERATE ONCE DAMPER IS OPENED. DAMPER CLOSES IF MAU IS DEACTIVATED.
4. SF STATUS SHALL BE MONITORED BY DDC THRU CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
5. VFC COMMON FAILURE ALARM FOR FAN SHALL BE MONITORED BY DDC THRU BACNET INTERFACE.
6. FIRE ALARM SYSTEM CONTROL MODULE SHALL SHUTDOWN MAU BASED ON FIRE ALARM SYSTEM SIGNAL (BY OTHERS).
7. PACKAGED MAU CONTROLLER PROVIDES THE FOLLOWING (BUT NOT LIMITED TO) POINTS AS AVAILABLE:
   - MAU RUN CONTINUOUSLY (FROM BAS)
   - DISCHARGE AIR TEMPERATURE (DAT) SETPOINT (FROM BAS)
   - MAU ENABLED/DISABLED STATUS (TO BAS)
   - SUPPLY FAN ON/OFF STATUS (TO BAS)
   - DISCHARGE AIR TEMPERATURE (TO BAS)
   - HEATING MODE STATUS (TO BAS)
   - HEATING OUTPUT STATUS (TO BAS)
   - MISC UNIT MONITORING (TO BAS)
   - DAT TEMP SENSOR FAILURE ALARM (TO BAS)
   - OTHER MISC ALARMS (TO BAS)
   - OTHER MISC STATUS POINTS (15) (TO BAS)



MAU-1 SF VFC WIRING

NOTES:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH VFC SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. PROVIDE VFC MANUFACTURER'S WIRING DESIGNATIONS ON SUBMITTAL DRAWINGS.
3. MOUNT CURRENT SWITCH ON FAN MOTOR LEADS.

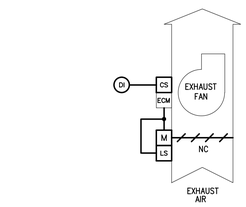


VFC BACNET MONITORING DETAIL

TYPICAL FOR ALL FAN AND PUMP MOTORS WITH VFCs.

NOTE:

1. EMCS CONTRACTOR SHALL COORDINATE BACnet OPEN PROTOCOL WIRE TERMINATION REQUIREMENTS AND POINT INTEGRATION CAPABILITIES WITH VFC SUPPLIER/MANUFACTURER AND PROVIDE APPROPRIATE BAS COMPONENTS FOR COMMUNICATION INTERFACE TO BAS.

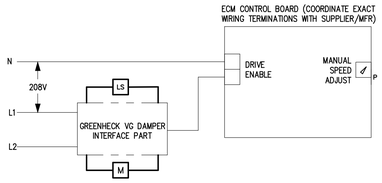


EXHAUST FAN EF-1 CONTROL

NOTE: TAB CONTRACTOR SHALL ADJUST SPEED AT EC MOTOR POTENTIOMETER.

SEQUENCE OF OPERATION

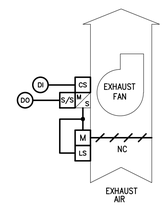
1. EXHAUST FAN EF-1 SHALL RUN CONTINUOUSLY.
2. WHEN EC MOTOR POWER IS APPLIED, DAMPER SHALL OPEN AND LIMIT SWITCH SHALL MAKE ALLOWING FAN TO RUN.
3. DDC SHALL MONITOR FAN STATUS VIA CURRENT SWITCH. IF FAN IS OFF, DDC SHALL PROVIDE THE BAS WITH AN ALARM. DDC SHALL TOTALIZE FAN MOTOR RUN TIME HOURS OF OPERATION.



GREENHECK EF-1 VG ECM WIRING

NOTE:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.

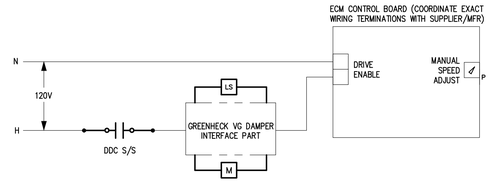


EXHAUST FAN EF-2 CONTROL

NOTE: TAB CONTRACTOR SHALL ADJUST SPEED AT EC MOTOR POTENTIOMETER.

SEQUENCE OF OPERATION:

1. EXHAUST FAN SHALL BE STARTED AND STOPPED BY DDC BASED ON BAS TIME OF DAY BUILDING OCCUPANCY SCHEDULE. WIRING INTERLOCK SHALL OPEN DAMPERS. ON FANS GREATER THAN 400 CFM, LIMIT SWITCH SHALL MAKE BEFORE FAN CAN START.
2. WHEN FAN MOTOR POWER IS ENERGIZED, DAMPER SHALL OPEN AND LIMIT SWITCH SHALL MAKE ALLOWING FAN TO RUN.
3. DDC SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM AT BAS.
4. DDC SHALL TOTALIZE FAN MOTOR RUNTIME HOURS OF OPERATION.



GREENHECK EF-2 VG ECM WIRING

NOTE:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.

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SRE BUILDING EXPANSION

TEMPERATURE CONTROLS

DRAWING NUMBER: M8.2

MECHANICAL

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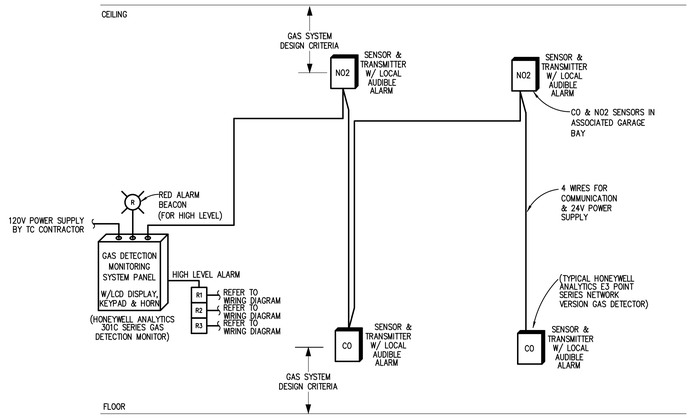
GENERAL NOTES

GENERAL NOTES ON TC DRAWING M8.1 APPLY TO THIS DRAWING.



GAS DETECTION MONITORING / VENTILATION SYSTEM WIRING DETAILS

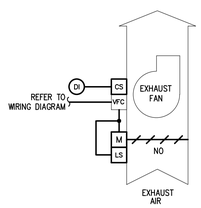
NOTES:

1. REFER TO MECHANICAL FLOOR PLANS FOR SENSORS AND DEVICE QUANTITIES & LOCATIONS.
2. TC CONTRACTOR SHALL PROVIDE GAS DETECTION MONITORING SYSTEM & SENSORS AS SPECIFIED.
3. THE REPRESENTATIVE OF THE GAS DETECTION SYSTEM MANUFACTURER SHALL PROVIDE RESPECTIVE CO AND NO2 ALARM LIMITS FOR THE OPERATION AND PROGRAMMING OF THE CONTROLLER.
4. PER MMC-2015, CO SHALL NOT EXCEED 25PPM AND NO2 SHALL NOT EXCEED 3PPM.
5. LOWER SPEED MANUAL DIAL SHALL BE ADJUSTED FOR VENTILATION AIRFLOW RATE BY TAB CONTRACTOR.
6. HIGHER SPEED MANUAL DIAL SHALL BE ADJUSTED BY TAB CONTRACTOR FOR PURGE AIRFLOW RATE.
7. ECM TRANSFORMER (SEE GREENHECK DETAIL ON THIS DRAWING) SHALL BE PROVIDED AT THE FACTORY.

SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

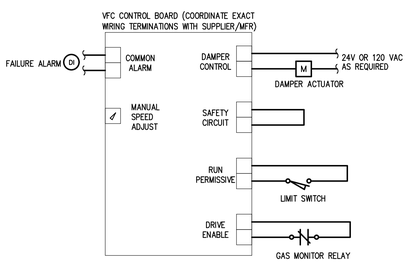
1. THE GAS DETECTION SYSTEM SHALL MONITOR THE GAS SENSORS IN THE SPACE. UPON DETECTION OF GAS(ES) AT PROPER LEVELS, THE PANEL SHALL PROVIDE AN ALARM CONTACT. THE GAS DETECTION SYSTEM CONTACT IS WIRED TO ENERGIZE THE RELAYS' COILS. IF A COIL FAILS OR THE CIRCUIT POWER IS LOST, THE RELAY CONTACTS WILL TRANSFER AND ENERGIZE THE CONNECTED EQUIPMENT.
2. WHEN GAS DETECTION INTERLOCK RELAYS R1 AND R2 ARE DE-ENERGIZED BY THE GAS DETECTION SYSTEM, RELAY CONTACTS SHALL ENERGIZE THE VARIOUS FANS' VFCs AND PURGE DAMPERS D-1 AND D-2. WHEN THE PURGE DAMPERS ARE SENSED AS OPEN BY THE RESPECTIVE LIMIT SWITCHES. THEN VARIOUS VFCs ARE ENERGIZED TO RUN. INDIVIDUAL FAN DAMPER LIMIT SWITCHES SHALL MAKE BEFORE THE FAN CAN RUN. MAU-1 RELAY CONTACT SHALL SHUTDOWN MAU-1 WHEN GAS IS DETECTED.



EXHAUST FAN EF-3, -4, -5, & -6 CONTROL

SEQUENCE OF OPERATION

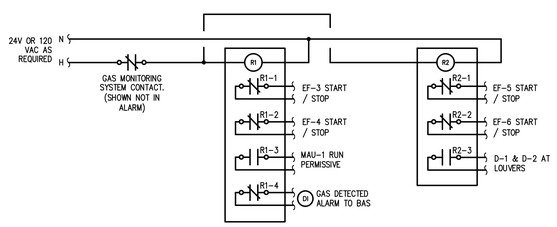
1. REFER TO THE GAS MONITORING SYSTEM SEQUENCE OF OPERATION.



GREENHECK EF-3 THRU -6 INTEGRAL VFC WIRING

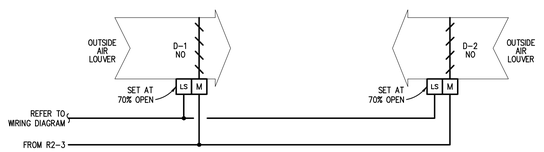
NOTE:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.



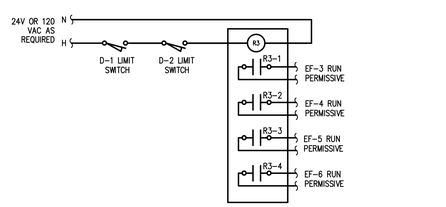
VEHICLE STORAGE PURGE FANS INTERLOCK WIRING

PROVIDE AUXILIARY PANEL FOR RELAYS



PURGE AIR DAMPERS CONTROL

1. NOTE: REFER TO GAS DETECTION SYSTEM SEQUENCE OF OPERATION.



EF-3 THRU EF-6 RUN PERMISSIVE WIRING

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SRE BUILDING EXPANSION

TEMPERATURE CONTROLS

DRAWING NUMBER M8.3

MECHANICAL

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GENERAL NOTES

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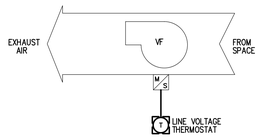
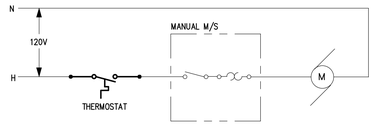


VENTILATION FAN VF-1 CONTROL

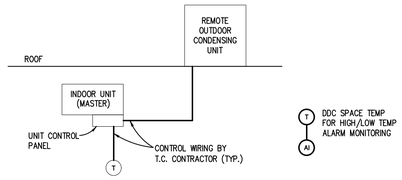
SERVES ELECTRICAL ROOM

SEQUENCE OF OPERATION:

1. VF-1 SHALL BE ACTIVATED WHEN SPACE TEMP RISES ABOVE 80ºF AND DEACTIVATED BELOW 78ºF BY LINE VOLTAGE THERMOSTAT.



VF-1 M/S WIRING



ACU-138 FIELD WIRING & CONTROL

NOTES:

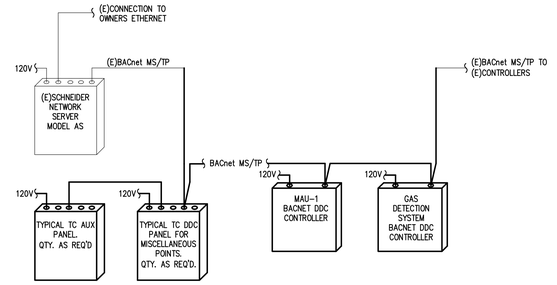
1. TC CONTRACTOR SHALL PROVIDE FIELD WIRING BETWEEN INDOOR UNIT CONTROLS AND THE REMOTE CONDENSER.
2. TC CONTRACTOR SHALL INSTALL THERMOSTAT PROVIDED BY ACU SUPPLIER AND PROVIDE REQUIRED FIELD WIRING.
3. TC CONTRACTOR SHALL COORDINATE WITH MANUFACTURER FOR EXACT TERMINATIONS AND WIRING REQUIREMENTS.

SEQUENCE OF OPERATION:

1. DDC SETPOINTS SHALL BE ADJUSTABLE BY BAS SYSTEM OPERATORS.
2. MANUFACTURER'S THERMOSTAT SHALL CONTROL TO SPACE TEMPERATURE SETPOINTS (ADJ. AT THERMOSTAT). ACU SHALL BE SET TO RUN 24X7.
3. SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:

   HEATING SETPOINT = 72ºF

   COOLING SETPOINT = 74ºF
4. DDC SHALL MONITOR ROOM TEMPERATURE SENSOR AND PROVIDE HIGH ALARM AT 2ºF SETPOINT (ADJ.) GREATER THAN ROOM COOLING SETPOINT AND LOW ALARM AT 2ºF SETPOINT (ADJ.) LESS THAN ROOM HEATING SETPOINT FOR BAS DISPLAY.

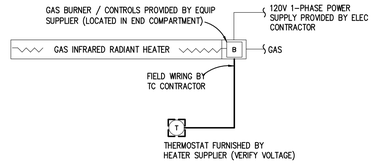


DDC SYSTEM ARCHITECTURE

NO SCALE

NOTES:

1. PROVIDE THE EXISTING SCHNEIDER MODEL "AS" NETWORK CONTROLLER WITH UPDATES/UPGRADES FOR THE ADDED POINTS AND CONTROLLERS AS PART OF THIS PROJECT. REPLACE THE MODEL "AS" NETWORK CONTROLLER IF NECESSARY.
2. TC CONTRACTOR SHALL CREATE ALL NECESSARY BACnet OPEN PROTOCOL OBJECTS FOR REMOTE SCHEDULING, CONTROL, MONITORING, ALARMING AND POINT TRENDING OF SYSTEMS WHERE REQUIRED.
2. TC CONTRACTOR SHALL CREATE ALL NECESSARY MODBUS TCP OBJECTS FOR REMOTE CONTROL, MONITORING, ALARMING, AND POINT TRENDING OF SYSTEMS WHERE REQUIRED.
3. TC CONTRACTOR SHALL CREATE ALL GRAPHICS FOR THIS PROJECT FROM (E)SCHNEIDER ECOSTRUXURE BAS SERVER SOFTWARE.
4. PROVIDE BACNET MS/TP DDC NETWORK COMMUNICATING WITH NETWORK SUPERVISOR PANEL HARDWARE/SOFTWARE.
5. WHERE APPLICABLE, PROVIDE INTEGRATION OF EXISTING 3RD PARTY CONTROLLERS TO THE BAS AND PROVIDE GRAPHICS.
6. PROVIDE NEW, BACNET MS/TP DDC CONTROLLERS FOR THE EQUIPMENT PROVIDED UNDER THIS PROJECT PER SPECIFICATION THAT ARE COMPATIBLE WITH THE EXISTING BAS. REFER TO TEMPERATURE CONTROL SCHEMATICS FOR THE REQUIRED POINTS ASSOCIATED FOR EACH SYSTEM.
7. TC CONTRACTOR SHALL DETERMINE DDC PANEL QUANTITY BASED ON POINT DENSITIES AND AVAILABLE MOUNTING SPACE. UNLESS SPECIFICALLY NOTED IN DESIGN DRAWINGS, TC CONTRACTOR SHALL LOCATE DDC PANELS AND COORDINATE WITH OTHER TRADES.
8. TC CONTRACTOR SHALL PROVIDE REQUIRED POWER SUPPLIES FROM SPARE CIRCUITS WHERE IDENTIFIED ON ELECTRICAL PANEL SCHEDULES. COORDINATE WITH ELEC CONTRACTOR. REFER TO ELECTRICAL DWGS FOR PANEL LOCATIONS.
9. TC CONTRACTOR SHALL PROVIDE 24V TRANSFORMERS REQUIRED FOR DDC CONTROLLERS / CONTROLS THAT SHALL BE LOCATED IN MECH OR ELEC ROOMS – COORDINATE LOCATIONS WITH ELECTRICAL CONTRACTOR AND ARCHITECT. MAXIMUM TRANSFORMER SIZE SHALL BE 100 VA. PROVIDE ENCLOSURE(S) FOR TRANSFORMERS.
10. TC CONTRACTOR SHALL PROVIDE AUXILIARY PANEL FOR GAUGES, TRANSMITTERS, RELAYS, POWER TRANSFORMERS, ETC., WHERE NEEDED.



1-STAGE GAS INFRARED RADIANT HEATER CONTROL

TYPICAL

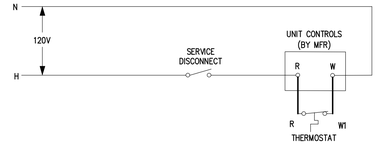
SEQUENCE OF OPERATION

NOTES:

1. REFER TO FLOOR PLANS FOR LOCATION OF UNITS AND THERMOSTATS
2. COORDINATE WIRING DETAILS AND TERMINATIONS REQUIREMENTS WITH EQUIPMENT SUPPLIER.

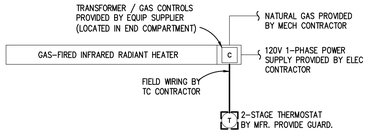
SEQUENCE OF OPERATION:

1. SETPOINTS ARE ADJUSTABLE AT THE THERMOSTAT.
2. THERMOSTAT SHALL MAINTAIN SPACE TEMP HEATING SETPOINT OF 68ºF USING ONE-STAGE OF HEAT.
3. THERMOSTAT SHALL PROVIDE DEADBAND CONTROL OF 2ºF (MINIMUM).



1-STAGE GAS INFRARED RADIANT HEATER CONTROL WIRING

TYPICAL



2-STAGE GAS-FIRED INFRARED RADIANT HEATER CONTROL

TYPICAL

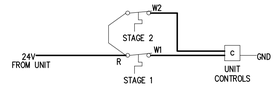
SEQUENCE OF OPERATION

NOTES:

1. REFER TO FLOOR PLANS FOR LOCATION OF UNITS AND THERMOSTATS
2. COORDINATE WIRING DETAILS AND TERMINATIONS REQUIREMENTS WITH EQUIPMENT SUPPLIER.

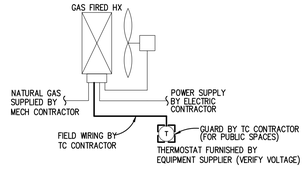
SEQUENCE OF OPERATION:

1. SETPOINTS ARE ADJUSTABLE AT THE THERMOSTAT.
2. THERMOSTAT SHALL MAINTAIN SPACE TEMP HEATING SETPOINT OF 68ºF USING TWO-STAGES OF HEAT.
3. THERMOSTAT SHALL PROVIDE DEADBAND CONTROL OF 2ºF (MINIMUM).



2-STAGE GAS-FIRED INFRARED HEATER CONTROL WIRING

TYPICAL



TYPICAL GAS FIRED UNIT HEATER

NOTE:

1. REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF UNITS.

SEQUENCE OF OPERATION:

1. SPACE THERMOSTAT SHALL ENERGIZE GAS FIRED UNIT HEATER CONTROL CIRCUIT TO MAINTAIN SPACE TEMPERATURE SETPOINT. INITIAL SETPOINT SHALL BE 68ºF.
2. THERMOSTAT SHALL PROVIDE A MINIMUM 1.5ºF DEADBAND FOR CONTROL. THERMOSTAT SHALL NOT BE ADJUSTABLE TO LESS THAN 40ºF OR GREATER THAN 90ºF.

