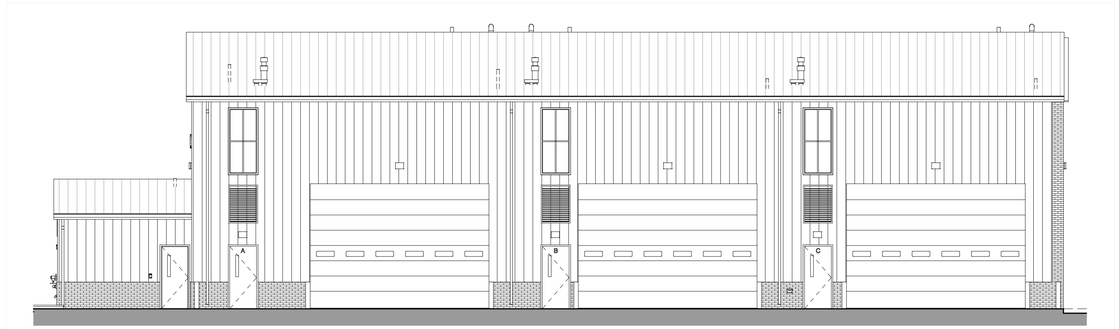
OCTOBER 26, 2022

3900 ULM NORTH FRONTAGE ROAD, GREAT FALLS, MT 59404
GREAT FALLS INTERNATIONAL AIRPORT

GFIA WAREHOUSE

BUILDING PERMIT SET



FOR VISUALIZATION PURPOSES ONLY

OWNER
GREAT FALLS INTERNATIONAL AIRPORT
2800 TERMINAL DR
GREAT FALLS, MT 59404
CONTACT: JOHN FAULKNER

ARCHITECT/ENGINEER
CUSHING TERRELL
219 2ND AVENUE SOUTH
GREAT FALLS, MT 59405
406.452.3321
PROJECT MANAGER: ANTHONY HOUTZ

PROJECT LOCATION
3900 ULM NORTH FRONTAGE ROAD
GREAT FALLS, MT 59404

VICINITY MAP: *Locator*

SHEET INDEX

MONTANA — CARL J. MAEHL — 10488 PE — LICENSED PROFESSIONAL ENGINEER
ELECTRICAL
CARL MAEHL, PE
10.26.2022

MONTANA — MARK DAVID VINCELLO — 29617PE — LICENSED PROFESSIONAL ENGINEER
MECHANICAL
MARK VINCELLO, PE
10.26.2022

MONTANA — MARK DAVID VINCELLO — 29617PE — LICENSED PROFESSIONAL ENGINEER
PLUMBING
MARK VINCELLO, PE
10.26.2022

MONTANA — STEVEN EDWARD BINGHAM — 40751PE — LICENSED PROFESSIONAL ENGINEER
FIRE ALARM
STEVE BINGHAM, PE
10.26.2022

MONTANA — STEVEN EDWARD BINGHAM — 40751PE — LICENSED PROFESSIONAL ENGINEER
FIRE PROTECTION
STEVE BINGHAM, PE
10.26.2022

MONTANA — KEVIN JOHN FELDMAN — No. 15317 PE — LICENSED PROFESSIONAL ENGINEER
STRUCTURAL
KEVEIN FELDMAN, PE
10.26.2022

MONTANA — ADAM JAMES SCHLEGEL — No. 49501 PE — LICENSED PROFESSIONAL ENGINEER
CIVIL
ADAM SCHLEGEL, PE
10.26.2022

STATE OF MONTANA — CTA ARCHITECTS — ANTHONY D HOUTZ — 2490 — LICENSED ARCHITECT
ARCHITECTURE
ANTHONY HOUTZ, AIA
10.26.2022

Cushing Terrell.

cushingterrell.com
800.757.9522

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GREAT FALLS INTERNATIONAL AIRPORT
GFIA WAREHOUSE

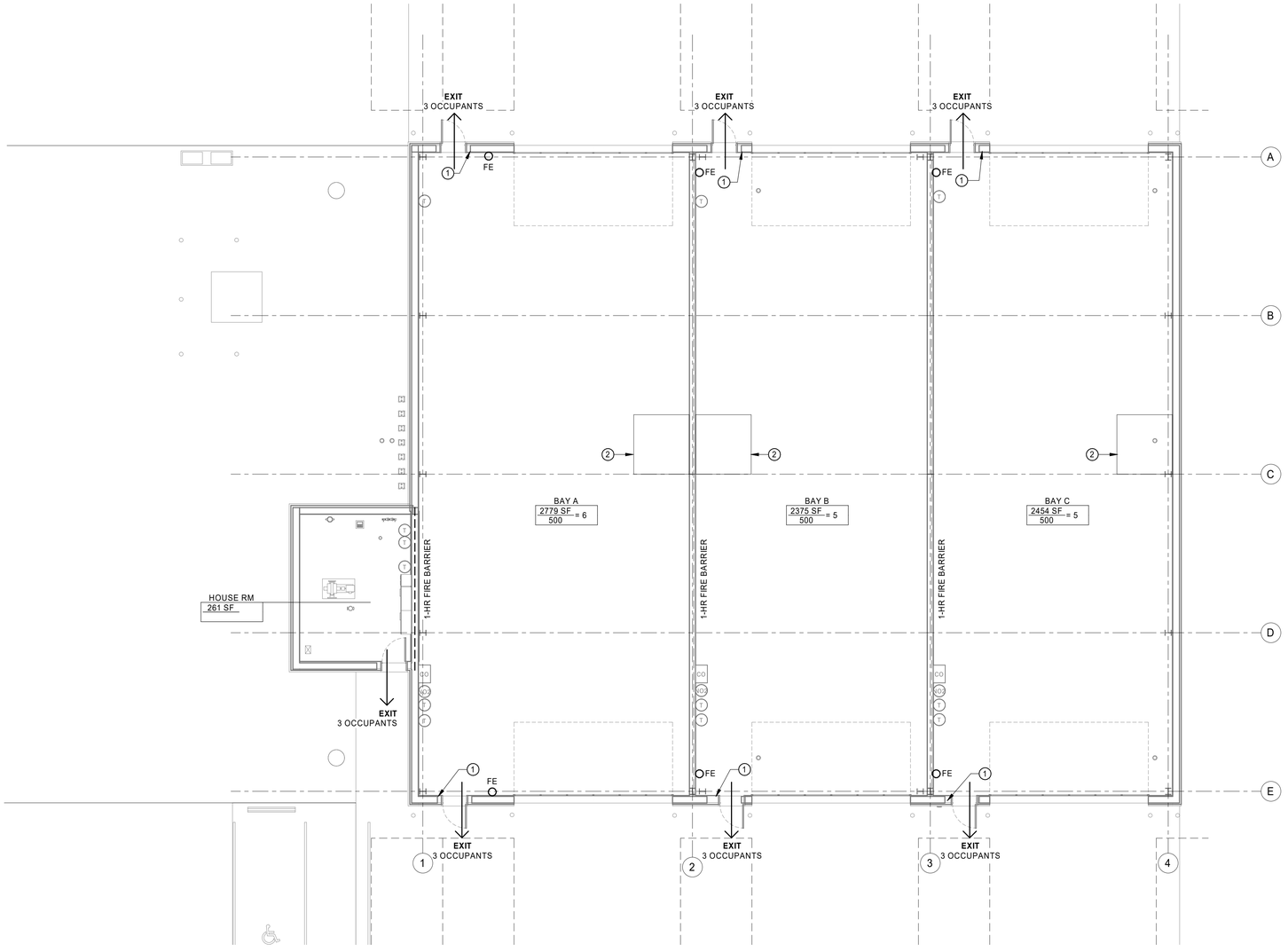
BUILDING PERMIT SET

10.26.2022
PROJECT# | GFIA_WRHSE

DRAWN BY | SUMMERS
REVISIONS

COVERSHEET

G001

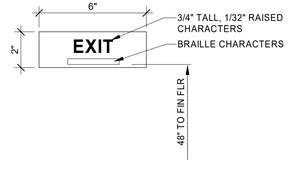


1 G002 CODE PLAN
1/8" = 1'-0"

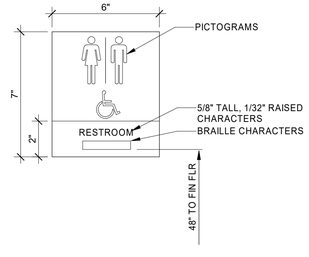
NORTH REF

SIGNAGE KEY

1. EXIT
2. UNISEX ADA WC

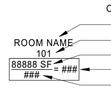


2 G002 EXIT SIGN
3" = 1'-0"



3 G002 UNISEX ROOM ADA
3" = 1'-0"

CODE PLAN LEGEND



EXIT PATH

1 HOUR FIRE BARRIER - SEAL PERMIETER AND PENETRATIONS PER DETAILS ON THIS SHEET

60M — UL RATED FIRE DOOR AND FRAME WITH RATING AS INDICATED - SEE SHEET A601

FE — SURFACE MOUNTED FIRE EXTINGUISHER - SEE SPECIFICATIONS

S# — SURFACE MOUNTED SIGN - SEE 3/F101

NOTE: SEE ELECTRICAL FOR ILLUMINATED EXIT SIGNS.

CODE REVIEW INFORMATION

GOVERNING CODES:
INTERNATIONAL BUILDING CODE, 2021 EDITION
UNIFORM PLUMBING CODE, 2021 EDITION
NATIONAL ELECTRICAL CODE, 2020 EDITION
INTERNATIONAL MECHANICAL CODE, 2021 EDITION
INTERNATIONAL FUEL GAS CODE, 2021 EDITION
NATIONAL FIRE PROTECTION ASSOCIATION 99, 2018 EDITION
INTERNATIONAL ENERGY CONSERVATION CODE, 2021 EDITION
ICC A117.1 ACCESSIBILTY, 2017 EDITION

OCCUPANCY CLASSIFICATION:
S-1 - STORAGE

FIRE SPRINKLER SYSTEM: PROVIDED

CONSTRUCTION TYPE: II-B

BASIC ALLOWABLE HEIGHT AND AREA FROM TABLE 504.3
ALLOWABLE HEIGHT: 2 STORIES, 75 FEET
ALLOWABLE AREA: 70,000 SF PER FLOOR

TOTAL GROSS BUILDING AREA = 7,840SF

INCIDENTAL ACCESSORY OCCUPANCIES FROM TABLE 508.4
FOR OCCUPANY OF B, F-1, M, S-1 IN SPRINKLED BUILDING 0-HOURS OF SEPARATION REQUIRED

FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS FROM TABLE 601
FOR TYPE II-B, ALL = 0 HOURS

FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE FROM TABLE 601
FOR ALL CONSTRUCTION TYPES = 0 HOURS

INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY FROM TABLE 803.13
FOR GROUP S-1, SPRINKLERED:
EXIT ENCLOSURES AND EXIT PASSAGEWAYS = C
CORRIDORS = C
ROOMS AND ENCLOSED SPACES = C

OCCUPANT LOAD FACTOR FROM TABLE 1004.5
WAREHOUSE AREAS OCCUPANT LOAD FACTOR = 500 SF GROSS
FIRST FLOOR BUSINESS AREAS = 7,840 SF / 500 SF = 16 OCCUPANTS
TOTAL OCCUPANT LOAD = 16 OCCUPANTS

SPACE WITH ONE EXIT OR EXIT ACCESS DOORWAY FROM TABLE 1006.2.1
FOR B AND F OCCUPANY:
MAXIMUM OCCUPANT LOAD = 49
MAXUMUN COMMON PATH OF TRAVEL DISTANCE W/ SPRINKLERS = 100 FEET
FOR M OCCUPANY:
MAXIMUM OCCUPANT LOAD = 49
MAXUMUN COMMON PATH OF TRAVEL DISTANCE W/ SPRINKLERS = 75 FEET
FOR S OCCUPANY:
MAXIMUM OCCUPANT LOAD = 29
MAXUMUN COMMON PATH OF TRAVEL DISTANCE W/ SPRINKLERS = 100 FEET

MINIMUM REQUIRED EGRESS WIDTH FROM SECTION 1005.1
OTHER EGRESS COMPONENTS = 16 x 0.2 = 3.20 INCHES REQUIRED, 204" INCHES PROVIDED

EXIT ACCESS TRAVEL DISTANCE FROM TABLE 1017.2
FOR S-1 OCCUPANCY, WITH SPRINKLER SYSTEM = 250 FEET

MINIMUM NUMBER OF PLUMBING FIXTURES FROM THE ADMINISTRATIVE RULES OF MONTANA RULE 24.301.351
BASED ON STORAGE OCCUPANCY = 16 OCCUPANTS

WATER CLOSETS:	1 PER 100	REQUIRED: 1 PER OCCUPIED SUITE PROVIDED: 1 PER OCCUPIED SUITE
LAVATORIES:	1 PER 100	REQUIRED: 1 PER OCCUPIED SUITE PROVIDED: 1 PER OCCUPIED SUITE
DRINKING FOUNTAIN:	NOT REQUIRED	

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GFIA WAREHOUSE

STATE OF MONTANA
CTA ARCHITECTS
ANTHONY D HOUTZ
2490
LICENSED ARCHITECT

BUILDING PERMIT SET

10.26.2022
PROJECT# | GFIA_WRHSE

DRAWN BY | SUMMERS
REVISIONS

CODE PLAN

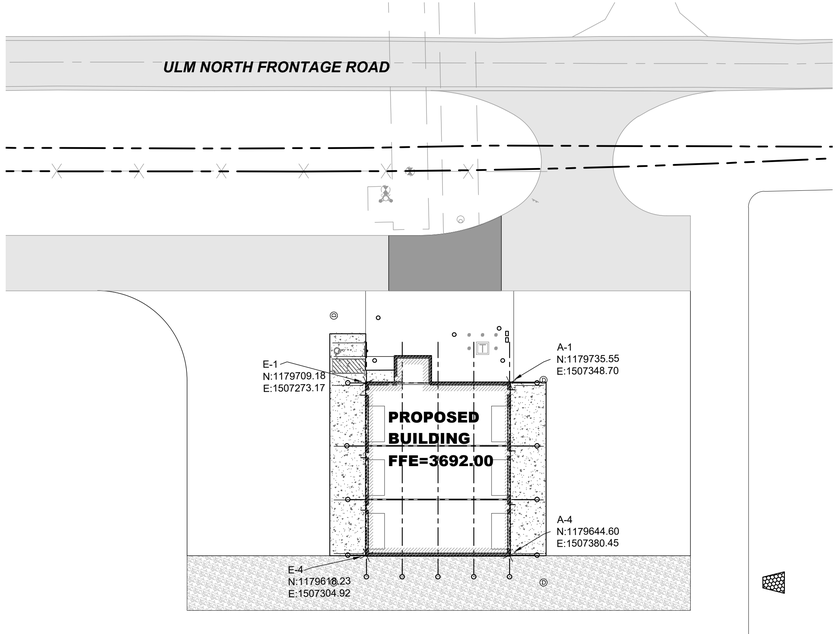
G002

ABBREVIATIONS

@	AT
AB	ABANDONED
AHJ	AUTHORITIES HAVING JURISDICTION
APPROX	APPROXIMATE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
BC	BACK OF CURB
BCR	BACK OF CURB RADIUS
BM	BENCHMARK
BOT	BOTTOM
BP	BURIED POWER
BT	BURIED TELEPHONE
BW	BOTTOM OF WALL
C&G	CURB & GUTTER
CATV, TV	CABLE TELEVISION
CI	CAST IRON
CIPP	CURED IN PLACE PIPE
℄, CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
D, DIA	DIAMETER
DG	DECOMPOSED GRANITE
DI	DUCTILE IRON
DIP	DUCTILE IRON PIPE
DOM	DOMESTIC WATER
DW	DRIVEWAY
DWG	DRAWING
EG	EXISTING GRADE
ELEC, E	ELECTRIC
EL, ELEV	ELEVATION
EOP, EP	EDGE OF PAVEMENT
ESCP	EROSION AND SEDIMENT CONTROL PLAN
EX	EXISTING
FC	FACE OF CURB
FG	FINISHED GRADE
FH, HYD	FIRE HYDRANT
FL	FLOW LINE
FT	FOOT, FEET
G	GAS
GM	GAS METER
GV	GAS VALVE
GW	GUY WIRE
HP	HIGH PRESSURE
IE	INVERT ELEVATION
INT	INTERSECTION
IRR	IRRIGATION
L	LENGTH
LF	LINEAL FOOT, LINEAR FEET
LS	LANDSCAPING
LT	LEFT
MEG	MATCH EXISTING GRADE
MH	MANHOLE
MTR	METER
NTS	NOT TO SCALE
OC	ON CENTER
OH, OHP	OVERHEAD, OVERHEAD POWER
OHU	OVERHEAD UTILITIES
PB	PULL BOX
PC	POINT OF CURVATURE
PIP	PROTECT IN PLACE
℄, PL	PROPERTY LINE
PP	POWER POLE
PRC	POINT OF REVERSE CURVE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RIM	RIM OF MANHOLE LID OR GRATE
ROW	RIGHT OF WAY
SF	SQUARE FOOT, SQUARE FEET
SP	SPECIAL PROVISIONS
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
ST	STORM DRAIN
STA	STATION
STCB	STORM CATCH BASIN
STCI	STORM CURB INLET
STD	STANDARD
STMH	STORM MANHOLE
STYD	STORM YARD DRAIN
SW	SIDEWALK
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
SY	SQUARE YARD
T, TEL	TELEPHONE
TA	TOP OF ASPHALT
TBC	TOP BACK OF CURB
TC	TOP OF CONCRETE
TEMP	TEMPORARY
TRANS	TRANSITION
TW	TOP OF WALL
TYP	TYPICAL
VCP	VITRIFIED CLAY PIPE
WM	WATER MAIN
WV	WATER VALVE
W/	WITH
Δ	DELTA

LEGEND

EXISTING	PROPOSED	
		ASPHALT
		CONCRETE
		HEAVY DUTY CONCRETE
		REINFORCED CONCRETE
		GRAVEL
		LANDSCAPE
		LANDSCAPE
wm	WM	WATER MAIN
	F F	FIRE SERVICE
	WS WS	DOMESTIC WATER SERVICE
st	ST	STORM DRAIN
ss	SS	SANITARY SEWER
bp	BP BP	BURIED POWER
oh	OHP OHP	OVERHEAD POWER
bt	BT BT	BURIED TELEPHONE
gas	GAS GAS	BURIED GAS
fo	FO FO	BURIED FIBER OPTIC
		FENCE - CHAINLINK
		FENCE - WOODEN
X	X	FENCE - BARBED WIRE
		BUILDING
		BUILDING ROOF OVERHANG
		VERTICAL CURB
		CURB AND GUTTER
		CURB AND GUTTER - CATCH
		CURB AND GUTTER - SPILL
		VEGETATION EXTENTS
		PROPERTY LINE - SUBJECT
		PROPERTY LINE - ADJACENT
		EASEMENT
△1		CONTROL POINT
●6		FOUND PROPERTY CORNER AS NOTED
		FIRE HYDRANT/ CONTROL POINT HYDRANT
		WATER VALVE
		WATER SHUTOFF
	Ⓦ	WATER WELL
	Ⓓ	STORM DRAIN MANHOLE
		STORM DRAIN INLET STRUCTURE
		STORM DRAIN CURB INLET
		STORM DRAIN OUTLET STRUCTURE
		STORM DRAIN ROOF DOWNSPOUT
		STORM DRAIN CLEANOUT
	Ⓢ	SANITARY SEWER MANHOLE
		SANITARY SEWER CLEANOUT
		UTILITY POLE
		GUY WIRE
		LIGHT POLE (ONE LIGHT AND DIRECTION)
		LIGHT POLE
		TRANSFORMER
	P	POWER METER OR POWER HANDHOLE
		GAS METER
	T	TELEPHONE PEDESTAL
		IRRIGATION CONTROL VALVE
		POLE SIGN AND DOUBLE POLE SIGN
	•	BOLLARD (OR AS NOTED)
	#	PARKING STALL COUNT
		DECIDUOUS TREE
		CONIFEROUS TREE
		BUSH



NORTH

1 C001 HORIZONTAL CONTROL PLAN

0 20 40 80

SCALE: 1" = 40'

GENERAL NOTES

1. ALL WORK, MATERIALS AND DETAILS PERTAINING TO CONSTRUCTION SHALL BE IN COMPLETE ACCORDANCE WITH THE CITY OF GREAT FALLS AND MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS 6TH EDITION, APRIL 2010, PROJECT SPECIFICATIONS, AND ALL OTHER GOVERNING AGENCIES' STANDARDS. REFER TO THE PROJECT SPECIFICATIONS FOR COMPLETE WORK COVERAGE.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR STORM WATER QUALITY DURING CONSTRUCTION. CONTRACTOR SHALL OBTAIN AND COMPLY WITH ALL CURRENT REQUIREMENTS OF THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES), AND LOCAL MS4 REQUIREMENTS WHERE APPLICABLE. THE CONTRACTOR IS RESPONSIBLE FOR THE PREPARATION AND MAINTENANCE OF A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) THROUGHOUT THE DURATION OF THE PROJECT.
3. THE CONTRACTOR SHALL PROTECT ADJACENT PROPERTIES, PUBLIC AND PRIVATE, AT ALL TIMES DURING CONSTRUCTION.
4. THE CONTRACTOR SHALL CONTROL DUST IN ACCORDANCE WITH REGULATIONS OF LOCAL AIR POLLUTION CONTROL AUTHORITY.
5. CONTRACTOR TO PROTECT ALL EXISTING UTILITIES, SIGNS AND EXISTING STRUCTURES. THE CONTRACTOR IS RESPONSIBLE TO REPAIR BACK TO ORIGINAL OR BETTER CONDITION IF DAMAGE HAS OCCURRED DURING CONSTRUCTION.
6. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS AND COORDINATE WITH OWNER, [INSERT PROJECT CITY OR AHJ] AND ENGINEER / ARCHITECT PRIOR TO DEMOLITION ACTIVITIES.
7. TRAFFIC, BOTH VEHICULAR AND PEDESTRIAN SHALL BE PROTECTED BY EFFECTIVE BARRICADES AND SIGNS IN ACCORDANCE WITH MUTCD GUIDANCE. EFFECTIVE LIGHTING OF OBSTRUCTIONS SHALL BE PROVIDED AT NIGHT.
8. OWNER WILL SECURE ALL NECESSARY UTILITY PERMITS REQUIRED FOR THE COMPLETION OF THE PROJECT. CONTRACTOR SHALL PERFORM ALL WORK IN STRICT ACCORDANCE WITH PERMIT REQUIREMENTS.
9. UNLESS OTHERWISE INDICATED, ALL CONSTRUCTION STAKING SHALL BE PERFORMED UNDER THE RESPONSIBLE CHARGE OF A [INSERT STATE] LICENSED LAND SURVEYOR.
10. THE CONTRACTOR SHALL MAINTAIN ONE COMPLETE SET OF APPROVED DRAWINGS ON THE CONSTRUCTION SITE AT ALL TIMES. ANY APPROVED DEVIATIONS IN CONSTRUCTION FROM THE APPROVED DRAWINGS SHALL BE NOTED ON THIS SET. THE LOCATION AND DEPTH OF ALL UTILITIES ENCOUNTERED SHALL BE RECORDED AND KEPT UP TO DATE AT ALL TIMES AND AVAILABLE FOR INSPECTION BY THE OWNER'S REPRESENTATIVE UPON REQUEST. FAILURE TO COMPLY MAY RESULT IN DELAY IN PAYMENT AND/OR FINAL ACCEPTANCE OF THE PROJECT.
11. UPON COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT A CLEAN SET OF FIELD DRAWINGS CONTAINING ALL AS-BUILT INFORMATION TO THE ENGINEER. *(Only if required in contract with owner)*
12. IF WITHIN ONE YEAR OF THE FINAL ACCEPTANCE BY THE OWNER, ANY WORK IS FOUND TO BE DEFECTIVE OR NOT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND/OR DRAWINGS, AND UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER, THE CONTRACTOR SHALL CORRECT ANY WORK BEGINNING WITHIN SEVEN (7) CALENDAR DAYS OF RECEIPT OF NOTICE. SHOULD THE CONTRACTOR FAIL TO RESPOND TO THE WRITTEN NOTICE, THE OWNER MAY CORRECT THE WORK AT THE CONTRACTOR'S EXPENSE.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPORTING AND/OR EXPORTING ALL MATERIAL AS REQUIRED TO PROPERLY GRADE THIS SITE TO THE FINISHED ELEVATIONS SHOWN HEREON AS WELL AS THE LEGAL DISPOSAL OF WASTE IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.
14. CONTRACTOR IS RESPONSIBLE TO COORDINATE ALL SITE WORK WITH ALL OTHER TRADES.
15. SAFETY - NEITHER THE OWNER NOR THE ENGINEER WILL BE RESPONSIBLE FOR COMPLIANCE WITH SAFETY MEASURES OR REGULATIONS. THE CONTRACTOR SHALL DESIGN, CONSTRUCT, AND MAINTAIN ALL SAFETY DEVICES, AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS, AND REGULATIONS.
16. ANY BURNING ON SITE SHALL BE SUBJECT TO LOCAL ORDINANCES.
17. THE CONTRACTOR IS RESPONSIBLE TO CALL 1-800-424-5555 (OR 811) AT LEAST 2 WORKING DAYS PRIOR TO ANY EARTH DISTURBING ACTIVITIES OR UTILITY EXCAVATIONS.

SHOP AND FABRICATION NOTES

1. THE CONTRACTOR SHALL PREPARE AND SUBMIT FABRICATION DRAWINGS, DESIGN MIX INFORMATION, MATERIAL TESTING COMPLIANCE DATA, AND ANY OTHER PERTINENT DATA TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT OF MATERIALS. FOLLOWING REVIEW, THE CONTRACTOR SHALL RESUBMIT COPIES OF ANY DRAWINGS WHICH REQUIRE REVISION OR CORRECTIONS.
2. ANY REVIEW BY THE ENGINEER WILL NOT RELIEVE THE CONTRACTOR FOR RESPONSIBILITY FOR ERRORS OR OMISSIONS, OR SCHEDULE REQUIREMENTS. THE CONTRACTOR SHALL REMAIN SOLELY RESPONSIBLE FOR FULL AND COMPLETE PERFORMANCE IN ACCORDANCE WITH THE TERMS, CONDITIONS, PROVISIONS, DRAWINGS, AND SPECIFICATIONS.

ACCESS NOTES

1. CONTRACTOR SHALL COORDINATE ACCESS, STAGING AND STOCKPILE LOCATIONS WITH OWNER.
2. CONTRACTOR SHALL RESTORE DISTURBED AREAS TO PRE-CONSTRUCTION OR BETTER CONDITIONS.

EXISTING UTILITY NOTES

1. EXISTING UNDERGROUND INSTALLATIONS AND PUBLIC UTILITIES SHOWN ARE INDICATED ACCORDING TO THE BEST INFORMATION AVAILABLE TO THE ENGINEER AND DEPICTED ON THESE PLANS TO A LEVEL OF QUALITY IN ACCORDANCE WITH ASCE 38-02.
2. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR LOCATING AND VERIFYING MATERIAL TYPES OF ALL EXISTING UTILITY INSTALLATIONS ABOVE AND BELOW GROUND IN ADVANCE OF THE PROJECT BY CONTACTING THEIR RESPECTIVE OWNERS. ALL COSTS RELATED TO LOCATING EXISTING UTILITIES ARE INCIDENTAL AND SHALL NOT BE PAID SEPARATELY. NOT ALL UTILITIES ARE IDENTIFIED ON THE PLANS. NOTIFY ENGINEER OF POTENTIAL CONFLICTS.
3. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE GREAT FALLS A MINIMUM OF 5 BUSINESS DAYS PRIOR TO THE START OF CONSTRUCTION.

GEOTECHNICAL REPORT

1. ALL GEOTECHNICAL RECOMMENDATIONS ARE TAKEN FROM THE REPORT TITLED "TASK ORDER NO. 29- LIGHT INDUSTRIAL WAREHOUSE GREAT FALLS, MT" BY TERRACON CONSULTANTS, INC DATED AUGUST 13, 2021.
2. ALL REFERENCES MADE TO THE GEOTECHNICAL REPORT IN THIS PLAN SET SHALL CONSULT THE AFOREMENTIONED REPORT.

Know what's **below.** **Call** before you dig.

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cushingterrell.com
800.757.9522

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GREAT FALLS INTERNATIONAL AIRPORT

GFIA WAREHOUSE

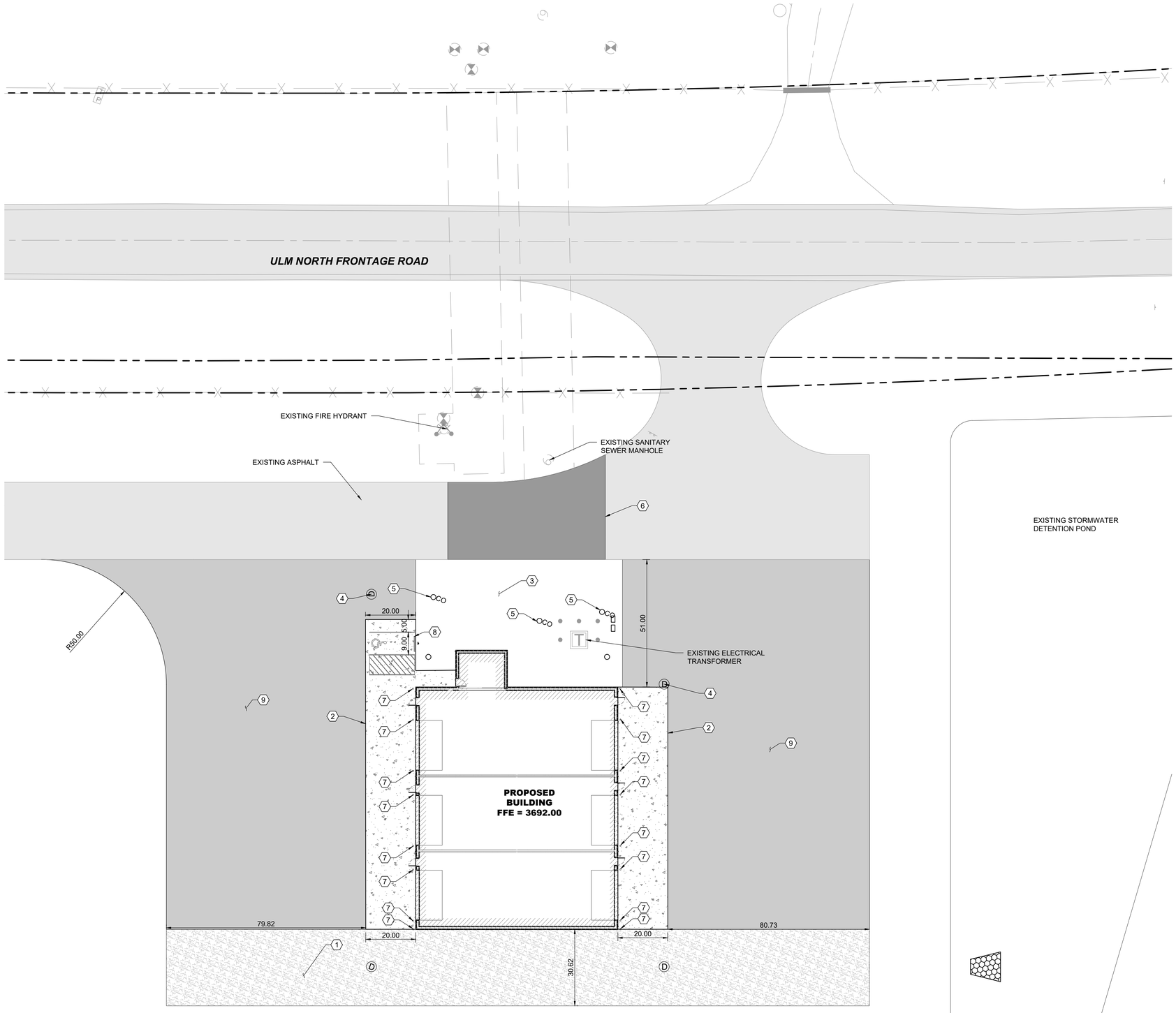
MONTANA
ADAM JAMES SCHLEGEL
No. 49501 PE
04/11/2023
LICENSED PROFESSIONAL ENGINEER

BUILDING PERMIT SET

10.26.2022
DRAWN BY | SCHLEGEL
CHECKED BY | HOUTZ
REVISIONS

GENERAL NOTES AND LEGEND

C001



CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL REFER TO BUILDING PLANS FOR LOCATION AND DIMENSIONS OF SLOPED PAVING, EXIT PORCHES, TRUCK DOCKS, BUILDING DIMENSIONS, BUILDING ENTRANCE LOCATIONS, TOTAL NUMBER, LOCATIONS AND SIZES OF ROOF DOWNSPOUTS.
2. ALL TRAFFIC CONTROL SIGNS SHALL BE FABRICATED AS SHOWN IN THE NATIONAL MANUAL ON UNIFORM CONTROL DEVICES FOR STREETS AND HIGHWAYS EXCEPT AS NOTED ON THE PLANS.
3. ALL CURB RADII SHOWN ARE TO FACE OF CURB.
4. ALL PAVING DIMENSIONS ARE TO FACE OF CURB, WHERE APPLICABLE, UNLESS OTHERWISE NOTED.
5. ALL COORDINATES SHOWN ARE TO FACE OF CURB OR OUTSIDE OF WALL.
6. THE CONTRACTOR SHALL MATCH EXISTING PAVEMENT IN GRADE AND ALIGNMENT.
7. THE CONTRACTOR SHALL MATCH EXISTING CURB AND GUTTER IN GRADE, SIZE, TYPE AND ALIGNMENT AT ADJACENT ROADWAYS, UNLESS OTHERWISE NOTED.
8. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS.
9. ALL WORK ON THIS PLAN SHALL BE DONE IN STRICT ACCORDANCE WITH THE PROJECT SPECIFICATIONS.

PAVING NOTES

1. PAVEMENT SHALL BE PLACED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2. PAVEMENT SECTION RECOMMENDATIONS WERE TAKEN FROM THE GEOTECHNICAL REPORT.

PROJECT CONDITIONS

1. CONDITIONS EXISTING AT TIME OF INSPECTION FOR BIDDING PURPOSES WILL BE MAINTAINED BY OWNER AS PRACTICABLE. VARIATIONS WITHIN STRUCTURES MAY OCCUR BY OWNER'S REMOVAL AND SALVAGE OPERATIONS PRIOR TO START OF DEMOLITION WORK.
2. UNLESS OTHERWISE INDICATED IN CONTRACT DOCUMENTS OR SPECIFIED BY THE OWNER, ITEMS OF SALVAGEABLE VALUE TO CONTRACTOR SHALL BE REMOVED FROM SITE AND STRUCTURES. STORAGE OR SALE OF REMOVED ITEMS ON SITE WILL NOT BE PERMITTED AND SHALL NOT INTERFERE WITH OTHER WORK SPECIFIED IN CONTRACT DOCUMENTS.
3. EXPLOSIVES SHALL NOT BE BROUGHT TO SITE OR USED WITHOUT WRITTEN CONSENT OF AUTHORITIES HAVING JURISDICTION. SUCH WRITTEN CONSENT WILL NOT RELIEVE CONTRACTOR OF TOTAL RESPONSIBILITY FOR INJURY TO PERSONS OR FOR DAMAGE TO PROPERTY DUE TO BLASTING OPERATIONS, PERFORMANCE OF REQUIRED BLASTING SHALL COMPLY WITH GOVERNING REGULATIONS.

SITE PREPARATION

1. PROVIDE, ERECT, AND MAINTAIN EROSION CONTROL DEVICES, TEMPORARY BARRIERS, AND SECURITY DEVICES PRIOR TO THE START OF DEMOLITION.
2. PROTECT EXISTING LANDSCAPING MATERIALS, APPURTENANCES, AND STRUCTURES WHICH ARE NOT TO BE DEMOLISHED. REPAIR DAMAGE CAUSED BY DEMOLITION OPERATIONS AT NO COST TO OWNER.
3. THE CONTRACTOR IS RESPONSIBLE TO PREVENT MOVEMENT OR SETTLEMENT OF ADJACENT STRUCTURES. PROVIDE BRACING AND SHORING AS NEEDED.
4. MARK LOCATION OF UTILITIES. PROTECT AND MAINTAIN IN SAFE AND OPERABLE CONDITION UTILITIES THAT ARE TO REMAIN. PREVENT INTERRUPTION OF EXISTING UTILITY SERVICE TO OCCUPIED OR USED FACILITIES, EXCEPT WHEN AUTHORIZED IN WRITING BY AUTHORITIES HAVING JURISDICTION. PROVIDE TEMPORARY SERVICES DURING INTERRUPTIONS TO EXISTING UTILITIES AS ACCEPTABLE TO GOVERNING AUTHORITIES AND OWNER.
5. THE CONTRACTOR IS RESPONSIBLE TO CALL 1-800-424-5555 (OR 811) AT LEAST 2 WORKING DAYS PRIOR TO ANY DEMOLITION ACTIVITIES.

DEMOLITION NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTION OF ALL PROPERTY CORNERS AND PINS.
2. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS
3. ALL WORK ON THIS PLAN SHALL BE DONE IN STRICT ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
4. THE CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST STANDARDS OF OSHA DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURE. CONTRACTOR SHALL USE SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION. THIS IS TO INCLUDE, BUT NOT LIMITED, FOR ACCESS AND EGRESS FROM ALL EXCAVATION AND TRENCHING. CONTRACTOR IS RESPONSIBLE TO COMPLY WITH PERFORMANCE CRITERIA FOR OSHA.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE PUBLIC DURING DEMOLITION, WHICH INCLUDES BUT IS NOT LIMITED TO CONSTRUCTION FENCING, BARRICADES, SIGNAGE, ETC.
6. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT OWNER AS TO SPECIFIC DETAILS REGARDING REMOVAL OF EXISTING BUILDINGS, CONTENTS AND ASSOCIATED APPURTENANCES.
7. THE CONTRACTOR IS RESPONSIBLE TO INSPECT THE SITE PRIOR TO BIDDING AND INCLUDE IN THE BID ANY AND ALL ITEMS TO BE REMOVED, DEMOLISHED, OR MAINTAINED AS NECESSARY FOR THE CONSTRUCTION OF THIS PROJECT WHETHER THEY ARE SHOWN ON THIS PLAN OR NOT.
8. ALL MATERIAL GENERATED FROM DEMOLITION ACTIVITIES SHALL BE DISPOSED OF OFF-SITE AT THE CONTRACTORS EXPENSE UNLESS OTHERWISE INDICATED BY THE OWNER. AN APPROPRIATE DUMP SITE SHALL BE NOMINATED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
9. THE CONTRACTOR SHALL VERIFY LOCATIONS AND MATERIAL TYPES OF ALL UTILITIES PRIOR TO THE START OF DEMOLITION.
10. PROVIDE POSITIVE DRAINAGE AT ALL TIMES WITHIN THE CONSTRUCTION AREA. DO NOT ALLOW WATER TO POND IN EXCAVATION AREAS, AND MAINTAIN ALL EXISTING DRAINAGE PATTERNS.
11. TRAFFIC, BOTH VEHICULAR AND PEDESTRIAN SHALL BE PROTECTED BY EFFECTIVE BARRICADES AND SIGNS IN ACCORDANCE WITH MUTCD GUIDANCE AND AS REQUIRED BY THE JURISDICTION HAVING AUTHORITY. EFFECTIVE LIGHTING OF OBSTRUCTIONS SHALL BE PROVIDED AT NIGHT.
12. PROTECTION OF PROPERTY - THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PUBLIC AND PRIVATE PROPERTY ADJACENT TO HIS WORK, AND SHALL EXERCISE DUE CAUTION TO AVOID DAMAGE TO SUCH PROPERTY. THE CONTRACTOR SHALL REPLACE OR REPAIR TO THEIR ORIGINAL CONDITION, ALL IMPROVEMENTS WITHIN OR ADJACENT TO THE WORK AREA WHICH ARE NOT DESIGNATED FOR REMOVAL, AND WHICH ARE DAMAGED OR REMOVED AS A RESULT OF OPERATIONS.

KEY NOTES

1. GRAVEL SECTION. SEE DETAIL 1/C400, EXISTING GRAVEL MAY BE UTILIZED IF NOT CONTAMINATED
2. CONCRETE APRON. SEE DETAIL 2/C400
3. LANDSCAPING ROCK.
4. STORM DRAIN STRUCTURE. SEE SHEET C200
5. SANITARY SEWER CLEANOUT. SEE SHEET C300
6. ASPHALT PATCH FOR UTILITY INSTALLATION. MATCH EXISTING 4" ASPHALT AND 12" BASE COURSE SECTION
7. PIPE BOLLARD. SEE DETAIL 6/C400
8. WHEEL STOP. SEE DETAIL 7/C400
9. ASPHALT PAVEMENT. SEE DETAIL 8/C400

NORTH

1 C100 SITE PLAN

0 10 20 40

SCALE: 1" = 20'

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GFIA WAREHOUSE

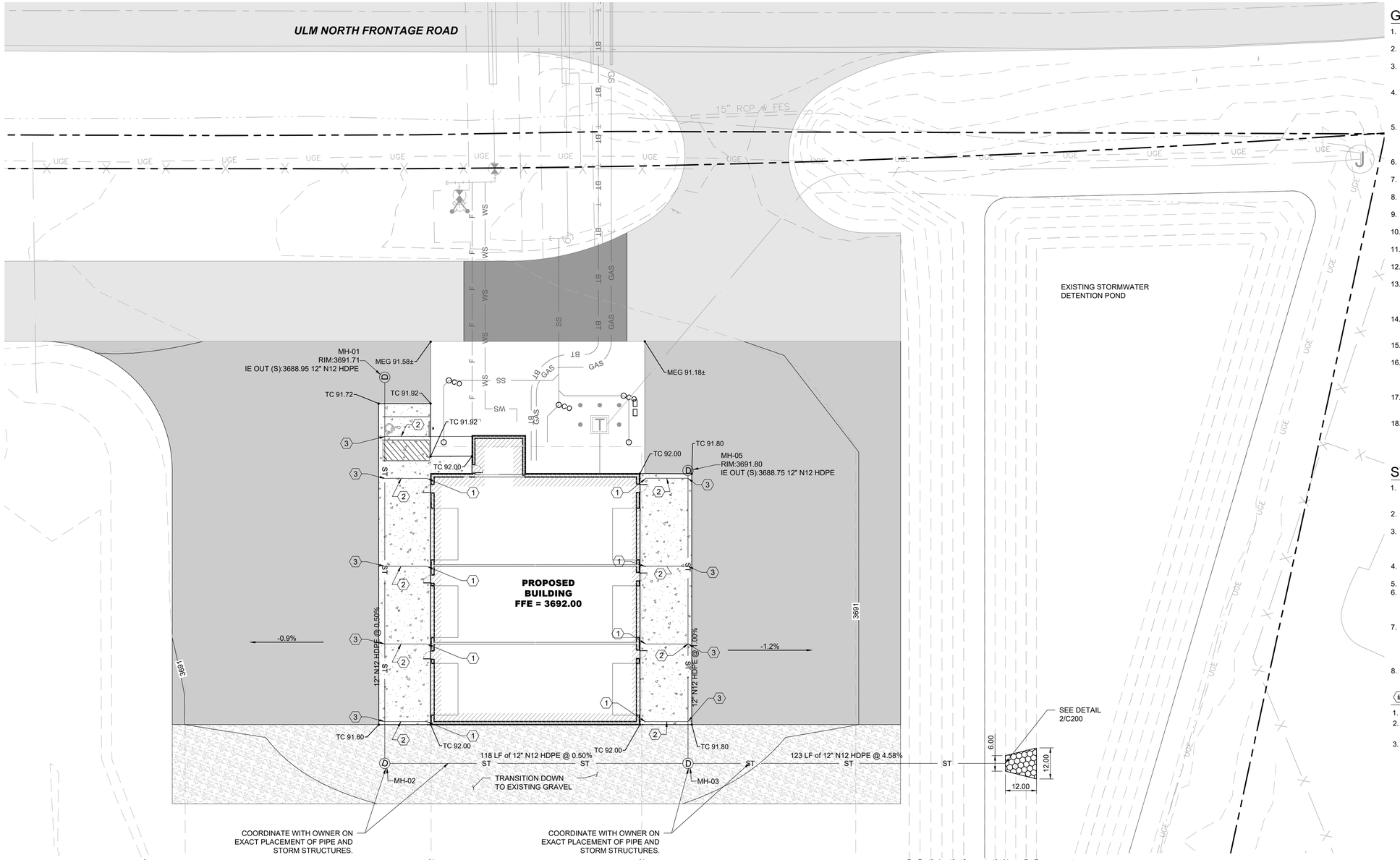
MONTANA
ADAM JAMES SCHLEGEL
No. 49501 PE
04.11.2023
LICENSED PROFESSIONAL ENGINEER

BUILDING PERMIT SET

10.26.2022
DRAWN BY | SCHLEGEL
CHECKED BY | HOUTZ
REVISIONS

SITE PLAN

C100



GRADING NOTES

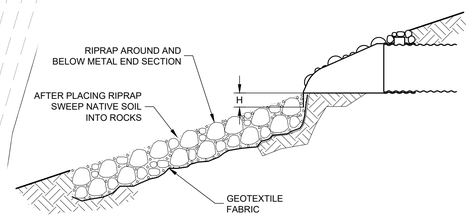
1. SITE GRADING SHALL NOT PROCEED UNTIL THE SWPPP HAS BEEN IMPLEMENTED.
2. ALL EARTHWORK AND GRADING SHALL PROCEED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.
3. NO MATERIAL SHALL BE EXCAVATED, MOVED, OR COMPACTED WITHOUT THE PRESENCE OR AUTHORIZATION OF THE OWNER'S REPRESENTATIVE.
4. THE CONTRACTOR IS RESPONSIBLE TO VERIFY EXISTING CONDITIONS AND LOCATE ALL EXISTING UTILITIES PRIOR TO COMMENCING EARTH. NOTIFY ENGINEER OF ANY UNFORESEEN CONDITIONS.
5. CONTRACTOR TO PROTECT ALL EXISTING UTILITIES, SIGNS AND EXISTING STRUCTURES AND REPAIR BACK TO ORIGINAL CONDITION IF DAMAGE HAS OCCURRED DURING CONSTRUCTION.
6. PROVIDE POSITIVE DRAINAGE AWAY FROM ALL STRUCTURES.
7. GRADES SHOWN REPRESENT FINISH GRADES UNLESS OTHERWISE NOTED.
8. SPOT ELEVATIONS INDICATE TOP OF ASPHALT, UNLESS OTHERWISE INDICATED.
9. FINISHED GRADE SPOT ELEVATIONS HAVE BEEN TRUNCATED. ADD 3600 FOR ACTUAL ELEVATION.
10. LONGITUDINAL SLOPES OF ALL SIDEWALKS SHALL NOT EXCEED 5%, EXCEPT FOR ON INDICATED RAMPS.
11. CROSS SLOPES OF ALL SIDEWALKS SHALL NOT EXCEED 2%. 1.5% IS PREFERRED.
12. PEDESTRIAN RAMPS SHALL NOT EXCEED 12H:1V IN ANY DIRECTION.
13. ADA PARKING AND ADA UNLOADING/LOADING AREAS SHALL NOT EXCEED 2% IN ANY DIRECTION. CONTRACTOR TO VERIFY GRADES OF BASE MATERIAL AND FORMS BEFORE PAVING INSTALLATION.
14. EXTERIOR CONCRETE FLATWORK ADJACENT TO BUILDINGS SHALL SLOPE AWAY FROM THE BUILDING AND NOT EXCEED 2%. 1% IS THE MINIMUM.
15. PROPOSED GRADE CONTOUR INTERVAL SHOWN AT ONE FOOT (1').
16. CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST STANDARDS OF OSHA DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING.
17. THE EARTHWORK FOR ALL BUILDING FOUNDATIONS AND SLABS SHALL BE IN ACCORDANCE WITH BUILDING PLANS AND SPECIFICATIONS.
18. THE CONTRACTOR IS RESPONSIBLE TO CALL 1-800-424-5555 (OR 811) AT LEAST 2 WORKING DAYS PRIOR TO ANY EARTH DISTURBING ACTIVITIES OR UTILITY EXCAVATIONS.

STORMWATER NOTES

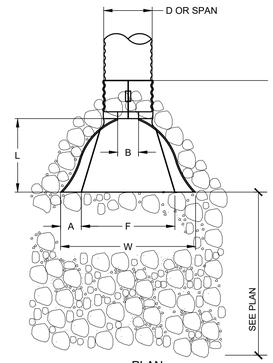
1. ALL DRAINAGE STRUCTURES AND STORM SEWER PIPES SHALL MEET HEAVY DUTY TRAFFIC (HS20) LOADING AND BE INSTALLED ACCORDINGLY.
2. TRENCHES SHALL BE PREPARED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
3. ALL PIPE MATERIAL, FITTINGS AND STRUCTURES SHALL FOLLOW THE CONSTRUCTION DRAWINGS AND CITY REQUIREMENTS. ALL STORMWATER PIPING SHALL BE ADS N-12 OR APPROVED EQUAL.
4. ALL STORMWATER TRENCHING, BEDDING AND PIPE LAYING, SHALL FOLLOW THE CURRENT CITY REQUIREMENTS.
5. ALL JOINTS SHALL BE "WATERTIGHT".
6. PRIOR TO FINAL ACCEPTANCE, CONTRACTOR SHALL FLUSH AND CLEAN ALL STORM DRAINS AND REMOVE ALL FOREIGN MATERIAL FROM THE PIPING, MANHOLES, AND DRAINAGE INLETS.
7. CONTRACTOR SHALL SUPPLY ALL MATERIALS, EQUIPMENT AND FACILITIES REQUIRED FOR TESTING ALL UTILITY PIPES IN ACCORDANCE WITH CITY CONSTRUCTION SPECIFICATIONS. COST OF ALL TESTING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
8. STORM SEWER PIPE AND MANHOLES SHALL BE TESTED FOR LEAKAGE PER CURRENT CITY STANDARDS.

(#) KEY NOTES

1. DOWNSPOUT BOOT ADAPTER. SEE DETAIL 4/C400
2. 6" PVC ROOF LEADER @ 2.0% MIN SLOPE. INV @ BLD 3689.50
3. 6X12 INSERTA-TEE CONNECTION



SECTION



PLAN

FLARED END SECTION DIMENSIONS						
PIPE DIAMETER (IN.)	A (MIN)(IN.)	B (MAX)(IN.)	H(MIN)(IN.)	F(MIN)(IN.)	L(±2")(IN.)	W(MAX WIDTH)(IN.)
12	5	7	6	22	21	44

NORTH

1 C200 GRADING AND DRAINAGE PLAN

0 10 20 40

SCALE: 1" = 20'

2 C200 TYPICAL METAL END SECTION
NOT TO SCALE

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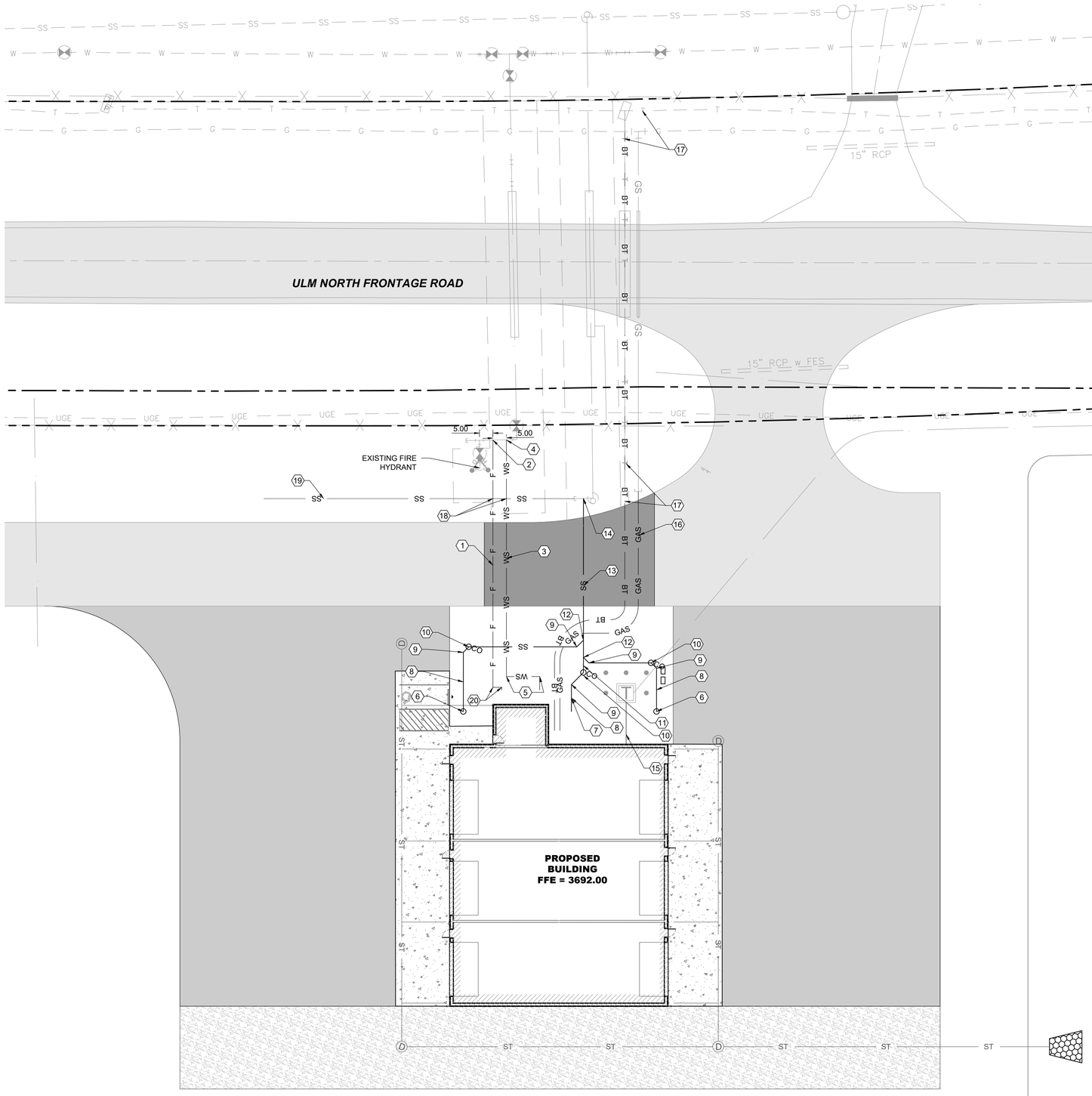
GRADING AND
DRAINAGE PLAN

C200



WATER NOTES

1. UNLESS OTHERWISE NOTED, ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CURRENT CITY OF GREAT FALLS STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS, AND MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS 6TH EDITION (MPWSS).
2. UNLESS OTHERWISE SPECIFIED, WATER LINES SHALL BE PVC C900 IN CONFORMANCE WITH AWWA C900. ALL SERVICES AND CONNECTIONS SHALL HAVE A PRESSURE RATING OF 200 PSI AND CONFORM TO THE CITY OF GREAT FALLS STANDARDS.
3. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY FITTINGS, COUPLING, AND SPOOL PIECES FOR CONNECTING NEW UTILITIES TO EXISTING UTILITIES. THESE PLANS MAY NOT SHOW ALL REQUIRED COMPONENTS FOR MAKING THE CONNECTIONS.
4. THE MINIMUM DEPTH OF BURY TO THE TOP OF PIPE FOR WATER LINES IS 6.0 FT. WHERE AT LEAST 6.0 FT OF COVER CANNOT BE MAINTAINED, INSTALL RIGID INSULATION BOARD ABOVE PIPING AS INDICATED ON PLANS.
5. THE CONTRACTOR MUST ENSURE THAT A MINIMUM OF 10 FEET (OUTSIDE PIPE WALL TO OUTSIDE PIPE WALL) OF CLEARANCE IS MAINTAINED ON THE HORIZONTAL PLANE BETWEEN ALL WATER AND SEWER MAINS. ADDITIONALLY, THE CONTRACTOR MUST ALSO ENSURE THAT 18 INCHES OF VERTICAL CLEARANCE IS MAINTAINED BETWEEN WATER AND SEWER MAINS THAT CROSS. IMMEDIATELY NOTIFY ENGINEER OF CONFLICTS.
6. LOCATIONS OF FITTINGS, BENDS, VALVES, AND OTHER APPURTENANCE ARE APPROXIMATE. PROVIDE ADEQUATE SPACING BETWEEN FIXTURES TO MAINTAIN PIPE INTEGRITY. PROVIDE AS BUILT LOCATIONS FOR ALL FIXTURES.
7. ANY EXISTING OR NEW VALVES THAT CONTROL THE WATER SUPPLY SHALL BE OPERATED BY CITY PERSONNEL ONLY.
8. PRESSURE TEST AND DISINFECT ALL WATER LINES IN ACCORDANCE WITH THE CITY OF GREAT FALLS STANDARDS AND ALL OTHER GOVERNING AGENCIES' STANDARDS.
9. ALL FITTINGS SHALL BE MECHANICAL JOINT WITH CONCRETE THRUST BLOCKS MEETING CITY OF GREAT FALLS STANDARDS AND ALL OTHER GOVERNING AGENCIES' STANDARDS.
10. ALL DUCTILE IRON FITTINGS TO BE WRAPPED IN POLYWRAP.

