SUNRAY PROPERTIES II- BUSINESS RENTAL SPACE
SITE PLAN
42 WEST 300 NORTH
CITY COUNCIL MEETING
NOVEMBER 21, 2019

ZONING- M-1 Light Manufacturing

UTILITIES- All available near site. They will be brought in from Center street. They will need to obtain a utility easement from Kelton Wilcox.

PARKING & ROADS- Access to the new building will be from two existing accesses. Asphalt will be added as shown.

LIGHTING- See electrical plan

LANDSCAPPING- Already existing at the entrance to this property.

STORMWATER- Some existing as shown. New pond will be added on the north property line.

SIGNAGE- Existing

FENCING- Five-foot-tall concrete fencing proposed on the north and east. May want to considering requiring fencing along the west & south sides also, at least by the parking area next to the residential property.

NOTES- They are building this building to provide space for rent for other businesses. This is similar to what they have done with the original building. They have been a great addition to the city and have always kept their property well maintained. Where this property is mostly up against other manufacturing property, this seems like a good location for expansion as long as the residential area is reasonably buffered. The Planning Commission recommends approval with the following conditions: 70' privacy fencing be added along west side bordering residential lot, utility easement obtained from Kelton Wilcox, & final storm water drainage system approved by City engineer.

SUNRAY PROPERTIES II
NEW BUILDING PROJECT
42 WEST 300 NORTH
HYRUM , UTAH

IBC 2018

DESCRIPTION		IBC REFERENCE	REMARKS
OCCUPANCY STORAGE MODERATE HAZARD STORAGE	S-1	Chapter 3 SECT NO. 311.2	
BASIC ALLOWABLE BUILDING HEIGHT, FLOOR AREA AND STORY IN HEIGHT MAX HEIGHT IN FEET (ALLOWED XS-1/VB/S&S) 40' MAX ALLOWED MAXIMUM # OF FLOORS (S-1/VB) 2 STORIES ALLOWED S-1 OCCUPANCIES FLOOR AREA (ALLOWED - S-1/VB) 36,000 ALLOWABLE AREA 36,000		Chapter 5 Table No. 504.3 Table No. 504.4 Table No. 506.3.3	Provided: PROVIDED HEIGHT = 20' PROVIDED STORIES = 1 18,070 S.F. PROVIDED
TYPE OF CONSTRUCTION TYPE VB Fire Resistive Requirements Fire Resistive Building Element Rating (In Hours) 1. Structural Frame 0 2. Exterior Bearing Walls 0 Interior Bearing Walls 0 3. Non-Bearing Walls - Exterior 0 4. Non-Bearing Walls - Interior 0 5. Floor Construction - Beams and Joists 0 6. Roof Construction - Beams and Joists 0		Chapter 6 Table No. 601	Comply
INTERIOR FINISHES SPRINKLERED - S-1 EXIT ENCLOSURES AND PASSAGEWAYS C CORRIDORS C ROOMS AND ENCLOSED SPACES C		Chapter 8 TABLE 803.11	N/A N/A WILL COMPLY
FIRE PROTECTION AUTOMATIC SPRINKLER SYSTEM - REQUIRED MANUAL FIRE ALARM SYSTEM - NOT REQUIRED MEANS OF EGRESS ILLUMINATION - REQUIRED		Chapter 9 SECTION 903.2.1.3 SECTION 907.2.10 SECTION 1008	GREATER THAN 12,000 S.F. (TOTAL BUILDING) PROVIDED
OCCUPANT LOAD OFFICE / CLINIC 3750 S.F. / 150 S.F./OCC - 25 OCCS.		Chapter 10 Table No. 1004.1.2	TOTAL OCCS - 25
EXITING TWO EXITS REQD PER FLOOR MORE THAN 50 OCCS ACCESSIBLE MEANS OF EGRESS		Chapter 10 TABLE 1006.3.1 SECTION 1007.1	2 EXISTS PROVIDED 2 PROVIDED
ACCESSIBILITY GROUP S-1 OCCUPANCIES WILL BE ACCESSIBLE TO EMPLOYEES WITH DISABILITIES AS REQUIRED. **FURNITURE / RESTROOM LAYOUT SHALL BE ARRANGED TO PROVIDE ACCESSIBILITY THROUGHOUT THE SPACE.		Chapter 11	WILL COMPLY

PLUMBING SYSTEMS	Chapter 29 TABLE 2902.1				
S-1 OCCUPANCY - STORAGE MEN = 30 OCCS WOMEN = 30 OCCS TOTAL = 60 OCCS	TOILET = 1	LAV = 1	SHWR = 0	DRINKING FOUNTAIN = 1	SERVICE SINK = 1
TOTAL FIXTURES REQUIRED	TOILET = 1	LAV = 1	SHWR = 0		
TOTAL FIXTURES PROVIDED	TOILETS = 6	LAV = 6	SHWR = 0	DRINKING FOUNTAIN = 6	SERVICE SINK = 6

NORTH

REFERENCE SITE PLAN
SCALE: 1" = 30' - 0"
NOTE: THIS PLAN FOR SITE REFERENCE ONLY.

NORTH

REF. PLAN
N.T.SCALE

SHEET INDEX

JOSEPH T. BECK ARCHITECT, INC.
497 EAST 520 SOUTH
SMITHFIELD, UTAH
(435) 764-6742

STATE OF UTAH
JOSEPH T. BECK
137544
10-7-19
LICENSED ARCHITECT

DATE
OCT 7, 2019

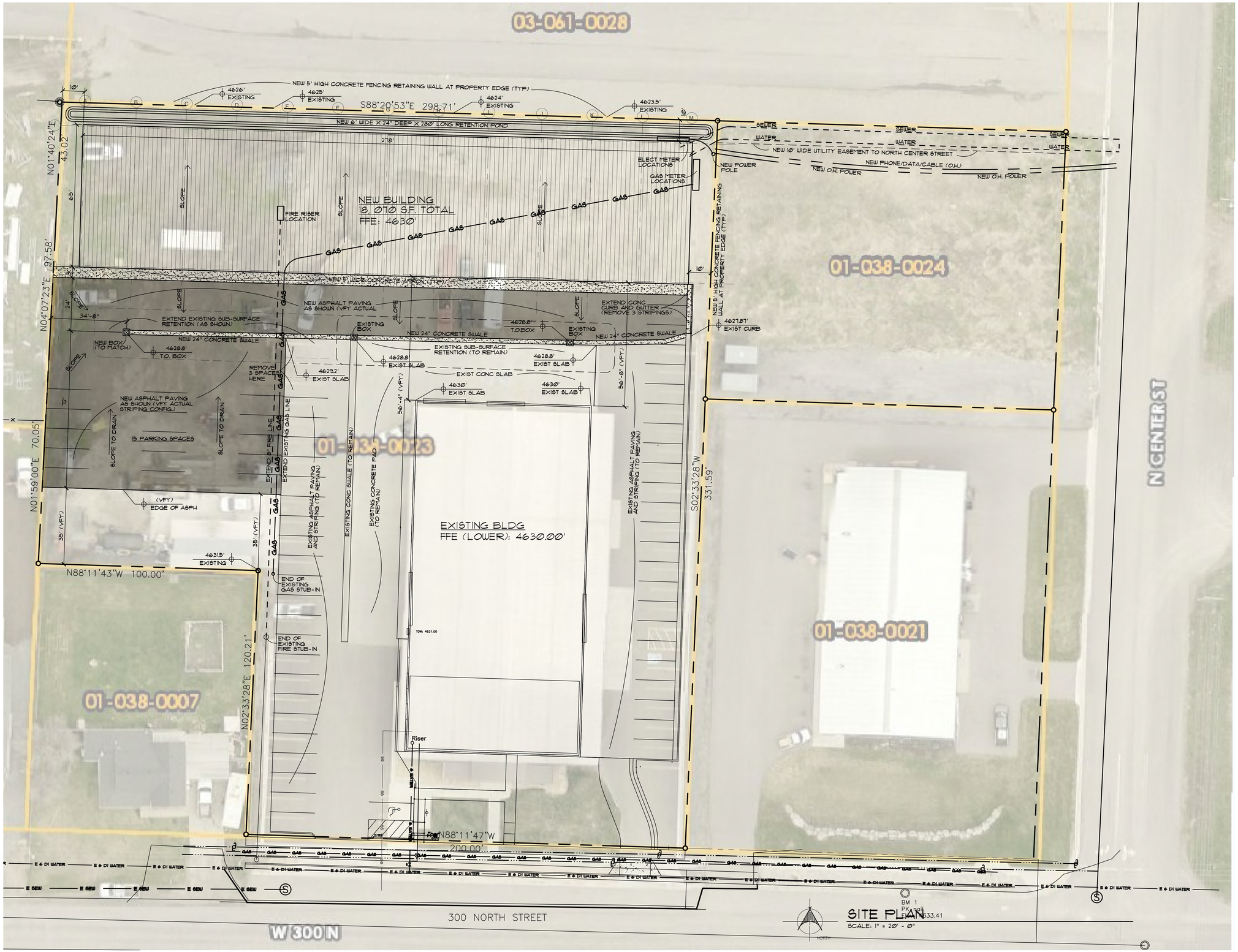
PROJECT TITLE
SUNRAY PROPERTIES II
NEW BUILDING PROJECT
42 WEST 300 NORTH
HYRUM , UTAH

SHEET TITLE
COVER SHEET
REF SITE PLAN
CODE REVIEW
SHEET INDEX

PROJECT NUMBER
-

REVISIONS

SHEET NUMBER
A0.0



JOSEPH T. BECK ARCHITECT, INC.
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SMITHFIELD, UTAH
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10-7-19
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DATE
OCT 7, 2019

PROJECT TITLE
SUNRAY PROPERTIES
NEW BUILDING PROJECT
42 WEST 300 NORTH
HYRUM, UTAH

SHEET TITLE
SITE PLAN
SITE DRAINAGE
SITE UTILITIES

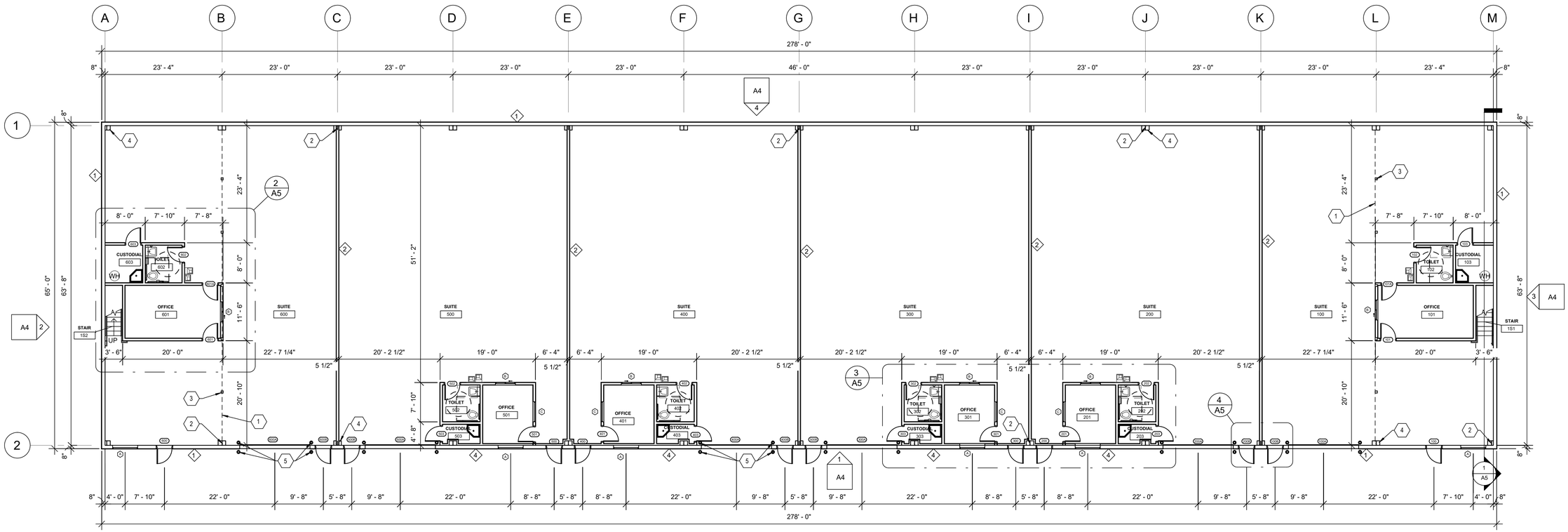
PROJECT NUMBER
-

REVISIONS

SHEET NUMBER
A0.1

KEYNOTES

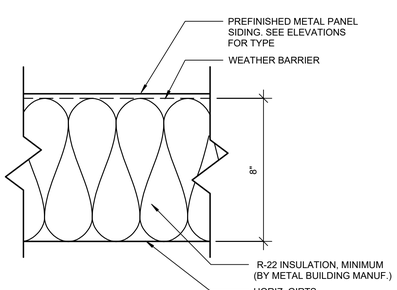
1. MEZZANINE ABOVE
2. STEEL STRUCTURE, TYP. - SEE STRUCTURAL DRAWINGS
3. COLUMNS, TYP. - SEE STRUCTURAL DRAWINGS
4. CONCRETE PIER, TYP. - SEE STRUCTURAL DRAWINGS
5. CONCRETE FILLED STEEL BOLLARD AT OVERHEAD DOORS, TYP.



1 MAIN FLOOR

1" = 10'-0"

NORTH



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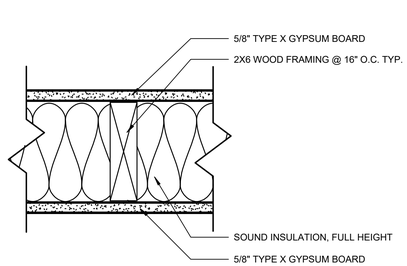

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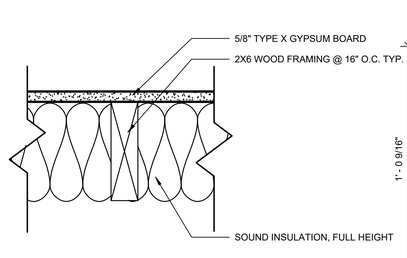

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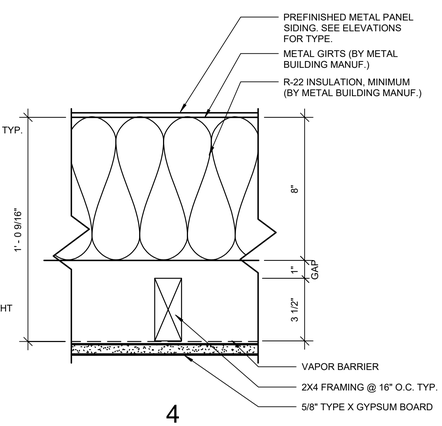

4

2 WALL TYPES

3" = 1'-0"

GENERAL NOTES

A. ALL DRYWALL WITHIN 6" OF PLUMBING FIXTURES SHOULD BE MOISTURE-RESISTANT OR PROTECTED BY A HARD, IMPERVIOUS MATERIAL.
B. DIMENSIONS ARE TO FACE OF STUD OR FACE OF CONCRETE WALL TYP.

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10-7-19
LICENSED ARCHITECT

DATE
OCT 7, 2019

PROJECT TITLE
SUNRAY PROPERTIES BUILDING II
NEW BUILDING PROJECT
2485 SOUTH 1350 WEST
NIBLEY , UTAH

SHEET TITLE
MAIN FLOOR PLAN
WALL TYPES

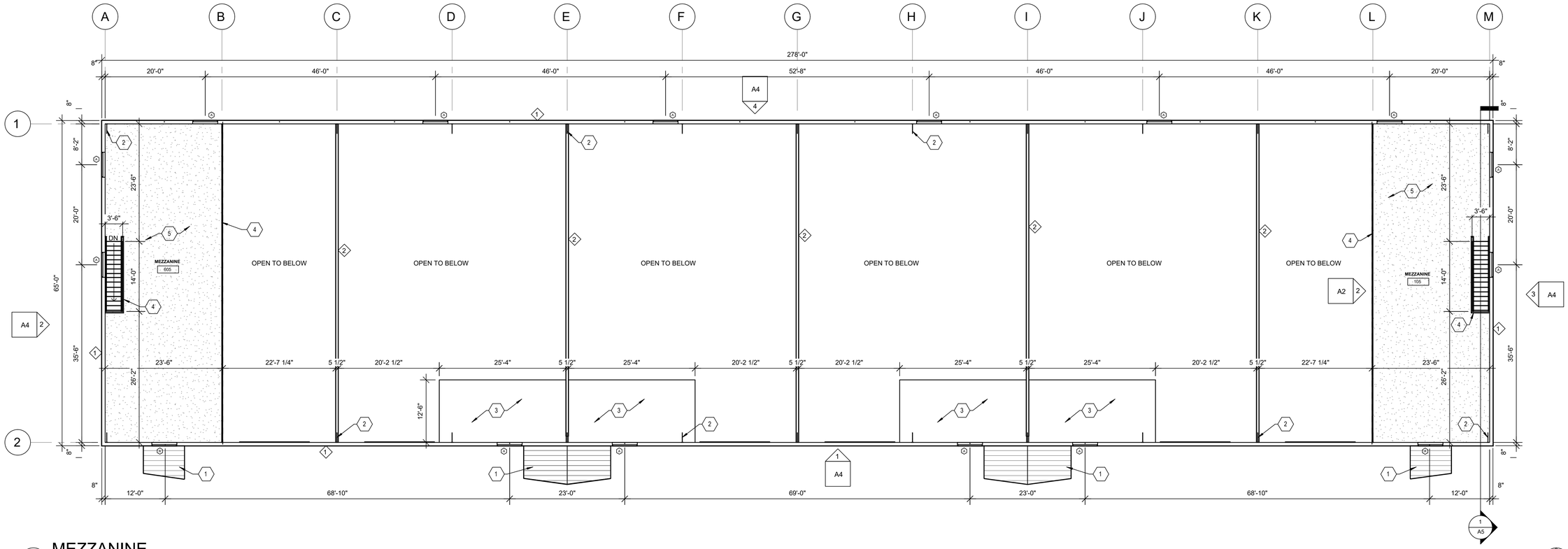
PROJECT NUMBER
-

REVISIONS

SHEET NUMBER
A1.0

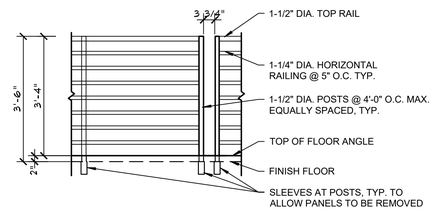
KEYNOTES

1. STANDING SEAM METAL ROOFING BELOW
2. STEEL STRUCTURE - SEE STRUCTURAL DRAWINGS, TYP.
3. 10" JOIST W/ 3/4" PLYWOOD SHEATHING
4. 42" HIGH METAL GUARDRAIL W/ POSTS @ 4'-0" O.C. TYP. SET POSTS IN SLEEVES TO ALLOW REMOVAL OF INDIVIDUAL PANEL SECTIONS
5. CONCRETE FLOOR OVER METAL DECK, TYP. @ MEZZANINES - SEE STRUCTURAL DRAWINGS



1 MEZZANINE
1" = 10'-0"

NORTH



2 RAILING ELEVATION
1/2" = 1'-0"

GENERAL NOTES

A. ALL DRYWALL WITHIN 6" OF PLUMBING FIXTURES SHOULD BE MOISTURE-RESISTANT OR PROTECTED BY A HARD, IMPERVIOUS MATERIAL.
B. DIMENSIONS ARE TO FACE OF STUD OR FACE OF CONCRETE WALL TYP.

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PROJECT TITLE
SUNRAY PROPERTIES BUILDING II
NEW BUILDING PROJECT
2485 SOUTH 1350 WEST
NIBLEY , UTAH

SHEET TITLE
UPPER FLOOR PLAN
RAILING DETAIL

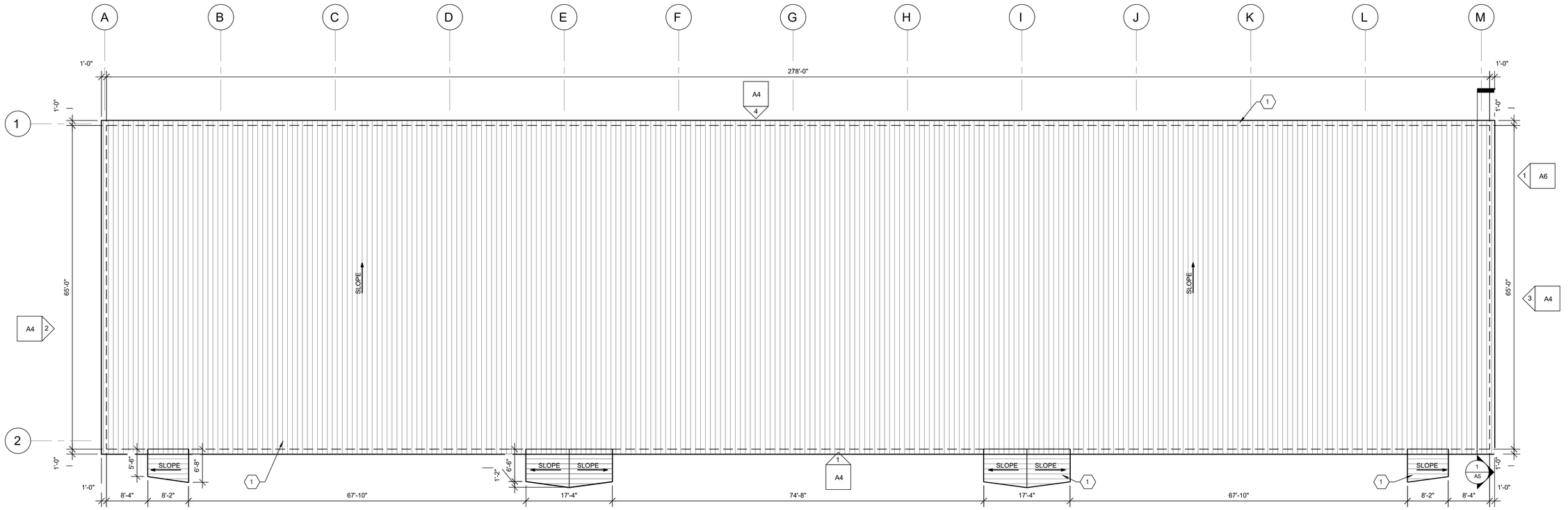
PROJECT NUMBER
-

REVISIONS

SHEET NUMBER
A1.1

KEYNOTES

1 PREFINISHED STANDING SEAM METAL ROOFING



1 ROOF PLAN

1" = 10'-0"

NORTH

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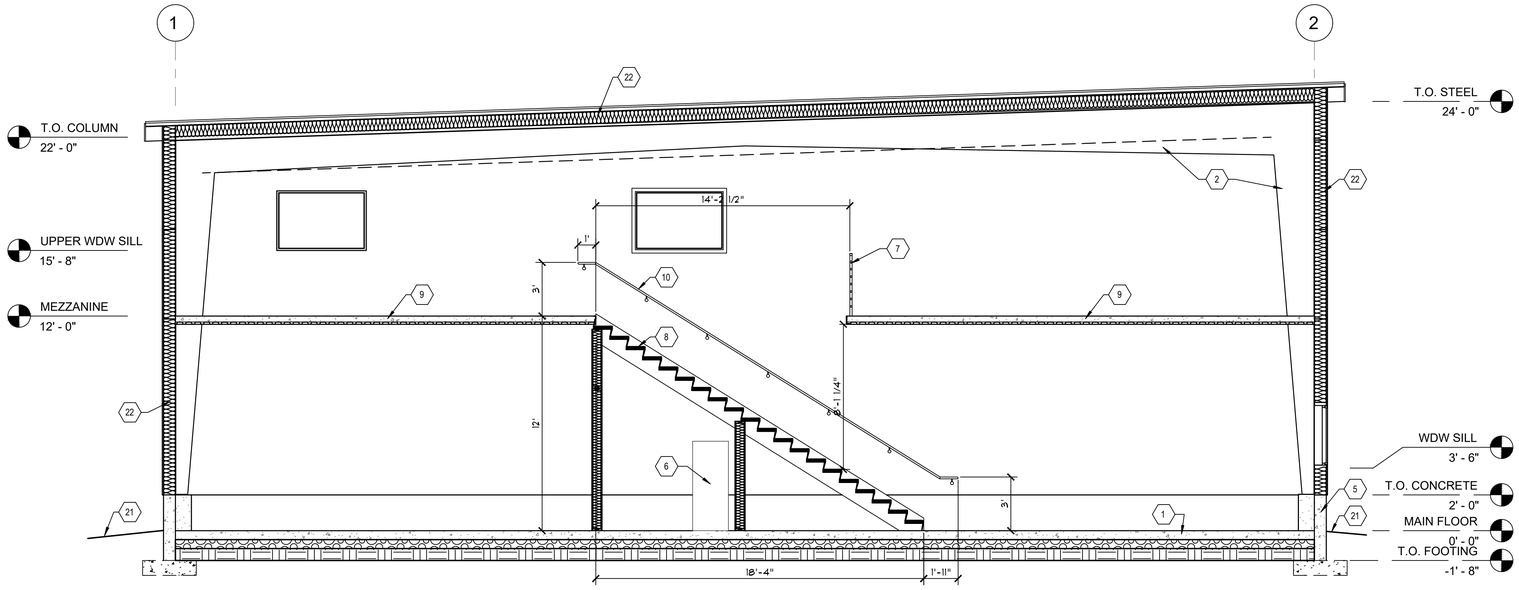
NEW BUILDING PROJECT
2485 SOUTH 1350 WEST
NIBLEY, UTAH

SHEET TITLE
ROOF PLAN

PROJECT NUMBER
-

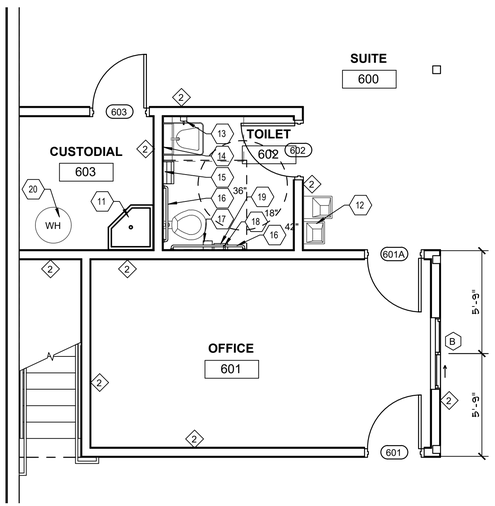
REVISIONS

SHEET NUMBER
A1.2



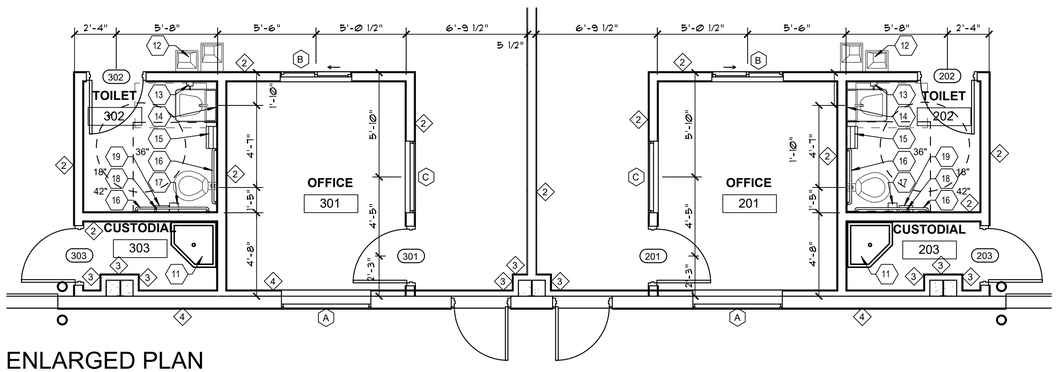
1 BUILDING SECTION

1/4" = 1'-0"



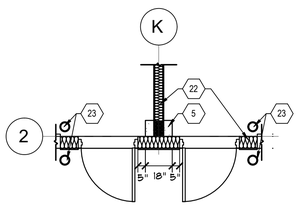
2 ENLARGED PLAN

1/4" = 1'-0"



3 ENLARGED PLAN

1/4" = 1'-0"



4 ENLARGED PLAN

1/4" = 1'-0"

KEYNOTES

1. 6" CONCRETE FLOOR OVER VAPOR RETARDER ON 6" COMPACTED GRAVEL
2. STEEL STRUCTURE - SEE STRUCTURAL DRAWINGS
3. 10" JOIST W/ 3/4" PLYWOOD SHEATHING
4. 2X4 WOOD STUDS W/ 5/8" GYPSUM BOARD ONE SIDE
5. CONCRETE FOUNDATION - SEE STRUCTURAL DRAWINGS
6. WATER HEATER
7. 42" METAL GUARDRAIL W/ POSTS @ 4'-0" O.C. TYP.
8. PAINTED STEEL PAN STAIR WITH CONCRETE TREADS
9. CONCRETE ON METAL DECK - SEE STRUCTURAL DRAWINGS
10. METAL HANDRAIL W/ SUPPORTS @ 4'-0" O.C. TYP.
11. MOP SINK
12. DRINKING FOUNTAIN
13. SOAP DISPENSER
14. MIRROR
15. PAPER TOWEL DISPENSER
16. HORIZONTAL GRAB BAR - SEE SIZE ON PLAN
17. TOILET TISSUE DISPENSER
18. VERTICAL GRAB BAR - SEE SIZE ON PLAN
19. SANITARY NAPKIN DISPOSAL
20. WATER HEATER
21. FINISH GRADE - SLOPE AWAY FROM BUILDING, TYP.
22. INSULATION BY METAL BUILDING MANUFACTURER
23. CONCRETE FILLED STEEL BOLLARD AT OVERHEAD DOORS, TYP.

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PROJECT TITLE
SUNRAY PROPERTIES BUILDING II
NEW BUILDING PROJECT
2485 SOUTH 1350 WEST
NIBLEY, UTAH

SHEET TITLE
ENLARGED PLANS
SECTION

PROJECT NUMBER
-

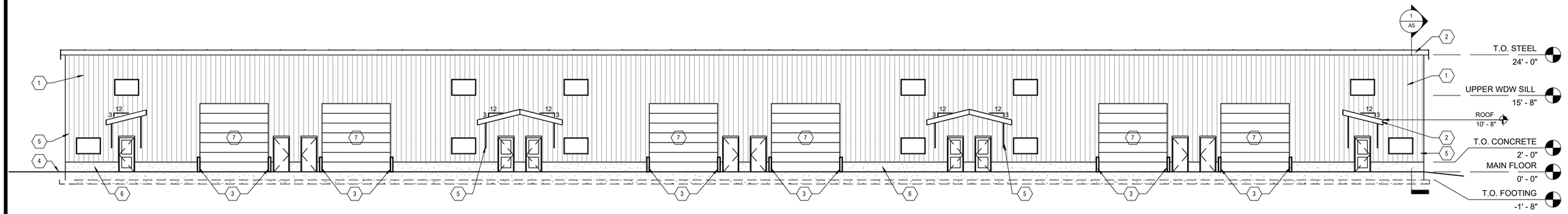
REVISIONS

SHEET NUMBER
A1.3

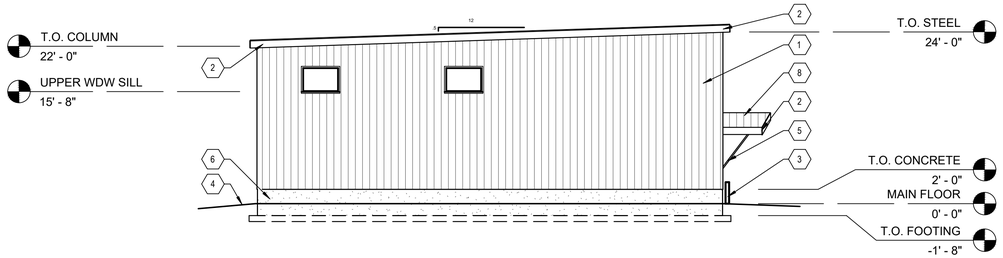
GENERAL NOTES

KEYNOTES

1. PREFINISHED METAL SIDING
2. PREFINISHED METAL FASCIA
3. PAINTED BOLLARD
4. FINISH GRADE - SLOPE AWAY FROM BUILDING
5. METAL CANOPY SUPPORTS, TYP.
6. CONCRETE FOUNDATION - RUBBED FINISH AT EXPOSED WALL
7. INSULATED OVERHEAD DOOR
8. STANDING SEAM METAL ROOFING



1 NORTH ELEVATION
1" = 10'-0"



2 EAST ELEVATION
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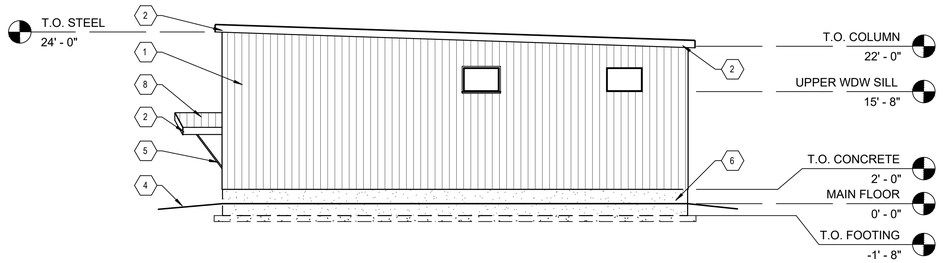
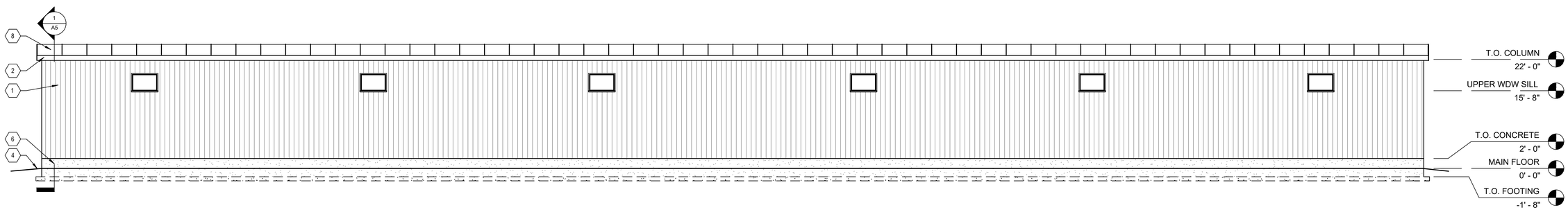


3 WEST ELEVATION
1" = 10'-0"



4 SOUTH ELEVATION
1" = 10'-0"

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PROJECT TITLE
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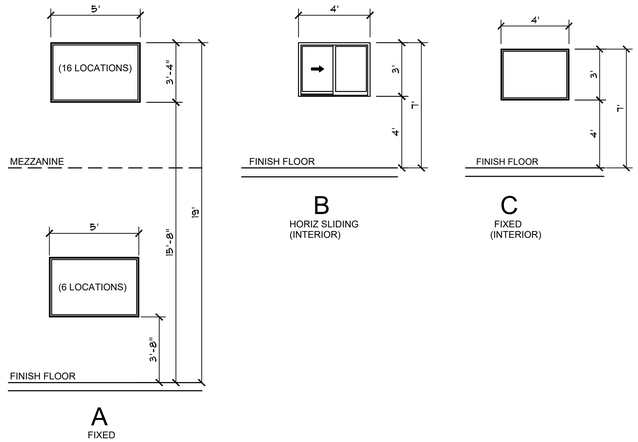
NEW BUILDING PROJECT
2485 SOUTH 1350 WEST
NIBLEY, UTAH

SHEET TITLE
EXT ELEVATIONS

PROJECT NUMBER
-

REVISIONS

SHEET NUMBER
A2.0



1 WINDOW ELEVATIONS

1/4" = 1'-0"

DOOR SCHEDULE

Mark	Width	Height	Frame Type	Fire Rating	Finish	Comments
100	3' - 0"	7' - 0"	HM			ENTRY
100A	14' - 0"	14' - 0"	-			OVERHEAD DOOR
100B	3' - 0"	7' - 0"	HM			
101	3' - 0"	7' - 0"	HM			
101A	3' - 0"	7' - 0"	HM			
102	3' - 0"	7' - 0"	HM			
103	3' - 0"	7' - 0"	HM			
200	3' - 0"	7' - 0"	HM			ENTRY
200A	14' - 0"	14' - 0"	-			OVERHEAD DOOR
200B	3' - 0"	7' - 0"	HM			
201	3' - 0"	7' - 0"	HM			
202	3' - 0"	7' - 0"	HM			
203	3' - 0"	7' - 0"	HM			
300	3' - 0"	7' - 0"	HM			ENTRY
300A	14' - 0"	14' - 0"	-			OVERHEAD DOOR
300B	3' - 0"	7' - 0"	HM			
301	3' - 0"	7' - 0"	HM			
302	3' - 0"	7' - 0"	HM			
303	3' - 0"	7' - 0"	HM			
400	3' - 0"	7' - 0"	HM			ENTRY
400A	14' - 0"	14' - 0"	-			OVERHEAD DOOR
400B	3' - 0"	7' - 0"	HM			
401	3' - 0"	7' - 0"	HM			
402	3' - 0"	7' - 0"	HM			
403	3' - 0"	7' - 0"	HM			
500	3' - 0"	7' - 0"	HM			ENTRY
500A	14' - 0"	14' - 0"	-			OVERHEAD DOOR
500B	3' - 0"	7' - 0"	HM			
501	3' - 0"	7' - 0"	HM			
502	3' - 0"	7' - 0"	HM			
503	3' - 0"	7' - 0"	HM			
600	3' - 0"	7' - 0"	HM			ENTRY
600A	14' - 0"	14' - 0"	-			OVERHEAD DOOR
600B	3' - 0"	7' - 0"	HM			
601	3' - 0"	7' - 0"	HM			
601A	3' - 0"	7' - 0"	HM			
602	3' - 0"	7' - 0"	HM			
603	3' - 0"	7' - 0"	HM			

ROOM FINISH SCHEDULE

RM #	ROOM NAME	FLOOR	BASE	WALL N	WALL S	WALL W	WALL E	CEILING	CEILING HT.	NOTES
100	SUITE	C	3	C	C	A	C	2		
101	OFFICE	A	2	A	A	A	A	1	8'-0"	
102	TOILET	B	1	B	B	B	B	1	8'-0"	
103	CUSTODIAL	C	2	A	B	B	A	1	8'-0"	
105	MEZZANINE	C	3	C	C	-	C	2		
200	SUITE	C	3	C	C	A	A	2		
201	OFFICE	A	2	A	A	A	A	1	8'-0"	
202	TOILET	B	1	B	B	B	B	1	8'-0"	
203	CUSTODIAL	C	2	B	C	B	A	1	8'-0"	
300	SUITE	C	3	C	C	A	A	2		
301	OFFICE	A	2	A	A	A	A	1	8'-0"	
302	TOILET	B	1	B	B	B	B	1	8'-0"	
303	CUSTODIAL	C	2	B	C	A	B	1	8'-0"	
400	SUITE	C	3	C	C	A	A	2		
401	OFFICE	A	2	A	A	A	A	1	8'-0"	
402	TOILET	B	1	B	B	B	B	1	8'-0"	
403	CUSTODIAL	C	2	B	C	B	A	1	8'-0"	
500	SUITE	C	3	C	C	A	A	2		
501	OFFICE	A	2	A	A	A	A	1	8'-0"	
502	TOILET	B	1	B	B	B	B	1	8'-0"	
503	CUSTODIAL	C	2	B	C	A	B	1	8'-0"	
600	SUITE	C	3	C	C	C	A	2		
601	OFFICE	A	2	A	A	A	A	1	8'-0"	
602	TOILET	B	1	B	B	B	B	1	8'-0"	
603	CUSTODIAL	C	2	A	B	C	B	1	8'-0"	
605	MEZZANINE	C	3	C	C	C	-	2		

FINISH SCHEDULE LEGEND

NOTE: STAIRS TO BE PAINTED STEEL TOEKICK, STRINGERS, & RAILINGS W/ CONCRETE PAN TREADS. (DESIGN BY OTHERS)

FLOOR
A. 2X2 CARPET TILES
B. SHEET VINYL FLOORING (COLOR BY OWNER)
C. SEALED CONCRETE - CLEAR FINISHED

BASE
1. 6" COVED VINYL BASE
2. 4" RUBBER BASE
3. NO BASE

WALLS
A. COLOR # PAINT, SEMI-GLOSS WITH SMOOTH TEXTURE - TBD
B. FULL HEIGHT WHITE FRP WALL COVERING.
C. EXPOSED STRUCTURE - NO FINISH.