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NO.	REVISION	DATE

DRAWN: -
DESIGNED: -
CHK'D: -
APPR'VD: -
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER: 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

TEMPERATURE CONTROLS

DRAWING NUMBER: M8.4

MECHANICAL

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ELECTRICAL SYMBOL LIST

(NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.)

SYMBOL	DESCRIPTION
FX (NL)	FIXTURE TYPE (NL INDICATES NIGHT LIGHT)
	LIGHTING FIXTURE
	DIRECT/INDIRECT LIGHTING FIXTURE
	EMERGENCY LIGHTING FIXTURE
	LIGHTING FIXTURE
	WALL MOUNTED LIGHTING FIXTURE
	LIGHTING FIXTURE
	RECESSED OR SURFACE MOUNTED DIRECTIONAL LIGHTING FIXTURE
	PENDANT LIGHTING FIXTURE
	WALL SCONCE
	LIGHTING TRACK
	TRACK LIGHTING FIXTURE
	POLE MOUNTED LIGHTING FIXTURE
	POLE MOUNTED LIGHTING FIXTURE - POST TOP
	BOLLARD LIGHTING FIXTURE
	EMERGENCY LIGHTING UNIT
	EXIT LIGHTING FIXTURE WITH DIRECTIONAL ARROWS (SHADED AREA INDICATES FACE)
	EXIT LIGHTING FIXTURE WITH DIRECTIONAL ARROWS (SHADED AREA INDICATES FACE)
	EXIT LIGHTING FIXTURE - WALL MOUNTED
	EXIT/EMERGENCY LIGHTING COMBO
ALCR	AUTOMATIC LOAD CONTROL RELAY
BCELTS	BRANCH CIRCUIT EMERGENCY LIGHTING TRANSFER SWITCH
LC	LIGHTING CONTROL DEVICE - REFER TO LIGHTING CONTROL SCHEDULE
XX	ROOM CONTROL DESIGNATION - REFER TO LIGHTING CONTROL SCHEDULE
S	SINGLE POLE TOGGLE SWITCH
S_2	TWO POLE TOGGLE SWITCH
S_3	3 WAY TOGGLE SWITCH
S_4	4 WAY TOGGLE SWITCH
K	KEY OPERATED SWITCH
K_3	3 WAY KEY OPERATED SWITCH
K_4	4 WAY KEY OPERATED SWITCH
D	DIMMER SWITCH
D_O	DIMMER OCCUPANCY SENSOR SWITCH
D_L	LOW VOLTAGE DIMMER SWITCH
D_3	3 WAY DIMMER SWITCH
S_P	PILOT SWITCH

SYMBOL	DESCRIPTION
TWC	TWO-WAY COMMUNICATION SYSTEM CALL STATION
TWCD	TWO-WAY COMMUNICATION SYSTEM AUTO DIALER
TWCA	TWO-WAY COMMUNICATION SYSTEM ANNUNCIATOR & COMMUNICATION PANEL
TWCP	TWO-WAY COMMUNICATION SYSTEM POWER SUPPLY WITH BATTERY BACK-UP
TWCDP	TWO-WAY COMMUNICATION SYSTEM AUTO DIALER POWER SUPPLY WITH BATTERY BACK-UP
RGP	REMOTE GENERATOR ANNUNCIATOR PANEL
ATS	AUTOMATIC TRANSFER SWITCH
UPS	UNINTERRUPTIBLE POWER SUPPLY
CSX	LOW VOLTAGE CONTROL STATION "X" INDICATES TYPE
	SINGLE / DUPLEX RECEPTACLE OUTLET "X" INDICATES TYPE
	SINGLE / DUPLEX RECEPTACLE OUTLET CONTROLLED BY AUTOMATIC CONTROL DEVICE / SYSTEM
	QUAD RECEPTACLE OUTLET
HH	ABOVE COUNTER DUPLEX RECEPTACLE (SIMILAR FOR TAMPER RESISTANT, QUADS, EMERGENCY AND GFCI RECEPTACLES)
X	DUPLEX RECEPTACLE-GROUND FAULT CIRCUIT INTERRUPTER
	DEAD FRONT-GROUND FAULT CIRCUIT INTERRUPTER
	DUPLEX EMERGENCY RECEPTACLE OUTLET
	DUPLEX TAMPER RESISTANT RECEPTACLE OUTLET
	QUAD TAMPER RESISTANT RECEPTACLE OUTLET
	ABOVE COUNTER TAMPER RESISTANT RECEPTACLE OUTLET
	DUPLEX UPS RECEPTACLE
	DUPLEX RECEPTACLE WITH 2 USB PORTS OUTLET
	USB 4 PORT CHARGING STATION
	CEILING MOUNTED DUPLEX / QUAD RECEPTACLE
	TELECOMMUNICATION BACKBOARD
	POWER POLE
TGB	TELECOMMUNICATION GROUNDING BUS BAR
	WALL / CEILING MOUNTED SPECIAL RECEPTACLE - REFER TO ELECTRICAL STANDARD SCHEDULES
TMGB	TELECOMMUNICATION MAIN GROUNDING BUS BAR
	MULTI-OUTLET SURFACE RACEWAY
	MULTI-SERVICE DROP SEE ELECTRICAL DETAILS AND DIAGRAMS SHEET "X" INDICATES TYPE
PTX	POKE-THROUGH ASSEMBLY "X" INDICATES TYPE
FBX	FLOOR SERVICE FITTING "X" INDICATES TYPE
AFX	ACCESS FLOOR SERVICE FITTING "X" INDICATES TYPE
RX	CORD REEL "X" INDICATES TYPE
S_3	DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
S_3S_3	3-WAY DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
S_4S_4	4-WAY DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
S_T	DIGITAL TIME SWITCH
S_I	ILLUMINATED TOGGLE SWITCH FOR CONTROL OF LIGHTING ON CRITICAL POWER-ILLUMINATED WHEN SWITCH IS IN "OFF" POSITION
S_L	LOW VOLTAGE SWITCH
S_O	OCCUPANCY SENSOR
S_{O2}	OCCUPANCY SENSOR - REFER TO ELECTRICAL STANDARD SCHEDULE
OS X	OCCUPANCY SENSOR - REFER TO ELECTRICAL STANDARD SCHEDULES - "X" INDICATES TYPE

SYMBOL	DESCRIPTION
CP	CONTROL PANEL
	MOTOR
VFC	VARIABLE FREQUENCY CONTROLLER
	MANUAL CONTROLLER
	MAGNETIC CONTROLLER
	COMBINATION MAGNETIC CONTROLLER
	NON-FUSIBLE DISCONNECT SWITCH
	FUSIBLE DISCONNECT SWITCH
CB	ENCLOSED CIRCUIT BREAKER
	PUSH BUTTON STATION
JD	JUNCTION BOX
	HARD WIRE POWER CONNECTION
	GROUND ROD
	GROUND CONNECTION
HH	HANDHOLE
X	CONDUIT SLEEVE WITH BUSHINGS LENGTH AS REQUIRED "X" INDICATES CONDUIT SIZE
	CONDUIT UP
	CONDUIT DOWN
	EMPTY BOX FOR FUTURE TELECOMMUNICATION OUTLET
	EMPTY BOX FOR FUTURE TELECOMMUNICATION OUTLET MOUNTED 8" ABOVE COUNTERTOP
	EMPTY BOX FOR FUTURE CEILING MOUNTED TELECOMMUNICATION OUTLET
X	TELECOMMUNICATION OUTLET "X" INDICATES TYPE
X	TELECOMMUNICATION OUTLET MOUNTED 8" ABOVE COUNTERTOP "X" INDICATES TYPE
X	TELECOMMUNICATION CEILING MOUNTED OUTLET "X" INDICATES TYPE
	REFER TO ELECTRICAL STANDARD SCHEDULES
TGB	TELECOMMUNICATION GROUNDING BUS BAR
TMGB	TELECOMMUNICATION MAIN GROUNDING BUS BAR
IC	INTERCOM OUTLET
S	SPEAKER
S	SPEAKER - WALL MOUNTED
MIC	MICROPHONE
VC	VOLUME CONTROL
B	SIGNALING BELL
	SINGLE FACE CLOCK - CEILING MOUNTED
	SINGLE FACE CLOCK - WALL MOUNTED
	DOUBLE FACE CLOCK - CEILING MOUNTED
S	DOUBLE FACE COMBINATION CLOCK/SPEAKER CEILING MOUNTED
	DOUBLE FACE CLOCK - WALL MOUNTED
S	DOUBLE FACE COMBINATION CLOCK/SPEAKER WALL MOUNTED
	TIME CLOCK
C	CONTACTOR
P	PHOTOCELL
TT	TWIST TIMER

SYMBOL	DESCRIPTION
	SECURITY CAMERA
MD	MOTION DETECTOR
K	SECURITY KEY SWITCH
DC	DOOR CONTACT
KP	KEY PAD
CR	CARD READER
DB	DURESS PUSH BUTTON STATION
DE	DELAYED EGRESS
REX	REQUEST TO EXIT STATION
PP	AUTOMATIC DOOR PUSH PAD OPERATOR
DO	DOOR OPERATOR
DA	DOOR ACTUATOR
AC	ACCESS CONTROL STATION
ACCP	ACCESS CONTROL CONTROL PANEL
ACPS	ACCESS CONTROL POWER SUPPLY
	CIRCUIT BREAKER
	DRAWOUT CIRCUIT BREAKER MANUALLY/ OPERATED
	DRAWOUT CIRCUIT BREAKER ELECTRICALLY/ OPERATED
	SWITCH
	AUTOMATIC OR MANUAL TRANSFER SWITCH
	FUSE
	TRANSFORMER
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	LIGHTNING ARRESTOR
X	PANELBOARD "X" INDICATES PANELBOARD NAME
	GROUND
	STRESS CONE TERMINATION
K	SECURITY KEY INTERLOCK
G	ENGINE GENERATOR
M	UTILITY METER
EMU	ELECTRONIC METERING UNIT
A	AMMETER
V	VOLTMETER
AS	AMMETER SWITCH
VS	VOLTMETER SWITCH
SPD	SURGE PROTECTIVE DEVICE
CR	CONTROL RELAY
TDR	TIME DELAY RELAY
PRM	PHASE ROTATION MONITOR
	CAMLOK - MALE
	CAMLOK - FEMALE
	THERMAL OVERLOAD RELAY
	NORMALLY OPEN CONTACTS
	NORMALLY CLOSED CONTACTS
	N.O. PUSH BUTTON SINGLE CIRCUIT
	N.C. PUSH BUTTON SINGLE CIRCUIT
X-X	CABLE VAULT "X-X" INDICATES TYPE

SYMBOL	DESCRIPTION
F	MANUAL FIRE ALARM BOX
SD	SMOKE DETECTOR
DD	DUCT SMOKE DETECTOR
CO	CARBON MONOXIDE DETECTOR
RT	REMOTE TEST STATION (FOR DUCT DETECTOR)
TD	THERMAL DETECTOR
BD	PROJECTED BEAM DETECTOR
F	FIRE ALARM BELL
F	FIRE ALARM AUDIBLE NOTIFICATION APPLIANCE
XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
XX	FIRE ALARM COMBINATION VISUAL/ AUDIBLE "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
F XX	FIRE ALARM COMBINATION VISUAL/ AUDIBLE NOTIFICATION APPLIANCE - CEILING MOUNTED "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE CEILING MOUNTED "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
F	FIRE ALARM AUDIBLE NOTIFICATION APPLIANCE - CEILING MOUNTED
F	FIREFIGHTERS PHONE JACK
FACP	FIRE ALARM CONTROL PANEL
FAA	FIRE ALARM ANNUNCIATOR PANEL
NAC	NOTIFICATION APPLIANCE CIRCUIT EXTENDER PANEL
IM	ADDRESSABLE MONITORING MODULE
CM	ADDRESSABLE CONTROL MODULE
TS	TAMPER SWITCH
FS	FLOW SWITCH
DR	MAGNETIC DOOR RELEASE
	BRANCH CIRCUIT PANEL BOARD
	LOAD CENTER
	MOTOR CONTROL CENTER
T	TRANSFORMER
	DISTRIBUTION PANEL
GB	GROUND BUS
PB	PLUG IN BUSWAY
FB	FEEDER BUSWAY

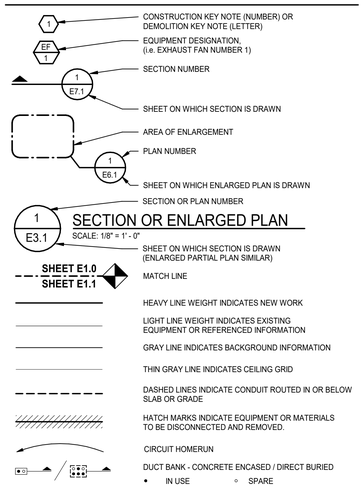
ELECTRICAL DRAWING INDEX

SHEET NO.	SHEET TITLE
E0.1	ELECTRICAL STANDARDS AND DRAWING INDEX
E0.2	ELECTRICAL STANDARD SCHEDULES
E2.1	FIRST FLOOR LIGHTING PLAN
E3.1	FIRST FLOOR POWER PLAN
E3.2	EXISTING POWER PLANS
E5.1	ONE LINE DIAGRAM AND PANEL SCHEDULES
E5.2	PANEL SCHEDULES
E7.1	ELECTRICAL DETAILS AND DIAGRAMS

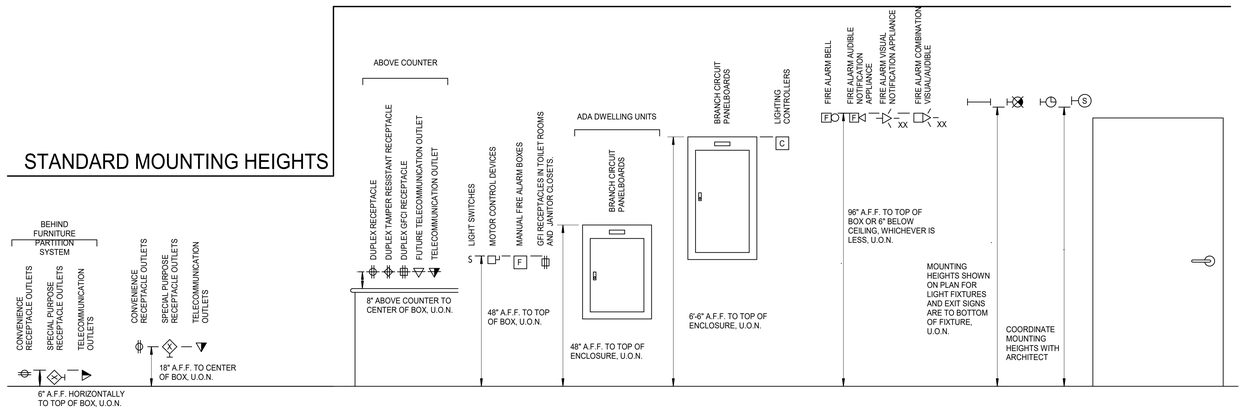
ELECTRICAL ABBREVIATION LIST

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
A	AMPERES	JB	JUNCTION BOX	P	POLE
AER	ARC ENERGY REDUCTION			PB	PUSHBUTTON STATION
AF	AMPERES FRAME (BREAKER RATING)	KA	THOUSAND AMP	PH	PHASE
AFCI	ARC FAULT CIRCUIT INTERRUPTER	KV	KILOVOLT	PT	POTENTIAL TRANSFORMER
A.F.F.	ABOVE FINISH FLOOR	KVA	KILOVOLT - AMPERES	PDP	POWER DISTRIBUTION PANEL
AIC	AMPS INTERRUPTING CAPACITY	KW	KILOWATT		
AL	AUDIENCE LEFT	KWH	KILOWATT - HOURS	RECEPT.	RECEPTACLE
ALCR	AUTOMATIC LOAD CONTROL RELAY			RDP	RECEPTACLE DISTRIBUTION PANEL
AR	AUDIENCE RIGHT	LA	LIGHTING ARRESTOR	RP	RECEPTACLE PANEL
AT	AMPERES TRIP (BREAKER SETTING)	LP	LIGHTING PANEL	RSC	RIGID STEEL CONDUIT
ATS	AUTOMATIC TRANSFER SWITCH	LDP	LIGHTING DISTRIBUTION PANEL		
AUX	AUXILIARY			SCCR	SHORT CIRCUIT CURRENT RATING
		MAX	MAXIMUM	SCHED	SCHEDULE
BCELTS	BRANCH CIRCUIT EMERGENCY LIGHTING TRANSFER SWITCH	MCA	MINIMUM CIRCUIT AMPACITY	SPD	SURGE PROTECTION DEVICE
		MCB	MAIN CIRCUIT BREAKER	ST	SHUNT TRIP
BKR	BREAKER	MCC	MOTOR CONTROL CENTER	SW	SWITCH
BPS	BOLTED PRESSURE SWITCH	MDP	MAIN DISTRIBUTION PANEL	SWBD	SWITCHBOARD
		MECH	MECHANICAL	SWGR	SWITCHGEAR
C	CONDUIT	MIN	MINIMUM		
CB	CIRCUIT BREAKER	MISC	MISCELLANEOUS	TB	TERMINAL BOX
CKT	CIRCUIT	MLO	MAIN LUGS ONLY	TELECOM	TELECOMMUNICATIONS
CT	CURRENT TRANSFORMER	MOP	MAXIMUM OVERCURRENT PROTECTION	TR	TAMPER RESISTANT
		MTD	MOUNTED	TTP	TELEPHONE TERMINAL BACKBOARD
DEMO	DEMOLITION	MTG	MOUNTING	TYP	TYPICAL
DIM	DIMENSION	MTR	MOTOR		
DISC	DISCONNECT			U.O.N.	UNLESS OTHERWISE NOTED
DP	DISTRIBUTION PANEL	N	NEUTRAL	US	UPSTAGE
DS	DOWNSTAGE	NC	NORMALLY CLOSED		
DWG	DRAWING	NEC	NATIONAL ELECTRICAL CODE	V	VOLTS
		NF	NON-FUSIBLE		
EBU	EMERGENCY BATTERY UNIT	NIC	NOT IN CONTRACT	W	WIRE OR WATTS
EC	ELECTRICAL CONTRACTOR	NL	NIGHT LIGHT	WG	WIRE GUARD
ELEC	ELECTRICAL	NO	NORMALLY OPEN	WP	WEATHERPROOF
EM/ EMERG	EMERGENCY	NTS	NOT TO SCALE	WR	WEATHER RESISTANT
EMT	ELECTRICAL METALLIC TUBING				
EO	ELECTRICALLY OPERATED	OC	ON CENTER	XFMR	TRANSFORMER
EPO	EMERGENCY POWER OFF	OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED	XP	EXPLOSION PROOF
EWC	ELECTRIC WATER COOLER				
EXIST	EXISTING	OFOI	OWNER FURNISHED, OWNER INSTALLED	(E)	EXISTING
				(R)	RELOCATED
FA	FIRE ALARM				
FLA	FULL LOAD AMPS				
FLR	FLOOR				
FOH	FRONT OF HOUSE				
FSEC	FOOD SERVICE EQUIPMENT CONTRACTOR				
FU	FUSE				
G/GRD/EG	GROUND				
GFCI	GROUND FAULT CIRCUIT INTERRUPTER				
GFP	GROUND FAULT PROTECTION				
HOA	HAND-OFF-AUTO				
HP	HORSEPOWER				
HV	HIGH VOLTAGE				
HZ	HERTZ				
IG	ISOLATED GROUND				

STANDARD METHODS OF NOTATION



STANDARD MOUNTING HEIGHTS



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NO.	REVISION	DATE
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DRAWN: SMB | CHK'D: EMG
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GERALD R. FORD INTERNATIONAL AIRPORT
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ELECTRICAL STANDARDS AND DRAWING INDEX

DRAWING NUMBER: E0.1
ELECTRICAL

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FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE - GENERAL PURPOSE