SEWER NOTES

1. UNLESS OTHERWISE NOTED, ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CITY OF GREAT FALLS STANDARDS AND MPWSS.
2. UNLESS OTHERWISE SPECIFIED, SANITARY SEWER PIPE SHALL BE PVC IN CONFORMANCE WITH ASTM D-3034, SDR 26. ALL SERVICES AND CONNECTIONS SHALL CONFORM TO THE CITY OF GREAT FALLS STANDARDS.
3. ALL PIPES SHALL BE BEDDED WITH TYPE 1 BEDDING PER CURRENT CITY OF GREAT FALLS STANDARDS AND MPWSS.
4. CONTRACTOR SHALL SUPPLY ALL MATERIALS, EQUIPMENT AND FACILITIES REQUIRED FOR TESTING ALL UTILITY PIPES IN ACCORDANCE WITH CITY OF GREAT FALLS STANDARDS AND MPWSS. COST OF ALL TESTING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
5. CONTRACTOR SHALL FIELD VERIFY LINE AND GRADE OF ANY EXISTING AND PROPOSED UTILITY.

DRY UTILITY NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE INSTALLATION OF ALL "DRY" UTILITIES (ELECTRIC, GAS, TELEPHONE) WITH SERVICE PROVIDERS.
2. REFER TO ELECTRICAL PLANS FOR ADDITIONAL CONDUIT AND SITE LIGHTING REQUIREMENTS.
3. REFER TO LANDSCAPE PLANS FOR IRRIGATION CONDUIT.
4. THE CONTRACTOR IS RESPONSIBLE TO CALL 1-800-424-5555 (OR 811) AT LEAST 2 WORKING DAYS PRIOR TO ANY EARTH DISTURBING ACTIVITIES OR UTILITY EXCAVATIONS.

(#) KEY NOTES

1. 8" C900 PVC FIRE LINE. SEE FIRE PROTECTION PLANS FOR CONTINUATION AT BUILDING.
2. 8"X16" TAPPING SLEEVE (ROMAC SST) AND 8" GATE VALVE. SEE DETAIL 7/C401.
3. 4" C900 PVC DOMESTIC WATER SERVICE LINE. SEE PLUMBING FOR CONTINUATION AT BUILDING.
4. 4"X16" TAPPING SLEEVE (ROMAC SST) AND 4" GATE VALVE. SEE DETAIL 7/C401
5. 4" 90 DEG BEND WITH THRUST BLOCK. SEE DETAIL 8/C401
6. SAMPLE PORT INV IN = 3685.83. INV OUT = 3685.00. SEE DETAIL 5/C401. SEE PLUMBING FOR SAND/OIL INTERCEPTOR AND CONNECTION TO BUILDING.
7. 4" SEWER SERVICE INV. 3685.83. SEE PLUMBING FOR CONNECTION TO BUILDING.
8. 4" SDR 26 PVC AT 2.0% MIN SLOPE
9. 4" 45 DEG BEND.
10. 4" 45 DEG BEND WITH CLEANOUT. SEE DETAIL 6/C401.
11. 4X6 PVC ECCENTRIC INCREASER FITTING.
12. 4X6 PVC WYE CONNECTION.
13. 6" SDR 26 @ 2.0 MIN SLOPE.
14. SEWER SERVICE CONNECTION TO EXISTING 12" MAIN. INVERT OF SERIVE 3682.42. INVERT OF MAIN 3680.75 (CONTRACTOR TO VERIFY). SEE DETAIL 4/C401.
15. NEW ELECTRICAL SERVICE. SEE ELECTRICAL PLANS AND COORDINATE WITH POWER COMPANY.
16. NEW GAS SERVICE LINE. SEE PLUMBING PLANS AND COORDINATE WITH GAS UTILITY COMPANY.
17. TELECOM NOT YET EXTENDED ACROSS ROADWAY. COORDINATE WITH UTILITY COMPANY FOR UTILITY EXTENSION TO BUILDING INCLUDING NEW SERVICE, AND NUMBER AND SIZE OF CONDUIT.
18. CONTRACTOR TO ENSURE 18" MIN VERTICAL SEPARATION BETWEEN WATER SERVICES AND FUTURE SEWER MAIN. TOP OF WATER PIPE AT FUTURE CROSSING 3679.00. FOLLOW CITY OF GREAT FALLS STANDARDS FOR SEWER UTILITY CROSSINGS INCLUDING RIGID INSULATION AND BEDDING SAND. REFER TO CITY OF GREAT FALLS STANDARD DETAIL 5-45A FOR SIMILAR INSTALLATION
19. FUTURE 12" SEWER MAIN EXTENTION
20. 8" 90 DEG BEND WITH THRUST BLOCK. SEE DETAIL 8/C401

NORTH

1 C300 UTILITY PLAN

0 10 20 40

SCALE: 1" = 20'

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ADAM JAMES SCHLEGEL
No. 49501 PE
LICENSED PROFESSIONAL ENGINEER
04.11.2023

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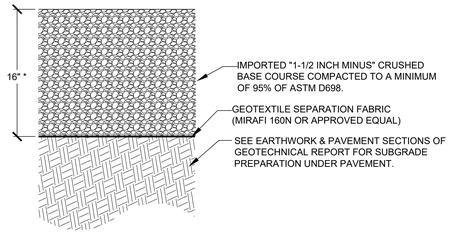
UTILITY PLAN

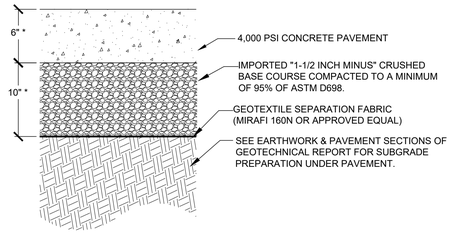
C300



NOTES:
1. NOT USED
2. NOT USED
3. SUBGRADE SHOULD BE PREPARED ACCORDING RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT. IF SOFT SOILS ARE ENCOUNTERED, THEY SHOULD BE REMOVED AND REPLACE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.

*REFER TO *GEOTECHNICAL REPORT* FOR ALL MATERIAL THICKNESS UNLESS DIRECTED OTHERWISE BY OWNER.

1 C400 GRAVEL SECTION — NOT TO SCALE



NOTES:
1. SEE DETAIL 3/C400 FOR FINISH & JOINTS
2. CONCRETE SHOULD HAVE MINIMUM ENTRAINED AIR CONTENT OF 5.0% AND UTILIZE TYPE III CEMENT.
3. SUBGRADE SHOULD BE PREPARED ACCORDING RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT. IF SOFT SOILS ARE ENCOUNTERED, THEY SHOULD BE REMOVED AND REPLACE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.

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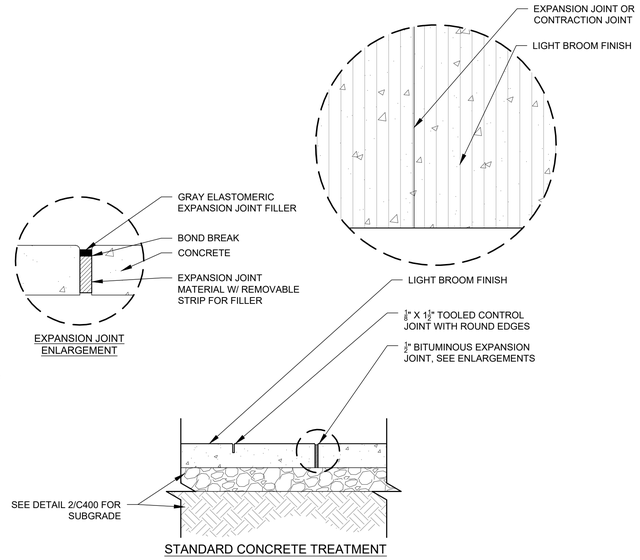
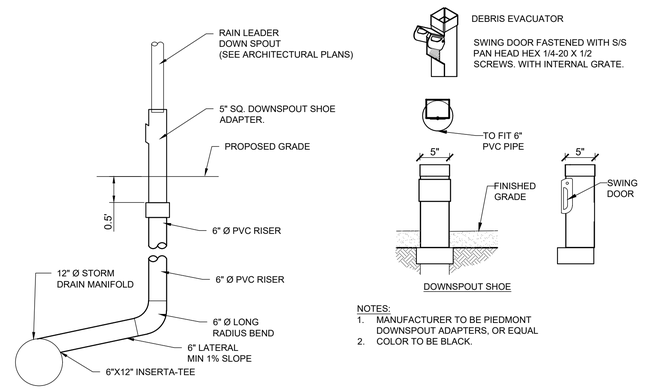
2 C400 HEAVY DUTY CONCRETE PAVEMENT — NOT TO SCALE

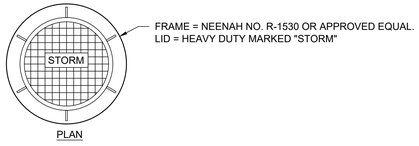


3 C400 CONCRETE EXPANSION AND CONTRACTION JOINTS SECTION — NOT TO SCALE

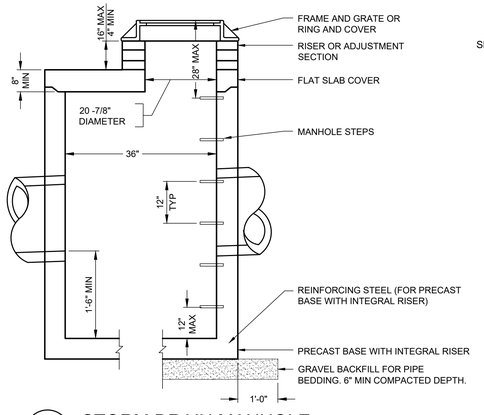


NOTES:
1. MANUFACTURER TO BE PIEDMONT DOWNSPOUT ADAPTERS, OR EQUAL
2. COLOR TO BE BLACK.

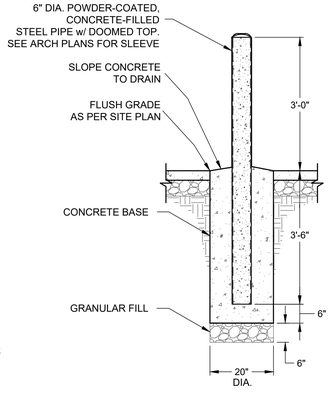
4 C400 DOWNSPOUT BOOT TO STORM PIPE — NOT TO SCALE



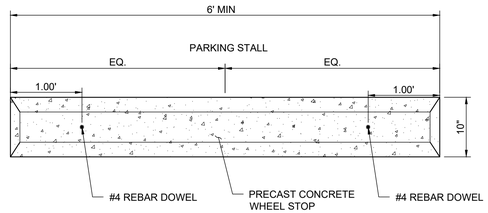
PLAN



5 C400 STORM DRAIN MANHOLE — NOT TO SCALE



6 C400 PIPE BOLLARD — NOT TO SCALE



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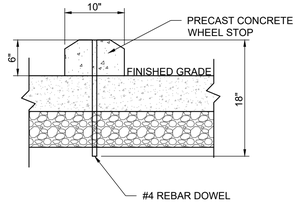
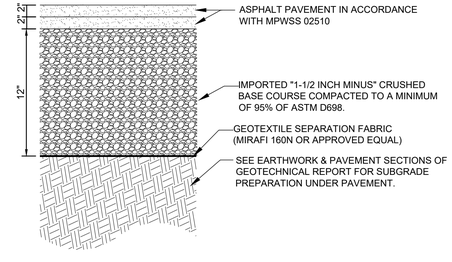


7 C400 WHEEL STOP — NOT TO SCALE



NOTES:
1. SUBGRADE SHOULD BE PREPARED ACCORDING RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT. IF SOFT SOILS ARE ENCOUNTERED, THEY SHOULD BE REMOVED AND REPLACE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.

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8 C400 ASPHALT PAVEMENT SECTION — NOT TO SCALE

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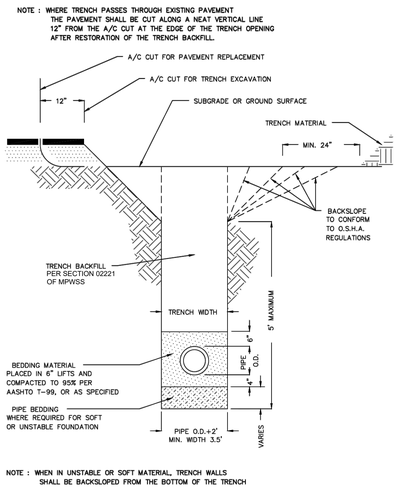
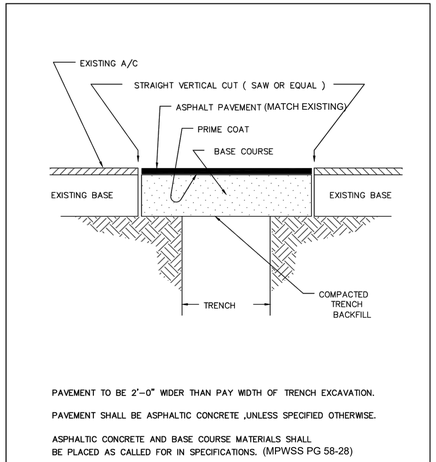
C400



TYPICAL TYPE 1 TRENCH DETAIL

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED	5 – 30

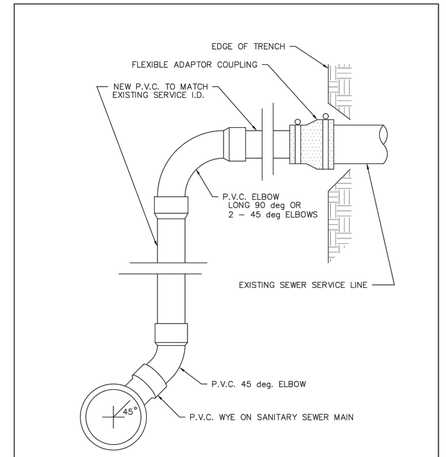
1 C401 TYPICAL TYPE I TRENCH DETAIL
CROSS SECTION NOT TO SCALE



TYPICAL TRENCH PAVEMENT REPLACEMENT

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	NOVEMBER 1987 REVISED	5 – 36

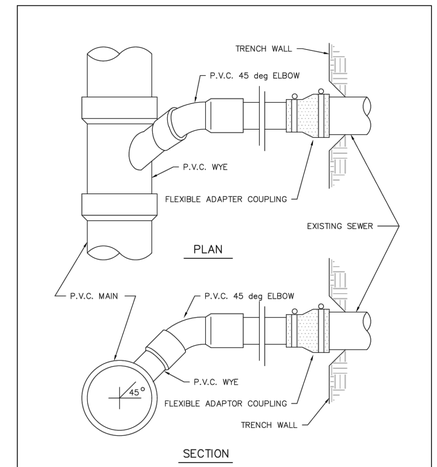
2 C401 TYPICAL TRENCH PAVEMENT REPLACEMENT
CROSS SECTION NOT TO SCALE



PVC RISER LATERAL WITH RISER TO EXISTING SERVICE LINE

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED	5 – 54

3 C401 RISER LATERAL TO EX. SERVICE LINE
CROSS SECTION NOT TO SCALE



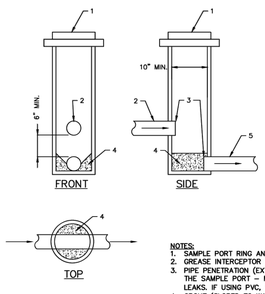
PVC LATERAL TO EXISTING SEWER SERVICE LINE

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED	5 – 53

4 C401 LATERAL TO EX. SERVICE MAIN
CROSS SECTION NOT TO SCALE

SAMPLE PORTS

1. ALL INTERCEPTORS ARE TO BE INSTALLED WITH A SAMPLING PORT THAT RECEIVES FLOW FROM THE INTERCEPTOR'S EFFLUENT.
2. TEE PIPING ON THE INTERCEPTOR'S INTERIOR WILL NOT SUFFICE AS A SAMPLE PORT.
3. SAMPLE PORTS MUST BE LOCATED IN AREAS PROTECTED FORM VEHICLE TRAFFIC.
4. SAMPLE PORTS ARE TO BE CLEANED AND INSPECTED DURING ROUTINE INTERCEPTOR PUMPING.
5. SAMPLE PORTS WILL HAVE A MINIMUM 10" DIAMETER ACCESS COVER.
6. SAMPLE PORTS WILL HAVE A MINIMUM 6" DROP BETWEEN INLET AND DISCHARGE PIPING.
7. SAMPLE PORTS MUST DRAIN COMPLETELY AND NOT HOLD WATER. BOTTOM TO BE GROUTED AND SLOPED
8. INLET PIPE PENETRATION MUST EXTEND 1" PAST THE INSIDE WALL OF THE SAMPLE PORT. PENETRATIONS ARE TO BE SEALED TO PREVENT LEAKS.



NOTES:
1. SAMPLE PORT RING AND LID
2. GREASE INTERCEPTOR DISCHARGE LINE
3. PIPE PENETRATION (EXTEND 1" PAST THE INSIDE WALL OF THE SAMPLE PORT – MUST BE SEALED TO PREVENT LEAKS. IF USING PVC, A SADDLE MUST BE USED)
4. GROUT (SLOPED TO WASTEWATER CHANNEL – THE SAMPLE PORT MUST DRAIN COMPLETELY AND NOT HOLD WATER)
5. SAMPLE PORT DISCHARGE LINE TO CITY'S SANITARY SEWER

SAMPLE PORT

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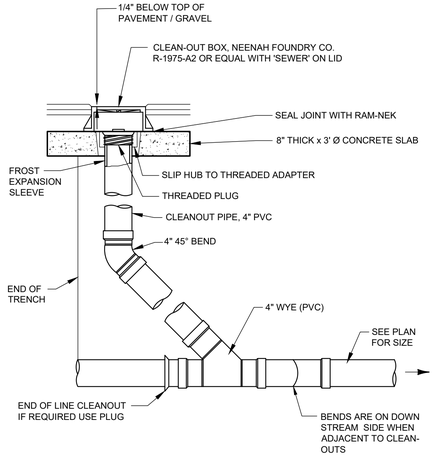
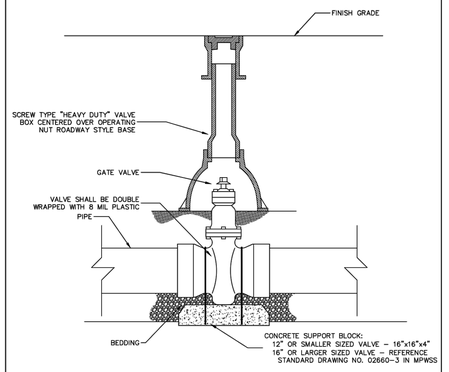
5 C401 SAMPLE PORT
CROSS SECTION NOT TO SCALE



6 C401 CLEANOUT
CROSS SECTION NOT TO SCALE

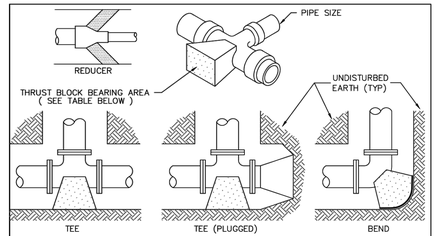
Notes :
1. The use of "Drop In" risers to achieve final grade is not allowed.
2. Three piece riser shall be used. A four piece riser with upward adjustment shall be allowed for deeper valves.
3. Engineer may require additional support and rebar anchor system for valves 12" and smaller depending on location and project conditions.
4. All bolts, mechanical and flanged joint fittings shall be double wrapped with polyethylene encasement in accordance with AWWA C105, and wrapped with Wax-Tape System.
5. 16" or larger sized valves shall be butterfly valves. Operating nut shall be on south or east side of water main. Rebar anchor system required.



STANDARD GATE VALVE DETAIL

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	OCT 2011 REVISED MAY 2018	5 – 39

7 C401 STANDARD GATE VALVE
CROSS SECTION NOT TO SCALE



* Blocking for tapping sleeves shall be the same as tee.
# Blocking is required on reducer (or increaser) if reducing over one pipe size.

MINIMUM THRUST BLOCK BEARING AREA (SQUARE FEET)					
PIPE SIZE	TEES * & PLUGS	90 Deg BEND	45 Deg & WYES	22–1/2 BEND & REDUCER #	VALVES
4"	1.8	2.6	1.4	0.8	4.0
6"	3.8	5.2	2.9	1.5	4.0
8"	6.7	9.5	5.0	2.6	4.0
10"	10.8	15.3	8.3	4.2	6.25
12"	15.3	21.8	11.9	5.8	9.0
14"	20.8	28.8	16.2	8.3	10.5
16"	27.4	37.7	20.9	10.8	16.0
18"	34.7	47.7	26.6	13.6	16.25
20"	42.8	58.9	32.7	16.8	
24"	61.7	84.8	47.1	24.2	32.5
30"	96.4	123.5	73.6	37.9	

NOTE: 1. This table is based on 150# PSI main pressure & 2000 # soil pressure.
2. Wrap all fittings with polyethlene.
3. Blocking for valves where determined by Engineer.
4. Concrete used for thrust blocks shall be allowed to 'CURE' for approx. 24 hours.

THRUST BLOCKING DETAILS FOR WATER MAIN FITTINGS

OFFICE OF CITY ENGINEER GREAT FALLS, MONTANA	DECEMBER 1987 REVISED	5 – 43

8 C401 THRUST BLOCKING FOR WATER MAIN
NOT TO SCALE

Cushing Terrell.
cushingterrell.com
800.757.9522

3900 ULM NORTH FRONTAGE ROAD, GREAT FALLS, MT 59404
GREAT FALLS INTERNATIONAL AIRPORT

GFIA WAREHOUSE

MONTANA
ADAM JAMES SCHLEGEL
No. 49501 PE
04.11.2023
LICENSED PROFESSIONAL ENGINEER

BUILDING PERMIT SET

10.26.2022
DRAWN BY | SCHLEGEL
CHECKED BY | HOUTZ
REVISIONS
-

CIVIL DETAILS

C401

STRUCTURAL GENERAL NOTES

STRUCTURAL GENERAL NOTES ARE INTENDED TO HIGHLIGHT OR IN SOME CASES SUPPLEMENT PROJECT SPECIFICATIONS. REFER TO THE PROJECT SPECIFICATIONS FOR COMPLETE WORK COVERAGE.

A. GOVERNING CODES

1) INTERNATIONAL BUILDING CODE (IBC), 2021 EDITION.
2) MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES, ASCE/SEI 7-16.
3) BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318-19.
4) SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AISC 360-16.
5) NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS, AISI S100-16 WITH SUPPLEMENT 2, 2020 EDITION.

B. DESIGN LOADS AND CRITERIA

1) GRAVITY LOADS:
a) ROOF LOADS:
1. ROOF DEAD LOAD: 10 psf
2. PRIMARY COLLATERAL DEAD LOAD: 5 psf
3. SECONDARY COLLATERAL DEAD LOAD: 5psf
4. ROOF LIVE LOAD:20 psf
b) SLABS ON GRADE:
1. SLABS ON GRADE LIVE LOAD: 125 psf (MANUFACTURING — LIGHT)
2) SNOW LOADS:
a) GROUND SNOW LOAD: Pg = 24 psf, Is = 1.00, Ce = 1.0, Ct = 1.1, Cs = 1.0
b) ROOF SNOW LOAD: Pf = 30 psf UNIFORM OR UNBALANCED
3) WIND CRITERIA:
a) 3-SEC PEAK GUST WIND SPEED = 107 mph
b) RISK CATEGORY = II
c) Iw = 1.00
d) EXPOSURE = C
e) INTERNAL PRESSURE COEFFICIENT (GCpi): ±0.18
f) EXTERNAL ROOF COMPONENTS & CLADDING: 85 psf MINIMUM (ULTIMATE)
g) EXTERNAL WALL COMPONENTS & CLADDING: 35 psf MINIMUM (ULTIMATE)
h) ROOF PURLIN NET UPLIFT - PERIMETER 20 FT: 50 psf MINIMUM (ULTIMATE)
i) INTERSTORY DRIFT LIMIT = 1/400
4) SEISMIC CRITERIA:
a) SS = 0.169 g / S1 = 0.07 g MAPPED MCER VALUES
b) RISK CATEGORY = II
c) PROJECT SITE CLASS = B
d) Ie = 1.00
e) SDS = 0.113 g / SD1 = 0.046 g DESIGN RESPONSE COEFFICIENT
f) SEISMIC DESIGN CATEGORY = D
g) ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE PROCEDURE
5) FOOTING BEARING PRESSURE: 4000 psf ON APPROVED SUBGRADE, SEE SECTION FOUNDATIONS
6) ROCK ANCHOR CRITERIA:
a) SERVICE LOAD CAPACITY = 50 kip
b) ULTIMATE LOAD CAPACITY = 100 kip
7) SOIL FRICTION COEFFICIENT: 0.25
8) LATERAL SOIL PRESSURE:
a) ACTIVE EQUIVALENT FLUID PRESSURE: 53 pcf
b) AT-REST EQUIVALENT FLUID PRESSURE: 73 pcf
c) PASSIVE EQUIVALENT FLUID PRESSURE: 265 pcf
9) ROOF RAIN LOADS:
a) PRIMARY DRAINAGE SYSTEM RAINFALL INTENSITY: 1.5 in/hour (60-MIN DURATION / 100-YEAR RETURN PERIOD STORM)
b) SECONDARY DRAINAGE SYSTEM RAINFALL INTENSITY: 3.0 in/hour (15-MIN DURATION / 100-YEAR RETURN PERIOD STORM)
10) FROST DEPTH: 36 INCHES TOP OF FOOTING

C. MATERIALS SECTION

1) CONCRETE MIXTURE: FOOTINGS, FOUNDATION WALLS
PORTLAND CEMENT ASTM C150 TYPE I/II
FLY ASH ASTM C618, CLASS F, 10% - 25% BY WEIGHT
WATER / CEMENT + FLY ASH = 0.45 MAXIMUM
f'c = 4500 psi BASED ON 28-DAY TEST
EXPOSURE CATEGORY F, EXPOSURE CLASS F2
TOTAL AIR CONTENT = 6% +/- 1.5%
3/4" OR 1" NORMAL WEIGHT AGGREGATE ASTM C33
2) CONCRETE MIXTURE: INTERIOR SLABS ON GRADE & ELEVATED COMPOSITE SLABS
PORTLAND CEMENT ASTM C150 TYPE I/II
WATER / CEMENT= 0.45 MAXIMUM
f'c = 4500 psi BASED ON 28-DAY TEST
TOTAL AIR CONTENT = 3% MAX
3/4" OR 1" NORMAL WEIGHT AGGREGATE ASTM C33
BALANCE CEMENTITIOUS RATIOS TO ACHIEVE FLOORING FINISH SCHEDULES AND CONCRETE WORKABILITY WITHOUT ADVERSELY AFFECTING CONCRETE SHRINKAGE
3) FLOWABLE FILL: PORTLAND CEMENT ASTM C150 TYPE I/II
CEMENTITIOUS MATERIALS CONTENT OF 75 POUNDS PER CUBIC YARD, MINIMUM.
SELECT WATER CONTENT AS NECESSARY TO PRODUCE A CONSISTENCY THAT WILL RESULT IN A FLOWABLE, SELF-LEVELING PRODUCT AT THE TIME OF PLACEMENT.
f'c = 300 psi AT 28 DAYS
TOTAL AIR CONTENT 5.0% - 12.0%
NORMAL WEIGHT FINE AGGREGATE CONFORMING TO ASTM C33 WITH 100% PASSING A 3/8 SIEVE AND NO MORE THAN 15% PASSING A NO. 200 SIEVE MAY BE USED.
MAXIMUM SLUMP PER ACI 229 SECTION 4.2.1 = 7" +/- 1"
4) REINFORCING BARS: ASTM A615, GRADE 60
ASTM A706, GRADE 60 WHERE INDICATED TO BE WELDED
5) EPOXY-COATED STEEL REINFORCING BARS: ASTM A775
6) MECHANICAL REBAR SPLICES: LENTON TAPER THREADED SPLICES AS MFD BY PENTAIR OR APPROVED EQUAL
7) WELDED WIRE FABRIC (WWF): ASTM A1064, PLAIN WIRE REINFORCEMENT, Fy = 65 ksi
8) ANCHOR RODS: ASTM F1554 GRADE 36 OR 55 AS INDICATED W/ ASTM A563 GRADE A PLAIN HEAVY HEX NUTS
9) HYDRAULIC CEMENT GROUT: ASTM C1107, NON-METALLIC, NON-SHRINK, 3 DAY f'c = 5000 psi
10) STRUCTURAL STEEL:
a) W & WT SHAPES: ASTM A992, Fy = 50 ksi
b) HP SHAPES: ASTM A572, Fy = 50 ksi
c) HSS — RECTANGULAR: ASTM A500 GRADE B, Fy = 46 ksi
d) HSS — ROUND: ASTM A500 GRADE B, Fy = 42 ksi
e) STEEL PIPE: ASTM A53 GRADE B, Fy = 35 ksi
f) CHANNEL & ANGLE SHAPES: ASTM A36, Fy = 36 ksi
g) PLATES AND BARS: ASTM A36, Fy = 36 ksi
11) HIGH-STRENGTH BOLTS: ASTM F3125 GRADE A325 TYPE 1 THREAD CONDITION N; STEEL TO STEEL CONNECTIONS
12) NUTS: ASTM A563 GRADE DH PLAIN; STEEL TO STEEL CONNECTIONS
13) COUPLER NUTS: ASTM A563 GRADE DH PLAIN; STEEL TO STEEL CONNECTIONS
14) WASHERS: ASTM F436 TYPE 1 PLAIN; STEEL TO STEEL CONNECTIONS
15) WELD FILLER METAL: FEXX = 70 ksi TENSILE STRENGTH
16) COLD-FORMED STEEL MEMBERS:
a) DESIGNATION THICKNESS 43 MIL OR LESS: ASTM A653 Fy = 33 ksi - GALVANIZED COATING WEIGHT G60
b) DESIGNATION THICKNESS 54 MIL OR GREATER: ASTM A653 Fy = 50 ksi - GALVANIZED COATING WEIGHT G60
17) EXPANSION ANCHORS: CARBON STEEL STUD, MIN Fy = 84 ksi W/ EXPANSION ELEMENTS (WEDGES) SUCH AS (HILTI KWIK BOLT TZ2) ICC-ES REPORT ESR-4266 OR APPROVED EQUAL
18) ADHESIVE ANCHORS:
a) CONCRETE: ASTM F1554 GRADE 36 THREADED ROD W/ CHISEL POINT & INJECTABLE ADHESIVE SUCH AS (HILTI HIT-RE 500 V3) ICC-ES REPORT ESR-3814 OR APPROVED EQUAL
b) ADHESIVE ANCHORS SHALL BE INSTALLED IN CONCRETE HAVING A MINIMUM AGE OF 21 DAYS AT TIME OF ANCHOR INSTALLATION. FOR INSTALLATIONS SOONER THAN 21 DAYS, CONSULT ADHESIVE MANUFACTURER FOR REQUIREMENTS.
c) IF TEMPERATURE OF BASE MATERIAL AT TIME OF ADHESIVE INSTALLATION IS 45 F OR LESS AN ACRYLIC ADHESIVE IS REQUIRED.
19) SCREW ANCHORS:
a) CONCRETE: ASTM B633, CLASS SC1, TYPE III SUCH AS (SIMPSON STRONG-TIE TITEN HD) ICC-ES REPORT ESR-2713 OR APPROVED EQUAL
b) FULLY GROUTED CMU: ASTM B633, CLASS SC1, TYPE III SUCH AS (SIMPSON STRONG-TIE TITEN HD) ICC-ES REPORT ESR-1056 OR APPROVED EQUAL
20) POWDER DRIVEN FASTENERS: (HILTI X-U FASTENER) ICC-ES REPORT ESR-2269 OR APPROVED EQUAL
21) FOUNDATION UPLIFT ANCHORS: ALL THREAD RODS SUCH AS R61 WILLIAMS ALL-THREAD ANCHORS, OR APPROVED EQUIVALENT PER ASTM A615, WITH MINIMUM YIELD STRENGTH OF 75KSI AND MINIMUM ULTIMATE STRENGTH OF 100KSI.
22) FOUNDATION ANCHOR ROD GROUT: ASTM C1107 TYPE 1-II-V CEMENT GROUT WITH MINIMUM f'c= 4500psi AND MAXIMUM W/C=0.4
23) VAPOR BARRIER: ASTM E1745, CLASS A, 0.1 PERMS

D. FOUNDATIONS

1) FOUNDATIONS HAVE BEEN DESIGNED BASED ON INFORMATION PROVIDED IN THE GEOTECHNICAL REPORT ENTITLED "GEOTECHNICAL ENGINEERING REPORT" BY TERRACON PROJECT NUMBER C4215014, DATED AUGUST 13, 2021. THE GEOTECHNICAL REPORT SHALL BE CONSIDERED A SUPPLMENTAL REFERENCE DOCUMENT TO THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL REVIEW AND FOLLOW ALL RECOMMENDATIONS PROVIDED THEREIN INCLUDING, BUT NOT LIMITED TO, SUBGRADE PREPARATION, GROUNDWATER MITIGATION AND SLOPE STABILITY. IN THE CASE OF DISCREPANCIES BETWEEN THE GEOTECHNICAL REPORT AND THE CONTRACT DOCUMENTS, THE ENGINEER SHALL BE NOTIFIED AND THE MOST STRINGENT CRITERIA SHALL BE APPLIED. BORING LOGS AND LABORATORY TEST RESULTS ARE INCLUDED FOR REFERENCE IN THE PROJECT MANUAL.
2) THE GEOTECHNICAL ENGINEER SHALL PERFORM AN OPEN EXCAVATION INSPECTION PRIOR TO PLACING FOUNDATIONS TO ENSURE ASSUMED SOIL DESIGN PARAMETERS ARE CONSISTENT WITH THOSE ENCOUNTERED ON SITE.
3) PLACE FOOTINGS ON UNDISTURBED NATIVE SOILS OR ENGINEERED FILL PLACED OVER UNDISTURBED NATIVE SOILS. ENGINEERED FILL MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT. PLACE ENGINEERED FILL IN UNIFORM LIFTS AND COMPACT TO MAXIMUM DRY UNIT WEIGHT OF 95% STANDARD PROCTOR IN ACCORDANCE WITH ASTM D698. PLAN LIMITS OF ENGINEERED FILL MUST EXTEND AT LEAST 2'-0" BEYOND ALL FOOTING EDGES, UNLESS NOTED OTHERWISE IN THE GEOTECHNICAL REPORT. IF ENCOUNTERED, EXISTING FILL SHALL BE REMOVED TO AN APPROVED DEPTH AND REPLACED WITH ENGINEERED FILL AS DESCRIBED IN THE GEOTECHNICAL REPORT.
4) DO NOT BACKFILL WALLS WITH UNBALANCED SOIL LEVELS UNLESS ADEQUATELY SHORED OR HAVING PERMANENT FLOOR DIAPHRAGMS INSTALLED WITH CONNECTIONS COMPLETE. WALLS SPECIFICALLY DETAILED AS RETAINING WALLS SHALL HAVE FOOTING TOE SOIL COVERAGE AS DETAILED PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SHORING DESIGN AND INSTALLATION, WHICH SHALL BE PERFORMED BY A REGISTERED PROFESSIONAL.
5) BACKFILL AND COMPACT BURIED WALLS OR GRADE BEAMS EVENLY ON EACH SIDE TO AVOID UNBALANCED LOADS.
6) BACKFILL SHALL NOT BE PLACED PRIOR TO CONCRETE ELEMENTS REACHING A TESTED COMPRESSIVE DESIGN STRENGTH OF 4500 psi. CONTACT ENGINEER AND COORDINATE REVIEW OF COMPRESSIVE STRENGTH TEST RESULTS TO CONFIRM BACKFILL WORK MAY PROCEED.
7) ALWAYS PROVIDE POSITIVE SURFACE WATER DRAINAGE AWAY FROM THE STRUCTURE.
8) FOUNDATIONS SHALL BE CENTERED UNDER SUPPORTED WALLS AND COLUMNS, UNLESS NOTED OTHERWISE.
9) CONCRETE SHALL NOT BE PLACED IN EXCAVATIONS CONTAINING FROZEN SOIL OR WATER.
10) SHOULD SITE CONDITIONS ENCOUNTERED VARY FROM THOSE INDICATED IN THE CONSTRUCTION DOCUMENTS, CONTACT THE ENGINEER FOR FURTHER GUIDANCE.

E. SLABS ON GRADE

1) PLACE INTERIOR SLABS ON GRADE DIRECTLY ON AN APPROVED VAPOR BARRIER OVER A 6" BASE OF CRUSHED, 3/4" MINUS DRAINAGE COURSE, GRADED FOR COMPACTION WITH LESS THAN 5% PASSING THE NO. 200 SIEVE. PLACE DRAINAGE COURSE ON STRUCTURAL FILL PLACED OVER UNDISTURBED BEDROCK. WHERE REQUIRED, PLACE ENGINEERED FILL IN UNIFORM LIFTS UNDER SLABS (ABOVE FOOTINGS) AND COMPACT TO MAXIMUM DRY UNIT WEIGHT OF 95% STANDARD PROCTOR IN ACCORDANCE WITH ASTM D698.
2) VAPOR BARRIER SYSTEM SHALL BE POLYOLEFIN SHEET AND SHALL INCLUDE MANUFACTURER'S ADHESIVE SEAM TAPE AND PENETRATION SLEEVES. INSTALL AND SEAL VAPOR BARRIER ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
a) VAPOR BARRIER INSTALLATION SHALL UTILIZE MATERIALS LISTED WHERE REQUIRED OR SUBMIT EQUIVALENT MATERIALS FOR ENGINEER APPROVAL:
1. VAPOR BARRIER: STEGO INDUSTRIES, LLC "STEGO WRAP" 15-MILS.
2. VAPOR BARRIER SEAM TAPE: STEGO INDUSTRIES, LLC "STEGO TAPE".
3. CHANNEL BAR (TERMINATION BAR): OMG ROOFING PRODUCTS "CHANNEL BAR" PRE PUNCHED AT 12-IN. ON CENTER.
4. CHANNEL BAR ANCHORS: OMG ROOFING PRODUCTS "MASONRY ANCHOR" 1/4" PIN DIAMETER, 1-1/4" PIN LENGTH.
5. VAPOR RETARDANT MEMBRANE: STEGO INDUSTRIES, LLC "STEGO MASTIC".
b) ENGINEER OF RECORD SHALL BE NOTIFIED 48 HOURS IN ADVANCE BY THE CONTRACTOR TO ALLOW FOR INSPECTION OF VAPOR BARRIER PRIOR TO PLACEMENT OF CONCRETE.
3) SLAB ON GRADE CONSTRUCTION JOINT AND CONTRACTION JOINT PLACEMENT SHALL BE APPROVED BY THE ENGINEER IF DIFFERENT THOSE SHOWN ON THE CONSTRUCTION DOCUMENTS. CONTRACTION JOINTS SHALL BE PLACED AT A MAXIMUM SPACING OF 24 TIMES THE THICKNESS OF THE SLAB AND IN NO CASE SHALL JOINT SPACING EXCEED 15'-0', UNLESS NOTED OTHERWISE. WHERE SLAB ON GRADE CONTRACTION JOINTS ARE SHOWN, CONSTRUCTION JOINTS MAY BE SUBSTITUTED TO ACCOMMODATE THE CONTRACTOR'S PLACEMENT STRATEGY.
4) SLABS ON GRADE SAW-CUT CONTRACTION JOINTS SHALL BE RUN WITHIN 4 TO 12 HOURS AFTER THE CONCRETE HAS BEEN FINISHED.
5) USE PREMOLDED JOINT FILLER 1/2" THICK FOR ISOLATION JOINTS TO SEPARATE SLABS ON GRADE FROM BUILDING WALLS, COLUMNS AND FOOTINGS.
6) WHERE TOP SURFACES OF CONCRETE SLABS ON GRADE ARE SHOWN TO BE RECESSED MORE THAN 1/2", THICKEN SLAB TO MAINTAIN INDICATED SLAB THICKNESS.
7) PROVIDE REBAR SUPPORTS, SPACERS, AND TIE BARS ADEQUATELY TO ENSURE ALL REINFORCEMENT REMAINS AT PROPER DEPTH AND LOCATION WHEN CONCRETE SLABS ON GRADE ARE PLACED. REBAR SUPPORTS AND SPACERS EXPOSED TO EARTH SHALL BE HOT-DIP GALVANIZED G90 OR OTHER APPROVED NON-CORROSIVE MATERIAL.
8) FOLLOW FLOORING MANUFACTURER'S RECOMMENDATIONS FOR SLAB ON GRADE FINISHING WHICH MAY INCLUDE EITHER A BROOM FINISH OR STEEL TROWELLED FINISH. IN AREAS WHERE NO FLOORING OR COATING IS SPECIFIED, FLOAT THE CONCRETE WITH SINGLE PASS FLAT TROWEL AND TEXTURE WITH BROOM FINISH.
9) CURE CONCRETE BY APPLYING POLYETHYLENE SHEETING MATERIAL TO THE TOP SURFACE AFTER FINAL FINISHING FOR A PERIOD OF 3 DAYS. REMOVE POLYETHYLENE SHEETING AFTER NOTED CURING PERIOD. CONTINUE COLD WEATHER PROTECTION OF SLAB ON GRADE AS REQUIRED.
10) THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING DRYING METHODS FOR CONCRETE SLABS WITH APPLIED COATINGS AND FLOORING MATERIALS TO ACHIEVE THE COATING OR FLOORING MANUFACTURER'S CONCRETE SLAB MOISTURE REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ADEQUATE MOISTURE MITIGATION PROCEDURES IN THE CASE THE SLAB MOISTURE LEVELS ARE ANTICIPATED TO NOT BE WITHIN THE MANUFACTURER'S REQUIREMENTS IN ORDER TO MEET THE PROJECT CONSTRUCTION SCHEDULE. CONTRACTOR SHALL TEST MOISTURE CONTENT OF THE CONCRETE SLABS ON GRADE 7 DAYS PRIOR TO FLOORING INSTALLATIONS TO DETERMINE IF REMEDIAL METHODS NEED TO BE TAKEN TO ENSURE MOISTURE CONTENT IN SLABS IS AT AN ACCEPTABLE LEVEL. REFERENCE FLOORING MANUFACTURER'S SPECIFICATIONS FOR REQUIRED TESTS.
11) ELECTRICAL AND MECHANICAL CONDUITS, RACEWAYS OR OTHER NON-STRUCTURAL ITEMS SHALL NOT BE PLACED WITHIN SLABS ON GRADE WITHOUT WRITTEN CONSENT FROM THE ENGINEER.
12) SLABS ON GRADE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING FLOOR FLATNESS (FF) AND FLOOR LEVELNESS (FL) REQUIREMENTS FOR EACH CLASSIFICATION TYPE LISTED AS DEFINED IN THE LATEST EDITION OF ACI 117 "SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS AND COMMENTARY". FLOOR SURFACE CLASSIFICATION TYPE SHALL BE MODERATELY FLAT, UNLESS NOTED OTHERWISE.
a) CONVENTIONAL
OVERALL: FF = 20, FL = 15, LOCAL MIN: FF = 12, FL = 9

F. CONCRETE

1) PERFORM CONCRETE WORK INCLUDING HANDLING, PLACING, AND CONSTRUCTING IN ACCORDANCE WITH THE LATEST EDITION OF ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE" INCLUDING THE REFERENCED LATEST EDITION OF ACI 117 "SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS AND COMMENTARY" UNLESS MORE STRINGENT REQUIREMENTS ARE SPECIFIED.
2) CAST-IN-PLACE CONCRETE SPECIFIED COVER FOR REINFORCEMENT SHALL NOT BE LESS THAN THE FOLLOWING:
a) 3" AT CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH
b) 2" AT CONCRETE EXPOSED TO EARTH OR WEATHER FOR #6 AND LARGER BARS
c) 1 1/2" AT CONCRETE EXPOSED TO EARTH OR WEATHER FOR #5 AND SMALLER BARS
d) 1 1/2" AT CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND FOR REINFORCEMENT OF BEAMS OR COLUMNS
e) 3/4" AT CONCRETE SLABS, WALLS OR JOISTS NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND
3) SPLICE REINFORCING BARS ACCORDING TO THE REINFORCING BAR LAP SCHEDULE. STAGGER ALTERNATING SPLICES A MINIMUM OF ONE LAP LENGTH. PLACE MECHANICAL REBAR SPLICE CONNECTORS WHERE SHOWN.
4) PLACE CORNER REINFORCING BARS AT ALL WALLS AND GRADE BEAMS WITH SIZE & SPACING TO MATCH HORIZONTAL REINFORCMENT UNLESS SHOWN OTHERWISE.
5) ADD #5X6'-0" DIAGONAL REBAR EACH FACE AT ALL WALL OPENING CORNERS AND #5X6'-0" DIAGONAL REBAR MID-DEPTH AT ALL RE-ENTRANT SLAB CORNERS, UNLESS SHOWN OTHERWISE.
6) PROVIDE REBAR SUPPORTS, SPACERS, AND TIE BARS ADEQUATELY TO ENSURE ALL REINFORCEMENT REMAINS AT PROPER DEPTH AND LOCATION WHEN CONCRETE ELEMENTS ARE PLACED. REBAR SUPPORTS AND SPACERS EXPOSED TO EARTH SHALL BE HOT-DIP GALVANIZED G90 OR OTHER APPROVED NON-CORROSIVE MATERIAL.
7) VERTICAL DOWELS SHALL BE SECURED AND SUPPORTED IN PLACE BEFORE PLACING CONCRETE. DO NOT STAB OR "WET-SET" VERTICAL DOWELS.
8) INSTALL AND SECURE EMBEDMENTS SUCH AS ANCHOR RODS AND EMBEDMENT PLATES WITHIN SPECIFIED TOLERANCES PRIOR TO CONCRETE PLACEMENT.
9) CONCRETE SHALL BE PROPERLY CONSOLIDATED PER THE LATEST EDITION OF ACI 309 USING INTERIOR MECHANICAL VIBRATION, EXCEPT CONCRETE SLABS ON GRADE LESS THAN 5" THICK. DO NOT OVER-VIBRATE CONCRETE.
10) PROTECT AND CURE ALL CONCRETE SURFACES WITH CURING COMPOUND CONFORMING TO ASTM C309, TYPE 2, CLASS B, UNLESS NOTED OTHERWISE. BEGIN CURING WALLS IMMEDIATELY AFTER STRIPPING FORMS.
11) CONCRETE WALLS INTERSECTING CONCRETE PILASTERS SHALL BE CAST MONOLITHICALLY WITH PILASTERS, UNLESS NOTED OTHERWISE.
12) IN ACCORDANCE WITH THE LATEST EDITION OF ACI 347.3R, PROVIDE FORMED CONCRETE SURFACE CATEGORIES (CSC) AS FOLLOWS PER TABLE 3.1A, UNLESS NOTED OTHERWISE:
a) CONCRETE SURFACES IN AREAS WITH LOW VISIBILITY USED OR COVERED WITH SUBSEQUENT FINISH MATERIALS INCLUDING BUT NOT LIMITED TO BASEMENT WALLS COVERED BY GRADE: CSC1
b) CONCRETE SURFACES WHERE VISUAL APPEARANCE IS OF MODERATE IMPORTANCE INCLUDING BUT NOT LIMITED TO INTERIOR SPACES OF ELECTRICAL AND MECHANICAL ROOMS: CSC2
c) CONCRETE SURFACES THAT ARE IN PUBLIC VIEW OR WHERE APPEARANCE IS SPECIFICALLY DESIGNATED IMPORTANT INCLUDING BUT NOT LIMITED TO INTERIOR AND EXTERIOR ELEMENTS: CSC3
d) CONCRETE SURFACES WHERE THE EXPOSED CONCRETE IS A PROMINENT FEATURE OF THE COMPLETED STRUCTURE OR VISUAL APPEARANCE IS SPECIFICALLY DESIGNATED IMPORTANT INCLUDING BUT NOT LIMITED TO MONUMENTAL STRUCTURES: CSC4
13) WHEN THE AMBIENT AIR TEMPERATURE HAS FALLEN TO, OR IS EXPECTED TO FALL BELOW 40 F DURING THE PROTECTION PERIOD, IMPLEMENT COLD WEATHER PROCEDURES AND COMPLY WITH COLD WEATHER CONCRETING PROVISIONS OF THE ADOPTED ACI 306R "GUIDE TO COLD WEATHER CONCRETING". CONTRACTOR SHALL PROVIDE A COLD WEATHER CONCRETE PLACEMENT AND PROTECTION PLAN AS A PROJECT SUBMITTAL IF JOB SITE TEMPERATURES ARE EXPECTED TO DROP BELOW NOTED THRESHOLD VALUE AT ANY TIME DURING THE CONCRETE PLACEMENT. CONTRACTOR IS RESPONSIBLE FOR ALL HEATING AND PROTECTION MATERIALS AND ASSOCIATED LABOR AS REQUIRED IN MAINTAINING COMPLIANCE WITH COLD WEATHER CONCRETING PROCEDURES.
14) WHEN THE AMBIENT AIR TEMPERATURE EXCEEDS 80 F OR THE RATE OF EVAPORATION IS GREATER THAN 0.2 PSF PER HOUR, IMPLEMENT HOT WEATHER PROCEDURES AND COMPLY WITH HOT WEATHER CONCRETING PROVISIONS OF THE ADOPTED ACI 305R "GUIDE TO HOT WEATHER CONCRETING". CONTRACTOR SHALL PROVIDE A HOT WEATHER CONCRETE PLACEMENT AND PROTECTION PLAN AS A PROJECT SUBMITTAL IF JOB SITE TEMPERATURES ARE EXPECTED TO EXCEED NOTED THRESHOLD VALUES AT ANY TIME DURING THE CONCRETE PLACEMENT.
15) CONCRETE TESTING AND ACCEPTANCE:
a) CONCRETE PRODUCTION FACILITY SHALL SUBMIT FOR ENGINEER APPROVAL CONCRETE MIX DESIGN A MINIMUM OF FIVE WORKING DAYS PRIOR TO PLACEMENT WHICH INCLUDES STRENGTH TEST RECORDS NOT MORE THAN 24 MONTHS OLD AND CONSISTING OF AT LEAST 30 CONSECUTIVE TESTS OR TWO GROUPS OF CONSECUTIVE TESTS TOTALING AT LEAST 30 TESTS.
b) OBTAIN SAMPLES IN ACCORDANCE WITH THE LATEST EDITION OF ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE" SECTION 1.6.4.2. OBTAIN AT LEAST ONE COMPOSITE SAMPLE FOR EACH 100 CUBIC YARDS, OR FRACTION THEREOF, OF EACH CONCRETE MIXTURE PLACED IN ANY ONE DAY.
c) MOLD AND CURE A MINIMUM OF FOUR CYLINDERS FROM EACH SAMPLE IN ACCORDANCE WITH ASTM C31. TEST ONE CYLINDER AT 7 DAYS AND TEST TWO CYLINDERS AT 28 DAYS. HOLD ONE CYLINDER IN RESERVE FOR TESTING AS DIRECTED BY THE ENGINEER.
d) A STRENGTH TEST SHALL BE THE AVERAGE OF THE STRENGTHS OF AT LEAST TWO 6 BY 12 IN CYLINDERS MADE FROM THE SAME SAMPLE OF CONCRETE AND TESTED AT TEST AGE DESIGNATED.
e) STRENGTH LEVEL OF AN INDIVIDUAL CLASS OF CONCRETE SHALL BE CONSIDERED SATISFACTORY IF BOTH OF THE FOLLOWING REQUIREMENTS ARE MET:
1. EVERY ARITHMETIC AVERAGE OF ANY THREE CONSECUTIVE STRENGTH TESTS EQUALS OR EXCEEDS f'c.
2. NO STRENGTH TEST FALLS BELOW f'c BY MORE THAN 500 PSI.