CEILING
1. PAINTED GYP BD CEILING, SEMI GLOSS W/ SMOOTH TEXTURE
2. NO FINISH - EXPOSED STRUCTURE ABOVE

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PROJECT TITLE
SUNRAY PROPERTIES BUILDING II
NEW BUILDING PROJECT
2485 SOUTH 1350 WEST
NIBLEY, UTAH

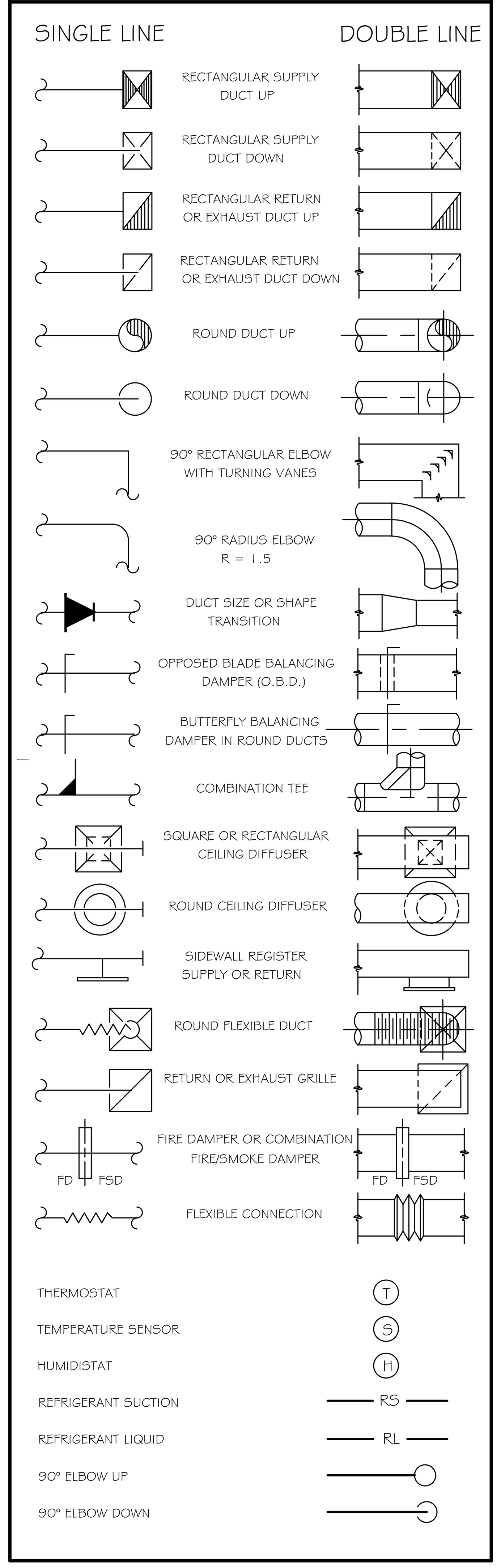
SHEET TITLE
SCHEDULES
WINDOW TYPES

PROJECT NUMBER
-

REVISIONS

SHEET NUMBER
A3.0

MECHANICAL SYMBOL LEGEND



MECHANICAL ABREVIATIONS

AD	ACCESS DOOR	N/A	NOT APPLICABLE
AHU	AIR HANDLING UNIT	NIC	NOT IN CONTRACT
BD	BALANCING DAMPER	NTS	NOT TO SCALE
BHP	BRAKE HORSE POWER	NO	NUMBER
BTU	BRITISH THERMAL UNIT	OZ	OUNCE
CFM	CUBIC FEET PER MINUTE	OA	OUTSIDE AIR
COND	CONDENS(-ER,-ING,-ATION)	PSF	POUNDS PER SQAURE FT.
CLG	COOLING	PSI	POUNDS PER SQUARE IN.
CW	COLD WATER	PSIA	PSI ABSOLUTE
DP	DEPTH OR DEEP	PSIG	PSI GAUGE
ID	INSIDE DIAMTER	PRESS	PRESSURE
OD	OUTSIDE DIAMTER	PD	PRESSURE DIFFERENCE
DB	DRY BULB TEMPERATURE	SP	STATIC PRESSURE
(E)	EXISTING	RA	RETURN AIR
EFF	EFFICIENCY	RPM	REVOLUTIONS PER MIN.
ELEV	ELEVATION	SF	SAFETY FACTOR
EWT	ENTERING WATER TEMP.	SL	SEA LEVEL
EVAP	EVAPORAT(-E,-ING,-ED,-OR)	SH	SENSIBLE HEAT
(F)	FUTURE	SC	SHADING COEFFICIENT
F	FARENHEIT	SPEC	SPECIFICATION
FC	FLEXIBLE CONNECT(-OR,-ION)	SQ	SQUARE
FD	FIRE DAMPER	STD	STANDARD
FPS	FEET PER SECOND	SP	STATIC PRESSURE
FSD	FIRE SMOKE DAMPER	SPLY	SUPPLY
FT	FEET	SA	SUPPLY AIR
GAL	GALLON(S)	TEMP	TEMPERATURE
GPH	GALLONS PER HOUR	TD	TEMP. DROP OR DIFF.
GPM	GALLONS PER MINUTE	R	THERMAL RESITANCE
HD	HEAD	TSTAT	THERMOSTAT
HT	HEIGHT	T	TIME
HTG	HEATING	VAC	VACUUM
HP	HORSE POWER	VAV	VARIBLE AIR VOLUME
HW	HOT WATER	VENT	VENT, VENTILATION
LH	LATENT HEAT	VERT	VERTICAL
LAT	LEAVING AIR TEMPERATURE	VOL	VOLUME
LWT	LEAVING WATER TEMP.	WTR	WATER
LG	LENGTH	WT	WEIGHT
MAX	MAXIMUM	WB	WET BULB TEMP.
MIN	MINIMUM	YR	YEAR
NO	NORMALLY OPEN		
NC	NORMALLY CLOSED		

MECHANICAL SPECIFICATIONS (3)

FURNACES

A. PROVIDE AND INSTALL FURNACES WITH CAPACITIES, FEATURES, AND ACCESSORIES AS SHOWN ON THE EQUIPMENT SCHEDULE. PROVIDE EQUIPMENT FROM THE FOLLOWING APPROVED MANUFACTURERS: BRYANT, CARRIER, LENNOX, TRANE, YORK.

B. PROVIDE 10 YEAR MINIMUM WARRANTY FOR THE HEAT EXCHANGER.

C. PROVIDE AN EXTRA SET OF FAN BELTS FOR EACH FAN AND AN EXTRA SET OF FILTERS FOR EACH UNIT.

D. FURNACE SHALL BE FACTORY ASSEMBLED AND TESTED. UNIT SHALL BE CONSTRUCTED WITH MANUFACTURER'S STANDARD CONSTRUCTION WITH ALL COMPONENTS, EQUIPMENT, AND ACCESSORIES. THE ENCLOSURE SHALL HAVE A CORROSION-PROTECTION COATING AND EXTERIOR FINISH.

E. PROVIDE THE FOLLOWING FEATURES WITH THE FURNACE UNLESS NOTED OHERWISE ON THE EQUIPMENT SCHEDULE: 7-DAY PROGRAMMABLE THERMOSTAT WITH AUTOMATIC HEATING AND COOLING CHANGEOVER, AND SERVICE DISCONNECT.

F. PROVIDE COMPLETE FURNACE STARTUP AND COMMISSIONING INCLUDING CONTROLS CHECKOUT, LUBRICATION, FAN ROTATION, VIBRATION, REFRIGERATION SYSTEM, CLEANING, TESTING, AND BALANCING.

G. PROVIDE A FACTORY AUTHORIZED SERVICE REPRESENTATIVE TO COMPLETE THE UNIT STARTUP AND OWNER TRAINING.

AIR COOLED CONDENSING UNITS

A. PROVIDE AND INSTALL AIR-COOLED CONDENSING UNITS WITH CAPACITIES, FEATURES, AND ACCESSORIES AS SHOWN ON THE EQUIPMENT SCHEDULE. PROVIDE EQUIPMENT FROM THE FOLLOWING APPROVED MANUFACTURERS:
BRYANT, CARRIER, LENNOX, TRANE, YORK.

B. CONDENSING UNIT SHALL BE FACTORY ASSEMBLED AND TESTED. UNIT SHALL BE CONSTRUCTED WITH MANUFACTURER'S STANDARD CONSTRUCTION WITH ALL COMPONENTS, EQUIPMENT, AND ACCESSORIES. THE ENCLOSURE SHALL HAVE A CORROSION-PROTECTION COATING AND EXTERIOR FINISH.

C. PROVIDE THE FOLLOWING FEATURES WITH THE CONDENSING UNIT UNLESS NOTED OHERWISE ON THE EQUIPMENT SCHEDULE: LOW AMBIENT HEAD-PRESSURE CONTROL TO OPERATE AT 0 DEG. F., VIBRATION ISOLATION PADS, MOTOR STARTER, AND SERVICE DISCONNECT.

D. PROVIDE COMPLETE UNIT STARTUP AND COMMISSIONING INCLUDING CONTROLS CHECKOUT, LUBRICATION, FAN ROTATION, VIBRATION, REFRIGERATION SYSTEM, CLEANING, TESTING, AND BALANCING.

E. PROVIDE A FACTORY AUTHORIZED SERVICE REPRESENTATIVE TO COMPLETE THE UNIT STARTUP AND OWNER TRAINING.

COMMISSIONING

A. PROVIDE SYSTEM COMMISSIONING OF ALL MECHANICAL SYSTEMS CONSISTING OF FIELD VERIFICATION AND CERTIFYING THAT THE MECHANICAL SYSTEM IS PROPERLY INSTALLED AND IS FULLY OPERATIONAL.

B. PROVIDE A SYSTEM COMMISSIONING REPORT TO BE INCLUDED IN THE OPERATION AND MAINTENANCE MANUAL THAT INCLUDES A CHECKLIST OF ALL EQUIPMENT AND SYSTEMS.

ELECTRIC AND ELECTRONIC CONTROLS

A. PROVIDE AND INSTALL A COMPLETE AUTOMATIC CONTROL SYSTEM AS DESCRIBED IN THE DRAWINGS. ALL SYSTEM CONTROLS SHALL BE PROVIDED BY A SINGLE MANUFACTURER'S PRODUCTS. APPROVED MANUFACTURERS ARE: BRYANT, CARRIER, HONEYWELL, TRANE

TEST AND BALANCE

A. PROVIDE A COMPLETE AIR SYSTEM BALANCE, TEST, AND REPORT BY A NEBB, OR AABC CERTIFIED TEST AND BALANCE SUPERVISER WITH EXPERIENCE IN BALANCING SYSTEMS OF SIMILAR TYPES AND SIZE.

B. PROVIDE ALL NECESSARY TOOLS, EQUIPMENT, SHEAVE CHANGES, BELTS, AND ACCESSORIES TO COMPLETE WORK.

C. PROVIDE A REPORT SHOWING THE REQUIRED AND THE ACTUAL FLOWS. INCLUDE IN THE REPORT A DRAWING SHEMATIC OF THE SYSTEMS BALANCED, AND SYSTEMS CHECK REPORT. SUBMIT THE BALANCING REPORT FOR REVIEW PRIOR TO THE FINAL INSPECTION. ALL REPORTS SHALL BE INCLUDED IN THE OPERATION AND MAINTENANCE MANUAL.

MECHANICAL SPECIFICATIONS (2)

METAL DUCTS

A. PROVIDE AND INSTALL SHEETMETAL DUCTS CONFORMING TO SMACNA, ASHRAE, AND AND NFPA 90A STANDARDS AS SHOWN ON THE MECHANICAL PLANS.

B. SHOP FABRICATE SQUARE, RECTANGULAR, ROUND, AND OVAL DUCTS, FITTINGS, HANGERS AND SUPPORTS ACCORDING TO SMACNA HVAC DUCT CONTRUCTION STANDARDS.

C. FACTORY APPLY DUCT LINER USING APPROVED SMACNA METHODS TO ALL REQUIRED DUCTS AS INDICATED IN THE INSULATION SECTION OF THIS SPECIFICATION.

D. PROVIDE TURNING VANES IN ALL RECTANGULAR DUCT FITTINGS OVER 45° ANGLES. PROVIDE 1.5 RADIUS ELBOWS ON ALL ROUND DUCTS.

E. SEAL ALL LONGITUDINAL AND TRANSVERSE JOINTS, SEAMS, AND CONNECTIONS WITH AN APPROVED SEALANT OR SEALING METHOD.

F. DUCT DIMENSIONS SHOWN ARE SHOWN ARE SHEETMETAL SIZES. NO INCREASE FOR DUCT LINER IS REQUIRED.

G. INSTALL DUCTWORK IN THE MOST EFFICIENT MANNER POSSIBLE, MINIMIZING JOINTS AND CHANGES IN DIRECTION.

H. PROTECT STORED AND INSTALLED DUCTWORK FROM DUST, DIRT, MOISTURE, AND CONSTRUCTION DEBRIS. CLEAN ALL DUCTWORK PRIOR TO OPERATION.

I. ALL ROUND DUCTS SHALL BE CONSTRUCTED OF SPIRAL WOUND SHEET METAL.

DUCT ACCESSORIES

A. PROVIDE AND INSTALL THE FOLLOWING DUCT ACCESSORIES WHERE INDICATED ON THE DRAWINGS: BACKDRAFT DAMPERS, BALANCING DAMPERS, FIRE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS, ACTUATORS, TURNING VANES, ACCESS DOORS, FLEXIBLE DUCTS, AND ACCESSORIES HARDWARE.

B. PROVIDE CONCEALED DAMPER REGULATORS WITH REQUIRED LINKAGES AND COVER PLATES FOR EACH DAMPER LOCATED ABOVE A NON-ACCESSIBLE CEILING.

C. FIRE DAMPERS SHALL BE UL LISTED AND LABELED. FIRE DAMPERS SHALL BE RATED FOR 1-1/2 HOURS FOR FIRE RESISTIVE ASSEMBLIES RATED FOR 2 HOURS OR LESS AND RATED FOR 3 HOURS FOR FIRE RESISTIVIE ASSEMBLIES RATED 3 HOURS OR MORE. REPLACEABLE FUSIBLE LINKS RATED FOR 165° F SHALL BE USED. USE TYPE A, B, OR C AS INDICATED ON THE DRAWINGS.

E. PROVIDE TURNING VANES WHERE NOTED IN THE METAL DUCTS SPECIFICATION.

F. PROVIDE DUCT MOUNTED ACCESS DOORS AT ALL FIRE DAMPERS, FIRE/SMOKE DAMPERS, AND MOTORIZED CONTROL DAMPERS. ACCESS DOORS SHALL BE FACTORY CONSTRUCTED OF GALVANIZED SHEET METAL AND HAVE HINGES, GASKETS, SEALS, AND LATCHES.

G. FLEXIBLE DUCTS SHALL BE ROUND INSULATED, FACTORY-FABRICATED OR CORRUGATED ALUMINUM WITH AN OUTER JACKET, AND A SPIN COLLAR. THE MAXIMUM ALLOWABLE LENGTH OF FLEX DUCT SHALL BE 5'-0" AT ALL DIFFUSER TERMINATIONS.

H. PROVIDE INSTRUMENT TEST HOLES AT THE INLET AND OUTLET OF ALL FAN SYSTEMS.

I. INSTALL ALL DUCT ACCESSORIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AND SMACNA STANDARDS.

EXHAUST FANS

A. PROVIDE AND INSTALL EXHAUST FANS WITH TYPE, CAPACITIES, FEATURES, AND ACCESSORIES AS SHOWN ON THE EQUIPMENT SCHEDULE. PROVIDE EQUIPMENT FROM THE FOLLOWING APPROVED MANUFACTURERS:
ACME, BROAN, CARNES, COOK. GREENHECK, PENN

B. ALL EXHAUST FANS SHALL DESIGNED, MANUFACTURED, TESTED, AND LABELED IN ACCORDANCE WITH UL REQUIREMENTS AND AMCA STANDARDS.

C. PROVIDE FACTORY FABRICATED AND ASSEMBLED EXHAUST FANS COMPLETE WITH ALUMINUM HOUSING, ALUMINUM FAN WHEEL, SHAFT, BEARINGS, DIRECT OR BELT DRIVE ASSEMBLY, PAINTED STEEL OR ALUMINUM GRILL, BACKDRAFT DAMPER, MOTOR, DISCONNECT SWITCH, MOUNTING BRACKETS, AND ACCESSORIES AS NOTED.

D. PROVIDE AND INSTALL REMOTE FAN SPEED CONTROL, PROGRAMMABLE TIMER, MANUAL TIMER, ON-OFF SWITCH AS INDICATED IN THE EQUIPMENT SCHEDULE.

E. PROVIDE COMPLETE FAN UNIT STARTUP AND COMMISSIONING INCLUDING CONTROLS CHECKOUT, LUBRICATION, FAN ROTATION, VIBRATION, CLEANING, TESTING, AND BALANCING.

AIR OUTLETS AND INLETS

A. PROVIDE FACTORY FABRICATED AND ASSEMBLED CEILING AIR DIFFUSERS AND GRILLES, WALL REGISTERS AND GRILLES, AND LOUVERS COMPLETE WITH ALL FEATURES AND ACCESSORIES AS NOTED IN THE SCHEDULE. PROVIDE EQUIPMENT FROM THE FOLLOWING APPROVED MANUFACTURERS:
AIROLITE, ANEMOSTAT, CARNES, COOLEY & HART, E.H. PRICE, J & J REGISTER, KRUEGER, LOUVERS AND DAMPERS, NAILOR, RUSKIN, TITUS, AND TUTTLE & BAILEY.

B. ALL AIR OUTLETS AND INLETS SHALL BE DESIGN, MANUFACTURERED, AND TESTED TO CONFORM TO ARI, ASHRAE, ADC, AND AMCA STANDARDS.

C. CEILING DIFFUSERS AND REGISTERS AND WALL REGISTERS AND GRILLES SHALL BE CONSTRUCTED OF GALVANIZED STEEL OR ALUMINUM AND SHALL HAVE A BAKED ENAMEL FINISH. COLOR SELECTION BY THE ARCHITECT OR OWNER.

D. LOUVERS SHALL BE CONSTRUCTED OF ALUMINUM EXTRUSIONS WITH WELDED CONNECTIONS OR STAINLESS STEEL FASTENERS. PROVIDE 1/2" ANODIZED ALUMINUM WIRE BIRD SCREEN. LOUVER FINISH SHALL BE ANODIZED ALUMINUM IN COLOR AS SELECTED BY THE ARCHITECT OR OWNER.

MECHANICAL SPECIFICATIONS (1)

BASIC MECHANICAL REQUIREMENTS

A. COMPLY WITH THE REQUIREMENTS OF THE 2018 EDITION OF THE INTERNATIONAL BUILDING CODE (IBC), INTERNATIONAL MECHANICAL CODE (IMC), UNIFORM PLUMBING CODE (UPC), INTERNATIONAL FUEL GAS CODE (IFGC), AND INTERNATIONAL ENERGY CONSERVATION CODE (IECC), AND THE CURRENT NATIONAL ELECTRIC CODE (NEC) INCLUDING ALL STATE AMENDMENTS. COMPLY WITH THE AUTHORITY HAVING JURISDICTION AND ALL APPLICABLE CITY, COUNTY, STATE, AND FEDERAL CODES AND REGULATIONS IN EFFECT AT THE BID DATE.

B. PREPARE AND SUBMIT SHOP DRAWINGS FOR ALL MECHANICAL EQUIPMENT, VALVES, AND ACCESSORIES
INCLUDING MANUFACTURER'S NAME, CATALOG NUMBER, DESCRIPTION, SIZE, CAPACITY, ELECTRICAL REQUIREMENTS, OPERATION, AND MAINTENANCE INFORMATION. SHOP DRAWINGS SHALL BE REVIEWED AND STAMPED BY THE MECHANICAL AND GENERAL CONTRACTOR PRIOR TO ENGINEER'S REVIEW. EQUIPMENT SHALL NOT BE ORDERED UNTIL APPROVED SHOP DRAWINGS HAVE BEEN RECEIVED.

C. PREPARE COORDINATION DRAWINGS DETAILING ALL MAJOR EQUIPMENT AND SYSTEMS. INCLUDE EQUIPMENT CONNECTIONS, CLEARANCES, FIRE-RATED WALL OR FLOOR PENETRATIONS, CONCRETE PADS, AND SUPPORT DETAILS IN COORDINATION DRAWINGS. COORDINATION DRAWINGS SHALL BE IN CONJUNCTION WITH THE MECHANICAL, FIRE SPRINKLER (WHERE REQUIRED), ELECTRICAL, REFLECTED CEILINGS, AND ALL OTHER APPLICABLE TRADES.

D. PREPARE RECORD "AS BUILT" DOCUMENTS INCLUDING ALL CHANGES FROM THE ORIGINAL BID DOCUMENTS. SUBMIT COMPLETE "AS BUILT" DOCUMENTS AT THE COMPLETION OF THE PROJECT.

E. PROVIDE 2 SETS OF OPERATION AND MAINTENANCE (O & M) MANUALS CONTAINING INFORMATION FOR ALL MECHANICAL AND PLUMBING SYSTEMS. THE MANUALS SHALL CONTAIN A LIST OF ALL SUB-CONTRACTORS AND SUPPLIERS, EQUIPMENT CUT SHEETS, START-UP INFORMATION, BALANCING REPORTS, AND MAINTENANCE REQUIREMENTS. THE MANUALS SHALL BE HARD BACKED 3-RING BINDERS WITH THE PROJECT LABELED ON THE COVER AND SPLINE.

F. INSTALL ALL MECHANICAL EQUIPMENT AND MATERIALS IN COORDINATION WITH ALL OTHER TRADES. VERIFY ALL ELECTRICAL CONNECTIONS WITH THE ELECTRICAL CONTRACTOR PRIOR TO INSTALLATION.

G. PROVIDE AND INSTALL ACCESS DOORS WHERE EQUIPMENT, VALVES OR DAMPERS ARE CONCEALED BEHIND FINISHED SURFACES.

H. PROVIDE FACTORY-AUTHORIZED EQUIPMENT START-UP, COMMISSIONING, AND TRAINING OF ALL MECHANICAL EQUIPMENT.

I. INSTALL ALL SYSTEMS, MATERIALS, AND EQUIPMENT LEVEL AND PLUMB, PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS. INSTALL ALL PIPING FREE FROM SAGS AND BENDS AND AT THE SLOPE INDICATED (WHERE REQUIRED). INSTALL DUCTWORK, PIPING, AND EQUIPMENT TO PROVIDE THE MAXIMUM POSSIBLE HEADROOM.

J. ALL WORK SHALL BE PERFORMED BY CERTIFIED AND SKILLED WORKERS WITH PRIOR EXPERIENCE IN THEIR PARTICULAR TRADE.

K. THE MECHANICAL SUB-CONTRACTOR SHALL PROVIDE WARRANTY THE ENTIRE MECHANICAL SYSTEM FOR A PERIOD OF ONE YEAR. INCLUDE THE WARRANTY AND ALL OTHER GUARANTEES AND WARRANTIES IN THE OPERATION AND MAINTENANCE MANUAL.

L. THE CONTRACTOR SHALL STORE AND PROTECT ALL EQUIPMENT AND MATERIALS DURING CONSTRUCTION AS REQUIRED AND SHALL REPAIR OR REPLACE ALL DAMAGED PIPING, EQUIPMENT, OR OTHER DAMAGE DURING CONSTRUCTION.

M. PROVIDE AND INSTALL ALL MECHANICAL EQUIPMENT, PIPING, FIXTURE, AND ACCESSORIES IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE ALL FITTINGS, VALVES, TRANSITIONS, AND OTHER DEVICES AS REQUIRED FOR A COMPLETE AND OPERATIONAL MECHANICAL SYSTEM.

N. SUBMIT FOR PRIOR APPROVAL FOR EQUIPMENT MANUFACTURERS NOT LISTED IN THE SPECIFICATIONS A MINIMUM OF FIVE PRIOR TO BID.

BASIC MECHANICAL MATERIALS AND METHODS

A. ALL PIPE AND PIPE FITTINGS SHALL BE NEW AND SHALL BE AMERICAN MADE WITH APPROVED LABELS. DELIVER, STORE, AND PROTECT DUCTWORK AND PIPING DURING CONSTRUCTION FROM DAMAGE, DIRT, AND MOISTURE.

B. SEAL ALL DUCT AND PIPE PENETRATIONS THROUGH WALLS AND FLOORS AIR TIGHT. CAULK ALL FIRE RATED PIPE PENETRATIONS WITH APPROVED FIRE-STOPPING MATERIAL.

C. CUT, CHANNEL, CHASE, AND DRILL FLOORS, WALLS, PARTITIONS, CEILINGS, AND OTHER SURFACES NECESSARY FOR PROPER INSTALLATION. REPAIR AS REQUIRED TO MATCH ADJACENT SURFACES.

HANGERS AND SUPPORTS

A. PROVIDE AND INSTALL DUCT SUPPORTS AND HANGERS AS REQUIRED FOR ALL DUCTWORK AND EQUIPMENT ACCORDING TO MANUFACTURERS STANDARDIZATION SOCIETY (MSS) AND SMACA STANDARDS.

VIBRATION ISOLATION AND SEISMIC CONTROLS

A. PROVIDE AND INSTALL VIBRATION ISOLATORS, FLEXIBLE CONNECTIONS, ISOLATION PADS, AND OTHER EQUIPMENT TO PREVENT NOISE AND VIBRATION TRANSMISSION.

DUCTWORK AND EQUIPMENT IDENTIFICATION

A. PROVIDE DUCT AND EQUIPMENT TAGS, LABELS, AND IDENTIFICATION INDICATING FLOW DIRECTION, AREA SERVED, SYSTEM TYPE AND OTHER IDENDIFYING INFORMATION. COMPLY WITH ASME PIPING EQUIPMENT IDENTIFICATION STANDARDS.

INSULATION

A. PROVIDE AND INSTALL GLASS FIBER DUCT INSULATION ACCORDING TO THE FOLLOWING SCHEDULE:
   RECTANGULAR SUPPLY AND RETURN DUCTS:
      1" DUCT LINER
   ROUND SUPPLY AND RETURN DUCTS:
      1-1/2" BLANKET WRAP WITH VAPOR BARRIER.
   ROUND AND RECTANGULAR EXHAUST DUCTS:
      NO INSULATION UNLESS OTHERWISE NOTED.
   UNLINED SUPPLY, COMBUSTION, AND OUTSIDE AIR DUCTS:
      1-1/2" BLANKET WRAP WITH VAPOR BARRIER.
   EXTERIOR INSTALLED SUPPLY AND RETURN DUCTS:
      2" BLANKET WRAP WITH VAPOR BARRIER.

B. DUCT LINER SHALL BE 1" THICK, 2 LBS. DENSITY, WITH ASTM C 1071, TYPE II COATED ACRYLIC SURFACE AND PRE-TEATED FOR ANTI-MICROBIAL AGENT TO PREVENT MICROBIAL GROWTH.

C. GLASS FIBER INSULATION SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS.

D. SEAL ALL ENDS AND JOINTS TO PROVIDE A COMPLETELY SEALED INSULATION SYSTEM.

E. SEAL JOINTS, BREAKS AND PUNCTURES WITH VAPOR BARRIER COMPOUND.

MECHANICAL GENERAL NOTES

1. PROVIDE ALL EQUIPMENT, PIPING, MATERIALS, LABOR, PERMITS, AND FEES TO CONSTUCT A COMPLETE AND OPERATIONAL MECHANICAL SYSTEM FOR THE ENTIRE PROJECT AS SHOWN ON THE DRAWINGS.
2. COORDINATE THE EXACT LOCATION OF ALL CEILING DIFFUSERS AND GRILLES WITH THE ARCHITECTURAL REFLECTED CEILING PLAN.
3. COORDINATE ALL WORK WITH THE GENERAL CONTRACTOR, PLUMBING SUB-CONTRACTOR, ELECTRICAL SUB-CONTRACTOR, AND ALL OTHER TRADES IN THE PROJECT.
4. ALL MECHANICAL INFORMATION IS NOT SHOWN ON THE MECHANICAL DRAWINGS. COORDINATE ALL WORK WITH THE ARCHITECTURAL, STRUCTURAL, PLUMBING, CIVIL, AND ELECTRICAL DRAWINGS.
5. MECHANICAL PLANS ARE SCHEMATIC IN NATURE AND THEREFORE DO NOT SHOW ALL DROPS, RISERS, AND OFFSETS. THE CONTRACTOR SHALL MAKE ALL REQUIRED MODIFICATIONS TO PROVIDE A COMPLETE AND OPERATIONAL MECHANICAL SYSTEM. MAJOR MODIFICATIONS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER.
6. DO NOT RUN DUCTWORK ABOVE ELECTRICAL PANELS. PROVIDE 4-0" DEEP X 6'-6" HIGH CLEAR ACCESS SPACE IN FRONT OF PANELS. DO NOT RUN DUCTWORK IN ELECTRICAL ROOMS.
7. INSTALLATION OF ALL DUCTWORK SHALL BE COORDINATED WITH STRUCTURAL GIRDERS AND JOIST. DUCTWORK SHALL BE RUN WITHIN STRUCTURE SPACE WHERE SHOWN ON THE PLANS.
8. COORDINATE ALL FLOOR, CEILING, AND ROOF PENETRATIONS WITH THE STRUCTURAL PLANS. MAINTAIN DUCTWORK TIGHT TO THE STRUCTURE. OFFSET INTO THE JOIST SPACE WHERE SHOWN ON THE PLANS.
9. REFER TO CEILING SUPPLY DIFFUSER AND RETURN AIR GRILL DETAIL 1/M2.0.

Mortensen Engineering, Inc.
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Smithfield, Utah 84335
(435) 770-5534

NORTH

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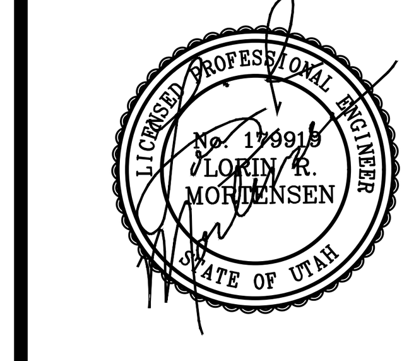
497 EAST 520 SOUTH
SMITHFIELD, UTAH
(435) 764-6742



DATE
October 5, 2019

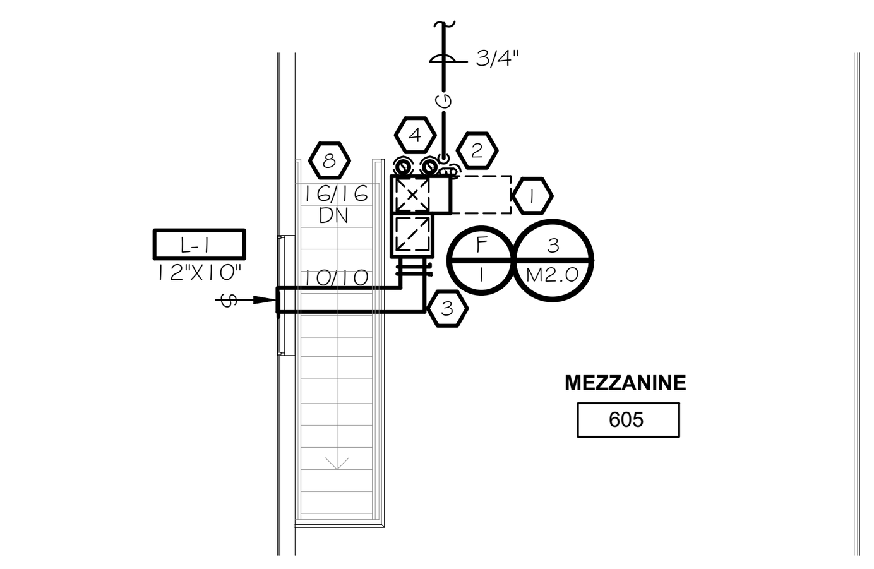
PROJECT TITLE
SUNRAY PROPERTIES BUILDING II
NEW BUILDING PROJECT
2485 SOUTH 1350 WEST
NIBLEY, UTAH

SHEET TITLE
MECHANICAL NOTES & SPECIFICATIONS

PROJECT NUMBER

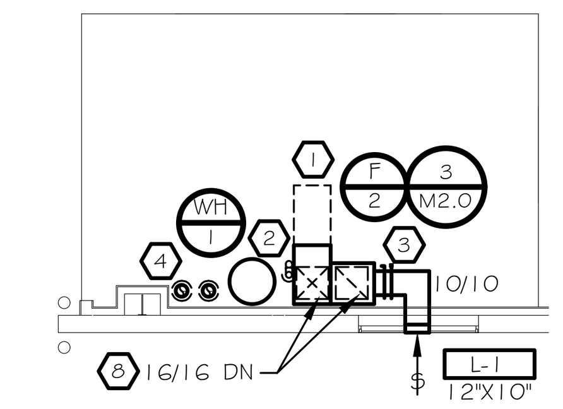
REVISIONS

SHEET NUMBER
M0.1



MEZZANINE MECHANICAL PLAN

C / M1.0 — SCALE: 1/4" = 1' - 0"

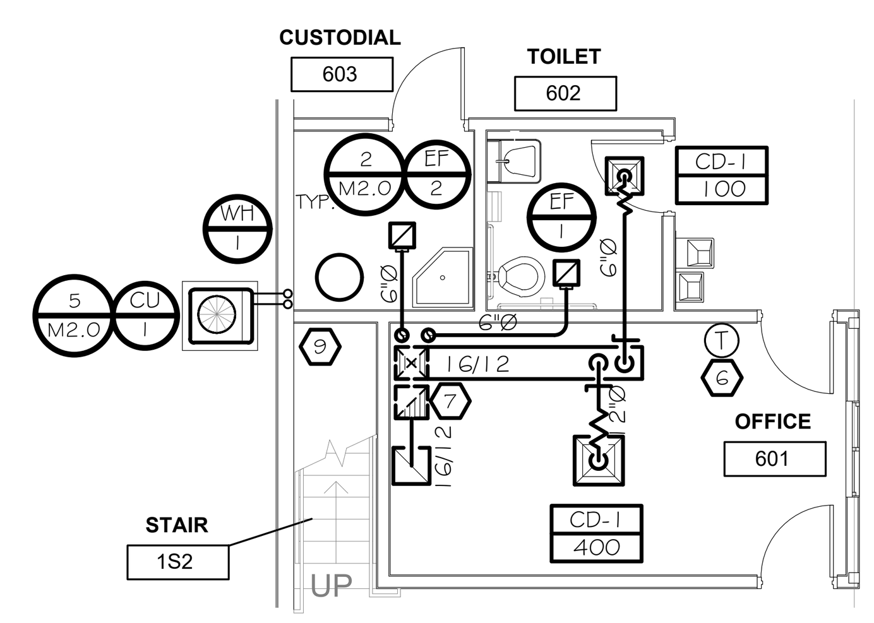


MEZZANINE MECHANICAL PLAN

D / M1.0 — SCALE: 1/4" = 1' - 0"

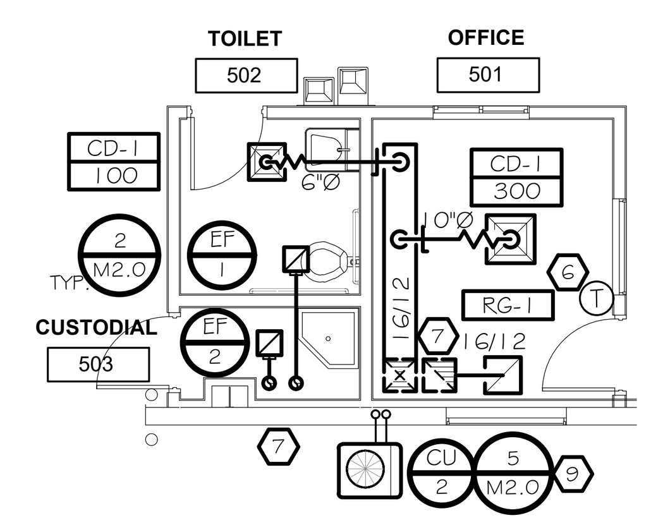
REFERENCE NOTES

1. EQUIPMENT SERVICE AREA. KEEP CLEAR OF DUCTS AND PIPES.
2. EXTEND FLUE/COMBUSTION PIPING UP THROUGH ROOF. PROVIDE CONCENTRIC VENT KIT.
3. MOTORIZED DAMPER.
4. EXTEND EXHAUST DUCTS UP THROUGH ROOF. PROVIDE TERMINATION EXHAUST CAP.
5. CONCRETE EQUIPMENT PAD.
6. PROGRAMMABLE THERMOSTAT.
7. DUCTS UP. SEE MEZZANINE MECHANICAL PLAN FOR CONTINUATION.
8. DUCTS DOWN. SEE MECHANICAL PLAN FOR CONTINUATION.
9. EXTEND REFRIGERANT PIPING UP TO DX COIL LOCATED ON MEZZANINE.
10. EXTEND FLUE/COMBUSTION AIR PIPING THROUGH ROOF AS PER MANUFACTURER'S RECOMMENDATIONS.