	COPPER CONDUCTORS							ALUMINUM CONDUCTORS						
	WIRE SIZE (AWG OR KCMIL)		CONDUIT SIZE					WIRE SIZE (AWG OR KCMIL)		CONDUIT SIZE				
OVERCURRENT DEVICE RATING (AMPERES)	PHASE & NEUTRAL	GROUND	SINGLE PHASE 2 WIRE+G (1PH, 1N, 1G)	SINGLE PHASE 3 WIRE+G (2PH, 1N, 1G)	THREE PHASE 3 WIRE+G (3PH, 1G)	THREE PHASE & NEUTRAL 4 WIRE+G (3PH, 1N, 1G)	KEYED NOTES	PHASE & NEUTRAL	GROUND	SINGLE PHASE 3 WIRE+G (2PH, 1N, 1G)	THREE PHASE 3 WIRE+G (3PH, 1G)	THREE PHASE & NEUTRAL 4 WIRE+G (3PH, 1N, 1G)	KEYED NOTES
15-20	12	12	3/4"	3/4"	3/4"	3/4"		N/A	N/A	N/A	N/A	N/A	
25-30	10	10	3/4"	3/4"	3/4"	3/4"		N/A	N/A	N/A	N/A	N/A	
35-40	8	10	3/4"	3/4"	3/4"	3/4"		N/A	N/A	N/A	N/A	N/A	
45-50	8 (6)	10	3/4"	3/4"	3/4"	3/4"	1	N/A	N/A	N/A	N/A	N/A	
60	6 (4)	10	3/4" (1")	3/4" (1")	3/4" (1")	1" (1 1/4")	1	N/A	N/A	N/A	N/A	N/A	
70	4	8	1"	1 1/4"	1 1/4"	1 1/4"		N/A	N/A	N/A	N/A	N/A	
80	4 (3)	8	1"	1 1/4"	1 1/4"	1 1/4"	1	N/A	N/A	N/A	N/A	N/A	
90-100	3 (2)	8	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1	1	6	1 1/2"	1 1/4"	1 1/2"	
110	2 (1)	6	-	1 1/4"	1 1/4"	1 1/4" (1 1/2")	1	1/0	4	1 1/2"	1 1/2"	2"	
125	1 (1/0)	6	-	1 1/4" (1 1/2")	1 1/4" (1 1/2")	1 1/2"	1	2/0	4	1 1/2"	1 1/2"	2"	
150	1/0	6	-	1 1/2"	1 1/2"	1 1/2"		3/0	4	2"	2"	2 1/2"	
175	2/0	6	-	2"	2"	2"		4/0	4	2"	2"	2 1/2"	
200	3/0	6	-	2"	2"	2 1/2"		250	4	2"	2"	3"	
225	4/0	4	-	2"	2"	2 1/2"		300	2	2 1/2"	2 1/2"	3"	
250	250	4	-	2 1/2"	2 1/2"	2 1/2"		350	2	2 1/2"	2 1/2"	3"	
300	350	4	-	2 1/2"	2 1/2"	3"		500	2	3"	3"	3 1/2"	
350	500	3	-	3"	3"	3"		2-4/0	2-1/0	2-2"	2-2"	2-2"	
400	500	3	-	3"	3"	3"		2-250	2-1/0	2-2 1/2"	2-2 1/2"	2-2 1/2"	
450	2-4/0	2-2	-	2-2"	2-2"	2-2 1/2"		2-300	2-1/0	2-2 1/2"	2-2 1/2"	2-3"	
500	2-250	2-2	-	2-2 1/2"	2-2 1/2"	2-2 1/2"		2-350	2-1/0	2-2 1/2"	2-2 1/2"	2-3"	
600	2-350	2-1	-	2-2 1/2"	2-2 1/2"	2-3"		2-500	2-2/0	2-3"	2-3"	2-3 1/2"	
700	2-500	2-1/0	-	2-3"	2-3"	2-3"		2-600	2-3/0	2-3"	2-3"	2-3 1/2"	
800	2-500	2-1/0	-	2-3"	2-3"	2-3 1/2"		3-400	3-3/0	3-3"	3-3"	3-3 1/2"	
1000	3-400	3-2/0	-	3-3"	3-3"	3-3"		3-600	3-4/0	-	3-3 1/2"	3-3 1/2"	
1200	3-600	3-3/0	-	3-3 1/2"	3-3 1/2"	3-3 1/2"		4-500	4-250	-	4-3"	4-3 1/2"	
1600	4-600	4-4/0	-	4-3 1/2"	4-3 1/2"	4-3 1/2"		5-600	5-350	-	5-3 1/2"	5-4"	
2000	5-600	5-250	-	5-3 1/2"	5-3 1/2"	5-3 1/2"		6-600	6-400	-	6-3 1/2"	6-4"	

GENERAL NOTES:
1. CONTRACTOR TO SIZE FEEDERS AND BRANCH CIRCUITS BASED ON THIS SCHEDULE AND OVER CURRENT DEVICE SIZE, UNLESS NOTED OTHERWISE.
2. CONTRACTOR MAY COMBINE 20A CIRCUITS AS NOTED IN SPECIFICATION.
3. CONDUCTORS ARE BASED ON THHN/THWN UP TO AND INCLUDING #4/0. LARGER THAN #4/0 ARE BASED ON TYPE XHHW.
4. CONDUIT SIZES ARE VALID FOR EMT OR RGS. CONDUIT SIZES SHALL BE ADJUSTED AS REQUIRED FOR OTHER TYPES OF CONDUIT.
5. ELECTRICAL CONTRACTOR TO COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE REQUIRED WIRE SIZES TO ACCOMMODATE MECHANICAL EQUIPMENT LUG SIZES.
6. SIZE OF DISCONNECT SWITCH LOCATED AT EQUIPMENT SHALL BE SIZED BASED UPON OVERCURRENT PROTECTION OF THAT DEVICE.
7. OBTAIN APPROVAL FROM ENGINEER PRIOR TO INSTALLING DIFFERENT SIZE/QUANTITY OF CONDUCTORS TO OBTAIN AN EQUIVALENT AMPACITY.
8. SPLICE FROM ALUMINUM TO COPPER PRIOR TO ENTERING EQUIPMENT LISTED FOR USE WITH COPPER CONDUCTORS ONLY OR USE COPPER CONDUCTORS FOR THE ENTIRE LENGTH OF FEEDER.
9. N/A = NOT ACCEPTABLE

KEYED NOTES:
1. CONDUCTORS ARE BASED ON 90°C, 600V. INSULATED WIRE APPLIED AT 75°C FOR TERMINATION RATED 60/75°C OR 75°C. FOR TERMINATION RATED AT 60°C, USE CONDUCTORS AND CONDUIT SIZES INDICATED IN PARENTHESES.

MOTOR CIRCUIT SIZING SCHEDULE (480V, 3 PHASE)

MOTOR HP	SWITCH/FUSE	CIRCUIT BREAKER	STARTER SIZE/TYPE	MOTOR DISCONNECT (NOTE 3)
1/2	30/3A	15A	1	30A
3/4	30/3A	15A	1	30A
1	30/6A	15A	1	30A
1 1/2	30/6A	15A	1	30A
2	30/6A	15A	1	30A
3	30/10A	15A	1	30A
5	30/15A	15A	1	30A
7 1/2	30/20A	20A	1	30A
10	30/20A	25A	1	30A
15	30/30A	40A	2	30A
20	60/40A	60A	2	60A
25	60/50A	70A	2	60A
30	60/60A	80A	3	60A
40	100/80A	90A	3	100A
50	100/100A	100A	3	100A
60	200/125A	125A	4	200A
75	200/150A	150A	4	200A
100	200/200A	200A	4	200A
125	200/200A	225A	5	200A
150	400/250A	250A	5	400A
200	400/350A	350A	5	400A

GENERAL NOTES:
1. BASED ON MOTOR FULL LOAD AMPERES AS PROVIDED BY THE N.E.C.
2. BASED ON MOTOR RUNNING OVERLOAD PROTECTIONS PROVIDED BY THERMAL OVERLOAD RELAYS.
3. WHERE THE STARTER IS LOCATED REMOTE FROM THE MOTOR, PROVIDE DISCONNECT LOCATED AT THE MOTOR, SIZE AS INDICATED.

NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT

DRY TYPE DISTRIBUTION TRANSFORMER CIRCUIT SIZING SCHEDULE

	PRIMARY (480V)	SECONDARY (208Y/120 VOLT)							
			CONDUCTOR SIZE (AWG OR KCMIL)						
			PHASE & NEUTRAL		SUPPLY SIDE BONDING JUMPER		CONDUIT (4W + SSBJ)		GROUNDING ELECTRODE CONDUCTOR	
TRANSFORMER KVA	OVERCURRENT PROTECTION	OVERCURRENT PROTECTION	COPPER	ALUMINUM	COPPER	ALUMINUM	COPPER	ALUMINUM	COPPER	ALUMINUM	KEYED NOTES
9	20A	30A	10	NA	8	NA	3/4"	NA	8	NA	
15	25A	60A	6	NA	8	NA	1"	NA	8	NA	1
30	45A	100A	3	1	8	6	1 1/4"	1 1/2"	8	6	1
45	70A	175A	2/0	4/0	4	2	2"	2 1/2"	4	2	
75	125A	300A/225A	350 / 4/0	500 / 300	2	1/0	3"	3 1/2"	2	1/0	2
112 1/2	175A	400A	600	2-250	1/0	2	3 1/2"	2-2 1/2"	1/0	1/0	
150	225A	600A	2-350	2-500	2-2	2-1/0	2-3"	2-3 1/2"	2/0	4/0	
225	350A	800A	2-600	3-400	2-1/0	3-1/0	2-3 1/2"	3-3"	3/0	4/0	
300	500A	1200A	3-600	4-500	3-1/0	4-1/0	3-3 1/2"	4-3 1/2"	3/0	250	
500	800A	1600A	4-600	5-600	4-1/0	5-3/0	4-3 1/2"	5-3 1/2"	3/0	250	

GENERAL NOTES:
1. TRANSFORMERS AND FEEDERS ARE BASED ON 480 VOLT, 3 PHASE, 3 WIRE PRIMARY AND 208Y/120 VOLT, 3 PHASE, 4 WIRE, SECONDARY.
2. ALUMINUM CONDUCTORS ARE PERMITTED ONLY IF INCLUDED IN FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE.
3. PRIMARY OVERCURRENT PROTECTION IS SIZED AT 125% OF TRANSFORMER FULL LOAD CURRENT. PROVIDE PRIMARY OVERCURRENT DEVICE SELECTION TO ALLOW TRANSFORMER IN-RUSH CURRENT AND PROTECT BASED ON THE ANSI DAMAGE CURVE. IF MANUFACTURER REQUIRES PRIMARY OVERCURRENT GREATER THAN 125% (NOT TO EXCEED 250%) THEN PRIMARY FEEDER SHALL BE INCREASED ACCORDINGLY
4. SECONDARY CONDUCTOR BASED ON TEN FOOT MAXIMUM LENGTH (NEC 240.21(C)(2)). IF CONDUCTORS ARE LONGER THAN TEN FOOT, REQUIREMENTS IN NEC 240.21(C)(6) MUST BE MET. IN NO CASE SHALL CONDUCTORS BE LONGER THAN TWENTY-FIVE FEET.

KEYED NOTES:
1. CONDUCTORS ARE BASED ON 90°C, 600V. INSULATED WIRE APPLIED AT 75°C FOR TERMINATION RATED 60/75°C OR 75°C.
2. THE SMALLER SIZE IS TO BE USED TO FEED 225A PANELBOARDS.

BRANCH CIRCUIT VOLTAGE DROP WIRING SCHEDULE FOR SINGLE PHASE CIRCUITS

BRANCH CIRCUIT RATING (A)	WIRE SIZE (AWG)	MAXIMUM BRANCH CIRCUIT LENGTH (IN FEET)				
		120V	208V	240V	277V	480V
20A	12	83	143	165	191	331
20A	10	128	222	256	295	511
20A	8	201	348	402	464	804
20A	6	313	542	625	721	1250
30A	10	85	148	170	197	341
30A	8	134	232	268	309	536
30A	6	208	361	417	481	833
30A	4	313	542	625	721	1250

GENERAL NOTES:
1. THE ABOVE TABLE VALUES ARE BASED ON COPPER CONDUCTORS, IN STEEL CONDUIT, WITH A LOAD POWER FACTOR OF 0.85 PER NEC CHAPTER 9, TABLE 9.
2. PROVIDE BRANCH CIRCUIT CONDUCTORS AS INDICATED IN THE TABLE ABOVE FOR ALL LIGHTING AND RECEPTACLE BRANCH CIRCUITS. WHERE BRANCH CIRCUITS SERVE DEDICATED EQUIPMENT, THE CONTRACTOR MAY PERFORM VOLTAGE DROP CALCULATIONS BASED ON ACTUAL EQUIPMENT CONNECTED LOAD AND PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO A MAXIMUM OF 3%.
3. CONDUCTOR SIZES ARE BASED ON MAXIMUM OF 9 CURRENT CARRYING CONDUCTORS IN A SINGLE CONDUIT.
4. LIMITS FOR CONDUCTOR LENGTHS SHOWN ARE BASED ON A MAXIMUM BRANCH CIRCUIT LOADING OF 64% OF THE BRANCH BREAKER RATING AND A MAXIMUM OF 3 PERCENT VOLTAGE DROP TO COMPLY WITH ASHRAE 90.1 AND THE NEC. FOR CIRCUITS LOADED GREATER THAN 64% OF BRANCH BREAKER RATING, THE CONTRACTOR SHALL PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO 3%.

RACEWAY / CONDUCTOR / CABLE APPLICATION SCHEDULE

	WIRE		RACEWAY													CABLE/CORD				
	COPPER, TYPE THHN/THWN-2	COPPER, TYPE XHHW-2	ALUMINUM, TYPE XHHW-2 (100A AND ABOVE ONLY)	ELECTRICAL METALLIC TUBING (EMT)	INTERMEDIATE METAL CONDUIT (IMC)	RIGID STEEL CONDUIT (RSC)	PVC COATED RIGID STEEL CONDUIT	RIGID NON-METALLIC CONDUIT (RNC) TYPE EPC-40	RIGID NON-METALLIC CONDUIT (RNC) TYPE EPC-80	HIGH DENSITY POLYETHYLENE (HDPE) SCHEDULE 40	HIGH DENSITY POLYETHYLENE (HDPE) SCHEDULE 80	FLEXIBLE METAL CONDUIT (FMC)	LIQUID TIGHT FLEXIBLE METAL CONDUIT (LFMC)	SURFACE RACEWAY	CABLE TRAY	METAL CLAD TYPE CABLE WITH INSULATED GROUND WIRE (TYPE MC)	TWO HOUR FIRE RATED MINERAL INSULATED CABLE (TYPE MI) (KEYED NOTE 1)	TRAY CABLE (TYPE TC)	TRAY CABLE EXPOSED RUNS (TYPE TC-ER)	POWER LIMITED CABLE
FEEDERS - EXTERIOR																				
EXPOSED, SURFACE MOUNTED TO STRUCTURE		X	X			X	X													
EXPOSED, WITH FREESTANDING SUPPORT		X	X			X	X													
CONCEALED IN RETAINING WALL OR SIMILAR ELEMENT		X	X				X	X	X											
BELOW PARKING LOTS AND ROADWAYS		X	X				X	X	X		X									
BELOW GREEN SPACE		X	X				X	X			X									
WITHIN 5' OF FOUNDATION WALL		X	X			X	X													
ROOFTOPS (WHEN APPROVED BY ENGINEER)		X	X			X	X	X												
FEEDERS - INTERIOR																				
CONCEALED, ACCESSIBLE CEILINGS	X			X	X															
CONCEALED, INACCESSIBLE CEILINGS	X			X	X															
CONCEALED IN GYPSUM BOARD PARTITION WALLS	X			X	X															
CONCEALED IN CMU WALLS	X			X	X															
EXPOSED, BELOW 10' AFF AND SUBJECT TO DAMAGE	X			X	X	X											X			
EXPOSED, BELOW 10' AFF AND NOT SUBJECT TO DAMAGE	X			X	X												X			
EXPOSED, ABOVE 10' AFF UNFINISHED SPACES	X			X	X												X			
EXPOSED, FINISHED SPACES	X			X										X						
BELOW SLAB ON GRADE	X			X		X	X	X	X								X			
DAMP AND WET LOCATIONS	X			X	X	X	X	X												
BRANCH CIRCUITS - EXTERIOR																				
EXPOSED, SURFACE MOUNTED TO STRUCTURE		X			X	X	X		X											
EXPOSED, WITH FREESTANDING SUPPORT		X			X	X	X													
CONCEALED IN RETAINING WALL OR SIMILAR ELEMENT		X			X	X	X													
BELOW PARKING LOTS AND ROADWAYS		X			X	X	X		X											
BELOW GREEN SPACE		X				X														
WITHIN 5' OF FOUNDATION WALL		X			X	X														
ROOFTOPS (WHEN APPROVED BY ENGINEER)		X			X	X	X													
BRANCH CIRCUITS - INTERIOR																				
CONCEALED, ACCESSIBLE CEILINGS	X			X	X											X				
CONCEALED, INACCESSIBLE CEILINGS	X			X	X															
CONCEALED IN GYPSUM BOARD PARTITION WALLS	X			X	X							X				X				
CONCEALED IN CMU WALLS	X			X	X															
EXPOSED, BELOW 10' AFF AND SUBJECT TO DAMAGE	X			X	X	X														
EXPOSED, BELOW 10' AFF AND NOT SUBJECT TO DAMAGE	X		X	X										X			X			
EXPOSED, ABOVE 10' AFF UNFINISHED SPACES	X		X	X																
EXPOSED, FINISHED SPACES	X													X						
BELOW SLAB ON GRADE	X						X													
EMBEDDED IN ELEVATED CONCRETE SLAB	X						X													
DAMP AND WET LOCATIONS	X				X	X	X	X					X							
SPECIAL APPLICATIONS																				
SERVICE ENTRANCE - UNDERGROUND		X	X					X	X	X	X	X								
SERVICE ENTRANCE - ABOVE GROUND		X	X	X	X	X														
CLASS 1 CONTROL CIRCUITS	X			X	X	X												X	X	
CLASS 2 CONTROL CIRCUITS	X			X	X	X								X				X	X	X
CLASS 3 CONTROL CIRCUITS	X			X	X	X								X				X	X	X
CONNECTIONS TO TRANSFORMERS, MOTORS AND VIBRATING EQUIPMENT		X											X							

GENERAL NOTES:
1. TRANSITION FROM PVC/HDPE AND PROVIDE RIGID STEEL OR RTRC SWEEPS WHERE CONDUITS PENETRATE WALLS, CONCRETE SLABS, CONCRETE BASES, AND ASPHALT.
2. REFER TO SPECIFICATIONS FOR RESTRICTIONS ON MC/AC CABLE INSTALLATION.
3. EMT SHALL NOT BE USED ON THE EXTERIOR OF A BUILDING OR IN AREAS SUBJECT TO DAMAGE BELOW 10' AFF.
4. INSTALL SURFACE RACEWAYS ONLY WHERE SHOWN ON DRAWINGS.

KEYED NOTES:
1. SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS BASED ON UL TESTING AND RATING.