G. FLOWABLE FILL

1) FLOWABLE MAY BE USED AS A REPLACEMENT FOR STRUCTURAL FILL ONLY WHEN APPROVED BY THE PROJECT ENGINEER. FLOWABLE FILL (CONTROLLED LOW-STRENGTH MATERIAL) PROPERTIES SHALL BE DETERMINED PER THE LATEST EDITION OF ACI 229, UNLESS NOTED OTHERWISE.
2) FLOWABLE FILL SHALL BE READY MIXED IN ACCORDANCE WITH ACI 304.
3) FLOWABLE FILL TESTING AND ACCEPTANCE:
a) FLOWABLE FILL PRODUCTION FACILITY SHALL SUBMIT FOR ENGINEER APPROVAL FLOWABLE FILL MIX DESIGN A MINIMUM OF FIVE WORKING DAYS PRIOR TO PLACEMENT WHICH INCLUDES STRENGTH TEST RECORDS NOT MORE THAN 24 MONTHS OLD AND CONSISTING OF AT LEAST 30 CONSECUTIVE TESTS OR TWO GROUPS OF CONSECUTIVE TESTS TOTALING AT LEAST 30 TESTS.
b) OBTAIN SAMPLES IN ACCORDANCE WITH THE LATEST EDITION OF ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE" SECTION 1.6.4.2. OBTAIN AT LEAST ONE COMPOSITE SAMPLE FOR EACH 100 CUBIC YARDS, OR FRACTION THEREOF, OF EACH FLOWABLE FILL MIXTURE PLACED IN ANY ONE DAY.
c) MOLD AND CURE A MINIMUM OF FOUR CYLINDERS FROM EACH SAMPLE IN ACCORDANCE WITH ASTM C31. TEST ONE CYLINDER AT 7 DAYS AND TEST TWO CYLINDERS AT 28 DAYS. HOLD ONE CYLINDER IN RESERVE FOR TESTING AS DIRECTED BY THE ENGINEER.
d) A STRENGTH TEST SHALL BE THE AVERAGE OF THE STRENGTHS OF AT LEAST TWO 6 BY 12 IN CYLINDERS MADE FROM THE SAME SAMPLE OF FLOWABLE FILL AND TESTED AT TEST AGE DESIGNATED.
e) STRENGTH LEVEL OF AN INDIVIDUAL CLASS OF FLOWABLE FILL SHALL BE CONSIDERED SATISFACTORY IF BOTH OF THE FOLLOWING REQUIREMENTS ARE MET:
1. EVERY ARITHMETIC AVERAGE OF ANY THREE CONSECUTIVE STRENGTH TESTS EQUALS OR EXCEEDS f'c.
2. NO STRENGTH TEST FALLS BELOW f'c BY MORE THAN 100 PSI.

H. COLD-FORMED (LIGHT GAUGE) STEEL FRAMING

1) COLD-FORMED STEEL MEMBERS SHALL COMPLY WITH THE LATEST EDITION OF AISI S200 "NORTH AMERICAN STANDARD FOR COLD-FORMED STEEL FRAMING — GENERAL PROVISIONS".
2) COLD-FORMED STEEL SHAPES INDICATED ON THE DRAWINGS ARE DESIGNATED PER THE STEEL STUD MANUFACTURERS ASSOCIATION (SSMA) NOMENCLATURE.
a) NOMENCLATURE EXAMPLE: 600S162-54 (50 ksi)
1. 600 = DEPTH X 1/100 INCH I.E. 6"
2. S = STYLE I.E. STUD OR JOIST SECTION
3. 162 = FLANGE WIDTH X 1/100 INCH I.E. 1-5/8"
4. 54 = MINIMUM BASE STEEL THICKNESS IN MILS (1/1000 INCH) I.E. 0.054"
5. (50 ksi) = YIELD POINT I.E. 50 ksi - PROVIDE 33 ksi UNLESS NOTED OTHERWISE
3) ALL COLD-FORMED STEEL ELEMENTS INCLUDING ACCESSORIES SHALL BE SUPPLIED BY A SINGLE MANUFACTURER.
4) THE INTENT OF THE DESIGN IS FOR THESE ITEMS TO BE ATTACHED TO EACH OTHER AND TO THE SURROUNDING STRUCTURE TO BEHAVE AS A SYSTEM. WHETHER SHOWN OR NOT, PROVIDE ACCESSORY ITEMS (BLOCKS, ANGLES, CLIPS, STIFFENERS, STRAPS, ETC) DESIGNED BY THE MANUFACTURER, FOR A COMPLETE SYSTEM. FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION AND USE.
5) INSTALL SUPPLEMENTARY FRAMING, BLOCKING, ETC TO SUPPORT FIXTURES AND OTHER ITEMS PROVIDED BY OTHER TRADES. COORDINATE ALL LOCATIONS WITH RESPECTIVE TRADES.
6) FASTEN ELEMENTS AND ACCESSORIES WITH MINIMUM NO. 8 TAPPING SCREWS. WELDING MAY BE USED IN LIEU OF TAPPING SCREWS AS DESIGNATED ON CONSTRUCTION DOCUMENTS. INSTALL SCREWS AT 1/2" MINIMUM EDGE DISTANCE AND AT 3/4" MINIMUM SPACING.
7) BOTTOM TRACK WEBS OF LOAD BEARING WALLS MUST BEAR UNIFORMLY ON FOUNDATION — GROUT BEARING SURFACE(S) IF NECESSARY.
8) SEAT SQUARE STUD ENDS SNUG IN TOP AND BOTTOM TRACK WEBS OF LOAD BEARING WALLS OR INSTALL CLIPS ON STUD WEBS TO TRANSFER ENTIRE STUD REACTION.
9) PROVIDE HEADERS FOR ALL OPENINGS PER SCHEDULE. WHERE NOT INDICATED, INSTALL 2-600S162-54 WITH T200-54 TRACKS TOP AND BOTTOM MATCHING STUD WIDTH. INSULATE ALL BOX HEADERS AS INDICATED BY ARCHITECTURAL.
10) INSTALL BRIDGING AS FOLLOWS:
a) WALL STUD HORIZONTAL BRIDGING AT 4'-0", UNLESS NOTED OTHERWISE ON CONSTRUCTION DOCUMENTS.
b) FLOOR JOIST BRIDGING:
1. UP TO 16 FT — 1 ROW AT MID-SPAN.
2. 16 FT TO 24 FT — 2 ROWS AT 1/3 POINTS.
3. 24 FT TO 32 FT — 3 ROWS AT 1/4 POINTS.

I. PRE-INSTALLATION CONFERENCES

1) SCHEDULING AND CONDUCTING PRE-INSTALLATION CONFERENCES ARE THE RESPONSIBILITY OF THE CONTRACTOR. MEETING ATTENDEES AND FORMAT ARE OUTLINED IN THE PROJECT SPECIFICATIONS. COORDINATE LOCATION, TIME AND AGENDA ITEMS WITH THE ENGINEER. CONDUCT PRE-INSTALLATION CONFERENCES FOR THE FOLLOWING ACTIVITIES RELATED TO STRUCTURAL SYSTEMS:
a) FOUNDATION UPLIFT ANCHOR
b) CAST-IN-PLACE CONCRETE
c) SLAB ON GRADE VAPOR BARRIERS

J. SPECIAL INSPECTIONS AND TESTS

1) SPECIAL INSPECTIONS DESCRIBED BELOW ARE REQUIRED BY SECTION 1705 OF THE IBC AND SHALL BE PERFORMED PRIOR TO ISSUANCE OF THE CERTIFICATE OF OCCUPANCY. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING THE ENGINEER APPRISED OF WORK PROGRESS AS IT PERTAINS TO SPECIAL INSPECTIONS AND ENSURING THAT NO WORK REQUIRING SPECIAL INSPECTIONS IS CONCEALED BEFORE SPECIAL INSPECTIONS OCCUR. REFER TO THE PROJECT SPECIFICATIONS FOR OTHER INSPECTIONS AND MATERIALS TESTING REQUIREMENTS.
2) EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A MAIN WIND- OR SEISMIC FORCE-RESISTING SYSTEM, DESIGNATED SEISMIC SYSTEM OR A WIND- OR SEISMIC-RESISTING COMPONENT LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT PER SECTION 1704 OF THE IBC.
3) THE OWNER SHALL EMPLOY QUALIFIED SPECIAL INSPECTORS DURING CONSTRUCTION TO PERFORM STRUCTURAL OBSERVATIONS FOR THE ELEMENTS NOTED BELOW.
a) STEEL CONSTRUCTION: THE SPECIAL INSPECTIONS FOR STEEL ELEMENTS OF BUILDINGS AND STRUCTURES SHALL BE AS REQUIRED IN SECTION 1705.2 OF THE IBC. SPECIAL INSPECTION FOR STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE QUALITY ASSURANCE INSPECTION REQUIREMENTS OF AISC 360. INSPECTIONS INCLUDE BUT ARE NOT LIMITED TO PERIODIC INSPECTION OF ALL WELDING INCLUDING STRUCTURAL STEEL, PERIODIC INSPECTION DURING AND AFTER INSTALLATION OF ALL HIGH-STRENGTH BOLTING CONNECTIONS REGARDLESS OF TYPE AND STRUCTURAL STEEL DURING OR AFTER INSTALLATION. WELDING INSPECTION AND INSPECTOR QUALIFICATION SHALL BE IN COMPLIANCE WITH AWS D1.1 "STRUCTURAL WELDING CODE — STEEL".
b) STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL: SPECIAL INSPECTION FOR STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH TABLE 1705.2.2 AND SECTION 1705.2.2 OF THE IBC. INSPECTIONS INCLUDE BUT ARE NOT LIMITED TO PERIODIC INSPECTION OF COLD-FORMED STEEL DECK AND REINFORCING STEEL INCLUDING THAT FOUND IN SLABS ON GRADE AND ELEVATED COMPOSITE SLABS DURING OR AFTER INSTALLATION AND PERIODIC INSPECTION OF ALL WELDS OF COLD-FORMED STEEL DECK, HEADED STUD ANCHORS AND STAIR RAILINGS.
c) CONCRETE CONSTRUCTION: THE SPECIAL INSPECTIONS AND VERIFICATIONS FOR CONCRETE CONSTRUCTION SHALL BE AS REQUIRED BY SECTION 1705.3 AND TABLE 1705.3 OF THE IBC. INSPECTIONS INCLUDE BUT ARE NOT LIMITED TO PERIODIC INSPECTION OF VAPOR BARRIERS, MECHANICAL COUPLERS, REINFORCING STEEL AND PRESTRESSING TENDONS, PERIODIC INSPECTION OF ANCHORS CAST IN CONCRETE PRIOR TO CONCRETE PLACEMENT, PERIODIC INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS, CONTINUOUS INSPECTION OF CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES EXCEPT PERIODIC INSPECTION FOR SLABS ON GRADE AND ELEVATED COMPOSITE SLABS. VERIFY USE OF REQUIRED MIX DESIGN AND INSPECT CONCRETE FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES. MATERIAL TESTING SHALL BE PERFORMED ACCORDING TO THE REQUIREMENTS OF THE LATEST EDITION OF ACI 318 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" CHAPTERS 3 AND 5.
d) SOILS: SPECIAL INSPECTIONS FOR EXISTING SITE SOIL CONDITIONS, FILL PLACEMENT AND LOAD-BEARING REQUIREMENTS SHALL BE AS REQUIRED BY SECTION 1705.6 AND TABLE 1705.6 OF THE IBC. THE APPROVED GEOTECHNICAL REPORT AND THE CONSTRUCTION DOCUMENTS PREPARED BY THE REGISTERED DESIGN PROFESSIONALS SHALL BE USED TO DETERMINE COMPLIANCE. INSPECTIONS INCLUDE BUT ARE NOT LIMITED TO PERIODIC INSPECTION OF MATERIALS BELOW SHALLOW FOUNDATIONS AND EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.

K. DEFERRED SUBMITTALS

1) DOCUMENTATION SUCH AS SHOP DRAWINGS, ERECTION DRAWINGS AND CALCULATIONS FOR DEFERRED SUBMITTAL ITEMS WILL BE REVIEWED BY THE ENGINEER WHEN AVAILABLE AND FORWARDED TO THE BUILDING OFFICIAL. CONTRACTOR SHALL ALLOW FOR A MINIMUM OF FIVE WORKING DAYS FOR ENGINEER REVIEW OF ALL DEFERRED SUBMITTALS.
2) SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL ITEMS REQUIRED BY THE PROJECT SPECIFICATIONS FOR REVIEW BY THE ENGINEER PRIOR TO FABRICATION. SHOP DRAWINGS FOR PROPRIETARY PRODUCTS DESIGNED BY THE MANUFACTURER SHALL INCLUDE DESIGN CALCULATIONS STAMPED BY AN ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED.
3) THE CONTRACTOR SHALL REVIEW AND STAMP ALL DEFERRED SUBMITTALS TO ENSURE CONFORMANCE WITH CONSTRUCTION DOCUMENTS PRIOR TO SUBMITTING FOR ARCHITECTURAL AND ENGINEERING REVIEW. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND COORDINATION OF ALL DIMENSIONS AND DETAILS WITH SUBCONTRACTORS. SHOP DRAWINGS OR PRODUCT DATA NOT STAMPED BY THE CONTRACTOR WILL NOT BE REVIEWED.
4) SHOP DRAWINGS SHALL NOT REPLACE THE CONTRACT DRAWINGS. ITEMS OMITTED OR SHOWN INCORRECTLY ARE NOT CONSIDERED AS CHANGES TO THE CONTRACT DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR THE CORRECTNESS AND COMPLETENESS OF ALL DEFERRED SUBMITTALS.
5) DEFERRED SUBMITTALS SHALL CLOUD AND NOTE ANY DEVIATIONS OR SUBSTITUTIONS FROM THE CONTRACT DRAWINGS IN ALL INSTANCES. DEVIATIONS NOT CLOUDED ARE CONSIDERED NOT APPROVED, UNLESS NOTED SPECIFICALLY OTHERWISE BY THE ENGINEER.

L. MISCELLANEOUS

1) REFERENCE CIVIL DRAWINGS FOR BUILDING LOCATION AND ORIENTATION ON THE SITE. DRAWING ELEVATION REFERENCE 100'-0" = 3692.00 FT CIVIL DATUM.
2) CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS SHOWN ON THE CONSTRUCTION DOCUMENTS AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN ARCHITECTURAL AND STRUCTURAL DRAWINGS PRIOR TO PROCEEDING WITH CONSTRUCTION.
3) USE ONLY WRITTEN DIMENSIONS FOR CONSTRUCTION. WHERE NO DIMENSION IS PROVIDED, CONSULT THE ENGINEER FOR CLARIFICATION PRIOR TO CONSTRUCTION.
4) DETAIL MARKS ANNOTATED ON PLANS ARE INTENDED TO INDICATE SPECIFIC CONFIGURATION(S) AND INFORMATION. FOR PLAN CLARITY, NOT EVERY LOCATION WHERE A SPECIFIC DETAIL MAY APPLY IS ANNOTATED. CONTACT THE ENGINEER IF CLARIFICATION IS NEEDED.
5) COORDINATE OPENINGS AND EMBEDDED ITEMS IN CONCRETE AND MASONRY WORK WITH ALL TRADES.
6) NOTIFY ENGINEER OF ANY DISCREPANCIES DISCOVERED WITH OTHER TRADES.
7) CONSTRUCTION LOADS SHALL NOT BE GREATER THAN THE DESIGN LOADS INDICATED IN DESIGN LOADS AND CRITERIA SECTION B.1, UNLESS REVIEWED AND APPROVED BY THE ENGINEER.
8) EQUIPMENT OPENINGS INDICATED ARE FOR REFERENCE ONLY. COORDINATE EXACT LOCATIONS, DIMENSIONS AND DETAILS WITH EQUIPMENT MANUFACTURERS AND TRADES. ALL OPENINGS IN FLOORS, ROOFS OR OTHER STRUCTURAL MEMBERS THAT ARE NOT SPECIFICALLY DETAILED IN THE STRUCTURAL DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF AND REVIEWED BY THE ENGINEER.
9) TEMPORARILY BRACE THE STRUCTURE TO RESIST ALL LOADS OR COMBINATIONS OF LOADS UNTIL ALL PERMANENT ELEMENTS ARE IN PLACE AND ALL CONNECTIONS ARE COMPLETE AS SHOWN. THE DESIGN AND SAFETY OF ALL ERECTION BRACING, SHORING AND TEMPORARY SUPPORTS IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
10) COSTS ASSOCIATED WITH STRUCTURAL DRAWING CHANGES RESULTING FROM USE OF ALTERNATES OR SUBSTITUTIONS, INCLUDING MECHANICAL EQUIPMENT, IS THE CONTRACTOR'S RESPONSIBILITY.
11) CONTRACTOR IS RESPONSIBLE FOR LOCATING, PROTECTING AND STABILIZING ALL ADJACENT STRUCTURES AND UTILITIES THROUGH ALL PHASES OF CONSTRUCTION.
12) STRUCTURAL GENERAL NOTES SHALL NOT BE A SUBSTITUTE FOR THE PROJECT SPECIFICATIONS. CONFLICTS BETWEEN THE STRUCTURAL GENERAL NOTES AND PROJECT SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER OR THE STRICTER OF THE TWO CRITERIA SHALL BE USED.

STRUCTURAL SHEET INDEX

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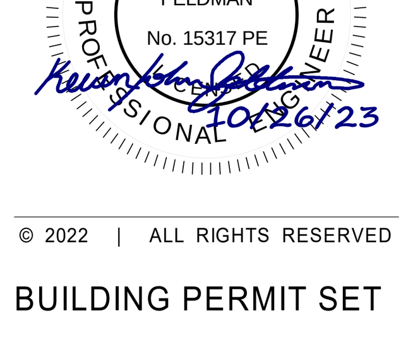

BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | FELDMAN
DRAWN BY | SALADINER
REVIEWED BY | FELDMAN
REVISIONS

STRUCTURAL GENERAL NOTES

S001

M. PRE-ENGINEERED METAL BUILDINGS

1) THESE NOTES ARE INTENDED TO SUPPLEMENT THE STRUCTURAL GENERAL NOTES WHERE PRE-ENGINEERED METAL BUILDING SYSTEMS ARE USED.
2) GOVERNING CODES
   a) INTERNATIONAL BUILDING CODE (IBC), 2021 EDITION.
3) DESIGN LOADS AND SERVICEABILITY CRITERIA
   a) PRIMARY LOADS ARE PROVIDED UNDER STRUCTURAL GENERAL NOTES. COORDINATE EQUIPMENT GRAVITY AND SEISMIC LOADS WITH OTHER DISCIPLINES. MINIMUM ROOF PRIMARY COLLATERAL DEAD LOAD IS 5 PSF WITH AN ADDITIONAL SECONDARY COLLATERAL DEAD LOAD OF 5 PSF.
   b) LATERAL DEFLECTION (DRIFT) LIMIT UNDER 75% OF DESIGN WIND LOAD = EAVE HEIGHT / 240.
   c) HORIZONTAL GIRT DEFLECTION LIMIT UNDER 75% OF DESIGN WIND LOAD = SPAN / 90 EXCEPT SPAN / 360 AT LOWER GIRT AT BRICK WAINSCOAT.
   d) VERTICAL FRAME DEFLECTION LIMIT UNDER DESIGN SNOW LOAD = SPAN / 240.
   e) VERTICAL PURLIN DEFLECTION LIMIT UNDER DESIGN SNOW LOAD = SPAN / 150.
4) BUILDING FRAMING
   a) THE BUILDING MANUFACTURER IS RESPONSIBLE FOR ENGINEERING, MATERIALS AND FABRICATION OF A COMPLETE SYSTEM.
   b) PRIMARY FRAMING LAYOUT SHALL BE ESTABLISHED BASED ON COLUMN LOCATIONS INDICATED. BUILDING FRAMES SHALL BE MODELED AND DESIGNED AS "PINNED BASE" UNLESS APPROVED OTHERWISE.
   c) LATERAL STABILITY OF THE STRUCTURE IS THE BUILDING MANUFACTURER'S RESPONSIBILITY. CABLE BRACING IS NOT ALLOWED AND MANUFACTURER SHALL USE ROD OR OTHER STRUCTURAL STEEL ELEMENTS.
5) SUBMITTALS
   a) FURNISH COMPLETE ANCHORAGE REACTIONS LISTED BY LOAD CASE AND LOAD COMBINATION.
   b) FURNISH COMPLETE DESIGN DRAWINGS INCLUDING ANCHOR ROD, FRAMING AND ERECTION PLANS OF THE BUILDING SYSTEM SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE THE PROJECT IS LOCATED.
   c) SUBMIT COMPLETE DESIGN CALCULATIONS INCLUDING SERVICEABILITY CHECKS SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE THE PROJECT IS LOCATED.
   d) SUBMIT A LETTER OF CERTIFICATION SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE THE PROJECT IS LOCATED INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING INFORMATION:
      1. OWNER / PURCHASER
      2. BUILDING DESCRIPTION AND LOCATION
      3. GOVERNING CODE(S)
      4. DESIGN LOADS AND SERVICEABILITY CRITERIA
      5. MANUFACTURER QUALITY CONTROL PROGRAM

N. ABBREVIATIONS LIST (SOME OF THE LISTED ABBREVIATIONS MAY NOT APPEAR ON THE DRAWINGS)

1) & AND
2) @ AT
3) AB ANCHOR BOLT
4) ACI AMERICAN CONCRETE INSTITUTE
5) AISC AMERICAN INSTITUTE OF STEEL CONSTRUCTION
6) AISI AMERICAN IRON AND STEEL INSTITUTE
7) ALT ALTERNATE
8) ANC ANCHOR
9) ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
10) ARCH ARCHITECTURE OR ARCHITECTURAL
11) ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS
12) ASD ALLOWABLE STRESS DESIGN
13) ASTM AMERICAN SOCIETY FOR TESTING AND MATERIALS
14) AWS AMERICAN WELDING SOCIETY
15) BLDG BUILDING
16) BOT BOTTOM
17) BRG BEARING
18) BTWN BETWEEN
19) CFS COLD-FORMED STEEL
20) CIP CAST-IN-PLACE
21) CJ CONTROL JOINT
22) CL CENTER LINE
23) CLR CLEAR
24) CNJT CONTRACTION JOINT
25) COL COLUMN
26) CONC CONCRETE
27) CONN CONNECTION OR CONNECTOR
28) CONST JT CONSTRUCTION JOINT
29) CONT CONTINUE OR CONTINUOUS
30) CRSI CONCRETE REINFORCING STEEL INSTITUTE
31) DET DETAIL
32) DIA DIAMETER
33) DIM DIMENSION OR DIMENSIONS
34) EA EACH
35) EL ELEVATION
36) ELEC ELECTRIC OR ELECTRICAL
37) EQ EQUAL
38) EXIST OR (E) EXISTING
39) EXP EXPANSION
40) EXP BOLT EXPANSION BOLT
41) EXP JT EXPANSION JOINT
42) FIN FINISH
43) FL FLOOR
44) FDN FOUNDATION
45) FT FOOT OR FEET
46) FTG FOOTING
47) FT-LB FOOT POUND
48) GA GAUGE OR GAGE
49) GALV GALVANIZED OR GALVANIZE
50) GC GENERAL CONTRACTOR
51) HORZ HORIZONTAL
52) HSS HOLLOW STRUCTURAL SECTION (TUBE STEEL)
53) ID INSIDE DIAMETER
54) IN INCH OR INCHES
55) INV INVERT
56) IP INFLECTION POINT
57) ISJT ISOLATION JOINT
58) LF LINEAR FEET OR LINEAL FEET
59) LLH LONG LEG HORIZONTAL
60) LLV LONG LEG VERTICAL
61) LONG LONGITUDINAL
62) MFR MANUFACTURER
63) MECH MECHANICAL
64) MIN MINIMUM
65) MTL METAL
66) (N) NEW
67) N/A NOT APPLICABLE
68) NO OR # NUMBER
69) NOM NOMINAL
70) NTS NOT TO SCALE
71) NWC NORMAL WEIGHT CONCRETE
72) OC ON CENTER
73) OD OUTSIDE DIAMETER
74) OPNG OPENING
75) % PERCENT
76) PERP PERPENDICULAR
77) PL PLATE
78) PLMB PLUMBING OR PLUMB
79) PROJ PROJECTION
80) PSF POUNDS PER SQUARE FOOT
81) PSI POUNDS PER SQUARE INCH
82) PVC POLYVINYL CHLORIDE
83) QTY QUANTITY
84) REINF REINFORCE, REINFORCED, REINFORCEMENT OR REINFORCING
85) REQD REQUIRED
86) REV REVISION
87) SCHED SCHEDULE
88) SECT SECTION
89) SF SQUARE FOOT OR SQUARE FEET
90) SHT SHEET
91) SIM SIMILAR
92) SOG SLAB ON GRADE
93) SPA SPACE OR SPACES
94) SPEC SPECIFIED OR SPECIFICATION
95) SQ SQUARE
96) STD STANDARD
97) STIFF STIFFENER
98) STL STEEL
99) STIR STIRRUP
100) STRUCT STRUCTURAL OR STRUCTURE
101) SYM SYMMETRICAL
102) THK THICK OR THICKNESS
103) THRD THREAD OR THREADED
104) TOCP TOP OF CONCRETE PIER/PILASTER
105) TOCS TOP OF CONCRETE SLAB
106) TOCW TOP OF CONCRETE WALL
107) TOF TOP OF FOOTING
108) TOW TOP OF WOOD/LIGHT GAGE WALL
109) TRANS TRANSVERSE
110) TYP TYPICAL
111) UNO UNLESS NOTED OTHERWISE
112) VERT VERTICAL
113) VIF VERIFY IN FIELD OR VERTICAL INSIDE FACE
114) W/ WITH

W/O WITHOUT

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GFIA WAREHOUSE

MONTANA
KEVIN JOHN FELDMAN
No. 15317 PE
PROFESSIONAL ENGINEER
10/26/23

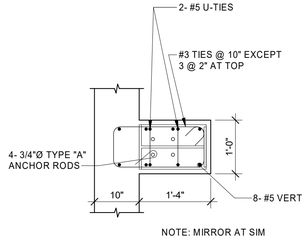
BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | FELDMAN
DRAWN BY | SALADINER
REVIEWED BY | FELDMAN
REVISIONS

STRUCTURAL
GENERAL NOTES

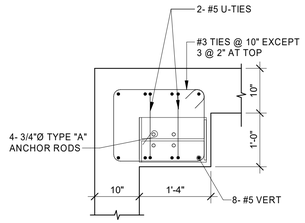
S002

CONCRETE PILASTER SCHEDULE



NOTE: MIRROR AT SIM

P1 PLAN VIEW



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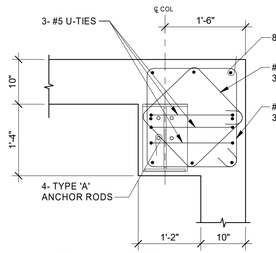
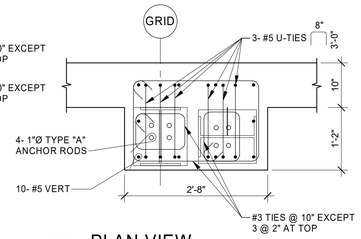


P3 PLAN VIEW



P4 PLAN VIEW

SCHEDULE NOTES: PILASTER "CUT PLANE" = 1" ABOVE TOP OF PILASTER.

FOOTING SCHEDULE

MARK	SIZE (WXLXTHK)	REINFORCING	REMARKS
F1	2'-0"XCONTX1'-0"	3- #5 BOT	-
F2	3'-6"X3'-6"X1'-6"	4- #5 EA WAY, BOT	-
F3	6'-6"X6'-6"X1'-6"	9- #5 EA WAY, BOT	-

COLUMN SCHEDULE NOTES:

1.) ALL FOOTINGS ARE CAST OVER RECONDITIONED OR ENGINEERED SOILS.

2.) SCHEDULED REINFORCING IS HORIZONTAL UNLESS INDICATED OTHERWISE. (DOWELS/EXTENSIONS ARE NOT SCHEDULED)

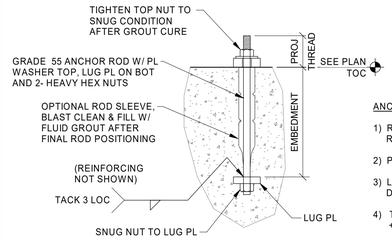
3.) SEE FOUNDATION SECTIONS & DETAILS FOR REINFORCEMENT PLACEMENT.

4.) PROVIDE CORNER BARS AT ALL STRIP FOOTING CORNERS OR TEES, SIZE AND PLACE TO MATCH HORIZONTAL REINFORCING.

5.) PAD FOOTINGS ARE CENTERED UNDER COLUMNS OR PILASTERS. STRIP FOOTINGS ARE CENTERED UNDER THE FOUNDATION WALL UNLESS SHOWN OTHERWISE IN PLAN FOR DETAILS.

6.) SEE PLAN FOR FOOTINGS NOT SCHEDULED.

ANCHOR ROD SCHEDULE



ANCHOR ROD NOTES:

1) REFERENCE THE BASE PLATE SCHEDULE FOR ANCHOR ROD DIAMETER AND PLAN ARRANGEMENTS.

2) PROVIDE LEVELING SHIMS UNDER BASEPLATE.

3) LIGHTLY GREASE TYPE "A" ANCHOR ROD SHANK WHEN DIAMETER IS GREATER THAN 1".

4) TOP WASHER HOLE DIAMETER = ANCHOR DIAMETER + 1/16". PLATE WASHER MAY BE SQUARE OR ROUND.

TYPE "A" ANCHOR ROD DETAIL

TYPE "A" ANCHOR ROD DATA

DIAMETER	EMBEDMENT	PROJ	LUG PL	TOP WASHER
3/4"	1'-0"	5"	SEE 9/S201	PL1/4X2 1/2"
1"	1'-6"	5"	SEE 9/S201	PL3/8X3"
1 1/2"	2'-6"	5"	SEE 9/S201	PL1/2X4"

CONC REINFORCING LAP SCHEDULE

REBAR SIZE	CONCRETE		
	VERT & HORZ (ld)	HORZ TOP BAR (ld)	STANDARD HOOK (ldh)
#3	1'-6"	1'-11"	0'-7"
#4	2'-0"	2'-7"	0'-9"
#5	2'-6"	3'-2"	1'-0"
#6	2'-11"	3'-10"	1'-2"
#7	4'-3"	5'-7"	1'-4"
#8	4'-11"	6'-4"	1'-6"
#9	5'-6"	7'-2"	1'-9"
#10	6'-2"	8'-0"	1'-11"

REINFORCING NOTES:

1. CONCRETE SPLICE LENGTHS ARE CLASS 'B' SPLICES BASED ON F'C=4,500 PSI AND GRADE 60 REINFORCEMENT WITH CLEAR COVER OF AT LEAST ONE BAR DIAMETER AND BAR SPACING OF AT LEAST TWO BAR DIAMETERS. USE CLASS 'B' SPLICES UNLESS NOTED OTHERWISE.
2. HORZ TOP BAR SPLICE LENGTHS ARE USED WHEN MORE THAN 12" OF FRESH CONCRETE IS CAST BELOW THE DEVELOPMENT LENGTH OR SPLICE.
3. HORZ TOP BAR SPLICE LENGTHS MAY BE USED AT ALL LOCATIONS IN CONCRETE AT THE CONTRACTORS DISCRETION.
4. HOOKED BAR TAIL LENGTH: Lhk = 16 BAR DIAMETERS (#3- #8)
   Lhk = 17 BAR DIAMETERS (#9- #10)

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GREAT FALLS INTERNATIONAL AIRPORT

GFIA WAREHOUSE

MONTANA
KEVIN JOHN FELDMAN
No. 15317 PE
PROFESSIONAL ENGINEER
10/26/23

BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | FELDMAN
DRAWN BY | SALADINER
REVIEWED BY | FELDMAN
REVISIONS

STRUCTURAL SCHEDULES

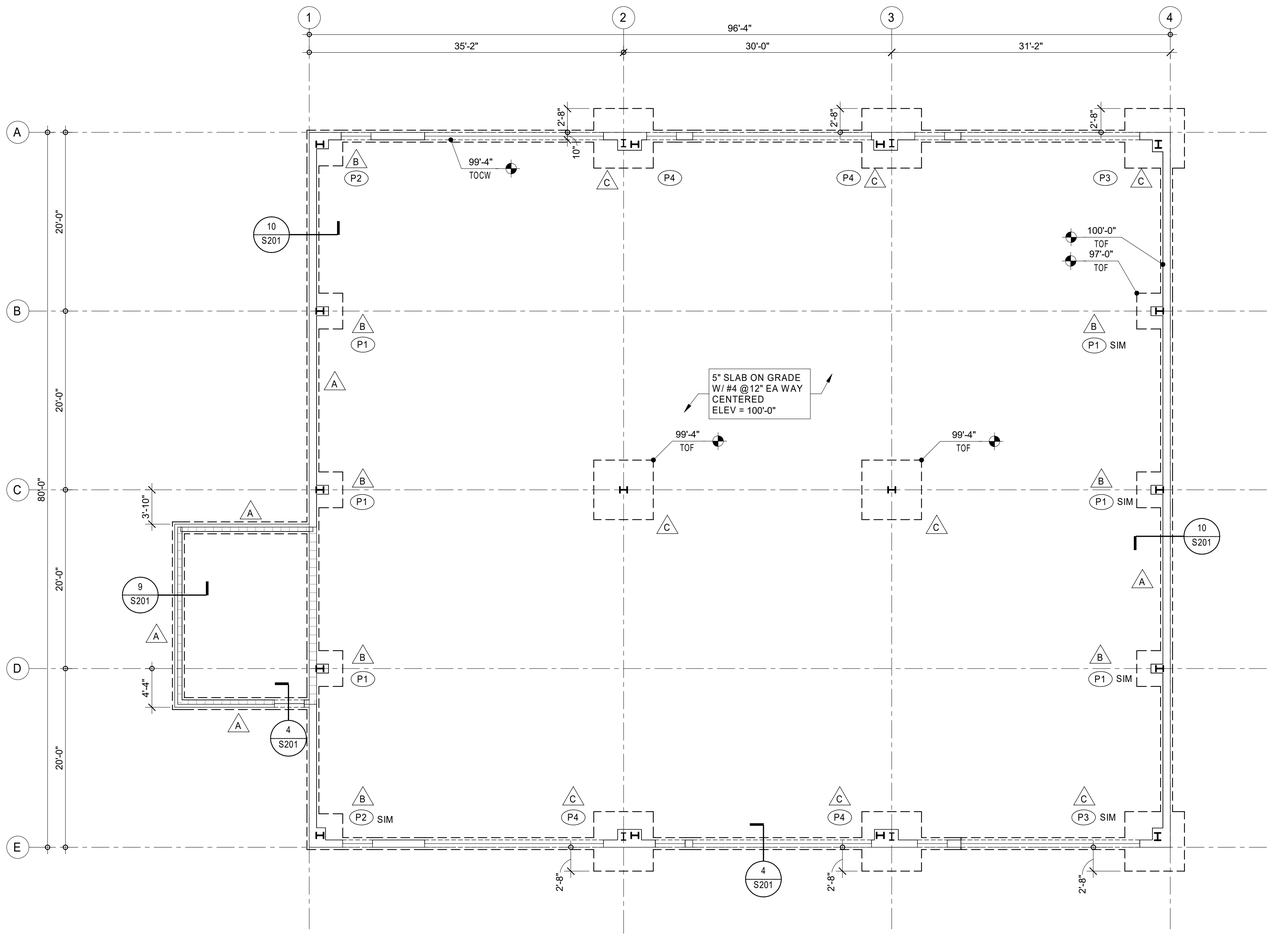
S003

FOUNDATION PLAN NOTES

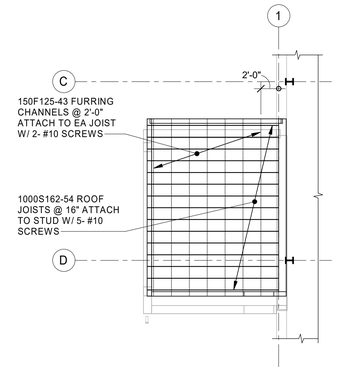
1. ALL GRID DIMENSIONS ARE LOCATED AT OUTSIDE FACE OF FOUNDATION WALL OR AT CL OF COLUMN.
2. PLAN SHEET "CUT" PLANE IS ASSUMED TO OCCUR 48" ABOVE FLOOR/SLAB LEVEL.
3. COORDINATE FOUNDATION WALL PENETRATION SIZE AND LOCATIONS WITH OTHER TRADE(S).
4. COORDINATE ALL REQUIRED SLEEVES FOR WATER, SEWER, STORM, ELECTRICAL, CABLE, AND IRRIGATION.
5. SEE<------ FOR UNDER FOOTING PIPE OR CONDUIT PASSAGE.
6. SEE ELECTRICAL, MECHANICAL AND PLUMBING FOR LOCATION AND SIZE OF EQUIPMENT PADS. SEE3/S201 ALSO.
7. VERIFY ELEVATOR PIT PLAN SIZE AND DEPTH WITH SELECTED EQUIPMENT MANUFACTURER INSTALLATION DRAWINGS BEFORE CONCRETE PLACEMENT.
8. SEE ARCHITECTURAL AND CIVIL DRAWINGS FOR PERIMETER FOUNDATION DRAIN.
9. BLOCK OUT TOP OF FOUNDATION WALL AT ALL EXTERIOR DOORWAYS FOR SLAB POUR IN ACCORDANCE WITH DETAIL 4/S201. COORDINATE LOCATION OF DOORWAYS WITH ARCHITECTURAL PLANS.
10. REFERENCE ARCHITECTURAL/PLUMBING PLANS FOR FLOOR DRAIN LOCATIONS AND SLOPED SLAB LIMITS.
11. TOP OF INTERIOR CONCRETE FOOTING ELEVATION = 99'-4", UNO.
12. UNDER SLAB VAPOR RETARDER:
    A. IF SLAB SUBGRADE PROTECTED FROM WEATHER, LOCATE VAPOR RETARDER UNDER DRAINAGE COURSE - PREFERRED.
    B. IF SLAB SUBGRADE IS NOT PROTECTED FROM WEATHER, LOCATE VAPOR RETARDER ON TOP OF DRAINAGE COURSE (DIRECTLY BENEATH SLAB), AND SUBSEQUENT PRE-CONSTRUCTION MEETING SHOULD TAKE PLACE TO DISCUSS LIKELY SLAB CURLING ISSUE.

STRUCTURAL PLAN NOTATION

XXX'-X" TOCW	INDICATES TOP OF CONCRETE WALL ELEVATION.
XXX'-X" TOF	INDICATES TOP OF FOOTING ELEVATION.
XXX'-X" TOC	INDICATES TOP OF CONCRETE STEM WALL, PILASTER OR PIER ELEVATION. (ELEVATION = 100'-0" UNO). SEE PILASTER SCHEDULE
X	INDICATES FOOTING TYPE, SEE SCHEDULE ON SHEET S003 .
(XXX'-X")	INDICATES TOP OF FOOTING ELEVATION. ELEVATION = 96'-6", UNO.
PX	INDICATES CONCRETE PIER/PILASTER, SEE SCHEDULE ON SHEET S003 .



1 S101 FOUNDATION PLAN
1/8" = 1'-0"



2 S101 ROOF FRAMING PLAN
1/8" = 1'-0"

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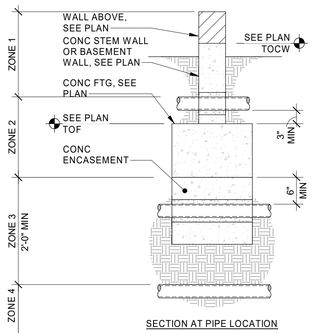
REVIEWED BY | FELDMAN
REVISIONS

FOUNDATION PLAN

S101



SECTION AT PIPE LOCATION

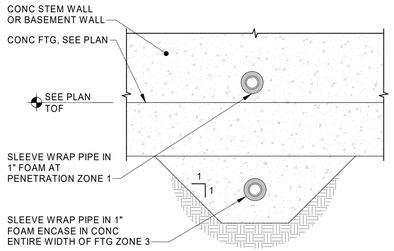
ZONE 1: SLEEVE WRAP PIPE AT PENETRATION THRU STEM WALL AS SHOWN IN ELEVATION.

ZONE 2: IF PIPE OCCURS AT FOOTING DEPTH, STEP FOOTING DOWN AND PENETRATE THRU WALL. DO NOT PENETRATE FOOTING.

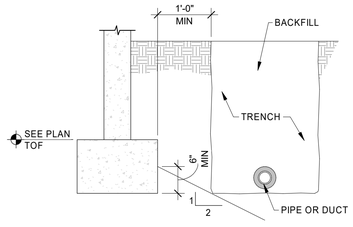
ZONE 3: PIPE OCCURS AT SHALLOW DEPTH BELOW FOOTING. SLEEVE WRAP & ENCASE IN CONCRETE AS SHOWN IN ELEVATION.

ZONE 4: PIPE PASSES FREELY WHEN MORE THAN 2'-0" BELOW BOTTOM OF FOOTING.

NOTE: UNDER NO CIRCUMSTANCES SHALL A PIPE PENETRATE THRU OR UNDER A COLUMN, PILASTER, PIER, PEDESTAL OR SPREAD FTG.

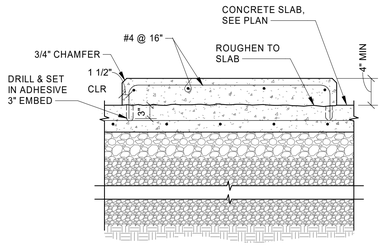


CONCRETE ENCASEMENT
- ELEVATION -

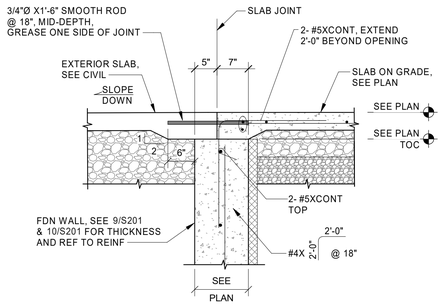


PARALLEL TO FOUNDATION
- ELEVATION -

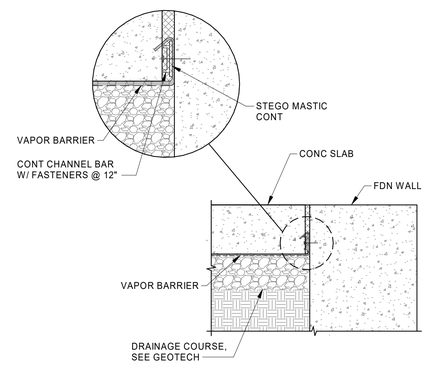
1 S201 **PIPE PENETRATIONS GUIDE AT FOUNDATIONS**
3/4" = 1'-0"



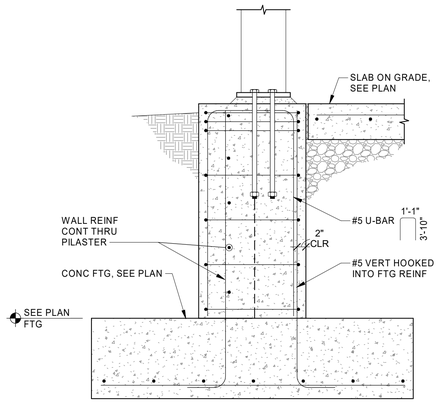
3 S201 **EQUIPMENT PAD**
3/4" = 1'-0"



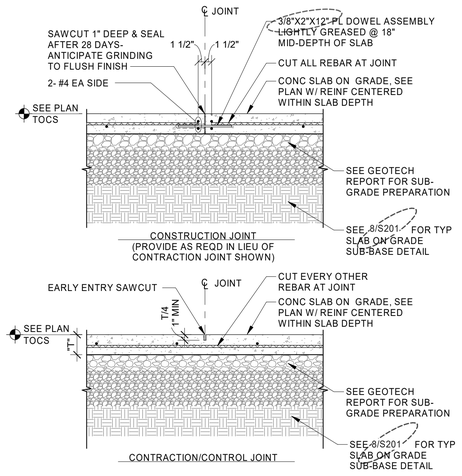
4 S201 **SLAB ON GRADE AT DOORWAYS**
REF S101 3/4" = 1'-0"



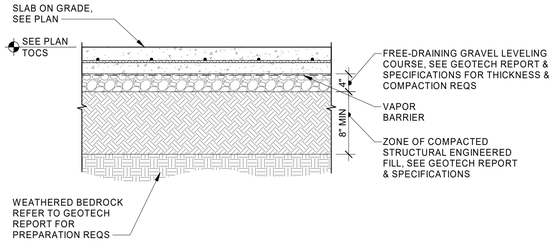
5 S201 **VAPOR BARRIER TO CONCRETE WALL**
1 1/2" = 1'-0"



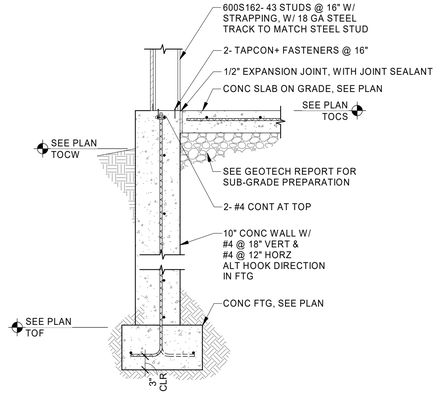
6 S201 **TYPICAL EXTERIOR PILASTER**
3/4" = 1'-0"



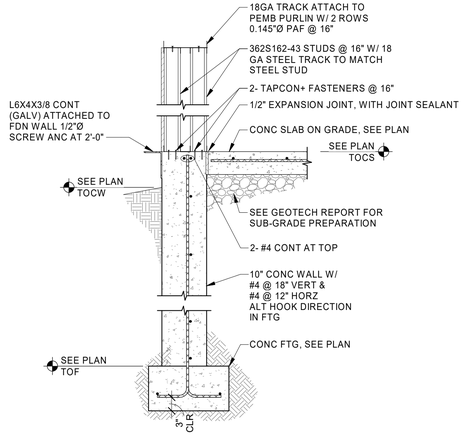
7 S201 **TYP CONC SLAB ON GRADE JOINT**
3/4" = 1'-0"



8 S201 **SLAB ON GRADE SUB-BASE & SUBGRADE DETAIL**
3/4" = 1'-0"



9 S201 **TYPICAL FOUNDATION WALL AT CFS**
3/4" = 1'-0"



10 S201 **TYPICAL FOUNDATION WALL AT PEMB**
3/4" = 1'-0"

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GREAT FALLS INTERNATIONAL AIRPORT

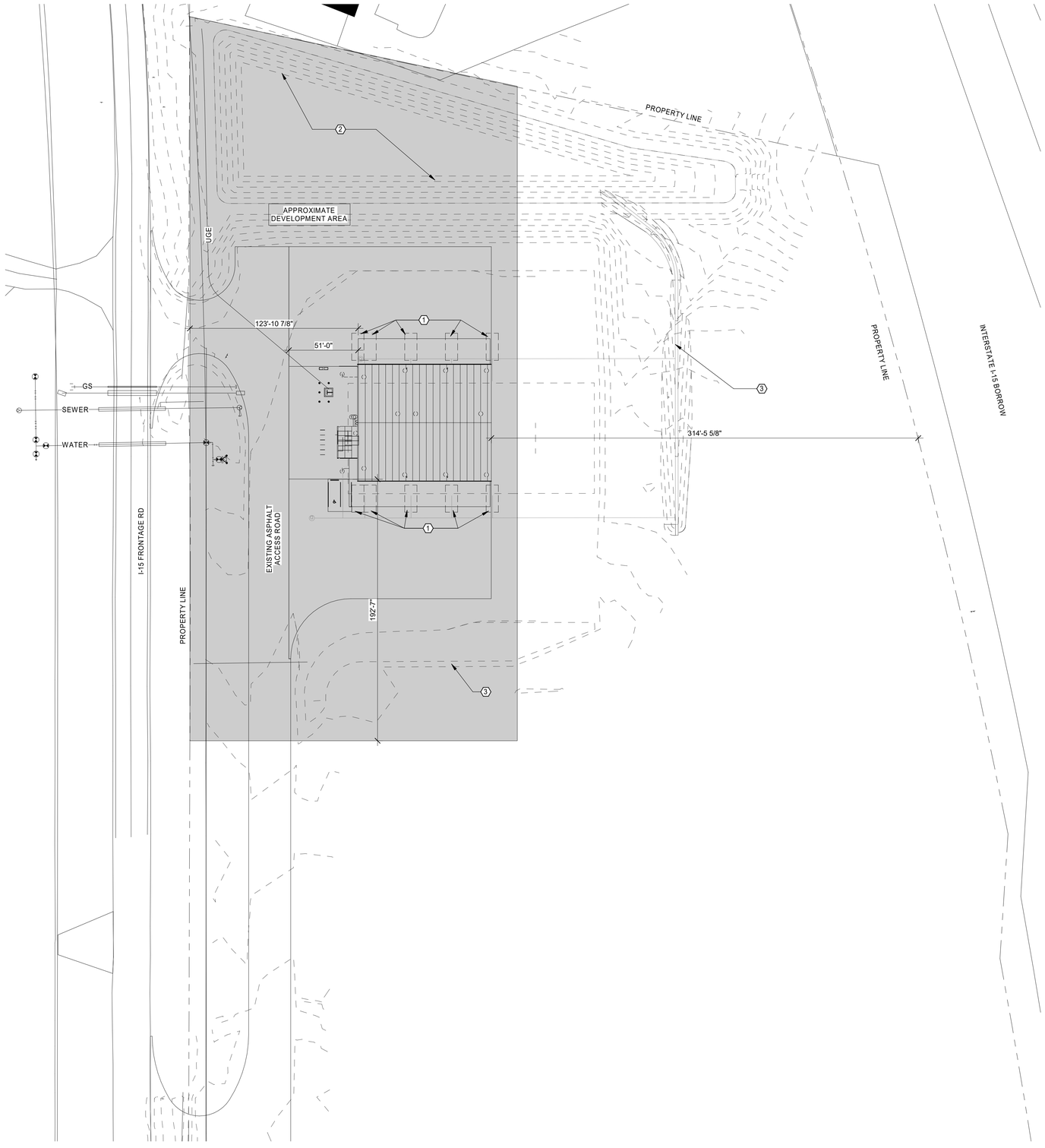
GFIA WAREHOUSE

BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | FELDMAN
DRAWN BY | SALADINER
REVIEWED BY | FELDMAN
REVISIONS

STRUCTURAL DETAILS

S201



ZONING REQUIREMENTS

ZONE: AI AIRPORT INDUSTRIAL

ADDRESS:
3900 ULM NORTH FRONTAGE ROAD
GREAT FALLS, MT 59404

LEGAL DESCRIPTION:
S20, T20 N, R03 E, C.O.S. 5051, PARCEL 2 IN SEC 20, 29 & 30

LOT ACREAGE:
163.794 ACRES
DEVELOPED AREA AS PART OF THIS PROJECT: APPOX 128, 773 SF

BUILDING SQUARE FOOTAGE:
FIRST FLOOR 7,840 SF
TOTAL= 7,840 SF

BUILDING COVERAGE:
7840 / 128,773 = 6.1%

SETBACKS:

FRONT YARD SETBACK (NORTH)	25 FEET REQ'D,	51 FEET PROVIDED
SIDE YARD SETBACK (WEST/EAST)	0 FEET REQ'D,	192 FEET MIN PROVIDED
REAR YARD SETBACK (SOUTH)	0 FEET REQ'D,	314 FEET PROVIDED

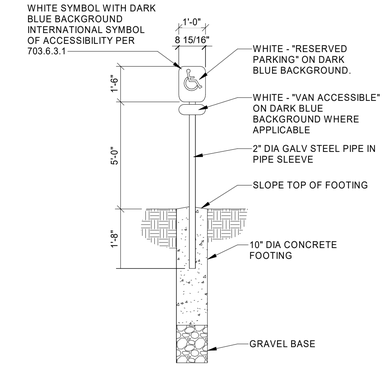
LANDSCAPING REQUIREMENTS
PER 17.44.3.030, LANDSCAPE NOT REQUIRED IN INDUSTRIAL USES

PARKING REQUIREMENTS
1ST FLOOR TENANT (WAREHOUSE, STORAGE) 1 PER EMPLOYEE PER SHIFT PLUS 1 PER 1000 SF AREA
3 TENANTS 1 EMPLOYEE PER SHIFT = 3 STALLS
7840 / 1000 = 7.84 REQUIRED SPACES
11 TOTAL SPACES REQUIRED - 1 ADAA SPACE REQUIRED

SPACES LOCATED IN FRONT OF EACH UNIT, ARE TO REMAIN UNSTRIPED EXCEPT FOR ADA STALL

SITE NOTES:

1. PARKING STALL UNSTRIPED.
2. EXISTING RETAINING POND
3. EXISTING DRAINAGE DITCH



1. CENTER SIGN IN STALL
2. (1) H/C SIGN PER H/C STALL

1 / A001 ARCHITECTURAL SITE PLAN
1" = 40'-0"

NORTH REF

2 / A001 ADA SIGN
1/2" = 1'-0"

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GREAT FALLS INTERNATIONAL AIRPORT

GFIA WAREHOUSE

STATE OF MONTANA
CTA ARCHITECTS
ANTHONY D HOUTZ
2490
LICENSED ARCHITECT

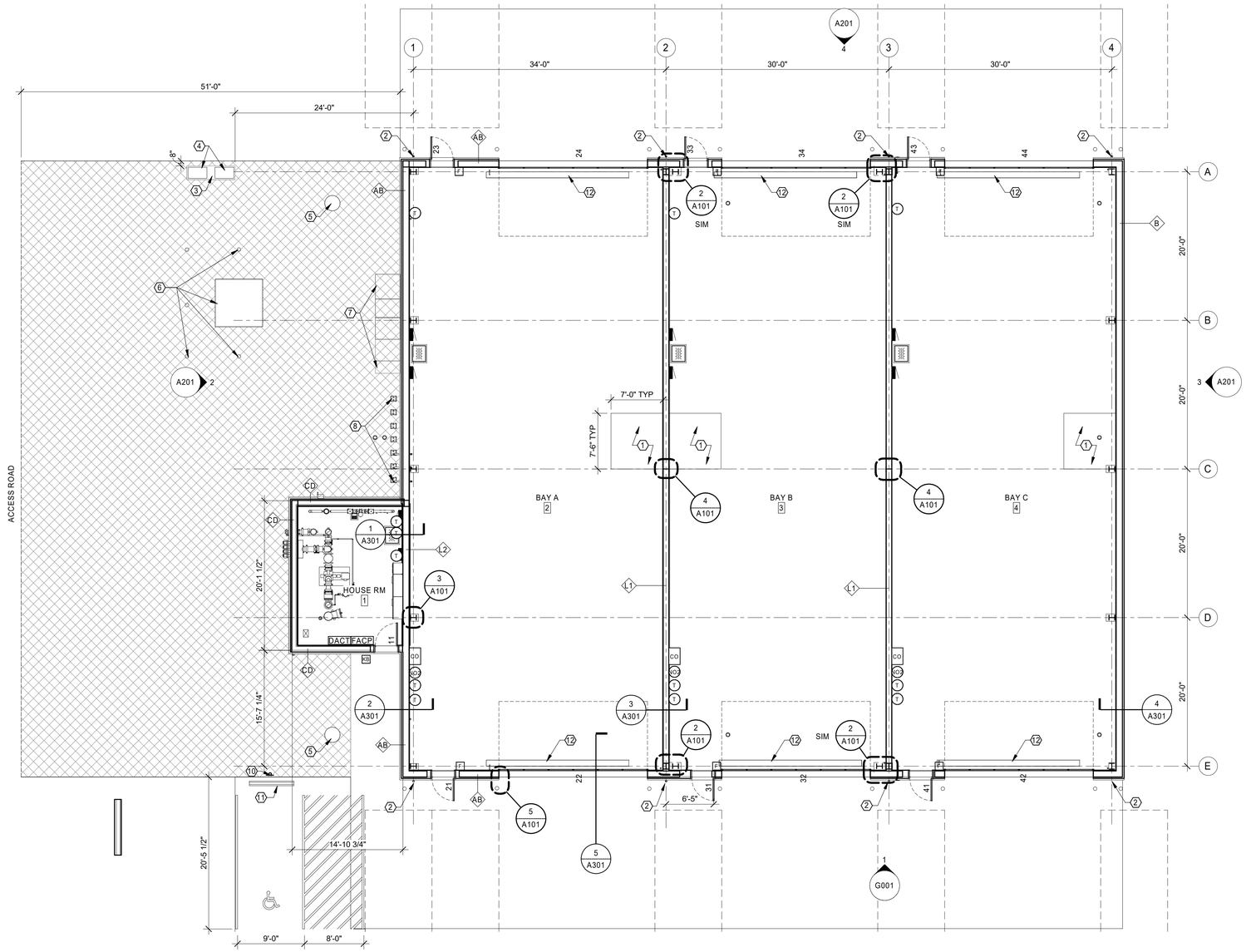
BUILDING PERMIT SET

10.26.2022
PROJECT# | GFIA_WRHSE

DRAWN BY | SUMMERS
REVISIONS

ARCHITECTURAL SITE PLAN

A001



1 A101 FIRST FLOOR

1/8" = 1'-0"

PLAN LEGEND

- X / XX — ASSEMBLY TYPE (SEE ASSEMBLIES SHEET) / ASSEMBLY MODIFIER, PER TYPE
- NAME / 101 — ROOM NAME AND NUMBER
- X — WINDOW TYPE (SEE A600s)
- X — KEYNOTE
- SIM / 1 / A101 — DIRECTION OF VIEW, IF APPLICABLE / DRAWING NUMBER / SHEET WHERE DRAWN
- 101-1 — DOOR NUMBER (SEE SHEET A601)
- DIMENSION TO FACE OF FRAMING
- DIMENSION TO GRID LINE
- DIMENSION TO CENTER LINE

WALL TYPE LEGEND

SCALE: 1" = 1'-0"

GENERAL WALL TYPE NOTES:

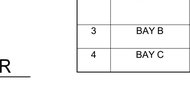
A. PROVIDE BLOCKING AS REQUIRED TO SECURE WALL HUNG COMPONENTS.
B. EXTEND ALL COMPONENTS TO UNDERSIDE OF DECK, UNLESS NOTED OTHERWISE.