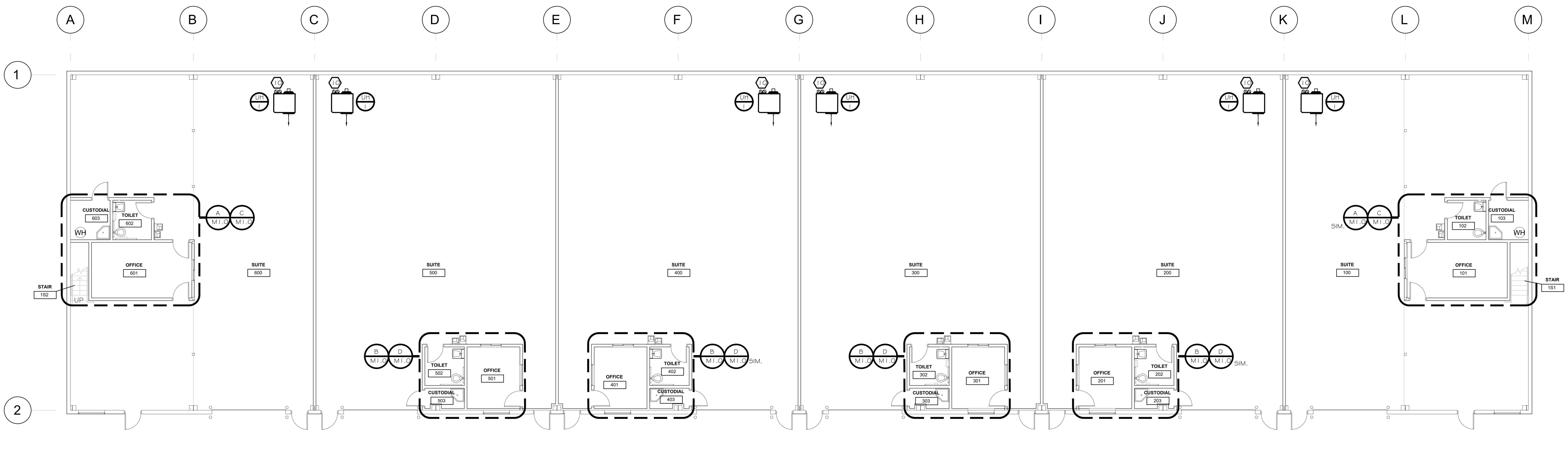
MECHANICAL PLAN

A / M1.0 — SCALE: 1/4" = 1' - 0"



MECHANICAL PLAN

B / M1.0 — SCALE: 1/4" = 1' - 0"



MECHANICAL PLAN

SCALE: 1" = 10'-0"

JOSEPH T. BECK ARCHITECT, INC.
497 EAST 520 SOUTH
SMITHFIELD , UTAH
(435) 764-6742

LICENSED PROFESSIONAL ENGINEER No. 179919 LORIN R. MORTENSEN STATE OF UTAH

DATE
October 5, 2019

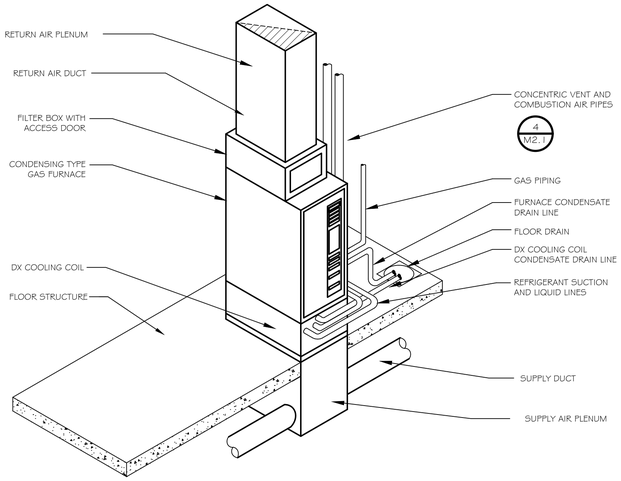
PROJECT TITLE
SUNRAY PROPERTIES BUILDING II
NEW BUILDING PROJECT
2485 SOUTH 1350 WEST
NIBLEY , UTAH

SHEET TITLE
MECHANICAL PLANS

PROJECT NUMBER

REVISIONS

SHEET NUMBER
M1.0



3 M2.1 DOWN FLOW FURNACE
NOT TO SCALE

REGISTER AND GRILLE SCHEDULE

SYMBOL	MANUFACTURER	MODEL	DESCRIPTION	MAX. NC	NECK SIZE	MAX. CFM
CD-1	PRICE	SCD	LOUVERED FACE CEILING DIFFUSERS REMOVABLE FACE & CORE. W/O.B.D. FRAME SHALL BE FOR SURFACE OR LAY-I IN MOUNTING AS REQUIRED BY CEILING TYPE. LAY-IN FRAMES SHALL BE 24" X 24", 24" X 12", OR 12" X 12" AS REQ'D. TO FIT CEILING TILE SPACE AVAILABLE. PROVIDE ROUND NECK ADAPTER.	30	6 x 6 8 x 8 9 x 9 10 x 10 6 x 18 12 x 12 15 x 15 18 x 18	125 220 250 320 350 425 625 900
RG-1	PRICE	535	LOUVERED FACE CEILING RETURN AIR UNIT, REMOVABLE FACE & CORE. FRAME SHALL BE FOR SURFACE OR LAY-IN MOUNTING AS REQUIRED BY CEILING TYPE. LAY-IN FRAMES SHALL BE 24" X 24", 24" X 12" OR 12" X 12" AS REQUIRED TO FIT CEILING TILE SPACE AVAILABLE. AIR QUANTITY SHALL MATCH ROOM SUPPLY OR EXHAUST AIR QUANTITY.	30	10 x 10 12 x 12 14 x 14 10 x 22 16 x 16 18 x 18 24 x 24 36 x 24	350 500 550 625 725 900 1300 2200
L-1	AIROLITE	K6774	WALL LOUVER. STATIONARY 4" THICK 45 BLADE 12 GA. EXT. ALUMINUM BLADES, 8 GA. EXT. JAMBS, CHANNEL FRAME. BRONZE ANODIZED FINISH WITH BIRD SCREEN. COLOR BY ARCHITECT.	30	SEE PLANS	
SWS-1	PRICE	510	SIDEWALL SUPPLY DIFFUSER. DOUBLE DEFLECTION SUPPLY REGISTER. VERTICAL FRONT WITH HORIZONTAL REAR DEFLECTION VANES SPACED AT 3/4" O.C. ADJUSTABLE. COMPLETE W/ O.B.D.	30	SEE PLANS	

FURNACE SCHEDULE

SYMBOL	MANUFACTURER & MODEL NO.	FUEL TYPE	BTU INPUT	BTU OUTPUT	CFM	MINIMUM OUTSIDE AIR, CFM	HP	SP	VOLTS/PHASE CYCLE	COIL MODEL NO.	COMMENTS
F 1	YORK TG9S	NAT. GAS	60,000	58,000	600	150	1/2	0.7	115/1/60	FC/MC/PC	(1)(2)(3)
F 2	YORK TG9S	NAT. GAS	40,000	38,000	600	100	1/3	0.7	115/1/60	FC/MC/PC	(1)(2)(3)

(1) RATINGS BASED ON 4600' ELEVATION.
(2) PROVIDE 7-DAY PROGRAMMABLE THERMOSTAT WITH AUTOMATIC HEATING AND COOLING CHANGEOVER
(3) PROVIDE BOTTOM SIDE PLENUM CONNECTIONS, FILTER HOUSING, AND CONCENTRIC VENT KIT.
(4) FURNACE, COIL, AND CONDENSING UNIT SHALL BE BY THE SAME MANUFACTURER.

CONDENSING UNIT SCHEDULE

SYMBOL	MANUFACTURER & MODEL	BTU CAPACITY	REFRIGERANT TYPE	VOLTS/PHASE/CYCLES	MCA	SEER	COMMENTS
CU 1	YORK YCE18B2 1HA	18,000	R-410A	208/1/60Hz	12.7	14.0	(1)(2)(3)(4)(5)(6)
CU 2	YORK YCE18B2 1HA	18,000	R-410A	208/1/60Hz	12.7	14.0	(1)(2)(3)(4)(5)(6)

(1) ALL CONDITIONS AT 4600' ELEVATION.
(2) 95°F. AMBIENT - 40 SST.
(3) UNIT COMPLETE WITH STARTER
(4) FURNACE, DX EVAPORATOR, AND CONDENSING UNIT SHALL BE COORDINATED TO PROVIDE A MATCHED COIL / CU SYSTEM.
(5) VERIFY VOLTAGE AND PHASE AVAILABLE WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING OF ANY EQUIPMENT.
(6) SIZE REFRIGERANT PIPING AS PER MANUFACTURER'S RECOMMENDATIONS.

EXHAUST FAN SCHEDULE

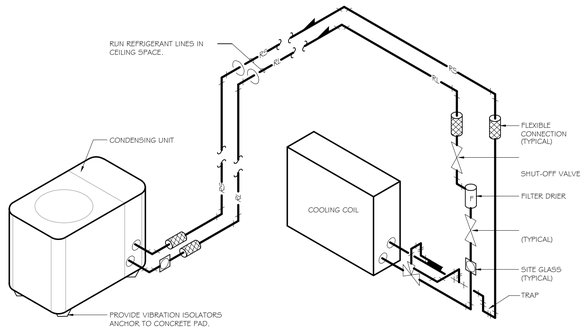
SYMBOL	MANUFACTURER	MODEL	CFM	STATIC PRESSURE IN. WG.	H.P.	RPM	VOLTS/PHASE/CYCLE	COMMENTS
EF 1	GREENHECK	CEILING/WALL SP-A190	100	0.375	113 WATTS	1400	115/1/60	(1)(2)(3)
EF 2	GREENHECK	CEILING/WALL SP-A110	60	0.375	49 WATTS	950	115/1/60	(1)(2)(3)

(1) ALL CAPACITIES AT 4600 FT. ELEVATION.
(2) CEILING/WALL EXHAUST FAN
PROVIDE GRAVITY BACKDRAFT DAMPER, INTEGRAL THERMAL OVERLOAD PROTECTION AND VARIABLE SPEED CONTROL.
(3) ON-OFF SWITCH BY ELECT.

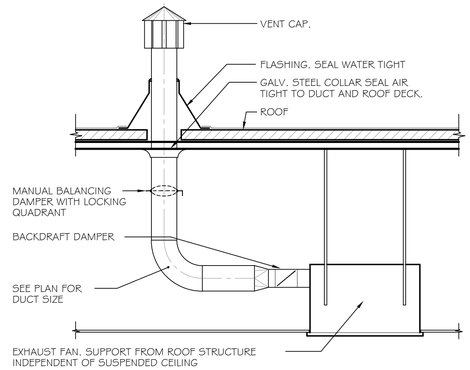
UNIT HEATER SCHEDULE (GAS-FIRED)

SYMBOL	MANUFACTURER & MODEL	FUEL	INPUT BTU/HR.	(3) OUTPUT BTU/HR.	FLUE SIZE	AIR DELIVERY	MOTOR H.P.	VOLTS/ PHASE/ CYCLES	COMMENTS
UH 1	REZNOR LDAP 200	N.G.	200,000	166,000 136,000	5"	2562	1/4	115/1/60	(1)(2)

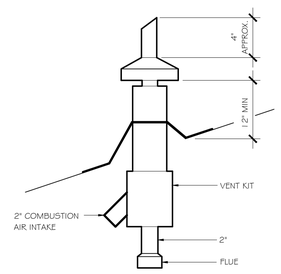
(1) CONDITIONS AT 4600 FT. ELEVATION.
(2) COMPLETE WITH THERMOSTAT AND ALL CONTROLS.
(3) SEA LEVEL/DERATED OUTPUT BTUH



5 M2.0 TYPICAL REFRIGERANT SCHEME
NOT TO SCALE

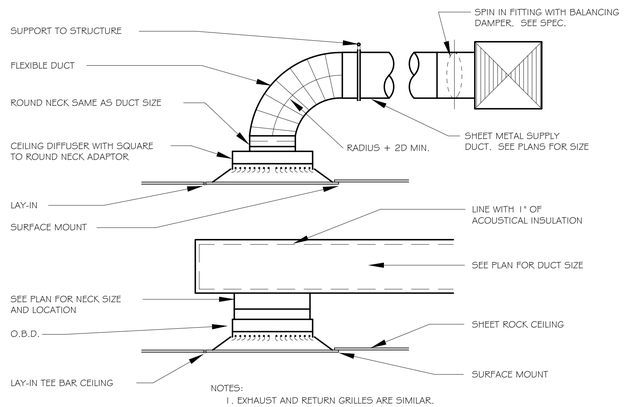


2 M2.0 CEILING EXHAUST FAN DETAIL
NOT TO SCALE



NOTE: INSTALL AS PER MANUFACTURE'S INSTRUCTIONS

4 M2.0 VENT KIT DETAIL
NOT TO SCALE



NOTES:
1. EXHAUST AND RETURN GRILLES ARE SIMILAR.
2. EITHER METHOD IS ACCEPTABLE

1 M2.0 CEILING DIFFUSER DETAIL
NOT TO SCALE

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SMITHFIELD UTAH
(435) 764-6742

LICENSED PROFESSIONAL ENGINEER
No. 176917
JOSEPH T. MORTENSEN
STATE OF UTAH

DATE
October 5, 2019

PROJECT TITLE
SUNRAY PROPERTIES BUILDING II
NEW BUILDING PROJECT
2485 SOUTH 1350 WEST
NIBLEY , UTAH

SHEET TITLE
MECHANICAL DETAILS & SCHEDULES

PROJECT NUMBER

REVISIONS

SHEET NUMBER
M2.0

PLUMBING SYMBOL LEGEND

SOIL, WASTE-ABOVE GRADE	
SOIL, WASTE-BELOW GRADE	
VENT	
COLD WATER	
HOT WATER	
HOT WATER CIRCULATE	
GAS	G
RAIN WATER-ABOVE GRADE	RW
RAIN WATER-BELOW GRADE	RW
OVERFLOW RAIN WATER-ABOVE GRADE	ORW
DRAIN LINE	D
WALL HYDRANT	W.H.
HOSE BIBB	H.B.
CLEANOUT TO GRADE	C.O.T.G.
FLOOR CLEANOUT	F.C.O.
WALL CLEANOUT	W.C.O.
SHUT OFF VALVE	
CHECK VALVE	
ANGLE VALVE	
VENTURI	
BALANCING OR PLUG COCK	
FLOW SETTER	
GAS COCK	
BUTTERFLY VALVE	
BALL VALVE	
RELIEF VALVE	
PRESSURE REDUCING VALVE	
GAUGE COCK	
STRAINER	
FLEXIBLE CONNECTION	
PRESSURE GAUGE	
THERMOMETER	
REDUCER CONCENTRIC	
REDUCER ECCENTRIC	
90° ELBOW UP	
90° ELBOW DOWN	
90° TEE UP	
90° TEE DOWN	
UNION	
CAPPED PIPE	
ANCHOR	

PLUMBING ABREVIATIONS

BHP	BRAKE HORSE POWER	NTS	NOT TO SCALE
BTU	BRITISH THERMAL UNIT	NO	NUMBER
CLG	COOLING	OZ	OUNCE
CW	COLD WATER	PSI	POUNDS PER SQUARE INCH
DP	DEPTH OR DEEP	PSIA	PSI ABSOLUTE
ID	INSIDE DIAMTER	PSIG	PSI GAUGE
OD	OUTSIDE DIAMTER	PRESS	PRESSURE
(E)	EXISTING	PD	PRESSURE DROP
EFF	EFFICIENCY	RECIRC	RECIRCULATE
ELEV	ELEVATION	RPM	REVOLUTIONS PER MINUTE
(F)	FUTURE	RW	RAIN WATER
F	FARENHEIT	SCW	SOFT COLD WATER
FC	FLEXIBLE CONNECTION	SF	SAFETY FACTOR
FT	FEET	SL	SEA LEVEL
GAL	GALLON(S)	SPEC	SPECIFICATION(S)
GPH	GALLONS PER HOUR	SQ	SQUARE
GPM	GALLONS PER MINUTE	STD	STANDARD
HD	HEAD	SPLY	SUPPLY
HT	HEIGHT	TEMP	TEMPERATURE
HTG	HEATING	TD	TEMP. DROP OR DIFF.
HP	HORSE POWER	R	THERMAL RESITANCE
HW	HOT WATER	T	TIME
LG	LENGTH	VAC	VACUUM
MAX	MAXIMUM	VENT	VENT, VENTILATION
MIN	MINIMUM	VERT	VERTICAL
NO	NORMALLY OPEN	VOL	VOLUME
NC	NORMALLY CLOSED	WTR	WATER
N/A	NOT APPLICABLE	WT	WEIGHT
NIC	NOT IN CONTRACT	YR	YEAR

PLUMBING SPECIFICATIONS ③

FIRE SPRINKLER SYSTEM

A. NOT INCLUDED IN THIS CONTRACT.

PLUMBING SPECIALTIES

A. PROVIDE AND INSTALL WATER PRESSURE REGULATING VALVE RATED FOR INITIAL WORKING PRESSURE OF 150 PSIG WITH INLET AND OUTLET SHUTOFF VALVES, PRESSURE GAUGE, AND DRAIN VALVE. PROVIDE BACKFLOW PREVENTION DEVICE. REFER TO WATER STATION MAIN DETAIL FOR REQUIREMENTS.

B. PROVIDE AND INSTALL CLEANOUTS AND COVER PLATES WHERE INDICATED ON THE DRAWINGS. INSTALL A CLEANOUT AT EACH PLUMBING FIXTURE. CLEANOUT FLOOR COVER PLATES SHALL BE MOUNTED FLUSH WITH THE FLOOR. COORDINATE CLEANOUT COVER PLATES WITH WALL OR FLOOR SURFACE FINISH.

WATER HEATERS

A. PROVIDE A WATER HEATER AS SHOWN ON THE DRAWINGS THAT COMPLIES WITH ASME BOILER AND PRESSURE VESSEL CODE, UL LISTING, AGA STANDARDS, AND ASHRAE ENERGY STANDARDS.

B. SUBMIT MANUFACTURERS CUTSHEET FOR REVIEW AND APPROVAL INCLUDING MANUFACTURER, TYPE, MODEL NUMBER, CAPACITY, ELECTRICAL REQUIREMENTS, AND OPTIONS.

C. INSTALL WATER HEATER LEVEL AND PLUMB ON CONCRETE EQUIPMENT PAD UNLESS OTHERWISE NOTED. INSTALL WATER HEATER ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. ANCHOR WATER HEATER TO EQUIPMENT PAD. INSTALL EARTHQUAKE BRACING SECURE TO STRUCTURAL MEMBERS.

D. INSTALL WATER HEATER WITH RELIEF VALVE, SHUTOFF VALVES, UNIONS, THERMOMETERS, DRAIN LINE, GAS CONNECTION, VENT AND RECIRCULATION SYSTEM AS INDICATED ON THE DRAWINGS.

PLUMBING SPECIFICATIONS ②

VALVES

A. PROVIDE AND INSTALL BALL SHUTOFF VALVES WHERE SHOWN ON PLANS FOR LINES 3" AND SMALLER. BALL VALVES SHALL BE MSS SP-110, CLASS 150 BRONZE BODY AND BONNET AND VINYL-COVERED STEEL HANDLE.

B. PROVIDE AND INSTALL BUTTERFLY VALVES WHERE SHOWN ON PLANS FOR LINES 4" AND LARGER. BUTTERFLY VALVES SHALL BE MSS SP-67, ASTM A 126 CAST-IRON BODY AND BONNET WITH EPDM SEALS.

FUEL GAS PIPING

A. COORDINATE INSTALLATION OF GAS YARD LINE AND GAS METER WITH THE GAS COMPANY. WORK TO BE PERFORMED BY THE GAS COMPANY PAID BY THE CONTRACTOR.

B. COMPLY WITH NFPA 54 "NATIONAL FUEL GAS CODE", LOCAL GAS COMPANY REQUIREMENTS, AND ALL OTHER APPLICABLE CODES FOR GAS PIPING MATERIALS, COMPONENTTS, INSTALLATIONS, INSPECTIONS, TESTING, AND PURGING.

C. GAS PIPING SHALL BE SEAMLESS, GRADE B, SCHEDULE 40 BLACK STEEL WITH THREADED FITTINGS.

D. INSTALL SHUTOFF VALVE DOWNSTREAM OF THE GAS METER OUTSIDE OF THE BUILDING.

F. INSTALL 2 PSIG - TO - 4 OZ. GAS PRESSURE REGULATOR WHERE SHOWN ON THE DRAWINGS. INSTALL AND VENT AS REQUIRED BY MANUFACTURERS INSTRUCTIONS.

G. INSTALL GAS SHUTOFF VALVE AT ALL GAS APPLIANCES. CONNECT TO APPLIANCE WITH APPROVED FLEXIBLE CONNECTION. INSTALL TEE FITTING SEDIMENT TRAPS WITHIN 6' OF EACH APPLIANCE.

PLUMBING PIPING

A. WATER DISTRIBUTION PIPING - BELOW GROUND (150 PSIG):
3-1/2" AND SMALLER - USE TYPE K SOFT OR HARD COPPER TUBE WITH CAST COPPER ALLOY BRAZED JOINT PRESSURE FITTINGS.

B. WATER DISTRIBUTION PIPING - ABOVE GROUND (125 PSIG):
3-1/2" AND SMALLER - USE TYPE L HARD COPPER TUBE WITH CAST COPPER ALLOY BRAZED JOINT PRESSURE FITTINGS. (PEX PIPING ALTERNATE BID)

C. WASTE AND VENT PIPING - BELOW GROUND (10-FOOT HEAD OF WATER):

2" TO 6" - USE ACRYLONITRILE-BUTADIENE-STYRENE (ABS) PLASTIC PIPE WITH ABS SOCKET-TYPE DRAIN, WASTE, AND VENT PIPE PATTERN FITTINGS WITH SOLVENT CEMENTED JOINTS.

D. WASTE AND VENT PIPING - ABOVE GROUND (10-FOOT HEAD OF WATER):

2" TO 8" - USE HUB-AND-SPIGOT CAST-IRON SOIL PIPE WITH CAST IRON SOIL PIPE FITTINGS, NEOPRENE RUBBER GASKETS, AND COMPRESSION JOINTS.

E. STORM DRAINAGE PIPING - ABOVE GROUND (10-FOOT HEAD OF WATER):

2" TO 8" - USE HUBLESS CAST-IRON SOIL PIPE WITH CAST IRON SOIL PIPE FITTINGS, HEAVY-DUTY, SHEILDED, STAIN-LESS-STEEL COUPLINGS.

F. INSTALL HANGERS FOR HORIZONTAL COPPER AND CAST IRON PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES:

NOM. PIPE SIZE	MAX. SPAN	MIN. ROD DIA.
3/4"	6'	3/8"
1"	6'	3/8"
1-1/2"	6'	3/8"
2"	12'	3/8"
2-1/2"	12'	1/2"
3"	12'	1/2"
3-1/2"	12'	1/2"
4"	12'	5/8"
5"	12'	5/8"
6"	12'	3/4"

SUPPORT VERTICAL PIPE AND TUBING AT EACH FLOOR.

G. SUPPORT HORIZONTAL ABS AND PVC PIPING WITH PIPE HANGERS LOCATED AT 4' MAXIMUM SPAN.

H. CLEAN, FLUSH, AND TEST ALL WATER DISTRIBUTION PIPING TO 1-1/2 TIMES THE OPERATING PRESSURE FOR A TIME PERIOD OF 4 HOURS. PURGE AND DISINFECT POTABLE WATER SYSTEMS WITH A WATER/CHLORINE SOLUTION IN ACCORDANCE WITH THE LOCAL HEALTH CODE REQUIREMENTS. TEST AND SUBMIT SATISFACTORY REPORT PRIOR TO BUILDING OCCUPANCY.

I. CLEAN, FLUSH, AND TEST THE WASTE AND VENT PIPING SYSTEM TO 10 FEET HEAD OF WATER.

PLUMBING FIXTURES

A. PROVIDE AND INSTALL PLUMBING FIXTURES WHERE INDICATED ON THE DRAWINGS FOR A COMPLETE PLUMBING SYSTEM. PROVIDE ALL REQUIRED CARRIERS, SUPPORTS, EQUIPMENT, HANGERS, FITTINGS, TRIM, STOPS, AND ACCESSORIES ASSOCIATED WITH THE PLUMBING FIXTURES. COORDINATE THE COLOR STYLE, COLOR, AND ACCESSORIES OF EACH FIXTURE WITH THE BUILDING OWNER. ALL FIXTURES NOTED AS ACCESSIBLE SHALL COMPLY WITH A.D.A. REQUIREMENTS. COORDINATE ALL ELECTRICAL REQUIREMENTS WITH THE ELECTRICAL SUB-CONTRACTOR. INSTALL ALL PLUMBING FIXTURES PLUMB, LEVEL, AND ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFER TO THE PLUMBING FIXTURE SCHEDULE.

B. PROVIDE PLUMBING FIXTURES FROM THE FOLLOWING MANUFACTURERS:
WATER CLOSETS AND URINALS:
AMERICAN STANDARD, BRIGGS, CRANE, ELJER, KOHLER
LAVATORIES:
ACORN,AMERICAN STANDARD, BRIGGS, CRANE, ELJER, ELKAY, KOHLER
SINKS AND SERVICE SINKS:
AMERICAN STANDARD, BRIGGS, CRANE, ELJER, ELKAY, KOHLER
DRINKING FOUNTAINS AND WATER COOLERS:
ELKAY, HALSEY TAYLOR, HAWS, OASIS, SUNROC
FLUSHOMETERS:
SLOAN, ZURN
FAUCETS:
AMERICAN STANDARD, BRIGGS, CHICAGO, CRANE, DELTA, ELJER, ELKAY, GERBER, KOHLER, MOEN, PRICE PFISTER, SYMMONS, T & S BRASS

C. SUBMIT MANUFACTURERS CUTSHEET FOR REVIEW AND APPROVAL FOR EACH PLUMBING FIXTURE INCLUDING MANUFACTURER, MODEL, STYLE, OPTIONS, AND ACCESSORIES.

PLUMBING SPECIFICATIONS ①

BASIC PLUMBING REQUIREMENTS

A. COMPLY WITH THE REQUIREMENTS OF THE 2018 EDITION OF THE INTERNATIONAL BUILDING CODE (IBC), INTERNATIONAL MECHANICAL CODE (IMC), INTERNATIONAL PLUMBING CODE (IPC), INTERNATIONAL FUEL GAS CODE (IFGC), AND INTERNATIONAL ENERGY CONSERVATION CODE (IECC), AND THE CURRENT NATIONAL ELECTRIC CODE (NEC) INCLUDING ALL STATE AMENDMENTS. COMPLY WITH THE AUTHORITY HAVING JURISDICTION AND ALL APPLICABLE CITY, COUNTY, STATE, AND FEDERAL CODES AND REGULATIONS IN EFFECT AT THE BID DATE.

B. PREPARE AND SUBMIT SHOP DRAWINGS FOR ALL PLUMBING FIXTURES, EQUIPMENT, VALVES, AND ACCESSORIES INCLUDING MANUFACTURER'S NAME, CATALOG NUMBER, DESCRIPTION, SIZE, CAPACITY, ELECTRICAL REQUIREMENTS, OPERATION, AND MAINTENANCE INFORMATION. SHOP DRAWINGS SHALL BE REVIEWED AND STAMPED BY THE PLUMBING AND GENERAL CONTRACTOR PRIOR TO ENGINEER'S REVIEW. FIXTURES, EQUIPMENT, ETC. SHALL NOT BE ORDERED UNTIL APPROVED SHOP DRAWINGS HAVE BEEN RECEIVED.

C. PREPARE COORDINATION DRAWINGS DETAILING ALL MAJOR EQUIPMENT AND SYSTEMS. INCLUDE EQUIPMENT CONNECTIONS, CLEARANCES, FIRE-RATED WALL OR FLOOR PENETRATIONS, CONCRETE PADS, AND SUPPORT DETAILS IN COORDINATION DRAWINGS. COORDINATION DRAWINGS SHALL BE IN CONJUNCTION WITH THE MECHANICAL, FIRE SPRINKLER (WHERE REQUIRED), ELECTRICAL, REFLECTED CEILINGS, AND ALL OTHER APPLICABLE TRADES.

D. PREPARE RECORD "AS BUILT" DOCUMENTS INCLUDING ALL CHANGES FROM THE ORIGINAL BID DOCUMENTS. SUBMIT COMPLETE "AS BUILT" DOCUMENTS AT THE COMPLETION OF THE PROJECT.

E. PROVIDE 2 SETS OF OPERATION AND MAINTENANCE (O & M) MANUALS CONTAINING INFORMATION FOR ALL MECHANICAL AND PLUMBING SYSTEMS. THE MANUALS SHALL CONTAIN A LIST OF ALL SUB-CONTRACTORS AND SUPPLIERS, EQUIPMENT CUT SHEETS, START-UP INFORMATION, BALANCING REPORTS, AND MAINTENANCE REQUIREMENTS. THE MANUALS SHALL BE HARD BACKED 3-RING BINDERS WITH THE PROJECT LABELED ON THE COVER AND SPLINE.

F. INSTALL ALL PLUMBING EQUIPMENT AND MATERIALS IN COORDINATION WITH ALL OTHER TRADES. VERIFY ALL ELECTRICAL CONNECTIONS WITH THE ELECTRICAL CONTRACTOR PRIOR TO INSTALLATION.

G. PROVIDE AND INSTALL ACCESS DOORS WHERE EQUIPMENT OR VALVES ARE CONCEALED BEHIND FINISHED SURFACES.

H. PROVIDE FACTORY-AUTHORIZED EQUIPMENT START-UP, COMMISSIONING, AND TRAINING OF ALL PLUMBING EQUIPMENT.

I. INSTALL ALL SYSTEMS, MATERIALS, AND EQUIPMENT LEVEL AND PLUMB, PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS. INSTALL ALL PIPING FREE FROM SAGS AND BENDS AND AT THE SLOPE INDICATED (WHERE REQUIRED). INSTALL PIPING AND EQUIPMENT TO PROVIDE THE MAXIMUM POSSIBLE HEADROOM.

J. ALL WORK SHALL BE PERFORMED BY CERTIFIED AND SKILLED WORKERS WITH PRIOR EXPERIENCE IN THEIR PARTICULAR TRADE.

K. THE PLUMBING SUB-CONTRACTOR SHALL PROVIDE WARRANTY THE ENTIRE PLUMBING SYSTEM FOR A PERIOD OF ONE YEAR. INCLUDE THE WARRANTY AND ALL OTHER GUARANTEES AND WARRANTIES IN THE OPERATION AND MAINTENANCE MANUAL.

L. THE CONTRACTOR SHALL REPAIR OR REPLACE ALL DAMAGED PIPING, EQUIPMENT, OR OTHER DAMAGE DURING CONSTRUCTION.

M. PROVIDE AND INSTALL ALL PLUMBING EQUIPMENT, PIPING, FIXTURE, AND ACCESSORIES IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE ALL FITTINGS, VALVES, TRANSITIONS, AND OTHER DEVICES AS REQUIRED FOR A COMPLETE AND OPERATIONAL PLUMBING SYSTEM.

BASIC PLUMBING MATERIALS AND METHODS

A. ALL PIPE AND PIPE FITTINGS SHALL BE NEW AND SHALL BE AMERICAN MADE WITH APPROVED LABELS. DELIVER, STORE, AND PROTECT PIPING DURING CONSTRUCTION FROM DAMAGE, DIRT, AND MOISTURE.

B. PROVIDE AND INSTALL DIELECTRIC FITTINGS AND FLEXIBLE CONNECTORS WERE REQUIRED FOR PROPER SYSTEM FLUID, PRESSURE, AND TEMPERATURE.

C. PROVIDE PIPE ESCUTCHEONS FOR ALL EXPOSED WALL AND CEILING PENETRATIONS. PROVIDE COVER PLATES FOR ALL FLOOR AND WALL CLEANOUTS.

D. SEAL ALL PIPE PENETRATIONS THROUGH WALLS AND FLOORS AIR TIGHT. CAULK ALL FIRE RATED PIPE PENETRATIONS WITH APPROVED FIRE-STOPPING MATERIAL.

E. CUT, CHANNEL, CHASE, AND DRILL FLOORS, WALLS, PARTITIONS, CEILINGS, AND OTHER SURFACES NECESSARY FOR PROPER INSTALLATION. REPAIR AS REQUIRED TO MATCH ADJACENT SURFACES.

HANGERS AND SUPPORTS

A. PROVIDE AND INSTALL PIPE SUPPORTS AND HANGERS AS REQUIRED FOR ALL PIPING AND EQUIPMENT ACCORDING TO MANUFACUTERS STANDARDIZATION SOCIETY (MSS) STANDARDS.

VIBRATION ISOLATION AND SEISMIC CONTROLS

A. PROVIDE AND INSTALL VIBRATION ISOLATORS, FLEXIBLE CONNECTIONS, ISOLATION PADS, AND OTHER EQUIPMENT TO PREVENT NOISE AND VIBRATION TRANSMISSION.

PIPING AND EQUIPMENT IDENTIFICATION

A. PROVIDE EQUIPMENT PIPE AND EQUIPMENT TAGS, LABELS, AND IDENTIFICATION INDICATING FLOW DIRECTION, AREA SERVED, SYSTEM TYPE AND OTHER IDENDIFYING INFORMATION. COMPLY WITH ASME PIPING AND EQUIPMENT IDENTIFICATION STANDARDS.

INSULATION

A. PROVIDE AND INSTALL GLASS FIBER PREFORMED PIPE INSULATION WITH VAPOR PROOF COATING ACCORDING TO THE FOLLOWING SCHEDULE:
DOMESTIC COLD WATER PIPING:
1/2" TO 2" PIPE SIZE - 3/4" INSULATION
2" AND ABOVE - 1" INSULATION
DOMESTIC HOT WATER AND RECIRCULATED HOT WATER PIPING:
1/2" TO 2" PIPE SIZE - 1" INSULATION
2" AND ABOVE - 1-1/2" INSULATION
RAIN WATER PIPING AND PLUMBING VENTS (WITHIN 6' OF ROOF):
1/2" TO 2" PIPE SIZE - 3/4" INSULATION
2" AND ABOVE - 1" INSULATION

B. GLASS FIBER INSULATION SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS.

C. SEAL ALL ENDS AND JOINTS TO PROVIDE A COMPLETELY SEALED INSULATION SYSTEM. PROVIDE COVER HANGER INSERTS AND SHIELDS WITH JACKET MATERIAL MATCHING ADJACENT PIPE INSULATION.

E. PROVIDE SNAP ON INSULATION KIT ON ALL ADA COMPLIANT LAVATORIES AND SINKS.

PLUMBING GENERAL NOTES

1. PROVIDE ALL EQUIPMENT, PIPING, MATERIALS, LABOR, PERMITS, AND FEES TO CONSTUCT A COMPLETE AND OPERATIONAL PLUMBING SYSTEM FOR THE ENTIRE PROJECT AS SHOWN ON THE DRAWINGS.
2. COORDINATE THE EXACT LOCATION OF ALL PLUMBING FIXTURES AND DRAINS WITH THE ARCHITECTURAL DRAWINGS AND THE GENERAL CONTRACTOR.
3. COORDINATE ALL WORK WITH THE GENERAL CONTRACTOR, MECHANICAL SUB-CONTRACTOR, ELECTRICAL SUB-CONTRACTOR, AND ALL OTHER TRADES IN THE PROJECT.
4. ALL PLUMBING INFORMATION IS NOT SHOWN ON THE PLUMBING DRAWINGS. COORDINATE ALL PLUMBING WORK WITH THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, CIVIL, AND ELECTRICAL DRAWINGS.
5. PLUMBING PLANS ARE SCHEMATIC IN NATURE AND THEREFORE DO NOT SHOW ALL DROPS, RISERS, AND OFFSETS. THE CONTRACTOR SHALL MAKE ALL REQUIRED MODIFICATIONS TO PROVIDE A COMPLETE AND OPERATIONAL PLUMBING SYSTEM. MAJOR MODIFICATIONS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER.
6. DO NOT RUN PIPING ABOVE ELECTRICAL PANELS. PROVIDE 4'-0" DEEP X 6'6" HIGH CLEAR ACCESS SPACE IN FRONT OF PANELS. DO NOT RUN PIPING IN ELECTRICAL ROOMS.
7. INSTALL ALL PIPING SHOWN IN EXTERIOR WALLS ON THE WARM (ROOM) SIDE OF THE BUILDING INSULATION.
8. INSTALL WATER, GAS, AND VENT PIPING AS HIGH AS POSSIBLE ABOVE THE CEILING UNLESS NOTED OTHERWISE.
9. INSTALL WASTE PIPING BELOW THE FLOOR UNLESS NOTED OTHERWISE.
10. PROVIDE AND INSTALL 2" MINIMUM WASTE PIPE SIZE BELOW GRADE.
11. INSTALL EXTERIOR PIPING 48" MINIMUM BELOW GRADE.
12. INSTALL PLUMBING VENTS A MINIMUM OF 3 FEET ABOVE OR 10 FEET AWAY FROM OUTSIDE AIR INTAKES. COORDINATE WITH THE MECHANICAL SUB-CONTRACTOR.
13. PAINT ALL ROOFTOP PLUMBING VENTS, CONCENTRIC VENTS, AND FLUES TO MATCH THE ROOF COLOR.
14. WATER CLOSET FLUSH VALVE CONTROLS SHALL BE LOCATED ON THE OPEN SIDE OF THE FIXTURE.