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DRAWN: SMB | CHK'D: EMG
DESIGNED: SMB
APPRV'D: EMG
DATE: SEPTEMBER 19, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

ELECTRICAL STANDARD SCHEDULES

DRAWING NUMBER E0.2

ELECTRICAL

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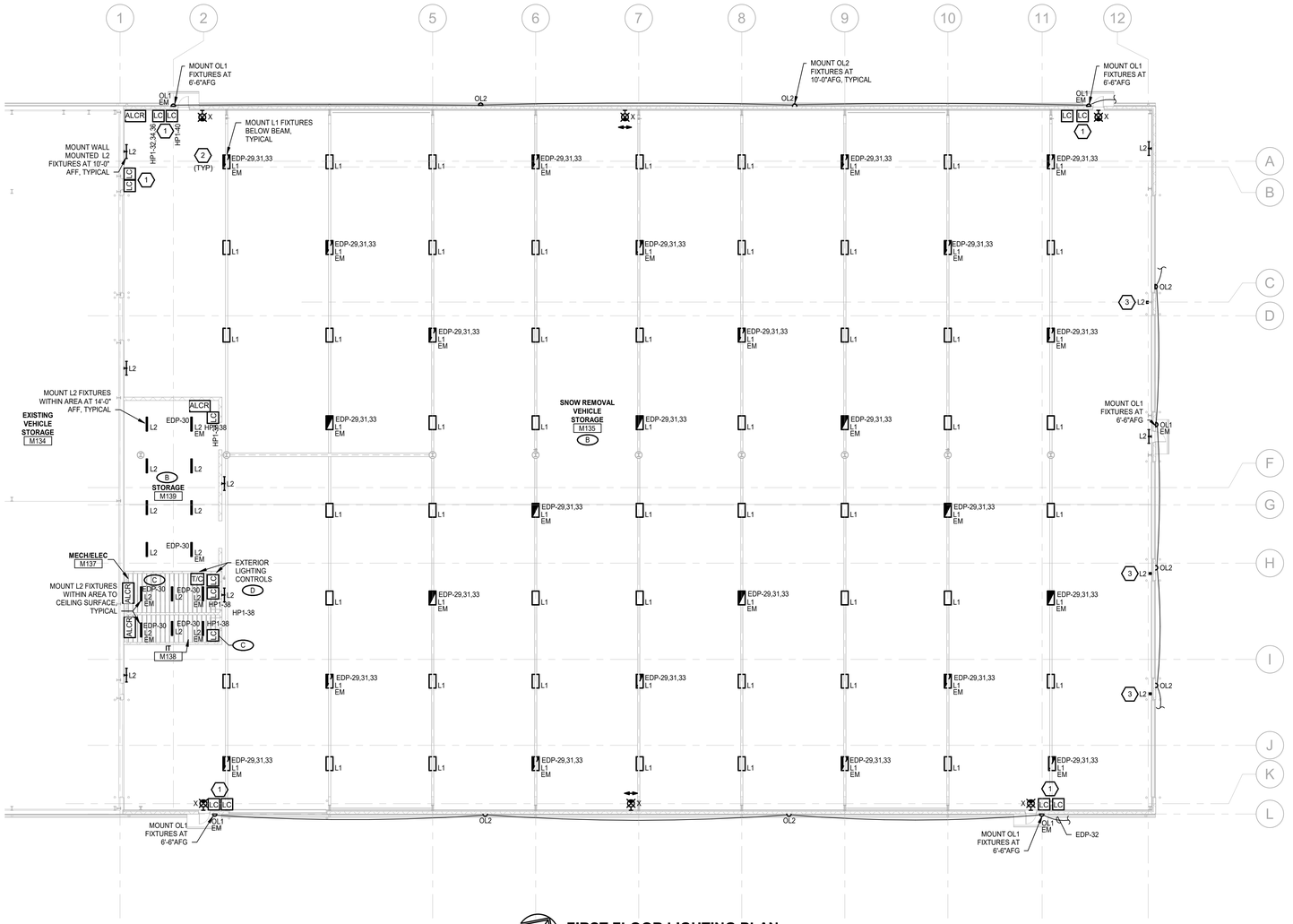

FIRST FLOOR LIGHTING PLAN
SCALE: 1/16" = 1'-0"

ELECTRICAL GENERAL NOTES:

1 THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

4 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

5 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

6 MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

9 REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.

10 REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.

11 THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.

12 REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.

13 ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. RE-TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT COMPLETION OF PROJECT.

CONSTRUCTION KEY NOTES:

1 PROVIDE (2) LOCAL CONTROLS FOR L1 FIXTURES AND L2 FIXTURES WITHIN SNOW REMOVAL VEHICLE STORAGE 135. PROVIDE SEPARATE CONTROL FOR EACH FIXTURE TYPE.

2 CIRCUIT EMERGENCY LIGHTING TO NEW LIGHTING INVERTER LOCATED IN MECH/ELEC 137. PROVIDE CIRCUIT FROM EDP FOR EMERGENCY LIGHTING FOR NORMAL OPERATION AND WHEN GENERATOR POWER TURNS ON.

3 MOUNT INDICATED LIGHTING FIXTURE VERTICALLY ON COLUMN AT 10'-0"AFF TO MIDDLE OF FIXTURE.

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DESIGNED: SMB
APPR'VD: EMG
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

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FIRST FLOOR LIGHTING PLAN

DRAWING NUMBER E2.1

ELECTRICAL

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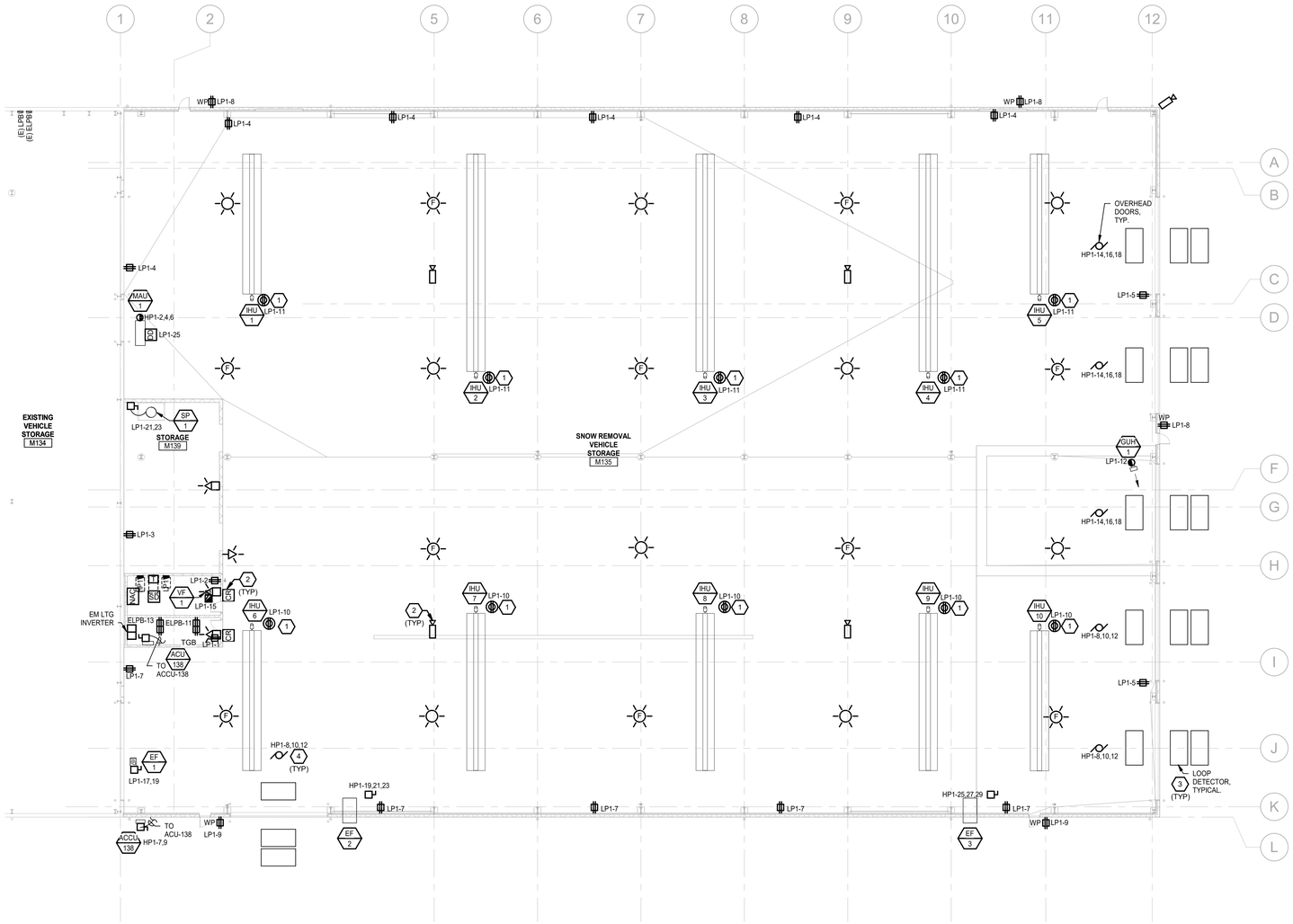

FIRST FLOOR POWER PLAN
SCALE: 1/16" = 1'-0"

ELECTRICAL GENERAL NOTES:

1 THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

4 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

5 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

6 MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

9 REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.

10 REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.

11 THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.

12 REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.

13 ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. RE-TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT COMPLETION OF PROJECT.

CONSTRUCTION KEY NOTES:

1 COORDINATE FINAL LOCATION OF CEILING MOUNTED RECEPTACLES WITH IHU POWER CORD LOCATION.

2 ELECTRICAL CONTRACTOR TO PROVIDE ROUGH INS FOR SECURITY SYSTEMS. REFER TO SECURE ALARM DRAWINGS FOR DETAILS OF DOOR SECURITY HARDWARE. TYPICAL FOR ALL SECURED DOORS.

3 REFER TO CP501 FOR LOOP DETECTOR DETAILS. RELATED JUNCTION BOX FOR ELECTRICAL WIRING TO BE PROVIDED BY ELECTRICAL CONTRACTOR. COORDINATE WITH LOOP DETECTOR MANUFACTURER.

4 COORDINATE EXACT CIRCUITING, BREAKER SIZE, AND CONTROLS WITH MANUFACTURER OF OVERHEAD DOORS.

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PBA Project No. 2022.0215

STATE OF MICHIGAN
ERIC MICHAEL GRAETTINGER
ENGINEER
No. 6201052164

ISSUED FOR BID

NO.	REVISION	DATE
1		

DRAWN: SMB
DESIGNED: SMB
APPRVD: EMG
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

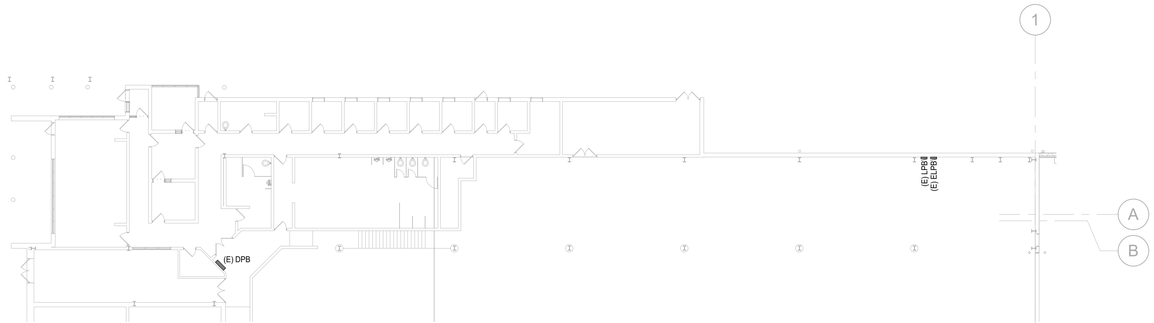
FIRST FLOOR POWER PLAN

DRAWING NUMBER E3.1

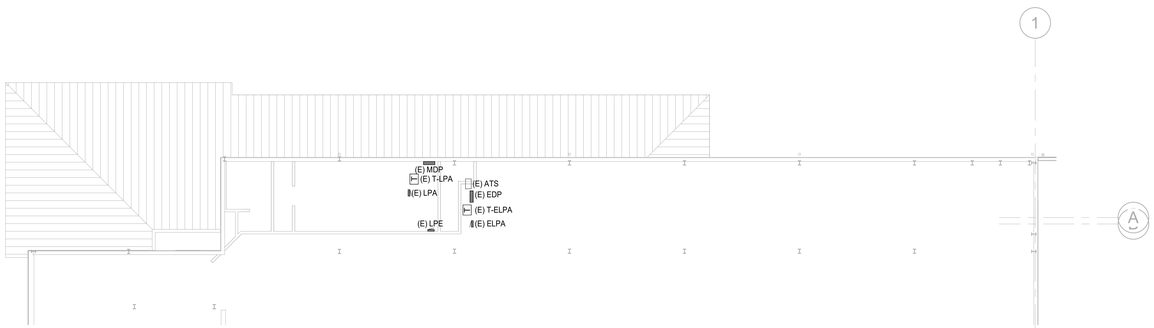
ELECTRICAL

9/15/2023 11:23:29 AM Autodesk Docs://GFIAA SNOW REMOVAL EQUIPMENT (SRE) FACILITY/2022-0215-MEP-GFIA SRE V22.rvt

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



FIRST FLOOR POWER EXISTING PLAN
SCALE: 1/16" = 1'-0"



MEZZANINE POWER EXISTING PLAN
SCALE: 1/16" = 1'-0"

ELECTRICAL GENERAL NOTES:

1 THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

4 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

5 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

6 MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

9 REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.

10 REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.

11 THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.

12 REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.

13 ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. RE-TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT COMPLETION OF PROJECT.

CONSTRUCTION KEY NOTES:

1 COORDINATE FINAL LOCATION OF CEILING MOUNTED RECEPTACLES WITH IHU POWER CORD LOCATION.

2 ELECTRICAL CONTRACTOR TO PROVIDE ROUGH INS FOR SECURITY SYSTEMS. REFER TO SECURE ALARM DRAWINGS FOR DETAILS OF DOOR SECURITY HARDWARE. TYPICAL FOR ALL SECURED DOORS.

3 REFER TO CP501 FOR LOOP DETECTOR DETAILS. RELATED JUNCTION BOX FOR ELECTRICAL WIRING TO BE PROVIDED BY ELECTRICAL CONTRACTOR. COORDINATE WITH LOOP DETECTOR MANUFACTURER.

4 COORDINATE EXACT CIRCUITING, BREAKER SIZE, AND CONTROLS WITH MANUFACTURER OF OVERHEAD DOORS.

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REGISTERED PROFESSIONAL ENGINEER

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PROJECT NUMBER 2241.7462.00

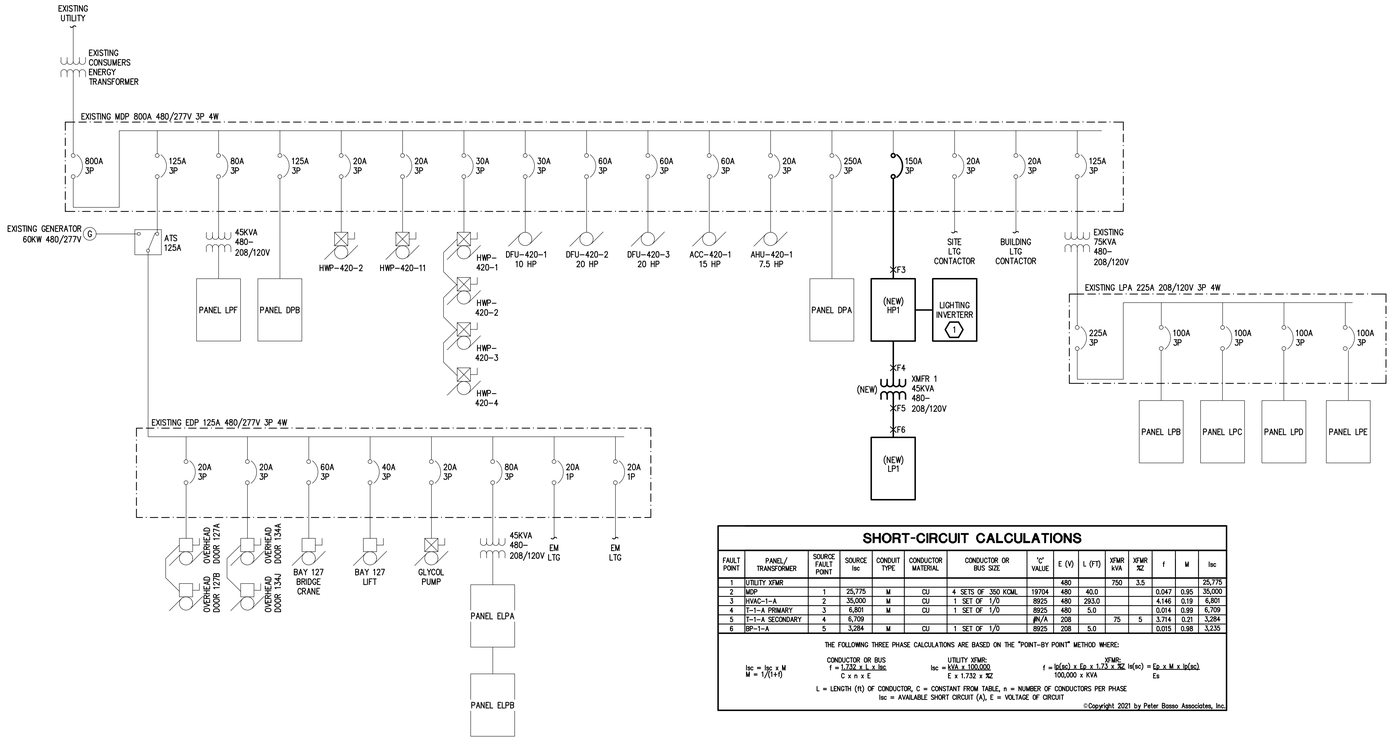
GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

EXISTING POWER PLANS

DRAWING NUMBER E3.2

ELECTRICAL

9/15/2023 11:23:31 AM Autodesk Docs://GFIAA SNOW REMOVAL EQUIPMENT (SRE) FACILITY/2022-0215-MEP-GFIA SRE V22.rvt



ONE LINE DIAGRAM

NO SCALE

SHORT-CIRCUIT CALCULATIONS

FAULT POINT	PANEL/ TRANSFORMER	SOURCE FAULT POINT	SOURCE Isc	CONDUIT TYPE	CONDUCTOR MATERIAL	CONDUCTOR OR BUS SIZE	'C' VALUE	E (V)	L (FT)	XFMR kVA	XFMR %Z	f	M	Isc
1	UTILITY XFMR							480		750	3.5			25,775
2	MDP	1	25,775	M	CU	4 SETS OF 350 KCMIL	19704	480	40.0			0.047	0.95	35,000
3	HVAC-1-A	2	35,000	M	CU	1 SET OF 1/0	8925	480	293.0			4.146	0.19	6,801
4	T-1-A PRIMARY	3	6,801	M	CU	1 SET OF 1/0	8925	480	5.0			0.014	0.99	6,709
5	T-1-A SECONDARY	4	6,709				#N/A	208		75	5	3.714	0.21	3,284
6	BP-1-A	5	3,284	M	CU	1 SET OF 1/0	8925	208	5.0			0.015	0.98	3,235

THE FOLLOWING THREE PHASE CALCULATIONS ARE BASED ON THE "POINT-BY POINT" METHOD WHERE:

Isc = Isc x M / M = 1/(1+f)

CONDUCTOR OR BUS: f = 1.732 x L x Isc / C x n x E

UTILITY XFMR: Isc = kVA x 100,000 / E x 1.732 x %Z

XFMR: f = Isc(pu) x Ep x 1.73 x %Z / 100,000 x KVA ; Isc(pu) = Ep x M x Isc(pu) / Es

L = LENGTH (ft) OF CONDUCTOR, C = CONSTANT FROM TABLE, n = NUMBER OF CONDUCTORS PER PHASE
Isc = AVAILABLE SHORT CIRCUIT (A), E = VOLTAGE OF CIRCUIT

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EXISTING MDP

VOLTAGE: 480Y/277 — MOUNTING: FLOOR
MAIN TYPE: M/S 800A — MINIMUM A.I.C.: 35,000
BUS AMPACITY: 800A — TVSS: NO
NEUTRAL: 100%

LOCATION: REMARKS:

CIRCUIT #	CIRCUIT BREAKER TRIP	CIRCUIT BREAKER POLE	LOAD DESCRIPTION	KVA CONN.	KVA DEMAND	FLA CONN.	FLA DEMAND
1	125	3	EXISTING EDP (480/277V)	95.0	102.6	114.3	123.4
2	80	3	EXISTING PANEL LPF (208/120V)	50.0	50.0	60.1	60.1
3	125	3	EXISTING PANEL DPB (480/277V)	37.5	46.9	45.1	56.4
4	20	3	EXIST HWP-420-2	11.6	11.6	14.0	14.0
5	20	3	EXIST HWP-420-11	11.6	11.6	14.0	14.0
6	30	3	EXIST HWP-420-1,HWP-420-2,HWP-420-3,HWP-420-4	17.5	17.5	21.0	21.0
7	30	3	DFU-420-1 (10HP) (NOT USED)				
8	60	3	DFU-420-2 (20HP) (NOT USED)				
9	60	3	DFU-420-3 (20HP) (NOT USED)				
10	60	3	ACC-420-1 (15HP)	17.5	17.5	21.0	21.0
11	20	3	AHU-420-1 (7.5HP)	9.1	9.1	10.9	10.9
12	250	3	EXISTING PANEL DPA (480/277V)	166.0	166.0	199.7	199.7
13	150A	3	NEW PANEL HP1 (480/277V)	46.9	48.2	56.4	58.0
14	20	3	EXISTING SITE LTG CONTACTOR	9.9	12.4	11.9	14.9
15	20	3	BUILDING LTG CONTACTOR	9.9	12.4	11.9	14.9
16	125	3	EXISTING LPA (208/120V)	83.0	83.0	99.8	99.8
			TOTALS:	565.4	588.8	680.1	708.2