EXTERIOR WALL TYPES — SCALE 1" = 1'-0"

A — EXTERIOR - MASONRY

FACE BRICK
1" MIN AIR SPACE
SELF ADHERED AIR/WATER BARRIER-LAY FOR POSITIVE DRAINAGE
5/8" DENSGLASS
2 LAYERS - 3-5/8" MTL STUDS @ 16" OC
R-30 BATT INSULATION (FILL CAVITY)
6 MIL VAPOR BARRIER (CONT.)
LINER PANEL

B — EXTERIOR - METAL SIDING

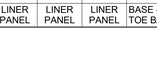


METAL SIDING PANELS
THERMAL TAPE (CONT)
MTL BUILDING GIRTS
R-30 BATT INSULATION (FILL CAVITY)
6 MIL VAPOR BARRIER (CONT.)
LINER PANEL

C — EXTERIOR - MASONRY

FACE BRICK
1" MIN AIR SPACE
SELF ADHERED AIR/WATER BARRIER-LAY FOR POSITIVE DRAINAGE
5/8" DENSGLASS
6" MTL STUDS
RE: STRUCT DWGS
R-21 UNFACED BATT INSULATION (FILL CAVITY)
1.5" RIGID INSULATION BATT (R-7.5) IN ZEE-FURRING @24" OC
6 MIL VAPOR BARRIER (CONT.)
LINER PANEL

D — EXTERIOR - METAL SIDING

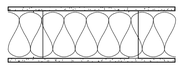


METAL SIDING PANELS
THERMAL TAPE (CONT)
6" MTL STUDS
RE: STRUCT DWGS
R-21 UNFACED BATT INSULATION (FILL CAVITY)
1.5" RIGID INSULATION BATT (R-7.5) IN ZEE-FURRING @24" OC
6 MIL VAPOR BARRIER (CONT.)
LINER PANEL

INTERIOR WALL TYPES — SCALE 1" = 1'-0"

L1 — INTERIOR DEMISING WALL - 1-HR

UL#: U404

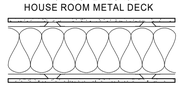


5/8" TYPE 'X' GYP BOARD - TAPE, FINISH AND PAINT
8" MTL STUDS - FULL HEIGHT. ANCHOR TO DECK ABOVE, FIRE CAULK ALL OPENINGS TYP.
R-21 BATT INSULATION
5/8" TYPE 'X' GYP BOARD - TAPE, FINISH AND PAINT

L2 — INTERIOR DEMISING WALL - 1-HR

UL#: U404 SIM

BAY A:
EXTEND RATED WALL TO MIN 1'-0" ABOVE ADJACENT HOUSE ROOM METAL DECK



5/8" TYPE 'X' GYP BOARD - TAPE, FINISH AND PAINT
3/4" HAT CHANNELS @16" OC
MTL BUILDING GIRTS
R-21 BATT INSULATION
3/4" HAT CHANNELS @16" OC
5/8" TYPE 'X' GYP BOARD - TAPE, FINISH AND PAINT

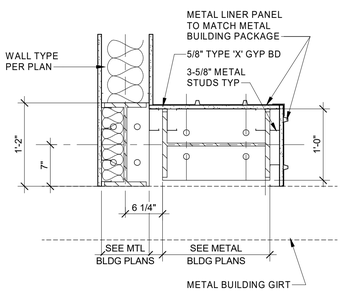
HOUSE ROOM:
EXTEND RATED WALL TO CEILING OF HOUSE ROOF. FIRE-CAULK ALL OPENINGS.

FLOOR NOTES

1. PROVIDE SLAB BLOCK-OUTS AT RESTROOM LOCATION.
2. CONNECT DOWNSPOUTS TO STORM SUBGRADE, PER CIVIL.
3. 6" CONCRETE SLAB.
4. MAIL BOXES: QUANTITY (2) SALSBURY 3304 4-COMPARTMENT OUTDOOR PARCEL LOCKERS TYPE II BLACK.
5. LID OF SAND OIL SEPARATOR, RE: PLUMBING
6. EXISTING TRANSFORMER PAD AND BOLLARDS.
7. ELECTRICAL METERS, RE SEE ELECTRICAL DRAWINGS.
8. GAS METER, SEE PLUMBING DRAWINGS.
9. SHADED AREA INDICATES UNPAVED AREA. GRADE FOR POSITIVE DRAINAGE, COVER WITH LANDSCAPE FABRIC AND MIN 6" OF 3" MINUS BLACK BASALT LANDSCAPE ROCK.
10. ADA SIGNAGE, SEE 2 / A001
11. PARKING BLOCK, RE: CIVIL DRAWINGS.
12. PROVIDE TRENCH DRAIN, RE: PLUMBING.

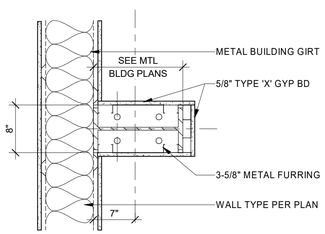
ROOM FINISH SCHEDULE

NO.	ROOM NAME	FLOOR	BASE	WALLS				ADDITIONAL NOTES
				NORTH	EAST	SOUTH	WEST	
1	HOUSE RM	SEALED CONC.	6" RUBBER BASE	PAINT	PAINT	PAINT	PAINT	BASE - JOHNSONITE COVED TOE BASE
2	BAY A	SEALED CONC.	6" RUBBER BASE	PAINT/ LINER PANEL	LINER PANEL	PAINT	LINER PANEL	BASE - JOHNSONITE COVED TOE BASE
3	BAY B	SEALED CONC.	6" RUBBER BASE	PAINT	LINER PANEL	PAINT	LINER PANEL	BASE - JOHNSONITE COVED TOE BASE
4	BAY C	SEALED CONC.	6" RUBBER BASE	PAINT	LINER PANEL	LINER PANEL	LINER PANEL	BASE - JOHNSONITE COVED TOE BASE



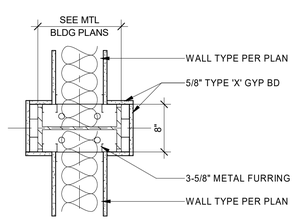
2 A101 COLUMN WRAP @ GRIDS A2, A3, E2, E3

1" = 1'-0"



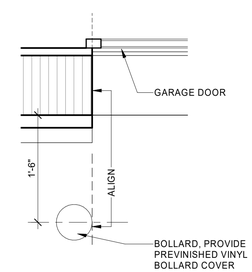
3 A101 COLUMN WRAP @ GRID D1

1" = 1'-0"



4 A101 COLUMN WRAP @ GRID C

1" = 1'-0"



5 A101 BOLLARD AT GARAGE DOOR

1" = 1'-0"

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GFIA WAREHOUSE

STATE OF MONTANA
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ANTHONY D HOUTZ
2490
LICENSED ARCHITECT

BUILDING PERMIT SET

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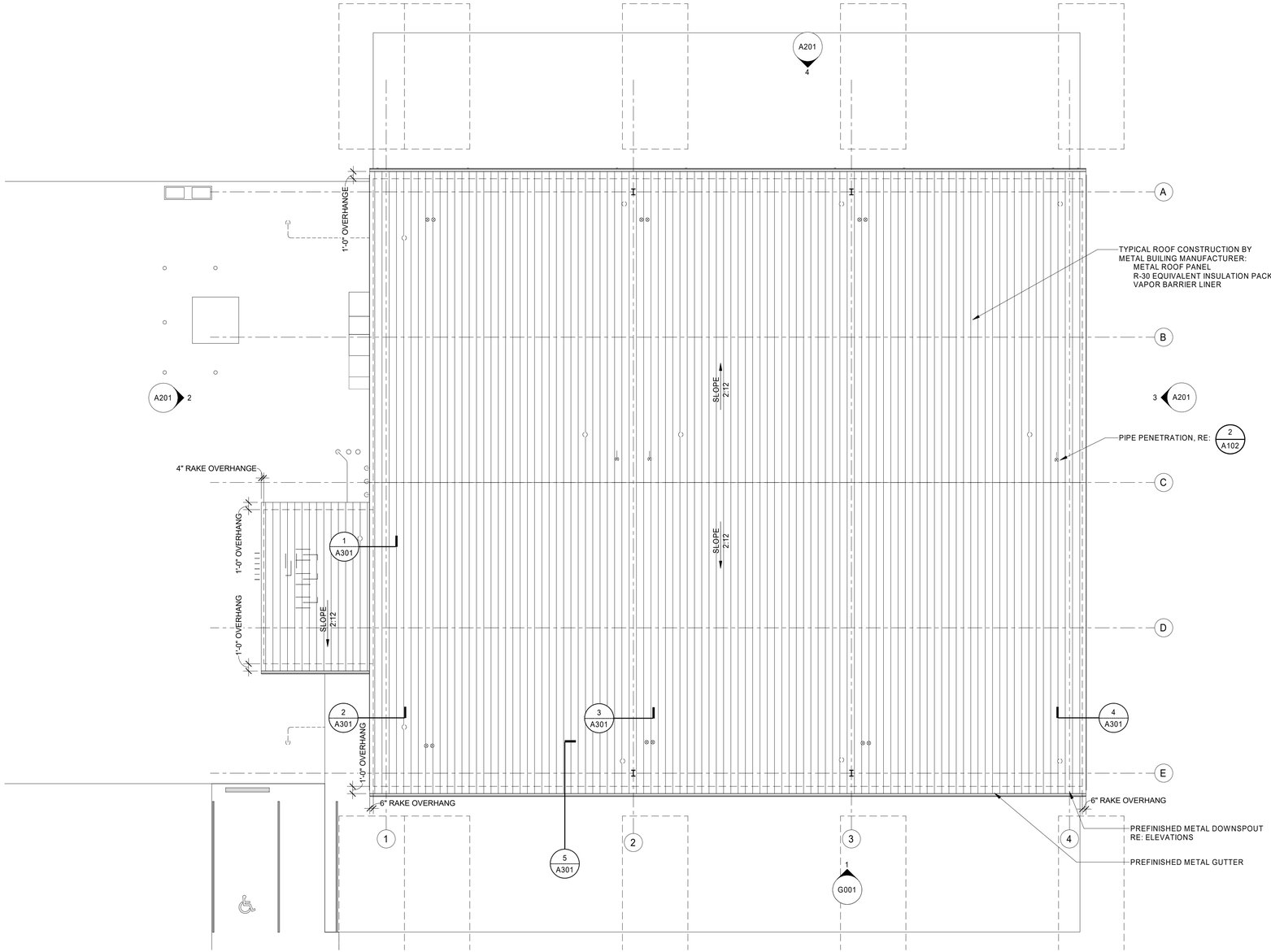
FLOOR PLAN

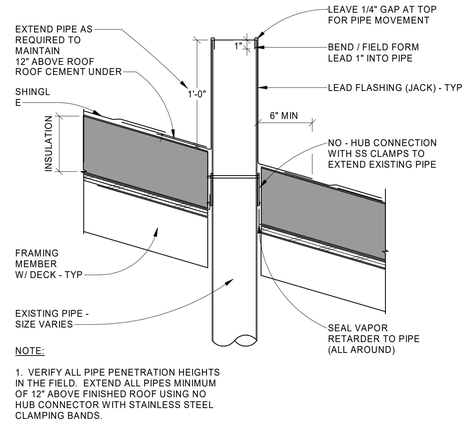
A101



1 A102 **ROOF PLAN**

1/8" = 1'-0"

NORTH REF



NOTE:

1. VERIFY ALL PIPE PENETRATION HEIGHTS IN THE FIELD. EXTEND ALL PIPES MINIMUM OF 12" ABOVE FINISHED ROOF USING NO HUB CONNECTOR WITH STAINLESS STEEL CLAMPING BANDS.

2 A102 **PIPE PENETRATION**

1 1/2" = 1'-0"

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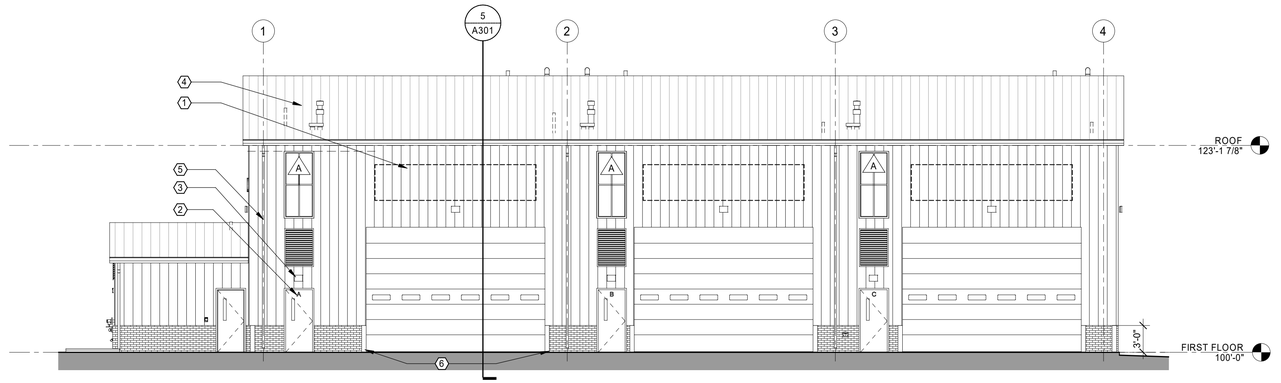
ROOF PLAN

A102



1 A201 EXTERIOR ELEVATION - WEST

1/8" = 1'-0"

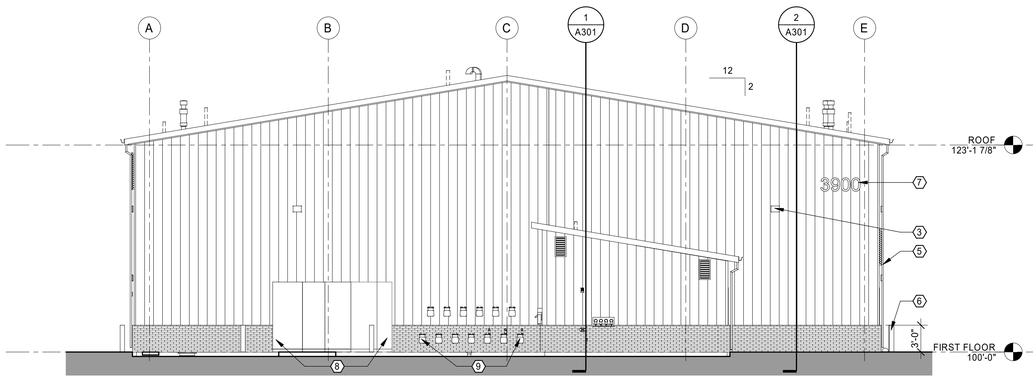
MATERIALS LEGEND

METAL PANELS

BRICK

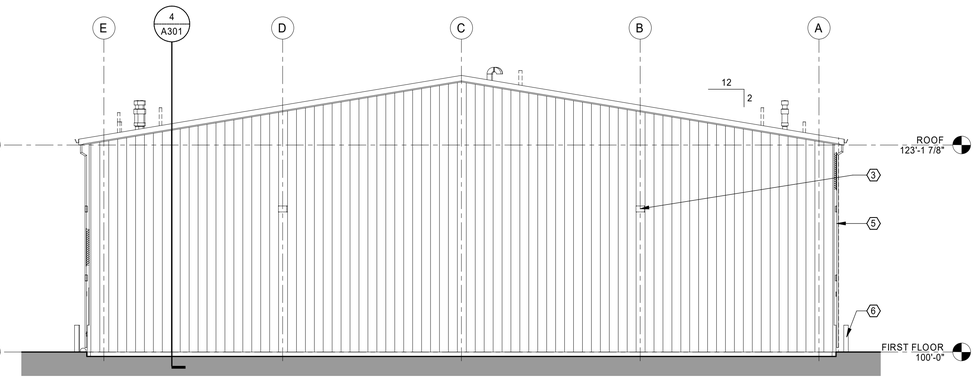
EXTERIOR ELEVATION NOTES

1. SIGNAGE, BY TENANT.
2. SUITE NUMBER SIGNAGE, EACH SIDE OF THE BAY.
3. EXTERIOR LIGHTS, RE ELECTRICAL DRAWINGS
4. TYPICAL ROOF CONSTRUCTION BY METAL BUILDING MANUFACTURE, RE: ROOF PLAN
5. DOWNSPOUT
6. BOLLARD, RE: CIVIL
7. 18"H METAL NUMBERALS ON 1/2" STANDOFFS
8. ELECTRICAL PANELS, RE: ELECTRCAL
9. GAS METTERS, RE: PLUMBING



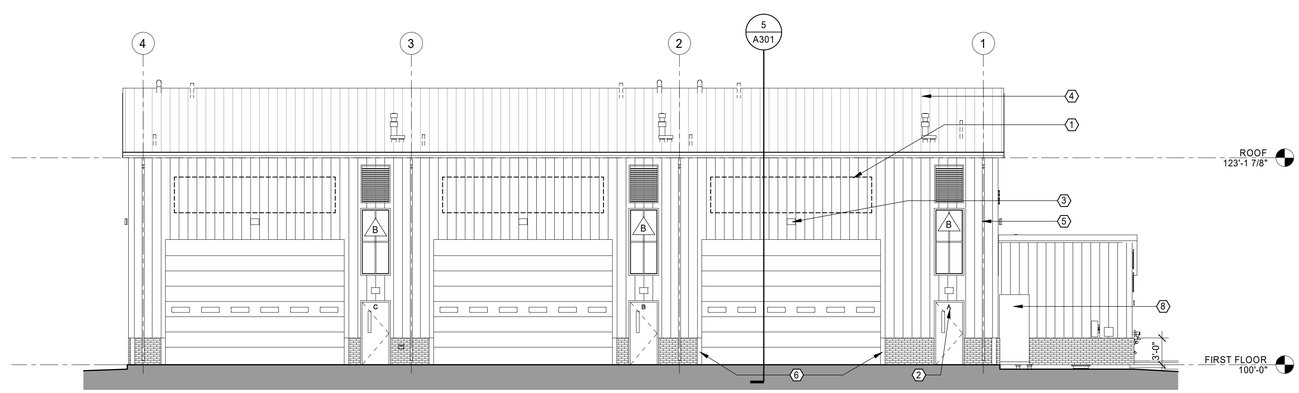
2 A201 EXTERIOR ELEVATION - NORTH

1/8" = 1'-0"



3 A201 EXTERIOR ELEVATION - SOUTH

1/8" = 1'-0"



4 A201 EXTERIOR ELEVATION - EAST

1/8" = 1'-0"

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EXTERIOR ELEVATIONS

A201

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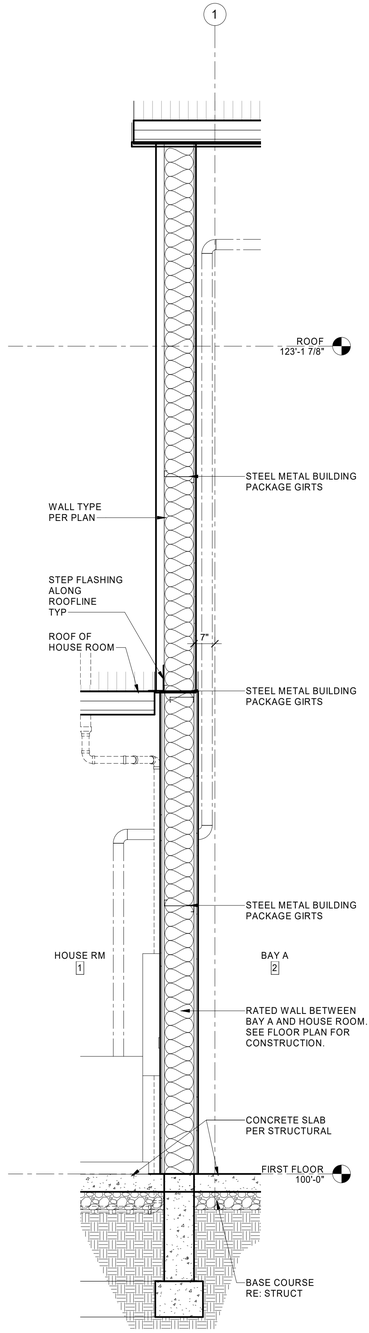
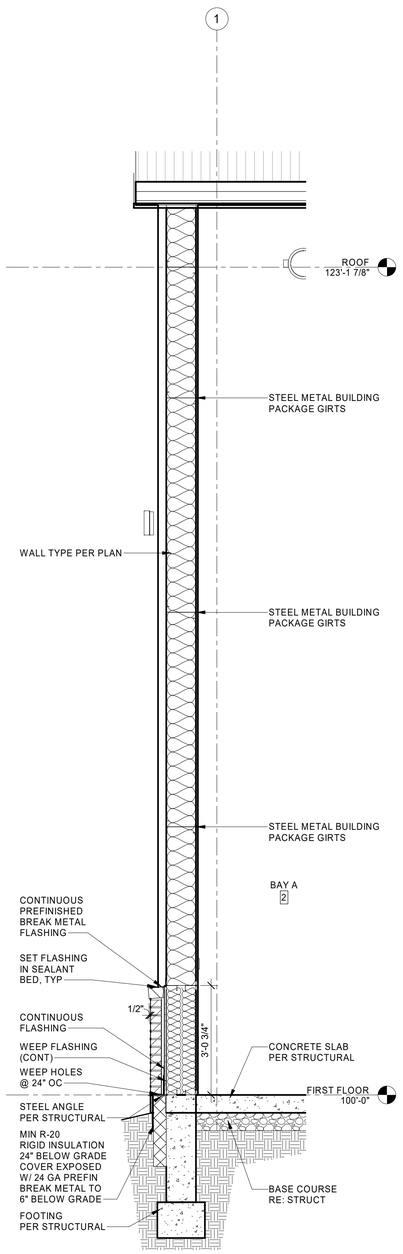
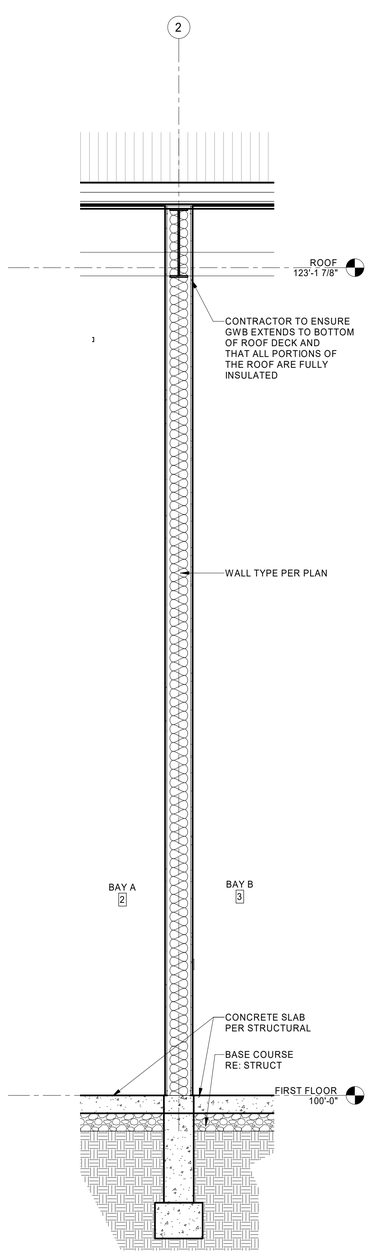


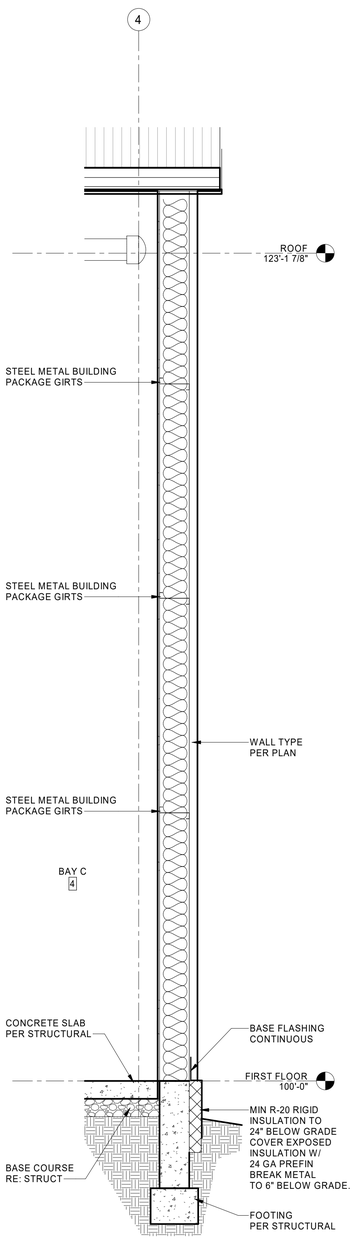
1 A301 — WALL SECTION - HOUSE RM TO BAY A
1/2" = 1'-0"



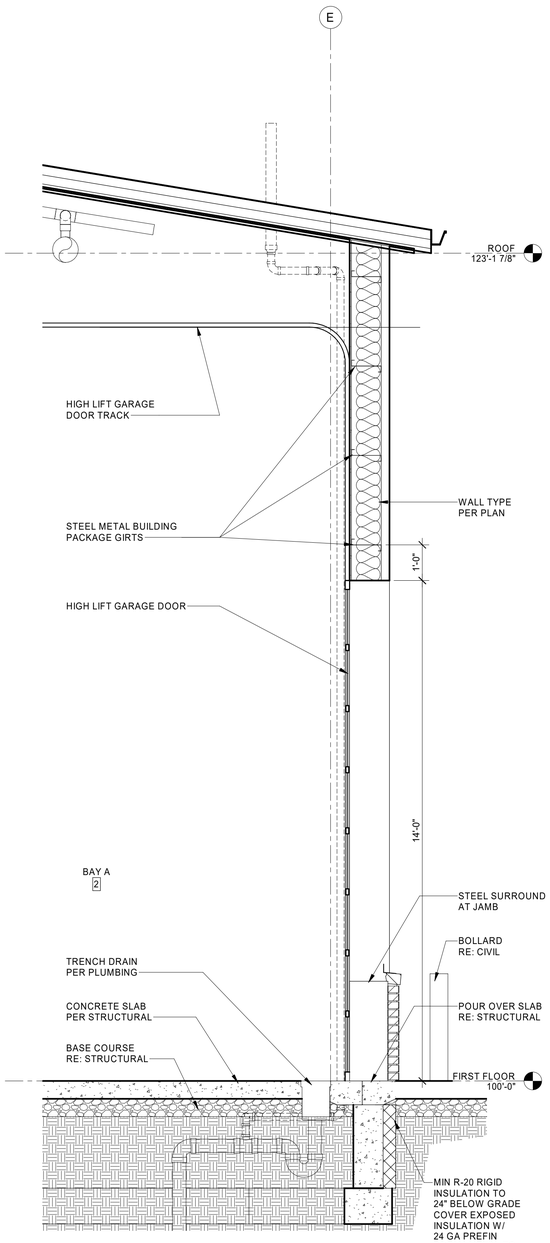
2 A301 — WALL SECTION - TYPICAL EXTERIOR
1/2" = 1'-0"



3 A301 — WALL SECTION - DEMISING WALL
1/2" = 1'-0"



4 A301 — WALL SECTION - EXTERIOR
1/2" = 1'-0"



5 A301 — WALL SECTION @ GARAGE DOOR
1/2" = 1'-0"

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WALL SECTIONS

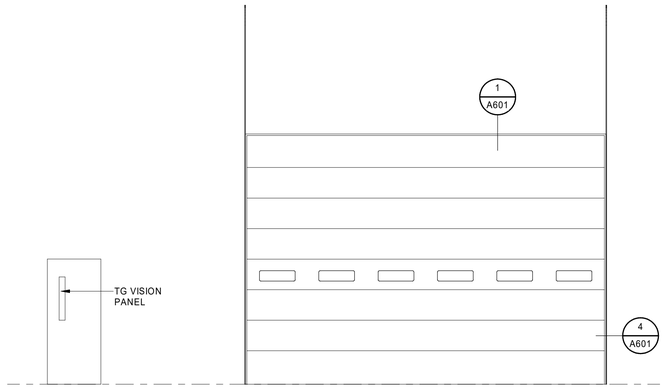
A301

DOOR, FRAME AND HARDWARE SCHEDULE

DOOR NUMBER	ROOM NUMBER	ROOM NAME	DOOR						FRAME					FIRE RATING	HARDWARE
			SIZE			MTL	TYPE	GLAZE	MTL	TYPE	DETAIL				NOTES
			W	H	T						HEAD	JAMB	SILL		
11	1	HOUSE RM	3'-0"	7'-0"	1 3/4"	HM	A		HM	1	4/A601				
21	2	BAY A	3'-0"	7'-0"	1 3/4"	HM	A		HM	1	4/A601				
22			20'-0"	14'-0"	1 1/2"		B			--					
23	2	BAY A	3'-0"	7'-0"	1 3/4"	HM	A		HM	1	4/A601				
24			20'-0"	14'-0"	1 1/2"		B			--					
31	3	BAY B	3'-0"	7'-0"	1 3/4"	HM	A		HM	1	4/A601				
32			20'-0"	14'-0"	1 1/2"		B			--					
33	3	BAY B	3'-0"	7'-0"	1 3/4"	HM	A		HM	1	4/A601				
34			20'-0"	14'-0"	1 1/2"		B			--					
41	4	BAY C	3'-0"	7'-0"	1 3/4"	HM	A		HM	1	4/A601				
42			20'-0"	14'-0"	1 1/2"		B			--					
43	4	BAY C	3'-0"	7'-0"	1 3/4"	HM	A		HM	1	4/A601				
44			20'-0"	14'-0"	1 1/2"		B			--					

DOOR TYPE

1/4" = 1'-0"



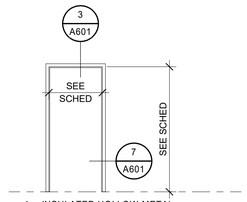
A - INSULATED FLUSH W/ VISION PANEL
HOLLOW METAL
MINIMUM U-VALUE OF 0.34

B - 24 GA RIBBED HEAVY DUTY GALVANIZED STEEL MIN R-7 INSULATED DOOR WITH HYBRID HIGH CLEARANCE LIFT AND VERTICAL LIFT TRACK

CUSTOM COLOR BACKED POLYESTER FINISH

DOOR FRAME

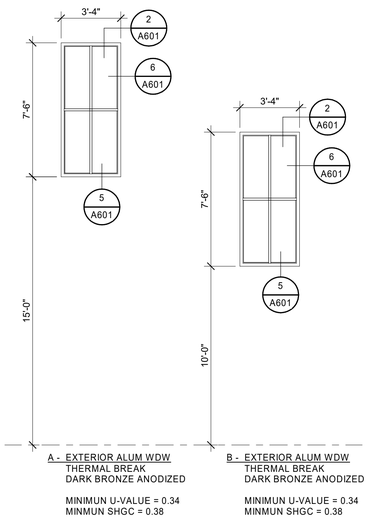
1/4" = 1'-0"



1 - INSULATED HOLLOW METAL

WINDOW LEGEND

1/4" = 1'-0"

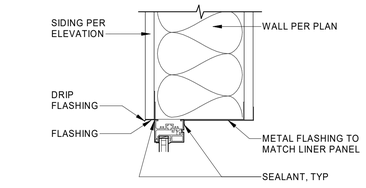


A - EXTERIOR ALUM WDW
THERMAL BREAK
DARK BRONZE ANODIZED

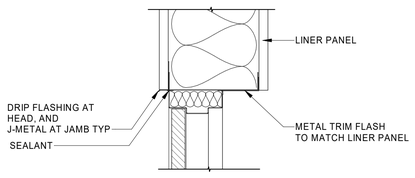
MINIMUN U-VALUE = 0.34
MINMUN SHGC = 0.38

B - EXTERIOR ALUM WDW
THERMAL BREAK
DARK BRONZE ANODIZED

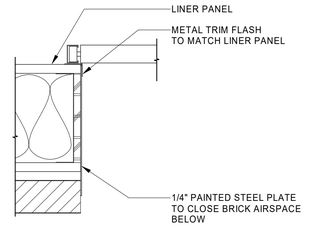
MINIMUN U-VALUE = 0.34
MINMUN SHGC = 0.38



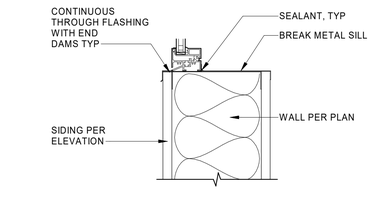
2 A601 — EXTERIOR ALUM WDW - HEAD
1 1/2" = 1'-0"



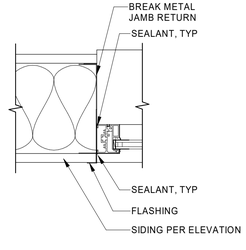
3 A601 — EXTERIOR DOOR HEAD/ JAMB @ METAL SIDING
1 1/2" = 1'-0"



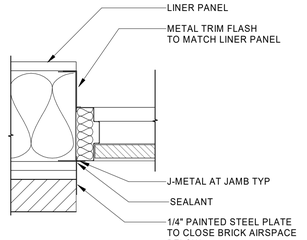
4 A601 — OVERHEAD DOOR JAMB @ BRICK
1 1/2" = 1'-0"



5 A601 — EXTERIOR ALUM WDW - SILL
1 1/2" = 1'-0"



6 A601 — EXTERIOR ALUM WDW - JAMB
1 1/2" = 1'-0"



7 A601 — EXTERIOR DOOR HEAD/ JAMB @BRICK
1 1/2" = 1'-0"

DOOR HARDWARE

ABBREVIATIONS

AL	ALUMINUM
HM	HOLLOW METAL
IN	1" INSULATED TEMPERED GLAZING
T	1/4" TEMPERED GLAZING
WD	WOOD
CLAD	ALUMINUM CLAD WOOD

MANUFACTURER ABBREVIATIONS

MK	MCKINNEY
PE	PEMKO
IVE	H.B. IVES
LCN	LCN COMMERCIAL DIVISION
SC	SCHLAGE
VON	VON DUPRIN
ZER	ZERO INTERNATIONAL INC
TR	TRIMCO

HARDWARE GROUP #1

EXTERIOR DOOR SINGLE DOOR #11,21,23,31,33,41,43

3 EA	MCKINNEY	FULL-MORTISE HINGES TA2314TB-NRP
1 EA	LCN	CLOSER 4040XP-HCUSH
1 EA	PEMKO	THRESHOLD FULL WIDTH 420AVL
1 EA	PEMKO	SWEEP SERIES 18000_NB
1 EA	PEMKO	PERIMETER WEATHERSTRIPPING - 303DS
1 EA	SCHLAGE	B760P DEADLOCK
1 EA	PEMKO	LATCHGUARD
1 EA	SCHLAGE	ND70PD LOCKSET
1 EA	TRIMCO	K SERIES 18"H KICKPLATE
1 EA	TRINCO	1214CK FLOOR STOP

HARDWARE GROUP #2

EXTERIOR OVERHEAD DOORS #22,24,32,34,42,44

1 EA WALL-MOUNTED MIN 1 HP OPENER - COORDINATE OPENER SIZE WITH FINAL DOOR SELECTION

ELECTRONIC SAFETY EDGE SENSOR
PHOTO-EYE SAFETY SENSORS
75000 CYCLE SPRINGS
FULL PERIMETER WEATHERSEALS

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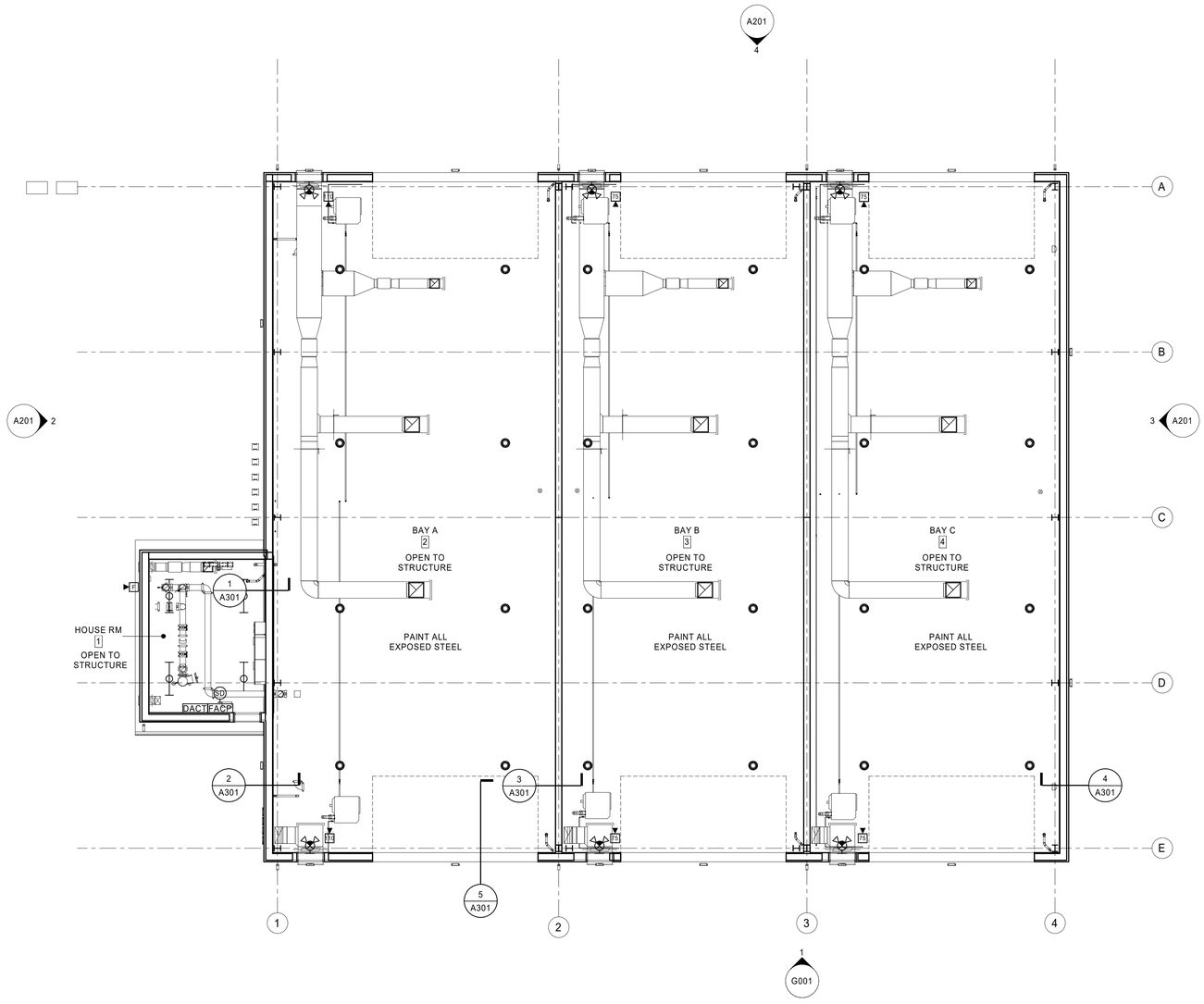
DOOR AND WINDOW SCHEDULES AND DETAILS

A601



1 A901 FIRST FLOOR REFLECTED CEILING PLAN

1/8" = 1'-0"

NORTH REF

REFLECTED CEILING LEGEND

CEILING MATERIAL — ACT
CEILING HEIGHT — 00'-00 00/00"
ADDITIONAL NOTES — NOTES

- 2X2 ACOUSTICAL LAY-IN CEILING
- GYPSUM BOARD CEILING - PAINT
- EXPOSED STRUCTURE AND DECK - PAINT
- LIGHTING - SEE ELECTRICAL
- HVAC REGISTERS - SEE MECHANICAL

CEILING MATERIAL

ACT1	2X2 ACOUSTICAL LAY-IN PANEL
EXP	EXPOSED STRUCTURE AND DECK - PAINT
GYP	GYPSUM BOARD - PAINT

CEILING HEIGHT

VAR	VARIES

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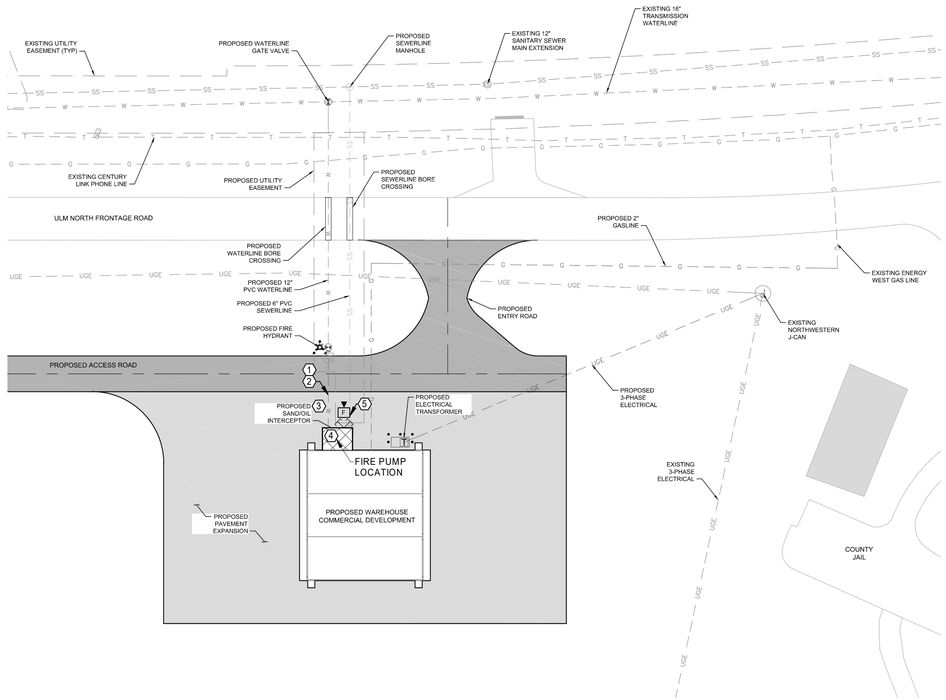
REFLECTED CEILING PLAN

A901



1 F001 **FIRE PROTECTION SITE PLAN**

NOT TO SCALE

NORTH REF

KEYNOTES

1. 8" FIRE SERVICE TO WITHIN 5'-0" OF BUILDING BY OTHERS. SEE SITE UTILITY PLAN.
2. 8" TRANSITION COUPLING.
3. 8" CLASS 52 CEMENT LINED DUCTILE IRON FIRE SERVICE UNDER BUILDING FOOTING AND THROUGH FLOOR SLAB. SEE DETAIL 3/F200.
4. FIRE SERVICE ENTRANCE, PUMP AND RISER. SEE DETAIL 2/F200.
5. FDC AND HORN/STROBE ASSEMBLY. SEE DETAIL 3/F200.

WATER SUPPLY INFORMATION			
TEST PRESSURE HYDRANT: -	LOCATION:		-
FLOW HYDRANT: -	LOCATION:		-
BY: -		DATE:	
STATIC PRESSURE: - PSI		RESIDUAL PRESSURE:	- PSI
PITOT PRESSURE: - PSI	WITH - GPM FLOWING		

UNAVAILABLE AT TIME OF DESIGN

NOTE: EXISTING WATER DATA FOR THIS AREA WAS UNAVAILABLE AT TIME OF DESIGN DUE TO THE ABSENCE OF UTILITIES. ONCE THE PROPOSED WATER UTILITY LINES AND HYDRANTS ARE INSTALLED, THE CONTRACTOR SHALL PERFORM FLOW TESTING IN ACCORDANCE WITH NFPA 291 AND UTILIZE THAT DATA FOR DEVELOPMENT OF SHOP DRAWINGS.

IFC 2021 REQUIRED FIRE FLOW:
2000 GPM @ 20 PSI FOR 4 HOURS

FIRE PROTECTION LEGEND

SYMBOL	DESCRIPTION
	PENDENT SPRINKLER, PLAN - ELEVATION
	UPRIGHT SPRINKLER, PLAN - ELEVATION
	SIDEWALL SPRINKLER, PLAN - ELEVATION
	BACK TO BACK ATTIC SPRINKLER, PLAN
F	FIRE SPRINKLER WET SYSTEM PIPE
F-D	FIRE SPRINKLER DRY SYSTEM PIPE
F-P	FIRE SPRINKLER PREACTION SYSTEM PIPE
FDC	FIRE SPRINKLER PREACTION SYSTEM PIPE
D	FIRE SPRINKLER DRAIN PIPE
	CONNECT TO EXISTING
	NEW PIPING
	EXISTING PIPING
	PIPING TO BE REMOVED
TS	TAMPER SWITCH
FS	FLOW SWITCH
PS	PRESSURE SWITCH
	FIRE HYDRANT
	FIRE DEPARTMENT CONNECTION, SIAMESE
F	HORN/STROBE ASSEMBLY
	FIRE SPRINKLER WET SYSTEM RISER

FIRE PROTECTION ABBREVIATIONS

FL	FLANGED
GR	GROOVED
GALV	GALVANIZED
SF	SQUARE FEET
FDC	FIRE DEPARTMENT CONNECTION
AUX	AUXILIARY
(E)	EXISTING
SCH	SCHEDULE
N.C.	NORMALLY CLOSED

HYDRAULIC CALCULATIONS REQUIRED:

HYDRAULICALLY CALCULATE THE MOST DEMANDING LIGHT HAZARD ; 1500 SF AT .10 GPM/SF AND 100 GPM OUTSIDE HOSE ALLOWANCE.

HYDRAULICALLY CALCULATE THE MOST DEMANDING ORDINARY GROUP 1 ; 1500 SF AT .15 GPM/SF AND 250 GPM OUTSIDE HOSE ALLOWANCE.

HYDRAULICALLY CALCULATE THE MOST DEMANDING ORDINARY GROUP 2 ; 1500 SF AT .20 GPM/SF AND 250 GPM OUTSIDE HOSE ALLOWANCE.

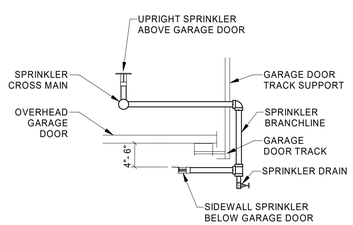
NOTES:
1. CALCULATED DEMAND INCLUDING HOSE STREAM REQUIREMENTS SHALL FALL NO LESS THAN 10 PSI BELOW THE AVAILABLE WATER SUPPLY CURVE.
2. NO REDUCTIONS FOR QUICK RESPONSE SPRINKLERS WILL BE ALLOWED.
3. HYDRAULIC CALCULATIONS INDICATING WATER VELOCITIES IN EXCESS OF 25 FT/SEC SHALL UTILIZE THE D-W METHOD.
4. NO EXTENDED COVERAGE SPRINKLERS WILL BE ALLOWED.

FIRE PUMP SCHEDULE

PLAN CODE	MFGR	MODEL NO	GPM	RATED PRES. PSI	RPM	HP UL RATED	HP (BHP)	POWER
FP-1	AC-FIRE ITT	8100/8X8X12F	1,500	50	1785	65	60	460V, 3Ø
JP-2	AC-FIRE ITT	1SV8	5	95	3450	.75	-	200-208V, 3Ø

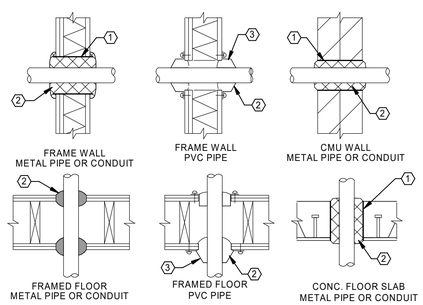
GENERAL NOTES

A. DESIGN AND INSTALLATION SHALL CONFORM TO NFPA 13, 2019 EDITION, LOCAL FIRE AND BUILDING DEPARTMENTS.
B. THE SPRINKLER SYSTEM SHOWN IS CONCEPTUAL ONLY. THE CONTRACTOR SHALL PROVIDE A COMPLETE SPRINKLER SYSTEM SHOWING ALL REQUIRED PIPING, OFFSETS, SPRINKLERS, RISERS AND DROPS.
C. CONTRACTOR SHALL SECURE ALL PERMITS AND PAY ALL FEES REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION AND BUILDING DEPARTMENTS.
D. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE FIRE PROTECTION SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND COMPLYING WITH THE STANDARDS OF THE NATIONAL FIRE PROTECTION ASSOCIATION, INDUSTRIAL RISK INSURERS, AND ALL STATE AND LOCAL REGULATIONS.
E. APPROVAL OF THE COMPLETE SYSTEM SHALL BE OBTAINED FROM THE AUTHORITIES HAVING JURISDICTION, AND A COPY OF SAME SHALL BE DELIVERED TO THE OWNER'S REPRESENTATIVE FOR DELIVERY TO THE OWNER.
F. RESTORE ALL DEVICES, FINISHES, ETC. DAMAGED OR ALTERED DURING CONSTRUCTION TO AN ACCEPTABLE CONDITION AS DETERMINED BY THE OWNER, ARCHITECT AND/OR ENGINEER.
G. CONTRACTOR SHALL SCHEDULE ALL SHUTDOWNS THAT AFFECT UTILITIES AND PORTIONS OF THE BUILDING THAT MUST REMAIN IN OPERATION WITH THE OWNER.
H. PROVIDE AND INSTALL SPRINKLERS OF THE PROPER TEMPERATURE RATING AND TYPE PER NFPA 13.
I. PROVIDE AND INSTALL VALVES OF THE PROPER TYPE, UL LISTED, AND PRESSURE RATING PER NFPA 13.
J. PROVIDE AND INSTALL SPARE SPRINKLERS, WRENCH AND CABINET PER NFPA 13.
K. COORDINATE INSTALLATION OF ALL ELECTRICALLY SUPERVISED VALVES, HORN/STROBE, ETC. WITH THE ELECTRICAL CONTRACTOR.
L. PROVIDE AND INSTALL A HYDRAULIC PLACARD WITH THE HYDRAULIC DESIGN DATA FOR EACH ZONE RISER OR SYSTEM CALCULATED.
M. PROVIDE AND INSTALL A SIGN WITH RAISED LETTERS FOR THE FDC PER NFPA 13.
N. PROVIDE AND INSTALL AUX DRAINS AND VALVES AS REQUIRED FOR PROPER DRAINING OF THE SYSTEM.
O. COORDINATE SPRINKLERS AND PIPING LOCATIONS WITH DUCTWORK, PIPING, LIGHTING FIXTURES, DIFFUSERS, ETC. AS REQUIRED.
P. ISOLATE, DRAIN AND REFILL EXISTING PIPING SYSTEM AS REQUIRED TO ACCOMMODATE INSTALLATION OF NEW WORK.
Q. HANGER INSTALLATION AND SPACING SHALL BE IN ACCORDANCE WITH NFPA 13.
R. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORING AND DRILLING AS REQUIRED.
S. THE CONTRACTOR SHALL SUBMIT SIZE AND LOCATION OF ALL BEAM PENETRATIONS TO THE STRUCTURAL ENGINEER FOR REVIEW AND DETAIL.
T. WHERE PIPING PASSES THROUGH FIRE RATED FLOORS OR WALLS, SLEEVES SHALL BE COMPLETELY SEALED WITH A FIRE STOP MATERIAL THAT IS UL LISTED AND ACCEPTED BY THE BUILDING DEPARTMENT AND FIRE DEPARTMENT. THIS MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE MANUFACTURER TO MAINTAIN THE FIRE RATING OF THE PENETRATED WALL OR FLOOR.
U. SLEEVES THROUGH WALL AND FLOOR SHALL BE SCH 10 GALVANIZED AND PACKED WITH NONCOMBUSTIBLE, SMOKEPROOF, AND WATERPROOF FIRE SEALANT.
V. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF FIRE EXTINGUISHER CABINETS.
W. ALL SHUTOFF VALVES IN SPRINKLER, STANDPIPE, AND COMBINED SYSTEMS SHALL BE APPROVED INDICATING TYPE.
X. COORDINATE SPRINKLER LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING, AND OTHER CEILING ITEMS AND MAKE MODIFICATIONS TO SUIT.
Y. SPRINKLERS INSTALLED IN CEILINGS OF FINISHED AREAS SHALL BE SYMMETRICAL IN RELATION TO CEILING SYSTEM COMPONENTS AND CENTERED IN THE CEILING TILE.
Z. THIS LOCATION IS A SEISMIC DESIGN CATEGORY "B" NO SEISMIC BRACING REQUIRED.
AA. ALL PIPING 2" AND SMALLER SHALL BE EDDY-THREAD OR SCH 40. PIPING 2 1/2" AND LARGER SHALL BE EDDY-FLOW OR SCH 10 PIPE WITH GROOVED FITTINGS.
BB. THE CONTRACTOR/INSTALLER SHALL HAVE THE SYSTEM "WORKING PLANS" REVIEWED AND APPROVED BY A THIRD-PARTY FIRE PROTECTION PLAN REVIEWING AGENCY, ACCEPTABLE TO THE AHJ, TO ENSURE COMPLIANCE WITH ALL LOCAL AND CURRENT NATIONAL FIRE CODES.
CC. SPRINKLER CONTRACTOR TO COORDINATE WITH OTHER TRADES TO PREVENT CONFLICT WITH OTHER BUILDING SYSTEMS. ANY INSTALLATION WITHOUT PRIOR COORDINATION IS SUBJECT TO REMOVAL AND REINSTALLATION AT THE INSTALLING CONTRACTOR'S EXPENSE.