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NORTH

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497 EAST 520 SOUTH
SMITHFIELD, UTAH
(435) 764-6742

LICENSED PROFESSIONAL ENGINEER
LORIN R. MORTENSEN
STATE OF UTAH

DATE
October 5, 2019

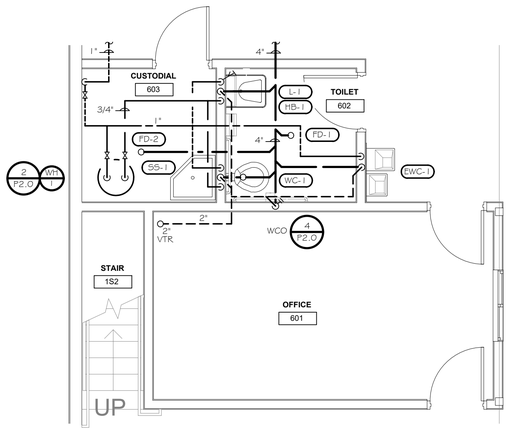
PROJECT TITLE
SUNRAY PROPERTIES BUILDING II
NEW BUILDING PROJECT
2485 SOUTH 1350 WEST
NIBLEY , UTAH

SHEET TITLE
PLUMBING NOTES & SPECIFICATIONS

PROJECT NUMBER

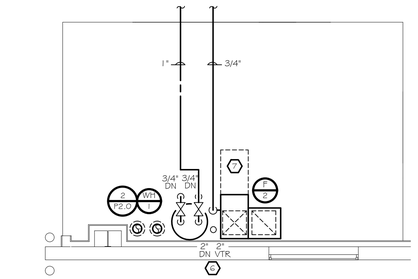
REVISIONS

SHEET NUMBER
P0.1



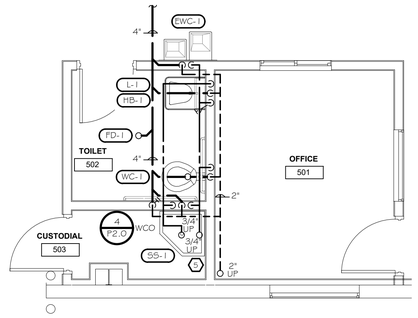
A P1.0 LARGE SCALE PLUMBING PLAN

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



MEZZANINE
LARGE SCALE PLUMBING PLAN

C P1.0 SCALE: 1/4" = 1'-0"

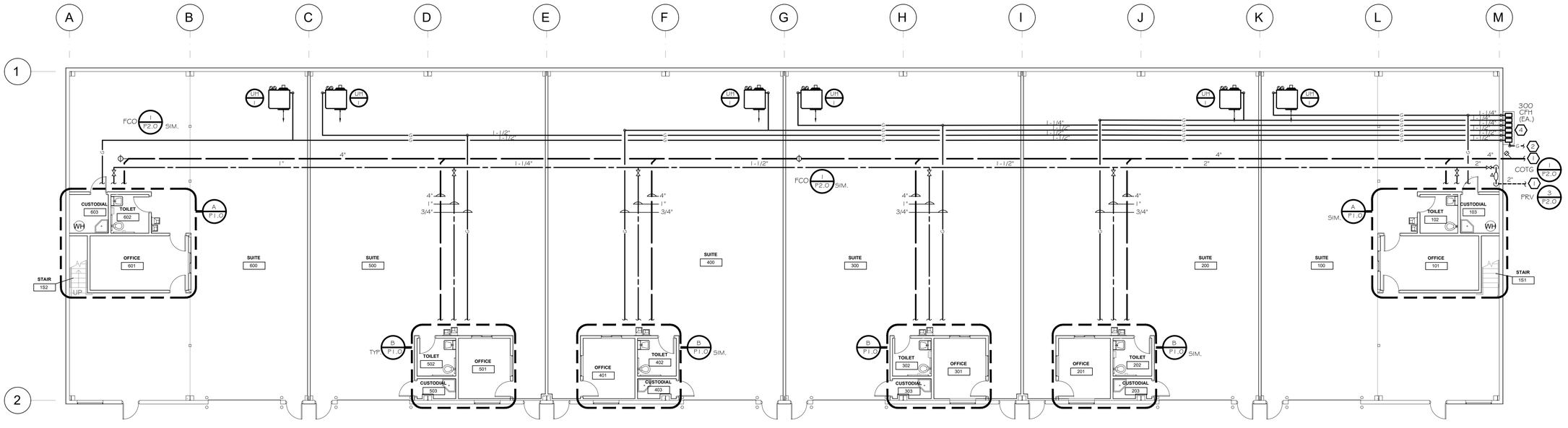


B P1.0 LARGE SCALE PLUMBING PLAN

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

REFERENCE NOTES

1. SEE SITE UTILITIES PLAN FOR CONTINUATION.
2. GAS YARD LINE BY GAS COMPANY.
3. GAS METERS BY GAS COMPANY.
4. 4 OZ. GAS METERS BY GAS COMPANY.
5. PLUMBING PIPING UP TO MEZZANINE. SEE LARGE SCALE PLAN C/P1.0 FOR CONTINUATION.
6. PLUMBING PIPING DOWN TO MAIN LEVEL. SEE LARGE SCALE PLAN B/P1.0 FOR CONTINUATION.
7. EQUIPMENT SERVICE AREA. KEEP PIPING CLEAR FROM THIS AREA.



PLUMBING PLAN

SCALE: 1" = 10'-0"

JOSEPH T. BECK ARCHITECT, INC.
497 EAST 520 SOUTH
SMITHFIELD UTAH
(435) 764-6742

LICENSED PROFESSIONAL ENGINEER
No. 176697
JEFFREY R. MORTENSEN
STATE OF UTAH

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October 5, 2019

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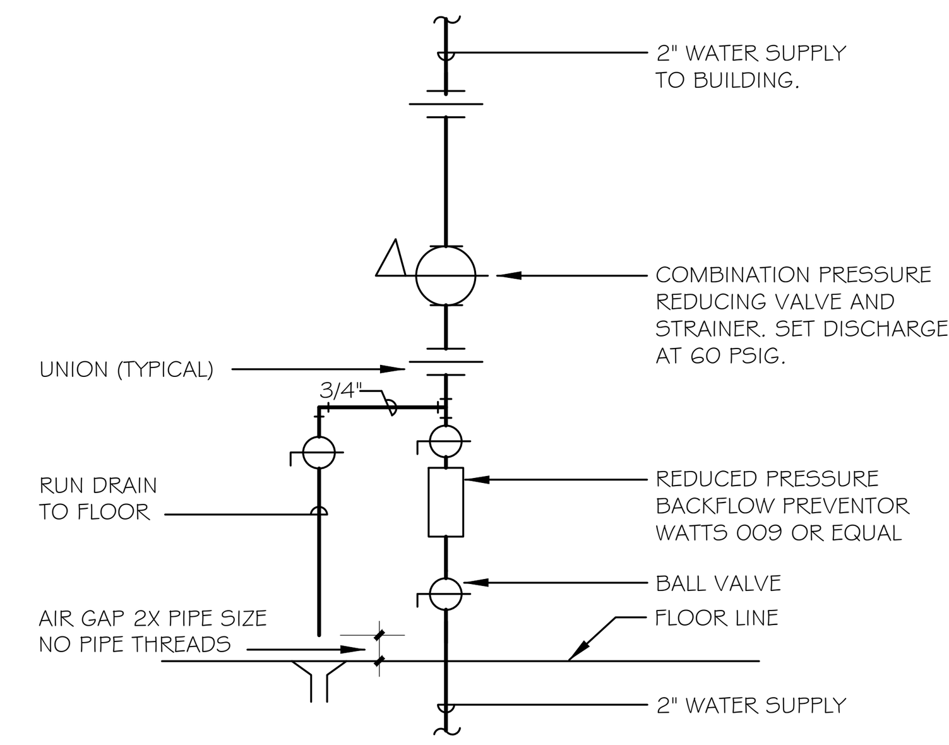


VERTICAL WATER PRESSURE REDUCING STATION DETAIL (3 / P2.0)
NOT TO SCALE

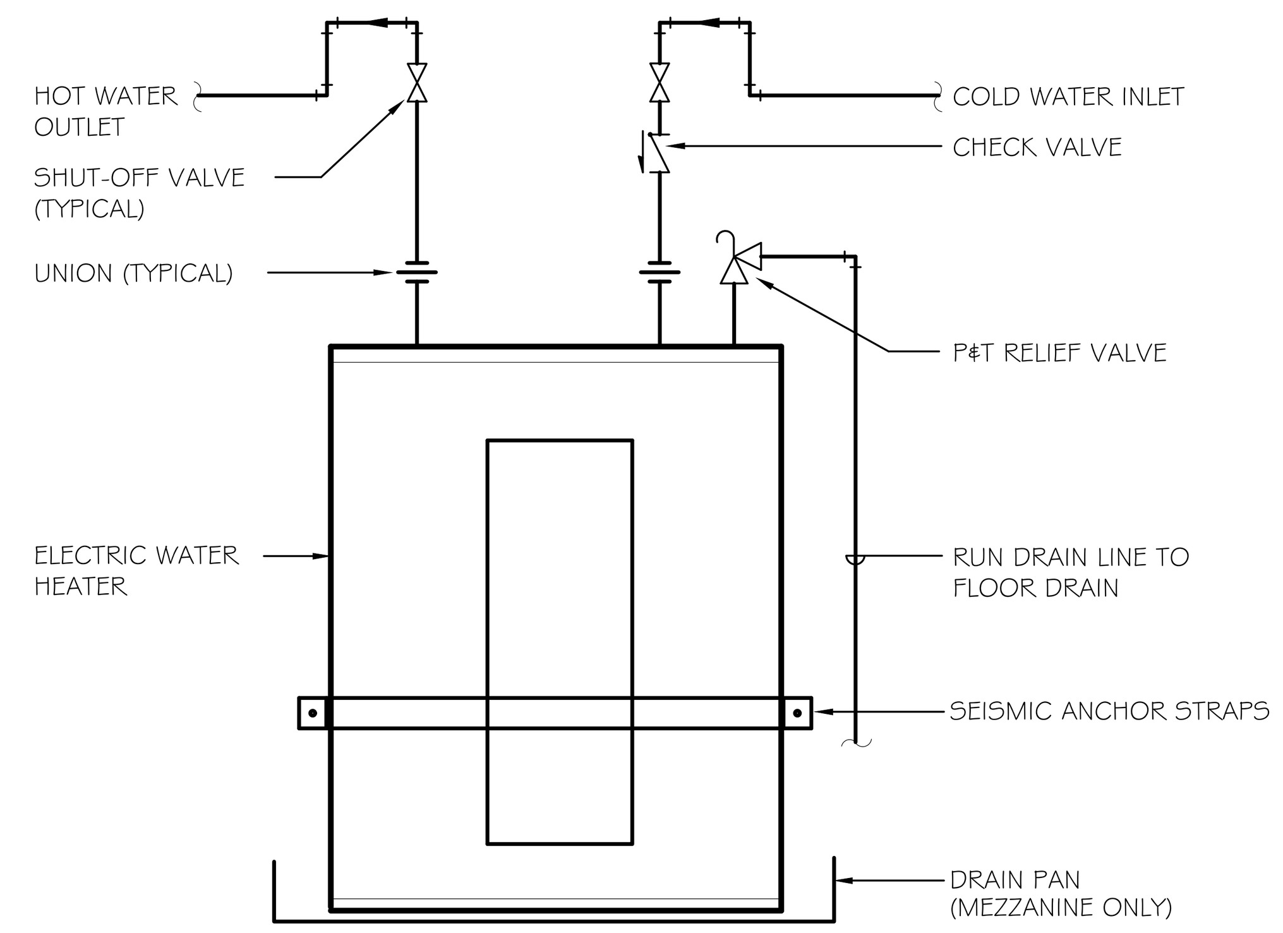
PLUMBING FIXTURE SCHEDULE

FIX. NO.	FIXTURE	TYPE	DESCRIPTION	WASTE	TRAP	VENT	HW	CW
EWC-1	ACCESSIBLE ELECTRIC WATER COOLER	ACCESSIBLE BARRIER-FREE	ACORN AQUA A112108F WALL MOUNTED BARRIER FREE BI-LEVEL WATER COOLER WITH ONE-PIECE STAINLESS STEEL TOP AND RECEPTOR, WELDED STEEL FRAME, AND STEEL PANELS WITH BAKED ENAMEL COATING. 1/4 HP, 115/1/60, FAN COOLED CONDENSER, 8 GPH OF 50 ° F WATER AT 80° F INLET WATER. COLOR BY ARCH.	1 1/2"	1 1/4"	1 1/4"	-	1/2"
FD-1	FLOOR DRAIN	TOILET ROOMS	SMITH FIGURE 2010-BP CAST IRON BODY AND FLASHING COLLAR WITH PROTECTIVE CAP AND ROUND NICKEL BRONZE ADJUSTABLE STRAINER HEAD WITH SECURED SQUARE HOLE GRATE. DEEP SEAL TRAP.	2"	2"	1 1/2"	-	-
FD-2	FLOOR DRAIN	CUSTODIAL MECHANICAL	SMITH FIGURE 2010-AP CAST IRON BODY AND FLASHING COLLAR WITH PROTECTIVE CAP AND ROUND NICKEL BRONZE ADJUSTABLE STRAINER HEAD WITH SECURED SQUARE HOLE GRATE. DEEP SEAL TRAP.	3"	3"	1 1/2"	-	-
HB-1	HOSE BIBB	WALL MOUNTED	ACORN HOSE VALVE MODEL 8121-CP WITH WHEEL HANDLE, VACUUM BREAKER, POLISHED CHROME FINISH, AND 3/4" HOSE CONNECTION.	-	-	-	-	1/2"
L-1	ACCESSIBLE LAVATORY	ACCESSIBLE WALL HUNG RECTANGULAR	SLOAN SS-3003 VITREOUS WALL HUNG LAVATORY SYSTEM WITH SLOAN EBF-650 FAUCET AND SFP-6 PLUG-IN ADAPTER AND BDT BELOW DECK THERMOSTATIC MIXING VALVE. BATTERY POWERED SENSOR ACTIVATED 4" CENTERSET ELECTRONIC HAND WASHING FAUCET.	1 1/2"	1 1/4"	1 1/4"	1/2"	1/2"
SS-1	SERVICE SINK	FLOOR MOUNTED CORNER INSTALLED SERVICE SINK	KOHLER K-6710 WHITBY WHITE ENAMELED CAST IRON CORNER SERVICE SINK WITH K-8940 COATED WIRE RIM GUARD, K-9146 STRAINER, AND DEEP SEAL TRAP. CHICAGO 897-CP WALL MOUNTED FAUCET WITH VACUUM BREAKER, PAIL HOOK, WALL BRACE, 369 HANDLES, 3/4" MALE HOSE OUTLET, & WALL HOOK.	3"	3"	1 1/2"	1/2"	1/2"
WC-1	WATER CLOSET	ACCESSIBLE FLOOR MOUNTED TANK TYPE	KOHLER K-3481 WELLWORTH COMFORT HEIGHT VITREOUS CHINA INGENIUM FLUSHING SYSTEM, COMFORT HT. BOLT CAPS; PLASTIC OPEN FRONT SEAT; 12" ROUGHING-IN. ACTUATOR SHALL BE ON THE WIDE SIDE OF STALL. 1.6 GAL./ FLUSH MAX.	3"	-	1 1/2"	-	1l/2"
WH-1	WALL HYDRANT	WALL MOUNTED	CHICAGO NONFREEZE AUTOMATIC DRAINING, ANTIBACKFLOW TYPE, KEY OPERATION WITH 3/4" HOSE CONNECTION.	-	-	-	-	3/4"

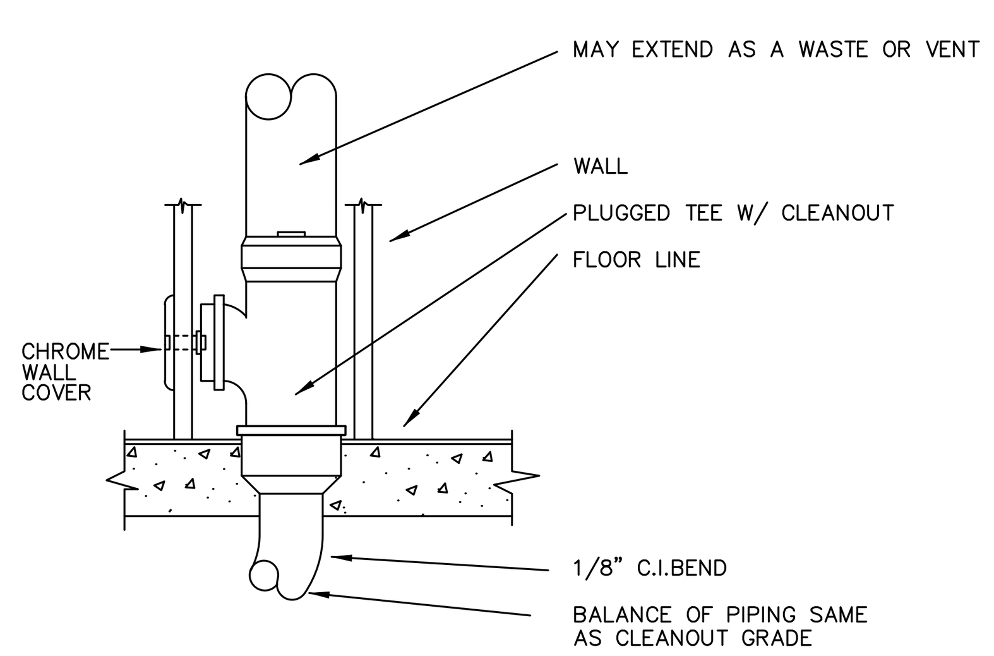
(1) PROVIDE SYMMONS THERMIXER MODEL 5-120 THERMOSTATIC MIXING VALVE BELOW LAVATORIES AND SINK. SET OUTLET AT 110° F. CONNECT TO HOT WATER INLET OF FAUCET.

ELECTRIC DOMESTIC HOT WATER HEATER SCHEDULE

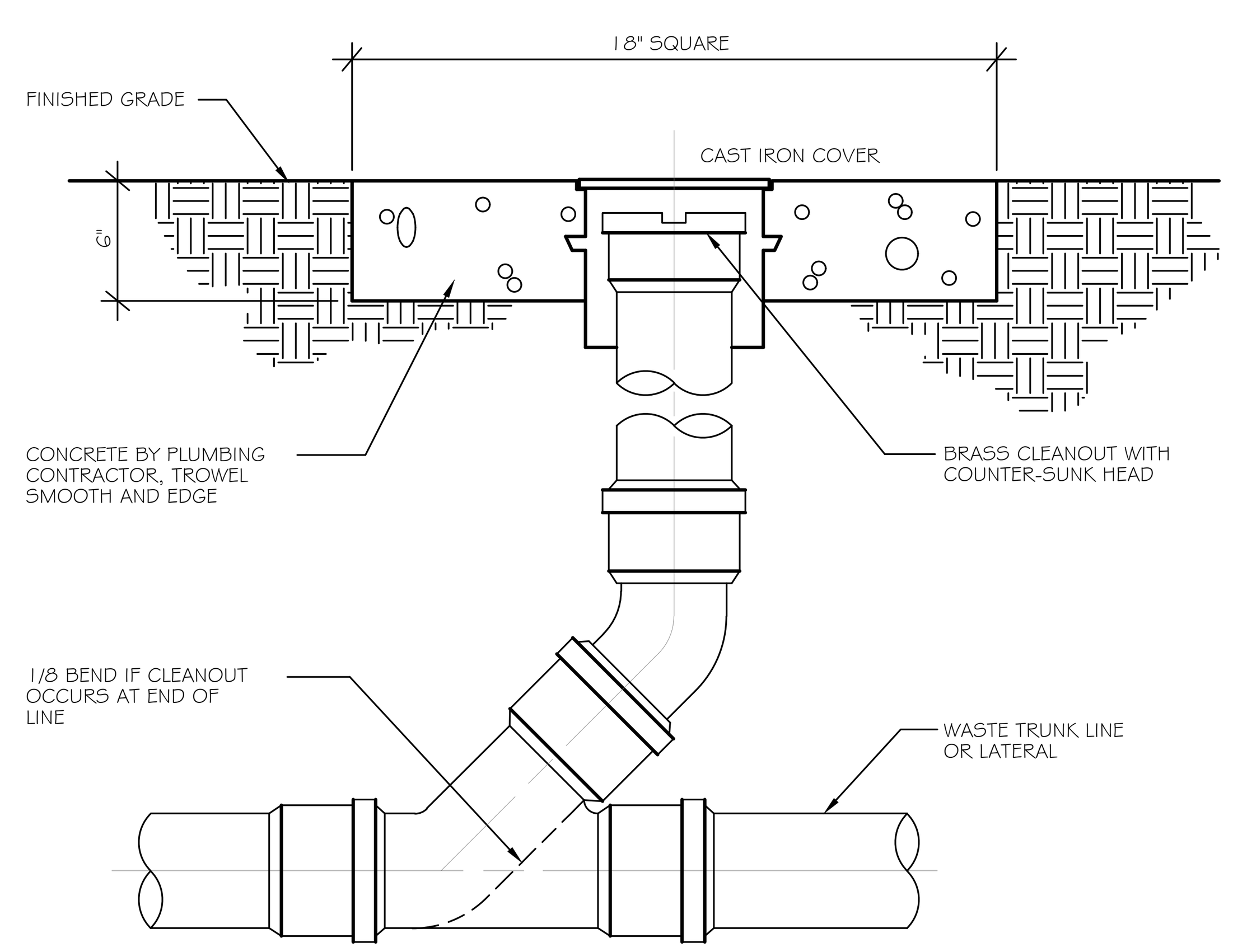
SYMBOL	MANUFACTURERS AND MODEL NO.	TANK CAPACITY GALLONS	INPUT KW	VOLTS/ PHASE/ CYCLE	RECOVERY RATE GPH (1)	WATER TEMP IN/OUT	COMMENTS
WH 1	A.O. SMITH ELJF-15	15	1.5	120/1/60	8.3	50/120	



WATER HEATER DETAIL (2 / P2.0)
NOT TO SCALE



WALL CLEANOUT DETAIL (4 / P2.0)
NOT TO SCALE



CLEAN OUT TO GRADE DETAIL (1 / P2.0)
NOT TO SCALE

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SHEET TITLE
PLUMBING DETAILS & SCHEDULES

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GENERAL PROJECT NOTES

1. ALL ELECTRICAL INSTALLATIONS TO CONFORM TO THE LATEST NEC AND LOCAL CODES.
2. THE ELECTRICAL CONTRACTOR SHALL HAVE A COORDINATION MEETING WITH THE MECHANICAL CONTRACTOR, CONSTRUCTION SUPERINTENDANT AND ANY OTHER TRADES AS REQUIRED WITHIN SEVEN DAYS OF THE START OF THE JOB TO REVIEW CODE CLEARANCE REQUIREMENTS FOR PANELS, SWITCHES, AND OTHER ELECTRICAL GEAR SPECIFICALLY FOR THIS JOB. RECORD THE MEETING IN THE SUPERINDENT'S LOG. REPORT UNRESOLVED CONFLICTS TO THE ARCHITECT IMMEDIATELY.
3. ELECTRICAL CONTRACTOR'S PROJECT MANAGER AND ON-SITE PROJECT FOREMAN SHALL REVIEW VENDOR SUBMITTALS FOR ACCURACY PRIOR TO SUBMITTING TO ENGINEER. INACCURACIES SHALL BE CORRECTED PRIOR TO ENGINEER SUBMITTAL.
4. SUBMITTALS FOR EACH SYSTEM WILL BE REVIEWED BY ENGINEER UP TO TWO TIMES--ONE FULL SUBMITTAL FOR OVERALL COMPLIANCE AND ONE RESUBMITTAL. ADDITIONAL REVIEWS WILL BE CHARGED TO CONTRACTOR AT ENGINEER'S STANDARD BILLING RATE.
5. SUBMITTALS TO ENGINEER SHALL INCLUDE ALL SPECIFIED SYSTEMS IN FIRST SUBMITTAL. PARTIAL SUBMITTALS WILL BE RETURNED TO CONTRACTOR AS INCOMPLETE AND WILL BE CONSIDERED ONE OF TWO INCLUDED SUBMITTAL REVIEWS.
6. THE CLARITY OF RECORD DRAWING CHANGES MADE BY THE CONTRACTOR SHALL BE EQUAL TO THE ORIGINAL DRAWINGS AS JUDGED BY THE ARCHITECT OR THE RECORD SET WILL BE RETURNED TO THE CONTRACTOR FOR CLARIFICATION.
7. WHEN THE GENERAL CONTRACT CALLS FOR "RECORD" OR "AS-BUILT" DRAWINGS TO BE FURNISHED BY THE CONTRACTOR AT JOB COMPLETION, THE ELECTRICAL CONTRACTOR SHALL BE REQUIRED TO FURNISH A COMPLETE SET OF "BLUE-PRINT READY" AUTOCAD ELECTRICAL DRAWINGS FOR ALL CONTRACTOR GENERATED CHANGES FROM THE DRAWINGS OF A CLARITY EQUAL TO THE ORIGINAL DRAWINGS AS JUDGED BY THE ENGINEER. CONTACT ARCHITECT FOR DISKS OR REPRODUCIBLE ORIGINAL MEDIA. PROVIDE DRAWINGS ON CD IN AUTOCAD FORMAT.
8. DO NOT SCALE ELECTRICAL FLOOR PLANS. SEE ARCHITECTURAL DRAWINGS FOR ACCURATE DIMENSIONS AND FLOOR PLANS.
9. ELECTRICAL DEVICES CANNOT BE SHOWN TO SCALE AND SOMETIMES OVERLAP BUILDING ELEMENTS. REFER TO ARCHITECTURAL ELEVATIONS FOR ACCURATE MOUNTING LOCATIONS
10. ELECTRICAL CONTRACTOR SHALL CONTACT POWER COMPANY, TELEPHONE COMPANY, AND TV COMPANY WITHIN THE FIRST WEEK OF THE START OF CONSTRUCTION AND NOTIFY THEM OF THE PROBABLE DATE WHEN THE NEW ELECTRICAL, TELEPHONE, AND/OR TV SERVICE CONNECTION WILL BE NEEDED.
11. THE MAIN TELEPHONE, TV, AND ELECTRICAL SERVICES AS SHOWN ON THE DRAWINGS HAVE NOT BEEN COORDINATED WITH THE RESPECTIVE UTILITY COMPANIES DURING DESIGN. THE CONTRACTOR SHALL VERIFY THE TELEPHONE, TV, AND ELECTRICAL SERVICES AS SHOWN WITH RESPECTIVE UTILITY COMPANIES PRIOR TO CONSTRUCTION FOR ANY CHANGES REQUIRED BY UTILITIES BEFORE INSTALLATION BEGINS. NOTIFY THE ARCHITECT IF CHANGES FROM THE DRAWING ARE REQUIRED.
12. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY ALL PANEL CLEARANCES PER NEC 110.26 AND NOTIFY ALL OTHER TRADES ON THE JOB OF THESE CODE REQUIREMENTS.
13. PANEL INDEXES SHALL INCLUDE ALL PERTINENT INFORMATION ON THE PANEL SCHEDULES INCLUDING INFORMATION ON LIGHTS AND OUTLETS. DO NOT SIMPLY COPY THE CIRCUIT DESCRIPTION COLUMN. INDEXES TO BE TYPEWRITTEN.
14. CONDUITS ENTERING MAIN PANEL FROM THE BOTTOM SHALL BE ARRANGED IN STRAIGHT ROWS FASTENED TO UNISTRUT. HOLES SHALL BE PUNCHED IN PANEL BOTTOM AND CONDUITS FASTENED BY TWO LOCKNUTS AND A CONDUIT BUSHING. CUTTING OUT THE BOTTOM OF THE PANEL IS NOT PERMITTED.
15. ALL PARALLEL CONDUCTORS TO BE INSTALLED IN ACCORDANCE WITH NEC ARTICLE 310.4. WIRE IS TO BE LAID ON A FLAT SURFACE FOR MEASUREMENT. USE TORQUE WRENCH ON TERMINATIONS.
16. COORDINATE MOUNTING HEIGHT AND LOCATION OF ALL OUTLETS, SWITCHES, AUXILIARY EQUIPMENT, AND OTHER DEVICES WITH THE ARCHITECTURAL DRAWINGS. PRIOR TO INSTALLATION, REVIEW WITH THE GENERAL CONTRACTOR THE LOCATION OF MILLWORK AS A FINAL CHECK TO PREVENT COVERING OF ELECTRICAL ITEMS.
17. MOUNTING HEIGHT OF GENERAL PURPOSE OUTLETS AND SWITCHES SHALL BE 16" TO BOTTOM AND 48" TO TOP RESPECTIVELY UNLESS OTHERWISE NOTED.
18. ALL ELECTRICAL EQUIPMENT SHALL BE LOCATED SO AS NOT TO INTERFERE WITH WOOD TRIM AND MOLDINGS. THE ELECTRICAL CONTRACTOR SHALL REVIEW FINISH SCHEDULES AND ARCHITECTURAL DETAILS BEFORE ROUGH-IN OF OUTLET OR SWITCH BOXES TO PREVENT BOXES AND PLATES FROM BEING PLACED BEHIND OR IN TRIMS AND MOLDINGS. REFER SPECIAL CONDITIONS TO ARCHITECT PRIOR TO ROUGH-IN.
19. EMT IS NOT ALLOWED OUT OF DOORS.
20. CIRCUIT WIRE SIZES MUST, AT MINIMUM, MATCH BRANCH CIRCUIT BREAKERS PER NEC. VERIFY WITH PANEL SCHEDULES BEFORE PULLING WIRE.
21. THE ELECTRICAL CONTRACTOR SHALL RUN BRANCH CIRCUIT CONDUITS IN A NEAT AND WORKMANLIKE MANNER SO AS TO CONSERVE OPEN SPACES AS MUCH AS POSSIBLE. HVAC DUCTWORK AND PLUMBING SHALL HAVE LOCATION PRIORITY OVER BRANCH CIRCUIT CONDUIT RUNS.
22. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR, PULLED INTO THE CONDUIT WITH THE PHASE CONDUCTOR, IN ALL SERVICE, FEEDER, AND BRANCH CIRCUITS.
23. PROVIDE A NEUTRAL CONDUCTOR FOR EACH BREAKER TRIP HANDLE. NEUTRALS SHALL NOT BE SHARED BETWEEN BRANCH CIRCUITS.
24. ALL CIRCUITS TO BE MINIMUM #12 CU IN MINIMUM 3/4" CONDUIT UNLESS OTHERWISE NOTED.
25. MC CABLE IS AN APPROVED ALTERNATE TO CONDUCTORS IN CONDUIT FOR BRANCH CIRCUIT WIRING BETWEEN DEVICES, BUT NOT FOR HOME-RUNS. HOME RUNS TO BE RAN IN CONDUIT COMPLETE FROM PANEL TO FIRST DEVICE OR FIXTURE ON CIRCUIT.
26. DO NOT INSTALL MORE THAN THREE PHASE CONDUCTORS IN ANY HOME-RUN CONDUITS UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
27. DO NOT INSTALL ELECTRICAL BOXES BACK-TO-BACK IN PARTITION WALLS. LOCATE DEVICES ON OPPOSITE SIDES OF STUD OR PROVIDE MINIMUM 12" HORIZONTAL SEPARATION.
28. A GFI OUTLET SHALL BE INSTALLED AT EACH LOCATION DESIGNATED BY "GFI" ON THE DRAWINGS. DOWNSTREAM PROTECTION BY A GFI OUTLET UPSTREAM IS NOT ALLOWED.
29. ALL CONVENIENCE OUTLETS MUST BE MOUNTED FLUSH WITH THE COVER PLATE AND SECURED FIRMLY TO THE OUTLET BOX.
30. THE CONTRACTOR SHALL TAKE SPECIAL CARE TO MAKE SURE OUTLET BOXES ARE SET FLUSH WITH FINISH WALL SURFACES WHERE WALL PANELING OR ACOUSTICAL WALLS ARE INSTALLED OR WHERE OUTLETS ARE INSTALLED ON CARPETED RISERS.
31. FIXTURE COUNTS SHOWN ON DRAWINGS ARE FOR REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE TO VERIFY FIXTURE COUNTS AS PART OF BIDDING PROCESS.
32. ELECTRICAL CONTRACTOR SHALL VERIFY CEILING THICKNESSES AND USE CEILING TRIM EXTENDERS ON DOWNLIGHTS AS REQUIRED.
33. EMERGENCY LIGHT BATTERY PACKS SHALL BE CONNECTED SO AS TO BE ABLE TO OPERATE IN THE TEST MODE WHEN THE NORMAL SWITCH LEG IS TURNED ON, AND SHALL ILLUMINATE ONE FIXTURE LAMP UNLESS OTHERWISE NOTED.
34. OVER-MIRROR WALL LIGHTS ARE TO BE MOUNTED SO THE LENS FACES DOWNARD.
35. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW ALL SWITCH LOCATIONS WITH THE GENERAL CONTRACTOR PRIOR TO ROUGH-IN TO PREVENT ANY SWITCHES FROM BEING LOCATED ON THE WRONG SIDE OF THE DOOR.
36. COORDINATE LOCATION OF EXIT LIGHTS WITH ARCHITECT.
37. FIELD VERIFY MOUNTING OF SURFACE FIXTURES SHOWN IN CONTINUOUS ROWS. MAKE ADJUSTMENTS SIDEWAYS OR UNDER OBSTRUCTIONS AS REQUIRED AND PROVIDE NECESSARY RACEWAY CONNECTIONS.
38. PENDANT FIXTURES SHALL HAVE SEISMIC RATED PENDANT CONNECTIONS AND SWIVEL JOINTS.
39. THE BOTTOM OF WALL MOUNTED FIXTURES MUST BE A MINIMUM OF 6'-8" AFF UNLESS FIXTURES ARE ADA COMPLIANT.
40. EXHAUST FANS FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR, WIRED BY ELECTRICAL CONTRACTOR.
41. REFER TO MECHANICAL PLANS FOR EXACT LOCATION OF MECHANICAL EQUIPMENT.
42. PROVIDE TWO-SPEED MAGNETIC STARTERS FOR MECHANICAL EQUIPMENT AS SHOWN ON MECHANICAL EQUIPMENT SCHEDULES.
43. ELECTRICAL CONTRACTOR SHALL FURNISH ALL MOTOR DISCONNECTS, STARTERS, AND CONTROL STATIONS FOR MECHANICAL EQUIPMENT UNLESS THE SAME IS FURNISHED AS AN INTEGRAL PART OF THE EQUIPMENT. VERIFY WITH MECHANICAL CONTRACTOR PRIOR TO BID.
44. ELECTRICAL CONTRACTOR SHALL COORDINATE THE ROUTING OF CONDENSATE LINES ON MECHANICAL PADS WITH THE MECHANICAL CONTRACTOR. WIREWAYS AND DISCONNECTS REQUIRE 3-FEET FRONTAL CLEARANCE AND A MINIMUM 30" WIDTH CLEARANCE, OR THE WIDTH OF THE UNIT, WHICHEVER IS GREATER.
45. PROVIDE SAFETY DISCONNECTS AS REQUIRED AT ALL CONNECTIONS TO MECHANICAL EQUIPMENT. PROVIDE FUSING AND RATINGS PER NAMEPLATE INFORMATION OF EQUIPMENT SERVED.
46. INSTALL WEATHERPROOF GFI DUPLEX OUTLETS ADJACENT TO EACH ROOFTOP HVAC UNIT (UNLESS OUTLET IS PROVIDED AS PART OF EQUIPMENT). SEE MECHANICAL PLANS AND SPECIFICATIONS.
47. LOCATE OUTLETS FOR ELECTRIC WATER COOLERS SO THAT THE OUTLET AND EXTENSION CORDS ARE CONCEALED FROM VIEW.
48. DISCONNECT SWITCHES ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL ELECTRICAL SWITCHES AND MOTOR CONTROL FOR PROPER CODE CLEARANCES. NOTIFY ARCHITECT IMMEDIATELY OF ANY CONFLICTS WITH OTHER TRADES REGARDING PROPER EQUIPMENT CLEARANCES.
49. BEFORE RUNNING CONDUITS, PLACING OUTLETS OR ORDERING EQUIPMENT, THE CONTRACTOR SHALL REVIEW THE SPECIFICATIONS AND DESIGN AND SHOP DRAWINGS OF THE OTHER TRADES SERVED BY THE CONDUIT, OUTLETS, AND/OR EQUIPMENT.
50. PROVIDE NEUTRAL CONNECTION TO 208/240/480V, SINGLE-PHASE EQUIPMENT. RUN SEPARATE GROUND WIRE TO ALL OUTDOOR UNITS AND BOND TO THE EQUIPMENT GROUND LUG.
51. ELECTRICAL CONTRACTOR SHALL INSTALL A PULL STRING IN ALL UNUSED POWER AND LIGHTING CONDUITS.
52. WHERE THERE ARE CONFLICTS IN THE DRAWINGS AND/OR SPECIFICATIONS THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER PRIOR TO BID. WHERE NO NOTIFICATION IS GIVEN THE MORE STRINGENT INTERPRETATION (GENERALLY INTERPRETED TO BE THE MORE COSTLY) WILL BE ENFORCED.