DIAGRAM GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
2. FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE-GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
3. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "TRANSFORMER CIRCUIT SIZING SCHEDULE-GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
4. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH THE MOTOR CIRCUIT SIZING SCHEDULES ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
5. BASIS OF DESIGN IS SQUARE D DISTRIBUTION EQUIPMENT AND ASCO TRANSFER SWITCHES. IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT FROM OTHER APPROVED MANUFACTURERS, THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THE LAYOUT AND CLEARANCE REQUIREMENTS IN ALL SPACES CONTAINING ELECTRICAL EQUIPMENT AND PROVIDE EQUIPMENT MEETING THE SPECIFICATIONS AND ACHIEVING CODE REQUIRED CLEARANCES WITHIN THE SPACE PROVIDED.
6. SELECTIVE COORDINATION (PER NEC ARTICLES 517.31(G), 700.32 AND 701.27) IS BASED ON SQUARE D DISTRIBUTION EQUIPMENT AND ASCO TRANSFER SWITCHES. ELECTRICAL CONTRACTOR SHALL SUBMIT SELECTIVE COORDINATION STUDY WITH TIME CURRENT CHARACTERISTIC CURVES (AND TABLES FOR TESTED PAIR INSTANTANEOUS COORDINATION) FOR THE EMERGENCY SYSTEMS. ELECTRICAL CONTRACTORS SHALL RECEIVE APPROVED SHOP DRAWINGS BACK FROM ENGINEER OF RECORD PRIOR TO PURCHASING OR INSTALLING ANY ELECTRICAL DISTRIBUTION EQUIPMENT. BREAKERS MUST BE COORDINATED WITH AUTOMATIC TRANSFER SWITCHES 3-CYCLE WITHSTAND RATING. ALTERNATE MANUFACTURERS SHALL MEET SELECTIVE COORDINATION CRITERIA AT NO ADDITIONAL COST TO THE PROJECT.
7. VARIABLE FREQUENCY CONTROLLERS (VFC) FURNISHED BY MECHANICAL TRADES. ELECTRICAL CONTRACTOR SHALL INSTALL VFC, PROVIDE POWER FEEDER FROM DISTRIBUTION EQUIPMENT TO VFC AND PROVIDE POWER FEEDER FROM VFC TO MOTOR. REFER TO SPECIFICATIONS FOR APPLICATION OF VFC POWER CABLE FROM VFC TO MOTOR.
8. AT PROJECT COMPLETION ALL PANELBOARDS TO FOLLOW AIRPORT LABELING STANDARDS. ALL PANELBOARDS INDICATED ON ONE LINE SHALL INCLUDE:
   - 8.1. BUILDING NUMBER
   - 8.2. ROOM LOCATION
   - 8.3. PANEL DESIGNATION
   - 8.4. "FED FROM" – XXX
   - 8.5. FEED ROOM LOCATION
   - 8.6. VOLTAGE/PHASE/# WIRES

⟨#⟩ CONSTRUCTION KEY NOTES:

1. PROVIDE LIGHTING INVERTER IIS3P-4800-277/480IN-277/480OUT OR ENGINEER APPROVED EQUAL.

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APPRV'D: EMG
DATE: SEPTEMBER 18, 2023
PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

DRAWING NUMBER E5.1

ONE LINE DIAGRAM

ELECTRICAL

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NEW PANELBOARD HP1

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	ØA	ØB	ØC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	C				2915	3935			1020				NC	2
3	C	LP1		150	3439		4459		1020	15		MAU-1	NC	4
5	C				3364			4384	1020				NC	6
7	NC				1331	3076			1745				NC	8
9	NC	ACCU-138/ACU-138		20	1331		3076		1745	15		GARAGE DOORS - SOUTHEAST	NC	10
11		SPARE		20				1745	1745				NC	12
13		SPARE		20		1745			1745				NC	14
15		SPARE		20			1745		1745	15		GARAGE DOORS - NORTHEAST	NC	16
17		SPARE		20				1745	1745				NC	18
19	M				1830	1830				20		SPARE		20
21	M	EF-2		15	1830		1830			20		SPARE		22
23	M				1830			1830		20		SPARE		24
25	MH				1830	1830				20		SPARE		26
27	MH	EF-3		15	1830		1830			20		SPARE		28
29	MH				1830			1830		20		SPARE	L	30
31		SPARE		20		3036			3036				L	32
33		SPARE		20			3036		3036	15		LTG - SNOW REMOVAL 135 L1 FIXTURES	L	34
35		SPARE		20				3036	3036				L	36
37		SPARE		20		620			620	15		LTG - RMS 137-139	L	38
39		SPARE		20			430		430	15		LTG - SNOW REMOVAL 135 L2 FIXTURES	L	40
41		SPARE		20						20		SPARE		42
						16072	16406	14570						
						ØA	ØB	ØC						

PANELBOARD INFORMATION
VOLTAGE: 480Y/277
BUS AMPACITY: 225A
MAIN TYPE: 150A MCB
MINIMUM A.I.C.: 10,000
MOUNTING: SURFACE

☐ FEED-THROUGH LUGS
☐ DOUBLE LUGS
☐ INTEGRAL SPD

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD

		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT SIZING	
CONTINUOUS LOAD (C)	9718	100%	9718	125%	12148
ELECTRIC HEAT (E)		100%		100%	
NON-CONTINUOUS LOAD (NC)	16192	100%	16192	100%	16192
KITCHEN LOAD (K)		100%		100%	
RECEPTACLE BASE LOAD (R)		100%		100%	
RECEPTACLE DEMAND LOAD (R)		50%		100%	
LIGHTING LOAD (L)	10158	100%	10158	125%	12698
ADDITIONAL TRACK LIGHTING LOAD				100%	
MOTORS, HIGHEST LOAD (MH)	5490	125%	6863	100%	6863
MOTORS, REMAINING LOAD (M)	5490	100%	5490	100%	5490
		TOTAL(KVA):	48.42		
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED FROM CONNECTED LOAD		TOTAL (AMPS):	58	TOTAL (AMPS):	64

NOTES:

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NEW PANELBOARD LP1

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	ØA	ØB	ØC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	RCPT - IT 38			20	180	360			180	20		RCPT - MECHELEC 137	R	2
3	R	RCPT - CHEMICAL STORAGE 139			20	180		1260		1080	20		RCPT - SRVS 135 NORTH	R	4
5	R	RCPT - SRVS 135 EAST			20	360			360		20		SPARE		6
7	R	RCPT - SRVS 135 SOUTH			20	900	1440			540	20		RCPT - EXTERIOR NORTHEAST	R	8
9	R	RCPT - EXTERIOR SOUTH			20	360		1260		900	20		RCPT - IHUS 6-10	R	10
11	R	RCPT - IHUS 6-10			20	900			1296	396	20		GUH-1	NC	12
13		SPARE			20						20		SPARE		14
15	M	VF-1			15	126		126			20		SPARE		16
17	MH	EF-1			15	915			915		20		SPARE		18
19	MH					915	915				20		SPARE		20
21	M	SP-1			15	793		793			20		SPARE		22
23	M					793			793		20		SPARE		24
25	NC	DUCT DETECTOR			20	200	200				20		SPARE		26
27		SPARE			20						20		SPARE		28
29		SPARE			20						20		SPARE		30
31		SPARE			20						20		SPARE		32
33		SPARE			20						20		SPARE		34
35		SPARE			20						20		SPARE		36
37		SPARE			20						20		SPARE		38
39		SPARE FOR TC CONTROLS			20						20		SPARE		40
41		SPARE FOR TC CONTROLS			20						20		SPARE		42
						2915	3439	3364						
						ØA	ØB	ØC						

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 225A
MAIN TYPE: MLO
MINIMUM A.I.C.: 10,000
MOUNTING: SURFACE

☐ FEED-THROUGH LUGS
☐ DOUBLE LUGS
☐ INTEGRAL SPD

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD

		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT SIZING	
CONTINUOUS LOAD (C)		100%		125%	
ELECTRIC HEAT (E)		100%		100%	
NON-CONTINUOUS LOAD (NC)	596	100%	596	100%	596
KITCHEN LOAD (K)		100%		100%	
RECEPTACLE BASE LOAD (R)	5580	100%	5580	100%	5580
RECEPTACLE DEMAND LOAD (R)		50%		100%	
LIGHTING LOAD (L)		100%		125%	
ADDITIONAL TRACK LIGHTING LOAD				100%	
MOTORS, HIGHEST LOAD (MH)	1830	125%	2288	100%	2288
MOTORS, REMAINING LOAD (M)	1712	100%	1712	100%	1712
		TOTAL(KVA):	10.18		
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED FROM CONNECTED LOAD		TOTAL (AMPS):	28	TOTAL (AMPS):	28

NOTES:

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EXISTING PANELBOARD EDP

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	ØA	ØB	ØC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	C		EXIST		8160	17578			9418		EXIST		MH	2
3	C	ELPA	EXIST	80	6560		15978		9418	60	EXIST	BAY 127 BRIDGE CRANE	MH	4
5	C		EXIST		7360			16778	9418		EXIST		MH	6
7	M		EXIST		1000	6817			5817		EXIST		M	8
9	M	OVERHEAD DOOR 217 A & B	EXIST	20	1000		6817		5817	40	EXIST	BAY 127 LIFT	M	10
11	M		EXIST		1000			6817	5817		EXIST		M	12
13	M		EXIST		1000	3000			2000		EXIST		M	14
15	M	OVERHEAD DOOR 134	EXIST	20	1000		3000		2000	20	EXIST	GLYCOL PUMP	M	16
17	M		EXIST		1000			3000	2000		EXIST		M	18
19		SPARE	EXIST	20						20	EXIST	SPARE - OFF		20
21		SPARE	EXIST	20						20	EXIST	SPARE - OFF		22
23		SPARE	EXIST	20						20	EXIST	SPARE - OFF		24
25	L	(E) LIGHTING OFFICE AREA	EXIST	20	1000	1000				20	EXIST	SPARE - OFF		26
27	L	(E) LIGHTING VEH STORAGE AREA	EXIST	20	1000		2000		1000	20	EXIST	(E) LIGHTING OFFICE AREA	L	28
29	L		NEW		1100			1346	246	20	NEW	LTG - RMS 137-139 (EM LTG, INVERT BACKUP)	L	30
31	L	EM LTG (INITIAL BACK-UP PROVIDED BY INVERTER)	NEW	15	1100	1280			180	20	NEW	EXTERIOR LIGHTING	L	32
33	L		NEW		1100		1100					SPACE		34
35		SPACE										SPACE		36
37		SPACE										SPACE		38
39		SPACE										SPACE		40
41		SPACE										SPACE		42
						29675	28895	27941						
						ØA	ØB	ØC						

PANELBOARD INFORMATION
VOLTAGE: 480Y/277
BUS AMPACITY: 225A
MAIN TYPE: MLO
MINIMUM A.I.C.: 35,000
MOUNTING: SURFACE

☐ FEED-THROUGH LUGS
☐ DOUBLE LUGS
☐ INTEGRAL SPD

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD

		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT SIZING	
CONTINUOUS LOAD (C)	22080	100%	22080	125%	27600
ELECTRIC HEAT (E)		100%		100%	
NON-CONTINUOUS LOAD (NC)		100%		100%	
KITCHEN LOAD (K)		100%		100%	
RECEPTACLE BASE LOAD (R)		100%		100%	
RECEPTACLE DEMAND LOAD (R)		50%		100%	
LIGHTING LOAD (L)	6726	100%	6726	125%	8408
ADDITIONAL TRACK LIGHTING LOAD				100%	
MOTORS, HIGHEST LOAD (MH)	28254	125%	35318	100%	35318
MOTORS, REMAINING LOAD (M)	29451	100%	29451	100%	29451
		TOTAL(KVA):	93.57		
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED FROM CONNECTED LOAD		TOTAL (AMPS):	113	TOTAL (AMPS):	121

NOTES:
LOAD REMOVED FROM PANEL EXCEEDS ADDED LOAD

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EXISTING PANELBOARD ELPA

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	ØA	ØB	ØC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	C		EXIST		4360	4860			500		EXIST	SOUTH GATE	NC	2
3	C	ELPB	EXIST	100	4000		4500		500	20	EXIST		NC	4
5	C		EXIST		4360			4560	200	20	EXIST	SECURE ALARM PANEL	C	6
7	R	DBL DUPLEX	EXIST	20	360	860			500	20	EXIST	NORTH GATE	NC	8
9		SPARE	EXIST	20			500		500		EXIST		NC	10
11		SPARE	EXIST	20				200	200	20	EXIST	FIRE ALARM BELL SMOKE DETECTOR	C	12
13		SPARE	EXIST	20						20	EXIST	SPARE		14
15		SPARE	EXIST	20			200		200	20	EXIST	CONTROL POWER	C	16
17	NC	LOW VOLTAGE DOOR LOCK OFFICE	EXIST	20	200			700	500	20	EXIST	BAY 127 BAYLIFT	NC	18
19		KITCHEN (RECIRCUIT TO LPD)	EXIST	20		540			540	20	EXIST	CHORD REELS BAY 127	R	20
21		KITCHEN (RECIRCUIT TO LPD)	EXIST	20						20	EXIST	SPARE		22
23		KITCHEN (RECIRCUIT TO LPD)	EXIST	20				540	540	20	EXIST	BAY 127	R	24
25	R	OFFICE	EXIST	20	360	900			540	20	EXIST	BAY 127	R	26
27	R	OFFICE	EXIST	20	360		860		500	20	EXIST	PHONE ROOM	R	28
29	R	OFFICE	EXIST	20	360			860	500		EXIST		R	30
31		SPARE	EXIST	20		500			500	20	EXIST	ITE CLOSET MINI SPLIT	NC	32
33		LATHE (RECIRCUIT TO LPC)	EXIST	20			500		500		EXIST		NC	34
35			EXIST					500	500	20	EXIST	ATT OUTLET 201	R	36
37		DRILL PRESS (RECIRCUIT TO LPC)	EXIST	20		500			500		EXIST		R	38
39			EXIST							20	EXIST	SPARE		40
41		SPARE	EXIST	20						20	EXIST	SPARE		42
						8160	6560	7360						
						ØA	ØB	ØC						

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 225A
MAIN TYPE: 150A MCB
MINIMUM A.I.C.: 10,000
MOUNTING: SURFACE

☐ FEED-THROUGH LUGS
☐ DOUBLE LUGS
☐ INTEGRAL SPD

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD

		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT SIZING	
CONTINUOUS LOAD (C)	13320	100%	13320	125%	16650
ELECTRIC HEAT (E)		100%		100%	
NON-CONTINUOUS LOAD (NC)	3700	100%	3700	100%	3700
KITCHEN LOAD (K)		50%		100%	
RECEPTACLE BASE LOAD (R)	5060	100%	5060	100%	5060
RECEPTACLE DEMAND LOAD (R)		50%		100%	
LIGHTING LOAD (L)		100%		125%	
ADDITIONAL TRACK LIGHTING LOAD				100%	
MOTORS, HIGHEST LOAD (MH)		125%		100%	
MOTORS, REMAINING LOAD (M)		100%		100%	
		TOTAL(KVA):	22.08		
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED FROM CONNECTED LOAD		TOTAL (AMPS):	61	TOTAL (AMPS):	71

NOTES:
RECIRCUIT EXISTING CIRCUITS 19,21,23 TO OPEN SPARE CIRCUITS IN LPD
RECIRCUIT EXISTING CIRCUITS 33,35,37,39 TO OPEN SPARE CIRCUITS IN LPD

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EXISTING PANELBOARD ELPB

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	ØA	ØB	ØC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1		SPACE										SPACE		2
3		SPACE										SPACE		4
5		SPACE										SPACE		6
7		SPACE										SPACE		8
9		SPACE										SPACE		10
11	R	RCPT - IT 138	NEW	20	360			360				SPACE		12
13	R	RCPT - IT 138	NEW	20	360	360						SPACE		14
15	NC	CARD READER	EXIST	15	500		500					SPACE		16
17	NC		EXIST		500			500		20	EXIST	SPARE		18
19	M	DIESEL #2 SUCTION MOTOR	EXIST	20	1000	2000			1000	20	EXIST	DIESEL #6 SUCTION MOTOR	M	20
21	MH		EXIST		1000		2000		1000		EXIST		M	22
23	M	DIESEL #1 SUCTION MOTOR	EXIST	20	1000			2000	1000	20	EXIST	DIESEL #5 SUCTION MOTOR	M	24
25	M		EXIST		1000	2000			1000		EXIST		M	26
27	NC	DISPENSER POWER	EXIST	15	500		1500		1000	20	EXIST	GAS 5 3&4 SUCTION MOTOR	M	28
29	NC		EXIST		500			1500	1000		EXIST		M	30
						4360	4000	4360						
						ØA	ØB	ØC						

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 100A
MAIN TYPE: MLO
MINIMUM A.I.C.: 10,000
MOUNTING: SURFACE

☐ FEED-THROUGH LUGS
☐ DOUBLE LUGS
☐ INTEGRAL SPD

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD

		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT SIZING	
CONTINUOUS LOAD (C)		100%		125%	
ELECTRIC HEAT (E)		100%		100%	
NON-CONTINUOUS LOAD (NC)	2000	100%	2000	100%	2000
KITCHEN LOAD (K)		100%		100%	
RECEPTACLE BASE LOAD (R)	720	100%	720	100%	720
RECEPTACLE DEMAND LOAD (R)		50%		100%	
LIGHTING LOAD (L)		100%		125%	
ADDITIONAL TRACK LIGHTING LOAD				100%	
MOTORS, HIGHEST LOAD (MH)	2000	125%	2500	100%	2500
MOTORS, REMAINING LOAD (M)	8000	100%	8000	100%	8000
		TOTAL(KVA):	13.22		
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED FROM CONNECTED LOAD		TOTAL (AMPS):	37	TOTAL (AMPS):	37

NOTES:

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EXISTING PANELBOARD LPC

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	ØA	ØB	ØC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R			60	4900	5440			540	20		OFFICE RCPT	R	2
3	R	240V WELDING RCPT			4900		5900		1000	20		AIR DRYER	NC	4
5	R	BAY 132 & 131		20	180			720	540	20		COMPRESSER ROOM	R	6
7	R	BAY 129		20	180	720			540	20		BAY 130	R	8
9	NC	HEATER WASH BAY EQUIP		20	1500		2500		1000	20		CAN LIGHTS SHOWERS	L	10
11	R	BAY 130		20	540			1080	540	20		TOOLS	R	12
13	NC	LATHE	NEW	20	500	1040			540	20		TOOLS	R	14
15	NC		NEW		500		1500		1000	20		WASH BAY EQUIP	NC	16
17		SPARE (OFF)		20				540	540	20		VEHICLE STORAGE	R	18
19	NC	CONTROL POWER BAY LIFT		20	500	500				20		SPARE		20
21	R	WORK SHOP		20	180		720		540	20		OUTSIDE	R	22
23	R	WORK SHOP		20	180			720	540	20		WORK SHOP	R	24
25	R	WORK SHOP		20	180	720			540	20		WORK SHOP	R	26
27	R	WORK SHOP		20	180		680		**500**	**20**		**DRILL PRESS**	**NC**	28
29	MH	EF WASH BAY EQUIP RM		20	1500			2000	**500**				**NC**	30
31		SPARE		20		1000			1000	20		HOT WATER HEATER	NC	32
33	R	CHORD REELS BAY 130		20	540		2040		1500	20		EF REPAIR BAY 130	M	34
35		SPARE (OFF)		20				1500	1500	20		EF WASH BAY 131	M	36
37						1500			1500	20		EF WASH BAY 132	M	38
39		SPARE		20			540		540	20		ROOF TOP	R	40
41														42
						10920	13880	6560						
						ØA	ØB	ØC						