2 F001 **TYPICAL SPRINKLER AT OVERHEAD DOOR**

NOT TO SCALE

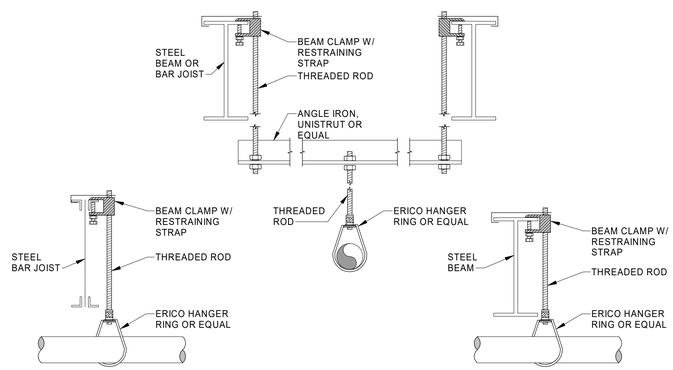


FIRE STOPPING DETAIL NOTES

1. PIPE SLEEVE THROUGH OPENING.
2. GUN OR TROWEL SPECIFIED FIRE STOPPING COMPOUND ALL AROUND OPENING ON BOTH SIDES (METACAULK 950 OR EQUAL).
3. METAL-TABBED RETAINING COLLAR AROUND OPENING AND FOLDED IN AFTER CAULKING IS APPLIED.

3 F001 **FIRE STOPPING PIPE PENETRATION DETAILS**

NOT TO SCALE



NOTES:
1. UNSUPPORTED LENGTHS BETWEEN THE END SPRINKLER ON A BRANCH AND THE LAST HANGER SHALL NOT BE GREATER THAN 12".
2. THE LENGTH OF AN UNSUPPORTED ARM OVER MUST NOT BE GREATER THAN 12".
3. ALL HANGERS LOCATED WITHIN 12" OF THE LAST SPRINKLER ON A BRANCH LINE OR ARMOVER MUST BE FITTED WITH A SURGE SUPPRESSOR OR EQUIVALENT.

MAXIMUM PIPE/TUBING SUPPORT SPACING, FEET

NOM. SIZE	THRU 3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
STEEL	N.A.	12	12	15	15	15	15	15	15	15

4 F001 **FIRE SPRINKLER PIPE HANGER DETAILS**

NOT TO SCALE

FIRE PROTECTION SHEET INDEX

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GFIA WAREHOUSE

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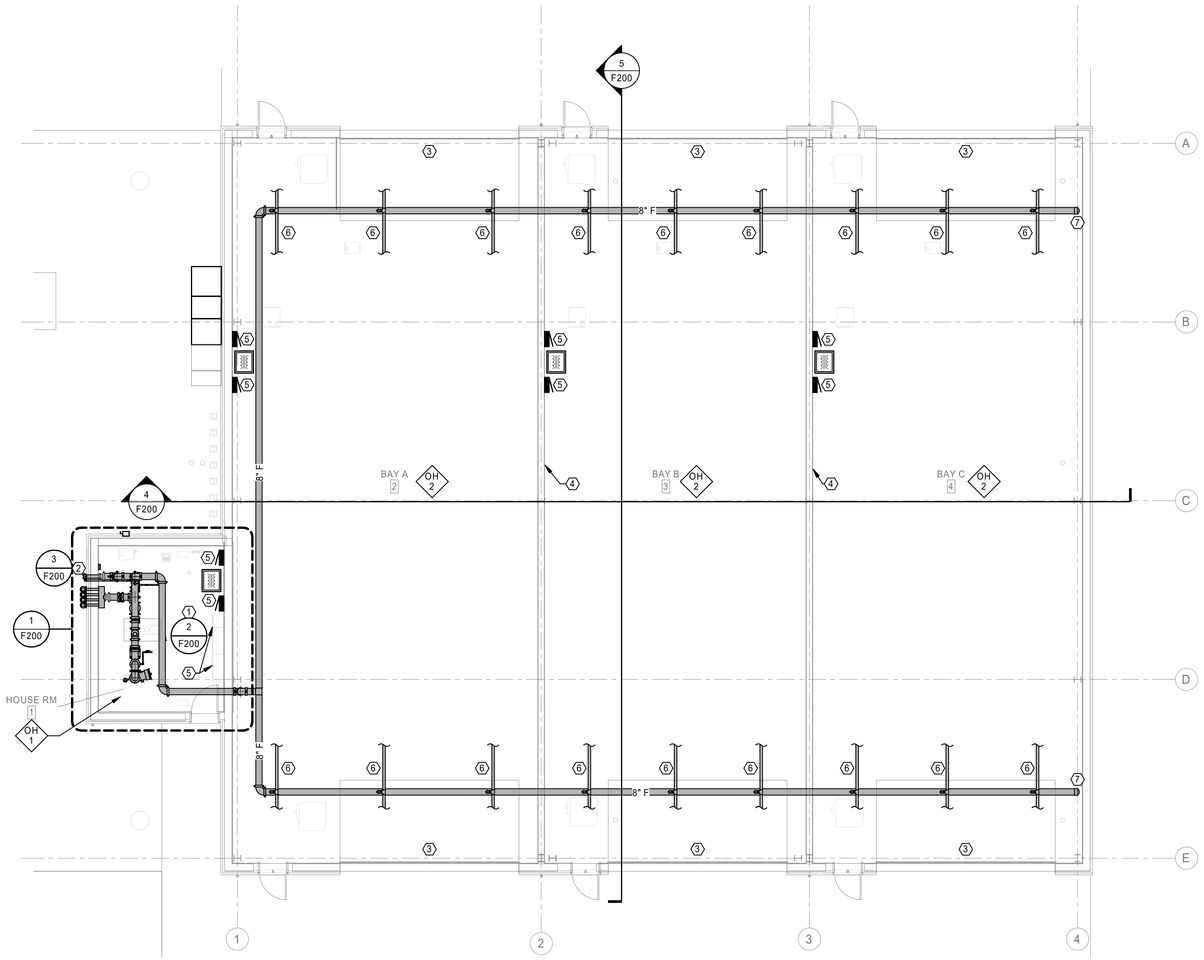
BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | BINGHAM
DRAWN BY | MARJERISON

REVISIONS

FIRE PROTECTION SITE PLAN, NOTES & DETAILS

F001



1 F100 FIRE PROTECTION FIRST FLOOR PLAN

1/8" = 1'-0"

NORTH REF

0 8 16

SCALE IN FEET

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

HAZARD CLASSIFICATION SCHEDULE

SYMBOL	HAZARD	DES. DENSITY-GPM/SF
OH 2	ORDINARY GROUP 2	0.20
NAS	NO AUTOMATIC SPRINKLERS	0.00

NOTE: HAZARD SYMBOLS AT ROOM NAMES INDICATE NEW SPRINKLER AND PIPE AS REQUIRED FOR THESE AREAS.

GENERAL NOTES

A. THE SPRINKLER SYSTEM SHOWN IS CONCEPTUAL ONLY. THE CONTRACTOR SHALL PROVIDE A COMPLETE SPRINKLER SYSTEM SHOWING ALL REQUIRED PIPING, OFFSETS, HEADS, RISERS AND DROPS.
B. SHOP DRAWINGS MUST BE FIELD VERIFIED AND REVISED BY THE CONTRACTOR PRIOR TO SUBMITTAL FOR REVIEW BY ENGINEER.
C. FIELD INVESTIGATION BEFORE BIDDING IS REQUIRED. BID SHALL BE COMPLETE AND ACCOUNT FOR ALL REQUIRED PIPE, ROUTING, SPRINKLERS, ETC.

(#) KEYNOTES

1. FIRE SPRINKLER SYSTEM WATER SERVICE ENTRANCE AND RISER, SEE DETAIL 2/F200.
2. FDC AND HORN/STROBE ASSEMBLY, SEE DETAIL 3/F200.
3. SPRINKLE UNDER OVERHEAD DOOR, SEE DETAIL 2/F001.
4. NEW FULL HEIGHT WALLS TO DECK, COORDINATE AND REVISE SPRINKLERS AS REQUIRED, SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF WALLS (TYPICAL OF ALL).
5. PROVIDE PROPER CLEARANCES AND ROUTE FIRE SPRINKLER PIPING AT ELECTRICAL EQUIPMENT AS REQUIRED BY NATIONAL ELECTRIC CODE.
6. 3" BRANCH LINES
7. MAIN LINES CAPPED FOR FUTURE EXPANSION

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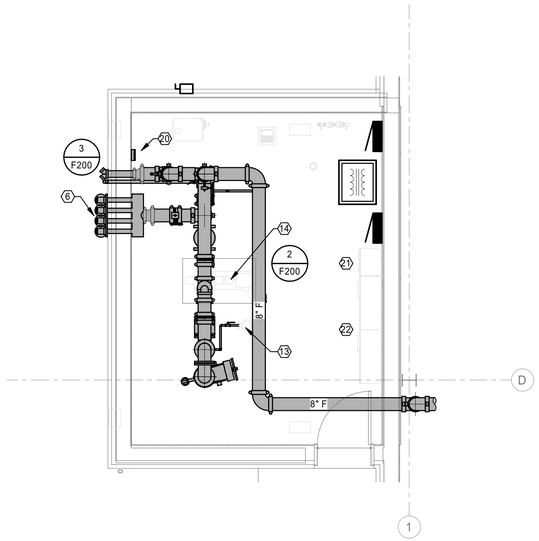
REVISIONS

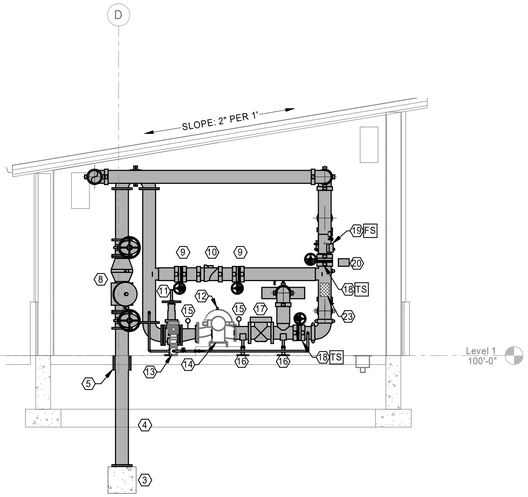
FIRE PROTECTION PLAN

F100



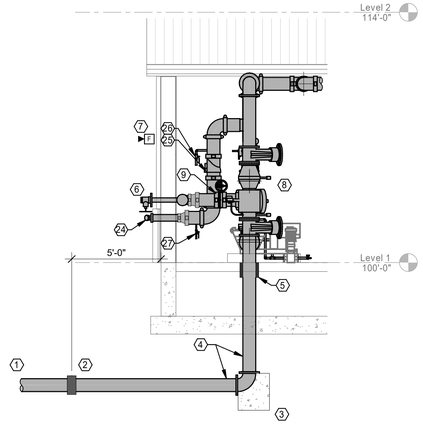
1 F200 FIRE PUMP ENLARGED FLOOR PLAN
1/4" = 1'-0"

0 4 8
SCALE IN FEET
SCALE: 1/4" = 1'-0"



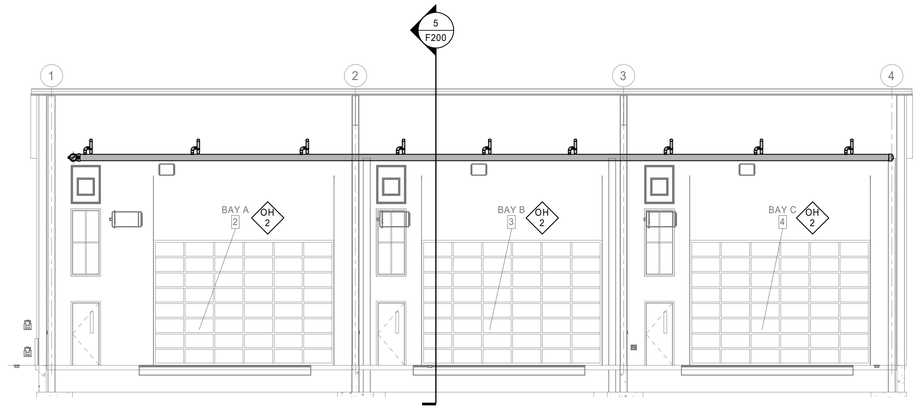
2 F200 FIRE PUMP ELEVATION
1/4" = 1'-0"

0 4 8
SCALE IN FEET
SCALE: 1/4" = 1'-0"



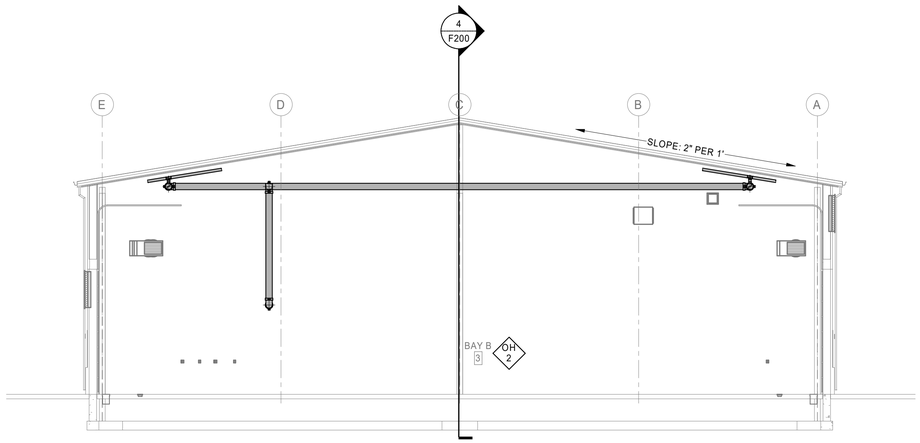
3 F200 FIRE ENTRANCE ELEVATION
1/4" = 1'-0"

0 4 8
SCALE IN FEET
SCALE: 1/4" = 1'-0"



4 F200 FIRE PROTECTION SECTION FACING EAST
1/8" = 1'-0"

0 8 16
SCALE IN FEET
SCALE: 1/8" = 1'-0"



5 F200 FIRE PROTECTION SECTION FACING SOUTH
1/8" = 1'-0"

0 8 16
SCALE IN FEET
SCALE: 1/8" = 1'-0"

HAZARD CLASSIFICATION SCHEDULE

SYMBOL	HAZARD	DES. DENSITY-GPM/SF
OH 2	ORDINARY GROUP 2	0.20
NAS	NO AUTOMATIC SPRINKLERS	0.00

NOTE: HAZARD SYMBOLS AT ROOM NAMES INDICATE NEW SPRINKLER AND PIPE AS REQUIRED FOR THESE AREAS.

GENERAL NOTES

A. THE SPRINKLER SYSTEM SHOWN IS CONCEPTUAL ONLY. THE CONTRACTOR SHALL PROVIDE A COMPLETE SPRINKLER SYSTEM SHOWING ALL REQUIRED PIPING, OFFSETS, HEADS, RISERS AND DROPS.
B. SHOP DRAWINGS MUST BE FIELD VERIFIED AND REVISED BY THE CONTRACTOR PRIOR TO SUBMITTAL FOR REVIEW BY ENGINEER.
C. FIELD INVESTIGATION BEFORE BIDDING IS REQUIRED. BID SHALL BE COMPLETE AND ACCOUNT FOR ALL REQUIRED PIPE, ROUTING, SPRINKLERS, ETC.

FIRE PUMP ELEVATIONS KEYNOTES

1 8" FIRE SERVICE TO WITHIN 5'-0" OF BUILDING BY OTHERS. SEE CIVIL SITE UTILITY PLAN.
2 8" TRANSITION COUPLING.
3 CONCRETE THRUST BLOCCK WITH MEGA-LUG RESTRAINT.
4 8" CLASS 51 CEMENT LINED DUCTILE IRON FIRE SERVICE UNDER BUILDING FOOTING AND THROUGH FLOOR SLAB.
5 12" GALV. STEEL SLEEVE THROUGH FLOOR, SEAL ANNULAR SPACE WITH WATERPROOF MASTIC.
6 HORIZONTAL FORWARD TEST HEADER WITH FOUR (4) 2-1/2" OUTLETS, 250GPM PER OUTLET MAXIMUM.
7 HORN/STROBE. COORDINATE WITH ELECTRICAL.
8 8" DOUBLE CHECK DETECTOR ASSEMBLY BACKFLOW PREVENTER WITH TAMPER SWITCHES (DCDA-1).
9 8" GR. BUTTERFLY VALVE N.C. (TEST HEADER AND PUMP BYPASS) (BFV-1).
10 8" GR. CHECK VALVE (PUMP BYPASS) (CV-1).
11 8" FL. OS&Y GATE VALVE.
12 AUTOMATIC AIR RELEASE.
13 JOCKEY PUMP (JP-1).
14 FIRE PUMP (FP-1). HORIZONTAL SPLIT CASE ELECTRIC DRIVE 1500 GPM @ 50 PSI RATED; 480V 3PH.
15 PRESSURE GUAGE.
16 2" PIPE STAND AS REQUIRED.
17 8" FL. CHECK VALVE (PUMP DISCHARGE).
18 8" GR BUTTERFLY VALVE WITH TAMPER (BFV-1).
19 COMMERCIAL RISER MANIFOLD (513 OR EQUAL) WITH INSPECTORS TEST DRAIN, FLOW SWITCH (WITH RETARD SETTING SET AT 40-50 SECONDS), PRESSURE RELIEF VALVE AND PRESSURE GUAGE.
20 SPARE SPRINKLER CABINET WITH WRENCHES (NUMBER AS REQUIRED).
21 PRESSURE MAINTENANCE CONTROLLER (JOCKEY PUMP) (JP-1).
22 FIRE PUMP CONTROLLER (FP-1).
23 PERMANENTLY AFFIXED HYDRAULIC DESIGN INFORMATION SIGN PER NFPA 13.
24 4" X 2-1/2" 2 WAY POLISHED BRASS FDC WITH WALL PLATE BRANDED "AUTO SPKR " BRANDING AND KNOX LOCKING CAP(S). FDC IS TO BE LOCATED NOT LESS THAN 18" AND NOT MORE THAN 48" ABOVE GROUND.
25 8" GR CHECK VALVE.
26 1" BALL VALVE WITH DRAIN LINE.
27 1/2" DRAIN FROM BALL DRIP.

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PROJ# | GFIA_WRHSE
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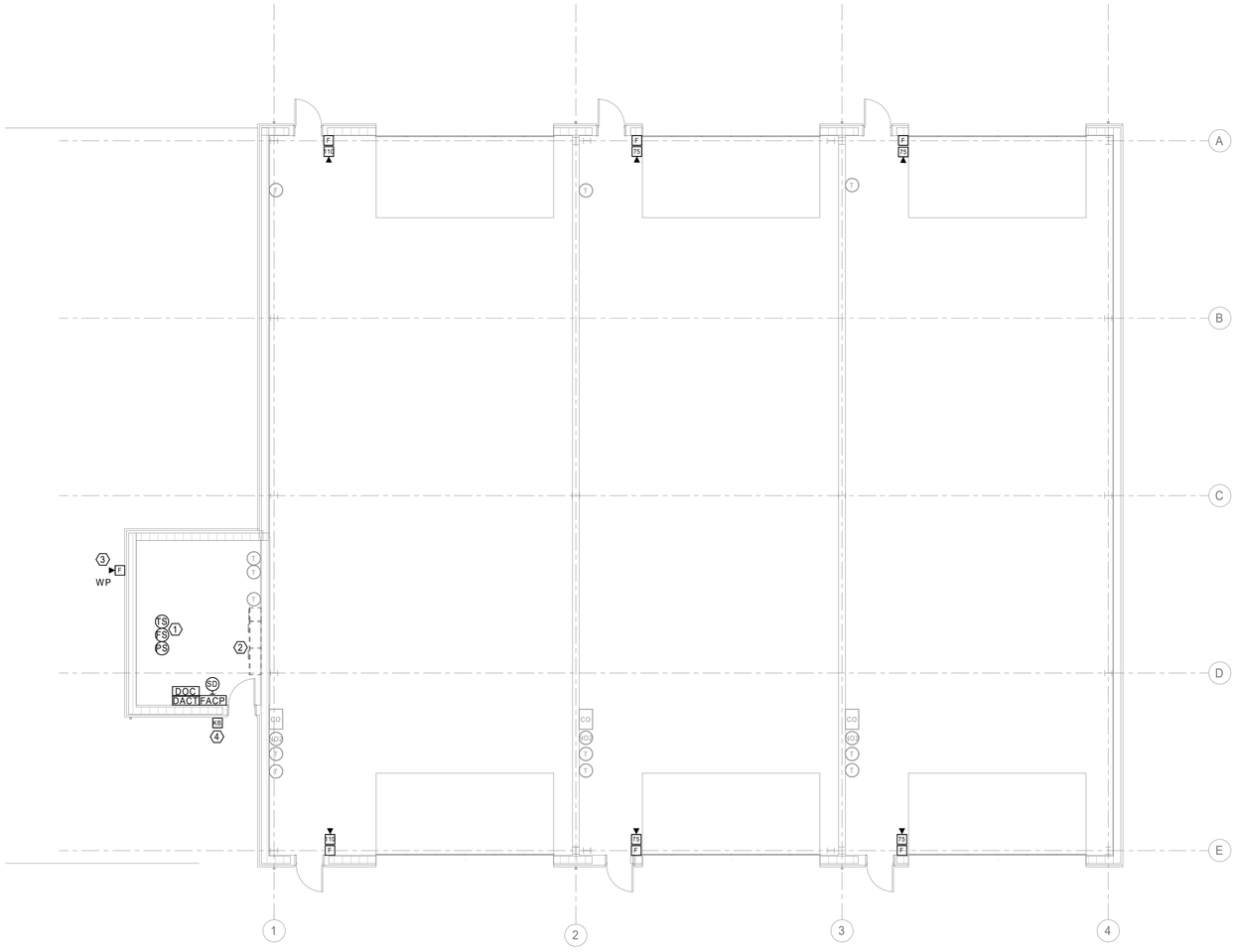
DRAWN BY | MARJERISON

REVISIONS

FIRE PROTECTION SECTIONS, DETAILS & ENLARGED PLANS

F200



1 FA001 — FIRE ALARM FIRST FLOOR PLAN

1/8" = 1'-0"

NORTH REF

0 8 16

SCALE IN FEET

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

FIRE ALARM LEGEND

SYMBOLS APPLY ONLY WHEN USED ON DRAWINGS

SYMBOL	DESCRIPTION
F	COMBINATION AUDIO & VISUAL NOTIFICATION DEVICE (# INDICATES CANDELA RATING)
F	ADDRESSABLE MANUAL PULL STATION
AM	ADDRESSABLE MODULE
SD	ADDRESSABLE SYSTEM SMOKE DETECTOR
TS	CONNECTION TO TAMPER SWITCH, SWITCH BY OTHERS
FS	CONNECTION TO FLOW SWITCH, SWITCH BY OTHERS
PS	CONNECTION TO PRESSURE SWITCH, SWITCH BY OTHERS
	FIRE ALARM CONNECTION AS NOTED
FACP	FIRE ALARM CONTROL PANEL
DACT	FIRE ALARM COMMUNICATOR - LTE (CELLULAR)
DOC	FIRE ALARM RECORD DOCUMENTS STORAGE BOX

FIRE ALARM KEYNOTES

1 PROVIDE ADDRESSABLE MODULES TO INDIVIDUALLY MONITOR ALL FIRE SPRINKLER VALVE SUPERVISORY DEVICES AND FLOW SWITCHES. COORDINATE WITH FIRE SPRINKLER CONTACTOR.

2 PROVIDE ADDRESSABLE MODULES TO MONITOR FIRE PUMP CONTROLLER IN ACCORDANCE WITH NFPA 13 AND NFPA 72. COORDINATE WITH FIRE SPRINKLER CONTRACTOR.

3 PROVIDE WEATHERPROOF NOTIFICATION DEVICE TO INDICATE WATER IS FLOWING IN THE AUTOMATIC FIRE SPRINKLER SYSTEM. LOCATE DIRECTLY ABOVE FIRE DEPARMENT CONNECTION. COORDINATE WITH FIRE SPRINKLER CONTRACTOR.

4 KNOX BOX LOCATION. COORDINATE REQUIREMENTS WITH LOCAL FIRE DEPARTMENT. COORDINATE LOCATION WITH ARCHITECT.

GENERAL NOTES - FIRE ALARM

A. COMPLY WITH LATEST ADOPTED EDITION OF THE INTERNATIONAL BUILDING CODE (IBC), INTERNATIONAL FIRE CODE (IFC), FIRE ALARM AND SIGNALING CODE (NFPA 72) AND NATIONAL ELECTRICAL CODE (NFPA 70) INCLUDING ANY LOCAL AMENDMENTS. ALL REFERENCES TO CODES AND STANDARDS SHALL BE AS NOTED IN THE FIRE ALARM CODE SUMMARY.

B. ALL FIRE ALARM CABLE SHALL BE INSTALLED IN MINIMUM 3/4" CONDUIT AND CONCEALED WITHIN WALLS OR ABOVE CEILINGS WHERE POSSIBLE. SURFACE MOUNTED CONDUIT SHALL BE ALLOWED IN UNFINISHED MECHANICAL AREAS.

C. ALL FIRE ALARM DEVICES SHALL BE MOUNTED TO A STEEL BACKBOX OR ELECTRICAL BOX. SURFACE MOUNT LOCATIONS SHALL INCLUDE A FACTORY MATCHED BOX SPECIFIC TO THE DEVICE.

D. REMOTE POWER SUPPLIES (NAC PANELS) SHALL BE PROVIDED IN SUFFICIENT QUANTITIES AND SHALL BE DETERMINED BY THE CONTRACTOR'S FINAL SHOP DRAWING DESIGN. PANEL LOCATIONS NOTED ON THESE DRAWINGS MERELY INDICATE ACCEPTABLE LOCATIONS.

E. CONTRACTOR SHALL COORDINATE WITH OWNER UPON SUBSTANTIAL COMPLETION TO PROVIDE CONNECTION TO REMOTE SUPERVISING STATION AS APPROVED BY THE OWNER.

F. CONTRACTOR SHALL COORDINATE WITH THE ARCHITECT AND LOCAL AHJ BEFORE PROGRAMMING FINAL DEVICE DESCRIPTIONS IN SYSTEM MEMORY. OBTAIN APPROVAL FROM BOTH PRIOR TO FINAL COMPLETION.

G. REFER TO ELECTRICAL SPECIFICATIONS FOR FIRE ALARM EQUIPMENT AND INSTALLATION REQUIREMENTS.

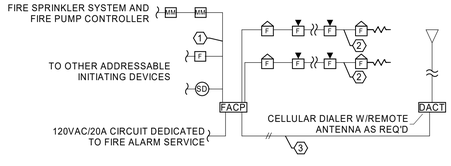
FIRE ALARM CODE SUMMARY

1. GROUP S-1 OCCUPANCY
   - WAREHOUSE
2. CONSTRUCTION:
   - TYPE: II-B
3. REFERENCED CODES (INCLUDES ALL LOCAL ADOPTED AMENDMENTS):
   - INTERNATIONAL BUILDING CODE (IBC) 2021 EDITION
   - INTERNATIONAL FIRE CODE (IFC) 2021 EDITION
   - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS - (NFPA 13) 2019 EDITION
   - NATIONAL ELECTRICAL CODE (NFPA 70) 2017 EDITION
   - NATIONAL FIRE ALARM AND SIGNALING CODE (NFPA 72) 2020 EDITION
   - INTERNATIONAL MECHANICAL CODE (IMC) 2021 EDITION
4. SYSTEM SCOPE:
   - ADDRESSABLE FIRE ALARM SYSTEM WITH AUTOMATIC DETECTION ABOVE CONTROL UNIT AND MANUAL STATIONS AT ALL EXIT DOORS
   - STANDARD AUDIBLE/VISIBLE NOTIFICATION THROUGHOUT ALL COMMON AREAS
   - MONITORING OF AUTOMATIC SPRINKLER SYSTEM AND DEDICATED FIRE PUMP/CONTROLLER
   - AUTOMATIC REPORTING OF SYSTEM EVENTS TO REMOTE SUPERVISING STATION VIA CELLULAR COMMUNICATOR

FIRE ALARM RISER NOTES

1. TYPICAL SIGNALING LINE CIRCUIT (SLC).
2. FIRE ALARM AUXILIARY 24VDC CIRCUIT.
3. TYPICAL NOTIFICATION APPLIANCE CIRCUIT (NAC).

**ALL CIRCUITS AND CONDUCTORS SHALL BE IN ACCORDANCE WITH EQUIPMENT MANUFACTURER RECOMMENDATIONS.



2 FA001 — FIRE ALARM RISER DIAGRAM (TYPICAL)

NOT TO SCALE

SYSTEM INPUT	ZONE ALARM SIGNAL INDICATION	AUDIBLE ALARM SIGNAL ACTIVATION	ZONE SUPERVISORY SIGNAL INDICATION	AUDIBLE SUPERVISORY SIGNAL ACTIVATION	ZONE TROUBLE SIGNAL INDICATION	AUDIBLE TROUBLE SIGNAL ACTIVATION	ACTIVATE ALL AUDIBLE DEVICES	ACTIVATE ALL VISIBLE DEVICES	TRANSMIT ALARM SIGNAL TO SUPERVISING STATION	TRANSMIT SUPERVISORY SIGNAL TO SUPERVISING STATION	TRANSMIT TROUBLE SIGNAL TO SUPERVISING STATION	ACTIVATE EXTERIOR NOTIFICATION DEVICE AT FDC
	SYSTEM OUTPUT											
	FACP ANNUNCIATION								NOTIFICATION			
MANUAL PULL STATION	X	X				X	X	X				
SMOKE DETECTOR - GENERAL (SYSTEM DETECTOR)	X	X				X	X	X				
FIRE SPRINKLER VALVE SUPERVISORY TAMPER SWITCH*			X	X					X			
FIRE SPRINKLER FLOW DETECTOR SWITCH*	X	X				X	X	X				X
FIRE PUMP RUNNING SIGNAL*	X	X				X	X	X				
FIRE PUMP PHASE REVERSAL SIGNAL*			X	X					X			
FIRE PUMP ALTERNATE POWER SOURCE SIGNAL*			X	X					X			
FIRE PUMP CONTROLLER TROUBLE SIGNAL*			X	X						X		
NOTIFICATION APPLIANCE CIRCUIT FAULT					X	X						X
INITIATING DEVICE CIRCUIT FAULT					X	X						X
SIGNALING LINE CIRCUIT FAULT					X	X						X
FACP AC POWER FAIL					X	X						X
FACP BATTERY CHARGER FAIL					X	X						X
FACP COMMUNICATION FAIL					X	X						X

* COORDINATE REQUIREMENTS WITH FIRE SPRINKLER CONTRACTOR

3 FA001 — FIRE ALARM OPERATIONAL MATRIX

NOT TO SCALE

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DRAWN BY | MARJERISON

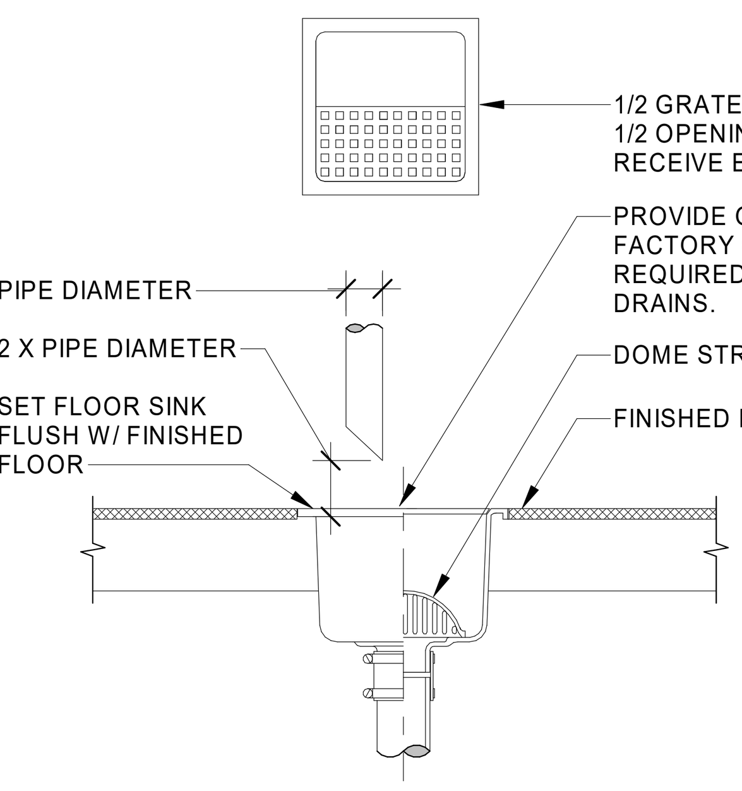
REVISIONS

GENERAL FIRE ALARM SYSTEM INFORMATION

FA001

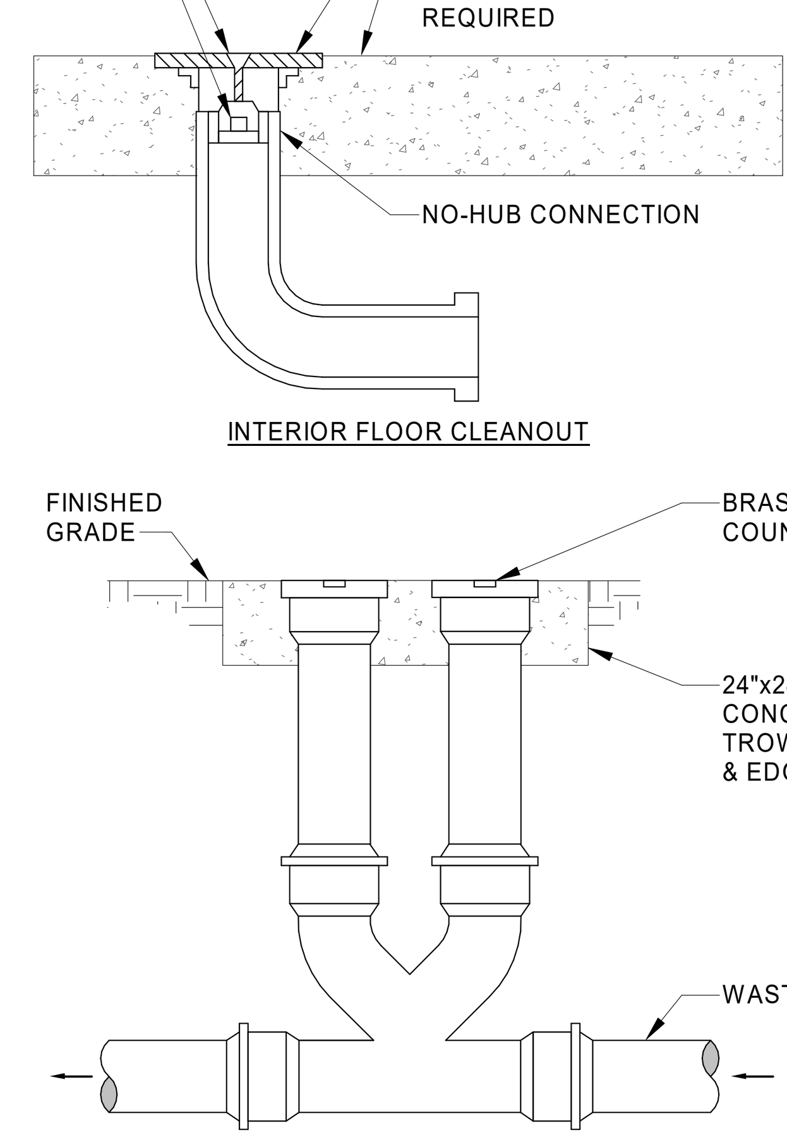
PLUMBING FIXTURE & CONNECTION SCHEDULE

PLAN CODE	ADA	FIXTURE						TRIM			ACCESSORIES			CONNECTIONS				NOTES
		ITEM	MANUFACTURER	MODEL	TYPE	MATERIAL	COLOR	TRIM	MANUFACTURER	MODEL	ITEM	MANUFACTURER	MODEL	COLD	HOT	WASTE	VENT	
FS-1		FLOOR SINK	JR SMITH	3120Y-12	12' x 12" SQUARE	ACID RESISTANT	WHITE	HALF GRATE	-	-	DOME BOTTOM STRAINER	-	-	-	-	3"	2"	
RPBP-1		REDUCED PRESSURE BACKFLOW PREVENTER	WATTS	LF009-OSY	REDUCED PRESSURE	LEAD FREE	-	-	-	-	BRONZE WYE STRAINER AND AIR GAP FITTING	-	-	3"	-	-	-	
SOI-1		SAND OIL INTERCEPTOR	STRIEM	OS-75	RECESSED	POLYETHYLENE	BLACK	-	-	75 GPM FLOW, CAPACITIES: 110 GALLON LIQUID, 93 GALLON OIL, 11 GALLON SAND	RISER	STRIEM	SR24/LR24	-	-	4"	2"	75 GPM INTEGRAL FLOW CONTROL
TD-1		TRENCH DRAIN	JR SMITH	9896BS	TRAFFIC RATED	POLYESTER CONCRETE	-	-	-	10" WIDE WITH INTEGRAL METAL RAIL. SIX SECTIONS 98960-1 TO 9896-6	GRATE	JR SMITH	9880-681-M	-	-	4"	2"	
WH-1		WALL HYDRANT	WOODFORD	MDEL 65	FREEZE PROOF	STAINLESS STEEL	-	-	-	-	AUTOMATIC DRAINING, FREEZELESS, ANTI-SIPHON, LOOSE KEY HANDLE	-	-	3/4"	-	-	-	

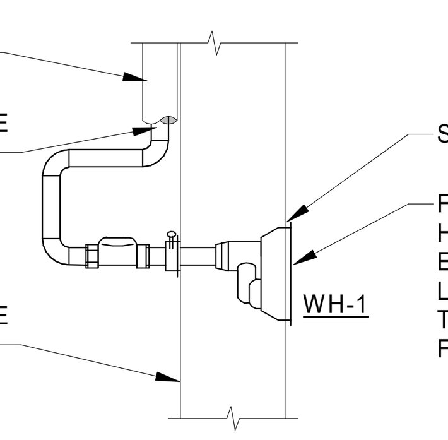


ALL INDIRECT DRAINS TO FLOOR RECEPTORS SHALL TERMINATE ABOVE THE FLOOD LEVEL RIM OF WASTE RECEPTOR. DIAGONAL CUT END OF DRAIN TO REDUCE SPLASHING AS INDICATED ABOVE.

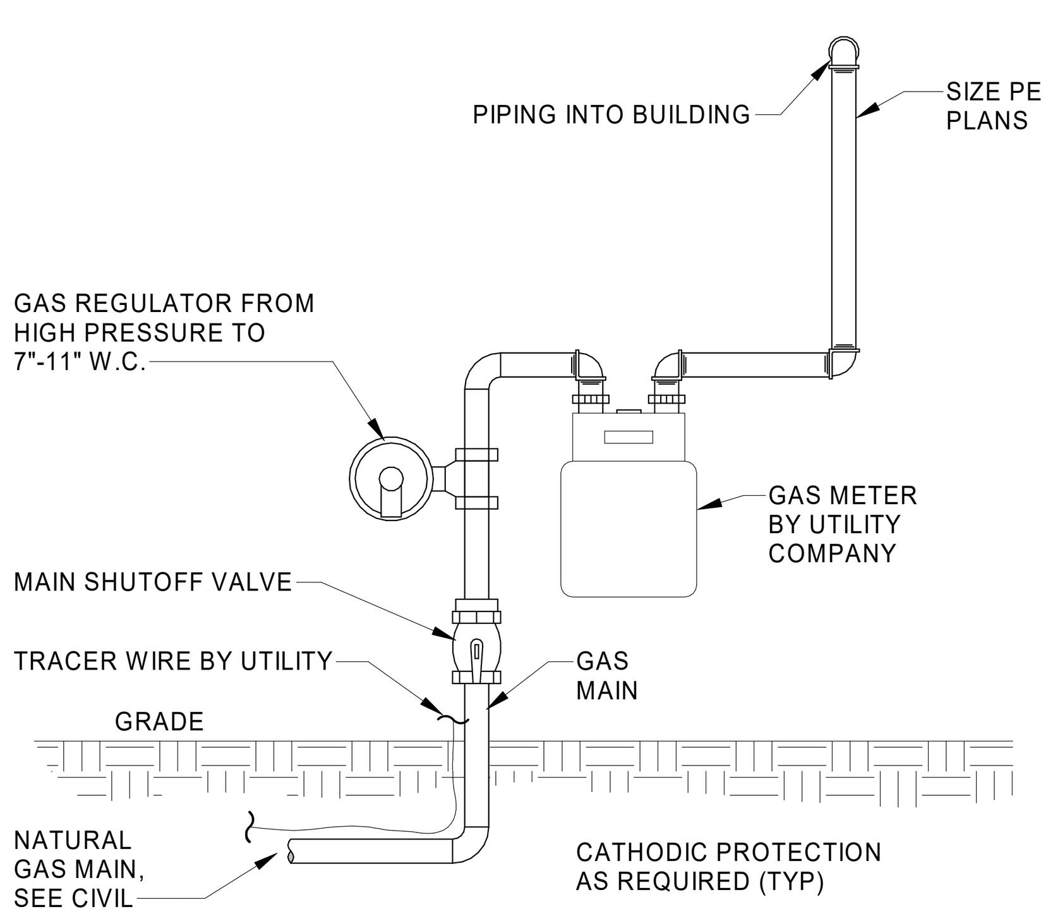
5 / P001 FLOOR SINK DETAIL
NOT TO SCALE



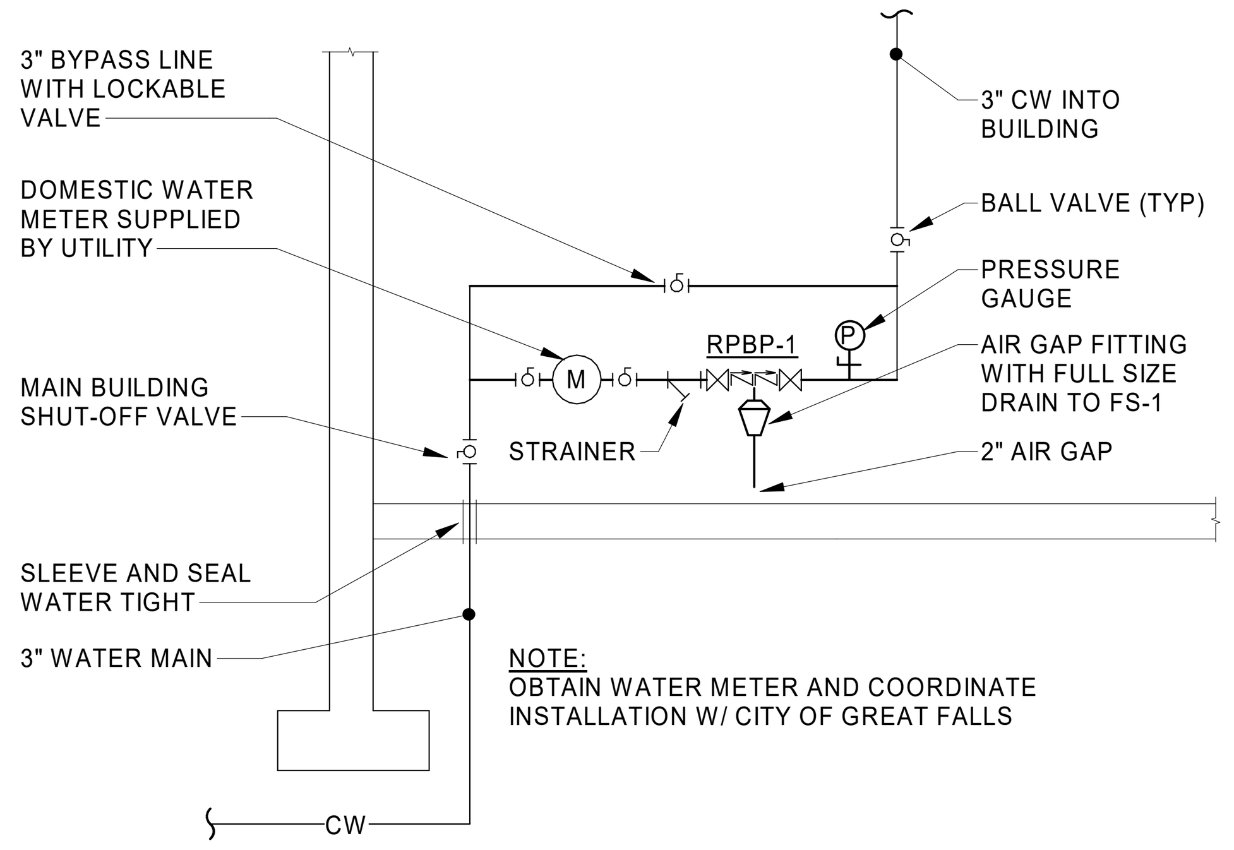
2 / P001 CLEANOUT DETAIL
NOT TO SCALE



4 / P001 FREEZE-PROOF WALL HYDRANT DETAIL
NOT TO SCALE



3 / P001 GAS METER DETAIL
NOT TO SCALE



NOTE:
OBTAIN WATER METER AND COORDINATE INSTALLATION W/ CITY OF GREAT FALLS

1 / P001 WATER SERVICE ENTRANCE DETAIL
NOT TO SCALE

WATER CALCULATIONS

AVAILABLE WATER PRESSURE	70.0 PSI
STATIC PRESS. LOSS (ELEV) 32'-0" x .43)	13.76 PSI
MIN PRESS. LAST FIXTURE	25.0 PSI
METER LOSS	1.0 PSI
RPZ LOSS	10.0 PSI
TOTAL PRESSURE AVAILABLE	20.24
DISTANCE TO LAST FIXTURE	450 FT
EQUIVALENT DISTANCE IN FEET	550 FT
GALLONS PER MINUTE	78 GPM
METER SIZE	2"
ALLOW PRESS. LOSS/100FT = 10.24 x 100' / 550 EQ. FT. =	3.68 PSI

FIXTURE	QTY	WSFU	TOTAL WSFU
WATER CLOSET FV (FUTURE)	13	5	65
URINAL FV (FUTURE)	13	4	52
LAVATORY (FUTURE)	13	1	13
WALL HYDRANT	2	2.5/1	3.5
WALL HYDRANT (FUTURE)	6	1	6
		TOTAL WSFU =	139.5

MAX. LENGTH: 550 FT
TOTAL PEAK FLOW: 78 GPM
WATER METER SIZE (BY UTILITY): 2"
BUILDING SUPPLY: 3"

WASTE PIPING CALC

FIXTURE	QTY	FIXTURE UNITS	TOTAL FIX UNITS
WATER CLOSET (FUT)	13	4	52
URINAL (FUTURE)	13	2	26
LAVATORY (FUTURE)	13	1	13
FLOOR SINK	1	2	2
TRENCH DRAIN	1	3	3
TRENCH DRAIN (FUT)	10	3	30
		TOTAL	126
		TOTAL FIX UNITS	WASTE PIPE SIZE
		126	4

COLD WATER SIZING CHART (8 FPS)

PIPE SIZE	GPM	FIXT. UNIT FLUSH TANK	FIXT. UNIT FLUSH VALVE
1/2"	0 - 2	0 - 1	-
3/4"	2 - 6	2 - 7	-
1"	6 - 13	8 - 18	-
1-1/4"	13 - 22	19 - 34	0 - 5
1-1/2"	22 - 34	35 - 63	6 - 18
2"	34 - 73	64 - 240	19 - 120
2-1/2"	73 - 120	241 - 479	121 - 365

- PIPE CHART BASED ON 5 PSI/100 FT OF PIPE

PLUMBING LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
—CW—	DOMESTIC COLD WATER		VALVE IN RISER
—SS—	SANITARY SEWER	S=.XXX	SLOPE DOWN IN DIRECTION OF FLOW
—V—	VENT		BALL VALVE
CO/WCO	CLEANOUT/ WALL CLEANOUT		GAS SHUT-OFF COCK
FCO	FLOOR CLEANOUT		WATER OUTLET (TYPE INDICATED)
GCO	GRADE CLEANOUT		BACKFLOW PREVENTER (TYPE INDICATED)
—CD—	CONDENSATE DRAIN		SLEEVE (PIPE) THRU WALL OR FLOOR
—D—	DRAIN		FLEX CONNECTOR (TYPE INDICATED)
—F—	FIRE SERVICE WATER		HOSE END DRAIN VALVE
—FND—	FOUNDATION DRAINAGE		PRESSURE REDUCING VALVE
—NG—	NATURAL GAS		UNION
	TEE UP	(P)	PRESSURE GAUGE - PROVIDE WITH PIGTAIL FOR STEAM
	TEE DOWN		
	ELBOW UP		
	ELBOW DOWN		
	PIPE CAP		

UPC PLUMBING NOTES

1. ALL PLUMBING WORK AND MATERIALS SHALL MEET THE REQUIREMENTS OF THE 2021 EDITION OF THE UNIFORM PLUMBING CODE. OTHERWISE REQUIRED BY THE DEPARTMENT OF BUILDING AND SAFETY.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL BACKFLOW PREVENTION DEVICES REQUIRED BY AGENCIES HAVING JURISDICTION.
3. DRAINAGE SYSTEM (SEWER)
   A. ALL MATERIALS SHALL COMPLY WITH SECTION 701.
   B. DRAINAGE PIPING SHALL BE SLOPED PER SECTION 708.
4. VENTS AND VENTING
   A. EACH FIXTURE TRAP SHALL BE VENTED.
   B. VENT PIPE MATERIAL SHALL COMPLY WITH SECTION 903.
5. PLUMBING FIXTURES, WATER CLOSET BOWLS SHALL BE ELONGATED BOWLS WITH OPEN FRONT SEATS.
6. WATER DISTRIBUTION, WATER PIPE AND FITTINGS SHALL BE COPPER PER SECTION 604.2.
7. FUEL GAS PIPING, GAS SUPPLY AND PIPING SIZE SHALL COMPLY WITH SECTIONS 1216 AND 1217 TABLES 12-7 THROUGH 12-11 AND SHALL BE SCHEDULE 40 BLACK STEEL.

PLUMBING SHEET INDEX

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MONTANA
MARK DAVID VINCELLO
59667 PE
LICENSED
PROFESSIONAL ENGINEER

BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | KRAT
DRAWN BY | KRAT
REVIEWED BY | VINCELLO
REVISIONS

PLUMBING SCHEDULES, LEGENDS, NOTES AND DETAILS

P001

PLUMBING SPECIFICATIONS, DIVISION 22

REGULATORY REQUIREMENTS, GENERAL

A. CONSTRUCT THE BUILDING SYSTEMS IN FULL COMPLIANCE WITH ALL APPLICABLE LOCAL BUILDING CODES, LATEST EDITION. COMPLY WITH THE FOLLOWING AS MODIFIED BY THE LOCAL JURISDICTION: ***2021 UNIFORM PLUMBING CODE AND 2021 NFPA 54*** OR CODES ENFORCED BY LOCAL AUTHORITY HAVING JURISDICTION.

B. IN ADDITION, COMPLY WITH THE FOLLOWING: THE LATEST VERSION OF THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND THE UNIFORM FEDERAL ACCESSIBILITY STANDARD, WHICHEVER IS MORE STRINGENT. ALL APPLICABLE LOCAL, STATE AND FEDERAL LAWS. OBTAIN REQUIRED PERMITS, PLAN REVIEW AND INSPECTIONS FROM AUTHORITIES HAVING JURISDICTION.

BASIC MECHANICAL REQUIREMENTS

GENERAL

A. SCOPE: THE CONTRACTOR SHALL, INSTALL AND COORDINATE ALL PLUMBING WORK TO PROVIDE COMPLETE AND OPERATIONAL PLUMBING INSTALLATIONS.

B. SUPPLY AND INSTALL COMPLETE PLUMBING SYSTEMS THROUGHOUT TO COMPLETE PROJECT FOR PLUMBING SYSTEMS DESCRIBED HEREIN AND INDICATED ON DRAWINGS. DRAWINGS ARE IN-PART DIAGRAMMATIC.

C. PROVIDE SHOP DRAWINGS FOR ALL PIPING AND EQUIPMENT PRIOR TO ORDERING. CONTRACTOR SHALL BE RESPOSNIBLE FOR SCHEDULING WORK FOR A TWO WEEK SHOP DRAWING REVIEW PERIOD.

D. CONTRACTOR SHALL GUARANTEE THAT ALL MATERIAL FURNISHED BE ACCEPTABLE IN EVERY RESPECT AND, IF NOT FOUND ACCEPTABLE, SHALL REPLACE THE SAME IMMEDIATELY. ALL WORK AND MATERIAL SHALL BE GUARANTEED FOR ONE (1) YEAR FROM DATE OF SUBSTANTIAL COMPLETION.

E. CONTRACTOR SHALL MAINTAIN A SET OF RED-LINED AS-BUILT DRAWINGS DURING CONSTRUCTION AND SUBMIT TO OWNER AT PROJECT COMPLETION.

F. CONTRACTOR SHALL PROVIDE TWO COPIES OF OPERATION AND MAINTENANCE MANUALS TO OWNER AT COMPLETION OF PROJECT. O&M MANUALS SHALL CONTAIN ALL APPROVED EQUIPMENT SUBMITTAL SHEETS; WIRING DIAGRAMS; FACTORY PUBLISHED INSTALLATION, OPERATION, AND MATINENANCE INSTRUCTIONS; AND PARTS LIST.

G. AT PROJECT COMPLETION, THE CONTRACTOR SHALL PROVIDE TRAINING TO THE OWNER THAT DESCRIBES THE CORRECT OPERATIONAND MAINTENANCE OF ALL EQUIPMENT FIXTURES AND EQUIPMENT USING THE O&M MANUAL.

H. PLUMBING PERFORMANCE REQUIREMENTS: PROVIDE COMPONENTS AND INSTALLATION CAPABLE OF PRODUCING PIPING SYSTEMS WITH THE FOLLOWING:
   a. MINIMUM WORKING PRESSURE RATINGS, UNLESS OTHERWISE INDICATED: DOMESTIC WATER PIPING: 125 PSIG
   b. SANITARY WASTE AND VENT PIPING: 10 FT. HEAD OF WATER.