ELECTRICAL LEGEND

ANNOTATIONS

X / XXX	DETAIL CALL-OUT; TOP "X" REFERS TO DETAIL NUMBER & BOTTOM "XXX" REFERS TO SHEET NUMBER

BRANCH CIRCUITING

	SIMPLEX OUTLET
	SIMPLEX OUTLET: GROUND FAULT INTERRUPTER
	DUPLEX OUTLET
	FACELESS GFCI PROTECTION DEVICE
	DUPLEX OUTLET: GROUND FAULT INTERRUPTER
EWC	ELECTRIC WATER COOLER OUTLET: GFCI UNLESS NOTED
HL	DUPLEX OUTLET: HAZARDOUS LOCATION
WPIU	DUPLEX OUTLET: WEATHERPROOF-IN-USE COVER
	DOUBLE DUPLEX OUTLET
	DOUBLE DUPLEX OUTLET: GROUND FAULT INTERRUPTER
	SPECIAL OUTLET: SEE PANEL SCHEDULE
J	JUNCTION BOX
	DISCONNECT; NO OVER-CURRENT PROTECTION
	DISCONNECT WITH OVER-CURRENT PROTECTION (CIRCUIT BREAKER STYLE OR AS SPECIFIED)
	COMBINATION DISCONNECT/MOTOR STARTER; NO OVER-CURRENT PROTECTION
	COMBINATION DISCONNECT/MOTOR STARTER WITH OVERCURRENT PROTECTION (CIRCUIT BREAKER STYLE OR AS SPECIFIED)
$m	MOTOR PROTECTIVE THERMAL SWITCH
$SSU	MOTOR PROTECTIVE FUSED THERMAL SWITCH
	QUANTITY OF CONDUCTORS: SHORT LINES = PHASE /SWITCH, LONG LINES = NEUTRAL
	HOME-RUN
D	DROP CORD. WIRE SIZE AS REQUIRED. SEE DETAILS
CR	RETRACTABLE CABLE REEL; WIRE SIZE AS REQUIRED. SEE DETAILS

LIGHTING CONTROL

$X	SINGLE POLE SWITCH; "x" INDICATES SWITCH GROUP
$3	THREE WAY SWITCH
$4	FOUR WAY SWITCH
$wp x	"x" INDICATES SWITCH TYPE; "wp" INDICATES WEATHERPROOF RATED SWITCH
$hl x	"x" INDICATES SWITCH TYPE; "hl" INDICATES HAZARDOUS LOCATION RATED SWITCH
	WALL MOUNT OCCUPANCY SENSOR: ADAPTIVE TECHNOLOGY
S	OCCUPANCY SENSOR
S DT	OCCUPANCY SENSOR: DUAL TECHNOLOGY
DL	LED DIMMER SWITCH

COMMUNICATIONS

	COMMUNICATIONS RACK
	DATA RACK; FREE STANDING CABINET
----CMJ ----	COMMUNICATIONS RACEWAY; OPEN D-RINGS OR J-HOOKS. SEE DETAILS AND SPECIFICATIONS
----CMCx---	COMMUNICATIONS RACEWAY: "x" 4" CONDUITS, UNLESS OTHERWISE NOTED
---- xCDy ---	COMMUNICATIONS RACEWAY: "x" CONDUITS OF "y" DIAMETER
LR#	COMMUNICATIONS LADDER RACK. SEE SPECIFICATIONS AND / OR SCHEDULES
CT#	COMMUNICATIONS RACEWAY CABLE TRAY. SEE SPECIFICATIONS AND / OR SCHEDULES
	PHONE BACKBOARD
	COMMUNICATIONS ENCLOSURE
	TELEVISION OUTLET (5" SQ x 2-7/8"D J-BOX; 1-GANG x 5/8"D MUD-RING; 1" CONDUIT, 1-RG-6 COAX)
	COMMUNICATIONS OUTLET (5" SQ x 2-7/8"D J-BOX; 1-GANG x 5/8"D MUD-RING; 1" CONDUIT, 1 CAT 6 CABLE)
	COMMUNICATIONS OUTLET (5" SQ x 2-7/8"D J-BOX; 1-GANG x 5/8"D MUD-RING; 1" CONDUIT, 2 CAT 6 CABLES)
	COMMUNICATIONS OUTLET (5" SQ x 2-7/8"D J-BOX; 1-GANG x 5/8"D MUD-RING; 1" CONDUIT; 3 CAT 6 CABLES)
x	COMMUNICATIONS OUTLET (5" SQ x 2-7/8"D J-BOX; 1-GANG x 5/8"D MUD-RING; 1" CONDUIT; x CAT 6 CABLES)
WAP	COMMUNICATIONS OUTLET: WIRELESS ACCESS POINT (5" SQ x 2-7/8"D J-BOX; 1-GANG x 5/8"D MUD-RING; 1" CONDUIT, 1 CAT 6 CABLE)
J FC x	MODULAR FURNITURE CONNECTION: COMMUNICATIONS (4-11/16 DEEP BOX; CUSTOM FLUSH COVER WITH 2" FLEXIBLE WHIP TO FURNITURE; (2)1.25" INCOMING CONDUIT; "X" CAT 6 CABLES)

POWER AND DISTRIBUTION

	DISTRIBUTION PANEL
	PANELBOARD
	METER / METER SOCKET

ONE-LINE

XA / YP	BREAKER : "x" = BREAKER AMPERAGE "y" = QUANTITY OF POLES
	BRANCH PANEL
	BRANCH PANEL WITH MAIN BREAKER
	BRANCH PANEL WITH SUB FEED BREAKER
x	FEEDER SIZE (REFER TO CONDUIT AND CONDUCTOR SCHEDULE UNLESS OTHERWISE NOTED)
	GROUND
M	CT AND METER
M	DIRECT METER
	TRANSFORMER
hp	MOTOR : hp = MOTOR HORSEPOWER

LIGHTING FIXTURES

	EMERGENCY LIGHT
	BATTERY PACK
	EXIT LIGHT: CEILING - FACE(S) AS SHOWN
	EXIT LIGHT: WALL - FACE(S) AS SHOWN
	EXIT LIGHT: FACE SIDE
	EXIT LIGHT: DIRECTIONAL ARROWS, DOUBLE FACE
	LED HIGH BAY
	STRIP LIGHT
	FLUORESCENT FIXTURE
DL	LIGHT FIXTURE LOCATED IN IECC DAY-LIGHTING ZONE
	EMERGENCY FIXTURE
	WALL MOUNT FIXTURE

FIRE ALARM

FSMP	FIRE SPRINKLER MONITORING PANEL
FS	FIRE ALARM FLOW SWITCH
TS	FIRE ALARM TAMPER SWITCH
S	FIRE ALARM HORN AND STROBE; "X" = MINIMUM CANDELA RATING; WP=WEATHER PROOF

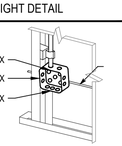
SITE ELECTRICAL

--(E)3ØOP--	3-PHASE OVERHEAD PRIMARY POWER : EXISTING
----3ØOP----	3-PHASE OVERHEAD PRIMARY POWER
----3ØOS----	3-PHASE OVERHEAD SECONDARY POWER
----3ØUP----	3-PHASE UNDERGROUND PRIMARY POWER
----3ØUS----	3-PHASE UNDERGROUND SECONDARY POWER
-----OT-----	OVERHEAD TELEPHONE
-----OTV----	OVERHEAD TV
----(E)UT----	UNDERGROUND TELEPHONE : EXISTING
---(E)UTV---	UNDERGROUND TV : EXISTING
-----UT-----	UNDERGROUND TELEPHONE
-----UTV----	UNDERGROUND TV
	POINT OF DISCONNECTION
	POINT OF CONNECTION
	UTILITY POLE

AUDIO/VISUAL

S P	SPEAKER : INTERCOM PENDANT MOUNT BAR STRAPS

GENERAL WALL-MOUNTED BOX HEIGHT DETAIL



SHEET INDEX

ELECTRICAL ABBREVIATIONS

A	AMPERE	LTG	LIGHTING
AF	AMP FUSE	MAX	MAXIMUM
AFF	ABOVE FINISHED FLOOR	MCB	MAIN CIRCUIT BREAKER
AFG	ABOVE FINISHED GRADE	MECH	MECHANICAL
AFI	ARC-FAULT CIRCUIT-INTERRUPTER	MFR	MANUFACTURER
AIC	AMPERE INTERRUPTING CAPACITY	MIN	MINIMUM
AL	ALUMINUM	MLO	MAIN LUGS ONLY
ARCH	ARCHITECT(URAL)	MTD	MOUNTED
AS	AMP SWITCH	NEC	NATIONAL ELECTRICAL CODE
AWG	AMERICAN WIRE GAUGE	NECA	NATIONAL ELECTRICAL CONTRACTOR'S ASSOCIATION
BLDG	BUILDING	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
BKBD	BACKBOARD	NEUT	NEUTRAL
C	CONDUIT	NFC	NATIONAL FIRE CODE
CAB	CABINET	NC	NORMALLY CLOSED
CAT	CATALOG/CATEGORY	NIC	NOT IN CONTRACT
C/B	CIRCUIT BREAKER	NL	NIGHT LITE
CKT	CIRCUIT	NO	NORMALLY OPEN
CLG	CEILING	NTS	NOT TO SCALE
CO	CONDUIT ONLY	OCP	OVERCURRENT PROTECTION
COMM	COMMUNICATION	P	POLE
CONN	CONNECTION	PH	PHASE
CU	COPPER	PNL	PANEL
DEMO	DEMOLITION/DEMOLISH	PWR	POWER
DISC	DISCONNECT	QTY	QUANTITY
DN	DOWN	RECEP	RECEPTACLE
DWG	DRAWING	REQ'D	REQUIRED
EA	EACH	RGSC	RIGID GALVANIZED STEEL CONDUIT
ELEC	ELECTRICAL	RM	ROOM
ELEV	ELEVATOR	SCHED	SCHEDULE
EMER, EM	EMERGENCY	SECT	SECTION
EMT	ELECTRICAL METALLIC TUBING	SP	SINGLE POLE
EOLR	END OF LINE RESISTOR	SN	SOLID NEUTRAL
EQUIP	EQUIPMENT	SPEC	SPECIFICATION
EX, EXIST	EXISTING	SW	SWITCH
FBO	FURNISHED BY OTHERS	SWBD	SWITCHBOARD
FCU	FAN COIL UNIT	SWGR	SWITCH GEAR
FF	FINISHED FLOOR	SYS	SYSTEM
FIXT	FIXTURE	TEMP	TEMPORARY
FLEX	FLEXIBLE METALLIC CONDUIT (STEEL)	TELE	TELEPHONE
FLUOR	FLUORESCENT	XFMR	TRANSFORMER
FT	FEET OR FOOT	T-STAT	THERMOSTAT
GFI	GROUND FAULT INTERRUPTER	TWP	TWISTED PAIR
GND	GROUND	TWSP	TWISTED SHEILDED PAIR
HP	HORSEPOWER	TYP	TYPICAL
HVAC	HEATING, VENTILATING & AIR CONDITIONING	UBC	UNIFORM BUILDING CODE
IG	ISOLATED GROUND	UL	UNDERWRITERS LABORATORY
IMC	INTERMEDIATE METAL CONDUIT	UMC	UNIFORM MECHANICAL CODE
IN	INCH(ES)	UNO	UNLESS NOTED OTHERWISE
ISC	SHORT CIRCUIT AMPERES, KA	V	VOLT OR VOLTAGE
JB, J-BOX	JUNCTION BOX	VA	VOLT AMPERE
KCMIL	THOUSAND CIRCULAR MILS	W	WATT
KVA	KILOVOLT AMPERE	W/	WITH
KW	KILOWATT	WG	WIRE GUARD
		WP	UL LISTED WEATHERPROOF, NEMA 3R or 4

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No. 294174
SHANE D. SWENSON
10/7/2019
STATE OF UTAH

DATE
OCT 7, 2019

PROJECT TITLE
SUNRAY PROPERTIES
NEW BUILDING PROJECT
42 WEST 300 NORTH
HYRUM, UTAH

SHEET TITLE
ABBREVIATIONS, G.P.N., LEGEND & SHEET INDEX

PROJECT NUMBER
SSE# 2019046

REVISIONS

SHEET NUMBER
E001

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SPECIFICATIONS

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

1.1 PERFORMANCE REQUIREMENTS
A. SEISMIC PERFORMANCE: ELECTRICAL EQUIPMENT SHALL WITHSTAND THE EFFECTS OF EARTHQUAKE MOTIONS DETERMINED ACCORDING TO SEI/ASCE 7.
1. THE TERM "WITHSTAND" MEANS "THE UNIT WILL REMAIN IN PLACE WITHOUT SEPARATION OF ANY PARTS FROM THE DEVICE WHEN SUBJECTED TO THE SEISMIC FORCES SPECIFIED."
1.2 QUALITY ASSURANCE
A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
1.3 SLEEVES FOR RACEWAYS AND CABLES
A. STEEL PIPE SLEEVES: ASTM A 53/A 53M, TYPE E, GRADE B, SCHEDULE 40, GALVANIZED STEEL, PLAIN ENDS.
B. SLEEVES FOR RECTANGULAR OPENINGS: GALVANIZED SHEET STEEL.
1.4 SLEEVE SEALS
A. DESCRIPTION: MODULAR SEALING DEVICE, DESIGNED FOR FIELD ASSEMBLY, TO FILL ANNULAR SPACE BETWEEN SLEEVE AND RACEWAY OR CABLE.
1. SEALING ELEMENTS: EPDM OR NBR INTERLOCKING LINKS SHAPED TO FIT SURFACE OF CABLE OR CONDUIT. INCLUDE TYPE AND NUMBER REQUIRED FOR MATERIAL AND SIZE OF RACEWAY OR CABLE.
2. PRESSURE PLATES: STAINLESS STEEL. INCLUDE TWO FOR EACH SEALING ELEMENT.
3. CONNECTING BOLTS AND NUTS: STAINLESS STEEL OF LENGTH REQUIRED TO SECURE PRESSURE PLATES TO SEALING ELEMENTS. INCLUDE ONE FOR EACH SEALING ELEMENT.
1.5 ELECTRICAL ENCLOSURES
A. FLUSH- AND SURFACE-MOUNTED CABINETS.
1. RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.
a. INDOOR DRY AND CLEAN LOCATIONS: NEMA 250, TYPE 1.
b. OUTDOOR LOCATIONS: NEMA 250, TYPE 3R.
c. KITCHEN AREAS: NEMA 250, TYPE 4X, STAINLESS STEEL.
d. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4.
1.6 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION
A. COMPLY WITH NECA 1.
B. EQUIPMENT: INSTALL TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS OF BOTH ELECTRICAL EQUIPMENT AND OTHER NEARBY INSTALLATIONS. CONNECT IN SUCH A WAY AS TO FACILITATE FUTURE DISCONNECTING WITH MINIMUM INTERFERENCE WITH OTHER ITEMS IN THE VICINITY.
C. RIGHT OF WAY: GIVE TO PIPING SYSTEMS INSTALLED AT A REQUIRED SLOPE.
1.7 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS
A. CONCRETE SLABS AND WALLS: INSTALL SLEEVES FOR PENETRATIONS UNLESS CORE-DRILLED HOLES OR FORMED OPENINGS ARE USED. INSTALL SLEEVES DURING ERECTION OF SLABS AND WALLS.
B. FIRE-RATED ASSEMBLIES: INSTALL SLEEVES FOR PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES UNLESS OPENINGS COMPATIBLE WITH FIRESTOP SYSTEM USED ARE FABRICATED DURING CONSTRUCTION OF FLOOR OR WALL.
C. SEAL SPACE OUTSIDE OF SLEEVES WITH GROUT FOR PENETRATIONS OF CONCRETE AND MASONRY
D. FIRE-RATED-ASSEMBLY PENETRATIONS: MAINTAIN INDICATED FIRE RATING OF WALLS, PARTITIONS, CEILINGS, AND FLOORS AT RACEWAY AND CABLE PENETRATIONS. INSTALL SLEEVES AND SEAL RACEWAY AND CABLE PENETRATION SLEEVES WITH FIRESTOP MATERIALS.
E. ROOF-PENETRATION SLEEVES: SEAL PENETRATION OF INDIVIDUAL RACEWAYS AND CABLES WITH FLEXIBLE BOOT-TYPE FLASHING UNITS APPLIED IN COORDINATION WITH ROOFING WORK.
1.8 FIRESTOPPING
A. APPLY FIRESTOPPING TO PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES FOR ELECTRICAL INSTALLATIONS TO RESTORE ORIGINAL FIRE-RESISTANCE RATING OF ASSEMBLY.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

1.1 CONDUCTOR MATERIAL APPLICATIONS
A. BRANCH CIRCUITS: COPPER. SOLID OR STRANDED FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG AND LARGER, EXCEPT VFC CABLE, WHICH SHALL BE EXTRA FLEXIBLE STRANDED.
1.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS
A. EXPOSED BRANCH CIRCUITS, INCLUDING IN CRAWLSPACES: TYPE THHN-2-THWN-2, SINGLE CONDUCTORS IN RACEWAY.
B. BRANCH CIRCUITS CONCEALED IN CEILINGS, WALLS, AND PARTITIONS: TYPE THHN-2-THWN-2, SINGLE CONDUCTORS IN RACEWAY, OR METAL-CLAD CABLE, TYPE MC.
1.3 INSTALLATION OF CONDUCTORS AND CABLES
A. CONCEAL CABLES IN FINISHED WALLS, CEILINGS, AND FLOORS UNLESS OTHERWISE INDICATED.
B. COMPLETE RACEWAY INSTALLATION BETWEEN CONDUCTOR AND CABLE TERMINATION POINTS ACCORDING TO SECTION 260533 "RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS" PRIOR TO PULLING CONDUCTORS AND CABLES.
C. USE MANUFACTURER-APPROVED PULLING COMPOUND OR LUBRICANT WHERE NECESSARY; COMPOUND USED MUST NOT DETERIORATE CONDUCTOR OR INSULATION. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM PULLING TENSIONS AND SIDEWALL PRESSURE VALUES.
D. USE PULLING MEANS, INCLUDING FISH TAPE, CABLE, ROPE, AND BASKET-WEAVE WIRE/CABLE GRIPS, THAT WILL NOT DAMAGE CABLES OR RACEWAY.
E. INSTALL EXPOSED CABLES PARALLEL AND PERPENDICULAR TO SURFACES OF EXPOSED STRUCTURAL MEMBERS, AND FOLLOW SURFACE CONTOURS WHERE POSSIBLE.
F. SUPPORT CABLES ACCORDING TO SECTION 260529 "HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS."
1.4 CONNECTIONS
A. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A-486B.
B. MAKE SPLICES, TERMINATIONS, AND TAPS THAT ARE COMPATIBLE WITH CONDUCTOR MATERIAL.
1. USE OXIDE INHIBITOR IN EACH SPLICE, TERMINATION, AND TAP FOR ALUMINUM CONDUCTORS.
C. WIRING AT OUTLETS: INSTALL CONDUCTOR AT EACH OUTLET, WITH AT LEAST 12 INCHES OF SLACK.
1.5 IDENTIFICATION
A. IDENTIFY AND COLOR-CODE CONDUCTORS AND CABLES ACCORDING TO SECTION 260553 "IDENTIFICATION FOR ELECTRICAL SYSTEMS."
B. IDENTIFY EACH SPARE CONDUCTOR AT EACH END WITH IDENTITY NUMBER AND LOCATION OF OTHER END OF CONDUCTOR, AND IDENTIFY AS SPARE CONDUCTOR.
1.6 FIRESTOPPING
A. APPLY FIRESTOPPING TO ELECTRICAL PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES TO RESTORE ORIGINAL FIRE-RESISTANCE RATING OF ASSEMBLY ACCORDING TO SECTION 078413 "PENETRATION FIRESTOPPING."

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1.1 CONDUCTORS
A. INSULATED CONDUCTORS: COPPER WIRE OR CABLE INSULATED FOR 600 V UNLESS OTHERWISE REQUIRED BY APPLICABLE CODE OR AUTHORITIES HAVING JURISDICTION.
B. BARE COPPER CONDUCTORS:
1. SOLID CONDUCTORS: ASTM B 3.
2. STRANDED CONDUCTORS: ASTM B 8.
3. BONDING CONDUCTOR: NO. 4 OR NO. 6 AWG, STRANDED CONDUCTOR.
1.2 CONNECTORS
A. LISTED AND LABELED BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION FOR APPLICATIONS IN WHICH USED AND FOR SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS CONNECTED.
B. BOLTED CONNECTORS FOR CONDUCTORS AND PIPES: COPPER OR COPPER ALLOY.
C. WELDED CONNECTORS: EXOTHERMIC-WELDING KITS OF TYPES RECOMMENDED BY KIT MANUFACTURER FOR MATERIALS BEING JOINED AND INSTALLATION CONDITIONS.
1.3 GROUNDING ELECTRODES
A. GROUND RODS: COPPER-CLAD STEEL; 3/4 INCH BY 10 FEET.
1.4 EQUIPMENT GROUNDING
A. INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH ALL FEEDERS AND BRANCH CIRCUITS.
1.5 INSTALLATION
A. GROUND RODS: DRIVE RODS UNTIL TOPS ARE 2 INCHES BELOW FINISHED FLOOR OR FINAL GRADE UNLESS OTHERWISE INDICATED.
B. BONDING STRAPS AND JUMPERS: INSTALL IN LOCATIONS ACCESSIBLE FOR INSPECTION AND MAINTENANCE EXCEPT WHERE ROUTED THROUGH SHORT LENGTHS OF CONDUIT.
1. BONDING TO STRUCTURE: BOND STRAPS DIRECTLY TO BASIC STRUCTURE, TAKING CARE NOT TO PENETRATE ANY ADJACENT PARTS.
2. BONDING TO EQUIPMENT MOUNTED ON VIBRATION ISOLATION HANGERS AND SUPPORTS: INSTALL BONDING SO VIBRATION IS NOT TRANSMITTED TO RIGIDLY MOUNTED EQUIPMENT.
3. USE EXOTHERMIC-WELDED CONNECTORS FOR OUTDOOR LOCATIONS; IF A DISCONNECT-TYPE CONNECTION IS REQUIRED, USE A BOLTED CLAMP.
1.6 GROUNDING AND BONDING FOR PIPING:
1. METAL WATER SERVICE PIPE: INSTALL INSULATED COPPER GROUNDING CONDUCTORS, IN CONDUIT, FROM BUILDING'S MAIN SERVICE EQUIPMENT, OR GROUNDING BUS, TO MAIN METAL WATER SERVICE ENTRANCES TO BUILDING. CONNECT GROUNDING CONDUCTORS TO MAIN METAL WATER SERVICE PIPES; USE A BOLTED CLAMP CONNECTOR OR BOLT A LUG-TYPE CONNECTOR TO A PIPE FLANGE BY USING ONE OF THE LUG BOLTS OF THE FLANGE. WHERE A DIELECTRIC MAIN WATER FITTING IS INSTALLED, CONNECT GROUNDING CONDUCTOR ON STREET SIDE OF FITTING. BOND METAL GROUNDING CONDUCTOR CONDUIT OR SLEEVE TO CONDUCTOR AT EACH END.
2. WATER METER PIPING: USE BRAIDED-TYPE BONDING JUMPERS TO ELECTRICALLY BYPASS WATER METERS. CONNECT TO PIPE WITH A BOLTED CONNECTOR.
3. BOND EACH ABOVEGROUND PORTION OF GAS PIPING SYSTEM DOWNSTREAM FROM EQUIPMENT SHUTOFF VALVE.

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

1.1 PERFORMANCE REQUIREMENTS
A. DESIGN SUPPORTS FOR MULTIPLE RACEWAYS CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS AND ITS CONTENTS.
B. DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND COMPONENTS.
C. RATED STRENGTH: ADEQUATE IN TENSION, SHEAR, AND PULLOUT FORCE TO RESIST MAXIMUM LOADS CALCULATED OR IMPOSED FOR THIS PROJECT, WITH A MINIMUM STRUCTURAL SAFETY FACTOR OF FIVE TIMES THE APPLIED FORCE.
1.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS
A. STEEL SLOTTED SUPPORT SYSTEMS WITH GALVANIZED COATINGS AND CHANNEL DIMENSIONS SELECTED FOR APPLICABLE LOAD CRITERIA.
B. RACEWAY AND CABLE SUPPORTS: AS DESCRIBED IN NECA 1 AND NECA 101.
C. CONDUIT AND CABLE SUPPORT DEVICES: STEEL HANGERS, CLAMPS, AND ASSOCIATED FITTINGS, DESIGNED FOR TYPES AND SIZES OF RACEWAY OR CABLE TO BE SUPPORTED.
D. STRUCTURAL STEEL FOR FABRICATED SUPPORTS AND RESTRAINTS: ASTM A 36/A 36M, STEEL PLATES, SHAPES, AND BARS; BLACK AND GALVANIZED.
E. MOUNTING, ANCHORING, AND ATTACHMENT COMPONENTS: ITEMS FOR FASTENING ELECTRICAL ITEMS OR THEIR SUPPORTS TO BUILDING SURFACES INCLUDE THE FOLLOWING:
1. POWDER-ACTUATED FASTENERS: THREADED-STEEL STUD, FOR USE IN HARDENED PORTLAND CEMENT CONCRETE, STEEL, OR WOOD, WITH TENSION, SHEAR, AND PULLOUT CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS WHERE USED.
2. MECHANICAL-EXPANSION ANCHORS: INSERT-WEDGE-TYPE, STAINLESS STEEL, FOR USE IN HARDENED PORTLAND CEMENT CONCRETE WITH TENSION, SHEAR, AND PULLOUT CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS IN WHICH USED.
3. CONCRETE INSERTS: STEEL OR MALLEABLE-IRON, SLOTTED SUPPORT SYSTEM UNITS SIMILAR TO MSS TYPE 18; COMPLYING WITH MFMA-4 OR MSS SP-58.
4. CLAMPS FOR ATTACHMENT TO STEEL STRUCTURAL ELEMENTS: MSS SP-58, TYPE SUITABLE FOR ATTACHED STRUCTURAL ELEMENT.
5. THROUGH BOLTS: STRUCTURAL TYPE, HEX HEAD, AND HIGH STRENGTH. COMPLY WITH ASTM A 325.
6. TOGGLE BOLTS: ALL-STEEL SPRINGHEAD TYPE.
7. HANGER RODS: THREADED STEEL.
1.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES
A. DESCRIPTION: WELDED OR BOLTED, STRUCTURAL-STEEL SHAPES, SHOP OR FIELD FABRICATED TO FIT DIMENSIONS OF SUPPORTED EQUIPMENT.
1.4 APPLICATION
A. COMPLY WITH NECA 1 AND NECA 101 FOR APPLICATION OF HANGERS AND SUPPORTS FOR ELECTRICAL EQUIPMENT AND SYSTEMS EXCEPT IF REQUIREMENTS IN THIS SECTION ARE STRICTER.
1.5 SUPPORT INSTALLATION
A. COMPLY WITH NECA 1 AND NECA 101 FOR INSTALLATION REQUIREMENTS EXCEPT AS SPECIFIED IN THIS ARTICLE.
B. STRENGTH OF SUPPORT ASSEMBLIES: WHERE NOT INDICATED, SELECT SIZES OF COMPONENTS SO STRENGTH WILL BE ADEQUATE TO CARRY PRESENT AND FUTURE STATIC LOADS WITHIN SPECIFIED LOADING LIMITS. MINIMUM STATIC DESIGN LOAD USED FOR STRENGTH DETERMINATION SHALL BE WEIGHT OF SUPPORTED COMPONENTS PLUS 200 LB.
C. MOUNTING AND ANCHORAGE OF SURFACE-MOUNTED EQUIPMENT AND COMPONENTS: ANCHOR AND FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTS TO BUILDING STRUCTURAL ELEMENTS BY THE FOLLOWING METHODS UNLESS OTHERWISE INDICATED BY CODE:
1. TO WOOD: FASTEN WITH LAG SCREWS OR THROUGH BOLTS.
2. TO NEW CONCRETE: BOLT TO CONCRETE INSERTS.
3. TO MASONRY: APPROVED TOGGLE-TYPE BOLTS ON HOLLOW MASONRY UNITS AND EXPANSION ANCHOR FASTENERS ON SOLID MASONRY UNITS.
4. TO EXISTING CONCRETE: EXPANSION ANCHOR FASTENERS.
5. INSTEAD OF EXPANSION ANCHORS, POWDER-ACTUATED DRIVEN THREADED STUDS PROVIDED WITH LOCK WASHERS AND NUTS MAY BE USED IN EXISTING STANDARD-WEIGHT CONCRETE 4 INCHES THICK OR GREATER. DO NOT USE FOR ANCHORAGE TO LIGHTWEIGHT-AGGREGATE CONCRETE OR FOR SLABS LESS THAN 4 INCHES THICK.
6. TO STEEL: WELDED THREADED STUDS COMPLYING WITH AWS D1.1/D1.1M, WITH LOCK WASHERS AND NUTS BEAM CLAMPS (MSS TYPE 19, 21, 23, 25, OR 27) COMPLYING WITH MSS SP-69.
7. TO LIGHT STEEL: SHEET METAL SCREWS.
8. ITEMS MOUNTED ON HOLLOW WALLS AND NONSTRUCTURAL BUILDING SURFACES: MOUNT CABINETS, PANELBOARDS, DISCONNECT SWITCHES, CONTROL ENCLOSURES, PULL AND JUNCTION BOXES, TRANSFORMERS, AND OTHER DEVICES ON SLOTTED-CHANNEL RACKS ATTACHED TO SUBSTRATE BY MEANS THAT MEET SEISMIC-RESTRAINT STRENGTH AND ANCHORAGE REQUIREMENTS.

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEM

1.1 METAL CONDUITS, TUBING, AND FITTINGS
A. LISTING AND LABELING: METAL CONDUITS, TUBING, AND FITTINGS SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
B. GRC: COMPLY WITH ANSI C80.1 AND UL 6.
C. PVC-COATED STEEL CONDUIT: PVC-COATED RIGID STEEL CONDUIT.
1. COMPLY WITH NEMA RN 1.
2. COATING THICKNESS: 0.040 INCH, MINIMUM.
D. EMT: COMPLY WITH ANSI C80.3 AND UL 797.
E. FMC: COMPLY WITH UL 1; ZINC-COATED STEEL.
F. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET AND COMPLYING WITH UL 360.
G. FITTINGS FOR METAL CONDUIT: COMPLY WITH NEMA FB 1 AND UL 514B.
1. CONDUIT FITTINGS FOR HAZARDOUS (CLASSIFIED) LOCATIONS: COMPLY WITH UL 886 AND NFPA 70.
2. FITTINGS FOR EMT:
a. MATERIAL: STEEL.
b. TYPE: SETSCREW OR COMPRESSION.
3. COATING FOR FITTINGS FOR PVC-COATED CONDUIT: MINIMUM THICKNESS OF 0.040 INCH, WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS.
H. JOINT COMPOUND FOR IMC, GRC, OR ARC: APPROVED, AS DEFINED IN NFPA 70, BY AUTHORITIES HAVING JURISDICTION FOR USE IN CONDUIT ASSEMBLIES, AND COMPOUNDED FOR USE TO LUBRICATE AND PROTECT THREADED CONDUIT JOINTS FROM CORROSION AND TO ENHANCE THEIR CONDUCTIVITY.
1.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS
A. LISTING AND LABELING: NONMETALLIC CONDUITS, TUBING, AND FITTINGS SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
B. RNC: TYPE EPC-40-PVC, COMPLYING WITH NEMA TC 2 AND UL 651 UNLESS OTHERWISE INDICATED.
C. LFNC: COMPLY WITH UL 1660.
D. FITTINGS FOR RNC: COMPLY WITH NEMA TC 3; MATCH TO CONDUIT OR TUBING TYPE AND MATERIAL.
E. FITTINGS FOR LFNC: COMPLY WITH UL 514B.
F. SOLVENT CEMENTS AND ADHESIVE PRIMERS SHALL HAVE A VOC CONTENT OF 510 AND 550 G/L OR LESS, RESPECTIVELY, WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
1.3 BOXES, ENCLOSURES, AND CABINETS
A. GENERAL REQUIREMENTS FOR BOXES, ENCLOSURES, AND CABINETS: BOXES, ENCLOSURES, AND CABINETS INSTALLED IN WET LOCATIONS SHALL BE LISTED FOR USE IN WET LOCATIONS.
B. GENERAL REQUIREMENTS FOR BOXES, ENCLOSURES, AND CABINETS: BOXES, ENCLOSURES, AND CABINETS INSTALLED INSIDE CAR WASH TUNNEL SHALL BE RATED FOR HOSE-DIRECTED WATER (NEMA 4 ENCLOSURE OR EQUIVALENT) AND SHALL ALSO BE RATED FOR THE CORROSIVE ENVIRONMENT. (STAINLESS STEEL OR EQUIVALENT)
C. SHEET METAL OUTLET AND DEVICE BOXES: COMPLY WITH NEMA OS 1 AND UL 514A.
D. CAST-METAL OUTLET AND DEVICE BOXES: COMPLY WITH NEMA FB 1, FERROUS ALLOY OR ALUMINUM, TYPE FD, WITH GASKETED COVER.
1.4 RACEWAY APPLICATION
A. OUTDOORS: APPLY RACEWAY PRODUCTS AS SPECIFIED BELOW UNLESS OTHERWISE INDICATED:
1. ABOVEGROUND: GRC.
2. UNDERGROUND CONDUIT: RNC, TYPE EPC-40-PVC,.
3. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): LFMC.
4. BOXES AND ENCLOSURES, ABOVEGROUND: NEMA 250, TYPE 3R.
B. INDOORS: APPLY RACEWAY PRODUCTS AS SPECIFIED BELOW UNLESS OTHERWISE INDICATED.
1. EXPOSED, NOT SUBJECT TO PHYSICAL DAMAGE: EMT.
2. EXPOSED AND SUBJECT TO SEVERE PHYSICAL DAMAGE: GRC.
3. CONCEALED IN CEILINGS AND INTERIOR WALLS AND PARTITIONS: EMT AND/OR MC CABLE.
4. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): FMC, EXCEPT USE LFMC IN DAMP OR WET LOCATIONS.
5. DAMP OR WET LOCATIONS: GRC.
6. BOXES AND ENCLOSURES: NEMA 250, TYPE 1, EXCEPT USE NEMA 250, TYPE 4 STAINLESS STEEL IN INSTITUTIONAL AND COMMERCIAL KITCHENS AND DAMP OR WET LOCATIONS.
D. MINIMUM RACEWAY SIZE: 3/4-INCH TRADE SIZE.
E. RACEWAY FITTINGS: COMPATIBLE WITH RACEWAYS AND SUITABLE FOR USE AND LOCATION.
3. RIGID AND INTERMEDIATE STEEL CONDUIT: USE THREADED RIGID STEEL CONDUIT FITTINGS UNLESS OTHERWISE INDICATED. COMPLY WITH NEMA FB 2.10.
4. PVC EXTERNALLY COATED, RIGID STEEL CONDUITS: USE ONLY FITTINGS LISTED FOR USE WITH THIS TYPE OF CONDUIT. PATCH AND SEAL ALL JOINTS, NICKS, AND SCRAPES IN PVC COATING AFTER INSTALLING CONDUITS AND FITTINGS. USE SEALANT RECOMMENDED BY FITTING MANUFACTURER AND APPLY IN THICKNESS AND NUMBER OF COATS RECOMMENDED BY MANUFACTURER.
5. EMT: USE SETSCREW OR COMPRESSION, FITTINGS. COMPLY WITH NEMA FB 2.10.
6. FLEXIBLE CONDUIT: USE ONLY FITTINGS LISTED FOR USE WITH FLEXIBLE CONDUIT. COMPLY WITH NEMA FB 2.20.
F. DO NOT INSTALL ALUMINUM CONDUITS, BOXES, OR FITTINGS IN CONTACT WITH CONCRETE OR EARTH.
G. INSTALL SURFACE RACEWAYS ONLY WHERE INDICATED ON DRAWINGS.
H. DO NOT INSTALL NONMETALLIC CONDUIT WHERE AMBIENT TEMPERATURE EXCEEDS 120 DEG
1.5 INSTALLATION
A. COMPLY WITH NECA 1 AND NECA 101 FOR INSTALLATION REQUIREMENTS EXCEPT WHERE REQUIREMENTS ON DRAWINGS OR IN THIS ARTICLE ARE STRICTER. COMPLY WITH NECA 102 FOR ALUMINUM CONDUITS. COMPLY WITH NFPA 70 LIMITATIONS FOR TYPES OF RACEWAYS ALLOWED IN SPECIFIC OCCUPANCIES AND NUMBER OF FLOORS.
B. KEEP RACEWAYS AT LEAST 6 INCHES AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT-WATER PIPES. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER AND STEAM PIPING.
C. COMPLY WITH REQUIREMENTS IN SECTION 260529 "HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS" FOR HANGERS AND SUPPORTS.
D. ARRANGE STUB-UPS SO CURVED PORTIONS OF BENDS ARE NOT VISIBLE ABOVE FINISHED SLAB.
E. INSTALL NO MORE THAN THE EQUIVALENT OF THREE 90-DEGREE BENDS IN ANY CONDUIT RUN EXCEPT FOR CONTROL WIRING CONDUITS, FOR WHICH FEWER BENDS ARE ALLOWED. SUPPORT WITHIN 18 INCHES OF CHANGES IN DIRECTION.
F. CONCEAL CONDUIT AND EMT WITHIN FINISHED WALLS, CEILINGS, AND FLOORS UNLESS OTHERWISE INDICATED. INSTALL CONDUITS PARALLEL OR PERPENDICULAR TO BUILDING LINES.
G. SUPPORT CONDUIT WITHIN 18 INCHESOF ENCLOSURES TO WHICH ATTACHED.
H. STUB-UPS TO ABOVE RECESSED CEILINGS:
1. USE EMT, IMC, OR RMC FOR RACEWAYS.
2. USE A CONDUIT BUSHING OR INSULATED FITTING TO TERMINATE STUB-UPS NOT TERMINATED IN HUBS OR IN AN ENCLOSURE.
I. THREADED CONDUIT JOINTS, EXPOSED TO WET, DAMP, CORROSIVE, OR OUTDOOR CONDITIONS: APPLY LISTED COMPOUND TO THREADS OF RACEWAY AND FITTINGS BEFORE MAKING UP JOINTS. FOLLOW COMPOUND MANUFACTURER'S WRITTEN INSTRUCTIONS.
J. COAT FIELD-CUT THREADS ON PVC-COATED RACEWAY WITH A CORROSION-PREVENTING CONDUCTIVE COMPOUND PRIOR TO ASSEMBLY.
K. RACEWAY TERMINATIONS AT LOCATIONS SUBJECT TO MOISTURE OR VIBRATION: USE INSULATING BUSHINGS TO PROTECT CONDUCTORS INCLUDING CONDUCTORS SMALLER THAN NO. 4 AWG.
L. TERMINATE THREADED CONDUITS INTO THREADED HUBS OR WITH LOCKNUTS ON INSIDE AND OUTSIDE OF BOXES OR CABINETS. INSTALL BUSHINGS ON CONDUITS UP TO 1-1/4-INCH TRADE SIZE AND INSULATED THROAT METAL BUSHINGS ON 1-1/2-INCH TRADE SIZE AND LARGER CONDUITS TERMINATED WITH LOCKNUTS. INSTALL INSULATED THROAT METAL GROUNDING BUSHINGS ON SERVICE CONDUITS.
M. INSTALL PULL WIRES IN EMPTY RACEWAYS. USE POLYPROPYLENE OR MONOFILAMENT PLASTIC LINE WITH NOT LESS THAN 200-LB TENSILE STRENGTH. LEAVE AT LEAST 12 INCHES OF SLACK AT EACH END OF PULL WIRE. CAP UNDERGROUND RACEWAYS DESIGNATED AS SPARE ABOVE GRADE ALONGSIDE RACEWAYS IN USE.
N. FLEXIBLE CONDUIT CONNECTIONS: COMPLY WITH NEMA RV 3. USE A MAXIMUM OF 60 INCHES OF FLEXIBLE CONDUIT FOR RECESSED AND SEMI-RECESSED LUMINAIRES, AND A MAXIMUM OF 36 INCHES OF FLEXIBLE CONDUIT FOR EQUIPMENT (WHERE SUBJECT TO VIBRATION, NOISE TRANSMISSION, OR MOVEMENT), TRANSFORMERS, AND MOTORS.
1. USE LFMC IN DAMP OR WET LOCATIONS.
O. MOUNT BOXES AT HEIGHTS INDICATED ON DRAWINGS. IF MOUNTING HEIGHTS OF BOXES ARE NOT INDIVIDUALLY INDICATED, GIVE PRIORITY TO ADA REQUIREMENTS. INSTALL BOXES WITH HEIGHT AS INDICATED.
P. HORIZONTALLY SEPARATE BOXES MOUNTED ON OPPOSITE SIDES OF WALLS SO THEY ARE NOT IN THE SAME VERTICAL CHANNEL.
Q. LOCATE BOXES SO THAT COVER OR PLATE WILL NOT SPAN DIFFERENT BUILDING FINISHES.
R. SUPPORT BOXES OF TWO GANGS OR MORE FROM MORE THAN ONE SIDE BY SPANNING TWO FRAMING MEMBERS OR MOUNTING ON BRACKETS SPECIFICALLY DESIGNED FOR THE PURPOSE.
S. FASTEN JUNCTION AND PULL BOXES TO OR SUPPORT FROM BUILDING STRUCTURE. DO NOT SUPPORT BOXES BY CONDUITS.