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 100A
MAIN TYPE: MLO
MINIMUM A.I.C.: 10,000
MOUNTING: SURFACE

☐ FEED-THROUGH LUGS
☐ DOUBLE LUGS
☐ INTEGRAL SPD

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD

		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT SIZING	
CONTINUOUS LOAD (C)		100%		125%	
ELECTRIC HEAT (E)		100%		100%	
NON-CONTINUOUS LOAD (NC)	7000	100%	7000	100%	7000
KITCHEN LOAD (K)		100%		100%	
RECEPTACLE BASE LOAD (R)	10000	100%	10000	100%	10000
RECEPTACLE DEMAND LOAD (R)	7360	50%	3680	100%	3680
LIGHTING LOAD (L)	1000	100%	1000	125%	1250
ADDITIONAL TRACK LIGHTING LOAD				100%	
MOTORS, HIGHEST LOAD (MH)	1500	125%	1875	100%	1875
MOTORS, REMAINING LOAD (M)	4500	100%	4500	100%	4500
		TOTAL(KVA):	28.06		
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED FROM CONNECTED LOAD		TOTAL (AMPS):	78	TOTAL (AMPS):	79

NOTES:

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EXISTING PANELBOARD LPD

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	ØA	ØB	ØC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	MICROWAVE		20	1000	2000			1000	20		HEATERS	NC	2
3	R	MICROWAVE		20	1000		1540		540	20		DINING	R	4
5	R	KITCHEN (FROM ELPA)		20	800			1340	540	20		ENTRY	R	6
7	R	OUTSIDE		20	540	1080			540	20		KITCHEN	R	8
9	R	KITCHEN		20	360		900		540	20		KITCHEN	R	10
11	R	KITCHEN		20	360			900	540	20		KITCHEN	R	12
13	R	KITCHEN (FROM ELPA)		20	800	800				20		SPARE (OFF)		14
15	R	KITCHEN		20	360		900		540	20		KITCHEN	R	16
17	R	KITCHEN		20	360			900	540	20		KITCHEN	R	18
19	R	HALLWAY		20	540	2040			1500	20		MINI SPLIT	NC	20
21	R	KITCHEN (FROM ELPA)		20	800		2300		1500				NC	22
23	R	BATHROOMS		20	540			1080	540	20		HALLWAYS	R	24
25	R	BATH/LAUNDRY		20	540	540				20		SPARE (OFF)		26
27		SPARE (OFF)		20			540		540	20		BUNK ROOM	R	28
29	R	BUNK ROOM		20	540			1080	540	20		BUNK ROOM	R	30
31	R	HALLWAY/BUNK ROOM		20	540	1080			540	20		PARTS	R	32
33		SPARE (OFF)		20			540		540	20		TV'S	R	34
35	R	JANITORS		20	540			1040	500	20		FUEL RECORDER	R	36
37														38
39														40
41														42
						7540	6720	6340						
						ØA	ØB	ØC						

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 100A
MAIN TYPE: MLO
MINIMUM A.I.C.: 10,000
MOUNTING: SURFACE

☐ FEED-THROUGH LUGS
☐ DOUBLE LUGS
☐ INTEGRAL SPD

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD

		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT SIZING	
CONTINUOUS LOAD (C)		100%		125%	
ELECTRIC HEAT (E)		100%		100%	
NON-CONTINUOUS LOAD (NC)	4000	100%	4000	100%	4000
KITCHEN LOAD (K)		100%		100%	
RECEPTACLE BASE LOAD (R)	10000	100%	10000	100%	10000
RECEPTACLE DEMAND LOAD (R)	6600	50%	3300	100%	3300
LIGHTING LOAD (L)		100%		125%	
ADDITIONAL TRACK LIGHTING LOAD				100%	
MOTORS, HIGHEST LOAD (MH)		125%		100%	
MOTORS, REMAINING LOAD (M)		100%		100%	
		TOTAL(KVA):	17.30		
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED FROM CONNECTED LOAD		TOTAL (AMPS):	48	TOTAL (AMPS):	48

NOTES:

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PBA Project No.: 2022.0215

STATE OF MICHIGAN
ERIC MICHAEL GRAETTINGER
ENGINEER
No. 6201052192
REGISTERED PROFESSIONAL ENGINEER

ISSUED FOR BID

NO.	REVISION	DATE

DRAWN: -
DESIGNED: -
APPRV'D: -
CHK'D: -
DATE: SEPTEMBER 18, 2023

PROJECT NUMBER 2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

PANEL SCHEDULES

DRAWING NUMBER E5.2

ELECTRICAL

g:\2022\2022-0215-00\CAD\2022-0215-E5-Std.dwg, E5.2, 9/15/2023 11:26:38 AM, Suha A. Matti, Peter Basso Associates Inc.

LIGHTING CONTROL SCHEDULE

PLAN REFERENCE	ROOM TYPE	LOCAL CONTROL		CONTROL ON / OFF	SENSOR TYPE	TURN ON LIGHTING TO %	BI-LEVEL CONTROL	NO DETECTION FULL OFF (MIN)	EMERGENCY LIGHTING CIRCUIT CONTROL	NOTES
		SWITCH TYPE	SWITCH CONTROL							
A	VEHICULAR MAINTENANCE AREA	LOW VOLTAGE	ON-OFF-DIM	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	20	ALCR	
B	STORAGE ROOM (ALL OTHER STORAGE ROOMS)	LOW VOLTAGE	ON-OFF	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	N/A	20	ALCR	
C	ELECTRICAL/MECHANICAL ROOM	LINE VOLTAGE	ON-OFF	MANUAL ON / MANUAL OFF	N/A	N/A	N/A	N/A	ALCR	
D	EXTERIOR	LINE VOLTAGE	ON-OFF	SENSOR ON / SENSOR OFF	N/A	N/A	N/A	N/A	ALCR	PROVIDE PHOTOCELL CONTROL PER MANUFACTUERES RECOMMENDATION

NOTE:
1. REFER TO PLANS FOR LOCATION OF LOCAL CONTROL.
2. REFER TO PLANS FOR SCENE CONTROL.
3. PROVIDE EMERGENCY LIGHTING CIRCUIT CONTROL (BCELTS OR ALCR) PER SWITCHING CIRCUIT AS REQUIRED.
4. CONTRACTOR SHALL PROVIDE FLOOR PLAN INDICATING SENSOR AND EQUIPMENT LOCATIONS OF CHOSEN CONTROL SYSTEM.
5. PROVIDE WIRING CONTROL DIAGRAM FOR APPLICABLE CONTROL SYSTEM(S).

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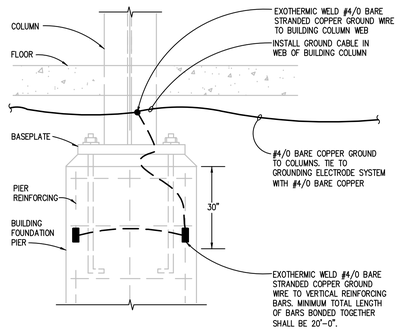
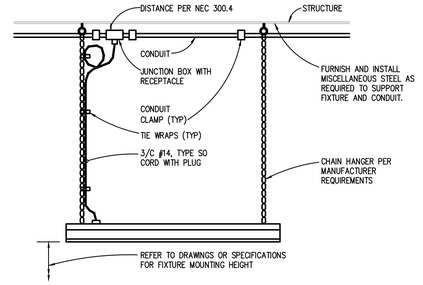
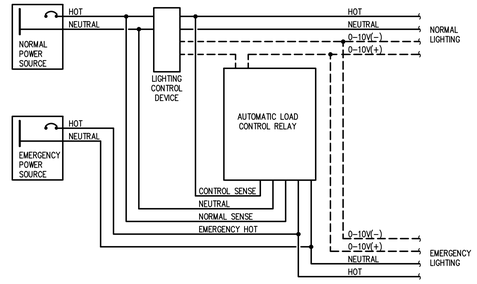


COLUMN GROUNDING DETAIL
NO SCALE



TYPICAL MOUNTING DETAIL FOR CHAIN HUNG LIGHTING FIXTURES
NO SCALE



AUTOMATIC LOAD CONTROL RELAY FOR 0-10V DIMMING
NO SCALE
NOTES:

1. BASIS OF DESIGN IS LVS CONTROLS EPC-2-D. REFER TO SPECIFICATIONS FOR APPROVED MANUFACTURERS. ADJUST WIRING AS NECESSARY FOR OTHER APPROVED MANUFACTURERS.
2. PROVIDE ONE AUTOMATIC LOAD CONTROL RELAY FOR EACH CONTROL CIRCUIT.

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PBA Project No. 2022.0215

STATE OF MICHIGAN
ERIC MICHAEL GRAETTINGER
ENGINEER
No. 6201052164
REGISTERED PROFESSIONAL ENGINEER

ISSUED FOR BID

NO.	REVISION	DATE

DRAWN: SAB | CHK'D: EMG
DESIGNED: -
APPRV'D: EMG
DATE: SEPTEMBER 19, 2023

PROJECT NUMBER
2241.7462.00

GERALD R. FORD INTERNATIONAL AIRPORT
SRE BUILDING EXPANSION

ELECTRICAL DETAILS AND DIAGRAMS

DRAWING NUMBER
E7.1

ELECTRICAL

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GERALD R. FORD International Airport

DRAWING INDEX

SAS-0.0	COVER PAGE AND DRAWING INDEX		
SAS-0.1	DEVICE LEGEND		
SAS-1.0	DESIGN FLOOR PLAN		
SAS-2.0	-		
SAS-3.0	-		
SAS-3.1	-		
SAS-3.2	-		
SAS-4.0	-		
SAS-5.0	DOOR DETAILS		
SAS-5.1	VIDEO DETAILS		
SAS-5.2	FIRE ALARM DETAILS		

SITE LOCATION MAP

5500 44TH ST SE, GRAND RAPIDS, MI

	SPECIAL CONSIDERATIONS	PERSON RESPONSIBLE
#1		
#2		
#3		
#4		
#5		

	OPEN ITEM	PERSON RESPONSIBLE	RESOLUTION
ITEM #1			
ITEM #2			

WIRE LEGEND

CABLE TYPE	DESCRIPTION
A	22 AWG / 4C NON-SHLD PLENUM
B	18 AWG / 6C SHIELDED PLENUM
C	18 AWG / 4C NON-SHLD PLENUM
D	22AWG / 6C SHIELDED PLENUM
E	16AWG / 2C NON-SHLD PLENUM
EX	EXISTING CABLE
F	RG59/U 20AWG PLENUM -K RG59- 18/2 SIAMESE
G	14 AWG SOLID BARE COPPER GROUNDING WIRE
H	RG6/U 18AWG PLENUM
I	24 AWG / 4 PAIR CAT 5E – NON-SHLD PLENUM
J	23 AWG / 4 PAIR CAT6E – NON-SHLD PLENUM
K	18 AWG / 2C NON-SHLD PLENUM -F 18 AWG-2C FLAT
M	18 AWG-4 CABLE COMPOSITE CABLE PLENUM -(C) CABLE 1: 18AWG / 4C LOCK POWER -(B) CABLE 2: 18AWG/ 2C & 22AWG / 4C CARD READER -(Q) CABLE 3: 22AWG / 2C DOOR CONTACT -(A) CABLE 4: 22AWG / 4C REQUEST TO EXIT
Q	22 AWG / 2C NON-SHLD PLENUM
T	14- 14 AWG THHN 16- 16 AWG THHN 18- 18 AWG THHN
U	16 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 16AWG-2C FPLP SHIELDED -S C° 16AWG- 2C FPLP SHIELDED/ FREEZER RATED -U 16AWG-2C FPL NON-SHLD UNDERGROUND
V	12 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP)
X	14 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 14AWG-2C FPLP SHIELDED -S C° 14AWG- 2C FPLP SHIELDED/ FREEZER RATED
Y	18 AWG / 2C SOLID, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 18AWG-2C FPLP SHIELDED -C° 18AWG-2C FPLP NON-SHLD FREEZER RATED -S C° 18AWG- 2C FPLP SHIELDED FREEZER RATED -U 18AWG-2C FPL NON-SHLD UNDERGROUND
Z	18 AWG / 4C SOLID, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 18AWG-4C FPLP SHIELDED -U 18AWG-4C FPL NON-SHLD UNDERGROUND

GERALD R. FORD International Airport

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REVISIONS

DATE	JOB NUM #	DESCRIPTION	BY
08/22/23	XXXXX	DESIGN	BJK

NORTH

GFIAA
SRE BUILDING EXPANSION
5500 44TH ST SE
GRAND RAPIDS, MI

SECURALARM
821 47TH ST. SW, GRAND RAPIDS, MI 49509
PHONE: (616) 773-6300 FAX (616) 773-6301
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SHEET NAME: **COVER PAGE & DRAWING INDEX**

SHEET# **SAS-0.0**

Plot Date: 8/22/2023 1:43:32 PM File Name: GFIAA SRE.dwg Plotted by: ben kramer

DEVICE LEGEND

ACE	ACCESS CONTROL ENCLOSURE	PWR	CRASH BAR POWER SUPPLY (REQUIRES 110VAC) — A = ALTRONIX POWER SUPPLY; # = DOOR # POWER SUPPLY
PWR	ACCESS CONTROL POWER SUPPLY (REQUIRES 110VAC)	PX	PUSH TO EXIT BUTTON
AO	ADA AUTO OPERATOR	RX	REQUEST TO EXIT BUILT IN
CR	CARD READER — LR = LONG RANGE; BIO = BIOMETRIC; M = MULLION; EL = ELEVATOR; KP = KEYPAD; W = WALL	SP	SPEAKER
DRB	DOOR RELEASE BUTTON	WC	WINDOW CONTACT
DB	DURESS BUTTON	TST	TURNSTILE
DC	DOOR CONTACT — DPDT = DOUBLE POLE DOUBLE THROW; OH = OVERHEAD; R = RECESS; S = SURFACE	UPS	UNINTERRUPTABLE POWER SUPPLY
DDC	DOUBLE DOOR CONTACTS — DPDT = DOUBLE POLE DOUBLE THROW; R = RECESS; S = SURFACE	VR1	ALTRONIX VR1 VOLTAGE REGULATOR
EA	EMBARRESMENT ALARM	WB	WATER BUG DETECTOR
EL	ELECTRIC LOCK SET	xxx	WIRELESS
ES	ELECTRIC STRIKE	NHE	NETWORK HEAD END CLOSET
ETH	ELECTRIC TRANSFER HINGE	IC	INTERCOM — SM=SOFTWARE MASTER; DM=DESKTOP MASTER; SS=SUBSTATION; MS=MASTER; VS=VIDEO SUBSTATION; VM=VIDEO MASTER
GB	GLASS BREAK DETECTOR	RCV	WIRELESS NETWORK RECEIVER
HU	HOLD UP	TSM	WIRELESS NETWORK TRANSMITTER
INT	INTRUSION ONLY PANEL		FIXED MINI DOME INDOOR CAMERA
KP	KEYPAD		
KS	KEYSWITCH		FIXED MINI DOME OUTDOOR CAMERA
LD	LOCK DOWN BUTTON		
LR	ELECTRIC LATCH RETRATION BAR — REX = BUILT IN REQUEST TO EXIT		PAN/ TILT/ ZOOM (PTZ) CAMERA OUTDOOR CAMERA
LT HT	LOW TEMP/ HIGH TEMP		
MD	MOTION DETECTOR — CR = CORNER; C = CEILING; W = WALL		180 DEGREE MULTI-LENS OUTDOOR CAMERA
ML	ELECTROMAGNETIC LOCK		
MX	MOTION TO EXIT		360 DEGREE MULTI-LENS DOME OUTDOOR CAMERA
POC	POINT OF CONNECTION — V = VON DUPRIN POWER SUPPLY		

FIRE DEVICE LEGEND

DD	DUCT DETECTOR	NAC	NOTIFICATION APPLICATION CIRCUIT
DDR	DUCT DETECTOR RESET RELAY	PB	PUSH BUTTON
DE	DELAYED EGRESS	PIV	POST INDICATOR VALVE - POINT OF CONNECTION
FAAP	FIRE ALARM ANNUNCIATOR PANEL	PC	POINT OF CONTACT
FACP	FIRE ALARM CONTROL PANEL	PS	PULLSTATION
FAI	FIRE ALARM AND INTRUSION CONTROL PANEL	PW	PROTECTAWIRE - POINT OF CONNECTION
FCM	ADDRESSABLE CONTROL MODULE	RV	DELUGE RELEASING VALVE
FDM	ADDRESSABLE DUAL MONITOR MODULE	S	SPEAKER
FMM	ADDRESSABLE SINGLE MONITOR MODULE	SA	SPEAKER AMP
FRM	ADDRESSABLE RELAY MODULE	SD	SMOKE DETECTOR
FS	FLOW SWITCH	SDR	SMOKE DETECTOR POWER RESET
HD	HEAT DETECTOR	SRG	SURGE PROTECTION — P = PRIMARY PROTECTION; S = SECONDARY PROTECTION
HS	HORN STROBE — C = CEILING MOUNTED; W = WALL MOUNTED; WP = WEATHERPROOF	SS	SPEAKER STROBE — C = CEILING MOUNTED; W = WALL MOUNTED; WP = WEATHERPROOF
HSC	HOOD SUPPRESSION CONNECTION	ST	STROBE — C = CEILING MOUNTED; W = WALL MOUNTED; WP = WEATHERPROOF
SO-X	FAULT ISOLATOR MODULE	TS	TAMPER SWITCH
KB	KNOX BOX	XP-10	ADDRESSABLE TEN-INPUT MONITOR MODULE
LA	LOW AIR PRESSURE - POINT OF CONNECTION	ZX00	FIRE ALARM AND INTRUSION EXPANDER