I. PLUMBING DESIGN REQUIREMENTS: COMPLY WITH THE REQUIREMENTS OF THE CITY OF ***GREAT FALLS*** AND AUTHORITIES HAVING JURISDICTION.

INSULATION

(VALUES BASED ON IECC)

A. ALL FIBERGLASS INSULATION TO INCLUDE WHITE ALL SERVICE JACKET AND PVC FITTING COVERS.

B. DOMESTIC COLD WATER, ABOVE GRADE: 1" PRE-FORMED FIBERGLASS.

C. DOMESTIC HOT WATER AND RECIRCULATING WATER IF SHOWN
   a. WATER TEMPERATURES 140°F AND BELOW:
      - PIPE SIZES 1-1/2" AND SMALLER: 1" PRE-FORMED FIBERGLASS.
      - PIPE SIZES 2" AND LARGER: 1-1/2" PRE-FORMED FIBERGLASS.
   b. WATER TEMPERATURES ABOVE 140°F
      - PIPE SIZES 1-1/2" AND SMALLER: 1-1/2" PRE-FORMED FIBERGLASS.
      - PIPE SIZES 2" AND LARGER: 2" PRE-FORMED FIBERGLASS.

D. VENT: INSULATE PIPING AT VENT THRU ROOF FROM ROOF PENETRATION TO 6 FEET FROM PENETRATION WITH 1" PRE-FORMED FIBERGLASS.

PLUMBING PIPING

MATERIALS

A. DRAIN, WASTE AND VENT PIPING:
   a. BELOW GRADE: PVC PIPE, ASTM D2665 OR ASTM D3034, WITH PVC FITTINGS AND ASTM D2564 SOLVENT WELDED JOINTS. INCLUDE PRIMER ACCORDING TO ASTM F656.
   b. ABOVE GRADE:
      - PVC PIPE, ASTM D2729 OR ASTM D2665, WITH PVC FITTINGS AND ASTM D2564 SOLVENT WELDED JOINTS. INCLUDE PRIMER ACCORDING TO ASTM F656.
      - CAST IRON PIPE, CISPI 301, HUBLESS, WITH CAST IRON FITTINGS AND CISPI 310 JOINTS WITH NEOPRENE GASKETS AND STAINLESS STEEL CLAMP-AND-SHIELD ASSEMBLIES.

B. DOMESTIC WATER PIPING, ABOVE GRADE:
   a. TYPE L COPPER TUBE, ASTM B88 WITH ONE OF THE FOLLOWING FITTINGS:
      - ASME B16.18 CAST COPPER ALLOY OR ASME B16.22 WROUGHT COPPER AND BRONZE FITTINGS.
      - CAST IRON, COATED, WITH GROOVED MECHANICAL COUPLINGS.
      - MECHANICAL PRESS-SEAL FITTINGS. DOUBLE-PRESSED TYPE, NSF 61 AND NSF 372 APPROVED OR CERTIFIED, UTILIZING EPDM, NON-TOXIC, SYNTHETIC RUBBER SEALING ELEMENTS.

C. NATURAL GAS PIPING:
   a. ABOVE GRADE:
      - STEEL PIPE, SCHEDULE 40, ASTM A53 / A 53M, WITH MALLEABLE IRON (ASME B16.3 OR WROUGHT STEEL WELDING (ASTM A234 / A234M) FITTINGS. THREADED OR WELDED JOINTS, ASME B31.1.

D. VALVES:
   a. DOMESTIC WATER: BALL VALVES, 3" AND SMALLER, ASTM B 584, BRONZE BODY AND BONNET, 2-PIECE CONSTRUCTION, CHROME-PLATED BRASS BALL, FULL PORT, BLOWOUT PROOF, BRASS OR BRONZE STEM, TEFLON SEAT AND SEALS, STEM EXTENSION FOR VALVES INSTALLED IN INSULATED PIPING. THREADED ENDS.
   b. NATURAL GAS (2 PSIG AND LOWER): GAS STOPS 2" AND SMALLER, AGA CERTIFIED, BRONZE BODY, PLUG TYPE WITH BRONZE PLUG OR BALL TYPE WITH CHROME PLATED BRASS BALL. INCLUDE AGA STAMPED AND THREADED ENDS.

HANGERS AND SUPPORTS

A. DESIGN CHANNEL SUPPORT SYSTEMS FOR PIPING TO SUPPORT MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM COMPONENTS AND SYSTEM FLUIDS.

B. DESIGN AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION FOR SEISMIC RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT.

C. PIPE HANGER AND SUPPORT INSTALLATION: COMPLY WITH MSS SP-69 AND MSS SP-89. INSTALL HANGERS, SUPPORTS, CLAMPS, AND ATTACHMENTS AS REQUIRED TO PROPERLY SUPPORT PIPING FROM BUILDING STRUCTURE.

D. PROVIDE COPPER-COATED HANGERS FOR DIRECT CONTACT WITH COPPER TUBING.

E. PROVIDE POLYISOCYANURATE THERMAL INSULATION SHIELDS AT HANGER LOCATIONS ON ALL INSULATED PIPING.

F. PROVIDE STRUCTURAL WORK AND EQUIPMENT AS REQUIRED TO CONTROL THERMAL AND SEISMIC MOVEMENT OF PIPING SYSTEMS. VERIFY THAT ALL ANCHORS, GUIDES, AND EXPANSION JOINTS PROVIDED ADEQUATELY PROTECT SYSTEM.

LABELS AND TAGS

A. PROVIDE PIPE LABELS ON ALL PLUMBING PIPING INSIDE BUILDING. USE PRETENSIONED PIPE LABELS WITH SERVICE AND DIRECTIONAL FLOW ARROWS.

B. PROVIDE BRASS VALVE TAGS WITH BEAD CHAIN OR S-HOOK SHOWING VALVE SERVICE AND NUMBER. PROVIDE VALVE CHART TO INCLUDE IN O&M MANUALS AND A LAMINATED COPY POSTED IN THE MECHANICAL ROOM.

C. PROVIDE ENGRAVED PLASTIC EQUIPMENT TAGS WITH PERMANENT ADHESIVE MATCHING SCHEDULE PLAN LABEL FOR ALL GAS OR ELECTRIC FIRED EQUIPMENT.

PLUMBING PIPING CONTINUED

CLEANING AND DISINFECTING FOR POTABLE DOMESTIC WATER PIPING

A. PURGE NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED BEFORE USING.

B. USE PURGING AND DISINFECTING PROCEDURES PRESCRIBED BY AUTHORITIES HAVING JURISDICTION. IF METHODS ARE NOT PRESCRIBED, USE PROCEDURES DESCRIBED IN EITHER AWWA C651 OR AWWA C652 OR FOLLOW PROCEDURES DESCRIBED BELOW:
   a. FLUSH PIPING SYSTEM WITH CLEAN, POTABLE WATER UNTIL DIRTY WATER DOES NOT APPEAR AT OUTLETS.
   b. FILL AND ISOLATE SYSTEM ACCORDING TO EITHER OF THE FOLLOWING:
      - PROVIDE NECESSARY CONNECTIONS THROUGHOUT THE PIPING SYSTEM TO INJECT CHLORINE SOLUTION FOR STERILIZATION.
      - STERILIZATION SHALL NOT OCCUR UNTIL ALL PIPING SYSTEMS HAVE BEEN FLUSHED.
      - MEASURE INCOMING WATER PH AND ADJUST AS NECESSARY USING AN ALKALI (CAUSTIC SODA OR SODA ASH) OR AN ACID (HYDROCHLORIC ACID) TO MAINTAIN PH IN THE RANGE OF 7.4 TO 7.6.
      - INJECT CHLORINE DISINFECTANT (FREE CHLORINE IN LIQUID, POWDER, OR TABLET FORM) INTO THE SYSTEM UNTIL RESIDUAL CHLORINE OF 50 TO 80 mg/L OCCURS IN EACH BRANCH LINE.
      - BLEED WATER FROM SYSTEM TO ENSURE CHLORINE DISTRIBUTION IN EACH BRANCH AND OBTAIN TEST SAMPLES FROM 15 PERCENT OF SPRINKLER LOCATIONS FOR EACH ZONE.
      - MAINTAIN CHLORINE SOLUTION IN SYSTEM FOR 24 HOURS.
      - MEASURE CHLORINE CONTENT AT END OF 24 HOUR PERIOD. REDOSE AND BLEED WATER FROM EACH BRANCH IF RESIDUAL CHLORINE CONTENT IS LESS THAN 25 mg/L, OR EQUAL TO THE CHLORINE CONTENTE OF THE INCOMING WATER.
      - ONCE SYSTEM RESIDUAL MEETS OR EXCEEDS 25 mg/L AFTER 24 HOURS, FLUSH ALL SYSTEM PIPING UNTIL RESIDUAL CHLORINE LEVEL IS 1 mg/L OR EQUAL TO THE CHLORINE CONTENT OF THE INCOMING WATER.
      - TAKE WATER SAMPLES FROM TWO PERCENT OF THE SPRINKLER LOCATIONS FOR EACH ZONE AND AT THE WATER ENTRY POINT. ANALYZE SAMPLES IN ACCORDANCE WITH AWWA C651 AND REPORT RESULTS TO OWNER.
   c. REPEAT PROCEDURES IF BIOLOGICAL EXAMINATION SHOWN CONTAMINATION.

C. PREPARE AND SUBMIT REPORTS OF PURGING AND DISINFECTING ACTIVITIES. INCLUDE COPIES OF WATER-SAMPLE APPROVALS FROM AUTHORITIES HAVING JURISDICTION.

D. CLEAN INTERIOR OF DOMESTIC WATER PIPING SYSTEM. REMOVE DIRT AND DEBRIS AS WORK PROGRESSES.

E. CLEAN FIXTURES, FAUCETS AND OTHER FITTINGS WITH MANUFACTURER'S RECOMMENDED CLEANING METHODS AND MATERIALS.

TESTING

A. GENERAL: THE PURPOSE OF PIPE TESTING IS TO OBTAIN EVIDENCE OF SATISFACTORY WORKMANSHIP AND MATERIALS. REMAKE OR REPAIR ALL SYSTEMS WHICH DO NOT PRODUCE SATISFACTORY RESULTS. SHOW A SIGNATURE FROM OWNER, CODE OFFICIAL, OR ENGINEER'S ASSIGNEE THAT EACH TEST WAS WITNESSED.

B. DOMESTIC WATER: INSTALL ALL PIPING TO THE POINT OF CONNECTION TO MAIN BUT DO NOT MAKE THE TIE-IN. USE THE STANDARD 2-HOUR AIR PRESSURE TST WITH NO LOSS OF AIR PRESSURE. MAKE THE TIE-IN TO EXISTING, PRESSURIZE, AND INSPECT FOR LEAKS. FLUSH NEW PIPING THOROUGHLY, OPERATING ALL VALVES AND FAUCETS DURING FLUSH.

C. DRAIN, WASTE AND VENT: INSTALL ALL PIPING TO THE POINT OF CONNECTION TO MAIN BUT DO NOT MAKE TIE-IN. USE THE STANDARD AIR PRESSURE TEST AND SOAP ALL JOINTS. INSPECT FOR LEAKS. MAKE THE TIE-IN TO EXISTING AND INSPECT FOR LEAKS, OPERATING ALL FIXTURES DISCHARGING INTO THE PIPING BEING TESTED FOR AT LEAST 5 MINUTES CONTINUOUSLY.

D. TEST INSTALLED FIXTURES AFTER WATER SYSTEMS ARE PRESSURIZED FOR PROPER OPERATION. REPLACE MALFUNCTIONING FIXTURES AND COMPONENTS, THEN RETEST. REPEAT PROCEDURE UNTIL UNITS OPERATE PROPERLY.

PLUMBING EXECUTION

A. SLOPE DRAIN, WASTE, RAINLEADER, AND RAINLEADER OVERFLOW PIPING IN DIRECTION OF FLOW UNLESS NOTED OTHERWISE ON PLANS:
   a. PIPE SIZE 3" OR SMALLER: 1/8" PER FOOT
   b. PIPE SIZE 4" AND GREATER: 1/8" PER FOOT

B. SLOPE VENT PIPE 1/8" PER FOOT BACK TO FIXTURES.

C. INSTALL ALL EQUIPMENT, ACCESSORIES AND SPECIALTIES ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND PROVIDE ACCESS FOR PERIODIC MAINTENANCE, CLEANING AND SERVICING. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES.

D. INSTALL PIPING TO PERMIT VALVE SERVICING.

E. FOR WALL-HANGING FIXTURES, INSTALL OFF-FLOOR SUPPORTS AFFIXED TO BUILDING SUBSTRATE.

F. INSTALL WOOD-BACKING REINFORCEMENT FOR WALL MOUNTING AND RECESSED-TYPE PLUMBING SPECIALTIES. FASTEN RECESSED-TYPE PLUMBING SPECIALTIES TO REINFORCEMENT BUILT INTO WALLS.

G. INSTALL BUILDING ATTACHMENTS WITHIN CONCRETE SLABS OR ATTACHED TO STRUCTURAL STEEL.

H. INSTALL AND SECURE FIXTURES IN PLACE WITH WALL CARRIERS AND BOLTS. SEAL FIXTURES TO WALL AND FLOOR SURFACES WITH SEALANT, COLOR TO MATCH FIXTURE.

I. INSTALL EQUIPMENT AND COMPONENTS LEVEL AND PLUMB. SET SERVICE SINKS IN A LEVELING BED OF CEMENT GROUT.

J. EXTEND CLEANOUTS TO FINISHED FLOOR OR WALL SURFACE. INSTALL CHROME PLATED ROUND COVER. DO NOT INSTALL FLOOR CLEANOUTS IN TRAFFIC AREAS OF FINISHED CORRIDORS.

K. PROVIDE PROTECTIVE COVERING OF INSTALLED FIXTURES. DO NOT ALLOW USE OF FIXTURES FOR TEMPORARY FACILITIES UNLESS APPROVED IN WRITING BY OWNER.

L. INSTALL PIPING IN CONCEALED LOCATIONS, UNLESS OTHERWISE INDICATED AND EXCEPT IN EQUIPMENT ROOMS AND SERVICE AREAS. INSTALL PIPING TO PERMIT REMOVAL OF CEILING PANELS.

M. INSTALL PIPING INDICATED TO BE EXPOSED AND PIPING IN EQUIPMENT ROOMS AND SERVICE AREAS AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE PROHIBITED UNLESS SPECIFICALLY INDICATED OTHERWISE.

N. RUN WATER BEARING PIPE IN HEATED SPACES (EXCLUDING DRAINAGE PIPING WHEN INSTALLED WITH SLOPE).

O. MAINTAIN INDICATED FIRE RATING OF WALLS, PARTITIONS, CEILINGS, AND FLOORS AT PIPE PENETRATIONS. SEAL PIPE PENETRATIONS WITH UL LISTED FIRE STOP MATERIALS.

P. BRANCH SHUT-OFF VALVES SHALL BE PROVIDED FOR ALL DOMESTIC WATER TAKEOFFS.

Q. INSTALL PIPING FREE OF SAGS AND BENDS.

R. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.

S. INSTALL PIPING TO ALLOW APPLICATION OF INSULATION.

T. INSTALL COPPER WATER TUBE ACCORDING TO CDA'S "COPPER TUBE HANDBOOK" LATEST EDITION.

U. INSTALL PVC SOIL AND WASTE DRAINAGE VENT PIPING ACCORDING TO ASTM D 2665.

V. INSTALL UNDERGROUND PVC SOIL AND WASTE DRAINAGE PIPING ACCORDING TO ASTM D 2321.

W. PROVIDE DIELECTRIC NIPPLES AT CONNECTIONS BETWEEN DISSIMILAR METALS. DIELECTRIC COUPLINGS OR UNIONS ARE NOT ACCEPTABLE.

X. INSTALL BACK FLOW PREVENTERS IN EACH WATER SUPPLY TO MECHANICAL EQUIPMENT AND SYSTEMS AND OTHER EQUIPMENT AND WATER SYSTEMS THAT MAY BE SOURCES OF CONTAMINATION. COMPLY WITH AUTHORITIES HAVING JURISDICTION.

Y. PIPING ROUTING SHOWN IS EXPANDED FOR CLARITY. EXACT ROUTING MAY VARY TO ACCOMODATE EQUIPMENT AND ACCESSIBILITY REQUIREMENTS.

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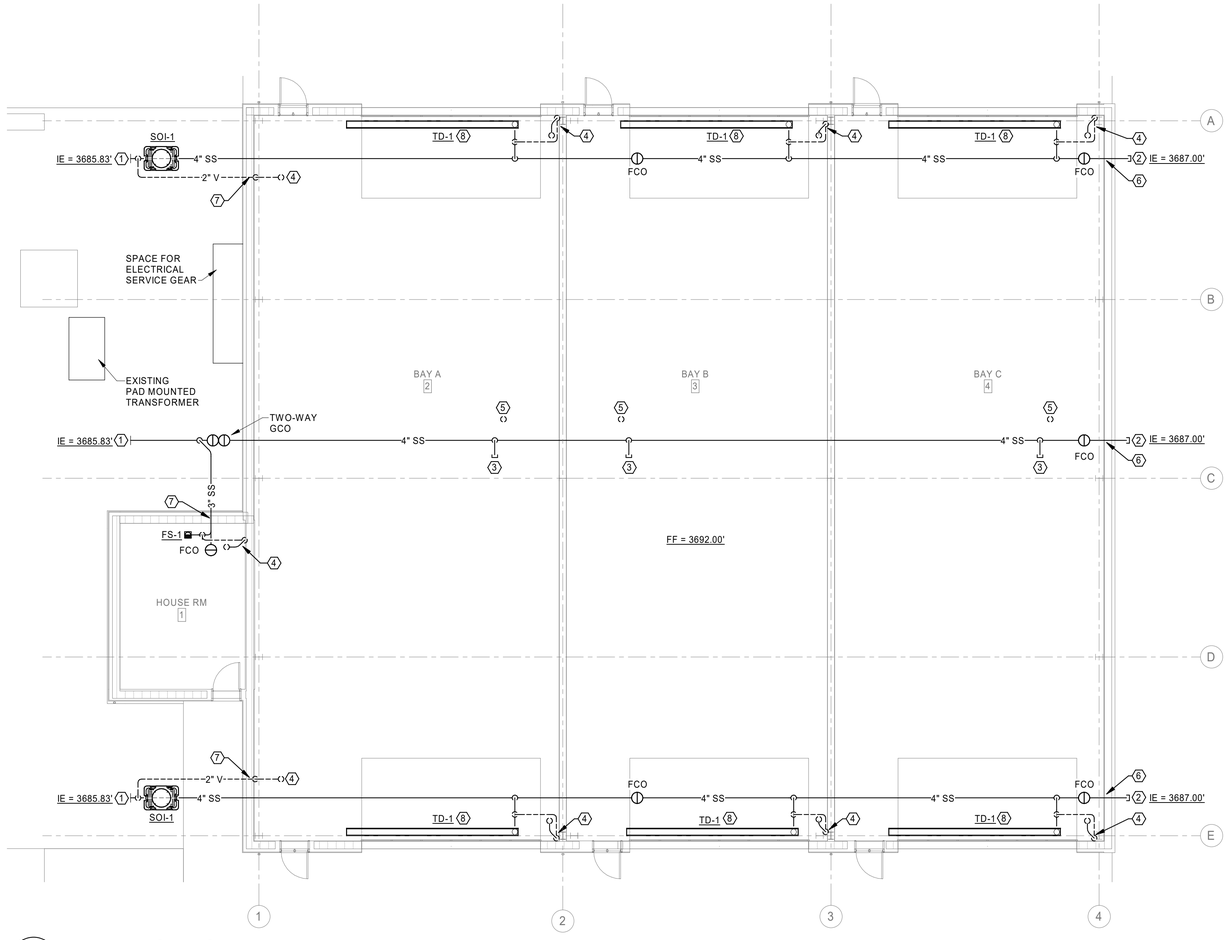
REVISIONS

PLUMBING SPECIFICATIONS

P002



1 P100 PLUMBING WASTE AND VENT PLAN

1/8" = 1'-0"

NORTH REF

GENERAL PLUMBING NOTES

A. REVIEW ARCHITECTURAL, STRUCTURAL, CIVIL, MECHANICAL, AND ELECTRICAL PLANS THOROUGHLY TO BECOME FAMILIAR WITH THIS PROJECT. ALL PLANS AND ALL SPECIFICATIONS COMPRISE ONE DOCUMENT OF WHICH THESE SHEETS ARE ONLY A PART.

B. PIPING SHOWN IS DIAGRAMMATIC ONLY. ANY MAJOR DEVIATION FROM THESE PLANS SHOULD BE COORDINATED WITH THE ENGINEER OF RECORD BEFORE PROCEEDING.

C. ALL NEW PIPING ON MAIN FLOOR SHALL BE CONCEALED IN WALLS, ABOVE CEILING, OR UNDER GROUND UNLESS OTHERWISE NOTED ON THESE PLANS. COORDINATE ROUTING WITH OTHER DISCIPLINES.

D. ALL WORK SHALL COMPLY WITH THE CURRENT ACCEPTED EDITION OF THE 2021 UPC, NFPA 54 AND ALL APPLICABLE CODES OF LOCAL JURISDICTION.

E. SLOPE SOIL PIPE 1/8" PER FOOT IN DIRECTION OF FLOW, UNLESS NOTED OTHERWISE ON PLANS. SLOPE VENT PIPE 1/8" PER FOOT BACK TO FIXTURES.

KEYNOTES

1. SEE CIVIL DRAWINGS FOR CONTINUATION OF 4" SANITARY SEWER LINE.
2. STUB-OUT AND CAP 4" SANITARY SEWER FOR EXTENSION TO FUTURE BUILDING EXPANSION LEASE SPACES.
3. STUB-OUT AND CAP 4" SANITARY SEWER AT -2'-0" BELOW FINISHED FLOOR FOR CONNECTION TO FUTURE TI.
4. 2" VENT LINE BELOW SLAB. RUN UP EXPOSED ALONG WALL. COORDINATE WITH BUILDING STRUCTURE. OFFSET UP HIGH, TRANSITION TO 3" AND RUN UP TO 3" VTR.
5. STUB DOWN AND CAP 3" VENT LINE BELOW ROOF FOR FUTURE CONNECTION. RUN UP TO 3" VTR. ADD TEMPORARY PIPE CAP TO VTR.
6. SLEEVE PLUMBING LINE BELOW STRUCTURAL STEM WALL FOOTING.
7. SLEEVEL PLUMBING LINE THRU STRUCTURAL STEM WALL.
8. TRENCH DRAIN DOES NOT CENTER ON THE DOOR OPENING. IT IS PURPOSELY OFFSET TO OVERLAP THE DOOR OPEINING TO ALLOW FOR THE CONDENSATE DRAIN FROM THE UNIT HEATER TO DISCHARGE OVER IT.

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GREAT FALLS INTERNATIONAL AIRPORT

GFIA WAREHOUSE

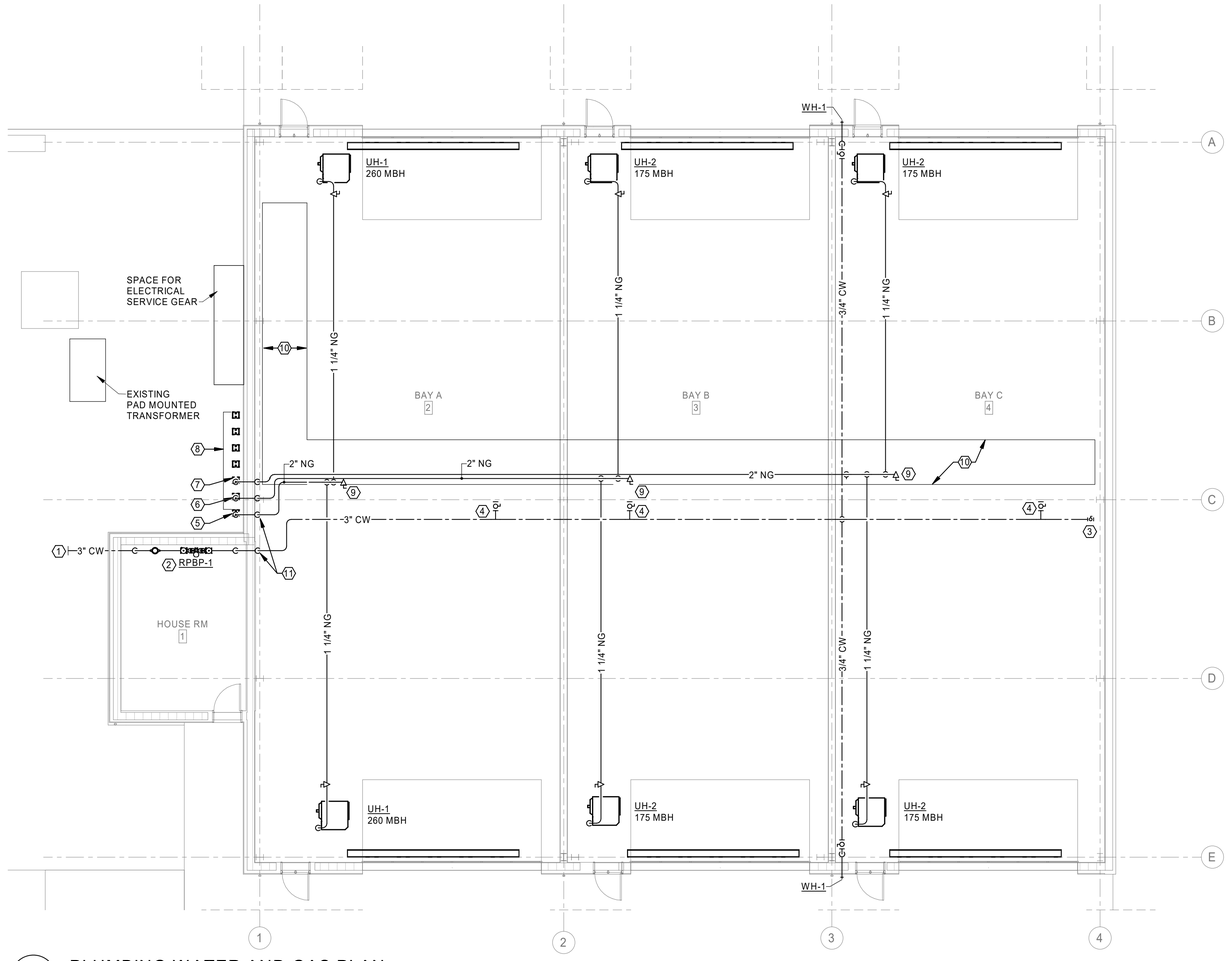
MONTANA
MARK DAVID VINCELLO
REGISTERED
LICENSED PROFESSIONAL ENGINEER

BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | KRAT
DRAWN BY | KRAT
REVIEWED BY | VINCELLO
REVISIONS

PLUMBING WASTE AND VENT PLAN

P100



1 P200 PLUMBING WATER AND GAS PLAN

1/8" = 1'-0"

NORTH REF

GENERAL PLUMBING NOTES

A. REVIEW ARCHITECTURAL, STRUCTURAL, CIVIL, MECHANICAL, AND ELECTRICAL PLANS THOROUGHLY TO BECOME FAMILIAR WITH THIS PROJECT. ALL PLANS AND ALL SPECIFICATIONS COMPRISE ONE DOCUMENT OF WHICH THESE SHEETS ARE ONLY A PART.

B. PIPING SHOWN IS DIAGRAMMATIC ONLY. ANY MAJOR DEVIATION FROM THESE PLANS SHOULD BE COORDINATED WITH THE ENGINEER OF RECORD BEFORE PROCEEDING.

C. ALL NEW PIPING ON MAIN FLOOR SHALL BE CONCEALED IN WALLS, ABOVE CEILING, OR UNDER GROUND UNLESS OTHERWISE NOTED ON THESE PLANS. COORDINATE ROUTING WITH OTHER DISCIPLINES.

D. ALL WORK SHALL COMPLY WITH THE CURRENT ACCEPTED EDITION OF THE 2021 UPC, NFPA 54 AND ALL APPLICABLE CODES OF LOCAL JURISDICTION.

KEYNOTES

1. SEE CIVIL DRAWINGS FOR CONTINUATION OF DOMESTIC WATER SERVICE. CIVIL LINE FROM SITE IS 4". REDUCE TO 3" AND RUN TO WATER METER.
2. DOMESTIC COLD WATER SERVICE ENTRANCE.
3. STUB-OUT VALVE AND CAP 3" CW LINE FOR EXTENSION TO FUTURE BUILDING EXPANSION LEASE SPACES.
4. STUB-OUT VALVE AND CAP 1 1/2" CW LINE FOR CONNECTION TO FUTURE TI.
5. BAY A GAS METER AND REGULATOR ASSEMBLY SET TO DELIVER 720 CFH AT 7" WC. 80'-0" TDL METER TO LAST CONNECTION. COORDINATE WITH LOCAL UTILITY COMPANY.
6. BAY B GAS METER AND REGULATOR ASSEMBLY SET TO DELIVER 550 CFH AT 7" WC. 120'-0" TDL METER TO LAST CONNECTION. COORDINATE WITH LOCAL UTILITY COMPANY.
7. BAY C GAS METER AND REGULATOR ASSEMBLY SET TO DELIVER 550 CFH AT 7" WC. 160'-0" TDL METER TO LAST CONNECTION. COORDINATE WITH LOCAL UTILITY COMPANY.
8. SPACE FOR 10 FUTURE GAS METER AND REGULATOR ASSEMBLIES FOR FUTURE BUILDING EXPANSION LEASE SPACES. COORDINATE WITH LOCAL UTILITY COMPANY FOR STACKED METER ARRANGEMENT. CURRENT ARRANGEMENT SHOWN IS A 7 x 6.
9. STUB-OUT VALVE AND CAP 1 1/4" NG LINE FOR CONNECTION TO FUTURE TI WATER HEATER OR OTHER GAS APPLIANCE.
10. INSTALL TWO TIER UNISTRUT PIPE SUPPORT ASSEMBLY CAPABLE OF HOLDING (7) 2" AND (6) 2 1/2" SCHEDULE 40 BLACK STEEL NG LINES AND (13) 2" ELECTRIC WIRING CONDUITS. (4) 2" NG LINES, (6) 2 1/2" NG LINES AND (10) CONDUITS WILL BE FUTURE. COORDINATE WITH ELECTRICAL CONTRACTOR.
11. COORDINATE PIPE DROPS WITH STRUCTURAL FRAMING.

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PLUMBING WATER AND GAS PLAN

P200

HVAC ABBREVIATIONS

%	PERCENT
ACFM	ACTUAL CFM
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AMP	AMPERE (AMP, AMPS)
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APD	AIR PRESSURE DROP
APPROX	APPROXIMATE
BHP	BRAKE HORSEPOWER, BOILER HORSEPOWER
BOD	BOTTOM OF DUCT
BTU	BRITISH THERMAL UNIT
C	COMMON
CFM	CUBIC FEET PER MINUTE
COD	CENTER OF DUCT
CU FT	CUBIC FEET
CU IN	CUBIC INCH
DB	DECIBEL
DBT	DRY-BULB TEMPERATURE
DIA	DIAMETER
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EDR	EQUIVALENT DIRECT RADIATION
EWT	ENTERING WATER TEMPERATURE
EXP	EXPANSION
F	FAHRENHEIT
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FOOT OR FEET
GA	GAGE OR GUAGE
GAL	GALLONS
GC	GENERAL CONTRACTOR
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD
HGT	HEIGHT
HP	HORSEPOWER
HZ	FREQUENCY
ID	INSIDE DIAMETER
KW	KILOWATT
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LF	LINEAR FEET
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	BTU PER HOUR (THOUSAND)
MC	MECHANICAL CONTRACTOR
MIN	MINIMUM
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NO	NUMBER
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
PD	PRESSURE DROP
PH	PHASE (ELECTRICAL)
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSIG	PSI GAUGE
R/O	RUN OUT
RA	RETURN AIR
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SCFM	CFM, STANDARD CONDITIONS
SH	SENSIBLE HEAT
SP	STATIC PRESSURE
SP VOL	SPECIFIC VOLUME
SPEC	SPECIFICATION
STD	STANDARD
SUCT	SUCTION
T STAT	THERMOSTAT
TC	TEMPERATURE CONTROL
TD	TEMPERATURE DIFFERENCE
TEMP	TEMPERATURE
TOD	TOP OF DUCT
TONS	TONS OF REFRIGERATION
V	VOLT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
W/	WITH
WPD	WATER PRESSURE DROP

MECHANICAL LEGEND

SYMBOL	DESCRIPTION
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
RS	REFRIGERANT SUCTION LINE
RL	REFRIGERANT LIQUID LINE
HG	REFRIGERANT HOT GAS LINE
HPS	HEAT PUMP SUPPLY
HPR	HEAT PUMP RETURN
LPS	LOW PRESS. STEAM SUPPLY
LPR	LOW PRESS. CONDENSATE RETURN
MPS	MEDIUM PRESS. STEAM SUPPLY
MPR	MEDIUM PRESS. CONDENSATE RETURN
CD	CONDENSATE DRAIN
	GATE VALVE
	BALL VALVE
	BUTTERFLY VALVE
	GLOBE VALVE
	TRIPLE DUTY VALVE
	SWING CHECK VALVE
	STRAINER
	FLEX CONNECTOR
	HOSE END DRAIN VALVE
	PRESSURE REDUCING VALVE
	SAFETY RELIEF VALVE
	UNION
	MOTORIZED T.C. VALVE / 2-WAY
	MOTORIZED T.C. VALVE / 3-WAY
	ECCENTRIC PLUG BALANCING VALVE
	VALVE IN RISER
	TEE UP
	TEE DOWN
	ELBOW UP
	ELBOW DOWN
	PIPE SIZE CHANGE
	MANUAL FLOW BALANCING VALVE (CIRCUIT SETTER)
A	AUTOMATIC FLOW BALANCING VALVE
	PIPE GUIDE
	PIPE ANCHOR
	PRESSURE / TEMP. TEST PLUG
T	DIAL THERMOMETER
P	PRESSURE GAUGE W/ SNUBBER

SYMBOL	DESCRIPTION
	ACOUSTICALLY LINED SHEET METAL DUCT
	MANUAL BALANCING DAMPER
	FLEX CONNECTOR
AD AD	ACCESS DOORS
FD	FIRE DAMPER
F/SD	FIRE/SMOKE DAMPER
M M	MOTORIZED DAMPERS
	TURNING VANE ELBOW
	HIGH EFFICIENCY BRANCH TAKE-OFF HETO" WITH VOLUME DAMPER & FLEXIBLE DUCT
	HIGH EFFICIENCY BRANCH TAKE-OFF "HETO" WITH VOLUME DAMPER & FLEXIBLE DUCT
S-1 (PLAN CODE) 200 (CFM)	SUPPLY DIFFUSER, 4-WAY THROW UNLESS INDICATED OTHERWISE (W/ FLEXIBLE DUCT)
R-1 (PLAN CODE) 200 (CFM)	RETURN GRILLE
E-1 (PLAN CODE) 200 (CFM)	EXHAUST GRILLE (W/ RIGID BRANCH DUCT)
	CONNECT NEW WORK TO EXISTING
	POINT OF DISCONNECT
(E)	EXISTING
(R)	RELOCATE / RELOCATED
T	THERMOSTAT/TEMPERATURE SENSOR
T_R	REVERSE ACTING THERMOSTAT
T	THERMOSTAT/TEMPERATURE SENSOR W/ GUARD
H	HUMIDISTAT
CO	CARBON MONOXIDE SENSOR
CO_2	CARBON DIOXIDE SENSOR
NO_2	NITROGEN DIOXIDE SENSOR

FAN SCHEDULE

ALTITUDE APROX. 4000 FT.

UNIT NO.	MAKE	MODEL	LOCATION	SERVICE	TYPE	CFM	S.P.	FAN DIA.	BLADE TYPE	FAN RPM	DRIVE	CONTROL	MOTOR RPM	MOTOR HP	MOTOR VOLTS	MOTOR PHASE	MOTOR HERTZ	MOTOR STARTER	REMARKS
EF-1	GREENHECK	SQ-90-VG	AS SHOWN	HOUSE	INLINE	300	0.25"	9" Ø	CENT.	1229	DIRECT	SEE M600	1229	1/10	120	1 Ø	60	VARI	NOTE 1
EF-2	GREENHECK	SQ-80-VG	AS SHOWN	TENANT A CONT.	INLINE	150	0.25"	8" Ø	CENT.	1173	DIRECT	SEE M600	1173	1/10	120	1 Ø	60	VARI	NOTE 1
EF-3	GREENHECK	SQ-140-VG	AS SHOWN	TENANT A INTM.	INLINE	2100	0.25"	14" Ø	CENT.	1117	DIRECT	SEE M600	1117	3/4	120	1 Ø	60	VARI	NOTE 1
EF-4	GREENHECK	SQ-80-VG	AS SHOWN	TENTANT B CONT.	INLINE	150	0.25"	8" Ø	CENT.	1173	DIRECT	SEE M600	1173	1/10	120	1 Ø	60	VARI	NOTE 1
EF-5	GREENHECK	SQ-140-VG	AS SHOWN	TENANT B INTM.	INLINE	1800	0.25"	14" Ø	CENT.	1091	DIRECT	SEE M600	1091	3/4	120	1 Ø	60	VARI	NOTE 1
EF-6	GREENHECK	SQ-80-VG	AS SHOWN	TENANT C CONT.	INLINE	150	0.25"	8" Ø	CENT.	1173	DIRECT	SEE M600	1173	1/10	120	1 Ø	60	VARI	NOTE 1
EF-7	GREENHECK	SQ-140-VG	AS SHOWN	TENANT C INTM.	INLINE	1800	0.25"	14" Ø	CENT.	1091	DIRECT	SEE M600	1091	3/4	120	1 Ø	60	VARI	NOTE 1
EF-A	PANASONIC	FV-0511VKS2	FUTURE (NIC)	TOILET EXHAUST	CEILING	70	0.25"	6" Ø	CENT.	MEDIUM	DIRECT	SEE M600	MEDIUM	5,9 W	120	1 Ø	60	MULTI	NOTE 2

NOTES:
(1) ECM MOTOR WITH VARIABLE SPEED CONTROLLER.
(2) PREINSTALLED MULTI-SPEED CONTROLER WITH ADJUSTABLE DELAY OFF, FUTURE FANS FOR INFORMATION ONLY, NOT IN CONTRACT(NIC).

ELECTRIC UNIT HEATER SCHEDULE

ALTITUDE APROX. 4000 FT.

UNIT TYPE	MAKE	MODEL	LOCATION	SERVICE	TYPE	CFM	WATTS	VOLTS	PHASE	HERTZ	AMP	CONTROL	OUTPUT BTU/HR	REMARKS
EUH-1	QMARK	MUH03-81	AS SHOWN	HEATING	HORIZONTAL	350	3000	208	1Ø	60	14.5	WALL T-STAT	10.2 MBH	NOTE 1 & 2

NOTES:
(1) SEVEN-DAY PROGRAMABLE THERMOSTAT, WALL SUPPORT BRACKET, FUSED DISCONNECT, CONTROL TRANSFORMER.
(2) INSTALL WITH BOTTOM OF UNIT APPROX. 8'-0" AFF.

GAS UNIT HEATER SCHEDULE

ALTITUDE APROX. 4000 FT.

UNIT TYPE	MAKE	MODEL	LOCATION	SERVICE	TYPE	CONF.	MBH INPUT	GAS PRES.	MBH. OUTPUT	CFM	RPM	VENTING/ COMBUSTION	MOTOR HP	VOLTS	PHASE	HERTZ	STARTER	CONTROL	MOP	MOUNT HEIGHT	REMARKS
UH-1	REZNOR	UEZ-260	AS SHOWN	HEATING	SEP. COMB.	HORIZ.	260	7"	239.2	4283	1050	4"Ø/6"Ø	1/2	120	1Ø	60	MAG.	WALL T-STAT	20A	16'-0"	NOTE 1 & 2
UH-2	REZNOR	UEZ-180	AS SHOWN	HEATING	SEP. COMB.	HORIZ.	175	7"	159.3	2458	1050	4"Ø/6"Ø	1/4	120	1Ø	60	MAG.	WALL T-STAT	15A	16'-0"	NOTE 1 & 2

NOTES:
(1) SEVEN-DAY PROGRAMMABLE THERMOSTAT, CONTROL TRANSFORMER, VERTICAL ROOF CONCENTRIC VENT KIT, FUSED DISCONNECT, SEALED COMBUSTION CHAMBER. INSTALL VENTING PER MANUFACTURERS INSTRUCTIONS.
(2) INSTALL WITH BOTTOM OF UNIT APPROX. 15'-6" AFF.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

PLAN CODE	MAKE	MODEL	FACE SIZE	NECK SIZE	BRANCH SIZE	CFM	S.P. DROP	NC	MATERIAL	FINISH	FRAME STYLE	REMARKS
E-1	TITUS	350FS	14x14	12x12	14x6	150-300	0.05	14	STEEL	WHITE	DUCT MTD.	NOTE 1
E-2	TITUS	350FS	22x22	20x20	24x8	900-1150	0.05	14	STEEL	WHITE	DUCT MTD.	NOTE 1

NOTES:
(1) DUCT MOUNTED, OPPOSED BLADE DAMPER.

LOUVER SCHEDULE

UNIT TYPE	MAKE	MODEL	LOCATION	SERVICE	TYPE	MATERIAL	BLADE TYPE	FACE SIZE (WxH)	FREE AREA (SF)	CFM	REMARKS
L-1	GREENHECK	ESK-402	AS SHOWN	HOUSE EXHAUST	STORM PROOF	ALUMINUM	K-BLADE	12"x24"	± 0.77	300	NOTES 1 & 2
L-2	GREENHECK	ESK-402	AS SHOWN	HOUSE INTAKE	STORM PROOF	ALUMINUM	K-BLADE	12"x24"	± 0.77	300	NOTES 1 & 2
L-3	GREENHECK	ESK-402	AS SHOWN	BAY EXHAUST	STORM PROOF	ALUMINUM	K-BLADE	36"x48"	± 6.21	1950-2250	NOTES 1 & 2
L-4	GREENHECK	ESK-402	AS SHOWN	BAY INTAKE	STORM PROOF	ALUMINUM	K-BLADE	36"x48"	± 6.21	1800-2100	NOTES 1 & 2

NOTES:
1) FACTORY KYNAR FINISH, COLOR SELECTED BY ARCHITECT.
2) 2 INCH WIDE FLASHING FLANGE, COORDINATE HEAD, JAMB AND SILL FLASHING WITH G.C., PROVIDE WITH BIRD SCREEN.

MECHANICAL SHEET INDEX

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10.26.2022
PROJ# | GFIA_WRHSE
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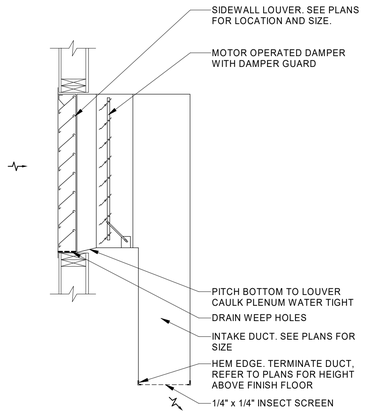
DRAWN BY | BLAKE
REVIEWED BY | LAST NAME
REVISIONS

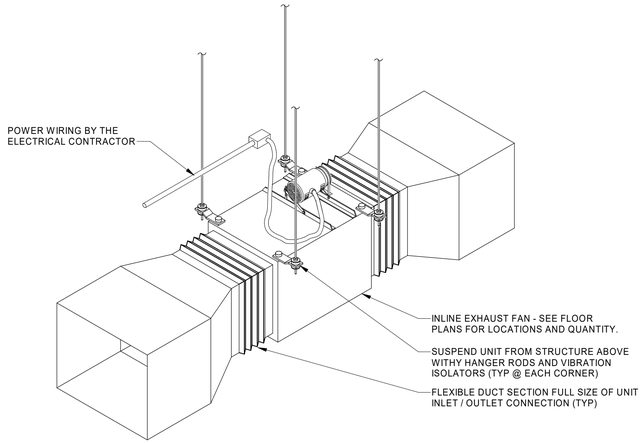
MECHANICAL SCHEDULES & LEGENDS

M001



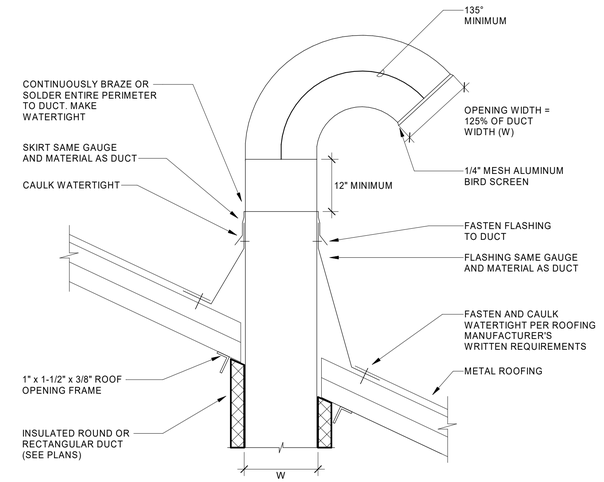
1 M002 **SIDEWALL INTAKE LOUVER DETAIL**

NOT TO SCALE



3 M002 **INLINE EXHAUST FAN DETAIL**

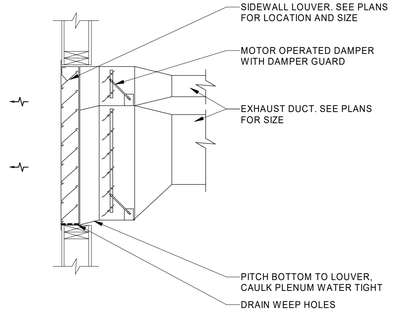
NOT TO SCALE



5 M002 **ROOF GOOSENECK DUCT DETAIL**

NOT TO SCALE

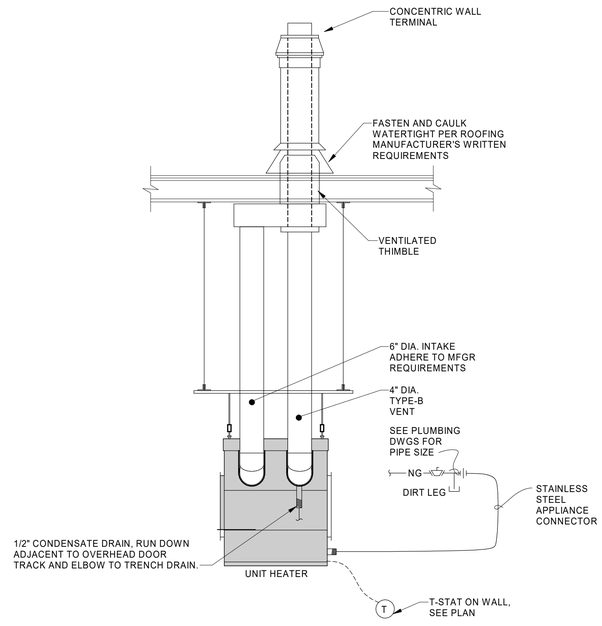
NOTE: G.C. TO PROVIDE ROOF OPENING. FRAMING, FLASHING, LOCATION, SETTINGS, AND SECURING OF DUCT BY HVAC.



2 M002 **SIDEWALL EXHAUST LOUVER DETAIL**

NOT TO SCALE

NOTE: SPLIT PLENUM BEHIND LOUVER, PROPORTIONS AS CALLED FOR ON PLANS. SINGLE EXHAUST CONFIGURATION SIMILAR.



4 M002 **UNIT HEATER INSTALLATION DETAIL**

NOT TO SCALE

NOTE: COMBUSTION INTAKE, VENTING AND GAS PIPING INSTALLED TO STRICT COMPLIANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

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MECHANICAL DETAILS

M002

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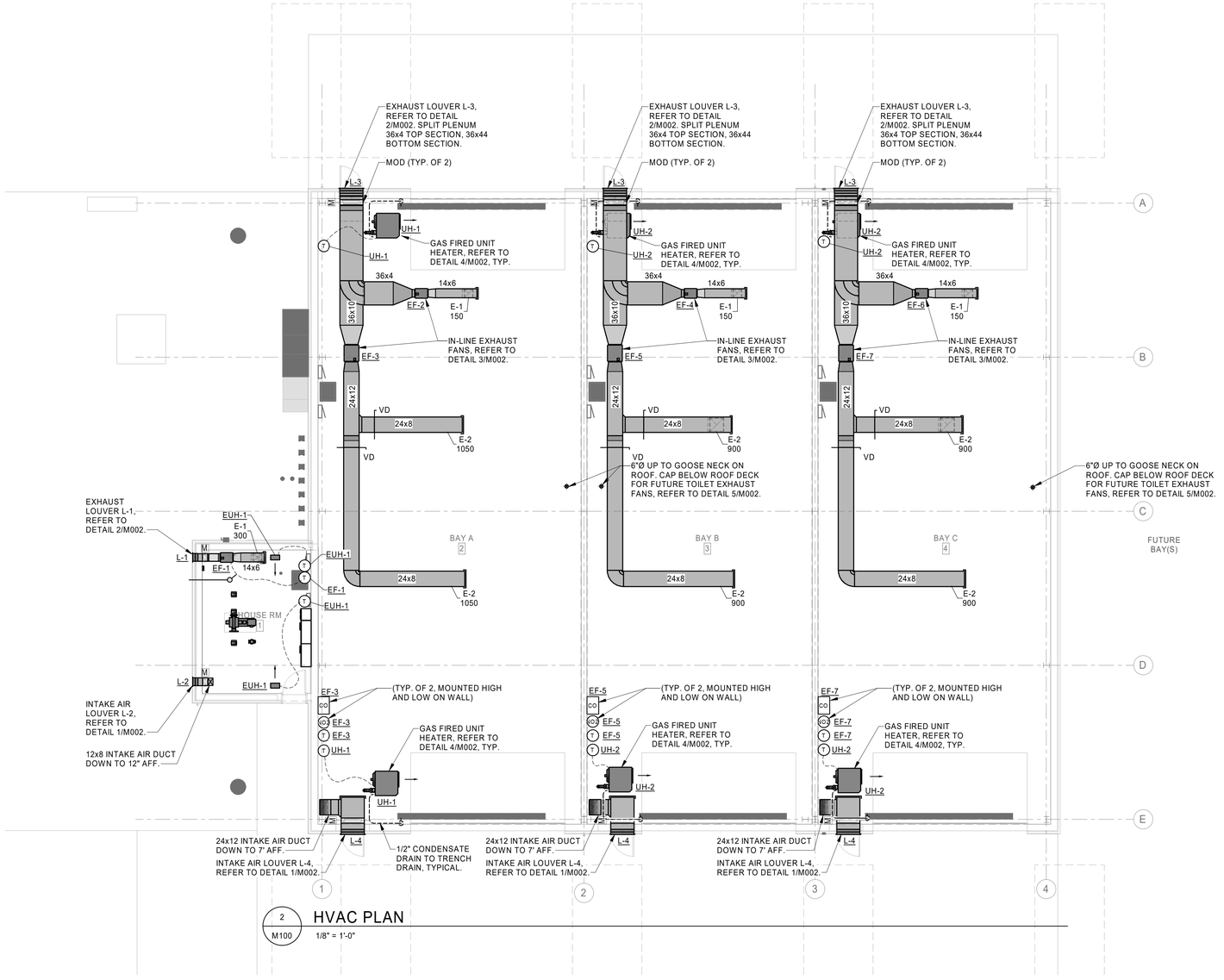

2 M100 HVAC PLAN

1/8" = 1'-0"

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HVAC PLANS

M100

SECTION 23 50 00 - MECHANICAL SPECIFICATION

PART 1 - GENERAL

1. THE SCOPE OF WORK IS TO PROVIDE LABOR, MATERIALS, SERVICES, SUPPLIES, TOOLS, EQUIPMENT, PERMITS, TRANSPORTATION AND FACILITIES NECESSARY AND INSTALL THE COMPLETE AND OPERABLE SYSTEMS AS CALLED FOR.

2. THE COMPLETE INSTALLATION SHALL BE IN COMPLIANCE WITH THE APPLICABLE LATEST OR ACCEPTED EDITION OF THE INTERNATIONAL BUILDING CODE AS ADOPTED BY THE STATE OF MONTANA AND AMENDED BY THE CITY OF GREAT FALLS, NFPA AND OTHER APPLICABLE RULES AND REGULATIONS AS PRESCRIBED BY THE ADMINISTRATIVE AUTHORITY.

3. THESE DRAWINGS ARE DIAGRAMMATIC ONLY AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND EQUIPMENT. BASIC DESIGN CONCEPTS MUST BE FOLLOWED OR BETTERED. DO NOT SCALE DRAWINGS, FIELD VERIFY DIMENSIONS AND FIELD CONDITIONS.

4. IT IS NOT INTENDED THAT DRAWINGS SHOW EVERY DETAIL. PROVIDE OFFSETS, CHANGES IN ELEVATION AND ITEMS NECESSARY FOR PROPER INSTALLATION AND OPERATION OF SYSTEM SO THAT WORK WILL BE COMPLETE AND READY FOR OPERATION.

5. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC PIPING, DUCTWORK AND EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7-16. ASSIGNED SEISMIC USE GROUP OR BUILDING CATEGORY AS DEFINED IN THE IBC: II. SITE DESIGN CLASS AS DEFINED IN THE IBC: B.

6. COORDINATE WORK WITH OTHER TRADES, VERIFY BUILDING CONDITIONS AND STRUCTURAL CONDITIONS PRIOR TO INSTALLATION.

7. IN THE EVENT OF A DISCREPANCY, IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE. DO NOT PROCEED WITH INSTALLATION IN AREAS OF DISCREPANCY UNTIL SUCH DISCREPANCIES HAVE BEEN RESOLVED. WHERE THERE ARE DISCREPANCIES IN THE CONTRACT DOCUMENTS, THE GREATER QUANTITY, THE GREATER QUALITY, AND THE GREATER TOTAL VALUE SHALL BE PROVIDED AS PART OF THE CONTRACT WORK.

8. PROVIDE IDENTIFICATION TAGS FOR VALVES, PANELS, STARTERS AND HVAC EQUIPMENT WITH CHART AND SCHEDULE OF LOCATION AND FUNCTION.

9. EXECUTE WORK IN A NEAT AND WORKMANLIKE MANNER IN CONFORMANCE WITH BEST MODERN TRADE PRACTICE, (I.E. ASME, SMACNA, ANSI, ASHRAE, ASPE, AGA, API) BY COMPETENT, EXPERIENCED MECHANICS, PRESENTING A NEAT APPEARANCE WHEN COMPLETED. REPLACE WORK NOT APPROVED BY OWNER'S REPRESENTATIVE WITHOUT ADDITIONAL CHARGE.