SECTION 260548 - VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

1.1 PERFORMANCE REQUIREMENTS
A. SEISMIC-RESTRAINT LOADING:
1. SITE CLASS AS DEFINED IN THE IBC: D.
2. ASSIGNED SEISMIC USE GROUP OR BUILDING CATEGORY AS DEFINED IN THE IBC: III.
a. COMPONENT IMPORTANCE FACTOR:
1) GENERAL: 1.0.
2) LIFE SAFETY (EM): 1.5
b. COMPONENT RESPONSE MODIFICATION FACTOR:
1) FIXTURES: 1.0
2) EQUIPMENT: 2.5
3) CONDUIT AND CABLES: 5.0.
c. COMPONENT AMPLIFICATION FACTOR: 2.5.
3. DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS (0.2 SECOND): 173%.
4. DESIGN SPECTRAL RESPONSE ACCELERATION AT 1.0-SECOND PERIOD: 76%.
1.2 SEISMIC-RESTRAINT DEVICES
A. GENERAL REQUIREMENTS FOR RESTRAINT COMPONENTS: RATED STRENGTHS, FEATURES, AND APPLICATION REQUIREMENTS SHALL BE AS DEFINED IN REPORTS BY AN AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
1. STRUCTURAL SAFETY FACTOR: ALLOWABLE STRENGTH IN TENSION, SHEAR, AND PULLOUT FORCE OF COMPONENTS SHALL BE AT LEAST FOUR TIMES THE MAXIMUM SEISMIC FORCES TO WHICH THEY WILL BE SUBJECTED.
B. RESTRAINT CABLES: ASTM A 603 GALVANIZED-STEEL CABLES WITH END CONNECTIONS MADE OF STEEL ASSEMBLIES WITH THIMBLES, BRACKETS, SWIVELS, AND BOLTS DESIGNED FOR RESTRAINING CABLE SERVICE; AND WITH A MINIMUM OF TWO CLAMPING BOLTS FOR CABLE ENGAGEMENT.
C. MECHANICAL ANCHOR: DRILLED-IN AND STUD-WEDGE OR FEMALE-WEDGE TYPE IN ZINC-COATED STEEL FOR INTERIOR APPLICATIONS AND STAINLESS STEEL FOR EXTERIOR APPLICATIONS. SELECT ANCHORS WITH STRENGTH REQUIRED FOR ANCHOR AND AS TESTED ACCORDING TO ASTM E 488. MINIMUM LENGTH OF EIGHT TIMES DIAMETER.
D. ADHESIVE ANCHOR: DRILLED-IN AND CAPSULE ANCHOR SYSTEM CONTAINING POLYVINYL OR URETHANE METHACRYLATE-BASED RESIN AND ACCELERATOR, OR INJECTED POLYMER OR HYBRID MORTAR ADHESIVE. PROVIDE ANCHOR BOLTS AND HARDWARE WITH ZINC-COATED STEEL FOR INTERIOR APPLICATIONS AND STAINLESS STEEL FOR EXTERIOR APPLICATIONS. SELECT ANCHOR BOLTS WITH STRENGTH REQUIRED FOR ANCHOR AND AS TESTED ACCORDING TO ASTM E 488.
1.3 APPLICATIONS
A. STRENGTH OF SUPPORT AND SEISMIC-RESTRAINT ASSEMBLIES: WHERE NOT INDICATED, SELECT SIZES OF COMPONENTS SO STRENGTH WILL BE ADEQUATE TO CARRY PRESENT AND FUTURE STATIC AND SEISMIC LOADS WITHIN SPECIFIED LOADING LIMITS.
1.4 SEISMIC-RESTRAINT DEVICE INSTALLATION
A. INSTALL BUSHING ASSEMBLIES FOR MOUNTING BOLTS FOR WALL-MOUNTED EQUIPMENT, ARRANGED TO PROVIDE RESILIENT MEDIA WHERE EQUIPMENT OR EQUIPMENT-MOUNTING CHANNELS ARE ATTACHED TO WALL.
B. ATTACHMENT TO STRUCTURE: IF SPECIFIC ATTACHMENT IS NOT INDICATED, ANCHOR BRACING TO STRUCTURE AT FLANGES OF BEAMS, AT UPPER TRUSS CHORDS OF BAR JOISTS, OR AT CONCRETE MEMBERS.
C. DRILLED-IN ANCHORS:
1. IDENTIFY POSITION OF REINFORCING STEEL AND OTHER EMBEDDED ITEMS PRIOR TO DRILLING HOLES FOR ANCHORS. DO NOT DAMAGE EXISTING REINFORCING OR EMBEDDED ITEMS DURING CORING OR DRILLING. NOTIFY THE STRUCTURAL ENGINEER IF REINFORCING STEEL OR OTHER EMBEDDED ITEMS ARE ENCOUNTERED DURING DRILLING. LOCATE AND AVOID PRESTRESSED TENDONS, ELECTRICAL AND TELECOMMUNICATIONS CONDUIT, AND GAS LINES.
2. DO NOT DRILL HOLES IN CONCRETE OR MASONRY UNTIL CONCRETE, MORTAR, OR GROUT HAS ACHIEVED FULL DESIGN STRENGTH.
3. WEDGE ANCHORS: PROTECT THREADS FROM DAMAGE DURING ANCHOR INSTALLATION. HEAVY-DUTY SLEEVE ANCHORS SHALL BE INSTALLED WITH SLEEVE FULLY ENGAGED IN THE STRUCTURAL ELEMENT TO WHICH ANCHOR IS TO BE FASTENED.
4. ADHESIVE ANCHORS: CLEAN HOLES TO REMOVE LOOSE MATERIAL AND DRILLING DUST PRIOR TO INSTALLATION OF ADHESIVE. PLACE ADHESIVE IN HOLES PROCEEDING FROM THE BOTTOM OF THE HOLE AND PROGRESSING TOWARD THE SURFACE IN SUCH A MANNER AS TO AVOID INTRODUCTION OF AIR POCKETS IN THE ADHESIVE.
5. SET ANCHORS TO MANUFACTURER'S RECOMMENDED TORQUE, USING A TORQUE WRENCH.
6. INSTALL ZINC-COATED STEEL ANCHORS FOR INTERIOR AND STAINLESS-STEEL ANCHORS FOR EXTERIOR APPLICATIONS.
1.5 ADJUSTING
A. ADJUST ISOLATORS AFTER ISOLATED EQUIPMENT IS AT OPERATING WEIGHT.
B. ADJUST LIMIT STOPS ON RESTRAINED SPRING ISOLATORS TO MOUNT EQUIPMENT AT NORMAL OPERATING HEIGHT. AFTER EQUIPMENT INSTALLATION IS COMPLETE, ADJUST LIMIT STOPS SO THEY ARE OUT OF CONTACT DURING NORMAL OPERATION.
C. ADJUST ACTIVE HEIGHT OF SPRING ISOLATORS.
D. ADJUST RESTRAINTS TO PERMIT FREE MOVEMENT OF EQUIPMENT WITHIN NORMAL MODE OF OPERATION.

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

1.1 QUALITY ASSURANCE
A. COMPLY WITH ANSI A13.1.
B. COMPLY WITH NFPA 70.
1.2 CONDUCTOR IDENTIFICATION MATERIALS
A. COLOR-CODING CONDUCTOR TAPE: COLORED, SELF-ADHESIVE VINYL TAPE NOT LESS THAN 3 MILS THICK BY 1 TO 2 INCHES WIDE.
1.3 WARNING LABELS AND SIGNS
A. COMPLY WITH NFPA 70 AND 29 CFR 1910.145.
B. WARNING LABEL AND SIGN SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING LEGENDS:
1. WORKSPACE CLEARANCE WARNING: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."
2. ARC FLASH HAZARD WARNING PER NFPA 70.
1.4 EQUIPMENT IDENTIFICATION LABELS
A. SELF-ADHESIVE, ENGRAVED, LAMINATED ACRYLIC OR MELAMINE LABEL: ADHESIVE BACKED, WITH WHITE LETTERS ON A DARK-GRAY BACKGROUND. MINIMUM LETTER HEIGHT SHALL BE 3/8 INCH.
1.5 IDENTIFICATION SCHEDULE
A. POWER-CIRCUIT CONDUCTOR IDENTIFICATION, 600 V OR LESS: FOR CONDUCTORS IN VAULTS, PULL AND JUNCTION BOXES, MANHOLES, AND HANDHOLES, USE COLOR-CODING CONDUCTOR TAPE TO IDENTIFY THE PHASE.
1. COLOR-CODING FOR PHASE IDENTIFICATION, 600 V OR LESS: USE COLORS LISTED BELOW FOR UNGROUNDED SERVICE, FEEDER, AND BRANCH-CIRCUIT CONDUCTORS.
a. COLORS FOR 208/120-V CIRCUITS:
1) PHASE A: BLACK.
2) PHASE B: RED.
3) PHASE C: BLUE.
4) NEUTRAL: WHITE WITH COLORED STRIPE TO MATCH ASSOCIATED PHASE
5) GROUND: GREEN
b. COLORS FOR 480/277-V CIRCUITS:
1) PHASE A: BROWN.
2) PHASE B: YELLOW.
3) PHASE C: PURPLE.
4) NEUTRAL: GRAY WITH COLORED STRIPE TO MATCH ASSOCIATED PHASE
5) GROUND: GREEN WITH GRAY STRIPE.
c. FIELD-APPLIED, COLOR-CODING CONDUCTOR TAPE: APPLY IN HALF-LAPPED TURNS FOR A MINIMUM DISTANCE OF 6 INCHES FROM TERMINAL POINTS AND IN BOXES WHERE SPLICES OR TAPS ARE MADE. APPLY LAST TWO TURNS OF TAPE WITH NO TENSION TO PREVENT POSSIBLE UNWINDING. LOCATE BANDS TO AVOID OBSCURING FACTORY CABLE MARKINGS.
B. WARNING LABELS FOR INDOOR CABINETS, BOXES, AND ENCLOSURES FOR POWER AND LIGHTING: SELF-ADHESIVE WARNING LABELS.
1. COMPLY WITH 29 CFR 1910.145.
2. EQUIPMENT IDENTIFICATION LABELS: ON EACH UNIT OF EQUIPMENT, INSTALL UNIQUE DESIGNATION LABEL THAT IS CONSISTENT WITH WIRING DIAGRAMS, SCHEDULES, AND THE OPERATION AND MAINTENANCE MANUAL. APPLY LABELS TO DISCONNECT SWITCHES AND PROTECTION EQUIPMENT, CENTRAL OR MASTER UNITS, CONTROL PANELS, CONTROL STATIONS, TERMINAL CABINETS, AND RACKS OF EACH SYSTEM. SYSTEMS INCLUDE POWER, LIGHTING, CONTROL, COMMUNICATION, SIGNAL, MONITORING, AND ALARM SYSTEMS UNLESS EQUIPMENT IS PROVIDED WITH ITS OWN IDENTIFICATION.
3. LABELING INSTRUCTIONS:
a. INDOOR EQUIPMENT: SELF-ADHESIVE, ENGRAVED, LAMINATED ACRYLIC OR MELAMINE LABEL. UNLESS OTHERWISE INDICATED, PROVIDE A SINGLE LINE OF TEXT WITH 1/2-INCH-HIGH LETTERS ON 1-1/2-INCH-HIGH LABEL; WHERE TWO LINES OF TEXT ARE REQUIRED, USE LABELS 2 INCHES HIGH.
b. OUTDOOR EQUIPMENT: ENGRAVED, LAMINATED ACRYLIC OR MELAMINE LABEL.
c. ELEVATED COMPONENTS: INCREASE SIZES OF LABELS AND LETTERS TO THOSE APPROPRIATE FOR VIEWING FROM THE FLOOR.
d. UNLESS PROVIDED WITH SELF-ADHESIVE MEANS OF ATTACHMENT, FASTEN LABELS WITH APPROPRIATE MECHANICAL FASTENERS THAT DO NOT CHANGE THE NEMA OR NRTL RATING OF THE ENCLOSURE.

SECTION 262200 - LOW-VOLTAGE TRANSFORMERS

1.1 ACTION SUBMITTALS
A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT.
B. SHOP DRAWINGS: INDICATE DIMENSIONS AND WEIGHTS.
1. WIRING DIAGRAMS: POWER, SIGNAL, AND CONTROL WIRING.
1.2 DISTRIBUTION TRANSFORMERS
A. COMPLY WITH NFPA 70, AND LIST AND LABEL AS COMPLYING WITH UL 1561.
B. PROVIDE TRANSFORMERS THAT ARE CONSTRUCTED TO WITHSTAND SEISMIC FORCES SPECIFIED IN SECTION 260548.16 "SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS."
C. CORES: ONE LEG PER PHASE.
D. ENCLOSURE: VENTILATED.
1. NEMA 250, TYPE 2 OR NEMA 250 TYPE 4X, STAINLESS STEEL: CORE AND COIL SHALL BE ENCAPSULATED WITHIN RESIN COMPOUND TO SEAL OUT MOISTURE AND AIR.
E. TAPS FOR TRANSFORMERS 25 KVA AND LARGER: TWO 2.5 PERCENT TAPS ABOVE AND TWO 2.5 PERCENT TAPS BELOW NORMAL FULL CAPACITY.
F. INSULATION CLASS, 30 KVA AND LARGER: 220 DEG C, UL-COMPONENT-RECOGNIZED INSULATION SYSTEM WITH A MAXIMUM OF 150-DEG C RISE ABOVE 40-DEG C AMBIENT TEMPERATURE.
G. K-FACTOR RATING: TRANSFORMERS INDICATED TO BE K-FACTOR RATED SHALL COMPLY WITH UL 1561 REQUIREMENTS FOR NONSINUSOIDAL LOAD CURRENT-HANDLING CAPABILITY TO THE DEGREE DEFINED BY DESIGNATED K-FACTOR.
1. UNIT SHALL NOT OVERHEAT WHEN CARRYING FULL-LOAD CURRENT WITH HARMONIC DISTORTION CORRESPONDING TO DESIGNATED K-FACTOR.
2. INDICATE VALUE OF K-FACTOR ON TRANSFORMER NAMEPLATE.
3. UNIT SHALL MEET REQUIREMENTS OF NEMA TP 1 WHEN TESTED ACCORDING TO NEMA TP 2 WITH A K-FACTOR EQUAL TO ONE.
H. NEUTRAL: RATED 200 PERCENT OF FULL LOAD CURRENT FOR K-FACTOR RATED TRANSFORMERS.
1.3 CONNECTIONS
A. GROUND EQUIPMENT ACCORDING TO SECTION 260526 "GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS."
B. CONNECT WIRING ACCORDING TO SECTION 260519 "LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES."
C. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A-486B.
D. PROVIDE FLEXIBLE CONNECTIONS AT ALL CONDUIT AND CONDUCTOR TERMINATIONS AND SUPPORTS TO ELIMINATE SOUND AND VIBRATION TRANSMISSION TO THE BUILDING STRUCTURE.
1.4 ADJUSTING
A. ADJUST TRANSFORMER TAPS TO PROVIDE OPTIMUM VOLTAGE CONDITIONS AT SECONDARY TERMINALS. OPTIMUM IS DEFINED AS NOT EXCEEDING NAMEPLATE VOLTAGE PLUS 5 PERCENT AND NOT BEING LOWER THAN NAMEPLATE VOLTAGE MINUS 3 PERCENT AT MAXIMUM LOAD CONDITIONS. SUBMIT RECORDING AND TAP SETTINGS AS TEST RESULTS.

SECTION 262416- PANELBOARDS

1.1 ACTION SUBMITTALS
A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.
B. SHOP DRAWINGS: FOR EACH PANELBOARD AND RELATED EQUIPMENT.
C. SEISMIC QUALIFICATION CERTIFICATES: SUBMIT CERTIFICATION THAT PANELBOARDS, OVERCURRENT PROTECTIVE DEVICES, ACCESSORIES, AND COMPONENTS WILL WITHSTAND SEISMIC FORCES DEFINED IN SECTION 260548.16 "SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS."
D. OPERATION AND MAINTENANCE DATA.
1.2 GENERAL REQUIREMENTS FOR PANELBOARDS
A. FABRICATE AND TEST PANELBOARDS ACCORDING TO IEEE 344 TO WITHSTAND SEISMIC FORCES DEFINED IN SECTION 260548.16 "SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS."
B. PHASE, NEUTRAL, AND GROUND BUSES: TIN-PLATED ALUMINUM OR HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
C. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL AND SIZES.
D. SERVICE EQUIPMENT LABEL: NRTL LABELED FOR USE AS SERVICE EQUIPMENT FOR PANELBOARDS WITH ONE OR MORE MAIN SERVICE DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES.
E. FUTURE DEVICES: MOUNTING BRACKETS, BUS CONNECTIONS, FILLER PLATES, AND NECESSARY APPURTENANCES REQUIRED FOR FUTURE INSTALLATION OF DEVICES.
F. PANELBOARD SHORT-CIRCUIT CURRENT RATING: FULLY RATED TO INTERRUPT SYMMETRICAL SHORT-CIRCUIT CURRENT AVAILABLE AT TERMINALS.
1.3 DISTRIBUTION PANELBOARDS
A. PANELBOARDS: NEMA PB 1, POWER AND FEEDER DISTRIBUTION TYPE.
B. DOORS: SECURED WITH VAULT-TYPE LATCH WITH TUMBLER LOCK; KEYED ALIKE.
C. BRANCH OVERCURRENT PROTECTIVE DEVICES: FOR CIRCUIT-BREAKER FRAME SIZES 125 A AND SMALLER: BOLT-ON CIRCUIT BREAKERS.
D. BRANCH OVERCURRENT PROTECTIVE DEVICES: FOR CIRCUIT-BREAKER FRAME SIZES LARGER THAN 125 A: BOLT-ON CIRCUIT BREAKERS; PLUG-IN CIRCUIT BREAKERS WHERE INDIVIDUAL POSITIVE-LOCKING DEVICE REQUIRES MECHANICAL RELEASE FOR REMOVAL.
1.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS
A. PANELBOARDS: NEMA PB 1, LIGHTING AND APPLIANCE BRANCH-CIRCUIT TYPE.
B. BRANCH OVERCURRENT PROTECTIVE DEVICES: PLUG-IN OR BOLT-ON CIRCUIT BREAKERS, REPLACEABLE WITHOUT DISTURBING ADJACENT UNITS.
C. DOORS: CONCEALED HINGES; SECURED WITH FLUSH LATCH WITH TUMBLER LOCK; KEYED ALIKE.
1.5 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES
A. MOLDED-CASE CIRCUIT BREAKER (MCCB): COMPLY WITH UL 489, WITH INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS.
1. THERMAL-MAGNETIC CIRCUIT BREAKERS: INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 250 A AND LARGER.
2. ADJUSTABLE INSTANTANEOUS-TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT-MOUNTED, FIELD-ADJUSTABLE TRIP SETTING.
3. GFCI CIRCUIT BREAKERS: SINGLE- AND TWO-POLE CONFIGURATIONS WITH CLASS A GROUND-FAULT PROTECTION (6-MA TRIP).
4. GROUND-FAULT EQUIPMENT PROTECTION (GFEP) CIRCUIT BREAKERS: CLASS B GROUND-FAULT PROTECTION (30-MA TRIP).
5. ARC-FAULT CIRCUIT INTERRUPTER (AFCI) CIRCUIT BREAKERS: COMPLY WITH UL 1699; 120/240-V, SINGLE-POLE CONFIGURATION.
6. MOLDED-CASE CIRCUIT-BREAKER (MCCB) FEATURES AND ACCESSORIES:
a. LUGS: MECHANICAL STYLE, SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIALS.
b. APPLICATION LISTING: APPROPRIATE FOR APPLICATION; TYPE SWD FOR SWITCHING FLUORESCENT LIGHTING LOADS; TYPE HID FOR FEEDING FLUORESCENT AND HIGH-INTENSITY DISCHARGE (HID) LIGHTING CIRCUITS.
c. HANDLE PADLOCKING DEVICE: FIXED ATTACHMENT, FOR LOCKING CIRCUIT-BREAKER HANDLE IN ON OR OFF POSITION.
d. HANDLE CLAMP: LOOSE ATTACHMENT, FOR HOLDING CIRCUIT-BREAKER HANDLE IN ON POSITION.
1.6 INSTALLATION
A. COMPLY WITH MOUNTING AND ANCHORING REQUIREMENTS SPECIFIED IN SECTION 260548.16 "SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS."
B. MOUNT PANELBOARD CABINET PLUMB AND RIGID WITHOUT DISTORTION OF BOX. MOUNT RECESSED PANELBOARDS WITH FRONTS UNIFORMLY FLUSH WITH WALL FINISH AND MATING WITH BACK BOX.
C. INSTALL OVERCURRENT PROTECTIVE DEVICES AND CONTROLLERS NOT ALREADY FACTORY INSTALLED.
1. SET FIELD-ADJUSTABLE, CIRCUIT-BREAKER TRIP RANGES.
D. INSTALL FILLER PLATES IN UNUSED SPACES.
E. STUB FOUR 1-INCHEMPTY CONDUITS FROM PANELBOARD INTO ACCESSIBLE CEILING SPACE OR SPACE DESIGNATED TO BE CEILING SPACE IN THE FUTURE. STUB FOUR 1-INCHEMPTY CONDUITS INTO RAISED FLOOR SPACE OR BELOW SLAB NOT ON GRADE.
F. ARRANGE CONDUCTORS IN GUTTERS INTO GROUPS AND BUNDLE AND WRAP WITH WIRE TIES.
G. COMPLY WITH NECA 1.

1.7 IDENTIFICATION
IDENTIFY FIELD-INSTALLED CONDUCTORS, INTERCONNECTING WIRING, AND COMPONENTS; PROVIDE WARNING SIGNS COMPLYING WITH SECTION 260553 "IDENTIFICATION FOR ELECTRICAL SYSTEMS."
A. CREATE A DIRECTORY TO INDICATE INSTALLED CIRCUIT LOADS AND INCORPORATING OWNER'S FINAL ROOM DESIGNATIONS. OBTAIN APPROVAL BEFORE INSTALLING. USE A COMPUTER OR TYPEWRITER TO CREATE DIRECTORY; HANDWRITTEN DIRECTORIES ARE NOT ACCEPTABLE.
B. PANELBOARD NAMEPLATES: LABEL EACH PANELBOARD WITH A NAMEPLATE COMPLYING WITH REQUIREMENTS FOR IDENTIFICATION SPECIFIED IN SECTION 260553 "IDENTIFICATION FOR ELECTRICAL SYSTEMS."
C. DEVICE NAMEPLATES: LABEL EACH BRANCH CIRCUIT DEVICE IN DISTRIBUTION PANELBOARDS WITH A NAMEPLATE COMPLYING WITH REQUIREMENTS FOR IDENTIFICATION SPECIFIED IN SECTION 260553 "IDENTIFICATION FOR ELECTRICAL SYSTEMS
1.8 PANELBOARD SUPPRESSORS
SURGE PROTECTION DEVICE: IEEE C62.41-COMPLIANT, INTEGRALLY MOUNTED, SOLID-STATE, PARALLEL-CONNECTED, NON-MODULAR TYPE, WITH SINE-WAVE TRACKING SUPPRESSION AND FILTERING MODULES, UL 1449, SECOND EDITION, SHORT-CIRCUIT CURRENT RATING MATCHING OR EXCEEDING THE PANELBOARD SHORT-CIRCUIT RATING, AND WITH THE FOLLOWING FEATURES AND ACCESSORIES:
1. ACCESSORIES:
a. LED INDICATOR LIGHTS FOR POWER AND PROTECTION STATUS.
b. AUDIBLE ALARM, WITH SILENCING SWITCH, TO INDICATE WHEN PROTECTION HAS FAILED.
c. ONE SET OF DRY CONTACTS RATED AT 5 A AND 250-V AC, FOR REMOTE MONITORING OF PROTECTION STATUS.
B. SURGE PROTECTION DEVICE: IEEE C62.41-COMPLIANT, INTEGRALLY MOUNTED, PLUG-IN OR BOLT-ON, SOLID-STATE, PARALLEL-CONNECTED, MODULAR (WITH FIELD-REPLACEABLE MODULES) TYPE, WITH SINE-WAVE TRACKING SUPPRESSION AND FILTERING MODULES, UL 1449, SECOND EDITION, SHORT-CIRCUIT CURRENT RATING MATCHING OR EXCEEDING THE PANELBOARD SHORT-CIRCUIT RATING, AND WITH THE FOLLOWING FEATURES AND ACCESSORIES:
1. ACCESSORIES:
a. FUSES RATED AT 200-KA INTERRUPTING CAPACITY.
b. FABRICATION USING BOLTED COMPRESSION LUGS FOR INTERNAL WIRING.
c. INTEGRAL DISCONNECT SWITCH.
d. REDUNDANT SUPPRESSION CIRCUITS.
e. REDUNDANT REPLACEABLE MODULES.
f. ARRANGEMENT WITH WIRE CONNECTIONS TO PHASE BUSES, NEUTRAL BUS, AND GROUND BUS.
g. LED INDICATOR LIGHTS FOR POWER AND PROTECTION STATUS.
h. AUDIBLE ALARM, WITH SILENCING SWITCH, TO INDICATE WHEN PROTECTION HAS FAILED.
i. FORM-C CONTACTS RATED AT 5 A AND 250-V AC, ONE NORMALLY OPEN AND ONE NORMALLY CLOSED, FOR REMOTE MONITORING OF SYSTEM OPERATION. CONTACTS SHALL REVERSE POSITION ON FAILURE OF ANY SURGE DIVERSION MODULE OR ON OPENING OF ANY CURRENT-LIMITING DEVICE. COORDINATE WITH BUILDING POWER MONITORING AND CONTROL SYSTEM.
j. FOUR-DIGIT, TRANSIENT-EVENT COUNTER SET TO TOTALIZE TRANSIENT SURGES.
2. PEAK SINGLE-IMPULSE SURGE CURRENT RATING: 120 KA PER MODE/240 KA PER PHASE.
3. MINIMUM SINGLE-IMPULSE CURRENT RATINGS, USING 8-BY-20-MIC.SEC. WAVEFORM DESCRIBED IN IEEE C62.41.2.
a. LINE TO NEUTRAL: 70,000 A.
b. LINE TO GROUND: 70,000 A.
c. NEUTRAL TO GROUND: 50,000 A.
4. WITHSTAND CAPABILITIES: 12,000 IEEE C62.41, CATEGORY C3 (10 KA), 8-BY-20-MIC.SEC. SURGES WITH LESS THAN 5 PERCENT CHANGE IN CLAMPING VOLTAGE.
5. PROTECTION MODES AND UL 1449 SVR FOR GROUNDED WYE CIRCUITS WITH 480Y/277-V, THREE-PHASE, FOUR-WIRE CIRCUITS SHALL BE AS FOLLOWS:
a. LINE TO NEUTRAL: 800 V FOR 480Y/277.
b. LINE TO GROUND: 800 V FOR 480Y/277.
NEUTRAL TO GROUND: 800 V FOR 480Y/277.

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REGISTERED PROFESSIONAL ENGINEER
No. 294174
SHANE D.
SWENSON
10/7/2019
STATE OF UTAH

DATE
OCT 7, 2019

PROJECT TITLE
SUNRAY PROPERTIES
NEW BUILDING PROJECT
42 WEST 300 NORTH
HYRUM, UTAH

SHEET TITLE
SPECIFICATIONS

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SPECIFICATIONS

SECTION 262713 - ELECTRICITY METERING

1.1 SUMMARY
- A. SECTION INCLUDES EQUIPMENT FOR ELECTRICITY METERING BY UTILITY COMPANY.

1.2 SUBMITTALS
- A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.
- B. SHOP DRAWINGS: DIMENSIONED PLANS AND SECTIONS OR ELEVATION LAYOUTS AND WIRING DIAGRAMS.
- C. FIELD QUALITY-CONTROL REPORTS.
- D. OPERATION AND MAINTENANCE DATA.

1.3 QUALITY ASSURANCE
- A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.

1.4 EQUIPMENT FOR ELECTRICITY METERING BY UTILITY COMPANY
- A. METERS WILL BE FURNISHED BY UTILITY COMPANY.
- B. CURRENT-TRANSFORMER CABINETS: COMPLY WITH REQUIREMENTS OF ELECTRICAL-POWER UTILITY COMPANY.
- C. METER SOCKETS: COMPLY WITH REQUIREMENTS OF ELECTRICAL-POWER UTILITY COMPANY.

1.5 INSTALLATION
- A. COMPLY WITH EQUIPMENT INSTALLATION REQUIREMENTS IN NECA 1.
- B. INSTALL METERS FURNISHED BY UTILITY COMPANY. INSTALL RACEWAYS AND EQUIPMENT ACCORDING TO UTILITY COMPANY'S WRITTEN REQUIREMENTS. PROVIDE EMPTY CONDUITS FOR METERING LEADS AND EXTEND GROUNDING CONNECTIONS AS REQUIRED BY UTILITY COMPANY.
- C. COMPLY WITH REQUIREMENTS FOR IDENTIFICATION SPECIFIED IN DIVISION 26 SECTION "IDENTIFICATION FOR ELECTRICAL SYSTEMS."
  - 1. SERIES COMBINATION WARNING LABEL: SELF-ADHESIVE TYPE, WITH TEXT AS REQUIRED BY NFPA 70.

SECTION 262726 - WIRING DEVICES

1.1 GENERAL WIRING-DEVICE REQUIREMENTS
WIRING DEVICES, COMPONENTS, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.

1.2 STRAIGHT-BLADE RECEPTACLES
CONVENIENCE RECEPTACLES, 125 V, 20 A: COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, UL 498, AND FS W-C-596.

1.3 GFCI RECEPTACLES
- A. GENERAL DESCRIPTION:
  - 1. STRAIGHT BLADE, FEED-THROUGH TYPE.
  - 2. COMPLY WITH NEMA WD 1, NEMA WD 6, UL 498, UL 943 CLASS A, AND FS W-C-596.
  - 3. INCLUDE INDICATOR LIGHT THAT SHOWS WHEN THE GFCI HAS MALFUNCTIONED AND NO LONGER PROVIDES PROPER GFCI PROTECTION.
- B. DUPLEX GFCI CONVENIENCE RECEPTACLES, 125 V, 20 A:

1.4 TOGGLE SWITCHES
- A. COMPLY WITH NEMA WD 1, UL 20, AND FS W-S-896.
- B. SWITCHES, 120/277 V, 20 A:
- C. PILOT-LIGHT SWITCHES, 20 A:
  - 1. DESCRIPTION: SINGLE POLE, WITH NEON-LIGHTED HANDLE, ILLUMINATED WHEN SWITCH IS "OFF."

1.5 WALL-BOX DIMMERS
DIMMER SWITCHES: MODULAR, FULL-WAVE, SOLID-STATE UNITS WITH INTEGRAL, QUIET ON-OFF SWITCHES, WITH AUDIBLE FREQUENCY AND EMI/RFI SUPPRESSION FILTERS.
- A. CONTROL: CONTINUOUSLY ADJUSTABLE SLIDER OR TOGGLE SWITCH; WITH SINGLE-POLE OR THREE-WAY SWITCHING. COMPLY WITH UL 1472.
- B. LED LAMP DIMMER SWITCHES: MODULAR, COMPATIBLE WITH LED DIMMER DRIVERS; TRIM POTENTIOMETER TO ADJUST LOW-END DIMMING; DIMMER-DRIVER COMBINATION CAPABLE OF CONSISTENT DIMMING WITH LOW END NOT GREATER THAN 1 PERCENT OF FULL BRIGHTNESS.

1.6 WALL PLATES
- D. SINGLE AND COMBINATION TYPES SHALL MATCH CORRESPONDING WIRING DEVICES.
  - 1. PLATE-SECURING SCREWS: METAL WITH HEAD COLOR TO MATCH PLATE FINISH.
  - 2. MATERIAL FOR FINISHED SPACES: SMOOTH, HIGH-IMPACT THERMOPLASTIC OR 0.035-INCH-THICK, SATIN-FINISHED, TYPE 302 STAINLESS STEEL.
  - 3. MATERIAL FOR UNFINISHED SPACES: GALVANIZED STEEL.
  - 4. MATERIAL FOR DAMP LOCATIONS: THERMOPLASTIC OR CAST ALUMINUM WITH SPRING-LOADED LIFT COVER, AND LISTED AND LABELED FOR USE IN WET AND DAMP LOCATIONS.

1.7 FINISHES
- A. DEVICE COLOR:
  - 1. WIRING DEVICES CONNECTED TO NORMAL POWER SYSTEM: AS SELECTED BY ARCHITECT UNLESS OTHERWISE INDICATED OR REQUIRED BY NFPA 70 OR DEVICE LISTING.
- B. WALL PLATE COLOR: FOR PLASTIC COVERS, MATCH DEVICE COLOR.

1.8 INSTALLATION
- A. COMPLY WITH NECA 1, INCLUDING MOUNTING HEIGHTS LISTED IN THAT STANDARD, UNLESS OTHERWISE INDICATED.
- B. COORDINATION WITH OTHER TRADES:
  - 1. PROTECT INSTALLED DEVICES AND THEIR BOXES. DO NOT PLACE WALL FINISH MATERIALS OVER DEVICE BOXES AND DO NOT CUT HOLES FOR BOXES WITH ROUTERS THAT ARE GUIDED BY RIDING AGAINST OUTSIDE OF BOXES.
  - 2. KEEP OUTLET BOXES FREE OF PLASTER, DRYWALL JOINT COMPOUND, MORTAR, CEMENT, CONCRETE, DUST, PAINT, AND OTHER MATERIAL THAT MAY CONTAMINATE THE RACEWAY SYSTEM, CONDUCTORS, AND CABLES.
  - 3. INSTALL DEVICE BOXES IN BRICK OR BLOCK WALLS SO THAT THE COVER PLATE DOES NOT CROSS A JOINT UNLESS THE JOINT IS TROWELED FLUSH WITH THE FACE OF THE WALL.
  - 4. INSTALL WIRING DEVICES AFTER ALL WALL PREPARATION, INCLUDING PAINTING, IS COMPLETE.
- C. CONDUCTORS:
  - 1. DO NOT STRIP INSULATION FROM CONDUCTORS UNTIL RIGHT BEFORE THEY ARE SPLICED OR TERMINATED ON DEVICES.
  - 2. STRIP INSULATION EVENLY AROUND THE CONDUCTOR USING TOOLS DESIGNED FOR THE PURPOSE. AVOID SCORING OR NICKING OF SOLID WIRE OR CUTTING STRANDS FROM STRANDED WIRE.
  - 3. THE LENGTH OF FREE CONDUCTORS AT OUTLETS FOR DEVICES SHALL MEET PROVISIONS OF NFPA 70, ARTICLE 300, WITHOUT PIGTAILS.
- D. DEVICE INSTALLATION:
  - 1. REPLACE DEVICES THAT HAVE BEEN IN TEMPORARY USE DURING CONSTRUCTION AND THAT WERE INSTALLED BEFORE BUILDING FINISHING OPERATIONS WERE COMPLETE.
  - 2. KEEP EACH WIRING DEVICE IN ITS PACKAGE OR OTHERWISE PROTECTED UNTIL IT IS TIME TO CONNECT CONDUCTORS.
  - 3. DO NOT REMOVE SURFACE PROTECTION, SUCH AS PLASTIC FILM AND SMUDGE COVERS, UNTIL THE LAST POSSIBLE MOMENT.
  - 4. CONNECT DEVICES TO BRANCH CIRCUITS USING PIGTAILS THAT ARE NOT LESS THAN 12 INCHES IN LENGTH.
  - 5. WHEN CONDUCTORS LARGER THAN NO. 12 AWG ARE INSTALLED ON 15- OR 20-A CIRCUITS, SPLICE NO. 12 AWG PIGTAILS FOR DEVICE CONNECTIONS.
  - 6. TIGHTEN UNUSED TERMINAL SCREWS ON THE DEVICE.
  - 7. WHEN MOUNTING INTO METAL BOXES, REMOVE THE FIBER OR PLASTIC WASHERS USED TO HOLD DEVICE-MOUNTING SCREWS IN YOKES, ALLOWING METAL-TO-METAL CONTACT.
- E. DIMMERS:
  - 1. INSTALL DIMMERS WITHIN TERMS OF THEIR LISTING.
  - 2. INSTALL UNSHARED NEUTRAL CONDUCTORS ON LINE AND LOAD SIDE OF DIMMERS ACCORDING TO MANUFACTURERS' DEVICE LISTING CONDITIONS IN THE WRITTEN INSTRUCTIONS.

SECTION 262816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

1.1 QUALITY ASSURANCE
- A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.

1.2 NONFUSIBLE SWITCHES
- A. TYPE GD, GENERAL DUTY, SINGLE THROW, 600 A AND SMALLER: UL 98 AND NEMA KS 1, HORSEPOWER RATED, LOCKABLE HANDLE WITH CAPABILITY TO ACCEPT TWO PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION.
- B. ACCESSORIES:
  - 1. EQUIPMENT GROUND KIT: INTERNALLY MOUNTED AND LABELED FOR COPPER AND ALUMINUM GROUND CONDUCTORS.
  - 2. NEUTRAL KIT: INTERNALLY MOUNTED; INSULATED, CAPABLE OF BEING GROUNDED AND BONDED; LABELED FOR COPPER AND ALUMINUM NEUTRAL CONDUCTORS.
  - 3. LUGS: SUITABLE FOR NUMBER, SIZE, AND CONDUCTOR MATERIAL.

1.3 MOLDED-CASE CIRCUIT BREAKERS
- A. GENERAL REQUIREMENTS: COMPLY WITH UL 489, NEMA AB 1, AND NEMA AB 3, WITH INTERRUPTING CAPACITY TO COMPLY WITH AVAILABLE FAULT CURRENTS.
- B. THERMAL-MAGNETIC CIRCUIT BREAKERS: INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 250 A AND LARGER.
- C. FEATURES AND ACCESSORIES:
  - 1. STANDARD FRAME SIZES, TRIP RATINGS, AND NUMBER OF POLES.
  - 2. LUGS: SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIAL.
  - 3. APPLICATION LISTING: APPROPRIATE FOR APPLICATION; TYPE SWD FOR SWITCHING FLUORESCENT LIGHTING LOADS; TYPE HID FOR FEEDING FLUORESCENT AND HIGH-INTENSITY DISCHARGE LIGHTING CIRCUITS.

1.4 INSTALLATION
- A. INSTALL INDIVIDUAL WALL-MOUNTED SWITCHES AND CIRCUIT BREAKERS WITH TOPS AT UNIFORM HEIGHT UNLESS OTHERWISE INDICATED.
- B. COMPLY WITH NECA 1.