POWER REQUIREMENTS

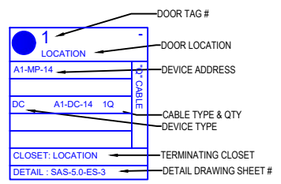
1. **POWER (EMERGENCY CIRCUIT)**
   ELECTRICAL CONTRACTOR TO PROVIDE A HARD WIRED CONNECTION TO A 120 VAC 20A EMERGENCY CIRCUIT DEDICATED TO SECURITY IN EACH RISER LOCATION WITHIN A 4"x4" BOX SURFACE MOUNTED 18" AFF, CIRCUIT TO BE EXTENDED & CONNECTED TO THE POWER SUPPLY TERMINALS.
2. **POWER (NON-EMERGENCY CIRCUIT)**
   ELECTRICAL CONTRACTOR TO PROVIDE A HARD WIRED CONNECTION TO A 120 VAC 20A NON-EMERGENCY CIRCUIT DEDICATED TO SECURITY IN EACH RISER LOCATION WITHIN A 4"x4" BOX SURFACE MOUNTED 18" AFF, CIRCUIT TO BE EXTENDED & CONNECTED TO THE POWER SUPPLY TERMINALS.
3. **SECURITY CONTROL/EQUIPMENT ROOM POWER (UPS CIRCUIT)**
   ELECTRICAL CONTRACTOR TO PROVIDE A HARD WIRED CONNECTION TO A 120 VAC 20A UNINTERRUPTIBLE POWER CIRCUIT DEDICATED TO SECURITY WITHIN A 4"x4" BOX SURFACE MOUNTED BELOW THE FLOOR UNDER THE COSOLE/RACK, CIRCUIT TO BE EXTENDED & CONNECTED TO THE POWER SUPPLY TERMINALS.
4. **EXTERIOR CAMERA POWER (NON-EMERGENCY CIRCUIT)**
   ELECTRICAL CONTRACTOR TO PROVIDE A HARD WIRED CONNECTION TO A 120 VAC 20A NON-EMERGENCY CIRCUIT DEDICATED TO SECURITY. THE CIRCUIT CONNECTION SHALL BE PROVIDED WITHIN A 4"x4" BOX MOUNTED ABOVE ACCESSIBLE CEILING ON INTERIOR OF BUILDING WITH WIRE ENDS TERMINATED AND INSULATED WITH WIRE NUTS.
5. **POLE MOUNTED CAMERA POWER (NON-EMERGENCY CIRCUIT)**
   ELECTRICAL CONTRACTOR TO PROVIDE A HARD WIRED CONNECTION TO AN UNSWITCHED 120 VAC 20A NON-EMERGENCY CIRCUIT DEDICATED TO SECURITY. THE CIRCUIT CONNECTION SHALL BE PROVIDED WITHIN A NEMA 8X8 ENCLOSURE MOUNTED AT THE BASE OF THE POLE WITH WIRE ENDS TERMINATED AND INSULATED WITH WIRE NUTS.
6. **ELECTRIC EXIT DEVICE POWER (NON-EMERGENCY CIRCUIT)**
   ELECTRICAL CONTRACTOR TO PROVIDE A HARD WIRED CONNECTION TO A 120 VAC 20A NON-EMERGENCY CIRCUIT DEDICATED TO SECURITY AT DOORS UTILIZING ELECTRIC EXIT DEVICES PROVIDED WITHIN A 4"x4" BOX MOUNTED ABOVE ACCESSIBLE CEILING ADJACENT TO THE DOOR WITH WIRE ENDS TERMINATED AND INSULATED WITH WIRE NUTS.
7. **SITE POWER (NON-EMERGENCY CIRCUIT)**
   ELECTRICAL CONTRACTOR TO PROVIDE A HARD WIRED CONNECTION TO A 120 VAC 20A NON-EMERGENCY CIRCUIT DEDICATED TO SECURITY WITHIN A NEMA 8X8 ENCLOSURE WITH WIRE ENDS TERMINATED AND INSULATED WITH WIRE NUTS.
8. **SERVER/NVR POWER (EMERGENCY UPS CIRCUIT)**
   ELECTRICAL CONTRACTOR TO PROVIDE A HARD WIRED CONNECTION TO A 120 VAC 20A UNINTERRUPTIBLE POWER CIRCUIT DEDICATED TO SECURITY WITHIN A 4"x4" BOX SURFACE MOUNTED BELOW THE FLOOR UNDER THE COSOLE/RACK, CIRCUIT TO BE EXTENDED & CONNECTED TO AN OUTLET.
9. **POWER (EXISTING CIRCUIT)**
   ELECTRICAL CONTRACTOR TO REWIRE HARD WIRED CONNECTION TO A 120 VAC DEDICATED TO SECURITY IN EACH RISER LOCATION WITHIN A 4"x4" BOX SURFACE MOUNTED 18" AFF, CIRCUIT TO BE EXTENDED & CONNECTED TO THE POWER SUPPLY TERMINALS.
10. **FIRE ALARM POWER (DEDICATED EMERGENCY CIRCUIT)**
    ELECTRICAL CONTRACTOR TO PROVIDE A HARD WIRED CONNECTION TO A 120 VAC 20A EMERGENCY CIRCUIT DEDICATED TO FIRE ALARM SYSTEM IN EACH RISER LOCATION WITHIN A 4"x4" BOX SURFACE MOUNTED 18" AFF, CIRCUIT TO BE EXTENDED & CONNECTED TO THE POWER SUPPLY TERMINALS. A LOCK-OUT DEVICE MUST BE INSTALLED ON THE BREAKER IN THE ELECTRICAL SERVICE PANEL BY ELECTRICIAN.
11. **DUPLEX RECEPTACLE**
    ELECTRICAL CONTRACTOR TO PROVIDE A 120 VAC 20A DUPLEX RECEPTACLE MOUNTED ON PARKING LOT POLE. THIS SHALL BE AN AN SECURED OUTLET AT THE APPROPRIATE HEIGHT TO SUPPLY POWER.

WIRE LEGEND

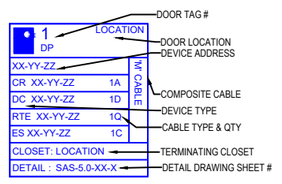
(WIRE TYPES WITHOUT PART NUMBERS ARE TO BE SOURCED BY CONTRACTORS)

CABLE TYPE	MANUFACTURER	PART NUMBER PLENUM	PART NUMBER NON-PLENUM	DESCRIPTION	O.D
A	WINDY CITY WIRE	444382-S	425300-S	22 AWG / 4 COND PLENUM NON-SHLD	.15 IN
B	WINDY CITY WIRE	442351-01UPSS	414401	18 AWG / 6 COND SHIELDED PLENUM	.208 IN
C	WINDY CITY WIRE	442380-S	427304-S	18 AWG / 4 COND PLENUM NON-SHLD	.184 IN
D	WINDY CITY WIRE	444357-03SUPSS	N/A	22AWG / 6 COND SHIELDED PLENUM	.207 IN
E	WINDY CITY WIRE	441367-S	N/A	16AWG / 2 COND PLENUM NON-SHLD	.184 IN
EX	EXISTING			EXISTING CABLE	
F	WINDY CITY WIRE	659211-S	659111-S	RG59/U 20AWG PLENUM -K 18AWG/2 COND SIAMESE	.214 IN
G		N/A	N/A	14 AWG SOLID GROUNDING WIRE	N/A
H	WINDY CITY WIRE	606211-S	606111-S	RG6/U 18AWG PLENUM	.238 IN
I	WINDY CITY WIRE	5556130-S	8665619-S	24 AWG / 4 PAIR CAT 5E – NON-SHIELDED PLENUM	.180 IN
J	WINDY CITY WIRE	5566050-S	7756060-S	23 AWG / 4 PAIR CAT6E – NON-SHIELDED PLENUM	.215 IN
K	WINDY CITY WIRE	442362-S	427100-S	18 AWG / 2 COND PLENUM	.158 IN
	ADI	N/A	AJ-87180210C	-F 18AWG / 2 COND FLAT MID CAP SOL NON-SHLD	N/A
M	WINDY CITY WIRE	446100UPS-S	4461140-S	4 ELEMENT COMPOSITE CABLE PLENUM (C) - CABLE 1: 18AWG / 4 COND – LOCK POWER - .180" O.D. (D) - CABLE 2: 22AWG / 6 COND – CARD READER - .190" O.D. (Q) - CABLE 3: 22AWG / 2 COND – DOOR CONTACT - .120" O.D. (A) - CABLE 4: 22AWG / 4 COND – REX - .140" O.D.	.420 IN
				- 18 COMP WITH (B) - 18AWG / 6 COND- CARD READER	
Q	WINDY CITY WIRE	444366GW-S	425102GW-S	22 AWG / 2 COND PLENUM NON-SHLD	.126 IN
T	N/A	N/A	N/A	T14 - 14 AWG THHN T16- 16 AWG THHN T18- 18 AWG THHN	N/A
U	WINDY CITY WIRE	761360-S	N/A	16 AWG / 2 COND SOL NON-SHLD RED FPLP	.178
	N/A	N/A	N/A	U-S : 16 AWG / 2 COND SOL SHIELDED RED FPLP	N/A
	N/A	N/A	N/A	U-Sc* : 16 AWG / 2 COND SOL SHIELDED RED FPLP FREEZER RATED	N/A
	N/A	N/A	N/A	U-U : 16 AWG / 2 COND SOL NON-SHLD FPL UNDERGROUND	N/A
V	WINDY CITY WIRE	761260-S	N/A	12 AWG / 2 COND SOL NON-SHLD RED FPLP	.238 IN
X	WINDY CITY WIRE	767960-S	N/A	14 AWG / 2 COND SOL NON-SHLD RED FPLP	.206 IN
	N/A	N/A	N/A	X-S : 14 AWG / 2 COND SOL SHIELDED RED FPLP	N/A
	N/A	N/A	N/A	X-Sc* : 14 AWG / 2 COND SOL SHIELDED RED FPLP FREEZER RATED	N/A
Y	WINDY CITY WIRE	762360-S	727100-B	18 AWG / 2 COND SOL NON-SHLD RED FPLP	.158 IN
	WINDY CITY WIRE	762320	N/A	Y-S : 18 AWG / 2 COND SOL SHIELDED RED FPLP	.158 IN
	WINDY CITY WIRE	EK4983.1	N/A	Y-c* : 18 AWG / 2 COND SOL NON-SHLD RED FPLP FREEZER RATED	N/A
	WINDY CITY WIRE	EK4987.1	N/A	Y-Sc* : 18 AWG / 2 COND SOL SHIELDED RED FPLP FREEZER RATED	N/A
	N/A	N/A	N/A	U-U : 18 AWG / 2 COND SOL NON-SHLD FPL UNDERGROUND	N/A
Z	WINDY CITY WIRE	762380-S	727306-S	18 AWG / 4 COND SOLD NON-SHLD RED FPLP	.184 IN
	N/A	N/A	N/A	Z-S : 18 AWG / 4 COND SOL SHIELDED RED FPLP	N/A
	N/A	N/A	N/A	Z-U : 18 AWG / 4 COND SOL NON-SHLD FPL UNDERGROUND	N/A

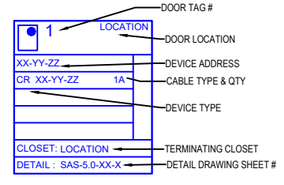
MONITOR POINT



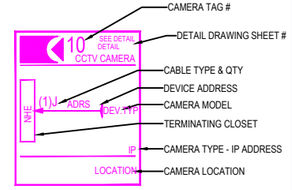
CARD READER DOORS



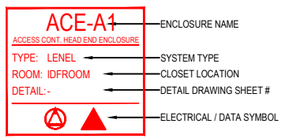
CARD READER IN/OUT



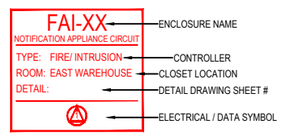
VIDEO DEVICES



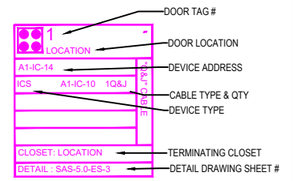
ACCESS CONTROL ENCLOSURE - ACE



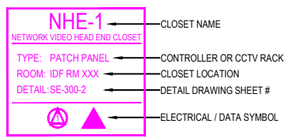
FIRE HEAD END CLOSET - FAI



INTERCOM DEVICES



NETWORK HEAD END CLOSET - NHE



REFERENCE LEGEND

1 REVISION TAG	NAME XXX ROOM NAME & NO. TAG	NORTH NORTH ARROW	XX S-X-00 DETAIL REFERENCE TAG	XX S-X-00 ELEVATION REFERENCE TAG XX - DETAIL NUMBER S-X-00=SHEET NUMBER	XXX WIRE LABEL Xx=WIRE RUN TOTAL WIRE TYPE	PHONE DROP LOCATION	CELLULAR COMMUNICATIONS
DEVICE ADDRESS = XX-YY-ZZ	XX = PANEL NUMBER YY = DEVICE TYPE ZZ = CONSECUTIVE NUMBER	DATA DROP LOCATION	1 PAGE NOTE TAG				

WIRE LEGEND

CABLE TYPE	DESCRIPTION
A	22 AWG / 4C NON-SHLD PLENUM
B	18 AWG / 6C SHIELDED PLENUM
C	18 AWG / 4C NON-SHLD PLENUM
D	22AWG / 6C SHIELDED PLENUM
E	16AWG / 2C NON-SHLD PLENUM
EX	EXISTING CABLE
F	RG59/U 20AWG PLENUM -K RG59- 18/2 SIAMESE
G	14 AWG SOLID BARE COPPER GROUNDING WIRE
H	RG6/U 18AWG PLENUM
I	24 AWG / 4 PAIR CAT 5E – NON-SHLD PLENUM
J	23 AWG / 4 PAIR CAT6E – NON-SHLD PLENUM
K	18 AWG / 2C NON-SHLD PLENUM -F 18 AWG-2C FLAT
M	18 AWG-4 CABLE COMPOSITE CABLE PLENUM -(C) CABLE 1: 18AWG / 4C LOCK POWER -(B) CABLE 2: 18AWG/ 2C & 22AWG / 4C CARD READER -(Q) CABLE 3: 22AWG / 2C DOOR CONTACT -(A) CABLE 4: 22AWG / 4C REQUEST TO EXIT
Q	22 AWG / 2C NON-SHLD PLENUM
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U	16 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 16AWG-2C FPLP SHIELDED -S c* 16AWG- 2C FPLP SHIELDED/ FREEZER RATED -U 16AWG-2C FPL NON-SHLD UNDERGROUND
V	12 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP)
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Y	18 AWG / 2C SOLID, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 18AWG-2C FPLP SHIELDED -c* 18AWG-2C FPLP NON-SHLD FREEZER RATED -S c* 18AWG- 2C FPLP SHIELDED FREEZER RATED -U 18AWG-2C FPL NON-SHLD UNDERGROUND
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GERALD R. FORD International Airport

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REVISIONS

DATE	JOB NUM #	DESCRIPTION	BY
08/22/23	XXXXX	DESIGN	BJK

NORTH

GFIAA
SRE BUILDING EXPANSION
6500 44TH ST SE
GRAND RAPIDS, MI

SECURALARM
921 47TH ST. SW, GRAND RAPIDS, MI 49509
PHONE: (616) 775-6300 FAX (616) 775-6301
http://www.securamichigan.com/

SHEET NAME: **DEVICE LEGEND**

SHEET# **SAS-0.1**

Plot Date: 8/22/2023 1:43:43 PM File Name: GFIAA SRE.dwg Plotted by: ben kramer

M135A
M135B
M135N
M135C
M135D
M135E
M135F
M135G
M135H
M135J
M135K
M135L
M135M
STORAGE
M139
SNOW REMOVAL
VEHICLE STORAGE
M135
MECH/ELEC
M137
IT
M138
NAC
SD
NHE
ACE
CR
HS
ST
C
W
X

WIRE LEGEND

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REVISIONS

DATE	JOB NUM #	DESCRIPTION	BY
08/22/23	XXXXX	DESIGN	BJK

NORTH

GFIAA
SRE BUILDING EXPANSION

5500 44TH ST SE
GRAND RAPIDS, MI

SECURALARM
921 47TH ST. SW, GRAND RAPIDS, MI 49509
PHONE: (616) 775-6300 FAX (616) 775-6301
http://www.securamichigan.com/

SHEET NAME:
SRE DESIGN LAYOUT

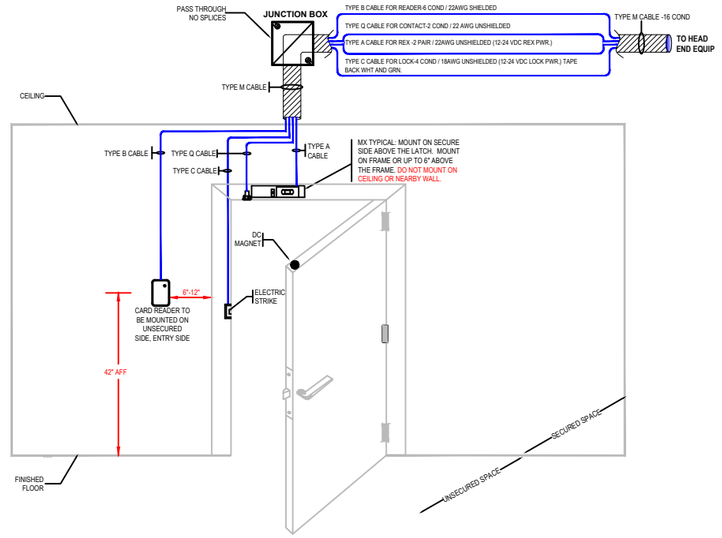
SHEET#
SAS-1.0

Plot Date: 8/22/2023 1:43:38 PM File Name: GFIAA SRE.dwg Plotted by: ben kramer

SINGLE DOOR WITH FLUSH CONTACT, CARD READER, ELECTRIC STRIKE & MX

OPERATIONAL DESCRIPTION

* VALID CARD READ UNLOCKS THE DOOR. OPENING THE DOOR WITHOUT VALID CARD READ OR WITHOUT ACTIVATING THE MX CAUSES A FORCED OPEN.

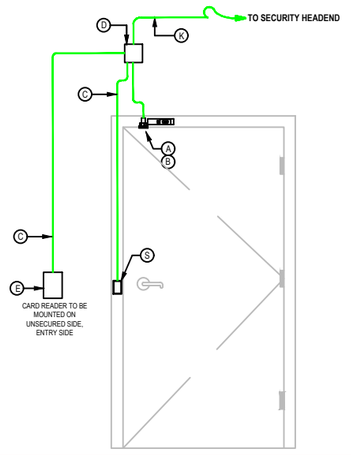


NOTE
FIELD VERIFY EXACT LOCATION OF CARD READERS & OTHER DOOR DEVICES AT PROPER SIDE OF DOOR.

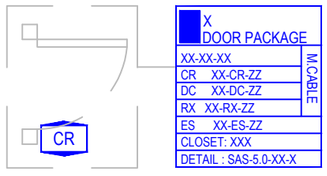
CONSTRUCTION CONDUIT AND WIRING ROUGH-IN LAYOUT

DOOR CONDUIT NOTES:

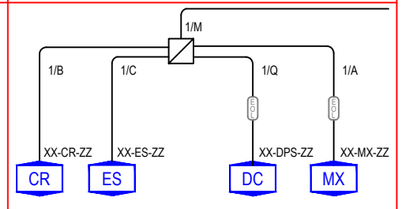
- (A) INSTALL APPROPRIATE DOOR CONTACT IN DOOR FRAME DUST BOX.
- (B) INSTALL ASSOCIATED MATCHING MAGNET IN TOP OF DOOR.
- (C) PROVIDE AND INSTALL 3/4" CONDUIT WITH WIRING FROM DOOR DEVICES TO BACK BOX (D) .
- (D) INSTALL 4 SQ. JUNCTION BOX OR LARGER, WITH PROPER EXTENSION AND PLATE ON SECURE SIDE OF DOOR.
- (E) PROVIDE 2-1/2" DEEP SINGLE GANG MASONRY BOX FLUSH MOUNTED 42" A.F.F. AND 6"-12" AWAY FROM DOOR FRAME ON UNSECURED SIDE OR PER ARCHITECT'S INTERIOR ELEVATIONS
- (S) ELECTRIC STRIKE.
- (K) INSTALL CONDUIT TO LOCAL SECURITY HEADEND CLOSET ACCESSIBLE. PLENUM CABLE ABOVE ACCESSIBLE CEILING.