10. SUBMIT COMPLETE ELECTRONIC PDF COPY OF CATALOG INFORMATION FOR MATERIALS AND EQUIPMENT. INFORMATION REQUIRED INCLUDES MANUFACTURER, CAPACITY, TYPE, CURVES, CERTIFICATION, ACCESSORIES, PHYSICAL AND PERFORMANCE DATA, FINISHES, MATERIALS AND LOCATION. CONFIRM DIMENSIONS AT JOB SITE TO INSURE THOSE ITEMS FURNISHED FIT THE SPACE AVAILABLE. SUBMIT SHOP DRAWING PRIOR TO INSTALLATION OR PURCHASE WITH THE DATE, CONTRACTORS STAMP AND SIGNATURE PROVIDED. NO INSTALLATION IS PERMITTED PRIOR TO REVIEW.

11. MAINTAIN AT THE SITE ONE RECORD SET OF DRAWINGS, SPECIFICATIONS, ADDENDA, CHANGE ORDERS, ACCEPTED SHOP DRAWINGS AND ACCEPTED SUBMITTALS TO REMAIN AS RECORD DRAWINGS OF THE WORK AS INSTALLED. TRANSFER RECORD DRAWING DATA TO BUILDING CAD FILES. PROVIDE ONE FULL SIZE SET OF THE CORRECTED RECORD DRAWINGS AND A CD WITH ELECTRONIC COPY OF THE CAD DRAWING FILES AND PDF PLOT FILES TO THE OWNER.

12. OPERATING AND MAINTENANCE MANUALS: BEFORE FINAL ACCEPTANCE OF PROJECT SUBMIT THREE (3) COPIES OF COMPLETE OPERATING INSTRUCTIONS AND SERVICE MANUALS NEATLY BOUND AND CONSISTING OF THE FOLLOWING: NEATLY TYPEWRITTEN INDEX, INSTRUCTIONS ON ALL EQUIPMENT OPERATION, PARTS REPLACEMENT INFORMATION, GUARANTEES AND WARRANTIES, TESTING AND BALANCING REPORTS, SERVICE MANUALS, AUTOMATIC TEMPERATURE CONTROL DRAWINGS AND DIAGRAMMATIC CHARTS.

13. PROVIDE A COMPLETE CD COPY OF ALL INSTALLED SOFTWARE FOR ALL EQUIPMENT AND SYSTEMS. PROVIDE ADMINISTRATIVE USER NAME, PASSWORD AND ALL OTHER SOFTWARE KEYS REQUIRED TO ACCESS, MODIFY AND SET PARAMETERS.

14. EQUIPMENT SHALL MEET UL AND NEC STANDARDS. EQUIPMENT AND MATERIALS FOR WHICH THERE IS A LISTING SERVICE SHALL BEAR A UL LABEL. GAS FIRED EQUIPMENT SHALL MEET AGA REQUIREMENTS AND HAVE AN AGA LABEL. MATERIALS SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPMENT RATING OF 50 OR LESS. MATERIAL SHALL BE ASBESTOS FREE.

15. CONCEAL CONTRACT WORK ABOVE CEILINGS AND IN WALL CHASES UNLESS OTHERWISE CALLED FOR. WHERE EQUIPMENT IS EXPOSED, CONFIRM EXACT PLACEMENT WITH THE ARCHITECT AND THE WORK OF ALL OTHER TRADES PRIOR TO INSTALLATION.

16. PROVIDE CUTTING AND PATCHING AS REQUIRED FOR THE INSTALLATION OF CONTRACT WORK. PATCHING MATERIALS AND METHODS SHALL MATCH ADJACENT MATERIALS.

17. PRIME COAT AND PAINT EXPOSED METAL PIPE, SUPPORTS AND EQUIPMENT EXCEPT THOSE ITEMS WITH GALVANIZED OR FACTORY FINISH.

18. FIRE STOPPING FOR OPENINGS THROUGH FIRE AND SMOKE RATED WALL AND FLOOR ASSEMBLIES. PROVIDE MATERIALS AND PRODUCTS LISTED OR CLASSIFIED BY AN APPROVED INDEPENDENT TESTING LABORATORY FOR THROUGH-PENETRATION FIRESTOP SYSTEMS. THE SYSTEMS SHALL MEET THE REQUIREMENTS OF FIRE TESTS OF THROUGH-PENETRATIONS FIRESTOPS DESIGNATED ASTM E814. PROVIDE FIRESTOP SYSTEM SEALS AT LOCATIONS WHERE PIPING, TUBING, CONDUIT, ELECTRICAL CABLES AND WIRES, DUCTWORK AND SIMILAR UTILITIES PASS THROUGH OR PENETRATE FIRE RATED WALL OR FLOOR ASSEMBLY. THE MINIMUM REQUIRED FIRE RESISTANCE RATINGS OF THE WALL OR FLOOR ASSEMBLY SHALL BE MAINTAINED BY THE FIRESTOP SYSTEM. THE INSTALLATION SHALL PROVIDE AN AIR AND WATERTIGHT SEAL. PENETRATION OPENINGS SHALL BE AS SMALL AS POSSIBLE. MAKE: DOW CORNING FIRESTOP SYSTEM FOAMS AND SEALANTS, NELSON ELECTRIC FIRESTOP SYSTEM PUTTY, CKL AND WRP, 3M BRAND FIRE BARRIER SYSTEM.

19. MOTORS SHALL BE SINGLE PHASE, 60 HZ, IN COMPLIANCE WITH NEMA, CLASS B TEMPERATURE RISE, 1.15 MINIMUM SERVICE FACTOR, 20,000 HR. BEARINGS. PREMIUM EFFICIENCY TYPE, IEEE STANDARD 112 METHOD B. MOTORS FOR GENERAL PURPOSES SHALL BE OPEN-DRIP-PROOF, DUSTY OR OPEN TO WEATHER SHALL BE TEFC. MOTORS SHALL BE ECM TYPE WITH VARIABLE SPEED SWITCH AS CALLED FOR. GENERAL ELECTRIC, GOULD, LINCOLN, RELIANCE OR WESTINGHOUSE.

20. STARTERS, CONTACTORS AND CONTROLLERS SHALL COMPLY WITH NEMA STANDARDS, SHORT CIRCUIT PROTECTION SHALL BE TIME DELAY MANUAL RESET TYPE, THERMAL OVERLOADS SHALL BE MANUAL RESET TYPE, PILOT LIGHTS SHALL BE SIX VOLT EXTENDED LIFE. EACH STARTER SUBJECT TO ELECTRICAL INTERLOCK OR AUTOMATIC CONTROL SHALL HAVE THE NECESSARY AUXILIARY CONTACTS, EQUIP WITH SELF-CONTAINED FUSED AND GROUNDED 120 VOLT CONTROL TRANSFORMERS.

21. MANUAL STARTERS SHALL BE TOGGLE OPERATED, SINGLE POLE LINE TO NEUTRAL, TWO POLE LINE TO LINE, FLUSH MOUNTED UNLESS OTHERWISE CALLED FOR.

22. COMBINATION MAGNETIC STARTERS SHALL BE ACROSS THE LINE TYPE WIRED FOR MAINTAINED CONTACT, HAND-OFF-AUTO SINGLE SPEED UNLESS OTHERWISE CALLED FOR.

23. DISCONNECTS SHALL BE HEAVY DUTY 250 VOLT. GENERAL PURPOSE ENCLOSURES SHALL BE NEMA 1, OUTDOOR LOCATIONS SHALL BE NEMA 3R. ALLEN-BRADLEY, CUTLER-HAMMER, GENERAL ELECTRIC, ITE, SQUARE D, WESTINGHOUSE.

24. PROVIDE WIRING CIRCUITS UP TO AND INCLUDING 120 VOLTS FOR EQUIPMENT IN DIVISION 23 MECHANICAL, INCLUDING POWER, CONTROL AND COMMUNICATION WIRING TO AND BETWEEN PANELS AND DEVICES. REFER TO E-SERIES DRAWINGS ELECTRICAL AND NEC FOR REQUIREMENTS FOR CONDUCTORS, RACEWAY AND WIRING DEVICES.

25. ALL OTHER POWER WIRING SHALL BE PROVIDED AS PART OF THE WORK OF E-SERIES DRAWINGS "ELECTRICAL".

26. PROVIDE COMPLETE WIRING DIAGRAMS FOR EQUIPMENT AND SYSTEMS. DELIVER WIRING DIAGRAMS TO PROPER PARTIES IN TIME FOR ROUGHING OF CONDUIT AND EQUIPMENT CONNECTIONS TO AVOID DELAY IN CONSTRUCTION SCHEDULE. WIRING DIAGRAMS AND ROUGHING INFORMATION TO CLEARLY INDICATE ITEMS TO BE MOUNTED AND/OR WIRED AS PART OF THE WORK OF E-SERIES DRAWINGS, "ELECTRICAL".

PART 2 - PIPING AND PIPING ACCESSORIES

1. STEEL PIPE AND FITTINGS: ASTM A53 OR A106, SCHEDULE 40 OR 80, BLACK OR GALVANIZED FINISH AS CALLED FOR. WELDED FITTINGS SHOULD FACTORY FORGED, BUTT WELD TYPE, CHAMFERED ENDS, "WELDOUTS" OR "THREADOUTS" MAY BE USED WHERE BRANCH CONNECTION SIZE IS TWO OR MORE SIZES SMALLER THAT THE MAIN, WELDING IN COMPLIANCE WITH THE NATIONAL CERTIFIED PIPE WELDING BUREAU.

2. SCREWED FITTING SHALL BE CAST OR MALLEABLE IRON, BLACK OR GALVANIZED OR DRAINAGE TYPE AS CALLED FOR, MAKE JOINTS WITH APPROPRIATE COMPOUND. UNIONS 2 INCH AND SMALL SHALL BE MALLEABLE CAST IRON, BRONZE TO IRON SEAT. 300 LB WWP COMPANION FLANGES FOR 2-1/2 INCH AND LARGER.

3. MECHANICAL PRESS FITTINGS FOR CARBON STEEL PIPING, ASTM 106, PRESS FIT EDPM SEALING ELEMENT APPLIED AND INSTALLED IN STRICT COMPLIANCE WITH MANUFACTURER. VIEGA MEPRESS OR APPROVED EQUAL.

4. THERMOPLASTIC PIPE AND FITTINGS: PVC, SCHEDULE 40 OR 80, ASTM D1785. SOCKET FITTINGS, SCHEDULE 40 OR 80, ASTM D2467. VALVES, SOCKET BALL VALVES 100 PSI WWP AT 250 DEGREES F, TEFLON SEAT. SOLVENT CEMENT ASTM D2564, BACK WELD 3 INCH AND LARGER.

5. POLYPROPYLENE POSITIVE PRESSURE VENTING: RIGID SINGLE WALL, FACTORY BUILT TYPE, DESIGNED FOR USE IN CONJUNCTION WITH CATEGORY II OR IV CONDENSING OR NON-CONDENSING GAS FIRED APPLIANCES. CONFORMS TO THE REQUIREMENTS OF THE NATIONAL FUEL GAS CODE, ANSI Z223.1 TO THE CANADIAN STANDARD ULC-S636, AS A CLASS IIA, IIB AND IIC, TYPE BH VENT SYSTEMS. COMPONENTS SHALL BE ULC LISTED. MAXIMUM CONTINUOUS FLUE GAS TEMPERATURE UP TO 230°F (110°C.). PROVIDE VENT SUPPORTS, ROOF AND WALL PENETRATIONS, TERMINATIONS, APPLIANCE CONNECTORS AND DRAIN FITTINGS REQUIRE TO INSTALL THE VENT SYSTEM BY THE VENT MANUFACTURER. VENT SYSTEMS MUST BE APPROVED BY THE MANUFACTURER OF THE GAS FIRED APPLIANCE. VENT SYSTEM SHALL BE ROUTED TO MAINTAIN MINIMUM CLEARANCE TO COMBUSTIBLES AS SPECIFIED BY THE MANUFACTURER. VENT LAYOUT SHALL BE FURNISHED AND INSTALLED IN COMPLIANCE WITH MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS AND ALL APPLICABLE LOCAL CODES. DURAVENT "POLYPRO" OR APPROVED EQUAL.

6. HANGERS SHALL BE ADJUSTABLE, MALLEABLE IRON OR STEEL, CADMIUM PLATED OR GALVANIZED. COPPER PLATED OR PVC COATED FOR COPPER PIPE. CLEVIS TYPE FOR 2-1/2 INCH AND LARGER.

PIPE SIZE	STEEL	PVC	ROD SIZE
3/4 TO 1 IN.	8 FT.	3 FT.	1/2 IN.
1-1/4 TO 2 IN.	10 FT.	3 FT.	3/8 IN.
2-1/2 TO 4 IN.	12 FT.	4 FT.	3/8 IN.
5 AND 6 IN.	12 FT.	4 FT.	5/8 IN.

7. PROVIDE SEISMIC RESTRAINT FOR ALL PIPING EXCEPT WHERE HANGERS ARE 12 INCH LONG OR LESS, 1 INCH OR LESS IN BOILER AND MECHANICAL ROOMS OR 2 INCH OR LESS IN ALL OTHER AREAS. WHERE SEISMIC RESTRAINTS ARE REQUIRED SPACE AT 40 FT. (20 FT. FOR GAS PIPING) FOR TRANSVERSE BRACING AND AT 80 FT. (40 FT. FOR GAS PIPING) FOR LONGITUDINAL BRACING, SUBMIT CERTIFIED ENGINEER SHOP DRAWING PRIOR TO INSTALLATION.

8. SUPPORTS SPACED FOR A MAXIMUM OF 1000 LBS, DRILLING INSERTS PHILLIPS "RED HEAD", UNISTRUT, BEAM CLAMPS AND OTHER STRUCTURALLY REVIEWED SUPPORT, FACTOR OF SAFETY SHALL BE AT LEAST FOUR.

9. DIELECTRIC PIPE FITTINGS ASTM B16.8, UNION 250 PSI, FLANGED 175 PSI, EPC OR CAPITOL MANUFACTURING. PROVIDE AT ALL DISSIMILAR PIPING CONNECTIONS.

10. SLEEVES TWO PIPE SIZES LARGER THAN PIPE, SCHEDULE 40 BLACK STEEL IN STRUCTURAL SURFACES, PVC OR 18 GAUGE SHEET METAL IN OTHER LOCATIONS, EXTEND 1/4 INCH ABOVE WATERPROOF FLOORS, SIZE TO PASS THROUGH INSULATION FOR REFRIGERANT AND DOMESTIC WATER, PACK VOID WITH LOOSE FIBERGLASS AND SEAL WITH WATERPROOF FIRESTOP MATERIAL, ASTM E814.

11. PIPING MATERIALS SCHEDULE:

SERVICE	PIPE MATERIALS	FITTINGS	CONNECTIONS
GAS (INTERIOR)	SCHEDULE 40, BLACK STEEL	2" AND SMALLER MALLEABLE, 2-1/2" AND LARGER BUTT WELDED.	SCREWED OR WELDED
GAS - OPTIONAL (INTERIOR)	SCHEDULE 40, BLACK STEEL	2" AND SMALLER MECHANICAL PRESS FITTINGS	INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS
GAS FIRED EQUIPMENT INTAKE	PVC	SOCKET WELDED	SOLVENT WELDED, PRIMER SHALL BE A CONTRASTING COLOR
GAS FIRED EQUIPMENT VENTING	POLYPROPYLENE	MANUFACTURERS FITTINGS	INSTALLED IN COMPLIANCE WITH THE BOILER MANUFACTURER

12. GAS VALVES: 2-1/2 IN. AND LARGER, LEVER ACTUATORS BOLTED GLAND TYPE, SHORT PATTERN, LUBRICATED PLUG TYPE, 175 LB. WOG, FLANGED, ROCKWELL, FIG. #143, UL LISTED.

13. GAS VALVES: 2 IN. AND SMALLER, 175 LB. WOG, MANUALLY ACTUATED, BOLTED COVER, SHORT PATTERN, LUBRICATED PLUG, SCREWED END. ROCKWELL FIG. #142, UL LISTED.

14. TESTS: TEST PIPING AND ACCESSORIES BEFORE CONCEALMENT. REPEAT AS MANY TIMES AS NECESSARY TO PROVE TIGHT SYSTEM. NOTIFY OWNER'S REPRESENTATIVE AT LEAST SEVEN DAYS IN ADVANCE OF EACH TEST. ISOLATE VALVES AND EQUIPMENT NOT CAPABLE OF WITHSTANDING TEST PRESSURES. MAKE LEAKS TIGHT; NO CAULKING PERMITTED. REMOVE AND REPLACE DEFECTIVE FITTINGS, PIPE OR CONNECTIONS. FURNISH NECESSARY PUMPS, GAUGES, EQUIPMENT, PIPING, VALVING, POWER AND LABOR FOR TESTING.

GAS PIPING: 100 PSI AIR PRESSURE, BUT NOT FOR LESS THAN SIX HOURS WITH A MAXIMUM LOSS 2 LB. OR AS REQUIRED BY LOCAL UTILITY COMPANY.

OTHER PIPING SYSTEMS: 150% OF NORMAL WORKING AIR PRESSURE, TWO HOURS DURATION.

15. PROVIDE WRITTEN CERTIFICATION THAT TESTS HAVE BEEN CONDUCTED AND SUCCESSFULLY COMPLETED. SUBMIT TO THE OWNER'S REPRESENTATIVE. PAY FOR ALL TESTING.

PART 3 - SHEET METAL AND SHEET METAL ACCESSORIES

1. DUCTWORK SHALL BE CONSTRUCTED FOR A MINIMUM PRESSURE CLASS OF 2 IN. WG. HANGERS, SUPPORTS, BRACING, GAUGES (26 GAUGE MINIMUM) AND WEIGHTS SHALL BE PER SMACNA AND NFPA. MATERIALS NEW, MARKED WITH MANUFACTURER'S NAME AND COMPLY WITH APPLICABLE ASTM AND ANSI STANDARDS. TRANSVERSE AND LONGITUDINAL JOINTS SHALL BE SEALED WITH DUCT JOINT SEALANT OR BE OF WELDED CONSTRUCTION.

2. RECTANGULAR DUCT SHALL HAVE CORNER CLOSURES AS DESCRIBED AND ILLUSTRATED BY SMACNA DUCT CONSTRUCTION STANDARDS. THROAT RADIUS OF ELBOW NOT LESS THAN DIMENSION OF DUCT IN PLANE OF RADIUS; WHERE THIS CANNOT BE MAINTAINED, USE SHORTER RADIUS WITH INTERNAL GUIDE VANES.

3. ROUND DUCTWORK SHALL BE SPIRAL LOCK SEAM OR CONTINUOUS FUSION-WELDED LONGITUDINAL SEAM. FITTINGS SHALL BE PRESS FORMED CONTINUOUS WELDED SEAMS. ADJUSTABLE ELBOWS MAY BE USED FOR ROUND DUCT UP TO 12 INCHES, SEAL ADJUSTABLE JOINT AFTER INSTALLATION. PIPE TO PIPE JOINTS SHALL BE MADE WITH SLEEVE COUPLINGS, PIPE TO FITTING JOINTS SHALL BE SLIP-FIT.

4. SEAL DUCT JOINTS WITH SEALANT, WATER BASED MASTIC, FIBER REINFORCED. AIR SEAL 33 OR APPROVED EQUAL.

5. CONFIGURATION AND SIZES OF DUCTWORK ARE THE BASIS OF DESIGN, RECTANGULAR ASPECT OR ROUND DUCTWORK MAY BE USED THAT MAINTAINS EQUIVALENT HYDRAULIC DIAMETER, STATIC LOSS AND DUCT VELOCITY. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF SIZES OF DUCTWORK AND LOCATIONS TO MAINTAIN CLEARANCES TO ALLOW PROPER INSTALLATION OF WORK OF OTHER TRADES AND BUILDING SYSTEMS.

6. PROVIDE SEISMIC RESTRAINT FOR ALL DUCTWORK EXCEPT WHERE HANGERS ARE 12 INCH LONG OR LESS OR HAVE A CROSS-SECTIONAL AREA OF 6 SQ. FT. OR LESS. WHERE SEISMIC RESTRAINTS ARE REQUIRED SPACE AT 40 FT. FOR TRANSVERSE BRACING AND AT 80 FT. FOR LONGITUDINAL BRACING, SUBMIT CERTIFIED ENGINEERED SHOP DRAWINGS PRIOR TO INSTALLATION.

7. FLEXIBLE CONNECTORS SHALL BE FIRE RETARDANT, WATER AND MILDEW RESISTANT AND COMPLY WITH UL STANDARD 214. MAKE CONNECTIONS WITH 1 INCH OF EXCESS MATERIAL BETWEEN EQUIPMENT COLLARS. FABRIC SHALL BE 20 OZ. PER SQUARE YARD. VENT FABRICS INC. "VENTFAB.".

8. SHEET METAL MATERIALS SCHEDULE:

SERVICE	MATERIAL	REQUIREMENTS
SUPPLY, RETURN, VENT, RELIEF AND EXHAUST	LOCK FORMING QUALITY, GALVANIZED STEEL ASTM 525	JOINTS AND FEATURES AS CALLED FOR NOTE 1
AIR PLENUMS AT ROOF OR WALL, INTAKE OR EXHAUST	GALVANIZED STEEL	BRAZE OR WELD WATERTIGHT

9. DUCT INSULATION: MAXIMUM THERMAL CONDUCTIVITY (K) SHALL BE 0.285 BTU/SQ. FT. HR. DEGREE F/IN. EXCLUDING AIR FILM AT 100 DEGREES F MEAN TEMPERATURE. RIGID BOARD TYPE: 3 LB. MINIMUM DENSITY, GLASS FIBERBOARD, 1 IN. MINIMUM THICKNESS. FACTORY APPLIED VAPOR BARRIER FINISH CONSISTING OF ALUMINUM FOIL REINFORCED WITH FIBERGLASS YARN; SEAMS AND JOINTS TAPED. FLEXIBLE BLANKET TYPE: LONG GLASS FIBER BLANKET, FACTORY APPLIED, FIBERGLASS YARN, REINFORCED ALUMINUM FOIL FACED VAPOR SEAL.

SERVICE	MATERIAL	THICKNESS	REMARKS
OUTSIDE AIR DUCTS AND PLENUMS	EXPOSED: RIGID FIBERGLASS CONCEALED: FLEXIBLE FIBERGLASS	R=12.0	PROVIDE NEAT FIT AT PLENUM
EXHAUST, RELIEF VENT, DUCTS AND PLENUMS	EXPOSED: RIGID FIBERGLASS CONCEALED: FLEXIBLE FIBERGLASS	R=6.0	INSULATE 15 FEET FROM EXTERIOR OPENING OR PENETRATION OF BUILDING INSULATION ENVELOPE

10. LOUVERS: FACTORY CONSTRUCTED ALUMINUM LOUVERS. 4 IN. DEEP STORMPROOF TYPE "K" BLADES. MULLIONS WHERE BLADE LENGTHS EXCEED 60 IN. WITH 1/2 IN. MESH, 14 GAUGE WIRE, ALUMINUM BIRD SCREEN SECURED IN REMOVABLE FRAME, SECURED TO BACK OF LOUVER, EXTRUDED SECTIONS 6063-T5 ALLOY, 0.8 IN. MINIMUM THICKNESS, 4 IN. DEEP, UNLESS OTHERWISE CALLED FOR. ONE PIECE STRUCTURAL HEAD. SILL EXTENSION AND SILL STYLE AS REQUIRED. STAINLESS STEEL FASTENERS: ANODIZED FINISH COLOR AS SELECTED AT REVIEW OF SUBMITTAL. GREENHECK "ESK-402" OR CONSTRUCTION SPECIALTIES, AMERICAN WARMING & VENTILATING INC., ARROW, CARNES, LOUVERS & DAMPERS, INC., RUSKIN

11. TYPE E - (EXHAUST REGISTERS): STEEL CONSTRUCTION WITH HORIZONTAL FRONT BARS SET AT 45 DEGREES AND CURVED HEMMED EDGE BLADES. WHITE FINISH. KEY OPERATED OPPOSED BLADE DAMPER. 1-1/4 IN. WIDE FLANGE WITH SPONGE RUBBER GASKET. FRAME STYLE TO MATCH CEILING TYPE IN EACH LOCATION. TITUS "350-RL" OR ANEMOSTAT, CARNES, KRUEGER, METALAIRE, PRICE.

PART 4 - EQUIPMENT

1. GAS-FIRED UNIT HEATER: THE UNIT HEATER SHALL BE HORIZONTAL GAS TYPE, FIRED UNIT WITH CAPACITY AS SCHEDULED. FACTORY ASSEMBLED AND WIRED AND TEST OPERATED. HEAVY GAUGE STEEL CABINET WITH BAKED ENAMEL FINISH. VENT AND INTAKE FLUE KIT. DYNAMICALLY BALANCED MULTI-SPEED BLOWER, WITH DIRECT DRIVE, SEALED AND PERMANENTLY LUBRICATED. THE MOTOR SHALL HAVE BUILT-IN THERMAL OVERLOAD PROTECTION, WITH MANUAL RESET. SEALED COMBUSTION GAS BURNER WITH COMBUSTION, OPERATING AND SAFETY CONTROLS WITH 100% SAFETY SHUT-OFF. GAS TRAIN SHALL INCLUDE PRESSURE REGULATING VALVE AND MAIN GAS SHUT-OFF VALVE. SEALED COMBUSTION, POWER VENTED. PROVIDE VENTING IN COMPLIANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. FAN AND LIMIT CONTROL ARRANGED FOR AUTOMATIC BLOWER OPERATION AND FOR PROTECTION AGAINST ABNORMAL OPERATING CONDITION. 24 VOLT CONTROL TRANSFORMER. THERMOSTAT AND GUARD. SOLID STATE ELECTRONIC SPARK IGNITION, INTERMITTENT PILOT. COMPLETE UNIT TO BE AGA AND UL LABELED. MAKE: REZNOR, JANITROL, STERLING, WING.

2. ELECTRIC UNIT HEATER: HORIZONTAL BLOW FAN TYPE, STEEL WITH BAKED ENAMEL FINISH AND TAMPERPROOF FRAME OR LOCKING CONTROL DOOR COVER. CAST ALUMINUM GRID HEATING ELEMENT OR METAL SHEATHED IN TUBULAR METAL JACKET CAST INTO ALUMINUM MOLDED FINS. REMOTE WALL MOUNTED THERMOSTAT THERMAL LIMIT SWITCH, CIRCUIT BREAKER AND FAN DELAY SWITCH. LINE POWER TERMINAL BLOCK FOR RATED VOLTAGE. ALUMINUM FAN WITH TOTALLY ENCLOSED SELF-LUBRICATING MOTOR. MARKEL OR BERKO, Q-MARK.

3. STEEL IN-LINE FANS: STRAIGHT AIRFLOW NON-OVERLOADING, STEEL CENTRIFUGAL WHEEL WITH BACKWARD CURVED FAN, STATICALLY AND DYNAMICALLY FACTORY BALANCED, HEAVY GAUGE STEEL HOUSING, REINFORCED, PRIME COATED, INTERNAL 2 IN. THICK MAT FACED GLASS FIBERBOARD ACOUSTICAL MATERIAL, DIRECT DRIVE, ECM MOTOR, UNIT MOUNTED VARIABLE SPEED SWITCH, TOGGLE DISCONNECT, J-BOX UNIT MOUNTED AND WIRED, COMPANION FLANGES AND SUPPORT BRACKETS. MAKE: CARNES OR ACME, GREENHECK, PENN.

4. CEILING FANS (FUTURE, NOT IN CONTRACT): ACOUSTICALLY INSULATED HOUSING CONSTRUCTED OF HEAVY GAUGE STEEL, PHOSPHATIZED AND FINISHED IN BAKED-ON ENAMEL, ADJUSTABLE MOUNTING BRACKETS, PERMANENTLY LUBRICATED RESILIENTLY MOUNTED MOTOR, INTEGRAL JUNCTION BOX WITH DISCONNECT SWITCH, BACKDRAFT DAMPER AT FAN DISCHARGE, ALUMINUM OR PLASTIC INLET GRILLE, WITH OUTLET DUCT COLLARS AND WALL CONTROL SWITCHES. MULTI-SPEED CONTROLLER WITH ADJUSTABLE DELAY TIMER. WALL CAP OR ROOF CAP AIR TERMINAL AS CALLED FOR. MAKE: PANASONIC "WHISPERGREEN" WITH "MULTI-SPEED MODULE" OR ACME, CARNES, COOK, GREENHECK, ILG, PENN.

PART 5 - CONTROLS, ADJUSTING AND BALANCING

1. PROVIDE A COMPLETE STANDALONE LOCAL AUTOMATIC TEMPERATURE CONTROL SYSTEM.

PROVIDE WIRING AND CONDUIT AS REQUIRED TO CONNECT DEVICES FURNISHED AS PART OF OR ADJUNCTIVE TO THIS AUTOMATIC CONTROL SYSTEM REGARDLESS OF THE SOURCE OF SUPPLY. POWER AND CONTROL CIRCUITS, 120 VOLT MAXIMUM, TO ELECTRICAL PANELS. COMMUNICATION WIRING TO TELEPHONE SERVICE ENTRANCE. INSTALL WIRING IN ACCORDANCE WITH REQUIREMENTS OF DIVISION 26 "ELECTRIC" AND NATIONAL ELECTRICAL CODE.

PROVIDE WIRING, CONDUIT AND DEVICES REQUIRED FOR PROPER SYSTEM OPERATION, INCLUDING SPECIAL ELECTRICAL SWITCHES, TRANSFORMERS, DISCONNECT SWITCHES, RELAYS, CIRCUIT BREAKER PROTECTION AND OTHER DEVICES AS REQUIRED.

AUTOMATIC DAMPERS SHALL BE LOW LEAKAGE, LESS THAN 1/2% AT 1500 FPM AND 4 INCH STATIC PRESSURE, OPPOSED BLADES FOR MODULATING FUNCTIONS, PARALLEL BLADES FOR TWO POSITION FUNCTIONS, EXTRUDED ALUMINUM BLADES, BLADES NOT OVER 8 INCHES WIDE, BLADES THERMALLY BROKEN AND INSULATED, EDGE AND SIDE SEALS, MAXIMUM PRESSURE DROP 0.1 INCH AT 1500 FPM, PROPORTIONING ELECTRIC ACTUATOR SUITABLE FOR FREEZING CONDITIONS, SQUARED OR KEY LINKAGE CONNECTION AT THE SHAFTS, FOR SIZE AS CALLED FOR. ARROW AFDTI-25LT AND BELIMO ACTUATOR.

2. GUARANTEE THE NEW CONTROL SYSTEM FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP, EXCEPT FOR DAMAGES FROM OTHER CAUSES, FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE OR OWNER OCCUPANCY, WHICHEVER IS EARLIER. MAINTAIN TEMPERATURES WITHIN 1 DEGREE F ABOVE AND BELOW SETTING.

WHEN THE WORK HAS BEEN COMPLETED, COMPLETELY ADJUST THE CONTROL SYSTEM. TAG EQUIPMENT WITH DESIGNATION FROM THE CONTROL DIAGRAM. PROVIDE COMPETENT CONTROL TECHNICIANS TO INSTRUCT THE OWNER'S OPERATING PERSONNEL AND TURN OVER THREE COPIES OF MAINTENANCE MANUAL: TOTAL OF ONE (1) WORKING DAY. CERTIFY IN WRITING THAT FACTORY STARTUP AND OWNER INSTRUCTIONS ARE PROVIDED.

3. ELECTRIC UNIT HEATERS

WALL MOUNTED ELECTRIC THERMOSTAT SHALL STAGE THE HEATING COIL AND CYCLE THE UNIT FAN TO MAINTAIN SET POINT 60 DEGREES F (ADJ.). UNIT SHALL PREVENT THE FAN FROM RUNNING ON "NO AIR FLOW". UNIT FAN SHALL DELAY OFF TO DISSIPATE COIL ELEMENT HEAT.

4. GAS FIRED UNIT HEATERS

WALL MOUNTED SPACE THERMOSTAT SHALL CYCLE THE UNIT HEATER AND STAGE GAS HEATING TO MAINTAIN SPACE SET POINT 60 DEGREES (ADJ.).

5. TOILET EXHAUST FANS (FUTURE, NOT IN CONTRACT)

FANS SHALL BE INTERLOCKED TO OPERATE WHENEVER THE BATHROOM LIGHT IS ON AND CONTINUE TO OPERATE FOR 5 MINUTES (ADJ.) WHEN THE LIGHT IS TURNED OFF.

6. STORAGE TENANT BAY VENTILATION

MINIMUM VENTILATION EXHAUST FAN SHALL OPERATE CONTINUOUSLY, NORMAL CLOSED MOTORIZED DAMPER SHALL OPEN WHENEVER FAN OPERATES. PROVIDE TWO CO AND NO2 SENSORS (MOUNTED HIGH AND LOW IN THE SPACE). PROVIDE INTERLOCK WITH THE DISPATCH SYSTEM. HIGH VOLUME EXHAUST SHALL OPERATE TO MAINTAIN CO 25 PPM (ADJ.) AND NO2 0.25 PPM (ADJ.) SET POINTS. IF THE CO OR NO2 LEVELS ARE ABOVE SET POINT FOR 5 MINUTES (ADJ.) THE FAN SHALL START, IF THE LEVELS ARE ABOVE SET POINT FOR AN ADDITIONAL 10 MINUTES (ADJ.) AN ALARM SHALL SOUND. HIGH VOLUME EXHAUST FAN SHALL OPERATE AT 100% SPEED WHENEVER THE DISPATCH SYSTEM ALARMS AND FOR 10 MINUTES (ADJ.) AFTER THE ALARM CLEARS. HIGH VOLUME EXHAUST SHALL START THE FAN WHEN SPACE TEMPERATURE IS ABOVE 80 DEGREES F (ADJ.). NORMALLY CLOSED EXHAUST DISCHARGE DAMPER SHALL OPEN WHENEVER ITS ASSOCIATED FAN OPERATES, MAKEUP AIR INTAKE DAMPERS SHALL OPEN WHENEVER THE HIGH VOLUME FAN OPERATES.

7. HOUSE UTILITY ROOM EXHAUST

SPACE TEMPERATURE SENSOR SHALL START THE FAN WHEN SPACE TEMPERATURE IS ABOVE 80 DEGREES F (ADJ.). NORMALLY CLOSED EXHAUST DAMPERS AND MAKEUP AIR INTAKE DAMPERS SHALL OPEN WHENEVER THE FAN OPERATES.

8. ADJUSTING AND BALANCING: BALANCING REPORT SHALL BE TYPED AND THREE COPIES SUBMITTED FOR REVIEW, RESULTS SHALL BE GUARANTEED. CONTRACTOR SHALL BE SUBJECT TO RECALL TO SITE TO VERIFY THE REPORT INFORMATION BEFORE ACCEPTANCE OF THE REPORT BY THE OWNER'S REPRESENTATIVE.

BALANCING CONTRACTOR SHALL FOLLOW THE PROCEDURES OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB).

PLACE SYSTEMS IN SATISFACTORY OPERATING CONDITION. ADJUSTING AND BALANCING SHALL BE ACCOMPLISHED AS SOON AS THE SYSTEMS ARE COMPLETE AND BEFORE OWNER TAKES POSSESSION. ADJUSTING AND BALANCING SHALL BE ACCOMPLISHED UNDER APPROPRIATE OUTDOOR TEMPERATURE CONDITIONS. PERFORM NECESSARY MECHANICAL ADJUSTMENTS IN CONJUNCTION WITH BALANCING PROCEDURE. REPLACE DAMPERS IN SYSTEMS THAT CANNOT BE MANIPULATED TO SATISFY BALANCING REQUIREMENTS.

AIR SYSTEMS: TEST AND ADJUST FAN RPM TO DESIGN REQUIREMENTS. TEST AND RECORD MOTOR NO LOAD AND FULL LOAD AMPERES AND DETERMINE OPERATING BRAKE HORSEPOWER. TEST AND RECORD SYSTEM STATIC PRESSURES, SUCTION AND DISCHARGE. TEST AND ADJUST ZONES AND SYSTEM FOR DESIGN EXHAUST AIR CFM.

TEST AND ADJUST ZONES TO PROPER DESIGN EXHAUST REGISTER TO WITHIN 10% OF DESIGN REQUIREMENTS.

Cushing Terrell

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GFIA WAREHOUSE

MONTANA
MARK DAVID VINCELLO
59667 PE
LICENSED
PROFESSIONAL ENGINEER

BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | VINCELLO
DRAWN BY | BLAKE
REVIEWED BY | LAST NAME
REVISIONS

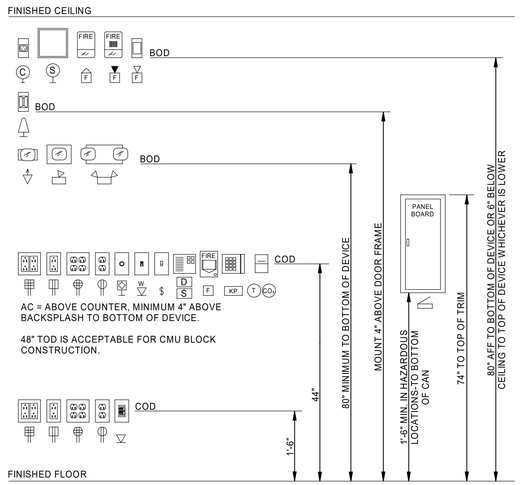
MECHANICAL SPECIFICATIONS

M600

GENERAL NOTES (APPLICABLE TO ALL SHEETS)

1. ALTHOUGH NOT SHOWN, ALL RACEWAYS SHALL BE EQUIPPED WITH AN EQUIPMENT GROUNDING CONDUCTOR.
2. THE CONDUCTOR SIZE CALLED OUT IN THE HOME RUN SHALL BE CARRIED THROUGHOUT THE ENTIRE CONDUIT.
3. DRAWINGS INDICATE GENERAL DIRECTIONS AND ROUTES OF FEEDERS, BRANCH CIRCUITS, AND SERVICE CONDUCTOR SYSTEMS. DETERMINE EXACT ROUTE AND INSTALLATION OF ELECTRICAL WIRING WITH CONDITIONS OF CONSTRUCTION.
4. PRIOR TO ROUGH-IN, COORDINATE EXACT LOCATIONS OF ALL DEVICES AND EQUIPMENT WITH ARCHITECTURAL ELEVATIONS, MILLWORK, REFLECTED CEILING PLANS, AND MECHANICAL EQUIPMENT.
5. ALL EXISTING CONDITIONS ARE NOT SHOWN ON THE DRAWINGS. CONTRACTOR SHALL CAREFULLY EXAMINE THE EXISTING SITE AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS. NO ADDITIONAL CHARGES WILL BE ALLOWED DUE TO THE LACK OF PRE-BID SITE EXAMINATION.
6. THE EXACT LOCATION OF ELECTRICAL EQUIPMENT SHALL BE COORDINATED WITH STRUCTURE AND MECHANICAL EQUIPMENT. ADJUST EQUIPMENT LOCATION AS REQUIRED TO MAINTAIN NEC WORKING CLEARANCES.
7. ALL SPARE CONDUITS SHALL CONTAIN A PULL CORD. EACH END OF THE CONDUIT SHALL HAVE A LABEL IDENTIFYING THE TERMINATION POINT OF THE OPPOSITE END OF THE CONDUIT.
8. COORDINATE EXACT LOCATION OF ALL WALL MOUNTED VOICE/DATA OUTLETS WITH POWER OUTLETS. ADJUST LOCATION OF ALL VOICE DATA OUTLETS SO THAT THEY ARE LOCATED AT THE SAME ELEV. AND OFFSET HORIZONTALLY 6".
9. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UNDERGROUND UTILITIES PRIOR TO EXCAVATION. ANY DAMAGE TO THE EXISTING UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
10. ALL CIRCUITS SHALL CONTAIN A DEDICATED NEUTRAL CONDUCTOR. SHARED NEUTRAL CONDUCTORS ARE NOT ALLOWED.
11. CONTRACTOR IS RESPONSIBLE FOR ALL TRENCHING, PATCHING, EXCAVATION, BACKFILL AND RESTORATION RELATED TO THEIR WORK.
12. IT SHALL BE THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO CONTACT THE LOCAL UTILITY COMPANY AND COORDINATE/SCHEDULE THE INSTALLATION OF THE ELECTRICAL SERVICE. ALL SERVICE CONNECTION FEES ARE THE RESPONSIBILITY OF THE OWNER.

INTERIOR BOX MOUNTING HEIGHTS



ELECTRICAL LEGEND

SYMBOLS APPLY ONLY WHEN USED ON DRAWINGS

LIGHTING

SYMBOL	DESCRIPTION
	LAY-IN OR RECESSED FIXTURE, SIZE ON PLANS
	WALL MOUNTED FIXTURE, SIZE ON PLANS
	SURFACE MOUNTED FIXTURE, SIZE ON PLANS
	PENDANT OR SURFACE MOUNTED FIXTURE, SIZE ON PLANS
	PENDANT MOUNTED FIXTURE, SIZE ON PLANS
	SHADED FIXTURE INDICATES FIXTURE IS UNSWITCHED AND ALSO INDICATES EMERGENCY POWER.
	RECESSED DOWNLIGHT FIXTURE
	SURFACE MOUNTED FIXTURE
	WALL MOUNTED FIXTURE
	WALL WASH OR DIRECTIONAL FIXTURE
	WALL SCONCE FIXTURE
	TRACK FIXTURE, SEE PLAN FOR SIZE AND HEADS
	CEILING FAN FIXTURE
	CEILING MOUNTED, WALL MOUNTED EXIT LIGHT (W/ DIRECTIONAL ARROWS)
	1 HEAD REMOTE EMERGENCY LIGHT
	2 HEAD EMERGENCY LIGHT BATTERY PACK
	1 HEAD REMOTE EMERGENCY LIGHT BATTERY PACK
	2 HEAD LIGHT WITH MOTION SENSOR
	SQUARE POLE MOUNTED FIXTURE, EXTERIOR
	ROUND POLE MOUNTED FIXTURE, EXTERIOR
	POST TOP FIXTURE, EXTERIOR
	BOLLARD FIXTURE, EXTERIOR
	DIRECTIONAL INGROUND FIXTURE, EXTERIOR

ABBREVIATIONS AND MISCELLANEOUS

SYMBOL	DESCRIPTION
AC	ABOVE COUNTER, 4" BACK SPLASH
ATS	AUTOMATIC TRANSFER SWITCH
AFG	ABOVE FINISHED GRADE
AFF	ABOVE FINISHED FLOOR
BLG	BELOW GRADE
BOD	BOTTOM OF DEVICE
C	CONDUIT
CAS	CARD ACCESS SYSTEM
CCTV	CLOSED CIRCUIT TV
CLG	CEILING
COD	CENTER OF DEVICE
CU	COPPER
DVR	DIGITAL VIDEO RECORDER
(E)	EXISTING
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
GC	GENERAL CONTRACTOR
GND	GROUND
LSI	FIELD ADJUSTABLE LONG TIME, SHORT TIME AND INSTANTANEOUS
LSIG	FIELD ADJUSTABLE LONG TIME, SHORT TIME, INSTANTANEOUS AND GROUND FAULT
MC	MECHANICAL CONTRACTOR
(N)	NEW
NL	NIGHT LIGHT
PTZ	PAN-TILT-ZOOM
QTY	QUANTITY
(R)	RELOCATED
SF	SURFACE
TBB	TELECOMMUNICATIONS BONDING BACKBONE
TC	TEMPERATURE CONTROL CONTRACTOR
TMGB	TELECOMMUNICATIONS MAIN GROUNDING BUS BAR
TTB	TELEPHONE TERMINAL BOARD
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
W/	WITH
WM	WIRE MOLD
WP	WEATHER PROOF (WHILE IN USE)
XFMR	TRANSFORMER
a,b,c etc	SWITCH DESIGNATION
BN1L-2,4,6	CIRCUIT DESIGNATION, PANEL BN1L, CIRCUITS 2,4,6
1/E501	INDICATES DETAIL 1 ON SHEET E501
	SHEET WORK NOTE
	SHEET DEMO WORK NOTE
	HOME RUN TO PANEL
	CONDUIT CONCEALED IN CEILING OR WALL
	CONDUIT CONCEALED UNDER FLOOR
LV	LOW VOLTAGE CIRCUIT
	FIBER OPTIC CABLE
	CABLE TRAY
///	CIRCUIT, NUMBER OF HASH MARKS INDICATES NUMBER OF CONDUCTORS IN CABLE/RACEWAY. GROUND WIRE IS NOT SHOWN BUT SHALL BE INCLUDED. NO HASH MARKS INDICATES 2 CONDUCTORS PLUS GROUND.

DEVICES AND POWER

SYMBOL	DESCRIPTION
$	SWITCH - SPST 2 SINGLE POLE, DOUBLE THROW 3 THREEWAY 4 FOURWAY K KEY OPERATED P PILOT LIGHT WP WEATHERPROOF OS OCCUPANCY SENSOR D DIMMER MC SPOT-MOMENTARY CONTACT LV LOW VOLTAGE T TIMER SWITCH TS TEST SWITCH
OS	OCCUPANCY SENSOR (CEILING) - SUBSCRIPT IS TYPE
	RECEPTACLE - SIMPLEX
CLG	RECEPTACLE - DUPLEX, MOUNTING IN CEILING
CLG	GFI RECEPTACLE - DUPLEX, MOUNTING IN CEILING
	RECEPTACLE - DUPLEX GFI RECEPTACLE - DUPLEX (GROUND FAULT INTERRUPT) USB DEVICE RECEPT W/2 USB PORTS DC DROP CORD WP WEATHERPROOF COVER & WEATHER RESISTANT RECEPTACLE TR TAMPER RESISTANT S SURGE PROTECTED IG ISOLATED GROUND
	RECEPTACLE - DOUBLE DUPLEX
	GFI RECEPTACLE - DOUBLE DUPLEX - SAME INDICATORS AS SHOWN FOR DUPLEX RECEPTACLE
	RECEPTACLE - 1/2 SWITCHED, 1/2 CONTINUOUS POWER
	RECEPTACLE - DOUBLE DUPLEX - 1/2 SWITCHED, 1/2 CONTINUOUS POWER
	RECEPTACLE - 208V R RANGE - NEMA 14-50R D DRYER - NEMA 14-30R W WELDER - NEMA 14-50R * NEMA CONFIGURATION AS NOTED
	208V RECEPTACLE IN RECESSED FLOORBOX
	DUPLEX RECEPTACLE/GFI IN RECESSED FLOORBOX
	DOUBLE DUPLEX RECEPTACLE/GFI IN RECESSED FLOORBOX
J	J-BOX - BOX INDICATES FLOOR MOUNTING -4"X4"X2-1/8" DEEP UNLESS OTHERWISE NOTED
PP	POWER POLE
T	THERMOSTAT/TEMPERATURE SENSOR BY MC OR TC, J-BOX AND CONDUIT TO CEILING BY EC
CO	CARBON MONOXIDE DETECTOR BY MC, J-BOX & CONDUIT TO CEILING BY EC
$M	MANUAL MOTOR DISCONNECT/STARTER SWITCH
	EMERGENCY PUSHBUTTON
R	RELAY
PC PC	PHOTOCELL, PHOTOCELL WALL MOUNTED
	SPECIAL PURPOSE CONNECTION - BOX INDICATES FLOOR MOUNTING - WORK AS NOTED
	ELECTRIC MOTOR CONNECTION
	COMBINATION STARTER/DISCONNECT SWITCH
	DISCONNECT SWITCH
	CONTACTOR
	CIRCUIT BREAKER
VFD	VARIABLE FREQUENCY DRIVE
	CONTROL PANEL LRP LIGHTING RELAY PANEL TCP TEMPERATURE CONTROL PANEL GAP GENERATOR ANNUNCIATOR PANEL PACP PA CONTROL PANEL MGA MED GAS ALARM PANEL
TC	TIME CLOCK
	PANELBOARD, SURFACE MOUNTED
	PANELBOARD, FLUSH MOUNTED
or	ELECTRIC METER, BUILDING MOUNTED
XFMR	TRANSFORMER, INTERIOR
	TRANSFORMER, EXTERIOR

LIGHTING FIXTURE SCHEDULE

FIXTURE					MOUNTING		OPTIONS		NOTES
TYPE	DESCRIPTION	MFG.	CATALOG NUMBER	LUMENS	VOLTS	VA	TYPE	HEIGHT	EMERGENCY	DIMMABLE	
P1	LED HIGH BAY FIXTURE, MOTION SENSOR	LITHONIA	JEBL 12000LM GL MVOLT 40K 80CRI VBF SCF120 SBOR6 DWHXD	13630	MVOLT	95	PENDANT	18'-0"		X	
S1	4' LED STRIP LIGHT	LITHONIA	ZL1N L48 5000LM FST MVOLT 35K 80CRI WH HC36 M12	4515	MVOLT	34	CHAIN				
W1	LED WALL MOUNTED EXTERIOR FIXTURE, BATTERY	LITHONIA	WPX1 LED P1 30K MVOLT E14WC DDBXD	1537	MVOLT	11	WALL	NOTE 1	X		1
W2	LED WALL MOUNTED EXTERIOR FIXTURE	LITHONIA	WPX1 LED P2 30K MVOLT DDBXD	2748	MVOLT	24	WALL	NOTE 1			1
ELU	LED EXIT SIGN EMERGENCY LIGHTING UNIT COMBO	LITHONIA	ECRG RD M6		MVOLT	2	WALL	NOTE 2			2

NOTES:
1. REFER TO ARCHITECTURAL ELEVATIONS FOR MOUNTING HEIGHT.
2. MOUNT 6" ABOVE DOOR AND CENTER OVER DOOR.

CONTROL AND DISCONNECT SCHEDULE

ITEMS BY OTHERS							ITEMS BY ELECTRICAL CONTRACTOR								CONTROL EQUIPMENT BY INDICATED CONTRACTOR			NOTES
							STARTER						FUSES	DISCONNECT				
UNIT	VOLTAGE	PHASE	KW	MCA	FLA	HP	STARTER TYPE	NEMA SIZE	COIL VOLTAGE	H-O-A	ON/OFF	PILOT	INTERLOCK		ADDITIONAL CONTROL DEVICES	INSTALLED BY	FURNISHED BY	
EF-1	120	1				1/10								PROVIDED W/UNIT				
EF-2	120	1				1/10								PROVIDED W/UNIT				
EF-3	120	1				3/4								PROVIDED W/UNIT				
EF-4	120	1				1/10								PROVIDED W/UNIT				
EF-5	120	1				3/4								PROVIDED W/UNIT				
EF-6	120	1				1/10								PROVIDED W/UNIT				
EF-7	120	1				3/4								PROVIDED W/UNIT				
EUH-1	208	1	3											PROVIDED W/UNIT				
UH-1	120	1				1/2								PROVIDED W/UNIT				
UH-2	120	1				1/4								PROVIDED W/UNIT				

NOTES:

ABBREVIATIONS:
WP = NEMA 3R
IL = INTERLOCK
COMB FVNR = COMBINATION FULL VOLTAGE NON-REVERSING
OL = THERMAL OVERLOAD
MC = MECHANICAL CONTRACTOR
EC = ELECTRICAL CONTRACTOR
TC = TEMPERATURE CONTROLS CONTRACTOR
MCA = MINIMUM CIRCUIT AMPS
FLA = FULL LOAD AMPS

ELECTRICAL SHEET INDEX

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GREAT FALLS INTERNATIONAL AIRPORT

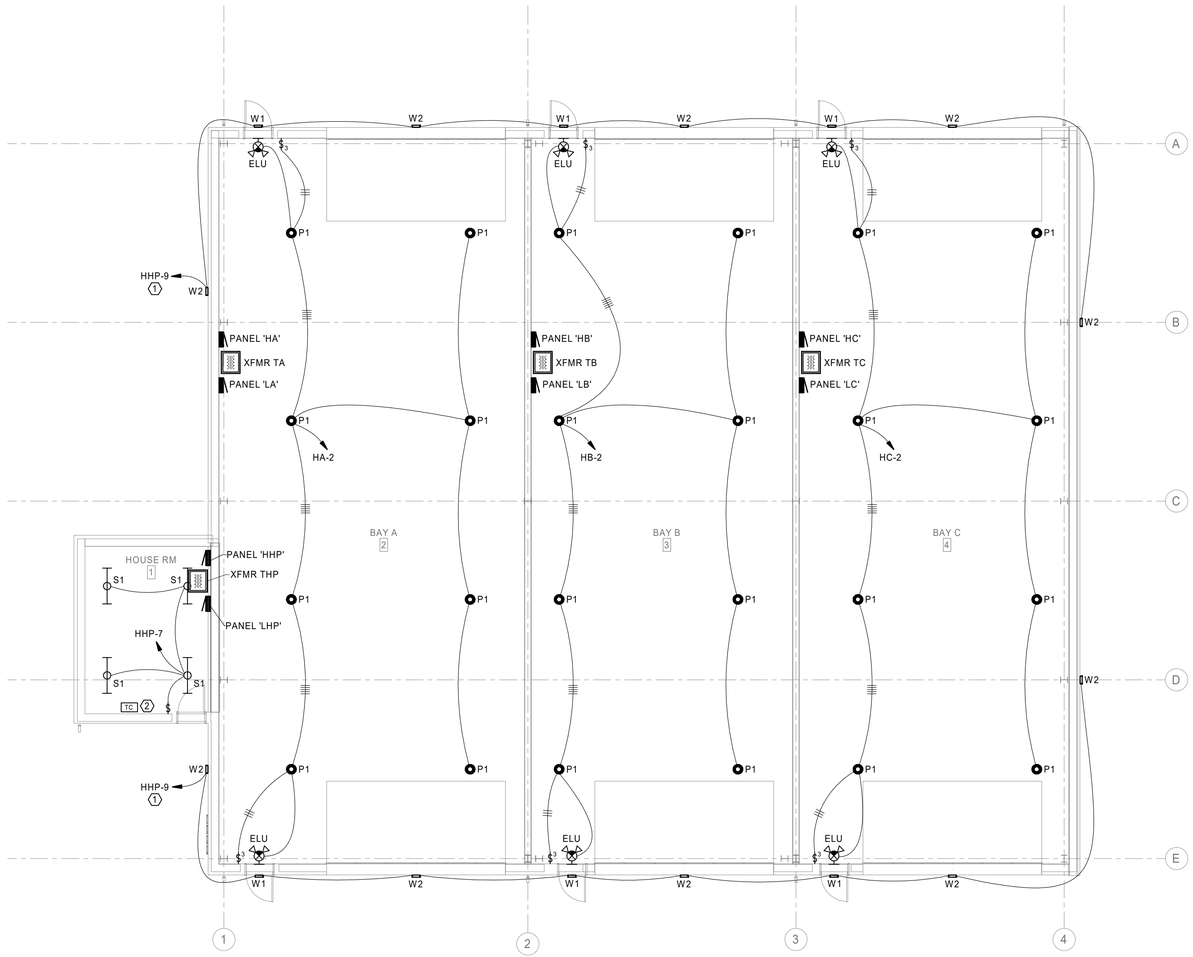
GFIA WAREHOUSE

BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | MAEHL
DRAWN BY | GALLI
REVIEWED BY | MAEHL
REVISIONS

ELECTRICAL LEGEND AND SCHEDULES

E001



1 E201 LIGHTING PLAN

1/8" = 1'-0"

NORTH REF

GENERAL NOTES

A. COMPLY WITH LATEST ADOPTED NEC AND APPLICABLE CODES/STANDARDS.
B. SHARED NEUTRALS ARE NOT ALLOWED FOR SINGLE PHASE BRANCH CIRCUITS.