1.5 IDENTIFICATION
- A. COMPLY WITH REQUIREMENTS IN SECTION 260553 "IDENTIFICATION FOR ELECTRICAL SYSTEMS."

SECTION 265100 - INTERIOR LIGHTING

1.1 ACTION SUBMITTALS
- A. PRODUCT DATA: FOR EACH TYPE OF LIGHTING FIXTURE, ARRANGED IN ORDER OF FIXTURE DESIGNATION. INCLUDE DATA ON FEATURES, ACCESSORIES, AND FINISHES.

1.2 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS
- A. RECESSED FIXTURES: COMPLY WITH NEMA LE 4 FOR CEILING COMPATIBILITY FOR RECESSED FIXTURES.
- B. FLUORESCENT FIXTURES: COMPLY WITH UL 1598. WHERE LER IS SPECIFIED, TEST ACCORDING TO NEMA LE 5 AND NEMA LE 5A AS APPLICABLE.
- C. METAL PARTS: FREE OF BURRS AND SHARP CORNERS AND EDGES.
- D. DIFFUSERS AND GLOBES:
  - 1. ACRYLIC LIGHTING DIFFUSERS: 100 PERCENT VIRGIN ACRYLIC PLASTIC. HIGH RESISTANCE TO YELLOWING AND OTHER CHANGES DUE TO AGING, EXPOSURE TO HEAT, AND UV RADIATION.
    - a. LENS THICKNESS: AT LEAST 0.125 INCH MINIMUM UNLESS OTHERWISE INDICATED.
    - b. UV STABILIZED.

1.3 LED LUMINAIRES
- A. SOLID STATE DRIVERS AND LED: COMPLY WITH DOE LM 79
  - 1. TOTAL HARMONIC DISTORTION RATING: LESS THAN 10 PERCENT
  - 2. TRANSIENT VOLTAGE PROTECTION
  - 3. POWER FACTOR: 0.90 OR HIGHER
  - 4. TEMPERATURES: MINUS 40 DEG F (MINUS 40 DEG C) AND HIGHER
  - 5. HEAT SINK TO REMOVE HEAT FROM CIRCUITS
  - 6. L70 COMPLIANT TO 70,000 HOURS MINIMUM
  - 7. COLOR RENDERING INDEX: 80 CRI MINIMUM
  - 8. DIMMABLE
    - a. DIMMING RANGE: 100 TO 1 PERCENT OF RATED LAMP LUMENS
    - b. INPUT WATTS: CAN BE REDUCED TO 20 PERCENT OF NORMAL

1.4 BALLASTS FOR LINEAR FLUORESCENT LAMPS
- A. GENERAL REQUIREMENTS FOR ELECTRONIC BALLASTS:
  - 1. COMPLY WITH UL 935 AND WITH ANSI C82.11.
  - 2. DESIGNED FOR TYPE AND QUANTITY OF LAMPS SERVED.
  - 3. PROGRAM-START

1.5 EMERGENCY FLUORESCENT POWER UNIT
- A. INTERNAL TYPE: SELF-CONTAINED, MODULAR, BATTERY-INVERTER UNIT, FACTORY MOUNTED WITHIN LIGHTING FIXTURE BODY AND COMPATIBLE WITH BALLAST. COMPLY WITH UL 924.
  - 1. EMERGENCY CONNECTION: OPERATE ONE FLUORESCENT LAMP(S) CONTINUOUSLY AT AN OUTPUT OF 1100 LUMENS EACH. CONNECT UNSWITCHED CIRCUIT TO BATTERY-INVERTER UNIT AND SWITCHED CIRCUIT TO FIXTURE BALLAST.
  - 2. NIGHTLIGHT CONNECTION: OPERATE ONE FLUORESCENT LAMP CONTINUOUSLY.
  - 3. TEST PUSH BUTTON AND INDICATOR LIGHT: VISIBLE AND ACCESSIBLE WITHOUT OPENING FIXTURE OR ENTERING CEILING SPACE.
    - a. PUSH BUTTON: PUSH-TO-TEST TYPE, IN UNIT HOUSING, SIMULATES LOSS OF NORMAL POWER AND DEMONSTRATES UNIT OPERABILITY.
    - b. INDICATOR LIGHT: LED INDICATES NORMAL POWER ON. NORMAL GLOW INDICATES TRICKLE CHARGE; BRIGHT GLOW INDICATES CHARGING AT END OF DISCHARGE CYCLE.
  - 4. BATTERY: SEALED, MAINTENANCE-FREE, NICKEL-CADMIUM TYPE.
  - 5. CHARGER: FULLY AUTOMATIC, SOLID-STATE, CONSTANT-CURRENT TYPE WITH SEALED POWER TRANSFER RELAY.
  - 6. INTEGRAL SELF-TEST: FACTORY-INSTALLED ELECTRONIC DEVICE AUTOMATICALLY INITIATES CODE-REQUIRED TEST OF UNIT EMERGENCY OPERATION AT REQUIRED INTERVALS. TEST FAILURE IS ANNUNCIATED BY AN INTEGRAL AUDIBLE ALARM AND A FLASHING RED LED.

1.6 EXIT SIGNS
- A. GENERAL REQUIREMENTS FOR EXIT SIGNS: COMPLY WITH UL 924; FOR SIGN COLORS, VISIBILITY, LUMINANCE, AND LETTERING SIZE, COMPLY WITH AUTHORITIES HAVING JURISDICTION.
- B. INTERNALLY LIGHTED SIGNS:
  - 1. LAMPS FOR AC OPERATION: LEDS, 50,000 HOURS MINIMUM RATED LAMP LIFE.
  - 2. SELF-POWERED EXIT SIGNS (BATTERY TYPE): INTEGRAL AUTOMATIC CHARGER IN A SELF-CONTAINED POWER PACK.

1.7 FLUORESCENT LAMPS
- A. T8 RAPID-START LAMPS CRI 85 (MINIMUM), COLOR TEMPERATURE 3500 K, AND AVERAGE RATED LIFE 20,000 HOURS UNLESS OTHERWISE INDICATED.

1.8 LIGHTING FIXTURE SUPPORT COMPONENTS
- A. WIRES: ASTM A 641/A 641M, CLASS 3, SOFT TEMPER, ZINC-COATED STEEL, 12 GAGE.
- B. WIRES FOR HUMID SPACES: ASTM A 580/A 580M, COMPOSITION 302 OR 304, ANNEALED STAINLESS STEEL, 12 GAGE.

1.9 INSTALLATION
- A. LIGHTING FIXTURES: SET LEVEL, PLUMB, AND SQUARE WITH CEILINGS AND WALLS. INSTALL LAMPS IN EACH FIXTURE.
- B. COMPLY WITH NFPA 70 FOR MINIMUM FIXTURE SUPPORTS.

1.10 FIELD QUALITY CONTROL
- A. TEST FOR EMERGENCY LIGHTING: INTERRUPT POWER SUPPLY TO DEMONSTRATE PROPER OPERATION. VERIFY TRANSFER FROM NORMAL POWER TO BATTERY AND RETRANSFER TO NORMAL.

SECTION 270528 - PATHWAYS FOR COMMUNICATIONS SYSTEMS

1.1 ACTION SUBMITTALS
- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of cable tray.
- C. Delegated-Design Submittal: For seismic restraints.

1.2 METAL CONDUITS AND FITTINGS
- A. See section 260533 “Raceways and boxes for Electrical Systems”.

1.3 BOXES, ENCLOSURES, AND CABINETS
- A. See section 260533 “Raceways and boxes for Electrical Systems” unless otherwise indicated below.
- B. Device Box Dimensions: 4 inches square by 2-1/2 inches deep.

1.4 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND CABLING
- A. See section 260533 “Raceways and boxes for Electrical Systems”.

1.5 WIRE-BASKET CABLE TRAYS
- A. Description:
  - 1. Configuration: Wires are formed into a standard 2-by-4-inch wire mesh pattern with intersecting wires welded together. Mesh sections must have at least one bottom longitudinal wire along entire length of section.
  - 2. Materials: High-strength-steel longitudinal wires with no bends.
  - 3. Safety Provisions: Wire ends along wire-basket sides (flanges) rounded during manufacturing to maintain integrity of cables and installer safety.
  - 4. Sizes:
    - a. Straight sections shall be furnished in standard 118-inch lengths.
    - b. Wire-Basket Depth: 4-inch usable loading depth by 12 inches wide.
  - 5. Connector Assemblies: Bolt welded to plate shaped to fit around adjoining tray wires and mating plate. Mechanically joins adjacent tray wires to splice sections together or to create horizontal fittings.
  - 6. Connector Assembly Capacity: Splices located within support span shall not diminish rated loading capacity of cable tray.
  - 7. Hardware and Fasteners: ASTM F 593 and ASTM F 594 stainless steel, Type 316.

1.6 PATHWAY APPLICATION
- A. See section 260533 “Raceways and boxes for Electrical Systems” unless otherwise indicated below.
- B. Indoors: Apply pathway products as specified below unless otherwise indicated:
- C. Minimum Pathway Size: 1 inch.

1.7 INSTALLATION
- A. See section 260533 “Raceways and boxes for Electrical Systems” unless otherwise indicated below.
- B. Install no more than the equivalent of two 90-degree bends in any pathway run. Support within 12 inches of changes in direction. Utilize long radius ells for all optical-fiber cables.
- C. Stub-ups to Above Recessed Ceilings:
  - 1. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- D. Coat field-cut threads on PVC-coated pathway with a corrosion-preventing conductive compound prior to assembly.
- E. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install insulated bushings on conduits terminated with locknuts.
- F. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- G. Spare Pathways: Install pull wires in empty pathways. Cap underground pathways designated as spare above grade alongside pathways in use.
- H. Pathways for Communications Cable: Install pathways as follows:
  - 1. 1-Inch Trade Size and Larger: Install pathways in maximum lengths of 75 feet.
  - 2. Install with a maximum of two 90-degree bends or equivalent for each length of pathway unless Drawings show stricter requirements.

1.8 INSTALLATION OF UNDERGROUND CONDUIT
- A. See section 260533 “Raceways and boxes for Electrical Systems” unless otherwise indicated below.

1.9 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES
- A. See section 260533 “Raceways and boxes for Electrical Systems” unless otherwise indicated below.

SECTION 271500 - COMMUNICATIONS CABLING

1.1 PERFORMANCE REQUIREMENTS
- A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA/EIA-568-B.1, when tested according to test procedures of this standard.

1.2 QUALITY ASSURANCE
- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Flame-Spread Index: 25 or less.
  - 2. Smoke-Developed Index: 50 or less.
- B. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.
- C. Grounding: Comply with ANSI-J-STD-607-A.

1.3 DELIVERY, STORAGE, AND HANDLING
- A. Test cables upon receipt at Project site. Test each pair of UTP cable for open and short circuits.

1.4 PATHWAYS
- A. Cable Support: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.
  - 1. Support brackets with cable tie slots for fastening cable ties to brackets.
  - 2. Lacing bars, spools, J-hooks, and D-rings.
  - 3. Straps and other devices.
- B. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems." Flexible metal conduit shall not be used.
  - 1. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high, and 2-1/2 inches deep.

1.5 LABELING
- A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

1.6 GROUNDING
- A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.

1.7 BACKBOARDS
- A. Backboards: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches.

1.8 UTP CABLE
- A. Description: 100-ohm, 4-pair UTP, covered with a blue thermoplastic jacket.
  - 1. Comply with ICEA S-90-661 for mechanical properties.
  - 2. Comply with TIA/EIA-568-B.1 for performance specifications.
  - 3. Comply with TIA/EIA-568-B.2, Category 6.
  - 4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
    - a. Communications, General Purpose: Type CM or CMG; or MPP, CMP, MPR, CMR, MP, or MPG.
    - b. Communications, Plenum Rated: Type CMP or MPP, complying with NFPA 262.

1.9 UTP CABLE HARDWARE
- A. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.
- B. Connecting Blocks: 110-style IDC for Category 6.
- C. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.
  - 1. Number of Terminals per Field: One for each conductor in assigned cables.
- D. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.
  - 1. Number of Jacks per Field: One for each four-pair UTP cable indicated.
- E. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals.
- F. Patch Cords: Factory-made, four-pair cables in varying lengths; terminated with eight-position modular plug at each end.
  - 1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.

1.10 COAXIAL CABLE
- A. General Coaxial Cable Requirements: Broadband type, recommended by cable manufacturer specifically for broadband data transmission applications. Coaxial cable and accessories shall have 75-ohm nominal impedance with a return loss of 20 dB maximum from 7 to 806 MHz.
- B. RG-6/U (Plenum Rated): NFPA 70, Type CMP.
- C. Coaxial-Cable Connectors: Type BNC, 75 ohms.

1.11 TELECOMMUNICATIONS OUTLET/CONNECTORS
- A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with TIA/EIA-568-B.1.
- B. Workstation Outlets: Four and six-port-connector assemblies mounted in single faceplate.
  - 1. For use with snap-in jacks accommodating any combination of UTP work area cords.
  - 2. Legend: Snap-in, clear-label covers and machine-printed paper inserts.

1.12 IDENTIFICATION PRODUCTS
- A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- B. Comply with requirements in Division 26 Section "Identification for Electrical Systems."

1.13 WIRING METHODS
- A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces, in attics, and in gypsum board partitions where unenclosed wiring method may be used. Conceal raceway and cables except in unfinished spaces.
  - 1. Install plenum cable in environmental air spaces, including plenum ceilings.
  - 2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."
- B. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

1.14 INSTALLATION OF PATHWAYS
- A. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.
- B. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.
- C. Install manufactured conduit sweeps and long-radius elbows.
- D. Pathway Installation in Communications Equipment Rooms:
  - 1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
  - 2. Secure conduits to backboard when entering room from overhead.
  - 3. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

1.15 INSTALLATION OF CABLES
- A. Comply with NECA 1.
- B. General Requirements for Cabling:
  - 1. Comply with TIA/EIA-568-B.1.
  - 2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
  - 3. Install 110-style IDC termination hardware unless otherwise indicated.
  - 4. Terminate conductors; no cable shall contain unterminated elements.
  - 5. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.
- C. UTP Cable Installation:
  - 1. Comply with TIA/EIA-568-B.2.
- D. Separation from EMI Sources:
  - 1. Comply with BICSI TDMM and TIA/EIA-569-A for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.

1.16 IDENTIFICATION
- A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
  - 1. Color-code cross-connect fields. Apply colors to voice and data service backboards, connections, covers, and labels.
- B. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-A

SECTION 283111 - DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

1.1 SUBMITTALS
- A. Product Data: For each type of product, including furnished options and accessories.
- B. Shop Drawings: For fire-alarm system.
- C. General Submittal Requirements:
  - 1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
- D. Delegated-Design Submittal: For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - 1. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.
  - 2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.
  - 3. Indicate audible appliances required to produce square wave signal per NFPA 72.
- E. Field quality-control reports.
- F. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
  - 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following and deliver copies to authorities having jurisdiction:
    - a. Comply with the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
    - b. Provide "Record of Completion Documents" according to NFPA 72 article "Permanent Records" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter.
    - c. Record copy of site-specific software.
    - d. Provide "Maintenance, Inspection and Testing Records" according to NFPA 72 article of the same name and include the following:
    - e. Frequency of testing of installed components.
    - f. Frequency of inspection of installed components.
    - g. Requirements and recommendations related to results of maintenance.
    - h. Manufacturer's user training manuals.
    - i. Manufacturer's required maintenance related to system warranty requirements.
    - j. Abbreviated operating instructions for mounting at fire-alarm control unit.
    - k. Retain subparagraph below if Project contains water-based sprinkler or standpipe systems.
    - l. Copy of NFPA 25.
    - m. Field redlines showing:
    - n. Routing of new conduits
    - o. Location of all devices, relays, control modules, j-boxes, etc.
    - p. Device connection order
    - q. Device addresses
    - r. Battery calculations
    - s. Visual device candela rating
    - t. Audible device sound pressure rating and setting
    - u. I/O matrix
    - v. FCPS location and number
    - w. The following information in digital (.pdf and AutoCad .dwg) and one hardcopy:
    - x. Field redline information indicated above
    - y. Equipment and device cutsheets
    - z. Panel programming information
    - aa. Device point report

1.2 SYSTEM DESCRIPTION
- A. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.
- B. Noncoded, UL-certified FM Global-placarded addressable system, with multiplexed signal transmission and horn/strobe evacuation.
- C. Automatic sensitivity control of certain smoke detectors.
- D. All components provided shall be listed for use with the selected system.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.1 MANUFACTURERS
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- 1. NOTIFIER; a Honeywell company supplied by Mountain Alarm

1.2 FIRE-ALARM CONTROL UNIT
- A. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:
  - 1. Pathway Class Designations: NFPA 72, Class D.
  - 2. Pathway Survivability: Level 1.
  - 3. Signaling Line Circuits: Style 7
  - 4. Install no more than 75% of loop capacity's addressable devices on each signaling line circuit
- B. Notification-Appliance Circuit:
  - 1. Operation shall match existing device audible pattern.
  - 2. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.
- C. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory.
- D. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch. Include battery upgrades to incorporate new devices.

1.3 SYSTEM SMOKE DETECTORS
- A. General Requirements for System Smoke Detectors:
  - 1. Comply with UL 268; operating at 24-V dc, nominal.
  - 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
  - 3. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
  - 4. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
  - 5. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
  - 6. Remote Control: Unless otherwise indicated, detectors shall be digital-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit.
    - a. Rate-of-rise temperature characteristic of combination smoke- and heat-detection units shall be selectable at fire-alarm control unit for 15 or 20 deg F per minute.
    - b. Fixed-temperature sensing characteristic of combination smoke- and heat-detection units shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155 deg F.
    - c. Multiple levels of detection sensitivity for each sensor.
    - d. Sensitivity levels based on time of day.
- B. Photoelectric Smoke Detectors:
  - 1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
  - 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
    - a. Primary status.
    - b. Device type.
    - c. Present average value.
    - d. Present sensitivity selected.
    - e. Sensor range (normal, dirty, etc.).

1.4 NOTIFICATION APPLIANCES
- A. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
  - 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.
- B. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464.
- C. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch-high letters on the lens.
  - 1. Mounting: Wall mounted unless otherwise indicated.
  - 2. Flashing shall be in a temporal pattern, synchronized with other units.
  - 3. Strobe Leads: Factory connected to screw terminals.
  - 4. Mounting Faceplate: Factory finished, [**red**] [**white**].

1.5 EQUIPMENT INSTALLATION
- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
- B. Connecting to Existing Equipment: Verify that existing fire-alarm system is operational before making changes or connections.
- C. Smoke- or Heat-Detector Spacing: Comply with NFPA 72.
- D. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.
- E. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling. Install all devices at the same height unless otherwise indicated.
- F. Device Location-Indicating Lights: Locate in public space near the device they monitor.

1.6 PATHWAYS
- A. Pathways shall be installed in EMT.
- B. Exposed EMT shall be painted red enamel.

1.7 IDENTIFICATION
- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

1.8 GROUNDING
- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

1.9 FIELD QUALITY CONTROL
- A. Field tests shall be witnessed by authorities having jurisdiction.
- B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
  - 1. Visual Inspection: Conduct visual inspection prior to testing.
    - a. Inspection shall be based on completed record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter.
    - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
  - 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
  - 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
  - 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
  - 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
  - 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- C. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- D. Prepare test and inspection reports.

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No. 294174
SHANE D. SWENSON
10/7/2019

DATE
OCT 7, 2019

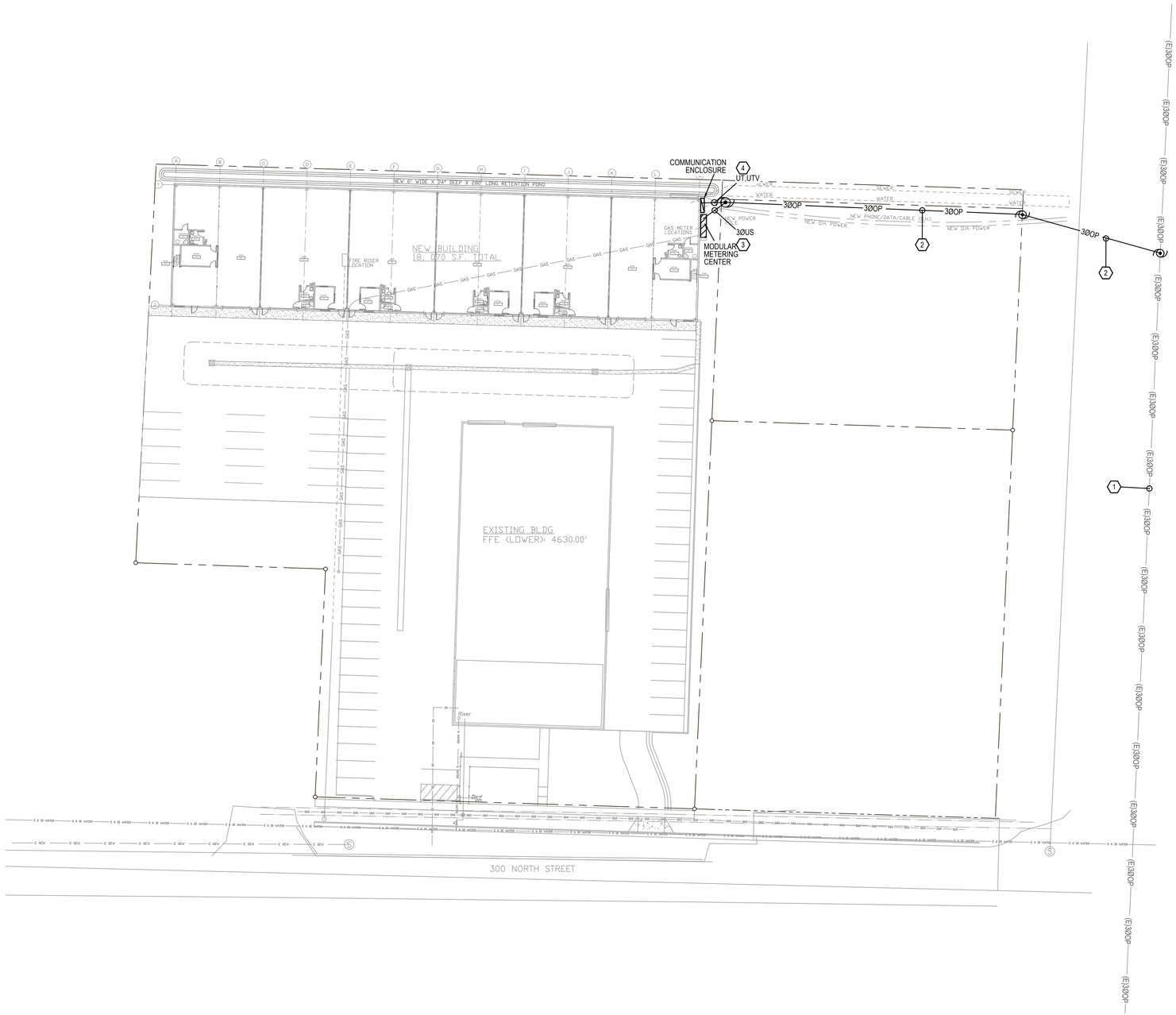
PROJECT TITLE
SUNRAY PROPERTIES
NEW BUILDING PROJECT
42 WEST 300 NORTH
HYRUM, UTAH

SHEET TITLE
SPECIFICATIONS

PROJECT NUMBER
SSE# 2019046

REVISIONS

SHEET NUMBER
E003



SHEET KEYED NOTES

1. EXISTING UTILITY LINE TO REMAIN.
2. COORDINATE UTILITY LINE EXTENSION WITH LOCAL UTILITY REP.
3. FIELD VERIFY METER CLEARANCES WITH UTILITY. COORDINATE WITH MECHANICAL CONTRACTOR TO KEEP UTILITY REQUIRED CLEARANCE BETWEEN ELECTRICAL EQUIPMENT AND GAS METER.
4. PROVIDE (1)4" CONDUITS AND (1)2"CONDUIT FROM COMMUNICATION ENCLOSURE TO LOCATION INDICATED BY COMMUNICATION UTILITY REP.

GENERAL SHEET NOTES

1. EXISTING ITEMS TO BE REMOVED ARE INDICATED AS BOLD/DASHED. ITEMS TO REMAIN ARE SHOWN AS LIGHT/SOLID.
2. CIRCUIT ROUTING IS SCHEMATIC UNLESS OTHERWISE NOTED.
3. COORDINATE ALL UTILITY INSTALLATIONS WITH LOCAL UTILITY REPS.
4. COMPLY WITH ALL UTILITY REQUIREMENTS FOR NEW UTILITY INSTALLATIONS.

1 ELECTRICAL SITE PLAN
Scale: 1"=30'-0"

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SHEET TITLE
ELECTRICAL SITE PLAN

PROJECT NUMBER
SSE# 2019046

REVISIONS

SHEET NUMBER
ES101

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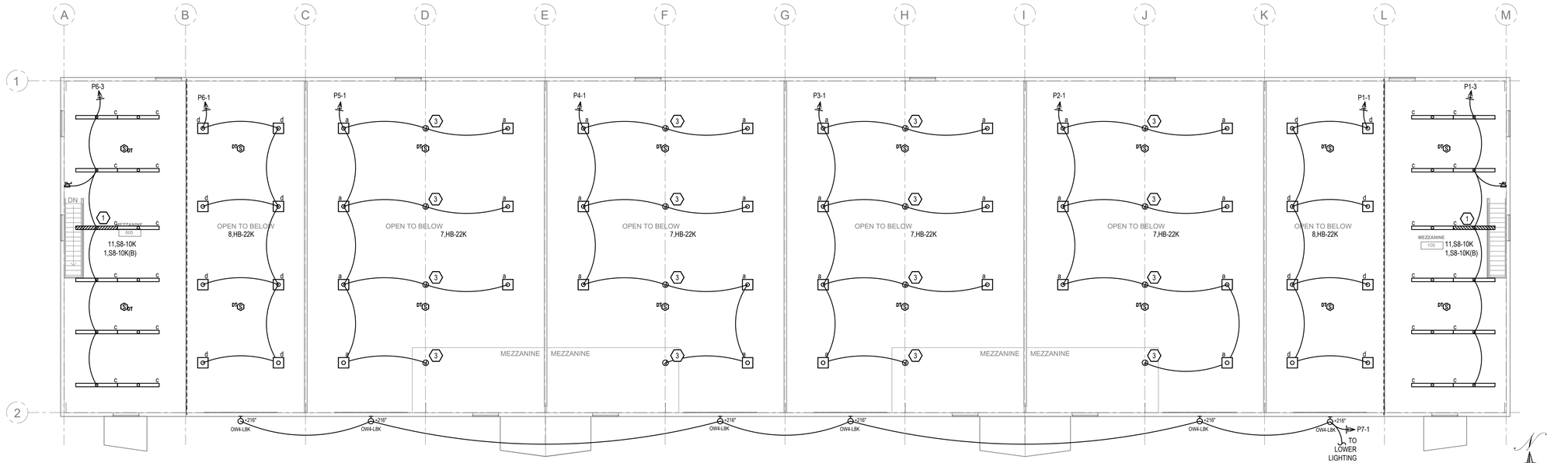
GENERAL SHEET NOTES

1. CONTRACTOR TO FURNISH OCCUPANCY SENSORS WITH COVERAGE PATTERNS APPROPRIATE FOR THEIR INSTALLED LOCATIONS. COORDINATE WITH EQUIPMENT SUPPLIER PRIOR TO BID.
2. CONNECT OCCUPANCY SENSORS TO ENABLE ALL SWITCHES IN CONTROLLED SPACE.
3. CONNECT OCCUPANCY SENSORS, BATTERY BALLASTS, EXIT SIGNS, ETC. TO UNSWITCHED SOURCE CONDUCTOR.
4. SEE POWER PLAN FOR ELECTRICAL DISTRIBUTION, EQUIPMENT AND LIGHTING RELAY PANEL LOCATIONS.
5. ALL NEW LIGHTING CONTROLS (SWITCH, OCCUPANCY SENSORS, DIMMERS, ETC.) SHALL BE LITHONIA N-LIGHT, WATTSTOPPER DLM, DOUGLASS DIALOG OR OTHER SIMILAR SYSTEM THAT ALLOWS SWITCHES AND SENSORS TO COMMUNICATE TO MEET MANUAL ON, AUTO OFF REQUIREMENTS OF ENERGY CODE.

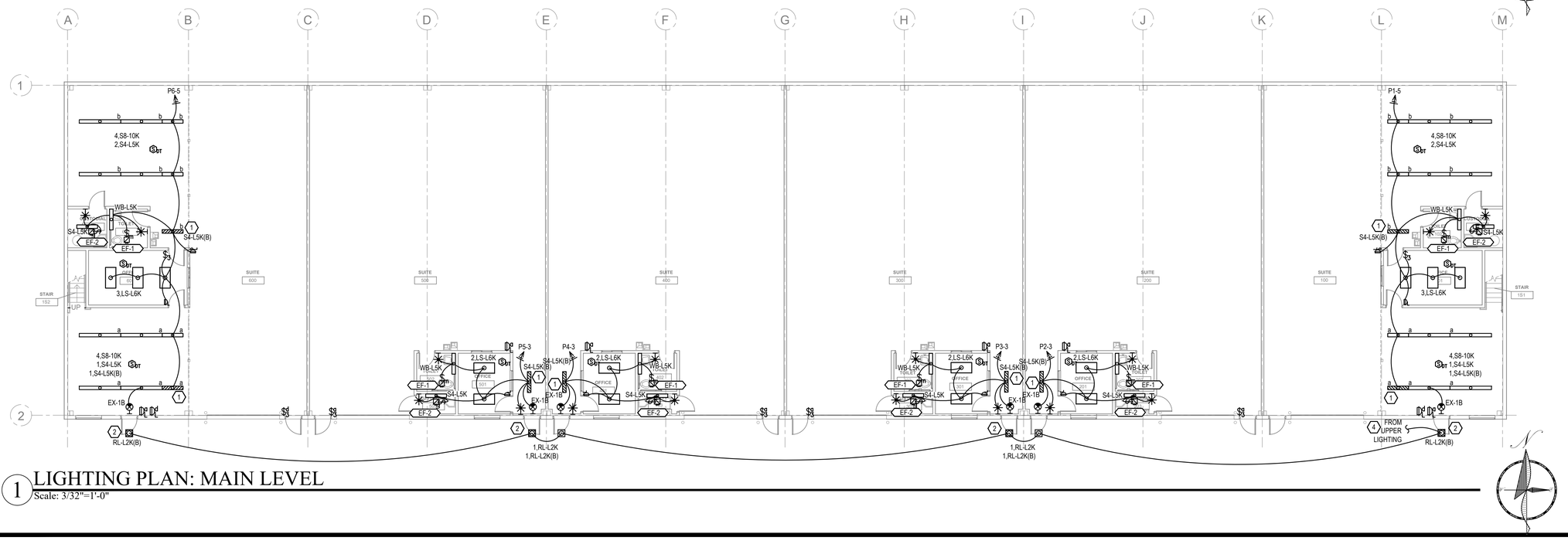
⬡ SHEET KEYED NOTES

1. PROVIDE EM BATTERY BALLAST IN FIXTURES NOTED. CONNECT BATTERY TO UNSWITCHED CIRCUIT CONDUCTOR OF CIRCUIT SERVING FIXTURE. CONNECT LAMPS TO OPERATE WITH SWITCH(S) IN NORMAL MODE.
2. PROVIDE COLD-WEATHER OR REMOTE EM BATTERY BACKUP FOR FIXTURES NOTED. CONNECT BATTERY TO UNSWITCHED CIRCUIT CONDUCTOR OF CIRCUIT SERVING FIXTURE. CONNECT LAMPS TO OPERATE WITH SWITCH(S) IN NORMAL MODE.
3. PROVIDE CEILING MOUNTED J-BOX FOR FUTURE LED HIGH BAY FIXTURE.
4. ROUTE CIRCUIT SERVING RECESSED CANS THROUGH PHOTOCELL.



2 LIGHTING PLAN: MEZZANINE LEVEL

Scale: 3/32"=1'-0"



1 LIGHTING PLAN: MAIN LEVEL

Scale: 3/32"=1'-0"

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HYRUM, UTAH

SHEET TITLE
LIGHTING PLAN

PROJECT NUMBER
SSE# 2019046

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SHEET NUMBER
E201

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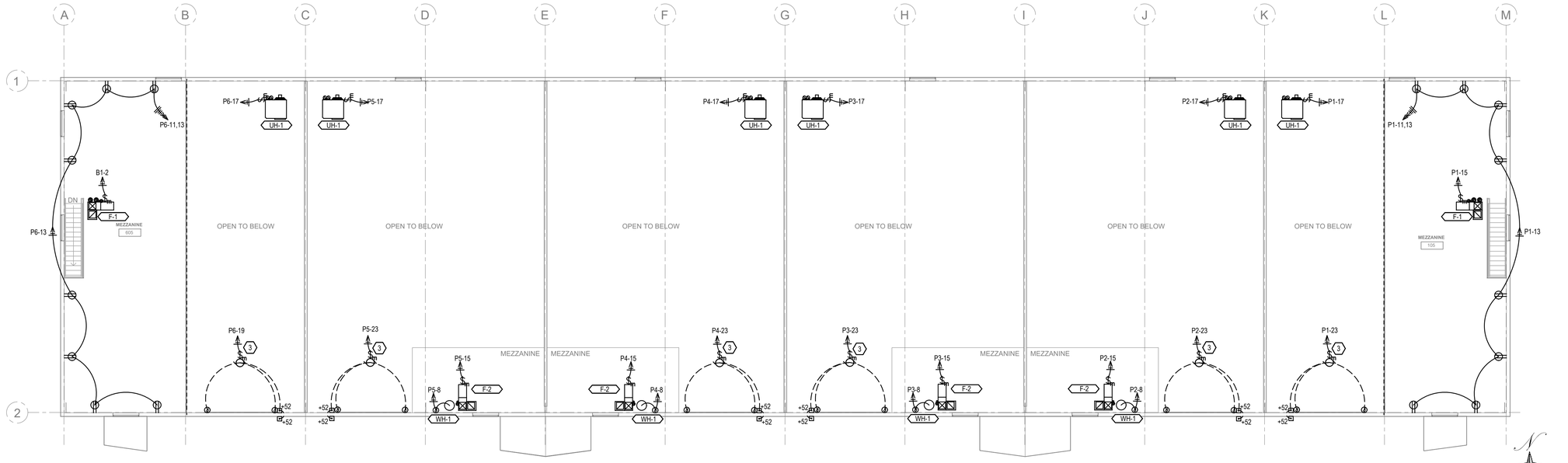
GENERAL SHEET NOTES

1. COORDINATE ALL SWITCH, OUTLET, LIGHT AND OTHER DEVICE LOCATIONS WITH ARCHITECTURAL ELEMENTS (CABINETS, WINDOWS ETC.) PRIOR TO ROUGH IN. REVIEW ARCHITECTURAL INTERIOR ELEVATIONS PRIOR TO ROUGH-IN OF EACH AREA FOR ADDITIONAL INFORMATION.
2. PROVIDE 4SD J-BOX WITH 1 GANG MUD RING AND 1" CONDUIT TO ACCESSIBLE CEILING SPACE FOR ALL VOICE/DATA/COMBO OUTLETS SHOWN ON FLOOR PLANS. PROVIDE INSULATED THROAT CONNECTORS ON BOTH ENDS OF CONDUIT.

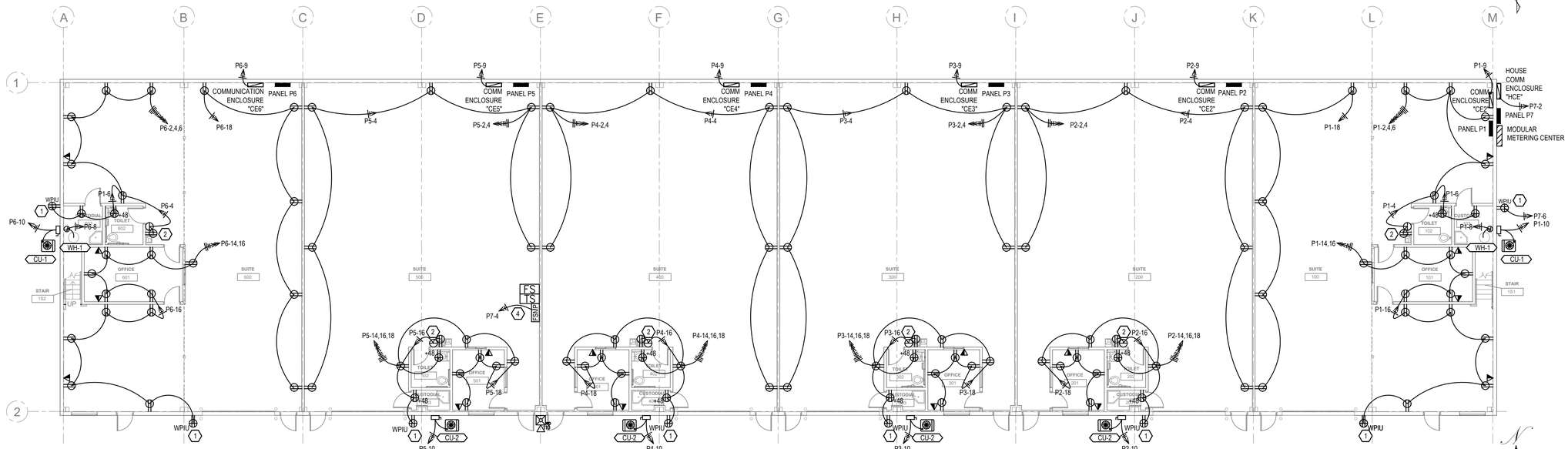
⬡ SHEET KEYED NOTES

1. PROVIDE WP-IN-USE, FLUSH-MOUNT BOX (ARLINGTON STEEL IN-BOX OR EQUIVALENT). COORDINATE TYPE WITH WALL CONSTRUCTION. FIELD PAINT INTERIOR AND TRIM TO MATCH BUILDING TRIM COLOR.
2. MOUNT EWC OUTLET BEHIND COOLER COVER. ROUTE CIRCUIT THROUGH FACELESS GFCI (LEVITON 7590 OR EQUIVALENT) MOUNTED BELOW COOLER COVER.
3. PROVIDE CONTROL ROUGH-IN FOR OPENER AND SENSORS AS REQUIRED. PROVIDE CONTROL WIRING PER EQUIPMENT REQUIREMENTS. EQUIPMENT AND DEVICES INDICATED ARE SHOWN FOR INTENT ONLY AND SHALL BE ADJUSTED PER EQUIPMENT REQUIREMENTS.
4. PROVIDE FIRE RISER MONITORING. FIELD VERIFY EXACT LOCATION OF FIRE RISER WITH FIRE SPRINKLE CONTRACTOR PRIOR TO ROUGH-IN. INCLUDE TAMPER SWITCH AND FLOW SWITCH. PROVIDE A WIRED DIALER.