FLOOR PLAN DIAGRAM



RISER DIAGRAM



Symbol on Dwgs: CR ES DC MX

DTL: ES-1

WIRE LEGEND

CABLE TYPE	DESCRIPTION
A	22 AWG / 4C NON-SHLD PLENUM
B	18 AWG / 6C SHIELDED PLENUM
C	18 AWG / 4C NON-SHLD PLENUM
D	22AWG / 6C SHIELDED PLENUM
E	16AWG / 2C NON-SHLD PLENUM
EX	EXISTING CABLE
F	RG59/U 20AWG PLENUM -K RG59- 18/2 SIAMESE
G	14 AWG SOLID BARE COPPER GROUNDING WIRE
H	RG6/U 18AWG PLENUM
I	24 AWG / 4 PAIR CAT 5E – NON-SHLD PLENUM
J	23 AWG / 4 PAIR CAT6E – NON-SHLD PLENUM
K	18 AWG / 2C NON-SHLD PLENUM -F 18 AWG-2C FLAT
M	18 AWG-4 CABLE COMPOSITE CABLE PLENUM -(C) CABLE 1: 18AWG / 4C LOCK POWER -(B) CABLE 2: 18AWG/ 2C & 22AWG / 4C CARD READER -(Q) CABLE 3: 22AWG / 2C DOOR CONTACT -(A) CABLE 4: 22AWG / 4C REQUEST TO EXIT
Q	22 AWG / 2C NON-SHLD PLENUM
T	14- 14 AWG THHN 16- 16 AWG THHN 18- 18 AWG THHN
U	16 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 16AWG-2C FPLP SHIELDED -S C° 16AWG- 2C FPLP SHIELDED/ FREEZER RATED -U 16AWG-2C FPL NON-SHLD UNDERGROUND
V	12 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP)
X	14 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 14AWG-2C FPLP SHIELDED -S C° 14AWG- 2C FPLP SHIELDED/ FREEZER RATED
Y	18 AWG / 2C SOLID, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 18AWG-2C FPLP SHIELDED -C° 18AWG-2C FPLP NON-SHLD FREEZER RATED -S C° 18AWG- 2C FPLP SHIELDED FREEZER RATED -U 18AWG-2C FPL NON-SHLD UNDERGROUND
Z	18 AWG / 4C SOLID, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 18AWG-4C FPLP SHIELDED -U 18AWG-4C FPL NON-SHLD UNDERGROUND

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REVISIONS

DATE	JOB NUM #	DESCRIPTION	BY
08/22/23	XXXXX	DESIGN	BJK

NORTH

GFIAA
SRE BUILDING EXPANSION
5500 44TH ST SE
GRAND RAPIDS, MI

SECURALARM
921 47TH ST. SW, GRAND RAPIDS, MI 49509
PHONE: (616) 775-6300 FAX (616) 775-6301
http://www.securamichigan.com/

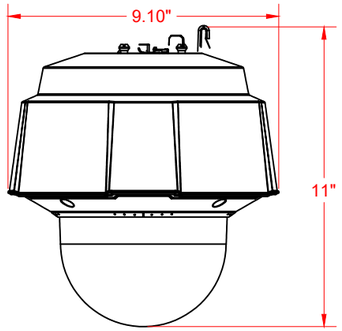
SHEET NAME: DOOR DETAILS

SHEET# SAS-5.0

Plot Date: 8/22/2023 1:43:56 PM File Name: GFIAA SRE.dwg Plotted by: ben kramer

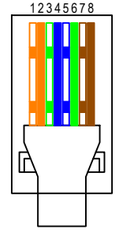
DOME IP CAMERA - AXIS P/N- Q6075-E MKII PTZ

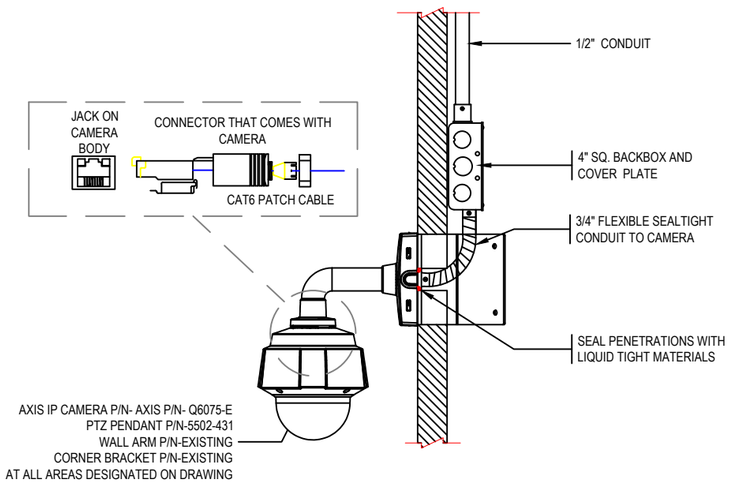
MODEL	Q6075-E
LENS SIZE	4.25MM - 170MM
ANGLE	65.1° - 2.00°
POE TYPE	CLASS HI POE 66.1W
NATIVE RESOLUTION	1920x1080 (HDTV 1080P)
OPERATIONAL TEMPERATURE	-58° - 122°F



T-568B WIRING
1- WHT/ORG
2- ORG
3- WHT/GRN
4- BLU
5- WHT/BLU
6- GRN
7- WHT/BRN
8- BRN

NOTE- RJ-45 PLUG CLIP IS POINTED AWAY





NOTES:

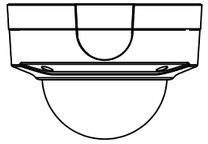
1- EXACT HEIGHT AND LOCATION TO BE VERIFIED IN FIELD PRIOR TO FINAL MOUNTING.
2- JUNCTION BOX TO BE MOUNTED WITHIN 3FT OF CAMERA OR 15FT SERVICE LOOP NEEDED

DEVICE SYMBOL:

DTL: C - Q6075-E - 2

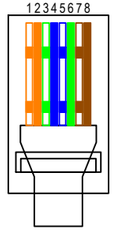
DOME IP CAMERA - AXIS P/N- P3265-LV

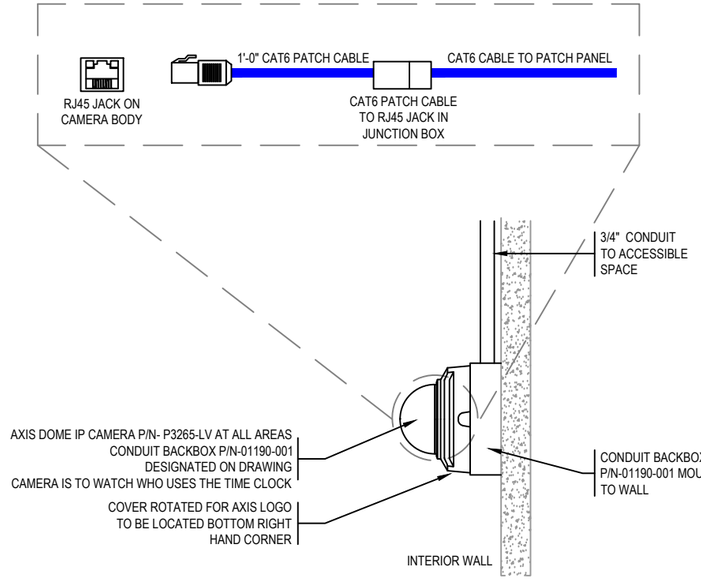
MODEL	P3247-LV
LENS SIZE	3-8mm
ANGLE	104° - 40°
POE TYPE	CLASS 3 3.5W
NATIVE RESOLUTION	2592 X 1944 5MP
OPERATIONAL TEMPERATURE	32° - 122°



T-568B WIRING
1- WHT/ORG
2- ORG
3- WHT/GRN
4- BLU
5- WHT/BLU
6- GRN
7- WHT/BRN
8- BRN

NOTE- RJ-45 PLUG CLIP IS POINTED AWAY





NOTES:

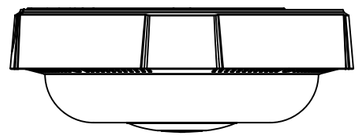
1- EXACT HEIGHT AND LOCATION TO BE VERIFIED IN FIELD PRIOR TO FINAL MOUNTING.
2- JUNCTION BOX TO BE MOUNTED WITHIN 3FT OF CAMERA OR 15FT SERVICE LOOP NEEDED

DEVICE SYMBOL:

DTL: C - P3265-LV - 3

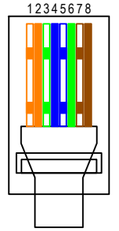
DOME IP CAMERA - AXIS P/N- P3719-PLE

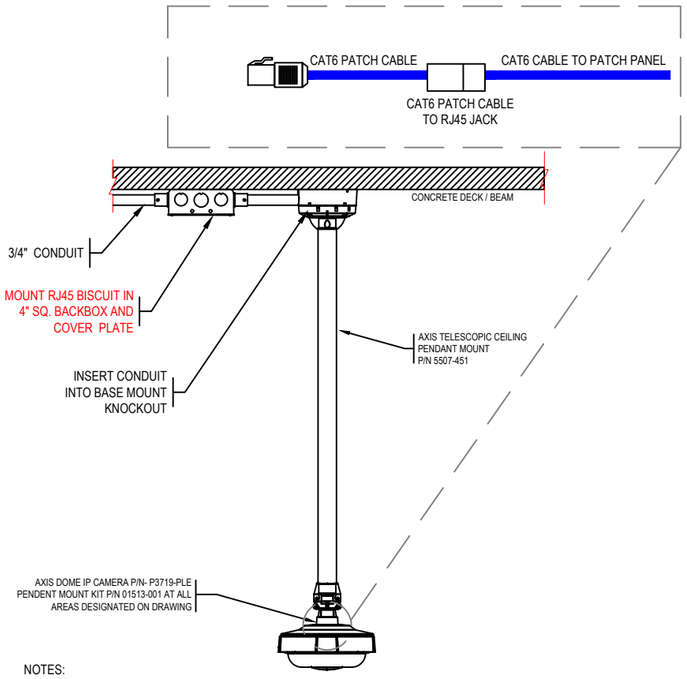
MODEL	P3719-PLE
LENS SIZE	3-8mm
ANGLE	360°
POE TYPE	CLASS 4 25.5 W
NATIVE RESOLUTION	(x4) 2560 X 1440 15MP
OPERATIONAL TEMPERATURE	-22° - 122°



T-568B WIRING
1- WHT/ORG
2- ORG
3- WHT/GRN
4- BLU
5- WHT/BLU
6- GRN
7- WHT/BRN
8- BRN

NOTE- RJ-45 PLUG CLIP IS POINTED AWAY





NOTES:

1- EXACT HEIGHT AND LOCATION TO BE VERIFIED IN FIELD PRIOR TO FINAL MOUNTING.
2- JUNCTION BOX TO BE MOUNTED WITHIN 3FT OF CAMERA OR 15FT SERVICE LOOP NEEDED.
3- CAMERA REQUIRES HIGHER POWER THAN TYPICAL EXTERNAL AXIS CAMERAS TYPICALLY USED. BE SURE TO PROVIDE CLASS 4 POE: TYPICAL AT 16.3W & MAX AT 25.5W.

DEVICE SYMBOL:

DTL: C - P3719-PLE - 5

WIRE LEGEND

CABLE TYPE	DESCRIPTION
A	22 AWG / 4C NON-SHLD PLENUM
B	18 AWG / 6C SHIELDED PLENUM
C	18 AWG / 4C NON-SHLD PLENUM
D	22AWG / 6C SHIELDED PLENUM
E	16AWG / 2C NON-SHLD PLENUM
EX	EXISTING CABLE
F	RG59/U 20AWG PLENUM -K RG59- 18/2 SIAMESE
G	14 AWG SOLID BARE COPPER GROUNDING WIRE
H	RG6/U 18AWG PLENUM
I	24 AWG / 4 PAIR CAT 5E – NON-SHLD PLENUM
J	23 AWG / 4 PAIR CAT6E – NON-SHLD PLENUM
K	18 AWG / 2C NON-SHLD PLENUM -F 18 AWG-2C FLAT
M	18 AWG-4 CABLE COMPOSITE CABLE PLENUM -(C) CABLE 1: 18AWG / 4C LOCK POWER -(B) CABLE 2: 18AWG/ 2C & 22AWG / 4C CARD READER -(Q) CABLE 3: 22AWG / 2C DOOR CONTACT -(A) CABLE 4: 22AWG / 4C REQUEST TO EXIT
Q	22 AWG / 2C NON-SHLD PLENUM
T	14- 14 AWG THHN 16- 16 AWG THHN 18- 18 AWG THHN
U	16 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 16AWG-2C FPLP SHIELDED -S c° 16AWG- 2C FPLP SHIELDED/ FREEZER RATED -U 16AWG-2C FPL NON-SHLD UNDERGROUND
V	12 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP)
X	14 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 14AWG-2C FPLP SHIELDED -S c° 14AWG- 2C FPLP SHIELDED/ FREEZER RATED
Y	18 AWG / 2C SOLID, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 18AWG-2C FPLP SHIELDED -c° 18AWG- 2C FPLP NON-SHLD FREEZER RATED -S c° 18AWG- 2C FPLP SHIELDED FREEZER RATED -U 18AWG-2C FPL NON-SHLD UNDERGROUND
Z	18 AWG / 4C SOLID, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 18AWG-4C FPLP SHIELDED -U 18AWG-4C FPL NON-SHLD UNDERGROUND

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REVISIONS

DATE	JOB NUM #	DESCRIPTION	BY
08/22/23	XXXXX	DESIGN	BJK

NORTH

GFIAA
SRE BUILDING EXPANSION
5500 44TH ST SE
GRAND RAPIDS, MI

SECURALARM
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http://www.securamichigan.com/

SHEET NAME: VIDEO DETAILS

SHEET# SAS-5.1

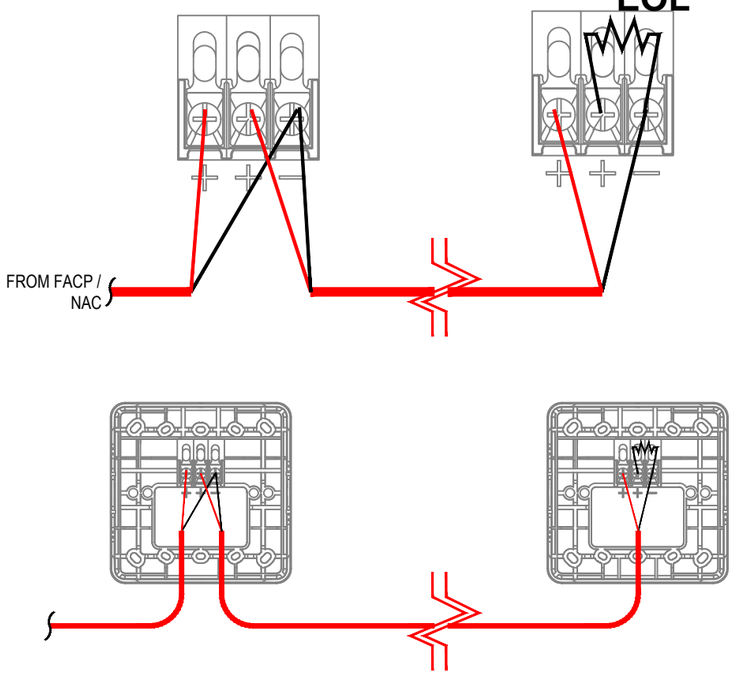
Plot Date: 8/22/2023 1:44:03 PM File Name: GFIAA SRE.dwg Plotted by: ben kramer

CW	HORN STROBE/STROBE	HS / ST

NOTIFICATION WIRING DETAIL

(WIRE SIZE SPECIFIED ON FLOOR PLAN AND ONE-LINE)

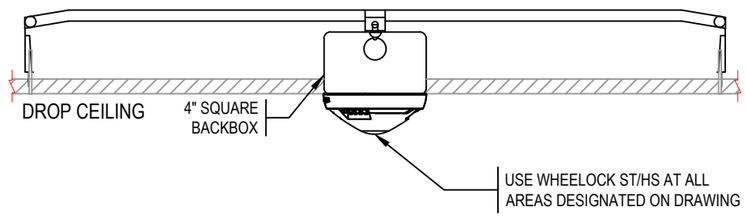
* HORN STROBE/ STROBE END OF LINE
* 2.2k OFF OF NAC CIRCUIT ON 640/320 FACP
* 2.2k OFF OF NAC CIRCUIT ON AL1002ULADA
* 4.7k OFF OF NAC CIRCUIT ON PSE-6/8/10
* 10k OFF OF NAC CIRCUIT ON FIRESWITCH 108
* 560 OFF OF NAC CIRCUIT ON BOSCH D192G

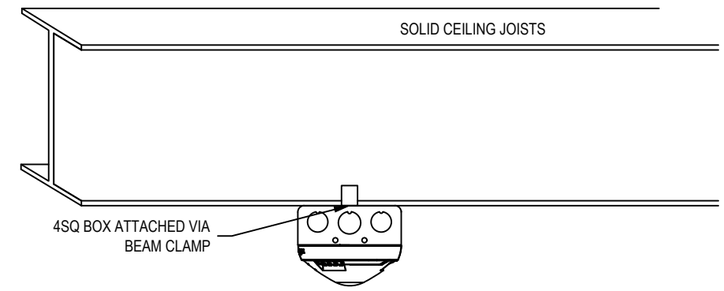


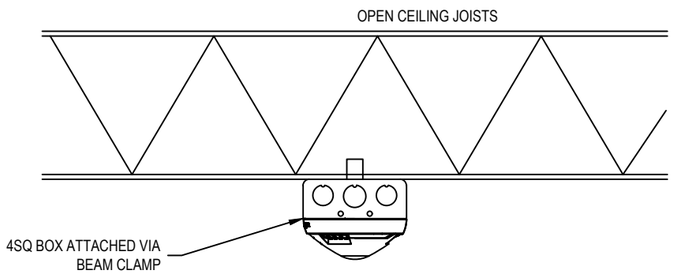
DEVICE SYMBOL: HS ST

DTL: FI - HS / ST

WHE	WHEELOCK ST/ HS	ST/HS



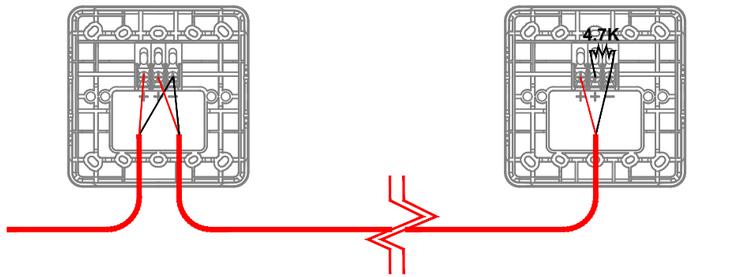




DEVICE SYMBOL: HS C ST C

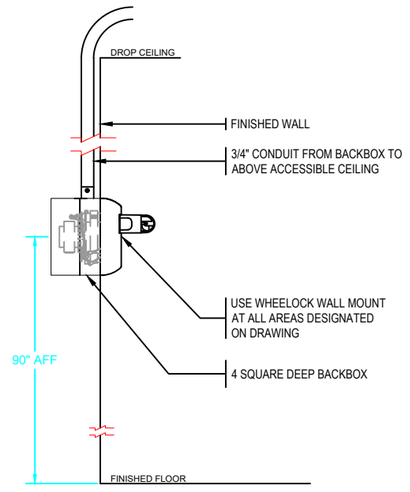
DTL: ST/HS

WHE	WHEELOCK ST/ HS	ST/HS



NOTIFICATION WIRING DIAGRAM

NOTIFICATION WIRING DIAGRAM WITH 4.7k END OF LINE RESISTOR



NOTES:

1- EXACT HEIGHT AND LOCATION TO BE VERIFIED IN FIELD PRIOR TO FINAL MOUNTING.
2- 4 SQUARE BACK BOX TO BE MOUNTED 90" ABOVE FINISHED FLOOR

DEVICE SYMBOL: HS W ST W

DTL: FI- ST/HS

WIRE LEGEND

CABLE TYPE	DESCRIPTION
A	22 AWG / 4C NON-SHLD PLENUM
B	18 AWG / 6C SHIELDED PLENUM
C	18 AWG / 4C NON-SHLD PLENUM
D	22AWG / 6C SHIELDED PLENUM
E	16AWG / 2C NON-SHLD PLENUM
EX	EXISTING CABLE
F	RG59/U 20AWG PLENUM -K RG59- 18/2 SIAMESE
G	14 AWG SOLID BARE COPPER GROUNDING WIRE
H	RG6/U 18AWG PLENUM
I	24 AWG / 4 PAIR CAT 5E – NON-SHLD PLENUM
J	23 AWG / 4 PAIR CAT6E – NON-SHLD PLENUM
K	18 AWG / 2C NON-SHLD PLENUM -F 18 AWG-2C FLAT
M	18 AWG-4 CABLE COMPOSITE CABLE PLENUM -(C) CABLE 1: 18AWG / 4C LOCK POWER -(B) CABLE 2: 18AWG/ 2C & 22AWG / 4C CARD READER -(Q) CABLE 3: 22AWG / 2C DOOR CONTACT -(A) CABLE 4: 22AWG / 4C REQUEST TO EXIT
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T	14- 14 AWG THHN 16- 16 AWG THHN 18- 18 AWG THHN
U	16 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 16AWG-2C FPLP SHIELDED -S c" 16AWG- 2C FPLP SHIELDED/ FREEZER RATED -U 16AWG-2C FPL NON-SHLD UNDERGROUND
V	12 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP)
X	14 AWG / 2C STRANDED, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 14AWG-2C FPLP SHIELDED -S c" 14AWG- 2C FPLP SHIELDED/ FREEZER RATED
Y	18 AWG / 2C SOLID, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 18AWG-2C FPLP SHIELDED -c" 18AWG-2C FPLP NON-SHLD FREEZER RATED -S c" 18AWG- 2C FPLP SHIELDED FREEZER RATED -U 18AWG-2C FPL NON-SHLD UNDERGROUND
Z	18 AWG / 4C SOLID, NON-SHLD PLENUM FIRE ALARM UL-RED JACKET (FPLP) -S 18AWG-4C FPLP SHIELDED -U 18AWG-4C FPL NON-SHLD UNDERGROUND

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SHEET NAME: VIDEO DETAILS

SHEET# SAS-5.2

Plot Date: 8/22/2023 1:43:50 PM File Name: GFIAA SRE.dwg Plotted by: ben kramer