KEYNOTES

1. ROUTE CIRCUIT THROUGH EXTERIOR LIGHTING TIME CLOCK LOCATED IN HOUSE ROOM.
2. EXTERIOR LIGHTING TIME CLOCK. TORK MODEL # E201B OR APPROVED EQUAL. COORDINATE TIME SETTINGS WITH OWNER AND PROVIDE PROGRAMMING.

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GFIA WAREHOUSE

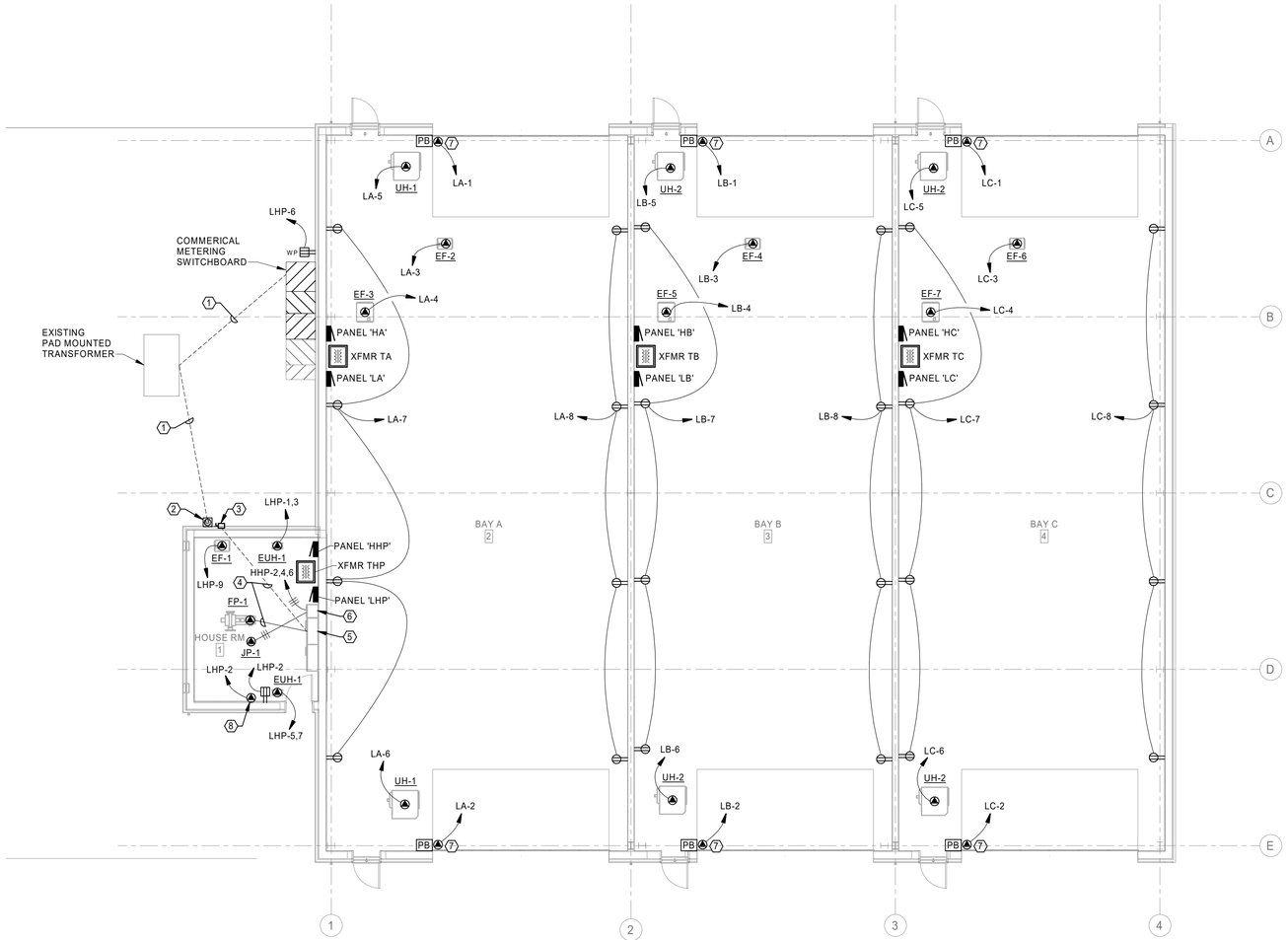
MONTANA
CARL J. MAEHL
10488 PE
LICENSED PROFESSIONAL ENGINEER

BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | MAEHL
DRAWN BY | GALLI
REVIEWED BY | MAEHL
REVISIONS

LIGHTING PLAN

E201



1 / E301 POWER PLAN

1/8" = 1'-0"

NORTH REF

GENERAL NOTES

A. COMPLY WITH LATEST ADOPTED NEC AND APPLICABLE CODES/STANDARDS.
B. SHARED NEUTRALS ARE NOT ALLOWED FOR SINGLE PHASE BRANCH CIRCUITS.

KEYNOTES

1. NEW UNDERGROUND SECONDARY SERVICE. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS.
2. PROVIDE METER BASE PER NWE REQUIREMENTS.
3. FIRE PUMP SERVICE DISCONNECT. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS.
4. FIRE PUMP FEEDER. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS.
5. FIRE PUMP CONTROLLER. SEE FIRE PROTECTION DRAWINGS.
6. JOCKEY PUMP CONTROLLER. SEE FIRE PROTECTION DRAWINGS.
7. PROVIDE A 120 VOLT CONNECTION TO MOTORIZED DOOR OPERATOR AND PUSH BUTTON. COORDINATE LOCATIONS AND REQUIREMENTS WITH DOOR SUPPLIER PRIOR TO ROUGH-IN.
8. PROVIDE A 120 VOLT CONNECTION TO FIRE ALARM CONTROL PANEL.

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REVISIONS

POWER PLAN

E301

ELECTRICAL SPECIFICATIONS

DIVISION 26 - ELECTRICAL

SCOPE

The provisions, terms and requirements of Division 1 and 2, the applicable Drawings and Technical Specifications herein shall apply to work under this Division.

This Work consists of, but is not necessarily limited to, the furnishing of all labor, equipment, appliances and materials and the performance of all operations in connection with the installation of all electrical work completed, in strict accordance with Specifications and/or Drawings, applicable codes, including incidental materials necessary and required for their completion.

"PROVIDE" = Furnished and installed complete. "OR EQUAL" = Or equal as approved to quote by Engineer, 10 days prior to Bid.

260000 - COMMON WORK RESULTS

A. Intent of Drawings: Drawings are partly diagrammatic and do not show exact location of conduit unless specifically dimensioned.

B. Workmanship:
1. Work shall be accomplished by workmen skilled in particular trade, in conformance with best practices and accepted standards.
2. Work shall contribute to efficiency of operation, accessibility, maintenance and appearance. No part of installation shall interfere with operation of any other system or part of building.
3. Non-satisfactory work shall be corrected at no additional expense to Owner.

C. Responsibility:
1. The Electrical Contractor is responsible for installation of satisfactory and complete work in accordance with the intent of Drawings and Specifications. Provide, at no extra cost, incidental items required for completion of work even though not specifically mentioned or indicated in Specifications or on Drawings.
2. If, at any time, and in any case, change in location of conduit, outlets, fixtures, switches, panels, electrical equipment or associated components, etc., becomes necessary due to obstacles or installation of other trades, such required changes shall be made by Contractor at no extra cost.
3. Conflicts discovered during construction shall be immediately called to the attention of the Engineer for decision. Do not proceed with installation in area of question until conflict has been fully resolved.
4. Coordinate all electrical work with other trades to prevent unnecessary delays in the construction schedule.
5. Excavation and backfill required by electrical installations shall be accomplished in accordance with Division 2 by this Contractor.
6. Provide temporary electrical power and lighting for all trades that require service during the course of this Project. Provide temporary service and distribution as required. Comply with the NFPA 70 and OSHA requirements. (Energy costs by General Contractor.)

D. Guarantee-Warranty: This Contractor shall and hereby does warrant and guarantee:
1. That all work executed under this Section will be free from defects of materials and workmanship for a period of one year from the date of final acceptance of this work.
2. The Contractor agrees to, at the Contractor's own expense, repair and replace all such defective materials and work and all other work damaged thereby which becomes defective during the term of warranty. Agreement does not include damages done by Owner.

E. Permits, Tests, Codes and Standards:
1. Electrical Contractor to pay for all permits and fees in connection with this work.
2. WORK SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITIONS OF ADOPTED LOCAL, STATE AND NATIONAL CODES AND ORDINANCES, THE STATE FIRE MARSHAL, AND UTILITY COMPANY REGULATIONS.
3. Electrical work shall conform to National Electrical Codes, latest editions, as a minimum requirement.
4. All material to conform with applicable standards.

F. Discrepancies: Prior to submitting Bid, Contractor shall refer any apparent discrepancies or omissions to engineer for clarification.

G. Prior Approvals: All proposed substitutions shall be received by the Engineer 10 days prior to Bid. Priors received after 3 p.m. of the 10th day will be rejected. Supply technical data, photometrics and dimensional Drawings showing that substitutes are equal to product specified.

H. Shop Drawing Submittals:
1. In addition to distribution requirements for submittals specified in Division 1 Section "Submittals," submit Electronic Drawings in pdf format for final and official approval through the General Contractor as listed below.

Additional copies may be required by individual Sections of these Specifications. Copies of price list sheets are not acceptable. Manufacturer's name and address must appear on each sheet. All copies shall be legible.

Shop Drawings shall include a completed specification sheet of all equipment along with fabrication, installation drawings, setting diagrams, schedules, patterns, templates and similar Drawings.

I. Project Close-Out Record Documents:
1. Provide three full size sets, unless more are called for under Division 1 (one for Engineer and one for Owner). In addition to requirements called for under Division 1, indicate the following installed conditions:
a. Actual location of all electrical service gear/feeders, panel/motor/special equipment feeders, all major underground or underslab conduits, all conduit stubs for future use, any change in branch circuitry from Drawings, key junction boxes and pull boxes not indicated on Drawings, any control locations or indicator lights not shown on Drawings.
b. Addendum items, change order items and all changes made to Drawings from Bidding phase through to Project completion.
c. Actual equipment and materials installed. Where manufacturer and catalog number are indicated on Drawings, generally or in fixture or equipment schedules, change to reflect actual products installed.
d. Change service panel and branch panel breaker locations and schedules to reflect actual installed conditions.

J. Project Close-out Maintenance Manuals:
1. Prepare 3 copies, unless more are called for under Division 1 (one for Engineer, two for Owner). In addition to requirements under Division 1, provide heavy duty, durable 3-ring vinyl covered loose-leaf binder for each manual sized to receive 8.5 inch by 11 inch paper. Provide a clear plastic sleeve on the spine to hold labels and pockets in the cover to receive folded sheets. In manual, include all Shop Drawings, installation/operation/maintenance data furnished with electrical equipment. List project name, date, and Contractor's name, address and telephone number. Include index sheet for each Specification Section indicating equipment, with supplier and supplier's telephone number. Provide tabbed dividers indicating major groupings of equipment.
2. Turn over to Owner all spare equipment and devices specified and shown.

K. Supporting Equipment:
1. Unless otherwise indicated, fasten electrical items and their supporting hardware securely to the building structure, including conduits, raceways, cables, busways, cabinets, panelboards, transformers, boxes, disconnect switches, and control components. Fasten by means of wood screws or screw-type nails on wood, toggle bolts on hollow masonry units, concrete inserts or expansion bolts on concrete or solid masonry, and machine screws, welded threaded studs, or spring-tension clamps on steel. Threaded studs driven by a power charge and provided with lock washers and nuts may be used instead of expansion bolts and machine or wood screws. Do not weld conduit, pipe straps, or items other than threaded studs to steel structures. In partitions of light steel construction, use sheet metal screws. All device boxes in sheetrock walls will be tight before, during and after installation of sheetrock.
2. Provide supports for electrical items in accordance with NFPA 70 and all other applicable codes.
3. Contractor responsible for providing watertight conduit penetrations at all watertight walls, floors roofs and membranes. Contractor also responsible to maintain fire rating of walls, floors, roofs and membranes penetrated.

L. Electrical Identification:
1. Apply circuit/control/item designation labels of engraved plastic laminate for disconnect switches, breakers, pushbuttons, pilot lights, motor starters, panelboards and main control panel and similar systems.
2. Identify underground exterior electrical circuits by installation of continuous underground plastic marker, 6 - 8 inches below grade.

260519 - CONDUCTORS AND CABLES

A. Feeders: Copper THHN-THWN. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper THHN-THWN. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

C. Aluminum conductors are not acceptable.

D. Conductor Insulation: Comply with NEMA WC 70 for types THHN-THWN. Utilize other types of insulation only where specifically noted or required by code for the installed condition.

E. Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening valves or as specified in UL Codes.

F. Color code secondary service, feeder, and branch circuit conductors with factory applied color as follows:

208y/120 Volts	Phase	480y/277 Volts
Black	A	Brown
Red	B	Purple
Blue	C	Yellow
White	Neutral	Gray
Green	Ground	Green

260526 - GROUNDING AND BONDING

A. Install separate insulated equipment grounding conductors for feeder and branch circuits in compliance with NFPA 70 Article 250.

B. Provide #6 AWG minimum green insulated copper conductor in raceway from grounding electrode system to each telephone, alarm and communications system's terminal board, cabinet or equipment location.

C. System Ground: Properly bond system neutral to system ground in the main service apparatus. All other neutral busses, bars, etc., must be isolated from ground. Establish the system ground as the grounding bus in main service apparatus by providing the proper ground bus in the main service apparatus and by providing the proper grounding conductor, installed in rigid steel conduit, bonded to the grounding bus and extended to the grounding point where the bond shall be made with the proper combination conduit/cable grounding clamp. Unless prohibited by Local Codes, the grounding point shall be established on the incoming water main, ufer ground and structural steel. Building metallic water piping system must be bonded, as required by codes, to the grounding bus in the main service apparatus. Carefully check the Drawings for additional grounding requirements and comply with NFPA 70 and all other applicable codes/standards.

D. Grounding Electrode: Ufer Ground fabricated according to NFPA 70, Paragraph 250-52(A)(3), using a minimum of 20 feet of bare copper conductor size as indicated on drawings. Bond grounding conductor by Cadweld process to reinforce steel in at least 4 locations and to anchor bolts.

260533 - RACEWAYS AND BOXES

A. Conduit Raceway:
1. Indoors, use the following, unless otherwise stated:
a. Concealed: EMT.
b. Exposed: EMT, IMC or RMC.
c. Connection to vibrating equipment: Flexible metal conduit.
2. Outdoors, use the following, unless otherwise stated:
a. Concealed: RMC or IMC.
b. Exposed: RMC or IMC.
c. Underground: Schedule 40 PVC with Schedule 80 PVC fittings.
d. Connection to Vibrating Equipment: Liquid tight flexible metal conduit.
3. ENT IS NOT ALLOWED.
4. Conceal conduit and cable, unless otherwise noted; conduit is permitted to be exposed in equipment rooms. All conduits shall have insulated ground wire installed. Do not install conduit embedded in slabs. EMT fittings shall be steel, compression or set screw type. All raceways shall be installed and supported in accordance with NFPA 70 and applicable codes.

B. Outlet Boxes:
1. Conform to UL 514A, "Metallic Boxes, Electrical," and UL 514B, "Fittings for Conduit and Outlet Boxes." Outlet boxes shall be metallic and installed flush in all areas, except mechanical rooms, above lay-in ceilings, or as otherwise indicated. Minimum size to be 4 inches square by 2-1/8 inches deep. Boxes shall be of type, shape, size and depth to suit each location and application. All fittings shall be steel.

C. Pull and Junction Boxes:
1. Comply with UL 50, "Electrical Cabinets and Boxes," for boxes over 100 cubic inches volume. Boxes shall have screwed or bolt-on covers, shall be suitable for the intended application and shall be labeled.

D. All materials shall be UL listed, appropriate for intended application. Entire raceway system shall be in accordance with NFPA 70, ANSI, NEMA, UL, and all other applicable codes.

262200 - TRANSFORMERS

A. Submit Shop Drawings in accordance with the "Common Work Results" Section.

B. Manufacturer: Siemens, Square-D, GE or Eaton.

C. Insulation: 220 Deg C with a maximum of 150 Deg C temperature rise above 40 Deg C ambient.

D. Coils: Aluminum, Continuous windings with terminations brazed or welded.

E. Comply with DOE 2016 efficiency levels.

F. Seismic restraints as necessary or in seismic hazard zones per USGS.

G. Grounding and bonding in accordance with Section 260526 and NEC requirements.

H. Install transformers level and plumb on a concrete base.

262413 - COMMERCIAL METERING SWITCHBOARD

A. Submit Shop Drawings in accordance with the "Common Work Results" Section.

B. Manufacturer: Siemens, Square-D, GE or Cutler Hammer.

C. Switchboard shall have aluminum bussing including neutral and ground bars. Breakers to be bolt on type. Main breaker shall be LSIG. Ground fault protection system shall be performance tested in accordance with NEC 230.95.

D. Enclosure shall be rain proof Type 3R.

E. Metering provisions shall be in accordance with serving utility requirements. Obtain serving utility approval prior to switchboard release.

F. Fixture devices: Equip compartments with provisions for future extension as indicated on drawings.

G. Install switchboard and accessories according to NEMA PB2.1 and NECA 40.

H. Install and anchor switchboard level on concrete base.

262416 - PANELBOARDS

A. Submit Shop Drawings in accordance with the "Common Work Results" Section.

B. Manufacturer: Siemens, Square-D, GE or Cutler Hammer.

C. Load centers are not acceptable unless specifically noted.

D. Branch Panelboards shall have aluminum bus including neutral and ground bars. Breakers shall be bolt on type. All 3-pole breakers 50 amp and larger shall have minimum feature of a thermal magnetic adjustment. All panels shall be fully rated for the available AIC; series ratings are not allowed.

F. Provide typed circuit schedules for all new panelboards with identification of items controlled by each individual breaker. Indicate room numbers of items controlled or room name where appropriate for Owner's convenience.

262716 - SERVICE ENTRANCE

A. Submit Shop Drawings in accordance with the "Common Work Results" Section.

B. Provide Commercial Metering Switchboard in accordance with NFPA 70 and serving utility company's requirements. Finish to be gray enamel.

C. Provide meter sockets in accordance with serving utility company's requirements. Meters shall be provided by serving utility.

D. Provide secondary service conduits from transformer pad to metering switchboard as called out on Drawings.

E. Install service-entrance equipment as indicated, in accordance with equipment manufacturer's written instructions, and with recognized industry practices, to ensure that service-entrance equipment fulfills requirements. Comply with applicable installation requirements of NFPA 70, UL, ANSI, IEEE, and NEMA standards.

F. Tighten electrical connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standards 486A, and the NFPA 70.

262726 - WIRING DEVICES

A. Submit Shop Drawings in accordance with the "Common Work Results" Section.

B. Acceptable Manufacturers: Pass & Seymore, Bryant, GE, Hubbell, Leviton.

C. Devices:
1. General light switches shall be 20 amp, 120/277 volt AC rated and Industrial Grade.
2. General receptacles shall be self grounding 5-20R and Industrial Grade. GFCI receptacles shall be 20 amp feed through type with two utilization points. Do not connect downstream devices to load side of GFCI.
3. General device color shall be ivory.

D. Device Plates:
1. Device plates shall have opening for device intended and shall be Lexan. General device color shall be ivory.
2. All device plates shall have a clear label with the panel and circuit number designation in black.

E. Weatherproof receptacle covers shall be a corrosion resistant die cast metal, minimum 3 inch deep, flip cover with latch and with pad locking provisions.

265100 - LIGHTING

A. Submit Shop Drawings in accordance with the "Common Work Results" Section.

B. Manufacturer, model, style, color, size, etc., as scheduled. If no color has been selected, provide fixture with the standard finish as published by the manufacturer. All fixtures to be supplied as complete, housing, sockets, lamp holders, internal working, wire guards, lens guards, diffusing materials or lenses, pendants, hangers, canopies, aligners, end caps, ballasts and emergency battery packs, plaster frames, recessing boxes, hold down clips, anchor bolts, etc. Install plumb and true, free of light leaks, warps, dents and other irregularities.

C. Support for Suspended Fixtures: Brace pendants and rods over 48 inches long to limit swinging.

D. Surface-mounted light fixtures attached to a ceiling grid shall be attached with positive clamping devices that completely surround the supporting members. Safety wires shall be attached between the clamping device and the adjacent ceiling hanger or to the structure above.

E. LED Modules:
1. Comply with ANSI C78.377, UL 8750, IES LM-79 and IES LM-80.
2. CRI minimum of 80 or as scheduled.
3. Rated life of minimum 50,000 hours minimum or as scheduled.
4. Fully serviceable and upgradable Light Engine.
5. Warranty: 3-year minimum for all fixture components.

F. LED Drivers:
1. LED Driver/Power Supply: Integral high efficiency driver with power supply of 120V-277v input 60HZ. Power factor greater than 0.9 at full load. Drive current at 1000ma maximum. Class 2 power supply. Dimming utilizing 0-10V dimming control. Provide continuous flicker free dimming from 100 percent to 10 percent. The driver shall be capable of being serviced through the aperture for down light applications.
2. Warranty: 3-year minimum for all fixture components.

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GREAT FALLS INTERNATIONAL AIRPORT
GFIA WAREHOUSE

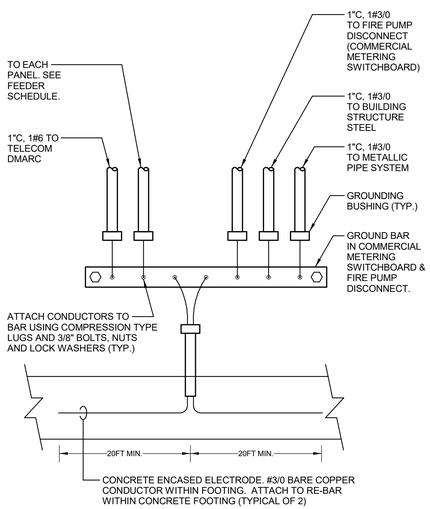
MONTANA
CARL J. MAEHL
10488 PE
LICENSED PROFESSIONAL ENGINEER

BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | MAEHL
DRAWN BY | GALLI
REVIEWED BY | MAEHL
REVISIONS

ELECTRICAL SPECIFICATIONS

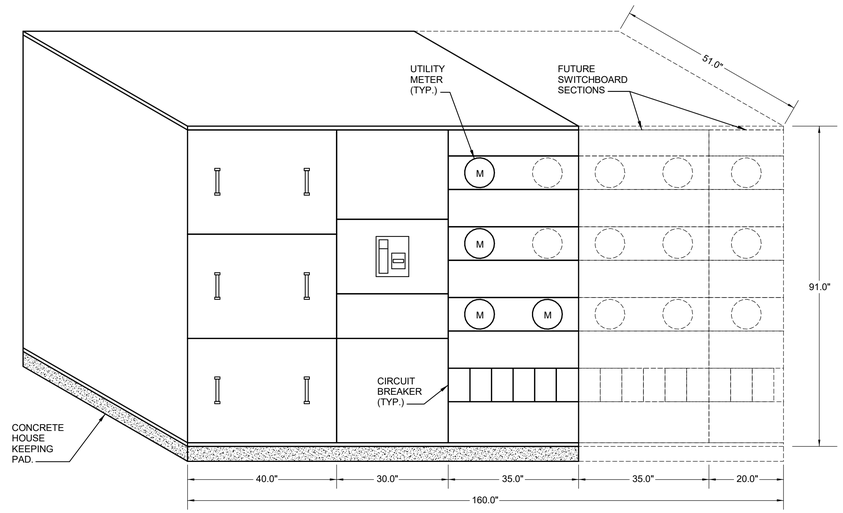
E401



2 / E501 GROUNDING DETAIL

NOT TO SCALE

SWITCHBOARD DIMENSIONS INDICATED ARE BASED ON A GE RELIAGEAR SWITCHBOARD. ALTERNATE MANUFACTURER'S MUST COMPLY WITH INDICATED MAXIMUM DIMENSIONS.



3 / E501 COMMERCIAL METERING SWITCHBOARD ELEVATION

NOT TO SCALE

FEEDER SCHEDULE XXXX

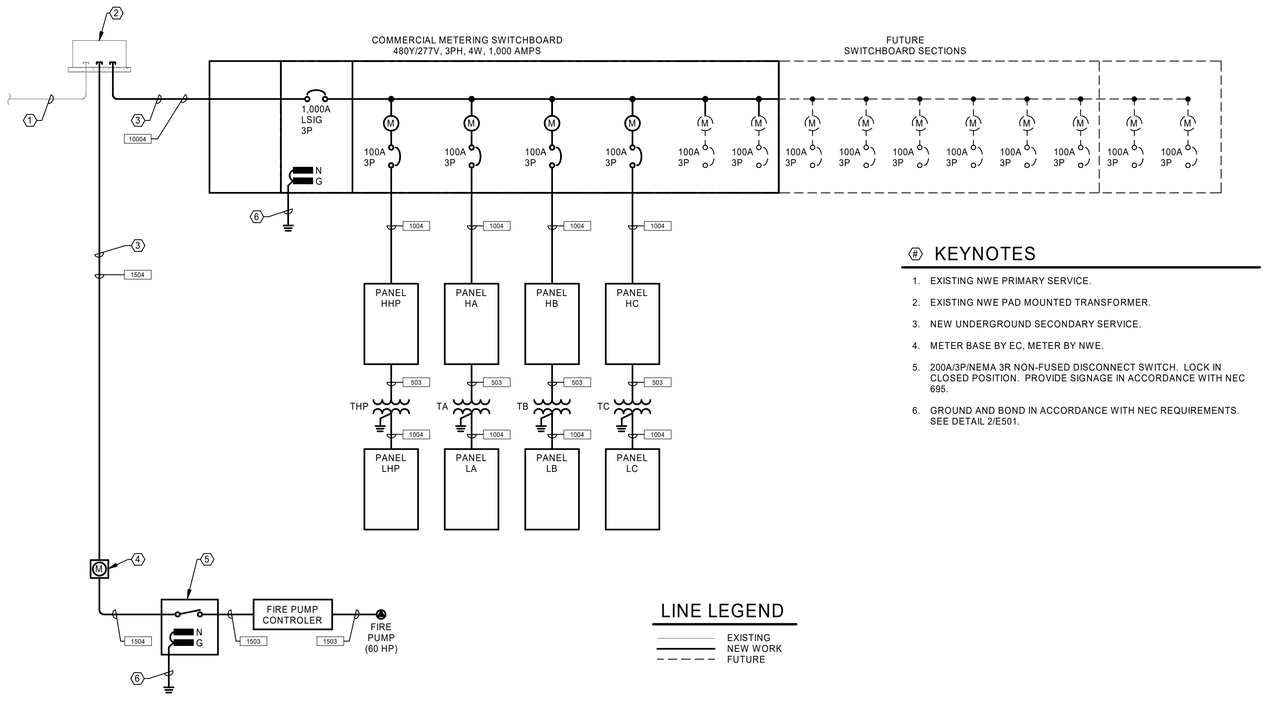
FEEDER DESIGNATION	# OF PARALLEL RUNS	# OF CONDUCTORS EACH RUN NOT INCLUDING GROUND	SIZE OF CONDUCTORS	SIZE OF GROUND	SIZE OF CONDUIT (INCHES)	AMPS
503	1	3	#6	#10	1	50, 3PH, 3W
1004	1	4	#1	#8	1 1/2	100, 3PH, 4W
1504	1	4	1/0	#6	1 1/2	150, 3PH, 4W
10004	3	4	400	-	3	1000, 3PH, 4W

NOTES:
1. ALL CONDUCTORS SHALL BE COPPER.

DRY TYPE TRANSFORMER SCHEDULE

CODE	KVA	PHASE	PRIMARY VOLTAGE	SECONDARY VOLTAGE	MOUNTING	GROUNDING CONDUCTOR	REMARKS
THP	30	3 PH	480	208Y/120	FLOOR	#6	1
TA	30	3 PH	480	208Y/120	FLOOR	#6	1
TB	30	3 PH	480	208Y/120	FLOOR	#6	1
TC	30	3 PH	480	208Y/120	FLOOR	#6	1

NOTES:
1. PROVIDE CONCRETE HOUSEKEEPING PAD.



KEYNOTES

1. EXISTING NWE PRIMARY SERVICE.
2. EXISTING NWE PAD MOUNTED TRANSFORMER.
3. NEW UNDERGROUND SECONDARY SERVICE.
4. METER BASE BY EC, METER BY NWE.
5. 200A/3P/NEMA 3R NON-FUSED DISCONNECT SWITCH. LOCK IN CLOSED POSITION. PROVIDE SIGNAGE IN ACCORDANCE WITH NEC 695.
6. GROUND AND BOND IN ACCORDANCE WITH NEC REQUIREMENTS. SEE DETAIL 2/E501.

LINE LEGEND

- EXISTING
- NEW WORK
- FUTURE

1 / E501 ONE-LINE DIAGRAM

NOT TO SCALE

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ONE-LINE DIAGRAM

E501

PANEL SCHEDULE — PANEL NAME: HHP

LOCATION: HOUSE ROOM | SOURCE: METER STACK | AIC RATING: 14,000 AMPS, RMS, SYM | MOUNTING: SURFACE

REV. NO.	CKT NO.	DESCRIPTION	BREAKER AMP	BREAKER POLE	REF. NOTE	LTG.	REC'S	MOTOR	EQUIP	HEATING	COOLING	VA	AMPS
	1	XFMR THP	50	3		0	0	0	200	3,000	0	3,200	11.6
	3		**	*		0	180	420	0	1,500	0	2,100	7.6
	5		**	*		0	180	0	0	1,500	0	1,680	6.1
	7	HOUSE ROOM LIGHTING	20	1		136						136	0.5
	9	EXTERIOR LIGHTING	20	1		306						306	1.1
	11	SPACE										0	0.0
	13	SPACE										0	0.0
	15	SPACE										0	0.0
	17	SPACE										0	0.0
	19	SPACE										0	0.0
	21	SPACE										0	0.0
	23	SPACE										0	0.0
	25	SPACE										0	0.0
	27	SPARE	20	1								0	0.0
	29	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
	2	JOCKEY PUMP JP-1	20	3				942				942	3.4
	4		**	*				942				942	3.4
	6		**	*				942				942	3.4
	8	SPACE										0	0.0
	10	SPACE										0	0.0
	12	SPACE										0	0.0
	14	SPACE										0	0.0
	16	SPACE										0	0.0
	18	SPACE										0	0.0
	20	SPACE										0	0.0
	22	SPACE										0	0.0
	24	SPACE										0	0.0
	26	SPACE										0	0.0
	28	SPARE	20	1								0	0.0
	30	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0

REFERENCE NOTES:
1
2
3
4

PANEL DATA		
AMPERAGE:	100	
VOLTAGE:	277/480	
PHASE:	3	
WIRE:	4	
MAINS		REF. NOTE
CKT. BKR.	-	
LUGS ONLY	YES	
GROUND BUSS		
EQUIPMENT:	YES	
ISOLATED:	-	
NEUTRAL BUSSING		
100%	YES	
200%	-	
BUSSING		
COPPER:	YES	
ALUMINUM:	-	
TOP FEED:	-	
BOTTOM FEED:	-	
FEED THRU LUGS:	-	
SUB FEED LUGS:	-	
CONNECTED TOTALS		
(INCLUDES FEED-THRU CONTRIBUTION)		
LOAD	KVA	AMPS
LIGHTING:	0.4	0.5
RECEPTACLES:	0.4	0.4
MOTOR:	3.2	3.9
EQUIPMENT:	0.2	0.2
HEATING:	6.0	7.2
COOLING:	0.0	0.0
TOTALS	10.2	12.3
PHASE	KVA	AMPS
A:	4.3	15.4
B:	3.3	12.1
C:	2.6	9.5
TOTAL	10.2	
FEEDER DEMAND TOTALS		
LOAD	KVA	AMPS
LIGHTING:	0.6	0.7
RECEPTACLES:	0.4	0.4
MOTOR:	3.2	3.9
EQUIPMENT:	0.2	0.2
HEAT/COOL:	6.0	7.2
LARGEST MOTOR:	0.7	0.9
TOTAL	11.1	13.3
DATE:		10/20/22

PANEL SCHEDULE — PANEL NAME: HA

LOCATION: BAY A | SOURCE: METER STACK | AIC RATING: 14,000 AMPS, RMS, SYM | MOUNTING: SURFACE

REV. NO.	CKT NO.	DESCRIPTION	BREAKER AMP	BREAKER POLE	REF. NOTE	LTG.	REC'S	MOTOR	EQUIP	HEATING	COOLING	VA	AMPS
	1	XFMR TA	50	3		0	1,440	3,312	0	0	0	4,752	17.2
	3		**	*		0	0	2,076	0	0	0	2,076	7.5
	5		**	*		0	0	2,400	0	0	0	2,400	8.7
	7	SPACE										0	0.0
	9	SPACE										0	0.0
	11	SPACE										0	0.0
	13	SPACE										0	0.0
	15	SPACE										0	0.0
	17	SPACE										0	0.0
	19	SPACE										0	0.0
	21	SPACE										0	0.0
	23	SPACE										0	0.0
	25	SPACE										0	0.0
	27	SPARE	20	1								0	0.0
	29	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
	2	INTERIOR LIGHTING	20	1		764						764	2.8
	4	SPACE										0	0.0
	6	SPACE										0	0.0
	8	SPACE										0	0.0
	10	SPACE										0	0.0
	12	SPACE										0	0.0
	14	SPACE										0	0.0
	16	SPACE										0	0.0
	18	SPACE										0	0.0
	20	SPACE										0	0.0
	22	SPACE										0	0.0
	24	SPACE										0	0.0
	26	SPACE										0	0.0
	28	SPARE	20	1								0	0.0
	30	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0

REFERENCE NOTES:
1
2
3
4

PANEL DATA		
AMPERAGE:	100	
VOLTAGE:	277/480	
PHASE:	3	
WIRE:	4	
MAINS		REF. NOTE
CKT. BKR.	-	
LUGS ONLY	YES	
GROUND BUSS		
EQUIPMENT:	YES	
ISOLATED:	-	
NEUTRAL BUSSING		
100%	YES	
200%	-	
BUSSING		
COPPER:	YES	
ALUMINUM:	-	
TOP FEED:	-	
BOTTOM FEED:	-	
FEED THRU LUGS:	-	
SUB FEED LUGS:	-	
CONNECTED TOTALS		
(INCLUDES FEED-THRU CONTRIBUTION)		
LOAD	KVA	AMPS
LIGHTING:	0.8	0.9
RECEPTACLES:	1.4	1.7
MOTOR:	7.8	9.4
EQUIPMENT:	0.0	0.0
HEATING:	0.0	0.0
COOLING:	0.0	0.0
TOTALS	10.0	12.0
PHASE	KVA	AMPS
A:	5.5	19.9
B:	2.1	7.5
C:	2.4	8.7
TOTAL	10.0	
FEEDER DEMAND TOTALS		
LOAD	KVA	AMPS
LIGHTING:	1.0	1.1
RECEPTACLES:	1.4	1.7
MOTOR:	7.8	9.4
EQUIPMENT:	0.0	0.0
HEAT/COOL:	0.0	0.0
LARGEST MOTOR:	0.4	0.5
TOTAL	10.6	12.7
DATE:		10/20/22

PANEL SCHEDULE — PANEL NAME: HB

LOCATION: BAY B | SOURCE: METER STACK | AIC RATING: 14,000 AMPS, RMS, SYM | MOUNTING: SURFACE

REV. NO.	CKT NO.	DESCRIPTION	BREAKER AMP	BREAKER POLE	REF. NOTE	LTG.	REC'S	MOTOR	EQUIP	HEATING	COOLING	VA	AMPS
	1	XFMR TB	50	3		0	1,440	3,312	0	0	0	4,752	17.2
	3		**	*		0	0	2,076	0	0	0	2,076	7.5
	5		**	*		0	0	1,512	0	0	0	1,512	5.5
	7	SPACE										0	0.0
	9	SPACE										0	0.0
	11	SPACE										0	0.0
	13	SPACE										0	0.0
	15	SPACE										0	0.0
	17	SPACE										0	0.0
	19	SPACE										0	0.0
	21	SPACE										0	0.0
	23	SPACE										0	0.0
	25	SPACE										0	0.0
	27	SPARE	20	1								0	0.0
	29	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
	2	INTERIOR LIGHTING	20	1		764						764	2.8
	4	SPACE										0	0.0
	6	SPACE										0	0.0
	8	SPACE										0	0.0
	10	SPACE										0	0.0
	12	SPACE										0	0.0
	14	SPACE										0	0.0
	16	SPACE										0	0.0
	18	SPACE										0	0.0
	20	SPACE										0	0.0
	22	SPACE										0	0.0
	24	SPACE										0	0.0
	26	SPACE										0	0.0
	28	SPARE	20	1								0	0.0
	30	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0

REFERENCE NOTES:
1
2
3
4

PANEL DATA		
AMPERAGE:	100	
VOLTAGE:	277/480	
PHASE:	3	
WIRE:	4	
MAINS		REF. NOTE
CKT. BKR.	-	
LUGS ONLY	YES	
GROUND BUSS		
EQUIPMENT:	YES	
ISOLATED:	-	
NEUTRAL BUSSING		
100%	YES	
200%	-	
BUSSING		
COPPER:	YES	
ALUMINUM:	-	
TOP FEED:	-	
BOTTOM FEED:	-	
FEED THRU LUGS:	-	
SUB FEED LUGS:	-	
CONNECTED TOTALS		
(INCLUDES FEED-THRU CONTRIBUTION)		
LOAD	KVA	AMPS
LIGHTING:	0.8	0.9
RECEPTACLES:	1.4	1.7
MOTOR:	6.9	8.3
EQUIPMENT:	0.0	0.0
HEATING:	0.0	0.0
COOLING:	0.0	0.0
TOTALS	9.1	11.0
PHASE	KVA	AMPS
A:	5.5	19.9
B:	2.1	7.5
C:	1.5	5.5
TOTAL	9.1	
FEEDER DEMAND TOTALS		
LOAD	KVA	AMPS
LIGHTING:	1.0	1.1
RECEPTACLES:	1.4	1.7
MOTOR:	6.9	8.3
EQUIPMENT:	0.0	0.0
HEAT/COOL:	0.0	0.0
LARGEST MOTOR:	0.4	0.5
TOTAL	9.7	11.7
DATE:		10/20/22

PANEL SCHEDULE — PANEL NAME: HC

LOCATION: BAY C | SOURCE: METER STACK | AIC RATING: 14,000 AMPS, RMS, SYM | MOUNTING: SURFACE

REV. NO.	CKT NO.	DESCRIPTION	BREAKER AMP	BREAKER POLE	REF. NOTE	LTG.	REC'S	MOTOR	EQUIP	HEATING	COOLING	VA	AMPS
	1	XFMR TC	50	3		0	1,440	3,312	0	0	0	4,752	17.2
	3		**	*		0	0	2,076	0	0	0	2,076	7.5
	5		**	*		0	0	1,512	0	0	0	1,512	5.5
	7	SPACE										0	0.0
	9	SPACE										0	0.0
	11	SPACE										0	0.0
	13	SPACE										0	0.0
	15	SPACE										0	0.0
	17	SPACE										0	0.0
	19	SPACE										0	0.0
	21	SPACE										0	0.0
	23	SPACE										0	0.0
	25	SPACE										0	0.0
	27	SPARE	20	1								0	0.0
	29	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
	2	INTERIOR LIGHTING	20	1		764						764	2.8
	4	SPACE										0	0.0
	6	SPACE										0	0.0
	8	SPACE										0	0.0
	10	SPACE										0	0.0
	12	SPACE										0	0.0
	14	SPACE										0	0.0
	16	SPACE										0	0.0
	18	SPACE										0	0.0
	20	SPACE										0	0.0
	22	SPACE										0	0.0
	24	SPACE										0	0.0
	26	SPACE										0	0.0
	28	SPARE	20	1								0	0.0
	30	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0

REFERENCE NOTES:
1
2
3
4

PANEL DATA		
AMPERAGE:	100	
VOLTAGE:	277/480	
PHASE:	3	
WIRE:	4	
MAINS		REF. NOTE
CKT. BKR.	-	
LUGS ONLY	YES	
GROUND BUSS		
EQUIPMENT:	YES	
ISOLATED:	-	
NEUTRAL BUSSING		
100%	YES	
200%	-	
BUSSING		
COPPER:	YES	
ALUMINUM:	-	
TOP FEED:	-	
BOTTOM FEED:	-	
FEED THRU LUGS:	-	
SUB FEED LUGS:	-	
CONNECTED TOTALS		
(INCLUDES FEED-THRU CONTRIBUTION)		
LOAD	KVA	AMPS
LIGHTING:	0.8	0.9
RECEPTACLES:	1.4	1.7
MOTOR:	6.9	8.3
EQUIPMENT:	0.0	0.0
HEATING:	0.0	0.0
COOLING:	0.0	0.0
TOTALS	9.1	11.0
PHASE	KVA	AMPS
A:	5.5	19.9
B:	2.1	7.5
C:	1.5	5.5
TOTAL	9.1	
FEEDER DEMAND TOTALS		
LOAD	KVA	AMPS
LIGHTING:	1.0	1.1
RECEPTACLES:	1.4	1.7
MOTOR:	6.9	8.3
EQUIPMENT:	0.0	0.0
HEAT/COOL:	0.0	0.0
LARGEST MOTOR:	0.4	0.5
TOTAL	9.7	11.7
DATE:		10/20/22

PANEL SCHEDULE — PANEL NAME: LHP

LOCATION: HOUSE ROOM | SOURCE: XFMR THP | AIC RATING: 10,000 AMPS, RMS, SYM | MOUNTING: SURFACE

REV. NO.	CKT NO.	DESCRIPTION	BREAKER AMP	BREAKER POLE	REF. NOTE	LTG.	REC'S	MOTOR	EQUIP	HEATING	COOLING	VA	AMPS
	1	EUH-1	20	2						1,500		1,500	12.5
	3		**	*						1,500		1,500	12.5
	5	EUH-1	20	2						1,500		1,500	12.5
	7		**	*						1,500		1,500	12.5
	9	EF-1	20	1				420				420	3.5
	11	SPACE										0	0.0
	13	SPACE										0	0.0
	15	SPACE										0	0.0
	17	SPACE										0	0.0
	19	SPACE										0	0.0
	21	SPACE										0	0.0
	23	SPACE										0	0.0
	25	SPARE	20	1								0	0.0
	27	SPARE	20	1								0	0.0
	29	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
	2	FIRE ALARM CONTROL PANEL	20	1					200			200	1.7
	4	RECEPTS - HOUSE ROOM	20	1			180					180	1.5
	6	RECEPTS - EXTERIOR	20	1			180					180	1.5
	8	SPACE										0	0.0
	10	SPACE										0	0.0
	12	SPACE										0	0.0
	14	SPACE										0	0.0
	16	SPACE										0	0.0
	18	SPACE										0	0.0
	20	SPACE										0	0.0
	22	SPACE										0	0.0
	24	SPACE										0	0.0
	26	SPARE	20	1								0	0.0
	28	SPARE	20	1								0	0.0
	30	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0

REFERENCE NOTES:
1
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3
4

PANEL DATA		
AMPERAGE:	100	
VOLTAGE:	120/208	
PHASE:	3	
WIRE:	4	
MAINS		REF. NOTE
CKT. BKR.	YES(100A)	
LUGS ONLY	-	
GROUND BUSS		
EQUIPMENT:	YES	
ISOLATED:	-	
NEUTRAL BUSSING		
100%	YES	
200%	-	
BUSSING		
COPPER:	YES	
ALUMINUM:	-	
TOP FEED:	-	
BOTTOM FEED:	-	
FEED THRU LUGS:	-	
SUB FEED LUGS:	-	
CONNECTED TOTALS		
(INCLUDES FEED-THRU CONTRIBUTION)		
LOAD	KVA	AMPS
LIGHTING:	0.0	0.0
RECEPTACLES:	0.4	1.0
MOTOR:	0.4	1.2
EQUIPMENT:	0.2	0.6
HEATING:	6.0	16.7
COOLING:	0.0	0.0
TOTALS	7.0	19.4
PHASE	KVA	AMPS
A:	3.2	26.7
B:	2.1	17.5
C:	1.7	14.0
TOTAL	7.0	
FEEDER DEMAND TOTALS		
LOAD	KVA	AMPS
LIGHTING:	0.0	0.0
RECEPTACLES:	0.4	1.0
MOTOR:	0.4	1.2
EQUIPMENT:	0.2	0.6
HEAT/COOL:	6.0	16.7
LARGEST MOTOR:	0.1	0.3
TOTAL	7.1	19.7
DATE:		10/20/22

PANEL SCHEDULE — PANEL NAME: LA

LOCATION: BAY A | SOURCE: XFMR TA | AIC RATING: 10,000 AMPS, RMS, SYM | MOUNTING: SURFACE

REV. NO.	CKT NO.	DESCRIPTION	BREAKER AMP	BREAKER POLE	REF. NOTE	LTG.	REC'S	MOTOR	EQUIP	HEATING	COOLING	VA	AMPS
	1	GARAGE DOOR OPENER	20	1				1,656				1,656	13.8
	3	EF-2	20	1				420				420	3.5
	5	UH-1	20	1				1,200				1,200	10.0
	7	RECEPTS	20	1			720					720	6.0
	9	SPACE										0	0.0
	11	SPACE										0	0.0
	13	SPACE										0	0.0
	15	SPACE										0	0.0
	17	SPACE										0	0.0
	19	SPACE										0	0.0
	21	SPACE										0	0.0
	23	SPACE										0	0.0
	25	SPARE	20	1								0	0.0
	27	SPARE	20	1								0	0.0
	29	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
	2	GARAGE DOOR OPENER	20	1				1,656				1,656	13.8
	4	EF-3	20	1				1,656				1,656	13.8
	6	UH-1	20	1				1,200				1,200	10.0
	8	RECEPTS	20	1			720					720	6.0
	10	SPACE										0	0.0
	12	SPACE										0	0.0
	14	SPACE										0	0.0
	16	SPACE										0	0.0
	18	SPACE										0	0.0
	20	SPACE										0	0.0
	22	SPACE										0	0.0
	24	SPACE										0	0.0
	26	SPARE	20	1								0	0.0
	28	SPARE	20	1								0	0.0
	30	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0

REFERENCE NOTES:
1
2
3
4

PANEL DATA		
AMPERAGE:	100	
VOLTAGE:	120/208	
PHASE:	3	
WIRE:	4	
MAINS		REF. NOTE
CKT. BKR.	YES(100A)	
LUGS ONLY	-	
GROUND BUSS		
EQUIPMENT:	YES	
ISOLATED:	-	
NEUTRAL BUSSING		
100%	YES	
200%	-	
BUSSING		
COPPER:	YES	
ALUMINUM:	-	
TOP FEED:	-	
BOTTOM FEED:	-	
FEED THRU LUGS:	-	
SUB FEED LUGS:	-	
CONNECTED TOTALS		
(INCLUDES FEED-THRU CONTRIBUTION)		
LOAD	KVA	AMPS
LIGHTING:	0.0	0.0
RECEPTACLES:	1.4	4.0
MOTOR:	7.8	21.6
EQUIPMENT:	0.0	0.0
HEATING:	0.0	0.0
COOLING:	0.0	0.0
TOTALS	9.2	25.6
PHASE	KVA	AMPS
A:	4.8	39.6
B:	2.1	17.3
C:	2.4	20.0
TOTAL	9.2	
FEEDER DEMAND TOTALS		
LOAD	KVA	AMPS
LIGHTING:	0.0	0.0
RECEPTACLES:	1.4	4.0
MOTOR:	7.8	21.6
EQUIPMENT:	0.0	0.0
HEAT/COOL:	0.0	0.0
LARGEST MOTOR:	0.4	1.1
TOTAL	9.6	26.8
DATE:		10/20/22

PANEL SCHEDULE — PANEL NAME: LB

LOCATION: BAY B | SOURCE: XFMR TB | AIC RATING: 10,000 AMPS, RMS, SYM | MOUNTING: SURFACE

REV. NO.	CKT NO.	DESCRIPTION	BREAKER AMP	BREAKER POLE	REF. NOTE	LTG.	REC'S	MOTOR	EQUIP	HEATING	COOLING	VA	AMPS
	1	GARAGE DOOR OPENER	20	1				1,656				1,656	13.8
	3	EF-4	20	1				420				420	3.5
	5	UH-2	15	1				756				756	6.3
	7	RECEPTS	20	1			720					720	6.0
	9	SPACE										0	0.0
	11	SPACE										0	0.0
	13	SPACE										0	0.0
	15	SPACE										0	0.0
	17	SPACE										0	0.0
	19	SPACE										0	0.0
	21	SPACE										0	0.0
	23	SPACE										0	0.0
	25	SPARE	20	1								0	0.0
	27	SPARE	20	1								0	0.0
	29	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
	2	GARAGE DOOR OPENER	20	1				1,656				1,656	13.8
	4	EF-5	20	1				1,656				1,656	13.8
	6	UH-2	15	1				756				756	6.3
	8	RECEPTS	20	1			720					720	6.0
	10	SPACE										0	0.0
	12	SPACE										0	0.0
	14	SPACE										0	0.0
	16	SPACE										0	0.0
	18	SPACE										0	0.0
	20	SPACE										0	0.0
	22	SPACE										0	0.0
	24	SPACE										0	0.0
	26	SPARE	20	1								0	0.0
	28	SPARE	20	1								0	0.0
	30	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0

REFERENCE NOTES:
1
2
3
4

PANEL DATA		
AMPERAGE:	100	
VOLTAGE:	120/208	
PHASE:	3	
WIRE:	4	
MAINS		REF. NOTE
CKT. BKR.	YES(100A)	
LUGS ONLY	-	
GROUND BUSS		
EQUIPMENT:	YES	
ISOLATED:	-	
NEUTRAL BUSSING		
100%	YES	
200%	-	
BUSSING		
COPPER:	YES	
ALUMINUM:	-	
TOP FEED:	-	
BOTTOM FEED:	-	
FEED THRU LUGS:	-	
SUB FEED LUGS:	-	
CONNECTED TOTALS		
(INCLUDES FEED-THRU CONTRIBUTION)		
LOAD	KVA	AMPS
LIGHTING:	0.0	0.0
RECEPTACLES:	1.4	4.0
MOTOR:	6.9	19.2
EQUIPMENT:	0.0	0.0
HEATING:	0.0	0.0
COOLING:	0.0	0.0
TOTALS	8.3	23.1
PHASE	KVA	AMPS
A:	4.8	39.6
B:	2.1	17.3
C:	1.5	12.6
TOTAL	8.3	
FEEDER DEMAND TOTALS		
LOAD	KVA	AMPS
LIGHTING:	0.0	0.0
RECEPTACLES:	1.4	4.0
MOTOR:	6.9	19.2
EQUIPMENT:	0.0	0.0
HEAT/COOL:	0.0	0.0
LARGEST MOTOR:	0.4	1.1
TOTAL	8.8	24.3
DATE:		10/20/22

PANEL SCHEDULE — PANEL NAME: LC

LOCATION: BAY C | SOURCE: XFMR TC | AIC RATING: 10,000 AMPS, RMS, SYM | MOUNTING: SURFACE

REV. NO.	CKT NO.	DESCRIPTION	BREAKER AMP	BREAKER POLE	REF. NOTE	LTG.	REC'S	MOTOR	EQUIP	HEATING	COOLING	VA	AMPS
	1	GARAGE DOOR OPENER	20	1				1,656				1,656	13.8
	3	EF-6	20	1				420				420	3.5
	5	UH-2	15	1				756				756	6.3
	7	RECEPTS	20	1			720					720	6.0
	9	SPACE										0	0.0
	11	SPACE										0	0.0
	13	SPACE										0	0.0
	15	SPACE										0	0.0
	17	SPACE										0	0.0
	19	SPACE										0	0.0
	21	SPACE										0	0.0
	23	SPACE										0	0.0
	25	SPARE	20	1								0	0.0
	27	SPARE	20	1								0	0.0
	29	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
	2	GARAGE DOOR OPENER	20	1				1,656				1,656	13.8
	4	EF-7	20	1				1,656				1,656	13.8
	6	UH-2	15	1				756				756	6.3
	8	RECEPTS	20	1			720					720	6.0
	10	SPACE										0	0.0
	12	SPACE										0	0.0
	14	SPACE										0	0.0
	16	SPACE										0	0.0
	18	SPACE										0	0.0
	20	SPACE										0	0.0
	22	SPACE										0	0.0
	24	SPACE										0	0.0
	26	SPARE	20	1								0	0.0
	28	SPARE	20	1								0	0.0
	30	SPARE	20	1								0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0
												0	0.0

REFERENCE NOTES:
1
2
3
4

PANEL DATA		
AMPERAGE:	100	
VOLTAGE:	120/208	
PHASE:	3	
WIRE:	4	
MAINS		REF. NOTE
CKT. BKR.	YES(100A)	
LUGS ONLY	-	
GROUND BUSS		
EQUIPMENT:	YES	
ISOLATED:	-	
NEUTRAL BUSSING		
100%	YES	
200%	-	
BUSSING		
COPPER:	YES	
ALUMINUM:	-	
TOP FEED:	-	
BOTTOM FEED:	-	
FEED THRU LUGS:	-	
SUB FEED LUGS:	-	
CONNECTED TOTALS		
(INCLUDES FEED-THRU CONTRIBUTION)		
LOAD	KVA	AMPS
LIGHTING:	0.0	0.0
RECEPTACLES:	1.4	4.0
MOTOR:	6.9	19.2
EQUIPMENT:	0.0	0.0
HEATING:	0.0	0.0
COOLING:	0.0	0.0
TOTALS	8.3	23.1
PHASE	KVA	AMPS
A:	4.8	39.6
B:	2.1	17.3
C:	1.5	12.6
TOTAL	8.3	
FEEDER DEMAND TOTALS		
LOAD	KVA	AMPS
LIGHTING:	0.0	0.0
RECEPTACLES:	1.4	4.0
MOTOR:	6.9	19.2
EQUIPMENT:	0.0	0.0
HEAT/COOL:	0.0	0.0
LARGEST MOTOR:	0.4	1.1
TOTAL	8.8	24.3
DATE:		10/20/22

Cushing Terrell
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800.757.9522

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GREAT FALLS INTERNATIONAL AIRPORT

GFIA WAREHOUSE

MONTANA
CARL J. MAEHL
10488 PE
LICENSED PROFESSIONAL ENGINEER

BUILDING PERMIT SET

10.26.2022
PROJ# | GFIA_WRHSE
DESIGNED BY | MAEHL
DRAWN BY | GALLI
REVIEWED BY | MAEHL
REVISIONS

PANEL SCHEDULES

E502