2 POWER PLAN: MEZZANINE LEVEL

Scale: 3/32"=1'-0"



1 POWER PLAN: MAIN LEVEL

Scale: 3/32"=1'-0"

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POWER PLAN

PROJECT NUMBER
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E301

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LIGHT FIXTURE SCHEDULE

TYPE	MANUFACTURER/CATALOG NO.	DESCRIPTION	MOUNTING	POWER	LAMPS
EX- 1B	DUAL LITE NV3-G-EN-W-CVS SURE-LITES CCX7-0-70-G-WH-SD LIGHTOLIER LT-N-U-G-W-SD LITHONIA LQM S W 3 G 120/277 EL N SD EELP XE-2-GW-EM-SD EXITRONIX MCPHILBEN CXXL-3-G-W	EXIT SIGN; SINGLE FACE; UNIVERSAL MOUNTING; WHITE, THERMOPLASTIC HOUSING; SELF DIAGNOSTICS; WIRE GUARD WHERE NOTED ON DRAWINGS	WALL OR CEILING 1-FACE	3W	LED
HB- 22K HB- 22K(B)	LITHONIA IBE-L24-22000LM-ATC-MD-MVOLT-GZ10-40K-80CRI-CS1W*-DWH-IBAC120M20 (EM:E15WCP-BPK) OR EQUIVALENT	LED HIGH BAY; 0-10V, 120/277V DIMMING DRIVER ACRYLIC LENS; MEDIUM DISTRIBUTION; *CORD SET LENGTH BY CONTRACTOR; AIR CRAFT CABLE; EMERGENCY BATTERY PACK WHERE INDICATED ON DRAWINGS	CABLE SUSPENDED TO BOTTOM OF TRUSSES	166W	21067 LUMEN NOMINAL LED 4000K
LS- L6K	LITHONIA CPANL-2X4-40/50/60LM-40K-M2-2X4CFMK OR EQUIVALENT	LED RIGID FLAT PANEL; SURFACE MOUNT WITH DIRECT CEILING MOUNT ACCESSORY 0-10V, 120/277V DIMMING DRIVER;	SURFACE PROVIDED DIRECT CEILING MOUNT KIT	32/42/52W	4000/5000/6000 SWITCHABLE LUMEN NOMINAL LED 4000K
OW4- L8K	LITHONIA DSX1 LED-P2-30K-TFTM-MVOLT-WBA-HS-PIRH OR EQUIVALENT	AREA LED FIXTURE; WALL MOUNTED; TYPE 4 OPTICAL DISTRIBUTION MULTI-VOLT DIMMABLE DRIVER HOUSE-SIDE SHIELD; HIGH/LOW MOTION/AMBIENT SENSOR;	WALL	70W	8275 LUMEN NOMINAL LED 3000K
RL- L2K RL- L2K(B)	COOPER LIGHTING PORTFOLIO LD6B-20-D010TR-(EM:EM14) EU6B-1020-80-30 6LB-M-1-H-HSA6 OR EQUIVALENT	RECESSED CAN; LED LAMPING; CLEAR, OPEN, SEMI-SPECULAR CONE; 6" NOMINAL OPENING; SELF-FLANGED TO MATCH CONE; DIMMABLE PROVIDE SLOPE ADAPTER; PROVIDE EM BATTERY PACK WHERE NOTED ON DRAWINGS	RECESS	21.2 W	2000 LUMEN NOMINAL LED 3000K
S4- L5K S4- L5K(B)	LITHONIA CLX-L48-5000LM-SEF-FDL-MVOLT-GZ10-40K-80CRI-(EM:PS1050) OR EQUIVALENT	LED 4' LINEAR FIXTURE; 0-10V 120/277V DIMMABLE DRIVER FLAT DIFFUSE LENS PROVIDE EM BATTERY PACK WHERE NOTED ON DRAWINGS	SURFACE	34.8 W	5000 LUMEN NOMINAL LED 4000K
S8- 10K S8- 10K(B)	LITHONIA CLX-L96-10000LM-SEF-FDL-MVOLT-GZ10-40K-80CRI-(EM:PS1050) OR EQUIVALENT	LED 8' LINEAR FIXTURE; 0-10V 120/277V DIMMABLE DRIVER FLAT DIFFUSE LENS PROVIDE EM BATTERY PACK WHERE NOTED ON DRAWINGS	SURFACE	66.5 W	10000 LUMEN NOMINAL LED 4000K
WB- L5K	TERON LIGHTING VCYL48-L34=7-TE950-120/277-**-40K OR EQUIVALENT	DECORATIVE WALL BRACKET; UNIVERSAL-VOLTAGE, PROGRAM-START, ELECTRONIC BALLAST; PARTIAL UP-LIGHT	WALL ABOVE MIRROR	34.7W	4722 LUMEN NOMINAL LED 4000K

LIGHT FIXTURE ACCESSORY SCHEDULE

B	AS SPECIFIED	APPENDED TO FIXTURE TYPE; 1100 LUMEN EM BATTERY SUPPLY	AS SPECIFIED	PER FIXTURE TYPE

NOTES

-FIXTURE APPENDS ARE ADDED TO STANDARD FIXTURE TYPES. APPENDS ARE INTENDED TO MODIFY FIXTURE CATALOG NUMBERS GIVEN ABOVE AS NOTED IN APPEND DESCRIPTION

GENERAL DIAGRAM NOTES

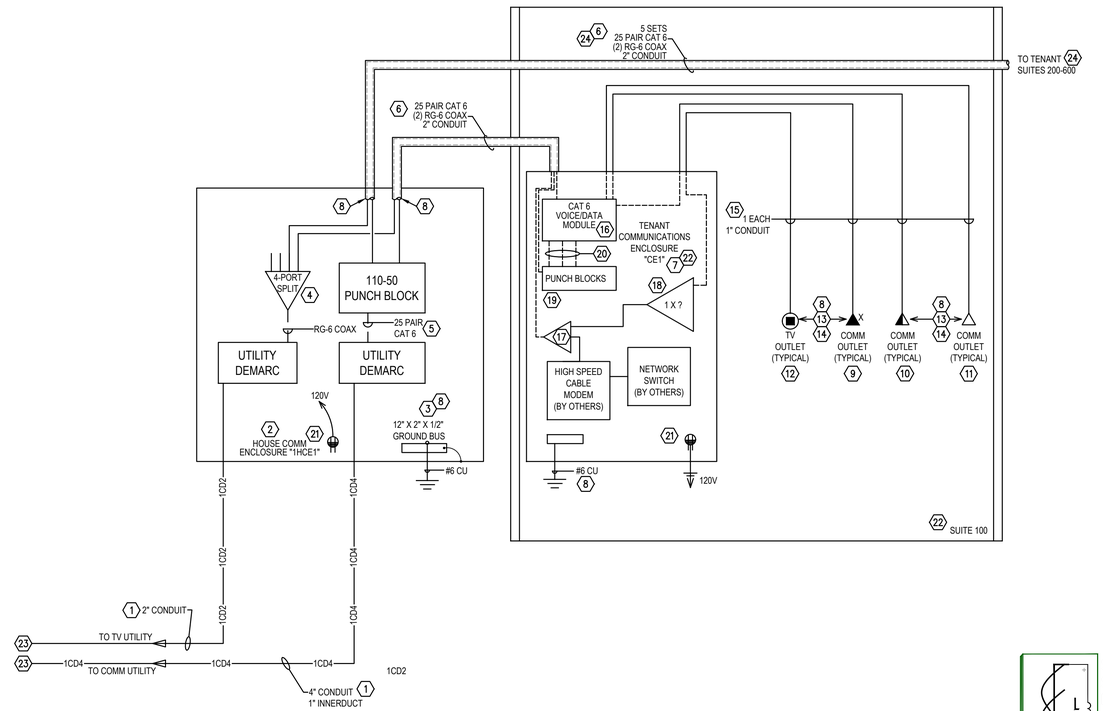
1. ALL INSTALLATIONS TO COMPLY WITH TIA/EIA STANDARD 586B FOR CAT 6 CABLE.
2. ALL STATION OUTLETS AND ASSOCIATED CABLING AND DATA RACKS, RACEWAYS, PUNCH BLOCKS, PATCH PANELS AND CROSS CONNECTS PROVIDED BY CONTRACTOR. ELECTRONICS BY OWNERS.
3. PROVIDE OWNER STANDARD OUTLET PLATES AT EACH OUTLET WITH PROVISIONS FOR FOUR JACKS IN EACH OUTLET. FILL UNUSED SPACES WITH BLANK INSERT.
4. FOLLOW OWNER'S IDENTIFICATION STANDARDS FOR ALL NEW INSTALLATIONS. COORDINATE WITH OWNER'S VOICE AND DATA PERSONNEL.
5. PROVIDE ONE PATCH CORD FOR EACH NEW CABLE/PORT INSTALLED. FIELD VERIFY LENGTHS, BUT ASSUME EQUAL QUANTITIES OF 2', 4', AND 10' CABLES FOR BID.
6. CONTRACTOR SHALL TEST ALL COPPER RUNS TO VERIFY dB LOSSES AND SHALL PROVIDE TEST RESULTS TO OWNER AND ENGINEER.
7. PROVIDE WIDE-SWEEP BENDS FOR ALL CONDUITS.
8. PROVIDE CONNECTORS WITH INSULATED THROATS OR PLASTIC BUSHINGS ON ALL CONDUIT ENDS.
9. ALL CABLING SHALL BE PLENUM RATED.

⬡ DIAGRAM KEYED NOTES

1. CONDUIT BY CONTRACTOR. CONDUCTORS BY UTILITY.
2. PROVIDE 36"x30" HINGED COVER, LOCKABLE ENCLOSURE WITH PLYWOOD BACKBOARD FOR UTILITY DEMARCATION.
3. PROVIDE PRE-DRILLED, CU GROUNDING BAR WITH STANDOFFS MOUNTED AT 12" AFF IN COMMUNICATIONS ENCLOSURE. PROVIDE #6 CU GROUND TO GROUNDING ELECTRODE SYSTEM. PROVIDE #6 BONDING CONDUCTORS TO ALL EQUIPMENT RACKS, CABLE-TRAYS, RACEWAYS, AND OTHER ASSOCIATED COMMUNICATIONS AND AUXILIARY SYSTEMS EQUIPMENT AS NECESSARY.
4. PROVIDE RG-6 CONNECTION TO UTILITY DEMARC. PROVIDE SPLITTER TO DISTRIBUTE TO TENANTS.
5. PROVIDE CONNECTIONS TO UTILITY DEMARC. PROVIDE PUNCH BLOCK FOR DISTRIBUTION TO TENANTS.
6. PROVIDE 2" CONDUIT TO TENANT SPACE. PROVIDE NEW CABLING AS INDICATED.
7. PROVIDE 42" STRUCTURED MEDIA CENTER (LEVITON 47605-42W OR EQUIVALENT) WITH HINGED COVER.
8. PROVIDE ELECTRICALLY BONDED RACEWAY SYSTEM - BOND COMM DEVICE CONDUITS TO COMM RACK, GROUND BUS, ETC. WHERE OUTLETS STUB TO ACCESSIBLE CEILING, BOND DEVICE BOX/CONDUIT TO ADJACENT ELECTRICAL OUTLET.
9. PROVIDE (3)DATA JACKS WITH (1)CAT 6 CABLE PER JACK FROM DATA RACK TO EACH COMPLETELY FILLED TRIANGLE OUTLET SHOWN ON FLOOR PLANS. WHERE OUTLETS HAVE A NUMERICAL SUPERSCRIPT, PROVIDE "X" QUANTITY OF JACKS AND CABLES WHERE "X" IS THE ASSOCIATED SUPERSCRIPT NUMBER.
10. PROVIDE (2)DATA JACKS WITH (1)CAT 6 CABLE PER JACK FROM DATA RACK TO EACH HALF-FILLED TRIANGLE OUTLET SHOWN ON FLOOR PLANS.
11. PROVIDE (1)DATA JACK WITH (1)CAT 6 CABLE FROM DATA RACK TO EACH EMPTY TRIANGLE OUTLET SHOWN ON FLOOR PLANS.
12. PROVIDE (2)F-CONNECTORS WITH (2)RG-6 COAX CABLES FROM TV DISTRIBUTION TO EACH TV OUTLET SHOWN ON PLAN. TV OUTLETS SHOWN ADJACENT TO COMMUNICATIONS OUTLETS MAY BE COMBINED INTO THE SAME OUTLET BOX .
13. PROVIDE OUTLET FOR EACH OUTLET. SEE ELECTRONIC SYSTEMS SHEETS, FOR LOCATIONS AND COUNTS. TV OUTLETS SHOWN ADJACENT TO COMM OUTLETS ON FLOOR PLAN MAY BE COMBINED INTO THE SAME BOX/RACEWAY/FACEPLATE.
14. PROVIDE 6-PORT, MODULAR FACEPLATE FOR EACH COMMUNICATIONS OR TV OUTLET SHOWN. PROVIDE ONE, CAT 6, RJ-45 JACK FOR EACH VOICE OR DATA CABLE TERMINATED IN OUTLET OR ONE F-CONNECTOR FOR EACH COAX CABLE. PROVIDE BLANK INSERTS FOR UNUSED PLATE OPENINGS.
15. PROVIDE CONDUIT FROM DEVICE TO ENCLOSURE. PROVIDE INSULATED THROAT CONNECTORS AND WIDE SWEEP BENDS FOR ALL CONDUIT RUNS.
16. PROVIDE CAT 6 MODULAR VOICE/DATA MODULES MOUNTED IN ENCLOSURE. PROVIDE QUANTITIES AS REQUIRED FOR COMMUNICATIONS OUTLETS PLUS MINIMUM 50% SPARE CAPACITY.
17. PROVIDE 2GHZ, 2-PORT SPLITTER FOR CATV/BROADBAND CONNECTIONS
18. PROVIDE SPLITTER TO DISTRIBUTE TO TV OUTLETS. PROVIDE PORTS FOR CURRENT DEVICES PLUS MINIMUM 50% SPARE CAPACITY.
19. PROVIDE 110 PUNCH BLOCK FOR INCOMING LINES.
20. PROVIDE CROSS-CONNECTS FROM PUNCH BLOCK TO PATCH MODULES AND BETWEEN PATCH MODULES FOR PHONE CONNECTIONS.
21. PROVIDE SURGE SUPPRESSOR OUTLET IN ENCLOSURE CIRCUITED AS SHOWN ON E301.
22. TYPICAL LAYOUT FOR EACH TENANT SUITE.
23. COMMUNICATION SERVICE HAS NOT BEEN COORDINATED WITH CORRESPONDING UTILITY. FIELD VERIFY WITH LOCAL UTILITY REPRESENTATIVE AND EXTEND CONDUIT TO PROPERTY LINE AS INDICATED BY UTILITY.
24. EXTEND TO EACH TENANT SPACE COMMUNICATION ENCLOSURE

COMMUNICATIONS RACEWAY SCHEDULE

SYMBOL	DESCRIPTION	MANUFACTURER	MODEL	ACCESSORIES
xCDy	CONDUIT; QUANTITY "X", DIAMETER "Y" AS INDICATED ON SYMBOL SCHEDULE	AS SPECIFIED		INSULATED THROAT CONNECTORS ON ALL ENDS; PULL STRING
OUTLET BOX	5" SQUARE X 2 7/8" DEEP 3/4" MUD RING (1 OR 2-GANG AS NOTED)	STEEL CITY STEEL CITY	82181T-1 SERIES 82C-*G-3/4 (OR EQUIVALENT)	



1 COMMUNICATIONS RISER DIAGRAM

SCALE: NTS

JOSEPH T. BECK ARCHITECT, INC.
497 EAST 520 SOUTH
SMITHFIELD , UTAH
(435) 764-6742

REGISTERED PROFESSIONAL ENGINEER
No. 294174
SHANE D. SWENSON
10/7/2019
STATE OF UTAH

DATE
OCT 7, 2019

PROJECT TITLE
SUNRAY PROPERTIES
NEW BUILDING PROJECT
42 WEST 300 NORTH
HYRUM, UTAH

SHEET TITLE
ELECTRICAL DETAILS

PROJECT NUMBER
SSE# 2019046

REVISIONS

SHEET NUMBER
E501

SINE SOURCE ENGINEERING
95 West Golf Course RD
Suite 102
Logan, Ut 84321
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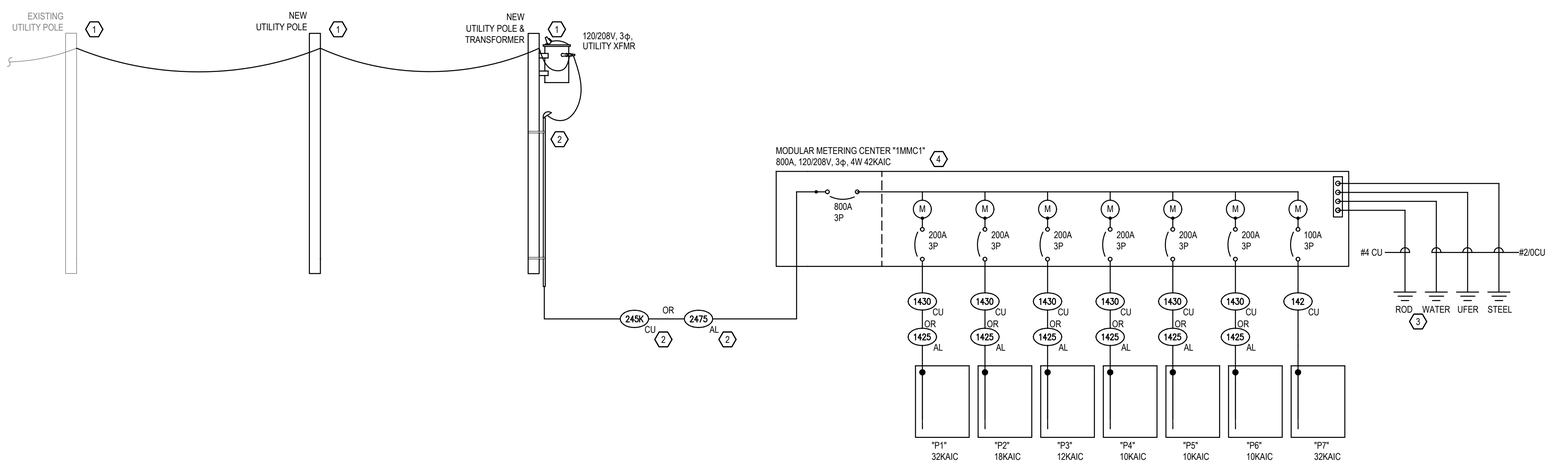
GENERAL SHEET NOTES

1. COMPLY WITH POWER UTILITY'S REQUIREMENTS FOR ALL UTILITY RELATED INSTALLATIONS. REVIEW CURRENT UTILITY STANDARDS MANUAL PRIOR TO BID. NOTIFY ENGINEER OF CONFLICTS PRIOR TO BID.
2. AIC RATINGS SHOWN INDICATE MINIMUM REQUIRED VALUES. SCCR RATINGS ARE TO MATCH OR EXCEED AIC RATINGS.
3. ALL CONDUCTORS ARE CONSIDERED TO BE COPPER UNLESS SPECIFICALLY NOTED OTHERWISE.
4. A FULL SIZE EQUIPMENT GROUNDING CONDUCTOR SIZED FOR THE OVERCURRENT PROTECTIVE DEVICE PROTECTING THE CIRCUIT IS REQUIRED IN EACH RACEWAY OR CABLE FOR PARALLELED CIRCUITS.
5. FIELD MARK SERVICE EQUIPMENT WITH AVAILABLE FAULT CURRENT AND CALCULATION DATE PER NEC 110.24(A).
6. RUN PORTIONS OF GROUNDING ELECTRODE CONDUCTORS NOT CONCEALED IN BUILDING FINISHES IN CONDUIT.

⬡ SHEET KEYED NOTES

1. COORDINATE LINE EXTENSION WITH LOCAL UTILITY REP.
2. SECONDARY CONDUIT, TRENCHING, AND BACKFILL BY CONTRACTOR. SECONDARY CONDUCTORS PROVIDED BY CONTRACTOR, INSTALLED BY UTILITY. PROVIDE RISER ON POWER POLE PER UTILITY REQUIREMENTS.
3. PROVIDE WATER & GROUND ROD GROUNDING ELECTRODE CONNECTIONS WHEN METALLIC WATERLINE ENTERS BUILDING, OTHERWISE OMIT.
4. PROVIDE FAULT CURRENT LABELING ON EQUIPMENT AS REQUIRED BY NEC 110.24.



1 ELECTRICAL ONE-LINE DIAGRAM

Scale: N.T.S.

PANEL P7 — TYPE NQOD — 3 Ø 4 WIRE 120/208 VOLTS — LOCATION: EXTERIOR — MOUNTING: X SURFACE

X NEW; EXISTING; 3R NEMA RATING; BOLT ON BREAKERS; ISOLATED GROUND BUS; 120KA SURGE PROTECT (SPD)

REMARKS HOUSE PANEL

125 AMP MAIN; 125 LUGS; BREAKER

No.	BRKR A	BRKR P	CIRCUIT DESCRIPTION	L	O	M	WIRE/CND P	WIRE/CND N	WIRE/CND G	WIRE/CND C	CIRC. LOAD	A	B	C	CIRC. LOAD	WIRE/CND P	WIRE/CND N	WIRE/CND G	WIRE/CND C	L	O	M	CIRCUIT DESCRIPTION	BRKR A	BRKR P	No.
1	20	1	EXTERIOR LIGHTING	14			10	10	10	3/4S	630	630				12S	12S	12S	3/4S	1			COMMUNICATION ENCLOSURE	20	1	2
3	20	1	SPARE										0			10	10	10	3/4S	1			FIRE MONITORING PANEL	20R	1	4
5	20	1	SPARE											0		12S	12S	12S	3/4S	1			EXTERIOR OUTLET	20	1	6
7	20	1	SPARE									0											SPARE	20	1	8
9	20	1	SPARE										0										SPARE	20	1	10
11	20	1	SPARE											0									SPARE	20	1	12
											TOTALS	630	0	0											

AIC SEE ONE-LINE; SCCR SEE ONE-LINE; PARALLEL RUNS SEE ONE-LINE

FEEDER SEE ONE-LINE — AMPS/PHASE 5 0 0

BREAKER CODES
A=ARC-FAULT; G=GROUND FAULT; H=HACR; L=LOCKING HANDLE; S=SHUNT TRIP; R=RED PAINTED HANDLE
WIRE CODES
I=ADD'L ISO GROUND TO MATCH SAFETY GROUND; S=UNLESS OTHERWISE SPECIFIED
GENERAL CODES
1LIN=SEE ONE-LINE DIAGRAM

PANEL P1,P6 — TYPE NQOD — 3 Ø 4 WIRE 120/208 VOLTS — LOCATION: TENANT SUITES 100,600 — MOUNTING: X SURFACE

X NEW; EXISTING; 1 NEMA RATING; BOLT ON BREAKERS; ISOLATED GROUND BUS; 120KA SURGE PROTECT (SPD)

REMARKS *TYPICAL PANEL SCHEDULE FOR PANELS P1, P6

225 AMP MAIN; 225 LUGS; BREAKER

No.	BRKR A	BRKR P	CIRCUIT DESCRIPTION	L	O	M	WIRE/CND P	WIRE/CND N	WIRE/CND G	WIRE/CND C	CIRC. LOAD	A	B	C	CIRC. LOAD	WIRE/CND P	WIRE/CND N	WIRE/CND G	WIRE/CND C	L	O	M	CIRCUIT DESCRIPTION	BRKR A	BRKR P	No.
1	20	1	LTG: UPPER LEVEL	8			12S	12S	12S	3/4S	1328	2228			900	12S	12S	12S	3/4S	5			PLUGS: UNDER MEZZ NORTH	20	1	2
3	20	1	LTG: MEZZANINE	12			12S	12S	12S	3/4S	798		1518		720	12S	12S	12S	3/4S	1			PLUGS: DRINKING FOUNTAIN	20	1	4
5	20	1	LTG: LOWER LEVEL	18		2	12S	12S	12S	3/4S	1004			1544	540	12S	12S	12S	3/4S	3			PLUGS: RESTROOM/JANITOR	20	1	6
7	20	1	SPARE									1500			1500	12S	12S	12S	3/4S			1	ELECTRIC WATER HEATER WH-1	20	1	8
9	20	1	COMMUNICATION ENCLOSURE	1			12S	12S	12S	3/4S	360		1884		1524	12S	12S	12S	3/4S			1	CONDENSING UNIT CU-1	20	2	10
11	20	1	PLUGS: MEZZ NORTH	4			12S	12S	12S	3/4S	720			2244	1524	12S						1	-	-	-	12
13	20	1	PLUGS: MEZZ SOUTH	4			12S	12S	12S	3/4S	720	720				12S	12S	12S	3/4S				PLUGS: OFFICE	20	1	14
15	20	1	FURNACE				12S	12S	12S	3/4S	720		720			12S	12S	12S	3/4S				PLUGS: UNDER MEZZ SOUTH	20	1	16
17	20	1	UNIT HEATER				12S	12S	12S	3/4S	720			720		12S	12S	12S	3/4S				PLUGS:OPEN AREA	20	1	18
19	20	1	OVER HEAD GARAGE DOOR				12S	12S	12S	3/4S	720	720											SPARE	20	1	20
21	20	1	SPARE										0										SPARE	20	1	22
23	20	1	SPARE											0									SPARE	20	1	24
25	20	1	SPARE									0											SPARE	20	1	26
27	20	1	SPARE										0										SPARE	20	1	28
29	20	1	SPARE											0									SPARE	20	1	30
31	20	1	SPARE									0											SPARE	20	1	32
33	20	1	SPARE										0										SPARE	20	1	34
35	20	1	SPARE											0									SPARE	20	1	36
37	20	1	SPARE									0											SPARE	20	1	38
39	20	1	SPARE										0										SPARE	20	1	40
41	20	1	SPARE											0									SPARE	20	1	42
											TOTALS	5168	4122	4508											

AIC SEE ONE-LINE; SCCR SEE ONE-LINE; PARALLEL RUNS SEE ONE-LINE

FEEDER SEE ONE-LINE — AMPS/PHASE 43 34 38

BREAKER CODES
A=ARC-FAULT; G=GROUND FAULT; H=HACR; L=LOCKING HANDLE; S=SHUNT TRIP; R=RED PAINTED HANDLE
WIRE CODES
I=ADD'L ISO GROUND TO MATCH SAFETY GROUND; S=UNLESS OTHERWISE SPECIFIED
GENERAL CODES
1LIN=SEE ONE-LINE DIAGRAM

MECHANICAL EQUIPMENT SCHEDULE

SYM	DESCRIPTION	LOAD	VOLTS	PHASE	FIRE ALARM SHUTDOWN	CONTROL CIRCUITS BY	* STARTER BY	SAFETY DISCONNECT BY	REMARKS
CU- 1	CONDENSING UNIT	12.7 MCA	208V	1	NO	MECH	EQUIP	ELEC	TYPICAL; SEE DRAWINGS FOR COUNT.
CU- 2	CONDENSING UNIT	12.7 MCA	208V	1	NO	MECH	EQUIP	ELEC	TYPICAL; SEE DRAWINGS FOR COUNT.
EF- 1	EXHAUST FAN	113 W	120V	1	NO	ELEC	EQUIP	ELEC	TYPICAL; SEE DRAWINGS FOR COUNT. INTEGRATE EXHAUST FAN INTO LIGHTING CONTROL OF ROOM SERVED.
EF- 2	EXHAUST FAN	49 W	120V	1	NO	ELEC	EQUIP	ELEC	TYPICAL; SEE DRAWINGS FOR COUNT. INTEGRATE EXHAUST FAN INTO LIGHTING CONTROL OF ROOM SERVED.
F- 1	FURNACE	1/2 HP	120V	1	NO	MECH	MECH	ELEC	TYPICAL; SEE DRAWINGS FOR COUNT.
F- 2	FURNACE	1/3 HP	120V	1	NO	MECH	MECH	ELEC	TYPICAL; SEE DRAWINGS FOR COUNT.
UH- 1	UNIT HEATER	1/2 HP	120V	1	NO	MECH	EQUIP	ELEC	TYPICAL; SEE DRAWINGS FOR COUNT.
WH- 1	ELECTRIC WATER HEATER	1.5 KW	120V	1	NO	MECH	EQUIP	ELEC	TYPICAL; SEE DRAWINGS FOR COUNT. PROVIDE CORD AND PLUG

* ELECTRICAL CONTRACTOR VERIFY SINGLE SPEED OR TWO SPEED STARTERS WITH MECHANICAL DRAWINGS.

PANEL P2,P3,P4,P5 — TYPE NQOD — 3 Ø 4 WIRE 120/208 VOLTS — LOCATION: TENANT SUITES 200,300 400,500 — MOUNTING: X SURFACE

X NEW; EXISTING; 1 NEMA RATING; BOLT ON BREAKERS; ISOLATED GROUND BUS; 120KA SURGE PROTECT (SPD)

REMARKS *TYPICAL PANEL SCHEDULE FOR PANELS P2, P3, P4, P5

225 AMP MAIN; 225 LUGS; BREAKER

No.	BRKR A	BRKR P	CIRCUIT DESCRIPTION	L	O	M	WIRE/CND P	WIRE/CND N	WIRE/CND G	WIRE/CND C	CIRC. LOAD	A	B	C	CIRC. LOAD	WIRE/CND P	WIRE/CND N	WIRE/CND G	WIRE/CND C	L	O	M	CIRCUIT DESCRIPTION	BRKR A	BRKR P	No.
1	20	1	LTG: UPPER LEVEL	11			12S	12S	12S	3/4S	1826	2366			540	12S	12S	12S	3/4S			3	PLUGS: OPEN AREA	20	1	2
3	20	1	LTG: LOWER LEVEL	5		2	12S	12S	12S	3/4S	520		1060		540	12S	12S	12S	3/4S			3	PLUGS: OPEN AREA	20	1	4
5	20	1	SPARE											0									SPARE	20	1	6
7	20	1	SPARE									1500			1500	12S	12S	12S	3/4S			1	ELECTRIC WATER HEATER WH-1	20	1	8
9	20	1	COMMUNICATION ENCLOSURE		1		12S	12S	12S	3/4S	360		1884		1524	12S	12S	12S	3/4S			1	CONDENSING UNIT CU-2	20	2	10
11	20	1	SPARE											1524	1524	12S						1	-	-	-	12
13	20	1	SPARE									1080			1080	12S	12S	12S	3/4S		6		PLUGS: OPEN AREA	20	1	14
15	20	1	FURNACE			1	12S	12S	12S	3/4S	720		1440		720	12S	12S	12S	3/4S		1		PLUGS: DRINKING FOUNTAIN	20	1	16
17	20	1	UNIT HEATER			1	12S	12S	12S	3/4S	720			2160	1440	12S	12S	12S	3/4S		4		PLUGS: OFFICE	20	1	18
19	20	1	SPARE																				SPARE	20	1	20
21	20	1	SPARE										0										SPARE	20	1	22
23	20	1	OVER HEAD GARAGE DOOR			1	12S	12S	12S	3/4S	720		720										SPARE	20	1	24
25	20	1	SPARE									0											SPARE	20	1	26
27	20	1	SPARE										0										SPARE	20	1	28
29	20	1	SPARE											0									SPARE	20	1	30
31	20	1	SPARE									0											SPARE	20	1	32
33	20	1	SPARE										0										SPARE	20	1	34
35	20	1	SPARE											0									SPARE	20	1	36
37	20	1	SPARE									0											SPARE	20	1	38
39	20	1	SPARE										0										SPARE	20	1	40
41	20	1	SPARE											0									SPARE	20	1	42
											TOTALS	4946	4384	4404											

AIC SEE ONE-LINE; SCCR SEE ONE-LINE; PARALLEL RUNS SEE ONE-LINE

FEEDER SEE ONE-LINE — AMPS/PHASE 41 37 37

BREAKER CODES
A=ARC-FAULT; G=GROUND FAULT; H=HACR; L=LOCKING HANDLE; S=SHUNT TRIP; R=RED PAINTED HANDLE
WIRE CODES
I=ADD'L ISO GROUND TO MATCH SAFETY GROUND; S=UNLESS OTHERWISE SPECIFIED
GENERAL CODES
1LIN=SEE ONE-LINE DIAGRAM

CONDUCTOR AND CONDUIT SCHEDULE

SIZE OF CONDUCTORS; QUANTITY OF PHASE/NEUTRAL CONDUCTORS; QUANTITY OF PARALLEL RUNS; SCHEDULE NUMBER; CONDUCTOR MATERIAL; SUBSCRIPTS (SEE NOTE 5)

SYM	AMP CU	AMP AL	CONDUIT QTY	CONDUIT SIZE	CONDUCTOR (NOTE 1,6,7) QTY	SIZE P/N	G CU	G AL	IG CU	IG AL	SE (NOTE 4) CU	SE (NOTE 4) AL	NOTES
1 2 12	20	N/A	1	3/4"	2	12	12	N/A	12	N/A	8	N/A	2
1 3 12					3								2,3
1 4 12					4								2,3
1 2 0	30				2	10	10		10				2
1 3 0					3								2
1 4 0					4								2
1 2 8	40			1"	2	8			8				2
1 3 8					3								2
1 4 8					4								2
1 2 6	55				2	6			6				2
1 3 6					3								2
1 4 6				1.25"	4								2
1 2 4	70	55			2	4	8	6	4	4			2
1 3 4					3								2
1 4 4			1		4								2
1 2 3	85	65			2	3			3	3			2
1 3 3					3								2
1 4 3					4								2
1 3 2	95	75			3	2			2	2		6	2
1 4 2				1.5"	4								2
1 3 1	130	100			3	1	6				6		2
1 4 1					4								2,8
1 3 10	150	120		2"	3	1/0		4		1			2
1 4 10					4								2
1 3 20	175	135			3	2/0					4	4	2
1 4 20					4								2
1 3 30	200	155			3	3/0							2
1 4 30				2.5"	4								2
1 3 40	230	180			3	4/0	4		1		2	2	2
1 4 40					4								2
1 3 25	255	205			3	250		2		2/0			2
1 4 25				3"	4								2,8
1 3 3K	285	230			3	300						1/0	2,8
1 4 3K					4								2
1 3 35	310	250			3	350	3		1/0				2
1 4 35					4								2,8
1 3 4K	335	270		3.5"	3	400					1/0		2
1 4 4K					4								2
1 3 5K	380	310		4"	3	500		1		3/0			2,4
1 4 5K					4								2,4
1 3 75	475	385			3	750	2		2/0		2/0	3/0	2,4
1 4 75					4								2,4
2 3 30	400	310	2	2"	3	3/0	3	1	1/0	3/0	2	1/0	2,4
2 4 30				2.5"	4								2,4
2 3 40	460	360			3	4/0	2		2/0		1/0		2,4
2 4 40					4								2,4
2 3 25	510	410			3	250	1	1/0	3/0	4/0			2,4
2 4 25				3"	4								2,4,8
2 3 3K	570	460			3	300						3/0	2,4,8
2 4 3K					4								2,4
2 3 35	620	500	2	3"	3	350	1/0	1/0	4/0	4/0	2/0	3/0	2,4
2 4 35					4								2,4,8
2 3 4K	670	540		3.5"	3	400		2/0					2,4
2 4 4K					4								2,4
2 3 5K	760	620		4"	3	500		3/0		300		4/0	2,4
2 4 5K					4								2,4
2 3 75	950	770			3	750					4/0		2,4
2 4 75					4								2,4

CONDUIT AND CONDUCTOR SCHEDULE NOTES

1. CONDUCTORS SHOWN ARE SHOWN FOR EACH CONDUIT WITH MODIFICATIONS AS NOTED IN NOTE #5. ALL CONDUCTORS SHOWN ARE THWN FOR CU OR THWN OR XHHW FOR AL UNLESS OTHERWISE NOTED.
2. PROVIDE EQUIPMENT GROUNDING CONDUCTORS PER NEC TABLE 250-122 WHEN CIRCUIT BREAKERS ARE SIZED GREATER THAN AMPERE RATING SHOWN IN TABLE.
3. PROVIDE #10 NEUTRALS FOR MULTIWIRE BRANCH CIRCUITS SERVING COMPUTERS.
4. GROUND (G) CONDUCTOR MAY BE DELETED ON SERVICE ENTRANCE CONDUCTORS.
5. SYMBOL SUBSCRIPTS;
   - "IG": INCLUDE IG (INSULATED/ISOLATED GROUND CONDUCTOR) SCHEDULED ALONG WITH THE GROUND OF EQUIPMENT GROUND CONDUCTOR.
   - "SE": SUBSTITUTE "SE" CONDUCTOR FOR "G" CONDUCTOR SHOWN, WHICH IS SIZED FOR THE GROUNDING OF THE SECONDARY OF THE SEPARATELY DERIVED SYSTEM.
   - "2N": INCLUDE TWO NEUTRAL CONDUCTORS, SIZED AS SCHEDULED FOR PHASED AND NEUTRAL CONDUCTORS.
   - "R": RACEWAY ONLY. CONDUCTORS PROVIDED BY UTILITY.
   - "V": PHASE AND NEUTRAL CONDUCTORS UPSIZED FOR VOLTAGE DROP. UPSIZE GROUNDING CONDUCTOR(G) PER NEC 250.122(B).
   - "A": ALUMINUM CONDUCTORS ALLOWED FOR FEEDER INDICATED. ALUMINUM CONDUCTORS ARE NOT TO BE USED FOR CONNECTIONS TO MOTORS OR MOTOR DRIVEN EQUIPMENT.
6. A FULL SIZE GROUNDING CONDUCTOR (SE OR G AND/OR IG) SHALL BE INSTALLED IN EACH RACEWAY OR CABLE FOR PARALLELED CIRCUITS.
7. GROUNDING CONDUCTORS (G, IG, AND SE) SHALL BE OF THE SAME CONDUCTOR MATERIAL AS THE CORRESPONDING PHASE CONDUCTORS TO KEEP TABLE CALCULATIONS IN 7. ACCORDANCE WITH NEC REQUIREMENTS.
8. INCREASE CONDUIT TO NEXT LARGEST STANDARD CONDUIT SIZE WHEN IG IS USED.

* -CONDUIT SIZED FOR COMPACT ALUMINUM CONDUCTORS. USE COPPER CONDUIT SIZE FOR STANDARD SIZE CONDUCTORS

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497 EAST 520 SOUTH
SMITHFIELD , UTAH
(435) 764-6742

REGISTERED PROFESSIONAL ENGINEER — No. 294174 — SHANE D. SWENSON — 10/7/2019 — STATE OF UTAH

DATE
OCT 7, 2019

PROJECT TITLE
SUNRAY PROPERTIES
NEW BUILDING PROJECT
42 WEST 300 NORTH
HYRUM, UTAH

SHEET TITLE
ELECTRICAL ONE-LINE DIAGRAM

PROJECT NUMBER
SSE# 2019046

REVISIONS

SHEET NUMBER
E601